Driving efficiency and sustainability

English

Quick Installation Guide

CFW503 Frequency Inverter

18256889 Document: 10012664198/01

1 SAFETY INSTRUCTIONS

This quick installation guide contains the basic information necessary to commission the CFW503. It has been written to be used by qualified personnel with suitable training or technical qualification for operating this type of equipment. The personnel shall follow all the safety instructions described in this manual defined by the local regulations. Failure to comply with the safety instructions may result in death, serious injury, and/or equipment damage.

2 SAFETY WARNINGS IN THIS GUIDE AND IN THE PRODUCT

DANGER!
The procedures recommended in this warning aim at protecting the user against death, serious injuries and considerable material damages.

ATTENTION!
The procedures recommended in this warning aim at preventing material damages.

NOTE!
The information mentioned in this warning is important for the proper understanding and good operation of the product.

High voltages present.

Components sensitive to electrostatic discharges.
Do not touch them.

The connection to the protection grounding is required (PE).

Connection of the shield to the grounding.

3 PRELIMINARY RECOMMENDATIONS

DANGER!
Always disconnect the general power supply before changing any electric component associated to the inverter. Many components may remain loaded with high voltages and/or moving (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 grounding point of the inverter to the protection grounding.

NOTE!
Frequency Inverter may interfere with other electronic equipment. Follow the precautions recommended in manual available for download on the website: **www.weg.net**.

NOTE!
It is not the intention of this guide to present all the possibilities for the application of the CFW503, as well as WEG cannot take any liability for the use of the CFW503 which is not based on this guide.
For further information about installation, full parameter list and recommendations, visit the website **www.weg.net**.

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

ATTENTION!
Electronic boards have components sensitive to electrostatic discharges.
Do not touch directly on components or connectors. If necessary, first touch the grounding point of the inverter, which must be connected to the protection earth (PE) or use a proper grounding strap.

DANGER!
Crushing Hazard.
In order to ensure safety in load lifting applications, electric and/or mechanical devices must be installed outside the inverter for protection against accidental fall of load.

DANGER!
This product was not designed to be used as a safety element. Additional measures must be taken so as to avoid material and personal damages.
The product was manufactured under strict quality control, however, if installed in systems where its failure causes risks of material or personal damages, additional external safety devices must ensure a safety condition in case of a product failure, preventing accidents.

ATTENTION!
The operation of this equipment requires detailed installation and operation instructions provided in the user's manual, programming manual and communication manuals, available for download on the website: **www.weg.net**.

4 ABOUT THE CFW503

The frequency inverter CFW503 is a high-performance product which allows the speed and torque control of three-phase induction motors.

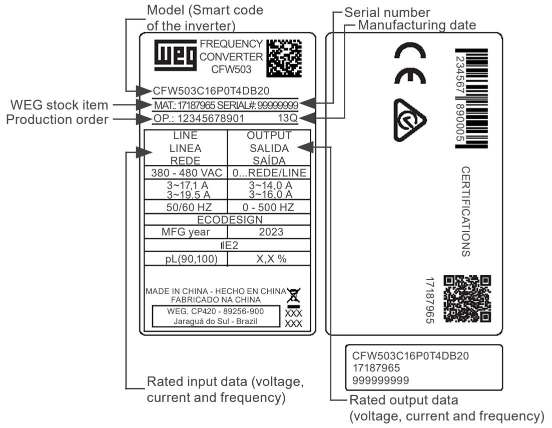
5 NOMENCLATURE

Table 5.1: *Nomenclature of the inverters CFW503*

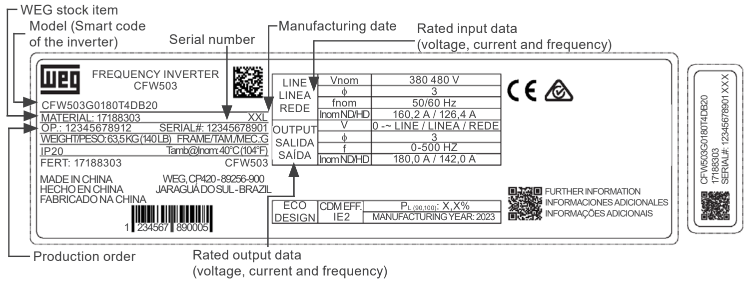
	Product and Series	Identification of the Model				Brake	Protection Rate	Conducted Emission Level	Hardware Version	Special Software Version
		Frame Size	Rated Current	Nº of Phases	Rated Voltage					
Ex.:	CFW503	A	02P6	T	4	NB	20	C2	---	---
Available options	CFW503	Refer to Table 2.2 to the CFW503 user's manual, available for download on the website: **www.weg.net**				NB = without dynamic braking DB = with dynamic braking	20 = IP20	Blank = it does not meet the levels of standards for conducted emission C2 or C3 = as per category 2 (C2) or 3 (C3) of IEC/EN 61800-3, with internal RFI filter	Blank = standard plug-in module H00 = without plug-in	Blank = standard Sx = special software

NOTE!
For models with a special software version (Sx in the smart code) and for specific applications, refer to the application manual available for download on **www.weg.net**.

6 IDENTIFICATION LABEL



(a) For frame sizes A to E



(b) For frame sizes F, G, H and I

Figure 6.1: *(a) and (b) Description of the identification label on the CFW503*

7 RECEIVING AND STORAGE

The CFW503 is supplied in a cardboard package up to frame size E. Models with larger enclosures are packed in a wooden box. On this package, there is an identification label which is the same as the one attached to the side of the inverter.

Follow the procedures below to open the package of models from frame size F up:

1. Place the package on a table with the help of two people.
2. Open the package.
3. Remove the cardboard or styrofoam protection.

Check if:

- The identification of the CFW503 matches the model purchased.
- Any damages occurred during transportation.

Report any damage immediately to the carrier.

If the CFW503 is not installed soon, store it in a clean and dry location (temperature between -25 °C and 60 °C (-77 °F and 140 °F)), with a cover to prevent dust accumulation inside it.

ATTENTION!
When the inverter is stored for a long period, it becomes necessary to perform the capacitor reforming. Refer to the procedure recommended in the user's manual, available for download on the website: **www.weg.net**.

8 INSTALLATION AND CONNECTION

8.1 ENVIRONMENTAL CONDITIONS:

Avoid:

- Direct exposure to sunlight, rain, high humidity or sea-air.
- Inflammable or corrosive liquids or gases.
- Excessive vibration.
- Dust, metallic particles or oil mist.

Environmental conditions permitted for the operation of the inverter:

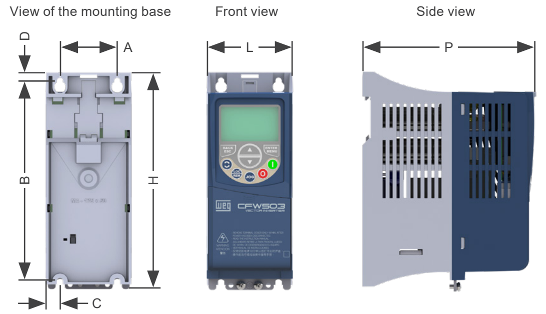
- Temperature around the inverter from -10 °C (14 °F) to the nominal temperature.
- Inverters with frame sizes A to I: for temperatures surrounding the inverter higher than the specifications in Table B.3 in the user's manual CFW503, available for download on the website: **www.weg.net**, it is necessary to apply 2 % of current derating for each Celsius degree, limited to an increase of 10 °C (50 °F).
- Air relative humidity: 5 % to 95 % non-condensing.
- Maximum altitude: up to 1,000 m (3,300 ft) - nominal conditions.
- 1,000 m to 4,000 m (3,300 ft to 13,200 ft) - 1 % of current derating for each 100 m (328 ft) above 1,000 m of altitude.
- From 2,000 m to 4,000 m (6,600 ft to 13,200 ft) above sea level - maximum voltage reduction of 1.1 % for each 100 m (330 ft) above 2,000 m (6,600 ft).
- Pollution degree: 2 (according to EN 50178), with non-conductive pollution. Condensation must not originate conduction through the accumulated residues.

8.2 POSITIONING AND MOUNTING

The external dimensions and the drilling for the mounting, as well as the net weight (mass) of the inverter are presented in Figure 8.2.

Mount the inverter in the upright position on a flat and vertical surface. First, put the screws on the surface where the inverter will be installed, install the inverter and then tighten the screws observing the maximum torque for the screws indicated in Figure 8.2.

Allow the minimum clearances indicated in Figure 8.2, in order to allow the cooling air circulation. Do not install heat sensitive components right above the inverter.

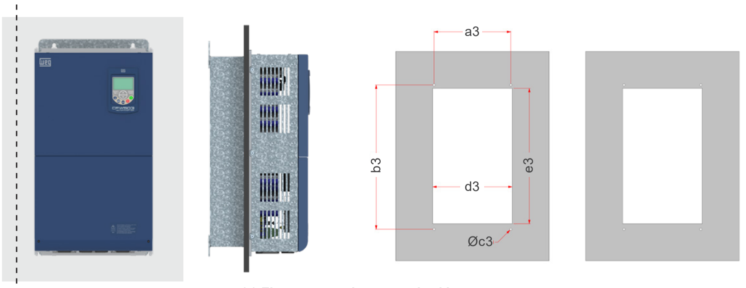


Frame Size	A	B	C	D	H	L	P	Weight	Mounting Bolt	Recommended Torque
	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	kg (lb)		N.m (lbf.in)
A	50.0 (1.97)	175.0 (6.89)	11.9 (0.47)	7.2 (0.28)	189.0 (7.44)	75.0 (2.95)	150.0 (5.91)	0.8 (1.76) (1)	M4	2 (17.7)
B	75.0 (2.95)	185.0 (7.30)	11.8 (0.46)	7.3 (0.29)	199.0 (7.83)	100.0 (3.94)	160.0 (6.30)	1.2 (2.65) (1)	M4	2 (17.7)
C	100.0 (3.94)	195.0 (7.70)	16.7 (0.66)	5.8 (0.23)	210.0 (8.27)	135.0 (5.31)	165.0 (6.50)	2 (4.4)	M5	3 (26.5)
D	125.0 (4.92)	290.0 (11.41)	27.5 (1.08)	10.2 (0.40)	306.6 (12.07)	180.0 (7.08)	166.5 (6.55)	4.3 (0.16)	M6	4.5 (39.82)
E	150.0 (5.90)	330.0 (12.99)	34.0 (1.34)	10.6 (0.42)	350.0 (13.78)	220.0 (8.66)	191.5 (7.54)	10 (22.05)	M6	4.5 (39.82)
F	200.0 (7.87)	525.0 (20.67)	42.5 (1.67)	15.0 (0.59)	550.0 (21.65)	300.0 (11.81)	254.0 (10.0)	26 (57.3)	M8	19 (168.16)
G	200.0 (7.87)	650.0 (25.59)	57.0 (2.24)	15.0 (0.59)	675.0 (26.57)	335.3 (13.2)	314.0 (12.36)	52 (114.64)	M8	20 (177)
H	125 (4.92) (2)	1000 (39.37)	43 (1.69)	27 (1.06)	1074.3 (42.30)	370 (14.57)	360.1 (14.18)	78 (172)	M10	35 (309.78)
I	150 (5.91) (3)	1200 (47.24)	48 (1.89)	27 (1.06)	1233.7 (48.57)	430 (16.93)	360.1 (14.18)	105 (231.5)	M10	35 (309.78)

Dimension tolerance: ±1.0 mm (±0.039 in).
(1) This value refers to the heaviest weight of the frame size.
(2) In the frame Frame size H there are 3 holes, therefore the total width between the holes is 250 mm (9.84 in).
(3) In frame size I there are 3 holes, therefore the total width between the holes is 300 mm (11.81 in).

Figure 8.1: *Inverter dimensions for mechanical installation*

(a) Surface mounting ***(b) DIN rail mounting (Only Sizes A, B, C)***



(c) Flange mounting - standard inverter

(d) Minimum ventilation free spaces

Frame Size	a3	b3	c3	d3	e3	A	B	C	D	Screw Torque (1)
	mm (in)	mm (in)	M	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	N.m. (lbf.in)
A	-	-	-	-	-	15.0 (0.59)	40.0 (1.57)	30.0 (1.18)	10.0 (0.39)	-
B	-	-	-	-	-	35.0 (1.38)	50.0 (1.97)	40.0 (1.57)	15.0 (0.59)	-
C	-	-	-	-	-	40.0 (1.57)	50.0 (1.97)	50.0 (1.97)	30.0 (1.18)	-
D	-	-	-	-	-	40.0 (1.57)	50.0 (1.97)	50.0 (1.97)	40.0 (1.57)	-
E	-	-	-	-	-	110.0 (4.33)	130.0 (5.11)	50.0 (1.97)	40.0 (1.57)	-
F	275.0 (10.83)	517.0 (20.35)	M8	288.0 (11.34)	488.0 (19.21)	110.0 (4.33)	130.0 (5.11)	10.0 (0.39)	30.0 (1.18)	20.0 (177)
G	275.0 (10.83)	635.0 (25.0)	M8	314.0 (12.36)	617.0 (24.29)	150.0 (5.91)	250.0 (9.84)	20.0 (0.79)	80.0 (3.15)	20.0 (177)
H	270.0 (10.63)	994.0 (39.14)	M10	331.0 (13.03)	957.0 (37.68)	150 (5.9)	250 (9.84)	20 (0.79)	50 (1.18)	35 (309.78)
I	350 (13.78)	1183.6 (46.58)	M10	392.0 (15.43)	1147.6 (45.18)	150 (5.9)	250 (9.84)	20 (0.79)	50 (1.18)	35 (309.78)

Dimension tolerance: ±1.0 mm (±0.039 in).
(1) Recommended torque for fixing the inverter (valid for c3).

Figure 8.2: *(a) to (d) Mechanical installation data (surface mounting, flange mounting and minimum ventilation free espaces)*

ATTENTION!
When installing two or more inverters vertically, respect the minimum clearance A + B (as per Figure 3) and provide an air deflecting plate so that the heat rising up from the bottom inverter does not affect the top inverter.
Provide independent conduits for the physical separation of signal, control, and power cables (refer to the Chapter 9 ELECTRICAL INSTALLATION).

9 ELECTRICAL INSTALLATION

DANGER!
The following information is merely a guide for proper installation. Comply with applicable local regulations for electrical installations.
Make sure the power supply is disconnected before starting the installation.
The CFW503 must not be used as an emergency stop device. Provide other devices for that purpose.

ATTENTION!
Integral solid state short circuit protection does not provide branch circuit protection. Branch circuit protection must be provided in accordance with applicable local codes.

9.1 IDENTIFICATION OF THE POWER TERMINALS AND GROUNDING POINTS

The power terminals can be of different sizes and configurations, depending on the model of the inverter, according to Table 9.1. The maximum torque of the power terminals and grounding points must be checked in Table 9.1.

Table 9.1: *Power terminals, grounding points and recommended tightening torque*

Frame Size	Power Supply	Recommended Torque			
		Grounding Points		Power Terminals	
		N.m	Lbf.in	N.m	Lbf.in
A	380...480 V	0.5	4.43	0.5	4.43
B				0.5	4.43
C				1.8	15.93
D				1.76	15.58
E				3.05	27
F				5.5	48.68
G		M5: 3.5 M8: 10	M5: 31.0 M8: 88.5	M8: 15 M10: 30	M8: 132.75 M10: 265.5
H		M5: 3.5 M8: 10	M5: 31.10 M8: 88.5	30	265.5
I		M5: 3.5 M8: 10	M5: 31.10 M8: 88.5	30	265.5

Description of the power terminals:

L1, L2 and L3 (R, S, T): AC power supply.
U, V, W: connection for the motor.
-UD: negative pole of the voltage of the DC Link.
+UD: positive pole of the voltage of the DC Link.
BR: connection of the brake resistor.
DCR: connection to the external DC Link inductor (optional). Only available for models 32 A, 37.1 A, 45 A, 58.5 A, 142 A, 180 A, 211 A, 315 A, 370 A, 480 A, 520 A and 600 A.

9.2 POWER AND GROUNDING WIRING, CIRCUIT BREAKERS AND FUSES

ATTENTION!
- Use proper cable lugs for the power and grounding connection cables. Refer to Table 14.1 for recommended wiring, circuit breakers and fuses.
- Keep sensitive equipment and wiring at a minimum distance of 0.25 m from the inverter and from the cables connecting the inverter to the motor.
- It is not recommended the use of mini circuit breakers (MDU), because of the actuation level of the magnet.

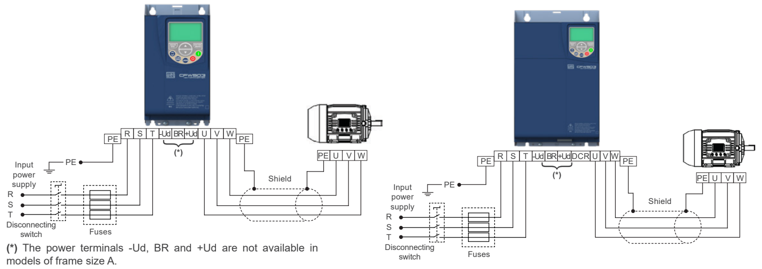
ATTENTION!
Residual Current Device (RCD):

- When installing an RCD to guard against electrical shock, only devices with a trip current of 300 mA should be used on the supply side of the inverter.
- Depending on the installation (motor cable length, cable type, multimotor configuration, etc.), the RCD protection may be activated. Contact the RCD manufacturer for selecting the most appropriate device to be used with inverters.

NOTE!

- The wire gauges listed in Table 14.1 are orientative values. Installation conditions and the maximum permitted voltage drop must be considered for the proper wiring sizing.

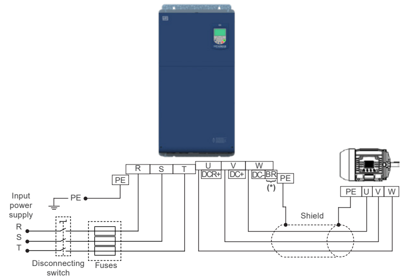
9.3 POWER CONNECTIONS



(*) The power terminals -Ud, BR and +Ud are not available in models of frame size A.

(a) Frame sizes A, B, C and F

(b) Frame sizes D and E



(*) The power terminal BR is not available in models of frame sizes H and I.

(c) Frame sizes G, H and I

Figure 9.1: *(a) to (c) Power and grounding connections*

9.3.1 Input Connections

DANGER!
Provide a disconnect device for the inverter power supply. This device must cut off the power supply whenever necessary (during maintenance for instance).

ATTENTION!
The power supply that feeds the inverter must have a grounded neutral. In case of IT networks, follow the instructions described in the user's manual, available for download on the website: **www.weg.net**.

NOTE!
The input power supply voltage must be compatible with the inverter rated voltage. Power factor correction capacitors are not needed at the inverter input (L1, L2, L3 or R, S, T) and must not be installed at the output (U, V, W).

Power supply capacity

Suitable for use in circuits capable of delivering not more than 30,000 Arms symmetrical 480 V, when protected by fuses as specified in Table 5.

9.3.2 Dynamic Braking

NOTE!
The dynamic braking is available from frame size B for the CFW503. For installation information, refer to Item 3.2.3.4 Dynamic Braking of the user's manual, available for download on the website: **www.weg.net**.

9.3.3 Output Connections

ATTENTION!
The inverter has an electronic motor overload protection that must be adjusted according to the driven motor. When several motors are connected to the same inverter, install individual overload relays for each motor.
The motor overload protection available in the CFW503 is in accordance with the UL508C standard. Note the following information:
1. Trip current equal to 1.2 times the motor rated current (P0401).
2. When parameters P0156, P0157 and P0158 (Overload current at 100 %, 50 % and 5 % of the rated speed, respectively) are manually set, the maximum value to meet the condition 1 is 1.1 x P0401.

ATTENTION!
If a disconnect switch or a contactor is installed at the power supply between the inverter and the motor, never operate it with the motor turning or with voltage at the inverter output.

The characteristics of the cable used to connect the motor to the inverter, as well as its interconnection and routing, are extremely important to avoid electromagnetic interference in other equipment and not to affect the life cycle of windings and bearings of the controlled motors.

Keep motor cables away from other cables (signal cables, sensor cables, control cables, etc.), according to Item 9.3.6 Cable Separation Distance.

Connect a fourth cable between the motor ground and the inverter ground.

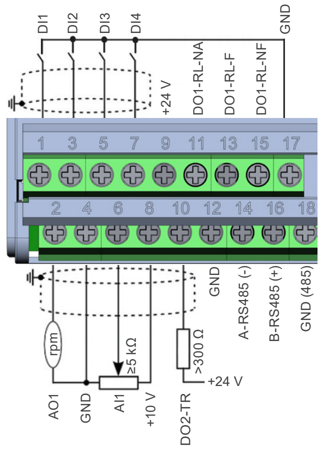
9.3.4 Grounding Connections

DANGER!

- The inverter must be connected to a protection grounding (PE).
- Use grounding wiring with a gauge at least equal to that indicated in Table 14.1.
- The maximum tightening torque of the grounding connections is of 1.7 N.m (15 lbf.in).
- Connect the grounding points of the inverter to a specific grounding rod, or specific grounding point or to the general grounding point (resistance ≤ 10 Ω).
- The neuter conductor that powers up the inverter must be solidly grounded; however, this conductor must not be used to ground the inverter.
- Do not share the grounding wiring with other equipment that operate with high currents (e.g. high power motors, soldering machines, etc.).

9.3.5 Control Connections

The control connections (analog input/output, digital input/output and interface RS485) must be performed according to the specification of the connector of the plug-in module connected to the CFW503. Refer to the guide of the plug-in module in the package of the product. The typical functions and connections for the CFW500-IOS standard plug-in module are shown in Figure 9.2.



	Connector		Description (**)
Top connection	1	DI1	Digital input 1
	3	DI2	Digital input 2 (*)
	5	DI3	Digital input 3
	7	DI4	Digital input 4
	9	+24 V	Power supply +24 Vdc
	11	DO1-RL-NA	Digital output 1 (NO contact of relay 1)
	13	DO1-RL-C	Digital output 1 (common point of relay 1)
	15	DO1-RL-NF	Digital output 1 (NC contact of relay 1)
	17	GND	Reference 0 V
Bottom connection	2	AO1	Analog output 1
	4	GND	Reference 0 V
	6	AI1	Analog input 1
	8	+10 V	Reference +10 Vdc for potentiometer
	10	DO2-TR	Digital output 2 (transistor)
	12	GND	Reference 0 V
	14	RS485 - A	RS485 (terminal A)
	16	RS485 - B	RS485 (terminal B)
	18	GND (485)	GND (RS485)

(*) The digital input 2 (DI2) can also be used as input in frequency (FI). For further details refer to the programming manual of the CFW503, available for download on the website: **www.weg.net**.
(**) For further information about the technical specifications, refer to Chapter 8 in the CFW503 user's manual, available for download on the website: **www.weg.net**.

Figure 9.2: *Signals of the connector of the CFW500-IOS plug-in module*

For the correct connection of the control, use:

1. Gauge of the cables: 0.5 mm^2 (20 AWG) to 1.5 mm^2 (14 AWG).
2. Maximum torque: 0.5 N.m (4.50 lbf.in).
3. Wiring of the plug-in module connector with shielded cable and separated from the other wiring (power, command in 110 V / 220 Vac, etc), according to Item 9.3.6 Cable Separation Distance.
4. Relays, contactors, solenoids or coils of electromechanical brake installed close to the inverters may occasionally generate interference in the control circuitry. To eliminate this effect, RC suppressors (with AC power supply) or freewheel diodes (with DC power supply) must be connected in parallel to the coils of these devices.
5. When using the external HMI, the cable that connects to the inverter must be separated from the other cables in the installation, keeping a minimum distance of 10 cm.
6. When using analog reference (AI1) and the frequency oscillates (problem of electromagnetic interference), interconnect the GND of the connector of the plug-in module to the inverter grounding connection.

9.3.6 Cable Separation Distance

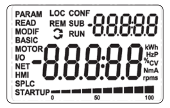
Table 9.2: *Cable separation distance*

Inverter Output Rated Current	Length of the Cable(s)	Minimum Separation Distance
≤ 24 A	≤ 100 m (330 ft) > 100 m (330 ft)	≥ 10 cm (3.94 in) ≥ 25 cm (9.84 in)
≥ 28 A	≤ 30 m (100 ft) > 30 m (100 ft)	≥ 10 cm (3.94 in) ≥ 25 cm (9.84 in)

10 PREPARATION AND POWERING UP

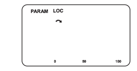
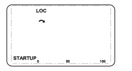
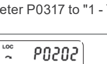
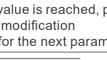
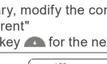
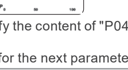
DANGER!
Always disconnect the general power supply before making any connection.

1. Check if the power, grounding and control connections are correct and firm.
2. Remove all materials left from the inside of the inverter or drive.
3. Check if the motor connections and if the motor current and voltage match the inverter.
4. Mechanically uncouple the motor from the load. If the motor cannot be uncoupled, be sure that the turning in any direction (clockwise or counterclockwise) will not cause damages to the machine or risk of accidents.
5. Close the covers of the inverters or drive.
6. Measure the voltage of the input power supply and check if it is within the permitted range, as presented in Chapter
7. Power up the input: close the disconnecting switch.
8. Check the success of the powering up:



10.1 STARTUP

10.1.1 V/f Control Type (P0202 = 0)

Step	Indication on the Display/Action	Step	Indication on the Display/Action
1	 - Monitoring mode - Press the key **ENTER/MENU** to enter 1st level of programming mode	2	 - The **PARAM** group is selected, press the keys ▲ or ▼ until selecting the **STARTUP** group
3	 - When the **STARTUP** group is selected - Press the key **ENTER/MENU**	4	 - The parameter "**P0317 – Oriented Start-up**" is then selected, press the **ENTER/MENU** to get into the parameter content
5	 - Change the parameter P0317 to "1 - Yes", by using the ▲ key	6	 - If necessary, press **ENTER/MENU** to modify the content of "P0202 - Control Type" for P0202 = 0 (V/f)
7	 - When the desired value is reached, press **ENTER/MENU** to save the modification - Press the key ▲ for the next parameter	8	 - If necessary, modify the content of "P0401 - Motor Rated Current" - Press the key ▲ for the next parameter
9	 - If necessary, modify the content of "P0402 - Motor Rated Speed" - Press the key ▲ for the next parameter	10	 - If necessary, modify the content of "P0403 - Motor Rated Frequency" - Press the key ▲ for the next parameter
11	 - To end the Start-up routine, press the key **BACK/ESC** - To return to the monitoring mode, press the key **BACK/ESC** again		

11 TECHNICAL SPECIFICATIONS

11.1 POWER DATA

Power Supply:

- Voltage Tolerance: -15 % to +10 % of nominal voltage.
- Frequency: 50/60 Hz (48 Hz to 62 Hz).
- Phase imbalance: ≤ 3 % of the rated phase-to-phase input voltage.
- Overvoltage according to Category III (IEC/EN 61010).
- Transient voltage according to Category III.
- Maximum of 10 connections (power up cycles - ON/OFF) per hour (1 every 6 minutes).
- Typical efficiency: ≥ 97 %.

12 CONSIDERED STANDARDS

Table 12.1: *Considered standards*

Safety standards	- IEC/EN 61800-5-1 - safety requirements electrical, thermal and energy. - EN 50178 - electronic equipment for use in power installations. - IEC/EN 60204-1 - safety of machinery. Electrical equipment of machines. Part 1: general requirements. - **Note:** for the machine to comply with this standard, the manufacturer of the machine is responsible for installing an emergency stop device and equipment to disconnect the input power supply. - IEC/EN 60146 (IEC 146) - semiconductor converters. - IEC/EN 61800-2 - adjustable speed electrical power drive systems - part 2: general requirements - rating specifications for low voltage adjustable frequency AC power drive systems.
Electromagnetic compatibility (EMC) standards	- IEC/EN 61800-3 - adjustable speed electrical power drive systems - part 3: EMC product standard including specific test methods. - CISPR 11 - industrial, scientific and medical (ISM) radio-frequency equipment - electromagnetic disturbance characteristics - limits and methods of measurement. - IEC/EN 61000-4-2 - electromagnetic compatibility (EMC) - part 4: testing and measurement techniques - section 2: electrostatic discharge immunity test. - IEC/EN 61000-4-3 - electromagnetic compatibility (EMC) - part 4: testing and measurement techniques - section 3: radiated, radio-frequency, electromagnetic field immunity test. - IEC/EN 61000-4-4 - electromagnetic compatibility (EMC) - part 4: testing and measurement techniques - section 4: electrical fast transient/burst immunity test. - IEC/EN 61000-4-5 - electromagnetic compatibility (EMC) - part 4: testing and measurement techniques - section 5: surge immunity test. - IEC/EN 61000-4-6 - electromagnetic compatibility (EMC)- part 4: testing and measurement techniques - section 6: immunity to conducted disturbances, induced by radio-frequency fields.
Mechanical construction standards	- EN 60529 - degrees of protection provided by enclosures (IP code). - IEC/EN 60721-3-3 – classification of environmental conditions - part 3: classification of groups of environmental parameters and their severities - section 3: stationary use at weather protected locations level 3m4.

13 CERTIFICATIONS

Certifications (*)	Notes
CE	

(*) For updated information on certifications, please contact WEG.

14 LIST OF MODELS CFW503 SERIES

Table 14.1: *List of models of CFW503 series, main electrical specifications - frame sizes A to I*

Inverter	Power Supply Rated Voltage	Frame Size	Output Rated Current		Maximum Motor		Recommended Fuse			Circuit Breaker		Power Wire Size	Grounding Wire Size	Dynamic Braking			
			ND	HD	ND	HD								Maximum Current	Recommended Resistor	Braking rms Current	Power Wire Size for DC+ and BR Terminals
	[Vrms]		[Arms]	[Arms]	[HP/kW]	[HP/kW]	I^2t [A^2s]	Current [A]	Recommended WEG aR Fuse	[A]	WEG	mm^2 (AWG)	mm^2 (AWG)	(Imax) [A]	[Ω]	[A]	mm^2 (AWG)
CFW503A01P0T4	380...480 V	A	1.0	1.0	0.25/0.18	0.25/0.18	450	20	FNH00-20K-A	1.6	MPW18i-3-D016 (3)	1.5 (16)	2.5 (14)	Dynamic braking not available			
CFW503A01P6T4			1.6	1.6	0.5/0.37	0.5/0.37	450	20	FNH00-20K-A	2.5	MPW18i-3-D025 (3)	1.5 (16)	2.5 (14)				
CFW503A02P6T4			2.6	2.6	1.5/1.1	1.5/1.1	450	20	FNH00-20K-A	4	MPW18i-3-U004 (3)	1.5 (16)	2.5 (14)				
CFW503A06P1T4			6.1	5.0	3/2.2	2/1.5	450	20	FNH00-20K-A	10	MPW18i-3-U010 (3)	1.5 (16)	2.5 (14)				
CFW503A08P2T4			8.2	7	5/3.7	3/2.2	1000	25	FNH00-25K-A	16	MPW18i-3-U016 (3)	2.5 (14)	2.5 (14)				
CFW503B02P6T4		B	2.6	2.6	1.5/1.1	1.5/1.1	450	20	FNH00-20K-A	4	MPW18i-3-U004 (3)	1.5 (16)	2.5 (14)	6	127	4.5	1.5 (16)
CFW503B04P3T4			4.3	4.3	2/1.5	2/1.5	450	20	FNH00-20K-A	6.3	MPW18i-3-D063 (3)	1.5 (16)	2.5 (14)	6	127	4.5	1.5 (16)
CFW503B10P0T4			10	7	6/4.5	3/2.2	1000	25	FNH00-25K-A	16	MPW18i-3-U016 (3)	2.5 (14)	2.5 (14)	8	100	5.7	2.5 (14)
CFW503B14P0T4			14	10	7.5/5.6	6/4.5	1000	35	FNH00-35K-A	20	MPW40i-3-U020 (3)	4.0 (12)	4.0 (12)	16	47	11.5	2.5 (14)
CFW503C16P0T4		C	16	14	10/7.5	7.5/5.6	1000	35	FNH00-35K-A	25	MPW40i-3-U025 (3)	4.0 (12)	4.0 (12)	24	33	14	6 (10)
CFW503C18P0T4			18	16	10/7.5	10/7.5	1800	35	FNH00-35K-A	32	MPW40i-3-U032 (3)	6.0 (10)	6.0 (10)	24	33	14	6 (10)
CFW503D32P0T4		D	32	25	20/15	15/11	1800	60	FNH00-63K-A	50	MPW80i-3-U050 (3)	10 (8)	10 (8)	34	22	21	10 (8)
CFW503D37P1T4			37.1	32	25/18.5	20/15	2100	80	FNH00-80K-A	65	MPW80i-3-U065 (3)	10 (8)	10 (8)	48	18	27	10 (8)
CFW503E45P0T4		E	45	39	30/22	25/18.5	13000	100	FNH00-100K-A	65	MPW80i-3-U080 (3)	10 (8)	10 (8)	78	8.6	39	10 (8)
CFW503E58P5T4			58.5	49	40/30	30/22	13000	125	FNH00-125K-A	90	MPW100-3-U100	16 (4)	16 (4)	78	8.6	39	10 (8)
CFW503F77P0T4		F	77	64	50/37	40/30	3050	100	FNH00-100K-A	100	DWB160N-100-3DX	25 (3)	16 (4)	66.7	12	43	10 (6)
CFW503F88P0T4			88	73	60/45	50/37	3050	125	FNH00-125K-A	100	DWB160N-100-3DX	35 (2)	16 (4)	66.7	12	43	10 (6)
CFW503F0105T4			105	88	75/55	60/45	5200	160 / 125 (1)	FNH1-160K-A / FNH1-125K-A (1) (2)	125	DWB160N-125-3DF	50 / 35 (1 / 2) (1)	16 (4)	129	6.2	63	25 (4)
CFW503G0142T4		G	142	115	100/75	75/55	135200	200	FNH00-200K-A	175	DWB250N-200-3DF	70 (2/0) / 50 (1/0) (1)	35 (2)	267	3	142	2x25 (2x4)
CFW503G0180T4			180	142	150/110	100/75	135200	315	FNH1-315K-A	225	DWB250N-250-3DF	2x35 (2x2) / 2x25 (2x4) (1)	50 (1)	267	3	180	2x35 (2x2)
CFW503G0211T4			211	190	175/132	150/110	135200	350	FNH1-350K-A	250	DWB250N-250-3DF	2x50 (2x1) / 2x35 (2x2) (1)	70 (2/0)	364	2.2	191.7	2x50 (2x1/0)
CFW503H0315T4		H	315	211	250	200	450000	800	FNH3-800K-A	800	UBW800H-FTU800-3A	2x85	95	Dynamic braking not available			
CFW503H0370T4			370	315	300	250	450000	800	FNH3-800K-A	800	UBW800H-FTU800-3A	2x120	120				
CFW503I0480T4		I	480	415	450	350	1080450	450	FNH3-450K-A(4)	1200	UBW1200H-ELS1200-3A	2x185	2x50				
CFW503I0520T4			520	480	500/350	400	1080450	630	FNH3-630K-A(4)	1200	UBW1200H-ELS1200-3A	3x95	2x50				
CFW503I0600T4			600	515	500/350	450	1080450	630	FNH3-630K-A(4)	1200	UBW1200H-ELS1200-3A	3x150	2x70				

(1) The first number refers to ND application and the second to HD application.
(2) When using the recommended Weg fuse, use two fuses in series per phase in the ND application.
(3) MPW18/40/80 may also be used.
(4) Use two fuses in parallel per phase.

Driving efficiency and sustainability

中文

快速安装指南

CFW503 变频器

18256889

文件：10012664198/01

1 安全说明

本快速安装指南包含调试 CFW503 变频器所需的基本信息。该指南用于经过培训，拥有技术资格的操作人员来操作设备。设备操作人员应遵守当地法规确定本手册所述之所有安全说明。不遵守安全说明可能导致死亡、严重伤害和设备损伤。

2 手册及产品安全警告

危险！
该警告建议之程序旨在使用户免受死亡、严重伤害和巨大物质损失。

警示！
该警告建议之程序旨在防止物质损失。

注意！
该警告提及之信息对于正确理解和使用产品是很重要的。

当前有高压。

组件对静电放电敏感。
请勿触摸。

要求保护接地的连接（PE）。

屏蔽连接接地。

3 初步建议

危险！
更换与变频器相关的所有电气元件之前，请务必切断总电源。
即使在交流电源输入断开或关闭后，许多运行组件仍可能载有高压或急需运行（风扇）。至少等待 10 分钟，以保证电容器完全放电。始终将变频器的接地点连接到保护接地。

注意！
变频器可能对其他电子设备造成干扰。
参照使用手册建议之事项，详情见网址 www.weg.net。

注意！
本手册无法呈现CFW503应用的所有可能情况，未按照指南使用CFW503进而出现问题，WEG不承担任何责任。
有关安装的更多信息、完整参数列表和建议，请访问网站 www.weg.net。

严禁在变频器上进行耐压试验。
如果必须进行此类实验，请与WEG联系。

警示！
电子板有对静电放电敏感的部件。
请勿直接触摸组件或连接器。如果必须要接触的话，应先接触接地的金属外壳或者佩戴合适的接地带。

危险！
挤压危险
为确保在提升机此类应用的安全性，必须在变频器外部安装机械或电气设备以防止意外坠落。

危险！
该产品并非设计用作安全元件。必须采取额外措施从而避免物质和个人损害。
该产品根据严格的质量控制制造，但是，如果所安装系统自身故障有可能导致重大风险或人身伤害，则必须额外安装满足安全条件的外部保护设备以防止本设备损坏及意外事故。

警示！
操作设备前，请认真阅读《用户手册》、《编程手册》和《通信手册》中提供的详细操作和安装说明，并按要求操作。如需下载上述手册，敬请登录：www.weg.net。

4 关于 CFW503

CFW503变频器性能卓越，可用于控制三相感应电机的转速和转矩。

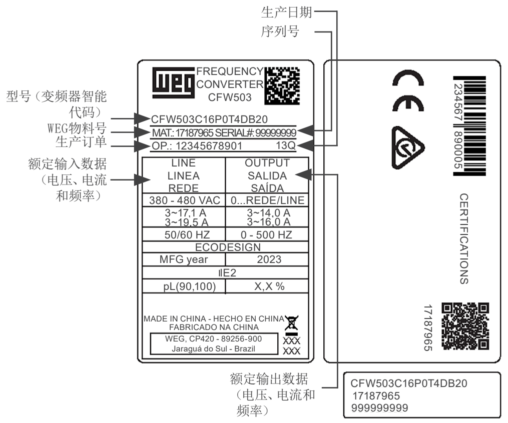
5 命名

表 5.1：CFW503变频器的命名

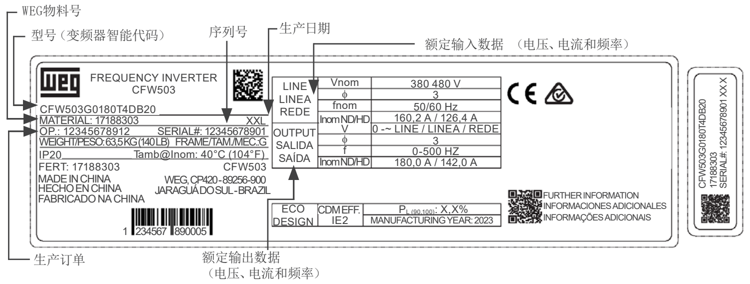
	产品及系列	代码含义				制动	防护等级	传导辐射水平	硬件版本	特殊软件版本
		机座号	额定电流	N° 相位	额定电压					
例子	CFW503	A	02P6	T	4	NB	20	C2	---	---
可用选项	CFW503	参见CFW503《用户手册》（下载网址：www.weg.net）中的表2.2				NB = 无动态制动 DB = 有动态制动	20 = IP20	空白 = 不符合传导辐射标准 C2或C3 = 符合IEC / EN 61800-3标准的2（C2）或3（C3）要求，内置RFI滤波器	空白 = 标准插入组件 H00 = 无插件	空白 = 标准软件 Sx = 特殊软件

注意！
对于带特殊软件版本（智能代码为Sx）和特定应用型产品，请参见《应用手册》（下载网址：www.weg.net）。

6 识别标签



(a) 机座号为A至E的型号



(b) 适用于框架尺寸F,G,H和I

图 6.1：(a) 和 (b) - CFW503标识说明

7 收货与存储

机座号小于等于E的CFW503逆变器采用纸板包装，更大机座号的型号则采用木箱包装。每个包装上均张贴逆变器的标识，规格和逆变器侧面的标识一致。

机座号大于等于F的型号开箱时须遵循以下步骤：

1. 在两人协助下将包装置于桌子上。
2. 打开包装。
3. 拆下纸板或聚苯乙烯泡沫塑料保护层。

做如下检查:

- 检查该 CFW503 的标识是否与购买的型号相匹配。
- 检查在运输过程中是否发生任何损坏。

如果变频器有任何损坏，请立即与运输方联系。

如 CFW503 未能尽快安装，可将其遮盖以防止里面的灰尘堆积，存放在清洁、干燥的地方（温度介于 -25° C 至 60° C 之间（-77° F 至 140° F））。

警示！
变频器存储长时间后，对电容器进行充电是很有必要的。参考程序详见 www.weg.net。

8 安装和连接

8.1 环境条件：

避免：

- 阳光直射、淋雨、高湿度或海风中。
- 易燃或腐蚀性液体或气体。
- 过度振动。
- 灰尘、金属颗粒或油雾。

允许变频器运行的环境条件：

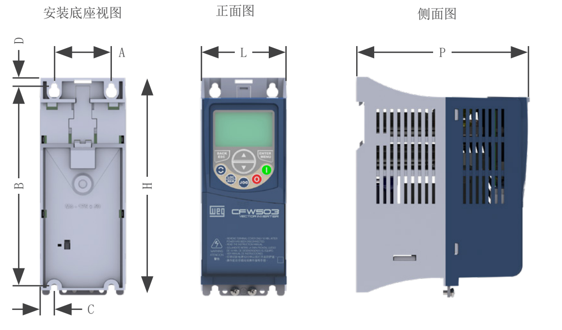
- 变频器周围温度：从 -10° C（14° F）至标准温度。
- 机座号为A到I的逆变器：若逆变器周边环境温度超过CFW503《用户手册》（下载网址：www.weg.net）中表B.3的规定，每超出1° C，额定电流就需要降额2%，且最大超出温度为10° C（50° F）。
- 空气相对湿度：5 % 至 95 %，无凝露。
- 最大海拔高度：高达 1,000 米（3,300 英尺） - 标准高度。
- 1,000 米至 4,000 米（3,300 英尺到 13,200 英尺） - 海拔高度 1,000 米以上每 100 米当前降额的 1 %（328 英尺）。
- 从海拔超过 2,000 米至 4,000 米（6,600 英尺到 13,200 英尺） - 2,000 米以上（6,600 英尺）每 100 米（330 英尺）1.1 % 的最大电压降低。
- 污染等级：2（根据 EN 50178），具有非导电性污染。冷凝不得通过累计残留引起传导。

8.2 定位和安装

变频器的外部尺寸和用于安装的钻孔，以及净重（质量）如图 8.2 所示。

将逆变器垂直安装在平坦的垂直表面上：先将螺钉放在要安装逆变器的表面上，安装逆变器，然后按照第1页“图 8.2：变频器机械安装尺寸”中指示的最大转矩拧紧螺钉。

允许最小间隙如图 3 所示，以便于容许冷却空气循环。不要在变频器正上方安装热敏感元器件。

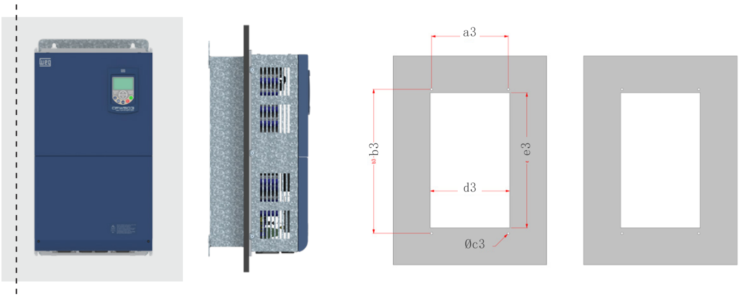


机座号	A	B	C	D	H	L	P	重量	安装螺栓	推荐转矩
	毫米（英寸）	毫米（英寸）	毫米（英寸）	毫米（英寸）	毫米（英寸）	毫米（英寸）	毫米（英寸）	公斤（磅）		牛.米（磅力.英寸）
A	50,0 (1.97)	175.0 (6.89)	11.9 (0.47)	7.2 (0.28)	189.0 (7.44)	75.0 (2.95)	150.0 (5.91)	0.8（1.76）(1)	M4	2（17.7）
B	75.0 (2.95)	185.0 (7.30)	11.8 (0.46)	7.3 (0.29)	199.0 (7.83)	100.0 (3.94)	160.0 (6.30)	1.2（2.65）(1)	M4	2（17.7）
C	100.0 (3.94)	195.0 (7.70)	16.7 (0.66)	5.8 (0.23)	210.0 (8.27)	135.0 (5.31)	165.0 (6.50)	2（4.4）	M5	3（26.5）
D	125.0 (4.92)	290.0 (11.41)	27.5 (1.08)	10.2 (0.40)	306.6 (12.07)	180.0 (7.08)	166.5 (6.55)	4.3（0.16）	M6	4.5 (39.82)
E	150.0 (5.90)	330.0 (12.99)	34.0 (1.34)	10.6 (0.42)	350.0 (13.78)	220.0 (8.66)	191.5 (7.54)	10（22.05）	M6	4.5 (39.82)
F	200.0 (7.87)	525.0 (20.67)	42.5 (1.67)	15.0 (0.59)	550.0 (21.65)	300.0 (11.81)	254.0 (10.0)	26（57.3）	M8	19 (168.16)
G	200.0 (7.87)	650.0 (25.59)	57.0 (2.24)	15.0 (0.59)	675.0 (26.57)	335.3 (13.2)	314.0 (12.36)	52 (114.64)	M8	20（177）
H	125 (4.92)(2)	1000 (39.37)	43 (1.69)	27 (1.06)	1074.3 (42.30)	370 (14.57)	360.1 (14.18)	78（172）	M10	35 (309.78)
I	150 (5.91)(3)	1200 (47.24)	48 (1.89)	27 (1.06)	1233.7 (48.57)	430 (16.93)	360.1 (14.18)	105（231.5）	M10	35 (309.78)

尺寸公差：±1.0毫米（±0.039英寸）
(1) 此值是指车架尺寸中最重的重量。
(2) 车架尺寸H有3个孔，因此孔之间的总宽度为250毫米（9.84英寸）。
(3) 车架尺寸I有3个孔，因此孔之间的总宽度为300毫米（11.81英寸）。

图 8.1：变频器机械安装尺寸

(a) 表面安装　(b) DIN 导轨安装（仅限尺寸A、B、C）



(c) 法兰安装 - 标准型逆变器

(d) 最小通风距离

机座号	a3	b3	c3	d3	e3	A	B	C	D	螺钉扭矩(1)
	毫米（英寸）	毫米（英寸）	M	毫米（英寸）	毫米（英寸）	毫米（英寸）	毫米（英寸）	毫米（英寸）	毫米（英寸）	牛.米（磅力.英寸）
A	–	–	–	–	–	15,0 (0.59)	40.0 (1.57)	30.0 (1.18)	10.0 (0.39)	–
B	–	–	–	–	–	35.0 (1.38)	50.0 (1.97)	40.0 (1.57)	15.0 (0.59)	–
C	–	–	–	–	–	40.0 (1.57)	50.0 (1.97)	50.0 (1.97)	30.0 (1.18)	–
D	–	–	–	–	–	40.0 (1.57)	50.0 (1.97)	50.0 (1.97)	40.0 (1.57)	–
E	–	–	–	–	–	110.0 (4.33)	130.0 (5.11)	50.0 (1.97)	40.0 (1.57)	–
F	275.0 (10.83)	517.0 (20.35)	M8	288.0 (11.34)	488.0 (19.21)	110.0 (4.33)	130.0 (5.11)	10.0 (0.39)	30.0 (1.18)	20.0 (177)
G	275.0 (10.83)	635.0 (25.0)	M8	314.0 (12.36)	617.0 (24.29)	150.0 (5.91)	250.0 (9.84)	20.0 (0.79)	80.0 (3.15)	20.0 (177)
H	270.0 (10.63)	994.0 (39.14)	M10	331.0 (13.03)	957.0 (37.68)	150 (5.9)	250 (9.84)	20 (0.79)	50 (1.18)	35 (309.78)
I	350 (13.78)	1183.6 (46.58)	M10	392.0 (15.43)	1147.6 (45.18)	150 (5.9)	250 (9.84)	20 (0.79)	50 (1.18)	35 (309.78)

尺寸公差：±1.0毫米（±0.039英寸）。
(1) 固定逆变器的推荐转矩（适用于c3）。

图 8.2：(a) 至 (d) 机械安装数据（表面安装、法兰安装和最小通风间隙）

警示！
- W垂直安装两个或多个变频器时，遵守最小间隙 A + B（按照图 3 所示），并提供一种空气挡板防止下方变频器的热量影响到上方安装的变频器。
- 为信号、控制和电源电缆（参见第 9 章电气安装）的物理分离提供独立的通道。

9 电气安装

危险！
- 以下信息仅供正确安装使用。符合电气安装的当地适用规定。
- 确保电源在开始安装前断开。
- 该 CFW503 不能用作紧急停止装置。有关紧急停止装置，请提供其他设备。

警示！
集成固态短路保护并不提供支路保护。
支路保护必须按照当地的适用法规提供。

9.1 电源端子和接地点识别

根据表 2 所示，根据变频器的型号，电源端子可以是不同的尺寸和配置。在表 2 中提供 电源端子和接地点的最大的参考值。

表 9.1：电源端子，接地柱推荐紧固力矩

机座号	电源	推荐力矩			
		接地点		电源端子	
		牛.米	磅力.英寸	牛.米	磅力.英寸
A	380...480 V	0.5	4.43	0.5	4.43
B				0.5	4.43
C				1.8	15.93
D				1.76	15.58
E				3.05	27
F				5.5	48.68
G		M5: 3.5 M8: 10	M5: 31.0 M8: 88.5	M8: 15 M10: 30	M8: 132.75 M10: 265.5
H		M5: 3.5 M8: 10	M5: 31.10 M8: 88.5	30	265.5
I		M5: 3.5 M8: 10	M5: 31.10 M8: 88.5	30	265.5

电源端子的说明：

L1、L2、L3（R, S, T）：交流电源。
U, V, W：电动机连接。
-UD：直流总线电压的负极。
+UD：直流总线电压的正极。
BR：制动电阻器的连接。
DCR：连接到外部直流环节电感器（可选）。仅适用于型号 32 A, 37.1 A, 45 A, 58.5 A, 142 A, 180 A, 211 A, 315 A, 370 A, 480 A, 520 A 和 600 A。

9.2 电源和接地布线、断路器及保险丝

警示！
- 对于电源和接地连接线，要使用合适的电缆接头。有关推荐的布线、断路器和保险丝，请参阅表 5。
- 敏感设备和布线与变频器和连接变频器到电动机的电缆之间至少要保持 0.25 米的最小距离。
- 由于磁铁的动作水平，不建议使用小型断路器（MDU）。

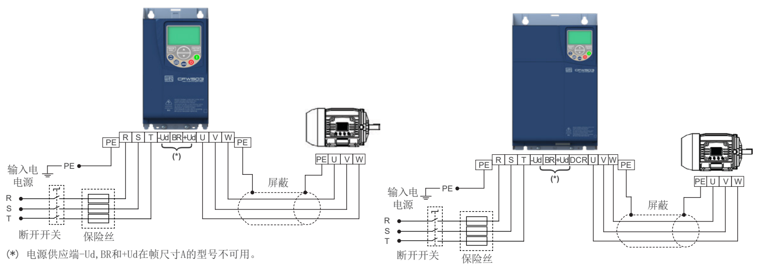
警示!
电流式漏电断路器（RCD）：

- 安装 RCD 以防止触电时，只有具备 300mA 跳闸电流的装置能在变频器的供电侧使用。
- 根据安装（电机电缆长度、电缆类型、多电机配置等），RCD 可供激活。联系 RCD 制造商，选择最适合用于变频器的设备。

注意!

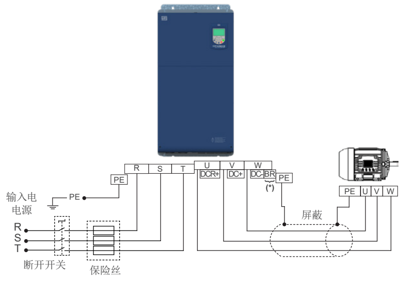
- 表 5 中列出的线规引导值。安装条件和最大允许压降必须考虑正确的布线线号。

9.3 电源连接



(*) 电源供应端-Ud,BR和+Ud在帧尺寸A的型号不可用。

(a) 机座号A,B,C和F (b) 机座号D和E



(*) 电源供应端BR在帧尺寸H和I的型号中不可用。

(c) 机座号G,H和I

图 9.1: (a) 至 (c) – 电源和接地连接

9.3.1 输入连接

危险!
提供变频器电源断开设备。必要时，设备必须切断电源（例如，在维护期间）。

警示!
逆变器的供电电源必须正确接地。对于IT网络，请遵循《用户手册》（下载网址：www.weg.net）中的说明。

注意!

- 输入电源电压必须与变频器的额定电压兼容。
- 在变频器输入端，不需要功率因数校正电容器（L1、L2、L3 或 R、S、T），且不能在输出端（U、V、W）安装。

电源容量

- 如表 5 所示，受保险丝保护时，适用于提供不超过 30,000 A 对称 480 V 电流的电路使用。

9.3.2 直流环节电感/电源电抗

注意!
机座号为B的 CFW503 逆变器可提供动态制动。有关安装信息，请参阅《用户手册》（下载网址：www.weg.net）第 3.2.3.4 章节“动态制动”。

9.3.3 输出连接

警示!
此变频器具有一个电子式电机过载保护装置，该保护装置可根据其所驱动的电机进行调节。如果有多台电机同一台变频器连接 则需为每一台电机安装独立的过载继电器。
CFW503 可用电机过载保护是根据 UL508C 标准执行的。请注意以下信息：
1. 跳闸电流等于电机额定电流（P0401）的 1.2 倍。
2.手动设置 P0156、P0157 和 P0158（分别为额定转速 100 %、50 % 和 5%的过载电流）参数时，满足条件 1 的最大值是 1.1×P0401。

警示!
如果执行电源断开动作的开关或接触器安装在变频器和电机之间，禁止在电机运行或变频器有输 电压时进行操作。

电缆（用于将电动机连接至变频器）的特性，以及它的互连和布线，在避免在其它设备的电磁干扰和不影响受控电机绕组和轴承寿命周期方面是极其重要的。

根据电缆间隔距离项 9.3.6，将电机电缆与其它电缆（信号电缆、传感器电缆、控制电缆等）保持间隔。

使用第四根电缆连接电机接地和变频器接地。

9.3.4 接地连接

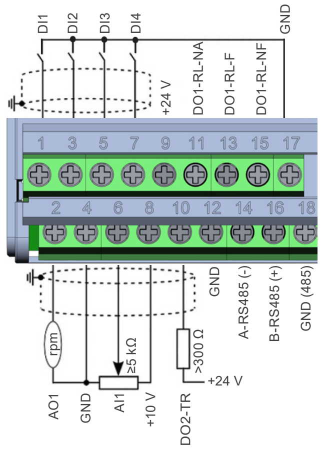
危险!
变频器必须连接到一个保护接地（PE）。

- 接地线的选择使用规格需至少同等于表5所示数据。
- 接地连接的最大拧紧扭矩为 1.7 牛.米（15 磅力.英寸）。
- 将变频器的接地点连接到特定的接地棒，或特定的接地点，或一般的接地点（电阻≤10Ω）。
- 为变频器上电的中性导体必须直接接地；但是，该导体不能用于接地变频器。
- 不要与其他大电流运行的设备共用接地线（例如：高功率电机、焊接机等）。

9.3.5 控制连接

控制连接（模拟输入/输出、数字输入/输出和 RS485 接口）必须根据连接至 CFW503 的插件模块连接器的规格来执行。

参考产品包中插件模块的指南。CFW500-IOS 标准插件模块的特色功能和连接如图 5 所示。



	连接器		描述 (**)
顶部连接	1	DI1	数字输入 1
	3	DI2	数字输入 2 (*)
	5	DI3	数字输入 3
	7	DI4	数字输入 4
	9	+24 V	+24 Vdc
	11	DO1-RL-NO	电源1（继电器）1的NA触点
	13	DO1-RL-C	数字输出1（继电器）1的公共触点
	15	DO1-RL-NC	数字输出1（继电器1的NF触点）
	17	GND	参考 0 V
底部连接	2	AO1	模拟输出 1
	4	GND	参考 0 V
	6	AI1	模拟输入 1
	8	+10 V	参考电位器 +10 Vdc
	10	DO2-TR	数字输出 2（晶体管）
	12	GND	参考 0 V
	14	RS485 - A	RS485 （终端 A）
	16	RS485 - B	RS485 （终端 B）
	18	接地 （485）	接地 （RS485）

(*) 数字输入2（DI2）也可用作频率（FI）输入。更多详细信息请参阅CFW503的《编程手册》（下载网站：www.weg.net）。
(**) 更多技术规格的信息，请参阅CFW503《用户手册》（下载网址：www.weg.net）第8章。

图 9.2: CFW500-IOS 插件模块连接器的信号

对于控制的正确连接，使用：

1. 电缆计：0.5 mm² (20 AWG) 至 1.5 mm² (14 AWG)。
2. 最大扭矩：0.5 牛.米 (4.50 磅力.英寸)。
3. 根据电缆分离距离项 9.3.6，配备屏蔽电缆插件模块连接器及从其他接线分离（电源，110 V/220 Vac 控制 等）的接线。
4. 控制电路中的继电器、接触器、螺线管或安装在接近变频器的机电制动器线圈可偶尔产生干扰。为了消除这种影响，RC 抑制器（交流电源）或续流二极管（直流电源）必须并列连接到这些装置的线圈。
5. 当使用外部 HMI 时，连接至变频器的电缆必须与安装的其他电缆分离，保持 10 厘米的最小距离。
6. 当使用模拟参考（AI1）和频率振荡（电磁干扰的问题）时，将插件模块连接器的接地互连至变频器接地连接。

9.3.6 电缆间隔距离

表 9.2: 电缆间隔距离

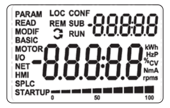
变频器输出额定电流	电缆长度	最小间隔距离
≤ 24 A	≤ 100 m (330 ft) > 100 m (330 ft)	≥ 10 cm (3.94 in) ≥ 25 cm (9.84 in)
≥ 28 A	≤ 30 m (100 ft) > 30 m (100 ft)	≥ 10 cm (3.94 in) ≥ 25 cm (9.84 in)

10 通电准备

危险!
进行任何接线工作前，请始终断开总电源。

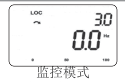
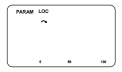
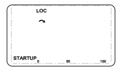
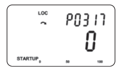
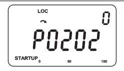
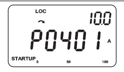
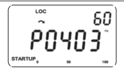
1. 检查电源、接地和控制连接是否正确牢固。
2. 清除变频器内遗留的所有安装材料。
3. 检查电机连接，以及电机电流和电压是否与变频器匹配。
4. 断开负载与电机的机械连接。如果电机无法脱开，确保在任何方向（顺时针或逆时针）的旋转不会造成机器损坏或意外事故的风险。
5. 安装变频器或驱动保护盖。
6. 测量输入电源的电压，参照第 11 章技术规范，检查电压是否在允许的范围内。
7. 变频器输入端通电：闭合断路开关。
8. 检查变频器成功通电：

HMI 显示屏显示：



10.1 启动

10.1.1 V/f 控制类型 (P0202 = 0)

顺序号	显示/操作指示	顺序号	显示/操作指示
1	 监控模式 按下 ENTER/MENU （输入/菜单）键，进入第一层主菜单编程模式选择	2	 选择 PARAM （参数）组，按下 ▲ 或 ▼ 键直至选择 STARTUP （启动）组
3	 选择STARTUP模式 按下 ENTER/MENU（输入/菜单）键	4	 然后选择参数“P0317 – 定向启动”，按下ENTER/MENU（输入/菜单）键查看参数内容
5	 使用 ▲ 键将参数P0317更改为“1 – 是”	6	 必要时，按下 ENTER/MENU （输入/菜单）键，将“P0202 – 控制类型”的内容修改为 P0202 = 0 (V/f)
7	 当目标值修改完成，按下 ENTER/MENU （输入/菜单），保存修改 按下 ▲ 键，设置其他参数	8	 必要时，修改“P0401 – 电机额定电流”的内容 按下 ▲ 键，设置其他参数
9	 必要时，修改“P0402 – 电机额定转速”的内容 按下 ▲ 键，设置其他参数	10	 必要时，修改“P0403 – 电机额定频率”的内容 按下 ▲ 键，设置其他参数
11	 结束STARTUP模式，按 BACK/ESC（返回/退出）键 返回监控模式，再次按 BACK/ESC （返回/退出）键		

11 技术规范

11.1 功率数据

电源：

- 公差：-15 % 至 +10 %。
- 频率：50/60 赫兹 (48 赫兹至 62 赫兹)。
- 相不平衡：≤ 3 % 的额定相与相输入电压。
- 根据类别 III (EN 61010)的超电压。
- 根据类别 III 的瞬时电压。
- 每小时 (每 6 分钟 1 次)最多 10 次连接(加电循环 – ON/OFF)。
- 典型效率：≥ 97 %。

12 考虑标准

表 12.1: 考虑后的标准

安全标准	■ EN 61800-5-1 – 电、热和能量的安全要求。 ■ EN 50178 – 用于电力安装的电子设备。 ■ EN 60204-1 – 机械安全性。机器的电气设备。第 1 部分：一般要求。 ■ 注：对于符合此标准的机器，该机器制造商负责安装用以断开输入电源的紧急停止装置和设备。 ■ EN 60146 (IEC 146) – 半导体转换器。 ■ EN 61800-2 – 可调速电驱动系统 – 第 2 部分：一般要求 – 低压变频交流电源驱动系统等级规范。
电磁兼容性(EMC)标准	■ EN 61800-3 – 可调速电源驱动系统 – 第 3 部分：包括具体测试方法的 EMC 产品标准。 ■ 工业、科学和医疗 (ISM) 用射频设备 – 无线电干扰特性 – 极限值和测量方法。 ■ EN 61000-4-2 – 电磁兼容性（EMC） – 第 4 部分：试验和测量技术 – 第 2 节：静电放电抗扰度试验。 ■ EN 61000-4-3 – 电磁兼容性（EMC） – 第 4 部分：试验和测量技术 – 第 3 节：辐射、射频、电磁场抗扰度试验。 ■ EN 61000-4-4 – 电磁兼容性（EMC） – 第 4 部分：试验和测量技术 – 第 4 节：电快速瞬变/脉冲群抗扰度试验。 ■ EN 61000-4-5 – 电磁兼容性（EMC） – 第 4 部分：试验和测量技术 – 第 5 节：振荡抗扰度试验。 ■ EN 61000-4-6 – 电磁兼容性（EMC） – 第 4 部分：试验和测量技术 – 第 6 节：传导骚扰抗干扰性，射频场感应。
机械施工标准	■ EN 60529 – 由附件提供的防护等级（IP代码）。 ■ IEC / EN 60721-3-3 – 环境条件的分类–第3部分：环境参数组及其严重程度的分类–第3节：在3m4的受天气保护的位置固定使用。

13 认证

认证 (*)	备注
CE	

(*) 有关认证的更新信息，请联系WEG。

14 型号 CFW503 系列列表

表 14.1: CFW503系列的型号列表，主要电气规格–帧尺寸A到I

逆变器	电源的额定电压	机座号	输出额定电流		最大电机功率		推荐保险丝			断路器		电源线规格	接地线规格	动态制动			
			ND	HD	ND	HD	I²t [A²s]	电流 [A]	推荐的WEG aR保险丝					最大电流	推荐电阻器	制动电流	DC+和BR接线端子的电源线规格
	[Vrms]		[Arms]	[Arms]	[HP/kW]	[HP/kW]				[A]	WEG	mm² (AWG)	mm² (AWG)	(Imax) [A]	[Ω]	[A]	mm² (AWG)
CFW503A01P0T4	380...480 V	A	1.0	1.0	0.25/0.18	0.25/0.18	450	20	FNH00-20K-A	1.6	MPW18i-3-D016 (3)	1.5 (16)	2.5 (14)	动态制动不可用			
CFW503A01P6T4			1.6	1.6	0.5/0.37	0.5/0.37	450	20	FNH00-20K-A	2.5	MPW18i-3-D025 (3)	1.5 (16)	2.5 (14)				
CFW503A02P6T4			2.6	2.6	1.5/1.1	1.5/1.1	450	20	FNH00-20K-A	4	MPW18i-3-U004 (3)	1.5 (16)	2.5 (14)				
CFW503A06P1T4			6.1	5.0	3/2.2	2/1.5	450	20	FNH00-20K-A	10	MPW18i-3-U010 (3)	1.5 (16)	2.5 (14)				
CFW503A08P2T4			8.2	7	5/3.7	3/2.2	1000	25	FNH00-25K-A	16	MPW18i-3-U016 (3)	2.5 (14)	2.5 (14)				
CFW503B02P6T4		B	2.6	2.6	1.5/1.1	1.5/1.1	450	20	FNH00-20K-A	4	MPW18i-3-U004 (3)	1.5 (16)	2.5 (14)	6	127	4.5	1.5 (16)
CFW503B04P3T4			4.3	4.3	2/1.5	2/1.5	450	20	FNH00-20K-A	6.3	MPW18i-3-D063 (3)	1.5 (16)	2.5 (14)	6	127	4.5	1.5 (16)
CFW503B10P0T4			10	7	6/4.5	3/2.2	1000	25	FNH00-25K-A	16	MPW18i-3-U016 (3)	2.5 (14)	2.5 (14)	8	100	5.7	2.5 (14)
CFW503B14P0T4			14	10	7.5/5.6	6/4.5	1000	35	FNH00-35K-A	20	MPW40i-3-U020 (3)	4.0 (12)	4.0 (12)	16	47	11.5	2.5 (14)
CFW503C16P0T4		C	16	14	10/7.5	7.5/5.6	1000	35	FNH00-35K-A	25	MPW40i-3-U025 (3)	4.0 (12)	4.0 (12)	24	33	14	6 (10)
CFW503C18P0T4			18	16	10/7.5	10/7.5	1800	35	FNH00-35K-A	32	MPW40i-3-U032 (3)	6.0 (10)	6.0 (10)	24	33	14	6 (10)
CFW503D32P0T4		D	32	25	20/15	15/11	1800	60	FNH00-63K-A	50	MPW80i-3-U050 (3)	10 (8)	10 (8)	34	22	21	10 (8)
CFW503D37P1T4			37.1	32	25/18.5	20/15	2100	80	FNH00-80K-A	65	MPW80i-3-U065 (3)	10 (8)	10 (8)	48	18	27	10 (8)
CFW503E45P0T4		E	45	39	30/22	25/18.5	13000	100	FNH00-100K-A	65	MPW80i-3-U080 (3)	10 (8)	10 (8)	78	8.6	39	10 (8)
CFW503E58P5T4			58.5	49	40/30	30/22	13000	125	FNH00-125K-A	90	MPW100-3-U100	16 (4)	16 (4)	78	8.6	39	10 (8)
CFW503F77P0T4		F	77	64	50/37	40/30	3050	100	FNH00-100K-A	100	DWB160N-100-3DX	25 (3)	16 (4)	66.7	12	43	10 (6)
CFW503F88P0T4			88	73	60/45	50/37	3050	125	FNH00-125K-A	100	DWB160N-100-3DX	35 (2)	16 (4)	66.7	12	43	10 (6)
CFW503F0105T4			105	88	75/55	60/45	5200	160 / 125 (1)	FNH1-160K-A / FNH1-125K-A (1) (2)	125	DWB160N-125-3DF	50 / 35 (1 / 2) (1)	16 (4)	129	6.2	63	25 (4)
CFW503G0142T4		G	142	115	100/75	75/55	135200	200	FNH00-200K-A	175	DWB250N-200-3DF	70 (2/0) / 50 (1/0) (1)	35 (2)	267	3	142	2x25 (2x4)
CFW503G0180T4			180	142	150/110	100/75	135200	315	FNH1-315K-A	225	DWB250N-250-3DF	2x35 (2x2) / 2x25 (2x4) (1)	50 (1)	267	3	180	2x35 (2x2)
CFW503G0211T4			211	190	175/132	150/110	135200	350	FNH1-350K-A	250	DWB250N-250-3DF	2x50 (2x1) / 2x35 (2x2) (1)	70 (2/0)	364	2.2	191.7	2x50 (2x1/0)
CFW503H0315T4		H	315	211	250	200	450000	800	FNH3-800K-A	800	UBW800H-FTU800-3A	2x85	95	动态制动不可用			
CFW503H0370T4			370	315	300	250	450000	800	FNH3-800K-A	800	UBW800H-FTU800-3A	2x120	120				
CFW503I0480T4		I	480	415	450	350	1080450	450	FNH3-450K-A (4)	1200	UBW1200H-ELS1200-3A	2x185	2x50				
CFW503I0520T4			520	480	500/350	400	1080450	630	FNH3-630K-A (4)	1200	UBW1200H-ELS1200-3A	3x95	2x50				
CFW503I0600T4			600	515	500/350	450	1080450	630	FNH3-630K-A (4)	1200	UBW1200H-ELS1200-3A	3x150	2x70				

(1) 第一个数字是指ND应用，第二个是指HD应用。
(2) 当使用推荐的Weg熔断器时，在ND应用中每相串联使用两个熔断器。
(3) 也可使用MPW18/40/80。
(4) 每相使用两个并联的保险丝。

Driving efficiency and sustainability

English

Quick Parameter Reference

CFW503 Frequency Inverter

18256889
Document: 10012664198/01

NOTE!
For further information, please, refer to the programming manual available for download at **www.weg.net**.

1 USE OF THE HMI TO OPERATE THE INVERTER

- When in the setting mode, level 1: press this key to return to the monitoring mode.
- When in the setting mode, level 2: press this key to return to level 1 of the setting mode.
- When in the setting mode, level 3: press this key to cancel the new value (new value is not saved) and return to level 2 of the setting mode.

- When in the monitoring mode: press this key to increase the speed.
- When in the setting mode, level 1: press this key to go to the previous group.
- When in the setting mode, level 2: press this key to go to the next parameter.
- When in the setting mode, level 3: press this key to increase the content of the parameter.

Press this key to define the motor rotation direction.
Active when:
P0223 = 2 or 3 in LOC and/or P0226 = 2 or 3 in REM.

Press this key to commute between LOCAL and REMOTE mode.
Active when:
P0220 = 2 or 3.

- When in the monitoring mode: press this key to enter the setting mode.
- When in the setting mode, level 1: press this key to select the desired parameter group – it shows the parameter group selected.
- When in the setting mode, level 2: press this key to show the parameter – it shows the content of the parameter in order to change the content.
- When in the setting mode, level 3: press this key to save the new content of the parameter – it returns to level 2 of the setting mode.

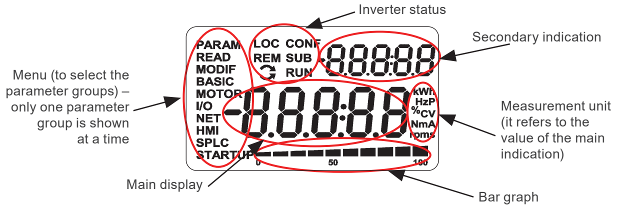
- When in the monitoring mode: press this key to decrease the speed.
- When in the setting mode, level 1: press this key to go to the next group.
- When in the setting mode, level 2: press this key to go to the previous parameter.
- When in the setting mode, level 3: press this key to decrease the content of the parameter.

Press this key to accelerate the motor within the time determined by the acceleration ramp.
Active when:
P0224 = 0 in LOC or P0227 = 0 in REM.

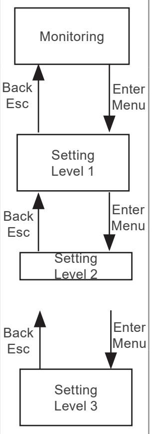
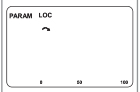
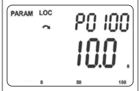
Press this key to decelerate the motor within the time determined by the deceleration ramp.
Active when:
P0224 = 0 in LOC or P0227 = 0 in REM.

Press this key to accelerate the motor up to the speed set in P0122 within the time determined by the acceleration ramp. The motor speed is kept while the key is pressed. When the key is released, the motor decelerates within the time determined by the deceleration ramp, until it stops.
This function is active when all the conditions below are met:
1. Turn/Stop = Stop.
2. Enable general = Active.
3. P0225 = 1 in LOC and/or P0228 = 1 in REM.

1.1 INDICATIONS ON THE HMI DISPLAY



1.2 OPERATING MODES OF THE HMI

Monitoring Mode		
■ It is the initial status of the HMI after the powering, up and of the initialization screen , with default values ■ The field Menu is not active in this mode ■ The main display, secondary display and bar graph indicate the values of three parameters predefined by P0205, P0206 and P0207 ■ From the monitoring mode, when you press the key ENTER/MENU you commute to the setting mode		
Setting Mode		
■ Level 1: ■ This is the first level of the setting mode. It is possible to choose the parameter group using the keys ▲ and ▼ ■ The main display, secondary display, bar graph and measurement units are not shown ■ Press the key ENTER/MENU to go to level 2 of the setting mode - parameter selection ■ Press the key BACK/ESC to return to the monitoring mode		
■ Level 2: ■ The number of the parameter is shown on the main display and its content on the secondary display ■ Use the keys ▲ and ▼ to find the desired parameter ■ Press the key ENTER/MENU to go to level 3 of the setting mode – modification of the parameter content ■ Press the key BACK/ESC to return to level 1 of the setting mode		
■ Level 3: ■ The content of the parameter is shown on the main display and the number of the parameter is shown on the secondary display ■ Use the keys ▲ and ▼ to configure the new value for the selected parameter ■ Press the key ENTER/MENU to confirm the modification (save the new value) or BACK/ ESC to cancel the modification (not save the new value). In both cases, the HMI returns to level 2 of the setting mode		

2 MAIN PAREMETERS

NOTE!
ro = read only parameter.
V/f = parameter available in V/f mode.
cfg = configuration parameter, value can only be changed with the motor stopped.
VVW = parameter available in VVW mode.
VVW PM = parameter available in VVW PM mode.
Vector = parameter available in vector mode.
Sless = parameter available only in sensorless mode.
Enc = parameter available only in vector mode with encoder.

Param.	Description	Adjustable Range	Factory Setting	Propr.	Groups
P0000	Access to Parameters	0 to 9999	0		
P0001	Speed Reference	0 to 65535		ro	READ
P0002	Output Speed (Motor)	0 to 65535		ro	READ
P0003	Motor Current	0.0 to 200.0 A		ro	READ
P0004	DC Link Voltage (Ud)	0 to 2000 V		ro	READ
P0005	Output Frequency (Motor)	0.0 to 500.0 Hz		ro	READ
P0006	Inverter Status	0 = Ready 1 = Run 2 = Undervoltage 3 = Fault 4 = Self-Tuning 5 = Configuration 6 = DC-Braking 7 = STO 8 = Fire Mode 9 = Reserved 10 = Sleep Mode		ro	READ
P0007	Output Voltage	0 to 2000 V		ro	READ
P0010	Output Power	0.0 to 6553.5 kW		ro	READ
P0011	Power Factor	-1.00 to 1.00		ro	READ
P0012	DI8 to DI1 Status	Bit 0 = DI1 Bit 1 = DI2 Bit 2 = DI3 Bit 3 = DI4 Bit 4 = DI5 Bit 5 = DI6 Bit 6 = DI7 Bit 7 = DI8		ro	READ, I/O
P0013	DO5 to DO1 Status	Bit 0 = DO1 Bit 1 = DO2 Bit 2 = DO3 Bit 3 = DO4 Bit 4 = DO5		ro	READ, I/O
P0022	FI Hz Value	0 to 20000 Hz		ro	READ, I/O
P0023	Main SW Version	0.00 to 655.35		ro	READ
P0030	Heatsink Temperature	-20 to 150 ºC		ro	READ
P0037	Motor Overload Ixt	0 to 100 %		ro	READ
P0047	CONF Status	0 to 999		ro	READ
P0048	Present Alarm	0 to 999		ro	READ
P0049	Present Fault	0 to 999		ro	READ
P0050	Last Fault	0 to 999		ro	READ
P0100	Acceleration Time	0.1 to 999.0 s	10.0 s		BASIC
P0101	Deceleration Time	0.1 to 999.0 s	10.0 s		BASIC
P0120	Speed Ref. Backup	0 = Inactive 1 = Active 2 = Backup por P0121	1		
P0121	Keypad Reference	0.0 to 500.0 Hz	3.0 Hz		
P0133	Minimum Speed	0.0 to 500.0 Hz	3.0 Hz		BASIC
P0134	Maximum Speed	0.0 to 500.0 Hz	66.0 (55.0) Hz		BASIC
P0135	Max. Output Current	0.0 to 400.0 A	1.5 x Inom	V/f, VVW, VVW PM	BASIC, MOTOR
P0136	Manual Torque Boost	0.0 to 30.0 %	According to inverter model	V/f, VVW PM	BASIC, MOTOR
P0156	Overload Current 100 %	0.0 to 400.0 A	1.1 x Inom		
P0157	Overload Current 50 %	0.0 to 400.0 A	1.0 x Inom		
P0158	Overload Current 5 %	0.0 to 400.0 A	0.8 x Inom		
P0202	Type of Control	0 = V/f 1 and 2 = Not Used 3 = Sensorless 4 = Encoder 5 = VVW 6 and 7 = Not Used 8 = VVW PM	0	cfg	STARTUP
P0204	Load/Save Parameters	0 and 1 = Not Used 2 = Reset P0045 3 = Reset P0043 4 = Reset P0044 5 = Load WEG 60 Hz 6 = Load WEG 50 Hz 7 = Load User 1 8 = Load User 2 9 = Save User 1 10 = Save User 2 11 = Load Default SoftPLC 12 to 15 = Reserved	0	cfg	
P0220	LOC/REM Selection Src	0 = Always Local 1 = Always Remote 2 = HMI Key (LOC) 3 = HMI Key (REM) 4 = DIx 5 = Serial/USB (LOC) 6 = Serial/USB (REM) 7 and 8 = Not Used 9 = CO/DN/PB/Eth (LOC) 10 = CO/DN/PB/Eth (REM) 11 = SoftPLC	2	cfg	I/O
P0221	LOC Reference Sel.	0 = HMI Keys 1 = AI1 2 = AI2 3 = AI3 4 = FI 5 = AI1 + AI2 > 0 6 = AI1 + AI2 7 = E.P. 8 = Multispeed 9 = Serial/USB 10 = Not Used 11 = CO/DN/PB/Eth 12 = SoftPLC 13 = Not Used 14 = AI1 > 0 15 = AI2 > 0 16 = AI3 > 0 17 = FI > 0	0	cfg	I/O
P0222	REM Reference Sel.	See options in P0221	1	cfg	I/O
P0223	LOC FWD/REV Selection	0 = Clockwise 1 = Counterclockwise 2 = HMI Key (H) 3 = HMI Keys (AH) 4 = DIx 5 = Serial/USB (H) 6 = Serial/USB (AH) 7 and 8 = Not Used 9 = CO/DN/PB/Eth (H) 10 = CO/DN/PB/Eth (AH) 11 = Not Used 12 = SoftPLC	2	cfg	I/O
P0224	LOC Run/Stop Selection	0 = HMI Keys 1 = DIx 2 = Serial/USB 3 = Not Used 4 = CO/DN/PB/Eth 5 = SoftPLC	0	cfg	I/O
P0225	LOC JOG Selection	0 = Disable 1 = HMI Keys 2 = DIx 3 = Serial/USB 4 = Not Used 5 = CO/DN/PB/Eth 6 = SoftPLC	1	cfg	I/O
P0226	REM Rotation Selection	See options in P0223	4	cfg	I/O
P0227	REM Run/Stop Selection	0 = Tecla HMI 1 = DIx 2 = Serial/USB 3 = Not Used 4 = CO/DN/PB/Eth 5 = SoftPLC	1	cfg	I/O
P0228	REM JOG Selection	See options in P0225	2	cfg	I/O
P0263	DI1 Function	0 = Not Used 1 = Run/Stop 2 = General Enable 3 = Quick Stop 4 = Forward Run 5 = Reverse Run 6 = Start 7 = Stop 8 = Clockwise Rotation Dir. 9 = LOC/REM 10 = JOG 11 = Accelerate E.P. 12 = Decelerate E.P. 13 = Multispeed 14 = 2nd Ramp 15 to 17 = Not Used 18 = No Ext. Alarm 19 = No Ext. Fault 20 = Reset 21 = SoftPLC 22 = PID Man./Auto 23 = Not Used 24 = Disab.Flying Start 25 = DC Link Regulator 26 = Lock Prog. 27 = Load User 1 28 = Load User 2 29 = PTC 30 and 31 = Not Used 32 = 2nd Ramp Multispeed 33 = 2nd Ramp E.P.Ac. 34 = 2nd Ramp E.P.De. 35 = 2nd Ramp FWD Run 36 = 2nd Ramp Rev Run 37 = Turn ON / Ac. E.P. 38 = De. E.P. / Turn OFF 39 = Function 1 Application 40 = Function 2 Application 41 = Function 3 Application 42 = Function 4 Application 43 = Function 5 Application 44 = Function 6 Application 45 = Function 7 Application 46 = Function 8 Application 47 = Auto/Man. PIDInt 48 = Auto/Man. PIDExt 49 = Bypass 50 = Fire Mode 51 = Run/Stop On-Lock 52 = FWDRun On-Lock 53 = RevRun On-Lock	1	cfg	I/O
P0264	DI2 Function	See Options in P0263	8	cfg	I/O
P0265	DI3 Function	See Options in P0263	20	cfg	I/O
P0266	DI4 Function	See Options in P0263	10	cfg	I/O
P0267	DI5 Function	See Options in P0263	0	cfg	I/O
P0268	DI6 Function	See Options in P0263	0	cfg	I/O
P0269	DI7 Function	See Options in P0263	0	cfg	I/O
P0270	DI8 Function	See Options in P0263	0	cfg	I/O
P0295	Inverter Rated Current	0.0 to 400.0 A	According to inverter model	ro	READ
P0296	Line Rated Voltage	0 = 200 - 240 V 1 = 380 V 2 = 400 - 415 V 3 = 440 - 460 V 4 = 480 V 5 = 500 - 525 V 6 = 550 - 575 V 7 = 600 V	According to inverter model	ro, cfg	READ
P0297	Switching Frequency	2500 to 15000 Hz	5000 Hz	cfg	
P0401	Motor Rated Current	0.0 to 400.0 A	1.0 x Inom	cfg	MOTOR, STARTUP
P0402	Motor Rated Speed	0 to 30000 rpm	1710 (1425) rpm	cfg	MOTOR, STARTUP
P0403	Motor Rated Frequency	0 to 500 Hz	60 (50) Hz	cfg	MOTOR, STARTUP

3 FAULTS AND ALARMS

Most common faults and alarms

Fault / Alarm	Description	Possible Causes
A0046 Motor Overload	Motor overload alarm	Settings of P0156, P0157, and P0158 are too low for the used motor Overload on the motor shaft
A0050 Power Module Overtemperature	Overtemperature alarm from the power module temperature sensor (NTC)	High ambient temperature around the inverter (> 40 °C (> 104 °F)) and high output current Blocked or defective fan Heatsink is too dirty, preventing the air flow
A0090 External Alarm	External alarm via DIx (option "No External Alarm" in P026x)	Wiring on DI1 to DI8 inputs are open or have poor contact
A0700 Communication Fault with Remote HMI	No communication with remote HMI, but there is no speed command or reference for this source	Check if the communication interface with the HMI is properly configured in parameter P0312 HMI cable disconnected
F0021 Undervoltage on the DC Link	Undervoltage fault on the intermediate circuit	Wrong voltage supply; check if the data on the inverter label comply with the power supply and parameter P0296 Supply voltage is too low, producing voltage on the DC link below the minimum value (in P0004): Ud < 360 Vdc in 380-480 Vac (P0296 = 1) Phase fault in the input Fault in the pre-charge circuit
F0022 Overvoltage on the DC Link	Overvoltage fault on the intermediate circuit	Wrong voltage supply; check if the data on the inverter label comply with the power supply and parameter P0296 Supply voltage is too high, producing voltage on the DC link above the maximum value (in P0004): Ud > 810 Vdc in 380-480 Vac (P0296 = 1) Load inertia is too high or deceleration ramp is too fast P0151, P0153 or P0185 setting is too high
F0031 Communication Fault with Plug-In Module	Main control cannot set a communication link with the Plug-In module	Plug-In module is damaged Plug-In module is not properly connected Problem in the identification of the Plug-In module; refer to P0027 for further information
F0051 IGBTs Overtemperature	Overtemperature fault measured on the temperature sensor of the power pack	High ambient temperature around the inverter (>40 °C (>104 °F)) and high output current Blocked or defective fan Heatsink is too dirty, preventing the air flow
F0070 Overcurrent/Short-Circuit	Overcurrent or short- circuit on the output, DC link or braking resistor	Short- circuit between two motor phases Short- circuit of the rheostatic braking resistor connecting cables IGBTs module in short- circuit or damaged Start with too short acceleration ramp Start with motor spinning without the flying-start function
F0072 Motor Overload	Motor overload fault (60 s in 1.5xInom)	P0156, P0157 and P0158 setting is too low in relation to the motor operating current Overload on the motor shaft
F0080 CPU Fault (Watchdog)	Fault related to the supervision algorithm of the inverter main CPU	Electric noise Inverter firmware fault
F0084 Auto-Diagnosis Fault	Fault related to the automatic identification algorithm of the inverter hardware and Plug-In module	Poor contact in the connection between the main control and the power pack Hardware not compatible with the firmware version Defect on the internal circuits of the inverter
F0091 External Fault	External fault via DIx ("No External Fault" in P026x)	Wiring on DI1 to DI8 inputs are open or have poor contact
F0700 Remote HMI Communication Fault	No communication with remote HMI, but there is speed command or reference for this source	Check if the communication interface with the HMI is properly configured in parameter P0312 HMI cable disconnected

4 DEFAULT CONFIGURATION FOR SPEED REFERENCE AND COMMAND

The CFW503 is configured at the factory by setting its parameters so as to define the logical command and the speed reference in both LOCAL and REMOTE operating modes. This default setting can be restored by means of P0204 for both motors 60Hz and 50Hz (P0204 = 5 or 6).

In the LOCAL mode, the command and reference are directed to the HMI of the CFW503, allowing the commands Run/Stop, JOG and Direction of Rotation of the motor. In addition to these commands, the HMI keypad can also be used to select the LOCAL or REMOTE mode. The speed reference can be set in P0121 or by means of the ▲ and ▼ keys of the HMI in the monitoring mode.

In the REMOTE mode, the speed reference and command are directed to the product terminals; DI1 executes Run/Stop and DI2 the Direction of Rotation. The reference is executed by analog input AI1 in this mode.

Driving efficiency and sustainability

中文

快速参考引用

CFW503 变频器

18256889

文件: 10012664198/01

1 使用HMI操作变频器

- 当在设置模式时，1级：按下此键返到监控模式。
- 当在设置模式时，2级：按下此键返回到设置模式的1级。
- 当在设置模式时，3 级：按下此键取消新值（新值未保存）并返回到设置模式的2级。

- 当在监控模式时：按下此键进入设置模式。
- 当在设置模式时，1级：按下此键选择想要的参数组别-它会显示已选择的组别。
- 当在设置模式时，2级：按下此键显示参数-它显示参数内容，以改变内容。
- 当在设置模式时，3级：按下此键保存新参数内容-它返回到设置模式的2级。

- 当在监控模式时：按下此键加速。
- 当在设置模式时，1级：按下此键进入前一个组别。
- 当在设置模式时，2级：按下此键进入下一个参数。
- 当在设置模式时，3级：按下此键增加参数内容。

- 当在监控模式时：按下此键减速。
- 当在设置模式时，1级：按下此键进入下一个组别。
- 当在设置模式时，2级：按下此键进入前一个参数。
- 当在设置模式时，3级：按下此键减少参数内容。

按下此键定义电机旋转方向。
当以下条件满足时，启动：
P0223 = LOC 和/或P0226中的2或3 = REM的2或3

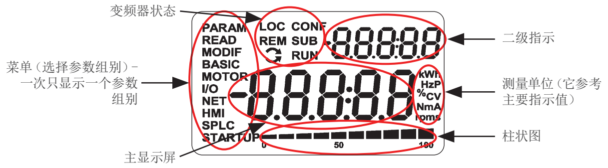
按下此键，将电机速度在加速转速决定的时间内加速。
当以下条件满足时，启动：
P0225 = LOC或P0227中的0 = REM的0。

按下此键切换本地模式和远程模式。
当以下条件满足时，启动：
P0220 = 2或3。

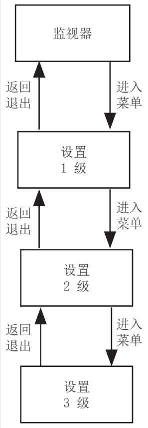
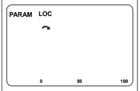
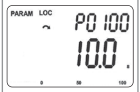
按下此键，将电机速度在减速转速决定的时间内减速。
当以下条件满足时，启动：
P0225 = LOC或P0227中的0 = REM的0。

按下此键，将电机速度在加速转速决定的时间内加速至P0122中设置的速度值。按下该键时，电机速度保持不变。放松该键时，电机在减速转速决定的时间内减速，直至停止。当以下所有条件都满足时，该功能被启动。
1.转/停止 = 停止。
2.常规启用 = 启动
3.P0225 = LOC和/或P0228中的1= REM的1。

1.1 HMI显示屏指示



1.2 HMI操作模式

监控模式		
■ 接入电源、初始化屏幕后，HMI的状态为初始状态，含故障值 ■ 在这种模式中，这个字段菜单未启动 ■ 主显示、二次显示和柱状图表明P0205、P0206和P0207预先定义的三个 ■ 参数值。 ■ 当你按下进入/菜单键时，你从监控模式切换到设置模式		
设置模式		
■ 级： ■ 这是设置模式的 1 级。可以用 ▲ 和 ▼ 键来选择参数组别 ■ 未显示主显示、二次显示、柱状图和测量单位 ■ 按下 进入/菜单 键，进入设置模式的 2级 - 参数选择 ■ 按下 返回/退出 键，返回到监控模式		
■ 级： ■ 参数数量显示在主显示中，参数内容显示在二次显示中 ■ 使用 ▲ 和 ▼ 键找到所需的参数 ■ 按下 进入/菜单 键，进入设置模式的 3级 - 参数内容修改 ■ 按下 返回/退出 键，返回到监控模式 1级		
■ 级： ■ 参数内容显示在主显示中，参数数量显示在二次显示中 ■ 使用 ▲ 和 ▼ 键，在所选参数中设置新值 ■ 按下 进入/菜单 键，确定修改（保存新值）或按下 返回/退出 键，取消修 ■ 改（未保存新值）。两种情况下，HMI 返回设置模式的 2级		

2 主要参数

注意!
ro = 只读参数。
V/f = V/f 模式下可用参数。
cfg = 配置参数，数值只能在电机停止后更改。
VVW = VVW模式中的可用参数。
矢量 = 矢量模式中的可用参数。
Sless = 仅是无传感器模式中的可用参数。
Enc = 含编码器矢量模式中的可用参数。

参数	描述	可调节范围	出厂设置	归属主体	组别
P0000	参数入口	0 至 9999	0		
P0001	速度参考值	速度参考值0 至 65535		ro	读取
P0002	输出速度（电机）	0 至 65535		ro	读取
P0003	电机电流	0.0 至 200.0 A		ro	读取
P0004	直流环节电压（Ud）	0 至 2000 V		ro	读取
P0005	输出频率（电机）	0.0 至 500.0 Hz		ro	读取
P0006	变频器状态	0 = 就绪 1 = 运行 2 = 低压 3 = 故障 4 = 自动调谐 5 = 配置 6 = 直流制动 7 = STO 8 = 消防模式 9 = 预留模式 10 = 睡眠模式		ro	读取
P0007	输出电压	0 至 2000 V		ro	读取
P0010	输出功率	0.0 至 6553.5 kW		ro	读取
P0011	功率系数	-1.00 至 1.00		ro	读取
P0012	DI8 至 DI1 状态	0 位 = DI1 1 位 = DI2 2 位 = DI3 3 位 = DI4 4 位 = DI5 5 位 = DI6 6 位 = DI7 7 位 = DI8		ro	读取，输入/输出
P0013	D05 至 D01 状态	0 位 = D01 1 位 = D02 2 位 = D03 3 位 = D04 4 位 = D05		ro	读取，输入/输出
P0022	FI Hz 值	0 至 20000 Hz		ro	读取，输入/输出
P0023	主要 SW 版本	0.00 至 655.35		ro	读取
P0030	散热器温度	-20 至 150°C		ro	读取
P0037	电机过载 Ixt	0 至 100 %		ro	读取
P0047	配置状态	0 至 999		ro	读取
P0048	当前警报	0 至 999		ro	读取
P0049	当前故障	0 至 999		ro	读取
P0050	上次故障	0 至 999		ro	读取
P0100	加速时间	0.1 至 999.0秒	10.0 s		基础
P0101	减速时间	0.1 至 999.0秒	10.0 s		基础
P0120	速度参考备份	0 = 无效 1 = 有效 2 = 经 P0121 备份	1		
P0121	键盘参考	0.0 至 500.0 Hz	3.0 Hz		
P0133	最低速度	0.0 至 500.0 Hz	3.0 Hz		基础
P0134	最高速度	0.0 至 500.0 Hz	66.0 (55.0) Hz		基础
P0135	最大输出电流	0.0 至 400.0 A	1.5 x Inom	V/f, VVW, VVW PM	基础，电机
P0136	手动转矩提升	0.0 至 30.0 %	根据变频器型号	V/f, VVW PM	基础，电机
P0156	过载电流100%	0.0 至 400.0 A	1.1 x Inom		
P0157	过载电流50 %	0.0 至 400.0 A	1.0 x Inom		
P0158	过载电流5 %	0.0 至 400.0 A	0.8 x Inom		
P0202	控制类型	0 = V/f 1和2 = 未使用 3 = 无传感器 4 = 编码器 5 = V VW 6和7 = 未使用 8 = V VW PM	0	cfg	启动
P0204	负载/保存参数	0 和 1 = 未使用 2 = 重置 P0045 3 = 重置 P0043 4 = 重置 P0044 5 = 负载 WEG 60 Hz 6 = 负载 WEG 50 Hz 7 = 加载用户 1 8 = 加载用户 2 9 = 保存用户 1 10 = 保存用户 2 11 = 加载默认 SoftPLC 12 至 15 = 保留	0	cfg	
P0220	LOC/REM 选择 Src	0 = 始终本地 1 = 总是远程 2 = HMI键（本地） 3 = HMI键（远程） 4 = DIx 5 = 串口/USB端口 (LOC) 6 = 串口/USB (REM) 7 = 未使用 8 = 未使用 9 = CO/DN/PB/Eth (LOC) 10 = CO/DN/PB/Eth (REM) 11 = SoftPLC	2	cfg	输入/输出
P0221	LOC参考选择	LOC参考选择0 = HMI 键 1 = AI1 2 = AI2 3 = AI3 4 = FI 5 = AI1 + AI2 > 0 6 = AI1 + AI2 7 = E.P. 8 = 多速 9 = 串口/USB 10 = 未使用 11 = CO/DN/PB/Eth 12 = SoftPLC 13 = 未使用 14 = AI1 > 0 15 = AI2 > 0 16 = AI3 > 0 17 = FI > 0	0	cfg	输入/输出
P0222	REM参考选择	见P0221中的选项	1	cfg	输入/输出
P0223	LOC FWD/REV 选择	0 = 顺时针 1 = 逆时针 2 = HMI 键（H） 3 = HMI 键（AH） 4 = DIx 5 = 串口/USB (H) 6 = 串口/USB (AH) 7和8 = 未使用 9 = CO/DN/PB/Eth (H) 10 = CO/DN/PB/Eth (AH) 11 = 未使用 12 = SoftPLC	2	cfg	输入/输出
P0224	LOC 运行/停止 选择	0 = HMI 键 1 = DIx 2 = 串口/USB 3 = 未使用 4 = CO/DN/PB/Eth 5 = SoftPLC	0	cfg	输入/输出
P0225	LOC JOG 选择	0 = 禁用 1 = HMI 键 2 = DIx 3 = 串口/USB 4 = 未使用 5 = CO/DN/PB/Eth 6 = SoftPLC	1	cfg	输入/输出
P0226	REM 旋转选择	见P0223中的选项	4	cfg	输入/输出
P0227	REM 运行/停止 选择	0 = Tecla HMI 1 = DIx 2 = 串口/USB 3 = 未使用 4 = CO/DN/PB/Eth 5 = SoftPLC	1	cfg	输入/输出
P0228	REM JOG 选择	见P0225中的选项	2	cfg	输入/输出
P0263	DI1 功能	0 = 未使用 1 = 运行/停止 2 = 常规启用 3 = 快速停止 4 = 快进 5 = 快退 6 = 启动 7 = 停止 8 = 顺时针旋转方向 9 = LOC/REM 10 = JOG 11 = 加速 E.P. 12 = 减速 E.P. 13 = 多速 14 = 第 2 斜坡 15至17 = 未使用 18 = 不延长警报 19 = 不延长故障 20 = 重新设置 21 = SoftPLC 22 = PID 手动/自动 23 = 未使用 24 =禁用快速启动 25 = 直流环节调节器 26 = 锁定程序 27 = 加载用户 1 28 = 加载用户 2 29 = PTC 30和31 = 未使用 32 = 第 2 斜坡多速 33 = 第 2 斜坡 E.P.加速 34 = 第 2 斜坡 E.P.减速 35 = 第 2 斜坡向前运行 36 = 第 2 斜坡退后运行 37 = 开启/加速E.P. 38 = 减速E.P./关闭 39 = 功能 1 应用 40 = 功能 2 应用 41 = 功能 3 应用 42 = 功能 4 应用 43 = 功能 5 应用 44 = 功能 6 应用 45 = 功能 7 应用 46 = 功能 8 应用 47 =自动/人工PIDInt 48 =自动/手动PIDExt 49 =绕过 50 =火灾模式 51 =运行/ S。开锁 52 = FWD /锁定运行 53 =锁定时修订/运行	1	cfg	输入/输出
P0264	DI2 功能	见P0263中的选项	8	cfg	输入/输出
P0265	DI3 功能	见P0263中的选项	20	cfg	输入/输出
P0266	DI4 功能	见P0263中的选项	10	cfg	输入/输出
P0267	DI5 功能	见P0263中的选项	0	cfg	输入/输出
P0268	DI6 功能	见P0263中的选项	0	cfg	输入/输出
P0269	DI7 功能	见P0263中的选项	0	cfg	输入/输出
P0270	DI8 功能	见P0263中的选项	0	cfg	输入/输出
P0295	变频器额定电流	0.0 至 400.0 A	根据变频器型号	ro	读取
P0296	线路额定电压	0 = 200 - 240 V 1 = 380 V 2 = 400 - 415 V 3 = 440 - 460 V 4 = 480 V 5 = 500 - 525 V 6 = 550 - 575 V 7 = 600 V	根据变频器型号	ro, cfg	读取
P0297	交换频率	2500 至 15000 Hz	5000 Hz	cfg	
P0401	电机额定电流	0.0 至 400.0 A	1,0 x Inom	cfg	电机，启动
P0402	电机额定转速	0 至 30000 转/分	1710 (1425) 转/分	cfg	电机，启动
P0403	电机额定频率	0 至 500 Hz	60 (50) Hz	cfg	电机，启动

3 故障和警报

最常见故障和警报

故障/警报	描述	可能原因
A0046 电机过载	电机过载警报	■ P0156、P0157和P0158的设置值对于所用电机过低 ■ 电机轴过载
A0050 功率模块 过热	电源温度过高警报 模块温度传感器（NTC）	■ 变频器周围高温 (> 40 °C (> 104 °F)) 及高额输出电流 ■ 风扇堵塞或故障 ■ 散热器太脏，导致空气无法流通
A0090 外部警报	通过DIx（P026x中的“无外部警报”选项）发出外部警报	■ DI1 至 DI8 输入接线断开或接触不良
A0700 远程HMI通信故障	远程HMI无通信，但 具有速度指令或参考值 作为数据源	■ 检查 HMI 通信接口是否按参数 P0312 正确配置 ■ HMI 电缆断开
F0021 直流环节低压	中间电路超电压故障	■ 供电不符；检查变频器标签上的数是否符合电源及参数 P0296 ■ 电源电压过低，导致 DC Link 上的电压低于最小值（P0004 中）： ■ Ud < 360 Vdc 在 380-480 Vac (P0296 = 1) ■ 输入端相位故障 ■ 预充电电路故障
F0022 直流母线过电压	中间电路超电压故障	■ 供电不符；检查变频器标签上的数是否符合电源及参数 P0296 ■ 供给电压太高时，在(P0004)高于最大值的直流环节上产生电压： ■ Ud > 810 Vdc 在 380-480 Vac (P0296 = 1) ■ 负载惯量过高或减速斜坡太快 ■ P0151，P0153或P0185設置過高
F0031 插入模块通信故障	主控制器不能设置插入模块的通信连接	■ 插入模块被损坏 ■ 插入模块未能正确连接 ■ 识别插入模块问题；参考P0027获取更多信息
F0051 IGBTs 过热	电源组温度传感器过热故障	■ 变频器周围高温 (> 40 °C (> 104 °F)) 及高额输出电流 ■ 风扇堵塞或故障 ■ 散热器太脏，导致空气无法流通
F0070 过载电流/短路	输出、直流环节或制动电阻器电流过载或短路	■ 两个电机相位间短路 ■ 制动电阻器连接电缆短路 ■ IGBTs 模块短路或损坏 ■ 启动加速斜坡过短 ■ 未使用快速启动功能启动电机旋转
F0072 电机过载	电机过载故障 (在 1.5xInom 内60 s)	■ 与电机操作电流相关的P0156、P0157和P0158的设置值过低 ■ 电机轴过载
F0080 CPU 故障 (监视器)	与变频器主CPU的监管算法相关的故障	■ 电子噪音 ■ 变频器固件故障
F0084 自动诊断故障	变频器硬件和插入模块自动识别算法相关的故障	■ 主要控制器件与电源组接触不良 ■ 硬件不兼容固件版本 ■ 变频器内部电路故障
F0091 外部故障	通过DIx（P026x中的“无外部故障”选项）发出外部故障	■ DI1 至 DI8 输入接线断开或接触不良
F0700 远程HMI通信故障	远程HMI无通信，但 具有该数据源的速度指令或参考值	■ 检查 HMI 通信接口是否按参数 P0312 正确配置 ■ HMI 电缆断开

4 速度参考和指令默认配置

CFW503出厂时已设置好参数，以便在本地和远程操作模式中定义逻辑指令和速度参考值。通过60Hz和50Hz 电机的P0204存储该默认设置（P0204= 5或6）。

在本地模式中，指令和参考指向CFW503的HMI，允许指令 运行/停止、JOG和电机旋转方向。除了这些指 令，HMI键盘还可以用于选择本地或远程模式。可在P0121或通过在监控模式下的HMI ▲ 和 ▼ 两个键设置 速度参考值。

在远程模式中，速度参考值和指令指向产品终端；DI1执行 运行/停止，DI2执行 旋转方向。参考值由该模 式中的模拟输入AI1执行。