Motors | Automation | Energy | Transmission & Distribution | Coatings

Medium Voltage Frequency Inverter

MVW3000

Programming Manual

Programming Manual

Series: MVW3000

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Version	Review	Description
1.0X	00	First edition
	01	New parameters, faults and alarms New voltage and current models Addition of the Ride-through function for scalar control mode
1.2X	02	Cell parallelism support Redundant cell support
1.3X	03	Monitoring and protection of multiple transformers Output contactor for operation with sinusoidal filter Inclusion of the synchronous motor line
1.4X	04	Update for HMIG3 Inclusion of communication networks PLC application watchdog Alternative speed reference for PLC Maximum output voltage setting Calculation of instantaneous values (maximum, minimum, and average) of DC bus voltages

Contents

1 QUICK REFERENCE OF PARAMETERS AND FAULTS

Software: V1.4X
Application:
Model:
Serial number:
Responsible:
Date: / / .

1.1 PARAMETERS

Param.	Description	Adjustable range	Factory setting	Page
P0001	Motor speed reference	Read-only parameter (1 rpm)	-	5-2
P0002	Motor speed	Read-only parameter (1 rpm)	-	5-2
P0003	Motor current	Read-only parameter (0.1 A)	-	5-2
P0004	DC link voltage - average value	Read-only parameter (1 V)	-	5-2
P0005	Motor frequency	Read-only parameter (0.1 Hz)	-	5-2
P0006	VFD status	Read-only parameter	-	5-2
P0009	Motor torque	Read-only parameter (0.1 %)	-	5-4
P0010	Inverter output power	Read-only parameter (1 kW)	-	5-5
P0012	Digital inputs DI1 to DI10 status	Read-only parameter	-	5-5
P0013	Digital outputs DO1 to RL5 status	Read-only parameter	-	5-5
P0018	Value of analog input AI1	Read-only parameter (0.1 %)	-	5-6
P0019	Value of analog input AI2	Read-only parameter (0.1 %)	-	5-6
P0020	Value of analog input AI3	Read-only parameter (0.1 %)	-	5-6
P0021	Value of analog input AI4	Read-only parameter (0.1 %)	-	5-6
P0022	Temperature on MVC3 board	Read-only parameter (0.1 °C)	-	5-6
P0023	MVC4 board	Read-only parameter	-	5-6
P0025	Iv current	Read-only parameter (0.1 A)	-	5-6
P0026	Iw current	Read-only parameter (0.1 A)	-	5-6
P0027	Iu current	Read-only parameter (0.1 A)	-	5-6
P0028	Value of analog input AI5	Read-only parameter (0.1 %)	-	5-7
P0030	Thermal protection relay 1 - Temperature CH1	-50 to 300 °C	0 °C	5-7
P0031	Thermal protection relay 1 - Temperature CH2	-50 to 300 °C	0 °C	5-7
P0032	Thermal protection relay 1 - Temperature CH3	-50 to 300 °C	0 °C	5-7
P0033	Thermal protection relay 1 - Temperature CH4	-50 to 300 °C	0 °C	5-7
P0034	Thermal protection relay 1 - Temperature CH5	-50 to 300 °C	0 °C	5-7
P0035	Thermal protection relay 1 - Temperature CH6	-50 to 300 °C	0 °C	5-7
P0036	Thermal protection relay 1 - Temperature CH7	-50 to 300 °C	0 °C	5-7
P0037	Thermal protection relay 1 - Temperature CH8	-50 to 300 °C	0 °C	5-7

Param.	Description	Adjustable range	Factory setting	Page
P0038	Encoder speed	Read-only parameter (1 rpm)	-	5-7
P0040	Value of process variable (PID)	Read-only parameter (0.1 %)	-	5-8
P0042	Time powered counter	Read-only parameter (1 h)	-	5-8
P0043	Time enabled counter	Read-only parameter (0.1 h)	-	5-8
P0044	MWh Counter	Read-only parameter (1 MWh)	-	5-8
P0045	HMI	Read-only parameter	-	5-8
P0066	MVC3 board - CPU	Read-only parameter	-	5-9
P0068	Present Error	Read-only parameter	-	5-9
P0070	Status of the MVC3 board digital inp. DI1, DI2, ..., DI16	Read-only parameter	-	5-9
P0071	Status of MVC3 board relay digital outputs RL1 to RL8	Read-only parameter	-	5-9
P0076	i x t Overload	Read-only parameter (0.1 %)	-	5-10
P0077	Motor field current	Read-only parameter (0.1 A)	-	5-10
P0078	Brushless synchronous motor voltage	Read-only parameter (1 V)	-	5-10
P0079	Synchronous motor shaft position	Read-only parameter (1 °)	-	5-10
P0100	Acceleration time	0.0 to 999.0 s	100.0 s	5-11
P0101	Deceleration time	0.0 to 999.0 s	180.0 s	5-11
P0102	Acceleration time 2nd ramp	0.0 to 999.0 s	100.0 s	5-11
P0103	Deceleration time 2nd ramp	0.0 to 999.0 s	180.0 s	5-11
P0104	S Ramp	0.0 to 100.0 %	0.0 %	5-11
P0119	Reactive power reference for the FP control	-99.99 to 99.99 %	0.00 %	5-12
P0120	Reference Backup	0 = Inactive 1 = Active	1	5-13
P0121	HMI speed reference	0 to 7200 rpm	90 rpm	5-13
P0122(2)	Speed reference for JOG or JOG+	0 to 8192 rpm	150 rpm	5-13
P0123(2)	Speed reference for JOG-	0 to 8192 rpm	150 rpm	5-13
P0124(2)	Multispeed reference 1	0 to 4095 rpm	90 rpm	5-14
P0125(2)	Multispeed reference 2	0 to 4095 rpm	300 rpm	5-14
P0126(2)	Multispeed reference 3	0 to 4095 rpm	600 rpm	5-14
P0127(2)	Multispeed reference 4	0 to 4095 rpm	900 rpm	5-14
P0128(2)	Multispeed reference 5	0 to 4095 rpm	1200 rpm	5-14
P0129(2)	Multispeed reference 6	0 to 4095 rpm	1500 rpm	5-14
P0130(2)	Multispeed reference 7	0 to 4095 rpm	1800 rpm	5-14
P0131(2)	Multispeed reference 8	0 to 4095 rpm	1650 rpm	5-14
P0132	Maximum overspeed level	0 to 100 %	10 %	5-16
P0133(2)	Minimum speed reference	0 to 7200 rpm	90 rpm	5-16
P0134(2)	Maximum speed reference	0 to 7200 rpm	1800 rpm	5-16

Param.	Description	Adjustable range	Factory setting	Page
P0136	Addition on the manual torque curve (IxR)	0 to 100	0	5-17
P0137	Addition on the automatic torque curve	0 to 1000	0	5-18
P0138(2)	Rated slip	-10.00 to 10.00 %	0.00 %	5-19
P0139	Output current filter	0.0 to 16.0 s	0.2 s	5-20
P0142	Maximum Voltage	0.0 to 100.0 %	100.0 %	5-21
P0143	Intermediate output voltage	0.0 to 100.0 %	50.0 %	5-21
P0144	Output voltage at 3 Hz	0.0 to 100.0 %	8.0 %	5-21
P0145(2)	Field weakening speed	0 to 7200 rpm	1800 rpm	5-21
P0146(2)	Intermediate speed	90 to 7200 rpm	900 rpm	5-21
P0150(1)	DC link voltage regulation mode	0 = Ramp hold 1 = DC Bus Regulation 2 = DC bus reg. with maximum flux	0	5-22
P0151(4)	DC Link voltage regulation actuation level	1071 to 1200 V	1118 V	5-22
P0152	Proportional gain of the DC link voltage regulator	0.00 to 9.99	0.00	5-23
P0156(2)(5)	Overload current at 100 %	0.0 to 1080.0 A	990.0 A	5-24
P0157(2)(5)	Overload current at 50 %	0.0 to 1080.0 A	810.0 A	5-24
P0158(2)(5)	Overload current at 5 %	0.0 to 1080.0 A	450.0 A	5-24
P0159	Temperature alarm I x t	0 to 100 %	80 %	5-25
P0161	Speed regulator proportional gain	0.0 to 200.0	20.0	5-25
P0162	Integration constant of the speed regulator	1 to 9999	100	5-25
P0163	Local reference offset	-999 to 999	0	5-26
P0164	Remote reference offset	-999 to 999	0	5-26
P0165	Time constant of the measured speed filter	0.001 to 1.000 s	0.012 s	5-26
P0167	Current regulator proportional gain	0.000 to 9.999	0.080	5-26
P0168	Current regulator Integral gain	0.1 to 999.9	12.3	5-26
P0169(5)	Maximum output current	0.0 to 1350.0 A	1035.0 A	5-26
P0170	Maximum reverse torque current	0 to 250 %	105 %	5-27
P0171	Maximum current of forward torque	0 to 250 %	105 %	5-27
P0175	Flux regulator proportional gain on the motor	0.0 to 999.9	50.0	5-27
P0176(3)	Integration const. of the flux regulator on the mot.	1 to 9999	900	5-27
P0177	Minimum flux on the motor	0 to 120 %	0 %	5-28
P0178	Rated flux on the motor	0 to 120 %	100 %	5-28
P0179	Maximum flux on the motor	0 to 200 %	120 %	5-28
P0180	Starting point of the field weakening	0 to 120 %	90 %	5-28
P0181(1)	Magnetization mode	0 = General enable 1 = Start/Stop	0	5-28
P0182	Flux ref. regulator proportional gain on the mot.	0.00 to 99.99	0.20	5-29
P0183	Flux ref. regulator integral gain on the motor	1 to 9999	25	5-29

Param.	Description	Adjustable range	Factory setting	Page
P0202(1)(2)	Control Type	0 = V/F 60 Hz 1 = V/F 50 Hz 2 = Adjustable V/F 3 = Sensorless Vector 4 = Vector with Encoder	0	5-29
P0203(1)	Special function selection	0 = None 1 = PID regulator	0	5-30
P0204(1)	Load/Save Parameters	0 = Not Used 1 = Reserved 2 = Reserved 3 = Reset enab. time count. (P0043) 4 = Reset MWh counter (P0044) 5 = Load factory default values	0	5-31
P0206	Auto-reset time after fault	0 to 255 s	0 s	5-31
P0208(2)	Reference scale factor	1 to 18000	1800	5-31
P0209(1)	Motor phase loss detection	0 = Inactive 1 = Active	0	5-32
P0211	Disable by zero speed (Stop Logic)	0 = Inactive 1 = Active	1	5-33
P0212	Condition for disabable output by zero speed	0 = P0001 (N*) > P0291 or P0002 (N) > P0291 1 = P0001 (N*) > 0	0	5-33
P0213	Time delay for zero speed disable	0 to 999 s	0 s	5-33
P0214(6)(7)	Line phase loss detection	0 = Inactive 1 = Active	0	5-33
P0220(1)	LOCAL/REMOTE selection source	0 = Always LOC 1 = Always REM 2 = Service HMI (LOC) 3 = Service HMI (REM) 4 = Digital Inputs DI2...DI10 5 = Serial (LOC) 6 = Serial (REM) 7 = Fieldbus (LOC) 8 = Fieldbus (REM) 9 = PLC (LOC) 10 = PLC (REM) 11 = HMI (LOC) 12 = HMI (REM)	11	5-34
P0221(1)	Speed reference selection LOCAL situation	0 = Service HMI 1 = Analog input AI1 2 = Analog input AI2 3 = Analog input AI3 4 = Analog input AI4 5 = Sum (AI1 + AI2) > 0 6 = Sum (AI1 + AI2) 7 = Electronic potentiometer 8 = Multispeed 9 = Serial 10 = Fieldbus 11 = Analog input AI5 12 = PLC 13 = HMI	13	5-35

Param.	Description	Adjustable range	Factory setting	Page
P0222(1)	Speed reference selection REMOTE situation	0 = Service HMI 1 = Analog input AI1 2 = Analog input AI2 3 = Analog input AI3 4 = Analog input AI4 5 = Sum (AI1 + AI2) > 0 6 = Sum (AI1 + AI2) 7 = Electronic potentiometer 8 = Multispeed 9 = Serial 10 = Fieldbus 11 = Analog input AI5 12 = PLC 13 = HMI	0	5-35
P0223(1)	Forward/Reverse Selection LOCAL Situation	0 = Always forward 1 = Always reverse 2 = Service HMI (Forward) 3 = Service HMI (Reverse) 4 = Digital Input DI2 5 = Serial (Forward) 6 = Serial (Reverse) 7 = Fieldbus (Forward) 8 = Fieldbus (Reverse) 9 = AI4 Polarity 10 = PLC (Forward) 11 = PLC (Reverse) 12 = HMI (Forward) 13 = HMI (Reverse)	12	5-35
P0224(1)	Start/Stop Selection LOCAL Situation	0 = Service HMI 1 = Digital input DIx 2 = Serial 3 = Fieldbus 4 = PLC 5 = HMI	5	5-36
P0225(1)	Selection of JOG Source LOCAL Situation	0 = Disable 1 = Service HMI 2 = Digital inputs DI3 to DI10 3 = Serial 4 = Fieldbus 5 = PLC 6 = HMI	6	5-36
P0226(1)	Selection of Direction of ROTATION REMOTE Situation	0 = Always forward 1 = Always reverse 2 = Service HMI (Forward) 3 = Service HMI (Reverse) 4 = Digital Input DI2 5 = Serial (Forward) 6 = Serial (Reverse) 7 = Fieldbus (Forward) 8 = Fieldbus (Reverse) 9 = AI4 Polarity 10 = PLC (Forward) 11 = PLC (Reverse) 12 = HMI (Forward) 13 = HMI (Reverse)	2	5-37
P0227(1)	Start/Stop Selection REMOTE Situation	0 = Service HMI 1 = Digital input DIx 2 = Serial 3 = Fieldbus 4 = PLC 5 = HMI	0	5-37
P0228(1)	JOG Selection - REMOTE Situation	0 = Disable 1 = Service HMI 2 = Digital inputs DI3 to DI10 3 = Serial 4 = Fieldbus 5 = PLC 6 = HMI	1	5-38

Param.	Description	Adjustable range	Factory setting	Page
P0231	Actuation in the transition between LOC and REM for the HMI	0 = It keeps the motor state 1 = It keeps the HMI state 2 = It turns off the motor	0	5-42
P0232	Stop Selection	0 = Run/Stop 1 = General disable	0	5-42
P0233	Dead Zone	0 = Inactive 1 = Active	1	5-43
P0234	Analog input AI1 gain	0.000 to 9.999	1.000	5-44
P0235(1)	AI1 Signal Type	0 = (0 to 10) V/(0 to 20) mA 1 = (4 to 20) mA 2 = (10 to 0) V/(20 to 0) mA 3 = (20 to 4) mA	0	5-44
P0236	Analog input AI1 offset	-100.0 to 100.0 %	0.0 %	5-45
P0237(1)	AI2 signal function	0 = P0221/P0222 1 = Not Used 2 = Maximum torque current 3 = PID process variable	0	5-45
P0238	Analog input AI2 gain	0.000 to 9.999	1.000	5-45
P0239(1)	AI2 Signal Type	0 = (0 to 10) V/(0 to 20) mA 1 = (4 to 20) mA 2 = (10 to 0) V/(20 to 0) mA 3 = (20 to 4) mA 4 = (-10 to +10) V	0	5-46
P0240	Analog input AI2 offset (bipolar MVC4 board)	-100.0 to 100.0 %	0.0 %	5-46
P0241(1)	AI3 signal function	0 = P0221/P0222 1 = Not Used 2 = Maximum torque current 3 = PID process variable	0	5-46
P0242	Analog input AI3 gain	0.000 to 9.999	1.000	5-47
P0243(1)	AI3 Signal Type	0 = (0 to 10) V/(0 to 20) mA 1 = (4 to 20) mA 2 = (10 to 0) V/(20 to 0) mA 3 = (20 to 4) mA	0	5-47
P0244	Analog input AI3 offset	-100.0 to 100.0 %	0.0 %	5-48
P0245	Analog input AI4 gain	0.000 to 9.999	1.000	5-48
P0246(1)	AI4 Signal Type	0 = (0 to 10) V/(0 to 20) mA 1 = (4 to 20) mA 2 = (10 to 0) V/(20 to 0) mA 3 = (20 to 4) mA 4 = (-10 to +10) V	0	5-48
P0247	Analog input AI4 offset	-100.0 to 100.0 %	0.0 %	5-48
P0248	Analog input AI2 filter	0.0 to 16.0 s	0.0 s	5-49

Param.	Description	Adjustable range	Factory setting	Page
P0251	AO1 Function	0 = Motor speed reference 1 = Total reference 2 = Motor speed 3 = Reserved 4 = Reserved 5 = Motor current 6 = Value of process variable (PID) 7 = Output active current 8 = Inverter output power 9 = PID Reference 10 = Reserved 11 = Reserved 12 = Reserved 13 = Reserved 14 = Reserved 15 = Reserved 16 = Reserved 17 = Reserved 18 = Reserved 19 = Inverter temperature 20 = PLC 21 = Output voltage	2	5-49
P0252	Analog output AO1 gain	0.000 to 9.999	1.000	5-49
P0253	AO2 Function	0 = Motor speed reference 1 = Total reference 2 = Motor speed 3 = Reserved 4 = Reserved 5 = Motor current 6 = Value of process variable (PID) 7 = Output active current 8 = Inverter output power 9 = PID Reference 10 = Reserved 11 = Reserved 12 = Reserved 13 = Reserved 14 = Reserved 15 = Reserved 16 = Reserved 17 = Reserved 18 = Reserved 19 = Inverter temperature 20 = PLC 21 = Output voltage	5	5-49
P0254	Analog output AO2 gain	0.000 to 9.999	1.000	5-49
P0255	AO3 Function	0 = Motor speed reference 1 = Total reference 2 = Motor speed 3 = Reserved 4 = Reserved 5 = Motor current 6 = Value of process variable (PID) 7 = Output active current 8 = Inverter output power 9 = PID Reference 10 = Reserved 11 = Reserved 12 = Reserved 13 = Reserved 14 = Reserved 15 = Reserved 16 = Reserved 17 = Reserved 18 = Reserved 19 = Inverter temperature 20 = PLC 21 = Output voltage	2	5-50
P0256	Analog output AO3 gain	0.000 to 9.999	1.000	5-50

Param.	Description	Adjustable range	Factory setting	Page
P0257	AO4 Function	0 = Motor speed reference 1 = Total reference 2 = Motor speed 3 = Reserved 4 = Reserved 5 = Motor current 6 = Value of process variable (PID) 7 = Output active current 8 = Inverter output power 9 = PID Reference 10 = Reserved 11 = Reserved 12 = Reserved 13 = Reserved 14 = Reserved 15 = Reserved 16 = Reserved 17 = Reserved 18 = Reserved 19 = Inverter temperature 20 = PLC 21 = Output voltage	5	5-50
P0258	Analog output AO4 gain	0.000 to 9.999	1.000	5-50
P0259	AO5 Function	0 = Motor speed reference 1 = Total reference 2 = Motor speed 3 = Reserved 4 = Reserved 5 = Motor current 6 = Value of process variable (PID) 7 = Output active current 8 = Inverter output power 9 = PID Reference 10 = Reserved 11 = Reserved 12 = Reserved 13 = Reserved 14 = Reserved 15 = Reserved 16 = Reserved 17 = Reserved 18 = Reserved 19 = Inverter temperature 20 = PLC 21 = Output voltage	2	5-50
P0260	Analog output AO5 gain	0.000 to 9.999	1.000	5-50
P0261	AO6 Function	0 = Motor speed reference 1 = Total reference 2 = Motor speed 3 = Reserved 4 = Reserved 5 = Motor current 6 = Value of process variable (PID) 7 = Output active current 8 = Inverter output power 9 = PID Reference 10 = Reserved 11 = Reserved 12 = Reserved 13 = Reserved 14 = Reserved 15 = Reserved 16 = Reserved 17 = Reserved 18 = Reserved 19 = Inverter temperature 20 = PLC 21 = Output voltage	5	5-51
P0262	Analog output AO6 gain	0.000 to 9.999	1.000	5-51

Param.	Description	Adjustable range	Factory setting	Page
P0263(1)	DI1 Function	0 = Not Used 1 = Start/Stop 2 = General enable 3 = Stop	1	5-53
P0264(1)	DI2 Function	0 = Forward/Reverse 1 = Local/Remote	0	5-53
P0265(1)	DI3 Function	0 = Not Used 1 = Local/Remote 2 = General enable 3 = JOG 4 = No external fault 5 = IncreaseEP 6 = Ramp 2 7 = Reserved 8 = Forward Run 9 = Sinusoidal Filter Circuit Breaker 10 = JOG+ 11 = JOG- 12 = Reset 13 = Fieldbus 14 = 3 Wire Start 15 = Manual/Automatic 16 = No external Alarm 17 = Reserved 18 = Reserved 19 = Parameterization Disabling 20 = Reserved 21 = RL2 Timer 22 = RL3 Timer 23 = Reserved 24 = Reserved 25 = Initiates synchronous transfer 26 = Ventilation OK 27 = Transformer OK 28 = Pressurization system OK 29 = Output filter OK 30 = Exciter OK	0	5-53
P0266(1)	DI4 Function	0 = Not Used 1 = Local/Remote 2 = General enable 3 = JOG 4 = No external fault 5 = Decrease EP 6 = Ramp 2 7 = Multispeed 8 = Forward Run 9 = Sinusoidal Filter Circuit Breaker 10 = JOG+ 11 = JOG- 12 = Reset 13 = Fieldbus 14 = 3 Wire Stop 15 = Manual/Automatic 16 = No external Alarm 17 = Reserved 18 = Reserved 19 = Parameterization Disabling 20 = Reserved 21 = RL2 Timer 22 = RL3 Timer 23 = Reserved 24 = Reserved 25 = Initiates Synchronous Transfer 26 = Ventilation OK 27 = Transformer OK 28 = Pressurization system OK 29 = Output filter OK 30 = Exciter OK	0	5-53

Param.	Description	Adjustable range	Factory setting	Page
P0267(1)	DI5 Function	0 = Not Used 1 = LOC/REM 2 = General enable 3 = JOG 4 = No external fault 5 = IncreaseEP 6 = Ramp 2 7 = Multispeed 8 = Stop 9 = Sinusoidal Filter Circuit Breaker 10 = JOG+ 11 = JOG- 12 = Reset 13 = Fieldbus 14 = 3 Wire Start 15 = Manual/Automatic 16 = No external Alarm 17 = Reserved 18 = Reserved 19 = Parameterization Disabling 20 = Reserved 21 = RL2 Timer 22 = RL3 Timer 23 = Reserved 24 = Reserved 25 = Initiates Synchronous Transfer 26 = Ventilation OK 27 = Transformer OK 28 = Pressurization system OK 29 = Output filter OK 30 = Exciter OK	3	5-53
P0268(1)	DI6 Function	0 = Not Used 1 = Local/Remote 2 = General enable 3 = JOG 4 = No external fault 5 = Decrease EP 6 = Ramp 2 7 = Multispeed 8 = Stop 9 = Sinusoidal Filter Circuit Breaker 10 = JOG+ 11 = JOG- 12 = Reset 13 = Fieldbus 14 = 3 Wire Stop 15 = Manual/Automatic 16 = No external Alarm 17 = Reserved 18 = Reserved 19 = Parameterization Disabling 20 = Reserved 21 = RL2 Timer 22 = RL3 Timer 23 = Reserved 24 = Reserved 25 = Initiates Synchronous Transfer 26 = Ventilation OK 27 = Transformer OK 28 = Pressurization system OK 29 = Output filter OK 30 = Exciter OK	6	5-53

Param.	Description	Adjustable range	Factory setting	Page
P0269(1)	DI7 Function	0 = Not Used 1 = Local/Remote 2 = General enable 3 = JOG 4 = No external fault 5 = Reserved 6 = Ramp 2 7 = Reserved 8 = Stop 9 = Reserved 10 = JOG+ 11 = JOG- 12 = Reset 13 = Fieldbus 14 = 3 Wire Start 15 = Manual/Automatic 16 = Reserved 17 = Reserved 18 = Reserved 19 = Parameterization Disabling 20 = Reserved 21 = RL2 Timer 22 = RL3 Timer 23 = Initiates Synchronous Transfer 24 = Ventilation OK 25 = Transformer OK 26 = Pressurization system OK 27 = Output filter OK 28 = Exciter OK	0	5-53
P0270(1)	DI8 Function	0 = Not Used 1 = Local/Remote 2 = General enable 3 = JOG 4 = No external fault 5 = Reserved 6 = Ramp 2 7 = Reserved 8 = Stop 9 = Reserved 10 = JOG + 11 = JOG - 12 = Reset 13 = Fieldbus 14 = 3 Wire Stop 15 = Manual/Automatic 16 = Motor Thermistor 17 = Reserved 18 = Reserved 19 = Parameterization Disabling 20 = Reserved 21 = RL2 Timer 22 = RL3 Timer 23 = Initiates Synchronous Transfer 24 = Ventilation OK 25 = Transformer OK 26 = Pressurization system OK 27 = Output filter OK 28 = Exciter OK	0	5-53

Param.	Description	Adjustable range	Factory setting	Page
P0271(1)	DI9 Function	0 = Not Used 1 = Local/Remote 2 = General enable 3 = JOG 4 = No external fault 5 = Reserved 6 = Ramp 2 7 = Reserved 8 = Stop 9 = Reserved 10 = JOG + 11 = JOG - 12 = Reset 13 = Fieldbus 14 = 3 Wire Stop 15 = Manual/Automatic 16 = No external Alarm 17 = Reserved 18 = Reserved 19 = No motor fault 20 = No Motor Alarm 21 = Reserved 22 = Reserved 23 = Initiates Synchronous Transfer 24 = Ventilation OK 25 = Transformer OK 26 = Pressurization system OK 27 = Output filter OK 28 = Exciter OK	0	5-53
P0272(1)	DI10 Function	0 = Not Used 1 = Local/Remote 2 = General enable 3 = JOG 4 = No external fault 5 = Reserved 6 = Ramp 2 7 = Reserved 8 = Stop 9 = Reserved 10 = JOG + 11 = JOG - 12 = Reset 13 = Fieldbus 14 = 3 Wire Stop 15 = Manual/Automatic 16 = No external Alarm 17 = Reserved 18 = Reserved 19 = No motor fault 20 = No Motor Alarm 21 = Reserved 22 = Reserved 23 = Initiates Synchronous Transfer 24 = Ventilation OK 25 = Transformer OK 26 = Pressurization system OK 27 = Output filter OK 28 = Exciter OK	0	5-53

Param.	Description	Adjustable range	Factory setting	Page
P0275(1)	DO1 Function	0 = Not Used 1 = N* > Nx 2 = N > Nx 3 = N < Ny 4 = N = N* 5 = Zero Speed 6 = Is > Ix 7 = Is < Ix 8 = Reserved 9 = Reserved 10 = Remote 11 = Run 12 = Ready 13 = No fault 14 = No F0070+F0071 15 = Reserved 16 = Reserved 17 = No F0072 18 = (4 to 20) mA OK 19 = Fieldbus 20 = Forward 21 = Process Variable > VPx 22 = Process Variable < VPy 23 = Reserved 24 = Pre-charge OK 25 = Fault 26 = N > Nx and Nt > Nx 27 = Without error with delay 28 = No Alarm 29 = Reserved 30 = Reserved 31 = Reserved 32 = Circuit break ON (Inp. Circuit Breaker ON) 33 = Transference OK 34 = Synchronism OK 35 = Serial 36 = Reserved 37 = Reserved 38 = Reserved 39 = Cell in bypass state	0	5-58

Param.	Description	Adjustable range	Factory setting	Page
P0276(1)	DO2 Function	0 = Not Used 1 = N* > Nx 2 = N > Nx 3 = N < Ny 4 = N = N* 5 = Zero Speed 6 = Is > Ix 7 = Is < Ix 8 = Reserved 9 = Reserved 10 = Remote 11 = Run 12 = Ready 13 = No fault 14 = No F0070+F0071 15 = Reserved 16 = Reserved 17 = No F0072 18 = (4 to 20) mA OK 19 = Fieldbus 20 = Forward 21 = Process Variable > VPx 22 = Process Variable < VPy 23 = Reserved 24 = Pre-charge OK 25 = Fault 26 = N > Nx and Nt > Nx 27 = Without error with delay 28 = No Alarm 29 = Reserved 30 = Reserved 31 = Reserved 32 = Circuit break ON (Inp. Circuit Breaker ON) 33 = Transference OK 34 = Synchronism OK 35 = Serial 36 = Reserved 37 = Reserved 38 = Reserved 39 = Cell in bypass state	0	5-58

Param.	Description	Adjustable range	Factory setting	Page
P0277(1)	RL1 Function	0 = Not Used 1 = N* > Nx 2 = N > Nx 3 = N < Ny 4 = N = N* 5 = N = 0 6 = Is > Ix 7 = Is < Ix 8 = Reserved 9 = Reserved 10 = Remote 11 = Run 12 = Ready 13 = No fault 14 = No F0070+F0071 15 = Reserved 16 = Reserved 17 = No E72 18 = (4 to 20) mA OK 19 = Fieldbus 20 = Forward 21 = Process Variable > VPx 22 = Process Variable < VPy 23 = Reserved 24 = Pre-charge OK 25 = Fault 26 = N > Nx and Nt > Nx 27 = Without error with delay 28 = No Alarm 29 = Reserved 30 = Reserved 31 = PLC 32 = Circuit Break ON (Inp. Circuit Breaker ON) 33 = Transference OK 34 = Synchronism OK 35 = Serial 36 = Reserved 37 = Reserved 38 = Reserved 39 = Cell in bypass state	13	5-58

Param.	Description	Adjustable range	Factory setting	Page
P0279(1)	RL2 Function	0 = Not Used 1 = N* > Nx 2 = N > Nx 3 = N < Ny 4 = N = N* 5 = N = 0 6 = Is > Ix 7 = Is < Ix 8 = Reserved 9 = Reserved 10 = Remote 11 = Run 12 = Ready 13 = No fault 14 = No F0070+F0071 15 = Reserved 16 = Reserved 17 = No E72 18 = 4 to 20 mA OK 19 = Fieldbus 20 = Forward 21 = Process Variable < VPx 22 = Process Variable < VPy 23 = Reserved 24 = Pre-charge OK 25 = Fault 26 = N > Nx and Nt > Nx 27 = Without error with delay 28 = No Alarm 29 = Timer 30 = Reserved 31 = PLC 32 = Circuit Break ON (Inp. Circuit Breaker ON) 33 = Transference OK 34 = Synchronism OK 35 = Serial 36 = Reserved 37 = Reserved 38 = Reserved 39 = Cell in bypass state	2	5-58

Param.	Description	Adjustable range	Factory setting	Page
P0280(1)	RL3 Function	0 = Not Used 1 = N* > Nx 2 = N > Nx 3 = N < Ny 4 = N = N* 5 = N = 0 6 = Is > Ix 7 = Is < Ix 8 = Reserved 9 = Reserved 10 = Remote 11 = Run 12 = Ready 13 = No fault 14 = No F0070+F0071 15 = Reserved 16 = Reserved 17 = No E72 18 = 4 to 20 mA OK 19 = Fieldbus 20 = Forward 21 = Process Variable < VPx 22 = Process Variable < VPy 23 = Reserved 24 = Pre-charge OK 25 = Fault 26 = N > Nx and Nt > Nx 27 = Without error with delay 28 = No Alarm 29 = Timer 30 = Reserved 31 = PLC 32 = Circuit Break ON (Inp. Circuit Breaker ON) 33 = Transference OK 34 = Synchronism OK 35 = Serial 36 = Reserved 37 = Reserved 38 = Reserved 39 = Cell in bypass state	1	5-58

Param.	Description	Adjustable range	Factory setting	Page
P0281(1)	RL4 Function	0 = Not Used 1 = N* > Nx 2 = N > Nx 3 = N < Ny 4 = N = N* 5 = Zero Speed 6 = Is > Ix 7 = Is < Ix 8 = Reserved 9 = Reserved 10 = Remote 11 = Run 12 = Ready 13 = No fault 14 = No F0070+F0071 15 = Reserved 16 = Reserved 17 = No F0072 18 = (4 to 20) mA OK 19 = Fieldbus 20 = Forward 21 = Process Variable > VPx 22 = Process Variable < VPy 23 = Reserved 24 = Pre-charge OK 25 = Fault 26 = N > Nx and Nt > Nx 27 = Without error with delay 28 = No Alarm 29 = Reserved 30 = Reserved 31 = Reserved 32 = Circuit break ON (Inp. Circuit Breaker ON) 33 = Transference OK 34 = Synchronism OK 35 = Serial 36 = Reserved 37 = Reserved 38 = Reserved 39 = Cell in bypass state	0	5-58

Param.	Description	Adjustable range	Factory setting	Page
P0282[(1)]	RL5 Function	0 = Not Used 1 = N* > Nx 2 = N > Nx 3 = N < Ny 4 = N = N* 5 = Zero Speed 6 = Is > Ix 7 = Is < Ix 8 = Reserved 9 = Reserved 10 = Remote 11 = Run 12 = Ready 13 = No fault 14 = No F0070+F0071 15 = Reserved 16 = Reserved 17 = No F0072 18 = (4 to 20) mA OK 19 = Fieldbus 20 = Forward 21 = Process Variable > VPx 22 = Process Variable < VPy 23 = Reserved 24 = Pre-charge OK 25 = Fault 26 = N > Nx and Nt > Nx 27 = Without error with delay 28 = No Alarm 29 = Reserved 30 = Reserved 31 = Reserved 32 = Circuit break ON (Inp. Circuit Breaker ON) 33 = Transference OK 34 = Synchronism OK 35 = Serial 36 = Reserved 37 = Reserved 38 = Reserved 39 = Cell in bypass state	0	5-58
P0283	RL2 ON time	0.0 to 300.0 s	0.0 s	5-62
P0284	RL2 OFF time	0.0 to 300.0 s	0.0 s	5-62
P0285	RL3 ON time	0.0 to 300.0 s	0.0 s	5-62
P0286	RL3 OFF time	0.0 to 300.0 s	0.0 s	5-62
P0288[(2)]	Nx Speed	0 to 4095 rpm	120 rpm	5-62
P0289[(2)]	Ny Speed	0 to 4095 rpm	1800 rpm	5-62
P0290[(5)]	Ix Current	0.0 to 3276.7 A	300.0 A	5-62
P0291	Zero Speed Zone	1 to 100 %	1 %	5-62
P0292	N=N* Band	1 to 100 %	1 %	5-63

1

Param.	Description	Adjustable range	Factory setting	Page
P0295(1)	Current	0 = 24 A 1 = 40 A 2 = 50 A 3 = 60 A 4 = 70 A 5 = 80 A 6 = 90 A 7 = 100 A 8 = 110 A 9 = 125 A 10 = 140 A 11 = 160 A 12 = 180 A 13 = 200 A 14 = 225 A 15 = 265 A 16 = 310 A 17 = 340 A 18 = 400 A 19 = 450 A 20 = 500 A 21 = 550 A 22 = 600 A 23 = 760 A 24 = 800 A 25 = 855 A 26 = 950 A 27 = 1045 A 28 = 1140 A 29 = 646 A	10	5-63
P0296(7)	Voltage	0 = 1150 V 1 = 2300 V 2 = 3300 V 3 = 4160 V 4 = 5500 V 5 = 6300 V 6 = 6900 V 7 = 7200 V 8 = 8000 V 9 = 9000 V 10 = 10000 V 11 = 11000 V 12 = 12000 V 13 = 13200 V 14 = 13800 V	14	5-64
P0303	Skipped speed 1	0 to 4095 rpm	600 rpm	5-64
P0304	Skipped speed 2	0 to 4095 rpm	900 rpm	5-64
P0305	Skipped speed 3	0 to 4095 rpm	1200 rpm	5-64
P0306	Skipped range	0 to 750 rpm	0 rpm	5-64
P0308(1)	Address	1 to 30	1	5-65
P0309(1)	Fieldbus	0 = Inactive 1 = Profibus-DP 2 I/O 2 = Profibus-DP 4 I/O 3 = Profibus-DP 6 I/O 4 = DeviceNet 2 I/O 5 = DeviceNet 4 I/O 6 = DeviceNet 6 I/O 7 = Modbus-RTU 2 I/O 8 = Modbus-RTU 4 I/O 9 = Modbus-RTU 6 I/O 10 = DeviceNet Drive Profile 11 = EtherNet 2 I/O 12 = EtherNet 4 I/O 13 = EtherNet 6 I/O	0	5-65

Param.	Description	Adjustable range	Factory setting	Page
P0312(1)	Protocol	0 = Not Used 1 = Modbus-RTU, 9600 bps, no parity 2 = Modbus-RTU, 9600 bps, odd parity 3 = Modbus-RTU, 9600 bps, even parity 4 = Modbus-RTU, 19200 bps, no parity 5 = Modbus-RTU, 19200 bps, odd parity 6 = Modbus-RTU, 19200 bps, even parity 7 = Modbus-RTU, 38400 bps, no parity 8 = Modbus-RTU, 38400 bps, odd parity 9 = Modbus-RTU, 38400 bps, even parity	7	5-66
P0313	Disabling with alarm A128, A129 and A130	0 = Disable via Run/Stop 1 = Disable via general enable 2 = Inactive 3 = Go to LOCAL 4 = Reserved 5 = Fault	0	5-66
P0314(1)	Watchdog	0.0 to 999.0 s	0.0 s	5-66
P0315	Thermal protection relay	0 = Service HMI 1 = Modbus serial for Tecsystem module 2 = Modbus Serial for Pextron module	0	5-67
P0320(1)	Flying Start/Ride-Through	0 = Inactive 1 = Flying Start 2 = Flying Start and Ride-Through 3 = Ride-Through	0	5-67
P0327(1)	Sensorless Flying Start delay	0.000 to 9.999 s	0.100 s	5-68
P0328	Flying Start frequency	0 = P0134 starting search speed 1 = P0001 starting search speed	1	5-68
P0329	Initial search direction for Flying Start	0 = +P0328 and then -P0328 1 = -P0328 and then +P0328 2 = +P0328 3 = -P0328	0	5-69
P0331	Voltage ramp time	0.2 to 50.0 s	8.0 s	5-69
P0332	Dead time	1.0 to 40.0 s	10.0 s	5-69
P0333	Ride-through time	0.0 to 20.0 s	10.0 s	5-69
P0400(1)(4)	Voltage	1 to 19999 V	6600 V	5-70
P0401(1)	Current	0.1 to 3705.0 A	140.0 A	5-71
P0402(1)	Speed	1 to 7200 rpm	1796 rpm	5-71
P0403(1)	Frequency	1 to 120 Hz	60 Hz	5-71
P0405(1)	Pulses per revolution	100 to 9999 PPR	1024 PPR	5-71
P0406(1)(2)	Ventilation Type	0 = Self-ventilated 1 = Separated ventilation	0	5-72
P0408(1)	Run Self-tuning	0 = No 1 = Self Gain	1	5-72
P0409	Stator resistance (Rs)	0.000 to 9.999 Ω	0.000 Ω	5-72
P0410	Magnetization current (Imr)	0.0 to 1024.0 A	0.0 A	5-73
P0411	Flux leakage inductance	0.00 to 99.99 mH	0.00 mH	5-73
P0412	Lr/Rr Constant	0.000 to 9.999 s	0.000 s	5-73
P0413	Tm Time Constant	0.00 to 99.99 s	0.00 s	5-73
P0414	Magnetizing voltage	0.0 to 20.0 %	0.0 %	5-74
P0415(1)	Maximum output voltage	0 to 2000 %	0 %	5-74

Param.	Description	Adjustable range	Factory setting	Page
P0427	Inductance LD sigma	0.00 to 99.99 mH	4.85 mH	5-75
P0428	Inductance LQ sigma	0.00 to 99.99 mH	4.41 mH	5-75
P0429	Resistence RD	0.000 to 9.999 Ω	1.139 Ω	5-76
P0430	Resistance RQ	0.000 to 9.999 Ω	0.831 Ω	5-76
P0431	Number of poles	2 to 64	4	5-76
P0433	Lq inductance	0.0 to 999.9 mH	45.7 mH	5-77
P0434	Ld inductance	0.0 to 999.9 mH	86.9 mH	5-77
P0436	Lf inductance	0.0 to 999.9 mH	88.0 mH	5-77
P0437	Resistence Rf	0.000 to 9.999 Ω	0.047 Ω	5-77
P0438	Proportional gain of the current regulator IQ	0.000 to 9.999	0.034	5-78
P0439	Integration constant of the current regulator IQ	0.1 to 999.9	9.0	5-78
P0440	Proportional gain of the current regulator ID	0.000 to 9.999	0.074	5-78
P0441	Integration constant of the current regulator ID	0.1 to 999.9	19.6	5-79
P0442	Proportional gain of brushless exciter field regulator	0.000 to 9.999	0.788	5-79
P0443	Brushless exciter field regulator integration const.	1 to 9999	703	5-79
P0444	Maximum field voltage (brushless)	0.01 to 1.00 PU	0.58 PU	5-79
P0445	Minimum field voltage (brushless)	0.01 to 1.00 PU	0.01 PU	5-79
P0446	Base field current	0.1 to 999.9 A	33.3 A	5-80
P0447	Proportional gain of the field regulator	0.000 to 9.999	0.087	5-80
P0448	Integration constant of the field regulator	1 to 9999	70	5-80
P0449	Maximum field current (Brushless)	0.01 to 5.00 PU	0.70 PU	5-81
P0450	Minimum field current (Brushless)	0.01 to 5.00 PU	0.01 PU	5-81
P0451	Minimum field for soft-start function	0.01 to 5.00 PU	0.15 PU	5-81
P0452	Field input frequency	0.0 to 60.0 Hz	0.0 Hz	5-82
P0453	Field ramp time	0.00 to 30.00 s	1.00 s	5-82
P0454	Coefficient A1 of the polynomial of the magnetic saturation curve	0.000 to 9.999	0.000	5-83
P0455	Coefficient B1 of the Polynomial of the magnetic saturation curve	0.000 to 9.999	0.174	5-83
P0456	Coefficient C1 of the Polynomial of the magnetic saturation curve	0.000 to 9.999	1.059	5-83
P0457	Polynomial A2 of the gain curve of the brushless exciter	0.000 to 9.999	0.185	5-83
P0458	Polynomial B2 of the gain curve of the brushless exciter	0.000 to 9.999	0.068	5-83
P0459	Polynomial C2 of the brushless mot. exciter curve	0.0 to 999.9	118.7	5-83
P0460	Field resistance not referred to the stator	0.000 to 9.999 Ω	1.150 Ω	5-84
P0461	Rated current in the field of brushless motor	0.1 to 999.9 A	25.6 A	5-84
P0462	Field current scale	0.1 to 999.9 A	94.0 A	5-84

Param.	Description	Adjustable range	Factory setting	Page
P0463	Exciter rated voltage scale	0 to 9999 V	380 V	5-85
P0464	Maximum compensation current of PF	0.00 to 1.00 PU	0.80 PU	5-85
P0468	PM Gain	0 to 9999	0	5-85
P0490	Graphic HMI LCD contrast adjustment	50 to 150	110	5-86
P0491(1)	HMI commands configuration	0 = Inactive 1 = Local HMI 2 = Remote HMI	0	5-86
P0493	Sampling time	1 to 100 x 10 ms	10 x 10 ms	5-87
P0520	PID proportional gain	0.000 to 7.999	1.000	5-87
P0521	PID integral gain	0.000 to 9.999	1.000	5-87
P0522	PID differential gain	0.000 to 9.999	0.000	5-87
P0523	PID ramp time	0.0 to 999.0 s	3.0 s	5-87
P0524(1)	PID feedback selection	0 = P0237 - AI2 signal function 1 = P0241 - AI3 signal function	0	5-88
P0525	PID regulator setpoint	0.0 to 100.0 %	0.0 %	5-88
P0526	Process variable filter	0.0 to 16.0 s	0.1 s	5-89
P0527	Error Value Inv	0 = No 1 = Yes	0	5-89
P0528	Process variable scale factor	0 to 9999	1000	5-89
P0529	Process Variable Decimal Point	0 to 3	1	5-89
P0533	Process variable X value	0.0 to 100.0 %	90.0 %	5-90
P0534	Process variable Y value	0.0 to 100.0 %	10.0 %	5-90
P0535	Output N = 0 PID	0 to 100 %	0 %	5-90
P0536	P0525 Automatic Setting	0 = Inactive 1 = Active	0	5-91
P0622	End frequency of boost I x R	0 to 9999	4095	5-91
P0629	Synchronism time	0.0 to 20.0 s	1.0 s	5-91
P0630	Synchronism timeout	20 to 240 s	60 s	5-91
P0631	DI13 delay	0 to 3000 ms	170 ms	5-92
P0632	Maximum phase error	0.0 to 60.0 °	5.0 °	5-92
P0636	Phase adjustment synchronous transfer	-180.0 to 180.0 °	0.0 °	5-92
P0652	MVC3 AO1 Funct.	0 to 767	2	5-92
P0653	Analog output gain AO1 MVC3	0.000 to 9.999	1.000	5-93
P0654	MVC3 AO2 Funct.	0 to 767	5	5-93
P0655	Analog output gain AO2 MVC3	0.000 to 9.999	1.000	5-93
P0656	MVC3 AO3 Funct.	0 to 767	2	5-94
P0657	Analog output gain AO3 MVC3	0.000 to 9.999	1.000	5-94
P0658	MVC3 AO4 Funct.	0 to 767	5	5-94
P0659	Analog output gain AO4 MVC3	0.000 to 9.999	1.000	5-94

Param.	Description	Adjustable range	Factory setting	Page
P0663	Analog output offset AO1 MVC3	-32768 to 32767	-90	5-94
P0664	Analog output offset AO2 MVC3	-32768 to 32767	-90	5-94
P0665	Analog output offset AO3 MVC3	-32768 to 32767	-90	5-94
P0666	Analog output offset AO4 MVC3	-32768 to 32767	-90	5-94
P0721(1)	Analog input AI5 function	0 = P221/P222	0	5-95
P0722	Analog. inp. AI5 gain (bipolar isolated MVC4 board)	0.000 to 9.999	1.000	5-95
P0723(1)	Analog input AI5 signal type	0 = 0-10V/20mA 1 = 4 - 20 mA 2 = 10V/20mA-0 3 = 20 - 4 mA	0	5-95
P0724	Analog. inp. AI5 offs. (bipolar isolated MVC4 board)	0.0 to 100.0 %	0.0 %	5-95
P0725	Minimum coasting time	0 to 300 s	0 s	5-96
P0740	Function of analog input AI1 MVC3	0 = Not used 1 = Torque reference 2 = Limit current	0	5-96
P0741	Analog input AI1 gain - MVC3	0.000 to 9.999	1.000	5-96
P0742	Analog input AI1 offset - MVC3	-100.0 to 100.0 %	0.0 %	5-96
P0744	Function of analog input AI2 - MVC3	0 = Not used 1 = Field current	0	5-97
P0745	Analog input AI2 gain - MVC3	0.000 to 9.999	1.000	5-97
P0746	Analog input AI2 offset - MVC3	-100.0 to 100.0 %	0.0 %	5-97
P0950(1)	Motor Type	0 = Induction motor 1 = Reserved 2 = Brushless synchronous motor 3 = Permanent magnet motor	0	5-97
P0957	Direction of rotation	0 = Reverse 1 = Direct	1	5-98
P1000	DC link voltage of cell U1	Read-only parameter (1 V)	-	5-98
P1001	DC link voltage of cell U2	Read-only parameter (1 V)	-	5-98
P1002	DC link voltage of cell U3	Read-only parameter (1 V)	-	5-98
P1003	DC link voltage of cell U4	Read-only parameter (1 V)	-	5-98
P1004	DC link voltage of cell U5	Read-only parameter (1 V)	-	5-98
P1005	DC link voltage of cell U6	Read-only parameter (1 V)	-	5-98
P1006	DC link voltage of cell U7	Read-only parameter (1 V)	-	5-98
P1007	DC link voltage of cell U8	Read-only parameter (1 V)	-	5-98
P1008	DC link voltage of cell U9	Read-only parameter (1 V)	-	5-98
P1009	DC link voltage of cell U10	Read-only parameter (1 V)	-	5-98
P1010	DC link voltage of cell U11	Read-only parameter (1 V)	-	5-98
P1011	DC link voltage of cell U12	Read-only parameter (1 V)	-	5-98
P1012	DC link voltage of cell V1	Read-only parameter (1 V)	-	5-98
P1013	DC link voltage of cell V2	Read-only parameter (1 V)	-	5-98
P1014	DC link voltage of cell V3	Read-only parameter (1 V)	-	5-98

Param.	Description	Adjustable range	Factory setting	Page
P1015	DC link voltage of cell V4	Read-only parameter (1 V)	-	5-98
P1016	DC link voltage of cell V5	Read-only parameter (1 V)	-	5-98
P1017	DC link voltage of cell V6	Read-only parameter (1 V)	-	5-98
P1018	DC link voltage of cell V7	Read-only parameter (1 V)	-	5-98
P1019	DC link voltage of cell V8	Read-only parameter (1 V)	-	5-98
P1020	DC link voltage of cell V9	Read-only parameter (1 V)	-	5-98
P1021	DC link voltage of cell V10	Read-only parameter (1 V)	-	5-98
P1022	DC link voltage of cell V11	Read-only parameter (1 V)	-	5-98
P1023	DC link voltage of cell V12	Read-only parameter (1 V)	-	5-98
P1024	DC link voltage of cell W1	Read-only parameter (1 V)	-	5-99
P1025	DC link voltage of cell W2	Read-only parameter (1 V)	-	5-99
P1026	DC link voltage of cell W3	Read-only parameter (1 V)	-	5-99
P1027	DC link voltage of cell W4	Read-only parameter (1 V)	-	5-99
P1028	DC link voltage of cell W5	Read-only parameter (1 V)	-	5-99
P1029	DC link voltage of cell W6	Read-only parameter (1 V)	-	5-99
P1030	DC link voltage of cell W7	Read-only parameter (1 V)	-	5-99
P1031	DC link voltage of cell W8	Read-only parameter (1 V)	-	5-99
P1032	DC link voltage of cell W9	Read-only parameter (1 V)	-	5-99
P1033	DC link voltage of cell W10	Read-only parameter (1 V)	-	5-99
P1034	DC link voltage of cell W11	Read-only parameter (1 V)	-	5-99
P1035	DC link voltage of cell W12	Read-only parameter (1 V)	-	5-99
P1050	Temperature on the power module of cell U1	Read-only parameter (0.1 °C)	-	5-99
P1051	Temperature on the power module of cell U2	Read-only parameter (0.1 °C)	-	5-99
P1052	Temperature on the power module of cell U3	Read-only parameter (0.1 °C)	-	5-99
P1053	Temperature on the power module of cell U4	Read-only parameter (0.1 °C)	-	5-99
P1054	Temperature on the power module of cell U5	Read-only parameter (0.1 °C)	-	5-99
P1055	Temperature on the power module of cell U6	Read-only parameter (0.1 °C)	-	5-99
P1056	Temperature on the power module of cell U7	Read-only parameter (0.1 °C)	-	5-99
P1057	Temperature on the power module of cell U8	Read-only parameter (0.1 °C)	-	5-99
P1058	Temperature on the power module of cell U9	Read-only parameter (0.1 °C)	-	5-99
P1059	Temperature on the power module of cell U10	Read-only parameter (0.1 °C)	-	5-99
P1060	Temperature on the power module of cell U11	Read-only parameter (0.1 °C)	-	5-99
P1061	Temperature on the power module of cell U12	Read-only parameter (0.1 °C)	-	5-99
P1062	Temperature on the power module of cell V1	Read-only parameter (0.1 °C)	-	5-100
P1063	Temperature on the power module of cell V2	Read-only parameter (0.1 °C)	-	5-100
P1064	Temperature on the power module of cell V3	Read-only parameter (0.1 °C)	-	5-100
P1065	Temperature on the power module of cell V4	Read-only parameter (0.1 °C)	-	5-100

Param.	Description	Adjustable range	Factory setting	Page
P1066	Temperature on the power module of cell V5	Read-only parameter (0.1 °C)	-	5-100
P1067	Temperature on the power module of cell V6	Read-only parameter (0.1 °C)	-	5-100
P1068	Temperature on the power module of cell V7	Read-only parameter (0.1 °C)	-	5-100
P1069	Temperature on the power module of cell V8	Read-only parameter (0.1 °C)	-	5-100
P1070	Temperature on the power module of cell V9	Read-only parameter (0.1 °C)	-	5-100
P1071	Temperature on the power module of cell V10	Read-only parameter (0.1 °C)	-	5-100
P1072	Temperature on the power module of cell V11	Read-only parameter (0.1 °C)	-	5-100
P1073	Temperature on the power module of cell V12	Read-only parameter (0.1 °C)	-	5-100
P1074	Temperature on the power module of cell W1	Read-only parameter (0.1 °C)	-	5-100
P1075	Temperature on the power module of cell W2	Read-only parameter (0.1 °C)	-	5-100
P1076	Temperature on the power module of cell W3	Read-only parameter (0.1 °C)	-	5-100
P1077	Temperature on the power module of cell W4	Read-only parameter (0.1 °C)	-	5-100
P1078	Temperature on the power module of cell W5	Read-only parameter (0.1 °C)	-	5-100
P1079	Temperature on the power module of cell W6	Read-only parameter (0.1 °C)	-	5-100
P1080	Temperature on the power module of cell W7	Read-only parameter (0.1 °C)	-	5-100
P1081	Temperature on the power module of cell W8	Read-only parameter (0.1 °C)	-	5-100
P1082	Temperature on the power module of cell W9	Read-only parameter (0.1 °C)	-	5-100
P1083	Temperature on the power module of cell W10	Read-only parameter (0.1 °C)	-	5-100
P1084	Temperature on the power module of cell W11	Read-only parameter (0.1 °C)	-	5-100
P1085	Temperature on the power module of cell W12	Read-only parameter (0.1 °C)	-	5-100
P1136	Inverter input current	Read-only parameter (0.1 A)	-	5-100
P1137	Inverter input line voltage	Read-only parameter (0.01 kV)	-	5-100
P1138	PF at the inverter input	Read-only parameter	-	5-101
P1139	Apparent power at the inverter input	Read-only parameter (1 kVA)	-	5-101
P1140	Active power at the inverter input	Read-only parameter (1 kW)	-	5-101
P1141	Reactive power at the inverter input	Read-only parameter (1 kVAr)	-	5-102
P1142	Frequency at the inverter input	Read-only parameter (0.01 Hz)	-	5-102
P1143	Output voltage	Read-only parameter (0.01 kV)	-	5-102
P1144	Voltage between the virtual neutral of the mot. and the GND of the syst.	Read-only parameter (0.1 %)	-	5-102
P1146	DC link voltage - lowest value	Read-only parameter (1 V)	-	5-102
P1147	DC link voltage - highest value	Read-only parameter (1 V)	-	5-102
P1155	Phase U cell status U1 ... Un	Read-only parameter	-	5-103
P1156	Phase V cell status V1...Vn	Read-only parameter	-	5-103
P1157	Phase W cell status W1...Wn	Read-only parameter	-	5-103
P1158	Thermal protection relay 2 - Temperature CH1	-50 to 300 °C	0 °C	5-103
P1159	Thermal protection relay 2 - Temperature CH2	-50 to 300 °C	0 °C	5-103

Param.	Description	Adjustable range	Factory setting	Page
P1160	Thermal protection relay 2 - Temperature CH3	-50 to 300 °C	0 °C	5-103
P1161	Thermal protection relay 2 - Temperature CH4	-50 to 300 °C	0 °C	5-103
P1162	Thermal protection relay 2 - Temperature CH5	-50 to 300 °C	0 °C	5-103
P1163	Thermal protection relay 2 - Temperature CH6	-50 to 300 °C	0 °C	5-103
P1164	Thermal protection relay 2 - Temperature CH7	-50 to 300 °C	0 °C	5-103
P1165	Thermal protection relay 2 - Temperature CH8	-50 to 300 °C	0 °C	5-103
P1166	Thermal protection relay 3 - Temperature CH1	-50 to 300 °C	0 °C	5-103
P1167	Thermal protection relay 3 - Temperature CH2	-50 to 300 °C	0 °C	5-103
P1168	Thermal protection relay 3 - Temperature CH3	-50 to 300 °C	0 °C	5-103
P1169	Thermal protection relay 3 - Temperature CH4	-50 to 300 °C	0 °C	5-103
P1170	Thermal protection relay 3 - Temperature CH5	-50 to 300 °C	0 °C	5-103
P1171	Thermal protection relay 3 - Temperature CH6	-50 to 300 °C	0 °C	5-103
P1172	Thermal protection relay 3 - Temperature CH7	-50 to 300 °C	0 °C	5-103
P1173	Thermal protection relay 3 - Temperature CH8	-50 to 300 °C	0 °C	5-103
P1350	Temperature on the board of cell U1	Read-only parameter (0.1 °C)	-	5-104
P1351	Temperature on the board of cell U2	Read-only parameter (0.1 °C)	-	5-104
P1352	Temperature on the board of cell U3	Read-only parameter (0.1 °C)	-	5-104
P1353	Temperature on the board of cell U4	Read-only parameter (0.1 °C)	-	5-104
P1354	Temperature on the board of cell U5	Read-only parameter (0.1 °C)	-	5-104
P1355	Temperature on the board of cell U6	Read-only parameter (0.1 °C)	-	5-104
P1356	Temperature on the board of cell U7	Read-only parameter (0.1 °C)	-	5-104
P1357	Temperature on the board of cell U8	Read-only parameter (0.1 °C)	-	5-104
P1358	Temperature on the board of cell U9	Read-only parameter (0.1 °C)	-	5-104
P1359	Temperature on the board of cell U10	Read-only parameter (0.1 °C)	-	5-104
P1360	Temperature on the board of cell U11	Read-only parameter (0.1 °C)	-	5-104
P1361	Temperature on the board of cell U12	Read-only parameter (0.1 °C)	-	5-104
P1362	Temperature on the board of cell V1	Read-only parameter (0.1 °C)	-	5-105
P1363	Temperature on the board of cell V2	Read-only parameter (0.1 °C)	-	5-105
P1364	Temperature on the board of cell V3	Read-only parameter (0.1 °C)	-	5-105
P1365	Temperature on the board of cell V4	Read-only parameter (0.1 °C)	-	5-105
P1366	Temperature on the board of cell V5	Read-only parameter (0.1 °C)	-	5-105
P1367	Temperature on the board of cell V6	Read-only parameter (0.1 °C)	-	5-105
P1368	Temperature on the board of cell V7	Read-only parameter (0.1 °C)	-	5-105
P1369	Temperature on the board of cell V8	Read-only parameter (0.1 °C)	-	5-105
P1370	Temperature on the board of cell V9	Read-only parameter (0.1 °C)	-	5-105
P1371	Temperature on the board of cell V10	Read-only parameter (0.1 °C)	-	5-105
P1372	Temperature on the board of cell V11	Read-only parameter (0.1 °C)	-	5-105

Param.	Description	Adjustable range	Factory setting	Page
P1373	Temperature on the board of cell V12	Read-only parameter (0.1 °C)	-	5-105
P1374	Temperature on the board of cell W1	Read-only parameter (0.1 °C)	-	5-105
P1375	Temperature on the board of cell W2	Read-only parameter (0.1 °C)	-	5-105
P1376	Temperature on the board of cell W3	Read-only parameter (0.1 °C)	-	5-105
P1377	Temperature on the board of cell W4	Read-only parameter (0.1 °C)	-	5-105
P1378	Temperature on the board of cell W5	Read-only parameter (0.1 °C)	-	5-105
P1379	Temperature on the board of cell W6	Read-only parameter (0.1 °C)	-	5-105
P1380	Temperature on the board of cell W7	Read-only parameter (0.1 °C)	-	5-105
P1381	Temperature on the board of cell W8	Read-only parameter (0.1 °C)	-	5-105
P1382	Temperature on the board of cell W9	Read-only parameter (0.1 °C)	-	5-105
P1383	Temperature on the board of cell W10	Read-only parameter (0.1 °C)	-	5-105
P1384	Temperature on the board of cell W11	Read-only parameter (0.1 °C)	-	5-105
P1385	Temperature on the board of cell W12	Read-only parameter (0.1 °C)	-	5-105
P1478	Seconds	0 to 59	0	5-105
P1479	Minute	0 to 59	0	5-105
P1480	Hour	0 to 23	0	5-105
P1481	Day	1 to 31	0	5-105
P1482	Month	0 = Reserved 1 = January 2 = February 3 = March 4 = April 5 = May 6 = June 7 = July 8 = August 9 = September 10 = October 11 = November 12 = December	0	5-105
P1483	Year	2022 to 2070	0	5-105
P1484	Control status	Read-only parameter	-	5-106
P1500(7)	Automatic Bypass	0 = Inactive 1 = Active with Flying Start	0	5-106
P1501(1)	Line tension balancing method	0 = Phase voltage ampl. readjustment 1 = Readj. of phase voltage angles	0	5-107
P1502(1)	Limit of bypassed cells per phase	0 to 12	1	5-107
P1507	Enables thermal protection relay faults	0 to 255	255	5-107
P1544	Baudrate	0 = 100 kHz 1 = 150 kHz 2 = 200 kHz 3 = 250 kHz 4 = 500 kHz	3	5-108
P1545	Data bits	8 to 20	13	5-109
P1546	Parity	0 = None 1 = Even 2 = Odd	0	5-109

Param.	Description	Adjustable range	Factory setting	Page
P1547	Encoding	0 = Binary 1 = Gray	0	5-109
P1550(7)	Transformer 1 CT Ratio	1 to 3000	200	5-109
P1551(7)	Ratio between the voltage of the primary and the aux. output of the Trafo 1	1.00 to 60.00	18.14	5-110
P1552(7)	Taps of transformer 1	-5.00 to 5.00 %	0.00 %	5-110
P1553(7)	Transformers rated voltage	0.00 to 99.99 kV	6.60 kV	5-110
P1554(7)	Transformer 1 rated power	0 to 10000 kVA	1500 kVA	5-110
P1555(7)	Transformers rated frequency	0 to 100 Hz	60 Hz	5-111
P1556(7)	Transformer 2 CT Ratio	50 to 3000	200	5-111
P1557(7)	Taps of transformer 2	-5.00 to 5.00 %	0.00 %	5-111
P1558(7)	Transformer 2 rated power	0 to 10000 kVA	1500 kVA	5-112
P1559(7)	Transformer 3 CT Ratio	50 to 3000	200	5-112
P1560(7)	Taps of transformer 3	-5.00 to 5.00 %	0.00 %	5-112
P1561(7)	Transformer 3 rated power	0 to 10000 kVA	1500 kVA	5-113
P1565(7)	Number of redundant cells per phase	0 to 11	0	5-113
P1610	Alternative speed reference for PLC	-32768 to 32767 PU	0 PU	5-113
P1700(7)	Bypass of the cell U1	0 = Disable 1 = Mechanical bypass cell 2 = Manual activation of the BP relay 3 = Aut. BP after a manageable fault 4 = Aut. bypass by parallel assoc.	0	5-114
P1701(7)	Bypass of the cell U2	0 = Disable 1 = Mechanical bypass cell 2 = Manual activation of the BP relay 3 = Aut. BP after a manageable fault 4 = Aut. bypass by parallel assoc.	0	5-114
P1702(7)	Bypass of the cell U3	0 = Disable 1 = Mechanical bypass cell 2 = Manual activation of the BP relay 3 = Aut. BP after a manageable fault 4 = Aut. bypass by parallel assoc.	0	5-114
P1703(7)	Bypass of the cell U4	0 = Disable 1 = Mechanical bypass cell 2 = Manual activation of the BP relay 3 = Aut. BP after a manageable fault 4 = Aut. bypass by parallel assoc.	0	5-114
P1704(7)	Bypass of the cell U5	0 = Disable 1 = Mechanical bypass cell 2 = Manual activation of the BP relay 3 = Aut. BP after a manageable fault 4 = Aut. bypass by parallel assoc.	0	5-114
P1705(7)	Bypass of the cell U6	0 = Disable 1 = Mechanical bypass cell 2 = Manual activation of the BP relay 3 = Aut. BP after a manageable fault 4 = Aut. bypass by parallel assoc.	0	5-114
P1706(7)	Bypass of the cell U7	0 = Disable 1 = Mechanical bypass cell 2 = Manual activation of the BP relay 3 = Aut. BP after a manageable fault 4 = Aut. bypass by parallel assoc.	0	5-114

Param.	Description	Adjustable range	Factory setting	Page
P1707(7)	Bypass of the cell U8	0 = Disable 1 = Mechanical bypass cell 2 = Manual activation of the BP relay 3 = Aut. BP after a manageable fault 4 = Aut. bypass by parallel assoc.	0	5-114
P1708(7)	Bypass of the cell U9	0 = Disable 1 = Mechanical bypass cell 2 = Manual activation of the BP relay 3 = Aut. BP after a manageable fault 4 = Aut. bypass by parallel assoc.	0	5-114
P1709(7)	Bypass of the cell U10	0 = Disable 1 = Mechanical bypass cell 2 = Manual activation of the BP relay 3 = Aut. BP after a manageable fault 4 = Aut. bypass by parallel assoc.	0	5-114
P1710(7)	Bypass of the cell U11	0 = Disable 1 = Mechanical bypass cell 2 = Manual activation of the BP relay 3 = Aut. BP after a manageable fault 4 = Aut. bypass by parallel assoc.	0	5-114
P1711(7)	Bypass of the cell U12	0 = Disable 1 = Mechanical bypass cell 2 = Manual activation of the BP relay 3 = Aut. BP after a manageable fault 4 = Aut. bypass by parallel assoc.	0	5-114
P1712(7)	Bypass of the cell V1	0 = Disable 1 = Mechanical bypass cell 2 = Manual activation of the BP relay 3 = Aut. BP after a manageable fault 4 = Aut. bypass by parallel assoc.	0	5-115
P1713(7)	Bypass of the cell V2	0 = Disable 1 = Mechanical bypass cell 2 = Manual activation of the BP relay 3 = Aut. BP after a manageable fault 4 = Aut. bypass by parallel assoc.	0	5-115
P1714(7)	Bypass of the cell V3	0 = Disable 1 = Mechanical bypass cell 2 = Manual activation of the BP relay 3 = Aut. BP after a manageable fault 4 = Aut. bypass by parallel assoc.	0	5-115
P1715(7)	Bypass of the cell V4	0 = Disable 1 = Mechanical bypass cell 2 = Manual activation of the BP relay 3 = Aut. BP after a manageable fault 4 = Aut. bypass by parallel assoc.	0	5-115
P1716(7)	Bypass of the cell V5	0 = Disable 1 = Mechanical bypass cell 2 = Manual activation of the BP relay 3 = Aut. BP after a manageable fault 4 = Aut. bypass by parallel assoc.	0	5-115
P1717(7)	Bypass of the cell V6	0 = Disable 1 = Mechanical bypass cell 2 = Manual activation of the BP relay 3 = Aut. BP after a manageable fault 4 = Aut. bypass by parallel assoc.	0	5-115
P1718(7)	Bypass of the cell V7	0 = Disable 1 = Mechanical bypass cell 2 = Manual activation of the BP relay 3 = Aut. BP after a manageable fault 4 = Aut. bypass by parallel assoc.	0	5-115

Param.	Description	Adjustable range	Factory setting	Page
P1719(7)	Bypass of the cell V8	0 = Disable 1 = Mechanical bypass cell 2 = Manual activation of the BP relay 3 = Aut. BP after a manageable fault 4 = Aut. bypass by parallel assoc.	0	5-115
P1720(7)	Bypass of the cell V9	0 = Disable 1 = Mechanical bypass cell 2 = Manual activation of the BP relay 3 = Aut. BP after a manageable fault 4 = Aut. bypass by parallel assoc.	0	5-115
P1721(7)	Bypass of the cell V10	0 = Disable 1 = Mechanical bypass cell 2 = Manual activation of the BP relay 3 = Aut. BP after a manageable fault 4 = Aut. bypass by parallel assoc.	0	5-115
P1722(7)	Bypass of the cell V11	0 = Disable 1 = Mechanical bypass cell 2 = Manual activation of the BP relay 3 = Aut. BP after a manageable fault 4 = Aut. bypass by parallel assoc.	0	5-115
P1723(7)	Bypass of the cell V12	0 = Disable 1 = Mechanical bypass cell 2 = Manual activation of the BP relay 3 = Aut. BP after a manageable fault 4 = Aut. bypass by parallel assoc.	0	5-115
P1724(7)	Bypass of the cell W1	0 = Disable 1 = Mechanical bypass cell 2 = Manual activation of the BP relay 3 = Aut. BP after a manageable fault 4 = Aut. bypass by parallel assoc.	0	5-116
P1725(7)	Bypass of the cell W2	0 = Disable 1 = Mechanical bypass cell 2 = Manual activation of the BP relay 3 = Aut. BP after a manageable fault 4 = Aut. bypass by parallel assoc.	0	5-116
P1726(7)	Bypass of the cell W3	0 = Disable 1 = Mechanical bypass cell 2 = Manual activation of the BP relay 3 = Aut. BP after a manageable fault 4 = Aut. bypass by parallel assoc.	0	5-116
P1727(7)	Bypass of the cell W4	0 = Disable 1 = Mechanical bypass cell 2 = Manual activation of the BP relay 3 = Aut. BP after a manageable fault 4 = Aut. bypass by parallel assoc.	0	5-116
P1728(7)	Bypass of the cell W5	0 = Disable 1 = Mechanical bypass cell 2 = Manual activation of the BP relay 3 = Aut. BP after a manageable fault 4 = Aut. bypass by parallel assoc.	0	5-116
P1729(7)	Bypass of the cell W6	0 = Disable 1 = Mechanical bypass cell 2 = Manual activation of the BP relay 3 = Aut. BP after a manageable fault 4 = Aut. bypass by parallel assoc.	0	5-116
P1730(7)	Bypass of the cell W7	0 = Disable 1 = Mechanical bypass cell 2 = Manual activation of the BP relay 3 = Aut. BP after a manageable fault 4 = Aut. bypass by parallel assoc.	0	5-116

Param.	Description	Adjustable range	Factory setting	Page
P1731(7)	Bypass of the cell W8	0 = Disable 1 = Mechanical bypass cell 2 = Manual activation of the BP relay 3 = Aut. BP after a manageable fault 4 = Aut. bypass by parallel assoc.	0	5-116
P1732(7)	Bypass of the cell W9	0 = Disable 1 = Mechanical bypass cell 2 = Manual activation of the BP relay 3 = Aut. BP after a manageable fault 4 = Aut. bypass by parallel assoc.	0	5-116
P1733(7)	Bypass of the cell W10	0 = Disable 1 = Mechanical bypass cell 2 = Manual activation of the BP relay 3 = Aut. BP after a manageable fault 4 = Aut. bypass by parallel assoc.	0	5-116
P1734(7)	Bypass of the cell W11	0 = Disable 1 = Mechanical bypass cell 2 = Manual activation of the BP relay 3 = Aut. BP after a manageable fault 4 = Aut. bypass by parallel assoc.	0	5-116
P1735(7)	Bypass of the cell W12	0 = Disable 1 = Mechanical bypass cell 2 = Manual activation of the BP relay 3 = Aut. BP after a manageable fault 4 = Aut. bypass by parallel assoc.	0	5-116
P1739(1)	RL8 Function MVC3	0 = Inactive 1 = Operation with filter type 2 2 = Op. with permanent magnet machine	0	5-116
P1892(7)	Cells in parallel	0 = No parallelism 1 = 2 cells in parallel 2 = 3 cells in parallel	0	5-117
P1893(7)	Transformers at the input	0 = 1 transformer 1 = 2 transformers 2 = 3 transformers	1	5-117

NOTE!
Quick parameter reference notes:
(1) Parameter can be changed only with the inverter disabled (motor stopped).
(2) Values may change as a function of the "Motor Parameters".
(3) Values may change as a function of the parameter P0412 (Lr/Rr Constant).
(4) Values may change as a function of the parameter P0296 (Voltage).
(5) Values may change as a function of the parameter P0295 (Current).
(6) Values may change as a function of the parameter P0320 (Flying Start/Ride-Through).
(7) Parameter can only be changed with input cubicle opened.

1.2 MESSAGES OF ALARMS AND FAULTS

The faults of the MVW3000 can be subdivided into Alarms (Axxxx) and Faults (Fxxxx). In general, the alarms serve to indicate a situation that, if not corrected, can lead the inverter to a stop by fault. A signalized fault indicates a situation that caused the inverter to be disabled (the main circuit breaker may open or not, depending on the type of fault).

Fault/Alarm	Description	Page
F0003	Under Voltage / Phase Loss	8-1
F0006	Mains Unbalance/ Phase Loss	8-1
A0008	Timeout in the synchronism with the input line during synchronous transfer	8-2
F0009	Incorrect status of the input cubicle	8-2
F0013	Output contactor feedback	8-2
F0014	Input cubicle closing failure	8-2
F0015	Input cubicle opening failure	8-2
F0016	Shutdown by input cubicle protection	8-2
F0017	Inverter not ready to energize	8-2
A0018	Inverter main transformer alarm	8-2
F0019	Inverter main transformer fault	8-2
F0020	Pre-charge fault	8-2
F0025	Inverter door locking fault	8-2
F0026	Input cubicle not ready fault	8-3
F0027	Improper opening of the input cubicle	8-3
F0028	Watchdog PLC	8-3
F0034	Sensor 1 - Electrical arcing detection fault	8-3
F0035	Sensor 2 - Electrical arcing detection fault	8-3
F0036	Sensor 3 - Electrical arcing detection fault	8-3
F0037	Sensor 4 - Electrical arcing detection fault	8-3
F0038	Sensor 5 - Electrical arcing detection fault	8-3
F0039	Sensor 6 - Electrical arcing detection fault	8-3
F0040	Sensor 7 - Electrical arcing detection fault	8-3
F0041	Sensor 8 - Electrical arcing detection fault	8-3
F0042	Sensor 9 - Electrical arcing detection fault	8-3
F0043	Sensor 10 - Electrical arcing detection fault	8-3
F0044	Electrical arcing detection fault	8-3
A0046	Motor Ixt function overload	8-3
F0048(1)	Forced ventilation fault	8-4
F0069	Calibration fault	8-4
F0070	Overcurrent/short circuit	8-4
F0071	Overcurrent at output	8-4
F0072(1)	Output over load Ixt function	8-4
F0076	Output current unbalanced	8-4
F0078(1)	Motor Over Temperature	8-4
F0079(1)	Signals of the motor speed sensor defective	8-4
F0080	CPU watchdog error	8-4
F0083(1)	Inverter setup fault	8-4
A0084	Incorrect programming of inverter model	8-5
F0085	Electronic power supply fault	8-5
F0087	Control boards communication fault	8-5
F0090(1)	External DIx open fault	8-5
F0092	Pre-charge power supply	8-5
A0094	Cooling system supply fault	8-5

Fault/Alarm	Description	Page
A0096	Alarm 4 to 20 mA (current < 3 mA)	8-5
A0098	Help not recorded/Incompatible HMI version	8-5
F0099	Invalid output current offset	8-5
F0100	MVC3 fatal fault	8-5
F0101(1)	Incompatible software version between control boards	8-5
F0102	Unknown failure in EPLD of MVC3	8-5
F0103	MVC3 RAM fault	8-5
F0105	MVC3 EEPROM failure	8-5
F0106	MVC4 fatal fault	8-6
A0108	Inverter Not Initialized	8-6
F0109	General Disable MVC3	8-6
A0110	Motor overtemperature alarm	8-6
A0111	DIx open external alarm	8-6
F0112	Motor Over Speed	8-6
A0114	Inverter ventilation alarm - set B	8-6
A0118	Pre-charge power supply	8-6
A0123	Programming alarm	8-6
A0124	Parameter alteration with enabled inverter	8-6
A0125	Reading/writing in inexistent parameter	8-6
A0126	Parameter Value Out of Range	8-6
A0127	Function not configured for Fieldbus	8-6
F0128	Fieldbus Connec. Fault	8-6
A0129	Fieldbus Connec. Inactive	8-7
A0130	Fieldbus board inactive	8-7
F0256(1)	Output transformer fault	8-7
F0257(1)	Pressurization system fault	8-7
F0258(1)	Output filter fault	8-7
F0259(1)	Exciter fault	8-7
F0260(1)	Communication with the position sensor	8-7
A0261	Direction of rotation between input voltage and current is inverted	8-7
A0262	Direction of rotation between the output current and voltage is inverted	8-7
F0263	Timeout on output contactor activation	8-8
A0301	Input undervoltage	8-8
A0302	Input overvoltage	8-8
F0303	Input undervoltage	8-8
F0304	Input overvoltage	8-8
F0305	Input unbalance/phase loss	8-8
F0309	Timeout in Ride-through state Waiting Line	8-8
F0310	Short circuit on the transformer 1 secondary	8-8
A0315	Ground fault for neutral shift	8-8
F0316	Ground fault for neutral shift	8-8
F0317	Ground fault for current leak	8-9
F0320	Vab measurement feedback fault	8-9
F0321	Vbc measurement feedback fault	8-9
F0323	Ib_1 measurement feedback fault	8-9
F0324	Ic_1 measurement feedback fault	8-9
F0325	Vuv measurement feedback fault	8-9
F0326	Vvw measurement feedback fault	8-9
F0327	Vn_gnd measurement feedback fault	8-9
F0328	Ib_2 measurement feedback fault	8-9

Fault/Alarm	Description	Page
F0329	Ic_2 measurement feedback fault	8-9
F0330	Ib_3 measurement feedback fault	8-9
F0331	Ic_3 measurement feedback fault	8-10
F0343	Short circuit on the transformer 2 secondary	8-10
F0346	Short circuit on the transformer 3 secondary	8-10
F0350	Invalid setting for the Bypass	8-10
F0351	Number of programmed cells exceeds the inverter capacity	8-10
F0359(1)	Thermal protection relay 1 - Communication timeout	8-10
A0360	Thermal protection relay 1 - CH1 temperature sensor failure	8-10
A0361	Thermal protection relay 1 - CH2 temperature sensor failure	8-11
A0362	Thermal protection relay 1 - CH3 temperature sensor failure	8-11
A0363	Thermal protection relay 1 - CH4 temperature sensor failure	8-11
A0364	Thermal protection relay 1 - CH5 temperature sensor failure	8-11
A0365	Thermal protection relay 1 - CH6 temperature sensor failure	8-11
A0366	Thermal protection relay 1 - CH7 temperature sensor failure	8-11
A0367	Thermal protection relay 1 - CH8 temperature sensor failure	8-11
F0368(1)	Thermal protection relay 1 - Overtemperature detected on CH1	8-11
F0369(1)	Thermal protection relay 1 - Overtemperature detected on CH2	8-11
F0370(1)	Thermal protection relay 1 - Overtemperature detected on CH3	8-12
F0371(1)	Thermal protection relay 1 - Overtemperature detected on CH4	8-12
F0372(1)	Thermal protection relay 1 - Overtemperature detected on CH5	8-12
F0373(1)	Thermal protection relay 1 - Overtemperature detected on CH6	8-12
F0374(1)	Thermal protection relay 1 - Overtemperature detected on CH7	8-12
F0375(1)	Thermal protection relay 1 - Overtemperature detected on CH8	8-12
A0376	Thermal protection relay 1 - Overtemperature detected on CH1	8-12
A0377	Thermal protection relay 1 - Overtemperature detected on CH2	8-12
A0378	Thermal protection relay 1 - Overtemperature detected on CH3	8-12
A0379	Thermal protection relay 1 - Overtemperature detected on CH4	8-12
A0380	Thermal protection relay 1 - Overtemperature detected on CH5	8-13
A0381	Thermal protection relay 1 - Overtemperature detected on CH6	8-13
A0382	Thermal protection relay 1 - Overtemperature detected on CH7	8-13
A0383	Thermal protection relay 1 - Overtemperature detected on CH8	8-13
F0400	Cell U1 DC link overvoltage	8-13
F0401	Cell U1 DC link undervoltage	8-13
A0402	Overtemperature on cell U1 IGBT module	8-13
F0403	Overtemperature on cell U1 IGBT module	8-14
F0404	Defective temperature sensor or undertemperature on cell U1 IGBT	8-14
F0405	Cell U1 phase IGBT	8-14
F0406	Cell U1 neutral IGBT	8-14
F0408	Cell U1 phase pulse feedback	8-14
F0410	Cell U1 neutral pulse feedback	8-14
F0411	Cell U1 electronics power supply	8-14
F0416	Cell U1 modulation synchronism	8-14
F0417	Cell U1 bypass system	8-14
F0418	Communication with cell U1	8-15
F0422	Cell U1 insulation defective	8-15
F0425	Cell U2 DC link overvoltage	8-15
F0426	Cell U2 DC link undervoltage	8-15
A0427	Overtemperature on cell U2 IGBT module	8-15
F0428	Overtemperature on cell U2 IGBT module	8-15

Fault/Alarm	Description	Page
F0429	Defective temperature sensor or undertemperature on cell U2 IGBT	8-15
F0430	Cell U2 phase IGBT	8-16
F0431	Cell U2 neutral IGBT	8-16
F0433	Cell U2 phase pulse feedback	8-16
F0435	Cell U2 neutral pulse feedback	8-16
F0436	Cell U2 electronics power supply	8-16
F0441	Cell U2 modulation synchronism	8-16
F0442	Cell U2 bypass system	8-16
F0443	Communication with cell U2	8-16
F0447	Cell U2 insulation defective	8-16
F0450	Cell U3 DC link overvoltage	8-16
F0451	Cell U3 DC link undervoltage	8-17
A0452	Overtemperature on cell U3 IGBT module	8-17
F0453	Overtemperature on cell U3 IGBT module	8-17
F0454	Defective temperature sensor or undertemperature on cell U3 IGBT	8-17
F0455	Cell U3 phase IGBT	8-17
F0456	Cell U3 neutral IGBT	8-17
F0458	Cell U3 phase pulse feedback	8-18
F0460	Cell U3 neutral pulse feedback	8-18
F0461	Cell U3 electronics power supply	8-18
F0466	Cell U3 modulation synchronism	8-18
F0467	Cell U3 bypass system	8-18
F0468	Communication with cell U3	8-18
F0472	Cell U3 insulation defective	8-18
F0475	Cell U4 DC link overvoltage	8-18
F0476	Cell U4 DC link undervoltage	8-18
A0477	Overtemperature on cell U4 IGBT module	8-19
F0478	Overtemperature on cell U4 IGBT module	8-19
F0479	Defective temperature sensor or undertemperature on cell U4 IGBT	8-19
F0480	Cell U4 phase IGBT	8-19
F0481	Cell U4 neutral IGBT	8-19
F0483	Cell U4 phase pulse feedback	8-19
F0485	Cell U4 neutral pulse feedback	8-20
F0486	Cell U4 electronics power supply	8-20
F0491	Cell U4 modulation synchronism	8-20
F0492	Cell U4 bypass system	8-20
F0493	Communication with cell U4	8-20
F0497	Cell U4 insulation defective	8-20
F0500	Cell U5 DC link overvoltage	8-20
F0501	Cell U5 DC link undervoltage	8-20
A0502	Overtemperature on cell U5 IGBT module	8-20
F0503	Overtemperature on cell U5 IGBT module	8-21
F0504	Defective temperature sensor or undertemperature on cell U5 IGBT	8-21
F0505	Cell U5 phase IGBT	8-21
F0506	Cell U5 neutral IGBT	8-21
F0508	Cell U5 phase pulse feedback	8-21
F0510	Cell U5 neutral pulse feedback	8-21
F0511	Cell U5 electronics power supply	8-21
F0516	Cell U5 modulation synchronism	8-21
F0517	Cell U5 bypass system	8-21

Fault/Alarm	Description	Page
F0518	Communication with cell U5	8-22
F0522	Cell U5 insulation defective	8-22
F0525	Cell U6 DC link overvoltage	8-22
F0526	Cell U6 DC link undervoltage	8-22
A0527	Overtemperature on cell U6 IGBT module	8-22
F0528	Overtemperature on cell U6 IGBT module	8-22
F0529	Defective temperature sensor or undertemperature on cell U6 IGBT	8-22
F0530	Cell U6 phase IGBT	8-23
F0531	Cell U6 neutral IGBT	8-23
F0533	Cell U6 phase pulse feedback	8-23
F0535	Cell U6 neutral pulse feedback	8-23
F0536	Cell U6 electronics power supply	8-23
F0541	Cell U6 modulation synchronism	8-23
F0542	Cell U6 bypass system	8-23
F0543	Communication with cell U6	8-23
F0547	Cell U6 insulation defective	8-23
F0550	Cell U7 DC link overvoltage	8-23
F0551	Cell U7 DC link undervoltage	8-24
A0552	Overtemperature on cell U7 IGBT module	8-24
F0553	Overtemperature on cell U7 IGBT module	8-24
F0554	Defective temperature sensor or undertemperature on cell U7 IGBT	8-24
F0555	Cell U7 phase IGBT	8-24
F0556	Cell U7 neutral IGBT	8-24
F0558	Cell U7 phase pulse feedback	8-25
F0560	Cell U7 neutral pulse feedback	8-25
F0561	Cell U7 electronics power supply	8-25
F0566	Cell U7 modulation synchronism	8-25
F0567	Cell U7 bypass system	8-25
F0568	Communication with cell U7	8-25
F0572	Cell U7 insulation defective	8-25
F0575	Cell U8 DC link overvoltage	8-25
F0576	Cell U8 DC link undervoltage	8-25
A0577	Overtemperature on cell U8 IGBT module	8-26
F0578	Overtemperature on cell U8 IGBT module	8-26
F0579	Defective temperature sensor or undertemperature on cell U8 IGBT	8-26
F0580	Cell U8 phase IGBT	8-26
F0581	Cell U8 neutral IGBT	8-26
F0583	Cell U8 phase pulse feedback	8-26
F0585	Cell U8 neutral pulse feedback	8-27
F0586	Cell U8 electronics power supply	8-27
F0591	Cell U8 modulation synchronism	8-27
F0592	Cell U8 bypass system	8-27
F0593	Communication with cell U8	8-27
F0597	Cell U8 insulation defective	8-27
F0600	Cell V1 DC link overvoltage	8-27
F0601	Cell V1 DC link undervoltage	8-27
A0602	Overtemperature on cell V1 IGBT module	8-27
F0603	Overtemperature on cell V1 IGBT module	8-28
F0604	Defective temperature sensor or undertemperature on cell V1 IGBT	8-28
F0605	Cell V1 phase IGBT	8-28

Fault/Alarm	Description	Page
F0606	Cell V1 neutral IGBT	8-28
F0608	Cell V1 phase pulse feedback	8-28
F0610	Cell V1 neutral pulse feedback	8-28
F0611	Cell V1 electronics power supply	8-28
F0616	Cell V1 modulation synchronism	8-28
F0617	Cell V1 bypass system	8-28
F0618	Communication with cell V1	8-29
F0622	Cell V1 insulation defective	8-29
F0625	Cell V2 DC link overvoltage	8-29
F0626	Cell V2 DC link undervoltage	8-29
A0627	Overtemperature on cell V2 IGBT module	8-29
F0628	Overtemperature on cell V2 IGBT module	8-29
F0629	Defective temperature sensor or undertemperature on cell V2 IGBT	8-29
F0630	Cell V2 phase IGBT	8-30
F0631	Cell V2 neutral IGBT	8-30
F0633	Cell V2 phase pulse feedback	8-30
F0635	Cell V2 neutral pulse feedback	8-30
F0636	Cell V2 electronics power supply	8-30
F0641	Cell V2 modulation synchronism	8-30
F0642	Cell V2 bypass system	8-30
F0643	Communication with cell V2	8-30
F0647	Cell V2 insulation defective	8-30
F0650	Cell V3 DC link overvoltage	8-30
F0651	Cell V3 DC link undervoltage	8-31
A0652	Overtemperature on cell V3 IGBT module	8-31
F0653	Overtemperature on cell V3 IGBT module	8-31
F0654	Defective temperature sensor or undertemperature on cell V3 IGBT	8-31
F0655	Cell V3 phase IGBT	8-31
F0656	Cell V3 neutral IGBT	8-31
F0658	Cell V3 phase pulse feedback	8-32
F0660	Cell V3 neutral pulse feedback	8-32
F0661	Cell V3 electronics power supply	8-32
F0666	Cell V3 modulation synchronism	8-32
F0667	Cell V3 bypass system	8-32
F0668	Communication with cell V3	8-32
F0672	Cell V3 insulation defective	8-32
F0675	Cell V4 DC link overvoltage	8-32
F0676	Cell V4 DC link undervoltage	8-32
A0677	Overtemperature on cell V4 IGBT module	8-33
F0678	Overtemperature on cell V4 IGBT module	8-33
F0679	Defective temperature sensor or undertemperature on cell V4 IGBT	8-33
F0680	Cell V4 phase IGBT	8-33
F0681	Cell V4 neutral IGBT	8-33
F0683	Cell V4 phase pulse feedback	8-33
F0685	Cell V4 neutral pulse feedback	8-34
F0686	Cell V4 electronics power supply	8-34
F0691	Cell V4 modulation synchronism	8-34
F0692	Cell V4 bypass system	8-34
F0693	Communication with cell V4	8-34
F0697	Cell V4 insulation defective	8-34

Fault/Alarm	Description	Page
F0700	Cell V5 DC link overvoltage	8-34
F0701	Cell V5 DC link undervoltage	8-34
A0702	Overtemperature on cell V5 IGBT module	8-34
F0703	Overtemperature on cell V5 IGBT module	8-35
F0704	Defective temperature sensor or undertemperature on cell V5 IGBT	8-35
F0705	Cell V5 phase IGBT	8-35
F0706	Cell V5 neutral IGBT	8-35
F0708	Cell V5 phase pulse feedback	8-35
F0710	Cell V5 neutral pulse feedback	8-35
F0711	Cell V5 electronics power supply	8-35
F0716	Cell V5 modulation synchronism	8-35
F0717	Cell V5 bypass system	8-35
F0718	Communication with cell V5	8-36
F0722	Cell V5 insulation defective	8-36
F0725	Cell V6 DC link overvoltage	8-36
F0726	Cell V6 DC link undervoltage	8-36
A0727	Overtemperature on cell V6 IGBT module	8-36
F0728	Overtemperature on cell V6 IGBT module	8-36
F0729	Defective temperature sensor or undertemperature on cell V6 IGBT	8-36
F0730	Cell V6 phase IGBT	8-37
F0731	Cell V6 neutral IGBT	8-37
F0733	Cell V6 phase pulse feedback	8-37
F0735	Cell V6 neutral pulse feedback	8-37
F0736	Cell V6 electronics power supply	8-37
F0741	Cell V6 modulation synchronism	8-37
F0742	Cell V6 bypass system	8-37
F0743	Communication with cell V6	8-37
F0747	Cell V6 insulation defective	8-37
F0750	Cell V7 DC link overvoltage	8-37
F0751	Cell V7 DC link undervoltage	8-38
A0752	Overtemperature on cell V7 IGBT module	8-38
F0753	Overtemperature on cell V7 IGBT module	8-38
F0754	Defective temperature sensor or undertemperature on cell V7 IGBT	8-38
F0755	Cell V7 phase IGBT	8-38
F0756	Cell V7 neutral IGBT	8-38
F0758	Cell V7 phase pulse feedback	8-39
F0760	Cell V7 neutral pulse feedback	8-39
F0761	Cell V7 electronics power supply	8-39
F0766	Cell V7 modulation synchronism	8-39
F0767	Cell V7 bypass system	8-39
F0768	Communication with cell V7	8-39
F0772	Cell V7 insulation defective	8-39
F0775	Cell V8 DC link overvoltage	8-39
F0776	Cell V8 DC link undervoltage	8-39
A0777	Overtemperature on cell V8 IGBT module	8-40
F0778	Overtemperature on cell V8 IGBT module	8-40
F0779	Defective temperature sensor or undertemperature on cell V8 IGBT	8-40
F0780	Cell V8 phase IGBT	8-40
F0781	Cell V8 neutral IGBT	8-40
F0783	Cell V8 phase pulse feedback	8-40

Fault/Alarm	Description	Page
F0785	Cell V8 neutral pulse feedback	8-41
F0786	Cell V8 electronics power supply	8-41
F0791	Cell V8 modulation synchronism	8-41
F0792	Cell V8 bypass system	8-41
F0793	Communication with cell V8	8-41
F0797	Cell V8 insulation defective	8-41
F0800	Cell W1 DC link overvoltage	8-41
F0801	Cell W1 DC link undervoltage	8-41
A0802	Overtemperature on cell W1 IGBT module	8-41
F0803	Overtemperature on cell W1 IGBT module	8-42
F0804	Defective temperature sensor or undertemperature on cell W1 IGBT	8-42
F0805	Cell W1 phase IGBT	8-42
F0806	Cell W1 neutral IGBT	8-42
F0808	Cell W1 phase pulse feedback	8-42
F0810	Cell W1 neutral pulse feedback	8-42
F0811	Cell W1 electronics power supply	8-42
F0816	Cell W1 modulation synchronism	8-42
F0817	Cell W1 bypass system	8-42
F0818	Communication with cell W1	8-43
F0822	Cell W1 insulation defective	8-43
F0825	Cell W2 DC link overvoltage	8-43
F0826	Cell W2 DC link undervoltage	8-43
A0827	Overtemperature on cell W2 IGBT module	8-43
F0828	Overtemperature on cell W2 IGBT module	8-43
F0829	Defective temperature sensor or undertemperature on cell W2 IGBT	8-43
F0830	Cell W2 phase IGBT	8-44
F0831	Cell W2 neutral IGBT	8-44
F0833	Cell W2 phase pulse feedback	8-44
F0835	Cell W2 neutral pulse feedback	8-44
F0836	Cell W2 electronics power supply	8-44
F0841	Cell W2 modulation synchronism	8-44
F0842	Cell W2 bypass system	8-44
F0843	Communication with cell W2	8-44
F0847	Cell W2 insulation defective	8-44
F0850	Cell W3 DC link overvoltage	8-44
F0851	Cell W3 DC link undervoltage	8-45
A0852	Overtemperature on cell W3 IGBT module	8-45
F0853	Overtemperature on cell W3 IGBT module	8-45
F0854	Defective temperature sensor or undertemperature on cell W3 IGBT	8-45
F0855	Cell W3 phase IGBT	8-45
F0856	Cell W3 neutral IGBT	8-45
F0858	Cell W3 phase pulse feedback	8-46
F0860	Cell W3 neutral pulse feedback	8-46
F0861	Cell W3 electronics power supply	8-46
F0866	Cell W3 modulation synchronism	8-46
F0867	Cell W3 bypass system	8-46
F0868	Communication with cell W3	8-46
F0872	Cell W3 insulation defective	8-46
F0875	Cell W4 DC link overvoltage	8-46
F0876	Cell W4 DC link undervoltage	8-46

Fault/Alarm	Description	Page
A0877	Overtemperature on cell W4 IGBT module	8-47
F0878	Overtemperature on cell W4 IGBT module	8-47
F0879	Defective temperature sensor or undertemperature on cell W4 IGBT	8-47
F0880	Cell W4 phase IGBT	8-47
F0881	Cell W4 neutral IGBT	8-47
F0883	Cell W4 phase pulse feedback	8-47
F0885	Cell W4 neutral pulse feedback	8-48
F0886	Cell W4 electronics power supply	8-48
F0891	Cell W4 modulation synchronism	8-48
F0892	Cell W4 bypass system	8-48
F0893	Communication with cell W4	8-48
F0897	Cell W4 insulation defective	8-48
F0900	Cell W5 DC link overvoltage	8-48
F0901	Cell W5 DC link undervoltage	8-48
A0902	Overtemperature on cell W5 IGBT module	8-48
F0903	Overtemperature on cell W5 IGBT module	8-49
F0904	Defective temperature sensor or undertemperature on cell W5 IGBT	8-49
F0905	Cell W5 phase IGBT	8-49
F0906	Cell W5 neutral IGBT	8-49
F0908	Cell W5 phase pulse feedback	8-49
F0910	Cell W5 neutral pulse feedback	8-49
F0911	Cell W5 electronics power supply	8-49
F0916	Cell W5 modulation synchronism	8-49
F0917	Cell W5 bypass system	8-49
F0918	Communication with cell W5	8-50
F0922	Cell W5 insulation defective	8-50
F0925	Cell W6 DC link overvoltage	8-50
F0926	Cell W6 DC link undervoltage	8-50
A0927	Overtemperature on cell W6 IGBT module	8-50
F0928	Overtemperature on cell W6 IGBT module	8-50
F0929	Defective temperature sensor or undertemperature on cell W6 IGBT	8-50
F0930	Cell W6 phase IGBT	8-51
F0931	Cell W6 neutral IGBT	8-51
F0933	Cell W6 phase pulse feedback	8-51
F0935	Cell W6 neutral pulse feedback	8-51
F0936	Cell W6 electronics power supply	8-51
F0941	Cell W6 modulation synchronism	8-51
F0942	Cell W6 bypass system	8-51
F0943	Communication with cell W6	8-51
F0947	Cell W6 insulation defective	8-51
F0950	Cell W7 DC link overvoltage	8-51
F0951	Cell W7 DC link undervoltage	8-52
A0952	Overtemperature on cell W7 IGBT module	8-52
F0953	Overtemperature on cell W7 IGBT module	8-52
F0954	Defective temperature sensor or undertemperature on cell W7 IGBT	8-52
F0955	Cell W7 phase IGBT	8-52
F0956	Cell W7 neutral IGBT	8-52
F0958	Cell W7 phase pulse feedback	8-53
F0960	Cell W7 neutral pulse feedback	8-53
F0961	Cell W7 electronics power supply	8-53

Fault/Alarm	Description	Page
F0966	Cell W7 modulation synchronism	8-53
F0967	Cell W7 bypass system	8-53
F0968	Communication with cell W7	8-53
F0972	Cell W7 insulation defective	8-53
F0975	Cell W8 DC link overvoltage	8-53
F0976	Cell W8 DC link undervoltage	8-53
A0977	Overtemperature on cell W8 IGBT module	8-54
F0978	Overtemperature on cell W8 IGBT module	8-54
F0979	Defective temperature sensor or undertemperature on cell W8 IGBT	8-54
F0980	Cell W8 phase IGBT	8-54
F0981	Cell W8 neutral IGBT	8-54
F0983	Cell W8 phase pulse feedback	8-54
F0985	Cell W8 neutral pulse feedback	8-55
F0986	Cell W8 electronics power supply	8-55
F0991	Cell W8 modulation synchronism	8-55
F0992	Cell W8 bypass system	8-55
F0993	Communication with cell W8	8-55
F0997	Cell W8 insulation defective	8-55
F1000	Cell U9 DC link overvoltage	8-55
F1001	Cell U9 DC link undervoltage	8-55
A1002	Overtemperature on cell U9 IGBT module	8-55
F1003	Overtemperature on cell U9 IGBT module	8-56
F1004	Defective temperature sensor or undertemperature on cell U9 IGBT	8-56
F1005	Cell U9 phase IGBT	8-56
F1006	Cell U9 neutral IGBT	8-56
F1008	Cell U9 phase pulse feedback	8-56
F1010	Cell U9 neutral pulse feedback	8-56
F1011	Cell U9 electronics power supply	8-56
F1016	Cell U9 modulation synchronism	8-56
F1017	Cell U9 bypass system	8-56
F1018	Communication with cell U9	8-57
F1022	Cell U9 insulation defective	8-57
F1025	Cell U10 DC link overvoltage	8-57
F1026	Cell U10 DC link undervoltage	8-57
A1027	Overtemperature on cell U10 IGBT module	8-57
F1028	Overtemperature on cell U10 IGBT module	8-57
F1029	Defective temperature sensor or undertemperature on cell U10 IGBT	8-57
F1030	Cell U10 phase IGBT	8-58
F1031	Cell U10 neutral IGBT	8-58
F1033	Cell U10 phase pulse feedback	8-58
F1035	Cell U10 neutral pulse feedback	8-58
F1036	Cell U10 electronics power supply	8-58
F1041	Cell U10 modulation synchronism	8-58
F1042	Cell U10 bypass system	8-58
F1043	Communication with cell U10	8-58
F1047	Cell U10 insulation defective	8-58
F1050	Cell U11 DC link overvoltage	8-58
F1051	Cell U11 DC link undervoltage	8-59
A1052	Overtemperature on cell U11 IGBT module	8-59
F1053	Overtemperature on cell U11 IGBT module	8-59

Fault/Alarm	Description	Page
F1054	Defective temperature sensor or undertemperature on cell U11 IGBT	8-59
F1055	Cell U11 phase IGBT	8-59
F1056	Cell U11 neutral IGBT	8-59
F1058	Cell U11 phase pulse feedback	8-60
F1060	Cell U11 neutral pulse feedback	8-60
F1061	Cell U11 electronics power supply	8-60
F1066	Cell U11 modulation synchronism	8-60
F1067	Cell U11 bypass system	8-60
F1068	Communication with cell U11	8-60
F1072	Cell U11 insulation defective	8-60
F1075	Cell U12 DC link overvoltage	8-60
F1076	Cell U12 DC link undervoltage	8-60
A1077	Overtemperature on cell U12 IGBT module	8-61
F1078	Overtemperature on cell U12 IGBT module	8-61
F1079	Defective temperature sensor or undertemperature on cell U12 IGBT	8-61
F1080	Cell U12 phase IGBT	8-61
F1081	Cell U12 neutral IGBT	8-61
F1083	Cell U12 phase pulse feedback	8-61
F1085	Cell U12 neutral pulse feedback	8-62
F1086	Cell U12 electronics power supply	8-62
F1091	Cell U12 modulation synchronism	8-62
F1092	Cell U12 bypass system	8-62
F1093	Communication with cell U12	8-62
F1097	Cell U12 insulation defective	8-62
F1100	Cell V9 DC link overvoltage	8-62
F1101	Cell V9 DC link undervoltage	8-62
A1102	Overtemperature on cell V9 IGBT module	8-62
F1103	Overtemperature on cell V9 IGBT module	8-63
F1104	Defective temperature sensor or undertemperature on cell V9 IGBT	8-63
F1105	Cell V9 phase IGBT	8-63
F1106	Cell V9 neutral IGBT	8-63
F1108	Cell V9 phase pulse feedback	8-63
F1110	Cell V9 neutral pulse feedback	8-63
F1111	Cell V9 electronics power supply	8-63
F1116	Cell V9 modulation synchronism	8-63
F1117	Cell V9 bypass system	8-63
F1118	Communication with cell V9	8-64
F1122	Cell V9 insulation defective	8-64
F1125	Cell V10 DC link overvoltage	8-64
F1126	Cell V10 DC link undervoltage	8-64
A1127	Overtemperature on cell V10 IGBT module	8-64
F1128	Overtemperature on cell V10 IGBT module	8-64
F1129	Defective temperature sensor or undertemperature on cell V10 IGBT	8-64
F1130	Cell V10 phase IGBT	8-65
F1131	Cell V10 neutral IGBT	8-65
F1133	Cell V10 phase pulse feedback	8-65
F1135	Cell V10 neutral pulse feedback	8-65
F1136	Cell V10 electronics power supply	8-65
F1141	Cell V10 modulation synchronism	8-65
F1142	Cell V10 bypass system	8-65

Fault/Alarm	Description	Page
F1143	Communication with cell V10	8-65
F1147	Cell V10 insulation defective	8-65
F1150	Cell V11 DC link overvoltage	8-65
F1151	Cell V11 DC link undervoltage	8-66
A1152	Overtemperature on cell V11 IGBT module	8-66
F1153	Overtemperature on cell V11 IGBT module	8-66
F1154	Defective temperature sensor or undertemperature on cell V11 IGBT	8-66
F1155	Cell V11 phase IGBT	8-66
F1156	Cell V11 neutral IGBT	8-66
F1158	Cell V11 phase pulse feedback	8-67
F1160	Cell V11 neutral pulse feedback	8-67
F1161	Cell V11 electronics power supply	8-67
F1166	Cell V11 modulation synchronism	8-67
F1167	Cell V11 bypass system	8-67
F1168	Communication with cell V11	8-67
F1172	Cell V11 insulation defective	8-67
F1175	Cell V12 DC link overvoltage	8-67
F1176	Cell V12 DC link undervoltage	8-67
A1177	Overtemperature on cell V12 IGBT module	8-68
F1178	Overtemperature on cell V12 IGBT module	8-68
F1179	Defective temperature sensor or undertemperature on cell V12 IGBT	8-68
F1180	Cell V12 phase IGBT	8-68
F1181	Cell V12 neutral IGBT	8-68
F1183	Cell V12 phase pulse feedback	8-68
F1185	Cell V12 neutral pulse feedback	8-69
F1186	Cell V12 electronics power supply	8-69
F1191	Cell V12 modulation synchronism	8-69
F1192	Cell V12 bypass system	8-69
F1193	Communication with cell V12	8-69
F1197	Cell V12 insulation defective	8-69
F1200	Cell W9 DC link overvoltage	8-69
F1201	Cell W9 DC link undervoltage	8-69
A1202	Overtemperature on cell W9 IGBT module	8-69
F1203	Overtemperature on cell W9 IGBT module	8-70
F1204	Defective temperature sensor or undertemperature on cell W9 IGBT	8-70
F1205	Cell W9 phase IGBT	8-70
F1206	Cell W9 neutral IGBT	8-70
F1208	Cell W9 phase pulse feedback	8-70
F1210	Cell W9 neutral pulse feedback	8-70
F1211	Cell W9 electronics power supply	8-70
F1216	Cell W9 modulation synchronism	8-70
F1217	Cell W9 bypass system	8-70
F1218	Communication with cell W9	8-71
F1222	Cell W9 insulation defective	8-71
F1225	Cell W10 DC link overvoltage	8-71
F1226	Cell W10 DC link undervoltage	8-71
A1227	Overtemperature on cell W10 IGBT module	8-71
F1228	Overtemperature on cell W10 IGBT module	8-71
F1229	Defective temperature sensor or undertemperature on cell W10 IGBT	8-71
F1230	Cell W10 phase IGBT	8-72

Fault/Alarm	Description	Page
F1231	Cell W10 neutral IGBT	8-72
F1233	Cell W10 phase pulse feedback	8-72
F1235	Cell W10 neutral pulse feedback	8-72
F1236	Cell W10 electronics power supply	8-72
F1241	Cell W10 modulation synchronism	8-72
F1242	Cell W10 bypass system	8-72
F1243	Communication with cell W10	8-72
F1247	Cell W10 insulation defective	8-72
F1250	Cell W11 DC link overvoltage	8-72
F1251	Cell W11 DC link undervoltage	8-73
A1252	Overtemperature on cell W11 IGBT module	8-73
F1253	Overtemperature on cell W11 IGBT module	8-73
F1254	Defective temperature sensor or undertemperature on cell W11 IGBT	8-73
F1255	Cell W11 phase IGBT	8-73
F1256	Cell W11 neutral IGBT	8-73
F1258	Cell W11 phase pulse feedback	8-74
F1260	Cell W11 neutral pulse feedback	8-74
F1261	Cell W11 electronics power supply	8-74
F1266	Cell W11 modulation synchronism	8-74
F1267	Cell W11 bypass system	8-74
F1268	Communication with cell W11	8-74
F1272	Cell W11 insulation defective	8-74
F1275	Cell W12 DC link overvoltage	8-74
F1276	Cell W12 DC link undervoltage	8-74
A1277	Overtemperature on cell W12 IGBT module	8-75
F1278	Overtemperature on cell W12 IGBT module	8-75
F1279	Defective temperature sensor or undertemperature on cell W12 IGBT	8-75
F1280	Cell W12 phase IGBT	8-75
F1281	Cell W12 neutral IGBT	8-75
F1283	Cell W12 phase pulse feedback	8-75
F1285	Cell W12 neutral pulse feedback	8-76
F1286	Cell W12 electronics power supply	8-76
F1291	Cell W12 modulation synchronism	8-76
F1292	Cell W12 bypass system	8-76
F1293	Communication with cell W12	8-76
F1297	Cell W12 insulation defective	8-76

NOTE!
Note found in the alarm and fault quick reference:
(1) It does not open the circuit breaker.

2 SAFETY INSTRUCTIONS

This manual contains the necessary information for the correct use of the MVW3000 frequency inverter.

It was written to be used by people with proper technical training or qualification to operate this kind of equipment.

This manual presents all the functions and parameters of the MVW3000, but it is not intended to explain every possible application of the MVW3000. WEG will not take any liabilities for applications not described in this manual.

This product is neither intended for applications whose purpose is to ensure physical integrity and/or life of people, nor for any other application in which a fault of the MVW3000 may create a situation of risk to the physical integrity and/or life of people. The designer who applies the MVW3000 must provide ways to ensure the safety of the installation even in case of a failure of the servo drive.

2.1 SAFETY WARNINGS IN THE MANUAL

The following safety notices are used in this manual:

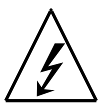
DANGER!
Not following the procedures recommended in this warning can lead to death, serious injuries and considerable material damages.

WARNING!
Not following the procedures recommended in this warning can lead to material damages.

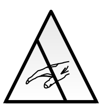
NOTE!
The text aims at providing important information for the complete understanding and proper operation of the product.

2.2 SAFETY WARNINGS ON THE PRODUCT

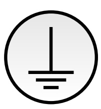
The following symbols are attached to the product as safety warnings:



High voltages are present.



Components sensitive to electrostatic discharge. Do not touch them.



Mandatory connection to the protective earth (PE).

Connection of the shield to the ground.

2.3 IDENTIFICATION LABEL OF THE MVW3000

The identification label of the MVW3000 is located inside the product Control Panel. The label contains important information on the inverter.

WEG	AUTOMATION UNIT SWITCHGEAR AND CONTROLGEAR
TYPE: MVW3000 MANUFACTURING YEAR: DOCUMENT : 10004545394 SERIAL No: MATERIAL: 13777913 WEIGHT: 1560 kg IP: 41	Ur: 7.2 kV fr: 50 Hz Up: 45 kV Ud: 15 kV COMMAND Ua: 220 Vca Ir (GENERAL BUSBAR): 200 A Ik: 15.7 kA Ip: 40.8 kA
INSTRUCTION MANUAL	

Figure 2.1 – *MVW3000 identification label (example)*

2.4 PRELIMINARY RECOMMENDATIONS

DANGER!
Only qualified personnel, familiar with the MVW3000 inverter and related equipment must plan or perform the installation, commissioning, operation and maintenance of this equipment.
Such personnel must follow the safety instructions described in this manual and/or defined by local standards.
Failure to comply with the safety instructions may cause risk of death and/or equipment damage.

NOTE!
For the purposes of this manual, qualified personnel are those trained in order to be able to:
1. Install, ground, power up and operate the MVW3000 in accordance with this manual and the safety legal procedures in force.
2. Wear/use protective equipment according to the standards in force.
3. Give first aid.

DANGER!
Always turn off the main power supply before touching any electrical component associated to the inverter.
Many components may remain charged with high voltages and/or moving parts (fans) even after the AC power supply input is disconnected or turned off.
Wait for at least ten minutes in order to guarantee the full discharge of the capacitors.
Always connect the equipment frame to the protective earth (PE) at the proper terminal.

WARNING!
Electronic boards have components sensitive to electrostatic discharges. Do not touch directly the component parts or connectors. If necessary, first touch the grounded metallic frame or use a proper grounding strap.

Do not execute any applied potential test on the inverter!
If necessary, contact WEG.

NOTE!
Frequency inverters may interfere with other electronic equipment. Follow the recommended procedures to minimize those effects.

NOTE!
Read the User's Manual completely before installing or operating this inverter.

3 GENERAL INFORMATION

This manual presents the necessary information for the configuration of all of the functions and parameters of of the MVW3000. This manual must be used together with the User's Manual.

3.1 ABOUT THE MANUAL

This manual contains chapters whith a logical sequence for the user to program and operate the MVW3000:

This manual contains information about the setting and programming of WEG / MVW3000 Medium Voltage Inverter. This document is arranged in dedicated and specific chapters that explain the proper setting, troubleshooting and functionalities of the equipment.

The characteristics and recommendations contained in this manual were based on models of the standard MVW3000. It is worth of notice that, in addition to supplying standard products, WEG technical team - composed of distinct departments: Technical Sales, Contract Management, Engineering, Technical Assistance, among others - is qualified to develop and provide customized solutions according to the customers' needs and their specific applications.

The MVW3000 may be engineered to meet the needs and technical specifications of our customers. Sizes, technical recommendations, performance data and optional items can be changed in relation to the information contained in this document.

In addition to the manual, the inverter detailed design is part of the documentation delivered to the customer. This design contains all the electrical, mechanical and setting information, as well as instructions for the interface/installation with other equipment.

The MVW3000, as well as other WEG products, is in constant evolution in relation to both internal parts (hardware) and programming (software/firmware). Any further explanation about the equipment and its documentation can be obtained by means of WEG communication channels.

WEG is not liable for the improper use of the information contained in this manual.

3.2 SOFTWARE VERSION

The software version used on the MVW3000 is important, since the software defines the functions and programming parameters. This manual refers to the software version as indicated on the back cover. For instance, the version 1.4X means from 1.40 to 1.49, where "X" are the evolutions in the software that do not affect the content of this manual.

3.2.1 Available Models

The MVW3000 line of Medium Voltage inverters offers different models, classified according to their power cell rated voltage and current levels. Different models of the MVW3000 may have different frames and codes. For constructive aspects of the available frames, check in chapter 4 TECHNICAL SPECIFICATIONS of the User's

Manual, Figure 4.3, page 4-3 and tables 4.1 to 4.12 on pages 4-3 and 4-4. For models with rated voltage above 8000 V, contact WEG.

***Figure 3.1** – General illustration of the panel (Frame B10)*

WARNING!
It is very important to check that the inverter software version is the same as indicated on the first page of this manual.

4 HMI

The HMI (*Human Machine Interface*) provides a number of features to the MVW3000 medium voltage frequency inverter, namely:

- View: view mode in text mode and graphic mode.
- Monitoring: up to 4 parameters can be monitored simultaneously on the screen.
- Navigation: menu navigation system with the addition of scroll bars and new keys.
- Help function *on-line*: help on HMI.
- Editing: new keys to speed up parameter editing.

The design, improvements and new functions have operation, navigation and programming similar to the WEG product line.

Figure 4.1 – *HMI for the MVW3000 inverter*

4.1 USERS AND ACCESS LEVELS

Users allow access to certain inverter functions and settings. Passwords are informed in the commissioning service report.

Table 4.1 – *Users and access levels*

User	Functions	Default password
OPERATION	Readings screen	5
	Graphics screen	
	Parameters screen	
	Read and write on parameters	
	Graphics screen settings	
MAINTENANCE	Graphics screen	31415
ASTEC	Firmware update	
	File backup	
	Remote access	
WEG	User access settings	
	Settings of the HMI operating system	

4.1.0.1 OPERATION

Access to commands via windows or settings menus, inverter operations and commands.

4.1.0.2 MAINTENANCE

Reading access to the settings of the HMI operating system and writing access to general settings.

4.1.0.3 ASTEC

Reserved for WEG technical assistance.

4.1.0.4 WEG

Reserved for WEG technical assistance.

4.2 VIEW MODES

In any use situation of the HMI (view mode or active screen) there are standard indications that are always displayed:

- Inverter status
- Help
- Language
- Login
- Date and time
- Local or remote mode
- Direction of rotation
- HMI speed reference
- Fault and alarm management

4.2.0.1 Standard screen

The HMI has a 10 inch screen, with navigation screens similar to Figure 4.2 on page 4-3.

Figure 4.2 – *Standard screen.*

NOTE!
The print screen function can be enabled in the HMI settings.

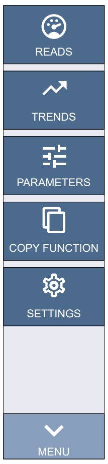


Figure 4.3 – *Function menu*

The navigation is performed using the function menu that shows the shortcuts:

- Readings.
- Graphics.
- Parameters.
- *Copy* function.
- Settings.

After power-up, the inverter *firmware* version is displayed, and the parameter transfer begins.

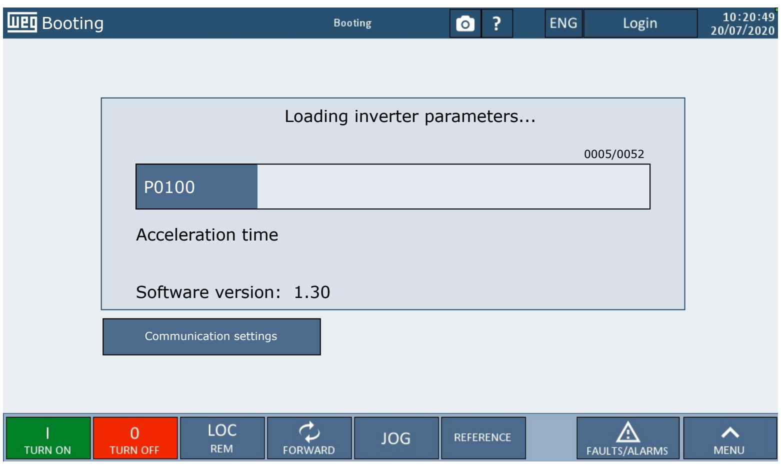


Figure 4.4 – *HMI initialization*

After initialization is complete, the "Readings" navigation screen is displayed with three configurable view modes:

- Screen 01: 4 parameters, graphic view.
- Screen 02: 4 parameters, numerical view.
- Screen 03: 1 parameter, numerical view.

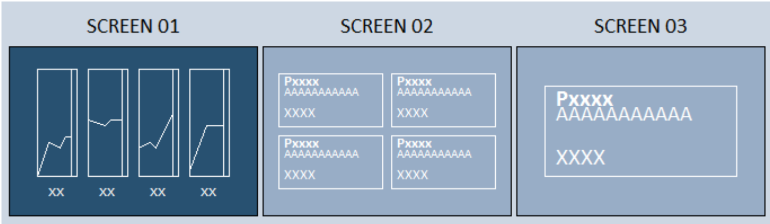


Figure 4.5 – *Readings screen configuration*

4.3 KEYBOARDS

The Figure 4.6 on page 4-4 and the Figure 4.7 on page 4-4 show the numeric and alphanumeric keyboards.

Figure 4.6 – *Numeric keyboard*

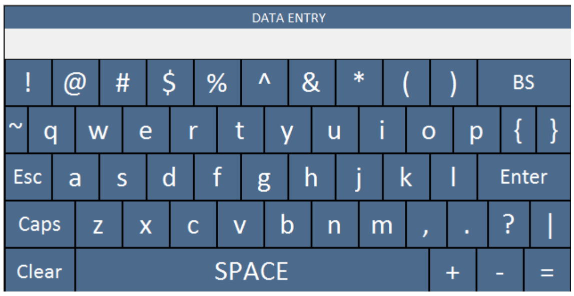


Figure 4.7 – *Alphanumeric keyboard*

The keyboards are displayed automatically whenever needed; the type of keyboard is selected according to the function being performed.

4.4 READINGS

The readings screen is loaded after the inverter initialization and allows monitoring up to four parameters simultaneously.

Figure 4.8 – *Shortcut to the readings screen*

It has three view modes with configurable parameters according to Figure 4.9 on page 4-5 .

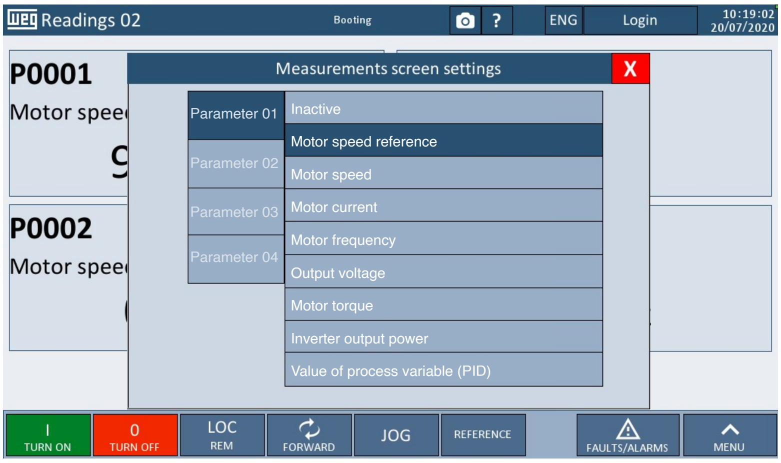


***Figure 4.9 –** Display settings*

4.4.0.1 Display settings

The settings can be changed at “MENU > SETTINGS > Home screen” or press directly on the parameter on the readings screen.

Available parameters:

- P0001 (Motor speed reference).
- P0002 (Motor speed).
- P0003 (Motor current).
- P1143 (Output voltage).
- P0005 (Motor frequency).
- P0009 (Motor torque).
- P0010 (Inverter output power).
- P0040 (Value of process variable (PID)).

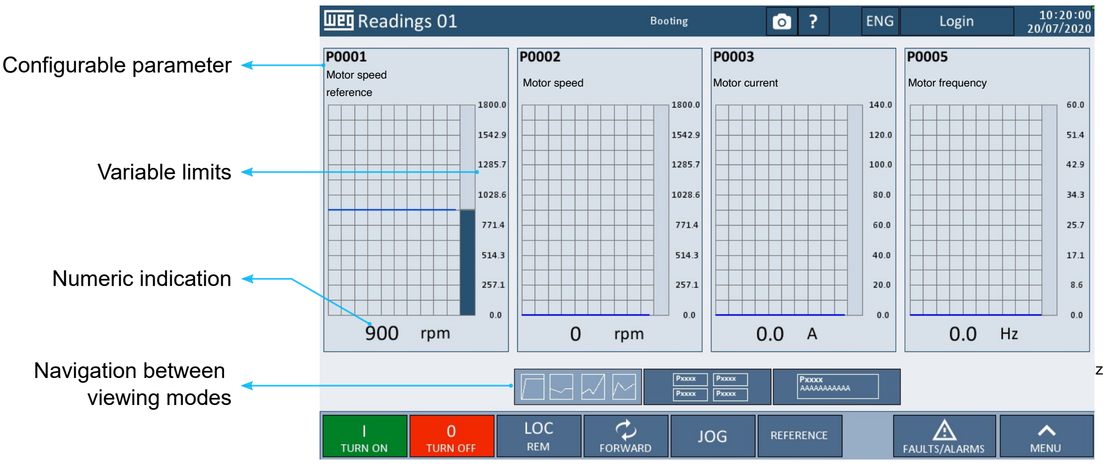


***Figure 4.10 –** Readings screen, view mode 01*

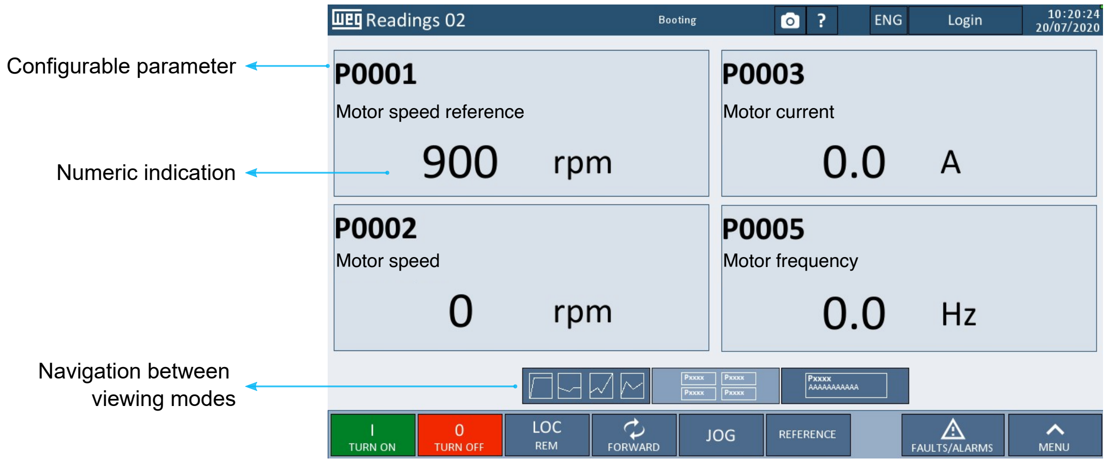


Figure 4.11 – Readings screen, view mode 02

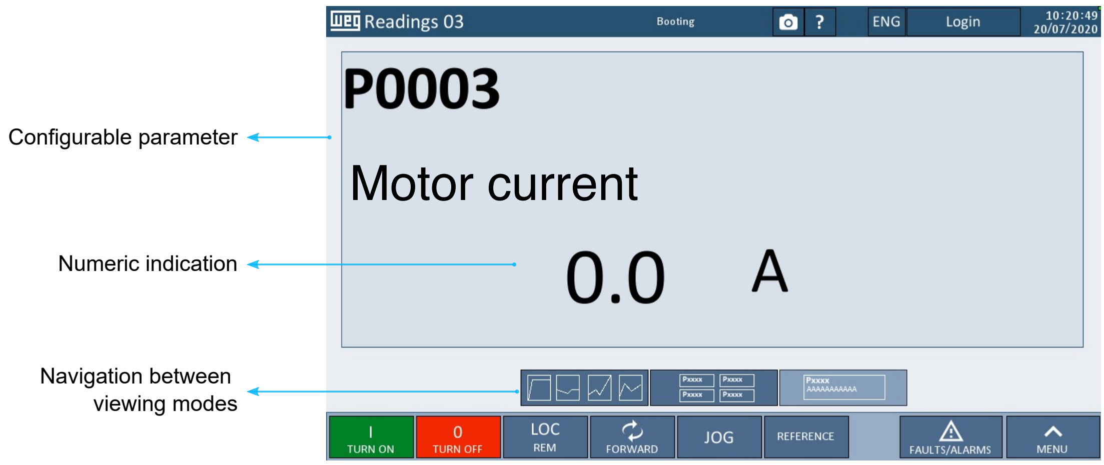


Figure 4.12 – Readings screen, view mode 03

4.5 GRAPHICS

On the graphics screen, it is possible to monitor up to four parameters, whose data read are saved in files and stored for seven days on the HMI memory, and such data and can be exported to a USB disk.

Figure 4.13 – Shortcut to the graphics screen

In the main screen there are the graphics, the current values of the parameters and buttons to configure the parameters and the limits of the channels.

Figure 4.14 – *Graphics screen*

4.5.0.1 Set channels of the graphics function

In "Channel settings", it is possible to set up to four channels, disabling or assigning a parameter of the reading parameters:

- Motor speed reference.
- Motor speed.
- Motor current.
- Output voltage.
- Motor frequency.
- Motor torque.
- Inverter output power.
- Value of process variable (PID).

The time interval of the X axis defines the scale of the X axis. To save the new channel configuration, use the "Save data" button.

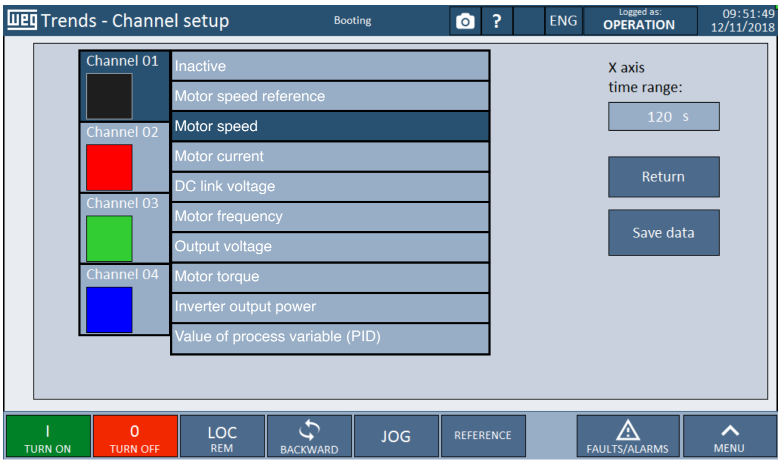


Figure 4.15 – *Channel settings*

4.5.0.2 Graphic limits

When the "Limits" button is pressed, a window will pop up with four fields, one for each channel, where values from 0 to 200% can be entered.

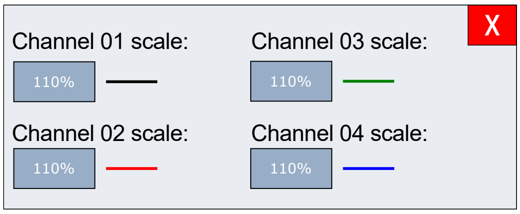


Figure 4.16 – *Graphic limits*

4.6 PARAMETERS

It allows access to all setting parameters of the MVW3000.

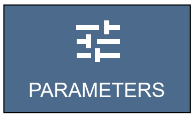


Figure 4.17 – *Button to access the parameters*

The main structure of the parameter menu is shown in Table 4.2 on page 4-8 .

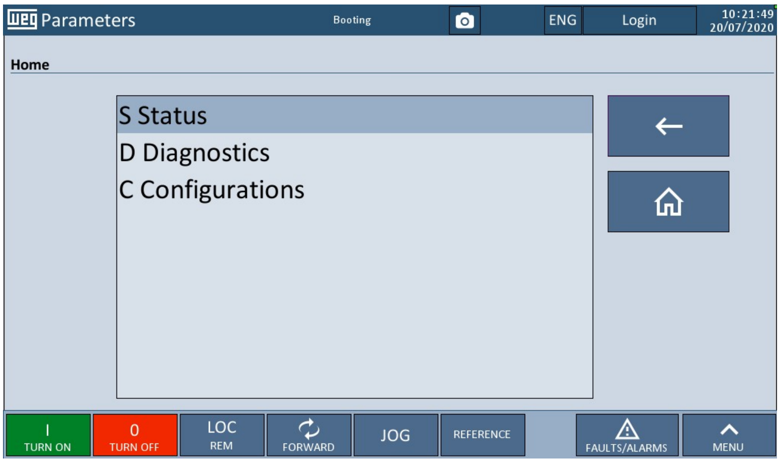


Figure 4.18 – *Parameter menu*

Table 4.2 – *Groups accessed through the main menu*

Menu	Parameters or Submenu to which access is given
Status	Allows viewing of the MVW3000 reading variables.
Diagnostics	It allows viewing variables and events that may help diagnose problems or improve the MVW3000 operation.
Configurations	This menu allows the programming of all MVW3000 configuration parameters.

4.6.0.1 Parameter view

Up to five parameters are displayed simultaneously on the screen, and the table is separated by ID, description and parameter value.

The "Search parameter" field allows searching for a parameter based on the ID. If the number does not exist, the existing parameter with the closest ID to the requested one will be displayed.

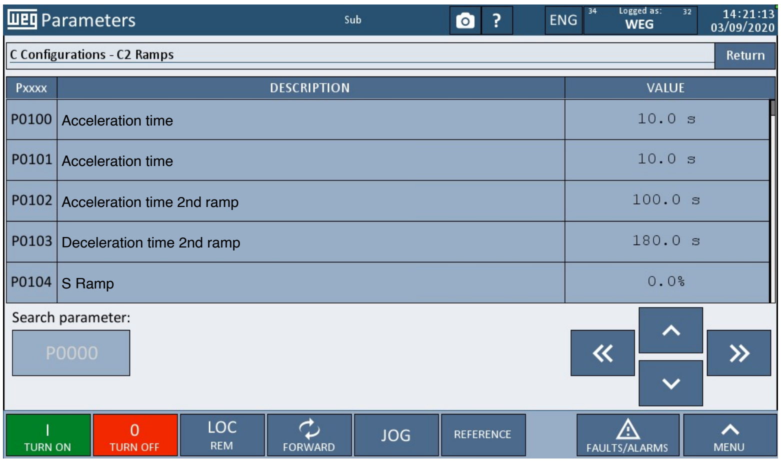
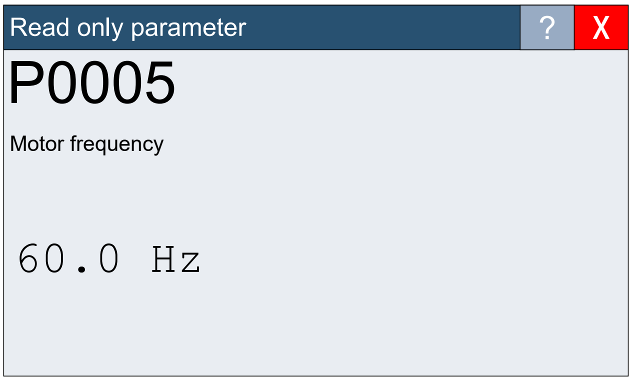


Figure 4.19 – Parameter view screen

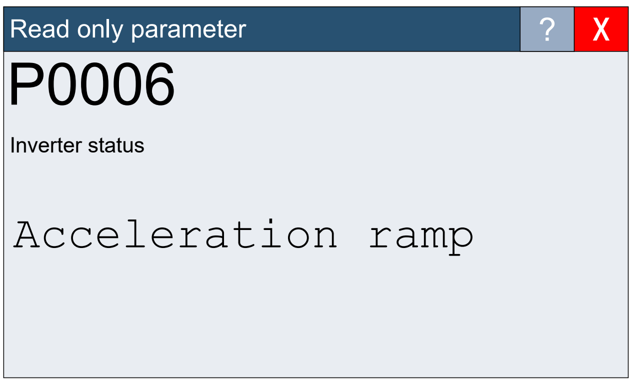
4.6.0.2 Reading parameters

In this display mode, it is possible to view the measured quantities and the inverter states.

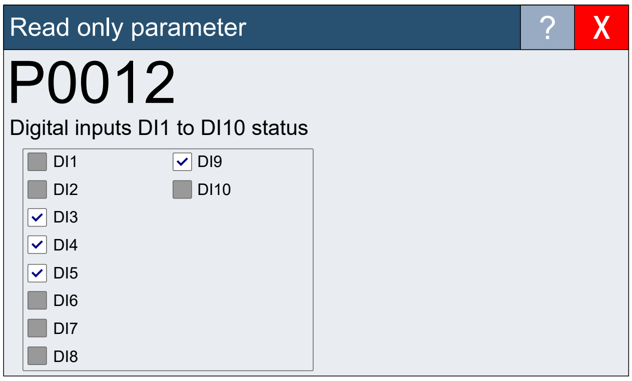
- Numerical view:



- Alphanumerical view:



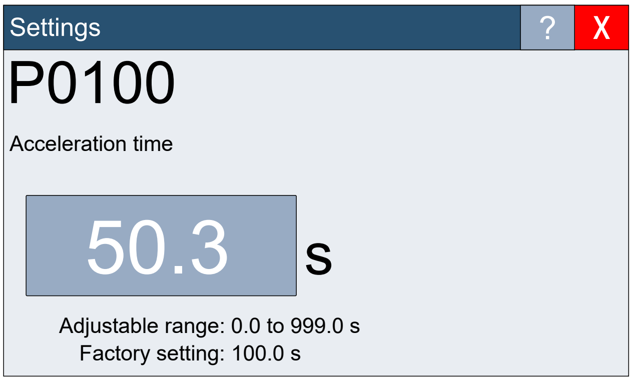
- Bitfield view:



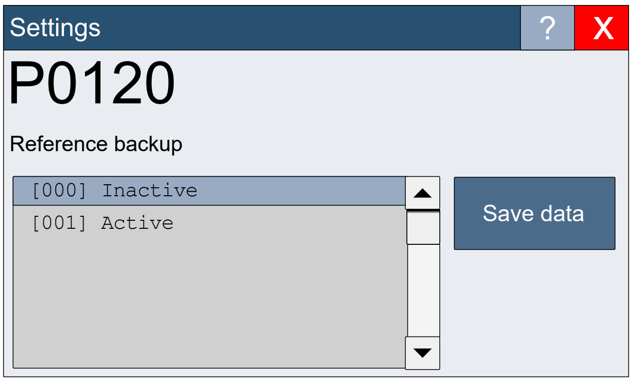
4.6.0.3 Configurable parameters

To access this type of parameter, it is necessary to perform *login*. The difference from the reading parameters is the possibility to change the values.

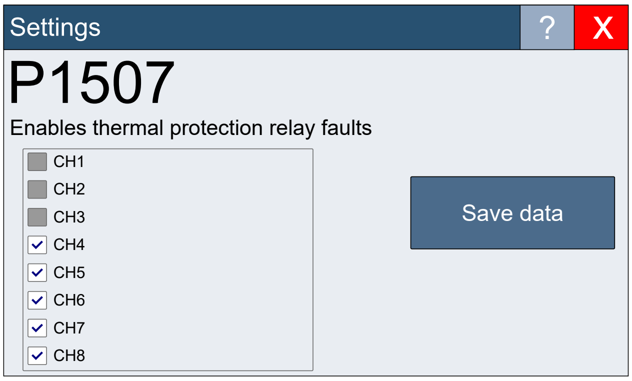
- Numerical edition:



- Alphanumerical edition:



- Bitfield edition:



4.6.0.4 Incompatibility between parameters

In case of incorrect setting of the inverter (see Table 4.3 on page 4-11), F0083 (Inverter setup fault) will be displayed.

Table 4.3 – *Incompatibility among parameters - F0083*

1	Two or more parameters among P0264, P0265, P0266, P0267, P0268, P0269 and P0270 equal to 1 (LOC/REM)
2	Two or more parameters among P0265, P0266, P0267, P0268, P0269 and P0270 equal to 6 (2nd ramp)
3	P0265 equal to 8 and P0266 different from 8 or vice versa (Forward/Reverse)
4	P0221 or P0222 equal 8 (Multispeed) and P0266 ≠ 7 and P0267 ≠ 7 and P0268 ≠ 7
5	[P0221 = 7 and P0222 = 7] and [(P0265 ≠ 5 or P0267 ≠ 5) or (P0266 ≠ 5 or P0268 ≠ 5)] (with reference = E.P. and without DIx = accelerates E.P. or without DIx = decelerates E.P.)
6	[P0221 ≠ 7 or P0222 ≠ 7] and [(P0265 = 5 and P0267 = 5 or P0266 = 5 and P0268 = 5)] (without reference = E.P. and with DIx = accelerates E.P. or with DIx = decelerates E.P.)
7	P0265 or P0267 or P0269 equal to 14 and P0266 and P0268 and P0270 different from 14 (with DIx = Start, without DIx = Stop)
8	P0266 or P0268 or P0270 equal to 14 and P0265 and P0267 and P0269 different from 14 (without Start, with Stop)
9	P0220 > 1 and P0224 = P0227 = 1 and sem DIx = Gira/Para or DIx = 3 Wire Start|3 Wire Stop and sem DIx = Habilita Geral
10	P0220 = 0 and P0224 = 1 and sem DIx = Gira/Para or 3 Wire Start|3 Wire Stop and sem DIx = Habilita Geral
11	P0220 = 1 and P0227 = 1 and sem DIx = Gira/Para or 3 Wire Start|3 Wire Stop and sem DIx = Habilita Geral
12	DIx = Start and DIx = Stop, porém P0224 ≠ 1 and P0227 ≠ 1
13	Two or more parameters among P0265, P0266, P0267, P0268, P0269 and P0270 equal to 15 (Man/Aut)
14	Two or more parameters among P0265, P0266, P0267, P0268, P0269 and P0270 equal to 18 (DC voltage regulator)
15	P0264 = 1 (DI2 = LOC/REM) and P0226 = 4 (selection of direction of rotation Remote situation via DI2
16	Two or more parameters among P0265, P0266, P0267, P0268, P0269 and P0270 equal to 17 (disable Flying Start)

4.7 SETTINGS

The HMI settings gathers all settings for functions and features. To access it, just use the maintenance login and then use the “Settings” button on the main menu.

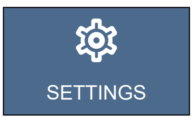


Figure 4.20 – *Settings shortcut*

4.7.0.1 Language, date and time

This screen allows the user to change the system date, time and language. It is also possible to change the time and date format:

- Time format, 12 or 24 hours
- Date format, DD/MM/YYYY or MM/DD/YYYY

Figure 4.21 – *Language, date and time settings*

4.7.0.2 HMI settings

This screen shows the basic settings of the HMI, namely:

- Backlight time
- Screen brightness
- Activate the mouse pointer
- Activate the *Print Screen* function
- Hardware settings

To change “Hardware settings” and “Download USB”, the user must be logged in.

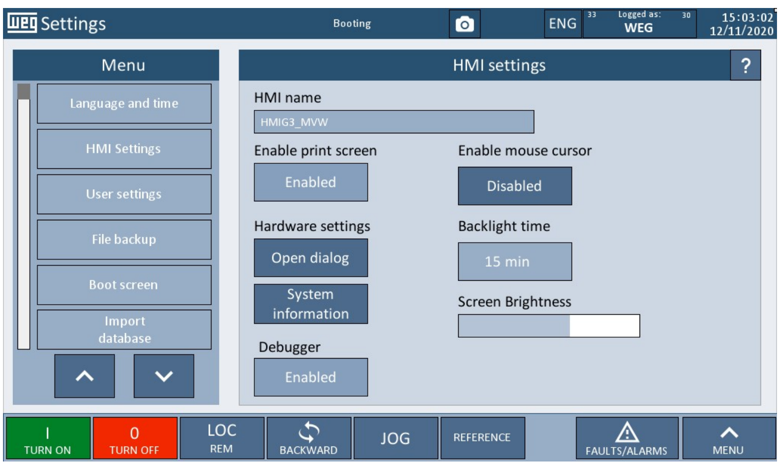


Figure 4.22 – *HMI screen settings*

4.7.0.3 User settings

This screen allows editing names, passwords, privileges, add or delete users.

Only administrator users have access to these commands.

Figure 4.23 – User manager

4.7.0.4 File backup

Graphic data, fault and alarm history can be exported to a USB disk via “Settings” menu.

In the “File backup” submenu, it is possible to save the graphic data, as shown in Figure 4.24 on page 4-13.

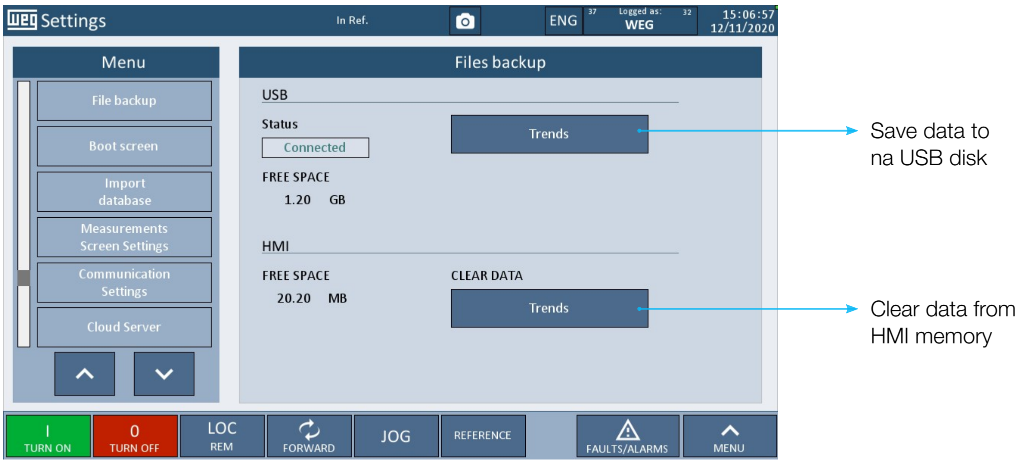


Figure 4.24 – Graphic backup screen

The fault and alarm history is exported on the Fault and Alarm monitoring and management screen; see Section 4.8 FAULTS AND ALARMS on page 4-15.

Administrator privileges are required to clear graphic and fault and alarm history data.

4.7.0.5 Home screen

The home screen settings allow selecting a home screen, accessible by pressing the “Readings” button in the HMI menu. There are three screens that can be selected, as shown in Figure 4.5 on page 4-4. To change it, just select one of the three options; the blue color indicates the current settings.

4.7.0.6 Communication

It allows setting serial, ethernet and WI-FI communications.

- Serial: Displays settings and status of the HMI Modbus-RTU communication with the inverter.

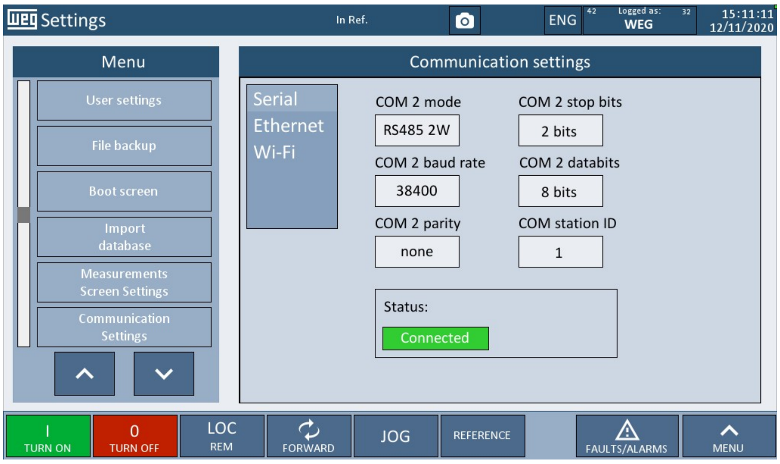


Figure 4.25 – *Serial communication settings and status*

- Ethernet: Allows editing the Ethernet port settings, such as IP address, netmask, Gateway and DNS address.

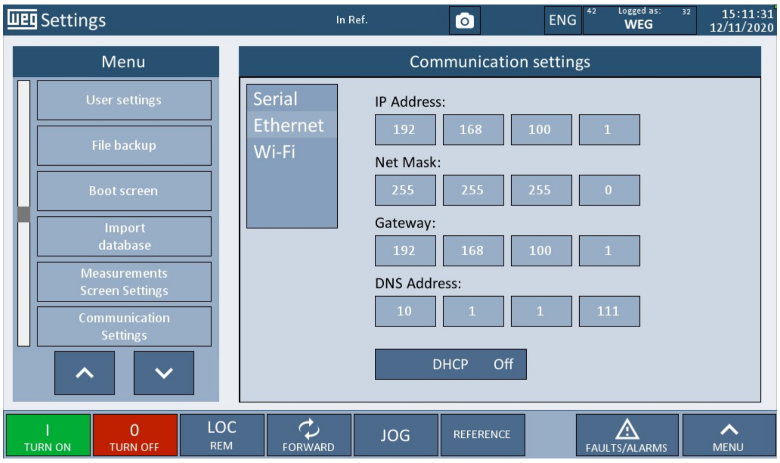


Figure 4.26 – *Ethernet port settings*

4

- WI-FI: Allows connection to a wireless network.

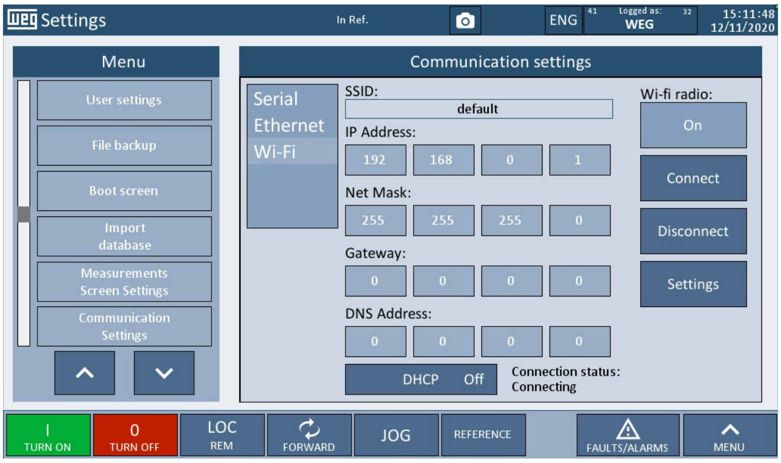


Figure 4.27 – *WI-FI communication status and settings*

4.8 FAULTS AND ALARMS

In case of an event, a window appears showing the fault or alarm code and description, as per Figure 4.28 on page 4-15.

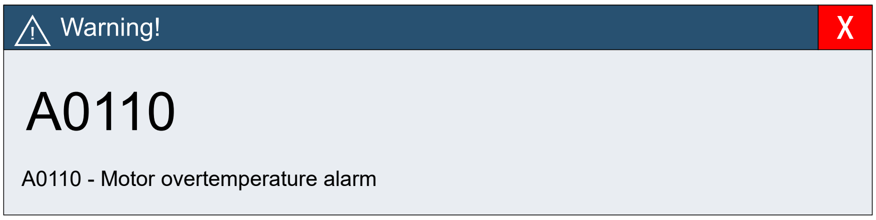


Figure 4.28 – *Fault and alarm indication window*

4.8.0.1 Indicators

When a fault or an alarm is active, the button will signal as per Figure 4.29 on page 4-15.

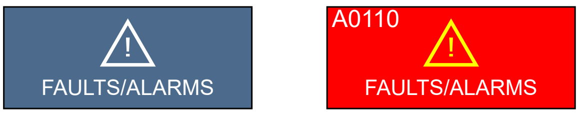


Figure 4.29 – *fault and alarm indication*

The faults and alarms screen has the record of the last 100 faults and alarms, date, time and status of the inverter at the time of the event; it can be accessed via the "FAULTS/ALARMS" button.

Figure 4.30 – *Fault and alarm history*

4.8.0.2 Information

The *Information* field displays a window with the data for the selected event. This window allows access to the "Online help" field, with information on the possible causes and solutions of the event.

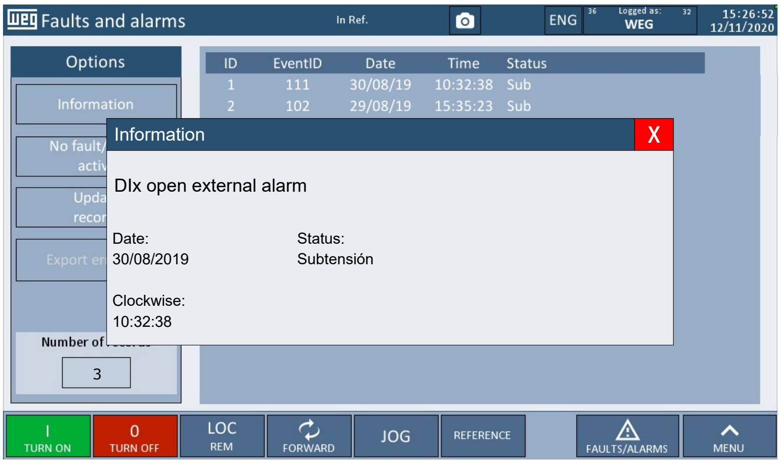


Figure 4.31 – *Fault and/or alarm information window*

4.8.0.3 Export fault and alarm history

It exports a file with the list of faults and alarms, with the respective date, time and status information at the time of the event.

Figure 4.32 – *Button to export the error log*

To use it, a USB disk must be connected to the HMI. The "Ready!" message indicates the saving of the file has ended.

5 DETAILED PARAMETER DESCRIPTION

This chapter describes in detail all the parameters of the inverter.

- S Status
  - S1 Measurements
    - S1.1 Speed
    - S1.2 Current
    - S1.3 Voltage
    - S1.4 Power
    - S1.5 Frequency
    - S1.6 Torque
    - S1.7 Temperature
    - S1.8 Position
  - S2 I/O
    - S2.1 Digital
    - S2.2 Analog
  - S3 Inverter
    - S3.1 References
    - S3.2 Status
    - S3.3 Software version
    - S3.4 Model
  - S4 PLC
- D Diagnostics
  - D1 Alarms and faults
  - D2 Hours control
- C Configurations
  - C1 HMI
    - C1.1 Language
    - C1.2 Password
    - C1.3 Main screen
    - C1.4 Graphic
    - C1.5 Settings
  - C2 Ramps
  - C3 Control
    - C3.1 Scalar
    - C3.2 Vector
    - C3.3 Settings
  - C4 Nominal data
    - C4.1 Inverter
    - C4.2 Motor
    - C4.3 Transformer
    - C4.4 Encoder
  - C5 Commands
    - C5.1 Local
    - C5.2 Remote
  - C6 References
  - C7 I/O
    - C7.1 Digital inputs
    - C7.2 Digital outputs
    - C7.3 Analog inputs
    - C7.5 Analog outputs
  - C8 Protections
    - C8.1 Inverter
    - C8.2 Motor
    - C8.3 Transformer
    - C8.4 Auto reset
  - C9 Calibrations
  - C10 Functions
    - C10.1 Bypass
    - C10.2 Flying-start
    - C10.3 Ride-through
    - C10.4 PID
    - C10.5 Trace
    - C10.7 Synchronous transfer
    - C10.8 Electronic dynamometer
  - C11 PLC
  - C12 Communications
    - C12.1 Serial
    - C12.2 Fieldbus
    - C12.3 Settings
  - C13 Backup

Menu → Status → Measurements → Speed	
P0001 - Motor speed reference	
Resolution:	1 rpm

Description:

- It indicates the speed reference value in rpm (factory setting).
- Independent from the reference source origin (HMI, serial communication, analog input, among others).
- The indication scale can be changed via P0208 (Reference scale factor).

Menu → Status → Measurements → Speed	
P0002 - Motor speed	
Resolution:	1 rpm

Description:

- It indicates the real motor speed value in rpm (with filter with time constant of 0.5 s).
- The indication scale can be changed via P0208 (Reference scale factor).

Menu → Status → Measurements → Current	
P0003 - Motor current	
Resolution:	0.1 A

Description:

- It indicates the motor current value in Amperes (A).
- The value is a result of the filter output with time constant defined in P0139 (Output current filter), default value P0139 = 0.2 s.

Menu → Status → Measurements → Voltage	
P0004 - DC link voltage - average value	
Resolution:	1 V

Description:

- It indicates the calculated value among all currently active cells.

Menu → Status → Measurements → Frequency	
P0005 - Motor frequency	
Resolution:	0.1 Hz

Description:

- It indicates the inverter output frequency value in Hertz (Hz).

Menu → Status → Inverter → Status
P0006 - VFD status

Description:

- It indicates the actual inverter status.

Inverter possible states:

0 = 'Booting' indicates that the control board is waiting for the initialization end.

1 = 'Sub' indicates that the inverter has insufficient voltage for operation (undervoltage), and it does not accept the enabling command (inverter waiting for the pre-charge/power energization command).

2 = 'Inv. Ready' It indicates the inverter is ready to be enabled.

3 = 'Motor Mag.' indicates that the motor is being magnetized by DC current. This state lasts for twice the motor rotoric constant time (P0412).

4 = 'Motor Rdy.' indicates that the motor is magnetized and the inverter is waiting for the run command.

5 = 'Up Ramp' indicates the motor is in the speed acceleration ramp.

6 = 'Down Ramp' indicates that the motor is in the speed deceleration ramp.

7 = 'In Ref.' indicates that the motor is rotating at the adjusted speed reference.

8 = Not implanted in this software version.

9 = 'Coast' indicates that the motor is coasting, without being driven by the inverter.

10 = 'Ride Thro.' indicates that the inverter is operating during momentary line faults.

11 = 'Flying St.' indicates that the inverter has received a command to start a spinning motor. This state persists until the inverter reaches the motor speed.

12 = 'Test Mode' indicates that the inverter is in a transitory state to test mode or to self-tuning.

13 = 'Inv. Test' indicates that the inverter is in a general test state.

14 = Not implanted in this software version.

15 = Not implanted in this software version.

16 = 'Fault' indicates the inverter is in a fault state.

17 = 'Alarm' indicates the inverter is in an alarm state.

18 = 'Calibrat.' indicates that the inverter is in the feedback signal calibration process.

19 = 'Hold' indicates that the inverter is in DC link regulation mode. Refer to the parameter P0151 description.

20 = 'I Limit' indicates that the inverter is in current limitation. Refer to the parameter P0169 description.

21 = 'I Fast Limit' indicates that the inverter is in fast current limitation.

22 = 'Ride Thr 2' indicates Ride-Through without interruption.

23 = 'Hold 2'.

24 = 'Sync Run' indicates that the inverter is trying to synchronize with the line.

25 = 'Fast Disab' indicates fast disable (HG = off) mode (MVC3).

26 = 'Sync OK' indicates that the inverter is synchronized with the line.

27 = Not implanted in this software version.

28 = Not implanted in this software version.

29 = 'Bypass'.

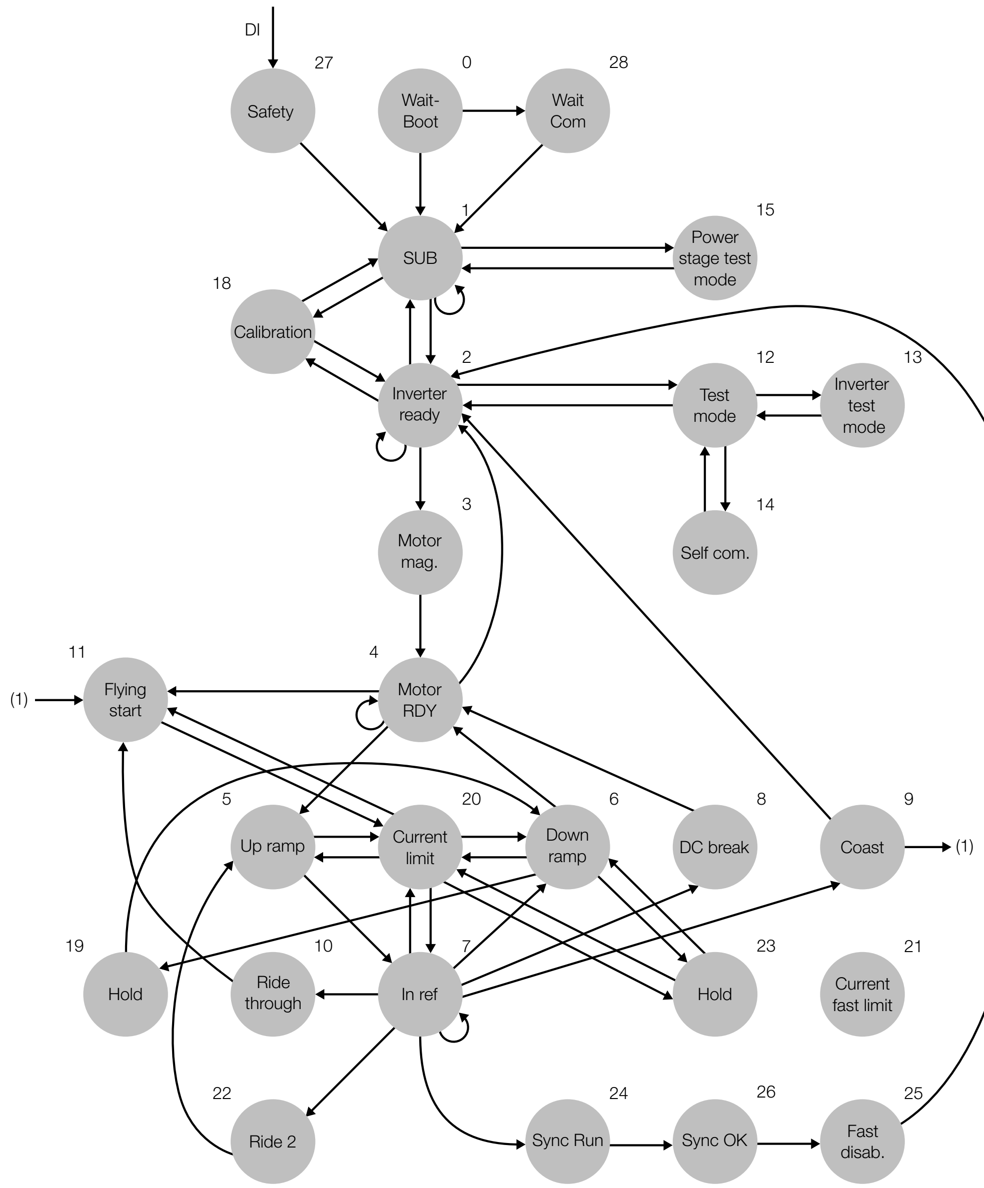


Figure 5.1 – *State machine*

Menu → Status → Measurements → Torque

P0009 - Motor torque

Resolution: 0.1 %

Description:

- It indicates the torque value produced by the motor.

It is calculated as follows:

$$P0009 = \frac{I_{tm} \times 100}{I_{tm_{rated}}}$$

Being:

I_{tm} = Present motor torque current.

Vector control mode:

$I_{tm_{rated}}$ = Rated motor torque current.

Scalar control mode:

$I_{tm_{rated}}$ = Rated inverter torque current.

Menu → Status → Measurements → Power

P0010 - Inverter output power

Resolution: 1 kW

Description:

- It indicates the calculated value of the inverter output power in kW.

Menu → Status → I/O → Digital

P0012 - Digital inputs DI1 to DI10 status

Description:

- It indicates, on the Graphic HMI, the status of the 8 digital inputs of the MVC4 control board (DI1 to DI6, DI9, DI10) and of the 2 digital inputs of the optional board (DI7, DI8) through the letters A (Active) and I (Inactive), in the following order:

DI1, DI2, ... ,DI7, DI8, DI9, DI10

Table 5.2 – *Digital inputs DI1 to DI10 status*

Description	Bit
DI8	Bit 0
DI7	Bit 1
DI6	Bit 2
DI5	Bit 3
DI4	Bit 4
DI3	Bit 5
DI2	Bit 6
DI1	Bit 7
DI9	Bit 8
DI10	Bit 9

Menu → Status → I/O → Digital

P0013 - Digital outputs DO1 to RL5 status

Description:

- It indicates, on the Graphic HMI, the status of the 2 digital outputs of the optional board (DO1, DO2) and of the 5 relay outputs of the MVC4 control board through the letters A (Active) and I (Inactive), in the following order:

DO1, DO2, RL1, RL2, RL3, RL4, RL5

Table 5.3 – Digital outputs DO1 to RL5 status

Description	Bit
RL5	Bit 1
RL4	Bit 2
RL3	Bit 3
RL2	Bit 4
RL1	Bit 5
DO2	Bit 6
DO1	Bit 7

Menu → Status → I/O → Analog

P0018 - Value of analog input AI1

P0019 - Value of analog input AI2

P0020 - Value of analog input AI3

P0021 - Value of analog input AI4

Resolution: 0.1 %

Description:

- They indicate the values of analog inputs AI1 and AI2 of the MVC4 control board, AI3 of the EBB board and AI4 of the EBA board in percentage of the full scale.
- The indicated values are obtained after addition of the offset and multiplication by the gain.
- See the description of parameters P0234 (Analog input AI1 gain) to P0247 (Analog input AI4 offset).
- Analog input AI2 has a filter that distinguishes it from others (see P0248 (Analog input AI2 filter)).

Menu → Status → Measurements → Temperature

P0022 - Temperature on MVC3 board

Resolution: 0.1 °C

Description:

- It indicates the temperature value on the MVC3 control board in degrees Celsius (°C).

Menu → Status → Inverter → Software version

P0023 - MVC4 board

Description:

- It indicates the software version contained in the microcontroller memory located on the MVC4 control board.

Menu → Status → Measurements → Current

P0025 - Iv current

P0026 - Iw current

P0027 - Iu current

Resolution: 0.1 A

Description:

- Indicate the rms value of the respective phase current.

Menu → Status → I/O → Analog	
P0028 - Value of analog input AI5	
Resolution:	0.1 %

Description:

- It indicates the value of analog input AI5 of the MVC4 control board in percentage of full scale. The indicated values are obtained by means of addition of the offset and multiplication by the gain.
- See description of parameters P0721 to P0724.

Menu → Status → Measurements → Temperature			
P0030 - Thermal protection relay 1 - Temperature CH1			
P0031 - Thermal protection relay 1 - Temperature CH2			
P0032 - Thermal protection relay 1 - Temperature CH3			
P0033 - Thermal protection relay 1 - Temperature CH4			
P0034 - Thermal protection relay 1 - Temperature CH5			
P0035 - Thermal protection relay 1 - Temperature CH6			
P0036 - Thermal protection relay 1 - Temperature CH7			
P0037 - Thermal protection relay 1 - Temperature CH8			
Adjustable range:	-50 to 300 °C	Factory setting:	0 °C

Description:

- For these parameters indicate the motor temperature properly, the temperature control module (Tecsystem, Pextron) must be installed observing the recommendations contained in its manual.
- The overtemperature alarm and fault levels are configured directly on the temperature control module according to its manual.

The module serial configuration must be set as follows:

- Baudrate: 2400 bps
- Slave address: 1, 2 or 3
- Parity: even
- Stop bit: 1

WARNING!
In the **PRG** (programming) and **VIS** (programming visualization) functions of the thermal protection relay, the communication with the inverter is temporarily disabled and can cause a communication time-out, in this situation the inverter disables the output, protecting the motor from possible damage.

Menu → Status → Measurements → Speed	
P0038 - Encoder speed	
Resolution:	1 rpm

Description:

- It indicates the encoder actual speed, in revolutions per minute (rpm), through a 0.1 second filter.

Menu → Status → Inverter → Status

P0040 - Value of process variable (PID)

Resolution: 0.1 %

Description:

- It indicates the value of the process variable in % (factory setting) used as the PID feedback.
- The scale can be changed through P0528 and P0529.
- See the detailed description in Section 6.1 PID REGULATOR on page 6-1.

NOTE!
This parameter is only visible on the HMI when: the PID function is active, P0203 = 1 (PID regulator).

Menu → Diagnostics → Hours control

P0042 - Time powered counter

Resolution: 1 h

Description:

- It indicates the total hours the inverter remained powered.
- This value is kept even when the inverter is powered down.

Menu → Diagnostics → Hours control

P0043 - Time enabled counter

Resolution: 0.1 h

Description:

- It indicates the total hours the inverter remained enabled.
- It indicates up to 6553 hours; after this value, it returns to zero.
- Setting P0204 = 3 (Reset enabled time counter (P0043)), the value of parameter P0043 goes to zero.
- This value is kept even when the inverter is powered down.

Menu → Status → Measurements → Power

P0044 - MWh Counter

Resolution: 1 MWh

Description:

- It indicates the energy consumed by the motor.
- It indicates up to 11930 MWh; after this value, it returns to zero.
- Setting P0204 = 4 (Reset MWh counter (P0044)), the value of P0044 goes to zero.
- This value is kept even when the inverter is powered down.

Menu → Status → Inverter → Software version

P0045 - HMI

Description:

- It indicates the software version contained in the microcontroller memory located in the HMI .

Menu → Status → Inverter → Software version

P0066 - MVC3 board - CPU

Description:

- It indicates the software version contained in the CPU of the MVC3 board.

Menu → Diagnostics → Alarms and faults

P0068 - Present Error

Description:

- It indicates the code of the current fault on the inverter.

Menu → Status → I/O → Digital

P0070 - Status of the MVC3 board digital inputs DI1, DI2, ..., DI16

Description:

- It indicates, on the Graphic HMI, the status of 16 digital inputs of the MVC3 control board (DI1 to DI16), by means of the letters A (Active) and I (Inactive), in the following order:

DI1, DI2, ... , DI15, DI16

Table 5.4 – *Status of the MVC3 board digital inputs DI1, DI2, ..., DI16*

Description	Bit
DI16 - State of mechanically locked doors	Bit 0
DI15 - Not used	Bit 1
DI14 - Not used	Bit 2
DI13 - General enable	Bit 3
DI12 - Inverter main transformer fault	Bit 4
DI11 - Inverter main transformer alarm	Bit 5
DI10 - Cooling system supply fault	Bit 6
DI9 - Not used	Bit 7
DI8 - Not used	Bit 8
DI7 - Pre-charge power supply	Bit 9
DI6 - See P1739 (RL8 Function MVC3)	Bit 10
DI5 - Enabling of the input protection	Bit 11
DI4 - Circuit breaker OFF state	Bit 12
DI3 - Circuit breaker ON state	Bit 13
DI2 - Circuit breaker Ready	Bit 14
DI1 - Power ON (Starts pre-charge)	Bit 15

Menu → Status → I/O → Digital

P0071 - Status of MVC3 board relay digital outputs RL1 to RL8

Description:

- It indicates, on the Graphic HMI, the status of the 8 relay outputs of the MVC3 control board, by means of the letters A (Active) and I (Inactive), in the following order:

RL1, RL2, ... , RL7, RL8

Table 5.5 – *Status of MVC3 board relay digital outputs RL1 to RL8*

Description	Bit
RL8 - Refer to P1739 (RL8 Function MVC3)	Bit 0
RL7 - Turns on the inverter ventilation	Bit 1
RL6 - Circuit break ON	Bit 2
RL5 - 2nd stage pre-charge	Bit 3
RL4 - Turns off input circuit breaker	Bit 4
RL3 - Closes input circuit breaker	Bit 5
RL2 - 1st stage pre-charge	Bit 6
RL1 - Inverter Ready	Bit 7

Menu → Status → Inverter → Status

P0076 - i x t Overload

Resolution: 0.1 %

Description:

- It indicates the overload percentage value given by parameters P0156, P0157 and P0158.
- The actuation of the overload fault (F0072) occurs when P0076 reaches 100 %.

Menu → Status → Measurements → Current

P0077 - Motor field current

Resolution: 0.1 A

Description:

- It indicates the field current value of the synchronous motor.

NOTE!
This parameter is only visible on the HMI when: P0950 = 1 (Reserved).

Menu → Status → Measurements → Voltage

P0078 - Brushless synchronous motor voltage

Resolution: 1 V

Description:

- It indicates the field voltage of the brushless synchronous motor.

NOTE!
This parameter is only visible on the HMI when P0950 = 2 (Brushless synchronous motor).

Menu → Status → Measurements → Position

P0079 - Synchronous motor shaft position

Resolution: 1 °

Description:

- It indicates the shaft position of the synchronous motor.

- The Graphic HMI shows the position in degrees between 0° and 360°.
- Resolution = 1.4°.

> **NOTE!**
> 8 most significant bits = number of turns.
> 8 least significant bits = position within the same turn.

> **NOTE!**
> This parameter is only visible on HMI when: P0950 = 1 (Reserved) or P0950 = 2 (Brushless synchronous motor).

Menu → Configurations → Ramps

P0100 - Acceleration time

P0101 - Deceleration time

P0102 - Acceleration time 2nd ramp

P0103 - Deceleration time 2nd ramp

Adjustable range:	0,0 to 999,0 s	Factory setting:	P0100 = 100.0 s P0101 = 180.0 s P0102 = 100.0 s P0103 = 180.0 s

5

Description:

- Setting 0.0 means without use of ramp. In this case a voltage step will be applied to the motor proportional to the programmed speed reference.
- It defines the times to accelerate linearly from 0 to Maximum speed reference (P0134) or decelerate linearly from the Maximum speed reference to 0.
- The switching to the second ramp is done through one of the digital inputs DI3 to DI10 if it is programmed for the 2nd ramp function. Refer to parameters from P0265 to P0272.

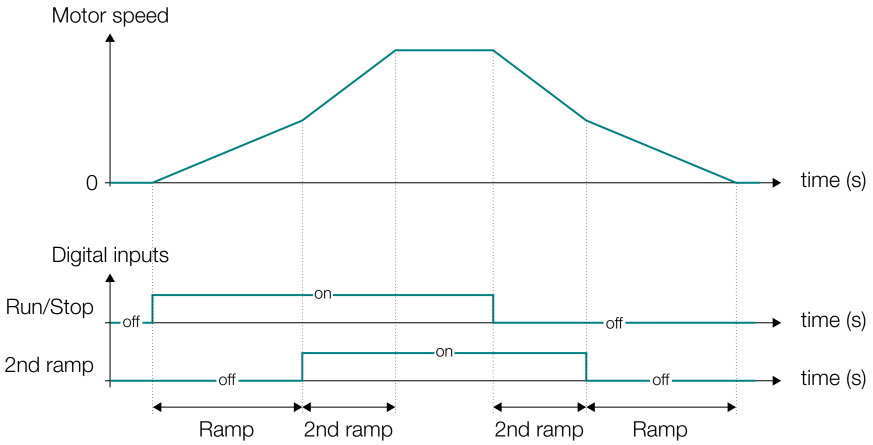


Figure 5.2 *– 2nd ramp*

Menu → Configurations → Ramps

P0104 - S Ramp

Adjustable range:	0,0 to 100,0 %	Factory setting:	0.0 %

Description:

- This parameter allows the acceleration and deceleration ramps to have a non-linear profile, similar to an "S".
- See Figure 5.3 on page 5-12.

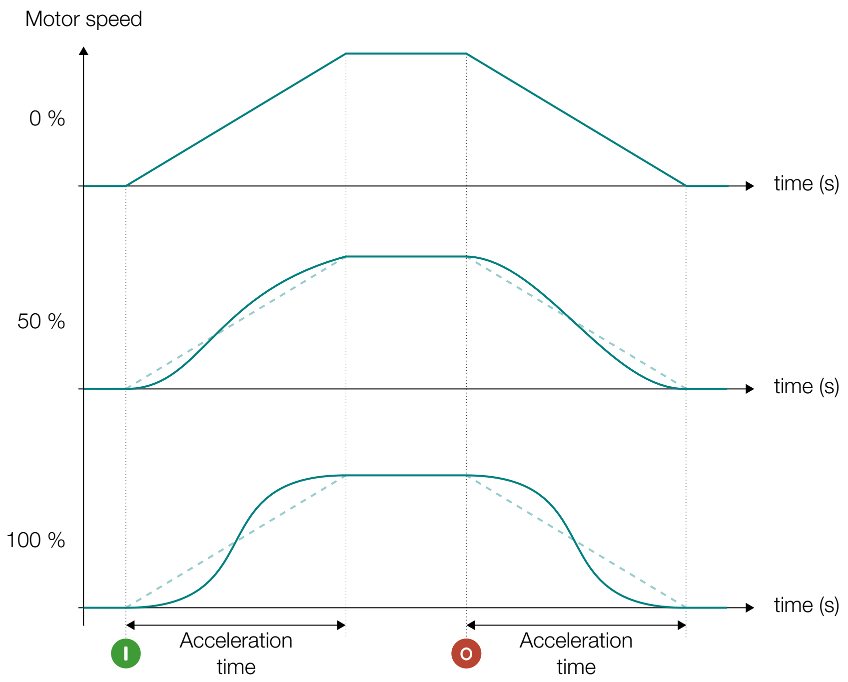


***Figure 5.3 –** S Ramp*

$$P0104 = \frac{t_{ramps}}{t_{acel}} \times 100\ \% = \frac{(t_{acel} - t_{linear})}{t_{acel}}, \text{ in the accelerations, or}$$
$$P0104 = \frac{t_{ramps}}{t_{decel}} \times 100\ \% = \frac{(t_{decel} - t_{linear})}{t_{decel}}, \text{ in the decelerations.}$$

Being:

t_{acel} = acceleration time, defined by P0100 or P0102.
t_{decel} = deceleration time, defined by P0101 or P0103.
t_{ramps} = S ramp time.
t_{linear} = linear ramp time.

- Setting 0.0 % means inactive function. In this case, only the linear ramp will be used.
- S ramp reduces mechanical shocks during accelerations or decelerations.

Menu → Configurations → Control → Settings			
P0119 - Reactive power reference for the power factor control			
Adjustable range:	-99,99 to 99,99 %	Factory setting:	0.00 %

Description:

- It defines the external reference for the reactive current of the synchronous motor.
- For negative values, the reference of the reactive current will be capacitive. For positive values, it will be inductive.

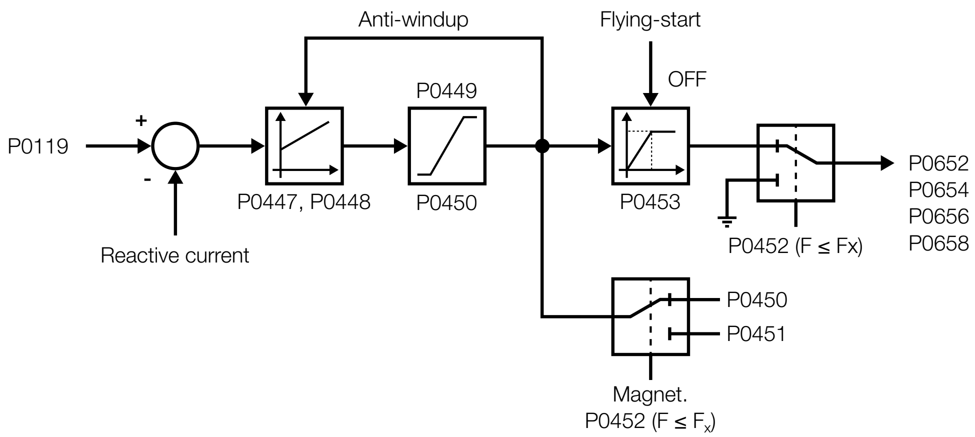


Figure 5.4 – *Analog signal of the field current to be used on the motor*

NOTE!
This parameter is only visible on the HMI when: P0950 > 0.

Menu → Configurations → HMI → Settings

P0120 - Reference Backup

Adjustable range: 0 to 1 Factory setting: 1

Description:

- It defines whether the Speed Reference Backup function is Active (1) or Inactive (0).
- If P0120 = Inactive, then the inverter will not save the reference value when it is disabled, i.e., when the inverter is enabled again, the speed reference will be the minimum speed.
- This backup function is applied only to the reference via HMI.

Table 5.6 – *Reference Backup*

P0120	Function
0	Inactive
1	Active

Menu → Configurations → HMI → Settings

P0121 - HMI speed reference

P0122 - Speed reference for JOG or JOG+

P0123 - Speed reference for JOG-

Adjustable range:		Factory setting:	
	P0121 = 0 to 7200 rpm		P0121 = 90 rpm
	P0122 = 0 to 8192 rpm		P0122 = 150 rpm
	P0123 = 0 to 8192 rpm		P0123 = 150 rpm

Description:

- The motor speed reference will assume the value set in P0121 if the reference control (P0221 or P0222) is set to HMI.
- When P0120 = 1 (Active), the value of P0121 is kept in the last value set even de-energizing the inverter.
- Activation of JOG function:

5

***Table 5.7 –** Selection of JOG command via digital input*

JOG key	Digital inputs DI1 to DI3 (P0255 = 2 and/or P0228 = 2)
P0225 = 1 and/or P0228 = 1	DI3 - P0265 = JOG or DI4 - P0266 = JOG or DI5 - P0267 = JOG or DI6 - P0268 = JOG or DI7 - P0269 = JOG or DI8 - P0270 = JOG or DI9 - P0271 = JOG or DI10 - P0272 = JOG

- When activating the JOG function, the motor will accelerate until reaching the value defined in P0122, following the adjusted ramp.
- The direction of rotation is defined by the direction of rotation function (P0223 or P0226).
- The JOG command is only effective with the motor stopped.
- Activation of JOG + function:

***Table 5.8 –** Selection of JOG + command*

Digital Inputs	Parameters
DI3 to DI10	P0265 to P0272 = JOG +

- Activation of JOG - function:

***Table 5.9 –** Selection of JOG - command*

Digital Inputs	Parameters
DI3 to DI10	P0265 to P0272 = JOG-

- When activating the JOG+/JOG- function, the speed reference in P0122/P0123 will be added (without ramp) to the other references to generate the total reference - see Figure 5.23 on page 5-38.

Menu → Configurations → References

P0124 - Multispeed reference 1

P0125 - Multispeed reference 2

P0126 - Multispeed reference 3

P0127 - Multispeed reference 4

P0128 - Multispeed reference 5

P0129 - Multispeed reference 6

P0130 - Multispeed reference 7

P0131 - Multispeed reference 8

Adjustable range:	0 to 4095 rpm	Factory setting:	P0124 = 90 rpm P0125 = 300 rpm P0126 = 600 rpm P0127 = 900 rpm P0128 = 1200 rpm P0129 = 1500 rpm P0130 = 1800 rpm P0131 = 1650 rpm

Description:

- These parameters (P0124 to P0131) will only be displayed when P0221 = 8 and/or P0222 = 8 (Multispeed).

- The Multispeed is used when up to 8 preset fixed speeds are desired.
- When only 2 or 4 speeds are to be used, any input combination among DI4, DI5 and DI6 may be used.
- Check the speed reference parameters, according to the DIs used.
- The Multispeed offers the advantages of stability of the preset fixed references and the immunity against electric noise (isolated digital inputs DIx).
- Multispeed function active when P0221 or P0222 = Multispeed.
- It allows the output speed control relating the values defined by parameters P0124 to P0131 through the logical combination of digital inputs (DIx).

Table 5.10 – *Selection of the Multispeed function via digital inputs*

DIx enabled	Programming
4	P0266 = 7
5	P0267 = 7
6	P0268 = 7

Table 5.11 – *Multispeed Reference*

8 speeds			Speed reference
	4 speeds		
		2 speeds	
DI6	DI5	DI4	
0	0	0	P0124
0	0	1	P0125
0	1	0	P0126
0	1	1	P0127
1	0	0	P0128
1	0	1	P0129
1	1	0	P0130
1	1	1	P0131

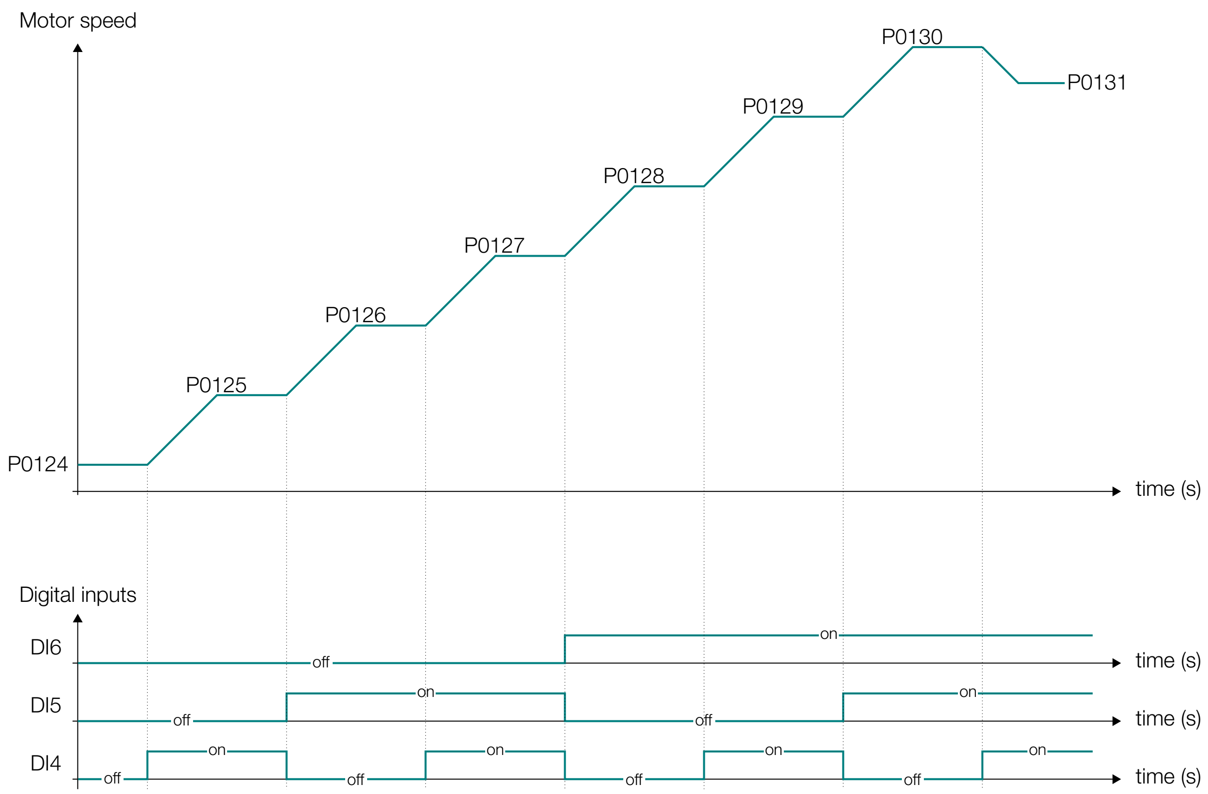


Figure 5.5 – *Multispeed*

Menu → Configurations → Control → Settings			
P0132 - Maximum overspeed level			
Adjustable range:	0 to 100 %	Factory setting:	10 %

Description:

- When the actual speed exceeds the value of P0134 + P0132 for over 20 ms, the MVW3000 will disable the PWM pulses and indicate fault F0112 (Motor Over Speed).
- The setting of P0132 is a percentage value of P0134.
- When setting P0132 = 100 % the function will be disabled.

NOTE!
This parameter is only visible on the HMI when: the control type is vector, P0202 = 3 (Sensorless Vector) or P0202 = 4 (Vector with Encoder).

Menu → Configurations → References			
P0133 - Minimum speed reference			
P0134 - Maximum speed reference			
Adjustable range:	0 to 7200 rpm	Factory setting:	P0133 = 90 rpm P0134 = 1800 rpm

Description:

- It defines the maximum/minimum values of speed reference for the motor when the inverter is enabled. Valid for any type of reference signal.
- For details on the actuation of P0133 see P0233 (Dead Zone).

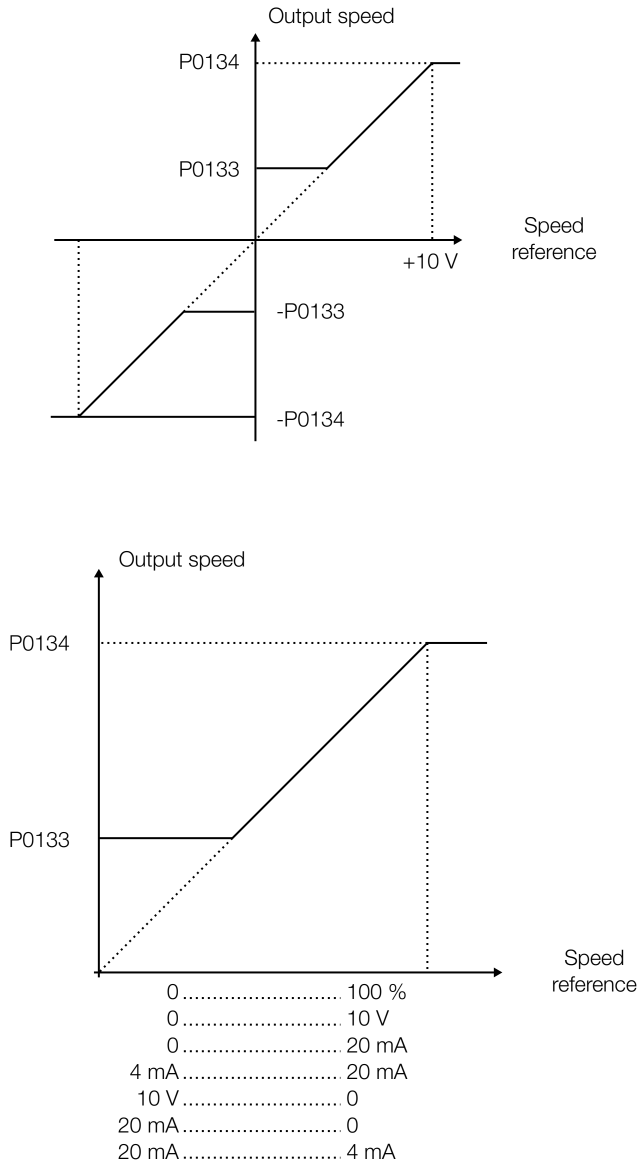


Figure 5.6 – *Speed limits considering active dead zone (P0233 = 1)*

Menu → Configurations → Control → Scalar			
P0136 - Addition on the manual torque curve (IxR)			
Adjustable range:	0 to 100	Factory setting:	0

Description:

- It compensates the voltage drop in the motor stator resistance.
- It actuates at low speeds, increasing the inverter output voltage in order to keep the torque constant at V/f operation.
- The optimal setting is the smallest value of P0136 that allows the satisfactory motor start.
- Value above the necessary will increment in excess the motor current at low speeds, which may force the inverter in an overcurrent condition (F0070, F0071 and F0072).
- The maximum value of increase for the output voltage is equal to 20 % of the rated voltage, in null frequency, when P0136 = 100.
- Setting 0 means inactive function.

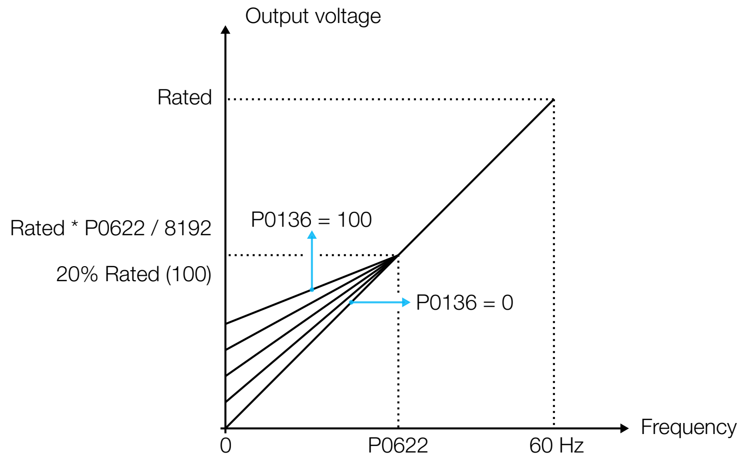


Figure 5.7 – *P0202 = 0, V/f curve 60 Hz*

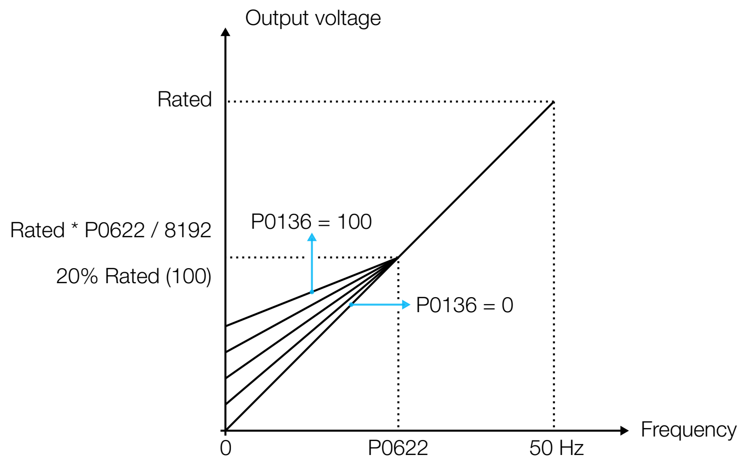


Figure 5.8 – *P0202 = 1, V/f curve 50 Hz*

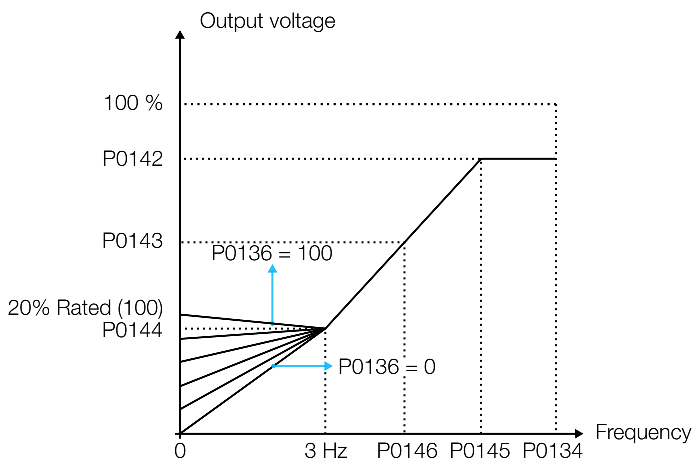


Figure 5.9 – *P0202 = 2, V/f adjustable curve*

NOTE!
This parameter is only visible on the HMI when: the control type is scalar, P0202 = 0, 1 or 2 (V/f control).

Menu → Configurations → Control → Scalar

P0137 - Addition on the automatic torque curve

Adjustable range:	0 to 1000	Factory setting:	0

Description:

- Addition on the automatic torque curve compensates the voltage drop in the stator resistance as a function of the motor active current.
- The criteria for the setting of P0137 are the same as those of parameter P0136.

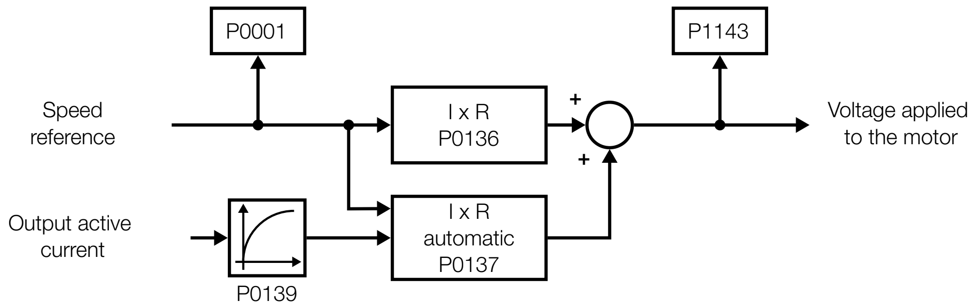


Figure 5.10 – *Block diagram of P0137*

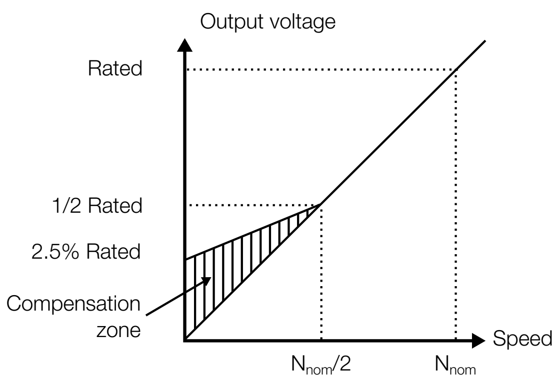


Figure 5.11 – *V/f curve with automatic torque boost*

NOTE!
This parameter is only visible on the HMI when: the control type is scalar, P0202 = 0 (V/F 60 Hz) or P0202 = 1 (V/F 50 Hz).

Menu → Configurations → Control → Scalar

P0138 - Rated slip			
Adjustable range:	-10,00 to 10,00 %	Factory setting:	0.00 %

Description: Scalar mode:

- Parameter P0138 (for speeds between -10.00 % and +10.00 %) is used in the motor Slip Compensation function. It compensates the motor speed drop due to the application of load. It increments the output frequency as a function of the increase in the motor active current.
- P0138 allows the user to set precisely the slip compensation on the MVW3000. Once P0138 is set, the inverter will keep the speed constant even with load variations by means of the automatic setting of voltage and frequency.

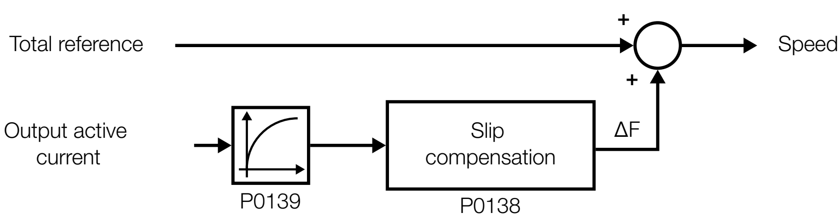


Figure 5.12 – *Block diagram P0138 (scalar)*

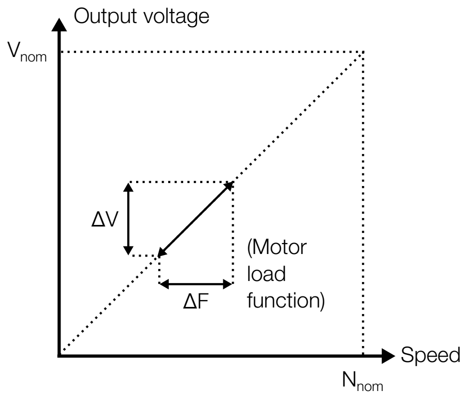


Figure 5.13 – *V/f curve with slip compensation*

P0138 adjustment procedure:

1. Drive motor with no load, at approximately half the use speed range.
2. Measure the motor or equipment speed.
3. Apply rated load to the equipment.
4. Increment parameter P0138 until the speed reaches the value with no load.

5

- Values P0138 < 0.0 are used in special applications to reduce the output speed as a function of the increase in the motor current. Ex.: load distribution on motors driven in parallel.

Vector Mode (Droop Control):

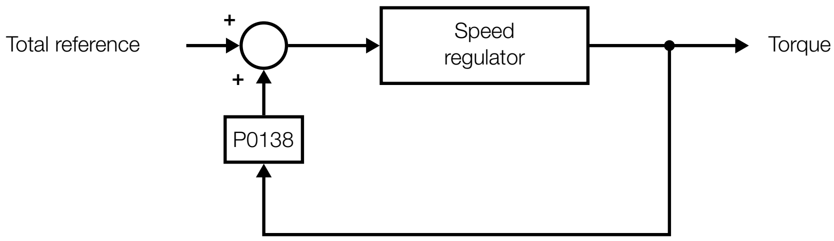


Figure 5.14 – *Block diagram P0138 (vector)*

- In the vector mode (encoder or sensorless) parameter P0138 has the function described in Figure 5.13 on page 5-20.
- A value proportional to the motor load is added to the total speed reference is added.
- This parameter is used in the multimotor application.

Menu → Configurations → Control → Scalar			
P0139 - Output current filter			
Adjustable range:	0,0 to 16,0 s	Factory setting:	0.2 s

Description:

- It sets the time constant of the active current filter.
- It sets the response time of the slip compensation and automatic torque boost.
- See Figure 5.10 on page 5-19 and Figure 5.12 on page 5-19.

Menu → Configurations → Control → Scalar

P0142 - Maximum Voltage

P0143 - Intermediate output voltage

P0144 - Output voltage at 3 Hz

P0145 - Field weakening speed

P0146 - Intermediate speed

Adjustable range:	P0142 = 0,0 to 100,0 % P0143 = 0,0 to 100,0 % P0144 = 0,0 to 100,0 % P0145 = 0 to 7200 rpm P0146 = 90 to 7200 rpm	Factory setting:	P0142 = 100.0 % P0143 = 50.0 % P0144 = 8.0 % P0145 = 1800 rpm P0146 = 900 rpm

Description:

- It allows changing the standard V/f curves defined in P0202. It may be used to obtain approximately quadratic V/f curves or on motors with voltages/frequencies different from the conventional standards.
- This function allows changing the defined standard characteristic curves, which relate the inverter output voltage and frequency and consequently the motor magnetization flux. This characteristic can be used in special applications in which the motors need rated voltage or rated frequency different from the standards.
- Function activated with P0202 = 2 (Adjustable V/F).
- The standard value of P0144 (8.0 %) is defined for standard motors 60 Hz. In case the motor rated frequency (set in P0403) is different from 60 Hz, the standard value of P0144 may become inadequate, and it may cause problems in the motor start.

5

If it is necessary to increase the starting torque, increase the value of P0144 gradually.

- Procedure to parameterize the "Adjustable V/f" function:

1. Disable the inverter.
2. Check the inverter data (P0295 and P0296).
3. Set the motor data (P0400 to P0406).
4. Set the data for indication of P0001 and P0002 (P0208).
5. Set the speed limits (P0133 and P0134).
6. Set the parameters of the adjustable V/f function (P0142 to P0146).
7. Enable the adjustable V/f function (P0202 = 2).

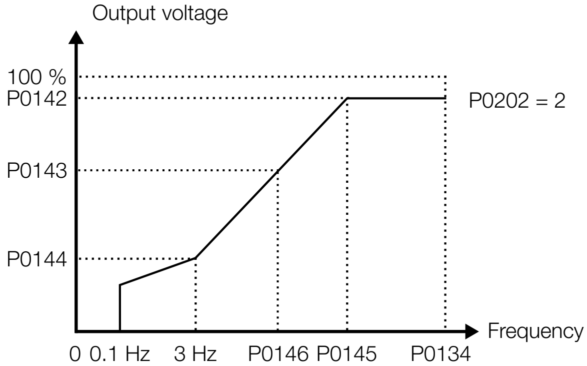


***Figure 5.15 –** Adjustable V/f curve*

NOTE!
This parameter is only visible on the HMI when: the control type is adjustable scalar, P0202 = 2 (Adjustable V/F).

Menu → Configurations → Control → Settings

P0150 - DC link voltage regulation mode

Adjustable range: 0 to 2 Factory setting: 0

Description:

- Configures the DC bus regulation mode in vector control, which occurs when the measured voltage of the largest DC bus of the cells exceeds the value set in P0151.
- In option 0, only the freezing of the speed ramp (see P0152 and P1183) occurs during deceleration.
- In option 1, the control action of the speed regulator is replaced by the DC bus voltage regulator, which acts to prevent overvoltage.
- In option 2, the control action of the speed regulator is replaced by the DC bus voltage regulator, which acts to prevent overvoltage, and at the same time, the motor flux reference is set to the maximum flux value with the aim of increasing losses.
- The gains of the voltage regulator are adjusted through parameters P0600 and P0601.

Table 5.12 – DC link voltage regulation mode

P0150	Function
0	Ramp hold
1	DC Bus Regulation
2	DC bus regulation with maximum flux

5

NOTE!

- This parameter can be changed only with the motor stopped.
- This parameter is only visible on the HMI when: the control type is vector, P0202 = 3 (Sensorless Vector) or P0202 = 4 (Vector with Encoder).

Menu → Configurations → Control → Settings

P0151 - DC Link voltage regulation actuation level

Adjustable range: 1071 to 1200 V Factory setting: 1118 V

Description: Scalar mode (P0202 = 0, 1 or 2):

- P0151 sets the voltage regulation level of the DC link to prevent overvoltage. This parameter, together with P0152, allows two operation types to regulate the DC link voltage.

Regulation type of the DC link when P0152 = 0.00 and P0151 different from the maximum value:

Ramp holding - When the voltage of the DC link reaches the regulation level during deceleration, the deceleration ramp time is extended and the speed is maintained at a constant value until the DC link voltage leaves the actuation level. See Figure 5.16 on page 5-23. This voltage regulation of the DC link (ramp holding) tries to avoid the locking of the inverter due to errors related to overvoltage on the DC link when the deceleration occurs with high inertia loads or with short deceleration times.

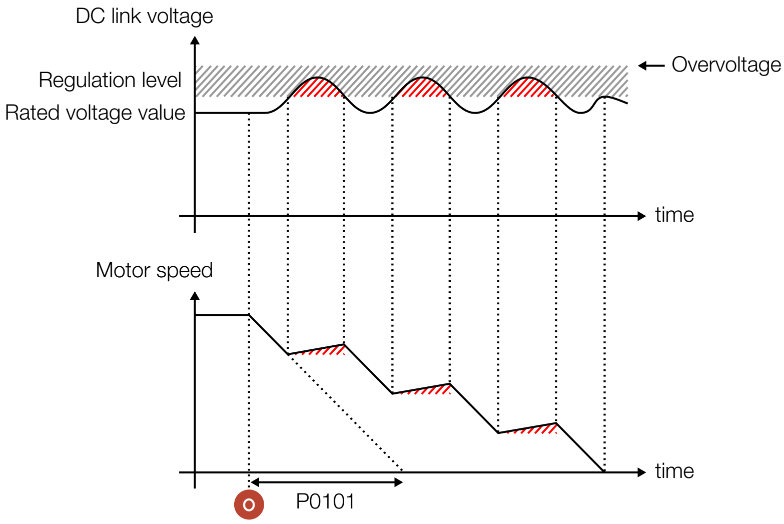


Figure 5.16 – Deceleration with ramp holding

- With this function, an optimized (minimum) deceleration time is obtained for the driven load.
- This function is useful in medium inertia applications that require short deceleration ramps.
- In case the supply line is permanently with overvoltage (DC link voltage > P0151), the inverter may not decelerate. In this case, reduce the line voltage or increment P0151.

Regulation type of the DC link voltage when P0152 > 0.00 and P0151 different from the maximum value:

When the DC link voltage reaches the regulation level during deceleration, the deceleration time is extended and the motor is accelerate until the DC link leaves the actuation level. See Figure 5.16 on page 5-23 and Figure 5.17 on page 5-23.

> **NOTE!**
> In case locking for overvoltage still occurs during deceleration, the value of parameter P0152 must be gradually increased or the deceleration ramp time (P0101 and/or P0103) must be increased. In case the line is permanently with overvoltage (DC link voltage > P0151) the inverter may not decelerate. Reduce the line voltage or increment P0151.

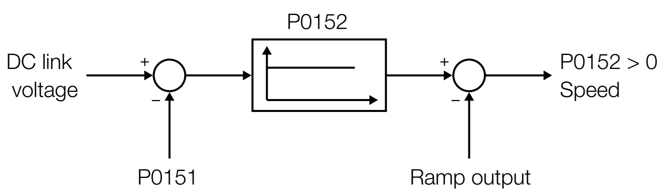


Figure 5.17 – Block diagram of the DC link voltage regulation

Vector Mode (P0202 = 3 or 4):

- P0151 defines the DC link regulation level during braking. During the braking process, the deceleration ramp time is automatically extended, thus avoiding an overvoltage fault.

Menu → Configurations → Control → Settings			
P0152 - Proportional gain of the DC link voltage regulator			
Adjustable range:	0,00 to 9,99	Factory setting:	0.00

Description:

- Refer to P0151 (with V/f control) and Figure 5.17 on page 5-23.
- If P0152 = 0.00 and P0151 different from the maximum value, the ramp holding function is active. Refer to P0151 for V/f.
- P0152 multiplies the voltage error of the DC link, that is, error = present DC link-P0151. P0152 is typically used to prevent overvoltage in applications with eccentric loads.

> **NOTE!**
> This parameter is only visible on the HMI when: the control type is scalar, P0202 = 0, 1 or 2 (V/f control).

Menu → Configurations → Protections → Motor

P0156 - Overload current at 100 %

P0157 - Overload current at 50 %

P0158 - Overload current at 5 %

Adjustable range:	0,0 to 1080,0 A	Factory setting:	P0156 = 990.0 A P0157 = 810.0 A P0158 = 450.0 A

Description:

- It is for the motor and inverter overload protection.
- The motor overload current is the value above which the inverter considers that the motor is operating under overload. The higher the difference between the motor current and the overload level, the sooner the fault occurs.
- Parameter P0156 (Motor Overload Current at Rated Speed) must be adjusted 10 % higher than the used motor rated current (P0401).
- The overload current is obtained as a function of the speed being applied to the motor, according to the overload curve.
- Parameters P0156, P0157 and P0158 are the three points used to form the motor overload curve, as shown in Figure 5.19 on page 5-25 for the factory setting. Refer to Item 6.3.2 Initial Power-up (Parameter Setting) on page 6-13 of the user's manual.
- With the overload current curve adjustment it is possible to program an overload value that varies according to the inverter operation speed (factory default), improving the protection for self-ventilated motors, or to use a constant overload level for any speed applied to the motor (motor with separated ventilation).

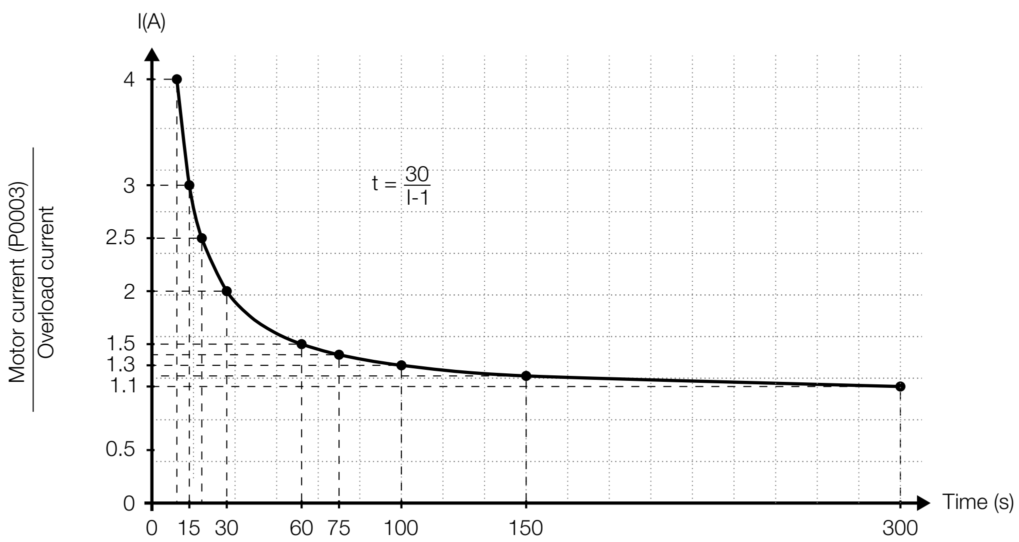


***Figure 5.18 –** Function I x t - overload detection*

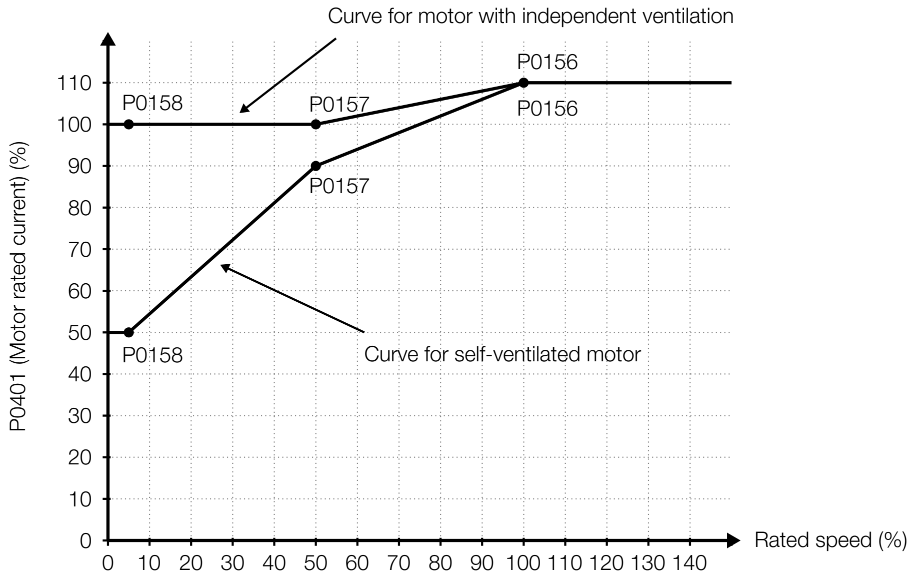


***Figure 5.19 –** Overload protection levels*

NOTE!
When P0295 or P0401 are changed, the values of P0156 to P0158 are changed according to the new current:
P0156 = 1.10 × (P0295 or P0401)
P0157 = 0.90 × (P0295 or P0401)
P0158 = 0.50 × (P0295 or P0401)

Menu → Configurations → Protections → Motor

P0159 - Temperature alarm I x t			
Adjustable range:	0 to 100 %	Factory setting:	80 %

Description:

- When the value of P0076 reaches the value given in this parameter, alarm A0046 (Motor Ixt function overload) is indicated on the HMI.

Menu → Configurations → Control → Vector

P0161 - Speed regulator proportional gain			
P0162 - Integration constant of the speed regulator			
Adjustable range:	P0161 = 0,0 to 200,0 P0162 = 1 to 9999	Factory setting:	P0161 = 20.0 P0162 = 100

Description:

- Gains set as a function of parameter P0413 (Tm Constant).
- These gains can also be manually adjusted to optimize the speed dynamic response. Increase those gains in order to obtain a faster response. If the speed starts oscillating, reduce the gains.
- See Figure 5.26 on page 5-41 .

NOTE!
This parameter is only visible on the HMI when: the control type is vector, P0202 = 3 (Sensorless Vector) or P0202 = 4 (Vector with Encoder).

Menu → Configurations → References

P0163 - Local reference offset			
P0164 - Remote reference offset			
Adjustable range:	-999 to 999	Factory setting:	0

Description:

- When the speed reference comes through the analog inputs AI1 to AI4, P0163 or P0164 can be used to compensate undesired offsets in these signals.
- See Figure 5.24 on page 5-39 .

> **NOTE!**
> This parameter is only visible on the HMI when: the control type is vector, P0202 = 3 (Sensorless Vector) or P0202 = 4 (Vector with Encoder).

Menu → Configurations → Control → Vector

P0165 - Time constant of the measured speed filter			
Adjustable range:	0,001 to 1,000 s	Factory setting:	0.012 s

Description:

- It sets the time constant for the speed filter.
- See Figure 5.26 on page 5-41 .

> **NOTE!**
> This parameter is only visible on the HMI when: the control type is vector, P0202 = 3 (Sensorless Vector) or P0202 = 4 (Vector with Encoder).

Menu → Configurations → Control → Vector

P0167 - Current regulator proportional gain			
P0168 - Current regulator Integral gain			
Adjustable range:	P0167 = 0,000 to 9,999 P0168 = 0,1 to 999,9	Factory setting:	P0167 = 0.080 P0168 = 12.3

Description:

- P0167 and P0168 set as a function of parameters P0411 and P0409 respectively.

> **NOTE!**
> This parameter is only visible on the HMI when: the control type is vector, P0202 = 3 (Sensorless Vector) or P0202 = 4 (Vector with Encoder).

Menu → Configurations → Control → Scalar

P0169 - Maximum output current			
Adjustable range:	0,0 to 1350,0 A	Factory setting:	1035.0 A

Description:

- It is intended to avoid the motor stalling (locking) during overloads. If the load on the motor increases, its current will increase.

- If the current exceeds the value set in P0169, the motor speed will be reduced following the deceleration ramp until the current is below the value set in P0169. When the overload disappears, the speed goes back to the normal value.

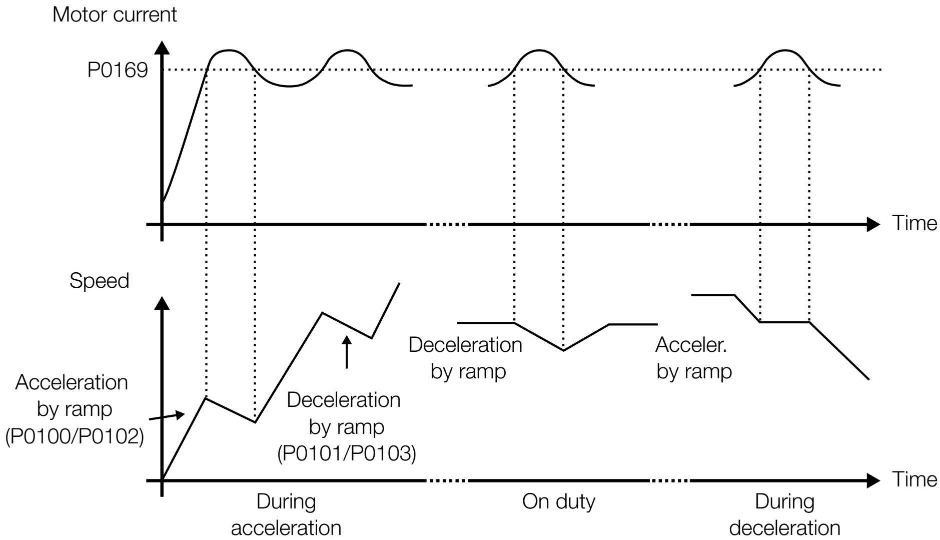


Figure 5.20 – *Curves showing the current limitation actuation*

> **NOTE!**
> This parameter is only visible on the HMI when: the control type is scalar, P0202 = 0, 1 or 2 (V/f control).

Menu → Configurations → Control → Vector			
P0170 - Maximum reverse torque current			
P0171 - Maximum current of forward torque			
Adjustable range:	0 to 250 %	Factory setting:	105 %

Description:

- It limits the value of the motor current component that produce torque. The adjustment is expressed in percentage of the inverter rated current (value of parameter P0295).
- During the current limitation process, the motor current can be calculated by:

$$I_{motor} = \sqrt{(\text{P0170 or P0171})^2 + (\text{P0410})^2}$$

- During the optimal braking, P0171 acts as the limitation of the maximum output current to generate the forward braking torque (refer to P0151).
- Although the value of P0170 and P0171 depends on the relation between P0295 and P0401, its value is limited to 250 %.

> **NOTE!**
> This parameter is only visible on the HMI when: the control type is vector, P0202 = 3 (Sensorless Vector) or P0202 = 4 (Vector with Encoder).

Menu → Configurations → Control → Vector			
P0175 - Flux regulator proportional gain on the motor			
P0176 - Integration constant of the flux regulator on the motor			
Adjustable range:	P0175 = 0,0 to 999,9 P0176 = 1 to 9999	Factory setting:	P0175 = 50.0 P0176 = 900

Description:

- Gains set as a function of parameter P0412.
- See Figure 5.26 on page 5-41.

> **NOTE!**
> This parameter is only visible on the HMI when: the control type is vector, P0202 = 3 (Sensorless Vector) or P0202 = 4 (Vector with Encoder).

Menu → Configurations → Control → Vector

P0177 - Minimum flux on the motor

P0178 - Rated flux on the motor

P0179 - Maximum flux on the motor

Adjustable range:	P0177 = 0 to 120 % P0178 = 0 to 120 % P0179 = 0 to 200 %	Factory setting:	P0177 = 0 % P0178 = 100 % P0179 = 120 %

Description:

- Flux conditions on the motor.
- See Figure 5.26 on page 5-41.

> **NOTE!**
> This parameter is only visible on the HMI when: the control type is vector, P0202 = 3 (Sensorless Vector) or P0202 = 4 (Vector with Encoder).

Menu → Configurations → Control → Vector

P0180 - Starting point of the field weakening

Adjustable range:	0 to 120 %	Factory setting:	90 %

Description:

- It expresses the percentage of the modulation index from which the motor field weakening occurs.

> **NOTE!**
> This parameter is only visible on the HMI when: the control type is vector, P0202 = 3 (Sensorless Vector) or P0202 = 4 (Vector with Encoder).

Menu → Configurations → Control → Settings

P0181 - Magnetization mode

Adjustable range:	0 to 1	Factory setting:	0

Description:

- It configures the magnetization mode of the machine to be driven.

Table 5.13 – *Magnetization mode*

P0181	Function
0	General enable
1	Start/Stop

> **NOTE!**
> This parameter can be changed only with the motor stopped.

Menu → Configurations → Control → Vector

P0182 - Flux reference regulator proportional gain on the motor

P0183 - Flux reference regulator integral gain on the motor

Adjustable range:	P0182 = 0,00 to 99,99 P0183 = 1 to 9999	Factory setting:	P0182 = 0.20 P0183 = 25

Description:

- PI gains of the flux regulator.
- See Figure 5.26 on page 5-41 .

Menu → Configurations → Control → Scalar

P0202 - Control Type

Adjustable range:	0 to 4	Factory setting:	0

Description:

- It defines the control type of the inverter.

Self-guided menu:

- When P0202 is programmed for sensorless vector (P0202 = 3) or vector with encoder (P0202 = 4), the inverter enters the guided start-up routine (refer to Figure 5.21 on page 5-29).
- In this mode, the user must adjust a series of motor parameters, so that the vector control operates properly.

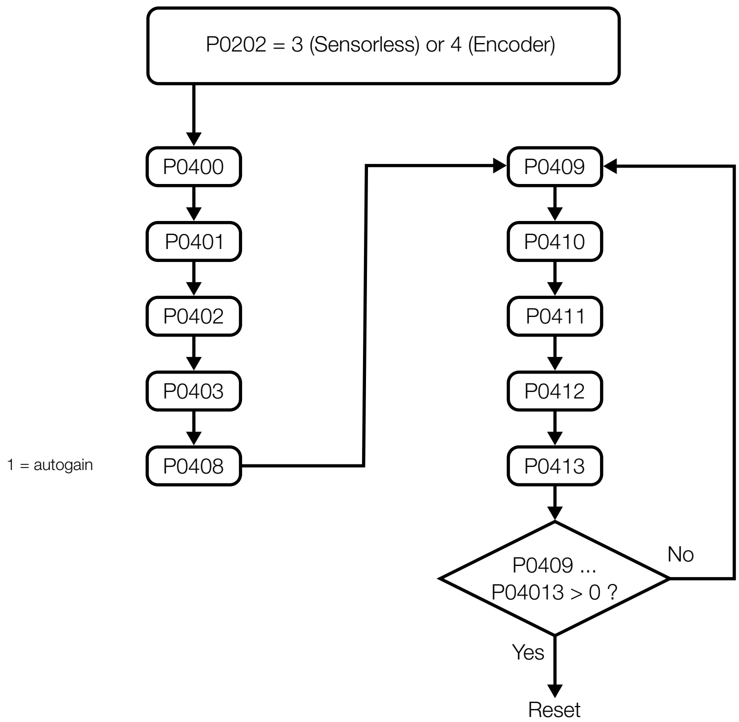


***Figure 5.21 –** Guided start-up routine sequence*

The Table 5.14 on page 5-30 shows the summarized description of each parameter:

***Table 5.14 –** Guided start-up routine*

Parameter	Description
P0400	Voltage
P0401	Current
P0402	Speed
P0403	Frequency
P0408	Run Self-tuning 0 = Inactive 1 = Autogain (automatic calculation of the gains of the controllers)
P0409	Stator resistance (Rs)
P0410	Magnetization current (Imr)
P0411	Flux leakage inductance
P0412	Lr/Rr Constant
P0413	Tm Time Constant

- Refer to the specific description of each parameter for more details.
- Parameters from P0409 to P0413 correspond to motor internal parameters, and they must be programmed according to the motor nameplate data.
- The values programmed at P0409 to P0413 must be different from zero; otherwise, the inverter will not leave the guided start-up routine.
- The configuration of this parameter must be done under the orientation of WEG technical assistance.

***Table 5.15 –** Control Type*

P0202	Function
0	V/F 60 Hz
1	V/F 50 Hz
2	Adjustable V/F
3	Sensorless Vector
4	Vector with Encoder

NOTE!
This parameter can be changed only with the motor stopped.

Menu → Configurations → Functions → PID

P0203 - Special function selection

Adjustable range: 0 to 1 Factory setting: 0

Description:

- It defines the special function selection.
- For the PID regulator special function, refer to the detailed description of the related parameters (P0520 to P0535).
- When P0203 is changed to 1, P0265 is automatically changed to 15 - Manual/Automatic.

***Table 5.16 –** Special function selection*

P0203	Function
0	None
1	PID regulator

NOTE!
This parameter can be changed only with the motor stopped.

Menu → Configurations → Backup

P0204 - Load/Save Parameters

Adjustable range: 0 to 5 Factory setting: 0

Description:

- P0204 (Load/Save Parameters)
- Option P0204 = 5 (Load factory default values) is disabled when P0309 ≠ 0 (Fieldbus active).

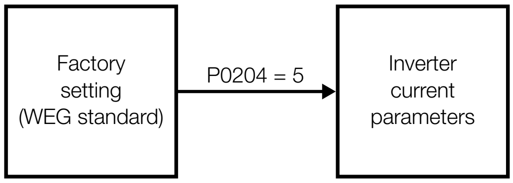


Figure 5.22 – *Parameter transference*

Table 5.17 – *Load/Save Parameters*

P0204	Function
0	Not Used
1	Reserved
2	Reserved
3	Reset enabled time counter (P0043)
4	Reset MWh counter (P0044)
5	Load factory default values

NOTE!
This parameter can be changed only with the motor stopped.

Menu → Configurations → Protections → Auto reset

P0206 - Auto-reset time after fault

Adjustable range: 0 to 255 s Factory setting: 0 s

Description:

- In the event of a fault trip the inverter can initiate an automatic reset after the time given by P0206 has elapsed.
- If P0206 ≤ 2 auto-reset will not occur.
- After the auto-reset if the same fault is repeated three times consecutively, then the Auto-Reset function will be disabled.
- A fault is considered consecutive if it happens again within 30 seconds after an auto-reset. Therefore, if an error occurs four consecutive times, it will be permanently indicated and the drive will be disabled (in such case a reset command becomes necessary. E.g.: HMI, DI, serial, etc).

Menu → Configurations → Control → Settings

P0208 - Reference scale factor

Adjustable range: 1 to 18000 Factory setting: 1800

Description:

- It defines how the Motor speed reference (P0001) and Motor speed (P0002) will be presented when it runs at synchronous speed.
- To indicate the values in rpm:
  Set P0208 to the synchronous speed according to Table 5.18 on page 5-32.

Table 5.18 – *Synchronous speed reference in rpm*

Frequency	Number of motor poles	Synchronous Speed
50 Hz	2	3000
	4	1500
	6	1000
	8	750
60 Hz	2	3600
	4	1800
	6	1200
	8	900

- The value shown can be calculated through the formulas:

$$P0002 = \frac{\text{speed} \times P0208}{\text{sync. speed}}$$

$$P0001 = \frac{\text{reference} \times P0208}{\text{sync. speed}}$$

Being:
Speed = present speed in rpm.
Sync. speed = 120 x P0403 / poles.
Poles = 120 x P0403 / P0402, it may be equal to 2, 4, 6, 8 or 10.
Reference = speed reference in rpm.

Menu → Configurations → Protections → Motor

P0209 - Motor phase loss detection

Adjustable range: 0 to 1 Factory setting: 0

Description:

- The Motor Phase Loss Detection trips indicating F0076 when the following conditions are simultaneously satisfied:

1. P0209 = Active.
2. Enabled inverter.
3. Speed reference higher than 3 %.
4. $I_{max} > 1.125 \times I_{min}$.

Being:
I_{max} is the highest current of the three phases.
I_{min} is the lowest current of the three phases.

Table 5.19 – *Motor phase loss detection*

P0209	Function
0	Inactive
1	Active

NOTE!
This parameter can be changed only with the motor stopped.

Menu → Configurations → Control → Settings

P0211 - Disable by zero speed (Stop Logic)

Adjustable range: 0 to 1 Factory setting: 1

Description:

- When active it disables the inverter (general disable) when the speed reference and the actual speed become lower than the value adjusted in P0291 (Zero Speed Zone) and after the time adjusted in P0213 has elapsed.
- The inverter is enabled again when any of the conditions defined in P0212 is fulfilled.

Table 5.20 – *Disable by zero speed (Stop Logic)*

P0211	Function
0	Inactive
1	Active

Menu → Configurations → Control → Settings

P0212 - Condition for disabable output by zero speed

Adjustable range: 0 to 1 Factory setting: 0

Description:

- When the PID Regulator is active (see P0203) and in automatic mode, besides the condition programmed in P0212, it is also necessary that the PID error (the difference between the setpoint and the process variable) be more than the value programmed in P0535, so that the inverter will be able to leave the zero speed disable.

Table 5.21 – *Condition for disabable output by zero speed*

P0212	Function
0	P0001 (N*) > P0291 or P0002 (N) > P0291
1	P0001 (N*) > 0

Menu → Configurations → Control → Settings

P0213 - Time delay for zero speed disable

Adjustable range: 0 to 999 s Factory setting: 0 s

Description:

- P0213 = 0: stop logic without timing.
- P0213 > 0: stop logic with timing. After the speed reference and the motor speed become lower than the value set in P0291, count of the time set in P0213 begins. When the time count reaches this value, the inverter will be disabled. When the time programmed at P213 has elapsed the inverter will be disabled. If during that time count any of the conditions for the disable by stop logic no longer exists, the time count is reset and the inverter will be enabled again.

Menu → Configurations → Protections → Inverter

P0214 - Line phase loss detection

Adjustable range: 0 to 1 Factory setting: 0

Description:

- Line phase loss detection.

- The parameter P0214, being active, controls the following faults and alarms:
  A0301: Input undervoltage.
  A0302: Input overvoltage.
  F0303: Input undervoltage.
  F0304: Input overvoltage.
  F0305: Input unbalance/phase loss.
- The phase-loss detector is enabled to act when:
  1. P0214 = Active.
  2. Inverter enabled.
  3. Pre-charge completed.
  4. No Ride-through.

***Table 5.22 –** Line phase loss detection*

P0214	Function
0	Inactive
1	Active

NOTE!
This parameter can be changed only with the motor stopped.

5

Menu → Configurations → Commands → Local

P0220 - LOCAL/REMOTE selection source

Adjustable range:	0 to 12	Factory setting:	11

Description:

- It defines the origin of the command that will select between the Local situation and the Remote situation.

***Table 5.23 –** LOCAL/REMOTE selection source*

P0220	Function
0	Always LOC
1	Always REM
2	Service HMI (LOC)
3	Service HMI (REM)
4	Digital Inputs DI2...DI10
5	Serial (LOC)
6	Serial (REM)
7	Fieldbus (LOC)
8	Fieldbus (REM)
9	PLC (LOC)
10	PLC (REM)
11	HMI (LOC)
12	HMI (REM)

NOTE!
This parameter can be changed only with the motor stopped.

Menu → Configurations → Commands → Local

P0221 - Speed reference selection LOCAL situation

P0222 - Speed reference selection REMOTE situation

Adjustable range:	0 to 13	Factory setting:	P0221 = 13 P0222 = 0

Description:

- The AIx' designation refers to the analog signal obtained after the addition of AIx to the OFFSET multiplied by the applied gain.
- See Figure 5.29 on page 5-44.
- The factory default for the Local speed reference is via HMI keys and and for Remote speed reference is via Analog Input AI1.
- The reference value adjusted with the and keys is contained in parameter P0121.
- Check the operation of the Electronic Potentiometer (P.E.) in Figure 5.36 on page 5-58.
- When selecting option 7 (P.E.), set P0265 or P0267 to 5 and P0266 or P0268 to 5.
- When selecting option 8, set P0266 and/or P0267 and/or P0268 to 7.

***Table 5.24 –** Speed reference selection REMOTE situation*

P0222	Function
0	Service HMI
1	Analog input AI1
2	Analog input AI2
3	Analog input AI3
4	Analog input AI4
5	Sum (AI1 + AI2) > 0
6	Sum (AI1 + AI2)
7	Electronic potentiometer
8	Multispeed
9	Serial
10	Fieldbus
11	Analog input AI5
12	PLC
13	HMI

NOTE!
This parameter can be changed only with the motor stopped.

Menu → Configurations → Commands → Local

P0223 - Forward/Reverse Selection LOCAL Situation

Adjustable range:	0 to 13	Factory setting:	12

Description:

- It defines the origin of the forward/reverse command and the direction used in LOCAL situation.

***Table 5.25 –** Forward/Reverse Selection LOCAL Situation*

P0223	Function
0	Always forward
1	Always reverse
2	Service HMI (Forward)
3	Service HMI (Reverse)
4	Digital Input DI2
5	Serial (Forward)
6	Serial (Reverse)
7	Fieldbus (Forward)
8	Fieldbus (Reverse)
9	AI4 Polarity
10	PLC (Forward)
11	PLC (Reverse)
12	HMI (Forward)
13	HMI (Reverse)

NOTE!
This parameter can be changed only with the motor stopped.

Menu → Configurations → Commands → Local

P0224 - Start/Stop Selection LOCAL Situation

Adjustable range: 0 to 5 Factory setting: 5

Description:

- It defines the origin of the Start/Stop command in the LOCAL situation.
- When the DIx inputs have the FORWARD/REVERSE function, the HMI keys I and O will remain inactive regardless of the value set in P0224 (Start/Stop Selection LOCAL Situation).

***Table 5.26 –** Start/Stop Selection LOCAL Situation*

P0224	Function
0	Service HMI
1	Digital input DIx
2	Serial
3	Fieldbus
4	PLC
5	HMI

NOTE!
This parameter can be changed only with the motor stopped.

Menu → Configurations → Commands → Local

P0225 - Selection of JOG Source LOCAL Situation

Adjustable range: 0 to 6 Factory setting: 6

Description:

- It defines the origin of the JOG command in the LOCAL situation.
- The speed reference value for JOG is provided by parameter P0122 (Speed reference for JOG or JOG+).

Table 5.27 – *Selection of JOG Source LOCAL Situation*

P0225	Function
0	Disable
1	Service HMI
2	Digital inputs DI3 to DI10
3	Serial
4	Fieldbus
5	PLC
6	HMI

NOTE!
This parameter can be changed only with the motor stopped.

Menu → Configurations → Commands → Remote

P0226 - Selection of Direction of ROTATION REMOTE Situation

Adjustable range: 0 to 13 Factory setting: 2

Description:

- It defines the origin of the forward/reverse command and the direction used in REMOTE situation.

Table 5.28 – *Selection of Direction of ROTATION REMOTE Situation*

P0226	Function
0	Always forward
1	Always reverse
2	Service HMI (Forward)
3	Service HMI (Reverse)
4	Digital Input DI2
5	Serial (Forward)
6	Serial (Reverse)
7	Fieldbus (Forward)
8	Fieldbus (Reverse)
9	AI4 Polarity
10	PLC (Forward)
11	PLC (Reverse)
12	HMI (Forward)
13	HMI (Reverse)

NOTE!
This parameter can be changed only with the motor stopped.

Menu → Configurations → Commands → Remote

P0227 - Start/Stop Selection REMOTE Situation

Adjustable range: 0 to 5 Factory setting: 0

Description:

- It defines the origin of the Start/Stop command in the REMOTE situation.
- When the DIx inputs have the FORWARD/REVERSE function, the HMI keys I and O will remain inactive regardless of the value set in P0227.

Table 5.29 – Start/Stop Selection REMOTE Situation

P0227	Function
0	Service HMI
1	Digital input DIx
2	Serial
3	Fieldbus
4	PLC
5	HMI

NOTE!
This parameter can be changed only with the motor stopped.

Menu → Configurations → Commands → Remote

P0228 - JOG Selection - REMOTE Situation

Adjustable range: 0 to 6 Factory setting: 1

Description:

- It defines the origin of the JOG command in the REMOTE situation.
- The speed reference value for JOG is provided by parameter P0122.

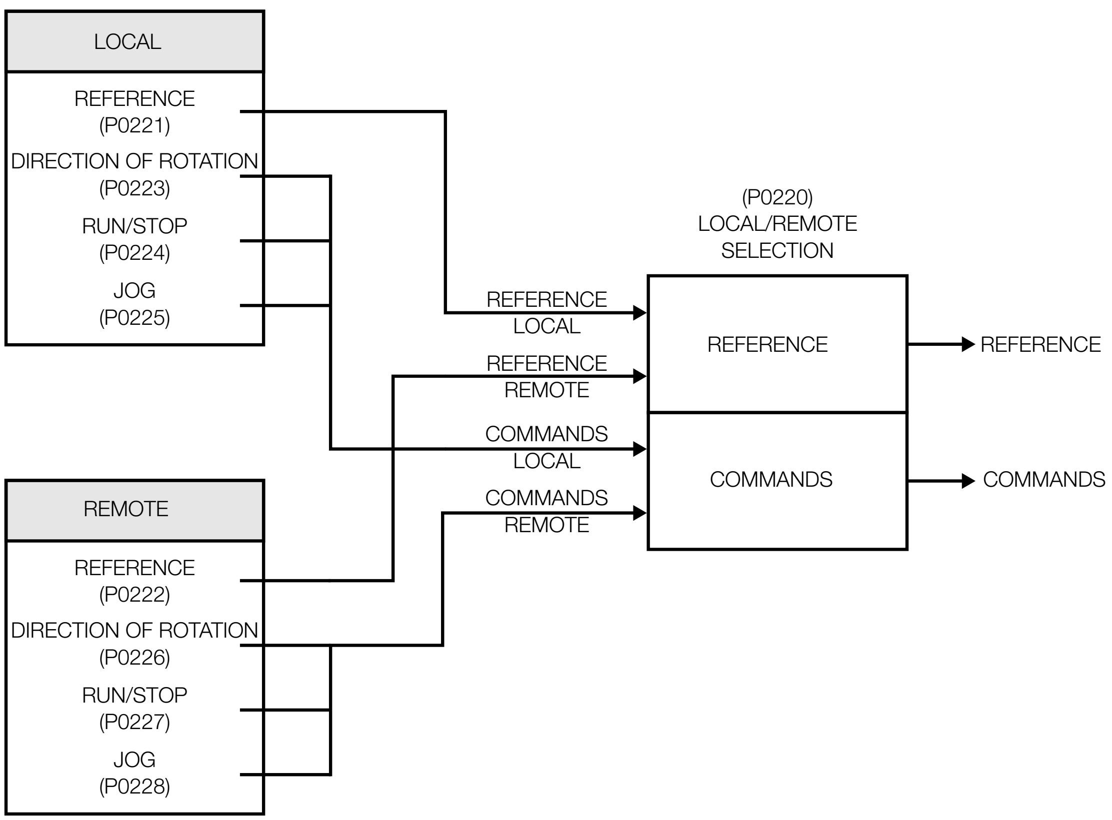


Figure 5.23 – LOCAL/REMOTE situation block diagram

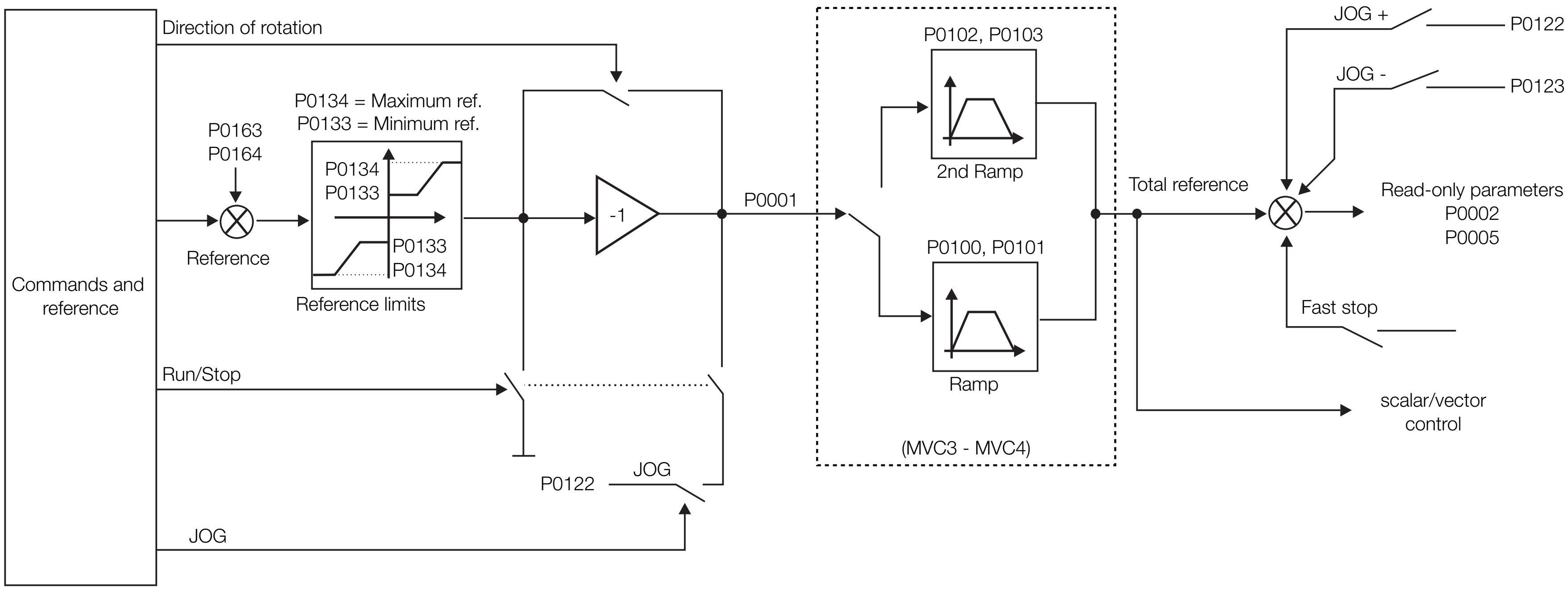


Figure 5.24 – *Speed reference block diagram*

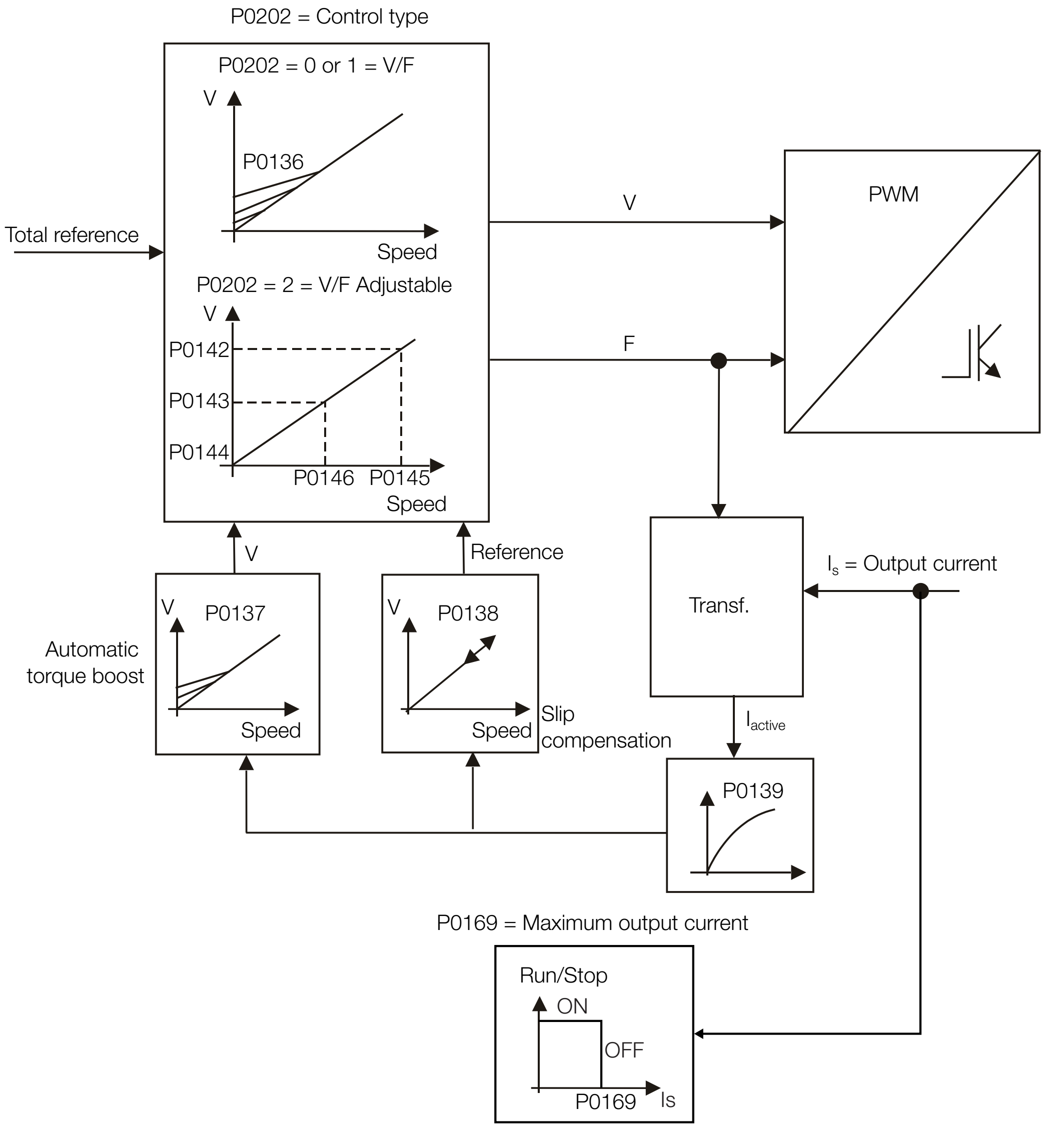


Figure 5.25 – *Block diagram of scalar control with sinusoidal output filter*

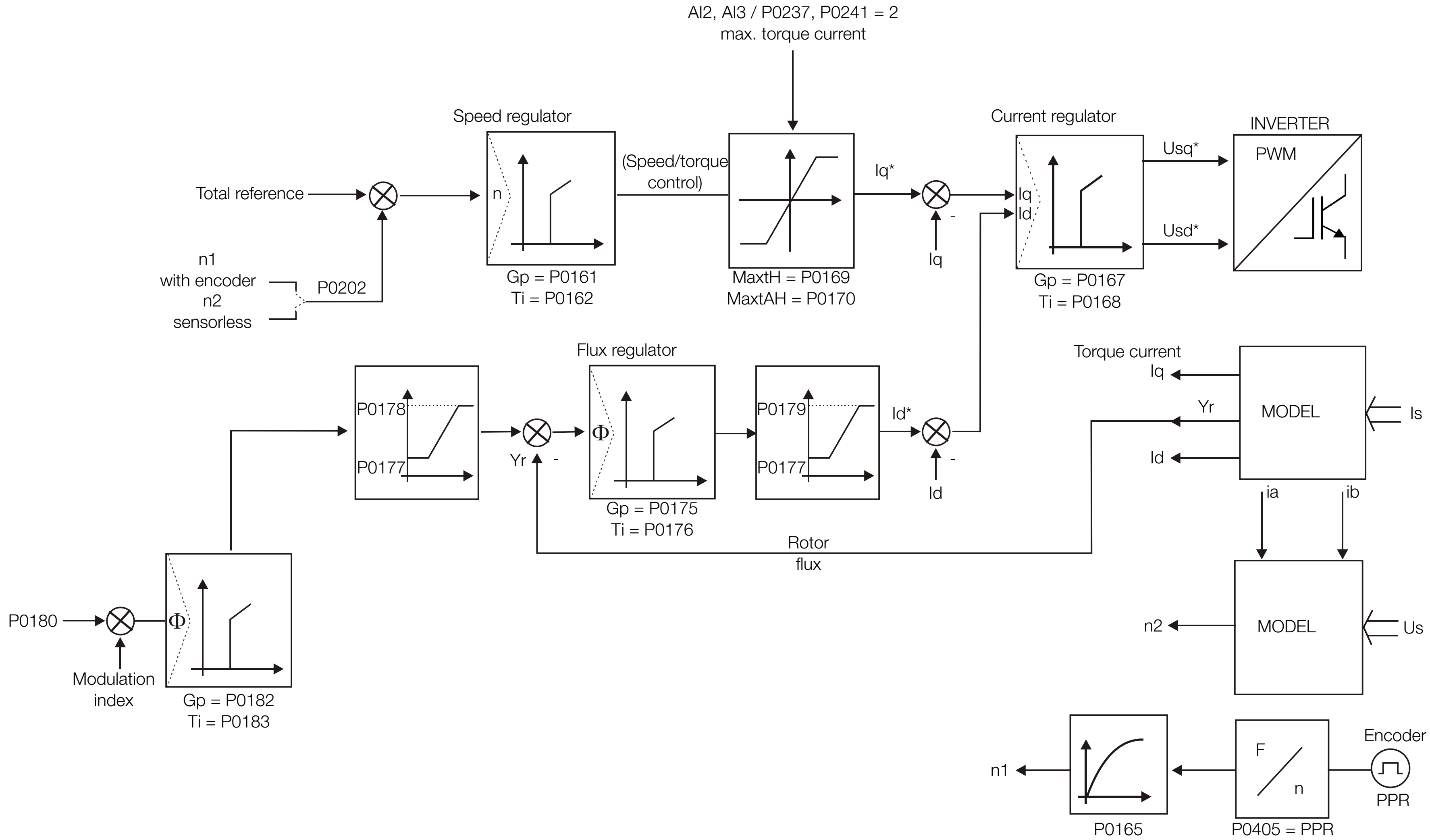


Figure 5.26 – *Vector control block diagram*

***Table 5.30 –** JOG Selection - REMOTE Situation*

P0228	Function
0	Disable
1	Service HMI
2	Digital inputs DI3 to DI10
3	Serial
4	Fieldbus
5	PLC
6	HMI

NOTE!
This parameter can be changed only with the motor stopped.

Menu → Configurations → HMI → Settings

P0231 - Actuation in the transition between LOC and REM for the HMI

Adjustable range:	0 to 2	Factory setting:	0

Description:

5

- P0231 defines the action to be taken by the inverter when the transition between LOCAL and REMOTE occurs for the Graphic HMI.
- This parameter only actuates when P0224 = 5 (HMI) or P0227 = 5 (HMI).

(*) In case the motor stops, it occurs according to the programming of P0232 (Stop Selection).

***Table 5.31 –** Actuation in the transition between LOC and REM for the HMI*

P0231	Function
0	It keeps the motor state
1	It keeps the HMI state
2	It turns off the motor

Menu → Configurations → Commands → Local

P0232 - Stop Selection

Adjustable range:	0 to 1	Factory setting:	0

Description:

- With the P0232 setting, it is possible to select between the stop modes (Run/Stop and General disable) for the key or for the STOP function (via DIx).

NOTE!
When the "DISABLE GENERAL" stop mode is programmed, only drive the motor if it is stopped or set the necessary time for which the inverter is disabled (COAST) in P0725 to ensure the motor stop, or enable the Flystart function.

***Table 5.32 –** Stop Selection*

P0232	Function
0	Run/Stop
1	General disable

Menu → Configurations → I/O → Analog inputs → AI1			
P0233 - Dead Zone			
Adjustable range:	0 to 1	Factory setting:	1

Description:

- It defines if the Dead Zone in the Analog Inputs is 0 = Inactive or 1 = Active
- If P0233 = 0 (Inactive), the signal in the Analog Inputs acts on the Speed Reference from the minimum point:
  - (0 to 10) V/(0 to 20) mA/(4 to 20) mA:0 V/0 mA/4 mA.
  - (10 to 0) V/(20 to 0) mA/(20 to 4) mA:10 V/20 mA/20 mA.
- If P0233 = 1 (Active), the signal in the Analog Inputs has a dead zone, where the Speed Reference remains at the value of the Minimum Value (P0133), even with the variation of the input signal.

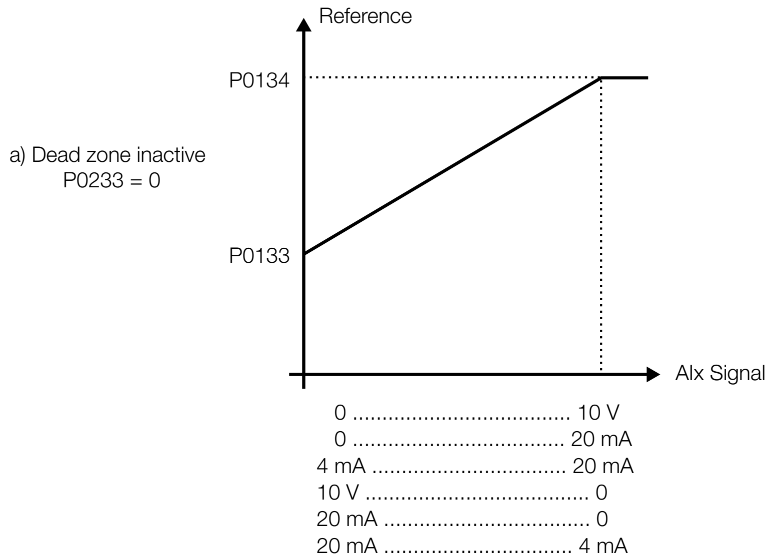


Figure 5.27 – *Analog input dead zone inactive*

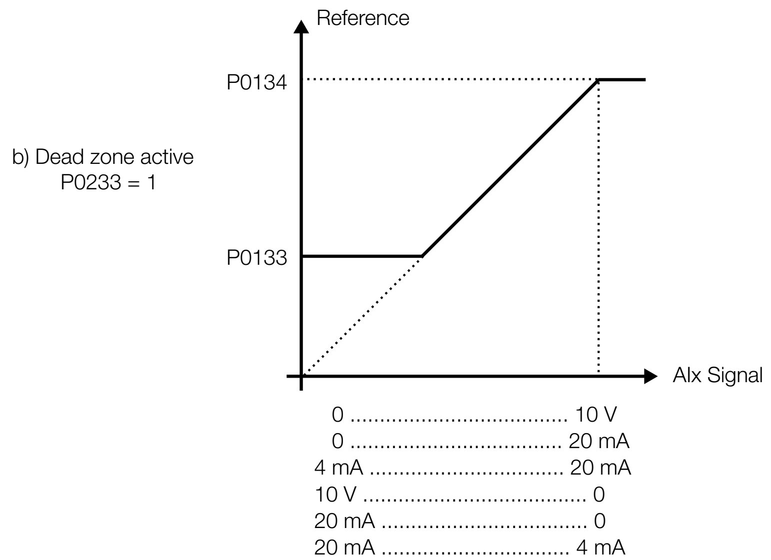


Figure 5.28 – *Analog input dead zone active*

- If the analog input AI2 or AI4 is programmed for (-10 to +10) V (P0246 = 4), curves identical to those of the Figure 5.28 on page 5-43 only when AI2 or AI4 is negative will the direction of rotation be inverted.

***Table 5.33 –** Dead Zone*

P0233	Function
0	Inactive
1	Active

Menu → Configurations → I/O → Analog inputs → AI1

P0234 - Analog input AI1 gain

Adjustable range: 0,000 to 9,999 Factory setting: 1.000

Description: AI1' = -2 V, means the motor will spin in the opposite direction with a reference in module equal to 2 V.

- The internal values AI1', AI3', AI4' and AI5' are the result of the following equation:

$$AIx' = (AIx + \frac{OFFSET}{100} \times 10\ V) \times Gain$$

Example: AI1 = 5 V, OFFSET = -70 % and Gain = 1,00

$$AI1' = (5 + \frac{(-70)}{100} \times 10\ V) \times 1 = -2\ V$$

AI1' = -2 V, means the motor will spin in the opposite direction with a reference in module equal to 2 V.

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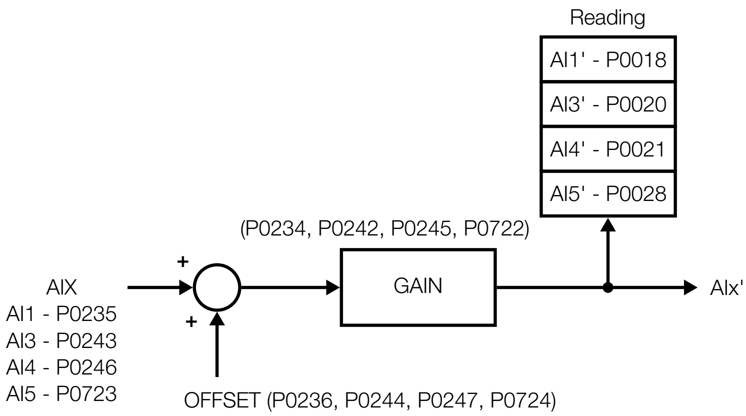

***Figure 5.29 –** Block diagram of the analog inputs AI1, AI3, AI4 and AI5*

Menu → Configurations → I/O → Analog inputs → AI1

P0235 - AI1 Signal Type

Adjustable range: 0 to 3 Factory setting: 0

Description:

- When current signals are used at AI1 input, put S2.A on the MVC4 control board in the "ON" position.
- For options 2 and 3 inverse reference is attained, that is, maximum speed is obtained with minimum reference.

***Table 5.34 –** AI1 Signal Type*

P0235	Function
0	(0 to 10) V/(0 to 20) mA
1	(4 to 20) mA
2	(10 to 0) V/(20 to 0) mA
3	(20 to 4) mA

NOTE!
This parameter can be changed only with the motor stopped.

Menu → Configurations → I/O → Analog inputs → AI1			
P0236 - Analog input AI1 offset			
Adjustable range:	-100,0 to 100,0 %	Factory setting:	0.0 %

Description:

- Refer to P0234.

Menu → Configurations → I/O → Analog inputs → AI2			
P0237 - AI2 signal function			
Adjustable range:	0 to 3	Factory setting:	0

Description:

- When the option 0 (P0221/P0222) is selected, AI2 is able to provide the reference (provided that programmed so in P0221/P0222), subject to the reference limits (P0133, P0134) and ramp action (P0100 to P0103).
- See Figure 5.24 on page 5-39.
- Option 3 (Process Variable) defines the AI2 input as the PID regulator feedback signal (e.g., pressure or temperature sensor, etc.), provided that P0524 = 0.

5

***Table 5.35 –** AI2 signal function*

P0237	Function
0	P0221/P0222
1	Not Used
2	Maximum torque current
3	PID process variable

NOTE!
This parameter can be changed only with the motor stopped.

Menu → Configurations → I/O → Analog inputs → AI2			
P0238 - Analog input AI2 gain			
Adjustable range:	0,000 to 9,999	Factory setting:	1.000

Description:

- AI2' = -2 V, meaning that the motor will run in reverse direction with a speed reference absolute value equal to 2 V.
- The internal value of AI2' is the result of the following equation:

$$\text{AI2'} = (\text{AI2} + \frac{\text{OFFSET}}{100} \times 10\ \text{V}) \times \text{Gain}$$

Example: AI2 = 5 V, OFFSET = -70 % and Gain = 1.00

$$\text{AI2'} = (5 + \frac{(-70)}{100} \times 10\ \text{V}) \times 1 = -2\ \text{V}$$

AI2' = -2 V, meaning that the motor will run in reverse direction with a speed reference absolute value equal to 2 V.

- AI2 has a variation range from -10 V to 10 V no matter if P0239 = 0 or 4, that is, an input voltage of 0 V corresponds in P0019 = 50 %. If it is necessary that 0 V correspond to P0019 = 0 %, the following setting must be done:

  P0238 = 2
  P0240 = -50 %

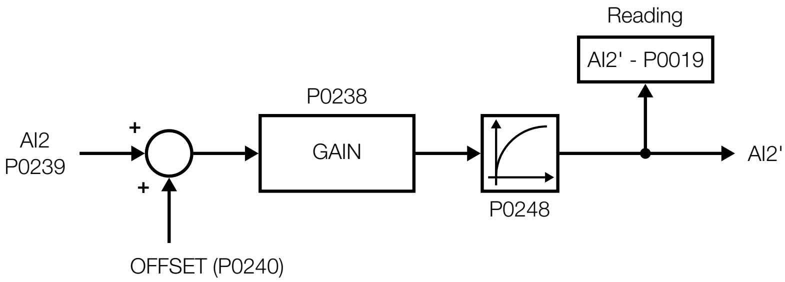

***Figure 5.30 –** Block diagram of analog input AI2*

Menu → Configurations → I/O → Analog inputs → AI2

P0239 - AI2 Signal Type

Adjustable range: 0 to 4 Factory setting: 0

5

Description:

- When current signals are used at AI2 input, put S2.B on the MVC4 control board in “ON” position.
- For options 2 and 3 inverse reference is attained, that is, maximum speed is obtained with minimum reference.

***Table 5.36 –** AI2 Signal Type*

P0239	Function
0	(0 to 10) V/(0 to 20) mA
1	(4 to 20) mA
2	(10 to 0) V/(20 to 0) mA
3	(20 to 4) mA
4	(-10 to +10) V

NOTE!
This parameter can be changed only with the motor stopped.

Menu → Configurations → I/O → Analog inputs → AI2

P0240 - Analog input AI2 offset (bipolar MVC4 board)

Adjustable range: -100,0 to 100,0 % Factory setting: 0.0 %

Description:

- Refer to P0238.

Menu → Configurations → I/O → Analog inputs → AI3

P0241 - AI3 signal function

Adjustable range: 0 to 3 Factory setting: 0

Description:

- When the option 0 (P0221/P0222) is selected, AI3 is able to receive the speed reference, which will be subjected to the speed limits(P0133 and P0134) and ramp action (P0100 to P0103).
- Refer to Figure 5.24 on page 5-39.
- The option 3, process variable, defines the AI3 input as the PID regulator feedback signal (e.g., pressure or temperature sensor, etc.), provided that P0524 = 1.

NOTE!
Isolated Analog Input located on the Optional Board EBB.

Table 5.37 – *AI3 signal function*

P0241	Function
0	P0221/P0222
1	Not Used
2	Maximum torque current
3	PID process variable

NOTE!
This parameter can be changed only with the motor stopped.

Menu → Configurations → I/O → Analog inputs → AI3

P0242 - Analog input AI3 gain

Adjustable range: 0,000 to 9,999 Factory setting: 1.000

Description:

- Refer to P0234.

Menu → Configurations → I/O → Analog inputs → AI3

P0243 - AI3 Signal Type

Adjustable range: 0 to 3 Factory setting: 0

Description:

- Set the S4.1 switch on the EBB optional board to "ON" position when a current signal is used at the analog input AI3.
- For options 2 and 3 inverse reference is attained, that is, maximum speed is obtained with minimum reference.

Table 5.38 – *AI3 Signal Type*

P0243	Function
0	(0 to 10) V/(0 to 20) mA
1	(4 to 20) mA
2	(10 to 0) V/(20 to 0) mA
3	(20 to 4) mA

NOTE!
This parameter can be changed only with the motor stopped.

Menu → Configurations → I/O → Analog inputs → AI3

P0244 - Analog input AI3 offset

Adjustable range:	-100,0 to 100,0 %	Factory setting:	0.0 %

Description:

- Refer to P0234.

Menu → Configurations → I/O → Analog inputs → AI4

P0245 - Analog input AI4 gain

Adjustable range:	0,000 to 9,999	Factory setting:	1.000

Description:

- Refer to P0234.

NOTE!
Analog Input located on the EBA Optional Board.

5

Menu → Configurations → I/O → Analog inputs → AI4

P0246 - AI4 Signal Type

Adjustable range:	0 to 4	Factory setting:	0

Description:

- Set the S2.1 switch on the EBB optional board to "ON" position when a current signal is used at the analog input AI4.
- For options 2 and 3 inverse reference is attained, that is, maximum speed is obtained with minimum reference.

Table 5.39 – *AI4 Signal Type*

P0246	Function
0	(0 to 10) V/(0 to 20) mA
1	(4 to 20) mA
2	(10 to 0) V/(20 to 0) mA
3	(20 to 4) mA
4	(-10 to +10) V

NOTE!
This parameter can be changed only with the motor stopped.

Menu → Configurations → I/O → Analog inputs → AI4

P0247 - Analog input AI4 offset

Adjustable range:	-100,0 to 100,0 %	Factory setting:	0.0 %

Description:

- Refer to P0234.

Menu → Configurations → I/O → Analog inputs → AI2			
P0248 - Analog input AI2 filter			
Adjustable range:	0,0 to 16,0 s	Factory setting:	0.0 s

Description:

- It sets the time constant of the RC filter of input AI2.
- See Figure 5.30 on page 5-46 .

Menu → Configurations → I/O → Analog outputs → AO1			
P0251 - AO1 Function			
Adjustable range:	0 to 21	Factory setting:	2

Description:

- See Table 5.40 on page 5-51 for further details related to the function of analog outputs.
- For values in the factory default (P0251 = 2 and P0252 = 1.000) AO1 = 10 V when Actual Speed = Maximum speed reference (P0134).
- AO1 output may be located on the MVC4 control board (0 to 10) V or on the EBB optional board [AO1', (0 to 20) mA/ (4 to 20) mA]. When EBB is used, the same signal is available for MVC4.

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Menu → Configurations → I/O → Analog outputs → AO1			
P0252 - Analog output AO1 gain			
Adjustable range:	0,000 to 9,999	Factory setting:	1.000

Description:

- It sets the gain of analog output AO1. For P0252 = 1.000 the output value of AO1 is set according to the description "analog output indication scale" in P0262.

Menu → Configurations → I/O → Analog outputs → AO2			
P0253 - AO2 Function			
Adjustable range:	0 to 21	Factory setting:	5

Description:

- For values in the factory default (P0253 = 5 and P0254 = 1.000) AO1 = 10 V when Motor current = 1.5 x P0295.
- For values in the factory default (P0253 = 5 and P0254 = 1.000) AO1 = 10 V when Motor current = 1.5 x P0295.
- AO2 output may be located on the MVC4 control board (0 to 10) V or on the EBB optional board [AO2', (0 to 20) mA/ (4 to 20) mA]. When EBB is used, the same signal is available for MVC4.

Menu → Configurations → I/O → Analog outputs → AO2			
P0254 - Analog output AO2 gain			
Adjustable range:	0,000 to 9,999	Factory setting:	1.000

Description:

- It sets the gain of analog output AO2. For P0254 = 1.000 the output value of AO2 is set according to the description "analog output indication scale" in P0262.

Menu → Configurations → I/O → Analog outputs → AO3			
P0255 - AO3 Function			
Adjustable range:	0 to 21	Factory setting:	2

Description:

- With factory default values (P0255 = 2 and P0256 = 1.000) AO3 = 10 V when Actual Speed = Maximum speed reference (P0134).
- Refer to Table 5.61 on page 5-93 for further details regarding the functions of the analog outputs of the MVC3 board.

Menu → Configurations → I/O → Analog outputs → AO3			
P0256 - Analog output AO3 gain			
Adjustable range:	0,000 to 9,999	Factory setting:	1.000

Description:

- It sets the gain of analog output AO3. For P0256 = 1.000 the output value of AO3 is set according to the description “analog output indication scale” in P0262.

Menu → Configurations → I/O → Analog outputs → AO4			
P0257 - AO4 Function			
Adjustable range:	0 to 21	Factory setting:	5

Description:

- For values in the factory default (P0257 = 5 and P0258 = 1.000) AO1 = 10 V when Motor current = 1.5 x P0295.
- See Table 5.40 on page 5-51 for further details related to the function of analog outputs.

Menu → Configurations → I/O → Analog outputs → AO4			
P0258 - Analog output AO4 gain			
Adjustable range:	0,000 to 9,999	Factory setting:	1.000

Description:

- It sets the gain of analog output AO4. For P0258 = 1.000 the output value of AO4 is set according to the description “analog output indication scale” in P0262.

Menu → Configurations → I/O → Analog outputs → AO5			
P0259 - AO5 Function			
Adjustable range:	0 to 21	Factory setting:	2

Description:

- For values in the factory default (P0259 = 2 and P0260 = 1.000) AO5 = 20 mA when Actual Speed = Maximum speed reference (P0134).
- See Table 5.40 on page 5-51 for further details related to the function of analog outputs.

Menu → Configurations → I/O → Analog outputs → AO5			
P0260 - Analog output AO5 gain			
Adjustable range:	0,000 to 9,999	Factory setting:	1.000

Description:

- It sets the gain of analog output AO4. For P0260 = 1.000 the output value of AO5 is set according to the description “analog output indication scale” in P0262.

Menu → Configurations → I/O → Analog outputs → AO6			
P0261 - AO6 Function			
Adjustable range:	0 to 21	Factory setting:	5

Description:

- For values in the factory default (P0261 = 5 and P0262 = 1.000) AO5 = 20 mA when Motor current = 1.5 x P0295.
- See Table 5.40 on page 5-51 for further details related to the function of analog outputs.

Menu → Configurations → I/O → Analog outputs → AO6			
P0262 - Analog output AO6 gain			
Adjustable range:	0,000 to 9,999	Factory setting:	1.000

Description:

- It sets the gain of analog output AO6. For P0262 = 1.000 the output value of AO6 is set according to the description “analog output indication scale” in P0262.

Table 5.40 – *Analog output functions*

Function	P0251 (AO1)	P0253 (AO2)	P0255 (AO3)	P0257 (AO4)	P0259 (AO5)	P0261 (AO6)	Full scale (10V)
Speed reference	0	0	0	0	0	0	1 x P0134
Total reference	1	1	1	1	1	1	1 x P0134
Actual speed	2	2	2	2	2	2	1 x P0134
Not used	3/4	3/4	3/4	3/4	3/4	3/4	
Output current (with filter 0.5 s)	5	5	5	5	5	5	1,5 x P0295
PID process variable	6	6	6	6	6	6	1 x P0528
Active output current	7	7	7	7	7	7	100 % P0295/P0401
Output power	8	8	8	8	8	8	2,0 x P0295 x P0296 x $\sqrt{3}$
PID reference	9	9	9	9	9	9	1 x P0528
Not used	10	10	10	10	10	10	
Trace channel 1 to 8	11 a 18	11 a 18	11 a 18	11 a 18	11 a 18	11 a 18	The same as the one of the chosen parameter
Inverter temperature	19	19	19	19	19	19	200 °C
PLC	20	20	20	20	20	20	
Output voltage	21	21	21	21	21	21	1 x P0296

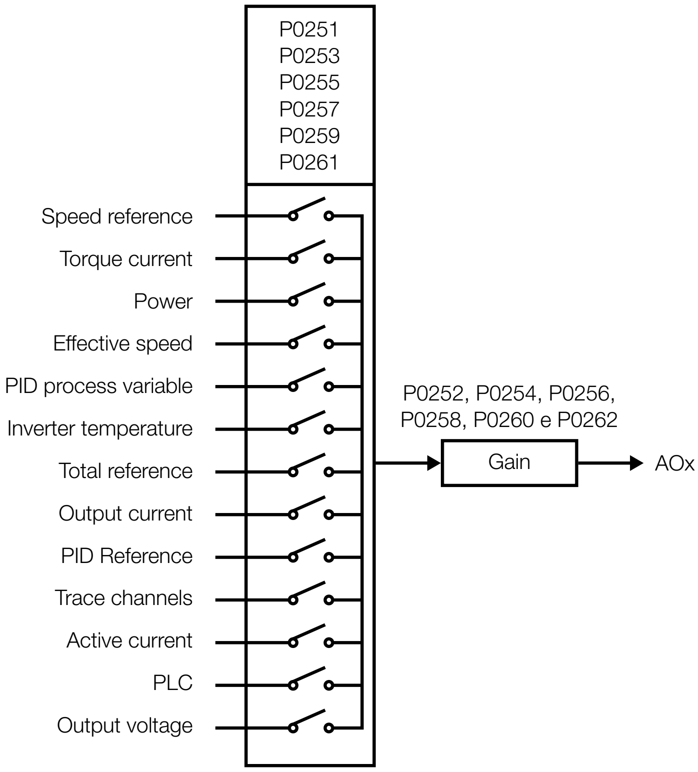


Figure 5.31 – *Block diagram of the analog outputs*

- Analog output indication scale:
  - Full scale = 10 V: for outputs AO1, AO2 located on the MVC4 control board and AO3 and AO4 on the EBA optional board.
  - Full scale = 20 mA for outputs AO1' and AO2' located on the optional EBB board and AO5, AO6 located on the MVC4 control board.
  - Speed reference (P0001): full scale = P0134.
  - Total reference: full scale = P0134.
  - Actual speed (P0002): full scale = P0134.
  - Output current: full scale = 1,5 x P0295.
  - PID Process Variable: full scale = 1,0 x P0528.
  - PID reference: full scale = 1,0 x P0528.
  - Inverter temperature = 200 °C.
  - Output power: full scale = 2.0 x P0295 x P0296 x $\sqrt{3}$.

Menu → Configurations → I/O → Digital inputs

P0263 - DI1 Function

P0264 - DI2 Function

P0265 - DI3 Function

P0266 - DI4 Function

P0267 - DI5 Function

P0268 - DI6 Function

P0269 - DI7 Function

P0270 - DI8 Function

P0271 - DI9 Function

P0272 - DI10 Function

Adjustable range:		Factory setting:	
	P0263 = 0 to 3		P0263 = 1
	P0264 = 0 to 1		P0264 = 0
	P0265 = 0 to 30		P0265 = 0
	P0266 = 0 to 30		P0266 = 0
	P0267 = 0 to 30		P0267 = 3
	P0268 = 0 to 30		P0268 = 6
	P0269 = 0 to 28		P0269 = 0
	P0270 = 0 to 28		P0270 = 0
	P0271 = 0 to 28		P0271 = 0
	P0272 = 0 to 28		P0272 = 0

5

Description:

- The digital input status can be monitored at the parameter P0012 (Digital inputs DI1 to DI10 status).
- Refer to Table 5.41 on page 5-55 , the Figure 5.32 on page 5-53 and Figure 5.34 on page 5-54 for further details regarding the functions of the digital inputs.

  Notes:
  - The **'Electronic Potentiometer'** (E.P.) function allows the speed reference to be adjusted through 2 digital inputs (one to increment it and the other to decrease it). To enable this function, you must first configure the speed reference for E.P., setting P0221 = 7 and/or P0222 = 7. After enabling this function, simply program DI3 or DI5 (P0265 or P0267 = 5) and DI4 or DI6 (P0266 or P0268 = 5). The operation of this function can be seen in Figure 5.36 on page 5-58 . It is important to note that the increase of the reference is made with the application of 24 V at the digital inputs, while the decrease is done with the application of level 0 V. To reset the reference to zero, apply 24 V at the "Increase EP" input and 0 V at the "Decrease EP" input simultaneously with the inverter disabled. Thus:
    'Increase E.P.' (Electronic Potentiometer) is active when DI3 or DI5 = +24 V.
    'Decrease E.P.' (Electronic Potentiometer) is active when DI4 or DI6 = 0 V.
  - **'LOCAL/REMOTE'** = 0 V/24 V in the digital input respectively.
  - DI8 digital input is linked to the input for **'Motor Thermistor'** (PTC) present on the EBA/EBB optional boards, as described in Table 5.41 on page 5-55 :

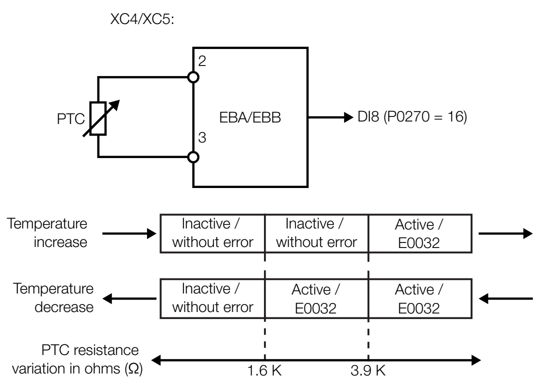
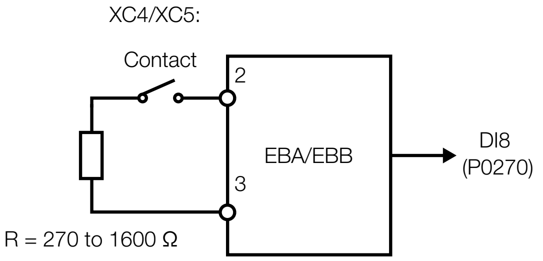


***Figure 5.32 –** DI8 as a PTC input*

- In order to use the DI8 as a normal digital input, program the designated function at P0270, and connect a resistor, ranging from 270 to 1600 Ω, in series with the contact (Figure 5.33 on page 5-54).



Contact	DI8
Open	Deactivated
Closed	Activated

Figure 5.33 – *DI8 as a normal digital input*

- If the function **'Parameterization Disabling'** is programmed and the correspondent DIx in +24 V input is closed, then parameter changes are not allowed, regardless of P0000 and P0200 settings. When the DIx input is open, parameter changes are conditioned to P0000 and P0200 settings.
- **'RL2 and RL3 Timer'**: this function acts as a timer to activate and deactivate the relays 2 and 3 (RL2 and RL3). When the timer function for the relay 2 or 3 is programmed at any DIx, and a transition from open to closed occurs, the programmed relay will be activated with the delay set in P0283 (RL2) or P0285 (RL3). When a transition from closed to open occurs, the programmed relay will be deactivated with the delay adjusted in P0284 (RL2) or P0286 (RL3). After the transition of the DIx, either for activating or deactivating the programmed relay, it is necessary that the DIx remains closed or open during at least the time set in P0283/P0285 and P0284/P0286. Otherwise, the timer will be reset. Refer to the Figure 5.34 on page 5-54. **Note:** In order to enable that function it is also necessary to program P0279 and/or P0280 = 29 (Timer).
- The 'Ventilation OK' function generates an inverter ventilation fault (F0048).

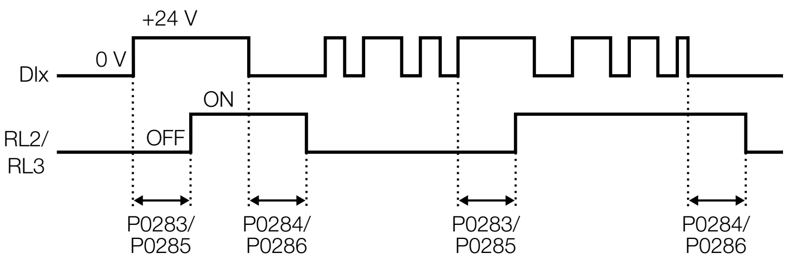


Figure 5.34 – *RL2 and RL3 timer function operation*

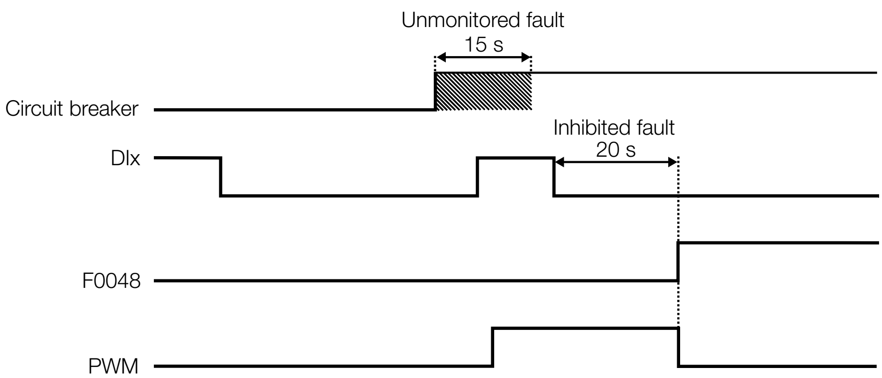


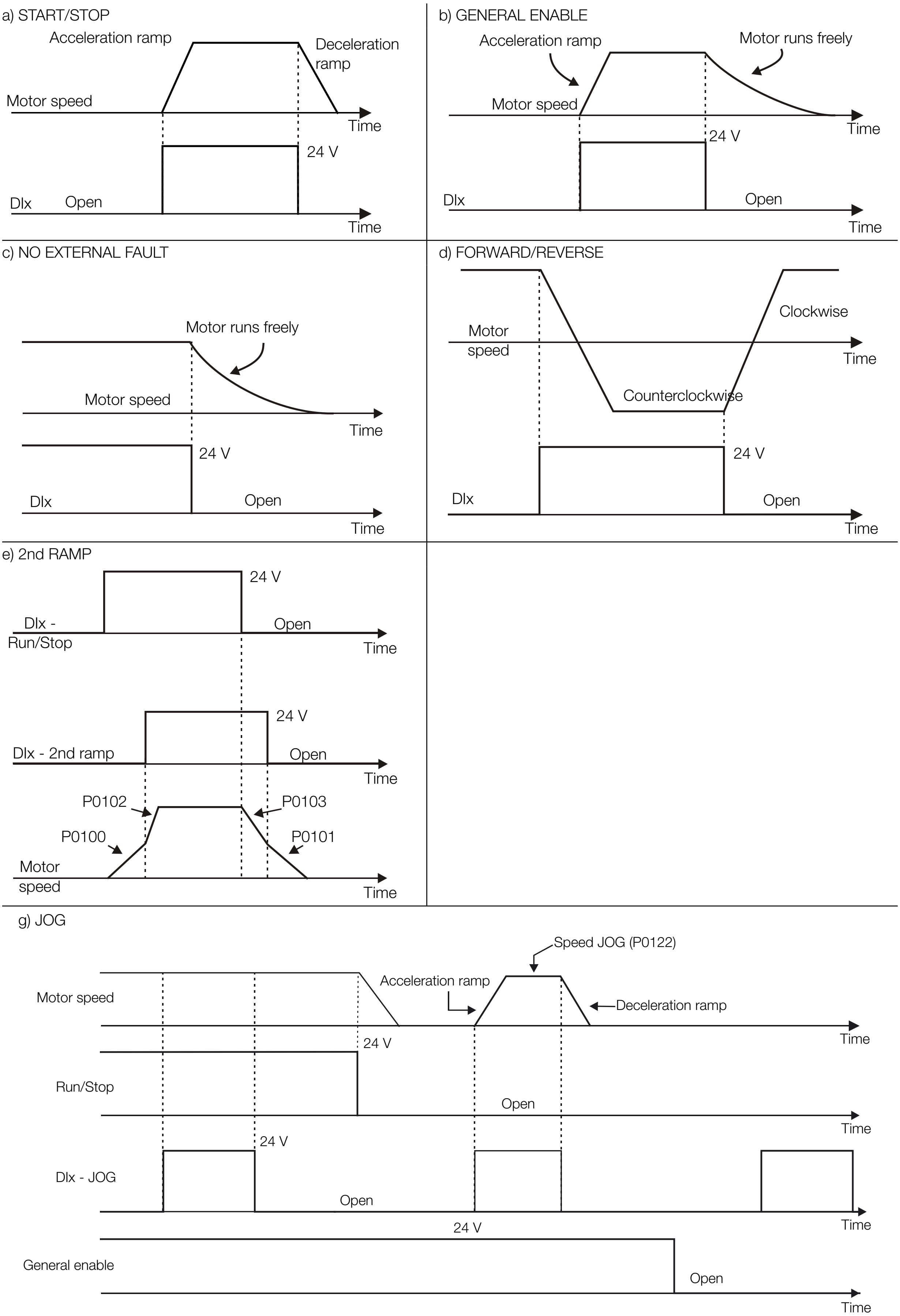
Figure 5.35 – *'Ventilation OK' function operation*

Table 5.41 – Digital input functions

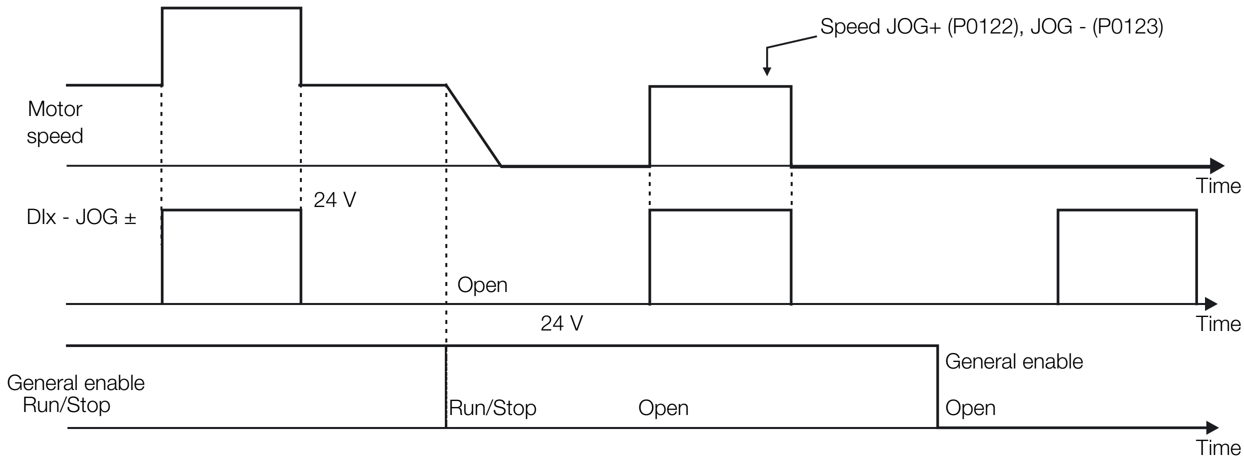
Function \ Parameter DIx	P0263 (DI1)	P0264 (DI2)	P0265 (DI3)	P0266 (DI4)	P0267 (DI5)	P0268 (DI6)	P0269 (DI7)	P0270 (DI8)	P0271 (DI9)	P0272 (DI10)
No function	0	-	0, 7, 17 and 18	0, 17 and 18	0, 17 and 18	0, 17 and 18	0, 5, 7, 9, 16, 17 and 18	0, 5, 7, 9, 17 and 18	0, 5, 7, 9, 17 and 18	0, 5, 7, 9, 17 and 18
Start/Stop	1	-	-	-	-	-	-	-	-	-
General Enable	2	-	2	2	2	2	2	2	2	2
Stop by ramp	3	-	-	-	8	8	8	8	8	8
Forward/Reverse	-	0	-	-	-	-	-	-	-	-
Local/Remote	-	1	1	1	1	1	1	1	1	1
JOG	-	-	3	3	3	3	3	3	3	3
No external fault	-	-	4	4	4	4	4	4	4	4
Increase E.P.	-	-	5	-	5	-	-	-	-	-
Decrease E.P.	-	-	-	5	-	5	-	-	-	-
2nd ramp	-	-	6	6	6	6	6	6	6	6
Multispeed (MSx)	-	-	-	7	7	7	-	-	-	-
Forward run	-	-	8	-	-	-	-	-	-	-
Reverse run	-	-	-	8	-	-	-	-	-	-
Sinusoidal filter circuit breaker	-	-	9	9	9	9	-	-	-	-
JOG+	-	-	10	10	10	10	10	10	10	10
JOG-	-	-	11	11	11	11	11	11	11	11
Reset	-	-	12	12	12	12	12	12	12	12
Fieldbus	-	-	13	13	13	13	13	13	13	13
Start	-	-	14	-	14	-	14	-	-	-
Stop	-	-	-	14	-	14	-	14	14	14
Manual/Automatic	-	-	15	15	15	15	15	15	15	15
No external alarm	-	-	16	16	16	16	-	-	16	16
Motor thermistor	-	-	-	-	-	-	-	16	-	-
Parameterization disabling	-	-	19	19	19	19	19	19	-	-
Reserved	-	-	20	20	20	20	20	20	-	-
RL2 timer	-	-	21	21	21	21	21	21	-	-
RL3 timer	-	-	22	22	22	22	22	22	-	-
No motor fault	-	-	-	-	-	-	-	-	19	19
No motor alarm	-	-	-	-	-	-	-	-	20	20
No alarm in the redundant ventilation set A	-	-	23	23	23	23	-	-	21	21
No alarm in the redundant ventilation set B	-	-	24	24	24	24	-	-	22	22
Initiates synchronous transfer	-	-	25	25	25	25	23	23	23	23
Ventilation OK	-	-	26	26	26	26	24	24	24	24
Transformer OK	-	-	27	27	27	27	25	25	25	25
Pressurization system OK	-	-	28	28	28	28	26	26	26	26
Output filter OK	-	-	29	29	29	29	27	27	27	27
Exciter OK	-	-	30	30	30	30	28	28	28	28

NOTE!
In order that Start/Stop works, configure also P0224 and/or P0227 = 1. The selection of P0265 or P0267 = 5, and P0266 or P0268 = 5, also requires the configuration of P0221 and/or P0222 = 7. The selection of P0266 and/or P0267 and/or P0268 = 7 also requires the configuration of P0221 and/or P0222 = 8.

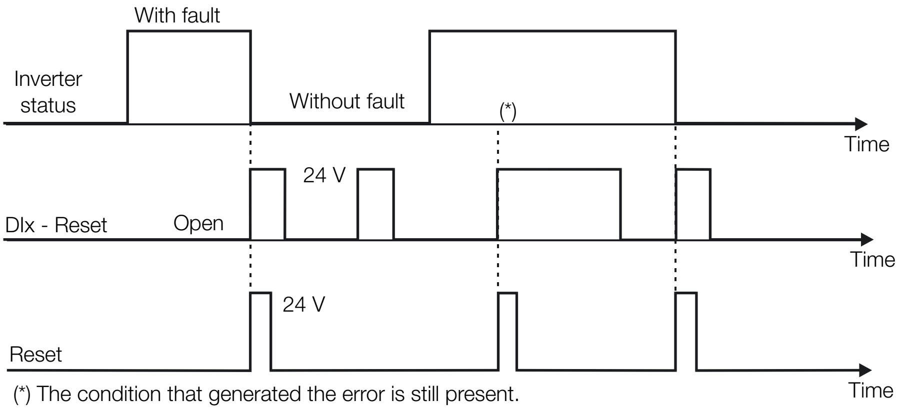
NOTE!
The functions "No external alarm", "No motor alarm", "No alarm in the redundant ventilation set A" and "No alarm in the redundant ventilation set B", occur by edge detection, as they are functions with low assets. That is, if the electronics are energized with the DI at low level, no alarm occurs.


a) START/STOP
Acceleration ramp
Deceleration ramp
Motor speed
Time
24 V
DIx
Open
Time
b) GENERAL ENABLE
Acceleration ramp
Motor runs freely
Motor speed
Time
24 V
DIx
Open
Time
c) NO EXTERNAL FAULT
Motor runs freely
Motor speed
Time
24 V
DIx
Open
Time
d) FORWARD/REVERSE
Clockwise
Motor speed
Time
Counterclockwise
24 V
DIx
Open
Time
e) 2nd RAMP
24 V
DIx - Run/Stop
Open
Time
24 V
DIx - 2nd ramp
Open
Time
P0102
P0103
P0100
P0101
Motor speed
Time
g) JOG
Speed JOG (P0122)
Motor speed
Acceleration ramp
Deceleration ramp
Time
24 V
Run/Stop
Open
Time
24 V
DIx - JOG
Open
Time
24 V
General enable
Open
Time

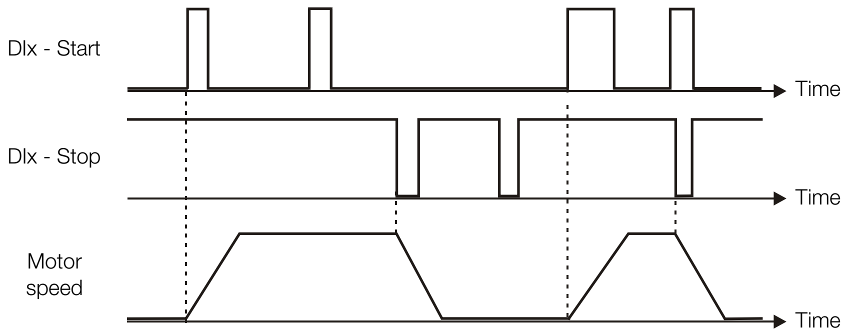
h) JOG + and JOG -



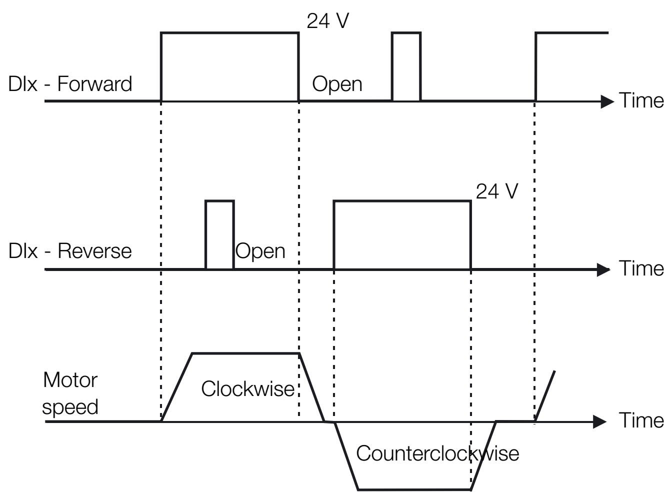
i) RESET



j) 3-WIRE START/STOP



k) FORWARD RUN/REVERSE RUN



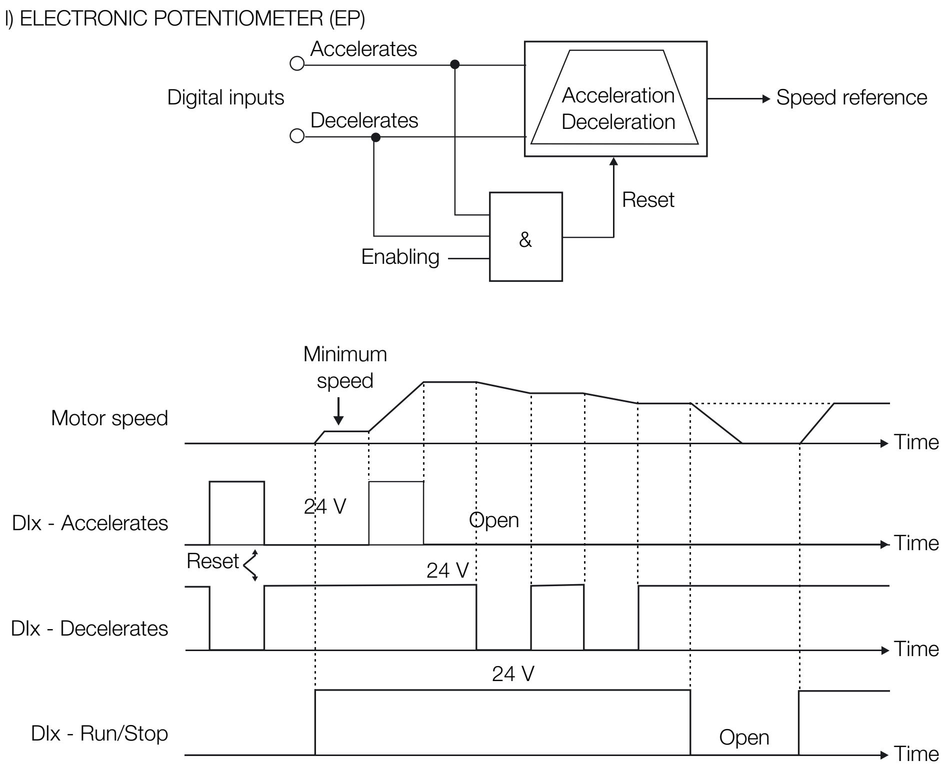


***Figure 5.36 –** (a) to (l) Details on the operation of the digital input functions*

NOTE!
This parameter can be changed only with the motor stopped.

Menu → Configurations → I/O → Digital outputs

P0275 - DO1 Function

P0276 - DO2 Function

P0277 - RL1 Function

P0279 - RL2 Function

P0280 - RL3 Function

P0281 - RL4 Function

P0282 - RL5 Function

Adjustable range:	0 to 39	Factory setting:	P0275 = 0 P0276 = 0 P0277 = 13 P0279 = 2 P0280 = 1 P0281 = 0 P0282 = 0

Description:

- The digital and relay output status can be monitored at the parameter P0013.
- Refer to Table 5.42 on page 5-60 and the Figure 5.37 on page 5-62 for more details regarding the digital outputs and relays.
- When the condition declared by the function is true, the digital output will be activated, i.e., a saturated transistor at a DOx output and/or a relay with energized coil for a RLx output
  Example: 'Is > Ix': when Is > Ix, then DOx = saturated transistor and/or RLx = relay with the coil energized.

When Is = Ix then DOx = open transistor and/or RLx = relay with the coil not energized.

Notes:

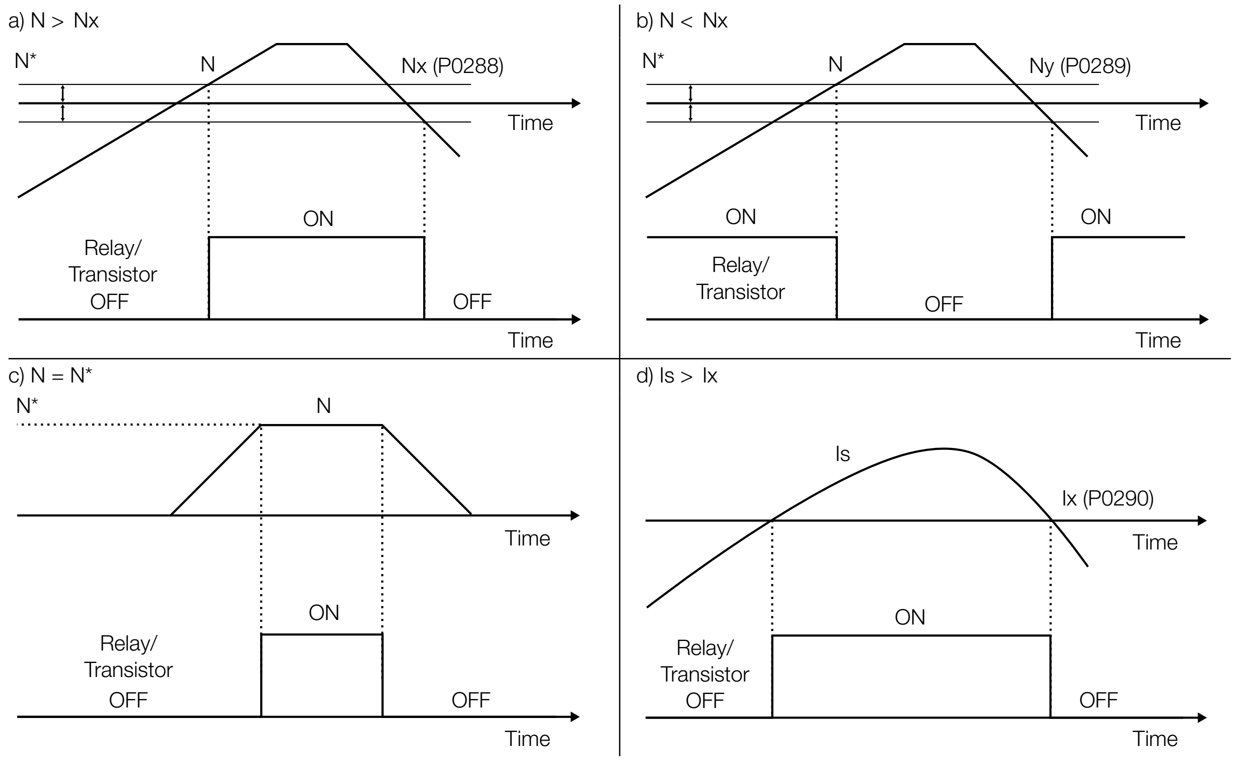
- **'Not Used'** it means that the digital outputs will remain always in a resting state, i.e., DOx = open transistor and/or RLx = relay with the coil not energized.
- **'N = 0'** it means that the motor speed is below the value adjusted in P0291 (Zero Speed Zone).
- **'Remote'** it means that the inverter is operating in Remote situation.
- **'Run'** it corresponds to enabled inverter. In this state, the IGBTs are commutating, and the motor may be at any speed, even zero speed.
- **'Ready'** it corresponds to the inverter without error and without undervoltage.
- **'No Fault'** it means that the inverter is not disabled by any type of fault.
- **'No F0070+F0071'** it means that the inverter is not disabled by faults F0070 or F0071.
- **'No F0072'** it means that the inverter is not disabled by faults F0072.
- **'4 to 20 mA Reference OK'** it means that the reference in current is within the 4 to 20 mA range.
- **'Forward'** it means that when the motor is rotating in the forward direction, the DOx = saturated transistor and/or RLx = relay with the coil energized. When the motor is rotating in the reverse direction, the DOx = open transistor and/or RLx = relay with the coil not energized.
- **'Pre-charge OK'** it means that the DC Link voltage is above the pre-charge voltage level.
- **'Fault'** it means that the inverter is disabled by a fault.
- **'N > Nx and Nt > Nx'** it means that both the conditions must be satisfied, so that DOx = saturated transistor and/or RLx = relay with the coil energized. In order that the digital outputs go back to the resting state, i.e., DOx = open transistor and/or RLx = relay with the coil not energized, it is necessary that only the condition N > Nx not be satisfied anymore (regardless of the Nt > Nx condition).

Definition of the symbols used with the functions:

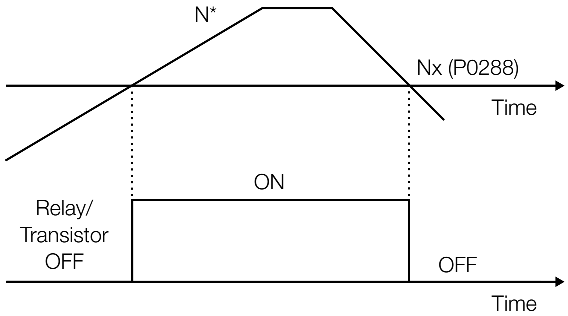
- N* = P0001 (Motor speed reference);
- N = P0002 (Motor speed);
- Nx = P0288 (Nx Speed) - It is a reference point of the speed selected by the user.
- Ny = P0289 (Ny Speed) - It is a reference point of the speed selected by the user.
- Ix = P0290 (Ix Current) - It is a reference point of the current selected by the user.
- Is = P0003 (Motor current);
- Torque = P0009 (Motor torque);
- VPx = P0533 (Process variable X value) - It is a reference point of the process variable selected by the user.
- VPy = P0534 (Process variable Y value) - It is a reference point of the process variable selected by the user.
- Nt = Total Reference (refer to Figure 5.24 on page 5-39).

Table 5.42 – Digital and relay output functions

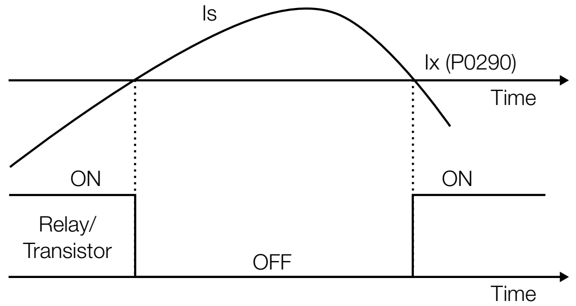
Function \ DOx Parameter	P0275 (DO1)	P0276 (DO2)	P0277 (RL1)	P0279 (RL2)	P0280 (RL3)	P0281 (RL4)	P0282 (RL5)
Not Used	0, 8, 9, 23 and 29	0, 8, 9, 23 and 29	0, 8, 9, 23 and 29	0, 8, 9 and 23	0, 8, 9 and 23	0, 8, 9, 23 and 29	0, 8, 9, and 29
N* > Nx	1	1	1	1	1	1	1
N > Nx	2	2	2	2	2	2	2
N < Ny	3	3	3	3	3	3	3
N = N*	4	4	4	4	4	4	4
N = 0	5	5	5	5	5	5	5
Is > Ix	6	6	6	6	6	6	6
Is < Ix	7	7	7	7	7	7	7
Remote	10	10	10	10	10	10	10
Run	11	11	11	11	11	11	11
Ready	12	12	12	12	12	12	12
No Fault	13	13	13	13	13	13	13
No F0070 + F0071	14	14	14	14	14	14	14
No F0072	17	17	17	17	17	17	17
4 to 20 mA OK	18	18	18	18	18	18	18
Fieldbus	19	19	19	19	19	19	19
Forward	20	20	20	20	20	20	20
Process variable >VPx	21	21	21	21	21	21	21
Process variable <VPy	22	22	22	22	22	22	22
Pre-charge OK	24	24	24	24	24	24	24
Fault	25	25	25	25	25	25	25
N > Nx and Nt > Nx	26	26	26	26	26	26	26
Without Fault with delay	27	27	27	27	27	27	27
No Alarm	28	28	28	28	28	28	28
Timer	-	-	-	29	29	-	-
Redundant ventilation	30	30	30	30	30	30	30
PLC	-	-	31	31	31	-	-
Circuit Break ON (Input Circuit Breaker ON)	32	32	32	32	32	32	32
Transference OK	33	33	33	33	33	33	33
Synchronism OK	34	34	34	34	34	34	34
Serial	35	35	35	35	35	35	35



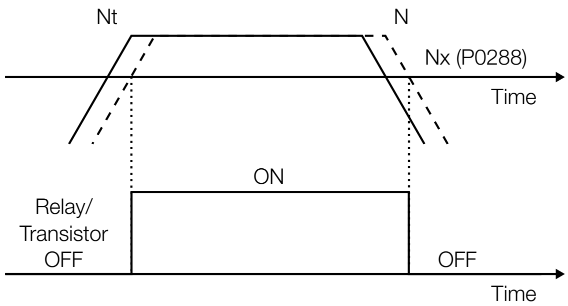
e) N* > Nx



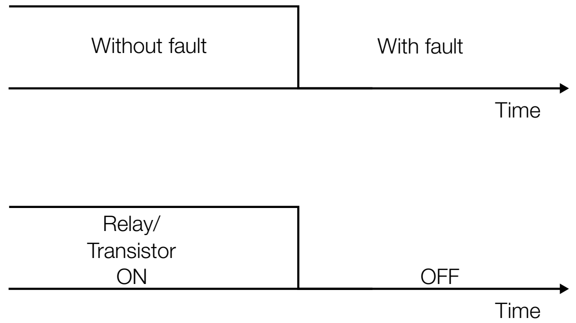
f) Is < Ix



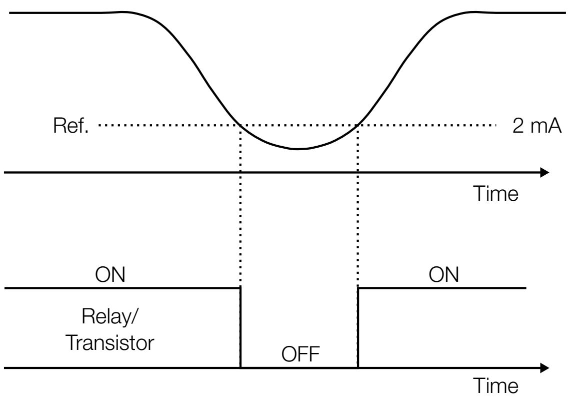
g) N > Nx and Nt > Nx



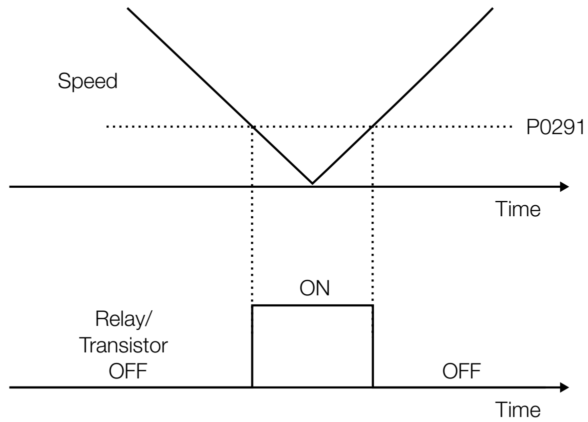
h) No external Fault



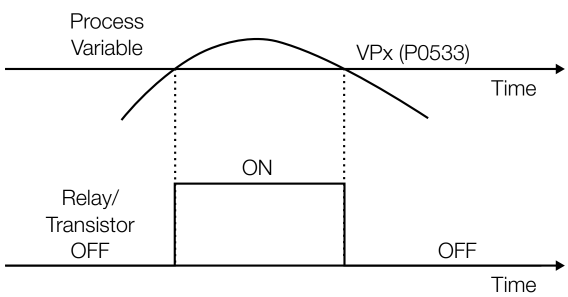
i) 4 to 20 mA reference



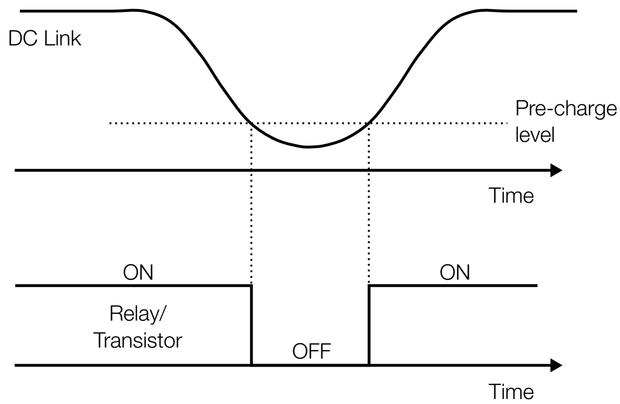
j) N = 0



k) Process variable X > VPx



l) Pre-charge OK



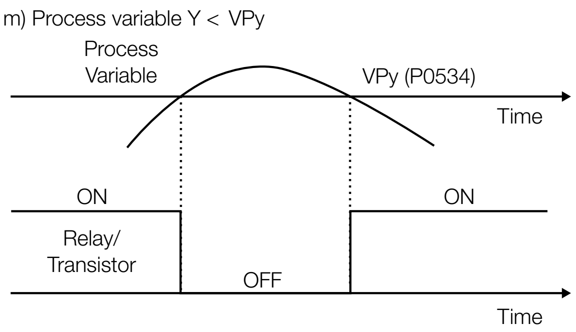


Figure 5.37 – *(a) to (m) - Details on the operation of the digital output functions*

> **NOTE!**
> This parameter can be changed only with the motor stopped.

Menu → Configurations → I/O → Digital outputs

P0283 - RL2 ON time

P0284 - RL2 OFF time

P0285 - RL3 ON time

P0286 - RL3 OFF time

Adjustable range:	0,0 to 300,0 s	Factory setting:	0.0 s

Description:

- Used in the relay output functions: Timers of relays 2 and 3.

Menu → Configurations → References

P0288 - Nx Speed

P0289 - Ny Speed

Adjustable range:	0 to 4095 rpm	Factory setting:	P0288 = 120 rpm P0289 = 1800 rpm

Description:

- Used in the digital and relay output functions: N* > Nx, N > Nx and N < Ny.

Menu → Configurations → References

P0290 - Ix Current

Adjustable range:	0,0 to 3276,7 A	Factory setting:	300.0 A

Description:

- Used in the digital and relay output functions: Is > Ix and Is < Ix.

Menu → Configurations → References

P0291 - Zero Speed Zone

Adjustable range:	1 to 100 %	Factory setting:	1 %

Description:

- Used in the digital and relay output functions: N = 0 and in the "Stop Logic" (Disable by N = 0; refer to P0211 and P0212).

Menu → Configurations → References

P0292 - N=N* Band

Adjustable range:	1 to 100 %	Factory setting:	1 %

Description:

- Used in the digital and relay output functions: N = N*.

Menu → Configurations → Nominal data → Inverter

P0295 - Current

Adjustable range:	0 to 29	Factory setting:	10

Description:

- It defines the inverter rated current according to the available models.

5

Table 5.43 – *Current*

P0295	Function
0	24 A
1	40 A
2	50 A
3	60 A
4	70 A
5	80 A
6	90 A
7	100 A
8	110 A
9	125 A
10	140 A
11	160 A
12	180 A
13	200 A
14	225 A
15	265 A
16	310 A
17	340 A
18	400 A
19	450 A
20	500 A
21	550 A
22	600 A
23	760 A
24	800 A
25	855 A
26	950 A
27	1045 A
28	1140 A
29	646 A

NOTE!
This parameter can be changed only with the motor stopped.

Menu → Configurations → Nominal data → Inverter

P0296 - Voltage

Adjustable range:	0 to 14	Factory setting:	14

Description:

- It defines the inverter rated voltage according to the available models.

WARNING!
Adjust P0296 according to the output voltage to be used!

Table 5.44 – *Voltage*

P0296	Function
0	1150 V
1	2300 V
2	3300 V
3	4160 V
4	5500 V
5	6300 V
6	6900 V
7	7200 V
8	8000 V
9	9000 V
10	10000 V
11	11000 V
12	12000 V
13	13200 V
14	13800 V

NOTE!
This parameter can be changed only with the motor stopped.

Menu → Configurations → Protections → Motor

P0303 - Skipped speed 1

P0304 - Skipped speed 2

P0305 - Skipped speed 3

P0306 - Skipped range

Adjustable range:		Factory setting:	
	P0303 = 0 to 4095 rpm		P0303 = 600 rpm
	P0304 = 0 to 4095 rpm		P0304 = 900 rpm
	P0305 = 0 to 4095 rpm		P0305 = 1200 rpm
	P0306 = 0 to 750 rpm		P0306 = 0 rpm

Description:

- It avoids permanent motor operation at speeds in which, for instance, the mechanical system enters into resonance causing high vibration or noise levels.
- The passage through the skipped range (2 x P0306) occurs through the acceleration and deceleration ramps.
- The function does not operate properly if two bands of skipped speed overlap.

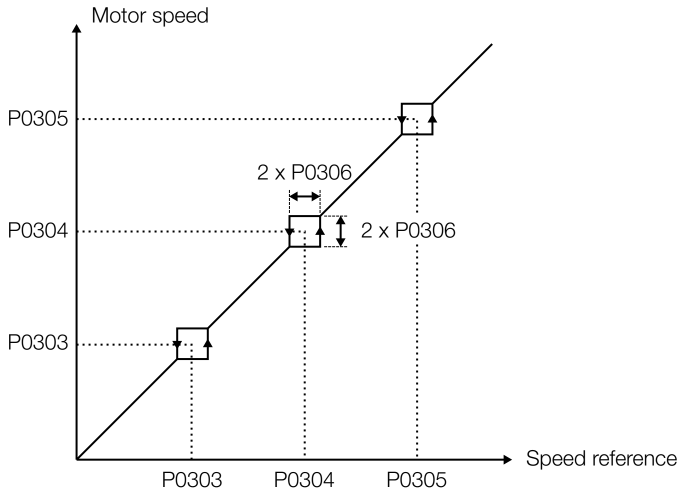


Figure 5.38 – *Skipped speed curve*

Menu → Configurations → Communications → Serial			
P0308 - Address			
Adjustable range:	1 to 30	Factory setting:	1

Description:

- It sets the inverter address for serial communication.
- Refer to Section 7.2 SERIAL on page 7-29 .

NOTE!
This parameter can be changed only with the motor stopped.

Menu → Configurations → Communications → Fieldbus			
P0309 - Fieldbus			
Adjustable range:	0 to 13	Factory setting:	0

Description:

- Define the Fieldbus standard to be used and the number of variables to be exchanged with the master.
- For P0309 = 10, refer to the DeviceNet Drive Profile Guide.
- Ethernet configurations cover the Ethernet/IP, Profinet-IO and Modbus TCP/IP protocols.

Table 5.45 – *Fieldbus*

P0309	Function
0	Inactive
1	Profibus-DP 2 I/O
2	Profibus-DP 4 I/O
3	Profibus-DP 6 I/O
4	DeviceNet 2 I/O
5	DeviceNet 4 I/O
6	DeviceNet 6 I/O
7	Modbus-RTU 2 I/O
8	Modbus-RTU 4 I/O
9	Modbus-RTU 6 I/O
10	DeviceNet Drive Profile
11	EtherNet 2 I/O
12	EtherNet 4 I/O
13	EtherNet 6 I/O

NOTE!
This parameter can be changed only with the motor stopped.

Menu → Configurations → Communications → Serial

P0312 - Protocol

Adjustable range: 0 to 9 Factory setting: 7

Description:

- It defines the type of protocol used for serial communication.

Table 5.46 – *Protocol*

P0312	Function
0	Not Used
1	Modbus-RTU, 9600 bps, no parity
2	Modbus-RTU, 9600 bps, odd parity
3	Modbus-RTU, 9600 bps, even parity
4	Modbus-RTU, 19200 bps, no parity
5	Modbus-RTU, 19200 bps, odd parity
6	Modbus-RTU, 19200 bps, even parity
7	Modbus-RTU, 38400 bps, no parity
8	Modbus-RTU, 38400 bps, odd parity
9	Modbus-RTU, 38400 bps, even parity

NOTE!
This parameter can be changed only with the motor stopped.

Menu → Configurations → Communications → Fieldbus

P0313 - Disabling with alarm A128, A129 and A130

Adjustable range: 0 to 5 Factory setting: 0

Description:

- It defines the inverter behavior when the serial communication is inactive (causing A0128), when the physical connection with the Fieldbus network master is interrupted (causing error A0129), when the Fieldbus board is inactive (causing error A0130) or when the communication between MVC3 and MVC4 boards is interrupted.

Table 5.47 – *Disabling with alarm A128, A129 and A130*

P0313	Function
0	Disable via Run/Stop
1	Disable via general enable
2	Inactive
3	Go to LOCAL
4	Reserved
5	Fault

Menu → Configurations → Communications → Serial

P0314 - Watchdog

Adjustable range: 0,0 to 999,0 s Factory setting: 0.0 s

Description:

- If the inverter does not receive any valid serial telegram after the time programmed in P0314, has elapsed, A0128 will be indicated on the HMI and the inverter will execute the action programmed in P0313 - Disabling with A0128/A0129/A0130.
- For the inverter to be able to execute that action, it is necessary that the commands be programmed for the "Serial" option in parameters P0220 to P0228.

Table 5.48 – *Time for serial watchdog action*

P0314	Function
0.0	Disabled
0.1 a 999.0	Enabled

NOTE!
This parameter can be changed only with the motor stopped.

Menu → Configurations → Protections → Motor

P0315 - Thermal protection relay

Adjustable range: 0 to 2 Factory setting: 0

Description:

- It selects the number of relays connected to the inverter.

The module serial configuration must be set as follows:

- Baudrate: 2400 bps
- Slave address: 1, 2 or 3
- Parity: even
- Stop bit: 1

WARNING!
In the **PRG** (programming) and **VIS** (programming visualization) functions of the thermal protection relay, the communication with the inverter is temporarily disabled and can cause a communication time-out, in this situation the inverter disables the output, protecting the motor from possible damage.

Table 5.49 – *Thermal protection relay*

P0315	Function
0	Service HMI
1	Modbus serial for Tecsystem module
2	Modbus Serial for Pextron module

Menu → Configurations → Functions → Flying-start

P0320 - Flying Start/Ride-Through

Adjustable range: 0 to 3 Factory setting: 0

Description:

- It determines whether the Flying Start and Ride-Through functions are active.

NOTE!
With the Ride-Through function active, disable function 27 of the protection relay of the input.

Table 5.50 – *Flying Start/Ride-Through*

P0320	Function
0	Inactive
1	Flying Start
2	Flying Start and Ride-Through
3	Ride-Through

NOTE!
This parameter can be changed only with the motor stopped.

Menu → Configurations → Functions → Flying-start

P0327 - Sensorless Flying Start delay

Adjustable range: 0,000 to 9,999 s   Factory setting: 0.100 s

Description:

- It is the delay to change the Sensorless Flying Start searching direction.

NOTE!
- This parameter can be changed only with the motor stopped.
- This parameter is only visible on the HMI when: the control type is vector, P0202 = 3 (Sensorless Vector).

Menu → Configurations → Functions → Flying-start

P0328 - Flying Start frequency

Adjustable range: 0 to 1   Factory setting: 1

Description:

- It defines the initial search frequency of the Flying Start.

Table 5.51 – *Flying Start frequency*

P0328	Function
0	P0134 starting search speed
1	P0001 starting search speed

NOTE!
This parameter is only visible on the HMI when: the control type is scalar or sensorless vector, P0202 = 0, 1 or 2 (Scalar control) or P0202 = 4 (Vector with Encoder).

Menu → Configurations → Functions → Flying-start

P0329 - Initial search direction for Flying Start

Adjustable range:	0 to 3	Factory setting:	0

Description:

- It is the sensorless Flying Start initial searching direction.

Table 5.52 – *Initial search direction for Flying Start*

P0329	Function
0	+P0328 and then -P0328
1	-P0328 and then +P0328
2	+P0328
3	-P0328

NOTE!
This parameter is only visible on the HMI when: the control type is scalar or sensorless vector, P0202 = 0, 1 or 2 (Scalar control) or P0202 = 4 (Vector with Encoder).

5

Menu → Configurations → Functions → Flying-start

P0331 - Voltage ramp time

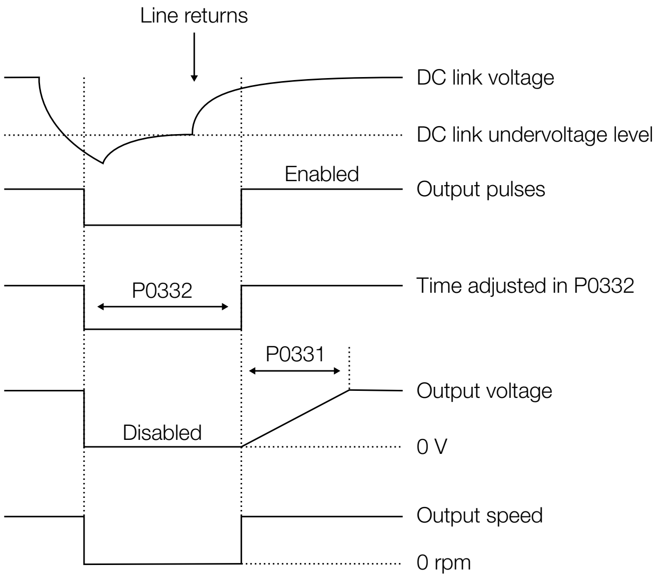
P0332 - Dead time

P0333 - Ride-through time

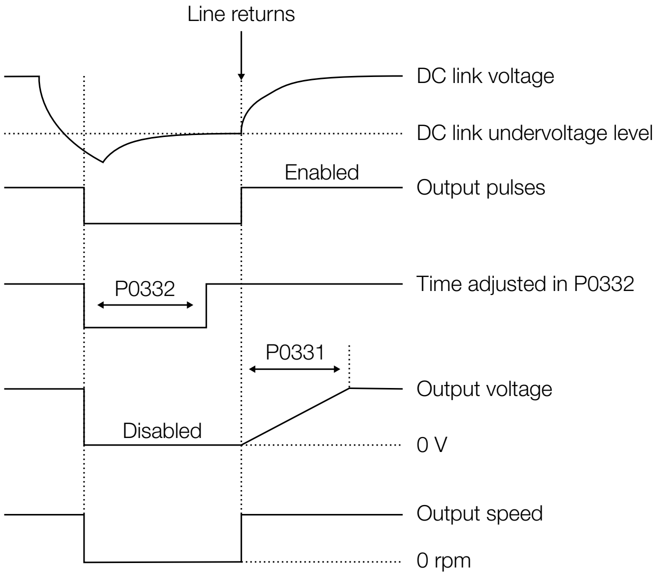
Adjustable range:	P0331 = 0,2 to 50,0 s P0332 = 1,0 to 40,0 s P0333 = 0,0 to 20,0 s	Factory setting:	P0331 = 8.0 s P0332 = 10.0 s P0333 = 10.0 s

Description: **Actuation with P0202 = 0, 1 or 2 (V/f Control):**

- Parameter P0331 sets the time required for the output voltage, starting from 0 V, to reach the nominal voltage.
- The Flying Start function allows starting a spinning motor. This function only acts when the inverter is enabled. At the start, the inverter will impose the reference speed, creating a voltage ramp with time defined in P0331.
- The parameter P0332 sets the minimum time the inverter waits before restarting the motor after the line recovery in Ride-Through. This time is counted from the line voltage drop, and it is necessary for the motor de-magnetizing.
- P0332 is also used at the start with Flying Start, before the beginning of the Flying Start. Set this time (P0332) to twice the rotor constant of the motor.
- The Ride-Through function allows the inverter recovery without DC link undervoltage, when a voltage dip occurs in the supply line.
- The inverter will indicate F0309 (Timeout in Ride-through state Waiting Line) if the voltage dip lasts longer than P0332 + P0333 seconds. If the drive is performing the pre-charge procedure, this time will be extended until the completion of the process.
- If Ride-Through is enabled and a voltage dip occurs, causing the DC link to drop below the undervoltage level, the output pulses are disabled and the motor coasts. If the line supply returns to its normal value, the inverter enables the pulses again, imposing the speed of the reference instantaneously (as in the Flying Start function) and applying a voltage ramp with the time defined in P0331. Refer to the Figure 5.39 on page 5-70. The Flying Start function does not work when P0202 = 3 or 4.
- During the Ride-Through, the input cubicle is opened and the pre-charge system is activated.



(a) *Line returns before the time set in P0332*



(b) *Line returns after the time set in P0332, but before the time set P0332+P0333*

Figure 5.39 – *(a) and (b) Actuation of the Ride-Through in V/f mode*

Menu → Configurations → Nominal data → Motor			
P0400 - Voltage			
Adjustable range:	1 to 19999 V	Factory setting:	6600 V

Description:

- Set according to the motor nameplate data and the connection diagram used in the terminal box.
- This parameter changes the inverter output voltage by applying a gain according to the relationship P0400/P0296 to the values defined by the V/f curves of the control mode chosen (P0202) and of the torque boost set (P0136 and P0137) This gain is added when P0202 = 0, 1 or 2.
- See Figure 5.7 on page 5-18 to Figure 5.9 on page 5-18.

NOTE!
The motor output voltage (P0400) must be lower than or equal to the inverter voltage (P0296).

NOTE!
This parameter can be changed only with the motor stopped.

Menu → Configurations → Nominal data → Motor

P0401 - Current			
Adjustable range:	0,1 to 3705,0 A	Factory setting:	140.0 A

Description:

- Set according to the motor nameplate data, taking into account the motor voltage.

NOTE!
This parameter can be changed only with the motor stopped.

Menu → Configurations → Nominal data → Motor

P0402 - Speed			
Adjustable range:	1 to 7200 rpm	Factory setting:	1796 rpm

Description:

- Set this parameter according to the motor nameplate data.
- The range for V/f is from 0 to 7200 rpm.

NOTE!
This parameter can be changed only with the motor stopped.

Menu → Configurations → Nominal data → Motor

P0403 - Frequency			
Adjustable range:	1 to 120 Hz	Factory setting:	60 Hz

Description:

- Set this parameter according to the motor nameplate data.
- The range for V/f is from 1 to 120 Hz.

NOTE!
This parameter can be changed only with the motor stopped.

Menu → Configurations → Nominal data → Encoder

P0405 - Pulses per revolution			
Adjustable range:	100 to 9999 PPR	Factory setting:	1024 PPR

Description:

- Program the number of pulses per revolution (ppr) of the used incremental encoder when P0202 = 4 (Vector with Encoder).

NOTE!
This parameter can be changed only with the motor stopped.

Menu → Configurations → Nominal data → Motor

P0406 - Ventilation Type

Adjustable range:	0 to 1	Factory setting:	0

Description:

- It sets the overload protection level according to the description of parameters P0156, P0157 and P0158.

Table 5.53 – *Ventilation Type*

P0406	Function
0	Self-ventilated
1	Separated ventilation

NOTE!
This parameter can be changed only with the motor stopped.

Menu → Configurations → Nominal data → Motor

P0408 - Run Self-tuning

Adjustable range:	0 to 1	Factory setting:	1

Description:

- With P0408 = 1 (autogain) the gains of the vector control regulators are automatically recalculated when the motor configuration parameters are changed.

Table 5.54 – *Run Self-tuning*

P0408	Function
0	No
1	Self Gain

NOTE!
- This parameter can be changed only with the motor stopped.
- This parameter is only visible on the HMI when: the control type is vector, P0202 = 3 (Sensorless Vector) or P0202 = 4 (Vector with Encoder).

Menu → Configurations → Nominal data → Motor

P0409 - Stator resistance (Rs)

Adjustable range:	0,000 to 9,999 Ω	Factory setting:	0.000 Ω

Description:

- It is the value of the motor stator resistance.

NOTE!
This parameter is only visible on the HMI when: the control type is vector, P0202 = 3 (Sensorless Vector) or P0202 = 4 (Vector with Encoder).

Menu → Configurations → Nominal data → Motor

P0410 - Magnetization current (Imr)			
Adjustable range:	0,0 to 1024,0 A	Factory setting:	0.0 A

Description:

- It is the value of the motor magnetization current.

NOTE!
This parameter is only visible on the HMI when: the control type is vector, P0202 = 3 (Sensorless Vector) or P0202 = 4 (Vector with Encoder).

Menu → Configurations → Nominal data → Motor

P0411 - Flux leakage inductance			
Adjustable range:	0,00 to 99,99 mH	Factory setting:	0.00 mH

Description:

- It is the value of the motor flux leakage inductance.

NOTE!
This parameter is only visible on the HMI when: the control type is vector, P0202 = 3 (Sensorless Vector) or P0202 = 4 (Vector with Encoder).

Menu → Configurations → Nominal data → Motor

P0412 - Lr/Rr Constant			
Adjustable range:	0,000 to 9,999 s	Factory setting:	0.000 s

Description:

- It is the motor rotor time constant (Lr/Rr).

Menu → Configurations → Nominal data → Motor

P0413 - Tm Time Constant			
Adjustable range:	0,00 to 99,99 s	Factory setting:	0.00 s

Description:

- It is the mechanical time constant.

NOTE!
This parameter is only visible on the HMI when: the control type is vector, P0202 = 3 (Sensorless Vector) or P0202 = 4 (Vector with Encoder).

Menu → Configurations → Nominal data → Motor			
P0414 - Magnetizing voltage			
Adjustable range:	0,0 to 20,0 %	Factory setting:	0.0 %

Description:

- It is a percentage of the nominal voltage applied for (2 x P0412) seconds to ensure the magnetization of the motor before the start.

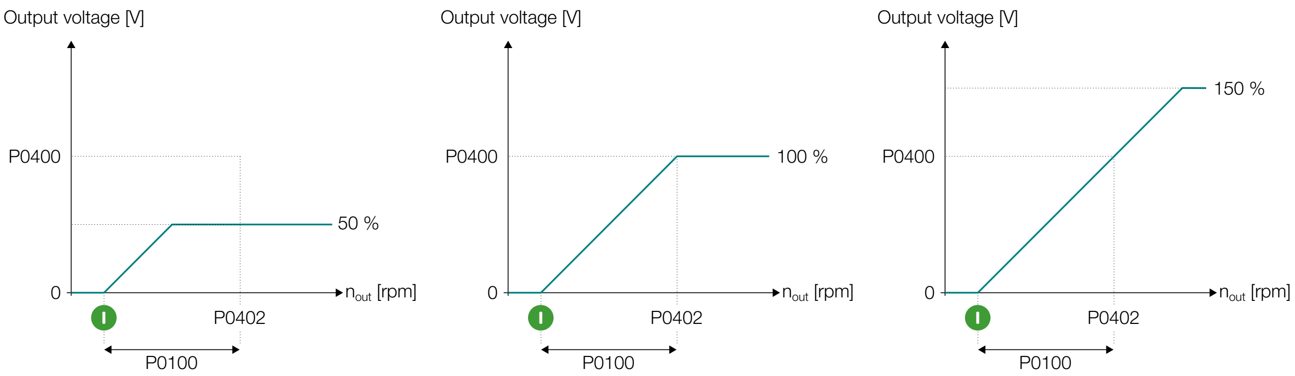
> **NOTE!**
> This parameter is only visible on the HMI when: the control type is scalar, P0202 = 0, 1 or 2 (V/f control).

Menu → Configurations → Protections → Inverter			
P0415 - Maximum output voltage			
Adjustable range:	0 to 2000 %	Factory setting:	0 %

Description:

5

- In scalar control, this parameter determines the maximum output voltage in relation to the motor rated voltage.
- In scalar control, the inverter seeks to maintain the rated motor flux, increasing the speed and voltage proportionally, until reaching the rated values. This parameter can be used to determine a maximum value for the output voltage in relation to P0400, for values either below or above the rated speed.
- The maximum voltage is determined by the number of cells in each phase and by the voltage of the DC busbars of the cells, which may vary during operation. Therefore, if the maximum voltage that the inverter can impose is lower than P0400, voltage saturation will occur before the rated speed, according to availability. If the maximum voltage is higher than the rated voltage, the voltage may continue to rise after reaching the rated speed.
- This value at 100 % limits the voltage to the value of P400 regardless of the availability of higher voltage for speeds above the rated speed. If set to 0 %, this parameter is disabled and the voltage is only limited by the availability of the inverter.



(a) *Limitation to 50 %* **(b)** *Limitation to 100 %* **(c)** *Limitation to 150 %*

Figure 5.40 – *Maximum output voltage in relation to the motor rated voltage*

> **NOTE!**
> - This parameter can be changed only with the motor stopped.
> - This parameter is only visible on the HMI when: the control type is scalar, P0202 = 0, 1 or 2 (V/f control).

Menu → Configurations → Nominal data → Motor			
P0427 - Inductance LD sigma			
Adjustable range:	0,00 to 99,99 mH	Factory setting:	4.85 mH

Description:

- Motor parameter used on the stator flux observer.

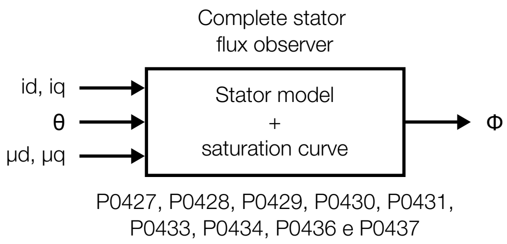


Figure 5.41 – *Complete model of the stator flux*

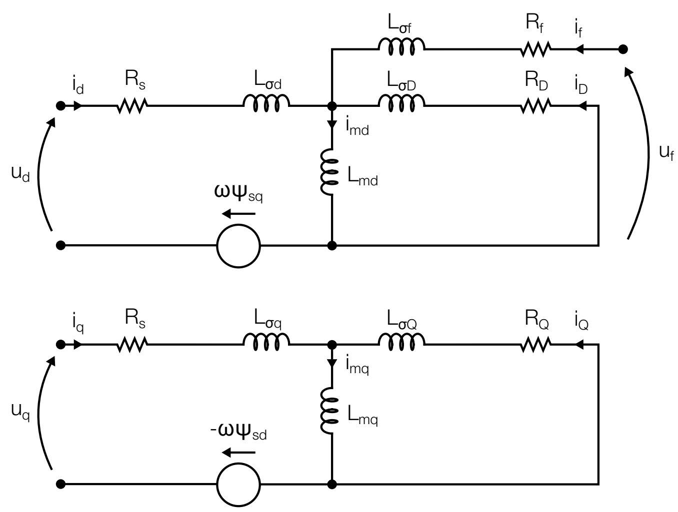


Figure 5.42 – *Electrical model of a synchronous motor*

NOTE!

- This parameter is only visible on HMI when: P0950 = 1 (Reserved) or P0950 = 2 (Brushless synchronous motor).
- This parameter is only visible on the HMI when: the control type is vector, P0202 = 3 (Sensorless Vector) or P0202 = 4 (Vector with Encoder).

Menu → Configurations → Nominal data → Motor			
P0428 - Inductance LQ sigma			
Adjustable range:	0,00 to 99,99 mH	Factory setting:	4.41 mH

Description:

- Motor parameter used in stator flux model.

NOTE!

- This parameter is only visible on HMI when: P0950 = 1 (Reserved) or P0950 = 2 (Brushless synchronous motor).
- This parameter is only visible on the HMI when: the control type is vector, P0202 = 3 (Sensorless Vector) or P0202 = 4 (Vector with Encoder).

Menu → Configurations → Nominal data → Motor			
P0429 - Resistence RD			
Adjustable range:	0,000 to 9,999 Ω	Factory setting:	1.139 Ω

Description:

- Motor parameter used in the stator flux model.

NOTE!

- This parameter is only visible on HMI when: P0950 = 1 (Reserved) or P0950 = 2 (Brushless synchronous motor).
- This parameter is only visible on the HMI when: the control type is vector, P0202 = 3 (Sensorless Vector) or P0202 = 4 (Vector with Encoder).

Menu → Configurations → Nominal data → Motor			
P0430 - Resistance RQ			
Adjustable range:	0,000 to 9,999 Ω	Factory setting:	0.831 Ω

Description:

- Motor parameter used in the stator flux model.

NOTE!

- This parameter is only visible on HMI when: P0950 = 1 (Reserved) or P0950 = 2 (Brushless synchronous motor).
- This parameter is only visible on the HMI when: the control type is vector, P0202 = 3 (Sensorless Vector) or P0202 = 4 (Vector with Encoder).

Menu → Configurations → Nominal data → Motor			
P0431 - Number of poles			
Adjustable range:	2 to 64	Factory setting:	4

Description:

- Number of motor poles.
- Determined by:

$$\text{Number of poles} = \frac{120 \times \text{frequency}_{\text{rated}}}{\text{rpm}_{\text{rated}}}$$

NOTE!
This parameter is only visible on the HMI when: P0950 > 0.

Menu → Configurations → Nominal data → Motor

P0433 - Lq inductance

Adjustable range:	0,0 to 999,9 mH	Factory setting:	45.7 mH

Description:

- Stator LQ inductance of the synchronous motor.

NOTE!
This parameter is only visible on the HMI when: P0950 > 0.

Menu → Configurations → Nominal data → Motor

P0434 - Ld inductance

Adjustable range:	0,0 to 999,9 mH	Factory setting:	86.9 mH

Description:

- Stator LD inductance of the synchronous motor.

NOTE!
This parameter is only visible on the HMI when: P0950 > 0.

Menu → Configurations → Nominal data → Motor

P0436 - Lf inductance

Adjustable range:	0,0 to 999,9 mH	Factory setting:	88.0 mH

Description:

- LF field inductance of the synchronous motor.

NOTE!

- This parameter is only visible on HMI when: P0950 = 1 (Reserved) or P0950 = 2 (Brushless synchronous motor).
- This parameter is only visible on the HMI when: the control type is vector, P0202 = 3 (Sensorless Vector) or P0202 = 4 (Vector with Encoder).

Menu → Configurations → Nominal data → Motor

P0437 - Resistence Rf

Adjustable range:	0,000 to 9,999 Ω	Factory setting:	0.047 Ω

Description:

- Field resistance of the synchronous motor.

NOTE!

- This parameter is only visible on HMI when: P0950 = 1 (Reserved) or P0950 = 2 (Brushless synchronous motor).
- This parameter is only visible on the HMI when: the control type is vector, P0202 = 3 (Sensorless Vector) or P0202 = 4 (Vector with Encoder).

Menu → Configurations → Control → Vector

P0438 - Proportional gain of the current regulator IQ

Adjustable range:	0,000 to 9,999	Factory setting:	0.034

Description:

- Parameter used by the regulator to control the currents.

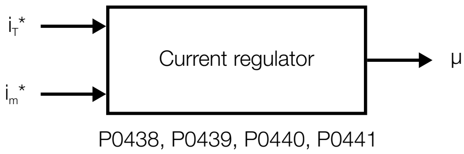


Figure 5.43 – *Complete model of the stator flux*

NOTE!

- This parameter is only visible on HMI when: P0950 = 1 (Reserved) or P0950 = 2 (Brushless synchronous motor).
- This parameter is only visible on the HMI when: the control type is vector, P0202 = 3 (Sensorless Vector) or P0202 = 4 (Vector with Encoder).

Menu → Configurations → Control → Vector

P0439 - Integration constant of the current regulator IQ

Adjustable range:	0,1 to 999,9	Factory setting:	9.0

Description:

- Parameter used by the regulator to control the currents.

NOTE!

- This parameter is only visible on HMI when: P0950 = 1 (Reserved) or P0950 = 2 (Brushless synchronous motor).
- This parameter is only visible on the HMI when: the control type is vector, P0202 = 3 (Sensorless Vector) or P0202 = 4 (Vector with Encoder).

Menu → Configurations → Control → Vector

P0440 - Proportional gain of the current regulator ID

Adjustable range:	0,000 to 9,999	Factory setting:	0.074

Description:

- Parameter used by the regulator to control the currents.

> **NOTE!**
> - This parameter is only visible on HMI when: P0950 = 1 (Reserved) or P0950 = 2 (Brushless synchronous motor).
> - This parameter is only visible on the HMI when: the control type is vector, P0202 = 3 (Sensorless Vector) or P0202 = 4 (Vector with Encoder).

Menu → Configurations → Control → Vector

P0441 - Integration constant of the current regulator ID

Adjustable range:	0,1 to 999,9	Factory setting:	19.6

Description:

- Parameter used by the regulator to control the currents.

> **NOTE!**
> - This parameter is only visible on HMI when: P0950 = 1 (Reserved) or P0950 = 2 (Brushless synchronous motor).
> - This parameter is only visible on the HMI when: the control type is vector, P0202 = 3 (Sensorless Vector) or P0202 = 4 (Vector with Encoder).

5

Menu → Configurations → Control → Vector

P0442 - Proportional gain of brushless exciter field regulator

P0443 - Brushless exciter field regulator integration constant

P0444 - Maximum field voltage (brushless)

P0445 - Minimum field voltage (brushless)

Adjustable range:	P0442 = 0,000 to 9,999 P0443 = 1 to 9999 P0444 = 0,01 to 1,00 PU P0445 = 0,01 to 1,00 PU	Factory setting:	P0442 = 0.788 P0443 = 703 P0444 = 0.58 PU P0445 = 0.01 PU

Description:

- The brushless exciter current regulator has as reference the field current required by the control, and as feed-back, the estimated current, based on the exciter parameters.
- P0444 and P0445 define the maximum and minimum limits of the regulator output.
- The maximum voltage value that can be applied to the exciter can be calculated as:

$$V_{exc,max} = P0444 \times V_{converterexciter} \times k_{transformer}$$

Where:
$V_{converter\ exciter}$ is the voltage of the converter used to supply the exciter.
$k_{transformer}$ is the gain of the transformer, if a transfrm is used in this circuit.

> **NOTE!**
> - This parameter is only visible on the HMI when P0950 = 2 (Brushless synchronous motor).
> - This parameter is only visible on the HMI when: the control type is vector, P0202 = 3 (Sensorless Vector) or P0202 = 4 (Vector with Encoder).

Menu → Configurations → Control → Vector

P0446 - Base field current			
Adjustable range:	0,1 to 999,9 A	Factory setting:	33.3 A

Description:

- Current base used for the field current.

> **NOTE!**
> - This parameter is only visible on HMI when: P0950 = 1 (Reserved) or P0950 = 2 (Brushless synchronous motor).
> - This parameter is only visible on the HMI when: the control type is vector, P0202 = 3 (Sensorless Vector) or P0202 = 4 (Vector with Encoder).

Menu → Configurations → Control → Vector

P0447 - Proportional gain of the field regulator			
Adjustable range:	0,000 to 9,999	Factory setting:	0.087

Description:

- PI (integrator proportional) gain used in the reference of the field regulator.

> **NOTE!**
> - This parameter is only visible on the HMI when: P0950 > 0.
> - This parameter is only visible on the HMI when: the control type is scalar, P0202 = 0, 1 or 2 (V/f control).

Menu → Configurations → Control → Vector

P0448 - Integration constant of the field regulator			
Adjustable range:	1 to 9999	Factory setting:	70

Description:

- PI (integrator proportional) gain used in the reference of the field regulator.

> **NOTE!**
> - This parameter is only visible on the HMI when: P0950 > 0.
> - This parameter is only visible on the HMI when: the control type is scalar, P0202 = 0, 1 or 2 (V/f control).

Menu → Configurations → Control → Settings

P0449 - Maximum field current (Brushless)			
Adjustable range:	0,01 to 5,00 PU	Factory setting:	0.70 PU

Description:

- Maximum limit in PU of P0462 used in the control of the field current reference; see Section 5.2 FIELD EXCITATION SET (DC WITH BRUSHES) on page 5-3 of the User's Manual.
- Set according to the possible overload on the inverter/exciter.

> **NOTE!**
> This parameter is only visible on the HMI when: P0950 > 0.

Menu → Configurations → Control → Settings

P0450 - Minimum field current (Brushless)			
Adjustable range:	0,01 to 5,00 PU	Factory setting:	0.01 PU

Description:

- Minimum limit in PU of P0462 used in the control of the field current reference, see Section 5.2 FIELD EXCITATION SET (DC WITH BRUSHES) on page 5-3 of the User's Manual.
- Minimum field for frequency higher than P0452.

> **NOTE!**
> This parameter is only visible on HMI when: P0950 = 1 (Reserved) or P0950 = 2 (Brushless synchronous motor).

Menu → Configurations → Control → Settings

P0451 - Minimum field for soft-start function			
Adjustable range:	0,01 to 5,00 PU	Factory setting:	0.15 PU

Description:

- Minimum limit in PU of P0462 used in the control of the field current reference, see Section 5.2 FIELD EXCITATION SET (DC WITH BRUSHES) on page 5-3 of the User's Manual.
- Minimum field for frequency lower than or equal to P0452.
- Used in the soft-start function without rotor orientation in scalar mode.

> **NOTE!**
> Function used in motor without encoder.

> **NOTE!**
>
> - This parameter is only visible on HMI when: P0950 = 1 (Reserved) or P0950 = 2 (Brushless synchronous motor).
> - This parameter is only visible on the HMI when: the control type is scalar, P0202 = 0, 1 or 2 (V/f control).

Menu → Configurations → Control → Settings

P0452 - Field input frequency

Adjustable range:	0,0 to 60,0 Hz	Factory setting:	0.0 Hz

Description:

- Input frequency of the field excitation in scalar mode used in the soft-start function without rotor orientation.

NOTE!

- In scalar mode without encoder, the motor must “match” the inverter, and it is not possible to start motors with currents higher than the inverter current.
- When encoder is used, this parameter must be set to 0 Hz, disabling the soft-start without encoder function.
- For further information, contact WEG Technical Assistance.

WARNING!
For encoder setting:

- Set parameter P0452 (Field input frequency) to 0 Hz.
- Control Type (P0202) must be scalar and the direction of rotation forward; configure one of the analog outputs for the encoder setting (E.g.: P0656 = [018] (EncAdjMS).

NOTE!

- This parameter is only visible on the HMI when: P0950 > 0.
- This parameter is only visible on the HMI when: the control type is scalar, P0202 = 0, 1 or 2 (V/f control).

Menu → Configurations → Control → Settings

P0453 - Field ramp time

Adjustable range:	0,00 to 30,00 s	Factory setting:	1.00 s

Description:

- Field ramp time in seconds, used in the field regulator reference.
- Used in the field soft-start.

NOTE!

- This parameter is only visible on HMI when: P0950 = 1 (Reserved) or P0950 = 2 (Brushless synchronous motor).
- This parameter is only visible on the HMI when: the control type is scalar, P0202 = 0, 1 or 2 (V/f control).

Menu → Configurations → Control → Vector			
P0454 - Coefficient A1 of the polynomial of the magnetic saturation curve			
P0455 - Coefficient B1 of the Polynomial of the magnetic saturation curve			
P0456 - Coefficient C1 of the Polynomial of the magnetic saturation curve			
Adjustable range:	0,000 to 9,999	Factory setting:	P0454 = 0.000 P0455 = 0.174 P0456 = 1.059

Description:

- Coefficient of the polynomial of the magnetic saturation curve.
- The machine operates with linear flux up to the point in which the linear curve follows the saturation curve; from this point the machine flux follows a mathematical model obtained from the data of the motor manufacturer.

Magnetic saturation curve

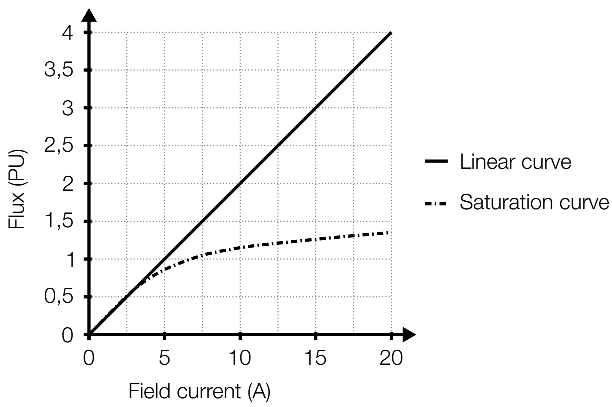


Figure 5.44 – *Typical saturation curve and mathematical approximations used by the inverter for flux control*

NOTE!
For further information, contact WEG Technical Assistance.

NOTE!

- This parameter is only visible on HMI when: P0950 = 1 (Reserved) or P0950 = 2 (Brushless synchronous motor).
- This parameter is only visible on the HMI when: the control type is vector, P0202 = 3 (Sensorless Vector) or P0202 = 4 (Vector with Encoder).

Menu → Configurations → Control → Vector			
P0457 - Polynomial A2 of the gain curve of the brushless exciter			
P0458 - Polynomial B2 of the gain curve of the brushless exciter			
P0459 - Polynomial C2 of the brushless motor exciter curve			
Adjustable range:	P0457 = 0,000 to 9,999 P0458 = 0,000 to 9,999 P0459 = 0,0 to 999,9	Factory setting:	P0457 = 0.185 P0458 = 0.068 P0459 = 118.7

Description:

- The brushless motor exciter polynomial describes the voltage variation at the field winding terminals of the synchronous machine as a function of the voltage applied to the exciter primary terminals.
- The A2 coefficient is multiplied by 10^{-4}.
- See the motor documentation to obtain the polynomial coefficients.

> **NOTE!**
> - This parameter is only visible on the HMI when P0950 = 2 (Brushless synchronous motor).
> - This parameter is only visible on the HMI when: the control type is vector, P0202 = 3 (Sensorless Vector) or P0202 = 4 (Vector with Encoder).

Menu → Configurations → Control → Vector			
P0460 - Field resistance not referred to the stator			
Adjustable range:	0,000 to 9,999 Ω	Factory setting:	1.150 Ω

Description:

- Electrical resistance of the field winding.

> **NOTE!**
> - This parameter is only visible on the HMI when P0950 = 2 (Brushless synchronous motor).
> - This parameter is only visible on the HMI when: the control type is vector, P0202 = 3 (Sensorless Vector) or P0202 = 4 (Vector with Encoder).

Menu → Configurations → Control → Vector			
P0461 - Rated current in the field of brushless motor			
Adjustable range:	0,1 to 999,9 A	Factory setting:	25.6 A

Description:

- Field current required to maintain the unit power factor, with voltage from the stator terminals at the rated voltage of the machine and without load on the shaft, at rated speed.

> **NOTE!**
> - This parameter is only visible on the HMI when P0950 = 2 (Brushless synchronous motor).
> - This parameter is only visible on the HMI when: the control type is vector, P0202 = 3 (Sensorless Vector) or P0202 = 4 (Vector with Encoder).

Menu → Configurations → Control → Vector			
P0462 - Field current scale			
Adjustable range:	0,1 to 999,9 A	Factory setting:	94.0 A

Description:

- It sets the full scale of the field current regulation action of synchronous machines in vector control.

- For synchronous machines with brushes, this value must be defined as the rated current of the converter that feeds the field.
- For synchronous machines with AC excitation, check the excitation curves of the machine and use the rated load starting current and unit power factor, adding a margin of 20% of the value.

NOTE!
This parameter is only visible on HMI when: P0950 = 1 (Reserved) or P0950 = 2 (Brushless synchronous motor).

Menu → Configurations → Control → Vector			
P0463 - Exciter rated voltage scale			
Adjustable range:	0 to 9999 V	Factory setting:	380 V

Description:

- Parameter used to control the field current with brushless exciter.
- Voltage at the AC exciter terminals when the maximum value (1 P.U.) is applied in the field reference.

NOTE!
This parameter is only visible on the HMI when P0950 = 2 (Brushless synchronous motor).

Menu → Configurations → Control → Vector			
P0464 - Maximum compensation current of PF			
Adjustable range:	0,00 to 1,00 PU	Factory setting:	0.80 PU

Description:

- Maximum compensation current, in PU, of the power factor.

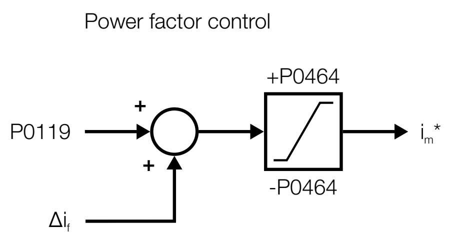


Figure 5.45 – *Block diagram of the power factor control*

NOTE!
- This parameter is only visible on HMI when: P0950 = 1 (Reserved) or P0950 = 2 (Brushless synchronous motor).
- This parameter is only visible on the HMI when: the control type is vector, P0202 = 3 (Sensorless Vector) or P0202 = 4 (Vector with Encoder).

Menu → Configurations → Control → Settings			
P0468 - PM Gain			
Adjustable range:	0 to 9999	Factory setting:	0

Description:

- Sets the maximum torque per ampere or maximum efficiency gain.
- To calculate the MTPA point online, set P0468 = 0, P0433 = P0434 and P0433 different from 0.

It can be calculated as follows:

$$\Phi = \frac{K_e}{2\pi}60$$

$$P0468 = \Gamma_e = \frac{L_s}{\Phi}$$

Being:
L_s = Stator Inductance
Φ = Rotor flux
K_e = Electrical constant $[V_{rms}/rpm](fase)$

NOTE!

- This parameter is only visible on the HMI when: P0950 = 3 (Permanent magnet motor).
- This parameter is only visible on the HMI when: the control type is scalar, P0202 = 0, 1 or 2 (V/f control).

Menu → Configurations → HMI → Settings

P0490 - Graphic HMI LCD contrast adjustment

Adjustable range:	50 to 150	Factory setting:	110

Description:

- It adjusts the Graphic LCD contrast percentage.

Menu → Configurations → HMI → Settings

P0491 - HMI commands configuration

Adjustable range:	0 to 2	Factory setting:	0

Description:

- It configures the origin of the inverter Local or Remote (LOC/REM) commands for 'Serial' type, so that the Graphic HMI will be able to operate properly (the Graphic HMI commands are of the Modbus RTU serial type).

Table 5.55 – *HMI commands configuration*

P0491	Function
0	Inactive
1	Local HMI
2	Remote HMI

NOTE!
This parameter can be changed only with the motor stopped.

Menu → Configurations → HMI → Graphic

P0493 - Sampling time

Adjustable range:	1 to 100 x 10 ms	Factory setting:	10 x 10 ms

Description:

- It adjusts the time between the points presented in the online graphic function.

Menu → Configurations → Functions → PID

P0520 - PID proportional gain

P0521 - PID integral gain

P0522 - PID differential gain

P0523 - PID ramp time

Adjustable range:	P0520 = 0,000 to 7,999 P0521 = 0,000 to 9,999 P0522 = 0,000 to 9,999 P0523 = 0,0 to 999,0 s	Factory setting:	P0520 = 1.000 P0521 = 1.000 P0522 = 0.000 P0523 = 3.0 s

Description:

- Some examples of initial settings for the PID Regulator and Ramp Time for some applications mentioned in Section 6.1 PID REGULATOR on page 6-1 are shown in Table 5.56 on page 5-87.

5

Table 5.56 – *PID initial gain setting suggestions*

Process Variable	Gains			Time	Type
	Proportional P0520	Integral P0521	Differential P0522	PID Ramp P0523	of action P0527
Pneumatic system pressure	1	0.043	0.0	3	0 = No
Pneumatic system flow	1	0.037	0.0	3	0 = No
Hydraulic system pressure	1	0.043	0.0	3	0 = No
Hydraulic system flow	1	0.037	0.0	3	0 = No
Temperature	2	0.004	0.0	3	See Note
Level	1	See note	0.0	3	See note

Note:

- For temperature and level, the action type setting will depend on the process. For level control, for instance, if the inverter drives the motor that pumps fluid out of the reservoir, the action will be reverse because when the level increases the inverter must increase the motor speed in order to lower the level, otherwise, when the inverter drives a motor that pumps fluid into the reservoir, the action will be direct.
- In case of level control, the integral gain adjustment will depend on the time required for the reservoir to pass from the minimum acceptable to the desired level, in the following conditions:
  1. For direct action, the time must be measured with maximum input flow and minimum output flow.
  2. For reverse action, the time must be measured with minimum input flow and maximum output flow.

An equation to calculate an initial value for P0521 (PID integral gain) as a function of the system response time, is presented below:

$$\text{P0521} = \frac{0.02}{t}$$

t = time (seconds)

NOTE!
This parameter is only visible on the HMI when: the PID function is active, P0203 = 1 (PID regulator).

Menu → Configurations → Functions → PID

P0524 - PID feedback selection

Adjustable range: 0 to 1 Factory setting: 0

Description:

- It selects the regulator feedback (Process Variable) input.
- After the feedback input has been chosen, the function of the selected input must be programmed at P0237 (for AI2) or P0241 (for AI3).
- Feedback type:
  - The PID action type described above considers that the process variable feedback signal increases when the process variable also increases (direct feedback). This is the most used feedback type.
  - If the process variable feedback decreases as the process variable increases (inverse feedback), then it is necessary to program the analog input selected for the PID feedback (AI2 or AI3) as inverse reference: P0239 = 2 (10 to 0 V/20 to 0 mA) or 3 (20 to 4 mA) for AI2 feedback and P0243 = 2 (10 to 0 V/20 to 0 mA) or 3 (20 to 4 mA) for AI3 feedback. Without this setting, the PID does not operate correctly.

5

***Table 5.57** – PID feedback selection*

P0524	Function
0	P0237 - AI2 signal function
1	P0241 - AI3 signal function

NOTE!
- This parameter is only visible on the HMI when: the PID function is active, P0203 = 1 (PID regulator).
- This parameter can be changed only with the motor stopped.

Menu → Configurations → Functions → PID

P0525 - PID regulator setpoint

Adjustable range: 0,0 to 100,0 % Factory setting: 0.0 %

Description:

- It provides the setpoint that is adjusted via the and keys for the PID regulator (see P0203), provided that P0221 = 0 (Local) or P0222 = 0 (Remote) and in automatic mode. If the PID is in manual mode, then the reference by keys is given by P0121.
- When the PID regulator is operating in automatic mode, the setpoint is via reference adjusted with P0221 (Local) or P0222 (Remote). Most PID applications either use setpoint via analog input AI1 [P0221 = 1 (Local) or P0222 = 1 (Remote) ou via and keys [P0221 = 0 (Local) or P0222 = 0 (Remote).
- Refer to Section 6.1 PID REGULATOR on page 6-1 .

NOTE!
This parameter is only visible on the HMI when: the PID function is active, P0203 = 1 (PID regulator).

Menu → Configurations → Functions → PID

P0526 - Process variable filter

Adjustable range:	0,0 to 16,0 s	Factory setting:	0.1 s

Description:

- It adjusts time constant of the process variable filter.
- The 0.1 s value is usually adequate, unless the process variable presents much noise. In such case, increase the value gradually, observing the result.

NOTE!
This parameter is only visible on the HMI when: the PID function is active, P0203 = 1 (PID regulator).

Menu → Configurations → Functions → PID

P0527 - Error Value Inv

Adjustable range:	0 to 1	Factory setting:	0

Description:

- It defines the type of control action.
- Select according to the process.

Table 5.58 – *Selection of operation*

Motor speed	Process variable	Select
Increases	Increases	Direct
	Decreases	Reverse

- Process necessity:
  - PID action type: the PID action must be selected as "Direct" when it is necessary to increase the motor speed in order to increase the process variable. Otherwise, select "Reverse".
    Example 1 - Direct: The inverter drives a pump responsible for filling a reservoir using the PID to control the level. For the level (process variable) to increase, it is necessary that the flow, and consequently the motor speed, also increases.
    Example 2 - Reverse: The inverter drives a fan responsible for cooling a cooling tower using the PID to control the temperature. In order to increase the temperature (process variable), it is necessary to decrease the ventilation by decreasing the motor speed.

Table 5.59 – *Error Value Inv*

P0527	Function
0	No
1	Yes

NOTE!
This parameter is only visible on the HMI when: the PID function is active, P0203 = 1 (PID regulator).

Menu → Configurations → Functions → PID

P0528 - Process variable scale factor

P0529 - Process Variable Decimal Point

Adjustable range:	P0528 = 0 to 9999 P0529 = 0 to 3	Factory setting:	P0528 = 1000 P0529 = 1

Description:

- P0528 and P0529 define how P0040 (Value of process variable (PID)) will be displayed.
- P0529 defines the number of digits after the decimal point.

- P0528 must be adjusted according to the equation below:

$$P0528 = \frac{\text{Process F.S.V. indication} \times (10)^{P0529}}{\text{Gain (AI2 or AI3)}}$$

Being:
Process F.S.V. indication: process variable full-scale value, corresponding to 10 V (20 mA) at the Analog Input (AI2 or AI3) used as feedback.

Example 1 (Bar Pressure Transducer 0 to 25 bar - output 4 to 20 mA):
- Desired indication: 0 to 25 bar (Process F.S.V).
- Feedback input: AI3.
- Gain AI3 = P0242 = 1.000.
- Signal AI3 = P0243 = 1 (4 to 20 mA).
- P0529 = 0 (no positions after the decimal point).

$$P0528 = \frac{25 \times (10)^0}{1.000} = 25$$

Example 2 (factory default settings):
- Desired indication: 0.0 % to 100 % (Process F.S.V).
- Feedback input: AI2.
- Gain AI2 = P0238 = 1.000.
- P0529 = 1 (one position after the decimal point).

$$P0528 = \frac{100.0 \times (10)^1}{1.000} = 1000$$

NOTE!
This parameter is only visible on the HMI when: the PID function is active, P0203 = 1 (PID regulator).

Menu → Configurations → Functions → PID

P0533 - Process variable X value

P0534 - Process variable Y value

P0535 - Output N = 0 PID

Adjustable range:	P0533 = 0,0 to 100,0 % P0534 = 0,0 to 100,0 % P0535 = 0 to 100 %	Factory setting:	P0533 = 90.0 % P0534 = 10.0 % P0535 = 0 %

Description:

- Used with the digital and relay output functions:
  V. Pr. > VPx and V. Pr. < VPy with the function of signal/alarm.

- The process variable full scale value in percentage is:

$$P0040 = \frac{(10)^{P0529}}{P0528} \times 100\ \%$$

- P0535 works together with P0212 (Condition for disabable output by zero speed), giving an additional condition to leave the disabled condition, that is, PID error > P0535. Refer to parameters P0211 to P0213.

NOTE!
This parameter is only visible on the HMI when: the PID function is active, P0203 = 1 (PID regulator).

Menu → Configurations → Functions → PID

P0536 - P0525 Automatic Setting

Adjustable range: 0 to 1 | Factory setting: 0

Description:

- When PID regulator setpoint is via HMI (P0221/P0222 = 13) and P0536 is set to 1 (Active), when switching from manual to automatic the process variable value (P0040) will be loaded in P0525. This avoids PID oscillations in manual to automatic switching.

***Table 5.60 –** P0525 Automatic Setting*

P0536	Function
0	Inactive
1	Active

NOTE!
This parameter is only visible on the HMI when: the PID function is active, P0203 = 1 (PID regulator).

Menu → Configurations → Control → Scalar

P0622 - End frequency of boost I x R

Adjustable range: 0 to 9999 | Factory setting: 4095

Description:

- It determines the end actuation frequency of the manual torque boost.
- For further information, refer to parameter P0136 (Addition on the manual torque curve (IxR)).
- The frequency is determined by the equation below:

$$\text{P0622 (Hz)} = \frac{\text{P0622} \times \text{P0403}}{8192}$$

Menu → Configurations → Functions → Synchronous transfer

P0629 - Synchronism time

Adjustable range: 0,0 to 20,0 s | Factory setting: 1.0 s

Description:

- Minimum time the inverter must maintain the phase error between the line voltage and the inverter output voltage smaller than the setting in P0632 (Maximum phase error) so as to signal it as synchronism OK.

Menu → Configurations → Functions → Synchronous transfer

P0630 - Synchronism timeout

Adjustable range: 20 to 240 s | Factory setting: 60 s

Description:

- Time out of synchronism with the line.
- Time counted from the activation of the DI of the MVC4, which starts the search until the signaling of synchronism OK.
- If this time is exceeded, A0008 (Timeout in the synchronism with the input line during synchronous transfer) will be indicated.

Menu → Configurations → Functions → Synchronous transfer			
P0631 - DI13 delay			
Adjustable range:	0 to 3000 ms	Factory setting:	170 ms

Description:

- Delay of DI13 of the MVC3 board, used to disable the inverter after the transfer.
- This time is used to compensate the delay on the transfer circuit, preventing the motor from remaining for a time interval without voltage.

Menu → Configurations → Functions → Synchronous transfer			
P0632 - Maximum phase error			
Adjustable range:	0,0 to 60,0 °	Factory setting:	5.0 °

Description:

- Phase error between the line voltage and the inverter voltage used together with P0629 (Synchronism time) to indicate synchronism OK.

5

Menu → Configurations → Functions → Synchronous transfer			
P0636 - Phase adjustment synchronous transfer			
Adjustable range:	-180,0 to 180,0 °	Factory setting:	0.0 °

Description:

- Parameter used to compensate the phase error between the voltage the inverter uses as reference for synchronism and the actual voltage in the point where the transfer will occur.

Menu → Configurations → I/O → Analog outputs → MVC3 - AO1			
P0652 - MVC3 AO1 Funct.			
Adjustable range:	0 to 767	Factory setting:	2

Description:

- It defines the function of the analog output.

Table 5.61 – Function of the analog outputs of the MVC3 board

P0652, P0654, P0656 and P0658	Function	Full scale
0	Phase Current V	5 V = P0295
1	Phase Current W	5 V = P0295
2	Phase Current U	5 V = P0295
3	Output Frequency	10 V = 120 Hz
4	Angle of the Fundamental Output Voltage	10 V = +180º
5	Modulation Index	5 V = 255
17	Reference of Voltage and Field Current for Synchronous Machine	10 V = P0462 (A) 10 V = P0463 (V)
18	Position Adjustment of the Absolute Encoder	10 V = +180°
34	Value fixe at 0 V	-
35	Value fixe at 10 V	-
36	Value fixe at -10 V	-
37	Voltage between Phase A and B Measured on the Line ISOX Board	5 V = VAB Rated
38	Voltage between Phase B and C Measured on the Line ISOX Board	5 V = VBC Rated
66	Inverter Status	-
187	Value of Analog Input AI1 MVC3	-
188	Torque Reference of the Inverter	-10 = -200 % * 10 V = +200 % *

* Torque percentage regarding the motor torque.

NOTE!
For other options not described in Table 5.61 on page 5-93 contact WEG Technical Assistance.

Menu → Configurations → I/O → Analog outputs → MVC3 - AO1

P0653 - Analog output gain AO1 MVC3

Adjustable range: 0,000 to 9,999 Factory setting: 1.000

Description:

- It sets the gain of analog output.

Menu → Configurations → I/O → Analog outputs → MVC3 - AO2

P0654 - MVC3 AO2 Funct.

Adjustable range: 0 to 767 Factory setting: 5

Description:

- It defines the function of the analog output.
- Refer to Table 5.61 on page 5-93 for further details regarding the functions of the analog outputs of the MVC3 board.

Menu → Configurations → I/O → Analog outputs → MVC3 - AO2

P0655 - Analog output gain AO2 MVC3

Adjustable range: 0,000 to 9,999 Factory setting: 1.000

Description:

- It sets the gain of analog output.

Menu → Configurations → I/O → Analog outputs → MVC3 - AO3			
P0656 - MVC3 AO3 Funct.			
Adjustable range:	0 to 767	Factory setting:	2

Description:

- It defines the function of the analog output.
- Refer to Table 5.61 on page 5-93 for further details regarding the functions of the analog outputs of the MVC3 board.

Menu → Configurations → I/O → Analog outputs → MVC3 - AO3			
P0657 - Analog output gain AO3 MVC3			
Adjustable range:	0,000 to 9,999	Factory setting:	1.000

Description:

- It sets the gain of analog output.

5

Menu → Configurations → I/O → Analog outputs → MVC3 - AO4			
P0658 - MVC3 AO4 Funct.			
Adjustable range:	0 to 767	Factory setting:	5

Description:

- It defines the function of the analog output.
- Refer to Table 5.61 on page 5-93 for further details regarding the functions of the analog outputs of the MVC3 board.

Menu → Configurations → I/O → Analog outputs → MVC3 - AO4			
P0659 - Analog output gain AO4 MVC3			
Adjustable range:	0,000 to 9,999	Factory setting:	1.000

Description:

- It sets the gain of analog output.

Menu → Configurations → I/O → Analog outputs → MVC3 - AO1			
P0663 - Analog output offset AO1 MVC3			
P0664 - Analog output offset AO2 MVC3			
P0665 - Analog output offset AO3 MVC3			
P0666 - Analog output offset AO4 MVC3			
Adjustable range:	-32768 to 32767	Factory setting:	-90

Description:

- It sets the offset of analog output.

-32768 = -100 %
32768 = 100 %

Menu → Configurations → I/O → Analog inputs → AI5

P0721 - Analog input AI5 function

Adjustable range: 0 to 0 Factory setting: 0

Description:

- When the option 0 (P0221/P0222) is selected, AI5 is able to provided the (if programmed so in P0221/P0222), subject to the reference limits (P0133, P0134) and the ramp action (P0100 to P0103).
- See Figure 5.24 on page 5-39 .

***Table 5.62** – Analog input AI5 function*

P0721	Function
0	P221/P222

NOTE!
This parameter can be changed only with the motor stopped.

Menu → Configurations → I/O → Analog inputs → AI5

P0722 - Analog input AI5 gain (bipolar isolated MVC4 board)

Adjustable range: 0,000 to 9,999 Factory setting: 1.000

Description:

- Refer to P0234 (Analog input AI1 gain).

Menu → Configurations → I/O → Analog inputs → AI5

P0723 - Analog input AI5 signal type

Adjustable range: 0 to 3 Factory setting: 0

Description:

- For options 2 and 3 inverse reference is attained, that is, maximum speed is obtained with minimum reference.
- When current signals are used at AI5 input, put S3.1 switch on the MVC4 control board in “ON” position.

***Table 5.63** – Analog input AI5 signal type*

P0723	Function
0	0-10V/20mA
1	4 - 20 mA
2	10V/20mA-0
3	20 - 4 mA

NOTE!
This parameter can be changed only with the motor stopped.

Menu → Configurations → I/O → Analog inputs → AI5

P0724 - Analog input AI5 offset (bipolar isolated MVC4 board)

Adjustable range: 0,0 to 100,0 % Factory setting: 0.0 %

Description:

- Refer to P0234 (Analog input AI1 gain).

Menu → Configurations → Commands → Local			
P0725 - Minimum coasting time			
Adjustable range:	0 to 300 s	Factory setting:	0 s

Description:

- The minimum coasting time determines for how long the inverter will not be accepting the General Enable or Start/Stop command after a general disable (P0232 = 1).

Menu → Configurations → I/O → Analog inputs → MVC3 - AI1			
P0740 - Function of analog input AI1 MVC3			
Adjustable range:	0 to 2	Factory setting:	0

Description:

- It defines the function of the respective analog input.
- Bipolar input.

***Table 5.64** – Function of analog input AI1 MVC3*

P0740	Function
0	Not used
1	Torque reference
2	Limit current

Menu → Configurations → I/O → Analog inputs → MVC3 - AI1			
P0741 - Analog input AI1 gain - MVC3			
Adjustable range:	0,000 to 9,999	Factory setting:	1.000

Description:

- It sets the gain of the respective analog input.
- Bipolar input.
- Refer to P0234 (Analog input AI1 gain).

Menu → Configurations → I/O → Analog inputs → MVC3 - AI1			
P0742 - Analog input AI1 offset - MVC3			
Adjustable range:	-100,0 to 100,0 %	Factory setting:	0.0 %

Description:

- It sets the offset of the respective analog input.
- Bipolar input.
- Refer to P0234 (Analog input AI1 gain).

Menu → Configurations → I/O → Analog inputs → MVC3 - AI2

P0744 - Function of analog input AI2 - MVC3

Adjustable range: 0 to 1 Factory setting: 0

Description:

- It defines the function of the respective analog input.
- Bipolar input.

Table 5.65 – *Function of analog input AI2 - MVC3*

P0744	Function
0	Not used
1	Field current

Menu → Configurations → I/O → Analog inputs → MVC3 - AI2

P0745 - Analog input AI2 gain - MVC3

Adjustable range: 0,000 to 9,999 Factory setting: 1.000

Description:

- It sets the gain of the respective analog input.
- Bipolar input.
- Refer to P0234 (Analog input AI1 gain).

Menu → Configurations → I/O → Analog inputs → MVC3 - AI2

P0746 - Analog input AI2 offset - MVC3

Adjustable range: -100,0 to 100,0 % Factory setting: 0.0 %

Description:

- It sets the offset of the respective analog input.
- Bipolar input.
- Refer to P0234 (Analog input AI1 gain).

Menu → Configurations → Nominal data → Motor

P0950 - Motor Type

Adjustable range: 0 to 3 Factory setting: 0

Description:

- It selects the type of the motor to be driven by the inverter, where each option presents specific configuration parameters.

Table 5.66 – *Motor Type*

P0950	Function
0	Induction motor
1	Reserved
2	Brushless synchronous motor
3	Permanent magnet motor

NOTE!
This parameter can be changed only with the motor stopped.

Menu → Configurations → Nominal data → Encoder

P0957 - Direction of rotation

Adjustable range: 0 to 1 Factory setting: 1

Description:

- It sets the direction of rotation of the speed sensor.
- Such configuration can be used in applications where the speed sensor is not mounted in the standard position, but installed in a location where it reads the speed in the reverse direction.

Examples:
Sensor installed in the rear of the motor: standard configuration P0957 = 1
Sensor installed in the rear of the load: special configuration P0957 = 0

***Table 5.67 –** Direction of rotation*

P0957	Function
0	Reverse
1	Direct

Menu → Status → Measurements → Voltage

P1000 - DC link voltage of cell U1
P1001 - DC link voltage of cell U2
P1002 - DC link voltage of cell U3
P1003 - DC link voltage of cell U4
P1004 - DC link voltage of cell U5
P1005 - DC link voltage of cell U6
P1006 - DC link voltage of cell U7
P1007 - DC link voltage of cell U8
P1008 - DC link voltage of cell U9
P1009 - DC link voltage of cell U10
P1010 - DC link voltage of cell U11
P1011 - DC link voltage of cell U12

Resolution: 1 V

Description:

- It indicates the DC link voltage, in volts, of the respective cell.

Menu → Status → Measurements → Voltage

P1012 - DC link voltage of cell V1
P1013 - DC link voltage of cell V2
P1014 - DC link voltage of cell V3
P1015 - DC link voltage of cell V4
P1016 - DC link voltage of cell V5
P1017 - DC link voltage of cell V6
P1018 - DC link voltage of cell V7
P1019 - DC link voltage of cell V8
P1020 - DC link voltage of cell V9
P1021 - DC link voltage of cell V10
P1022 - DC link voltage of cell V11
P1023 - DC link voltage of cell V12

Resolution: 1 V

Description:

- It indicates the DC link voltage, in volts, of the respective cell.

Menu → Status → Measurements → Voltage

P1024 - DC link voltage of cell W1
P1025 - DC link voltage of cell W2
P1026 - DC link voltage of cell W3
P1027 - DC link voltage of cell W4
P1028 - DC link voltage of cell W5
P1029 - DC link voltage of cell W6
P1030 - DC link voltage of cell W7
P1031 - DC link voltage of cell W8
P1032 - DC link voltage of cell W9
P1033 - DC link voltage of cell W10
P1034 - DC link voltage of cell W11
P1035 - DC link voltage of cell W12

Resolution:	1 V

Description:

- It indicates the DC link voltage, in volts, of the respective cell.

Menu → Status → Measurements → Temperature

P1050 - Temperature on the power module of cell U1
P1051 - Temperature on the power module of cell U2
P1052 - Temperature on the power module of cell U3
P1053 - Temperature on the power module of cell U4
P1054 - Temperature on the power module of cell U5
P1055 - Temperature on the power module of cell U6
P1056 - Temperature on the power module of cell U7
P1057 - Temperature on the power module of cell U8
P1058 - Temperature on the power module of cell U9
P1059 - Temperature on the power module of cell U10
P1060 - Temperature on the power module of cell U11
P1061 - Temperature on the power module of cell U12

Resolution:	0.1 °C

Description:

- It indicates the temperature of the IGBT module, in degrees Celsius (°C), of the respective cell.

Menu → Status → Measurements → Temperature

P1062 - Temperature on the power module of cell V1
P1063 - Temperature on the power module of cell V2
P1064 - Temperature on the power module of cell V3
P1065 - Temperature on the power module of cell V4
P1066 - Temperature on the power module of cell V5
P1067 - Temperature on the power module of cell V6
P1068 - Temperature on the power module of cell V7
P1069 - Temperature on the power module of cell V8
P1070 - Temperature on the power module of cell V9
P1071 - Temperature on the power module of cell V10
P1072 - Temperature on the power module of cell V11
P1073 - Temperature on the power module of cell V12

Resolution: 0.1 °C

Description:

- It indicates the temperature of the IGBT module, in degrees Celsius (°C), of the respective cell.

Menu → Status → Measurements → Temperature

P1074 - Temperature on the power module of cell W1
P1075 - Temperature on the power module of cell W2
P1076 - Temperature on the power module of cell W3
P1077 - Temperature on the power module of cell W4
P1078 - Temperature on the power module of cell W5
P1079 - Temperature on the power module of cell W6
P1080 - Temperature on the power module of cell W7
P1081 - Temperature on the power module of cell W8
P1082 - Temperature on the power module of cell W9
P1083 - Temperature on the power module of cell W10
P1084 - Temperature on the power module of cell W11
P1085 - Temperature on the power module of cell W12

Resolution: 0.1 °C

Description:

- It indicates the temperature of the IGBT module, in degrees Celsius (°C), of the respective cell.

Menu → Status → Measurements → Current

P1136 - Inverter input current

Resolution: 0.1 A

Description:

- It indicates the current reading at the inverter input, in amperes (A) effective value.

Menu → Status → Measurements → Voltage

P1137 - Inverter input line voltage

Resolution: 0.01 kV

Description:

- It indicates the voltage effective value at the inverter input, in kV.

Menu → Status → Measurements → Power

P1138 - PF at the inverter input

Description:

- It indicates the cosine of the angle between the voltage and current at the inverter input.

The input power factor is calculated according to the equation:

$$P1138 = \frac{P1140}{P1139}$$

Menu → Status → Measurements → Power

P1139 - Apparent power at the inverter input

Resolution: 1 kVA

Description:

- Indicates the apparent power in the inverter input, in kVA.

The total power in the input is calculated according to the equation below:

$$P1139 = \sqrt{3} \times P1136 \times P1137$$

Being:

P1136 = Inverter input current;
P1137 = Inverter input line voltage.

Menu → Status → Measurements → Power

P1140 - Active power at the inverter input

Resolution: 1 kW

Description:

- Indicates the real power in the inverter input, in kW.
- Positive numbers indicate that the inverter is consuming power from the power grid.
- Negative numbers indicate that the inverter is regenerating power to the power grid.

The real power in the input is calculated according to the equation below:

$$P1140 = \sqrt{3} \times \text{active current} \times P1137$$

Being:

P1137 = Inverter input line voltage.

Menu → Status → Measurements → Power

P1141 - Reactive power at the inverter input

Resolution:	1 kVAr

Description:

- Indicates the reactive power in the inverter input, in kVAr.
- In P1137 you can see the angle between voltage and current in the inverter input.

The reactive power in the input is calculated according to the equation below:

$$P1141 = \sqrt{3} \times \text{reactive current} \times P1137$$

Being:

P1137 = Inverter input line voltage.

Menu → Status → Measurements → Frequency

P1142 - Frequency at the inverter input

Resolution:	0.01 Hz

Description:

- Indicates the frequency at the inverter input, in hertz (Hz).
- Function not implemented in this software version.

Menu → Status → Measurements → Voltage

P1143 - Output voltage

Resolution:	0.01 kV

Description:

- It indicates the effective valueof the voltage at inverter output, in kV.

Menu → Status → Measurements → Voltage

P1144 - Voltage between the virtual neutral of the motor and the ground of the system

Resolution:	0.1 %

Description:

- It indicates the value of the voltage between the virtual motor neutral and the ground (GND) of the inverter, as a percentage of the nominal effective phase voltage of the inverter.
- Refer to P0296 (To obtain the value in volts, multiply by P0296/$\sqrt{3}$).

Menu → Status → Measurements → Voltage

P1146 - DC link voltage - lowest value

P1147 - DC link voltage - highest value

Resolution:	1 V

Description:

- It indicates the calculated value among all currently active cells.

Menu → Status → Inverter → Status

P1155 - Phase U cell status U1 ... Un

P1156 - Phase V cell status V1...Vn

P1157 - Phase W cell status W1...Wn

Description:

- It indicates the cell bypass status.
- It indicates the state in the following order:

U1, U2, ..., Un
V1, V2, ..., Vn
W1, W2, ..., Wn

- The number of cells is variable and depends of:
  - P0296 (Voltage)
  - P1565 (Number of redundant cells per phase)
  - P1892 (Cells in parallel)

5

Table 5.68 – *Phase W cell status W1...Wn*

Description	Bit
Cell 1	Bit 0
Cell 2	Bit 1
Cell 3	Bit 2
Cell 4	Bit 3
Cell 5	Bit 4
Cell 6	Bit 5
Cell 7	Bit 6
Cell 8	Bit 7
Cell 9	Bit 8
Cell 10	Bit 9
Cell 11	Bit 10
Cell 12	Bit 11

Menu → Status → Measurements → Temperature

P1158 - Thermal protection relay 2 - Temperature CH1

P1159 - Thermal protection relay 2 - Temperature CH2

P1160 - Thermal protection relay 2 - Temperature CH3

P1161 - Thermal protection relay 2 - Temperature CH4

P1162 - Thermal protection relay 2 - Temperature CH5

P1163 - Thermal protection relay 2 - Temperature CH6

P1164 - Thermal protection relay 2 - Temperature CH7

P1165 - Thermal protection relay 2 - Temperature CH8

P1166 - Thermal protection relay 3 - Temperature CH1

P1167 - Thermal protection relay 3 - Temperature CH2

P1168 - Thermal protection relay 3 - Temperature CH3

P1169 - Thermal protection relay 3 - Temperature CH4

P1170 - Thermal protection relay 3 - Temperature CH5

P1171 - Thermal protection relay 3 - Temperature CH6

P1172 - Thermal protection relay 3 - Temperature CH7

P1173 - Thermal protection relay 3 - Temperature CH8

Adjustable range:	-50 to 300 °C	Factory setting:	0 °C

Description:

- For these parameters indicate the motor temperature properly, the temperature control module (Tecsystem, Pextron) must be installed observing the recommendations contained in its manual.
- The overtemperature alarm and fault levels are configured directly on the temperature control module according to its manual.

The module serial configuration must be set as follows:

- Baudrate: 2400 bps
- Slave address: 1, 2 or 3
- Parity: even
- Stop bit: 1

WARNING!
In the **PRG** (programming) and **VIS** (programming visualization) functions of the thermal protection relay, the communication with the inverter is temporarily disabled and can cause a communication time-out, in this situation the inverter disables the output, protecting the motor from possible damage.

Menu → Status → Measurements → Temperature

P1350 - Temperature on the board of cell U1
P1351 - Temperature on the board of cell U2
P1352 - Temperature on the board of cell U3
P1353 - Temperature on the board of cell U4
P1354 - Temperature on the board of cell U5
P1355 - Temperature on the board of cell U6
P1356 - Temperature on the board of cell U7
P1357 - Temperature on the board of cell U8
P1358 - Temperature on the board of cell U9
P1359 - Temperature on the board of cell U10
P1360 - Temperature on the board of cell U11
P1361 - Temperature on the board of cell U12

Resolution:	0.1 °C

Description:

- It indicates the temperature on the control board, in degrees Celsius (°C), of the respective cell.

Menu → Status → Measurements → Temperature

P1362 - Temperature on the board of cell V1
P1363 - Temperature on the board of cell V2
P1364 - Temperature on the board of cell V3
P1365 - Temperature on the board of cell V4
P1366 - Temperature on the board of cell V5
P1367 - Temperature on the board of cell V6
P1368 - Temperature on the board of cell V7
P1369 - Temperature on the board of cell V8
P1370 - Temperature on the board of cell V9
P1371 - Temperature on the board of cell V10
P1372 - Temperature on the board of cell V11
P1373 - Temperature on the board of cell V12

Resolution: 0.1 °C

Description:

- It indicates the temperature on the control board, in degrees Celsius (°C), of the respective cell.

Menu → Status → Measurements → Temperature

P1374 - Temperature on the board of cell W1
P1375 - Temperature on the board of cell W2
P1376 - Temperature on the board of cell W3
P1377 - Temperature on the board of cell W4
P1378 - Temperature on the board of cell W5
P1379 - Temperature on the board of cell W6
P1380 - Temperature on the board of cell W7
P1381 - Temperature on the board of cell W8
P1382 - Temperature on the board of cell W9
P1383 - Temperature on the board of cell W10
P1384 - Temperature on the board of cell W11
P1385 - Temperature on the board of cell W12

Resolution: 0.1 °C

Description:

- It indicates the temperature on the control board, in degrees Celsius (°C), of the respective cell.

Menu → Status → Inverter → Status

P1478 - Seconds
P1479 - Minute
P1480 - Hour
P1481 - Day
P1482 - Month
P1483 - Year

Adjustable range:	P1478 = 0 to 59 P1479 = 0 to 59 P1480 = 0 to 23 P1481 = 1 to 31 P1482 = 1 to 12 P1483 = 2022 to 2070	Factory setting:	0

Description:

- Indicate the date and time of the real-time clock.

Menu → Status → Inverter → Status

P1484 - Control status

Description:

- It indicates the status of the inverter functions.

Table 5.69 – *Control status*

Description	Bit
Portas trancadas	Bit 0
Portas trancadas - abertura em andamento	Bit 1
Pré-carga concluída	Bit 2
Cell in bypass state	Bit 3

Menu → Configurations → Functions → Bypass

P1500 - Automatic Bypass

Adjustable range: 0 to 1 Factory setting: 0

Description:

- It defines the action to be taken by the control board upon the need to remove one of the cells from operation.
- Depending on the fault type, the low voltage cells must be removed from the motor power supply circuit.
- If P1500 = 0, in any cell fault situation, the entire system is locked.
- If P1500 = 1, in situations that require the removal of the faulty cell, the Bypass function will automatically rearrange the set by removing the damaged cell and putting the system back to operation.
- If P1500 = 1, the Flying Start restart method is used.
- If P1500 = 1, the time to close the bypass relay is half the Flying Start dead time (P0332).
- The maximum number of bypassed cells after a manageable fault occurs is limited by parameter P1502.

Faults manageable by the automatic bypass function:

- Defective temperature sensor or undertemperature IGBT cell.
- Cell phase IGBT
- Cell neutral IGBT
- Cell phase pulse feedback
- Cell neutral pulse feedback
- Cell electronics power supply
- Defect in the cell insulation.

WARNING!
Only cells with the bypass system installed will be able to enter the bypass mode. For further details, contact WEG.

Table 5.70 – *Automatic Bypass*

P1500	Function
0	Inactive
1	Active with Flying Start

NOTE!
This parameter can be changed only with the motor stopped.

Menu → Configurations → Functions → Bypass

P1501 - Line tension balancing method

Adjustable range:	0 to 1	Factory setting:	0

Description:

- Defines the balancing method of the line voltages when the inverter is operating with an uneven number of cells between phases.
- Option 0 makes the inverter keep the phase voltages always balanced, with the same amplitude and with a shift of 120°, having the phase with the smallest number of cells as the amplitude limit.
- Option 1 makes the inverter keep the line voltages balanced by adjusting the angles between phases to a value different from 120°.

Table 5.71 – *Line tension balancing method*

P1501	Function
0	Phase voltage amplitude readjustment
1	Readjustment of phase voltage angles

5

NOTE!
This parameter can be changed only with the motor stopped.

Menu → Configurations → Functions → Bypass

P1502 - Limit of bypassed cells per phase

Adjustable range:	0 to 12	Factory setting:	1

Description:

- It defines the maximum number of cells per phase may be placed in automatic bypass.

NOTE!
This parameter can be changed only with the motor stopped.

Menu → Configurations → Protections → Motor

P1507 - Enables thermal protection relay faults

Adjustable range:	0 to 255	Factory setting:	255

Description:

- It enables the overtemperature faults on the channels of the respective thermal protection relay.
- When the *voting* function is enabled on the relay, this parameter must be set according to the selected operating mode.

Table 5.72 – Function voting (Tecsystem)

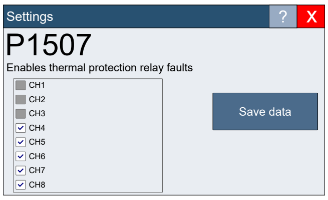
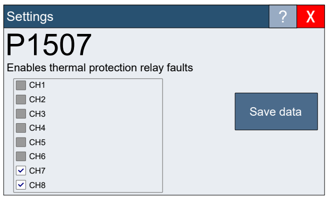
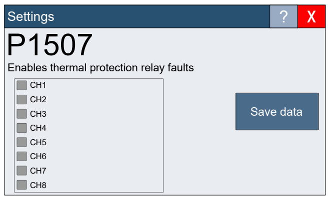
Function voting	Mode 1	Mode 2	Mode 3
Channel 1	Active function	Active function	Active function
Channel 2			
Channel 3			
Channel 4	Inactive function		
Channel 5			
Channel 6			
Channel 7		Inactive function	
Channel 8			
Parameter setting			

Figure 5.46 – Recommended parameter setting on the inverter for the voting function inactive on the thermal protection relay

Table 5.73 – Enables thermal protection relay faults

Description	Bit
Canal 1	Bit 0
Canal 2	Bit 1
Canal 3	Bit 2
Canal 4	Bit 3
Canal 5	Bit 4
Canal 6	Bit 5
Canal 7	Bit 6
Canal 8	Bit 7

Menu → Configurations → Nominal data → Encoder

P1544 - Baudrate

Adjustable range: 0 to 4 Factory setting: 3

Description:

- Baud rate for the absolute encoder via SSI interface.
- The baud rate is limited by the length of the cable in the connection to the SSI encoder, or by the presence of other transducers on this communication line.
- The longer the connection cable between the interface board and the encoder, the lower the baud rate must be.

Table 5.74 – *Baudrate*

P1544	Function
0	100 kHz
1	150 kHz
2	200 kHz
3	250 kHz
4	500 kHz

NOTE!
This parameter is only visible on HMI when: P0950 = 1 (Reserved) or P0950 = 2 (Brushless synchronous motor).

Menu → Configurations → Nominal data → Encoder

P1545 - Data bits

P1546 - Parity

P1547 - Encoding

Adjustable range:	P1545 = 8 to 20 P1546 = 0 to 2 P1547 = 0 to 1	Factory setting:	P1545 = 13 P1546 = 0 P1547 = 0

Description:

- Configuration of the SSI interface with the absolute encoder.
- The configuration of the SSI interface with the absolute encoder has the DDbPC format, where:
  - DD: quantity of data bits
  - P: message parity type (E = even, O = odd, N = none)
  - C: message encoding (B = binary, G = Gray)

Table 5.75 – *Encoding*

P1547	Function
0	Binary
1	Gray

Menu → Configurations → Nominal data → Transformer

P1550 - Transformer 1 CT Ratio

Adjustable range:	1 to 3000	Factory setting:	200

Description:

- It sets the ratio of the current transformers used in the measurement of the inverter input current.
- Set it according to the current transformer nameplate data.

Notes:

- It is recommended that the CT primary current be greater than or equal to the transformer primary rated current.
- The CT primary current must be smaller than 1.95 times the transformer primary rated current.

WARNING!
In case the user sets a value in P1550 that is out of the mandatory range, programming error will occur.

NOTE!
This parameter can be changed only with the motor stopped.

Menu → Configurations → Nominal data → Transformer			
P1551 - Ratio between the voltage of the primary and the auxiliary output of the transformer 1			
Adjustable range:	1,00 to 60,00	Factory setting:	18.14

Description:

- It sets the voltage ratio between the primary and the auxiliary output of the input transformer.
- Set it according to the nameplate data of the transformer used.

NOTE!
This parameter can be changed only with the motor stopped.

Menu → Configurations → Nominal data → Transformer			
P1552 - Taps of transformer 1			
Adjustable range:	-5,00 to 5,00 %	Factory setting:	0.00 %

Description:

- It sets the modification occurred on the voltage supplied for the inverter cells.
- Set it according to the input transformer tap connections.

NOTE!
This parameter can be changed only with the motor stopped.

Menu → Configurations → Nominal data → Transformer			
P1553 - Transformers rated voltage			
Adjustable range:	0,00 to 99,99 kV	Factory setting:	6.60 kV

Description:

- It sets the rated line voltage of the input transformer, in kV effective value.
- Set it according to the nameplate data of the transformer used.

NOTE!
This parameter can be changed only with the motor stopped.

Menu → Configurations → Nominal data → Transformer			
P1554 - Transformer 1 rated power			
Adjustable range:	0 to 10000 kVA	Factory setting:	1500 kVA

Description:

- It sets the rated power of the input transformer, in kVA.
- Set it according to the nameplate data of the transformer used.

NOTE!
This parameter can be changed only with the motor stopped.

Menu → Configurations → Nominal data → Transformer

P1555 - Transformers rated frequency

Adjustable range:	0 to 100 Hz	Factory setting:	60 Hz

Description:

- It sets the rated frequency of the input transformer, in Hertz (Hz).
- Set it according to the nameplate data of the transformer used.

NOTE!
This parameter can be changed only with the motor stopped.

Menu → Configurations → Nominal data → Transformer

P1556 - Transformer 2 CT Ratio

Adjustable range:	50 to 3000	Factory setting:	200

Description:

- It sets the ratio of the current transformers used in the measurement of the inverter input current.
- Set it according to the current transformer nameplate data.

Notes:

- It is recommended that the CT primary current be greater than or equal to the transformer primary rated current.
- The CT primary current must be smaller than 1.95 times the transformer primary rated current.

WARNING!
In case the user sets a value in P1550 that is out of the mandatory range, programming error will occur.

NOTE!
- This parameter can be changed only with the motor stopped.
- This parameter is only visible on the HMI when: P1893 (Transformers at the input) = 2 or 3 transformers.

Menu → Configurations → Nominal data → Transformer

P1557 - Taps of transformer 2

Adjustable range:	-5,00 to 5,00 %	Factory setting:	0.00 %

Description:

- It sets the modification occurred on the voltage supplied for the inverter cells.
- Set it according to the input transformer tap connections.

NOTE!

- This parameter can be changed only with the motor stopped.
- This parameter is only visible on the HMI when: P1893 (Transformers at the input) = 2 or 3 transformers.

Menu → Configurations → Nominal data → Transformer			
P1558 - Transformer 2 rated power			
Adjustable range:	0 to 10000 kVA	Factory setting:	1500 kVA

Description:

- It sets the rated power of the input transformer, in kVA.
- Set it according to the nameplate data of the transformer used.

NOTE!

- This parameter can be changed only with the motor stopped.
- This parameter is only visible on the HMI when: P1893 (Transformers at the input) = 2 or 3 transformers.

Menu → Configurations → Nominal data → Transformer			
P1559 - Transformer 3 CT Ratio			
Adjustable range:	50 to 3000	Factory setting:	200

Description:

- It sets the ratio of the current transformers used in the measurement of the inverter input current.
- Set it according to the current transformer nameplate data.

Notes:

- It is recommended that the CT primary current be greater than or equal to the transformer primary rated current.
- The CT primary current must be smaller than 1.95 times the transformer primary rated current.

WARNING!
In case the user sets a value in P1550 that is out of the mandatory range, programming error will occur.

NOTE!

- This parameter can be changed only with the motor stopped.
- This parameter is only visible on the HMI when: P1893 (Transformers at the input) = 3 transformers.

Menu → Configurations → Nominal data → Transformer			
P1560 - Taps of transformer 3			
Adjustable range:	-5,00 to 5,00 %	Factory setting:	0.00 %

Description:

- It sets the modification occurred on the voltage supplied for the inverter cells.
- Set it according to the input transformer tap connections.

NOTE!
- This parameter can be changed only with the motor stopped.
- This parameter is only visible on the HMI when: P1893 (Transformers at the input) = 3 transformers.

Menu → Configurations → Nominal data → Transformer			
P1561 - Transformer 3 rated power			
Adjustable range:	0 to 10000 kVA	Factory setting:	1500 kVA

Description:

- It sets the rated power of the input transformer, in kVA.
- Set it according to the nameplate data of the transformer used.

NOTE!
- This parameter can be changed only with the motor stopped.
- This parameter is only visible on the HMI when: P1893 (Transformers at the input) = 3 transformers.

Menu → Configurations → Nominal data → Inverter			
P1565 - Number of redundant cells per phase			
Adjustable range:	0 to 11	Factory setting:	0

Description:

- This parameter specifies the amount of redundant cells in each phase of the inverter.

NOTE!
This parameter can be changed only with the motor stopped.

Menu → Configurations → References			
P1610 - Alternative speed reference for PLC			
Adjustable range:	-32768 to 32767 PU	Factory setting:	0 PU

Description:

- The motor speed reference will assume the value programmed in P1610 when it is greater than 0 and P0221 = 12 (PLC) or P0222 = 12 (PLC).

Menu → Configurations → Functions → Bypass

P1700 - Bypass of the cell U1
P1701 - Bypass of the cell U2
P1702 - Bypass of the cell U3
P1703 - Bypass of the cell U4
P1704 - Bypass of the cell U5
P1705 - Bypass of the cell U6
P1706 - Bypass of the cell U7
P1707 - Bypass of the cell U8
P1708 - Bypass of the cell U9
P1709 - Bypass of the cell U10
P1710 - Bypass of the cell U11
P1711 - Bypass of the cell U12

Adjustable range: 0 to 4 Factory setting: 0

Description:

- It defines whether the respective cell should be removed from the system (option > 0).
- The option 1 should be used when the corresponding cell is replaced by a mechanical bypass cell.
- Option 2 must be used to manually actuate the automatic bypass relay of the cell.
- Option 3 is read-only. Indicates that the respective cell was automatically removed from operation due to a manageable fault.
- Option 4 is read-only. Indicates that the respective cell was automatically removed from operation, because it was linked in parallel (P1892) with another cell that was bypassed.
- Once the parameter is set to 1, 2, 3 or 4, the respective cell can operate again as soon as the user resets the parameter to 0 (Disable).
- Refer to P1500 (Automatic Bypass).

WARNING!
Option 1 must be used after the user has physically verified that the cell in question is assembled in the set and that it has the bypass system.

***Table 5.76** – Bypass of the cell U12*

P1711	Function
0	Disable
1	Mechanical bypass cell
2	Manual activation of the bypass relay
3	Automatic bypass after a manageable fault
4	Automatic bypass by parallel association

NOTE!
This parameter can be changed only with the motor stopped.

Menu → Configurations → Functions → Bypass			
P1712 - Bypass of the cell V1			
P1713 - Bypass of the cell V2			
P1714 - Bypass of the cell V3			
P1715 - Bypass of the cell V4			
P1716 - Bypass of the cell V5			
P1717 - Bypass of the cell V6			
P1718 - Bypass of the cell V7			
P1719 - Bypass of the cell V8			
P1720 - Bypass of the cell V9			
P1721 - Bypass of the cell V10			
P1722 - Bypass of the cell V11			
P1723 - Bypass of the cell V12			
Adjustable range:	0 to 4	Factory setting:	0

Description:

- It defines whether the respective cell should be removed from the system (option > 0).
- The option 1 should be used when the corresponding cell is replaced by a mechanical bypass cell.
- Option 2 must be used to manually actuate the automatic bypass relay of the cell.
- Option 3 is read-only. Indicates that the respective cell was automatically removed from operation due to a manageable fault.
- Option 4 is read-only. Indicates that the respective cell was automatically removed from operation, because it was linked in parallel (P1892) with another cell that was bypassed.
- Once the parameter is set to 1, 2, 3 or 4, the respective cell can operate again as soon as the user resets the parameter to 0 (Disable).
- Refer to P1500 (Automatic Bypass).

WARNING!
Option 1 must be used after the user has physically verified that the cell in question is assembled in the set and that it has the bypass system.

Table 5.77 – *Bypass of the cell V12*

P1723	Function
0	Disable
1	Mechanical bypass cell
2	Manual activation of the bypass relay
3	Automatic bypass after a manageable fault
4	Automatic bypass by parallel association

NOTE!
This parameter can be changed only with the motor stopped.

Menu → Configurations → Functions → Bypass

P1724 - Bypass of the cell W1

P1725 - Bypass of the cell W2

P1726 - Bypass of the cell W3

P1727 - Bypass of the cell W4

P1728 - Bypass of the cell W5

P1729 - Bypass of the cell W6

P1730 - Bypass of the cell W7

P1731 - Bypass of the cell W8

P1732 - Bypass of the cell W9

P1733 - Bypass of the cell W10

P1734 - Bypass of the cell W11

P1735 - Bypass of the cell W12

Adjustable range: 0 to 4 Factory setting: 0

Description:

- It defines whether the respective cell should be removed from the system (option > 0).
- The option 1 should be used when the corresponding cell is replaced by a mechanical bypass cell.
- Option 2 must be used to manually actuate the automatic bypass relay of the cell.
- Option 3 is read-only. Indicates that the respective cell was automatically removed from operation due to a manageable fault.
- Option 4 is read-only. Indicates that the respective cell was automatically removed from operation, because it was linked in parallel (P1892) with another cell that was bypassed.
- Once the parameter is set to 1, 2, 3 or 4, the respective cell can operate again as soon as the user resets the parameter to 0 (Disable).
- Refer to P1500 (Automatic Bypass).

WARNING!
Option 1 must be used after the user has physically verified that the cell in question is assembled in the set and that it has the bypass system.

Table 5.78 – *Bypass of the cell W12*

P1735	Function
0	Disable
1	Mechanical bypass cell
2	Manual activation of the bypass relay
3	Automatic bypass after a manageable fault
4	Automatic bypass by parallel association

NOTE!
This parameter can be changed only with the motor stopped.

Menu → Configurations → I/O → Digital outputs

P1739 - RL8 Function MVC3

Adjustable range: 0 to 2 Factory setting: 0

Description:

- Digital output state can be monitored on parameter P0071 (Status of MVC3 board relay digital outputs RL1 to RL8).

- In option 1, the opening of the output contactor is commanded whenever the PWM is disabled, and the output frequency is greater than 25% of the motor rated frequency. The closing is commanded when the inverter is enabled, and the contactor is open.
- In option 2, the opening of the output contactor is commanded whenever the PWM is disabled. The closing is commanded when the inverter is enabled, and the contactor is open.

NOTE!
When selected options 1 and 2 for output contactor command, MVC3's DI6 is used to monitor the contactor, and it's state can be checked on parameter P0070.

Table 5.79 – *RL8 Function MVC3*

P1739	Function
0	Inactive
1	Operation with filter type 2
2	Operation with permanent magnet machine

NOTE!
This parameter can be changed only with the motor stopped.

Menu → Configurations → Nominal data → Inverter

P1892 - Cells in parallel

Adjustable range: 0 to 2 Factory setting: 0

Description:

- Sets the number of cells operating in parallel.

Table 5.80 – *Cells in parallel*

P1892	Function
0	No parallelism
1	2 cells in parallel
2	3 cells in parallel

NOTE!
This parameter can be changed only with the motor stopped.

Menu → Configurations → Nominal data → Transformer

P1893 - Transformers at the input

Adjustable range: 0 to 2 Factory setting: 1

Description:

- Sets the number of transformers at the inverter input.

Table 5.81 – *Transformers at the input*

P1893	Function
0	1 transformer
1	2 transformers
2	3 transformers

NOTE!
This parameter can be changed only with the motor stopped.

6 SPECIAL FUNCTIONS

6.1 PID REGULATOR

The MVW3000 has the PID regulator function, which can be used to control a closed loop process. That function consists of a controller with proportional, integral and derivative gain, superposed to the normal MVW3000 speed control.

In order to keep the process variable (the one to be controlled - water level in a reservoir, for instance) at the value adjusted with the setpoint, the speed will be varied automatically by the PID regulator.

That regulator is able, for instance, to control the flow in a pipeline by means of flow feedback applied to the analog input AI2 or AI3 (selected through P0524), and setpoint according to the P0221 or P0222 definition (e.g., AI1), with the inverter driving the pump that is responsible for the pipeline flow.

Other application examples are: Level or temperature control, dosage, etc.

The PID regulator function is activated by setting P0203 = 1 or 3. The Figure 6.1 on page 6-3 presents an Academic PID Regulator block diagram. The Academic PID Regulator transfer function in the frequency domain is:

$$y(s) = Kp\, e(s)(1 + \frac{1}{sTi} + sTd)$$

Replacing the integrator by a sum and the derivative by the incremental quotient, we will obtain an approximate value for the discrete (recursive) transfer equation shown next:

$$y(kTa) = y(k\text{-}1)Ta + Kp[(e(kTa) - e(k\text{-}1)Ta) + Ki\, e(k\text{-}1)Ta + Kd(e(kTa) - 2e(k\text{-}1)Ta + e(k\text{-}2)Ta)]$$

Where:
Kp (Proportional Gain): Kp = P0520 x 4096.
Ki (Integral Gain): Ki = P0521 x 4096 = [Ta/Ti x 4096].
Kd (Differential Gain): Kd = P0522 x 4096 = [Td/Ta x 4096].
Ta = 0.02 s (PID regulator sampling period).
SP*: reference, maximum 13 bits (0 to 8191).
X: process variable (or controlled), read through AI2 or AI3, maximum 13 bits.
e(kTa): current output.
y(kTa): current PID output, maximum 13 bits.
y(k-1)Ta: previous PID output.
e(kTa): current error [SP*(k) - X(k)].
e(k-1)Ta: previous error [SP*(k-1) - X(k-1)].
e(k-2)Ta: error at two previous samplings [SP*(k-2) - X(k-2)].

The feedback signal must be connected to the analog input AI2’ and AI3’ (see Figure 6.1 on page 6-3).

Setpoint can be defined via:

- Keypad: parameter P0525.
- Analog inputs AI1’, AI2’, AI3’, AI4’, AI5’, (AI1’ + AI2’) > 0, (AI1’ + AI2’), Multispeed, Serial, Fieldbus.

Note: When P0203 = 1 or 3, do not use the reference via P.E. at P0221/P0222 = 7.

When the PID function is enabled (P0203 = 1 or 3):

- One of the digital inputs from DI3 to DI10 can select between manual and automatic PID operation (P0265 to P0272).
- When the PID regulator function is activated (P0203 = 1 or 3), the digital input DI3 is automatically programmed for the Manual/Automatic function (P0265 = 15):

Table 6.1 – *DIx operation mode*

DIx	Action type
0 (0 V)	Manual
1 (24 V)	Automatic

P0040 indicates the process variable value (feedback) in the selected scale and unit. In order to avoid the feedback analog input saturation during the regulation overshoot, the signal must vary between 0 and 9.0 V (0(4) to 18 mA). The adaptation between the setpoint and the feedback can be done changing the gain of the analog input selected as feedback (P0238 for AI2 or P0242 for AI3). The Process variable can also be visualized at the outputs AO1 to AO6, provided that programmed at P0251, P0253, P0255, P0257, P0259 and P0261. This is also valid for the PID setpoint.

The outputs DO1, DO2 and RL1 to RL5 can be programmed (P0275 to P0277, P0279 to P0282) for the functions Process Variable > VPx (P0533)" and Process Variable < VPy (P0534)".

The functions JOG and Forward/Reverse remain disabled. Enable and Start/Stop commands are defined at P0220, P0224 and P0227.

If the setpoint is defined by P0525 (P0221 or P0222 = 0), and the system is changed from manual to automatic, then P0525 is automatically adjusted with the P0040 value. In this case the transition from manual to automatic is smooth (there is no sudden speed variation).

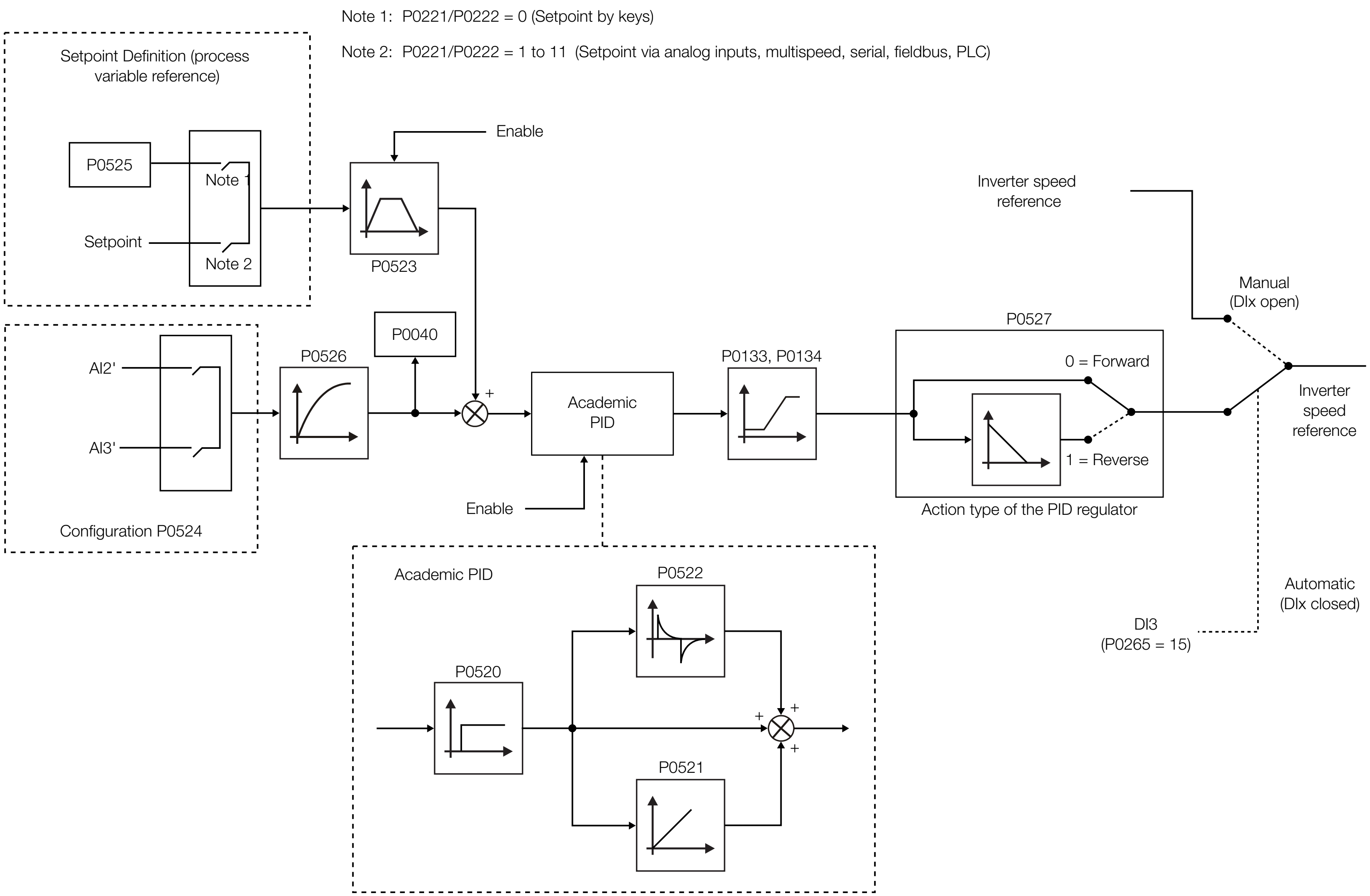


***Figure 6.1** – Academic PID regulator block diagram*

7 COMMUNICATION NETWORKS

The MVW3000 can be connected to communication networks allowing control and parameter setting.

For the MVW3000 to communicate on the Profibus DP, DeviceNet, Ethernet/IP or PROFINET network, it is necessary to use a communication board provided via an optional kit with the desired Fieldbus standard.

7.1 FIELDBUS

Profibus DP-V0 fieldbus kit (code 10932880)

Quantity	Description	Code
1	ABS Profibus DP communication board	10413436
1	Connection cable	10050246

Profibus DP-V1 fieldbus kit (code 10933427)

Quantity	Description	Code
1	ABS Profibus DP-V1 communication board	10413449
1	Connection cable	10050246

DeviceNet fieldbus kit (code 10932883)

Quantity	Description	Code
1	ABS DeviceNet communication board	10413435
1	Connection accessory	10413374

DeviceNet Drive Profile fieldbus kit (code 10933426)

Quantity	Description	Code
1	ABS DeviceNet communication board	10413437
1	Connection accessory	10413374

Ethernet/IP fieldbus kit (code 10933495)

Quantity	Description	Code
1	ABS Ethernet/IP communication board	10193758

Profinet fieldbus kit (code 13760262)

Quantity	Description	Code
1	ABS PROFINET IO communication board	13759351

NOTE!

- For communication with Modbus-TCP/IP protocol, use the Ethernet/IP fieldbus kit.
- The chosen Fieldbus option can be specified in the appropriate field of the MVW3000 coding. In this case, the user receives the MVW3000 with all the necessary components already installed on the product. In the subsequent purchase of the optional fieldbus kit, the installation must be done by the user himself.

7.1.1 Introduction

This chapter provides the necessary description for network operation of the MVW3000, using the optional communication board for Profibus DP, DeviceNet, Ethernet/IP and PROFINET. The subjects covered in this item include:

- Description of the communication kit.
- Features of the MVW3000 in a fieldbus network.
- Parameterization of the MVW3000.

- Operation of the MVW3000 via fieldbus interface.
- Errors and possible causes.

FIELDBUS NETWORK

“Fieldbus” is a generic term used to describe a digital communication system connecting various equipment in the field, such as sensors, actuators and controllers. A fieldbus network functions like a local communication network.

Currently, there are several different protocols used for communication between devices in the field, including the Profibus DP, DeviceNet, Ethernet/IP and PROFINET protocols. In this item, which deals with the use of communication boards for the Profibus DP, DeviceNet, Ethernet/IP and PROFINET protocols, the term fieldbus will be used to generically designate these protocols.

ABBREVIATIONS AND DEFINITIONS

CAN	Controller Area Network
DP-V0	Decentralized Periphery Version 0
DP-V1	Decentralized Periphery Version 1
I/O	Input / Output
ODVA	Open DeviceNet Vendor Association
PLC	Programmable Logic Controller
HMI	Human-Machine-Interface

NUMERICAL REPRESENTATION

- Decimal numbers are represented by means of digits without suffix.
- Hexadecimal numbers are represented with the letter ‘h’ after the number.

7.1.2 Installation

7

The communication board that forms the Fieldbus kit is directly installed on the MVC4 control board, connected to the XC140 connector and fixed by spacers.

NOTE!
Follow the safety instructions in Chapter 2 SAFETY INSTRUCTIONS on page 2-1 .

If a function expansion board (EBA/EBB) is already installed, it is necessary to remove it temporarily.

1. Power down the control rack.
2. Remove the screw attached to the metal spacer next to THE XC140 connector (MVC4).
3. Carefully insert the pin bar connector of the Fieldbus electronic board into the XC140 female connector of the MVC4 control board. Check the exact match of all the pins of the XC140 connector according to Figure 7.1 on page 7-3 .
4. Press the board close to XC140 and on the lower right corner until the connector and plastic spacer are completely inserted.
5. Fix the board to the metal spacer using the screw.
6. Connect one end of the cable to the control rack the MVW3000, and the other end to the Fieldbus board

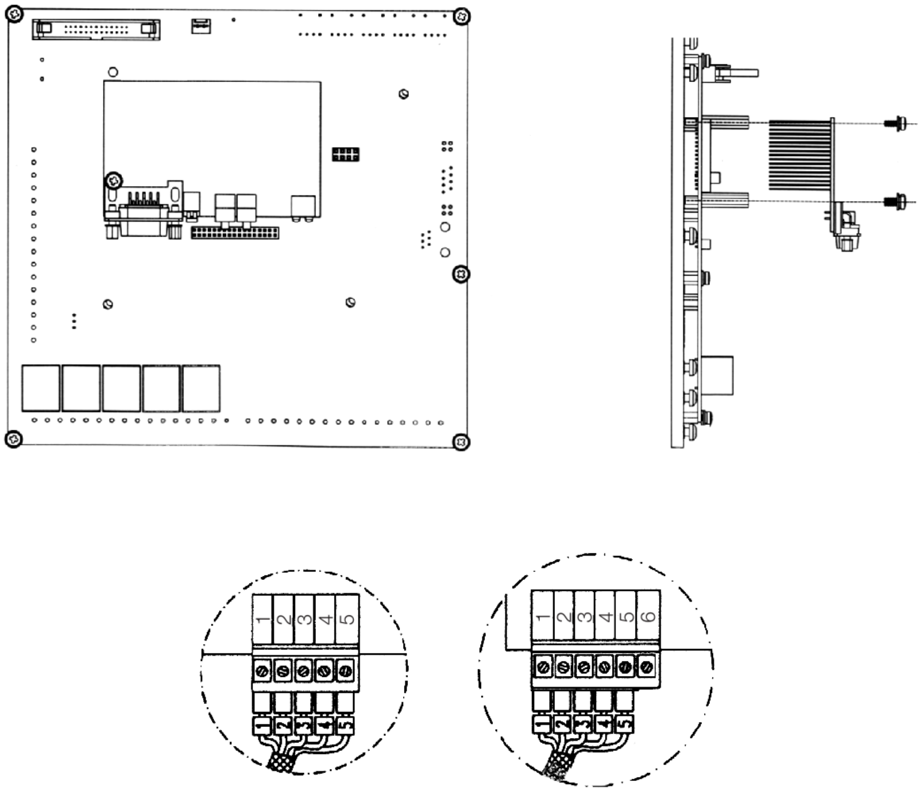


Figure 7.1 – *Installing the Fieldbus electronic board*

7.1.3 Fieldbus communication parameters

The MVW3000 has a set of parameters, described below, for setting the device on the Fieldbus network. Before starting the network operation, it is necessary to configure these parameters so that the inverter operates as desired.

P0309 - Fieldbus			
Adjustable range:	0 to 13	Factory setting:	0

This parameter allows enabling the fieldbus board and setting the number of words communicated between the MVW3000 and the network master.

P0309	Function
0	Inactive
1	Profibus DP 2 I/O
2	Profibus DP 4 I/O
3	Profibus DP 6 I/O
4	DeviceNet 2 I/O
5	DeviceNet 4 I/O
6	DeviceNet 6 I/O
7	Modbus-RTU 2 I/O
8	Modbus-RTU 4 I/O
9	Modbus-RTU 6 I/O
10	DeviceNet Drive Profile
11	Ethernet 2 I/O
12	Ethernet 4 I/O
13	Ethernet 6 I/O

It is possible to select three different communication options, containing 2, 4 or 6 input/output words (2, 4 or 6 words, where 1 word = 2 bytes). The content of each word is described in the Section 7.1.9 Operation via network

on page 7-24 .

NOTE!
The Ethernet settings include the Ethernet/IP, Profinet-IO and Modbus TCP/IP protocols.

P0313 - Disabling with alarm A128, A129 and A130

Adjustable range: 0 to 13 Factory setting: 0

If the drive is being controlled via network, and a problem communicating with the master occurs (cable break, power failure, master failure, etc.), it will not be possible to send a command via network to disable the device. In applications where that is an issue, it is possible to program an action in P0313 that the MVW3000 will automatically execute in case of a network failure.

Table 7.1 – *Communication error action*

P0313	Function
0	Stop by ramp
1	General disable
2	No action
3	Go to LOC
4	Reserved
5	Fault

For fieldbus communication, errors 129 (Fieldbus Connec. Inactive) and error 130 (Fieldbus board inactive) are considered communication errors.

- **0 - Disable via Run/Stop**: It disables the motor by deceleration ramp in case of a communication error.
- **1 - Disable via general enable**: In this option, the MVW3000 cuts off the power to the motor, which should coast to a stop.
- **2 - Inactive**: if one of the errors previously mentioned occurs, the drive remains in its current state and only indicates the error.
- **3 - Go to LOCAL**: If you are operating in REMOTE mode, and a communication error occurs, it will automatically go to LOCAL mode.
- **5 - Fault**: Upon detecting a communication fault, it will go to the error state, the motor will be disabled, and the error indication will only be removed after resetting the device errors.

7

NOTE!
The *Disable via Run/Stop* and *Go to LOCAL* commands can only be executed if they are being controlled via fieldbus. This setting is done through parameters P0220 (LOCAL/REMOTE selection source), P0224 (Start/Stop Selection LOCAL Situation) and P0227 (Start/Stop Selection REMOTE Situation).

LOCAL setting:

P0220 - LOCAL/REMOTE selection source

P0221 - Speed reference selection LOCAL situation

P0223 - Forward/Reverse Selection LOCAL Situation

P0224 - Start/Stop Selection LOCAL Situation

P0225 - Selection of JOG Source LOCAL Situation

REMOTE setting:

P0220 - LOCAL/REMOTE selection source

P0222 - Speed reference selection REMOTE situation

P0226 - Selection of Direction of ROTATION REMOTE Situation

P0227 - Start/Stop Selection REMOTE Situation

P0228 - JOG Selection - REMOTE Situation

These parameters define the source of commands and references for the inverter in the LOCAL and REMOTE modes.
For the commands that will be controlled via network, set it in the “Fieldbus” option.

P0275 - DO1 Function

P0276 - DO2 Function

P0277 - RL1 Function

P0279 - RL2 Function

P0280 - RL3 Function

P0281 - RL4 Function

P0282 - RL5 Function

These parameters define the function of the inverter digital outputs.
For the digital outputs that will be controlled via network, set it in the “Fieldbus” option.

7.1.4 Profibus DP

The term Profibus is used to describe a digital communication system that can be used in several application fields. It is an open and standardized system, defined by IEC 61158 and IEC 61784 standards, which covers from the physical medium used to data profiles for certain device sets.
In this system, the DP communication protocol was developed to allow fast, cyclical and deterministic communication between masters and slaves.

Among the various communication technologies that can be used in this system, Profibus DP technology means a solution that is typically composed of the DP protocol, RS-485 transmission medium and application profiles, used mainly in applications and devices focused on manufacturing automation.

Currently, there is an organization called Profibus International, responsible for maintaining, updating and disseminating Profibus technology among users and members. Further information regarding the technology, as well as the complete protocol specification, can be obtained from this organization or from one of the regional associations or centers of competence linked to the Profibus International.

7.1.4.1 Baud rates

The Profibus DP protocol defines a series of baud rates that can be used, from 9.6 Kbit/s to 12 Mbit/s. The maximum length of the transmission line depends on the baud rate used, and this relationship is shown in Table 7.2 on page 7-6 .

Table 7.2 – Baud rate and cable length

Baud rate [kbps]	Maximum cable length [m]
9.6	1200
19.2	1200
45.45	1200
93.75	1200
187.5	1000
500	400
1500	200
3000	100
60000	100
12000	100

The communication board of the MVW3000 has automatic baud rate detection, according to the settings of the network master, and setting this option is not required.

7.1.4.2 Addressing

The Profibus DP protocol allows connecting up to 126 devices to the network, among masters and slaves, with addresses from 0 (zero) to 125 (addresses 126 and 127 are reserved). Each device on the network must have a different address.

The MVW3000 has two rotating switches that allow selecting the address on the Profibus DP network from 0 (zero) to 99. The drive address is formed by the values of those switches, where the left rotating switch (next to the Profibus connector) provides the tens digit, while the right rotating switch (next to the LED indicators) provides the units digit.

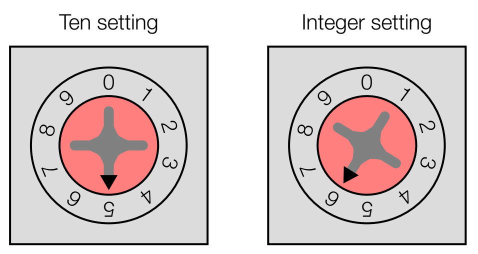


Figure 7.2 – Example showing how to set address 56 on the Profibus DP board

7.1.4.3 LED indicators

The Profibus DP communication board has four LEDs for the device diagnostics.

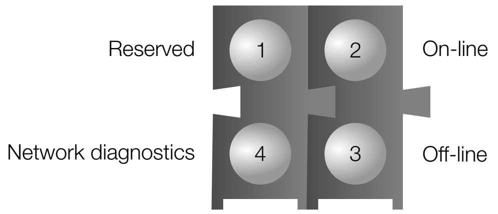


Figure 7.3 – Profibus DP network status LEDs

Table 7.3 – Network status LED indicators

LED	Color	Function
On-line	Green	**Off:** drive is not online **On:** drive is online
Off-line	Red	**Off:** drive is not offline **On:** drive is offline
Network diagnostics	Red	**Off:** without diagnostics **Flashing 1 Hz:** error in the setting of the number of input and/or output words communicated with the master **Flashing 2 Hz:** error in parameter data communicated via network (not used) **Flashing 4 Hz:** error in the initialization of the component responsible for processing the Profibus communication (ASIC)

7.1.4.4 Connector

To connect to the network, the fieldbus kit for Profibus DP of the MVW3000 has a connecting cable with a 6-way plug-in connector at one end that must be connected to the communication board, and a DB9 female connector at the other end used for connection to the Profibus DP bus. The pinout of these connectors follows the description in Table 7.4 on page 7-7 .

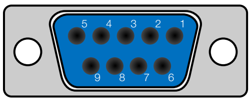


Table 7.4 – Connection of (DB9) pins for Profibus DP

Pin	Description	Function
1	Not connected	-
2	Not connected	-
3	B-Line	Positive RxD/TxD, according to RS-485 specification
4	Not connected	-
5	GND	0 V isolated from the RS-485 circuit
6	+5 V	+5 V isolated from the RS-485 circuit
7	Not connected	-
8	A-Line	Negative RxD/TxD, according to RS-485 specification
9	Not connected	-
Frame	Shield	Connected to the protective earth (PE)

7.1.4.5 Profibus DP cable

In the installation, it is recommended to use type A cable, whose characteristics are described in Table 7.5 on page 7-7 . The cable has a pair of wires that must be shielded and twisted to ensure greater immunity to electro-magnetic interference.

Table 7.5 – Properties of type A cable

Impedance	135 to 165 Function
Capacitance	30 pf/m
Resistance and loop	110/km
Cable diameter	> 0.64 mm
Wire cross section	> 0.34 mm

7.1.4.6 Connection of the drive to the network

The Profibus DP protocol, using RS485 physical medium, allows connecting up to 32 devices per segment without repeaters. With repeaters, up to 126 addressable devices can be connected to the network. Each repeater must also be included as a device connected to the segment, although it will not take an address in the network.

It is recommended that all the devices present on the Profibus DP network be connected from the main bus. In general, the connector of the Profibus network itself has one input and one output for the cable, allowing the connection to be taken to the other points of the network. Shunts from the main line are not recommended, especially for baud rates greater than or equal to 1.5 Mbit/s.

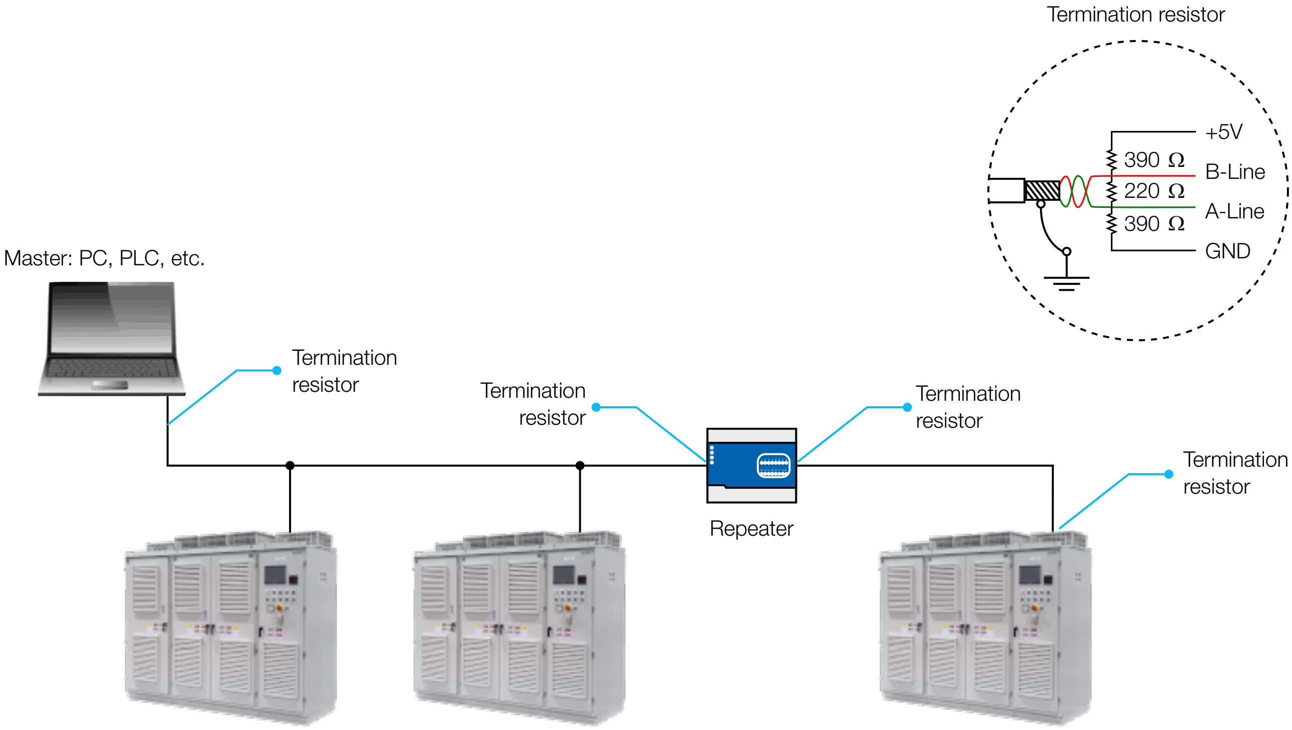


Figure 7.4 – *MVW3000 on Profibus DP network*

The Profibus DP network cable must be routed separately (and if possible distant) from the power supply cables. All drives must be properly grounded, preferably on the same connection with the ground. The Profibus cable shield must also be grounded. The DB9 connector of the Profibus board of the MVW3000 already has a connection to the protective earth and, thus, connects the shield to the ground when the Profibus connector is connected to the drive. However, a better connection, by means of fixing clamps between the shield and a grounding point, is also recommended.

7.1.4.7 Termination resistor

For each segment of the Profibus DP network, it is necessary to enable a termination resistor at the ends of the main bus. The communication board of the MVW3000 itself has a switch for enabling the resistor, which should only be enabled (ON position) if the drive is the first or the last element in the segment.

That switch must also remain disabled if the Profibus DP network connector already has the termination resistor enabled.

It is worth to mention that, to allow disconnecting the element from the network without damaging the bus, it is recommended to place active terminations, which are elements that just play the role of the termination. Thus, any drive on the network can be disconnected from the bus without damaging the termination.

7.1.4.8 Configuration file (GSD file)

Every element of the Profibus DP network has an associated configuration file with GSD extension. This file describes the features of each device, and it is used by the configuration tool of the Profibus DP network master. During the master configuration, the GSD configuration file, supplied with the equipment, must be used.

The communication board used by the MVW3000 was developed by the company HMS Industrial Networks AB.

Therefore, in the network configuration software, the product will not be recognized as MVW3000 but as “AnyBus-S PDP” or “AnyBus-S Profibus DPV1” in the “General” category.

7.1.4.9 Profibus DP-V1 – Parameters access

The DP-V1 communication kit supports class 1 and 2 DP-V1 services. By using these services, in addition to the exchange of cyclic data, it is possible to read/write on parameters through DP-V1 acyclic functions, via both the network master and a commissioning tool. Parameters are mapped based on the index and slot addressing, as shown in the equation below:

- Slot: (parameter number - 1) / 255.
- Index: (parameter number -1) MOD 255.

Example: Parameter P0100 will be identified through acyclic messages as located in slot 0, index 99.
Parameter P0312 will be identified through acyclic messages as located in slot 1, index 57.

The value for the parameters is always communicated with a size of 2 bytes (1 word). The value is also transmitted as an integer, without a decimal point, and its representation depends on the resolution used.

Example: P0003 = 3.6 A → The value read via network is 36.

7.1.5 DeviceNet

Initially developed by Allen-Bradley in 1994, the DeviceNet communication protocol is used to interconnect controllers and industrial devices, such as sensors, valves, starters, barcode readers, frequency inverters, panels and operating interfaces. Currently, there are several suppliers of PLCs, processors and devices for communication.

One of the main characteristics of the DeviceNet network is that it uses the so-called CAN - Controller Area Network to transmit and receive telegrams. The CAN bus is composed of a pair of wires that transmit a differential electrical signal, responsible for sending the communication signal to all devices connected to the bus.

The DeviceNet protocol is an open protocol, and it is possible to obtain any information about this technology to develop devices for communication. Currently, ODVA (Open DeviceNet Vendor Association) is the organization that manages the specifications of the DeviceNet network for its development.

7.1.5.1 Baud rates and address

To set the baud rate and the address of the MVW3000 on the network, the DeviceNet communication board has a set of eight switches, which have the following function:

Baud rate [kbits/s]	DIPs 1...2
125	00
250	01
500	10
Reserved	11

Address	DIPs 3...8
0	000000
1	000001
...	...
62	111110
63	111111

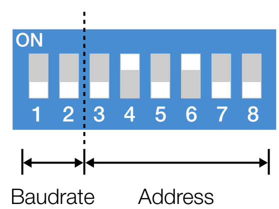


Figure 7.5 – *Settings of the baud rate and address for DeviceNet*

The DeviceNet protocol defines three baud rates that can be used: 125, 250 and 500 Kbit/s. All devices connected to the network must be set to operate at the same baud rate. For the MVW3000, this setting is done using switches 1 and 2 located on the communication board.

A device on the DeviceNet network can take the addresses from 0 (zero) to 63. For the MVW3000, this setting is done using switches 3 to 8 located on the communication board. Each device on the network must have a different address from the others.

NOTE!
The baud rate and the address of the MVW3000 on the network are only updated when the device is powered up. Therefore, if changes are made to those settings, the device must be turned off and back on.

7.1.5.2 LED indicators

The DeviceNet communication board has a set of four LEDs for device diagnostics. The description of each LED function is shown in Table 7.6 on page 7-10.

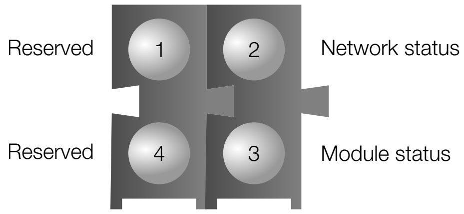


***Figure 7.6 –** LEDs for indicating the DeviceNet network status*

***Table 7.6 –** Network status LED indicators*

LED	Color	Function
Network Status	Green or red	**Off:** No power/offline **Green:** Online, connected **Red:** Fault **Flashing green:** Online, not connected **Flashing red:** Connection timeout
Module Status	Green or red	**Off:** No power/offline **Green:** Operating board **Red:** Fault **Flashing red:** Manageable fault

LED 3 provides information about the communication board only, and its normal state should be solid green. LED 2 provides information about the connection to the network, and whether the device is communicating with the master or not. Its normal state should be solid green. Variations in this LED may indicate problems in the connection with the bus or in the settings of the network master.

7.1.5.3 Connector and cables

The fieldbus kit for DeviceNet of the MVW3000 has a female 5-way plug-in connector that must be used to connect to the bus. The pinout of this connector, as well as the standard color used in DeviceNet cables, follows the description of the following table.

Pin	Description	Color
1	V-	Black
2	CAN_L	Blue
3	Shield	
4	CAN_H	White
5	V+	Red

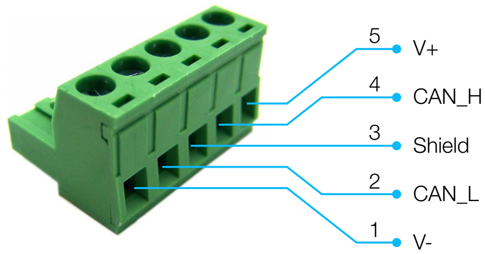


Figure 7.7 – *Connector for the DeviceNet network*

To connect the various devices to the network, it is recommended to use a shielded cable with two twisted pairs: one pair of wires to transmit communication signals (CAN_L and CAN_H) and another for the power supply signal (V- and V+). Note that the maximum cable size allowed depends on the baud rate and the type of cable used. The following table shows the relationship between the baud rate used and the maximum cable length.

Table 7.7 – *Maximum DeviceNet cable length*

Cable type	Baud rate		
	125 kbps	250 kbps	500 kbps
Thick cable	500 m	250 m	100 m
Thin cable	100 m	100 m	100 m
Maximum length per shunt	6 m	6 m	6 m
Maximum cumulative shunt length	156 m	78 m	39 m

7.1.5.4 Bus power supply

As previously mentioned, one of the characteristics of the DeviceNet network is that the network cable itself must have a pair of wires to send a supply voltage to all devices connected to the bus. This voltage is used to feed the network interface circuit. For the communication board of the MVW3000, the current and voltage data used to size the source are provided in the following table.

7

Supply voltage (Vdc)			Current consumption (mA)		
Minimum	Maximum	Recommended	Minimum	Maximum	Typical
11	25	24	-	30	25

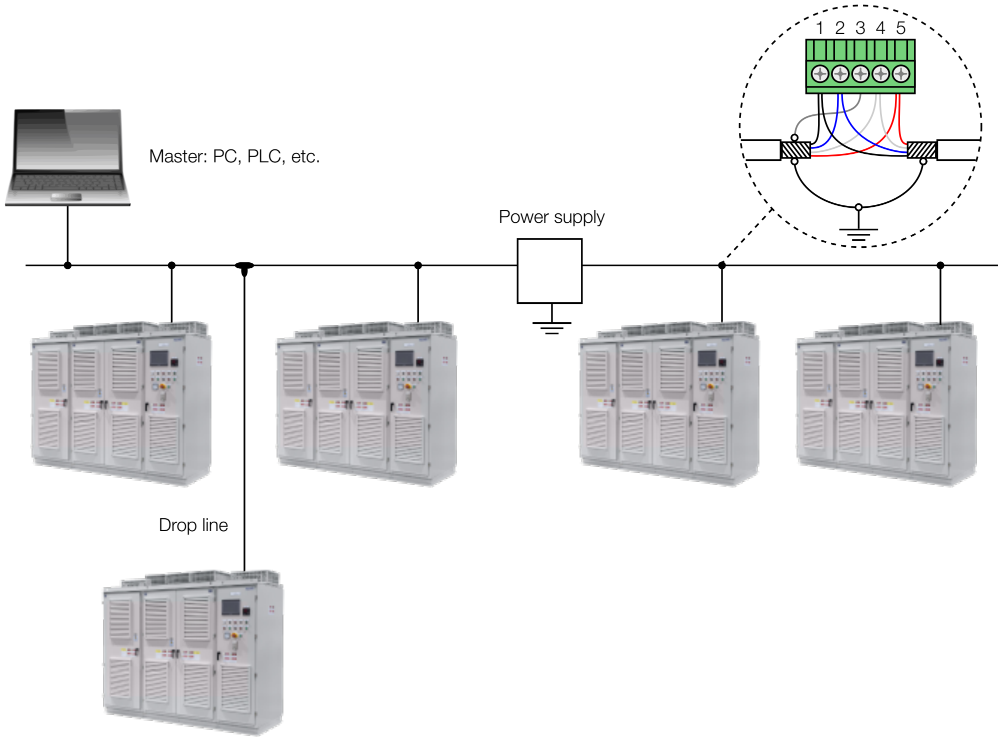


Figure 7.8 – MVW3000 on DeviceNet network

The DeviceNet network cable must be routed separately (and if possible distant) from the power supply cables. All drives must be properly grounded, preferably on the same connection with the ground. The shield of the DeviceNet cable must be grounded at a single point near the source that supplies power to the bus.

7.1.5.5 Termination resistors

For the DeviceNet network, it is necessary to install 121Ω/0.25 W termination resistors at the ends of the main bus. Each resistor must connect the CAN_H and CAN_L signals (pins 2 and 4 of the connector), and they may be placed on the connector that connects the device to the network.

7.1.5.6 Data types

The DeviceNet network allows different connections types to exchange data between the network master and other devices. For the MVW3000, the connection types available to transmit I/O data depend on the communication kit used:

- DeviceNet fieldbus kit: only Polled messages can be communicated.
- DeviceNet Drive Profile fieldbus kit: Polled or Change of State & Cyclic messages can be communicated.

Those connection types are set using a configuration tool of the DeviceNet network master, so that the MVW3000 can communicate correctly with the master. The amount of data that must be set depends on the value set at parameter P0309 (Fieldbus).

7.1.5.7 Configuration file (EDS file)

Every element of the Profibus DP network has an associated configuration file with EDS extension. This file describes the features of each device, and it is used by the configuration tool of the Profibus DP network master. When setting the master, the EDS configuration file, supplied with the device, must be used.

The EDS file to be used also depends on the communication kit used:

- DeviceNet fieldbus kit: you must use the EDS file provided in the ”DeviceNet” directory, on the CD-ROM that comes with the product. For this kit, the product will not be recognized as MVW3000 but as “AnyBus-S DeviceNet” in the “Communications Adapter” category.
- DeviceNet Drive Profile fieldbus kit: you must use the EDS file provided in the “DeviceNet Drive Profile” directory on the CD-ROM that comes with the product. It is important to check the software version of the MVW3000, which must match the version indicated in the EDS file name.

7.1.5.8 Parameter setting via Acyclic Data

The DeviceNet Drive Profile fieldbus kit, in addition to the I/O data communicated cyclically with the master, also allows setting the parameters of the MVW3000 through acyclic data. The EDS file for this communication kit provides information about the parameters of the device and can be used by a commissioning tool to view or edit the value of the parameters. To that end, it is important to check the software version of the MVW3000, which must match the version indicated in the EDS file name.

7.1.6 Ethernet

Ethernet/IP (Industrial Ethernet Protocol) is a communication system suitable for industrial environments. This system allows exchanging critical or time-restricted application data between industrial devices. Ethernet/IP is available for both simple devices such as sensors/actuators and complex devices such as robots, welders, PLCs, HMIs and drives.

EtherNet/IP uses CIP (Common Industrial Protocol) at the application layer. This is the same protocol used by DeviceNet™ and ControlNet™, which arranges the devices as a set of objects and defines methods and procedures for data access. In addition, it uses the standard IEEE 802.3 Ethernet at the lower layers and the TCP/IP and UDP/IP protocols at the intermediate layers to carry CIP packets.

Therefore, the infrastructure used by Ethernet/IP is the same as the one used by corporate Ethernet computer networks. This fact considerably expands the control and monitoring methods of devices connected to the network, such as:

- Availability of application protocols (HTTP, FTP, etc.).
- Integration of the industrial network from the production line to the office network.
- It is based on a widely spread and accepted standard.
- Greater data flow than the protocols normally used in industrial automation.

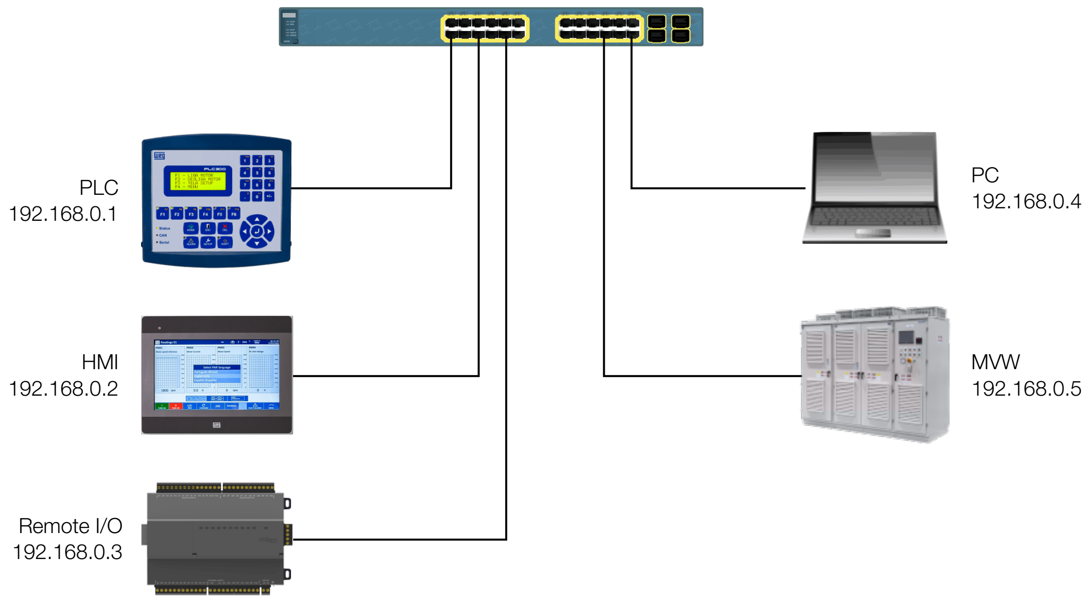


Figure 7.9 – *Example of an Ethernet network*

7.1.6.1 Connector

Connector: socket for 8-way RJ-45 plug.

Pinout: there are two patterns for straight-through Ethernet cables: T-568A and T-568B. The cable to be used must follow one of these two standards. In addition, a single standard should be used to make the cable. That is, the plugs at the ends of a cable must be crimped according to standard T-568A or T-568B.

RJ-45 Plug T-568A Standard

Pin	Wire color	Signal
1	White/Green	TX+
2	Green	TX-
3	White/Orange	RX+
4	Blue	-
5	White/Blue	-
6	Orange	RX-
7	White/Brown	-
8	Brown	-

RJ-45 Plug T-568B Standard

Pin	Wire color	Signal
1	White/Orange	TX+
2	Orange	TX-
3	White/Green	RX+
4	Blue	-
5	White/Blue	-
6	Green	RX-
7	White/Brown	-
8	Brown	-

Figure 7.10 – *Standards for Ethernet straight-though cables (Straight-Through)*

7.1.6.2 Line termination

In Ethernet 10BASE-T (10 Mbps) or 100BASE-TX (100 Mbps), the termination is already done on the communication board and also on any other device that uses peer-to-peer twisted pair. Therefore, no additional settings to the MVW3000 are necessary.

7.1.6.3 Baud rate

the MVW3000 can operate on Ethernet networks at rates of 10 Mbps or 100 Mbps and in half-duplex or full-duplex mode. When it operates at 100 Mbps full-duplex, the effective rate doubles to 200 Mbps. Those settings are made in the network configuration and programming software. No setting is required on the board.
It is recommended to use the autosensing function of those parameters.

7.1.6.4 Configuration file (EDS file)

Each device on an Ethernet/IP network is associated with an EDS file that contains information about its operation. This file provided with the product is used by the network configuration program.

7.1.6.5 Data settings

When setting the master, besides the IP address used by the EtherNet/IP board, it is necessary to indicate the number of I/O instances and the quantity of data exchanged with the master in each instance. For the MVW3000 with Anybus-S Ethernet/IP board, the following values must be set:

- Input instance (input): 100
- Output instance (output): 150
- Quantity of data: programmable via P0309, which can be 2, 4 or 6 words of 16 bits (4, 8 or 12 bytes).
- The EtherNet/IP board is described on the network as Generic Ethernet Module. Using those settings, it is possible to set the master of the network to communicate with the MVW3000.

7.1.6.6 LED indicators

The communication board has four bicolor LEDs grouped on the lower right corner that indicate the status of the module and Ethernet/IP network.

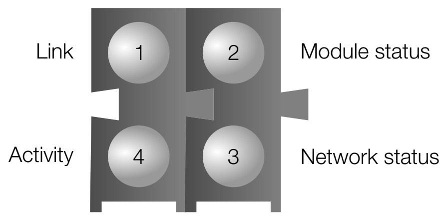


Figure 7.11 – *LEDs for indicating the status of the Ethernet/IP network*

Table 7.8 – Network status LED indicators

LED	Color	Function
Link	Green	**Off:** Not connected **On:** Connected
Module status	Green or red	**Off:** No power **Green:** Operating correctly **Red:** Fault **Flashing green:** Module not set, or network master in IDLE **Flashing red:** Manageable fault **Flashing green/red:** running self-diagnosis
Network status	Green or red	**Off:** No power/IP address not set **Green:** Ethernet/IP connection established **Red:** Duplicate IP address **Flashing green:** No connections allocated **Flashing red:** Timeout **Flashing green/red:** running self-diagnosis
Activity	Green	**Flashing green:** Receiving and/or transmitting

NOTE!
The communication board that comes with the product was developed by the company HMS Industrial Networks AB. Therefore, in the network configuration software the product will not be recognized as MVW3000, but as "Anybus-S Ethernet/IP" in the category "Communication Adapter".
The distinction will be based on the device address on the network.

7.1.6.7 WEB control and monitoring

The Ethernet/IP communication board has an internal HTTP server. This means that it is capable of serving HTML pages. Thus, you can set network parameters, control and monitor the MVW3000 through a WEB browser installed on a computer on the same network as the drive. This operation is done using the same reading/writing variables of the MVW3000; (see Section 7.1.9 Operation via network on page 7-24).

NOTE!
For the first access via WEB, use the factory default username and password.
Username: web
Password: web.

Figure 7.12 – WEB input screen

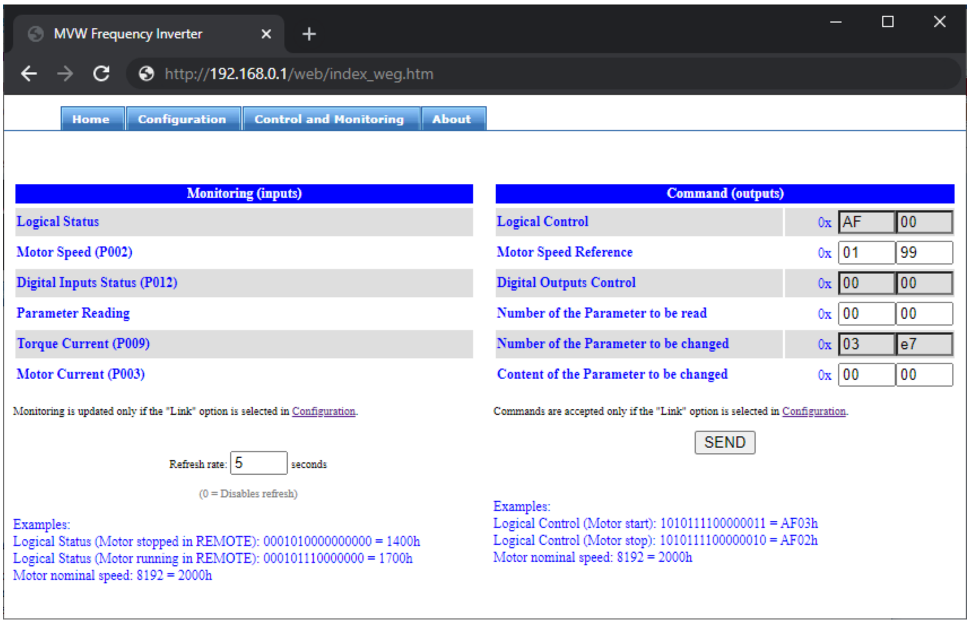


Figure 7.13 – WEB input screen

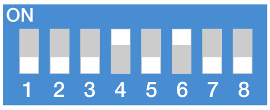
NOTE!
A PC with an Ethernet board connected to the same network as the MVW3000 and an Internet browser (MS Internet Explorer or Mozilla/Firefox) are required.
For better compatibility, it is recommended to use the Internet Explorer browser version 8 or earlier.

7.1.6.8 Settings

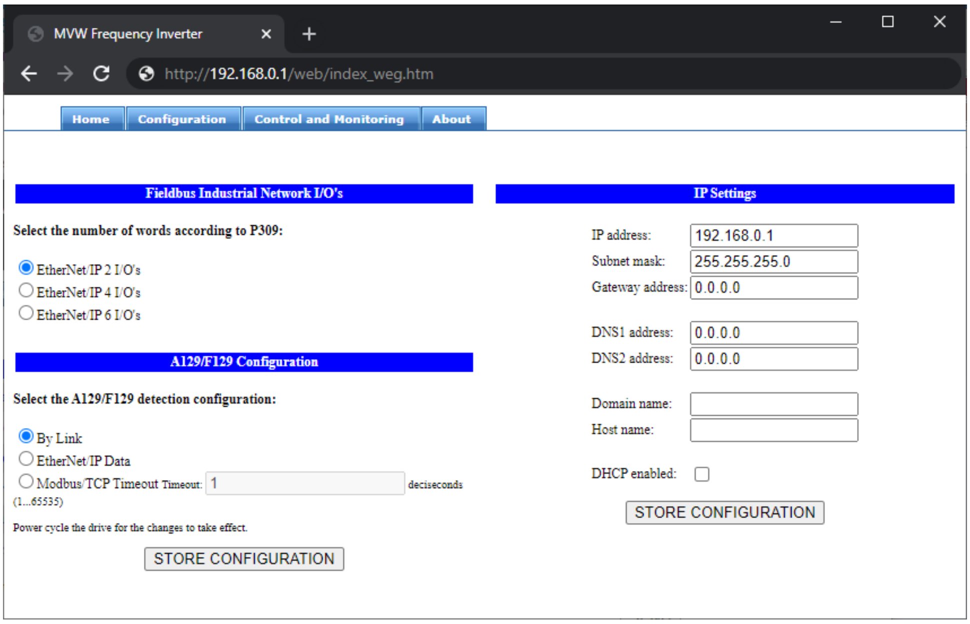
To operate the MVW3000 on an Ethernet/IP network, follow the steps below:

1. Install the KFB-ENIP kit on the MVW3000.
2. Using parameter P0309, select the Ethernet protocol and the number of input/output words.

3. Connect the RJ-45 plug of the Ethernet network cable to the MVW3000 and make sure the Link indicator LED is lit (LED 1).
4. Open the browser and enter the address of the MVW3000 on the network – the factory default is 'http://192.168.0.1'. Make sure your browser supports javascript and cookies enabled.
5. On the 'configuration' tab of the displayed web page, set the network parameters in 'Network Parameters' if necessary.
   a) If the address of the MVW3000 on the network belongs to the reserved range '192.168.0.X', use the board dip-switch for addressing. In this case, the switch represents the binary value of the last byte of the address.
   Example:



   The dip-switch above is set to 0001 0100 (20 in decimal).
   Therefore, the address of the MVW3000 on the network is 192.168.0.20.
   b) If the MVW3000 has an IP address different from the default range (192.168.0.X), disable the hardware addressing via dip-switch by placing it in the zero position (00000000).
   c) If the network addressing is done through a DHCP server, check the 'DHCP enabled' box and set the dip-switch position to zero (00000000).
   d) Click on the 'STORECONFIGURATION' button to save the settings.



6. Also set the content of parameter P0309 (Fieldbus).
   a) For the Online/Offline status modification to be effected when the Link status changes, select the 'Link' option.
   b) For the Online/Offline status modification to be effected when there are no telegrams being exchanged with the Ethernet/IP master, select the 'EtherNet/IP' option.
   c) For the Online/Offline status modification to be effected when there are no telegrams in the MVW3000 being exchanged with the Modbus master for a certain time, select the 'Modbus' option and set the Timeout according to the application.
   d) Click on the 'STORECONFIGURATION' button to save the settings.

Restart the MVW3000.

7.1.6.9 Communication board access

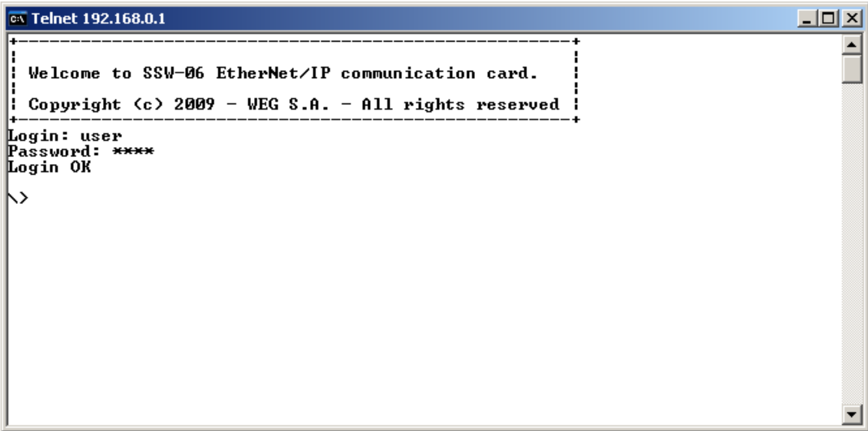
The communication board allows access via FTP and Telnet. Thus, you can transfer files to/from the board and also access the file system in an interactive way.

To use such services, proceed as follows:

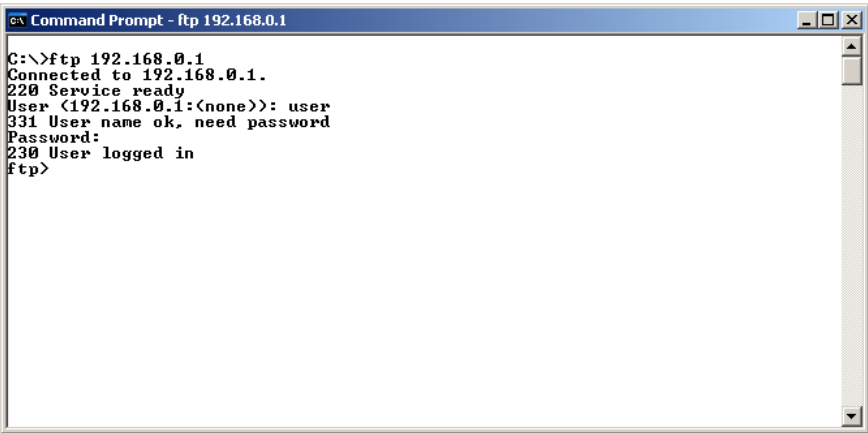
- Open an MS-DOS command window.
- Enter the desired service (FTP or Telnet) followed by the IP or hostname of the MVW3000 on the network.
- Enter: Username: **user** Password: **user**

Examples:

Telnet session to the MVW3000 whose IP address is 192.168.0.1



FTP session for the MVW3000 whose IP address is 192.168.0.1



7.1.6.10 Security and access passwords

The communication board file system has two security levels for the users; **admin** and **normal**.

It is allowed to connect in normal mode only. In this case, the users are restricted to the directory 'user\',where it is possible to create or delete files and/or folders. The accounts of users of this level defined in the file 'sys_pswd.cfg' that is located under directory 'user\pswd\'. Each line in this file contains a 'login: password' pair that corresponds to a user account.

To change it, create, with a simple text editor (Windows Notepad, for example), a file that contains a 'login: password' pair in each line. The two words must be separated by a colon.

Note that there is no password encryption mechanism, that is, both the login and the password are in plain text.

After creating/modifying the user accounts, transfer via FTP the file 'sys_pswd.cfg' to the directory 'user\pswd\'.

Example of file transfer via FTP:

```
Command Prompt - ftp 192.168.0.1

C:\>ftp 192.168.0.1
Connected to 192.168.0.1.
220 Service ready
User (192.168.0.1:(none)): user
331 User name ok, need password
Password:
230 User logged in
ftp> dir
200 Command OK
150 Listing files.
drw-rw-rw- 0 root root            4 Jan  1 01:01 pswd
226 Transfer OK, Closing connection
ftp: 54 bytes received in 0.11Seconds 0.49Kbytes/sec.
ftp> put sys_pswd.cfg
200 Command OK
150 Connecting for STOR
226 Transfer OK, Closing connection
ftp: 9 bytes sent in 0.01Seconds 0.90Kbytes/sec.
ftp>
```

NOTE!
The MVW3000 leaves the factory set with a normal user account:
Username: user Password: user
Users of the **normal** security level are restricted to the directory **'\user'**.

In addition to the control for accessing the file system, there is also a password for accessing the HTML pages of the communication board. The file containing the access passwords is located under the directory 'user\pswd', and it is named 'web_accs.cfg'. As with other passwords, each line in the file represents an account for access. To change it, create a text file with the same name containing a 'login: password' pair in each line. Then transfer this new file via FTP to the communication board, exactly as in the previous case.

NOTE!
After the equipment start-up period, it is recommended to change all passwords on the Ethernet/IP communication board. The new passwords will only take effect after the MVW3000 is powered up again. When the MVW3000 returns from the offline state, the output values are reset to zero.

7.1.7 Modbus/TCP

Modbus is a data communication protocol used in industrial automation systems. Created in the 1970s by Modicon, it is one of the oldest protocols used in networks for supervision and control of automation equipment.

The Modbus/TCP protocol is an implementation of the Modbus standard over TCP/IP enabling the use of the ModBus message system on an 'Intranet' or 'Internet' network. Modbus/TCP basically encapsulates a Modbus frame in a TCP frame in a simple way.

Modbus/TCP uses the physical medium Ethernet (IEEE 802.3) and the client-server model. The infrastructure used is the same as that used by corporate Ethernet computer networks. This fact considerably expands the control and monitoring methods of devices connected to the network.

The Ethernet/IP board for the MVW3000 has a Modbus/TCP server that provides access to the Input and Output areas through a set of functions defined in the Modbus/TCP specification. All messages use TCP port 502 and the Modbus/TCP server can manage a maximum of 8 simultaneous connections.

The following items for the Modbus/TCP protocol are similar to that described for the Ethernet/IP protocol:

Description	Refer to section:
Connector	Section 7.1.6.1 Connector on page 7-14
Line termination	Section 7.1.6.2 Line termination on page 7-15
Baud rate	Section 7.1.6.3 Baud rate on page 7-15
LED indicators	Section 7.1.6.6 LED indicators on page 7-15
WEB control and monitoring	Section 7.1.6.7 WEB control and monitoring on page 7-16
Settings	Section 7.1.6.8 Settings on page 7-17
Communication board access	Section 7.1.6.9 Communication board access on page 7-19

7.1.7.1 Data Settings for the Network Master

To use the Modbus/TCP protocol of the Ethernet/IP communication board, it is necessary to set the amount of data exchanged with the master.

For the MVW3000 with Anybus-S Ethernet/IP board, the quantity of data is programmable through P0309, which can be 2, 4 or 6 16-bit words (4, 8 or 12 bytes).

The mapping of the I/O words in the Modbus protocol is shown in the table below:

Table 7.9 – *Addressing map*

Area	Register	I/O word
Input data	1	1st WORD
	2	2nd WORD
	3	3rd WORD
	4	4th WORD
	5	5th WORD
	6	6th WORD
Output data	1025	1st WORD
	1026	2nd WORD
	1027	3rd WORD
	1028	4th WORD
	1029	5th WORD
	1030	6th WORD

NOTE!

- The table above applies to all function codes.
- Coils are mapped with MSB first, e.g.: coil #1 corresponds to bit 15 of register #1.
- I/O words are represented in registers with the least significant byte first.

Thus, it may be necessary to replace the most significant byte with the least significant byte so that the words are interpreted correctly by the network master.

- Some *Clients* employ offset in the register address.

Several Modbus functions may be used to access the same data area on the module. Below are the functions available for the Ethernet/IP module:

Table 7.10 – Supported function codes

Modbus function	Function Code	Associated with:
Read Coil	1	Input and output data
Read Input Discrete	2	
Read Multiple Registers	3	
Read Input Registers	4	
Write Coil	5	Output data
Write Single Register	6	
Force Multiple Coils	15	
Force Multiple Registers	16	
Mask Write Register	22	
Read/Write Registers	23	Input and output data

Table 7.11 – Supported error codes

Code	Name	Description
0x01	Illegal function	Function code is not supported
0x02	Illegal data address	Address outside the initialized memory area
0x03	Illegal data value	Illegal value

7.1.8 Profinet

7.1.8.1 Connector

Connector: socket for 8-way RJ-45 plug.

Pinout: there are two patterns for straight-through Ethernet cables: T-568A and T-568B. The cable to be used must follow one of these two standards. In addition, a single standard should be used to make the cable. That is, the plugs at the ends of a cable must be crimped according to standard T-568A or T-568B.

RJ-45 Plug T-568A Standard

Pin	Wire color	Signal
1	White/Green	TX+
2	Green	TX-
3	White/Orange	RX+
4	Blue	-
5	White/Blue	-
6	Orange	RX-
7	White/Brown	-
8	Brown	-

RJ-45 Plug T-568B Standard

Pin	Wire color	Signal
1	White/Orange	TX+
2	Orange	TX-
3	White/Green	RX+
4	Blue	-
5	White/Blue	-
6	Green	RX-
7	White/Brown	-
8	Brown	-

Figure 7.14 – Standards for Ethernet straight-though cables (Straight-Through)

7.1.8.2 Baud rate

The Ethernet interface of the MVW3000 for the PROFINET IO protocol can communicate using the 100 Mbps rate in full duplex mode, as required by the protocol.

7.1.8.3 Configuration file (GSDML file)

Each device on a PROFINET network is associated with a GSDML file that contains information about its operation. This file provided with the product is used by the network configuration program.

7.1.8.4 Station name

A name must be assigned to each device on the PROFINET IO network. Such name, which is stored in the communication accessory itself, is used to identify and address the device on the network. For the MVW3000, this name must be assigned via the PROFINET network master configuration tool.

7.1.8.5 Data settings

To set the master, in addition to the Station Name used by the PROFINET board, it is necessary to indicate the amount of data exchanged with the master. For the MVW3000 with Anybus-S PROFINET board, the following values must be set:

- Number of data: programmable via P0309, which can be 2, 4 or 6 words of 16 bits (4, 8 or 12 bytes). This number of words must also be set in the network configuration tool, using the GSDML configuration file, and selecting the input and output modules necessary to compose the number of words as set in P0309.
- The PROFINET board for the MVW3000 is identified on the network as Anybus-S PRT. Using those settings, it is possible to set the master of the network to communicate with the MVW3000.

7.1.8.6 LED indicators

The communication board has four bicolor LEDs grouped on the lower right corner indicating the status of the module and of the Ethernet/IP network

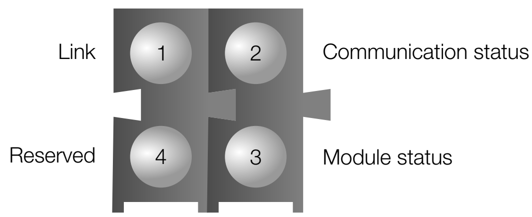


Figure 7.15 – *PROFINET network status LED indicators*

Table 7.12 – Supported function codes

LED	Color	Function
Link	Green	**On:** Link established **Flashing:** Receiving/transmitting data **Off:** No link or not powered
Communication status	Green	**On:** On line, RUN. Connection to controller established **Flashing:** On line, STOP. Connection to controller established **Off:** Off line. No connection to the controller
Module status	Green or red	**Off:** Module not powered or not initialized **On green:** Initialized, no error **Flashing Green, 1 flash:** With diagnostic data **Flashing green, 2 flashes:** Blink function, used to identify slave on the network **Flashing Red, 1 flash:** Configuration error. Incorrect module or incorrect number of configured I/O words **Flashing Red, 3 flashes:** Station Name or IP Address has not been configured **Flashing Red, 4 flashes:** Internal error

7.1.9 Operation via network

Parameter P0309 allows setting the number of I/O words that will be exchanged with the network master. This item will present the data format for each of the existing options.

Depending on the value selected in parameter P0309, the drive will communicate with the network master 2, 4 or 6 I/O words. The greater the number of words communicated via network, the more functions are available for operation of the MVW3000, but both the amount of memory reserved in the master and the time required for communication will also be greater.

Input (drive → master):

Input	Description
1st word	Inverter logical status
2nd word	Motor speed
3rd word	Digital inputs DI1 to DI10 status
4th word	Content of the read parameter
5th word	Motor torque
6th word	Motor current

Output (master → drive):

Output	Description
1st word	Logical command
2nd word	Motor speed reference
3rd word	Digital outputs DO1 to RL5 status
4th word	Number of the parameter to be read
5th word	Number of the parameter to be changed
6th word	Content of the parameter to be changed

7.1.9.1 Input - 1st word: Inverter Logical Status

The word that defines the Logical Status consists of 16 bits, with 8 upper bits and 8 lower bits (reserved), having the following construction:

Table 7.13 – Logical Status: Upper bits

Bit	Function	Description
15	Active fault	0 = No 1 = Yes
14	PID controller	0 = Manual 1 = Automatic
13	Undervoltage in the sources of the electronics	0 = Without undervoltage 1 = With undervoltage
12	Local/Remote Command	0 = Local 1 = Remote
11	Jog Command	0 = Inactive 1 = Active
10	Direction of Rotation	0 = Reverse 1 = Forward
09	General Enable	0 = Disabled 1 = Enabled
08(*)	Run/Stop	0 = Stop 1 = Run

To obtain the fault code, see parameter P0068.

(*) Bit 08 = 1. It means the inverter received the run/stop command via networks. This EL is not intended to signal that the motor is effectively spinning.

7.1.9.2 Input - 2nd word: Motor speed

This variable is shown using 13-bit resolution plus signal. Therefore, the rated value will be equal to 8191 (1FFFh) (forward run) or -8191 (E001h) (reverse run) when the motor is spinning at synchronous speed (or base speed, for example 1800 rpm for a 4-pole, 60 Hz).

7.1.9.3 Input - 3rd word: Status of digital inputs

Indicates the content of parameter P0012 (Digital inputs DI1 to DI10 status).

The digital inputs of this WORD are distributed as follows:

Table 7.14 – Status of digital inputs

Bit	Function	Description
9	DI10	0 = Inactive 1 = Active
8	DI09	0 = Inactive 1 = Active
7	DI01	0 = Inactive 1 = Active
6	DI02	0 = Inactive 1 = Active
5	DI03	0 = Inactive 1 = Active
4	DI04	0 = Inactive 1 = Active
3	DI05	0 = Inactive 1 = Active
2	DI06	0 = Inactive 1 = Active
1	DI07	0 = Inactive 1 = Active
0	DI08	0 = Inactive 1 = Active

7.1.9.4 Input - 4th word: Content of the parameter to be read

This position allows reading the content of the inverter parameters, which are selected in position 4. Number of the parameter to be read, of the "Variables Written on the Inverter". The values read will have the same order of magnitude as those described in the product manual or shown on the HMI.
Values are read without the decimal point, when applicable.

Examples:
a) HMI indicates 12.3, and the reading via Fieldbus will be 123.
b) HMI indicates 0.246 and the reading via Fieldbus will be 246.

7.1.9.5 Input - 5th word: Torque on the motor

Indicates the content of parameter P0009, disregarding the decimal point. This variable is filtered by a low-pass filter with a 0.5 s time constant.

7.1.9.6 Input - 6th word: Motor current

Indicates the content of parameter P0003, disregarding the decimal point. This variable is filtered by a low-pass filter with a 0.3 s time constant.

7.1.9.7 Output - 1st word: Logical Command

This word is transmitted from the network master to the MVW3000, in the first position of the output data, allowing the control of the main functions of the device. It has 16 bits, which can be divided into two bytes for a better understanding of the command:

7

Most significant byte: acts as the command mask. Each bit enables the execution of a command, and the effective value of the command is transmitted in the corresponding least significant bit.

Table 7.15 – *Logical Command - Upper bits*

Bit	Function
15	Inverter fault reset
14	Not used
13	Save changes of parameter P169/P170 to the EEPROM
12	Local/Remote Command
11	Jog Command
10	Direction of Rotation
09	General Enable
08	Run/Stop

Least significant byte: has the effective value for each command you want to execute. Each bit is responsible for executing a command, but the command will only be executed if the corresponding upper bit is set to 1. If the mask bit is not set to 1, the value received in the corresponding lower bit is disregarded.

***Table 7.16 –** Logical Command - Lower bits*

Bit	Function	Description
7	Inverter fault reset(*)	0 = No 0 → 1 = Reset
6	Not used	- -
5	Save changes of parameter P169/P170 to the EEPROM	0 = Save 1 = Not save
4	Local/Remote Command	0 = Local 1 = Remote
3	Jog Command	0 = Inactive 1 = Active
2	Direction of Rotation	0 = Reverse 1 = Forward
1	General Enable	0 = Disabled 1 = Enabled
0	Run/Stop	0 = Stop 1 = Run

NOTE! Logic command Bit 13:
The function to save changes in the content of the parameters to the EEPROM occurs normally when using the HMI. The EEPROM supports a limited number of writings (100,000). In applications where the speed regulator is saturated and you want to control the torque, you must act on the current limitation value P0169/P0170 (valid for P0202 > 2).
When the Network Master writes on P0169/P0170 continuously, you must prevent the changes from being saved on the EEPROM, doing the following: Bit 13 = 1 and Bit 5 = 1.

7.1.9.8 Output - 2nd word: Motor speed reference

This variable is displayed using a 13-bit resolution. Therefore, the speed reference value for the motor synchronous speed will be equal to 8191 (1FFFh).

NOTE!
Values above 8191 (1FFFh) are allowed when it is desired to obtain values above the motor synchronous speed, as long as they respect the value set for the inverter maximum speed reference.

7.1.9.9 Output - 3rd word: Command for digital outputs

It allows changing the status of the digital outputs set for Fieldbus in parameters P0275 to P0282. The word that defines the state of the digital outputs is formed by 16 bits, with the following construction:

***Table 7.17 –** Command of the digital outputs - Upper bits*

Bit	Function
8	DO1 output control
9	DO2 output control
10	RL1 output control
11	RL2 output control
12	RL3 output control
13	RL4 output control
14	RL5 output control

__Table 7.18 –__ Command of the digital outputs - Lower bits

Bit	Function	Description
0	DO1 output command	0 = Inactive output
		1 = Active output
1	DO2 output command	0 = Inactive output
		1 = Active output
2	RL1 output command	0 = Inactive output
		1 = Active output
3	RL2 output command	0 = Inactive output
		1 = Active output
4	RL3 output command	0 = Inactive output
		1 = Active output
5	RL4 output command	0 = Inactive output
		1 = Active output
6	RL5 output command	0 = Inactive output
		1 = Active output

7.1.9.10 Output - 4th word: Number of the parameter to be read

Through this position it is possible to read any parameter of the inverter. The number corresponding to the desired parameter must be provided, and its content will be shown in position 4 of the "Inverter variables read".

7.1.9.11 Output - 5th word: Number of the parameter to be changed

This position works together with the *Output - 6th word*.
If you do not want to change any parameters, the 999 code must be placed in this position.

During the modification process, you must:

- Keep code 999 in position 5.
- Replace code 999 with the number of the parameter to be changed.
- If no error code (124 to 127) is signaled in the Logical Status, replace the parameter number with code 999 to end the modification.

The modification can be checked via HMI or by reading the parameter content.

NOTE!

- The command to switch from scalar to vector control will not be accepted if any of parameters P0409 to P0413 are set to zero. This must be done via HMI.
- Do not set P0204 = 5 since in the factory settings P0309 = Inactive.
- P0204 and P0408 do not accept command modifications via networks.
- The desired content must be maintained by the master for 15.0 ms.
  Only after this time has elapsed can a new value be sent or written to another parameter.

7.1.9.12 Output - 6th word: Content of the parameter to be changed

Value for the parameter selected in *Output - 5th word*: (write the value without the decimal point).

> **NOTE!**
> When parameters P0409 to P0413 are changed, slight differences in content may arise due to truncation (rounding) during the reading process.

7.2 SERIAL

This chapter provides the necessary information for the operation of the MVW3000 via serial communication.

CAUTION

- Carefully follow the cautions and safety warnings contained therein.
- When there is a possibility of damage to people or equipment related to motors driven by the inverter, provide electromechanical safety devices.

ATTENTION

- Carefully follow the precautions defined in this manual regarding the interconnection cables of the two interfaces for serial communication.
- Equipment with components sensitive to static electricity. Electronic boards must be handled with the following care:
  - Do not directly touch with the hands the component parts or connectors. When necessary, first touch a grounded metallic object.
  - Use weld iron with a grounded tip.

TERMS USED

- **Parameters:** Are those existing on the drive and which can be viewed and changed via human-machine interface (HMI).
- **Basic variables:** Internal values of the MVW3000 that can only be accessed through the serial, used to monitor the device status, commands and identification.
- **Registers:** These are internal memory addresses of the MVW3000. Can be used to represent both basic variables and parameters.
- **EEPROM:** It is the non-volatile memory that allows the MVW3000 to maintain parameter values even after the device is turned off.

NUMERICAL REPRESENTATION:

- Decimal numbers are represented by means of digits without suffix.
- Hexadecimal numbers are represented with the letter “h” after the number.

7.2.1 Introduction

The basic purpose of serial communication is the physical connection between two or more devices in a network configured as follows:

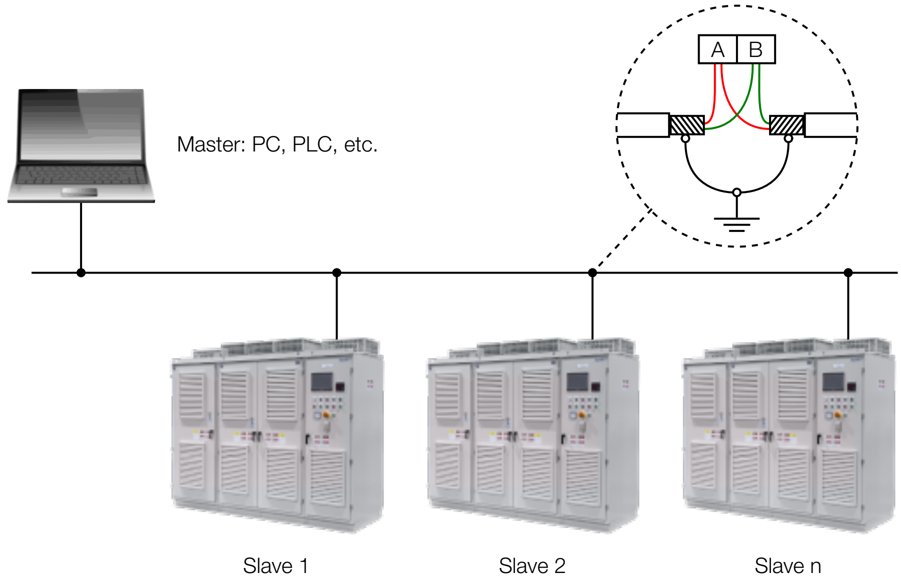


Figure 7.16 – *Connection Diagram*

Using this interface, the network master can request several services from each slave connected to the network, such as:

- IDENTIFICATION:
  - Type of device (frequency inverter, servo drive, soft-starter)
  - Status monitoring
  - Reading of errors
- PARAMETER SETTING:
  - Reading of parameters (current, voltage, etc.)
  - Writing of parameters for the device configuration
- COMMANDS:
  - Enabling
  - Direction of rotation
  - Error reset

The MVW3000 uses the Modbus-RTU protocol for communication via its serial interface. This protocol allows the integration of of the MVW3000 into different systems, since it allows its connection to various devices, such as:

- PC (master) to set the parameters of one or several drives simultaneously.
- SDCD monitoring variables and parameters of the MVW3000.
- PLC controlling the operation of the device in an industrial process.

7.2.2 Serial communication parameters

The parameters related to serial communication and operation via the Modbus-RTU protocol of the MVW3000 will be described next.

P0308 - Address			
Adjustable range:	1 to 30	Factory setting:	1

Each slave on the network must have an address different from the others, so that the master can send the desired telegram to a specific slave on the network. This parameter allows setting address of the MVW3000 on the network.

It is necessary to install a repeater for more than 30 devices on the same communication network.

P0312 - Protocol

Adjustable range:	0 to 9	Factory setting:	7

The MVW3000 has one of the following options for communication via the product serial interface:

P0312	Function
0	Reserved
1	Modbus-RTU, 9600 bps, no parity
2	Modbus-RTU, 9600 bps, odd parity
3	Modbus-RTU, 9600 bps, even par
4	Modbus-RTU, 19200 bps, no parity
5	Modbus-RTU, 19200 bps, odd parity
6	Modbus-RTU, 19200 bps, even par
7	Modbus-RTU, 38400 bps, no parity
8	Modbus-RTU, 38400 bps, odd parity
9	Modbus-RTU, 38400 bps, even par

It is necessary that all devices operating on the same network have the same communication settings.

P0313 - Disabling with alarm A128, A129 and A130

Adjustable range:	0 to 5	Factory setting:	0

Table 7.19 – *Communication error action*

P0313	Function
0	Stop by ramp
1	General disable
2	No action
3	Go to LOC
4	Reserved
5	Fault

- **0 - Disable via Run/Stop**: It disables the motor by deceleration ramp in case of a communication error.
- **1 - Disable via general enable**: In this option, the MVW3000 cuts off the power to the motor, which should coast to a stop.
- **2 - Inactive**: if one of the errors previously mentioned occurs, the drive remains in its current state and only indicates the error.
- **3 - Go to LOCAL**: If you are operating in REMOTE mode, and a communication error occurs, it will automatically go to LOCAL mode.
- **5 - Fault**: Upon detecting a communication fault, it will go to the error state, the motor will be disabled, and the error indication will only be removed after resetting the device errors.

Only the timeout receiving telegrams error is considered a communication error. The timeout receiving telegrams is set through parameter P0314.

NOTE!
The *Disable via Run/Stop* and *Go to LOCAL* commands can only be executed if they are being controlled via fieldbus. This setting is done through parameters P0220 (LOCAL/REMOTE selection source), P0224 (Start/Stop Selection LOCAL Situation) and P0227 (Start/Stop Selection REMOTE Situation).

P0314 - Watchdog

Adjustable range:	0.0 to 999.0 s	Factory setting:	0.0 s

It allows setting the time for detecting timeout when receiving telegrams. Value 0 (zero) disables this function.

If the drive is controlled via serial, and a problem communicating with the master occurs (cable break, power failure, etc.), it will not be possible to send a command via serial to disable the device. In applications where that is a problem, it is possible to set a maximum interval in P0314 within which the MVW3000 must receive a valid serial telegram, otherwise it will consider that the serial communication has failed.

Once that time has been set, if it does not receive valid serial telegrams within the time set, it will display E28 and take the action set in P0313. If the communication is reestablished, the timeout receiving telegrams indication will be removed.

P0220 - LOCAL/REMOTE selection source

P0221 - Speed reference selection LOCAL situation

P0222 - Speed reference selection REMOTE situation

P0223 - Forward/Reverse Selection LOCAL Situation

P0224 - Start/Stop Selection LOCAL Situation

P0225 - Selection of JOG Source LOCAL Situation

P0226 - Selection of Direction of ROTATION REMOTE Situation

P0227 - Start/Stop Selection REMOTE Situation

P0228 - JOG Selection - REMOTE Situation

These parameters define the source of commands and references for the inverter in the LOCAL and REMOTE modes.
For the commands that will be controlled via network, set it in the “Serial” option.

P0275 - DO1 Function

P0276 - DO2 Function

P0277 - RL1 Function

P0279 - RL2 Function

P0280 - RL3 Function

P0281 - RL4 Function

P0282 - RL5 Function

These parameters define the function of the inverter digital outputs.
For the digital outputs that will be controlled via network, set it in the “Serial” option.

7.2.3 Interface

The MVW3000 frequency inverters operate as slaves to the Modbus-RTU network, and every communication starts with the master of the Modbus-RTU network requesting some service from an address on the network.

If the inverter is configured for the corresponding address, it processes the request and responds what was requested to the master.

NOTE!

- Power and control cables with a voltage of 110 V/220 V must be separated from the Serial RS-232 wiring.
- It is not possible to use RS-232 and RS-485 simultaneously.

7.2.3.1 RS-232

The MVW3000 has an RS-232 serial port (X7 connector on the MVC4 board) available.

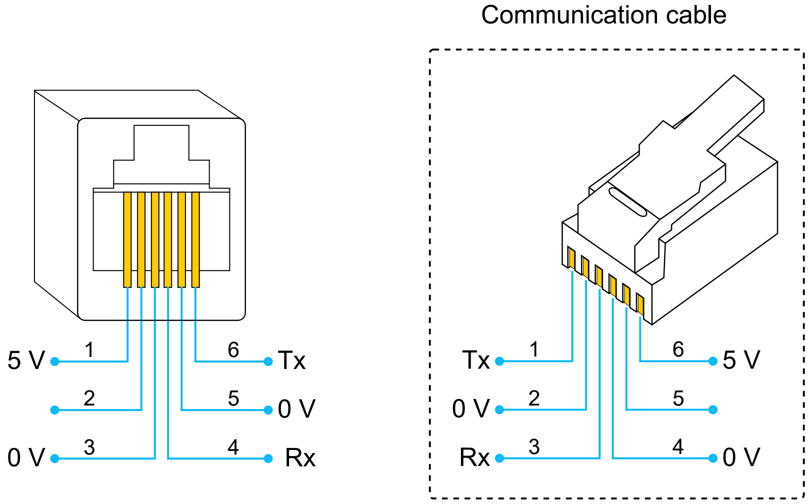


Figure 7.17 – *Description of the XC7 connector signals (RJ11)*

This interface allows connecting a master to a MVW3000 (peer-to-peer) up to 10 m distant. For communication with the master, one wire for transmission (TX), one for reception (RX) and a reference (0 V) must be used, signals which are present on pins 4, 5 and 6. The signals present on pins 1, 2 and 3 are on this connector for external power supply, used as one of the options for RS-485 communication.

7.2.3.2 RS-485

In addition to the EBB board, the CSI2 board (15423438 code) on the XC9 connector of the MVC4 board can be used as an RS-485 interface on the MVW3000:

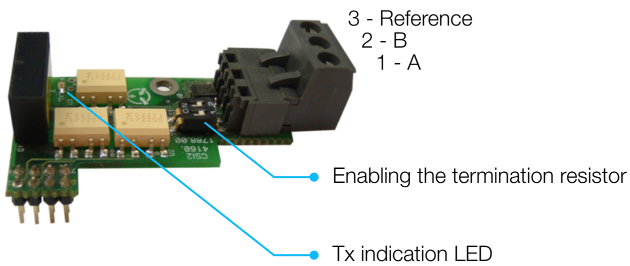


Figure 7.18 – *CSI2 Board*

Using the RS-485 interface, the master can control several drives connected to the same bus.
The Modbus-RTU protocol allows the connection of up to 247 slaves (1 per address), provided that signal repeaters are also used along the bus. This interface has good noise immunity, and the maximum cable length allowed is 1000 meters.

The following recommendations must be observed when installing the network using this interface:

- Generally, a shielded twisted pair is used to transmit signals B and A. Those signals must be connected to terminals 1 and 2 of the board.
- Terminal 3 is used to connect the reference signal to the RS-485 circuit. If this signal is not used, this connection can be disregarded.
- It is very important to correctly ground all devices connected to the RS-485 network, preferably at the same grounding point. The cable shield must also be grounded, and for that purpose, the shield can be connected somewhere to the frame of the MVW3000.

- The cable must be routed separately and, if possible, distant from the power supply cables.
- Termination resistors must be provided on the first and last devices connected to the main bus. The interface board for RS-485 CSI2 has switches for enabling this resistor. Just put both S1 switches to the “ON” position.

7.2.4 Accessible data

Various data can be accessed via the serial interface to enable their setting, command and monitoring. Basically, those data can be divided into two groups: basic parameters and variables.

7.2.4.1 Parameters

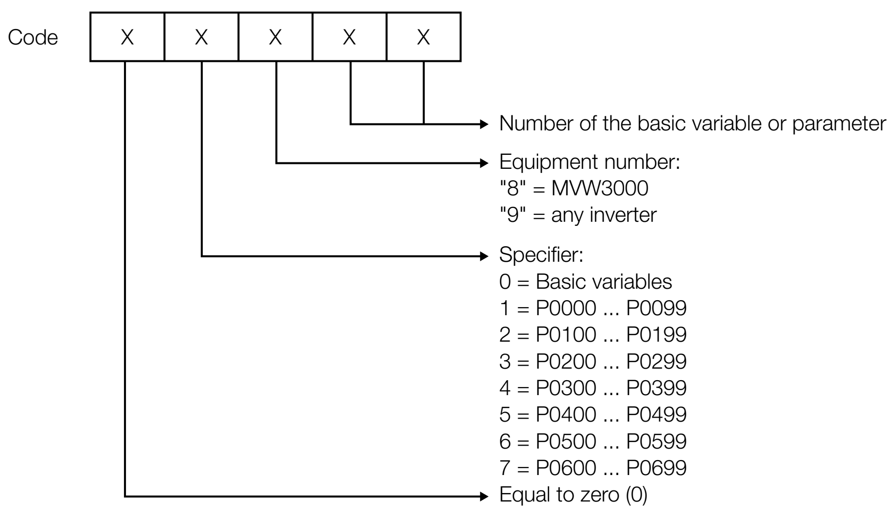
The parameters are those available through the MVW3000 HMI. Virtually all drive parameters can be accessed via serial, and through those parameters it is possible to configure the way the device will operate and monitor information relevant to the application, such as current, voltage, errors, etc.

7.2.4.2 Basic variables

The basic variables are internal values of the MVW3000 accessible only through the serial interface of the product. Using these variables, it is possible to monitor the states of the drive and send commands such as enable and reset.

Each basic variable represents a register (16 bits). For the MVW3000, the following basic variables were provided:

V00 (address: 5000):
Inverter model indication (reading variable).
The reading of this variable allows identifying the inverter type. For the MVW3000 this value is 8, as shown below:



V02 (address: 5002):
Inverter status indication (reading variable).
Logical status (byte-high). Error code (byte-low).

Where:
Logical Status:

	MSB							
Status word	15	14	13	12	11	10	9	8

- Bits 7...0: Reserved
- Bit 8: 0 = Enable by ramp (run/stop) inactive / 1 = Enable by ramp active.
- Bit 9: 0 = General enable inactive / 1 = General enable active.
- Bit 10: 0 = Reverse / 1 = Forward.
- Bit 11: 0 = JOG inactive / 1 = JOG active.
- Bit 12: 0 = Local / 1 = Remote.
- Bit 13: 0 = Without undervoltage / 1 = With undervoltage.
- Bit 14: 0 = Manual (PID) / 1 = Automatic (PID).
- Bit 15: 0 = Without fault / 1 = With fault.

V03 (address: 5003):
Selection of the logical command.
Writing variable, whose bits have the following meaning:

Upper bits: mask of the desired action. The corresponding bit must be set to 1 for the action to occur.

	MSB							
Logical command	15	14	13	12	11	10	9	8

- Bit 8: 1 = Enable ramp (run/stop).
- Bit 9: 1 = General Enable.
- Bit 10: 1 = Direction of rotation.
- Bit 11: 1 = JOG.
- Bit 12: 1 = Local/Remote Selection.
- Bit 13: Not used.
- Bit 14: Not used.
- Bit 15: 1 = Fault reset.

Lower bits: logical level of the desired action.

								LSB
Logical command	7	6	5	4	3	2	1	0

- Bit 0: 0 = Disable (stop) / 1 = Enable (run).
- Bit 1: 0 = General disable / 1 = General enable.
- Bit 2: 0 = Reverse / 1 = Forward.
- Bit 3: 0 = JOG inactive / 1 = JOG active.
- Bit 4: 0 = Local / 1 = Remote.
- Bit 5: Not used.
- Bit 6: Not used.
- Bit 7: 0 = Reset inactive. / 1 = Reset active.

NOTE!

- Disable via DIx has priority over these disabling actions.
- To enable the inverter via serial, it is necessary that CL0 = CL1 = 1 and that the external disable be inactive.
- If CL0 = CL1 = 0 simultaneously, general disable will occur.

V04 (address: 5004):
Speed reference given by the Serial (reading/writing variable).
It allows sending the reference to the inverter provided that P0221 = 9 for Local or P0222 = 9 for Remote; this variable has a 13-bit resolution.

V06 (address: 5006):
Status of the operating modes (reading variable).

								LSB
Operation modes	7	6	5	4	3	2	1	0

- Bit 0: 1 = Setting mode after reset to factory settings/first power-up.
- The inverter will go into this operating mode when it is powered up for the first time or when the factory settings of the parameters is loaded (P0204 = 5 or 6). In this mode, only parameters P0023, P0201, P0295, P0296, P0400, P0401, P0402, P0403, P0404 and P0406 will be accessible. If another parameter is accessed, the inverter will return A0125.
- Bit 1: 1 = Setting mode after changing from Scalar to Vector control.
- The inverter will go into this operating mode when the control mode is changed from Scalar (P0202 = 0, 1 or 2) to Vector (P0202 = 3 or 4). In this mode, only parameters P0023, P0201, P0295, P0296, P0400, P0401, P0402, P0403, P0404 and P0406 will be accessible. If another parameter is accessed, the inverter will return A0125.
- Bit 2: 1 = Performing Self-tuning.
- Bit 3: Not used.
- Bit 4: Not used.
- Bit 5: Not used.
- Bit 6: Not used.
- Bit 7: Not used.

7

V07 (address: 5007):
Status of the operating modes (reading/writing variable).

								LSB
Operation modes	7	6	5	4	3	2	1	0

- Bit 0: 1 = Exit the setting mode after Reset to factory settings.
- Bit 1: 1 = It exits the setting mode after changing from Scalar to Vector control..
- Bit 2: 1 = Abort Self-tuning..
- Bit 3: Not used.
- Bit 4: Not used.
- Bit 5: Not used.
- Bit 6: Not used.
- Bit 7: Not used.

V08 (address: 5008):
Motor speed in 13 bits (reading variable).

V09 (address: 5009). Reading:

- Bit 0: 1 = Inverting DOR (Direction of Rotation).
- Bit 1: 1 = Alarm active.

VB 12 (address: 5012). Digital Output State:

It allows changing the state of the Digital Outputs set to Serial in parameters P0275...P0280.

The word that defines the state of the digital outputs is formed by 16 bits, with the following construction:

Upper bits: define the output you want to control when set to 1.

- Bit 8: 1 - DO1 output control.
- Bit 9: 1 - DO2 output control.
- Bit 10: 1 - RL1 output control.
- Bit 11: 1 - RL2 output control.
- Bit 12: 1 - RL3 output control.
- Bit 13: 1 - RL4 output control.
- Bit 14: 1 - RL5 output control.

Lower bits: define the desired state for each output.

- Bit 0: - DO1 output state: 0 = output disabled, 1 = output enabled.
- Bit 1: - DO2 output state: 0 = output disabled, 1 = output enabled.
- Bit 2: - RL1 output state: 0 = output disabled, 1 = output enabled.
- Bit 3: - RL2 output state: 0 = output disabled, 1 = output enabled.
- Bit 4: - RL3 output state: 0 = output disabled, 1 = output enabled.
- Bit 5: - RL4 output state: 0 = output disabled, 1 = output enabled.
- Bit 6: - RL5 output state: 0 = output disabled, 1 = output enabled.

7.2.5 Modbus-RTU

The Modbus protocol was initially developed in 1979. Currently, it is an open protocol widely used by several manufacturers in different kinds of equipment. The Modbus-RTU communication of the MVW3000 was developed based on two documents:

1. MODBUS Protocol Reference Guide Rev. J, MODICON, 1996.
2. MODBUS Application Protocol Specification, MODBUS.ORG, 2002.

These documents define the format of messages used by the elements that are part of the Modbus network, the services (or functions) that can be provided via network and how these elements exchange data on the network.

7.2.5.1 Transmission Modes

The protocol specification defines two transmission modes: ASCII and RTU. The modes define the way the message bytes are transmitted. It is not possible to use two transmission modes on the same network.

In the RTU mode, each word transmitted has 1 start bit, eight data bits, 1 parity bit (optional) and 1 stop bit (2 stop bits if no parity bit is used). Thus, the sequence of bits for transmission of a byte is as follows:

START	B0	B1	B2	B3	B4	B5	B6	B7	Parity or STOP	STOP

In the RTU mode, each data byte is transmitted as a single word with its value directly in hexadecimal. the MVW3000 uses only this transmission mode for communication; therefore, it does not have communication in ASCII mode.

7.2.5.2 Message structure in the RTU Mode

The Modbus-RTU network operates in the Master-Slave system, which may contain up to 247 slaves, but only one master. Every communication begins with the master making a request to a slave, and the slave responds to the master what was requested. In both telegrams (request and response), the structure used is the same: Address, Function Code, Data and CRC. Only the data field can have variable length, depending on what is being requested.

Table 7.20 – *Telegram structure*

Master	Slave
Slave address (1 byte)	Slave address (1 byte)
Function (1 byte)	Function (1 byte)
Data (n bytes)	Data (n bytes)
CRC (2 bytes)	CRC (2 bytes)

Address:
The master starts the communication by sending a byte with the address of the slave destination of the message.

When sending the response, the slave also starts the telegram with its own address. The master can also send a message to address 0 (zero), which means that the message is sent to all the slaves on the network (broadcast). In this case, no slave will respond to the master.

Function Code:
This field also contains a single byte, where the master specifies the type of service or function requested from the slave (reading, writing, etc.). According to the protocol, each function is used to access a specific type of data.

In MVW3000, data related to parameters and basic variables are available as holding registers type (referenced from address 40000 or '4x'). In addition to those registers, the inverter status (enabled/disabled, with error/without error, etc.) and the command for the inverter (run/stop, forward run/reverse run, etc.) can also be accessed through functions for reading/writing "coils" or internal bits (referenced from address 00000 or '0x').

7

Data Field:
Field with variable size. The format and content of this field depend on the function used and the values transmitted. This field is described together with the functions (see Section 7.2.7 Detailed description of the functions on page 7-42).

CRC:
The last part of the telegram is the field for checking transmission errors. The method used is the CRC-16 (Cycling Redundancy Check). This field consists of two bytes, where the least significant byte (CRC-) is transmitted first, and then the most significant byte (CRC+).

The CRC calculation starts first by loading a 16-bit variable (from now on referred to as CRC variable) with the FFFFh value. Then perform the steps according to the following routine:

1. The first byte of the message (only the data bits - start bit, parity and stop bit are not used) is submitted to an XOR logic (exclusive OR) with the eight least significant bits of the CRC variable, returning the result in the CRC variable itself.

2. Then, the CRC variable is shifted one position to the right, towards the least significant bit, and the position of the most significant bit is filled in with 0 (zero).

3. After this shift, the flag bit (bit that was shifted out of the CRC variable) is analyzed, with the following occurring:

   - If the bit value is 0 (zero), nothing is done.
   - If the bit value is 1, the content of the CRC variable is submitted to an XOR logic with a constant value of A001h, and the result is returned to the CRC variable.

4. Steps 2 and 3 are repeated until eight shifts.
5. Steps 1 through 4 are repeated, using the next byte of the message, until the entire message has been processed.

The final content of the CRC variable is the value of the CRC field that is transmitted at the end of the telegram. The least significant part is transmitted first (CRC-) and then the most significant part (CRC+).

Time between Messages:
The RTU mode does not have a specific character that indicates the beginning or the end of a telegram. Thus, what indicates when a new message starts or when it finishes is the absence of data transmission on the network for a minimum period of 3.5 times the transmission time of a data word (11 bits). Thus, if a telegram is started after this minimum no transmission period has elapsed, the network elements will assume that the character received represents the beginning of a new telegram. And, likewise, the network elements will assume that the telegram reached the end after this period has elapsed again.

If during the transmission of a telegram, the time between the bytes is longer than this minimum period, the telegram will be considered invalid, because the inverter will discard the bytes already received and build a new telegram with the bytes that are being transmitted.

The table below shows the times for three different baud rates.

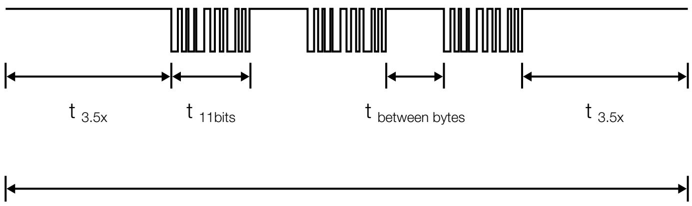


Figure 7.19 – *Times involved during the communication of a telegram*

Table 7.21 – *Telegram transmission time*

Baud rate [kbps]	$t_{11\ bits}$ [μs]	$t_{3.5x}$ [ms]
9600	1146	4.010
19200	573	2.005
38400	285	1.003

$t_{11\ bits}$ = time to transmit a word of the telegram.
time between bytes = time between bytes (cannot be longer than 3.5x time).
$t_{3.5x}$ = minimum interval to indicate the beginning and end of the telegram (3.5 times the 11-bit time).

7.2.6 Operation

The MVW3000 frequency inverters operate as slaves to the Modbus-RTU network, and every communication starts with the master of the Modbus-RTU network requesting some service from an address on the network.

If the inverter is configured for the corresponding address, it processes the request and responds what was requested to the master.

Available Functions and Response Times:
In the specification of the Modbus-RTU protocol, you define the functions used to access the register types described in the specification. In MVW3000, both parameters and basic variables were defined as holding registers (referred to as 4x). In addition to these registers, it is also possible to directly access internal command and monitoring bits (referred to as 0x). To access these bits and registers, the following services (or functions) were provided for MVW3000 frequency inverters:

Read Coils
Description: Reading of block of internal bits or coils.
Function code: 01.
Broadcast: not supported.
Response time: 5 to 10 ms.

Read Holding Registers
Description: Reading of block of holding registers.
Function code: 03.
Broadcast: not supported.
Response time: 5 to 10 ms.

Write Single Coil
Description: Writing on a single internal bit or coil.
Function code: 05.
Broadcast: supported.
Response time: 5 to 10 ms.

Write Single Register
Description: Writing on a single holding register.
Function code: 06.
Broadcast: supported.
Response time: 5 to 10 ms.

Write Multiple Coils
Description: Writing on block of internal bits or coils.
Function code: 15.
Broadcast: supported.
Response time: 5 to 10 ms.

Write Multiple Registers
Description: Writing on block of holding registers.
Function code: 16.
Broadcast: supported.
Response time: 10 to 20 ms for each written register.

Read Device Identification
Description: Identification of the inverter model.
Function code: 43.
Broadcast: not supported.
Response time: 5 to 10 ms.

NOTE!

- Slaves on the Modbus-RTU network are addressed from 1 to 247.
- Address 0 (zero) is used by the master to send a common message to all slaves (broadcast).
- All registers (parameters and basic variables) are treated as holding registers, referenced from 40000 or '4x', while the bits are referenced from 0000 or 0x.

Data Addressing and Offset:
The data addressing in the MVW3000 is done with an offset equal to zero, which means that the address number is equivalent to the given number. The parameters are available starting from address 0 (zero), while the basic variables are available starting from address 5000. Likewise, the status bits are provided starting from address 0 (zero) and the command bits are provided starting from address 100.

The following table illustrates the addressing of bits, parameters and basic variables:

Table 7.22 – *Addressing of bits, parameters and basic variables*

Parameter	Modbus address
P0000	0
P0001	1
...	...
P0100	100
...	...

Basic variable	Modbus address
V00	5000
V01	5001
...	...
V08	5008

Status bits	Modbus address
Bit 0	00
Bit 1	01
...	...
Bit 7	07

Command bits	Modbus address
Bit 100	100
Bit 101	101
...	...
Bit 107	107

The status bits have the same functions as bits 8 to 15 of the logical status (basic variable 2). These bits are available as read only, and any writing command returns an error to the master.

Table 7.23 – *Status bits*

Bit number	Function
0	0 = Enable by ramp inactive 1 = Enable by ramp active
1	0 = General enable inactive 1 = General enable active
2	0 = Reverse run 1 = Forward run
3	0 = JOG inactive 1 = JOG active
4	0 = Local mode 1 = Remote mode
5	0 = Without undervoltage 1 = With undervoltage
6	Not used
7	0 = Without fault 1 = With fault

The command bits are available for reading and writing and have the same function as bits 0 to 7 of the logical command (basic variable 3), without requiring mask though. The writing on basic variable 3 has an influence on the status of these bits.

7

Table 7.24 – *Command bits*

Bit number	Function
100	0 = Disable ramp (Stop) 1 = Enables ramp (Run)
101	0 = General Disable 1 = General Enable
102	0 = Reverse run 1 = Forward run
103	0 = Disable JOG 1 = Enable JOG
104	0 = Go to Local mode 1 = Go to Remote mode
105	Not used
106	Not used
107	0 = Do not reset inverter 1 = Reset inverter

7.2.7 Detailed description of the functions

This item describes in details the functions available in the MVW3000 for Modbus-RTU communication. For the preparation of telegrams, it is important to note the following:

- Values are always transmitted in hexadecimal.
- The address of a data, the number of data and the value of registers are always represented in 16 bits. Therefore, it is necessary to transmit those fields using two bytes (high and low). To access bits, the way to represent a bit depends on the function used.
- Telegrams for both request and response cannot exceed 128 bytes.

7.2.7.1 Function 01 - Read Coils

7

Reads the contents of a group of internal bits that must be in numerical sequence. This function has the following structure for the reading and response telegrams (the values are always hexadecimal, and each field represents a byte):

Table 7.25 – *Telegram structure*

Request (Master)	Response (Slave)
Slave address	Slave address
Function	Function
Start bit address (byte high)	Number of data bytes
Start bit address (byte low)	Byte 1
Number of bits (byte high)	Byte 2
Number of bits (byte low)	Byte 3
CRC-	Byte n
CRC+	CRC-
-	CRC+

Each response bit is placed in a position of the data bytes sent by the slave. The first byte, in bits 0 to 7, receives the first 8 bits from the starting address indicated by the master. The other bytes (if the number of reading bits is greater than 8), continue the sequence. If the number of bits read is not a multiple of 8, the remaining bits of the last byte must be filled in with 0 (zero).

Example: reading of the status bits for general enable (bit 1) and direction of rotation (bit 2) of the of the MVW3000 at address 1:

Table 7.26 – *Telegram structure example*

Request from the master	
Field	**Value**
Address	0x01
Function	0x01
Starting bit (high)	0x00
Starting bit (low)	0x01
Number of bits (high)	0x00
Number of bits (low)	0x02
CRC-	0xEC
CRC+	0x0B

Slave response	
Field	**Value**
Address	0x01
Function	0x01
Byte Count	0x01
Status of bits 1 and 2	0x02
CRC-	0xD0
CRC+	0x49

In the example, since the number of bits read is less than 8, the slave needed only 1 byte for the response. The value of the byte was 02h, which in binary has the form 0000 0010. Since the number of bits read is equal to 2, we are only interested in the two least significant bits, which have the values 0 = general disabled and 1 = forward run. As the remaining bits were not requested, they are filled with 0 (zero).

7.2.7.2 Function 03 - Read Holding Register

Reads the contents of a group of registers that must be in numerical sequence. This function has the following structure for the reading and response telegrams (the values are always hexadecimal, and each field represents a byte):

Table 7.27 – *Telegram structure*

Request (Master)	Response (Slave)
Slave address	Slave address
Function	Function
Starting register address (byte high)	Number of data bytes
Starting register address (byte low)	Data 1 (High)
Number of registers (byte high)	Data 1 (Low)
Number of registers (byte low)	Data 2 (High)
CRC-	Data 2 (Low)
CRC+	Data n (High)
-	Data n (Low)
-	CRC+
-	CRC+

Example: reading of the values with proportional value to Motor speed (P0002) and Motor current (P0003) of the MVW3000 at address 1:

Table 7.28 – *Telegram structure example*

Request from the master	
Field	**Value**
Address	0x01
Function	0x03
Starting register (high)	0x00
Starting register (low)	0x02
Number of registers (high)	0x00
Number of registers (low)	0x02
CRC-	0x65
CRC+	0xCB

Slave response	
Field	**Value**
Address	0x01
Function	0x03
Byte Count	0x04
P0002 (high)	0x03
P0002 (low)	0x84
P0003 (high)	0x00
P0003 (low)	0x35
CRC-	0x7A
CRC+	0x49

Each register always consists of two bytes (high and low). For the example, we have that P0002 = 0384h, which in decimal is equal to 900. As this parameter has no decimal place for indication, the actual value read is 900 rpm.

Likewise, we have the current value P0003 = 0035h, which is equal to 53 decimal. As the current has a resolution of one decimal place, the actual value read is 5.3 A.

7.2.7.3 Function 05 - Write Single Coil

This function is used to write a value for a single bit. The value for the bit is represented using two bytes, where the value FF00h represents the bit equal to 1, and the value 0000h represents the bit equal to 0 (zero). It has the following structure (values are always hexadecimal, and each field represents one byte):

Table 7.29 – *Telegram structure*

Request (Master)	Response (Slave)
Slave address	Slave address
Function	Function
Bit address (byte high)	Bit address (byte high)
Bit address (byte low)	Bit address (byte low)
Bit value (byte high)	Bit value (bye high)
Bit value (byte low)	Bit value (bye low)
CRC-	CRC-
CRC+	CRC+

Example: activating the command enables ramp (bit 100 = 1) of a MVW3000 at address 1:

Table 7.30 – *Telegram structure example*

Request from the master	
Field	**Value**
Address	0x01
Function	0x05
Bit number (high)	0x00
Bit number (low)	0x64
Bit value (high)	0xFF
Bit value (low)	0x00
CRC-	0xCD
CRC+	0xE5

Slave response	
Field	**Value**
Address	0x01
Function	0x01
Bit number (high)	0x01
Bit number (low)	0x02
Bit value (high)	0xD0
Bit value (high)	0x49
CRC-	0xCD
CRC+	0xE5

For this function, the slave response is an identical copy of the request made by the master.

7.2.7.4 Function 06 - Write Single Register

This function is used to write a value for a single register. It has the following structure (values are always hexadecimal, and each field represents one byte):

Table 7.31 – *Telegram structure*

Request (Master)	Response (Slave)
Slave address	Slave address
Function	Function
Starting register address (byte high)	Register address (byte high)
Starting register address (byte low)	Register address (byte low)
Value for the register (byte high)	Value for the register (byte high)
Value for the register (byte low)	Value for the register (byte low)
CRC-	CRC-
CRC+	CRC+

Example: speed reference writing (basic variable 4) equal to 900 rpm, of an MVW3000 at address 1.

It is worth of notice that the value for basic variable 4 depends on the type of motor used, and that value 8191 is equivalent to the rated motor speed. In this case, let us assume the motor has an 1800 rpm rated speed; so, the value that will be written in basic variable 4 for a 900 rpm speed is half 8191, that is, 4096 (1000h).

Table 7.32 – *Telegram structure example*

Request from the master		Slave response	
Field	**Value**	**Field**	**Value**
Address	0x01	Address	0x01
Function	0x06	Function	0x06
Register (high)	0x13	Register (high)	0x13
Register (low)	0x8C	Register (low)	0x8C
Value (high)	0x10	Value (high)	0x10
Value (low)	0x00	Value (low)	0x00
CRC-	0x41	CRC-	0x41
CRC+	0x65	CRC+	0x65

For this function, again, the slave response is an identical copy of the request made by the master.
As stated earlier, the basic variables are addressed from 5000, so the basic variable 4 is addressed at 5004 (138Ch).

7.2.7.5 Function 15 - Write Multiple Coils

This function allows you to write values for a group of bits, which must be in numerical sequence. It can also be used to write a single bit (values are always hexadecimal, and each field represents a byte).

Table 7.33 – *Telegram structure*

Request (Master)	Response (Slave)
Slave address	Slave address
Function	Function
Start bit address (byte high)	Starting bit address (byte high)
Start bit address (byte low)	Starting bit address (byte low)
Number of bits (byte high)	Number of bits (byte high)
Number of bits (byte low)	Number of bits (byte low)
Byte Count	CRC-
Byte 1	CRC+
Byte 2	-
Byte n	-
CRC-	-
CRC+	-

The value of each bit being written is placed in a position of the data bytes sent by the master.

The first byte, in bits 0 to 7, receives the first 8 bits from the starting address indicated by the master.

The other bytes (if the number of written bits is greater than eight) continues the sequence. If the number of bits written is not a multiple of 8, the remaining bits of the last byte must be filled with 0 (zero).

Example: writing of the commands to enable ramp (bit 100 = 1), general enable (bit 101 = 1) and reverse run (bit 102 = 0), for a MVW3000 at address 1:

Table 7.34 – *Telegram structure example*

Request from the master	
Field	**Value**
Address	0x01
Function	0x0F
Starting bit (byte high)	0x00
Starting bit (byte low)	0x64
Number of bits (byte high)	0x00
Number of bits (byte low)	0x03
Byte Count	0x01
Value for the bits	0x03
CRC-	0xBE
CRC+	0x9E

Slave response	
Field	**Value**
Address	0x01
Function	0x0F
Starting bit (byte high)	0x00
Starting bit (byte low)	0x64
Number of bits (byte high)	0x00
Number of bits (byte low)	0x03
CRC-	0x54
CRC+	0x15

As only three bits are being written, the master needed only one byte to transmit the data. The transmitted values are in the three least significant bits of the byte that contains the value for the bits. The remaining bits of this byte were left with value 0 (zero).

7.2.7.6 Function 16 - Write Multiple Registers

This function allows writing values for a group of registers, which must be in numerical sequence.
It can also be used to write a single register (values are always hexadecimal, and each field represents a byte).

Table 7.35 – *Telegram structure*

Request (Master)	Response (Slave)
Slave address	Slave address
Function	Function
Starting register address (byte high)	Starting register address (byte high)
Starting register address (byte low)	Starting register address (byte low)
Number of registers (byte high)	Number of registers (byte high)
Number of registers (byte low)	Number of registers (byte low)
Byte Count	CRC-
Data 1 (high)	CRC+
Data 1 (low)	-
Data 2 (high)	-
Data 2 (low)	-
Byte n (high)	-
Byte n (low)	-
CRC-	-
CRC+	-

Example: writing of Acceleration time (P0100) = 1.0 if Deceleration time (P0101) = 2.0 s, of a MVW3000 at address 20:

Table 7.36 – *Telegram structure example*

Request from the master	
Field	**Value**
Address	0x14
Function	0x10
Starting register (byte high)	0x00
Starting register (byte low)	0x64
Number of registers (byte high)	0x00
Number of registers (byte low)	0x02
Byte Count	0x04
P0100 (high)	0x00
P0100 (low)	0x0A
P0100 (high)	0x00
P0100 (low)	0x14
CRC-	0x91
CRC+	0x75

Slave response	
Field	**Value**
Address	0x14
Function	0x10
Starting register (high)	0x00
Starting register (low)	0x64
Number of registers (high)	0x00
Number of registers (low)	0x02
CRC-	0x02
CRC+	0xD2

As both parameters have a resolution of one decimal place, for writing 1.0 and 2.0 seconds, the values 10 (000Ah) and 20 (0014h) must be transmitted, respectively.

7.2.7.7 Function 43 - Read Device Identification

Auxiliary function that allows reading the product manufacturer, model and firmware version. It has the following structure:

Table 7.37 – *Telegram structure*

Request (Master)	Response (Slave)
Slave address	Slave address
Function	Function
MEI type	MEI type
Reading code	Conformity Level
Object number	More Follows
CRC-	Next Object
CRC+	Number of objects
-	Object Code
-	Object Size
-	Object Value
-	CRC-
-	CRC+

Fields are repeated according to the number of objects.
This function allows reading three categories of information: Basic, Regular and Extended, and each category is formed by a group of objects. Each object consists of a sequence of ASCII characters. For the MVW3000, only basic information is available, consisting of three objects:

- Object 00 - VendorName: 'WEG'.
- Object 01 - ProductCode: Formed by the product code plus the inverter rated current.
- Object 02 - MajorMinorRevision: indicates the inverter firmware version, in the 'VX.XX' format.

The reading code indicates which information categories are being read and whether the objects are being accessed in sequence or individually. In this case, the inverter supports codes 01 (basic information in sequence) and 04 (individual access to objects).

The remaining fields for the MVW3000 have fixed values.

Example: reading of basic information in sequence, from object 00, of a MVW3000 at address 1:

Table 7.38 – Telegram structure example

Request from the master	
Field	**Value**
Address	0x01
Function	0x2B
MEI type	0x0E
Reading code	0x01
Object number	0x00
CRC-	0x70
CRC+	0x77

Slave response	
Field	**Value**
Address	0x01
Function	0x2B
MEI type	0x0E
Reading code	0x01
Conformity Level	0x51
More Follows	0x00
Next Object	0x00
Number of objects	0x03
Object Code	0x00
Object Size	0x03
Object Value	'WEG'
Object Code	0x01
Object Size	0x0E
Object Value	'MVW-01 7.0A'
Object Code	0x02
Object Size	0x05
Object Value	'V2.09'
CRC-	0xB8
CRC+	0x39

In this example, the value of the objects was not represented in hexadecimal but using the corresponding ASCII characters. For example, for object 00, the value 'WEG' was transmitted as three ASCII characters, which in hexadecimal have the values 57h (W), 45h (E) and 47h (G).

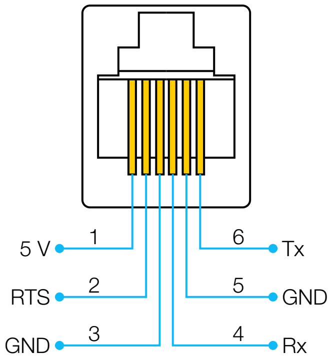
7.3 PLC2 BOARD

The PLC2 board adds to the MVW3000 inverter important PLC functions (Programmable Logic Controller), enabling the execution of Ladder programs. It also offers CANopen, DeviceNet and Modbus-RTU communication, in addition to increasing the number of I/Os of Fieldbus communications with Anybus-S board.

NOTE!
The PLC2 board has its own manual, which can be consulted for detailed information.

7.3.1 Modbus-RTU

7.3.1.1 Connector



Pin	Signal	Function
1	+5V	Power supply
2	RTS	Ready to send
3	GND	Power supply reference
4	Rx	RS-232, data reception
5	GND	Power supply reference
6	Tx	RS-232, data transmission

***Figure 7.20 –** XC7 connector: Modbus-RTU*

7.3.1.2 Parameter setting

P0764 - PLC address

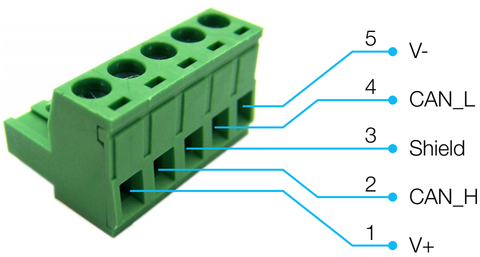
Defines the serial address of the PLC2 board.

P0765 - RS232 baud rate

Defines the serial communication baud rate.

7.3.2 CANopen

7.3.2.1 Connector



Pin	Signal	Function
1	V-	Power supply reference
2	CAN_L	CAN_L
3	Shield	Cable shield
4	CAN_H	CAN_H
5	V+	Power supply: 11...25Vcc

***Figure 7.21 –** XC17 connector: CANopen*

7.3.2.2 Termination

The starting and ending points of the network must be terminated at the characteristic impedance to avoid reflections. To that end, a 120 Ohms/0.5 W resistor must be connected between pins 2 and 4 of the connector.

7.3.2.3 Inverter parameter setting

P0770 - CAN protocol

It allows selecting which protocol is desired for communication through the CAN interface.

7.3.2.4 Node address

P0771 - CAN address

It allows selecting the PLC2 address on the CAN network; the node address can be set from 1 to 127.

7.3.2.5 Baud rate

P0772 - CAN baud rate

It sets the CAN baud rate.

Table 7.39 – *Baud rates of the CANopen network*

P0772	Description
0	1 Mbps
1	Reserved
2	500 kbps
3	250 kbps
4	125 kbps
5	100 kbps
6	50 kbps
7	20 kbps
8	10 kbps

7.3.3 DeviceNet

7.3.3.1 Inverter parameter setting

P0770 - CAN protocol

It allows selecting which protocol is desired for communication through the CAN interface.

7.3.3.2 Node address

P0771 - CAN address

It allows selecting the PLC2 address on the CAN network; the node address can be set from 0 to 63.

7.3.3.3 Baud rate

P0772 - CAN baud rate

It sets the CAN baud rate.

Table 7.40 – *Baud rates of the DeviceNet network*

P0772	Description
0	auto-baud
1	auto-baud
2	500 kbps
3	250 kbps
4	125 kbps
5	auto-baud
6	auto-baud
7	auto-baud
8	auto-baud

7.3.4 Fieldbus

It allows the user to define more than six input and output variables that will be used by the Fieldbus network.

The following items are the same as described for Fieldbus networks without a PLC2 board:

- Connector
- Termination resistor
- Baud rate
- LED indicators

See Chapter 7.1 FIELDBUS on page 7-1 for more information.

7.3.4.1 Inverter parameter setting

There is a set of parameters that enable and configure the operation of the inverter in the Fieldbus network with PLC2 board. Before starting the network operation, it is necessary to configure these parameters so that the inverter operates as desired.

P0774 - Communication failure

Selects between alarm indication or fault occurrence, if the inverter is being controlled by the network and a communication failure occurs.

P0275 - DO1 Function

P0276 - DO2 Function

P0277 - RL1 Function

P0279 - RL2 Function

P0280 - RL3 Function

P0281 - RL4 Function

P0282 - RL5 Function

These parameters define the function of the inverter digital outputs. For the digital outputs to be operated via Fieldbus with a PLC2 board, it is necessary to program these parameters for the “PLC” option.

LOCAL setting:

P0220 - LOCAL/REMOTE selection source

P0221 - Speed reference selection LOCAL situation

P0223 - Forward/Reverse Selection LOCAL Situation

P0224 - Start/Stop Selection LOCAL Situation

P0225 - Selection of JOG Source LOCAL Situation

REMOTE setting:

P0220 - LOCAL/REMOTE selection source

P0222 - Speed reference selection REMOTE situation

P0226 - Selection of Direction of ROTATION REMOTE Situation

P0227 - Start/Stop Selection REMOTE Situation

P0228 - JOG Selection - REMOTE Situation

These parameters define the source of commands and references for the inverter in the LOCAL and REMOTE modes.
For the commands to be operated via Fieldbus with a PLC2 board, it is necessary to program these parameters for the "PLC" option.

7.3.4.2 Read/written variables

The following data can be configured in the WLP software, via Menu → Tools → Anybus:

Inputs: allows to program the data sent from the PLC2 board to the network master.
Outputs: allows to program the data sent by the network master and received by the PLC2 board.

In the list of inputs and outputs, different data can be added:

- User parameters
- Word Markers
- Bit markers (always multiples of 16, because for each line added with bit markers, groups of 16 markers are considered to form a word).

Each data added to this list is 1 word (16 bits) long. The order in which the data is programmed in these lists is the same order in which this data is received and sent by the master of the network.
The maximum number of words that can be configured increases from 6 to 32.

NOTE! For use of the PLC2 board and anybus board, the parameter P0309 must be set to "inactive" so that the quantity of anybus IO's configured on the PLC2 works correctly.

7.3.4.3 Application example

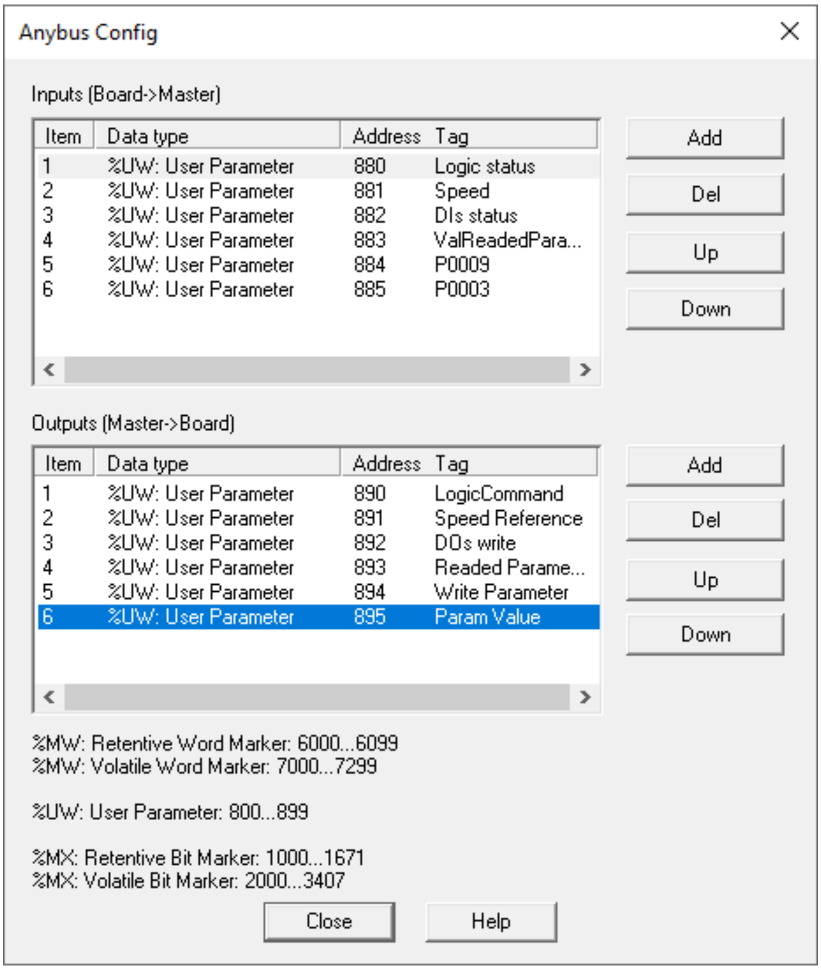


Figure 7.22 – *Anybus-S word mapping*

8 DIAGNOSTICS AND TROUBLESHOOTING

This chapter assists the user in the identification and correction of possible faults that may occur during the inverter operation. Guidance on the necessary periodical inspections and cleaning of the inverter is also provided.

8.1 ALARMS, FAULTS AND POSSIBLE CAUSES

When faults or alarms are detected, the inverter indicates them on the HMI. Alarms and faults are displayed as AXXXX (for alarms) and FXXXX (for faults), and "XXXX" is the code of the alarm or fault.

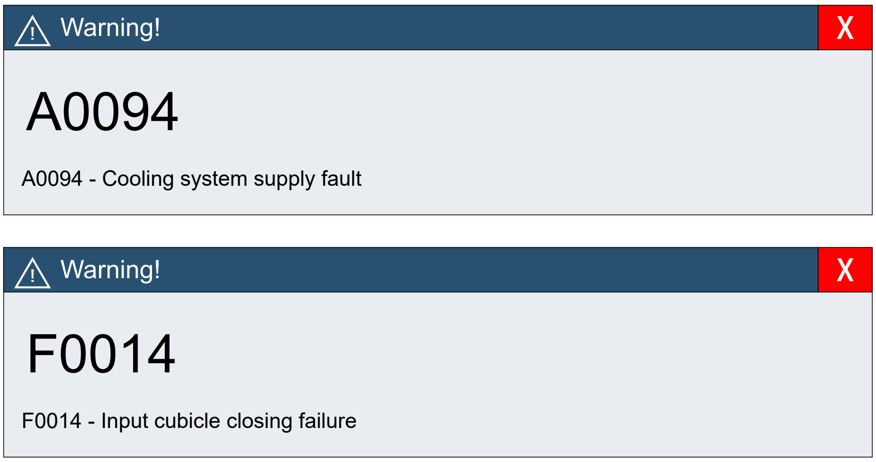


Figure 8.1 – *Example of alarm and fault codes displayed on the HMI*

If a fault occurs the inverter is disabled, whereas in an alarm event it continues operating normally. In order to restart the inverter after a fault has occurred, it must be reset. The reset can normally be performed in the following manners:

- By pressing the key (Manual Reset).
- Automatically through P0206 (Auto-reset).
- Via digital input: DI3 (P0265 = 12) or DI4 (P0266 = 12) or DI5 (P0267 = 12) or DI6 (P0268 = 12) or DI7 (P0269 = 12) or DI8 (P0270 = 12) or DI9 (P0271 = 12) or DI10 (P0272 = 12): DI Reset.
- Via networks.

The table below defines each alarm/fault code, explains how to reset the faults and shows the possible causes for each one.

Fault/alarm	Reset	Possible causes
F0003 Under Voltage / Phase Loss	▪ Power-on. ▪ Manual (/RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Inverter input voltage below 70 %. ▪ Power supply undervoltage. ▪ Incorrect settings of the input transformer primary taps. ▪ See P0673 (Undervoltage level at the inverter input).
F0006 Mains Unbalance/ Phase Loss	▪ Power-on. ▪ Manual (/RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Phase loss at the power supply. ▪ Voltage imbalance greater than 10 % of the rated value.

Fault/alarm	Reset	Possible causes
A0008 Timeout in the synchronism with the input line during synchronous transfer	▪ Manual (O /RESET key).	▪ Synchronism function could not synchronize successfully.
F0009 Incorrect status of the input cubicle	▪ Contact WEG Service Center.	▪ Incorrect operation of the input cubicle. ▪ Defective input cubicle. ▪ Wiring of the DI3 input (XC7:3) and/or action of the DI4 input (XC7:4) of PIC board defective.
F0013 Output contactor feedback	▪ Auto-reset.	▪ Fault on the closing or opening of the output contactor. ▪ Defect on the DI6/DO8 (MVC3) connections of the sinusoidal filter drive and feedback function.
F0014 Input cubicle closing failure	▪ Power-on. ▪ Manual (O /RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Input circuit breaker will not close when commanded. ▪ Defective circuit breaker. ▪ Wiring of the DI3 input of PIC board (XC7:3) open (no feedback of +24 V) in the closing of the cubicle.
F0015 Input cubicle opening failure	▪ Power-on. ▪ Manual (O /RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Input cubicle will not open when commanded. ▪ Defective circuit breaker. ▪ Wiring of DI4 input of PIC board (XC7:4) open (no feedback 24 V) in the opening of the cubicle.
F0016 Shutdown by input cubicle protection	▪ Manual (O /RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Trip of the input cubicle protection related to the inverter main transformer. ▪ Wiring on DI5 input of PIC board (XC7:5) open (no feedback of +24 V).
F0017 Inverter not ready to energize	▪ Power-on. ▪ Manual (O /RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Input circuit breaker not ready when commanded to close. ▪ Defective circuit breaker. ▪ Attempt to turn on the circuit breaker via DI1, while the inverter is indicating via DO1, which is not able to close the circuit breaker.
A0018 Inverter main transformer alarm	▪ Automatically eliminated when the transformer alarm stops actuating.	▪ Inverter main transformer alarm. ▪ Wiring of DI11 of PIC board (XC7:16) open (no feedback +24 V).
F0019 Inverter main transformer fault	▪ Power-on. ▪ Manual (O /RESET key). ▪ Auto-reset. ▪ DIx.	▪ Inverter main transformer fault. ▪ Wiring of DI12 input of PIC board (XC8:1) open (no feedback +24 V).
F0020 Pre-charge fault	▪ Power-on. ▪ Manual (O /RESET key). ▪ Auto-reset. ▪ DIx.	▪ DC link voltages have not risen to the necessary level to complete the pre-charge process within the established time. ▪ Wrong setting of the auxiliary transformer secondary tap. ▪ Low voltage or phase loss in the auxiliary power supply. ▪ Fault on contactors of pre-charging circuit. ▪ Communication optical fiber of one of the cells not connected, broken or defective.
F0025 Inverter door locking fault	▪ Power-on. ▪ Manual (O /RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Attempt to energize the inverter with the panel doors unlocked. ▪ Unlocking of the doors with the inverter enabled or with the DC links energized. ▪ Wiring at DI16 input of PIC board (XC8:10) open (no feedback of +24 V with the doors closed).

8

Fault/alarm	Reset	Possible causes
F0026 Input cubicle not ready fault	▪ Power-on. ▪ Manual (O /RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Input cubicle indicating, via DI2, it is not available for operation. ▪ Defective input cubicle. ▪ Wiring of DI2 input of PIC board (XC7:2) open (no feedback of +24 V).
F0027 Improper opening of the input cubicle	▪ Power-on. ▪ Manual (O /RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Input cubicle opening command with inverter enabled. ▪ Wiring of DI1 input of PIC board (XC7:1) open (no feedback of +24 V).
F0028 Watchdog PLC	▪ Power-on. ▪ Manual (O /RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Time-out in the execution of the PLC2 board ladder.
F0034 Sensor 1 - Electrical arcing detection fault	▪ Contact WEG Service Center.	▪ Electrical arcing detection by the panel sensors.
F0035 Sensor 2 - Electrical arcing detection fault	▪ Contact WEG Service Center.	▪ Electrical arcing detection by the panel sensors.
F0036 Sensor 3 - Electrical arcing detection fault	▪ Contact WEG Service Center.	▪ Electrical arcing detection by the panel sensors.
F0037 Sensor 4 - Electrical arcing detection fault	▪ Contact WEG Service Center.	▪ Electrical arcing detection by the panel sensors.
F0038 Sensor 5 - Electrical arcing detection fault	▪ Contact WEG Service Center.	▪ Electrical arcing detection by the panel sensors.
F0039 Sensor 6 - Electrical arcing detection fault	▪ Contact WEG Service Center.	▪ Electrical arcing detection by the panel sensors.
F0040 Sensor 7 - Electrical arcing detection fault	▪ Contact WEG Service Center.	▪ Electrical arcing detection by the panel sensors.
F0041 Sensor 8 - Electrical arcing detection fault	▪ Contact WEG Service Center.	▪ Electrical arcing detection by the panel sensors.
F0042 Sensor 9 - Electrical arcing detection fault	▪ Contact WEG Service Center.	▪ Electrical arcing detection by the panel sensors.
F0043 Sensor 10 - Electrical arcing detection fault	▪ Contact WEG Service Center.	▪ Electrical arcing detection by the panel sensors.
F0044 Electrical arcing detection fault	▪ Contact WEG Service Center.	▪ Electrical arcing detection by the panel sensors.
A0046 Motor Ixt function overload	▪ Automatic eliminated when overload percentage value (P0076) is below P0159.	▪ Setting of P0156, P0157 and P0158 too low for the used motor. ▪ Setting of P0159 too low for the used motor. ▪ Load on the motor shaft too high. ▪ Setting of P0136 and P0137 too high (valid for operation at low speed).

8

Fault/alarm	Reset	Possible causes
F0048 Forced ventilation fault	▪ Power-on. ▪ Manual (O /RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Fans blocked. ▪ Input air filters blocked.
F0069 Calibration fault	▪ Contact WEG Service Center. ▪ For WEG use.	▪ For WEG use.
F0070 Overcurrent/short circuit	▪ Power-on. ▪ Manual (O /RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Inverter output instant current higher than twice the rated current (detection by Hardware). ▪ Short circuit between two motor phases or power cables (detection by hardware). ▪ Load inertia too high or acceleration ramp too fast. ▪ Incorrect regulation and/or configuration parameter(s). ▪ Setting of P0169, P0170 or P0171 too high. ▪ IGBTs modules of the cells in short circuit.
F0071 Overcurrent at output	▪ Power-on. ▪ Manual (O /RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Short circuit between two motor phases or power cables (detection by hardware). ▪ Load inertia too high or acceleration ramp too fast. ▪ Incorrect regulation and/or configuration parameter(s). ▪ Setting of P0169, P0170 or P0171 too high.
F0072 Output over load Ixt function	▪ Power-on. ▪ Manual (O /RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Setting of P0156, P0157 and P0158 too low for the used motor. ▪ Setting of P0136 and P0137 too high (valid for operation at load speed). ▪ Load on the motor shaft too high. ▪ The output overload fault does not cause the opening of the input cubicle.
F0076 Output current unbalanced	▪ Power-on. ▪ Manual (O /RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Motor cable disconnected or poor contact. ▪ Fault on the current feedback circuit. ▪ Difference between output currents above 12.5 % of the rated current for a period above the limit.
F0078 Motor Over Temperature	▪ Power-on. ▪ Manual (O /RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Motor temperature above the fault level set on the thermal protection relay. ▪ Digital input signal, coming from the thermal protection relay, set to "Fault on the motor" at low level.
F0079 Signals of the motor speed sensor defective	▪ Power-on. ▪ Manual (O /RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Wiring between the motor speed sensor and the inverter interface board defective. ▪ Speed sensor defective. ▪ Cable length longer than the specified limit. ▪ Speed sensor incorrectly installed on the motor.
F0080 CPU watchdog error	▪ Power-on. ▪ Manual (O /RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Electric noise on the control boards.
F0083 Inverter setup fault		▪ Attempt to set a parameter incompatible with the others. ▪ See Table Table 4.3 on page 4-11 .

8

Fault/alarm	Reset	Possible causes
A0084 Incorrect programming of inverter model	▪ Power-on. ▪ Manual (O /RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Incorrect programming of inverter model. ▪ Incompatibility between the inverter current (P0295) and voltage (P0296) parameters; see values in the product manual.
F0085 Electronic power supply fault	▪ Power-on. ▪ Manual (O /RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Power supply monitoring signal keeps indicating electronics power supplies not OK.
F0087 Control boards communication fault	▪ Automatically eliminated when the MVC3 and MVC4 control boards reestablish communication	▪ Fault on the serial communication circuit of the MVC3 board. ▪ Fault on the serial communication circuit of the MVC4 board. ▪ Fiber optic cables not connected or defective.
F0090 External DIx open fault	▪ Power-on. ▪ Manual (O /RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Digital input set to "No external fault" open (no feedback of +24 V). ▪ For further details on this DI function, refer to the inverter project.
F0092 Pre-charge power supply	▪ Power-on. ▪ Manual (O /RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Short-circuit in the pre-charge system. ▪ Defective pre-charge capacitors. ▪ Defective pre-charge resistors. ▪ Pre-charge circuit breaker is open. ▪ Wiring of DI7 input of PIC board (XC7:16) is open (no feedback of +24 V). ▪ Problems in the pre-charge auxiliary inverter.
A0094 Cooling system supply fault	▪ It resets automatically after the cause is eliminated.	▪ Short circuit in the ventilation system. ▪ Fan locked. ▪ Circuit breakers that feed the inverter ventilation system open. ▪ Wiring of DI10 input of PIC board (XC7:15) open (no feedback of +24 V).
A0096 Alarm 4 to 20 mA (current < 3 mA)	▪ It resets automatically after the cause is eliminated.	▪ Cable of one or more analog inputs set to signal 4 to 20 mA disconnected or broken. ▪ Current received at analog input below 3 mA.
A0098 Help not recorded/Incompatible HMI version	▪ It resets automatically after the cause is eliminated.	▪ No help saved or the version saved is incompatible with the current firmware version of the graphic HMI.
F0099 Invalid output current offset	▪ Contact WEG Service Center.	▪ Offset of the output current measurements out of the acceptable range. ▪ Defect on the output current measurement circuit.
F0100 MVC3 fatal fault	▪ Contact WEG Service Center.	▪ Invalid CPU addressing.
F0101 Incompatible software version between control boards	▪ Contact WEG Service Center.	▪ Firmware version of the MVC3 control board incompatible with the MVC4.
F0102 Unknown failure in EPLD of MVC3	▪ Contact WEG Service Center.	▪ Invalid data informed by the EPLD/FPGA of the MVC3 control board.
F0103 MVC3 RAM fault	▪ Contact WEG Service Center.	▪ Auto-diagnosis fault of the SRAM with battery.
F0105 MVC3 EEPROM failure	▪ Contact WEG Service Center.	▪ Auto-diagnosis fault on the EEPROM.

8

Fault/alarm	Reset	Possible causes
F0106 MVC4 fatal fault	▪ Contact WEG Service Center.	▪ Invalid CPU addressing.
A0108 Inverter Not Initialized	▪ It resets automatically after the cause is eliminated.	▪ Waiting for the boot conclusion.
F0109 General Disable MVC3	▪ Power-on. ▪ Manual (O /RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Wiring of DI13 input of PIC board (XC8:7) open (no feedback of +24 V). ▪ For further details on this DI function, refer to the inverter project.
A0110 Motor overtemperature alarm	▪ It resets automatically after the cause is eliminated.	▪ Motor temperature above the alarm level set on the thermal protection relay. ▪ Digital input signal, coming from the thermal protection relay, set to "Motor alarm" at low level.
A0111 DIx open external alarm	▪ It resets automatically after the cause is eliminated.	▪ Digital input set to "No external alarm" open (no feedback of +24 V). ▪ For further details on this DI function, refer to the inverter project.
F0112 Motor Over Speed	▪ Power-on. ▪ Manual (O /RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ High acceleration mechanical torque on the load. ▪ Motor speed above the limit set. ▪ If P0002 > P0132 * P0134.
A0114 Inverter ventilation alarm - set B	▪ It resets automatically after the cause is eliminated.	▪ Short circuit on the ventilation system. ▪ Fan locked. ▪ Circuit breakers that feed the inverter ventilation set B are open. ▪ Digital input signal set to "No alarm on Redundant Fan B" at low level.
A0118 Pre-charge power supply	▪ Power-on. ▪ Manual (O /RESET key). ▪ Auto-reset. ▪ It resets automatically after the cause is eliminated. ▪ DIx. ▪ Networks.	▪ Short-circuit in the pre-charge system. ▪ Defective pre-charge capacitors. ▪ Defective pre-charge resistors. ▪ Pre-charge circuit breaker is open. ▪ Wiring of DI7 input of PIC board (XC7:16) is open (no feedback of +24 V). ▪ Problems in the pre-charge auxiliary inverter.
A0123 Programming alarm	▪ It resets automatically after the cause is eliminated.	▪ Alarm occurs when parameter P0169 is set to a value beyond the one accepted by the overload duty. ▪ P0169 above 15 % of the value of P0295 (Current).
A0124 Parameter alteration with enabled inverter	▪ It resets automatically after the cause is eliminated.	▪ Specific Fieldbus/Serial fault.
A0125 Reading/writing in inexistent parameter	▪ It resets automatically after the cause is eliminated.	▪ Specific Fieldbus/Serial fault.
A0126 Parameter Value Out of Range	▪ It resets automatically after the cause is eliminated.	▪ Specific Fieldbus/Serial fault.
A0127 Function not configured for Fieldbus	▪ It resets automatically after the cause is eliminated.	▪ Specific Fieldbus/Serial fault.
F0128 Fieldbus Connec. Fault	▪ Networks.	▪ Specific Fieldbus/Serial fault.

8

Fault/alarm	Reset	Possible causes
A0129 Fieldbus Connec. Inactive	▪ It resets automatically after the cause is eliminated.	▪ Specific Fieldbus/Serial fault.
A0130 Fieldbus board inactive	▪ It resets automatically after the cause is eliminated.	▪ Specific Fieldbus/Serial fault.
F0256 Output transformer fault	▪ Power-on. ▪ Manual (/RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Digital input set to "Transformer OK" open (no feedback of +24 V). ▪ For further details on this DI function, refer to the inverter project.
F0257 Pressurization system fault	▪ Power-on. ▪ Manual (/RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Digital input set to "Pressurization system OK" open (no feedback of +24 V). ▪ For further details on this DI function, refer to the inverter project.
F0258 Output filter fault	▪ Power-on. ▪ Manual (/RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Digital input set to "Output filter OK" open (no feedback of +24 V). ▪ For further details on this DI function, refer to the inverter project.
F0259 Exciter fault	▪ Power-on. ▪ Manual (/RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Digital input set to "Exciter OK" open (no feedback of +24 V). ▪ For further details on this DI function, refer to the inverter project.
F0260 Communication with the position sensor	▪ Power-on. ▪ Manual (/RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Wiring between the motor speed sensor and the inverter interface board is defective. ▪ Defective speed sensor. ▪ Cable length exceeds the specified limit. ▪ Motor speed sensor is incorrectly installed. ▪ Encoder parameter setting is wrong; see Menu → Configurations → Nominal data → Encoder.
A0261 Direction of rotation between input voltage and current is inverted	▪ Power-on. ▪ Manual (/RESET key). ▪ Auto-reset. ▪ It resets automatically after the cause is eliminated. ▪ DIx. ▪ Networks.	▪ Connections between the terminals of the transformer auxiliary windings and the input voltage measurement ISOC2 are inverted. ▪ Input CTs connected to the wrong phases of the transformers. ▪ Wrong connection of the current transformers of the transformers to the ISOC2. ▪ Measuring fibers between the input ISOC2 and the control rack are inverted. ▪ See parameter P1477 to check the direction of rotation identified by the software for the measurements.
A0262 Direction of rotation between the output current and voltage is inverted	▪ Power-on. ▪ Manual (/RESET key). ▪ Auto-reset. ▪ It resets automatically after the cause is eliminated. ▪ DIx. ▪ Networks.	▪ Connections between the output terminals and the electronic board for output voltage measurement are inverted. ▪ Output CTs connected to the wrong output phases. ▪ Wrong connection of the output current transformers to the PIC board. ▪ Measurement fibers between the electronic board for output voltage measurement and the control rack are inverted. ▪ See parameter P1477 to check the direction of rotation identified by the software for the measurements.

Fault/alarm	Reset	Possible causes
F0263 Timeout on output contactor activation	▪ Power-on. ▪ Manual (O /RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ The condition for the command to close the output contactor has not been met. ▪ If configured to drive PM motors, the voltage of the terminals was higher than that the DC links withstand.
A0301 Input undervoltage	▪ Eliminate automatically when the voltage at the inverter input exceeds 75.5 %.	▪ Voltage on the input transformer secondary is below 75.5 %. ▪ Undervoltge on the supply line. ▪ Wrong setting of the transformer primary taps.
A0302 Input overvoltage	▪ Eliminate automatically when the voltage at the inverter input is less than 113.5 %.	▪ Inverter input voltage above 114 %. ▪ Overvoltage on the supply line. ▪ Wrong setting of the transformer primary taps.
F0303 Input undervoltage	▪ Power-on. ▪ Manual (O /RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ The inverter input voltage less than 70 %. ▪ Undervoltage on the supply line. ▪ Wrong setting of the transformer primary taps.
F0304 Input overvoltage	▪ Power-on. ▪ Manual (O /RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Inverter input voltage above 117 %. ▪ Overvoltage on the supply line. ▪ Wrong setting of the transformer primary taps.
F0305 Input unbalance/phase loss	▪ Power-on. ▪ Manual (O /RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Phase loss on the supply line. ▪ Voltage difference between the phases above 40 % of the rated value. ▪ Voltage on any phase below 30 % of the rated value.
F0309 Timeout in Ride-through state Waiting Line	▪ Power-on. ▪ Manual (O /RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Time for the return of the power longer than the time set at P0332 + P0333. ▪ Inverter input voltage below 80 %. ▪ Undervoltage in the mains supply. ▪ Incorrect setting of the transformer primary taps;
F0310 Short circuit on the transformer 1 secondary	▪ Power-on. ▪ Manual (O /RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Reversal of the inverter input cables (RTS or 132 phase sequence). ▪ Short circuit on the cables of the input transformer secondaries. ▪ Short circuit on the coils of the input transformer secondaries. ▪ Defect on the transformer current measurement circuit. ▪ Defect on the input voltage measurement circuit. ▪ Incorrect setting of the input transformer parameters.
A0315 Ground fault for neutral shift	▪ Automatically eliminated when the voltage between the motor virtual neutral point and the ground presents a value below 20	▪ Fault in the insultation to the ground of the connecting cables or of the load driven by the inverter. ▪ Voltage between the virtual neutral of the motor and the ground of the system (P1144) above 25 % the voltage value of the motor phase. ▪ Only detected with the load running.
F0316 Ground fault for neutral shift	▪ Power-on. ▪ Manual (O /RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Fault in the insultation to the ground of the connecting cables or of the load driven by the inverter. ▪ Voltage between the virtual neutral of the motor and the ground of the system (P1144) above 50 % the voltage value of the motor phase for more than 0.5 s. ▪ Only detected with the load running.

Fault/alarm	Reset	Possible causes
F0317 Ground fault for current leak	▪ Power-on. ▪ Manual (/RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Fault in the insultation to the ground of the connecting cables or of the load driven by the inverter with the presence of current leak. ▪ The sum of the three output currents is above 12.5 % of the inverter rated current. ▪ Sensors measuring the output current are defective.
F0320 Vab measurement feedback fault	▪ Contact WEG Service Center.	▪ Fault on the feedback circuit of the line voltage between phases A and B at the inverter input. ▪ Fiber optic Vab not connected, inverted or defective.
F0321 Vbc measurement feedback fault	▪ Contact WEG Service Center.	▪ Fault on the feedback circuit of the line voltage between phases A and B at the inverter input. ▪ Fiber optic Vbc not connected, inverted or defective.
F0323 Ib_1 measurement feedback fault	▪ Contact WEG Service Center.	▪ Fault on the feedback circuit of the current of phase B at the inverter input. ▪ Fiber optic Ib_x not connected, inverted or defective. ▪ Refer to the parameter P1893 (Transformers at the input) description.
F0324 Ic_1 measurement feedback fault	▪ Contact WEG Service Center.	▪ Fault on the feedback circuit of the current of phase C at the inverter input. ▪ Fiber optic Ic_x not connected, inverted or defective. ▪ Refer to the parameter P1893 description.
F0325 Vuv measurement feedback fault	▪ Contact WEG Service Center.	▪ Fault on the feedback circuit of the line voltage measured between phases U and V at the inverter output. ▪ Fiber optic Vuv not connected, inverted or defective.
F0326 Vvw measurement feedback fault	▪ Contact WEG Service Center.	▪ Fault on the feedback circuit of the line voltage measured between phases V and W at the inverter output. ▪ Fiber optic Vvw not connected, inverted or defective.
F0327 Vn_gnd measurement feedback fault	▪ Contact WEG Service Center.	▪ Fault on the feedback circuit of the voltage between the motor virtual neutral and the system ground. ▪ Fiber optic N_GND not connected, inverted or defective.
F0328 Ib_2 measurement feedback fault	▪ Contact WEG Service Center.	▪ Fault on the feedback circuit of the current of phase B at the inverter input. ▪ Fiber optic Ib_x not connected, inverted or defective. ▪ Refer to the parameter P1893 (Transformers at the input) description.
F0329 Ic_2 measurement feedback fault	▪ Contact WEG Service Center.	▪ Fault on the feedback circuit of the current of phase C at the inverter input. ▪ Fiber optic Ic_x not connected, inverted or defective. ▪ Refer to the parameter P1893 description.
F0330 Ib_3 measurement feedback fault	▪ Contact WEG Service Center.	▪ Fault on the feedback circuit of the current of phase B at the inverter input. ▪ Fiber optic Ib_x not connected, inverted or defective. ▪ Refer to the parameter P1893 (Transformers at the input) description.

Fault/alarm	Reset	Possible causes
F0331 Ic_3 measurement feedback fault	▪ Contact WEG Service Center.	▪ Fault on the feedback circuit of the current of phase C at the inverter input. ▪ Fiber optic Ic_x not connected, inverted or defective. ▪ Refer to the parameter P1893 description.
F0343 Short circuit on the transformer 2 secondary	▪ Power-on. ▪ Manual (O /RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Reversal of the inverter input cables (RTS or 132 phase sequence). ▪ Short circuit on the cables of the input transformer secondaries. ▪ Short circuit on the coils of the input transformer secondaries. ▪ Defect on the transformer current measurement circuit. ▪ Defect on the input voltage measurement circuit. ▪ Incorrect setting of the input transformer parameters.
F0346 Short circuit on the transformer 3 secondary	▪ Power-on. ▪ Manual (O /RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Reversal of the inverter input cables (RTS or 132 phase sequence). ▪ Short circuit on the cables of the input transformer secondaries. ▪ Short circuit on the coils of the input transformer secondaries. ▪ Defect on the transformer current measurement circuit. ▪ Defect on the input voltage measurement circuit. ▪ Incorrect setting of the input transformer parameters.
F0350 Invalid setting for the Bypass	▪ Power-on. ▪ Manual (O /RESET key). ▪ DIx. ▪ Networks.	▪ Bypass situation where the arrangement of the operating power arms represent an invalid combination for operation. ▪ With the operating power arms available in the system, it is not possible to obtain a confinement to provide balanced three-phase voltage for the motor. ▪ The invalid arrangement condition occurs when the selected bypass function is the neutral shift. ▪ See the settings of the power arms in parameters P1155, P1156 and P1157.
F0351 Number of programmed cells exceeds the inverter capacity	▪ Power-on. ▪ Manual (O /RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ The total number of cells resulting from the inverter configuration exceeds the communication capacity of the control rack; such number should be fewer than 36 cells. ▪ Invalid inverter configuration considering the setting of parameters: Voltage (P0296), Number of redundant cells per phase (P1565) and Cells in parallel (P1892).
F0359 Thermal protection relay 1 - Communication timeout	▪ Power-on. ▪ Manual (O /RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ P0315 > 0 and the cable for communication with the thermal protection relay disconnected or defective for more than 10 s. ▪ Incorrect protection relay communication parameters or relay in **PRG** (programming) or **VIS** (programming view) modes.
A0360 Thermal protection relay 1 - CH1 temperature sensor failure	▪ Power-on. ▪ Manual (O /RESET key). ▪ Auto-reset. ▪ It resets automatically after the cause is eliminated. ▪ DIx. ▪ Networks.	▪ Temperature sensor broken wire. ▪ PT100 accessory connectors disconnected. ▪ Temperature channel active without a sensor connected to the PT100 accessory.

Fault/alarm	Reset	Possible causes
A0361 Thermal protection relay 1 - CH2 temperature sensor failure	▪ Power-on. ▪ Manual (/RESET key). ▪ Auto-reset. ▪ It resets automatically after the cause is eliminated. ▪ DIx. ▪ Networks.	▪ Temperature sensor broken wire. ▪ PT100 accessory connectors disconnected. ▪ Temperature channel active without a sensor connected to the PT100 accessory.
A0362 Thermal protection relay 1 - CH3 temperature sensor failure	▪ Power-on. ▪ Manual (/RESET key). ▪ Auto-reset. ▪ It resets automatically after the cause is eliminated. ▪ DIx. ▪ Networks.	▪ Temperature sensor broken wire. ▪ PT100 accessory connectors disconnected. ▪ Temperature channel active without a sensor connected to the PT100 accessory.
A0363 Thermal protection relay 1 - CH4 temperature sensor failure	▪ Power-on. ▪ Manual (/RESET key). ▪ Auto-reset. ▪ It resets automatically after the cause is eliminated. ▪ DIx. ▪ Networks.	▪ Temperature sensor broken wire. ▪ PT100 accessory connectors disconnected. ▪ Temperature channel active without a sensor connected to the PT100 accessory.
A0364 Thermal protection relay 1 - CH5 temperature sensor failure	▪ Power-on. ▪ Manual (/RESET key). ▪ Auto-reset. ▪ It resets automatically after the cause is eliminated. ▪ DIx. ▪ Networks.	▪ Temperature sensor broken wire. ▪ PT100 accessory connectors disconnected. ▪ Temperature channel active without a sensor connected to the PT100 accessory.
A0365 Thermal protection relay 1 - CH6 temperature sensor failure	▪ Power-on. ▪ Manual (/RESET key). ▪ Auto-reset. ▪ It resets automatically after the cause is eliminated. ▪ DIx. ▪ Networks.	▪ Temperature sensor broken wire. ▪ PT100 accessory connectors disconnected. ▪ Temperature channel active without a sensor connected to the PT100 accessory.
A0366 Thermal protection relay 1 - CH7 temperature sensor failure	▪ Power-on. ▪ Manual (/RESET key). ▪ Auto-reset. ▪ It resets automatically after the cause is eliminated. ▪ DIx. ▪ Networks.	▪ Temperature sensor broken wire. ▪ PT100 accessory connectors disconnected. ▪ Temperature channel active without a sensor connected to the PT100 accessory.
A0367 Thermal protection relay 1 - CH8 temperature sensor failure	▪ Power-on. ▪ Manual (/RESET key). ▪ Auto-reset. ▪ It resets automatically after the cause is eliminated. ▪ DIx. ▪ Networks.	▪ Temperature sensor broken wire. ▪ PT100 accessory connectors disconnected. ▪ Temperature channel active without a sensor connected to the PT100 accessory.
F0368 Thermal protection relay 1 - Overtemperature detected on CH1	▪ Power-on. ▪ Manual (/RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Temperature above the fault level set on the thermal protection relay and P0315 > 0.
F0369 Thermal protection relay 1 - Overtemperature detected on CH2	▪ Power-on. ▪ Manual (/RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Temperature above the fault level set on the thermal protection relay and P0315 > 0.

8

Fault/alarm	Reset	Possible causes
F0370 Thermal protection relay 1 - Overtemperature detected on CH3	▪ Power-on. ▪ Manual (/RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Temperature above the fault level set on the thermal protection relay and P0315 > 0.
F0371 Thermal protection relay 1 - Overtemperature detected on CH4	▪ Power-on. ▪ Manual (/RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Temperature above the fault level set on the thermal protection relay and P0315 > 0.
F0372 Thermal protection relay 1 - Overtemperature detected on CH5	▪ Power-on. ▪ Manual (/RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Temperature above the fault level set on the thermal protection relay and P0315 > 0.
F0373 Thermal protection relay 1 - Overtemperature detected on CH6	▪ Power-on. ▪ Manual (/RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Temperature above the fault level set on the thermal protection relay and P0315 > 0.
F0374 Thermal protection relay 1 - Overtemperature detected on CH7	▪ Power-on. ▪ Manual (/RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Temperature above the fault level set on the thermal protection relay and P0315 > 0.
F0375 Thermal protection relay 1 - Overtemperature detected on CH8	▪ Power-on. ▪ Manual (/RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Temperature above the fault level set on the thermal protection relay and P0315 > 0.
A0376 Thermal protection relay 1 - Overtemperature detected on CH1	▪ Power-on. ▪ Manual (/RESET key). ▪ Auto-reset. ▪ It resets automatically after the cause is eliminated. ▪ DIx. ▪ Networks.	▪ Temperature above the alarm level set on the thermal protection relay and P0315 > 0.
A0377 Thermal protection relay 1 - Overtemperature detected on CH2	▪ Power-on. ▪ Manual (/RESET key). ▪ Auto-reset. ▪ It resets automatically after the cause is eliminated. ▪ DIx. ▪ Networks.	▪ Temperature above the alarm level set on the thermal protection relay and P0315 > 0.
A0378 Thermal protection relay 1 - Overtemperature detected on CH3	▪ Power-on. ▪ Manual (/RESET key). ▪ Auto-reset. ▪ It resets automatically after the cause is eliminated. ▪ DIx. ▪ Networks.	▪ Temperature above the alarm level set on the thermal protection relay and P0315 > 0.
A0379 Thermal protection relay 1 - Overtemperature detected on CH4	▪ Power-on. ▪ Manual (/RESET key). ▪ Auto-reset. ▪ It resets automatically after the cause is eliminated. ▪ DIx. ▪ Networks.	▪ Temperature above the alarm level set on the thermal protection relay and P0315 > 0.

<table>
<tr><th>Fault/alarm</th><th>Reset</th><th>Possible causes</th></tr>
<tr><td>A0380
Thermal protection relay 1 - Overtemperature detected on CH5</td><td>▪ Power-on.
▪ Manual (/RESET key).
▪ Auto-reset.
▪ It resets automatically after the cause is eliminated.
▪ DIx.
▪ Networks.</td><td>▪ Temperature above the alarm level set on the thermal protection relay and P0315 > 0.</td></tr>
<tr><td>A0381
Thermal protection relay 1 - Overtemperature detected on CH6</td><td>▪ Power-on.
▪ Manual (/RESET key).
▪ Auto-reset.
▪ It resets automatically after the cause is eliminated.
▪ DIx.
▪ Networks.</td><td>▪ Temperature above the alarm level set on the thermal protection relay and P0315 > 0.</td></tr>
<tr><td>A0382
Thermal protection relay 1 - Overtemperature detected on CH7</td><td>▪ Power-on.
▪ Manual (/RESET key).
▪ Auto-reset.
▪ It resets automatically after the cause is eliminated.
▪ DIx.
▪ Networks.</td><td>▪ Temperature above the alarm level set on the thermal protection relay and P0315 > 0.</td></tr>
<tr><td>A0383
Thermal protection relay 1 - Overtemperature detected on CH8</td><td>▪ Power-on.
▪ Manual (/RESET key).
▪ Auto-reset.
▪ It resets automatically after the cause is eliminated.
▪ DIx.
▪ Networks.</td><td>▪ Temperature above the alarm level set on the thermal protection relay and P0315 > 0.</td></tr>
<tr><td>F0400
Cell U1 DC link overvoltage</td><td>▪ Power-on.
▪ Manual (/RESET key).
▪ Auto-reset.
▪ DIx.
▪ Networks.</td><td>▪ Inverter input supply voltage too high.
▪ Incorrect setting of the inverter main transformer taps.
▪ Cell DC link voltage above 1200 V.
▪ Load inertia too high or deceleration ramp too short.
▪ Setting of P0151 too high.</td></tr>
<tr><td>F0401
Cell U1 DC link undervoltage</td><td>▪ Power-on.
▪ Manual (/RESET key).
▪ Auto-reset.
▪ DIx.
▪ Networks.</td><td>▪ Inverter input supply voltage too low.
▪ Incorrect setting of the inverter main transformer taps.
▪ Cell DC link voltage below 745 V below 652 V for operation in vector control.</td></tr>
<tr><td>A0402
Overtemperature on cell U1 IGBT module</td><td>▪ Automatically eliminated when the temperature at the cell heatsink presents a value below the alarm level.</td><td>▪ Temperature on the cell heatsink above the alarm level.
▪ Ambient temperature too high (> 40 °C) and high output current.
▪ Fans locked or defective.
▪ Air input filters blocked.
<table><tr><th>Cell model</th><th>Alarm level</th></tr><tr><td>70 A</td><td>85 °C</td></tr><tr><td>140 A</td><td>85 °C</td></tr><tr><td>200 A</td><td>85 °C</td></tr><tr><td>265 A</td><td>85 °C</td></tr><tr><td>340 A</td><td>85 °C</td></tr><tr><td>450 A</td><td>90 °C</td></tr><tr><td>600 A</td><td>90 °C</td></tr></table></td></tr>
</table>

<table>
<tr><th>Fault/alarm</th><th>Reset</th><th>Possible causes</th></tr>
<tr><td>F0403
Overtemperature on cell U1 IGBT module</td><td>▪ Power-on.
▪ Manual (O /RESET key).
▪ Auto-reset.
▪ DIx.
▪ Networks.</td><td>▪ Temperature on the cell heatsink above the fault level.
▪ Ambient temperature too high (> 40 °C) and high output current.
▪ Fans locked or defective.
▪ Air input filters blocked.
<table>
<tr><th>Cell model</th><th>Fault level</th></tr>
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<tr><td>450 A</td><td>95 °C</td></tr>
<tr><td>600 A</td><td>95 °C</td></tr>
</table></td></tr>
<tr><td>F0404
Defective temperature sensor or undertemperature on cell U1 IGBT</td><td>▪ Contact WEG Service Center.</td><td>▪ Cell temperature measurement sensor defective.
▪ Cell temperature sensor disconnected.
▪ Temperature on the cell heatsink below -10 °C.</td></tr>
<tr><td>F0405
Cell U1 phase IGBT</td><td>▪ Contact WEG Service Center.</td><td>▪ Short circuit at the inverter output.
▪ Trigger board of the IGBTs of the cell phase arm disconnected.
▪ IGBTs of the cell phase arm operating out of the saturation region.
▪ IGBTs or trigger board of the cell phase arm defective.
▪ Fault on the desaturation signal feedback or gate-driver supply.</td></tr>
<tr><td>F0406
Cell U1 neutral IGBT</td><td>▪ Contact WEG Service Center.</td><td>▪ Short circuit at the inverter output.
▪ Trigger board of the IGBTs of the cell neutral arm disconnected.
▪ IGBTs of the cell neutral arm operating out of the saturation region.
▪ IGBTs or trigger board of the cell neutral arm defective.
▪ Fault on the desaturation signal feedback or gate-driver supply.</td></tr>
<tr><td>F0408
Cell U1 phase pulse feedback</td><td>▪ Contact WEG Service Center.</td><td>▪ Fault on the commutation of the IGBTs of the cell phase arm.
▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the phase arm disconnected or defective.
▪ IGBTs or trigger board of the cell phase arm defective.</td></tr>
<tr><td>F0410
Cell U1 neutral pulse feedback</td><td>▪ Contact WEG Service Center.</td><td>▪ Fault on the confirmation of the commutation of the IGBTs of the cell neutral arm.
▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the neutral arm disconnected or defective.
▪ IGBTs or trigger board of the cell neutral arm defective.</td></tr>
<tr><td>F0411
Cell U1 electronics power supply</td><td>▪ Contact WEG Service Center.</td><td>▪ Voltages of the internal electronic circuits of the cell out of the operation level.
▪ Defect on the cell power supply.</td></tr>
<tr><td>F0416
Cell U1 modulation synchronism</td><td>▪ Contact WEG Service Center.</td><td>▪ Fault in the synchronism between the MCC1 control board of the cell and the MVC3 main control.</td></tr>
<tr><td>F0417
Cell U1 bypass system</td><td>▪ Contact WEG Service Center.</td><td>▪ Fault in the operation of the cell bypass system.
▪ Bypass system is not connected or defective.</td></tr>
</table>

<table>
<tr><th>Fault/alarm</th><th>Reset</th><th>Possible causes</th></tr>
<tr><td>F0418
Communication with cell U1</td><td>Contact WEG Service Center.</td><td>Fault on the communication between the MCC1 control board of the cell and the MVC3 main control.
Break or defect on the cell communication optic cable.</td></tr>
<tr><td>F0422
Cell U1 insulation defective</td><td>Contact WEG Service Center.</td><td>Fault in the internal insulation of the cell: Contact between some energized point of the circuit and the frame.
Fault on the capacitor discharge resistors of the cell DC link.</td></tr>
<tr><td>F0425
Cell U2 DC link overvoltage</td><td>Power-on.
Manual (/RESET key).
Auto-reset.
DIx.
Networks.</td><td>Inverter input supply voltage too high.
Incorrect setting of the inverter main transformer taps.
Cell DC link voltage above 1200 V.
Load inertia too high or deceleration ramp too short.
Setting of P0151 too high.</td></tr>
<tr><td>F0426
Cell U2 DC link undervoltage</td><td>Power-on.
Manual (/RESET key).
Auto-reset.
DIx.
Networks.</td><td>Inverter input supply voltage too low.
Incorrect setting of the inverter main transformer taps.
Cell DC link voltage below 745 V below 652 V for operation in vector control.</td></tr>
<tr><td>A0427
Overtemperature on cell U2 IGBT module</td><td>Automatically eliminated when the temperature at the cell heatsink presents a value below the alarm level.</td><td>Temperature on the cell heatsink above the alarm level.
Ambient temperature too high (> 40 °C) and high output current.
Fans locked or defective.
Air input filters blocked.
<table>
<tr><th>Cell model</th><th>Alarm level</th></tr>
<tr><td>70 A</td><td>85 °C</td></tr>
<tr><td>140 A</td><td>85 °C</td></tr>
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<tr><td>450 A</td><td>90 °C</td></tr>
<tr><td>600 A</td><td>90 °C</td></tr>
</table></td></tr>
<tr><td>F0428
Overtemperature on cell U2 IGBT module</td><td>Power-on.
Manual (/RESET key).
Auto-reset.
DIx.
Networks.</td><td>Temperature on the cell heatsink above the fault level.
Ambient temperature too high (> 40 °C) and high output current.
Fans locked or defective.
Air input filters blocked.
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<tr><th>Cell model</th><th>Fault level</th></tr>
<tr><td>70 A</td><td>90 °C</td></tr>
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<tr><td>340 A</td><td>90 °C</td></tr>
<tr><td>450 A</td><td>95 °C</td></tr>
<tr><td>600 A</td><td>95 °C</td></tr>
</table></td></tr>
<tr><td>F0429
Defective temperature sensor or undertemperature on cell U2 IGBT</td><td>Contact WEG Service Center.</td><td>Cell temperature measurement sensor defective.
Cell temperature sensor disconnected.
Temperature on the cell heatsink below -10 °C.</td></tr>
</table>

Fault/alarm	Reset	Possible causes
F0430 Cell U2 phase IGBT	▪ Contact WEG Service Center.	▪ Short circuit at the inverter output. ▪ Trigger board of the IGBTs of the cell phase arm disconnected. ▪ IGBTs of the cell phase arm operating out of the saturation region. ▪ IGBTs or trigger board of the cell phase arm defective. ▪ Fault on the desaturation signal feedback or gate-driver supply.
F0431 Cell U2 neutral IGBT	▪ Contact WEG Service Center.	▪ Short circuit at the inverter output. ▪ Trigger board of the IGBTs of the cell neutral arm disconnected. ▪ IGBTs of the cell neutral arm operating out of the saturation region. ▪ IGBTs or trigger board of the cell neutral arm defective. ▪ Fault on the desaturation signal feedback or gate-driver supply.
F0433 Cell U2 phase pulse feedback	▪ Contact WEG Service Center.	▪ Fault on the commutation of the IGBTs of the cell phase arm. ▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the phase arm disconnected or defective. ▪ IGBTs or trigger board of the cell phase arm defective.
F0435 Cell U2 neutral pulse feedback	▪ Contact WEG Service Center.	▪ Fault on the confirmation of the commutation of the IGBTs of the cell neutral arm. ▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the neutral arm disconnected or defective. ▪ IGBTs or trigger board of the cell neutral arm defective.
F0436 Cell U2 electronics power supply	▪ Contact WEG Service Center.	▪ Voltages of the internal electronic circuits of the cell out of the operation level. ▪ Defect on the cell power supply.
F0441 Cell U2 modulation synchronism	▪ Contact WEG Service Center.	▪ Fault in the synchronism between the MCC1 control board of the cell and the MVC3 main control.
F0442 Cell U2 bypass system	▪ Contact WEG Service Center.	▪ Fault in the operation of the cell bypass system. ▪ Bypass system is not connected or defective.
F0443 Communication with cell U2	▪ Contact WEG Service Center.	▪ Fault on the communication between the MCC1 control board of the cell and the MVC3 main control. ▪ Break or defect on the cell communication optic cable.
F0447 Cell U2 insulation defective	▪ Contact WEG Service Center.	▪ Fault in the internal insulation of the cell: Contact between some energized point of the circuit and the frame. ▪ Fault on the capacitor discharge resistors of the cell DC link.
F0450 Cell U3 DC link overvoltage	▪ Power-on. ▪ Manual (O /RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Inverter input supply voltage too high. ▪ Incorrect setting of the inverter main transformer taps. ▪ Cell DC link voltage above 1200 V. ▪ Load inertia too high or deceleration ramp too short. ▪ Setting of P0151 too high.

<table>
<tr><th>Fault/alarm</th><th>Reset</th><th>Possible causes</th></tr>
<tr><td>F0451
Cell U3 DC link undervoltage</td><td>▪ Power-on.
▪ Manual (/RESET key).
▪ Auto-reset.
▪ DIx.
▪ Networks.</td><td>▪ Inverter input supply voltage too low.
▪ Incorrect setting of the inverter main transformer taps.
▪ Cell DC link voltage below 745 V below 652 V for operation in vector control.</td></tr>
<tr><td>A0452
Overtemperature on cell U3 IGBT module</td><td>▪ Automatically eliminated when the temperature at the cell heatsink presents a value below the alarm level.</td><td>▪ Temperature on the cell heatsink above the alarm level.
▪ Ambient temperature too high (> 40 °C) and high output current.
▪ Fans locked or defective.
▪ Air input filters blocked.
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<tr><td>70 A</td><td>85 °C</td></tr>
<tr><td>140 A</td><td>85 °C</td></tr>
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<tr><td>450 A</td><td>90 °C</td></tr>
<tr><td>600 A</td><td>90 °C</td></tr>
</table></td></tr>
<tr><td>F0453
Overtemperature on cell U3 IGBT module</td><td>▪ Power-on.
▪ Manual (/RESET key).
▪ Auto-reset.
▪ DIx.
▪ Networks.</td><td>▪ Temperature on the cell heatsink above the fault level.
▪ Ambient temperature too high (> 40 °C) and high output current.
▪ Fans locked or defective.
▪ Air input filters blocked.
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<tr><th>Cell model</th><th>Fault level</th></tr>
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<tr><td>450 A</td><td>95 °C</td></tr>
<tr><td>600 A</td><td>95 °C</td></tr>
</table></td></tr>
<tr><td>F0454
Defective temperature sensor or undertemperature on cell U3 IGBT</td><td>▪ Contact WEG Service Center.</td><td>▪ Cell temperature measurement sensor defective.
▪ Cell temperature sensor disconnected.
▪ Temperature on the cell heatsink below -10 °C.</td></tr>
<tr><td>F0455
Cell U3 phase IGBT</td><td>▪ Contact WEG Service Center.</td><td>▪ Short circuit at the inverter output.
▪ Trigger board of the IGBTs of the cell phase arm disconnected.
▪ IGBTs of the cell phase arm operating out of the saturation region.
▪ IGBTs or trigger board of the cell phase arm defective.
▪ Fault on the desaturation signal feedback or gate-driver supply.</td></tr>
<tr><td>F0456
Cell U3 neutral IGBT</td><td>▪ Contact WEG Service Center.</td><td>▪ Short circuit at the inverter output.
▪ Trigger board of the IGBTs of the cell neutral arm disconnected.
▪ IGBTs of the cell neutral arm operating out of the saturation region.
▪ IGBTs or trigger board of the cell neutral arm defective.
▪ Fault on the desaturation signal feedback or gate-driver supply.</td></tr>
</table>

Fault/alarm	Reset	Possible causes
F0458 Cell U3 phase pulse feedback	▪ Contact WEG Service Center.	▪ Fault on the commutation of the IGBTs of the cell phase arm. ▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the phase arm disconnected or defective. ▪ IGBTs or trigger board of the cell phase arm defective.
F0460 Cell U3 neutral pulse feedback	▪ Contact WEG Service Center.	▪ Fault on the confirmation of the commutation of the IGBTs of the cell neutral arm. ▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the neutral arm disconnected or defective. ▪ IGBTs or trigger board of the cell neutral arm defective.
F0461 Cell U3 electronics power supply	▪ Contact WEG Service Center.	▪ Voltages of the internal electronic circuits of the cell out of the operation level. ▪ Defect on the cell power supply.
F0466 Cell U3 modulation synchronism	▪ Contact WEG Service Center.	▪ Fault in the synchronism between the MCC1 control board of the cell and the MVC3 main control.
F0467 Cell U3 bypass system	▪ Contact WEG Service Center.	▪ Fault in the operation of the cell bypass system. ▪ Bypass system is not connected or defective.
F0468 Communication with cell U3	▪ Contact WEG Service Center.	▪ Fault on the communication between the MCC1 control board of the cell and the MVC3 main control. ▪ Break or defect on the cell communication optic cable.
F0472 Cell U3 insulation defective	▪ Contact WEG Service Center.	▪ Fault in the internal insulation of the cell: Contact between some energized point of the circuit and the frame. ▪ Fault on the capacitor discharge resistors of the cell DC link.
F0475 Cell U4 DC link overvoltage	▪ Power-on. ▪ Manual (O /RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Inverter input supply voltage too high. ▪ Incorrect setting of the inverter main transformer taps. ▪ Cell DC link voltage above 1200 V. ▪ Load inertia too high or deceleration ramp too short. ▪ Setting of P0151 too high.
F0476 Cell U4 DC link undervoltage	▪ Power-on. ▪ Manual (O /RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Inverter input supply voltage too low. ▪ Incorrect setting of the inverter main transformer taps. ▪ Cell DC link voltage below 745 V below 652 V for operation in vector control.

<table>
<tr><th>Fault/alarm</th><th>Reset</th><th>Possible causes</th></tr>
<tr><td>A0477
Overtemperature on cell U4 IGBT module</td><td>Automatically eliminated when the temperature at the cell heatsink presents a value below the alarm level.</td><td>Temperature on the cell heatsink above the alarm level.
Ambient temperature too high (> 40 °C) and high output current.
Fans locked or defective.
Air input filters blocked.
<table>
<tr><th>Cell model</th><th>Alarm level</th></tr>
<tr><td>70 A</td><td>85 °C</td></tr>
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<tr><td>340 A</td><td>85 °C</td></tr>
<tr><td>450 A</td><td>90 °C</td></tr>
<tr><td>600 A</td><td>90 °C</td></tr>
</table></td></tr>
<tr><td>F0478
Overtemperature on cell U4 IGBT module</td><td>Power-on.
Manual (/RESET key).
Auto-reset.
DIx.
Networks.</td><td>Temperature on the cell heatsink above the fault level.
Ambient temperature too high (> 40 °C) and high output current.
Fans locked or defective.
Air input filters blocked.
<table>
<tr><th>Cell model</th><th>Fault level</th></tr>
<tr><td>70 A</td><td>90 °C</td></tr>
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<tr><td>450 A</td><td>95 °C</td></tr>
<tr><td>600 A</td><td>95 °C</td></tr>
</table></td></tr>
<tr><td>F0479
Defective temperature sensor or undertemperature on cell U4 IGBT</td><td>Contact WEG Service Center.</td><td>Cell temperature measurement sensor defective.
Cell temperature sensor disconnected.
Temperature on the cell heatsink below -10 °C.</td></tr>
<tr><td>F0480
Cell U4 phase IGBT</td><td>Contact WEG Service Center.</td><td>Short circuit at the inverter output.
Trigger board of the IGBTs of the cell phase arm disconnected.
IGBTs of the cell phase arm operating out of the saturation region.
IGBTs or trigger board of the cell phase arm defective.
Fault on the desaturation signal feedback or gate-driver supply.</td></tr>
<tr><td>F0481
Cell U4 neutral IGBT</td><td>Contact WEG Service Center.</td><td>Short circuit at the inverter output.
Trigger board of the IGBTs of the cell neutral arm disconnected.
IGBTs of the cell neutral arm operating out of the saturation region.
IGBTs or trigger board of the cell neutral arm defective.
Fault on the desaturation signal feedback or gate-driver supply.</td></tr>
<tr><td>F0483
Cell U4 phase pulse feedback</td><td>Contact WEG Service Center.</td><td>Fault on the commutation of the IGBTs of the cell phase arm.
Measurement circuit of the confirmation signal of the commutation of the IGBTs of the phase arm disconnected or defective.
IGBTs or trigger board of the cell phase arm defective.</td></tr>
</table>

<table>
<tr><th>Fault/alarm</th><th>Reset</th><th>Possible causes</th></tr>
<tr><td>F0485
Cell U4 neutral pulse feedback</td><td>▪ Contact WEG Service Center.</td><td>▪ Fault on the confirmation of the commutation of the IGBTs of the cell neutral arm.
▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the neutral arm disconnected or defective.
▪ IGBTs or trigger board of the cell neutral arm defective.</td></tr>
<tr><td>F0486
Cell U4 electronics power supply</td><td>▪ Contact WEG Service Center.</td><td>▪ Voltages of the internal electronic circuits of the cell out of the operation level.
▪ Defect on the cell power supply.</td></tr>
<tr><td>F0491
Cell U4 modulation synchronism</td><td>▪ Contact WEG Service Center.</td><td>▪ Fault in the synchronism between the MCC1 control board of the cell and the MVC3 main control.</td></tr>
<tr><td>F0492
Cell U4 bypass system</td><td>▪ Contact WEG Service Center.</td><td>▪ Fault in the operation of the cell bypass system.
▪ Bypass system is not connected or defective.</td></tr>
<tr><td>F0493
Communication with cell U4</td><td>▪ Contact WEG Service Center.</td><td>▪ Fault on the communication between the MCC1 control board of the cell and the MVC3 main control.
▪ Break or defect on the cell communication optic cable.</td></tr>
<tr><td>F0497
Cell U4 insulation defective</td><td>▪ Contact WEG Service Center.</td><td>▪ Fault in the internal insulation of the cell: Contact between some energized point of the circuit and the frame.
▪ Fault on the capacitor discharge resistors of the cell DC link.</td></tr>
<tr><td>F0500
Cell U5 DC link overvoltage</td><td>▪ Power-on.
▪ Manual (/RESET key).
▪ Auto-reset.
▪ DIx.
▪ Networks.</td><td>▪ Inverter input supply voltage too high.
▪ Incorrect setting of the inverter main transformer taps.
▪ Cell DC link voltage above 1200 V.
▪ Load inertia too high or deceleration ramp too short.
▪ Setting of P0151 too high.</td></tr>
<tr><td>F0501
Cell U5 DC link undervoltage</td><td>▪ Power-on.
▪ Manual (/RESET key).
▪ Auto-reset.
▪ DIx.
▪ Networks.</td><td>▪ Inverter input supply voltage too low.
▪ Incorrect setting of the inverter main transformer taps.
▪ Cell DC link voltage below 745 V below 652 V for operation in vector control.</td></tr>
<tr><td>A0502
Overtemperature on cell U5 IGBT module</td><td>▪ Automatically eliminated when the temperature at the cell heatsink presents a value below the alarm level.</td><td>▪ Temperature on the cell heatsink above the alarm level.
▪ Ambient temperature too high (> 40 °C) and high output current.
▪ Fans locked or defective.
▪ Air input filters blocked.
<table><tr><th>Cell model</th><th>Alarm level</th></tr><tr><td>70 A</td><td>85 °C</td></tr><tr><td>140 A</td><td>85 °C</td></tr><tr><td>200 A</td><td>85 °C</td></tr><tr><td>265 A</td><td>85 °C</td></tr><tr><td>340 A</td><td>85 °C</td></tr><tr><td>450 A</td><td>90 °C</td></tr><tr><td>600 A</td><td>90 °C</td></tr></table></td></tr>
</table>

Fault/alarm	Reset	Possible causes
F0503 Overtemperature on cell U5 IGBT module	▪ Power-on. ▪ Manual (/RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Temperature on the cell heatsink above the fault level. ▪ Ambient temperature too high (> 40 °C) and high output current. ▪ Fans locked or defective. ▪ Air input filters blocked. **Cell model** / **Fault level**: 70 A – 90 °C 140 A – 90 °C 200 A – 90 °C 265 A – 90 °C 340 A – 90 °C 450 A – 95 °C 600 A – 95 °C
F0504 Defective temperature sensor or undertemperature on cell U5 IGBT	▪ Contact WEG Service Center.	▪ Cell temperature measurement sensor defective. ▪ Cell temperature sensor disconnected. ▪ Temperature on the cell heatsink below -10 °C.
F0505 Cell U5 phase IGBT	▪ Contact WEG Service Center.	▪ Short circuit at the inverter output. ▪ Trigger board of the IGBTs of the cell phase arm disconnected. ▪ IGBTs of the cell phase arm operating out of the saturation region. ▪ IGBTs or trigger board of the cell phase arm defective. ▪ Fault on the desaturation signal feedback or gate-driver supply.
F0506 Cell U5 neutral IGBT	▪ Contact WEG Service Center.	▪ Short circuit at the inverter output. ▪ Trigger board of the IGBTs of the cell neutral arm disconnected. ▪ IGBTs of the cell neutral arm operating out of the saturation region. ▪ IGBTs or trigger board of the cell neutral arm defective. ▪ Fault on the desaturation signal feedback or gate-driver supply.
F0508 Cell U5 phase pulse feedback	▪ Contact WEG Service Center.	▪ Fault on the commutation of the IGBTs of the cell phase arm. ▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the phase arm disconnected or defective. ▪ IGBTs or trigger board of the cell phase arm defective.
F0510 Cell U5 neutral pulse feedback	▪ Contact WEG Service Center.	▪ Fault on the confirmation of the commutation of the IGBTs of the cell neutral arm. ▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the neutral arm disconnected or defective. ▪ IGBTs or trigger board of the cell neutral arm defective.
F0511 Cell U5 electronics power supply	▪ Contact WEG Service Center.	▪ Voltages of the internal electronic circuits of the cell out of the operation level. ▪ Defect on the cell power supply.
F0516 Cell U5 modulation synchronism	▪ Contact WEG Service Center.	▪ Fault in the synchronism between the MCC1 control board of the cell and the MVC3 main control.
F0517 Cell U5 bypass system	▪ Contact WEG Service Center.	▪ Fault in the operation of the cell bypass system. ▪ Bypass system is not connected or defective.

8

<table>
<tr><th>Fault/alarm</th><th>Reset</th><th>Possible causes</th></tr>
<tr><td>F0518
Communication with cell U5</td><td>Contact WEG Service Center.</td><td>Fault on the communication between the MCC1 control board of the cell and the MVC3 main control.
Break or defect on the cell communication optic cable.</td></tr>
<tr><td>F0522
Cell U5 insulation defective</td><td>Contact WEG Service Center.</td><td>Fault in the internal insulation of the cell: Contact between some energized point of the circuit and the frame.
Fault on the capacitor discharge resistors of the cell DC link.</td></tr>
<tr><td>F0525
Cell U6 DC link overvoltage</td><td>Power-on.
Manual (/RESET key).
Auto-reset.
DIx.
Networks.</td><td>Inverter input supply voltage too high.
Incorrect setting of the inverter main transformer taps.
Cell DC link voltage above 1200 V.
Load inertia too high or deceleration ramp too short.
Setting of P0151 too high.</td></tr>
<tr><td>F0526
Cell U6 DC link undervoltage</td><td>Power-on.
Manual (/RESET key).
Auto-reset.
DIx.
Networks.</td><td>Inverter input supply voltage too low.
Incorrect setting of the inverter main transformer taps.
Cell DC link voltage below 745 V below 652 V for operation in vector control.</td></tr>
<tr><td>A0527
Overtemperature on cell U6 IGBT module</td><td>Automatically eliminated when the temperature at the cell heatsink presents a value below the alarm level.</td><td>Temperature on the cell heatsink above the alarm level.
Ambient temperature too high (> 40 °C) and high output current.
Fans locked or defective.
Air input filters blocked.
<table>
<tr><th>Cell model</th><th>Alarm level</th></tr>
<tr><td>70 A</td><td>85 °C</td></tr>
<tr><td>140 A</td><td>85 °C</td></tr>
<tr><td>200 A</td><td>85 °C</td></tr>
<tr><td>265 A</td><td>85 °C</td></tr>
<tr><td>340 A</td><td>85 °C</td></tr>
<tr><td>450 A</td><td>90 °C</td></tr>
<tr><td>600 A</td><td>90 °C</td></tr>
</table></td></tr>
<tr><td>F0528
Overtemperature on cell U6 IGBT module</td><td>Power-on.
Manual (/RESET key).
Auto-reset.
DIx.
Networks.</td><td>Temperature on the cell heatsink above the fault level.
Ambient temperature too high (> 40 °C) and high output current.
Fans locked or defective.
Air input filters blocked.
<table>
<tr><th>Cell model</th><th>Fault level</th></tr>
<tr><td>70 A</td><td>90 °C</td></tr>
<tr><td>140 A</td><td>90 °C</td></tr>
<tr><td>200 A</td><td>90 °C</td></tr>
<tr><td>265 A</td><td>90 °C</td></tr>
<tr><td>340 A</td><td>90 °C</td></tr>
<tr><td>450 A</td><td>95 °C</td></tr>
<tr><td>600 A</td><td>95 °C</td></tr>
</table></td></tr>
<tr><td>F0529
Defective temperature sensor or undertemperature on cell U6 IGBT</td><td>Contact WEG Service Center.</td><td>Cell temperature measurement sensor defective.
Cell temperature sensor disconnected.
Temperature on the cell heatsink below -10 °C.</td></tr>
</table>

Fault/alarm	Reset	Possible causes
F0530 Cell U6 phase IGBT	▪ Contact WEG Service Center.	▪ Short circuit at the inverter output. ▪ Trigger board of the IGBTs of the cell phase arm disconnected. ▪ IGBTs of the cell phase arm operating out of the saturation region. ▪ IGBTs or trigger board of the cell phase arm defective. ▪ Fault on the desaturation signal feedback or gate-driver supply.
F0531 Cell U6 neutral IGBT	▪ Contact WEG Service Center.	▪ Short circuit at the inverter output. ▪ Trigger board of the IGBTs of the cell neutral arm disconnected. ▪ IGBTs of the cell neutral arm operating out of the saturation region. ▪ IGBTs or trigger board of the cell neutral arm defective. ▪ Fault on the desaturation signal feedback or gate-driver supply.
F0533 Cell U6 phase pulse feedback	▪ Contact WEG Service Center.	▪ Fault on the commutation of the IGBTs of the cell phase arm. ▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the phase arm disconnected or defective. ▪ IGBTs or trigger board of the cell phase arm defective.
F0535 Cell U6 neutral pulse feedback	▪ Contact WEG Service Center.	▪ Fault on the confirmation of the commutation of the IGBTs of the cell neutral arm. ▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the neutral arm disconnected or defective. ▪ IGBTs or trigger board of the cell neutral arm defective.
F0536 Cell U6 electronics power supply	▪ Contact WEG Service Center.	▪ Voltages of the internal electronic circuits of the cell out of the operation level. ▪ Defect on the cell power supply.
F0541 Cell U6 modulation synchronism	▪ Contact WEG Service Center.	▪ Fault in the synchronism between the MCC1 control board of the cell and the MVC3 main control.
F0542 Cell U6 bypass system	▪ Contact WEG Service Center.	▪ Fault in the operation of the cell bypass system. ▪ Bypass system is not connected or defective.
F0543 Communication with cell U6	▪ Contact WEG Service Center.	▪ Fault on the communication between the MCC1 control board of the cell and the MVC3 main control. ▪ Break or defect on the cell communication optic cable.
F0547 Cell U6 insulation defective	▪ Contact WEG Service Center.	▪ Fault in the internal insulation of the cell: Contact between some energized point of the circuit and the frame. ▪ Fault on the capacitor discharge resistors of the cell DC link.
F0550 Cell U7 DC link overvoltage	▪ Power-on. ▪ Manual (O /RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Inverter input supply voltage too high. ▪ Incorrect setting of the inverter main transformer taps. ▪ Cell DC link voltage above 1200 V. ▪ Load inertia too high or deceleration ramp too short. ▪ Setting of P0151 too high.

8

<table>
<tr><th>Fault/alarm</th><th>Reset</th><th>Possible causes</th></tr>
<tr><td>F0551
Cell U7 DC link undervoltage</td><td>Power-on.
Manual (/RESET key).
Auto-reset.
DIx.
Networks.</td><td>Inverter input supply voltage too low.
Incorrect setting of the inverter main transformer taps.
Cell DC link voltage below 745 V below 652 V for operation in vector control.</td></tr>
<tr><td>A0552
Overtemperature on cell U7 IGBT module</td><td>Automatically eliminated when the temperature at the cell heatsink presents a value below the alarm level.</td><td>Temperature on the cell heatsink above the alarm level.
Ambient temperature too high (> 40 °C) and high output current.
Fans locked or defective.
Air input filters blocked.
<table>
<tr><th>Cell model</th><th>Alarm level</th></tr>
<tr><td>70 A</td><td>85 °C</td></tr>
<tr><td>140 A</td><td>85 °C</td></tr>
<tr><td>200 A</td><td>85 °C</td></tr>
<tr><td>265 A</td><td>85 °C</td></tr>
<tr><td>340 A</td><td>85 °C</td></tr>
<tr><td>450 A</td><td>90 °C</td></tr>
<tr><td>600 A</td><td>90 °C</td></tr>
</table></td></tr>
<tr><td>F0553
Overtemperature on cell U7 IGBT module</td><td>Power-on.
Manual (/RESET key).
Auto-reset.
DIx.
Networks.</td><td>Temperature on the cell heatsink above the fault level.
Ambient temperature too high (> 40 °C) and high output current.
Fans locked or defective.
Air input filters blocked.
<table>
<tr><th>Cell model</th><th>Fault level</th></tr>
<tr><td>70 A</td><td>90 °C</td></tr>
<tr><td>140 A</td><td>90 °C</td></tr>
<tr><td>200 A</td><td>90 °C</td></tr>
<tr><td>265 A</td><td>90 °C</td></tr>
<tr><td>340 A</td><td>90 °C</td></tr>
<tr><td>450 A</td><td>95 °C</td></tr>
<tr><td>600 A</td><td>95 °C</td></tr>
</table></td></tr>
<tr><td>F0554
Defective temperature sensor or undertemperature on cell U7 IGBT</td><td>Contact WEG Service Center.</td><td>Cell temperature measurement sensor defective.
Cell temperature sensor disconnected.
Temperature on the cell heatsink below -10 °C.</td></tr>
<tr><td>F0555
Cell U7 phase IGBT</td><td>Contact WEG Service Center.</td><td>Short circuit at the inverter output.
Trigger board of the IGBTs of the cell phase arm disconnected.
IGBTs of the cell phase arm operating out of the saturation region.
IGBTs or trigger board of the cell phase arm defective.
Fault on the desaturation signal feedback or gate-driver supply.</td></tr>
<tr><td>F0556
Cell U7 neutral IGBT</td><td>Contact WEG Service Center.</td><td>Short circuit at the inverter output.
Trigger board of the IGBTs of the cell neutral arm disconnected.
IGBTs of the cell neutral arm operating out of the saturation region.
IGBTs or trigger board of the cell neutral arm defective.
Fault on the desaturation signal feedback or gate-driver supply.</td></tr>
</table>

Fault/alarm	Reset	Possible causes
F0558 Cell U7 phase pulse feedback	▪ Contact WEG Service Center.	▪ Fault on the commutation of the IGBTs of the cell phase arm. ▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the phase arm disconnected or defective. ▪ IGBTs or trigger board of the cell phase arm defective.
F0560 Cell U7 neutral pulse feedback	▪ Contact WEG Service Center.	▪ Fault on the confirmation of the commutation of the IGBTs of the cell neutral arm. ▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the neutral arm disconnected or defective. ▪ IGBTs or trigger board of the cell neutral arm defective.
F0561 Cell U7 electronics power supply	▪ Contact WEG Service Center.	▪ Voltages of the internal electronic circuits of the cell out of the operation level. ▪ Defect on the cell power supply.
F0566 Cell U7 modulation synchronism	▪ Contact WEG Service Center.	▪ Fault in the synchronism between the MCC1 control board of the cell and the MVC3 main control.
F0567 Cell U7 bypass system	▪ Contact WEG Service Center.	▪ Fault in the operation of the cell bypass system. ▪ Bypass system is not connected or defective.
F0568 Communication with cell U7	▪ Contact WEG Service Center.	▪ Fault on the communication between the MCC1 control board of the cell and the MVC3 main control. ▪ Break or defect on the cell communication optic cable.
F0572 Cell U7 insulation defective	▪ Contact WEG Service Center.	▪ Fault in the internal insulation of the cell: Contact between some energized point of the circuit and the frame. ▪ Fault on the capacitor discharge resistors of the cell DC link.
F0575 Cell U8 DC link overvoltage	▪ Power-on. ▪ Manual (/RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Inverter input supply voltage too high. ▪ Incorrect setting of the inverter main transformer taps. ▪ Cell DC link voltage above 1200 V. ▪ Load inertia too high or deceleration ramp too short. ▪ Setting of P0151 too high.
F0576 Cell U8 DC link undervoltage	▪ Power-on. ▪ Manual (/RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Inverter input supply voltage too low. ▪ Incorrect setting of the inverter main transformer taps. ▪ Cell DC link voltage below 745 V below 652 V for operation in vector control.

8

<table>
<tr><th>Fault/alarm</th><th>Reset</th><th>Possible causes</th></tr>
<tr><td>A0577
Overtemperature on cell U8 IGBT module</td><td>Automatically eliminated when the temperature at the cell heatsink presents a value below the alarm level.</td><td>Temperature on the cell heatsink above the alarm level.
Ambient temperature too high (> 40 °C) and high output current.
Fans locked or defective.
Air input filters blocked.
<table><tr><th>Cell model</th><th>Alarm level</th></tr>
<tr><td>70 A</td><td>85 °C</td></tr>
<tr><td>140 A</td><td>85 °C</td></tr>
<tr><td>200 A</td><td>85 °C</td></tr>
<tr><td>265 A</td><td>85 °C</td></tr>
<tr><td>340 A</td><td>85 °C</td></tr>
<tr><td>450 A</td><td>90 °C</td></tr>
<tr><td>600 A</td><td>90 °C</td></tr></table></td></tr>
<tr><td>F0578
Overtemperature on cell U8 IGBT module</td><td>Power-on.
Manual (O /RESET key).
Auto-reset.
DIx.
Networks.</td><td>Temperature on the cell heatsink above the fault level.
Ambient temperature too high (> 40 °C) and high output current.
Fans locked or defective.
Air input filters blocked.
<table><tr><th>Cell model</th><th>Fault level</th></tr>
<tr><td>70 A</td><td>90 °C</td></tr>
<tr><td>140 A</td><td>90 °C</td></tr>
<tr><td>200 A</td><td>90 °C</td></tr>
<tr><td>265 A</td><td>90 °C</td></tr>
<tr><td>340 A</td><td>90 °C</td></tr>
<tr><td>450 A</td><td>95 °C</td></tr>
<tr><td>600 A</td><td>95 °C</td></tr></table></td></tr>
<tr><td>F0579
Defective temperature sensor or undertemperature on cell U8 IGBT</td><td>Contact WEG Service Center.</td><td>Cell temperature measurement sensor defective.
Cell temperature sensor disconnected.
Temperature on the cell heatsink below -10 °C.</td></tr>
<tr><td>F0580
Cell U8 phase IGBT</td><td>Contact WEG Service Center.</td><td>Short circuit at the inverter output.
Trigger board of the IGBTs of the cell phase arm disconnected.
IGBTs of the cell phase arm operating out of the saturation region.
IGBTs or trigger board of the cell phase arm defective.
Fault on the desaturation signal feedback or gate-driver supply.</td></tr>
<tr><td>F0581
Cell U8 neutral IGBT</td><td>Contact WEG Service Center.</td><td>Short circuit at the inverter output.
Trigger board of the IGBTs of the cell neutral arm disconnected.
IGBTs of the cell neutral arm operating out of the saturation region.
IGBTs or trigger board of the cell neutral arm defective.
Fault on the desaturation signal feedback or gate-driver supply.</td></tr>
<tr><td>F0583
Cell U8 phase pulse feedback</td><td>Contact WEG Service Center.</td><td>Fault on the commutation of the IGBTs of the cell phase arm.
Measurement circuit of the confirmation signal of the commutation of the IGBTs of the phase arm disconnected or defective.
IGBTs or trigger board of the cell phase arm defective.</td></tr>
</table>

Fault/alarm	Reset	Possible causes
F0585 Cell U8 neutral pulse feedback	▪ Contact WEG Service Center.	▪ Fault on the confirmation of the commutation of the IGBTs of the cell neutral arm. ▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the neutral arm disconnected or defective. ▪ IGBTs or trigger board of the cell neutral arm defective.
F0586 Cell U8 electronics power supply	▪ Contact WEG Service Center.	▪ Voltages of the internal electronic circuits of the cell out of the operation level. ▪ Defect on the cell power supply.
F0591 Cell U8 modulation synchronism	▪ Contact WEG Service Center.	▪ Fault in the synchronism between the MCC1 control board of the cell and the MVC3 main control.
F0592 Cell U8 bypass system	▪ Contact WEG Service Center.	▪ Fault in the operation of the cell bypass system. ▪ Bypass system is not connected or defective.
F0593 Communication with cell U8	▪ Contact WEG Service Center.	▪ Fault on the communication between the MCC1 control board of the cell and the MVC3 main control. ▪ Break or defect on the cell communication optic cable.
F0597 Cell U8 insulation defective	▪ Contact WEG Service Center.	▪ Fault in the internal insulation of the cell: Contact between some energized point of the circuit and the frame. ▪ Fault on the capacitor discharge resistors of the cell DC link.
F0600 Cell V1 DC link overvoltage	▪ Power-on. ▪ Manual (/RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Inverter input supply voltage too high. ▪ Incorrect setting of the inverter main transformer taps. ▪ Cell DC link voltage above 1200 V. ▪ Load inertia too high or deceleration ramp too short. ▪ Setting of P0151 too high.
F0601 Cell V1 DC link undervoltage	▪ Power-on. ▪ Manual (/RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Inverter input supply voltage too low. ▪ Incorrect setting of the inverter main transformer taps. ▪ Cell DC link voltage below 745 V below 652 V for operation in vector control.
A0602 Overtemperature on cell V1 IGBT module	▪ Automatically eliminated when the temperature at the cell heatsink presents a value below the alarm level.	▪ Temperature on the cell heatsink above the alarm level. ▪ Ambient temperature too high (> 40 °C) and high output current. ▪ Fans locked or defective. ▪ Air input filters blocked. **Cell model** / **Alarm level**: 70 A – 85 °C 140 A – 85 °C 200 A – 85 °C 265 A – 85 °C 340 A – 85 °C 450 A – 90 °C 600 A – 90 °C

8

<table>
<tr><th>Fault/alarm</th><th>Reset</th><th>Possible causes</th></tr>
<tr><td>F0603
Overtemperature on cell V1 IGBT module</td><td>▪ Power-on.
▪ Manual (O /RESET key).
▪ Auto-reset.
▪ DIx.
▪ Networks.</td><td>▪ Temperature on the cell heatsink above the fault level.
▪ Ambient temperature too high (> 40 °C) and high output current.
▪ Fans locked or defective.
▪ Air input filters blocked.
<table><tr><th>Cell model</th><th>Fault level</th></tr><tr><td>70 A</td><td>90 °C</td></tr><tr><td>140 A</td><td>90 °C</td></tr><tr><td>200 A</td><td>90 °C</td></tr><tr><td>265 A</td><td>90 °C</td></tr><tr><td>340 A</td><td>90 °C</td></tr><tr><td>450 A</td><td>95 °C</td></tr><tr><td>600 A</td><td>95 °C</td></tr></table></td></tr>
<tr><td>F0604
Defective temperature sensor or undertemperature on cell V1 IGBT</td><td>▪ Contact WEG Service Center.</td><td>▪ Cell temperature measurement sensor defective.
▪ Cell temperature sensor disconnected.
▪ Temperature on the cell heatsink below -10 °C.</td></tr>
<tr><td>F0605
Cell V1 phase IGBT</td><td>▪ Contact WEG Service Center.</td><td>▪ Short circuit at the inverter output.
▪ Trigger board of the IGBTs of the cell phase arm disconnected.
▪ IGBTs of the cell phase arm operating out of the saturation region.
▪ IGBTs or trigger board of the cell phase arm defective.
▪ Fault on the desaturation signal feedback or gate-driver supply.</td></tr>
<tr><td>F0606
Cell V1 neutral IGBT</td><td>▪ Contact WEG Service Center.</td><td>▪ Short circuit at the inverter output.
▪ Trigger board of the IGBTs of the cell neutral arm disconnected.
▪ IGBTs of the cell neutral arm operating out of the saturation region.
▪ IGBTs or trigger board of the cell neutral arm defective.
▪ Fault on the desaturation signal feedback or gate-driver supply.</td></tr>
<tr><td>F0608
Cell V1 phase pulse feedback</td><td>▪ Contact WEG Service Center.</td><td>▪ Fault on the commutation of the IGBTs of the cell phase arm.
▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the phase arm disconnected or defective.
▪ IGBTs or trigger board of the cell phase arm defective.</td></tr>
<tr><td>F0610
Cell V1 neutral pulse feedback</td><td>▪ Contact WEG Service Center.</td><td>▪ Fault on the confirmation of the commutation of the IGBTs of the cell neutral arm.
▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the neutral arm disconnected or defective.
▪ IGBTs or trigger board of the cell neutral arm defective.</td></tr>
<tr><td>F0611
Cell V1 electronics power supply</td><td>▪ Contact WEG Service Center.</td><td>▪ Voltages of the internal electronic circuits of the cell out of the operation level.
▪ Defect on the cell power supply.</td></tr>
<tr><td>F0616
Cell V1 modulation synchronism</td><td>▪ Contact WEG Service Center.</td><td>▪ Fault in the synchronism between the MCC1 control board of the cell and the MVC3 main control.</td></tr>
<tr><td>F0617
Cell V1 bypass system</td><td>▪ Contact WEG Service Center.</td><td>▪ Fault in the operation of the cell bypass system.
▪ Bypass system is not connected or defective.</td></tr>
</table>

<table>
<tr><th>Fault/alarm</th><th>Reset</th><th>Possible causes</th></tr>
<tr><td>F0618
Communication with cell V1</td><td>Contact WEG Service Center.</td><td>Fault on the communication between the MCC1 control board of the cell and the MVC3 main control.
Break or defect on the cell communication optic cable.</td></tr>
<tr><td>F0622
Cell V1 insulation defective</td><td>Contact WEG Service Center.</td><td>Fault in the internal insulation of the cell: Contact between some energized point of the circuit and the frame.
Fault on the capacitor discharge resistors of the cell DC link.</td></tr>
<tr><td>F0625
Cell V2 DC link overvoltage</td><td>Power-on.
Manual (/RESET key).
Auto-reset.
DIx.
Networks.</td><td>Inverter input supply voltage too high.
Incorrect setting of the inverter main transformer taps.
Cell DC link voltage above 1200 V.
Load inertia too high or deceleration ramp too short.
Setting of P0151 too high.</td></tr>
<tr><td>F0626
Cell V2 DC link undervoltage</td><td>Power-on.
Manual (/RESET key).
Auto-reset.
DIx.
Networks.</td><td>Inverter input supply voltage too low.
Incorrect setting of the inverter main transformer taps.
Cell DC link voltage below 745 V below 652 V for operation in vector control.</td></tr>
<tr><td>A0627
Overtemperature on cell V2 IGBT module</td><td>Automatically eliminated when the temperature at the cell heatsink presents a value below the alarm level.</td><td>Temperature on the cell heatsink above the alarm level.
Ambient temperature too high (> 40 °C) and high output current.
Fans locked or defective.
Air input filters blocked.
<table>
<tr><th>Cell model</th><th>Alarm level</th></tr>
<tr><td>70 A</td><td>85 °C</td></tr>
<tr><td>140 A</td><td>85 °C</td></tr>
<tr><td>200 A</td><td>85 °C</td></tr>
<tr><td>265 A</td><td>85 °C</td></tr>
<tr><td>340 A</td><td>85 °C</td></tr>
<tr><td>450 A</td><td>90 °C</td></tr>
<tr><td>600 A</td><td>90 °C</td></tr>
</table></td></tr>
<tr><td>F0628
Overtemperature on cell V2 IGBT module</td><td>Power-on.
Manual (/RESET key).
Auto-reset.
DIx.
Networks.</td><td>Temperature on the cell heatsink above the fault level.
Ambient temperature too high (> 40 °C) and high output current.
Fans locked or defective.
Air input filters blocked.
<table>
<tr><th>Cell model</th><th>Fault level</th></tr>
<tr><td>70 A</td><td>90 °C</td></tr>
<tr><td>140 A</td><td>90 °C</td></tr>
<tr><td>200 A</td><td>90 °C</td></tr>
<tr><td>265 A</td><td>90 °C</td></tr>
<tr><td>340 A</td><td>90 °C</td></tr>
<tr><td>450 A</td><td>95 °C</td></tr>
<tr><td>600 A</td><td>95 °C</td></tr>
</table></td></tr>
<tr><td>F0629
Defective temperature sensor or undertemperature on cell V2 IGBT</td><td>Contact WEG Service Center.</td><td>Cell temperature measurement sensor defective.
Cell temperature sensor disconnected.
Temperature on the cell heatsink below -10 °C.</td></tr>
</table>

Fault/alarm	Reset	Possible causes
F0630 Cell V2 phase IGBT	▪ Contact WEG Service Center.	▪ Short circuit at the inverter output. ▪ Trigger board of the IGBTs of the cell phase arm disconnected. ▪ IGBTs of the cell phase arm operating out of the saturation region. ▪ IGBTs or trigger board of the cell phase arm defective. ▪ Fault on the desaturation signal feedback or gate-driver supply.
F0631 Cell V2 neutral IGBT	▪ Contact WEG Service Center.	▪ Short circuit at the inverter output. ▪ Trigger board of the IGBTs of the cell neutral arm disconnected. ▪ IGBTs of the cell neutral arm operating out of the saturation region. ▪ IGBTs or trigger board of the cell neutral arm defective. ▪ Fault on the desaturation signal feedback or gate-driver supply.
F0633 Cell V2 phase pulse feedback	▪ Contact WEG Service Center.	▪ Fault on the commutation of the IGBTs of the cell phase arm. ▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the phase arm disconnected or defective. ▪ IGBTs or trigger board of the cell phase arm defective.
F0635 Cell V2 neutral pulse feedback	▪ Contact WEG Service Center.	▪ Fault on the confirmation of the commutation of the IGBTs of the cell neutral arm. ▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the neutral arm disconnected or defective. ▪ IGBTs or trigger board of the cell neutral arm defective.
F0636 Cell V2 electronics power supply	▪ Contact WEG Service Center.	▪ Voltages of the internal electronic circuits of the cell out of the operation level. ▪ Defect on the cell power supply.
F0641 Cell V2 modulation synchronism	▪ Contact WEG Service Center.	▪ Fault in the synchronism between the MCC1 control board of the cell and the MVC3 main control.
F0642 Cell V2 bypass system	▪ Contact WEG Service Center.	▪ Fault in the operation of the cell bypass system. ▪ Bypass system is not connected or defective.
F0643 Communication with cell V2	▪ Contact WEG Service Center.	▪ Fault on the communication between the MCC1 control board of the cell and the MVC3 main control. ▪ Break or defect on the cell communication optic cable.
F0647 Cell V2 insulation defective	▪ Contact WEG Service Center.	▪ Fault in the internal insulation of the cell: Contact between some energized point of the circuit and the frame. ▪ Fault on the capacitor discharge resistors of the cell DC link.
F0650 Cell V3 DC link overvoltage	▪ Power-on. ▪ Manual (O /RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Inverter input supply voltage too high. ▪ Incorrect setting of the inverter main transformer taps. ▪ Cell DC link voltage above 1200 V. ▪ Load inertia too high or deceleration ramp too short. ▪ Setting of P0151 too high.

8

<table>
<tr><th>Fault/alarm</th><th>Reset</th><th>Possible causes</th></tr>
<tr><td>F0651
Cell V3 DC link undervoltage</td><td>■ Power-on.
■ Manual (O /RESET key).
■ Auto-reset.
■ DIx.
■ Networks.</td><td>■ Inverter input supply voltage too low.
■ Incorrect setting of the inverter main transformer taps.
■ Cell DC link voltage below 745 V below 652 V for operation in vector control.</td></tr>
<tr><td>A0652
Overtemperature on cell V3 IGBT module</td><td>■ Automatically eliminated when the temperature at the cell heatsink presents a value below the alarm level.</td><td>■ Temperature on the cell heatsink above the alarm level.
■ Ambient temperature too high (> 40 °C) and high output current.
■ Fans locked or defective.
■ Air input filters blocked.
<table><tr><th>Cell model</th><th>Alarm level</th></tr><tr><td>70 A</td><td>85 °C</td></tr><tr><td>140 A</td><td>85 °C</td></tr><tr><td>200 A</td><td>85 °C</td></tr><tr><td>265 A</td><td>85 °C</td></tr><tr><td>340 A</td><td>85 °C</td></tr><tr><td>450 A</td><td>90 °C</td></tr><tr><td>600 A</td><td>90 °C</td></tr></table></td></tr>
<tr><td>F0653
Overtemperature on cell V3 IGBT module</td><td>■ Power-on.
■ Manual (O /RESET key).
■ Auto-reset.
■ DIx.
■ Networks.</td><td>■ Temperature on the cell heatsink above the fault level.
■ Ambient temperature too high (> 40 °C) and high output current.
■ Fans locked or defective.
■ Air input filters blocked.
<table><tr><th>Cell model</th><th>Fault level</th></tr><tr><td>70 A</td><td>90 °C</td></tr><tr><td>140 A</td><td>90 °C</td></tr><tr><td>200 A</td><td>90 °C</td></tr><tr><td>265 A</td><td>90 °C</td></tr><tr><td>340 A</td><td>90 °C</td></tr><tr><td>450 A</td><td>95 °C</td></tr><tr><td>600 A</td><td>95 °C</td></tr></table></td></tr>
<tr><td>F0654
Defective temperature sensor or undertemperature on cell V3 IGBT</td><td>■ Contact WEG Service Center.</td><td>■ Cell temperature measurement sensor defective.
■ Cell temperature sensor disconnected.
■ Temperature on the cell heatsink below -10 °C.</td></tr>
<tr><td>F0655
Cell V3 phase IGBT</td><td>■ Contact WEG Service Center.</td><td>■ Short circuit at the inverter output.
■ Trigger board of the IGBTs of the cell phase arm disconnected.
■ IGBTs of the cell phase arm operating out of the saturation region.
■ IGBTs or trigger board of the cell phase arm defective.
■ Fault on the desaturation signal feedback or gate-driver supply.</td></tr>
<tr><td>F0656
Cell V3 neutral IGBT</td><td>■ Contact WEG Service Center.</td><td>■ Short circuit at the inverter output.
■ Trigger board of the IGBTs of the cell neutral arm disconnected.
■ IGBTs of the cell neutral arm operating out of the saturation region.
■ IGBTs or trigger board of the cell neutral arm defective.
■ Fault on the desaturation signal feedback or gate-driver supply.</td></tr>
</table>

Fault/alarm	Reset	Possible causes
F0658 Cell V3 phase pulse feedback	▪ Contact WEG Service Center.	▪ Fault on the commutation of the IGBTs of the cell phase arm. ▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the phase arm disconnected or defective. ▪ IGBTs or trigger board of the cell phase arm defective.
F0660 Cell V3 neutral pulse feedback	▪ Contact WEG Service Center.	▪ Fault on the confirmation of the commutation of the IGBTs of the cell neutral arm. ▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the neutral arm disconnected or defective. ▪ IGBTs or trigger board of the cell neutral arm defective.
F0661 Cell V3 electronics power supply	▪ Contact WEG Service Center.	▪ Voltages of the internal electronic circuits of the cell out of the operation level. ▪ Defect on the cell power supply.
F0666 Cell V3 modulation synchronism	▪ Contact WEG Service Center.	▪ Fault in the synchronism between the MCC1 control board of the cell and the MVC3 main control.
F0667 Cell V3 bypass system	▪ Contact WEG Service Center.	▪ Fault in the operation of the cell bypass system. ▪ Bypass system is not connected or defective.
F0668 Communication with cell V3	▪ Contact WEG Service Center.	▪ Fault on the communication between the MCC1 control board of the cell and the MVC3 main control. ▪ Break or defect on the cell communication optic cable.
F0672 Cell V3 insulation defective	▪ Contact WEG Service Center.	▪ Fault in the internal insulation of the cell: Contact between some energized point of the circuit and the frame. ▪ Fault on the capacitor discharge resistors of the cell DC link.
F0675 Cell V4 DC link overvoltage	▪ Power-on. ▪ Manual (/RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Inverter input supply voltage too high. ▪ Incorrect setting of the inverter main transformer taps. ▪ Cell DC link voltage above 1200 V. ▪ Load inertia too high or deceleration ramp too short. ▪ Setting of P0151 too high.
F0676 Cell V4 DC link undervoltage	▪ Power-on. ▪ Manual (/RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Inverter input supply voltage too low. ▪ Incorrect setting of the inverter main transformer taps. ▪ Cell DC link voltage below 745 V below 652 V for operation in vector control.

<table>
<tr><th>Fault/alarm</th><th>Reset</th><th>Possible causes</th></tr>
<tr><td>A0677
Overtemperature on cell V4 IGBT module</td><td>Automatically eliminated when the temperature at the cell heatsink presents a value below the alarm level.</td><td>Temperature on the cell heatsink above the alarm level.
Ambient temperature too high (> 40 °C) and high output current.
Fans locked or defective.
Air input filters blocked.
<table>
<tr><th>Cell model</th><th>Alarm level</th></tr>
<tr><td>70 A</td><td>85 °C</td></tr>
<tr><td>140 A</td><td>85 °C</td></tr>
<tr><td>200 A</td><td>85 °C</td></tr>
<tr><td>265 A</td><td>85 °C</td></tr>
<tr><td>340 A</td><td>85 °C</td></tr>
<tr><td>450 A</td><td>90 °C</td></tr>
<tr><td>600 A</td><td>90 °C</td></tr>
</table></td></tr>
<tr><td>F0678
Overtemperature on cell V4 IGBT module</td><td>Power-on.
Manual (O /RESET key).
Auto-reset.
DIx.
Networks.</td><td>Temperature on the cell heatsink above the fault level.
Ambient temperature too high (> 40 °C) and high output current.
Fans locked or defective.
Air input filters blocked.
<table>
<tr><th>Cell model</th><th>Fault level</th></tr>
<tr><td>70 A</td><td>90 °C</td></tr>
<tr><td>140 A</td><td>90 °C</td></tr>
<tr><td>200 A</td><td>90 °C</td></tr>
<tr><td>265 A</td><td>90 °C</td></tr>
<tr><td>340 A</td><td>90 °C</td></tr>
<tr><td>450 A</td><td>95 °C</td></tr>
<tr><td>600 A</td><td>95 °C</td></tr>
</table></td></tr>
<tr><td>F0679
Defective temperature sensor or undertemperature on cell V4 IGBT</td><td>Contact WEG Service Center.</td><td>Cell temperature measurement sensor defective.
Cell temperature sensor disconnected.
Temperature on the cell heatsink below -10 °C.</td></tr>
<tr><td>F0680
Cell V4 phase IGBT</td><td>Contact WEG Service Center.</td><td>Short circuit at the inverter output.
Trigger board of the IGBTs of the cell phase arm disconnected.
IGBTs of the cell phase arm operating out of the saturation region.
IGBTs or trigger board of the cell phase arm defective.
Fault on the desaturation signal feedback or gate-driver supply.</td></tr>
<tr><td>F0681
Cell V4 neutral IGBT</td><td>Contact WEG Service Center.</td><td>Short circuit at the inverter output.
Trigger board of the IGBTs of the cell neutral arm disconnected.
IGBTs of the cell neutral arm operating out of the saturation region.
IGBTs or trigger board of the cell neutral arm defective.
Fault on the desaturation signal feedback or gate-driver supply.</td></tr>
<tr><td>F0683
Cell V4 phase pulse feedback</td><td>Contact WEG Service Center.</td><td>Fault on the commutation of the IGBTs of the cell phase arm.
Measurement circuit of the confirmation signal of the commutation of the IGBTs of the phase arm disconnected or defective.
IGBTs or trigger board of the cell phase arm defective.</td></tr>
</table>

<table>
<tr><th>Fault/alarm</th><th>Reset</th><th>Possible causes</th></tr>
<tr><td>F0685
Cell V4 neutral pulse feedback</td><td>▪ Contact WEG Service Center.</td><td>▪ Fault on the confirmation of the commutation of the IGBTs of the cell neutral arm.
▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the neutral arm disconnected or defective.
▪ IGBTs or trigger board of the cell neutral arm defective.</td></tr>
<tr><td>F0686
Cell V4 electronics power supply</td><td>▪ Contact WEG Service Center.</td><td>▪ Voltages of the internal electronic circuits of the cell out of the operation level.
▪ Defect on the cell power supply.</td></tr>
<tr><td>F0691
Cell V4 modulation synchronism</td><td>▪ Contact WEG Service Center.</td><td>▪ Fault in the synchronism between the MCC1 control board of the cell and the MVC3 main control.</td></tr>
<tr><td>F0692
Cell V4 bypass system</td><td>▪ Contact WEG Service Center.</td><td>▪ Fault in the operation of the cell bypass system.
▪ Bypass system is not connected or defective.</td></tr>
<tr><td>F0693
Communication with cell V4</td><td>▪ Contact WEG Service Center.</td><td>▪ Fault on the communication between the MCC1 control board of the cell and the MVC3 main control.
▪ Break or defect on the cell communication optic cable.</td></tr>
<tr><td>F0697
Cell V4 insulation defective</td><td>▪ Contact WEG Service Center.</td><td>▪ Fault in the internal insulation of the cell: Contact between some energized point of the circuit and the frame.
▪ Fault on the capacitor discharge resistors of the cell DC link.</td></tr>
<tr><td>F0700
Cell V5 DC link overvoltage</td><td>▪ Power-on.
▪ Manual (/RESET key).
▪ Auto-reset.
▪ DIx.
▪ Networks.</td><td>▪ Inverter input supply voltage too high.
▪ Incorrect setting of the inverter main transformer taps.
▪ Cell DC link voltage above 1200 V.
▪ Load inertia too high or deceleration ramp too short.
▪ Setting of P0151 too high.</td></tr>
<tr><td>F0701
Cell V5 DC link undervoltage</td><td>▪ Power-on.
▪ Manual (/RESET key).
▪ Auto-reset.
▪ DIx.
▪ Networks.</td><td>▪ Inverter input supply voltage too low.
▪ Incorrect setting of the inverter main transformer taps.
▪ Cell DC link voltage below 745 V below 652 V for operation in vector control.</td></tr>
<tr><td>A0702
Overtemperature on cell V5 IGBT module</td><td>▪ Automatically eliminated when the temperature at the cell heatsink presents a value below the alarm level.</td><td>▪ Temperature on the cell heatsink above the alarm level.
▪ Ambient temperature too high (> 40 °C) and high output current.
▪ Fans locked or defective.
▪ Air input filters blocked.
<table><tr><th>Cell model</th><th>Alarm level</th></tr><tr><td>70 A</td><td>85 °C</td></tr><tr><td>140 A</td><td>85 °C</td></tr><tr><td>200 A</td><td>85 °C</td></tr><tr><td>265 A</td><td>85 °C</td></tr><tr><td>340 A</td><td>85 °C</td></tr><tr><td>450 A</td><td>90 °C</td></tr><tr><td>600 A</td><td>90 °C</td></tr></table></td></tr>
</table>

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<table>
<tr><th>Fault/alarm</th><th>Reset</th><th>Possible causes</th></tr>
<tr><td>F0703
Overtemperature on cell V5 IGBT module</td><td>
Power-on.
Manual (/RESET key).
Auto-reset.
DIx.
Networks.</td><td>
Temperature on the cell heatsink above the fault level.
Ambient temperature too high (> 40 °C) and high output current.
Fans locked or defective.
Air input filters blocked.
<table>
<tr><th>Cell model</th><th>Fault level</th></tr>
<tr><td>70 A</td><td>90 °C</td></tr>
<tr><td>140 A</td><td>90 °C</td></tr>
<tr><td>200 A</td><td>90 °C</td></tr>
<tr><td>265 A</td><td>90 °C</td></tr>
<tr><td>340 A</td><td>90 °C</td></tr>
<tr><td>450 A</td><td>95 °C</td></tr>
<tr><td>600 A</td><td>95 °C</td></tr>
</table></td></tr>
<tr><td>F0704
Defective temperature sensor or undertemperature on cell V5 IGBT</td><td>Contact WEG Service Center.</td><td>Cell temperature measurement sensor defective.
Cell temperature sensor disconnected.
Temperature on the cell heatsink below -10 °C.</td></tr>
<tr><td>F0705
Cell V5 phase IGBT</td><td>Contact WEG Service Center.</td><td>Short circuit at the inverter output.
Trigger board of the IGBTs of the cell phase arm disconnected.
IGBTs of the cell phase arm operating out of the saturation region.
IGBTs or trigger board of the cell phase arm defective.
Fault on the desaturation signal feedback or gate-driver supply.</td></tr>
<tr><td>F0706
Cell V5 neutral IGBT</td><td>Contact WEG Service Center.</td><td>Short circuit at the inverter output.
Trigger board of the IGBTs of the cell neutral arm disconnected.
IGBTs of the cell neutral arm operating out of the saturation region.
IGBTs or trigger board of the cell neutral arm defective.
Fault on the desaturation signal feedback or gate-driver supply.</td></tr>
<tr><td>F0708
Cell V5 phase pulse feedback</td><td>Contact WEG Service Center.</td><td>Fault on the commutation of the IGBTs of the cell phase arm.
Measurement circuit of the confirmation signal of the commutation of the IGBTs of the phase arm disconnected or defective.
IGBTs or trigger board of the cell phase arm defective.</td></tr>
<tr><td>F0710
Cell V5 neutral pulse feedback</td><td>Contact WEG Service Center.</td><td>Fault on the confirmation of the commutation of the IGBTs of the cell neutral arm.
Measurement circuit of the confirmation signal of the commutation of the IGBTs of the neutral arm disconnected or defective.
IGBTs or trigger board of the cell neutral arm defective.</td></tr>
<tr><td>F0711
Cell V5 electronics power supply</td><td>Contact WEG Service Center.</td><td>Voltages of the internal electronic circuits of the cell out of the operation level.
Defect on the cell power supply.</td></tr>
<tr><td>F0716
Cell V5 modulation synchronism</td><td>Contact WEG Service Center.</td><td>Fault in the synchronism between the MCC1 control board of the cell and the MVC3 main control.</td></tr>
<tr><td>F0717
Cell V5 bypass system</td><td>Contact WEG Service Center.</td><td>Fault in the operation of the cell bypass system.
Bypass system is not connected or defective.</td></tr>
</table>

<table>
<tr><th>Fault/alarm</th><th>Reset</th><th>Possible causes</th></tr>
<tr><td>F0718
Communication with cell V5</td><td>Contact WEG Service Center.</td><td>Fault on the communication between the MCC1 control board of the cell and the MVC3 main control.
Break or defect on the cell communication optic cable.</td></tr>
<tr><td>F0722
Cell V5 insulation defective</td><td>Contact WEG Service Center.</td><td>Fault in the internal insulation of the cell: Contact between some energized point of the circuit and the frame.
Fault on the capacitor discharge resistors of the cell DC link.</td></tr>
<tr><td>F0725
Cell V6 DC link overvoltage</td><td>Power-on.
Manual (/RESET key).
Auto-reset.
DIx.
Networks.</td><td>Inverter input supply voltage too high.
Incorrect setting of the inverter main transformer taps.
Cell DC link voltage above 1200 V.
Load inertia too high or deceleration ramp too short.
Setting of P0151 too high.</td></tr>
<tr><td>F0726
Cell V6 DC link undervoltage</td><td>Power-on.
Manual (/RESET key).
Auto-reset.
DIx.
Networks.</td><td>Inverter input supply voltage too low.
Incorrect setting of the inverter main transformer taps.
Cell DC link voltage below 745 V below 652 V for operation in vector control.</td></tr>
<tr><td>A0727
Overtemperature on cell V6 IGBT module</td><td>Automatically eliminated when the temperature at the cell heatsink presents a value below the alarm level.</td><td>Temperature on the cell heatsink above the alarm level.
Ambient temperature too high (> 40 °C) and high output current.
Fans locked or defective.
Air input filters blocked.
<table>
<tr><th>Cell model</th><th>Alarm level</th></tr>
<tr><td>70 A</td><td>85 °C</td></tr>
<tr><td>140 A</td><td>85 °C</td></tr>
<tr><td>200 A</td><td>85 °C</td></tr>
<tr><td>265 A</td><td>85 °C</td></tr>
<tr><td>340 A</td><td>85 °C</td></tr>
<tr><td>450 A</td><td>90 °C</td></tr>
<tr><td>600 A</td><td>90 °C</td></tr>
</table></td></tr>
<tr><td>F0728
Overtemperature on cell V6 IGBT module</td><td>Power-on.
Manual (/RESET key).
Auto-reset.
DIx.
Networks.</td><td>Temperature on the cell heatsink above the fault level.
Ambient temperature too high (> 40 °C) and high output current.
Fans locked or defective.
Air input filters blocked.
<table>
<tr><th>Cell model</th><th>Fault level</th></tr>
<tr><td>70 A</td><td>90 °C</td></tr>
<tr><td>140 A</td><td>90 °C</td></tr>
<tr><td>200 A</td><td>90 °C</td></tr>
<tr><td>265 A</td><td>90 °C</td></tr>
<tr><td>340 A</td><td>90 °C</td></tr>
<tr><td>450 A</td><td>95 °C</td></tr>
<tr><td>600 A</td><td>95 °C</td></tr>
</table></td></tr>
<tr><td>F0729
Defective temperature sensor or undertemperature on cell V6 IGBT</td><td>Contact WEG Service Center.</td><td>Cell temperature measurement sensor defective.
Cell temperature sensor disconnected.
Temperature on the cell heatsink below -10 °C.</td></tr>
</table>

Fault/alarm	Reset	Possible causes
F0730 Cell V6 phase IGBT	▪ Contact WEG Service Center.	▪ Short circuit at the inverter output. ▪ Trigger board of the IGBTs of the cell phase arm disconnected. ▪ IGBTs of the cell phase arm operating out of the saturation region. ▪ IGBTs or trigger board of the cell phase arm defective. ▪ Fault on the desaturation signal feedback or gate-driver supply.
F0731 Cell V6 neutral IGBT	▪ Contact WEG Service Center.	▪ Short circuit at the inverter output. ▪ Trigger board of the IGBTs of the cell neutral arm disconnected. ▪ IGBTs of the cell neutral arm operating out of the saturation region. ▪ IGBTs or trigger board of the cell neutral arm defective. ▪ Fault on the desaturation signal feedback or gate-driver supply.
F0733 Cell V6 phase pulse feedback	▪ Contact WEG Service Center.	▪ Fault on the commutation of the IGBTs of the cell phase arm. ▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the phase arm disconnected or defective. ▪ IGBTs or trigger board of the cell phase arm defective.
F0735 Cell V6 neutral pulse feedback	▪ Contact WEG Service Center.	▪ Fault on the confirmation of the commutation of the IGBTs of the cell neutral arm. ▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the neutral arm disconnected or defective. ▪ IGBTs or trigger board of the cell neutral arm defective.
F0736 Cell V6 electronics power supply	▪ Contact WEG Service Center.	▪ Voltages of the internal electronic circuits of the cell out of the operation level. ▪ Defect on the cell power supply.
F0741 Cell V6 modulation synchronism	▪ Contact WEG Service Center.	▪ Fault in the synchronism between the MCC1 control board of the cell and the MVC3 main control.
F0742 Cell V6 bypass system	▪ Contact WEG Service Center.	▪ Fault in the operation of the cell bypass system. ▪ Bypass system is not connected or defective.
F0743 Communication with cell V6	▪ Contact WEG Service Center.	▪ Fault on the communication between the MCC1 control board of the cell and the MVC3 main control. ▪ Break or defect on the cell communication optic cable.
F0747 Cell V6 insulation defective	▪ Contact WEG Service Center.	▪ Fault in the internal insulation of the cell: Contact between some energized point of the circuit and the frame. ▪ Fault on the capacitor discharge resistors of the cell DC link.
F0750 Cell V7 DC link overvoltage	▪ Power-on. ▪ Manual (/RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Inverter input supply voltage too high. ▪ Incorrect setting of the inverter main transformer taps. ▪ Cell DC link voltage above 1200 V. ▪ Load inertia too high or deceleration ramp too short. ▪ Setting of P0151 too high.

<table>
<tr><th>Fault/alarm</th><th>Reset</th><th>Possible causes</th></tr>
<tr><td>F0751
Cell V7 DC link undervoltage</td><td>Power-on.
Manual (O /RESET key).
Auto-reset.
DIx.
Networks.</td><td>Inverter input supply voltage too low.
Incorrect setting of the inverter main transformer taps.
Cell DC link voltage below 745 V below 652 V for operation in vector control.</td></tr>
<tr><td>A0752
Overtemperature on cell V7 IGBT module</td><td>Automatically eliminated when the temperature at the cell heatsink presents a value below the alarm level.</td><td>Temperature on the cell heatsink above the alarm level.
Ambient temperature too high (> 40 °C) and high output current.
Fans locked or defective.
Air input filters blocked.
<table>
<tr><th>Cell model</th><th>Alarm level</th></tr>
<tr><td>70 A</td><td>85 °C</td></tr>
<tr><td>140 A</td><td>85 °C</td></tr>
<tr><td>200 A</td><td>85 °C</td></tr>
<tr><td>265 A</td><td>85 °C</td></tr>
<tr><td>340 A</td><td>85 °C</td></tr>
<tr><td>450 A</td><td>90 °C</td></tr>
<tr><td>600 A</td><td>90 °C</td></tr>
</table></td></tr>
<tr><td>F0753
Overtemperature on cell V7 IGBT module</td><td>Power-on.
Manual (O /RESET key).
Auto-reset.
DIx.
Networks.</td><td>Temperature on the cell heatsink above the fault level.
Ambient temperature too high (> 40 °C) and high output current.
Fans locked or defective.
Air input filters blocked.
<table>
<tr><th>Cell model</th><th>Fault level</th></tr>
<tr><td>70 A</td><td>90 °C</td></tr>
<tr><td>140 A</td><td>90 °C</td></tr>
<tr><td>200 A</td><td>90 °C</td></tr>
<tr><td>265 A</td><td>90 °C</td></tr>
<tr><td>340 A</td><td>90 °C</td></tr>
<tr><td>450 A</td><td>95 °C</td></tr>
<tr><td>600 A</td><td>95 °C</td></tr>
</table></td></tr>
<tr><td>F0754
Defective temperature sensor or undertemperature on cell V7 IGBT</td><td>Contact WEG Service Center.</td><td>Cell temperature measurement sensor defective.
Cell temperature sensor disconnected.
Temperature on the cell heatsink below -10 °C.</td></tr>
<tr><td>F0755
Cell V7 phase IGBT</td><td>Contact WEG Service Center.</td><td>Short circuit at the inverter output.
Trigger board of the IGBTs of the cell phase arm disconnected.
IGBTs of the cell phase arm operating out of the saturation region.
IGBTs or trigger board of the cell phase arm defective.
Fault on the desaturation signal feedback or gate-driver supply.</td></tr>
<tr><td>F0756
Cell V7 neutral IGBT</td><td>Contact WEG Service Center.</td><td>Short circuit at the inverter output.
Trigger board of the IGBTs of the cell neutral arm disconnected.
IGBTs of the cell neutral arm operating out of the saturation region.
IGBTs or trigger board of the cell neutral arm defective.
Fault on the desaturation signal feedback or gate-driver supply.</td></tr>
</table>

Fault/alarm	Reset	Possible causes
F0758 Cell V7 phase pulse feedback	▪ Contact WEG Service Center.	▪ Fault on the commutation of the IGBTs of the cell phase arm. ▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the phase arm disconnected or defective. ▪ IGBTs or trigger board of the cell phase arm defective.
F0760 Cell V7 neutral pulse feedback	▪ Contact WEG Service Center.	▪ Fault on the confirmation of the commutation of the IGBTs of the cell neutral arm. ▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the neutral arm disconnected or defective. ▪ IGBTs or trigger board of the cell neutral arm defective.
F0761 Cell V7 electronics power supply	▪ Contact WEG Service Center.	▪ Voltages of the internal electronic circuits of the cell out of the operation level. ▪ Defect on the cell power supply.
F0766 Cell V7 modulation synchronism	▪ Contact WEG Service Center.	▪ Fault in the synchronism between the MCC1 control board of the cell and the MVC3 main control.
F0767 Cell V7 bypass system	▪ Contact WEG Service Center.	▪ Fault in the operation of the cell bypass system. ▪ Bypass system is not connected or defective.
F0768 Communication with cell V7	▪ Contact WEG Service Center.	▪ Fault on the communication between the MCC1 control board of the cell and the MVC3 main control. ▪ Break or defect on the cell communication optic cable.
F0772 Cell V7 insulation defective	▪ Contact WEG Service Center.	▪ Fault in the internal insulation of the cell: Contact between some energized point of the circuit and the frame. ▪ Fault on the capacitor discharge resistors of the cell DC link.
F0775 Cell V8 DC link overvoltage	▪ Power-on. ▪ Manual (/RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Inverter input supply voltage too high. ▪ Incorrect setting of the inverter main transformer taps. ▪ Cell DC link voltage above 1200 V. ▪ Load inertia too high or deceleration ramp too short. ▪ Setting of P0151 too high.
F0776 Cell V8 DC link undervoltage	▪ Power-on. ▪ Manual (/RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Inverter input supply voltage too low. ▪ Incorrect setting of the inverter main transformer taps. ▪ Cell DC link voltage below 745 V below 652 V for operation in vector control.

8

<table>
<tr><th>Fault/alarm</th><th>Reset</th><th>Possible causes</th></tr>
<tr><td>A0777
Overtemperature on cell V8 IGBT module</td><td>▪ Automatically eliminated when the temperature at the cell heatsink presents a value below the alarm level.</td><td>▪ Temperature on the cell heatsink above the alarm level.
▪ Ambient temperature too high (> 40 °C) and high output current.
▪ Fans locked or defective.
▪ Air input filters blocked.
<table><tr><th>Cell model</th><th>Alarm level</th></tr><tr><td>70 A</td><td>85 °C</td></tr><tr><td>140 A</td><td>85 °C</td></tr><tr><td>200 A</td><td>85 °C</td></tr><tr><td>265 A</td><td>85 °C</td></tr><tr><td>340 A</td><td>85 °C</td></tr><tr><td>450 A</td><td>90 °C</td></tr><tr><td>600 A</td><td>90 °C</td></tr></table></td></tr>
<tr><td>F0778
Overtemperature on cell V8 IGBT module</td><td>▪ Power-on.
▪ Manual (/RESET key).
▪ Auto-reset.
▪ DIx.
▪ Networks.</td><td>▪ Temperature on the cell heatsink above the fault level.
▪ Ambient temperature too high (> 40 °C) and high output current.
▪ Fans locked or defective.
▪ Air input filters blocked.
<table><tr><th>Cell model</th><th>Fault level</th></tr><tr><td>70 A</td><td>90 °C</td></tr><tr><td>140 A</td><td>90 °C</td></tr><tr><td>200 A</td><td>90 °C</td></tr><tr><td>265 A</td><td>90 °C</td></tr><tr><td>340 A</td><td>90 °C</td></tr><tr><td>450 A</td><td>95 °C</td></tr><tr><td>600 A</td><td>95 °C</td></tr></table></td></tr>
<tr><td>F0779
Defective temperature sensor or undertemperature on cell V8 IGBT</td><td>▪ Contact WEG Service Center.</td><td>▪ Cell temperature measurement sensor defective.
▪ Cell temperature sensor disconnected.
▪ Temperature on the cell heatsink below -10 °C.</td></tr>
<tr><td>F0780
Cell V8 phase IGBT</td><td>▪ Contact WEG Service Center.</td><td>▪ Short circuit at the inverter output.
▪ Trigger board of the IGBTs of the cell phase arm disconnected.
▪ IGBTs of the cell phase arm operating out of the saturation region.
▪ IGBTs or trigger board of the cell phase arm defective.
▪ Fault on the desaturation signal feedback or gate-driver supply.</td></tr>
<tr><td>F0781
Cell V8 neutral IGBT</td><td>▪ Contact WEG Service Center.</td><td>▪ Short circuit at the inverter output.
▪ Trigger board of the IGBTs of the cell neutral arm disconnected.
▪ IGBTs of the cell neutral arm operating out of the saturation region.
▪ IGBTs or trigger board of the cell neutral arm defective.
▪ Fault on the desaturation signal feedback or gate-driver supply.</td></tr>
<tr><td>F0783
Cell V8 phase pulse feedback</td><td>▪ Contact WEG Service Center.</td><td>▪ Fault on the commutation of the IGBTs of the cell phase arm.
▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the phase arm disconnected or defective.
▪ IGBTs or trigger board of the cell phase arm defective.</td></tr>
</table>

Fault/alarm	Reset	Possible causes
F0785 Cell V8 neutral pulse feedback	▪ Contact WEG Service Center.	▪ Fault on the confirmation of the commutation of the IGBTs of the cell neutral arm. ▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the neutral arm disconnected or defective. ▪ IGBTs or trigger board of the cell neutral arm defective.
F0786 Cell V8 electronics power supply	▪ Contact WEG Service Center.	▪ Voltages of the internal electronic circuits of the cell out of the operation level. ▪ Defect on the cell power supply.
F0791 Cell V8 modulation synchronism	▪ Contact WEG Service Center.	▪ Fault in the synchronism between the MCC1 control board of the cell and the MVC3 main control.
F0792 Cell V8 bypass system	▪ Contact WEG Service Center.	▪ Fault in the operation of the cell bypass system. ▪ Bypass system is not connected or defective.
F0793 Communication with cell V8	▪ Contact WEG Service Center.	▪ Fault on the communication between the MCC1 control board of the cell and the MVC3 main control. ▪ Break or defect on the cell communication optic cable.
F0797 Cell V8 insulation defective	▪ Contact WEG Service Center.	▪ Fault in the internal insulation of the cell: Contact between some energized point of the circuit and the frame. ▪ Fault on the capacitor discharge resistors of the cell DC link.
F0800 Cell W1 DC link overvoltage	▪ Power-on. ▪ Manual (O /RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Inverter input supply voltage too high. ▪ Incorrect setting of the inverter main transformer taps. ▪ Cell DC link voltage above 1200 V. ▪ Load inertia too high or deceleration ramp too short. ▪ Setting of P0151 too high.
F0801 Cell W1 DC link undervoltage	▪ Power-on. ▪ Manual (O /RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Inverter input supply voltage too low. ▪ Incorrect setting of the inverter main transformer taps. ▪ Cell DC link voltage below 745 V below 652 V for operation in vector control.
A0802 Overtemperature on cell W1 IGBT module	▪ Automatically eliminated when the temperature at the cell heatsink presents a value below the alarm level.	▪ Temperature on the cell heatsink above the alarm level. ▪ Ambient temperature too high (> 40 °C) and high output current. ▪ Fans locked or defective. ▪ Air input filters blocked. **Cell model** / **Alarm level**: 70 A – 85 °C 140 A – 85 °C 200 A – 85 °C 265 A – 85 °C 340 A – 85 °C 450 A – 90 °C 600 A – 90 °C

8

<table>
<tr><th>Fault/alarm</th><th>Reset</th><th>Possible causes</th></tr>
<tr><td>F0803
Overtemperature on cell W1 IGBT module</td><td>▪ Power-on.
▪ Manual (O /RESET key).
▪ Auto-reset.
▪ DIx.
▪ Networks.</td><td>▪ Temperature on the cell heatsink above the fault level.
▪ Ambient temperature too high (> 40 °C) and high output current.
▪ Fans locked or defective.
▪ Air input filters blocked.
<table><tr><th>Cell model</th><th>Fault level</th></tr><tr><td>70 A</td><td>90 °C</td></tr><tr><td>140 A</td><td>90 °C</td></tr><tr><td>200 A</td><td>90 °C</td></tr><tr><td>265 A</td><td>90 °C</td></tr><tr><td>340 A</td><td>90 °C</td></tr><tr><td>450 A</td><td>95 °C</td></tr><tr><td>600 A</td><td>95 °C</td></tr></table></td></tr>
<tr><td>F0804
Defective temperature sensor or undertemperature on cell W1 IGBT</td><td>▪ Contact WEG Service Center.</td><td>▪ Cell temperature measurement sensor defective.
▪ Cell temperature sensor disconnected.
▪ Temperature on the cell heatsink below -10 °C.</td></tr>
<tr><td>F0805
Cell W1 phase IGBT</td><td>▪ Contact WEG Service Center.</td><td>▪ Short circuit at the inverter output.
▪ Trigger board of the IGBTs of the cell phase arm disconnected.
▪ IGBTs of the cell phase arm operating out of the saturation region.
▪ IGBTs or trigger board of the cell phase arm defective.
▪ Fault on the desaturation signal feedback or gate-driver supply.</td></tr>
<tr><td>F0806
Cell W1 neutral IGBT</td><td>▪ Contact WEG Service Center.</td><td>▪ Short circuit at the inverter output.
▪ Trigger board of the IGBTs of the cell neutral arm disconnected.
▪ IGBTs of the cell neutral arm operating out of the saturation region.
▪ IGBTs or trigger board of the cell neutral arm defective.
▪ Fault on the desaturation signal feedback or gate-driver supply.</td></tr>
<tr><td>F0808
Cell W1 phase pulse feedback</td><td>▪ Contact WEG Service Center.</td><td>▪ Fault on the commutation of the IGBTs of the cell phase arm.
▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the phase arm disconnected or defective.
▪ IGBTs or trigger board of the cell phase arm defective.</td></tr>
<tr><td>F0810
Cell W1 neutral pulse feedback</td><td>▪ Contact WEG Service Center.</td><td>▪ Fault on the confirmation of the commutation of the IGBTs of the cell neutral arm.
▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the neutral arm disconnected or defective.
▪ IGBTs or trigger board of the cell neutral arm defective.</td></tr>
<tr><td>F0811
Cell W1 electronics power supply</td><td>▪ Contact WEG Service Center.</td><td>▪ Voltages of the internal electronic circuits of the cell out of the operation level.
▪ Defect on the cell power supply.</td></tr>
<tr><td>F0816
Cell W1 modulation synchronism</td><td>▪ Contact WEG Service Center.</td><td>▪ Fault in the synchronism between the MCC1 control board of the cell and the MVC3 main control.</td></tr>
<tr><td>F0817
Cell W1 bypass system</td><td>▪ Contact WEG Service Center.</td><td>▪ Fault in the operation of the cell bypass system.
▪ Bypass system is not connected or defective.</td></tr>
</table>

<table>
<tr><th>Fault/alarm</th><th>Reset</th><th>Possible causes</th></tr>
<tr><td>F0818
Communication with cell W1</td><td>▪ Contact WEG Service Center.</td><td>▪ Fault on the communication between the MCC1 control board of the cell and the MVC3 main control.
▪ Break or defect on the cell communication optic cable.</td></tr>
<tr><td>F0822
Cell W1 insulation defective</td><td>▪ Contact WEG Service Center.</td><td>▪ Fault in the internal insulation of the cell: Contact between some energized point of the circuit and the frame.
▪ Fault on the capacitor discharge resistors of the cell DC link.</td></tr>
<tr><td>F0825
Cell W2 DC link overvoltage</td><td>▪ Power-on.
▪ Manual (/RESET key).
▪ Auto-reset.
▪ DIx.
▪ Networks.</td><td>▪ Inverter input supply voltage too high.
▪ Incorrect setting of the inverter main transformer taps.
▪ Cell DC link voltage above 1200 V.
▪ Load inertia too high or deceleration ramp too short.
▪ Setting of P0151 too high.</td></tr>
<tr><td>F0826
Cell W2 DC link undervoltage</td><td>▪ Power-on.
▪ Manual (/RESET key).
▪ Auto-reset.
▪ DIx.
▪ Networks.</td><td>▪ Inverter input supply voltage too low.
▪ Incorrect setting of the inverter main transformer taps.
▪ Cell DC link voltage below 745 V below 652 V for operation in vector control.</td></tr>
<tr><td>A0827
Overtemperature on cell W2 IGBT module</td><td>▪ Automatically eliminated when the temperature at the cell heatsink presents a value below the alarm level.</td><td>▪ Temperature on the cell heatsink above the alarm level.
▪ Ambient temperature too high (> 40 °C) and high output current.
▪ Fans locked or defective.
▪ Air input filters blocked.
<table>
<tr><th>Cell model</th><th>Alarm level</th></tr>
<tr><td>70 A</td><td>85 °C</td></tr>
<tr><td>140 A</td><td>85 °C</td></tr>
<tr><td>200 A</td><td>85 °C</td></tr>
<tr><td>265 A</td><td>85 °C</td></tr>
<tr><td>340 A</td><td>85 °C</td></tr>
<tr><td>450 A</td><td>90 °C</td></tr>
<tr><td>600 A</td><td>90 °C</td></tr>
</table></td></tr>
<tr><td>F0828
Overtemperature on cell W2 IGBT module</td><td>▪ Power-on.
▪ Manual (/RESET key).
▪ Auto-reset.
▪ DIx.
▪ Networks.</td><td>▪ Temperature on the cell heatsink above the fault level.
▪ Ambient temperature too high (> 40 °C) and high output current.
▪ Fans locked or defective.
▪ Air input filters blocked.
<table>
<tr><th>Cell model</th><th>Fault level</th></tr>
<tr><td>70 A</td><td>90 °C</td></tr>
<tr><td>140 A</td><td>90 °C</td></tr>
<tr><td>200 A</td><td>90 °C</td></tr>
<tr><td>265 A</td><td>90 °C</td></tr>
<tr><td>340 A</td><td>90 °C</td></tr>
<tr><td>450 A</td><td>95 °C</td></tr>
<tr><td>600 A</td><td>95 °C</td></tr>
</table></td></tr>
<tr><td>F0829
Defective temperature sensor or undertemperature on cell W2 IGBT</td><td>▪ Contact WEG Service Center.</td><td>▪ Cell temperature measurement sensor defective.
▪ Cell temperature sensor disconnected.
▪ Temperature on the cell heatsink below -10 °C.</td></tr>
</table>

Fault/alarm	Reset	Possible causes
F0830 Cell W2 phase IGBT	▪ Contact WEG Service Center.	▪ Short circuit at the inverter output. ▪ Trigger board of the IGBTs of the cell phase arm disconnected. ▪ IGBTs of the cell phase arm operating out of the saturation region. ▪ IGBTs or trigger board of the cell phase arm defective. ▪ Fault on the desaturation signal feedback or gate-driver supply.
F0831 Cell W2 neutral IGBT	▪ Contact WEG Service Center.	▪ Short circuit at the inverter output. ▪ Trigger board of the IGBTs of the cell neutral arm disconnected. ▪ IGBTs of the cell neutral arm operating out of the saturation region. ▪ IGBTs or trigger board of the cell neutral arm defective. ▪ Fault on the desaturation signal feedback or gate-driver supply.
F0833 Cell W2 phase pulse feedback	▪ Contact WEG Service Center.	▪ Fault on the commutation of the IGBTs of the cell phase arm. ▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the phase arm disconnected or defective. ▪ IGBTs or trigger board of the cell phase arm defective.
F0835 Cell W2 neutral pulse feedback	▪ Contact WEG Service Center.	▪ Fault on the confirmation of the commutation of the IGBTs of the cell neutral arm. ▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the neutral arm disconnected or defective. ▪ IGBTs or trigger board of the cell neutral arm defective.
F0836 Cell W2 electronics power supply	▪ Contact WEG Service Center.	▪ Voltages of the internal electronic circuits of the cell out of the operation level. ▪ Defect on the cell power supply.
F0841 Cell W2 modulation synchronism	▪ Contact WEG Service Center.	▪ Fault in the synchronism between the MCC1 control board of the cell and the MVC3 main control.
F0842 Cell W2 bypass system	▪ Contact WEG Service Center.	▪ Fault in the operation of the cell bypass system. ▪ Bypass system is not connected or defective.
F0843 Communication with cell W2	▪ Contact WEG Service Center.	▪ Fault on the communication between the MCC1 control board of the cell and the MVC3 main control. ▪ Break or defect on the cell communication optic cable.
F0847 Cell W2 insulation defective	▪ Contact WEG Service Center.	▪ Fault in the internal insulation of the cell: Contact between some energized point of the circuit and the frame. ▪ Fault on the capacitor discharge resistors of the cell DC link.
F0850 Cell W3 DC link overvoltage	▪ Power-on. ▪ Manual (O /RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Inverter input supply voltage too high. ▪ Incorrect setting of the inverter main transformer taps. ▪ Cell DC link voltage above 1200 V. ▪ Load inertia too high or deceleration ramp too short. ▪ Setting of P0151 too high.

8

<table>
<tr><th>Fault/alarm</th><th>Reset</th><th>Possible causes</th></tr>
<tr>
<td>F0851
Cell W3 DC link undervoltage</td>
<td>Power-on.
Manual (/RESET key).
Auto-reset.
DIx.
Networks.</td>
<td>Inverter input supply voltage too low.
Incorrect setting of the inverter main transformer taps.
Cell DC link voltage below 745 V below 652 V for operation in vector control.</td>
</tr>
<tr>
<td>A0852
Overtemperature on cell W3 IGBT module</td>
<td>Automatically eliminated when the temperature at the cell heatsink presents a value below the alarm level.</td>
<td>Temperature on the cell heatsink above the alarm level.
Ambient temperature too high (> 40 °C) and high output current.
Fans locked or defective.
Air input filters blocked.
<table>
<tr><th>Cell model</th><th>Alarm level</th></tr>
<tr><td>70 A</td><td>85 °C</td></tr>
<tr><td>140 A</td><td>85 °C</td></tr>
<tr><td>200 A</td><td>85 °C</td></tr>
<tr><td>265 A</td><td>85 °C</td></tr>
<tr><td>340 A</td><td>85 °C</td></tr>
<tr><td>450 A</td><td>90 °C</td></tr>
<tr><td>600 A</td><td>90 °C</td></tr>
</table></td>
</tr>
<tr>
<td>F0853
Overtemperature on cell W3 IGBT module</td>
<td>Power-on.
Manual (/RESET key).
Auto-reset.
DIx.
Networks.</td>
<td>Temperature on the cell heatsink above the fault level.
Ambient temperature too high (> 40 °C) and high output current.
Fans locked or defective.
Air input filters blocked.
<table>
<tr><th>Cell model</th><th>Fault level</th></tr>
<tr><td>70 A</td><td>90 °C</td></tr>
<tr><td>140 A</td><td>90 °C</td></tr>
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<tr><td>340 A</td><td>90 °C</td></tr>
<tr><td>450 A</td><td>95 °C</td></tr>
<tr><td>600 A</td><td>95 °C</td></tr>
</table></td>
</tr>
<tr>
<td>F0854
Defective temperature sensor or undertemperature on cell W3 IGBT</td>
<td>Contact WEG Service Center.</td>
<td>Cell temperature measurement sensor defective.
Cell temperature sensor disconnected.
Temperature on the cell heatsink below -10 °C.</td>
</tr>
<tr>
<td>F0855
Cell W3 phase IGBT</td>
<td>Contact WEG Service Center.</td>
<td>Short circuit at the inverter output.
Trigger board of the IGBTs of the cell phase arm disconnected.
IGBTs of the cell phase arm operating out of the saturation region.
IGBTs or trigger board of the cell phase arm defective.
Fault on the desaturation signal feedback or gate-driver supply.</td>
</tr>
<tr>
<td>F0856
Cell W3 neutral IGBT</td>
<td>Contact WEG Service Center.</td>
<td>Short circuit at the inverter output.
Trigger board of the IGBTs of the cell neutral arm disconnected.
IGBTs of the cell neutral arm operating out of the saturation region.
IGBTs or trigger board of the cell neutral arm defective.
Fault on the desaturation signal feedback or gate-driver supply.</td>
</tr>
</table>

8

Fault/alarm	Reset	Possible causes
F0858 Cell W3 phase pulse feedback	▪ Contact WEG Service Center.	▪ Fault on the commutation of the IGBTs of the cell phase arm. ▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the phase arm disconnected or defective. ▪ IGBTs or trigger board of the cell phase arm defective.
F0860 Cell W3 neutral pulse feedback	▪ Contact WEG Service Center.	▪ Fault on the confirmation of the commutation of the IGBTs of the cell neutral arm. ▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the neutral arm disconnected or defective. ▪ IGBTs or trigger board of the cell neutral arm defective.
F0861 Cell W3 electronics power supply	▪ Contact WEG Service Center.	▪ Voltages of the internal electronic circuits of the cell out of the operation level. ▪ Defect on the cell power supply.
F0866 Cell W3 modulation synchronism	▪ Contact WEG Service Center.	▪ Fault in the synchronism between the MCC1 control board of the cell and the MVC3 main control.
F0867 Cell W3 bypass system	▪ Contact WEG Service Center.	▪ Fault in the operation of the cell bypass system. ▪ Bypass system is not connected or defective.
F0868 Communication with cell W3	▪ Contact WEG Service Center.	▪ Fault on the communication between the MCC1 control board of the cell and the MVC3 main control. ▪ Break or defect on the cell communication optic cable.
F0872 Cell W3 insulation defective	▪ Contact WEG Service Center.	▪ Fault in the internal insulation of the cell: Contact between some energized point of the circuit and the frame. ▪ Fault on the capacitor discharge resistors of the cell DC link.
F0875 Cell W4 DC link overvoltage	▪ Power-on. ▪ Manual (/RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Inverter input supply voltage too high. ▪ Incorrect setting of the inverter main transformer taps. ▪ Cell DC link voltage above 1200 V. ▪ Load inertia too high or deceleration ramp too short. ▪ Setting of P0151 too high.
F0876 Cell W4 DC link undervoltage	▪ Power-on. ▪ Manual (/RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Inverter input supply voltage too low. ▪ Incorrect setting of the inverter main transformer taps. ▪ Cell DC link voltage below 745 V below 652 V for operation in vector control.

<table>
<tr><th>Fault/alarm</th><th>Reset</th><th>Possible causes</th></tr>
<tr><td>A0877
Overtemperature on cell W4 IGBT module</td><td>▪ Automatically eliminated when the temperature at the cell heatsink presents a value below the alarm level.</td><td>▪ Temperature on the cell heatsink above the alarm level.
▪ Ambient temperature too high (> 40 °C) and high output current.
▪ Fans locked or defective.
▪ Air input filters blocked.
<table><tr><th>Cell model</th><th>Alarm level</th></tr><tr><td>70 A</td><td>85 °C</td></tr><tr><td>140 A</td><td>85 °C</td></tr><tr><td>200 A</td><td>85 °C</td></tr><tr><td>265 A</td><td>85 °C</td></tr><tr><td>340 A</td><td>85 °C</td></tr><tr><td>450 A</td><td>90 °C</td></tr><tr><td>600 A</td><td>90 °C</td></tr></table></td></tr>
<tr><td>F0878
Overtemperature on cell W4 IGBT module</td><td>▪ Power-on.
▪ Manual (O /RESET key).
▪ Auto-reset.
▪ DIx.
▪ Networks.</td><td>▪ Temperature on the cell heatsink above the fault level.
▪ Ambient temperature too high (> 40 °C) and high output current.
▪ Fans locked or defective.
▪ Air input filters blocked.
<table><tr><th>Cell model</th><th>Fault level</th></tr><tr><td>70 A</td><td>90 °C</td></tr><tr><td>140 A</td><td>90 °C</td></tr><tr><td>200 A</td><td>90 °C</td></tr><tr><td>265 A</td><td>90 °C</td></tr><tr><td>340 A</td><td>90 °C</td></tr><tr><td>450 A</td><td>95 °C</td></tr><tr><td>600 A</td><td>95 °C</td></tr></table></td></tr>
<tr><td>F0879
Defective temperature sensor or undertemperature on cell W4 IGBT</td><td>▪ Contact WEG Service Center.</td><td>▪ Cell temperature measurement sensor defective.
▪ Cell temperature sensor disconnected.
▪ Temperature on the cell heatsink below -10 °C.</td></tr>
<tr><td>F0880
Cell W4 phase IGBT</td><td>▪ Contact WEG Service Center.</td><td>▪ Short circuit at the inverter output.
▪ Trigger board of the IGBTs of the cell phase arm disconnected.
▪ IGBTs of the cell phase arm operating out of the saturation region.
▪ IGBTs or trigger board of the cell phase arm defective.
▪ Fault on the desaturation signal feedback or gate-driver supply.</td></tr>
<tr><td>F0881
Cell W4 neutral IGBT</td><td>▪ Contact WEG Service Center.</td><td>▪ Short circuit at the inverter output.
▪ Trigger board of the IGBTs of the cell neutral arm disconnected.
▪ IGBTs of the cell neutral arm operating out of the saturation region.
▪ IGBTs or trigger board of the cell neutral arm defective.
▪ Fault on the desaturation signal feedback or gate-driver supply.</td></tr>
<tr><td>F0883
Cell W4 phase pulse feedback</td><td>▪ Contact WEG Service Center.</td><td>▪ Fault on the commutation of the IGBTs of the cell phase arm.
▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the phase arm disconnected or defective.
▪ IGBTs or trigger board of the cell phase arm defective.</td></tr>
</table>

8

Fault/alarm	Reset	Possible causes
F0885 Cell W4 neutral pulse feedback	▪ Contact WEG Service Center.	▪ Fault on the confirmation of the commutation of the IGBTs of the cell neutral arm. ▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the neutral arm disconnected or defective. ▪ IGBTs or trigger board of the cell neutral arm defective.
F0886 Cell W4 electronics power supply	▪ Contact WEG Service Center.	▪ Voltages of the internal electronic circuits of the cell out of the operation level. ▪ Defect on the cell power supply.
F0891 Cell W4 modulation synchronism	▪ Contact WEG Service Center.	▪ Fault in the synchronism between the MCC1 control board of the cell and the MVC3 main control.
F0892 Cell W4 bypass system	▪ Contact WEG Service Center.	▪ Fault in the operation of the cell bypass system. ▪ Bypass system is not connected or defective.
F0893 Communication with cell W4	▪ Contact WEG Service Center.	▪ Fault on the communication between the MCC1 control board of the cell and the MVC3 main control. ▪ Break or defect on the cell communication optic cable.
F0897 Cell W4 insulation defective	▪ Contact WEG Service Center.	▪ Fault in the internal insulation of the cell: Contact between some energized point of the circuit and the frame. ▪ Fault on the capacitor discharge resistors of the cell DC link.
F0900 Cell W5 DC link overvoltage	▪ Power-on. ▪ Manual (O /RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Inverter input supply voltage too high. ▪ Incorrect setting of the inverter main transformer taps. ▪ Cell DC link voltage above 1200 V. ▪ Load inertia too high or deceleration ramp too short. ▪ Setting of P0151 too high.
F0901 Cell W5 DC link undervoltage	▪ Power-on. ▪ Manual (O /RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Inverter input supply voltage too low. ▪ Incorrect setting of the inverter main transformer taps. ▪ Cell DC link voltage below 745 V below 652 V for operation in vector control.
A0902 Overtemperature on cell W5 IGBT module	▪ Automatically eliminated when the temperature at the cell heatsink presents a value below the alarm level.	▪ Temperature on the cell heatsink above the alarm level. ▪ Ambient temperature too high (> 40 °C) and high output current. ▪ Fans locked or defective. ▪ Air input filters blocked. Cell model / Alarm level: 70 A: 85 °C 140 A: 85 °C 200 A: 85 °C 265 A: 85 °C 340 A: 85 °C 450 A: 90 °C 600 A: 90 °C

8

<table>
<tr><th>Fault/alarm</th><th>Reset</th><th>Possible causes</th></tr>
<tr><td>F0903
Overtemperature on cell W5 IGBT module</td><td>▪ Power-on.
▪ Manual (O /RESET key).
▪ Auto-reset.
▪ DIx.
▪ Networks.</td><td>▪ Temperature on the cell heatsink above the fault level.
▪ Ambient temperature too high (> 40 °C) and high output current.
▪ Fans locked or defective.
▪ Air input filters blocked.
<table>
<tr><th>Cell model</th><th>Fault level</th></tr>
<tr><td>70 A</td><td>90 °C</td></tr>
<tr><td>140 A</td><td>90 °C</td></tr>
<tr><td>200 A</td><td>90 °C</td></tr>
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<tr><td>340 A</td><td>90 °C</td></tr>
<tr><td>450 A</td><td>95 °C</td></tr>
<tr><td>600 A</td><td>95 °C</td></tr>
</table></td></tr>
<tr><td>F0904
Defective temperature sensor or undertemperature on cell W5 IGBT</td><td>▪ Contact WEG Service Center.</td><td>▪ Cell temperature measurement sensor defective.
▪ Cell temperature sensor disconnected.
▪ Temperature on the cell heatsink below -10 °C.</td></tr>
<tr><td>F0905
Cell W5 phase IGBT</td><td>▪ Contact WEG Service Center.</td><td>▪ Short circuit at the inverter output.
▪ Trigger board of the IGBTs of the cell phase arm disconnected.
▪ IGBTs of the cell phase arm operating out of the saturation region.
▪ IGBTs or trigger board of the cell phase arm defective.
▪ Fault on the desaturation signal feedback or gate-driver supply.</td></tr>
<tr><td>F0906
Cell W5 neutral IGBT</td><td>▪ Contact WEG Service Center.</td><td>▪ Short circuit at the inverter output.
▪ Trigger board of the IGBTs of the cell neutral arm disconnected.
▪ IGBTs of the cell neutral arm operating out of the saturation region.
▪ IGBTs or trigger board of the cell neutral arm defective.
▪ Fault on the desaturation signal feedback or gate-driver supply.</td></tr>
<tr><td>F0908
Cell W5 phase pulse feedback</td><td>▪ Contact WEG Service Center.</td><td>▪ Fault on the commutation of the IGBTs of the cell phase arm.
▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the phase arm disconnected or defective.
▪ IGBTs or trigger board of the cell phase arm defective.</td></tr>
<tr><td>F0910
Cell W5 neutral pulse feedback</td><td>▪ Contact WEG Service Center.</td><td>▪ Fault on the confirmation of the commutation of the IGBTs of the cell neutral arm.
▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the neutral arm disconnected or defective.
▪ IGBTs or trigger board of the cell neutral arm defective.</td></tr>
<tr><td>F0911
Cell W5 electronics power supply</td><td>▪ Contact WEG Service Center.</td><td>▪ Voltages of the internal electronic circuits of the cell out of the operation level.
▪ Defect on the cell power supply.</td></tr>
<tr><td>F0916
Cell W5 modulation synchronism</td><td>▪ Contact WEG Service Center.</td><td>▪ Fault in the synchronism between the MCC1 control board of the cell and the MVC3 main control.</td></tr>
<tr><td>F0917
Cell W5 bypass system</td><td>▪ Contact WEG Service Center.</td><td>▪ Fault in the operation of the cell bypass system.
▪ Bypass system is not connected or defective.</td></tr>
</table>

<table>
<tr><th>Fault/alarm</th><th>Reset</th><th>Possible causes</th></tr>
<tr><td>F0918
Communication with cell W5</td><td>▪ Contact WEG Service Center.</td><td>▪ Fault on the communication between the MCC1 control board of the cell and the MVC3 main control.
▪ Break or defect on the cell communication optic cable.</td></tr>
<tr><td>F0922
Cell W5 insulation defective</td><td>▪ Contact WEG Service Center.</td><td>▪ Fault in the internal insulation of the cell: Contact between some energized point of the circuit and the frame.
▪ Fault on the capacitor discharge resistors of the cell DC link.</td></tr>
<tr><td>F0925
Cell W6 DC link overvoltage</td><td>▪ Power-on.
▪ Manual (/RESET key).
▪ Auto-reset.
▪ DIx.
▪ Networks.</td><td>▪ Inverter input supply voltage too high.
▪ Incorrect setting of the inverter main transformer taps.
▪ Cell DC link voltage above 1200 V.
▪ Load inertia too high or deceleration ramp too short.
▪ Setting of P0151 too high.</td></tr>
<tr><td>F0926
Cell W6 DC link undervoltage</td><td>▪ Power-on.
▪ Manual (/RESET key).
▪ Auto-reset.
▪ DIx.
▪ Networks.</td><td>▪ Inverter input supply voltage too low.
▪ Incorrect setting of the inverter main transformer taps.
▪ Cell DC link voltage below 745 V below 652 V for operation in vector control.</td></tr>
<tr><td>A0927
Overtemperature on cell W6 IGBT module</td><td>▪ Automatically eliminated when the temperature at the cell heatsink presents a value below the alarm level.</td><td>▪ Temperature on the cell heatsink above the alarm level.
▪ Ambient temperature too high (> 40 °C) and high output current.
▪ Fans locked or defective.
▪ Air input filters blocked.
<table><tr><th>Cell model</th><th>Alarm level</th></tr><tr><td>70 A</td><td>85 °C</td></tr><tr><td>140 A</td><td>85 °C</td></tr><tr><td>200 A</td><td>85 °C</td></tr><tr><td>265 A</td><td>85 °C</td></tr><tr><td>340 A</td><td>85 °C</td></tr><tr><td>450 A</td><td>90 °C</td></tr><tr><td>600 A</td><td>90 °C</td></tr></table></td></tr>
<tr><td>F0928
Overtemperature on cell W6 IGBT module</td><td>▪ Power-on.
▪ Manual (/RESET key).
▪ Auto-reset.
▪ DIx.
▪ Networks.</td><td>▪ Temperature on the cell heatsink above the fault level.
▪ Ambient temperature too high (> 40 °C) and high output current.
▪ Fans locked or defective.
▪ Air input filters blocked.
<table><tr><th>Cell model</th><th>Fault level</th></tr><tr><td>70 A</td><td>90 °C</td></tr><tr><td>140 A</td><td>90 °C</td></tr><tr><td>200 A</td><td>90 °C</td></tr><tr><td>265 A</td><td>90 °C</td></tr><tr><td>340 A</td><td>90 °C</td></tr><tr><td>450 A</td><td>95 °C</td></tr><tr><td>600 A</td><td>95 °C</td></tr></table></td></tr>
<tr><td>F0929
Defective temperature sensor or undertemperature on cell W6 IGBT</td><td>▪ Contact WEG Service Center.</td><td>▪ Cell temperature measurement sensor defective.
▪ Cell temperature sensor disconnected.
▪ Temperature on the cell heatsink below -10 °C.</td></tr>
</table>

Fault/alarm	Reset	Possible causes
F0930 Cell W6 phase IGBT	▪ Contact WEG Service Center.	▪ Short circuit at the inverter output. ▪ Trigger board of the IGBTs of the cell phase arm disconnected. ▪ IGBTs of the cell phase arm operating out of the saturation region. ▪ IGBTs or trigger board of the cell phase arm defective. ▪ Fault on the desaturation signal feedback or gate-driver supply.
F0931 Cell W6 neutral IGBT	▪ Contact WEG Service Center.	▪ Short circuit at the inverter output. ▪ Trigger board of the IGBTs of the cell neutral arm disconnected. ▪ IGBTs of the cell neutral arm operating out of the saturation region. ▪ IGBTs or trigger board of the cell neutral arm defective. ▪ Fault on the desaturation signal feedback or gate-driver supply.
F0933 Cell W6 phase pulse feedback	▪ Contact WEG Service Center.	▪ Fault on the commutation of the IGBTs of the cell phase arm. ▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the phase arm disconnected or defective. ▪ IGBTs or trigger board of the cell phase arm defective.
F0935 Cell W6 neutral pulse feedback	▪ Contact WEG Service Center.	▪ Fault on the confirmation of the commutation of the IGBTs of the cell neutral arm. ▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the neutral arm disconnected or defective. ▪ IGBTs or trigger board of the cell neutral arm defective.
F0936 Cell W6 electronics power supply	▪ Contact WEG Service Center.	▪ Voltages of the internal electronic circuits of the cell out of the operation level. ▪ Defect on the cell power supply.
F0941 Cell W6 modulation synchronism	▪ Contact WEG Service Center.	▪ Fault in the synchronism between the MCC1 control board of the cell and the MVC3 main control.
F0942 Cell W6 bypass system	▪ Contact WEG Service Center.	▪ Fault in the operation of the cell bypass system. ▪ Bypass system is not connected or defective.
F0943 Communication with cell W6	▪ Contact WEG Service Center.	▪ Fault on the communication between the MCC1 control board of the cell and the MVC3 main control. ▪ Break or defect on the cell communication optic cable.
F0947 Cell W6 insulation defective	▪ Contact WEG Service Center.	▪ Fault in the internal insulation of the cell: Contact between some energized point of the circuit and the frame. ▪ Fault on the capacitor discharge resistors of the cell DC link.
F0950 Cell W7 DC link overvoltage	▪ Power-on. ▪ Manual (O /RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Inverter input supply voltage too high. ▪ Incorrect setting of the inverter main transformer taps. ▪ Cell DC link voltage above 1200 V. ▪ Load inertia too high or deceleration ramp too short. ▪ Setting of P0151 too high.

<table>
<tr><th>Fault/alarm</th><th>Reset</th><th>Possible causes</th></tr>
<tr><td>F0951
Cell W7 DC link undervoltage</td><td>
Power-on.
Manual (O/RESET key).
Auto-reset.
DIx.
Networks.</td><td>
Inverter input supply voltage too low.
Incorrect setting of the inverter main transformer taps.
Cell DC link voltage below 745 V below 652 V for operation in vector control.</td></tr>
<tr><td>A0952
Overtemperature on cell W7 IGBT module</td><td>
Automatically eliminated when the temperature at the cell heatsink presents a value below the alarm level.</td><td>
Temperature on the cell heatsink above the alarm level.
Ambient temperature too high (> 40 °C) and high output current.
Fans locked or defective.
Air input filters blocked.
<table>
<tr><th>Cell model</th><th>Alarm level</th></tr>
<tr><td>70 A</td><td>85 °C</td></tr>
<tr><td>140 A</td><td>85 °C</td></tr>
<tr><td>200 A</td><td>85 °C</td></tr>
<tr><td>265 A</td><td>85 °C</td></tr>
<tr><td>340 A</td><td>85 °C</td></tr>
<tr><td>450 A</td><td>90 °C</td></tr>
<tr><td>600 A</td><td>90 °C</td></tr>
</table></td></tr>
<tr><td>F0953
Overtemperature on cell W7 IGBT module</td><td>
Power-on.
Manual (O/RESET key).
Auto-reset.
DIx.
Networks.</td><td>
Temperature on the cell heatsink above the fault level.
Ambient temperature too high (> 40 °C) and high output current.
Fans locked or defective.
Air input filters blocked.
<table>
<tr><th>Cell model</th><th>Fault level</th></tr>
<tr><td>70 A</td><td>90 °C</td></tr>
<tr><td>140 A</td><td>90 °C</td></tr>
<tr><td>200 A</td><td>90 °C</td></tr>
<tr><td>265 A</td><td>90 °C</td></tr>
<tr><td>340 A</td><td>90 °C</td></tr>
<tr><td>450 A</td><td>95 °C</td></tr>
<tr><td>600 A</td><td>95 °C</td></tr>
</table></td></tr>
<tr><td>F0954
Defective temperature sensor or undertemperature on cell W7 IGBT</td><td>
Contact WEG Service Center.</td><td>
Cell temperature measurement sensor defective.
Cell temperature sensor disconnected.
Temperature on the cell heatsink below -10 °C.</td></tr>
<tr><td>F0955
Cell W7 phase IGBT</td><td>
Contact WEG Service Center.</td><td>
Short circuit at the inverter output.
Trigger board of the IGBTs of the cell phase arm disconnected.
IGBTs of the cell phase arm operating out of the saturation region.
IGBTs or trigger board of the cell phase arm defective.
Fault on the desaturation signal feedback or gate-driver supply.</td></tr>
<tr><td>F0956
Cell W7 neutral IGBT</td><td>
Contact WEG Service Center.</td><td>
Short circuit at the inverter output.
Trigger board of the IGBTs of the cell neutral arm disconnected.
IGBTs of the cell neutral arm operating out of the saturation region.
IGBTs or trigger board of the cell neutral arm defective.
Fault on the desaturation signal feedback or gate-driver supply.</td></tr>
</table>

Fault/alarm	Reset	Possible causes
F0958 Cell W7 phase pulse feedback	▪ Contact WEG Service Center.	▪ Fault on the commutation of the IGBTs of the cell phase arm. ▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the phase arm disconnected or defective. ▪ IGBTs or trigger board of the cell phase arm defective.
F0960 Cell W7 neutral pulse feedback	▪ Contact WEG Service Center.	▪ Fault on the confirmation of the commutation of the IGBTs of the cell neutral arm. ▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the neutral arm disconnected or defective. ▪ IGBTs or trigger board of the cell neutral arm defective.
F0961 Cell W7 electronics power supply	▪ Contact WEG Service Center.	▪ Voltages of the internal electronic circuits of the cell out of the operation level. ▪ Defect on the cell power supply.
F0966 Cell W7 modulation synchronism	▪ Contact WEG Service Center.	▪ Fault in the synchronism between the MCC1 control board of the cell and the MVC3 main control.
F0967 Cell W7 bypass system	▪ Contact WEG Service Center.	▪ Fault in the operation of the cell bypass system. ▪ Bypass system is not connected or defective.
F0968 Communication with cell W7	▪ Contact WEG Service Center.	▪ Fault on the communication between the MCC1 control board of the cell and the MVC3 main control. ▪ Break or defect on the cell communication optic cable.
F0972 Cell W7 insulation defective	▪ Contact WEG Service Center.	▪ Fault in the internal insulation of the cell: Contact between some energized point of the circuit and the frame. ▪ Fault on the capacitor discharge resistors of the cell DC link.
F0975 Cell W8 DC link overvoltage	▪ Power-on. ▪ Manual (/RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Inverter input supply voltage too high. ▪ Incorrect setting of the inverter main transformer taps. ▪ Cell DC link voltage above 1200 V. ▪ Load inertia too high or deceleration ramp too short. ▪ Setting of P0151 too high.
F0976 Cell W8 DC link undervoltage	▪ Power-on. ▪ Manual (/RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Inverter input supply voltage too low. ▪ Incorrect setting of the inverter main transformer taps. ▪ Cell DC link voltage below 745 V below 652 V for operation in vector control.

8

<table>
<tr><th>Fault/alarm</th><th>Reset</th><th>Possible causes</th></tr>
<tr><td>A0977
Overtemperature on cell W8 IGBT module</td><td>Automatically eliminated when the temperature at the cell heatsink presents a value below the alarm level.</td><td>Temperature on the cell heatsink above the alarm level.
Ambient temperature too high (> 40 °C) and high output current.
Fans locked or defective.
Air input filters blocked.
<table>
<tr><th>Cell model</th><th>Alarm level</th></tr>
<tr><td>70 A</td><td>85 °C</td></tr>
<tr><td>140 A</td><td>85 °C</td></tr>
<tr><td>200 A</td><td>85 °C</td></tr>
<tr><td>265 A</td><td>85 °C</td></tr>
<tr><td>340 A</td><td>85 °C</td></tr>
<tr><td>450 A</td><td>90 °C</td></tr>
<tr><td>600 A</td><td>90 °C</td></tr>
</table></td></tr>
<tr><td>F0978
Overtemperature on cell W8 IGBT module</td><td>Power-on.
Manual (O /RESET key).
Auto-reset.
DIx.
Networks.</td><td>Temperature on the cell heatsink above the fault level.
Ambient temperature too high (> 40 °C) and high output current.
Fans locked or defective.
Air input filters blocked.
<table>
<tr><th>Cell model</th><th>Fault level</th></tr>
<tr><td>70 A</td><td>90 °C</td></tr>
<tr><td>140 A</td><td>90 °C</td></tr>
<tr><td>200 A</td><td>90 °C</td></tr>
<tr><td>265 A</td><td>90 °C</td></tr>
<tr><td>340 A</td><td>90 °C</td></tr>
<tr><td>450 A</td><td>95 °C</td></tr>
<tr><td>600 A</td><td>95 °C</td></tr>
</table></td></tr>
<tr><td>F0979
Defective temperature sensor or undertemperature on cell W8 IGBT</td><td>Contact WEG Service Center.</td><td>Cell temperature measurement sensor defective.
Cell temperature sensor disconnected.
Temperature on the cell heatsink below -10 °C.</td></tr>
<tr><td>F0980
Cell W8 phase IGBT</td><td>Contact WEG Service Center.</td><td>Short circuit at the inverter output.
Trigger board of the IGBTs of the cell phase arm disconnected.
IGBTs of the cell phase arm operating out of the saturation region.
IGBTs or trigger board of the cell phase arm defective.
Fault on the desaturation signal feedback or gate-driver supply.</td></tr>
<tr><td>F0981
Cell W8 neutral IGBT</td><td>Contact WEG Service Center.</td><td>Short circuit at the inverter output.
Trigger board of the IGBTs of the cell neutral arm disconnected.
IGBTs of the cell neutral arm operating out of the saturation region.
IGBTs or trigger board of the cell neutral arm defective.
Fault on the desaturation signal feedback or gate-driver supply.</td></tr>
<tr><td>F0983
Cell W8 phase pulse feedback</td><td>Contact WEG Service Center.</td><td>Fault on the commutation of the IGBTs of the cell phase arm.
Measurement circuit of the confirmation signal of the commutation of the IGBTs of the phase arm disconnected or defective.
IGBTs or trigger board of the cell phase arm defective.</td></tr>
</table>

Fault/alarm	Reset	Possible causes
F0985 Cell W8 neutral pulse feedback	▪ Contact WEG Service Center.	▪ Fault on the confirmation of the commutation of the IGBTs of the cell neutral arm. ▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the neutral arm disconnected or defective. ▪ IGBTs or trigger board of the cell neutral arm defective.
F0986 Cell W8 electronics power supply	▪ Contact WEG Service Center.	▪ Voltages of the internal electronic circuits of the cell out of the operation level. ▪ Defect on the cell power supply.
F0991 Cell W8 modulation synchronism	▪ Contact WEG Service Center.	▪ Fault in the synchronism between the MCC1 control board of the cell and the MVC3 main control.
F0992 Cell W8 bypass system	▪ Contact WEG Service Center.	▪ Fault in the operation of the cell bypass system. ▪ Bypass system is not connected or defective.
F0993 Communication with cell W8	▪ Contact WEG Service Center.	▪ Fault on the communication between the MCC1 control board of the cell and the MVC3 main control. ▪ Break or defect on the cell communication optic cable.
F0997 Cell W8 insulation defective	▪ Contact WEG Service Center.	▪ Fault in the internal insulation of the cell: Contact between some energized point of the circuit and the frame. ▪ Fault on the capacitor discharge resistors of the cell DC link.
F1000 Cell U9 DC link overvoltage	▪ Power-on. ▪ Manual (/RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Inverter input supply voltage too high. ▪ Incorrect setting of the inverter main transformer taps. ▪ Cell DC link voltage above 1200 V. ▪ Load inertia too high or deceleration ramp too short. ▪ Setting of P0151 too high.
F1001 Cell U9 DC link undervoltage	▪ Power-on. ▪ Manual (/RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Inverter input supply voltage too low. ▪ Incorrect setting of the inverter main transformer taps. ▪ Cell DC link voltage below 745 V below 652 V for operation in vector control.
A1002 Overtemperature on cell U9 IGBT module	▪ Automatically eliminated when the temperature at the cell heatsink presents a value below the alarm level.	▪ Temperature on the cell heatsink above the alarm level. ▪ Ambient temperature too high (> 40 °C) and high output current. ▪ Fans locked or defective. ▪ Air input filters blocked. **Cell model** / **Alarm level**: 70 A / 85 °C 140 A / 85 °C 200 A / 85 °C 265 A / 85 °C 340 A / 85 °C 450 A / 90 °C 600 A / 90 °C

8

Fault/alarm	Reset	Possible causes
F1003 Overtemperature on cell U9 IGBT module	▪ Power-on. ▪ Manual (O /RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Temperature on the cell heatsink above the fault level. ▪ Ambient temperature too high (> 40 °C) and high output current. ▪ Fans locked or defective. ▪ Air input filters blocked. **Cell model** / **Fault level**: 70 A: 90 °C 140 A: 90 °C 200 A: 90 °C 265 A: 90 °C 340 A: 90 °C 450 A: 95 °C 600 A: 95 °C
F1004 Defective temperature sensor or undertemperature on cell U9 IGBT	▪ Contact WEG Service Center.	▪ Cell temperature measurement sensor defective. ▪ Cell temperature sensor disconnected. ▪ Temperature on the cell heatsink below -10 °C.
F1005 Cell U9 phase IGBT	▪ Contact WEG Service Center.	▪ Short circuit at the inverter output. ▪ Trigger board of the IGBTs of the cell phase arm disconnected. ▪ IGBTs of the cell phase arm operating out of the saturation region. ▪ IGBTs or trigger board of the cell phase arm defective. ▪ Fault on the desaturation signal feedback or gate-driver supply.
F1006 Cell U9 neutral IGBT	▪ Contact WEG Service Center.	▪ Short circuit at the inverter output. ▪ Trigger board of the IGBTs of the cell neutral arm disconnected. ▪ IGBTs of the cell neutral arm operating out of the saturation region. ▪ IGBTs or trigger board of the cell neutral arm defective. ▪ Fault on the desaturation signal feedback or gate-driver supply.
F1008 Cell U9 phase pulse feedback	▪ Contact WEG Service Center.	▪ Fault on the commutation of the IGBTs of the cell phase arm. ▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the phase arm disconnected or defective. ▪ IGBTs or trigger board of the cell phase arm defective.
F1010 Cell U9 neutral pulse feedback	▪ Contact WEG Service Center.	▪ Fault on the confirmation of the commutation of the IGBTs of the cell neutral arm. ▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the neutral arm disconnected or defective. ▪ IGBTs or trigger board of the cell neutral arm defective.
F1011 Cell U9 electronics power supply	▪ Contact WEG Service Center.	▪ Voltages of the internal electronic circuits of the cell out of the operation level. ▪ Defect on the cell power supply.
F1016 Cell U9 modulation synchronism	▪ Contact WEG Service Center.	▪ Fault in the synchronism between the MCC1 control board of the cell and the MVC3 main control.
F1017 Cell U9 bypass system	▪ Contact WEG Service Center.	▪ Fault in the operation of the cell bypass system. ▪ Bypass system is not connected or defective.

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<table>
<tr><th>Fault/alarm</th><th>Reset</th><th>Possible causes</th></tr>
<tr><td>F1018
Communication with cell U9</td><td>▪ Contact WEG Service Center.</td><td>▪ Fault on the communication between the MCC1 control board of the cell and the MVC3 main control.
▪ Break or defect on the cell communication optic cable.</td></tr>
<tr><td>F1022
Cell U9 insulation defective</td><td>▪ Contact WEG Service Center.</td><td>▪ Fault in the internal insulation of the cell: Contact between some energized point of the circuit and the frame.
▪ Fault on the capacitor discharge resistors of the cell DC link.</td></tr>
<tr><td>F1025
Cell U10 DC link overvoltage</td><td>▪ Power-on.
▪ Manual (/RESET key).
▪ Auto-reset.
▪ DIx.
▪ Networks.</td><td>▪ Inverter input supply voltage too high.
▪ Incorrect setting of the inverter main transformer taps.
▪ Cell DC link voltage above 1200 V.
▪ Load inertia too high or deceleration ramp too short.
▪ Setting of P0151 too high.</td></tr>
<tr><td>F1026
Cell U10 DC link undervoltage</td><td>▪ Power-on.
▪ Manual (/RESET key).
▪ Auto-reset.
▪ DIx.
▪ Networks.</td><td>▪ Inverter input supply voltage too low.
▪ Incorrect setting of the inverter main transformer taps.
▪ Cell DC link voltage below 745 V below 652 V for operation in vector control.</td></tr>
<tr><td>A1027
Overtemperature on cell U10 IGBT module</td><td>▪ Automatically eliminated when the temperature at the cell heatsink presents a value below the alarm level.</td><td>▪ Temperature on the cell heatsink above the alarm level.
▪ Ambient temperature too high (> 40 °C) and high output current.
▪ Fans locked or defective.
▪ Air input filters blocked.
<table><tr><th>Cell model</th><th>Alarm level</th></tr><tr><td>70 A</td><td>85 °C</td></tr><tr><td>140 A</td><td>85 °C</td></tr><tr><td>200 A</td><td>85 °C</td></tr><tr><td>265 A</td><td>85 °C</td></tr><tr><td>340 A</td><td>85 °C</td></tr><tr><td>450 A</td><td>90 °C</td></tr><tr><td>600 A</td><td>90 °C</td></tr></table></td></tr>
<tr><td>F1028
Overtemperature on cell U10 IGBT module</td><td>▪ Power-on.
▪ Manual (/RESET key).
▪ Auto-reset.
▪ DIx.
▪ Networks.</td><td>▪ Temperature on the cell heatsink above the fault level.
▪ Ambient temperature too high (> 40 °C) and high output current.
▪ Fans locked or defective.
▪ Air input filters blocked.
<table><tr><th>Cell model</th><th>Fault level</th></tr><tr><td>70 A</td><td>90 °C</td></tr><tr><td>140 A</td><td>90 °C</td></tr><tr><td>200 A</td><td>90 °C</td></tr><tr><td>265 A</td><td>90 °C</td></tr><tr><td>340 A</td><td>90 °C</td></tr><tr><td>450 A</td><td>95 °C</td></tr><tr><td>600 A</td><td>95 °C</td></tr></table></td></tr>
<tr><td>F1029
Defective temperature sensor or undertemperature on cell U10 IGBT</td><td>▪ Contact WEG Service Center.</td><td>▪ Cell temperature measurement sensor defective.
▪ Cell temperature sensor disconnected.
▪ Temperature on the cell heatsink below -10 °C.</td></tr>
</table>

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Fault/alarm	Reset	Possible causes
F1030 Cell U10 phase IGBT	▪ Contact WEG Service Center.	▪ Short circuit at the inverter output. ▪ Trigger board of the IGBTs of the cell phase arm disconnected. ▪ IGBTs of the cell phase arm operating out of the saturation region. ▪ IGBTs or trigger board of the cell phase arm defective. ▪ Fault on the desaturation signal feedback or gate-driver supply.
F1031 Cell U10 neutral IGBT	▪ Contact WEG Service Center.	▪ Short circuit at the inverter output. ▪ Trigger board of the IGBTs of the cell neutral arm disconnected. ▪ IGBTs of the cell neutral arm operating out of the saturation region. ▪ IGBTs or trigger board of the cell neutral arm defective. ▪ Fault on the desaturation signal feedback or gate-driver supply.
F1033 Cell U10 phase pulse feedback	▪ Contact WEG Service Center.	▪ Fault on the commutation of the IGBTs of the cell phase arm. ▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the phase arm disconnected or defective. ▪ IGBTs or trigger board of the cell phase arm defective.
F1035 Cell U10 neutral pulse feedback	▪ Contact WEG Service Center.	▪ Fault on the confirmation of the commutation of the IGBTs of the cell neutral arm. ▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the neutral arm disconnected or defective. ▪ IGBTs or trigger board of the cell neutral arm defective.
F1036 Cell U10 electronics power supply	▪ Contact WEG Service Center.	▪ Voltages of the internal electronic circuits of the cell out of the operation level. ▪ Defect on the cell power supply.
F1041 Cell U10 modulation synchronism	▪ Contact WEG Service Center.	▪ Fault in the synchronism between the MCC1 control board of the cell and the MVC3 main control.
F1042 Cell U10 bypass system	▪ Contact WEG Service Center.	▪ Fault in the operation of the cell bypass system. ▪ Bypass system is not connected or defective.
F1043 Communication with cell U10	▪ Contact WEG Service Center.	▪ Fault on the communication between the MCC1 control board of the cell and the MVC3 main control. ▪ Break or defect on the cell communication optic cable.
F1047 Cell U10 insulation defective	▪ Contact WEG Service Center.	▪ Fault in the internal insulation of the cell: Contact between some energized point of the circuit and the frame. ▪ Fault on the capacitor discharge resistors of the cell DC link.
F1050 Cell U11 DC link overvoltage	▪ Power-on. ▪ Manual (O /RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Inverter input supply voltage too high. ▪ Incorrect setting of the inverter main transformer taps. ▪ Cell DC link voltage above 1200 V. ▪ Load inertia too high or deceleration ramp too short. ▪ Setting of P0151 too high.

<table>
<tr><th>Fault/alarm</th><th>Reset</th><th>Possible causes</th></tr>
<tr><td>F1051
Cell U11 DC link undervoltage</td><td>Power-on.
Manual (/RESET key).
Auto-reset.
DIx.
Networks.</td><td>Inverter input supply voltage too low.
Incorrect setting of the inverter main transformer taps.
Cell DC link voltage below 745 V below 652 V for operation in vector control.</td></tr>
<tr><td>A1052
Overtemperature on cell U11 IGBT module</td><td>Automatically eliminated when the temperature at the cell heatsink presents a value below the alarm level.</td><td>Temperature on the cell heatsink above the alarm level.
Ambient temperature too high (> 40 °C) and high output current.
Fans locked or defective.
Air input filters blocked.
<table>
<tr><th>Cell model</th><th>Alarm level</th></tr>
<tr><td>70 A</td><td>85 °C</td></tr>
<tr><td>140 A</td><td>85 °C</td></tr>
<tr><td>200 A</td><td>85 °C</td></tr>
<tr><td>265 A</td><td>85 °C</td></tr>
<tr><td>340 A</td><td>85 °C</td></tr>
<tr><td>450 A</td><td>90 °C</td></tr>
<tr><td>600 A</td><td>90 °C</td></tr>
</table></td></tr>
<tr><td>F1053
Overtemperature on cell U11 IGBT module</td><td>Power-on.
Manual (/RESET key).
Auto-reset.
DIx.
Networks.</td><td>Temperature on the cell heatsink above the fault level.
Ambient temperature too high (> 40 °C) and high output current.
Fans locked or defective.
Air input filters blocked.
<table>
<tr><th>Cell model</th><th>Fault level</th></tr>
<tr><td>70 A</td><td>90 °C</td></tr>
<tr><td>140 A</td><td>90 °C</td></tr>
<tr><td>200 A</td><td>90 °C</td></tr>
<tr><td>265 A</td><td>90 °C</td></tr>
<tr><td>340 A</td><td>90 °C</td></tr>
<tr><td>450 A</td><td>95 °C</td></tr>
<tr><td>600 A</td><td>95 °C</td></tr>
</table></td></tr>
<tr><td>F1054
Defective temperature sensor or undertemperature on cell U11 IGBT</td><td>Contact WEG Service Center.</td><td>Cell temperature measurement sensor defective.
Cell temperature sensor disconnected.
Temperature on the cell heatsink below -10 °C.</td></tr>
<tr><td>F1055
Cell U11 phase IGBT</td><td>Contact WEG Service Center.</td><td>Short circuit at the inverter output.
Trigger board of the IGBTs of the cell phase arm disconnected.
IGBTs of the cell phase arm operating out of the saturation region.
IGBTs or trigger board of the cell phase arm defective.
Fault on the desaturation signal feedback or gate-driver supply.</td></tr>
<tr><td>F1056
Cell U11 neutral IGBT</td><td>Contact WEG Service Center.</td><td>Short circuit at the inverter output.
Trigger board of the IGBTs of the cell neutral arm disconnected.
IGBTs of the cell neutral arm operating out of the saturation region.
IGBTs or trigger board of the cell neutral arm defective.
Fault on the desaturation signal feedback or gate-driver supply.</td></tr>
</table>

Fault/alarm	Reset	Possible causes
F1058 Cell U11 phase pulse feedback	▪ Contact WEG Service Center.	▪ Fault on the commutation of the IGBTs of the cell phase arm. ▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the phase arm disconnected or defective. ▪ IGBTs or trigger board of the cell phase arm defective.
F1060 Cell U11 neutral pulse feedback	▪ Contact WEG Service Center.	▪ Fault on the confirmation of the commutation of the IGBTs of the cell neutral arm. ▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the neutral arm disconnected or defective. ▪ IGBTs or trigger board of the cell neutral arm defective.
F1061 Cell U11 electronics power supply	▪ Contact WEG Service Center.	▪ Voltages of the internal electronic circuits of the cell out of the operation level. ▪ Defect on the cell power supply.
F1066 Cell U11 modulation synchronism	▪ Contact WEG Service Center.	▪ Fault in the synchronism between the MCC1 control board of the cell and the MVC3 main control.
F1067 Cell U11 bypass system	▪ Contact WEG Service Center.	▪ Fault in the operation of the cell bypass system. ▪ Bypass system is not connected or defective.
F1068 Communication with cell U11	▪ Contact WEG Service Center.	▪ Fault on the communication between the MCC1 control board of the cell and the MVC3 main control. ▪ Break or defect on the cell communication optic cable.
F1072 Cell U11 insulation defective	▪ Contact WEG Service Center.	▪ Fault in the internal insulation of the cell: Contact between some energized point of the circuit and the frame. ▪ Fault on the capacitor discharge resistors of the cell DC link.
F1075 Cell U12 DC link overvoltage	▪ Power-on. ▪ Manual (O /RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Inverter input supply voltage too high. ▪ Incorrect setting of the inverter main transformer taps. ▪ Cell DC link voltage above 1200 V. ▪ Load inertia too high or deceleration ramp too short. ▪ Setting of P0151 too high.
F1076 Cell U12 DC link undervoltage	▪ Power-on. ▪ Manual (O /RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Inverter input supply voltage too low. ▪ Incorrect setting of the inverter main transformer taps. ▪ Cell DC link voltage below 745 V below 652 V for operation in vector control.

<table>
<tr><th>Fault/alarm</th><th>Reset</th><th>Possible causes</th></tr>
<tr><td>A1077
Overtemperature on cell U12 IGBT module</td><td>Automatically eliminated when the temperature at the cell heatsink presents a value below the alarm level.</td><td>Temperature on the cell heatsink above the alarm level.
Ambient temperature too high (> 40 °C) and high output current.
Fans locked or defective.
Air input filters blocked.
<table>
<tr><th>Cell model</th><th>Alarm level</th></tr>
<tr><td>70 A</td><td>85 °C</td></tr>
<tr><td>140 A</td><td>85 °C</td></tr>
<tr><td>200 A</td><td>85 °C</td></tr>
<tr><td>265 A</td><td>85 °C</td></tr>
<tr><td>340 A</td><td>85 °C</td></tr>
<tr><td>450 A</td><td>90 °C</td></tr>
<tr><td>600 A</td><td>90 °C</td></tr>
</table></td></tr>
<tr><td>F1078
Overtemperature on cell U12 IGBT module</td><td>Power-on.
Manual (O /RESET key).
Auto-reset.
DIx.
Networks.</td><td>Temperature on the cell heatsink above the fault level.
Ambient temperature too high (> 40 °C) and high output current.
Fans locked or defective.
Air input filters blocked.
<table>
<tr><th>Cell model</th><th>Fault level</th></tr>
<tr><td>70 A</td><td>90 °C</td></tr>
<tr><td>140 A</td><td>90 °C</td></tr>
<tr><td>200 A</td><td>90 °C</td></tr>
<tr><td>265 A</td><td>90 °C</td></tr>
<tr><td>340 A</td><td>90 °C</td></tr>
<tr><td>450 A</td><td>95 °C</td></tr>
<tr><td>600 A</td><td>95 °C</td></tr>
</table></td></tr>
<tr><td>F1079
Defective temperature sensor or undertemperature on cell U12 IGBT</td><td>Contact WEG Service Center.</td><td>Cell temperature measurement sensor defective.
Cell temperature sensor disconnected.
Temperature on the cell heatsink below -10 °C.</td></tr>
<tr><td>F1080
Cell U12 phase IGBT</td><td>Contact WEG Service Center.</td><td>Short circuit at the inverter output.
Trigger board of the IGBTs of the cell phase arm disconnected.
IGBTs of the cell phase arm operating out of the saturation region.
IGBTs or trigger board of the cell phase arm defective.
Fault on the desaturation signal feedback or gate-driver supply.</td></tr>
<tr><td>F1081
Cell U12 neutral IGBT</td><td>Contact WEG Service Center.</td><td>Short circuit at the inverter output.
Trigger board of the IGBTs of the cell neutral arm disconnected.
IGBTs of the cell neutral arm operating out of the saturation region.
IGBTs or trigger board of the cell neutral arm defective.
Fault on the desaturation signal feedback or gate-driver supply.</td></tr>
<tr><td>F1083
Cell U12 phase pulse feedback</td><td>Contact WEG Service Center.</td><td>Fault on the commutation of the IGBTs of the cell phase arm.
Measurement circuit of the confirmation signal of the commutation of the IGBTs of the phase arm disconnected or defective.
IGBTs or trigger board of the cell phase arm defective.</td></tr>
</table>

8

<table>
<tr><th>Fault/alarm</th><th>Reset</th><th>Possible causes</th></tr>
<tr><td>F1085
Cell U12 neutral pulse feedback</td><td>Contact WEG Service Center.</td><td>Fault on the confirmation of the commutation of the IGBTs of the cell neutral arm.
Measurement circuit of the confirmation signal of the commutation of the IGBTs of the neutral arm disconnected or defective.
IGBTs or trigger board of the cell neutral arm defective.</td></tr>
<tr><td>F1086
Cell U12 electronics power supply</td><td>Contact WEG Service Center.</td><td>Voltages of the internal electronic circuits of the cell out of the operation level.
Defect on the cell power supply.</td></tr>
<tr><td>F1091
Cell U12 modulation synchronism</td><td>Contact WEG Service Center.</td><td>Fault in the synchronism between the MCC1 control board of the cell and the MVC3 main control.</td></tr>
<tr><td>F1092
Cell U12 bypass system</td><td>Contact WEG Service Center.</td><td>Fault in the operation of the cell bypass system.
Bypass system is not connected or defective.</td></tr>
<tr><td>F1093
Communication with cell U12</td><td>Contact WEG Service Center.</td><td>Fault on the communication between the MCC1 control board of the cell and the MVC3 main control.
Break or defect on the cell communication optic cable.</td></tr>
<tr><td>F1097
Cell U12 insulation defective</td><td>Contact WEG Service Center.</td><td>Fault in the internal insulation of the cell: Contact between some energized point of the circuit and the frame.
Fault on the capacitor discharge resistors of the cell DC link.</td></tr>
<tr><td>F1100
Cell V9 DC link overvoltage</td><td>Power-on.
Manual (/RESET key).
Auto-reset.
DIx.
Networks.</td><td>Inverter input supply voltage too high.
Incorrect setting of the inverter main transformer taps.
Cell DC link voltage above 1200 V.
Load inertia too high or deceleration ramp too short.
Setting of P0151 too high.</td></tr>
<tr><td>F1101
Cell V9 DC link undervoltage</td><td>Power-on.
Manual (/RESET key).
Auto-reset.
DIx.
Networks.</td><td>Inverter input supply voltage too low.
Incorrect setting of the inverter main transformer taps.
Cell DC link voltage below 745 V below 652 V for operation in vector control.</td></tr>
<tr><td>A1102
Overtemperature on cell V9 IGBT module</td><td>Automatically eliminated when the temperature at the cell heatsink presents a value below the alarm level.</td><td>Temperature on the cell heatsink above the alarm level.
Ambient temperature too high (> 40 °C) and high output current.
Fans locked or defective.
Air input filters blocked.
<table>
<tr><th>Cell model</th><th>Alarm level</th></tr>
<tr><td>70 A</td><td>85 °C</td></tr>
<tr><td>140 A</td><td>85 °C</td></tr>
<tr><td>200 A</td><td>85 °C</td></tr>
<tr><td>265 A</td><td>85 °C</td></tr>
<tr><td>340 A</td><td>85 °C</td></tr>
<tr><td>450 A</td><td>90 °C</td></tr>
<tr><td>600 A</td><td>90 °C</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>Fault/alarm</th><th>Reset</th><th>Possible causes</th></tr>
<tr><td>F1103
Overtemperature on cell V9 IGBT module</td><td>
Power-on.
Manual (/RESET key).
Auto-reset.
DIx.
Networks.</td><td>
Temperature on the cell heatsink above the fault level.
Ambient temperature too high (> 40 °C) and high output current.
Fans locked or defective.
Air input filters blocked.
<table>
<tr><th>Cell model</th><th>Fault level</th></tr>
<tr><td>70 A</td><td>90 °C</td></tr>
<tr><td>140 A</td><td>90 °C</td></tr>
<tr><td>200 A</td><td>90 °C</td></tr>
<tr><td>265 A</td><td>90 °C</td></tr>
<tr><td>340 A</td><td>90 °C</td></tr>
<tr><td>450 A</td><td>95 °C</td></tr>
<tr><td>600 A</td><td>95 °C</td></tr>
</table></td></tr>
<tr><td>F1104
Defective temperature sensor or undertemperature on cell V9 IGBT</td><td>Contact WEG Service Center.</td><td>
Cell temperature measurement sensor defective.
Cell temperature sensor disconnected.
Temperature on the cell heatsink below -10 °C.</td></tr>
<tr><td>F1105
Cell V9 phase IGBT</td><td>Contact WEG Service Center.</td><td>
Short circuit at the inverter output.
Trigger board of the IGBTs of the cell phase arm disconnected.
IGBTs of the cell phase arm operating out of the saturation region.
IGBTs or trigger board of the cell phase arm defective.
Fault on the desaturation signal feedback or gate-driver supply.</td></tr>
<tr><td>F1106
Cell V9 neutral IGBT</td><td>Contact WEG Service Center.</td><td>
Short circuit at the inverter output.
Trigger board of the IGBTs of the cell neutral arm disconnected.
IGBTs of the cell neutral arm operating out of the saturation region.
IGBTs or trigger board of the cell neutral arm defective.
Fault on the desaturation signal feedback or gate-driver supply.</td></tr>
<tr><td>F1108
Cell V9 phase pulse feedback</td><td>Contact WEG Service Center.</td><td>
Fault on the commutation of the IGBTs of the cell phase arm.
Measurement circuit of the confirmation signal of the commutation of the IGBTs of the phase arm disconnected or defective.
IGBTs or trigger board of the cell phase arm defective.</td></tr>
<tr><td>F1110
Cell V9 neutral pulse feedback</td><td>Contact WEG Service Center.</td><td>
Fault on the confirmation of the commutation of the IGBTs of the cell neutral arm.
Measurement circuit of the confirmation signal of the commutation of the IGBTs of the neutral arm disconnected or defective.
IGBTs or trigger board of the cell neutral arm defective.</td></tr>
<tr><td>F1111
Cell V9 electronics power supply</td><td>Contact WEG Service Center.</td><td>
Voltages of the internal electronic circuits of the cell out of the operation level.
Defect on the cell power supply.</td></tr>
<tr><td>F1116
Cell V9 modulation synchronism</td><td>Contact WEG Service Center.</td><td>
Fault in the synchronism between the MCC1 control board of the cell and the MVC3 main control.</td></tr>
<tr><td>F1117
Cell V9 bypass system</td><td>Contact WEG Service Center.</td><td>
Fault in the operation of the cell bypass system.
Bypass system is not connected or defective.</td></tr>
</table>

<table>
<tr><th>Fault/alarm</th><th>Reset</th><th>Possible causes</th></tr>
<tr><td>F1118
Communication with cell V9</td><td>Contact WEG Service Center.</td><td>Fault on the communication between the MCC1 control board of the cell and the MVC3 main control.
Break or defect on the cell communication optic cable.</td></tr>
<tr><td>F1122
Cell V9 insulation defective</td><td>Contact WEG Service Center.</td><td>Fault in the internal insulation of the cell: Contact between some energized point of the circuit and the frame.
Fault on the capacitor discharge resistors of the cell DC link.</td></tr>
<tr><td>F1125
Cell V10 DC link overvoltage</td><td>Power-on.
Manual (/RESET key).
Auto-reset.
DIx.
Networks.</td><td>Inverter input supply voltage too high.
Incorrect setting of the inverter main transformer taps.
Cell DC link voltage above 1200 V.
Load inertia too high or deceleration ramp too short.
Setting of P0151 too high.</td></tr>
<tr><td>F1126
Cell V10 DC link undervoltage</td><td>Power-on.
Manual (/RESET key).
Auto-reset.
DIx.
Networks.</td><td>Inverter input supply voltage too low.
Incorrect setting of the inverter main transformer taps.
Cell DC link voltage below 745 V below 652 V for operation in vector control.</td></tr>
<tr><td>A1127
Overtemperature on cell V10 IGBT module</td><td>Automatically eliminated when the temperature at the cell heatsink presents a value below the alarm level.</td><td>Temperature on the cell heatsink above the alarm level.
Ambient temperature too high (> 40 °C) and high output current.
Fans locked or defective.
Air input filters blocked.
<table>
<tr><th>Cell model</th><th>Alarm level</th></tr>
<tr><td>70 A</td><td>85 °C</td></tr>
<tr><td>140 A</td><td>85 °C</td></tr>
<tr><td>200 A</td><td>85 °C</td></tr>
<tr><td>265 A</td><td>85 °C</td></tr>
<tr><td>340 A</td><td>85 °C</td></tr>
<tr><td>450 A</td><td>90 °C</td></tr>
<tr><td>600 A</td><td>90 °C</td></tr>
</table></td></tr>
<tr><td>F1128
Overtemperature on cell V10 IGBT module</td><td>Power-on.
Manual (/RESET key).
Auto-reset.
DIx.
Networks.</td><td>Temperature on the cell heatsink above the fault level.
Ambient temperature too high (> 40 °C) and high output current.
Fans locked or defective.
Air input filters blocked.
<table>
<tr><th>Cell model</th><th>Fault level</th></tr>
<tr><td>70 A</td><td>90 °C</td></tr>
<tr><td>140 A</td><td>90 °C</td></tr>
<tr><td>200 A</td><td>90 °C</td></tr>
<tr><td>265 A</td><td>90 °C</td></tr>
<tr><td>340 A</td><td>90 °C</td></tr>
<tr><td>450 A</td><td>95 °C</td></tr>
<tr><td>600 A</td><td>95 °C</td></tr>
</table></td></tr>
<tr><td>F1129
Defective temperature sensor or undertemperature on cell V10 IGBT</td><td>Contact WEG Service Center.</td><td>Cell temperature measurement sensor defective.
Cell temperature sensor disconnected.
Temperature on the cell heatsink below -10 °C.</td></tr>
</table>

Fault/alarm	Reset	Possible causes
F1130 Cell V10 phase IGBT	▪ Contact WEG Service Center.	▪ Short circuit at the inverter output. ▪ Trigger board of the IGBTs of the cell phase arm disconnected. ▪ IGBTs of the cell phase arm operating out of the saturation region. ▪ IGBTs or trigger board of the cell phase arm defective. ▪ Fault on the desaturation signal feedback or gate-driver supply.
F1131 Cell V10 neutral IGBT	▪ Contact WEG Service Center.	▪ Short circuit at the inverter output. ▪ Trigger board of the IGBTs of the cell neutral arm disconnected. ▪ IGBTs of the cell neutral arm operating out of the saturation region. ▪ IGBTs or trigger board of the cell neutral arm defective. ▪ Fault on the desaturation signal feedback or gate-driver supply.
F1133 Cell V10 phase pulse feedback	▪ Contact WEG Service Center.	▪ Fault on the commutation of the IGBTs of the cell phase arm. ▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the phase arm disconnected or defective. ▪ IGBTs or trigger board of the cell phase arm defective.
F1135 Cell V10 neutral pulse feedback	▪ Contact WEG Service Center.	▪ Fault on the confirmation of the commutation of the IGBTs of the cell neutral arm. ▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the neutral arm disconnected or defective. ▪ IGBTs or trigger board of the cell neutral arm defective.
F1136 Cell V10 electronics power supply	▪ Contact WEG Service Center.	▪ Voltages of the internal electronic circuits of the cell out of the operation level. ▪ Defect on the cell power supply.
F1141 Cell V10 modulation synchronism	▪ Contact WEG Service Center.	▪ Fault in the synchronism between the MCC1 control board of the cell and the MVC3 main control.
F1142 Cell V10 bypass system	▪ Contact WEG Service Center.	▪ Fault in the operation of the cell bypass system. ▪ Bypass system is not connected or defective.
F1143 Communication with cell V10	▪ Contact WEG Service Center.	▪ Fault on the communication between the MCC1 control board of the cell and the MVC3 main control. ▪ Break or defect on the cell communication optic cable.
F1147 Cell V10 insulation defective	▪ Contact WEG Service Center.	▪ Fault in the internal insulation of the cell: Contact between some energized point of the circuit and the frame. ▪ Fault on the capacitor discharge resistors of the cell DC link.
F1150 Cell V11 DC link overvoltage	▪ Power-on. ▪ Manual (/RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Inverter input supply voltage too high. ▪ Incorrect setting of the inverter main transformer taps. ▪ Cell DC link voltage above 1200 V. ▪ Load inertia too high or deceleration ramp too short. ▪ Setting of P0151 too high.

<table>
<tr><th>Fault/alarm</th><th>Reset</th><th>Possible causes</th></tr>
<tr><td>F1151
Cell V11 DC link undervoltage</td><td>Power-on.
Manual (O /RESET key).
Auto-reset.
DIx.
Networks.</td><td>Inverter input supply voltage too low.
Incorrect setting of the inverter main transformer taps.
Cell DC link voltage below 745 V below 652 V for operation in vector control.</td></tr>
<tr><td>A1152
Overtemperature on cell V11 IGBT module</td><td>Automatically eliminated when the temperature at the cell heatsink presents a value below the alarm level.</td><td>Temperature on the cell heatsink above the alarm level.
Ambient temperature too high (> 40 °C) and high output current.
Fans locked or defective.
Air input filters blocked.
<table>
<tr><th>Cell model</th><th>Alarm level</th></tr>
<tr><td>70 A</td><td>85 °C</td></tr>
<tr><td>140 A</td><td>85 °C</td></tr>
<tr><td>200 A</td><td>85 °C</td></tr>
<tr><td>265 A</td><td>85 °C</td></tr>
<tr><td>340 A</td><td>85 °C</td></tr>
<tr><td>450 A</td><td>90 °C</td></tr>
<tr><td>600 A</td><td>90 °C</td></tr>
</table></td></tr>
<tr><td>F1153
Overtemperature on cell V11 IGBT module</td><td>Power-on.
Manual (O /RESET key).
Auto-reset.
DIx.
Networks.</td><td>Temperature on the cell heatsink above the fault level.
Ambient temperature too high (> 40 °C) and high output current.
Fans locked or defective.
Air input filters blocked.
<table>
<tr><th>Cell model</th><th>Fault level</th></tr>
<tr><td>70 A</td><td>90 °C</td></tr>
<tr><td>140 A</td><td>90 °C</td></tr>
<tr><td>200 A</td><td>90 °C</td></tr>
<tr><td>265 A</td><td>90 °C</td></tr>
<tr><td>340 A</td><td>90 °C</td></tr>
<tr><td>450 A</td><td>95 °C</td></tr>
<tr><td>600 A</td><td>95 °C</td></tr>
</table></td></tr>
<tr><td>F1154
Defective temperature sensor or undertemperature on cell V11 IGBT</td><td>Contact WEG Service Center.</td><td>Cell temperature measurement sensor defective.
Cell temperature sensor disconnected.
Temperature on the cell heatsink below -10 °C.</td></tr>
<tr><td>F1155
Cell V11 phase IGBT</td><td>Contact WEG Service Center.</td><td>Short circuit at the inverter output.
Trigger board of the IGBTs of the cell phase arm disconnected.
IGBTs of the cell phase arm operating out of the saturation region.
IGBTs or trigger board of the cell phase arm defective.
Fault on the desaturation signal feedback or gate-driver supply.</td></tr>
<tr><td>F1156
Cell V11 neutral IGBT</td><td>Contact WEG Service Center.</td><td>Short circuit at the inverter output.
Trigger board of the IGBTs of the cell neutral arm disconnected.
IGBTs of the cell neutral arm operating out of the saturation region.
IGBTs or trigger board of the cell neutral arm defective.
Fault on the desaturation signal feedback or gate-driver supply.</td></tr>
</table>

Fault/alarm	Reset	Possible causes
F1158 Cell V11 phase pulse feedback	▪ Contact WEG Service Center.	▪ Fault on the commutation of the IGBTs of the cell phase arm. ▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the phase arm disconnected or defective. ▪ IGBTs or trigger board of the cell phase arm defective.
F1160 Cell V11 neutral pulse feedback	▪ Contact WEG Service Center.	▪ Fault on the confirmation of the commutation of the IGBTs of the cell neutral arm. ▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the neutral arm disconnected or defective. ▪ IGBTs or trigger board of the cell neutral arm defective.
F1161 Cell V11 electronics power supply	▪ Contact WEG Service Center.	▪ Voltages of the internal electronic circuits of the cell out of the operation level. ▪ Defect on the cell power supply.
F1166 Cell V11 modulation synchronism	▪ Contact WEG Service Center.	▪ Fault in the synchronism between the MCC1 control board of the cell and the MVC3 main control.
F1167 Cell V11 bypass system	▪ Contact WEG Service Center.	▪ Fault in the operation of the cell bypass system. ▪ Bypass system is not connected or defective.
F1168 Communication with cell V11	▪ Contact WEG Service Center.	▪ Fault on the communication between the MCC1 control board of the cell and the MVC3 main control. ▪ Break or defect on the cell communication optic cable.
F1172 Cell V11 insulation defective	▪ Contact WEG Service Center.	▪ Fault in the internal insulation of the cell: Contact between some energized point of the circuit and the frame. ▪ Fault on the capacitor discharge resistors of the cell DC link.
F1175 Cell V12 DC link overvoltage	▪ Power-on. ▪ Manual (/RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Inverter input supply voltage too high. ▪ Incorrect setting of the inverter main transformer taps. ▪ Cell DC link voltage above 1200 V. ▪ Load inertia too high or deceleration ramp too short. ▪ Setting of P0151 too high.
F1176 Cell V12 DC link undervoltage	▪ Power-on. ▪ Manual (/RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Inverter input supply voltage too low. ▪ Incorrect setting of the inverter main transformer taps. ▪ Cell DC link voltage below 745 V below 652 V for operation in vector control.

<table>
<tr><th>Fault/alarm</th><th>Reset</th><th>Possible causes</th></tr>
<tr><td>A1177
Overtemperature on cell V12 IGBT module</td><td>Automatically eliminated when the temperature at the cell heatsink presents a value below the alarm level.</td><td>Temperature on the cell heatsink above the alarm level.
Ambient temperature too high (> 40 °C) and high output current.
Fans locked or defective.
Air input filters blocked.
<table>
<tr><th>Cell model</th><th>Alarm level</th></tr>
<tr><td>70 A</td><td>85 °C</td></tr>
<tr><td>140 A</td><td>85 °C</td></tr>
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<tr><td>265 A</td><td>85 °C</td></tr>
<tr><td>340 A</td><td>85 °C</td></tr>
<tr><td>450 A</td><td>90 °C</td></tr>
<tr><td>600 A</td><td>90 °C</td></tr>
</table></td></tr>
<tr><td>F1178
Overtemperature on cell V12 IGBT module</td><td>Power-on.
Manual (O /RESET key).
Auto-reset.
DIx.
Networks.</td><td>Temperature on the cell heatsink above the fault level.
Ambient temperature too high (> 40 °C) and high output current.
Fans locked or defective.
Air input filters blocked.
<table>
<tr><th>Cell model</th><th>Fault level</th></tr>
<tr><td>70 A</td><td>90 °C</td></tr>
<tr><td>140 A</td><td>90 °C</td></tr>
<tr><td>200 A</td><td>90 °C</td></tr>
<tr><td>265 A</td><td>90 °C</td></tr>
<tr><td>340 A</td><td>90 °C</td></tr>
<tr><td>450 A</td><td>95 °C</td></tr>
<tr><td>600 A</td><td>95 °C</td></tr>
</table></td></tr>
<tr><td>F1179
Defective temperature sensor or undertemperature on cell V12 IGBT</td><td>Contact WEG Service Center.</td><td>Cell temperature measurement sensor defective.
Cell temperature sensor disconnected.
Temperature on the cell heatsink below -10 °C.</td></tr>
<tr><td>F1180
Cell V12 phase IGBT</td><td>Contact WEG Service Center.</td><td>Short circuit at the inverter output.
Trigger board of the IGBTs of the cell phase arm disconnected.
IGBTs of the cell phase arm operating out of the saturation region.
IGBTs or trigger board of the cell phase arm defective.
Fault on the desaturation signal feedback or gate-driver supply.</td></tr>
<tr><td>F1181
Cell V12 neutral IGBT</td><td>Contact WEG Service Center.</td><td>Short circuit at the inverter output.
Trigger board of the IGBTs of the cell neutral arm disconnected.
IGBTs of the cell neutral arm operating out of the saturation region.
IGBTs or trigger board of the cell neutral arm defective.
Fault on the desaturation signal feedback or gate-driver supply.</td></tr>
<tr><td>F1183
Cell V12 phase pulse feedback</td><td>Contact WEG Service Center.</td><td>Fault on the commutation of the IGBTs of the cell phase arm.
Measurement circuit of the confirmation signal of the commutation of the IGBTs of the phase arm disconnected or defective.
IGBTs or trigger board of the cell phase arm defective.</td></tr>
</table>

<table>
<tr><th>Fault/alarm</th><th>Reset</th><th>Possible causes</th></tr>
<tr><td>F1185
Cell V12 neutral pulse feedback</td><td>- Contact WEG Service Center.</td><td>- Fault on the confirmation of the commutation of the IGBTs of the cell neutral arm.
- Measurement circuit of the confirmation signal of the commutation of the IGBTs of the neutral arm disconnected or defective.
- IGBTs or trigger board of the cell neutral arm defective.</td></tr>
<tr><td>F1186
Cell V12 electronics power supply</td><td>- Contact WEG Service Center.</td><td>- Voltages of the internal electronic circuits of the cell out of the operation level.
- Defect on the cell power supply.</td></tr>
<tr><td>F1191
Cell V12 modulation synchronism</td><td>- Contact WEG Service Center.</td><td>- Fault in the synchronism between the MCC1 control board of the cell and the MVC3 main control.</td></tr>
<tr><td>F1192
Cell V12 bypass system</td><td>- Contact WEG Service Center.</td><td>- Fault in the operation of the cell bypass system.
- Bypass system is not connected or defective.</td></tr>
<tr><td>F1193
Communication with cell V12</td><td>- Contact WEG Service Center.</td><td>- Fault on the communication between the MCC1 control board of the cell and the MVC3 main control.
- Break or defect on the cell communication optic cable.</td></tr>
<tr><td>F1197
Cell V12 insulation defective</td><td>- Contact WEG Service Center.</td><td>- Fault in the internal insulation of the cell: Contact between some energized point of the circuit and the frame.
- Fault on the capacitor discharge resistors of the cell DC link.</td></tr>
<tr><td>F1200
Cell W9 DC link overvoltage</td><td>- Power-on.
- Manual (/RESET key).
- Auto-reset.
- DIx.
- Networks.</td><td>- Inverter input supply voltage too high.
- Incorrect setting of the inverter main transformer taps.
- Cell DC link voltage above 1200 V.
- Load inertia too high or deceleration ramp too short.
- Setting of P0151 too high.</td></tr>
<tr><td>F1201
Cell W9 DC link undervoltage</td><td>- Power-on.
- Manual (/RESET key).
- Auto-reset.
- DIx.
- Networks.</td><td>- Inverter input supply voltage too low.
- Incorrect setting of the inverter main transformer taps.
- Cell DC link voltage below 745 V below 652 V for operation in vector control.</td></tr>
<tr><td>A1202
Overtemperature on cell W9 IGBT module</td><td>- Automatically eliminated when the temperature at the cell heatsink presents a value below the alarm level.</td><td>- Temperature on the cell heatsink above the alarm level.
- Ambient temperature too high (> 40 °C) and high output current.
- Fans locked or defective.
- Air input filters blocked.
<table><tr><th>Cell model</th><th>Alarm level</th></tr><tr><td>70 A</td><td>85 °C</td></tr><tr><td>140 A</td><td>85 °C</td></tr><tr><td>200 A</td><td>85 °C</td></tr><tr><td>265 A</td><td>85 °C</td></tr><tr><td>340 A</td><td>85 °C</td></tr><tr><td>450 A</td><td>90 °C</td></tr><tr><td>600 A</td><td>90 °C</td></tr></table></td></tr>
</table>

<table>
<tr><th>Fault/alarm</th><th>Reset</th><th>Possible causes</th></tr>
<tr><td>F1203
Overtemperature on cell W9 IGBT module</td><td>▪ Power-on.
▪ Manual (O/RESET key).
▪ Auto-reset.
▪ DIx.
▪ Networks.</td><td>▪ Temperature on the cell heatsink above the fault level.
▪ Ambient temperature too high (> 40 °C) and high output current.
▪ Fans locked or defective.
▪ Air input filters blocked.
<table>
<tr><th>Cell model</th><th>Fault level</th></tr>
<tr><td>70 A</td><td>90 °C</td></tr>
<tr><td>140 A</td><td>90 °C</td></tr>
<tr><td>200 A</td><td>90 °C</td></tr>
<tr><td>265 A</td><td>90 °C</td></tr>
<tr><td>340 A</td><td>90 °C</td></tr>
<tr><td>450 A</td><td>95 °C</td></tr>
<tr><td>600 A</td><td>95 °C</td></tr>
</table></td></tr>
<tr><td>F1204
Defective temperature sensor or undertemperature on cell W9 IGBT</td><td>▪ Contact WEG Service Center.</td><td>▪ Cell temperature measurement sensor defective.
▪ Cell temperature sensor disconnected.
▪ Temperature on the cell heatsink below -10 °C.</td></tr>
<tr><td>F1205
Cell W9 phase IGBT</td><td>▪ Contact WEG Service Center.</td><td>▪ Short circuit at the inverter output.
▪ Trigger board of the IGBTs of the cell phase arm disconnected.
▪ IGBTs of the cell phase arm operating out of the saturation region.
▪ IGBTs or trigger board of the cell phase arm defective.
▪ Fault on the desaturation signal feedback or gate-driver supply.</td></tr>
<tr><td>F1206
Cell W9 neutral IGBT</td><td>▪ Contact WEG Service Center.</td><td>▪ Short circuit at the inverter output.
▪ Trigger board of the IGBTs of the cell neutral arm disconnected.
▪ IGBTs of the cell neutral arm operating out of the saturation region.
▪ IGBTs or trigger board of the cell neutral arm defective.
▪ Fault on the desaturation signal feedback or gate-driver supply.</td></tr>
<tr><td>F1208
Cell W9 phase pulse feedback</td><td>▪ Contact WEG Service Center.</td><td>▪ Fault on the commutation of the IGBTs of the cell phase arm.
▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the phase arm disconnected or defective.
▪ IGBTs or trigger board of the cell phase arm defective.</td></tr>
<tr><td>F1210
Cell W9 neutral pulse feedback</td><td>▪ Contact WEG Service Center.</td><td>▪ Fault on the confirmation of the commutation of the IGBTs of the cell neutral arm.
▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the neutral arm disconnected or defective.
▪ IGBTs or trigger board of the cell neutral arm defective.</td></tr>
<tr><td>F1211
Cell W9 electronics power supply</td><td>▪ Contact WEG Service Center.</td><td>▪ Voltages of the internal electronic circuits of the cell out of the operation level.
▪ Defect on the cell power supply.</td></tr>
<tr><td>F1216
Cell W9 modulation synchronism</td><td>▪ Contact WEG Service Center.</td><td>▪ Fault in the synchronism between the MCC1 control board of the cell and the MVC3 main control.</td></tr>
<tr><td>F1217
Cell W9 bypass system</td><td>▪ Contact WEG Service Center.</td><td>▪ Fault in the operation of the cell bypass system.
▪ Bypass system is not connected or defective.</td></tr>
</table>

<table>
<tr><th>Fault/alarm</th><th>Reset</th><th>Possible causes</th></tr>
<tr><td>F1218
Communication with cell W9</td><td>Contact WEG Service Center.</td><td>Fault on the communication between the MCC1 control board of the cell and the MVC3 main control.
Break or defect on the cell communication optic cable.</td></tr>
<tr><td>F1222
Cell W9 insulation defective</td><td>Contact WEG Service Center.</td><td>Fault in the internal insulation of the cell: Contact between some energized point of the circuit and the frame.
Fault on the capacitor discharge resistors of the cell DC link.</td></tr>
<tr><td>F1225
Cell W10 DC link overvoltage</td><td>Power-on.
Manual (/RESET key).
Auto-reset.
DIx.
Networks.</td><td>Inverter input supply voltage too high.
Incorrect setting of the inverter main transformer taps.
Cell DC link voltage above 1200 V.
Load inertia too high or deceleration ramp too short.
Setting of P0151 too high.</td></tr>
<tr><td>F1226
Cell W10 DC link undervoltage</td><td>Power-on.
Manual (/RESET key).
Auto-reset.
DIx.
Networks.</td><td>Inverter input supply voltage too low.
Incorrect setting of the inverter main transformer taps.
Cell DC link voltage below 745 V below 652 V for operation in vector control.</td></tr>
<tr><td>A1227
Overtemperature on cell W10 IGBT module</td><td>Automatically eliminated when the temperature at the cell heatsink presents a value below the alarm level.</td><td>Temperature on the cell heatsink above the alarm level.
Ambient temperature too high (> 40 °C) and high output current.
Fans locked or defective.
Air input filters blocked.
<table>
<tr><th>Cell model</th><th>Alarm level</th></tr>
<tr><td>70 A</td><td>85 °C</td></tr>
<tr><td>140 A</td><td>85 °C</td></tr>
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<tr><td>450 A</td><td>90 °C</td></tr>
<tr><td>600 A</td><td>90 °C</td></tr>
</table></td></tr>
<tr><td>F1228
Overtemperature on cell W10 IGBT module</td><td>Power-on.
Manual (/RESET key).
Auto-reset.
DIx.
Networks.</td><td>Temperature on the cell heatsink above the fault level.
Ambient temperature too high (> 40 °C) and high output current.
Fans locked or defective.
Air input filters blocked.
<table>
<tr><th>Cell model</th><th>Fault level</th></tr>
<tr><td>70 A</td><td>90 °C</td></tr>
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<tr><td>265 A</td><td>90 °C</td></tr>
<tr><td>340 A</td><td>90 °C</td></tr>
<tr><td>450 A</td><td>95 °C</td></tr>
<tr><td>600 A</td><td>95 °C</td></tr>
</table></td></tr>
<tr><td>F1229
Defective temperature sensor or undertemperature on cell W10 IGBT</td><td>Contact WEG Service Center.</td><td>Cell temperature measurement sensor defective.
Cell temperature sensor disconnected.
Temperature on the cell heatsink below -10 °C.</td></tr>
</table>

8

Fault/alarm	Reset	Possible causes
F1230 Cell W10 phase IGBT	▪ Contact WEG Service Center.	▪ Short circuit at the inverter output. ▪ Trigger board of the IGBTs of the cell phase arm disconnected. ▪ IGBTs of the cell phase arm operating out of the saturation region. ▪ IGBTs or trigger board of the cell phase arm defective. ▪ Fault on the desaturation signal feedback or gate-driver supply.
F1231 Cell W10 neutral IGBT	▪ Contact WEG Service Center.	▪ Short circuit at the inverter output. ▪ Trigger board of the IGBTs of the cell neutral arm disconnected. ▪ IGBTs of the cell neutral arm operating out of the saturation region. ▪ IGBTs or trigger board of the cell neutral arm defective. ▪ Fault on the desaturation signal feedback or gate-driver supply.
F1233 Cell W10 phase pulse feedback	▪ Contact WEG Service Center.	▪ Fault on the commutation of the IGBTs of the cell phase arm. ▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the phase arm disconnected or defective. ▪ IGBTs or trigger board of the cell phase arm defective.
F1235 Cell W10 neutral pulse feedback	▪ Contact WEG Service Center.	▪ Fault on the confirmation of the commutation of the IGBTs of the cell neutral arm. ▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the neutral arm disconnected or defective. ▪ IGBTs or trigger board of the cell neutral arm defective.
F1236 Cell W10 electronics power supply	▪ Contact WEG Service Center.	▪ Voltages of the internal electronic circuits of the cell out of the operation level. ▪ Defect on the cell power supply.
F1241 Cell W10 modulation synchronism	▪ Contact WEG Service Center.	▪ Fault in the synchronism between the MCC1 control board of the cell and the MVC3 main control.
F1242 Cell W10 bypass system	▪ Contact WEG Service Center.	▪ Fault in the operation of the cell bypass system. ▪ Bypass system is not connected or defective.
F1243 Communication with cell W10	▪ Contact WEG Service Center.	▪ Fault on the communication between the MCC1 control board of the cell and the MVC3 main control. ▪ Break or defect on the cell communication optic cable.
F1247 Cell W10 insulation defective	▪ Contact WEG Service Center.	▪ Fault in the internal insulation of the cell: Contact between some energized point of the circuit and the frame. ▪ Fault on the capacitor discharge resistors of the cell DC link.
F1250 Cell W11 DC link overvoltage	▪ Power-on. ▪ Manual (O /RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Inverter input supply voltage too high. ▪ Incorrect setting of the inverter main transformer taps. ▪ Cell DC link voltage above 1200 V. ▪ Load inertia too high or deceleration ramp too short. ▪ Setting of P0151 too high.

8

<table>
<tr><th>Fault/alarm</th><th>Reset</th><th>Possible causes</th></tr>
<tr><td>F1251
Cell W11 DC link undervoltage</td><td>Power-on.
Manual (/RESET key).
Auto-reset.
DIx.
Networks.</td><td>Inverter input supply voltage too low.
Incorrect setting of the inverter main transformer taps.
Cell DC link voltage below 745 V below 652 V for operation in vector control.</td></tr>
<tr><td>A1252
Overtemperature on cell W11 IGBT module</td><td>Automatically eliminated when the temperature at the cell heatsink presents a value below the alarm level.</td><td>Temperature on the cell heatsink above the alarm level.
Ambient temperature too high (> 40 °C) and high output current.
Fans locked or defective.
Air input filters blocked.
<table>
<tr><th>Cell model</th><th>Alarm level</th></tr>
<tr><td>70 A</td><td>85 °C</td></tr>
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<tr><td>450 A</td><td>90 °C</td></tr>
<tr><td>600 A</td><td>90 °C</td></tr>
</table></td></tr>
<tr><td>F1253
Overtemperature on cell W11 IGBT module</td><td>Power-on.
Manual (/RESET key).
Auto-reset.
DIx.
Networks.</td><td>Temperature on the cell heatsink above the fault level.
Ambient temperature too high (> 40 °C) and high output current.
Fans locked or defective.
Air input filters blocked.
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<tr><th>Cell model</th><th>Fault level</th></tr>
<tr><td>70 A</td><td>90 °C</td></tr>
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<tr><td>450 A</td><td>95 °C</td></tr>
<tr><td>600 A</td><td>95 °C</td></tr>
</table></td></tr>
<tr><td>F1254
Defective temperature sensor or undertemperature on cell W11 IGBT</td><td>Contact WEG Service Center.</td><td>Cell temperature measurement sensor defective.
Cell temperature sensor disconnected.
Temperature on the cell heatsink below -10 °C.</td></tr>
<tr><td>F1255
Cell W11 phase IGBT</td><td>Contact WEG Service Center.</td><td>Short circuit at the inverter output.
Trigger board of the IGBTs of the cell phase arm disconnected.
IGBTs of the cell phase arm operating out of the saturation region.
IGBTs or trigger board of the cell phase arm defective.
Fault on the desaturation signal feedback or gate-driver supply.</td></tr>
<tr><td>F1256
Cell W11 neutral IGBT</td><td>Contact WEG Service Center.</td><td>Short circuit at the inverter output.
Trigger board of the IGBTs of the cell neutral arm disconnected.
IGBTs of the cell neutral arm operating out of the saturation region.
IGBTs or trigger board of the cell neutral arm defective.
Fault on the desaturation signal feedback or gate-driver supply.</td></tr>
</table>

Fault/alarm	Reset	Possible causes
F1258 Cell W11 phase pulse feedback	▪ Contact WEG Service Center.	▪ Fault on the commutation of the IGBTs of the cell phase arm. ▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the phase arm disconnected or defective. ▪ IGBTs or trigger board of the cell phase arm defective.
F1260 Cell W11 neutral pulse feedback	▪ Contact WEG Service Center.	▪ Fault on the confirmation of the commutation of the IGBTs of the cell neutral arm. ▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the neutral arm disconnected or defective. ▪ IGBTs or trigger board of the cell neutral arm defective.
F1261 Cell W11 electronics power supply	▪ Contact WEG Service Center.	▪ Voltages of the internal electronic circuits of the cell out of the operation level. ▪ Defect on the cell power supply.
F1266 Cell W11 modulation synchronism	▪ Contact WEG Service Center.	▪ Fault in the synchronism between the MCC1 control board of the cell and the MVC3 main control.
F1267 Cell W11 bypass system	▪ Contact WEG Service Center.	▪ Fault in the operation of the cell bypass system. ▪ Bypass system is not connected or defective.
F1268 Communication with cell W11	▪ Contact WEG Service Center.	▪ Fault on the communication between the MCC1 control board of the cell and the MVC3 main control. ▪ Break or defect on the cell communication optic cable.
F1272 Cell W11 insulation defective	▪ Contact WEG Service Center.	▪ Fault in the internal insulation of the cell: Contact between some energized point of the circuit and the frame. ▪ Fault on the capacitor discharge resistors of the cell DC link.
F1275 Cell W12 DC link overvoltage	▪ Power-on. ▪ Manual (O /RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Inverter input supply voltage too high. ▪ Incorrect setting of the inverter main transformer taps. ▪ Cell DC link voltage above 1200 V. ▪ Load inertia too high or deceleration ramp too short. ▪ Setting of P0151 too high.
F1276 Cell W12 DC link undervoltage	▪ Power-on. ▪ Manual (O /RESET key). ▪ Auto-reset. ▪ DIx. ▪ Networks.	▪ Inverter input supply voltage too low. ▪ Incorrect setting of the inverter main transformer taps. ▪ Cell DC link voltage below 745 V below 652 V for operation in vector control.

8

<table>
<tr><th>Fault/alarm</th><th>Reset</th><th>Possible causes</th></tr>
<tr><td>A1277
Overtemperature on cell W12 IGBT module</td><td>▪ Automatically eliminated when the temperature at the cell heatsink presents a value below the alarm level.</td><td>▪ Temperature on the cell heatsink above the alarm level.
▪ Ambient temperature too high (> 40 °C) and high output current.
▪ Fans locked or defective.
▪ Air input filters blocked.
<table>
<tr><th>Cell model</th><th>Alarm level</th></tr>
<tr><td>70 A</td><td>85 °C</td></tr>
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<tr><td>450 A</td><td>90 °C</td></tr>
<tr><td>600 A</td><td>90 °C</td></tr>
</table></td></tr>
<tr><td>F1278
Overtemperature on cell W12 IGBT module</td><td>▪ Power-on.
▪ Manual (/RESET key).
▪ Auto-reset.
▪ DIx.
▪ Networks.</td><td>▪ Temperature on the cell heatsink above the fault level.
▪ Ambient temperature too high (> 40 °C) and high output current.
▪ Fans locked or defective.
▪ Air input filters blocked.
<table>
<tr><th>Cell model</th><th>Fault level</th></tr>
<tr><td>70 A</td><td>90 °C</td></tr>
<tr><td>140 A</td><td>90 °C</td></tr>
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<tr><td>450 A</td><td>95 °C</td></tr>
<tr><td>600 A</td><td>95 °C</td></tr>
</table></td></tr>
<tr><td>F1279
Defective temperature sensor or undertemperature on cell W12 IGBT</td><td>▪ Contact WEG Service Center.</td><td>▪ Cell temperature measurement sensor defective.
▪ Cell temperature sensor disconnected.
▪ Temperature on the cell heatsink below -10 °C.</td></tr>
<tr><td>F1280
Cell W12 phase IGBT</td><td>▪ Contact WEG Service Center.</td><td>▪ Short circuit at the inverter output.
▪ Trigger board of the IGBTs of the cell phase arm disconnected.
▪ IGBTs of the cell phase arm operating out of the saturation region.
▪ IGBTs or trigger board of the cell phase arm defective.
▪ Fault on the desaturation signal feedback or gate-driver supply.</td></tr>
<tr><td>F1281
Cell W12 neutral IGBT</td><td>▪ Contact WEG Service Center.</td><td>▪ Short circuit at the inverter output.
▪ Trigger board of the IGBTs of the cell neutral arm disconnected.
▪ IGBTs of the cell neutral arm operating out of the saturation region.
▪ IGBTs or trigger board of the cell neutral arm defective.
▪ Fault on the desaturation signal feedback or gate-driver supply.</td></tr>
<tr><td>F1283
Cell W12 phase pulse feedback</td><td>▪ Contact WEG Service Center.</td><td>▪ Fault on the commutation of the IGBTs of the cell phase arm.
▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the phase arm disconnected or defective.
▪ IGBTs or trigger board of the cell phase arm defective.</td></tr>
</table>

Fault/alarm	Reset	Possible causes
F1285 Cell W12 neutral pulse feedback	▪ Contact WEG Service Center.	▪ Fault on the confirmation of the commutation of the IGBTs of the cell neutral arm. ▪ Measurement circuit of the confirmation signal of the commutation of the IGBTs of the neutral arm disconnected or defective. ▪ IGBTs or trigger board of the cell neutral arm defective.
F1286 Cell W12 electronics power supply	▪ Contact WEG Service Center.	▪ Voltages of the internal electronic circuits of the cell out of the operation level. ▪ Defect on the cell power supply.
F1291 Cell W12 modulation synchronism	▪ Contact WEG Service Center.	▪ Fault in the synchronism between the MCC1 control board of the cell and the MVC3 main control.
F1292 Cell W12 bypass system	▪ Contact WEG Service Center.	▪ Fault in the operation of the cell bypass system. ▪ Bypass system is not connected or defective.
F1293 Communication with cell W12	▪ Contact WEG Service Center.	▪ Fault on the communication between the MCC1 control board of the cell and the MVC3 main control. ▪ Break or defect on the cell communication optic cable.
F1297 Cell W12 insulation defective	▪ Contact WEG Service Center.	▪ Fault in the internal insulation of the cell: Contact between some energized point of the circuit and the frame. ▪ Fault on the capacitor discharge resistors of the cell DC link.

8.2 INFORMATION FOR CONTACTING TECHNICAL SUPPORT

NOTE!
For technical support or servicing, it is important to have the following information at hand:

- Inverter model.
- Serial number, manufacturing date and hardware revision, which are available on the product identification label (refer to Section 2.3 IDENTIFICATION LABEL OF THE MVW3000 on page 2-2).
- Software version (refer to Section 3.2 SOFTWARE VERSION on page 3-1).
- Application and programming data.

For explanations, training or services, please, contact WEG Technical Assistance.

8.3 SAFE DE-ENERGIZATION INSTRUCTIONS

1. Decelerate the motor to a complete stop.

2. Check the DC link voltage values of the installed power cells at parameters P1000 to P1035 on the HMI.

3. Press the “POWER OFF” pushbutton. The input transformer switchgear should open at this moment, which is indicated by the “INPUT ON” pilot light going off.

WARNING!
If the input transformer switchgear does not open with the "POWER OFF" command, then open it manually.

4. Follow the DC link voltage decrease through the respective parameters on the HMI. Even with the zero volt indication, you must wait for ten minutes so as to ensure the full discharge of the DC link capacitors.

5. Press the emergency pushbutton located on the control column door and remove its key.

6. On the circuit breaker cabinet (switchgear) of the input transformer, switch off the switch disconnector and grounding of the inverter circuit. It is necessary to confirm visually the opening of the switch through the inspection window. Lock the cabinet and/or add warning sign indicating "System in maintenance".

7. Switch off the Q2 circuit breaker in the control column and lock it in the open position with a padlock and/or put a warning sign indicating "System in maintenance".

8. Switch off the Q1 circuit breaker in the control column. Remove the auxiliary power supply.

It is only after the sequence of procedures described above that high voltage compartment doors can be opened.

DANGER!
Even after the DC link voltage indication parameters present 0 V on the HMI, 250 V may still be presented on the DC link of the power cells. Wait for ten minutes, and the cabinet doors may be opened.

9. Execute the procedures 2 and 3 of the Preventive Maintenance During Operation.

10. Clean the dust accumulated inside the control and high voltage cabinets as described next:

- Heatsink ventilation system (fans, rectifier and inverter arm heatsinks): remove the dust accumulated on the heatsink fins using compressed air.
- Electronic boards: remove the dust accumulated on the boards using an anti-static brush and/ or low pressure ionized compressed air. If necessary, remove the boards from the inverter.

WARNING!
Electronic boards have components sensitive to electrostatic discharges. Do not touch the components or connectors directly. If necessary, first touch the grounded metallic frame or wear a proper grounded wrist strap.

- Cabinet inner part and other components: remove the accumulated dust using a vacuum cleaner with a nonmetallic nozzle. Perform this cleaning especially on the insulating materials that support energized parts to avoid leakage currents during operation.

11. Connection retightening: inspect all the electrical and mechanical connections and retighten them if necessary.

12. Reinstall all the removed components and connections in their respective places and follow the start-up procedures described in section 6.3 ENERGIZATION, START-UP AND SAFE DE-ENERGIZATION on page 6-15 of the User's Manual.

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