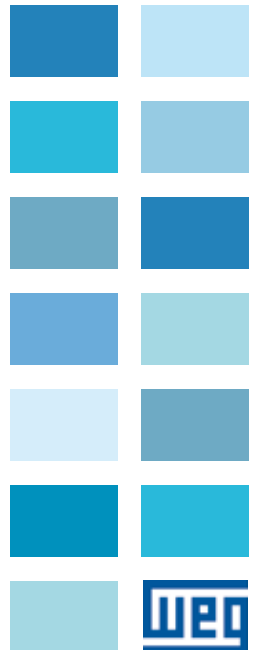


Field oriented vector AC Drive

ADV200 WA
ADV200 WA-...-DC

Quick start up guide
Specification and installation

Language: English



Information about this manual

The ADV200 WA Quick start guide is a handy-sized manual for mechanical installation, electrical connection and fast start-up.
The manual explaining the functions and a description of the parameters and the manuals of the expansions and field bus can be found on WEG web site ([https://www.weg.net/...](https://www.weg.net/)).

Software version

This manual is updated according the software version V 2.X.1
The identification number of the software version is indicated on the identification plate of the drive or can be checked with the **Firmware ver.rel** - PAR 490 parameter, menu 2.5.

General information

Note !

|||||
In industry, the terms "Inverter", "Regulator" and "Drive" are sometimes interchanged. In this document, the term "Drive" will be used.
|||||

Before using the product, read the safety instruction section carefully. Keep the manual in a safe place and available to engineering and installation personnel during the product functioning period.
WEG Automation Europe S.r.l. has the right to modify products, data and dimensions without notice. The data can only be used for the product description and they can not be understood as legally stated properties.

Thank you for choosing this WEG product.
We will be glad to receive any possible information which could help us improving this manual.
The e-mail address is the following: techdoc@weg.net.
All rights reserved

Table of contents

Information about this manual	2
1 - Safety Precautions	6
1.1 Symbols used in the manual	6
1.2 Safety precaution	7
1.3 General warnings	7
1.4 Instruction for compliance with UL Mark (UL requirements), U.S. and Canadian electrical codes	9
1.5 Disclaimer	10
2 - Introduction to the product.....	11
2.1 Drive type designation	13
2.1.1 Parallel inverters	14
3 - Transport and storage	15
3.1 General	15
3.2 Permissible Environmental Conditions	16
3.3 Disposal of the device	16
4 - Mechanical installation	17
4.1 Inclination and mounting clearance	17
4.2 Fastening positions.....	18
5 - Wiring Procedure	24
5.1 Power section	28
5.1.1 Cable Cross Section	28
5.1.2 Connection of shielding	29
5.1.3 EMC guide line	30
5.1.4 Block diagram power section	31
5.1.5 Internal EMC filter	35
5.1.6 Power line connection.....	36
5.1.7 Input mains choke (L1)	39
5.1.8 Motor connection	39
5.1.9 Braking unit connection (optional)	41
5.1.10 Parallel connection on the AC (Input) and DC (Intermediate Circuit) side of several inverters	42
5.1.11 Parallel DC connection.....	43
5.1.12 Connection of fans	44
5.2 Regulation section	46
5.2.1 Removing the terminal cover	46
5.2.2 Cable Cross Section	46
5.2.3 Regulation section connection	46
5.2.4 Switches, jumpers and LED	48
5.2.5 R-PSM pre-charge card (only for sizes \geq 72000).....	51
5.2.6 R-SM3-ADV pre-charge card (only for sizes \geq 72000)	57
5.3 Braking	59
5.3.1 Braking unit.....	59
5.4 Serial interface (XS connector).....	61
5.4.1 Drive / RS 485 Port (not insulated) point-to-point connection	61
5.4.2 Drive / RS485 port point-to-point connection (with insulation)	62
5.4.3 RS 485 multi-drop connection	63
5.5 Typical connection diagrams	65
6 - Use of the keypad	71
6.1 Description.....	71
6.2 Navigation.....	72
6.2.1 Scanning of the first and second level menus	72
6.2.2 Display of a parameter.....	72
6.2.3 Scanning of the parameters	73

6.2.4	List of the last parameters modified	73
6.2.5	"Goto parameter" function	73
6.3	Parameter modification	74
6.4	How to save parameters	75
6.5	Configuration of the display	76
6.5.1	Language selection	76
6.5.2	Selection of Easy / Export mode	76
6.5.3	Startup display	76
6.5.4	Back-lighting of the display	76
6.6	Alarms	77
6.6.1	Alarm reset	77
6.7	Messages	77
6.8	Saving and recovery of new parameter settings	78
6.8.1	Selection of the keypad memory	78
6.8.2	Saving of parameters on the keypad	78
6.8.3	Load parameters from keypad	79
6.8.4	Transfer of parameters between drives	79
7	- Commissioning via keypad (STARTUP WIZARD)	80
7.1	Startup Wizard	83
7.1.1	Startup Wizard for Asynchronous Motors	83
7.2	First customized start-up	93
7.3	Programming	98
7.3.1	Menu display modes	98
7.3.2	Programming of "function block" analog and digital input signals	98
7.3.3	Variable interconnections mode	98
7.3.4	Multiple destination	100
8	- Troubleshooting	102
8.1	Alarms	102
8.2	Messages	106
9	- Specification	111
9.1	Environmental Conditions	111
9.2	Standards	111
9.3	Accuracy (Asynchronous)	112
9.3.1	Current control	112
9.3.2	Speed control	112
9.3.3	Speed control limits	112
9.3.4	Torque control	112
9.3.5	Overload	112
9.4	DC circuit	112
9.5	Input electrical data	113
9.5.1	AC power supply	113
9.5.2	DC power supply	114
9.6	Output electrical data	115
9.6.1	Derating factors	117
9.6.2	Overload for output frequency	120
9.7	Voltage level of the inverter for safe operations	121
9.8	Cooling	121
9.9	Weight and dimensions	122
10	- Options	133
10.1	Optional external fuses	133
10.1.1	AC input side fuses (F1)	133
10.1.2	External fuses of the power section DC input side (F2)	134
10.1.3	Optional internal fuses for the DC connection (F2)	135
10.2	Choke	136
10.2.1	Optional input chokes (L1)	136
10.2.2	Input chokes for conformity to EN61000-3-12 for drives with input currents of between 16A and 75A	137
10.2.3	Optional external choke (L2)	137

10.3 External EMC filter (optional).....	141
10.4 External filters to reduce grid harmonics (optional)	143
10.4.1 Choice of performance and calculation of current in RHF filters	143
10.4.2 Connection diagrams	144
10.4.3 Matching motors, RHF filters and ADV200-WA drives.....	146
10.4.4 Dimensions and weights of RHF filters	149
10.4.5 Dimensions and weights of L0-RHF chokes.....	150
10.5 Braking resistor (optional).....	151
10.6 Insulation monitor	152
10.7 Installation of optional cards	153
10.7.1 Procedure	154
10.7.2 Shielding of optional card connections	155
Appendix 1 - Parallel connection (500 ... 1800 kW sizes)...	156
A 1.1 Introduction.....	156
A 1.2 Compatibility of IGBT modules	157
A 1.2 MS-SL interface cable wiring sizes 400...800 kW	159
A 1.2 MS-SL interface cable wiring sizes 900...1000 kW	160
A 1.4 MS-SL interface cable wiring size 1500 kW	161
A 1.5 MS-SL interface cable wiring size 1800 kW	162
A 1.6 Jumpers and Switches	163
A 1.7 LEDs.....	163
A 1.8 Safety STO Interface	165
A 1.8.1 ADV200 WA-...-MS-SI models (INT-P-ADV card, revision "F" and lower)	165
A 1.8.2 ADV-...-MS-SI models (INT-P-ADV card, from revision "L")	165
Appendix 2 - Miscellaneous	168
A 2.1 DC-link capacity	168

1 - Safety Precautions

1.1 Symbols used in the manual



Indicates a procedure, condition, or statement that, if not strictly observed, could result in personal injury or death.

Indique le mode d'utilisation, la procédure et la condition d'exploitation. Si ces consignes ne sont pas strictement respectées, il y a des risques de blessures corporelles ou de mort.



Indicates a procedure, condition, or statement that, if not strictly observed, could result in damage to or destruction of equipment.

Indique le mode d'utilisation, la procédure et la condition d'exploitation. Si ces consignes ne sont pas strictement respectées, il y a des risques de détérioration ou de destruction des appareils.



Indicates that the presence of electrostatic discharge could damage the appliance. When handling the boards, always wear a grounded bracelet.

Indique que la présence de décharges électrostatiques est susceptible d'endommager l'appareil. Toujours porter un bracelet de mise à la terre lors de la manipulation des cartes.



Indicates a procedure, condition, or statement that should be strictly followed in order to optimize these applications.

Indique le mode d'utilisation, la procédure et la condition d'exploitation. Ces consignes doivent être rigoureusement respectées pour optimiser ces applications.

Note !

Indicates an essential or important procedure, condition, or statement.

Indique un mode d'utilisation, de procédure et de condition d'exploitation essentiels ou importants

Qualified personnel

For the purpose of this Instruction Manual, a "Qualified person" is someone who is skilled to the installation, mounting, start-up and operation of the equipment and the hazards involved. This operator must have the following qualifications:

- trained in rendering first aid.
- trained in the proper care and use of protective equipment in accordance with established safety procedures.
- trained and authorized to energize, de-energize, clear, ground and tag circuits and equipment in accordance with established safety procedures.

Personne qualifiée

Aux fins de ce manuel d'instructions, le terme « personne qualifiée » désigne toute personne compétente en matière d'installation, de montage, de mise en service et de fonctionnement de l'appareil et au fait des dangers qui s'y rattachent. L'opérateur en question doit posséder les qualifications suivantes :

- formation lui permettant de dispenser les premiers soins
- formation liée à l'entretien et à l'utilisation des équipements de protection selon les consignes de sécurité en vigueur
- formation et habilitation aux manoeuvres suivantes : branchement, débranchement,

vérification des isolations, mise à la terre et étiquetage des circuits et des appareils selon les consignes de sécurité en vigueur

Use for intended purpose only

The power drive system (electrical drive + application plant) may be used only for the application stated in the manual and only together with devices and components recommended and authorized by WEG.

Utiliser uniquement dans les conditions prévues

Le système d'actionnement électrique (drive électrique + installation) ne peut être utilisé que dans les conditions d'exploitation et les lieux prévus dans le manuel et uniquement avec les dispositifs et les composants recommandés et autorisés par WEG.

1.2 Safety precaution

The following instructions are provided for your safety and as a means of preventing damage to the product or components in the machines connected. This section lists instructions, which apply generally when handling electrical drives. Specific instructions that apply to particular actions are listed at the beginning of each chapter.

Les instructions suivantes sont fournies pour la sécurité de l'utilisateur tout comme pour éviter l'endommagement du produit ou des composants à l'intérieur des machines raccordées. Ce paragraphe dresse la liste des instructions généralement applicables lors de la manipulation des drives électriques.

Les instructions spécifiques ayant trait à des actions particulières sont répertoriées au début de chaque chapitre.

Read the information carefully, since it is provided for your personal safety and will also help prolong the service life of your electrical drive and the plant you connect to it.

Lire attentivement les informations en matière de sécurité personnelle et visant par ailleurs à prolonger la durée de vie utile du drive tout comme de l'installation à laquelle il est relié.

1.3 General warnings

.....

This equipment contains dangerous voltages and controls potentially dangerous rotating mechanical parts. Non-compliance with Warnings or failure to follow the instructions contained in this manual can result in loss of life, severe personal injury or serious damage to property.

Cet appareil utilise des tensions dangereuses et contrôle des organes mécaniques en mouvement potentiellement dangereux. L'absence de mise en pratique des consignes ou le non-respect des instructions contenues dans ce manuel peuvent provoquer le décès, des lésions corporelles graves ou de sérieux dégâts aux équipements.

The drives cause mechanical movements. The user is responsible for ensuring that these mechanical movements do not create unsafe conditions. The safety blocks and operating limits provided by the manufacturer cannot be bypassed or modified

Les drives occasionnent des mouvements mécaniques. L'utilisateur est tenu de s'assurer que de tels mouvements mécaniques ne débouchent pas sur des conditions d'insécurité. Les butées de sécurité et les seuils d'exploitation prévus par le fabricant ne doivent être ni contournés ni modifiés.

Only suitable qualified personnel should work on this equipment, and only after becoming familiar with all safety notices, installation, operation and maintenance procedures contained in this manual. The successful and safe operation of this equipment is dependent upon its proper handling, installation, operation and maintenance.



Warning!

Seul un personnel dûment formé peut intervenir sur cet appareil et uniquement après avoir assimilé l'ensemble des informations concernant la sécurité, les procédures d'installation, le fonctionnement et l'entretien contenues dans ce manuel. La sécurité et l'efficacité du fonctionnement de cet appareil dépendent du bon accomplissement des opérations de manutention, d'installation, de fonctionnement et d'entretien.

In the case of faults, the drive, even if disabled, may cause accidental movements if it has not been disconnected from the mains supply.

En cas de panne et même désactivé, le drive peut provoquer des mouvements fortuits s'il n'a pas été débranché de l'alimentation secteur.

Electrical Shock

The DC link capacitors remain charged at a hazardous voltage even after cutting off the power supply.

Never open the device or covers while the AC Input power supply is switched on. Minimum time to wait before working on the terminals or inside the device is listed in [section 9.7](#).

Risque de décharge électrique

Les condensateurs de la liaison à courant continu restent chargés à une tension dangereuse même après que la tension d'alimentation a été coupée.

Ne jamais ouvrir l'appareil lorsqu'il est sous tension. Le temps minimum d'attente avant de pouvoir travailler sur les bornes ou bien à l'intérieur de l'appareil est indiqué dans la [section 9.7](#).

Electrical Shock and Burn Hazard:

When using instruments such as oscilloscopes to work on live equipment, the oscilloscope's chassis should be grounded and a differential probe input should be used. Care should be used in the selection of probes and leads and in the adjustment of the oscilloscope so that accurate readings may be made. See instrument manufacturer's instruction book for proper operation and adjustments to the instrument.

Décharge Électrique et Risque de Brûlure : Lors de l'utilisation d'instruments (par exemple oscilloscope) sur des systèmes en marche, le châssis de l'oscilloscope doit être relié à la terre et une sonde différentiel devrait être utilisée en entrée. Les sondes et conducteurs doivent être choisis avec soin pour effectuer les meilleures mesures à l'aide d'un oscilloscope. Voir le manuel d'instruction pour une utilisation correcte des instruments.

Fire and Explosion Hazard:

Fires or explosions might result from mounting Drives in hazardous areas such as locations where flammable or combustible vapors or dusts are present. Drives should be installed away from hazardous areas, even if used with motors suitable for use in these locations.

Risque d'incendies et d'explosions: L'utilisation des drives dans des zones à risques (présence de vapeurs ou de poussières inflammables), peut provoquer des incendies ou des explosions. Les drives doivent être installés loin des zones dangereuses, et équipés de moteurs appropriés.

.....

1.4 Instruction for compliance with UL Mark (UL requirements), U.S. and Canadian electrical codes

Short circuit ratings

ADV200 WA inverters must be connected to a mains capable of supplying a symmetrical short-circuit power of less than or equal to “xxxx A rms (at 480 V +10% V max).

The values of the “xxxx” A rms short-circuit current, in accordance with UL requirements (UL 508 c), for each motor power rating (Pn mot in the manual) are shown in the table below.

Short current rating	
Pn mot (kW)	SCCR (A) @480Vac
1.1...37.3	5000
39....149	10000
150....298	18000
299.....447	30000
448 ... 671	42000
672 ... 1193	85000

Note!

Drive will be protected by semiconductor Fuse type as specified in the instruction manual.

Branch circuit protection

In order to protect drive against over-current use fuses specified in par. “10.1 Optional external fuses”, page 133.

Environmental condition

The drive has to be considered “Open type equipment”. Max surrounding air temperature equal to 40°C. Pollution degree 2.

Wiring of the input and output power terminals

Use UL listed cables rated at 75°C and round crimping terminals. Crimp terminals with tool recommended by terminal manufacturer.
Field wiring terminals shall be used with the tightening torque specified in par. “5.1.1 Cable Cross Section”, page 28.

Over-voltage control

In compliance with CSA-requirements Overvoltage at mains terminal is achieved installing an overvoltage protection device as for :
Type OVR 1N 15 320 from ABB or similar.

Minimum time required for safe DC-link voltage

Before removing drive cover in order to access internal parts, after mains disconnection wait 300 sec for time.

Over-speed; over-load/current limit; motor overload

Drive incorporate over-speed, over-current/current limit, motor overload protection. Instruction manual specify degree of protection and detailed installation instruction.

Solid State Motor Overload Protection

Drive incorporate motor overload protection. Protection is implemented as

software function. Instruction manual specify degree of protection and detailed installation instruction. *

*Applicable up to 9 May 2013.

New requirement. Applicable as from 9 May 2013.

The drive is not provided with the internal motor overload protection (software function) as required under UL 508c as from 9 May 2013.

The drive is designed for use with motors with integrated thermal overload protection.

The integrated thermal overload protection signal must be connected to the equipment, starting from a contact, on the "digital input connector" terminal, pins 4 and 10, that accepts a maximum of 24 VDC, 5 mA. The final result of this signal is the switching of the motor control device output to solid state OFF.

1.5 Disclaimer

Any remote connection functions shall be used only under adequate security conditions, in compliance with current regulatory provisions and only by properly trained personnel. The evaluation of such conditions is up to the user.

2 - Introduction to the product

The new inverter series ADV200 WA represents an innovative concept in drive technology, as a result of the constant technological research and of the experience that the WEG Automation Europe has acquired keeping a constant presence aside that of the major sector players.

The new range has been engineered and developed to satisfy the real needs of System Integrators and OEM's in order to provide them the best innovations and economical competitiveness in the international markets.

Based on full mechanical modularity and on a powerful, intuitive and "fully open" programming platform, ADV200 WA offers absolute integration flexibility with high-end performance in any system architectures of the most advanced automation environments.

Designed and built specifically for the control of variable torque applications such as centrifugal pumps and fans, ADV200 WA is the ideal inverter for water treatment plants and HVAC systems.

• Modularity

An innovative concept of integrated technology that offers full modularity. Mountable side by side and with accessories specifically dedicated to system solutions, ADV200 WA has been engineered to make installation easy for any operator, both in existing systems and in specific machine solutions, always offering a real reduction of required space in the cabinet and the best manageability.

• Integrated Quality

ADV200 WA integrates the fundamental devices for an absolute quality level, such as the DC choke that ensures maximum reliability in any conditions of working and the input filter that renders the drive in compliance with the EMC normative EN61800-3. Note: the choke and filter are not present in ADV200 WA-DC models.

• Fast Access

Structured to offer simple and fast management of the product in any situation of installation and mounting. From the terminal access to the rack assembling of the options, each operation is quick and easy.

• Smart Connections

Dedicated accessories and fully removable terminals, ensure simple and fast installation and start-up in compliance with the EMC normative.

• Options

ADV200 WA manages up to 3 option cards. The following cards should be installed:

- **EXP-IO-D6A4R1-ADV**: 4 Digital inputs, 2 Digital Outputs, 2 Analog Inputs, 2 Analog Outputs and 2 double contact Relays.
- **EXP-IO-SEN-100-ADV** and **EXP-IO-SEN-1000-ADV**: dedicated cards for direct reading of PT100, PT1000 and NI1000 temperature sensors
- **EXP-IO-D5R8-ADV**: control of multi-pump systems.
- **EXP-CAN-ADV**, **EXP-PDP-ADV**, **EXP-ETH-...**, **SBI-...** : Field Bus expansion.

-
- **Safety STO Interface** (ADV200 WA-...-SI models and the master inverter of 500 kW to 1.2 MW parallel versions)

Integrated on board as the 4th option or integrated in the INT-P-ADV power card (sizes ≥ 72000 and from "L" HW version), the EXP- SFTy card allows the motor to be disabled without the use of a safety contactor on the drive output, guaranteeing compliance to the directive for machine safety EN61800-5-2 SIL3.

- **Serial Line**

Integrated standard RS485 serial line with Modbus RTU protocol, for peer-to-peer or multidrop connections (with OPT-RS485-ADV card).

- **Back-Up Supply**

ADV200 WA can be supplied through an external +24Vdc supply in order to be kept active in case of mains input loss, ensuring in this situation the operation of all monitoring functions, programming and any connected fieldbus network.

- **Cables shield**

OMEGA clamp to grounding 360° of shielded cables.


2.1 Drive type designation

The main technical characteristic of the drive are showed in the product code and in the nameplate. I.e. product code:

ADV200-WA 1 040 -K BX -4 -XX YY -DC -SI -IT

IT = IT Network configuration		
Safety card	EXP-SFTy-ADV included	
DC bus power supply version		
Parallel version only:		
XX : MS = MASTER	YY :	
SL = SLAVE	05 = 500.0 kW	10 = 1000.0 kW
	06 = 630.0 kW	12 = 1200.0 kW
	07 = 710.0 kW	15 = 1500.0 kW
	08 = 800.0 kW	18 = 1800.0 kW
Rated voltage :		
A = 400 Vac	4A = 460 Vac	
Software:	X = standard	
Braking unit:	B = included	
X = non included		
Keypad:	K = included	
X = not included		
Drive power, in kW:		
015 = 1.5 kW	185 = 18.5 kW	1100 = 110.0 kW
022 = 2.2 kW	220 = 22.0 kW	1320 = 132.0 kW
030 = 3.0 kW	300 = 30.0 kW	1600 = 160.0 kW
040 = 4.0 kW	370 = 37.0 kW	2000 = 200.0 kW
055 = 5.5 kW	450 = 45.0 kW	2500 = 250.0 kW
075 = 7.5 kW	550 = 55.0 kW	3150 = 315.0 kW
110 = 11.0 kW	750 = 75.0 kW	3550 = 355.0 kW
150 = 15.0 kW	900 = 90.0 kW	4000 = 400.0 kW
Mechanical drive sizes:		
1 = size 1	4 = size 4	7 = size 7
2 = size 2	5 = size 5	
3 = size 3	6 = size 6	
Drive ADV200 WA series		

Identification Nameplate

Serial number	WEG	WEG Automation Europe S.r.l. - Via G.Cardiucci, 24 I-21040-Cesenano, VA
Drive model	Type: ADV200-WA-1055-KBX-4	S/N: 07012345
Input (mains supply, frequency, AC Input Current at constant torque)	Inp: 400Vac-15% + 500Vac+5% 50/60Hz 3Ph 11.1A@400Vac 10A@480Vac	
Output (Output voltage, frequency, power, current, CT and VT overloads)	Out: 0-480Vac 500Hz 3Ph 5.5kW@400Vac 7.5Hp@460Vac 5.5kW 13A@400V 11.7A@460V Ovid.110%-60s 4kW 9.5A@400V 8.6A@460V Ovid.150%-60s	
Approvals	Made in Italy 	

Firmware & cards revision level nameplate

Firmware revision	Firmware Release	HW release					S/N	07012345	Prod. CONF
	2.00	D	F	P	R	S	BU	SW .CFG	A2
Cards revision									
				Power	Regulation	Safety	Braking unit	Software revision	Product configuration

The inverter must be selected according to the rated current of the motor. The rated output current of the drive must be higher than or equal to the rated current of the motor used.

The speed of the three-phase motor is determined by the number of pole pairs and the frequency (nameplate, data sheet) of the motor concerned.

Operation above the rated frequency and speed of the motor must take into account the specifications given by the manufacturer losses (bearings, unbalance etc.). This also applies to temperature specifications for continuous operation under 20 Hz (poor motor ventilation, not applicable to motors with external ventilation).

2.1.1 Parallel inverters

- Inverters of between 500 kW and 800 kW comprise one master and one slave.
- Inverters of over 1000 kW comprise one master and two or more slaves.

When placing your order **please give the code number of the master and slave and number of these:**

Power	code	Description (Designation)	code	Description (Designation)
500kW	S9O25WM	ADV200-WA-72500-KXX-4-MS 05 -SI	S9O25WMC	ADV200-WA-72500-KXX-4- MS 05-DC- SI
	S9O25WS	ADV200-WA-72500-KXX-4-SL	S9O25WMC	ADV200-WA-72500-KXX-4- SL-DC
630kW	S9O26WM	ADV200-WA-73150-KXX-4-MS 06 -SI	S9O26WMC	ADV200-WA-73150-KXX-4-MS 06-DC-SI
	S9O26WS	ADV200-WA-73150-KXX-4-SL	S9O26WSC	ADV200-WA-73150-KXX-4-SL-DC
710kW	S9O27WM	ADV200-WA-73550-KXX-4-MS 07 -SI	S9O27WMC	ADV200-WA-73550-KXX-4-MS 07-DC-SI
	S9O27WL	ADV200-WA-73550-KXX-4-SL	S9O27WSC	ADV200-WA-73550-KXX-4-SL-DC
800kW	S9O28WM	ADV200-WA-74000-KXX-4-MS 08 -SI	S9O28WMC	ADV200-WA-74000-KXX-4- MS 08-DC-SI
	S9O28WS	ADV200-WA-74000-KXX-4-SL	S9O28WSC	ADV200-WA-74000-KXX-4- SL-DC
1000kW	S9O27WM1	ADV200-WA-73550-KXX-4-MS 10 -SI	S9O27WMC	ADV200-WA-73550-KXX-4-MS 10-DC-SI
	S9O27WL	ADV200-WA-73550-KXX-4-SL	S9O27WSC	ADV200-WA-73550-KXX-4-SL-DC
	S9O27WL	ADV200-WA-73550-KXX-4-SL	S9O27WSC	ADV200-WA-73550-KXX-4-SL-DC
1200kW	S9O28WM1	ADV200-WA-74000-KXX-4-MS 12 -SI	S9O28WMC	ADV200-WA-74000-KXX-4- MS 12-DC-SI
	S9O28WS	ADV200-WA-74000-KXX-4-SL	S9O28WSC	ADV200-WA-74000-KXX-4- SL-DC
	S9O28WS	ADV200-WA-74000-KXX-4-SL	S9O28WSC	ADV200-WA-74000-KXX-4- SL-DC
1500kW	S9O27WM3	ADV200-WA-73550-KXX-4-MS 15-SI	S9O28WM3	ADV200-WA-74000-KXX-4-MS 15-DC-SI
	S9O27WL	ADV200-WA-73550-KXX-4-SL	S9O28WSC	ADV200-WA-74000-KXX-4-SL-DC
	S9O27WL	ADV200-WA-73550-KXX-4-SL	S9O28WSC	ADV200-WA-74000-KXX-4-SL-DC
	S9O27WL1	ADV200-WA-73550-KXX-4-SL2	S8O28WSC1	ADV200-WA-74000-KXX-4-SL2-DC
1800kW	S9O27WM4	ADV200-WA-73550-KXX-4-MS 18-SI	S9O28WM4	ADV200-WA-74000-KXX-4-MS 18-DC-SI
	S9O27WL	ADV200-WA-73550-KXX-4-SL	S9O28WSC	ADV200-WA-74000-KXX-4-SL-DC
	S9O27WL	ADV200-WA-73550-KXX-4-SL	S9O28WSC	ADV200-WA-74000-KXX-4-SL-DC
	S9O27WL1	ADV200-WA-73550-KXX-4-SL2	S9O28WSC1	ADV200-WA-74000-KXX-4-SL2-DC
	S9O27WL1	ADV200-WA-73550-KXX-4-SL2	S9O28WSC1	ADV200-WA-74000-KXX-4-SL2-DC

3 - Transport and storage



Correct transport, storage, erection and mounting, as well as careful operation and maintenance are essential for proper and safe operation of the equipment. Protect the inverter against physical shocks and vibration during transport and storage. Also be sure to protect it against water (rainfall) and excessive temperatures.

Le bon accomplissement des opérations de transport, de stockage, d'installation et de montage, ainsi que l'exploitation et l'entretien minutieux, sont essentiels pour garantir à l'appareil un fonctionnement adéquat et sûr.

If the Drives have been stored for longer than two years, the operation of the DC link capacitors may be impaired and must be "reformed". Before commissioning devices that have been stored for long periods, connect them to a power supply for two hours with no load connected in order to regenerate the capacitors, (the input voltage has to be applied without enabling the drive).

En cas de stockage des variateurs pendant plus de deux ans, il est conseillé de contrôler l'état des condensateurs CC avant d'en effectuer le branchement. Avant la mise en service des appareils, ayant été stockés pendant long temps, il faut alimenter variateurs à vide pendant deux heures, pour régénérer les condensateurs : appliquer une tension d'alimentation sans actionner le variateur.

3.1 General

A high degree of care is taken in packing the ADV Drives and preparing them for delivery. They should only be transported with suitable transport equipment (see weight data). Observe the instructions printed on the packaging. This also applies when the device is unpacked and installed in the control cabinet.

Upon delivery, check the following:

- the packaging for any external damage
- whether the delivery note matches your order.

Open the packaging with suitable tools. Check whether:

- any parts were damaged during transport
- the device type corresponds to your order

In the event of any damage or of an incomplete or incorrect delivery please notify the responsible sales offices immediately. The devices should only be stored in dry rooms within the specified temperature ranges .

Note!

A certain degree of moisture condensation is permissible if this arises from changes in temperature. This does not, however, apply when the devices are in operation. Always ensure that there is no moisture condensation in devices that are connected to the power supply!

3.2 Permissible Environmental Conditions

Temperature

storage _____	-25...+55°C (-13...+131°F), class 1K4 per EN50178
	-20...+55°C (-4...+131°F), for devices with keypad
transport _____	-25...+70°C (-13...+158°F), class 2K3 per EN50178
	-20...+60°C (-4...+140°F), for devices with keypad

Air humidity

storage _____	from 5% to 95 % and from 1 g/m ³ to 29 g/m ³ (class 1K3 as per EN50178)
transport _____	95 % (3), 60 g/m ³ (4)

A light condensation of moisture may occur for a short time occasionally if the device is not in operation (class 2K3 as per EN50178)

Air pressure:

storage _____	[kPa] 86 to 106 (class 1K4 as per EN50178)
transport _____	[kPa] 70 to 106 (class 2K3 as per EN50178)

- (3) Greatest relative air humidity occurs with the temperature @ 40°C (104°F) or if the temperature of the device is brought suddenly from -25...+30°C (-13°...+86°F).
- (4) Greatest absolute air humidity if the device is brought suddenly from 70...15°C (158°...59°F).

.....
The drive is suitable for use under the environmental service conditions (climate, mechanical, pollution, etc.) defined as usual service conditions according to EN61800-2.
.....



3.3 Disposal of the device

The ADV200 inverter can be disposed of as electronic waste according to national regulations in force for the disposal of electronic components.



Pursuant to Article 26 of Italian Legislative Decree no. 49 of 14 March 2014 “Implementation of Directive 2012/19/EU on waste electrical and electronic equipment (WEEE)”

The symbol showing a crossed-out wheeled bin on equipment or its packaging indicates that the product must be collected separately from other waste at the end of its useful life. The manufacturer is responsible for organising and managing the separate collection of this piece of equipment at the end of its useful life.

Users wishing to dispose of the equipment must therefore contact the manufacturer to obtain instructions from the same on how to have the equipment collected separately at the end of its useful life.

By collecting the disused equipment separately, it can be recycled, treated or disposed of in an environmentally friendly manner, thus helping to prevent the environment and public health from being affected negatively and enabling reuse and/or recycling of the materials forming the same equipment.

4 - Mechanical installation



The Drive must be mounted on a wall that is constructed of heat resistant material. While the Drive is operating, the temperature of the Drive's cooling fins can rise to a temperature of 158° F (70°C).

Le drive doit être monté sur un mur construit avec des matériaux résistants à la chaleur. Pendant le fonctionnement du drive, la température des ailettes du dissipateur thermique peut arriver à 70°C (158° F).

Because the ambient temperature greatly affects Drive life and reliability, do not install the Drive in any location that exceeds the allowable temperature.

Étant donné que la température ambiante influe sur la vie et la fiabilité du drive, on ne devrait pas installer le drive dans des places où la température permise est dépassée.

Be sure to remove the desiccant dryer packet(s) when unpacking the Drive. (If not removed these packets may become lodged in the fan or air passages and cause the Drive to overheat).

Lors du déballage du drive, retirer le sachet déshydraté. (Si celui-ci n'est pas retiré, il empêche la ventilation et provoque une surchauffe du drive).

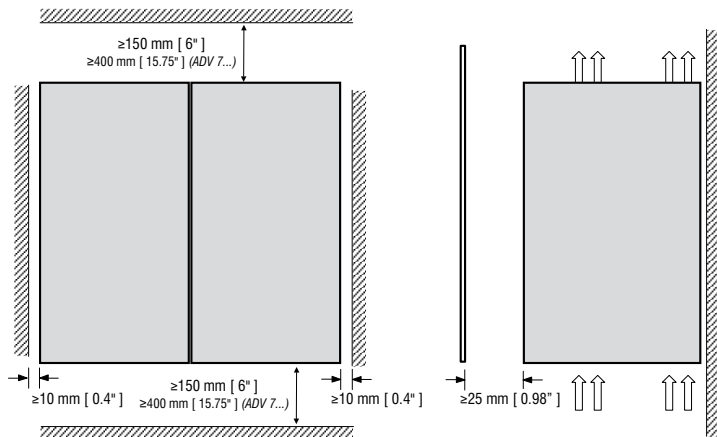
Protect the device from impermissible environmental conditions (temperature, humidity, shock etc.).

Protéger l'appareil contre des effets extérieurs non permis (température, humidité, chocs etc.).

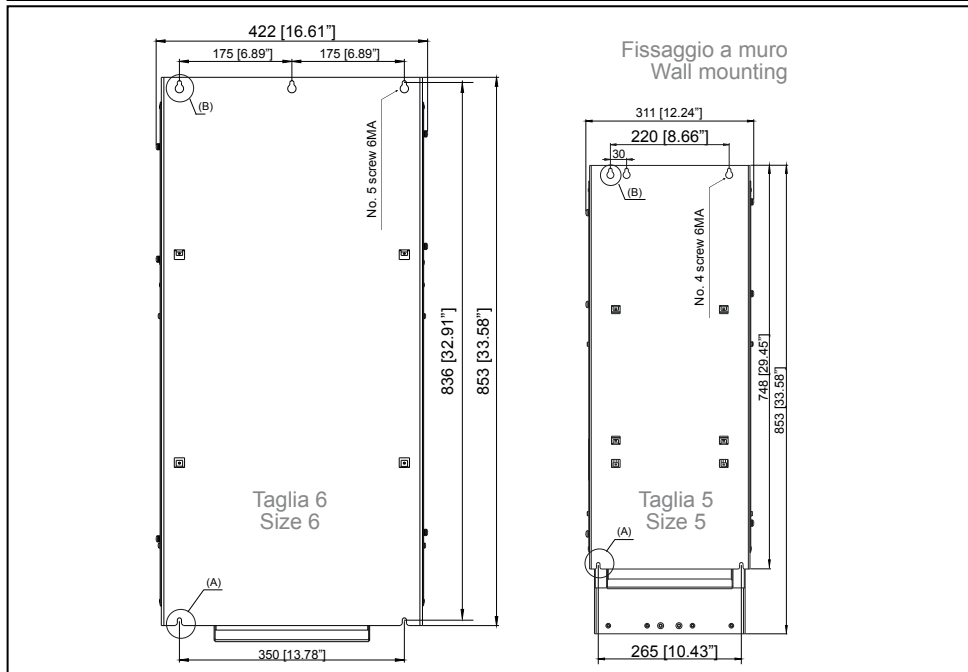
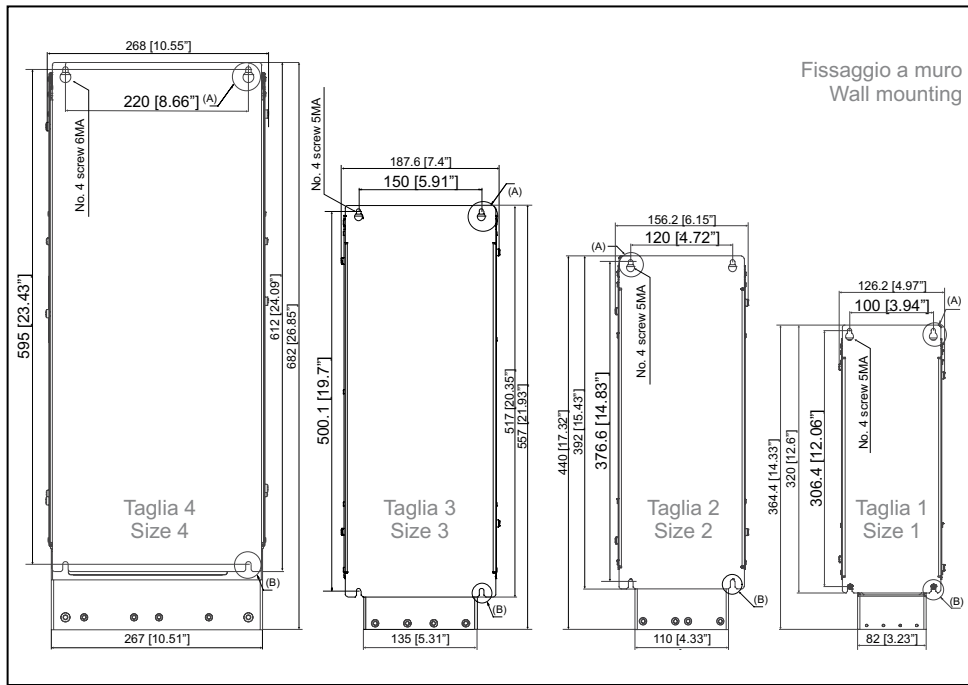
4.1 Inclination and mounting clearance

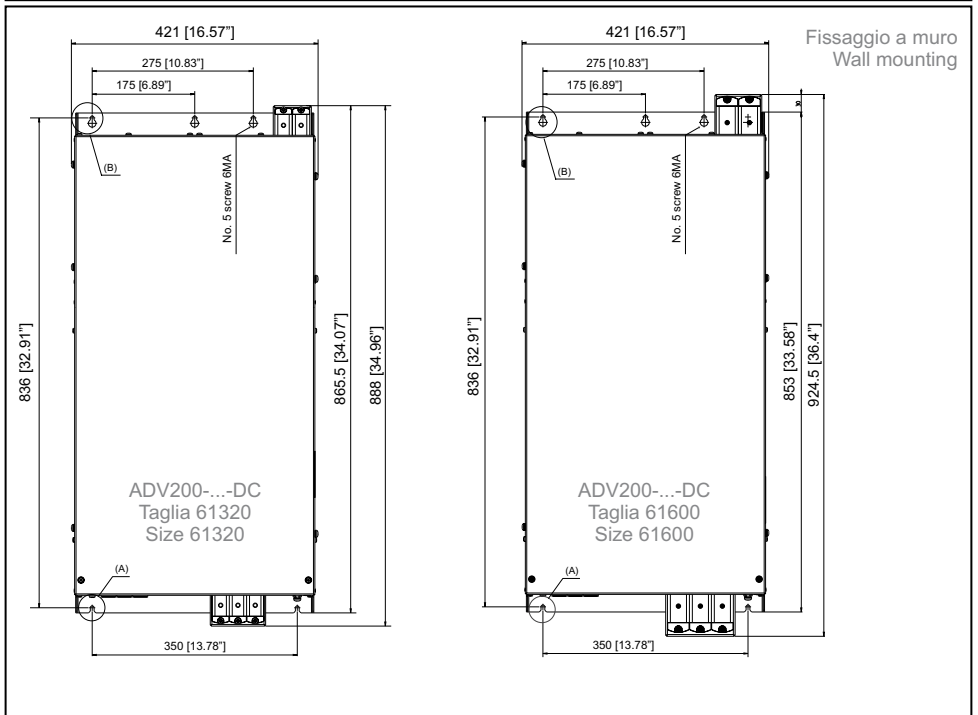
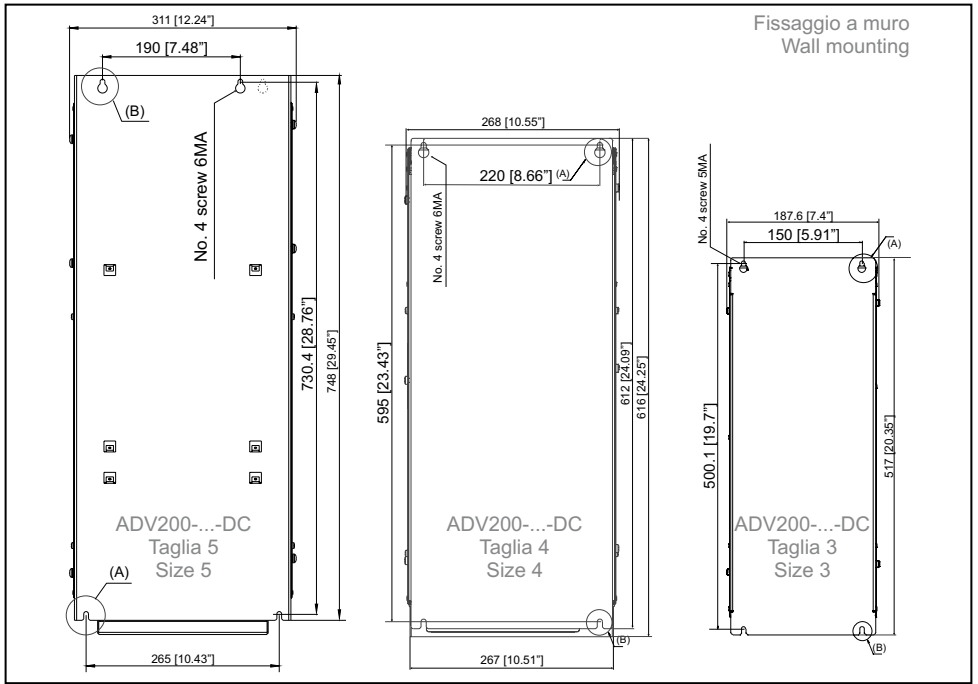
The Drives must be mounted in such a way that the free flow of air is ensured see paragraph "9.8 Cooling", page 121.

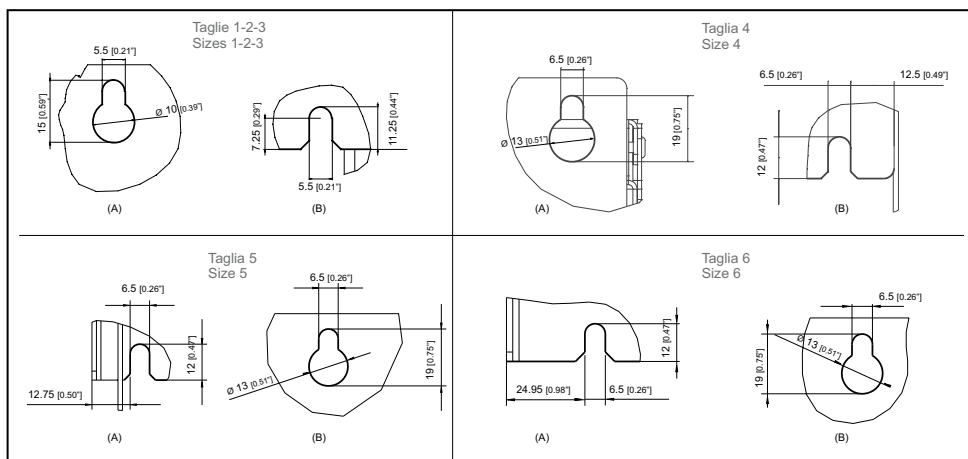
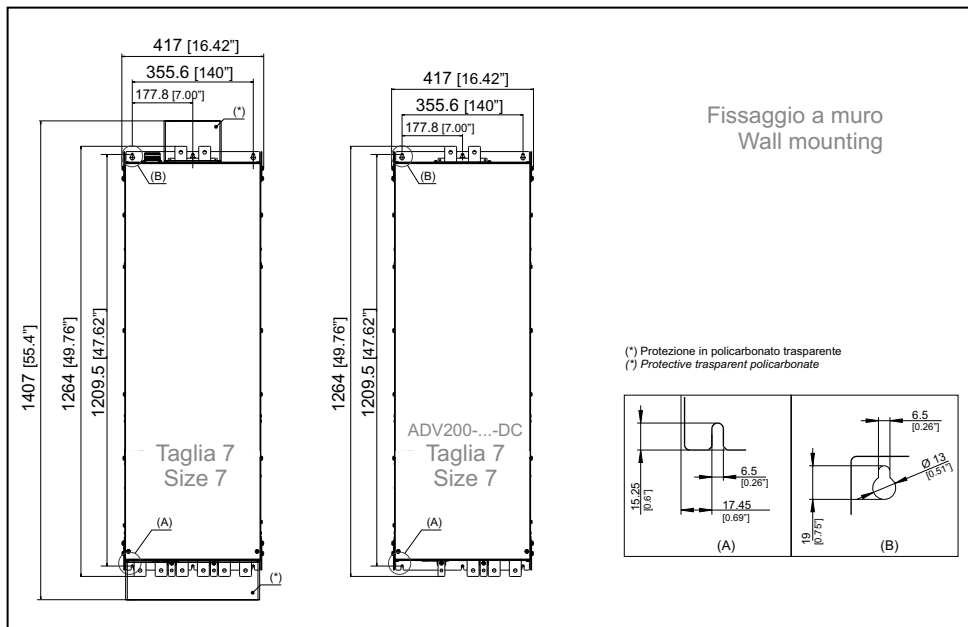
Maximum angle of inclination _____ 30° (referred to vertical position)
 Minimum top and bottom distance _____ 150 mm (≥ADV200 WA-72000 = 400mm)
 Minimum free space to the front _____ 25 mm
 Minimum distance between drives _____ none
 Minimum distance to the side with the cabinet 10 mm



4.2 Fastening positions



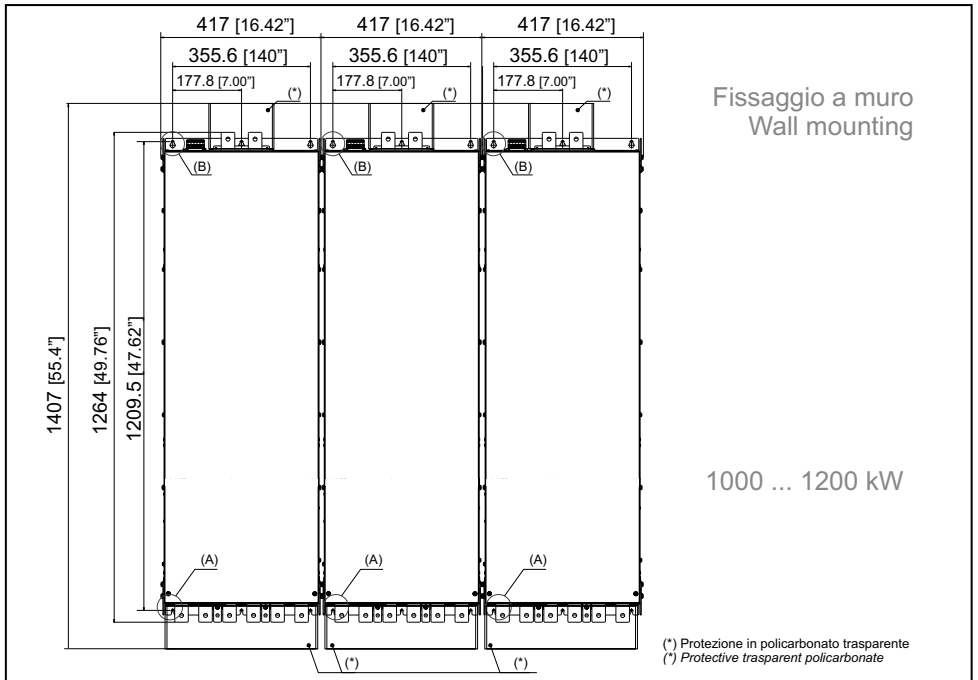
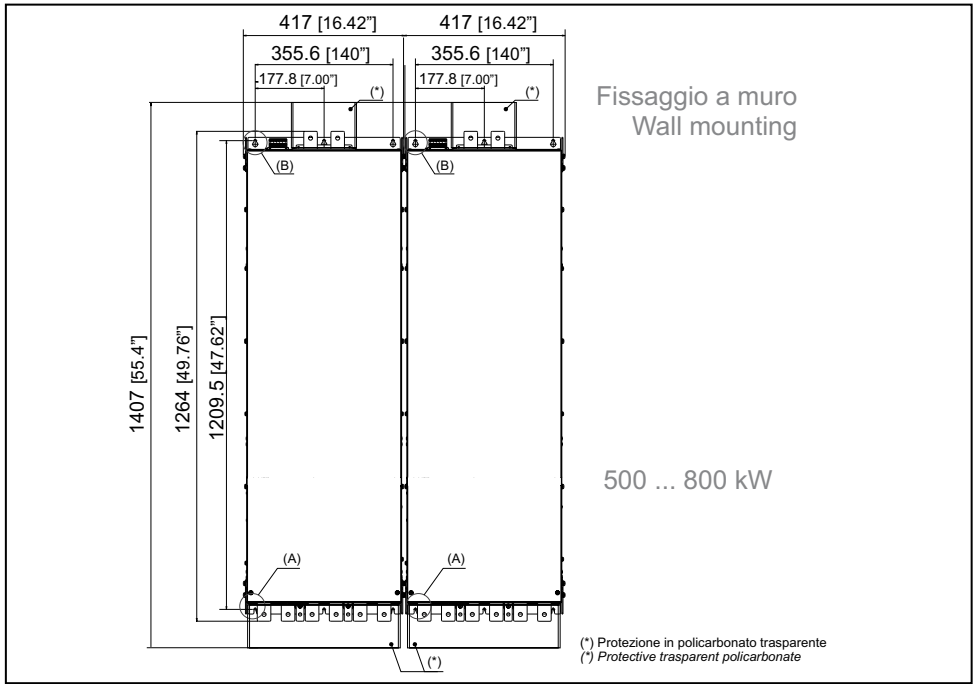


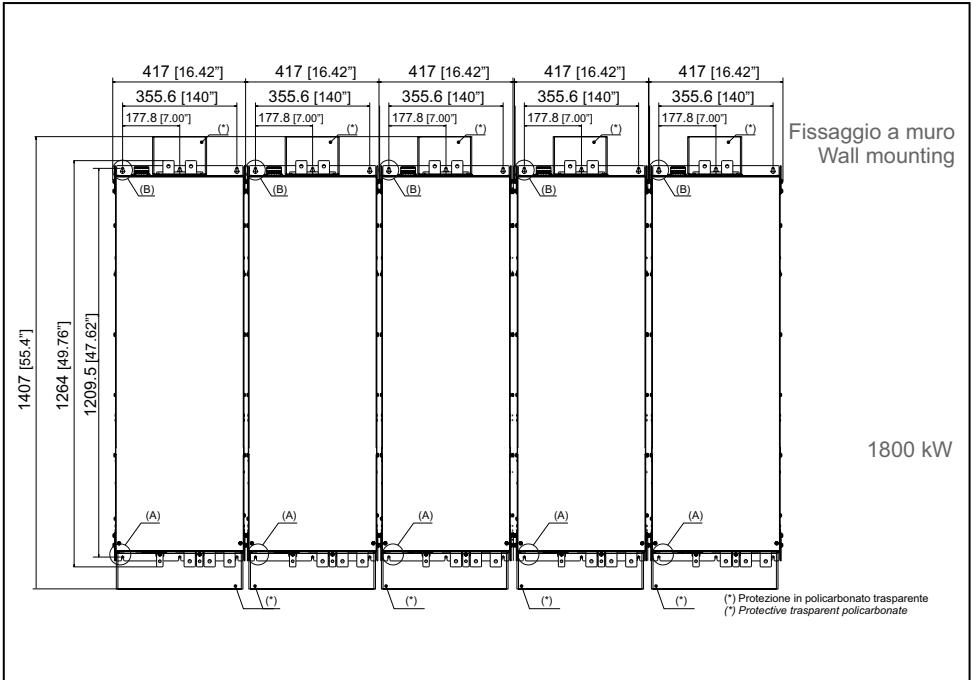
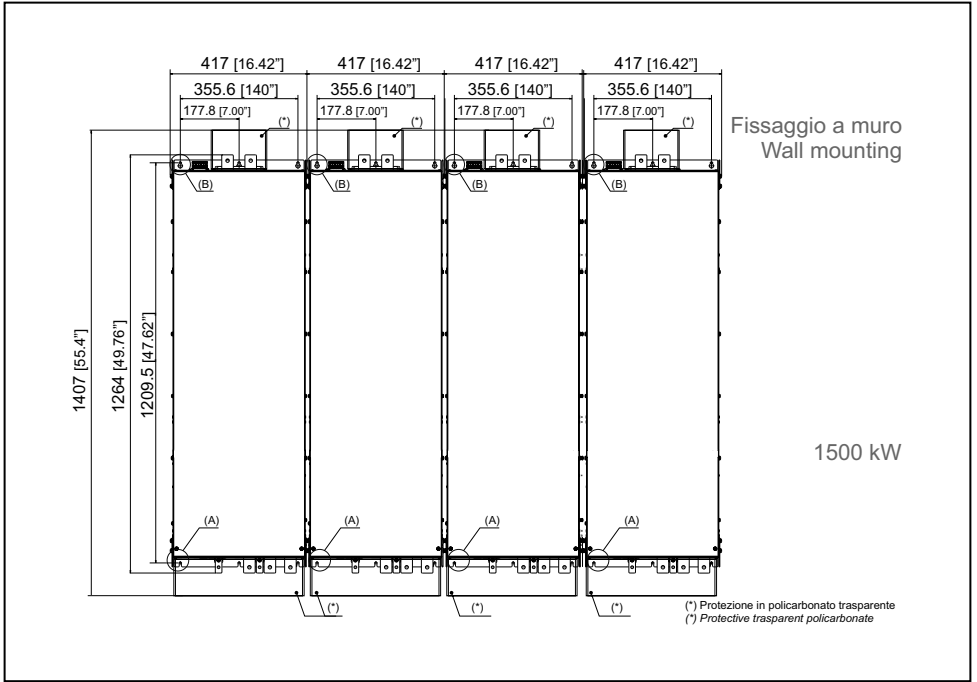


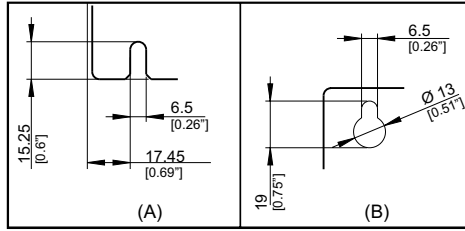
			Recommended screws for fastening
Size 1 (ADV 1...)	Size 2 (ADV 2...)	Size 3 (ADV 3...)	4 x M5 x 12 mm screws + Grover (spring-lock) washer + Flat washer
Size 4 (ADV 4...)	Size 5 (ADV 5...)		4 x M6 x 16 mm screws + Grover (spring-lock) washer + Flat washer
Size 6 (ADV 6...)			5 x M6 x 16 mm screws + Grover (spring-lock) washer + Flat washer
Size 7 (ADV 7...)			6 x M6 x 16 mm screws + Grover (spring-lock) washer + Flat washer

Note:

Other dimensions see chapter "9.9 Weight and dimensions", page 122.







		Recommended screws for fastening
500kW	ADV200-WA-72500-KXX-4-MS 05-... ADV200-WA-72500-KXX-4-SL	12 x M6 x 16 mm screws + Grover (spring-lock) washer + Flat washer
630kW	ADV200-WA-73150-KXX-4-MS 06-... ADV200-WA-73150-KXX-4-SL	
710kW	ADV200-WA-73550-KXX-4-MS 07-... ADV200-WA-73550-KXX-4-SL	
800kW	ADV200-WA-74000-KXX-4-MS 08-... ADV200-WA-74000-KXX-4-SL	
1000kW	ADV200-WA-73550-KXX-4-MS 10-... ADV200-WA-73550-KXX-4-SL ADV200-WA-73550-KXX-4-SL	18 x M6 x 16 mm screws + Grover (spring-lock) washer + Flat washer
1200kW	ADV200-WA-74000-KXX-4-MS 12-... ADV200-WA-74000-KXX-4-SL ADV200-WA-74000-KXX-4-SL	24 x M6 x 16 mm screws + Grover (spring-lock) washer + Flat washer
1500 kW	ADV200-WA-73550-KXX-4-MS 15-SI ADV200-WA-73550-KXX-4-SL ADV200-WA-73550-KXX-4-SL ADV200-WA-73550-KXX-4-SL2	
	ADV200-WA-74000-KXX-4-MS 15-DC-SI ADV200-WA-74000-KXX-4-SL-DC ADV200-WA-74000-KXX-4-SL-DC ADV200-WA-74000-KXX-4-SL2-DC	
1800 kW	ADV200-WA-73550-KXX-4-MS 18-SI ADV200-WA-73550-KXX-4-SL ADV200-WA-73550-KXX-4-SL ADV200-WA-73550-KXX-4-SL2 ADV200-WA-73550-KXX-4-SL2	30 x M6 x 16 mm screws + Grover (spring-lock) washer + Flat washer
	ADV200-WA-74000-KXX-4-MS 18-DC-SI ADV200-WA-74000-KXX-4-SL-DC ADV200-WA-74000-KXX-4-SL-DC ADV200-WA-74000-KXX-4-SL2-DC ADV200-WA-74000-KXX-4-SL2-DC	

Note!

Other dimensions see chapter "9.9 Weight and dimensions", page 122.

5 - Wiring Procedure



Adjustable frequency drives are electrical apparatus for use in industrial installations. Parts of the Drives are energized during operation. The electrical installation and the opening of the equipment should therefore only be carried out by qualified personnel. Improper installation of motors or Drives may therefore cause the failure of the device as well as serious injury to persons or material damage. Drive is not equipped with motor overspeed protection logic other than that controlled by software. Follow the instructions given in this manual and observe the local and national safety regulations applicable.

Les drives à fréquence variable sont des dispositifs électriques utilisés dans des installations industriels. Une partie des drives sont sous tension pendant l'opération. L'installation électrique et l'ouverture des drives devrait être exécuté uniquement par du personnel qualifié. De mauvaises installations de moteurs ou de drives peuvent provoquer des dommages matériels ou blesser des personnes. On doit suivre les instructions données dans ce manuel et observer les règles nationales de sécurité.

Replace all covers before applying power to the Drive. Failure to do so may result in death or serious injury.

Remettre tous les capots avant de mettre sous tension le drive. Des erreurs peuvent provoquer de sérieux accidents ou même la mort.

The drive must always be grounded. If the drive is not connected correctly to ground, extremely hazardous conditions may be generated that may result in death or serious injury.

Le drive doit toujours être raccordé au système de mise à la terre. *Un mauvais raccordement du drive au système de mise à la terre peut se traduire par des conditions extrêmement dangereuses susceptibles d'entraîner le décès ou de graves lésions corporelles.*

Never open the device or covers while the AC Input power supply is switched on. Minimum time to wait before working on the terminals or inside the device is listed in section 9.8.

Ne jamais ouvrir l'appareil lorsqu'il est sous tension. Le temps minimum d'attente avant de pouvoir travailler sur les bornes ou bien à l'intérieur de l'appareil est indiqué dans la section 9.8.

Do not touch or damage any components when handling the device. The changing of the isolation gaps or the removing of the isolation and covers is not permissible.

Manipuler l'appareil de façon à ne pas toucher ou endommager des parties. Il n'est pas permis de changer les distances d'isolement ou bien d'enlever des matériaux isolants ou des capots.



Do not connect power supply voltage that exceeds the standard specification voltage fluctuation permissible. If excessive voltage is applied to the Drive, damage to the internal components will result.

Ne pas raccorder de tension d'alimentation dépassant la fluctuation de tension permise par les normes. Dans le cas d'une alimentation en tension excessive, des composants internes peuvent être endommagés.

Operation with Residual Current Device

If an RCD (also referred to as ELCB or RCCB) is fitted, the inverters will operate without nuisance tripping, provided that:

- a type B RCD is used.
- the trip limit of the RCD is 300mA.
- the neutral of the supply is grounded (TT or TN systems)
- only one inverter is supplied from each RCD.

- the output cables are less than 50m (screened) or 100m (unscreened).

RCD: Residual Current Device

RCCB: Residual Current Circuit Breaker

ELCB: Earth Leakage Circuit Breaker

Note: The residual current operated circuit-breakers used must provide protection against direct-current components in the fault current and must be suitable for briefly suppressing power pulse current peaks. It is recommended to protect the frequency inverter by fuse separately.

The regulations of the individual country (e.g. VDE regulations in Germany) and the regional power suppliers must be observed!

Fonctionnement avec un dispositif de courant résiduel

En cas d'installation d'un RCD – dispositif de courant résiduel – (également dénommé RCCB ou ELCB), les onduleurs fonctionneront sans faux arrêt à condition que :

- le RCD utilisé soit de type B
- le seuil de déclenchement du RCD soit fixé à 300 mA
- le neutre du bloc d'alimentation soit mis à la terre (systèmes TT ou TN)
- chaque RCD n'alimente qu'un seul onduleur
- la longueur des câbles de sortie soit inférieure à 50 m (blindés) ou 100 m (non blindés)

RCD: Dispositif de courant résiduel

RCCB: Disjoncteur à courant résiduel

ELCB: Disjoncteur contre fuite à la terre

Remarque : Les RCD utilisés doivent assurer la protection contre les composants à courant continu présents dans le courant de défaut et doivent être capables de supprimer des crêtes de courant en peu de temps. Il est recommandé de protéger séparément l'onduleur au moyen de fusibles.

Respecter la réglementation des pays concernés (par exemple, les normes VDR en Allemagne) et des fournisseurs locaux d'énergie électrique.



Functioning of the Drive without a ground connection is not permitted. To avoid disturbances, the armature of the motor must be grounded using a separate ground connector from those of other appliances.

Défense de faire fonctionner le drive sans qu'il y ait eu raccordement de mise à la terre préalable. Pour éviter les perturbations, la carcasse du moteur doit être mise à la terre à l'aide d'un raccord de mise à la masse séparé de ceux des autres appareils.

The grounding connector shall be sized in accordance with the NEC or Canadian Electrical Code. The connection shall be made by a UL listed or CSA certified closed-loop terminal connector sized for the wire gauge involved. The connector is to be fixed using the crimp tool specified by the connector manufacturer.

Le raccordement devrait être fait par un connecteur certifié et mentionné à boucle fermée par les normes CSA et UL et dimensionné pour l'épaisseur du câble correspondant. Le connecteur doit être fixé à l'aide d'un instrument de serrage spécifié par le producteur du connecteur.

Do not perform a megger test between the Drive terminals or on the control circuit terminals.

Ne pas exécuter un test megger entre les bornes du drive ou entre les bornes du circuit de contrôle.

No voltage should be connected to the output of the drive (terminals U, V, W). The parallel connection of several drives via the outputs and the direct connection of the inputs and outputs (bypass) are not permissible.

Aucune tension ne doit être appliquée sur la sortie du convertisseur (bornes U, V, W). Il n'est pas permis de raccorder la sortie de plusieurs convertisseurs en parallèle, ni d'effectuer une connexion directe de l'entrée avec la sortie du convertisseur (Bypass).

The electrical commissioning should only be carried out by qualified personnel, who are also responsible for the provision of a suitable ground connection and a protected power supply feeder in accordance with the local and national regulations. The motor must be protected against overloads.

La mise en service électrique doit être effectuée par un personnel qualifié. Ce dernier est responsable de l'existence d'une connexion de terre adéquate et d'une protection des câbles d'alimentation selon les prescriptions locales et nationales. Le moteur doit être protégé contre la surcharge

If the Drives have been stored for longer than two years, the operation of the DC link capacitors may be impaired and must be "reformed". Before commissioning devices that have been stored for long periods, connect them to a power supply for two hours with no load connected in order to regenerate the capacitors, (the input voltage has to be applied without enabling the drive).

En cas de stockage des variateurs pendant plus de deux ans, il est conseillé de contrôler l'état des condensateurs CC avant d'en effectuer le branchement. Avant la mise en service des appareils, ayant été stockés pendant long temps, il faut alimenter variateurs à vide pendant deux heures, pour régénérer les condensateurs : appliquer une tension d'alimentation sans actionner le variateur.

.....
.....



Type of networks

ADV200 WA drives are designed to be powered from standard three phase lines that are electrically symmetrical with respect to ground (TN or TT network). In case of supply with IT network, the use of the "ADV200 WA....-IT" series is mandatory.

ADV200 WA....-IT does not include the use of an EMI filter with internal capacitors connected to the ground. The RFI emissions level are more relevant but in accordance with EN 61800-3.

In case of limited emission levels requirements, it is suggested to check for excessive noise from close electrical equipment or to the public low-voltage mains. If necessary, to reduce the levels of emissions is enough to use a voltage transformer with static screening between the primary and secondary windings.

Do not install an external EMI filter to the ADV200....-IT. Capacitors inside the standard EMI filter could be damaged and could cause safety problem. Special EMC filters for IT Network are available on request.

ADV200-...-IT can only operate on IT networks devoid of any faults (between active parts and PE) or in the presence of temporary faults.

Therefore an insulation monitor MUST be used to detect and enable prompt removal of any fault condition. For more information, see section "10.6 Insulation monitor", page 152.

Type de réseaux :

Les variateurs ADV200 WA sont conçus pour être alimentés à partir des lignes triphasées standard qui sont électriquement symétrique par rapport à la terre (TN ou réseau TT). En cas d'alimentation avec le réseau IT, la référence "ADV200 WA-IT" est obligatoire.

ADV200 WAIT" n'inclut pas l'utilisation d'un filtre EMI avec des condensateurs internes reliés à la masse. Le niveau des émissions de RFI sont plus pertinentes, mais en conformité avec la norme EN 61800-3.

En cas de besoins pour limités les niveaux d'émission, il est suggéré de vérifier le bruit excessif provenant des équipements électriques à proximité ou sur le réseau basse tension . Si nécessaire, pour réduire les niveaux d'émissions trop important utiliser un

5.1 Power section

5.1.1 Cable Cross Section

Sizes	Terminals: L1 - L2 - L3 - BR1 - BR2 - C - D - U - V - W			
	Maximum Cable Cross Section (flexible conductor)		Recommended stripping	Tightening torque (min)
	(mm ²)	AWG	(mm)	(Nm)
1015	4	10	7	0,5 ... 0,6
1022	4	10	7	0,5 ... 0,6
1030	4	10	7	0,5 ... 0,6
1040	4	10	7	0,5 ... 0,6
1055	4	10	7	0,5 ... 0,6
2075	6	8	10	0,7 ... 0,8
2110	6	8	10	1,2 ... 1,5
2150	6	7	12	1,5 ... 1,7
3185	16	6	14	1,5 ... 1,7
3220	16	6	14	1,5 ... 1,7
3300	16	6	14	1,5 ... 1,7
4370	35	2	18	2,4 ... 4,5
4450	35	2	18	2,4 ... 4,5
4550	35	2	18	2,4 ... 4,5
5750	95 (BR1/BR2=50)	4/0 (BR1/BR2=1/0)	23 (BR1/BR2=27)	14 (BR1/BR2=10)
5900	95	4/0	23	14
51100	95	4/0	23	14
61320	150	300	30	24
61600	240	500	40	40

Sizes	Bars: L1 - L2 - L3 - C - D - U - V - W			
	Recommended cable cross-section		Lock screw diameter	Tightening torque (min)
	(mm ²)	AWG / kcmil	(mm)	(Nm)
72000 - 72500	2 x 100	2 x AWG 4/0	M10 (U,V,W=M12)	25 (M10) / 45 (M12)
73150	2 x 150	2 x kcmil 300	M10 (U,V,W=M12)	25 (M10) / 45 (M12)
73550 - 74000	2 x 185	2 x kcmil 350	M10 (U,V,W=M12)	25 (M10) / 45 (M12)

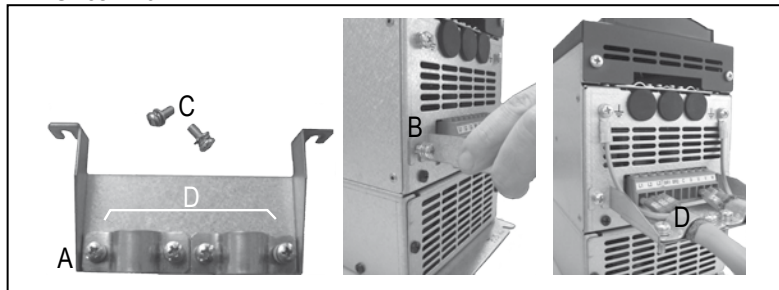
Sizes	Connection $\frac{1}{2}$ on mechanical cabinet				
	Cable Cross Section		Lock screw diameter	Recommended terminal	Tightening torque
	(mm ²)	AWG / kcmil	(mm)	(mm)	(Nm)
1015 ... 1030	16	AWG 6	M5	Eyelet - Spade	5
1040 ... 4550	16	AWG 6	M6	Eyelet - Spade	5
5750 ... 51100	50	AWG 1/0	M6	Eyelet - Spade	5
61320	75	AWG 2/0	M8	Eyelet - Spade	12
61600	120	250 kcmil	M8	Eyelet - Spade	12
Connection $\frac{1}{2}$ on bars					
72000 ... 73150	150	300 kcmil	M10	Eyelet	25
73550 - 74000	185	350 kcmil	M10	Eyelet	25

Note !

Parallel versions ($\geq 500\text{kW}$): refer to the single modules.

5.1.2 Connection of shielding

- **Sizes 1...5**



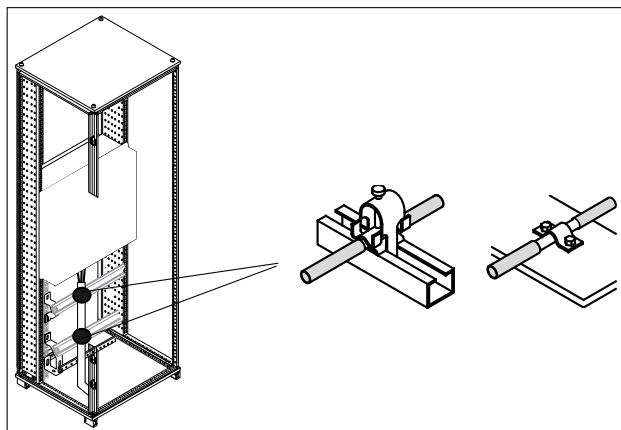
Fasten the metallic support (A), for shielding of the power section, in the two housings (B) and secure with the two screws + washer provided (C).
Fasten the shield of the cables to the omega sections (D).

- **Sizes ≥ 6**

For these sizes the metal support (A) is not provided. Cable shielding must be provided by the installer.

Connection of shielding inside a cabinet

The motor connection cable must be shielded inside a cabinet. The figure shows two examples.



5.1.3 EMC guide line



.....

In a domestic environment, this product may cause radio interference, in which case supplementary mitigation measures may be required.

Dans un environnement domestique, ce produit peut causer des interférences radio, auquel cas des mesures d'atténuation supplémentaire peuvent être nécessaires.

.....



.....

Drives are designed to operate in an industrial environment where a high level of electromagnetic interference are to be expected. Proper installation practices will ensure safe and trouble-free operation. If you encounter problems, follow the guidelines which follow.

- Check for all equipment in the cabinet are well grounded using short, thick grounding cable connected to a common star point or busbar. Better solution is to use a conductive mounting plane and use that as EMC ground reference plane.
- Flat conductors, for EMC grounding, are better than other type because they have lower impedance at higher frequencies.
- Make sure that any control equipment (such as a PLC) connected to the inverter is connected to the same EMC ground or star point as the inverter via a short thick link.
- Connect the return ground from the motors controlled by the drives directly to the ground connection ($\underline{\underline{\perp}}$) on the associated inverter.
- Separate the control cables from the power cables as much as possible, using separate trunking, if necessary at 90° to each other.
- Whenever possible, use screened leads for the connections to the control circuitry.
- Ensure that the contactors in the cubicle are suppressed, either with R-C suppressors for AC contactors or 'flywheel' diodes for DC contactors fitted to the coils. Varistor suppressors are also effective. This is important when the contactors are controlled from the inverter relay .
- Use screened or armored cables for the motor connections and ground the screen at both ends using the cable clamps.

Note!

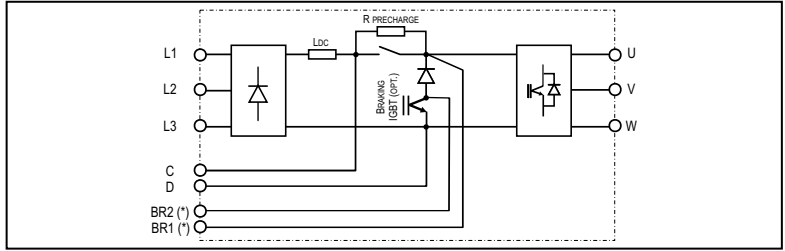
.....

For further information regarding electro-magnetic compatibility standards, according to Directive 2014/30/EU, conformity checks carried out on WEG appliances, connection of filters and mains inductors, shielding of cables, ground connections, etc., consult the "Electro-magnetic compatibility guide" (1S5E84) you can download from www.weg.net.

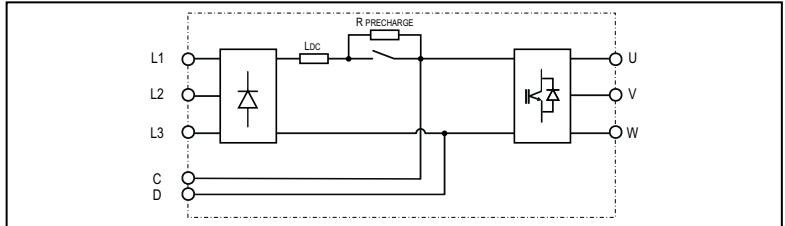
.....

5.1.4 Block diagram power section

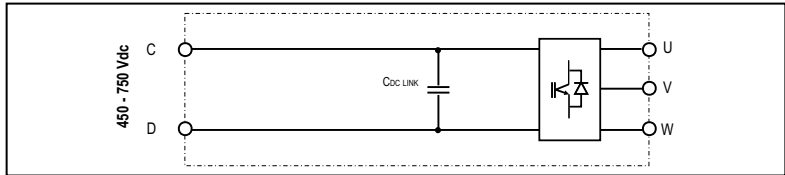
ADV200 WA-1015 ... 5750, ADV200 WA-61320... 61600



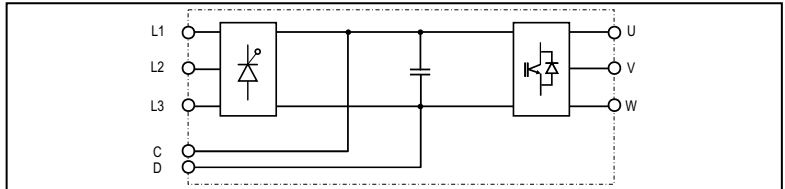
ADV200 WA-5900 ... 51100



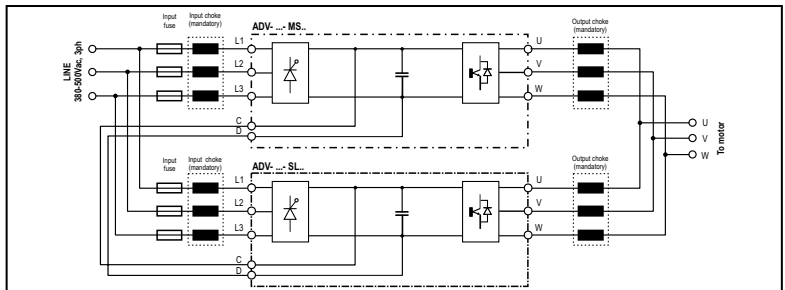
ADV200 WA-3220-DC... 61600-DC



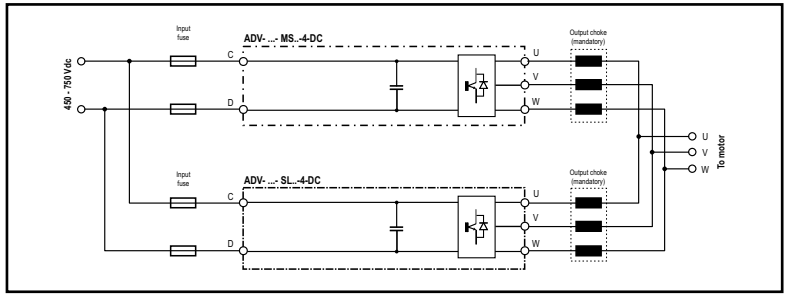
ADV200 WA-72000 ... 74000



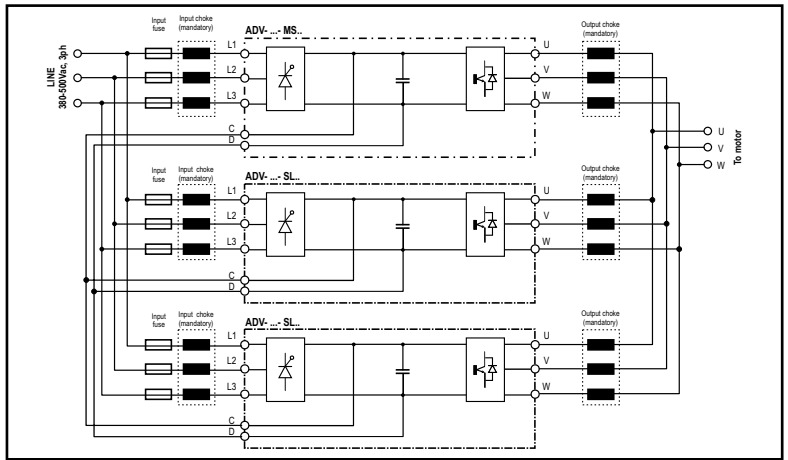
500 ... 800kW



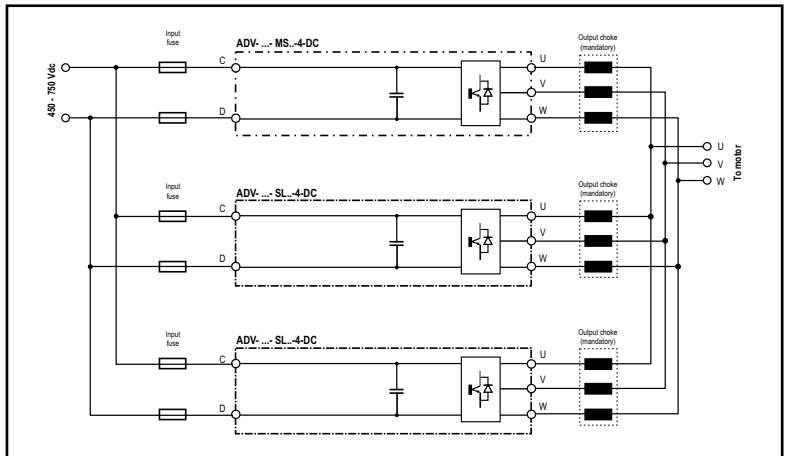
500 ... 800kW (ADV200 WA...-DC)



1000 ... 1200kW



1000 ... 1200kW (ADV200 WA...-DC)

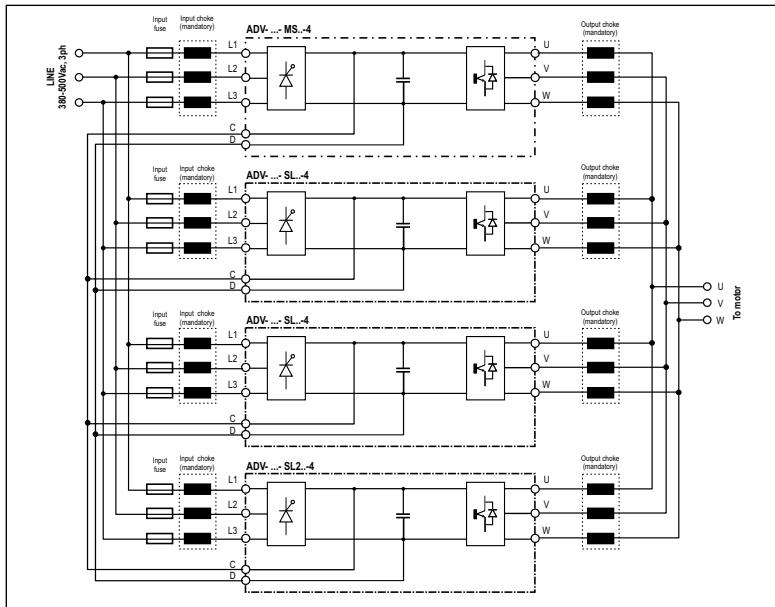


(*) Terminals BR1/BR2 (and braking unit) are standard up to size ADV200 WA-3300, optional in sizes ADV200 WA-4370 ... 5750. These are not present in larger sizes and ADV200 WA...-DC versions.

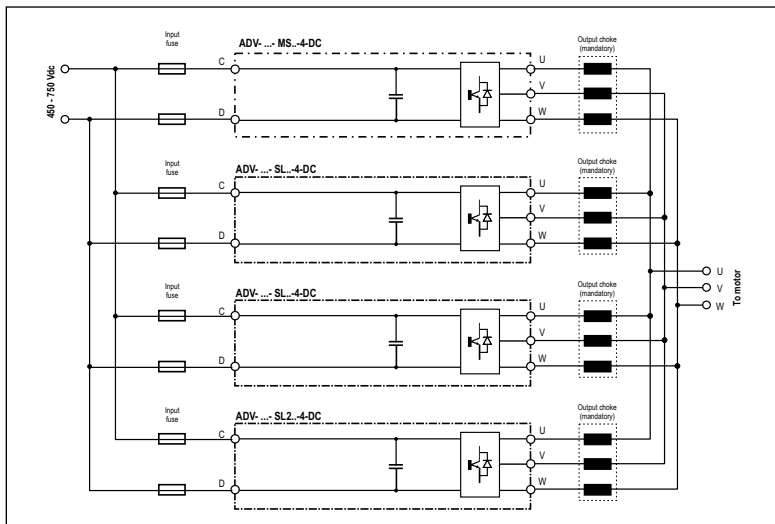
Note!

For size 7 only, internal mounting of fuses (DC side) is possible.

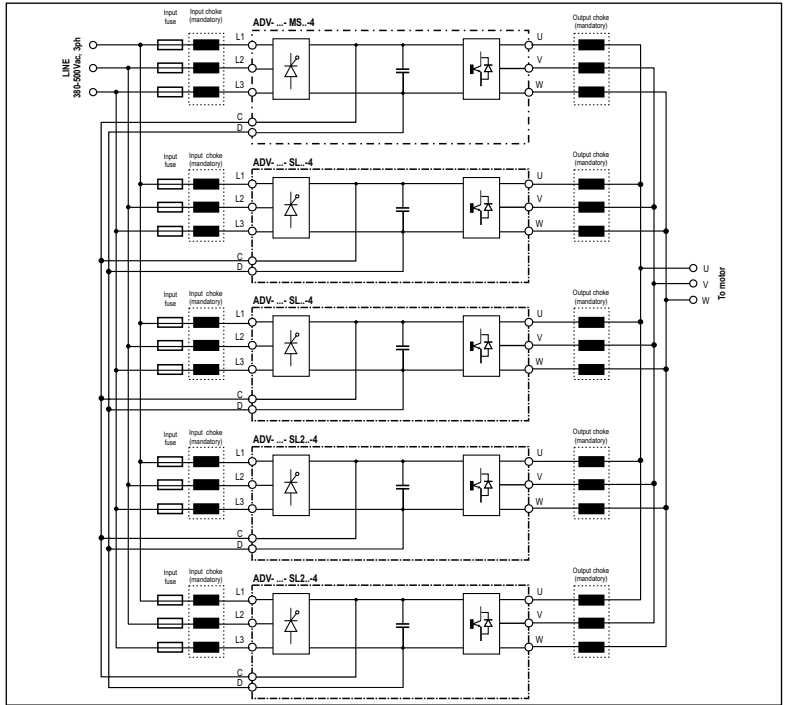
1,5 MW



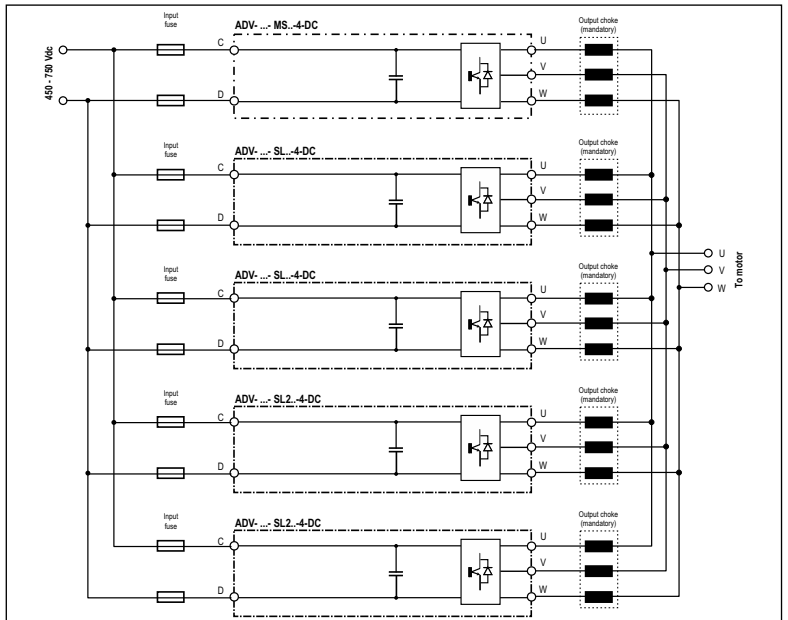
1,5 MW (ADV200 WA-...-DC)



1,8 MW



1,8 MW (ADV200-...-DC)

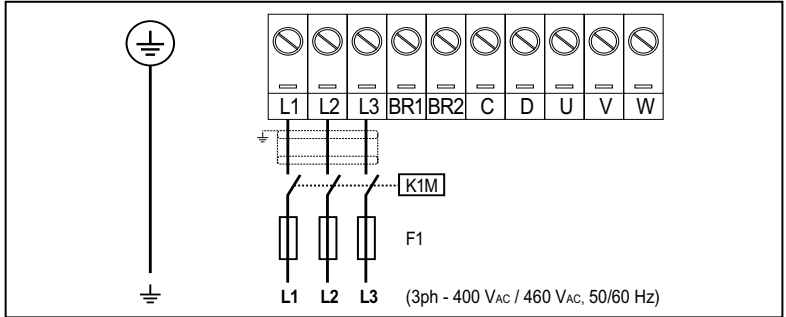


5.1.5 Internal EMC filter

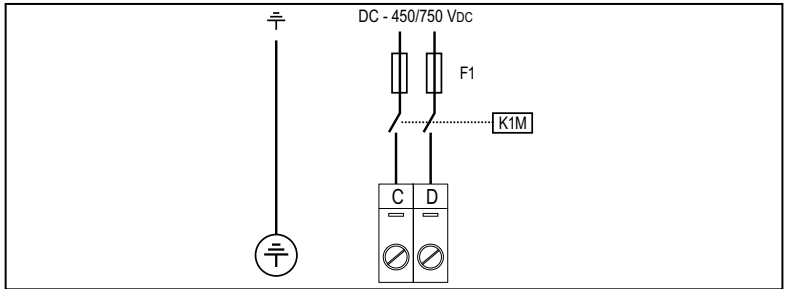
ADV200 WA series inverters are equipped with an internal EMI (except ADV200 WA-...-DC models) filter able to guarantee the performance levels required by EN 61800-3 standard (according to 2nd environment, category C3) with a maximum of 20 meters of shielded motor cable (up to 50 metres for size 5 and above).

5.1.6 Power line connection

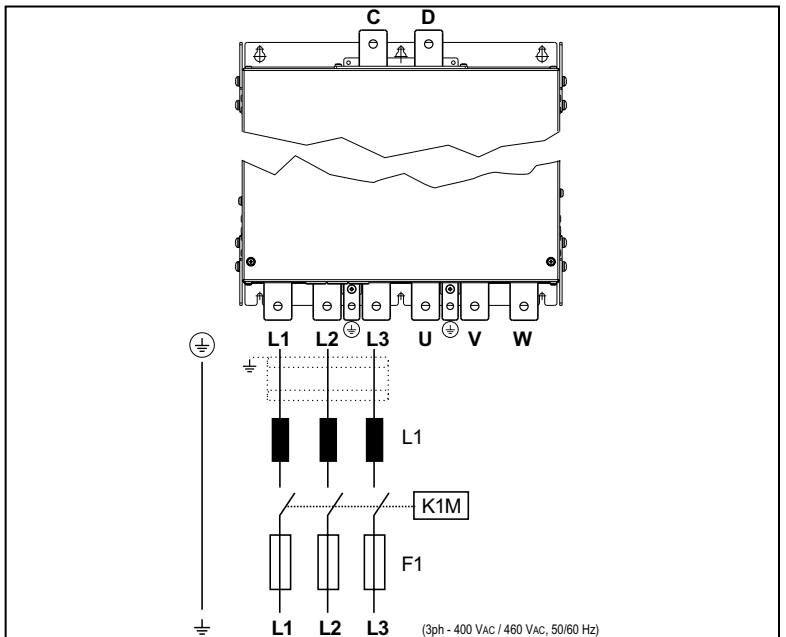
ADV200 WA-1015 ... 61600

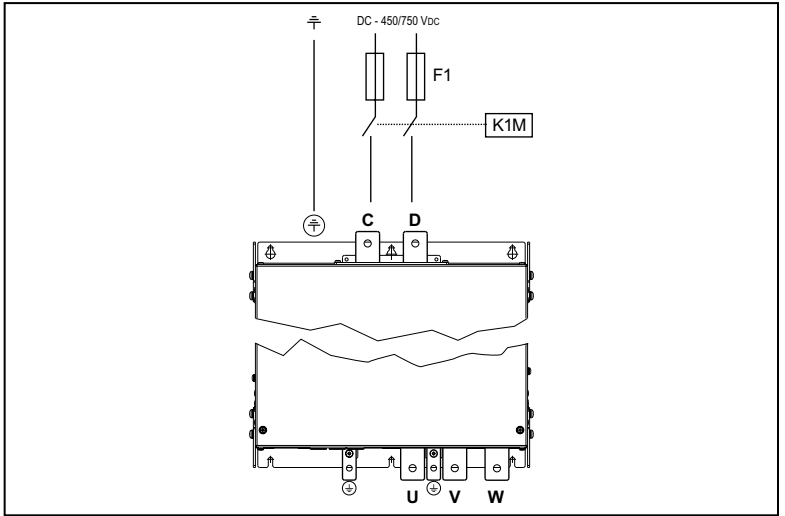


ADV200 WA-3220-DC... 61600-DC

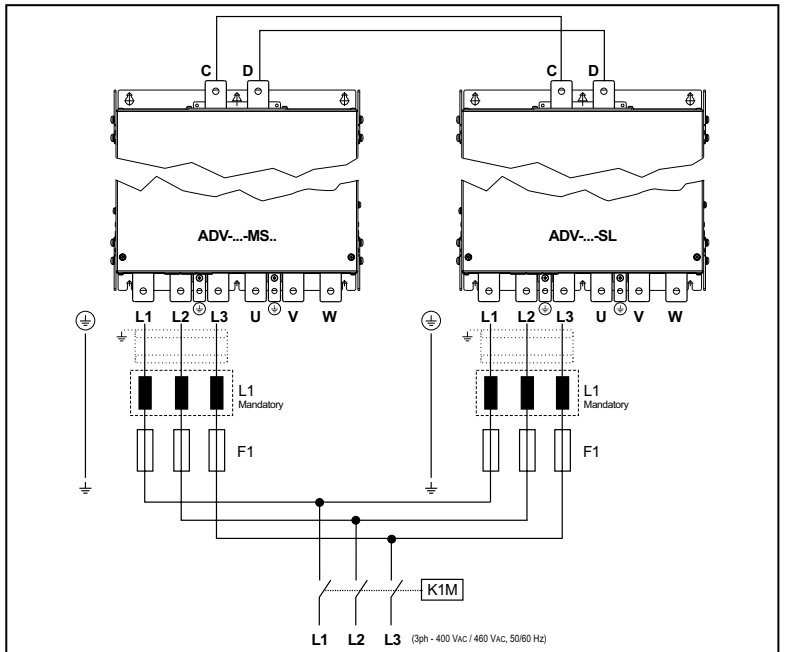


ADV200 WA-72000 ... 74000

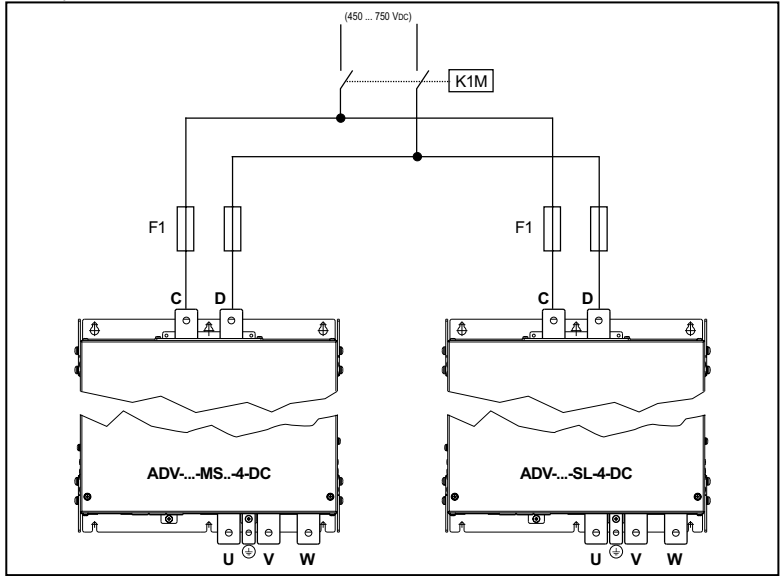




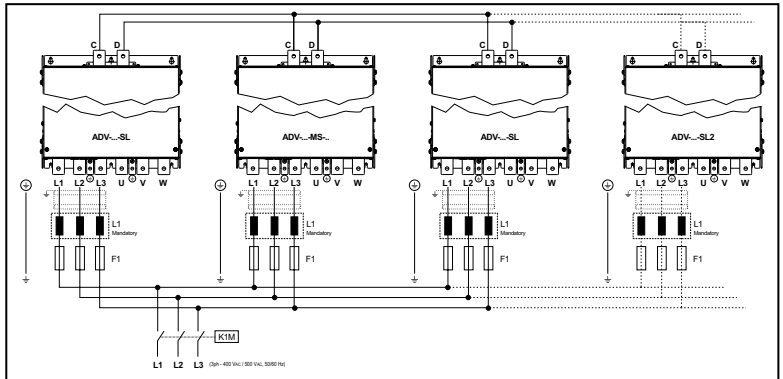
500 ... 800 kW



500 ... 800 kW (ADV200 WA-...-DC)

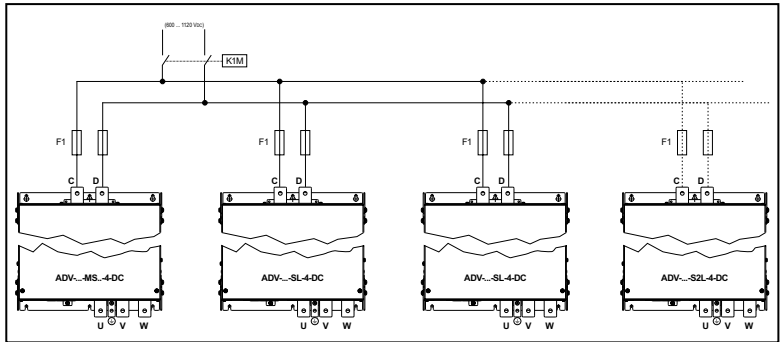


1000 ... 1800 kW



Nota!

- 1 MW:** n.1 ADV200-WA-73550-KXX-4-MS 10 -SI, n.2 ADV200-WA-73550-XXX-4-SL
1,2 MW: n.1 ADV200-WA-74000-KXX-4-MS 12 -SI, n.2 ADV200-WA-74000-XXX-4-SL
1,5 MW: n.1 ADV200-WA-73550-KXX-4-MS 15-SI, n.2 ADV200-WA-73550-XXX-4-SL, n.1 ADV200-WA-73550-XXX-4-SL2
1,8 MW: n.1 ADV200-WA-73550-KXX-4-MS 18-SI, n.2 ADV200-WA-73550-XXX-4-SL, n.2 ADV200-WA-73550-XXX-4-SL2



Note!

- 1 **MW:** n.1 ADV200-WA-73550-KXX-4-MS 10-DC-SI, n.2 ADV200-WA-73550-XXX-4-SL-DC
 1,2 **MW:** n.1 ADV200-WA-74000-KXX-4-MS 12-DC-SI, n.2 ADV200-WA-74000-XXX-4-SL-DC
 1,5 **MW:** n.1 ADV200-WA-73550-KXX-4-MS 15-DC-SI, n.2 ADV200-WA-73550-XXX-4-SL-DC, n.1
 ADV200-WA-73550-XXX-4-SL2-DC
 1,8 **MW:** n.1 ADV200-WA-73550-KXX-4-MS 18-DC-SI, n.2 ADV200-WA-73550-XXX-4-SL-DC, n.2
 ADV200-WA-73550-XXX-4-SL2-DC

Note!

Terminals BR1/BR2 are standard up to size ADV200 WA-3300, optional in sizes ADV200 WA-4370 ... 5750, larger sizes are not used.

Recommended combination F1 fuses: see paragraph "10.1 Optional external fuses", page 133.

5.1.7 Input mains choke (L1)

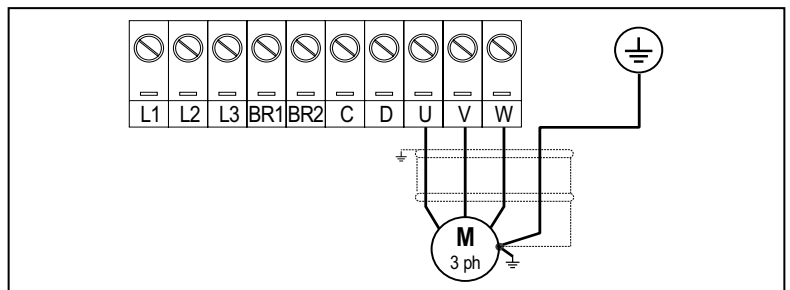
Sizes ADV200 WA-1015 ... 61600: Integrated on DC-link.

Sizes ADV200 WA-72000 ... and above: external choke mandatory (for the recommended combination see chapter "10.2.1 Optional input chokes (L1)", page 136.

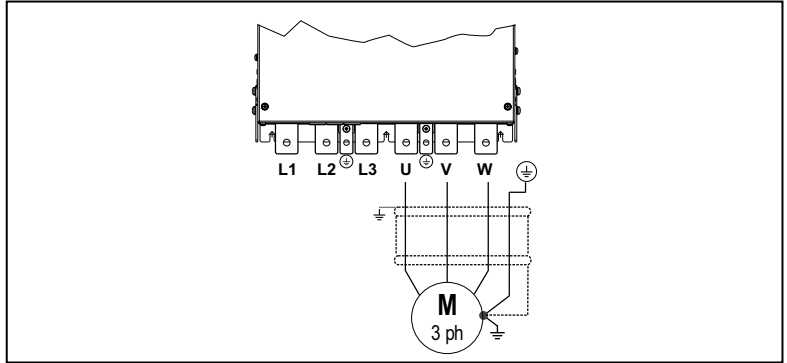
Sizes ADV-...-DC: not available.

5.1.8 Motor connection

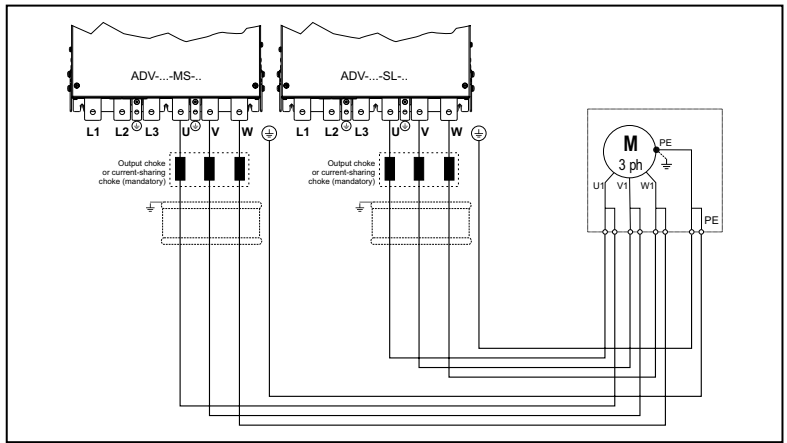
ADV200 WA-1015 ... 61600



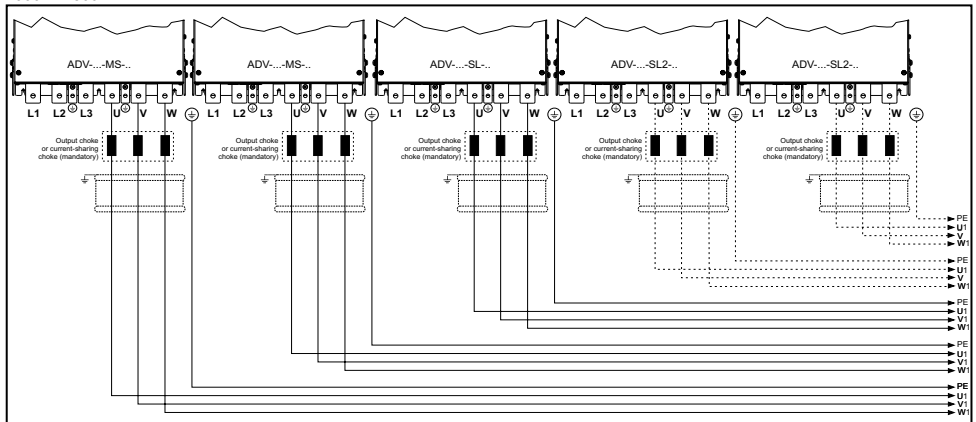
Note: terminals L1-L2 and L3 are not present in -DC versions.



Note: terminals L1-L2 and L3 are not present in -DC versions.



Note: terminals L1-L2 and L3 are not present in -DC versions.



Note: terminals L1-L2 and L3 are not present in -DC versions.

Nota!

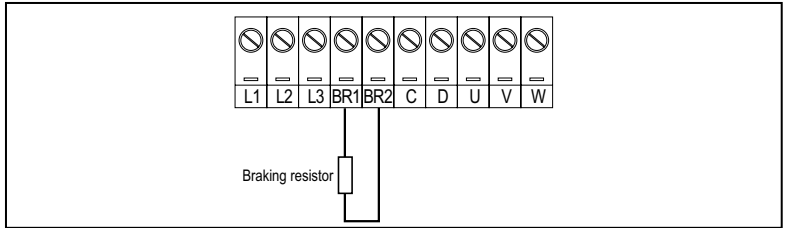
1 MW: n.1 ADV200-WA-73550-KXX-4-MS 10-DC-SI, n.2 ADV200-WA-73550-XXX-4-SL-DC
 1,2 MW: n.1 ADV200-WA-74000-KXX-4-MS 12-DC-SI, n.2 ADV200-WA-74000-XXX-4-SL-DC
 1,5 MW: n.1 ADV200-WA-73550-KXX-4-MS 15-DC-SI, n.2 ADV200-WA-73550-XXX-4-SL-DC, n.1
 ADV200-WA-73550-XXX-4-SL2-DC
 1,8 MW: n.1 ADV200-WA-73550-KXX-4-MS 18-DC-SI, n.2 ADV200-WA-73550-XXX-4-SL-DC, n.2
 ADV200-WA-73550-XXX-4-SL2-DC



Output chokes value and their technical characteristics MUST be the same for all the drive power modules.

All drive-motor cables connections MUST have same length and they have to run in parallel ways.

5.1.9 Braking unit connection (optional)



Nota!

ADV200 WA-...-4

Terminals BR1/BR2 are standard up to size ADV200 WA-3300, optional in sizes ADV200 WA-4370 ... 5750, larger sizes are not used.

From size ADV200 WA-5900 an optional external BUy/BU200 braking unit can be used and connected to terminals C and D. Refer to the BUy/BU200 handbook for further information.

Recommended combination braking resistors: see paragraph 10.4.

ADV200 WA-...-4-DC

Terminals BR1/BR2 are not present.

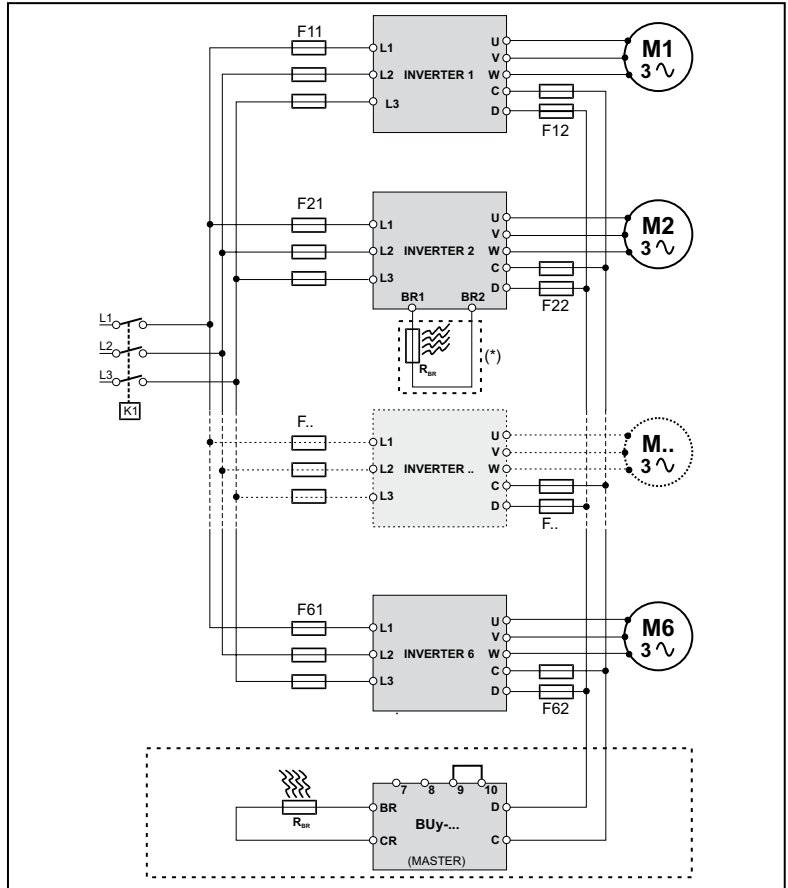
An optional BUy/BU200 braking unit connected to terminals C and D can be used. For further details reference should be made to the BUy/BU200 manual.

You MUST set the parameters for controlling braking resistance overload (MENU 22.6) to detect overheating of the braking resistance. Without this information on the resistance used, you have to monitor the overtemperature switch on the resistance. Overheating may be caused by:

- ramp times too short or braking too long
- wrong braking resistance size
- input voltage too high
- defective braking transistor on inverter or on braking module.

The overtemperature switch can be connected to the auxiliary contacts of the power supply contactor in order to disable the drive in case of failure.

5.1.10 Parallel connection on the AC (Input) and DC (Intermediate Circuit) side of several inverters



- The inverters used have to be all the same size.
- The mains power supply has to be simultaneous for all inverters, i.e. a single switch /line contactor has to be used.
- Such connection is suitable for a maximum of 6 inverters.
- If necessary dissipate braking energy; a single internal braking unit (with external resistor) has to be used or one (or several) external braking unit.
- Fast fuses (F12...F62) have to be fitted on the dc-link side (C and D terminals) of each inverters (see chapter 10.1.2).



(*) Do not connect if external braking units BUy/BU200 is used.

(*) Pas raccorder si l'unité de freinage extérieure BUy/BU200 est utilisée

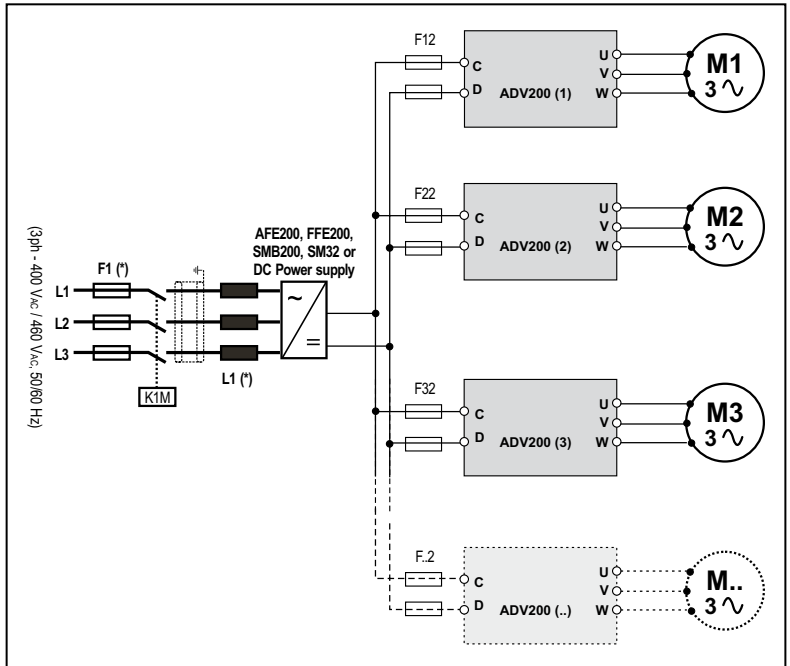
5.1.11 Parallel DC connection



In the case of DC power supply, insertion of an AC mains inductance on the power supply input of the power supply unit **is compulsory** (for the type of inductance, consult the manual of the power supply unit).

To avoid to damage the integrated EMI filter, **AFE200 regenerative power supply unit may not supply the DC power supply to ADV200 WA-1015 ...ADV200 WA-61600 drives.**

FFE200 Regenerative power supply unit may supply the DC power supply to the ADV200 WA (≥ 72000), ADV200 WA-...-DC series and ADV200 WA...-IT series.

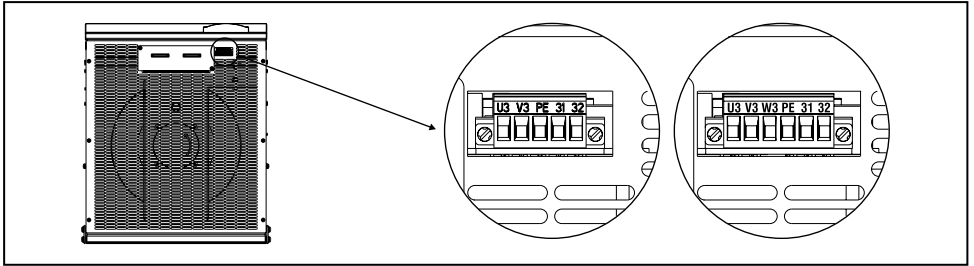


(*) Refer to AFE200, FFE200, SMB200, SM32 or DC Power supply manual.

Note!

For size 7 only, adaptation for internal mounting of "F12, F22, F32, F.2" fuses (DC side) on request

5.1.12 Connection of fans



Sizes	Terminals
1015 ... 61600	No connection is necessary: the drive's internal power supply unit powers the fan (+24Vac).

Terminals	Version before 2009/125/CE (ErP regulation)				
	U3	V3	PE	31	32
Sizes 72000 ... 73150 500 kW (1) 630 kW (1)	1 x 230V ($\pm 10\%$) 50/60Hz, 2.4A (50Hz) - 3.3A (60Hz)		Ground	250V/10A contact OK fan contact management terminals 31-32: Closed: Internal fan OK and powered; Open: Internal fan in over temperature alarm and/or input power supply not available.	
	Power the internal fan (max 600W) with a single-phase voltage on terminals U3/V3.				
	Type of fan compliant 2009/125/CE (ErP) ADV200 starting from S/N 33GC017331				
	U3	V3	W3	PE	31
3 x 400V ($\pm 10\%$) 50/60Hz, 1.25/1.65Arms 3 x 460V ($\pm 10\%$) 60Hz, 1.55Arms		Ground	250V/2A contact OK fan contact management terminals 31-32: Closed: Internal fan OK (also with non-powered fan) Open: Internal fan in over temperature alarm		
Power the internal fan (570W @400V, 930W @460V) with a three-phase voltage on terminals U3/V3/W3.					

Terminals	Version before 2009/125/CE (ErP regulation)				
	U3	V3	W3	PE	31
Sizes 73550 ... 74000 710 kW (1) 800 kW (1) 1 MW kW (1) 1.2 MW (1)	3 x 400V ($\pm 10\%$) 50Hz, 1,55Arms or 3 x 460V ($\pm 10\%$) 60Hz, 1,7Arms (2)		Ground	250V/10A contact OK fan contact management terminals 31-32: Closed: Internal fan OK (also with non-powered fan) Open: Internal fan in over temperature alarm	
	Power the internal fan (max 1200W) with a three-phase voltage on terminals U3/V3/W3.				
	Type of fan compliant 2009/125/CE (ErP) ADV200 starting from S/N 33GN071493				
	3	380...480V ($\pm 10\%$) 50/60Hz, 1.9 ... 1.7 Arms	Ground	250V/10A contact OK inverter fan contact management terminals 31-32: Closed: Inverter fan OK and powered; Open: Inverter fan in alarm or not supplied.	
Power the internal fan (max 1200W) with a three-phase voltage on terminals U3/V3/W3.					

(1) For each module.

(2) ADV200 WA-73550-KXX-4A and ADV200 WA-74000-KXX-4A models.



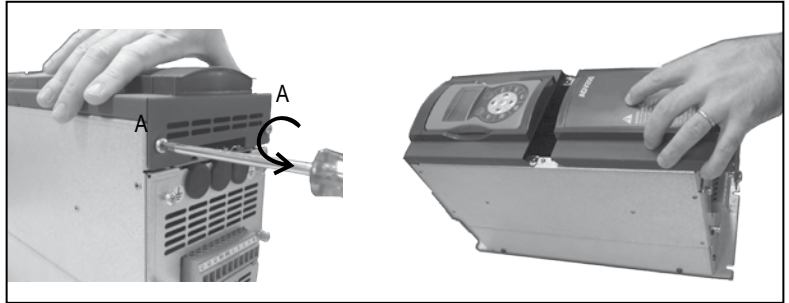
|||||
Make sure the sequence of the three-phase fan power supply phases is the same as that shown on the relative drive terminals. If not, the air flow will be inadequate to ensure correct cooling and it could cause Overtemperature alarm.
|||||

5.2 Regulation section

5.2.1 Removing the terminal cover



When removing the covers be careful to lateral metal sheet enclosure. Presence of sharp edges are possible.

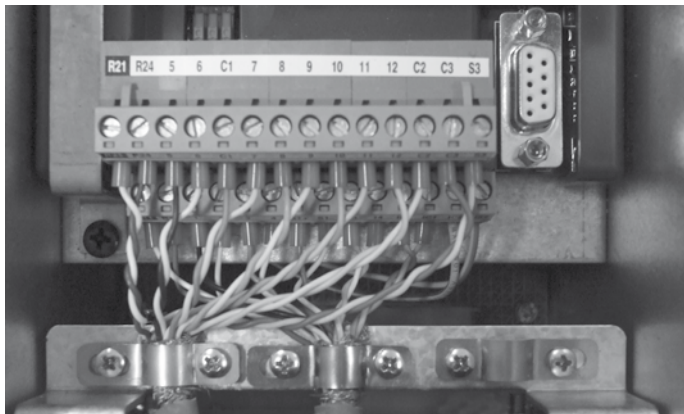


5.2.2 Cable Cross Section

Terminal strips (Regulation card)	Maximum Cable Cross Section		Recommended stripping (mm)	Tightening torque (min) (min) (Nm)
	(mm ²)	(AWG)		
	0.2 ... 2.5	24 ... 12	7	0.5

5.2.3 Regulation section connection

Figure 5.2.3.1: Regulation shielding



For shielding of the regulation section (recommended), fasten the shield of the cables to the omega sections (see figure above).

Table 5.2.3.1: Regulation terminals

Strip T2 (top)			
Terminal	Designation	Function	Max
R21	COM Digital output 2	Common reference for digital output 2 (Relay 2)	-
R24	Digital output 2	Programmable digital relay output 2 (NO). Default = Drive ready	250 V _{ac} - 30 V _{dc} / 2A
5	Analog output 1	Analog output 1. Default = Null (not assigned)	±12,5 V (typical ±10 V / 5 mA)
6	Analog output 2	Analog output 2. Default = Null (not assigned)	- voltage (default): ±12,5 V (typical ±10V/5mA) - current (set by S3 switch): 0...20mA or 4...20mA (setting by PAR 1848, 15 - ANALOG OUPUTS menu)
C1	COM Analog output	Common reference for analog outputs and ±10V potential voltage reference	-
7	Digital input E	Digital input E . Default = Digital input E mon (Enable)	5mA @ +24V (+30V max)
8	Digital input 1	Digital input 1 . Default = FR forward src, PAR 1042	5mA @ +24V (+30V max)
9	Digital input 2	Digital input 2 . Default = FR reverse src, PAR 1044	5mA @ +24V (+30V max)
10	Digital input 3	Digital input 3 . Default = Null (not assigned)	5mA @ +24V (+30V max)
11	Digital input 4	Digital input 4 . Default = Null (not assigned)	5mA @ +24V (+30V max)
12	Digital input 5	Digital input 5 . Default = Fault reset src	5mA @ +24V (+30V max)
C2	COM Digital inputs	Common reference for digital inputs	-
C3	0V 24 OUT	Reference point for +24V OUT	-
S3	+ 24V OUT	+24V supply for IO	150 mA (Resettable fuse), ±10 %

Strip T1 (bottom)			
Terminal	Designation	Function	Max
R11	COM Digital output 1	Common reference for digital output 1 (Relay 1)	-
R14	Digital output 1	Programmable digital relay output 1 (NO). Default = Drive OK	250 V _{ac} - 30 V _{dc} / 2A
1	Analog input 1	Programmable / configurable analog differential input. Signal: terminal 1. Reference: terminal 2. Default = Ramp ref 1 src	- voltage (default): ±12,5 V (typical ±10V/1mA)
2			- current (set by switches S1-S2): 0...20mA or 4...20mA (set by PAR 1502 or 1552, 14 - ANALOG INPUTS menu)
3	Analog input 2	Programmable / configurable analog differential input. Signal: terminal 3. Reference: terminal 4. Default = Not used	- input impedance = 10 kΩ
4			
S1+	+10 V	Voltage reference +10V; reference point: C1 terminal	+10 V ±1% / 10 mA
S1-	-10V	Analog output -10V; reference point: C1 terminal	-10 V ±1% / 10 mA
13	Digital output 3	Digital output 3. Default = Speed is 0 delay	+24 V / 20 mA (typ), 40 mA (max)
14	Digital output 4	Digital output 4. Default = Ref is 0 delay	+24 V / 20 mA (typ), 40 mA (max)
IS1	PS Digital output	Digital outputs 3 / 4 power supply	-
IC1	COM Digital output	Common reference for digital outputs 3 / 4	-
IC2	0V 24 EXT	Reference for regulation card 24V external supply	-
IS2	+ 24V EXT	External supply of regulation card	+24V ±10% / 1A

Note!

Standard Digital inputs are normally updated every 1ms. If the digital input is set as **Resolver freeze** input command (thru Positioner or customized app by using MDPLC), it will be updated every 125micros.



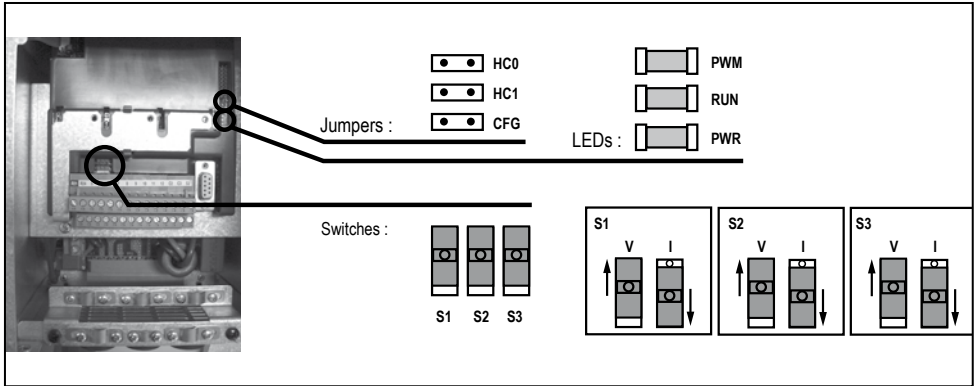
Caution

+24V_{dc} voltage, which is used to externally supply the regulation card has to be stabilized and with a maximum ±10% tolerance. The maximum absorption is 1A.

It is not suitable to power supply the regulation card only through a unique rectifier and capacitive filter.

La tension de + 24V_{dc} utilisée pour alimenter extérieurement la carte de régulation doit être stabilisée et avec une tolérance de ±10% ; absorption maximum de 1A. Les alimentations obtenues avec les seules redresseur e filtre capacitive ne sont pas appropriées.

5.2.4 Switches, jumpers and LED



Switch	V/I settings on inputs and analog output
S1	Analog input 1 Default = voltage (± 10 V)
S2	Analog input 2 Default = voltage (± 10 V)
S3	Analog output 2 Default = voltage (± 10 V)

LEDs	Function
PWM (green)	LED lit during IGBT modulation
RUN (green)	Flashes (freq. 1 sec) if no errors or faults have occurred. If ON or OFF, indicates an error conditions (software hangup)
PWR (green)	ON when the regulation card is correctly powered

Jumpers	Function
HC0 HC1	Reserved. Default = Open
CFG (1)	Open = 400 Vac rated voltage (default) (2) Closed = 460 Vac rated voltage (3)

- (1) Need to be verified the setting of the Undervoltage alarm threshold
For drive size 7 and parallel units, Threshold can be selected thru S1 switch (mounted on R-PSM board). This selection has to be the same of parameter PAR 560.
- (2) Drive is automatically set for EU configuration (400V/50Hz). Parameter 460 will show 0 : EU (default configuration).
- (3) Drive is automatically set for USA configuration (460V/60Hz). Parameter 460 will show 1 : USA.

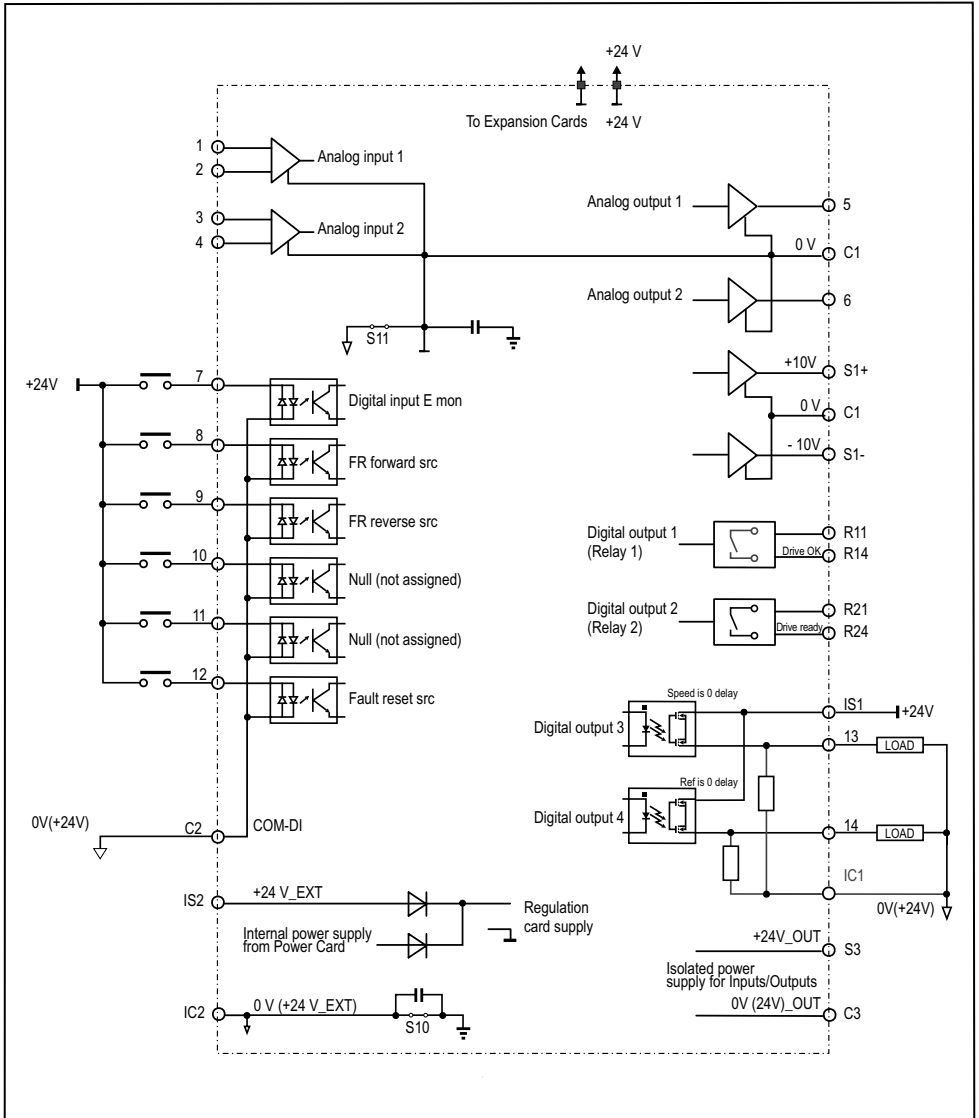


Figure 5.2.4.1: Potentials of the control section, Digital I/O PNP connection

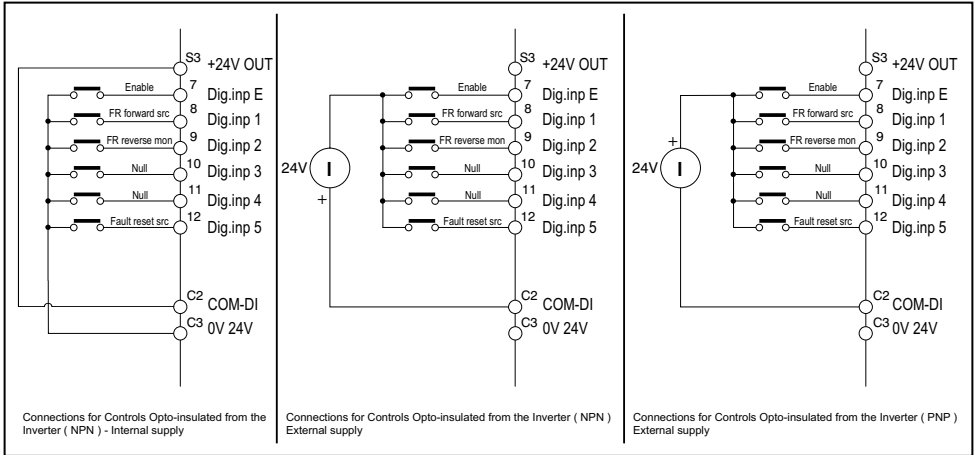


Figure 5.2.4.2: Other inputs connections (NPN-PNP)

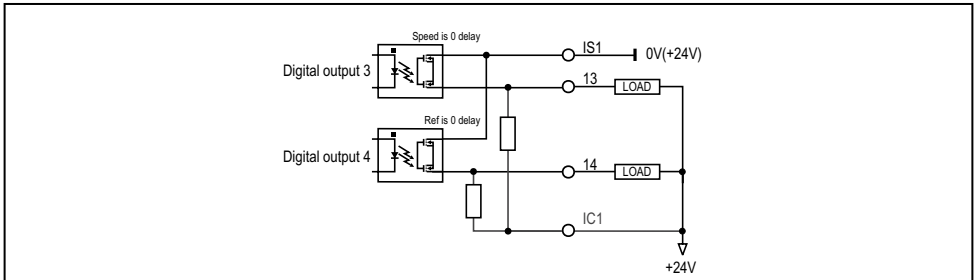


Figure 5.2.4.3: NPN outputs connection

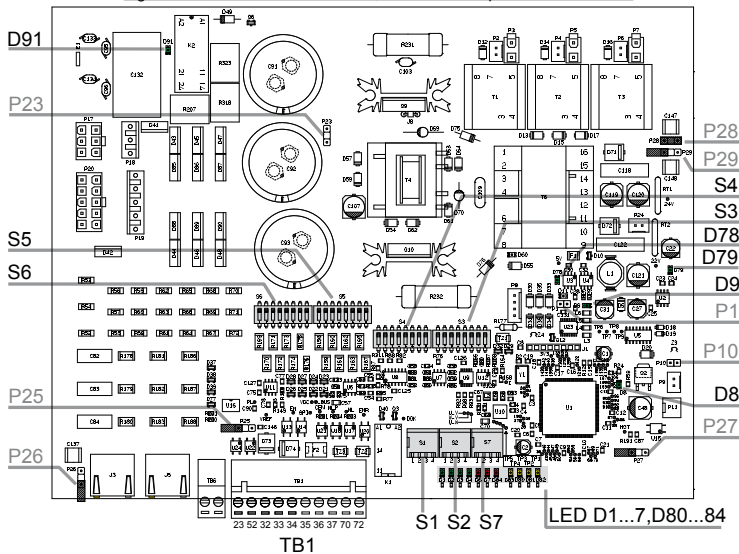
5.2.5 R-PSM pre-charge card (only for sizes ≥ 72000)

Starting from ADV200 WA power size $\geq 200\text{KW}$, the R-PSM card is used to control the pre-charge circuit on the power supply module. When the pre-charge circuit is connected to the mains (terminals L1 – L2 – L3), the R-PSM regulation card generates the internal power supplies needed for operation. Therefore, additional external power supplies are unnecessary.

If an UNDERVOLTAGE alarm is detected when the SCR bridge is enabled, the pre-charge ramp can be repeated only after 300ms, the time needed for the phase loss circuit to confirm that normal Mains conditions have been restored.



Figure 5.2.5.1: Position of Switches, LEDs and Jumpers on R-PSM card



5.2.5.1 Input/Output R-PSM Regulation card

The switches and jumpers on the R-PSM card are factory-set.

If the module is used according to its standard power supply characteristics:

- ADV200-...-4 = 400VAC / 50Hz
- ADV200-...-6 = 690VAC / 50Hz

the settings should not be changed.

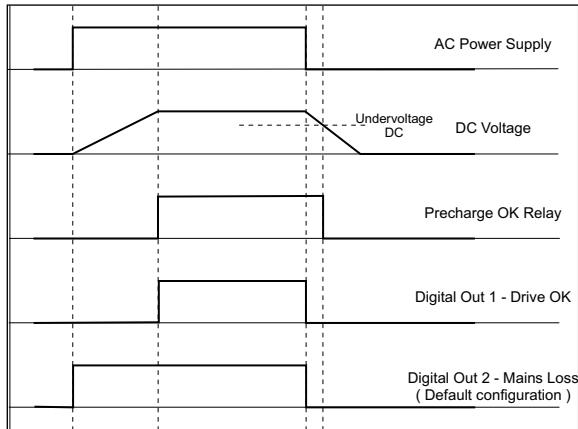
In case of non-standard power supply, see the configuration tables shown further below.

Table 5.2.5.1: TB1 terminal strip on R-PSM

Terminal	Designation	Function	Electrical specifications
23	ENABLE	ENABLE digital input of the pre-charge control	5mA @ +24Vdc (+20% max, -20% min)
52	ENABLE in COM	ENABLE common digital input	
32	Digital Out 1	Drive OK	24V / 20mA typ (40mA max)
33	Dig Out Com	Common Digital Out 1 and Digital Out 2	-
34	0V24 Out	Reference point for power supply	-
35	+24V Out	Power supply output	150mA resettable fuse
36	Digital Out 2	Digital output : Factory preset as Mains Loss	24V / 20mA typ (40mA max)
37	Dig Out Supply	Power supply for digital outputs	-
70, 72	Relay 1	Factory preset as Precharge OK	250Vac - 30Vdc - 0,5A

Terminal strip TB1			
Cable Cross Section (flexible conductor)		Recommended stripping (mm)	Tightening torque (min) (Nm)
(mm ²)	AWG		
0,2 ... 2,5	24 ... 12	7	0,5

5.2.5.2 Behavior of Pre-charge OK Relay-Digital Out 1, Digital Out 2 at “PowerOn” and “PowerOff”



Relay 1 – Precharge OK (factory setting)

The relay between terminals 70 – 72 closes at the end of the pre-charge phase and opens when DC voltage drops below the DC Undervoltage threshold. Wiring of the OK relay contact (70 - 72) in series with the Enable chain of the ADV200 regulation card is recommended

Digital Out 1 – Drive OK

Digital output 1 connected to terminal 32 goes high at the end of the pre-charge phase and goes low under one of the following conditions:

- power failure
- lack of a power supply phase

- mains frequency out of range ($> \pm 5\%$). This condition occurs only during the power-on phase.
- presence of Enable command at terminal 23.

Digital Out 2 – Mains Loss (factory setting)

Digital output 2 connected to terminal 36 goes high at Power On and goes low under one of the following conditions.

- power failure;
- lack of a power supply phase.

5.2.5.3 R-PSM card configuration switches

The jumpers and switches on these cards are factory-set. **If the module is used according to its standard power supply characteristics the settings should not be changed.**

The R-PSM card has three 4-position configuration switches.

The following tables show all of the permitted combinations.

Legenda:

0 OPEN

1 CLOSE

(*) Default setting for models ADV200-...-4,

(**) Default setting for models ADV200-...-6

Setting for ADV200 WA with R-PSM card hardware revision “F” and higher

S1 - Mains voltage configuration switches						
Mains voltage	DC undervoltage trip threshold	DC undervoltage return threshold	S1-1	S1-2	S1-3	S1-4
[Vac]	[Vdc]	[Vdc]				
380	330	370	1	0	0	0
400 (*)	330	370	0	1	0	0
415	361	401	1	1	0	0
440	383	423	0	0	1	0
460	400	440	1	0	1	0
480	417	457	0	1	1	0
500	435	475	1	1	1	0
575	500	540	0	0	0	1
690 (**)	600	640	1	0	0	1

Setting for ADV200 WA with R-PSM card hardware revision “E” and lower

S1 - Mains voltage configuration switches						
Mains voltage [Vac]	DC undervoltage trip threshold [Vdc]	DC undervoltage return threshold [Vdc]	S1-1	S1-2	S1-3	S1-4
380	372	412	1	0	0	0
400 (*)	392	432	0	1	0	0
415	407	447	1	1	0	0
440	431	471	0	0	1	0
460	451	491	1	0	1	0
480	470	510	0	1	1	0
500	490	530	1	1	1	0
575	563	603	0	0	0	1
690 (**)	676	716	1	0	0	1

The correct selection of mains voltage is very important for correct setting of UNDERVOLTAGE limits.

The same value set has to be carried out on PAR560 (DRIVE CONFIG MENU).

S2 - Mains frequency configuration switch	
Mains frequency [Hz]	S2-1
50 (*)	0
60 (**)	1

An incorrect mains frequency setting will disable the control card: the mains frequency tolerance is $\pm 5\%$.

S2 – Switch configuration for pre-charge times				
Selection of pre-charge time for 50Hz [s]	Selection of pre-charge time for 60Hz [s]	S2-2	S2-3	S2-4
17.4	24.1	0	0	0
11.6 (*)(**)	12.1	1	0	0
8.7	8	0	1	0
6.9	6	1	1	0
5.0	4.8	0	0	1
3.5	3.4	1	0	1
2.7	2.7	0	1	1
1.9	2	1	1	1

Switch S2-2...4 lets you set the pre-charge time for the capacitors connected to the DC link.

The default configuration calls for a time of 11.6[s] for a 50[Hz] line and 12.1[s] for a 60[Hz] line.

Remember that with equal levels of energy to be transferred to the condenser bank, decreasing the precharge time increases the current draw.

The rectifier bridge and pre-charge inductance are sized for maximum peak current of 400[Apk].

Considering that with decreased pre-charge time the increased current is not linear, and that the larger the capacitors bank connected to the DC Link the greater the energy to be transferred, if you need a pre-charge time shorter than the default configuration you have to run the following check procedure:

- 1) Keep the default configuration of switches S2-2...4 and connect an current probe to output C or D of the ADV200 module. The probe must be able to measure a peak current ≤ 10 [ms].
- 2) Power and enable the pre-charge bridge by measuring the value of the peak current absorbed.
- 3) Cut power to the pre-charge bridge and wait for the DC Link to discharge completely (discharge time depends on the total capacitance installed on the DC Link).
- 4) Set the switches to have a pre-charge time of 8.7[s] (8[s] for 60[Hz] line).
- 5) Repeat point 2). If the peak current measured is below 400[Apk] you can further reduce the pre-charge time. In this case, run the entire procedure again until you reach the required pre-charge time.

S7-1...3 – Dig Out 2 configuration switch	S7-1	S7-2	S7-3
No Mains Loss or Phase Loss (*) (**)	0	0	0
Mains Loss alarm	1	0	0
Phase Loss alarm	0	1	0
Drive OK (excluded UV alarm)	1	1	0
Heatsink OT alarm	0	0	1
SCRs pulses enabled	1	0	1
Precharge ramp finished	0	1	1
Undervoltage alarm	1	1	1

The configurable output goes high when the condition indicated in the table occurs.

S7-4 -Function exchange between Relay 1 and Digital Out 2	
Function	S7-4
Factory preset	0 (*) (**)
Function exchanged between Relay 1 and Digital Out 2	1

5.2.5.4 Jumpers

The configuration of the configuration Jumpers can be changed ONLY by WEG personnel. Unauthorized changes will invalidate the warranty.

Jumper	Function	Default
P1	FPGA manual reset	OPEN
P10	Disables heatsink overtemperature monitor	CLOSE
P23	Enables function of 230VAC line power supply	OPEN
P25	Internal use	OPEN
P26	Connects J3 shield with ground	OPEN
P27	Connects 0V control with OV_24 I/O	OPEN
P28	Grounds 0V control	CLOSE
P29	Grounds 0V_24 I/O	CLOSE

Note!

For the position of the Jumpers, see "Figure 5.2.5.1: Position of Switches, LEDs and Jumpers on R-PSM card" .

5.2.5.5 Leds on R-PSM card

LED	Color	"MONITOR" function
D9	GREEN	+3V3 logic power
D78	GREEN	+5V logic power
D79	GREEN	+22V driver power
D91	BLUE	Presence of DC-Link voltage
LED	Colore	"SIGNAL" function
D1	GREEN	DC-Link voltage above UNDERVOLTAGE limit
D2	GREEN	Power supply enabled
D3	GREEN	Not used
D4	GREEN	Power supply OK (no alarms – excluding UV)
D6	RED	Phase loss or Main loss alarm
D7	RED	Heatsink overtemperature alarm
D8	GREEN	FPGA configuration in progress
D84	RED	Wrong line frequency alarm
LED	Color	"POWER SUPPLY STATE" functions
D83	YELLOW	Bit S0: codes STATE of power supply (LSB)
D80	YELLOW	Bit S1: codes STATE of power supply
D81	YELLOW	Bit S2: codes STATE of power supply (MSB)
D82	YELLOW	SCR bridge enabled

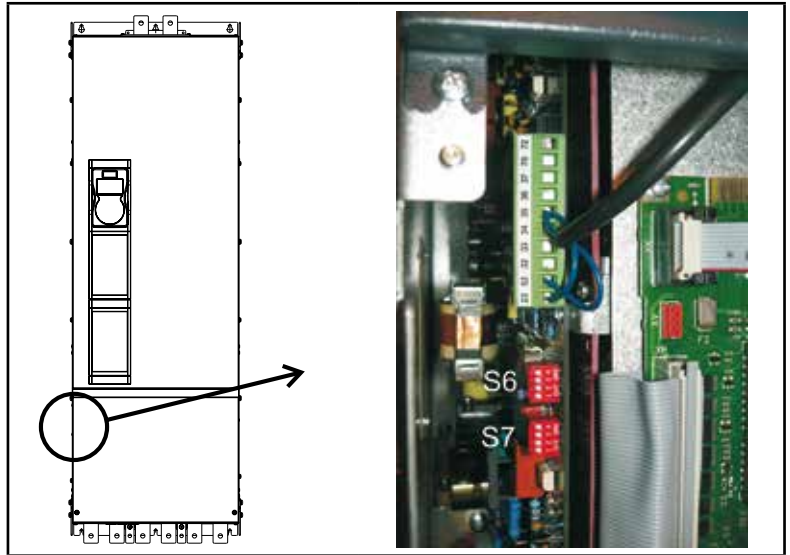
Note!

For the position of the Jumpers, see "Figure 5.2.5.1: Position of Switches, LEDs and Jumpers on R-PSM card" .

5.2.6 R-SM3-ADV pre-charge card (only for sizes ≥ 72000)

Pre-charge card for drive S/N previous than S/N:34GG044151 (September 2014).

Figure 1: Terminals location



Terminals	Function	Voltage / Current
23	Input of the precharge enable control	(15 - 35V, 5 - 11mA)
32	Output of the MLP static signal (low - active signal)	(5 ... 35V, 20mA source)
33	(Common) Ground of the MLP and ML static signals	-
34	Reference point for Power supply +24V	-
35	Power supply output +24V	(32V / 300mA max)
36	Output of the ML signal (low - active signal)	(5 ... 35V, 20mA max sink)
37	Power supply of the ML and MLP signals	(35V max)
52	(Common) Ground of the precharge enable control	-
70, 72	OK Relay	(max 250VAC, 1A – AC11)

Note!

.....
 The jumpers shown are factory-wired.

Wiring of the OK relay contact (70 - 72) in series with the Enable chain of the ADV200 WA regulation card is recommended.

Dip-switch and Jumper

S6 - S7 Selection of the AC mains frequency: 50 or 60 Hz

AC Mains frequency	S6-1...4	S7-1...4
50 Hz (Default)	OFF (50 Hz)	OFF (50 Hz)
60 Hz	ON (60 Hz)	ON (60 Hz)

Control description

- OK RELAY

The OK relay has a normally open contact which close at the end of the precharging phase if no alarm condition is present (overtemperature, power supply on the regulation card $\pm 15V$).

The contact is closed during the normal functioning of the device and also during an undervoltage situation. The contact opens when a failure occurs (see the alarm conditions described above) or when the power supply is switched off and the DC-LINK is completely discharged (C and D terminals).

5.3 Braking

There are various possible types of braking:

- via internal braking unit and external braking resistor (up to size ADV5550),
- via external braking unit (BUy/BU200, usable for all sizes),
- Injection of direct current from the Inverter into the motor (D.C. braking)
- through a special overflux function (AC braking) available if V/F control is selected.

The various possibilities have the following key difference:

- Using a braking unit or the AC braking function it is possible to control a speed reduction (for example from 1000 to 800rpm) while the DC braking can only used to stop the motor.
- Using a braking unit the energy is dissipated into heat in the braking resistor
- Using the AC braking function or the DC braking function, the energy is dissipated into heat in the motor windings (resulting in a further rise in the motor temperature)
- By using the AC braking function in place of the DC braking, the braking action is more efficient (more braking capability) and allows to maintain the same speed control without introducing operational discontinuities. It means that the AC braking allows the machine to change quickly its behavior from motorizing to braking when required.

5.3.1 Braking unit

Frequency-regulated asynchronous motors during hyper-synchronous or regenerative functioning behave as generators, recovering energy that flows through the inverter bridge, in the intermediate circuit as continuous current.

This leads to an increase in the intermediate circuit voltage.

Braking units (internal to drive or external BUy/BU200) are therefore used in order to prevent the DC voltage rising to an impermissible value. When used, these activate a braking resistor (external to drive) that is connected in parallel to the capacitors of the intermediate circuit. The feedback energy is converted to heat via the braking resistor (RBR), thus providing very short deceleration times and restricted four-quadrant operation.

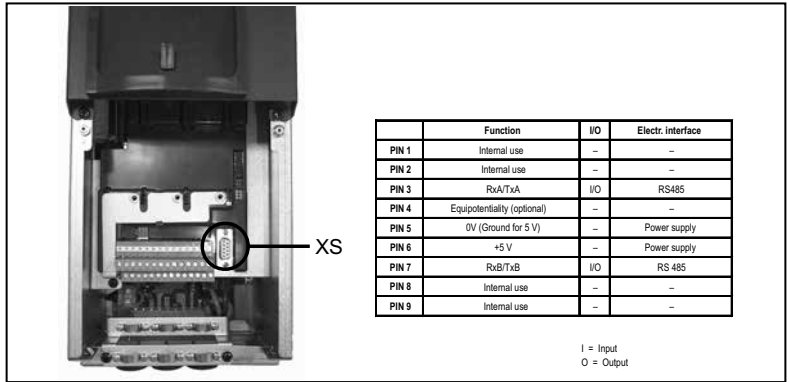
Note!

%%
An optional BUy/BU200 braking unit connected to terminals C and D can be used. For further details reference should be made to the BUy/BU200 manual.

Recommended combination braking resistors: see chapter "10.5 Braking resistor (optional)", page 151.
%%

Sizes		Technical data of the Internal Braking Units (Duty 50%)		
		Nominal current of the internal braking unit	Peak current	Minimum braking resistance value
		I _{RMS} (A)	I _{PK} (A)	R _{BR} (Ω)
1015	Internal Braking Units (standard internal)	5.7	8	100
1022		5.7	8	100
1030		5.7	8	100
1040		5.7	8	100
1055		5.7	8	100
2075		8.5	12	67
2110		8.5	12	67
2150		15.5	22	36
3185		22	31	26
3220		37	53	15
3300		37	53	15
4370		Internal Braking Units (standard internal)	57	80
4450	57		80	10
4550	76		107	7.5
5750	76		107	7.5
≥ 5900 and ADV200 WA- ...-DC	External Braking Unit (optional)	See BUy/BU200 manual for all technical details.		
	BUy-1020	28	40	17
	BUy-1050	70	100	6.8
	BUy-1085	120	170	4
	BU200-2150-4	212	300	2,67
	BU200-2300-4	424	600	1,33

5.4 Serial interface (XS connector)



The ADV200 WA drive is equipped as standard with a port (9-pin D-SUB receptacle connector: **XS**) for connection of the RS485 serial line used for drive/PC point-to-point communication (through the WEG_eXpress configuration software) or for multi-drop connection.

To access the connector, remove the lower cover as illustrated in shown in [paragraph 5.2.1](#).

5.4.1 Drive / RS 485 Port (not insulated) point-to-point connection



.....
 The connection indicated is without galvanic insulation !

Le raccordement indiqué n'a pas d'isolation galvanique !

.....

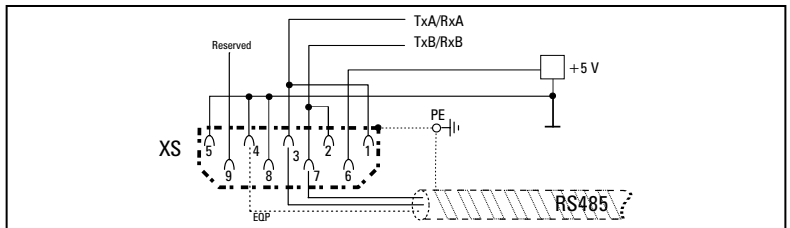


Figure 5.4.1.1: Serial connection (not insulated)

A twin-pair consisting of two symmetrical conductors, spiral wound with a common shield plus the bonding connection cable, connected as shown in the figure, must be used for connection. The transmission speed is 38.4 kBaud.

For connection of the RS485 serial line to the PC, see the figure below.

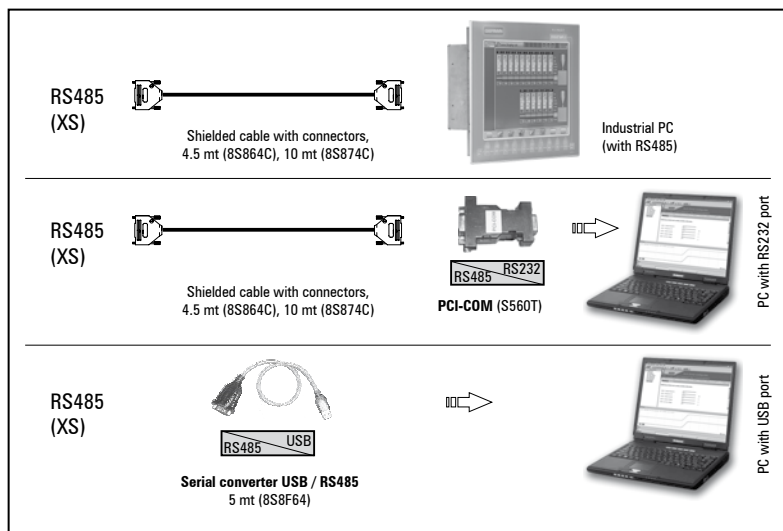


Figure 5.4.1.2: RS485 connection to the PC

Connection of an industrial PC with RS485

The following are required for connection:

- shielded cable for the **XS / RS485** connection (see figure 5.4.1.2), code 8S864C (L=4,5 mt) or 8S874C (L=10 mt).

Connection to a PC with RS232 port

The following are required for connection:

- an optional **PCI-COM** (or PCI-485) adapter, code S560T.
- shielded cable for **XS / PCI-COM** (or PCI-485) connection, code 8S864C (L=4,5 mt) or 8S874C (L=10 mt), see figure 5.4.1.2 .

Connection to a PC with USB port

The following is required for connection: optional adapter **USB/ RS485**, code 8S8F64, see figure 5.5.1.2 .

5.4.2 Drive / RS485 port point-to-point connection (with insulation)

To make the connection with galvanic isolation, the **OPT-RS485-ADV** optional card is required.

The card is equipped with a 9-pin D-SUB male receptacle connector which must be inserted in the **XS** connector of the ADV200 WA drive.

Connect terminals 1, 2 and 4 to the serial line as shown in the figure below; for the connection from the serial line to the PC, the adapters indicated in paragraph 5.4.1 must be used.

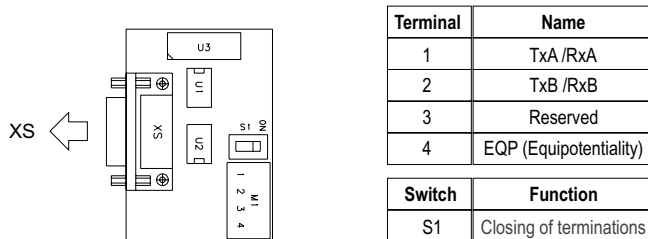


Figure 5.4.2.1: OPT-RS485-ADV card

5.4.3 RS 485 multi-drop connection

For the multi-drop connection, the **OPT-RS485-ADV** optional card must be installed on each drive; the ends of the connection must have **S1** termination switch set to ON (for point 3: ON only on the first).

The multi-drop connection is always galvanically insulated. Up to 20 drives can be connected; the maximum length of the connection is 200 meters.

1) Multidrop connection between ADV200 and an industrial PC with RS485 output

See figure 5.4.3.1. The connection requires:

- an optional **OPT-RS485-ADV** card for each ADV200,
- shielded wires to connect the **OPT-RS485-ADV** to the PC.

2) Multidrop connection between ADV200 and a PC with RS232 output

See figure 5.4.3.2. The connection requires:

- an optional **OPT-RS485-ADV** card for each ADV200,
- shielded wires to connect the **OPT-RS485-ADV** to the PC, and an optional **PCI-COM** adapter (code S560T).

3) Multidrop connection between ADV200 and a PC with USB output

See figure 5.4.3.3. The connection requires:

- an optional **OPT-RS485-ADV** card for each ADV200,
- a **USB-RS485** Serial converter interface (8S8F60).

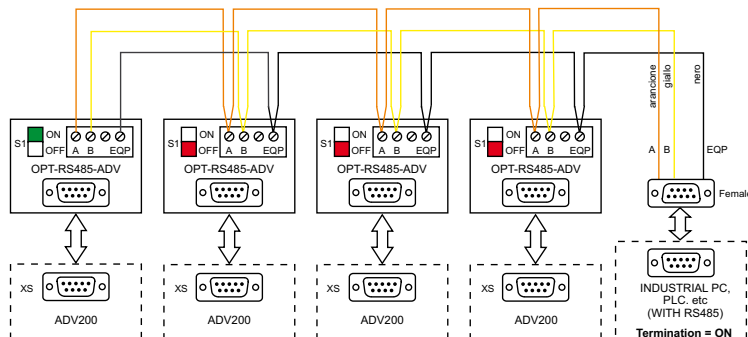


Figure 5.4.3.1: Example of Multidrop connection between ADV200 and an industrial PC with RS485 port

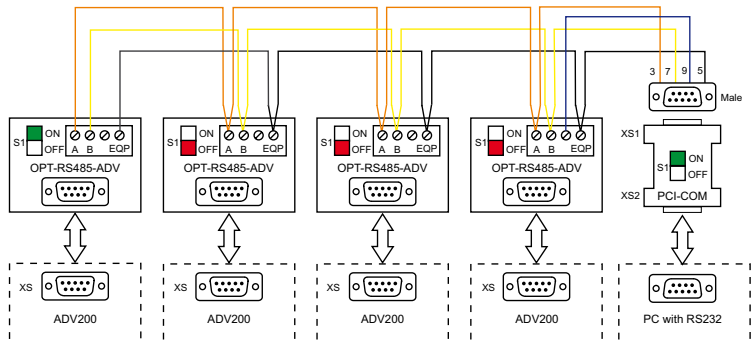


Figure 5.4.3.2: Example of Multidrop connection between ADV200 and a PC with RS232 port

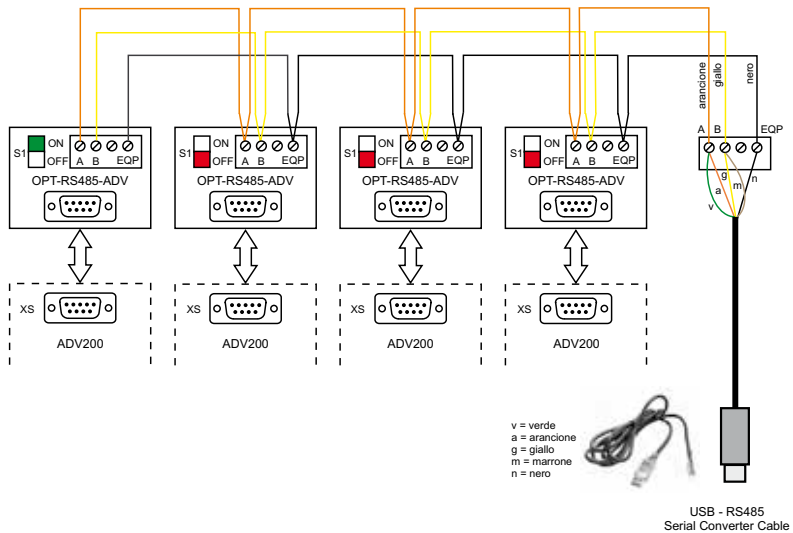
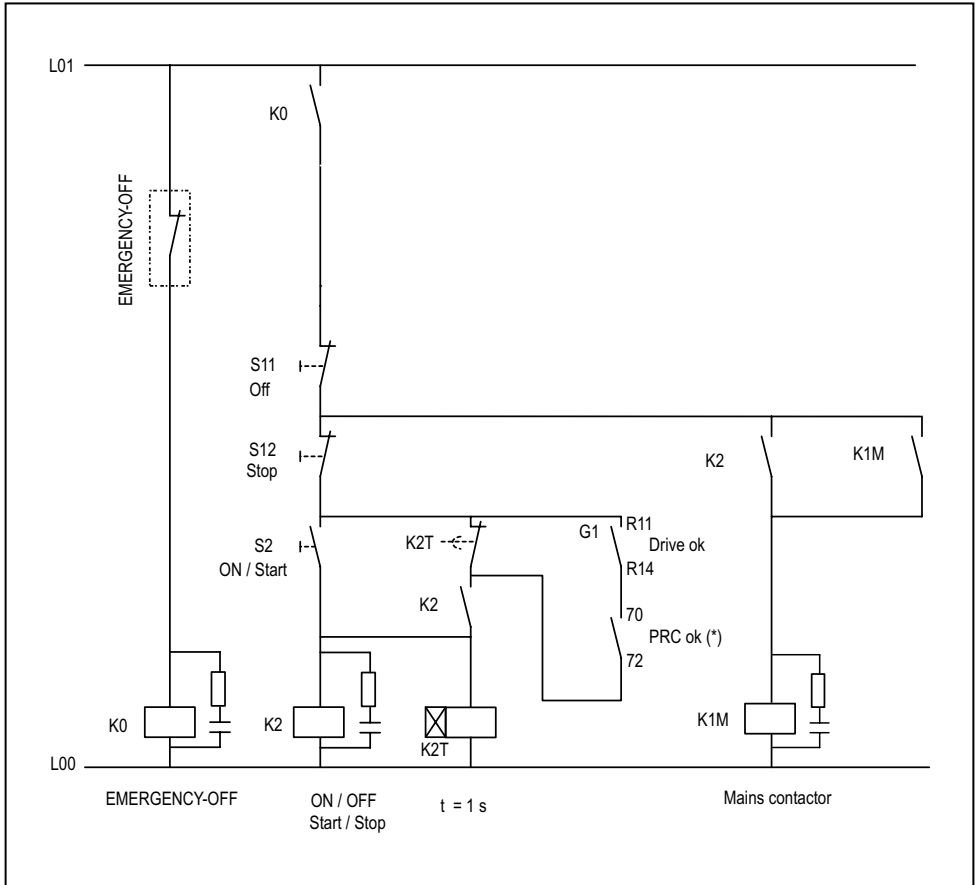


Figure 5.4.3.3: Example of Multidrop connection between ADV200 and a PC with USB port

5.5 Typical connection diagrams



(*): Only for sizes \geq ADV200 WA-72000.

Figure 5.5.1: Auxiliary control circuits

Note:

See ADV200 WA FP manual, chapter 26.14- PROCESS/MULTI PUMP for dedicated connection diagram and sw configuration of multi-pump systems.

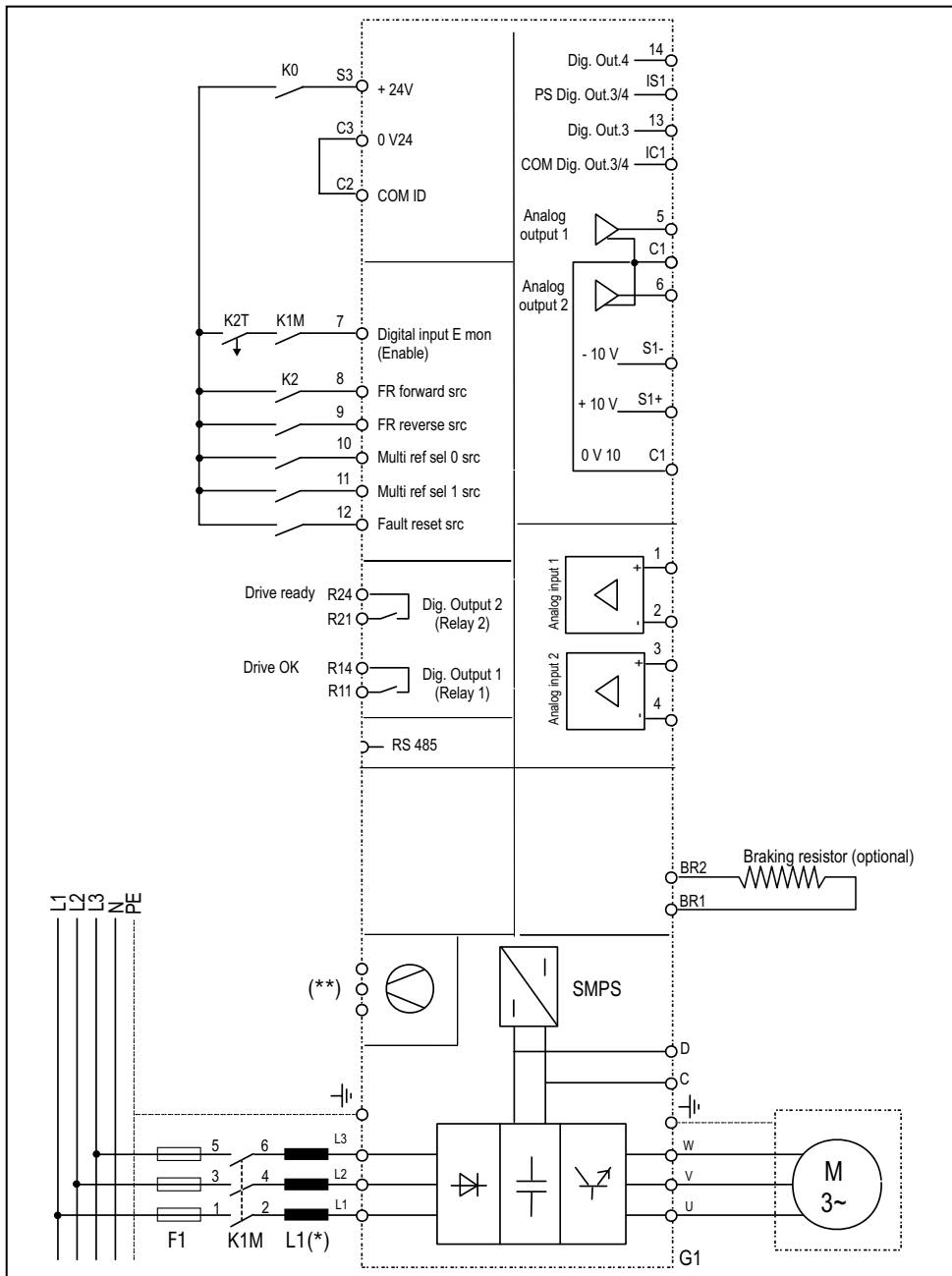


Figure 5.5.2: Typical connection diagram, connection through terminals strip

(*): 1015 ... 61600: Integrated choke on DC link; ≥ 72000 : external choke mandatory;

(**): See chapter 5.1.12, Connection of fans.

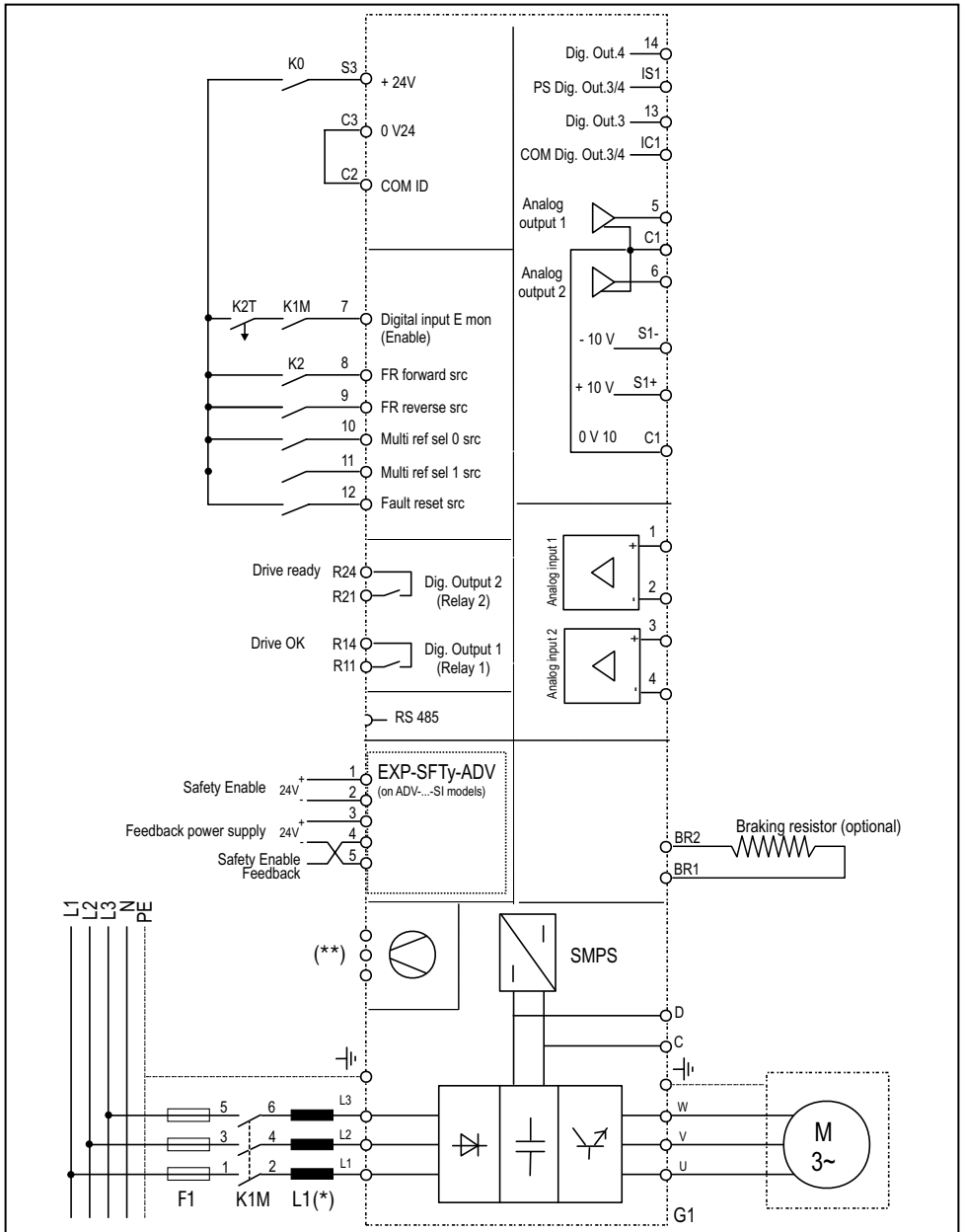
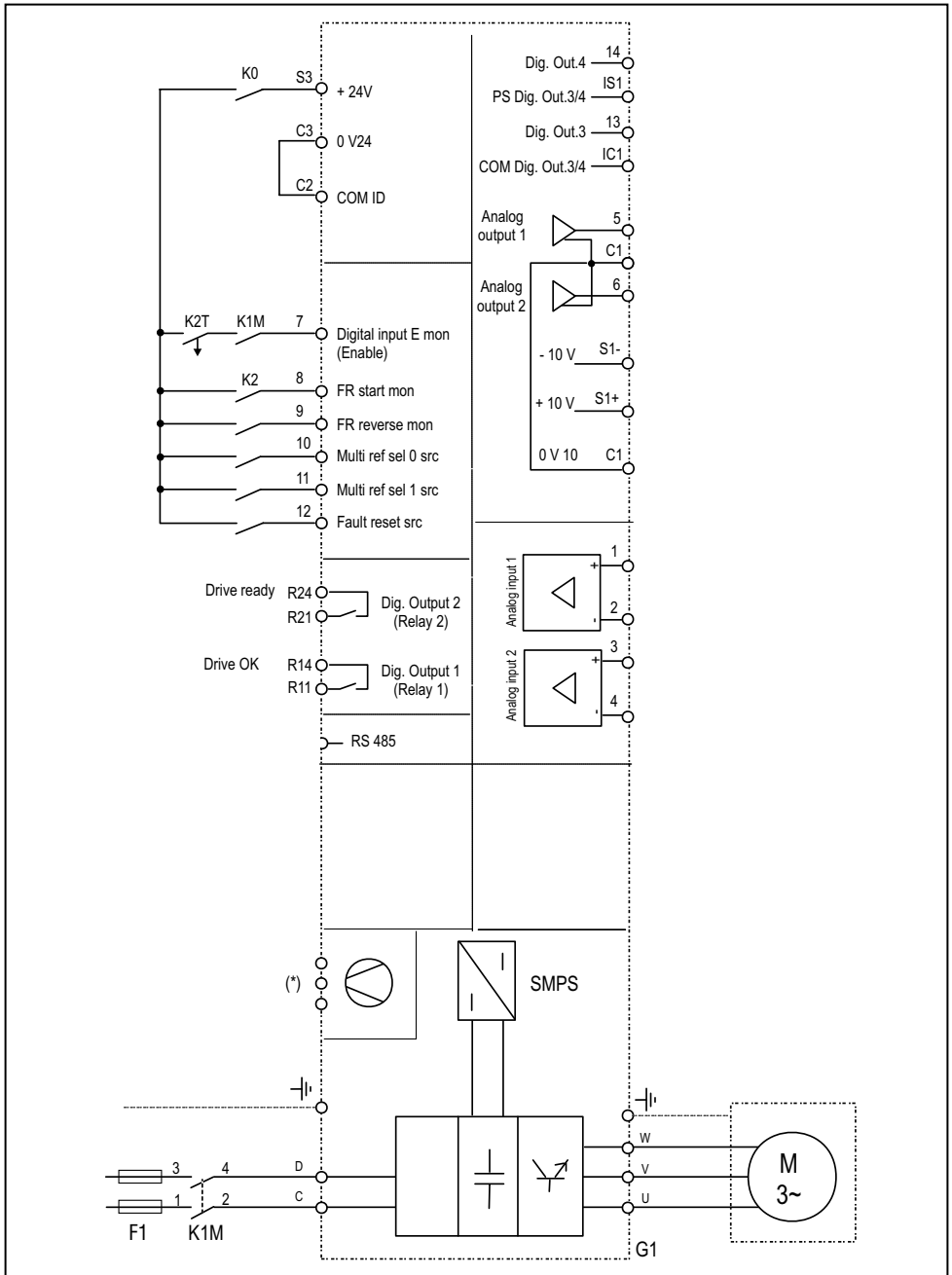


Fig 5.5.3: Simplified diagram, Safe Torque Off function (ADV...-SI models only)



Caution

For instructions on connecting and commissioning the SIL2 or SIL3 safety level function, please see chapter 7 "Application Examples" in the Safety manual (code 1S5F94) which you can download from www.weg.net



(*) See paragraph "5.1.12 Connection of fans", page 44.

Fig 5.5.4: Typical connection diagram, command via terminal strip, ADV200 WA-...-DC models

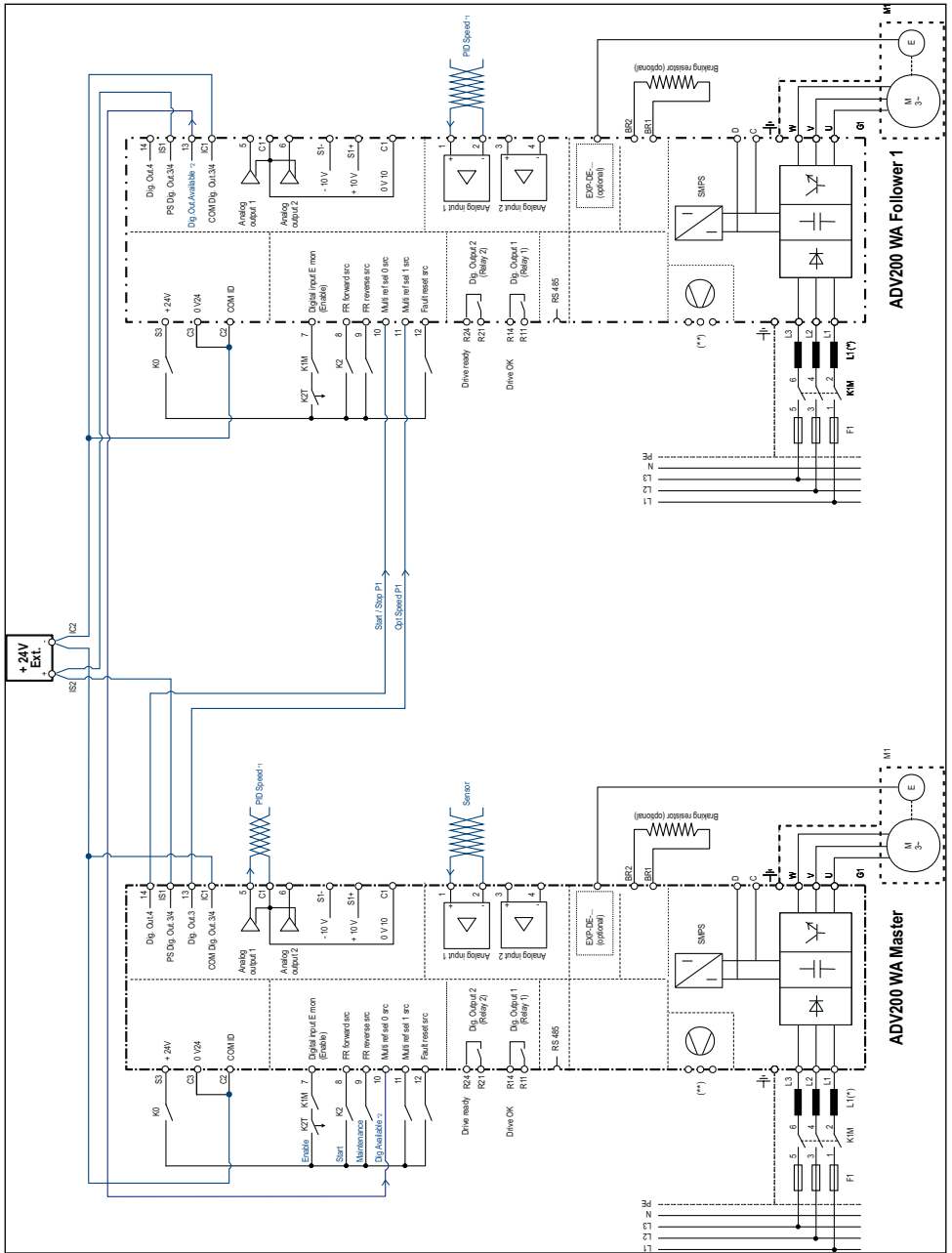


Fig 5.5.5: Typical connection diagram, WA Multidrive application

Notes:

- 1) The diagram refers to Multidrive Application. It consist of 1 Controller drive + 1 Follower (2 pumps).

- 2) Using the standard inputs and outputs you can connect up to 2 Followers (3 pumps). Connections:
 - > Analog output 1 of Drive Controller to Analog input 1 of Drive Follower 2 (PID Speed P2),
 - > Dig. Output 1 of Drive Controller to terminal 10 of Drive Follower 2 (Opt. Speed P2),
 - > Dig. Output 2 of Drive Controller to terminal 11 of Drive Follower 2 (Start / Stop P2)
 - > + 24V EXT (morsetti IC1, IS1, COM ID)

3) You can connect up to 5 Follower (total 6 pumps) adding an optional card EXP-IO-D5R8-ADV to drive Controller. Connections:

- > Analog output 1 of Drive Controller to Analog input 1 inputs of n Drives Follower (PID Speed Px),
- > Dig. Output 1 of Drive Controller to Drive Follower 2 terminal 10 (Opt. Speed P2),
- > Dig. Output 2 of Drive Controller to Drive Follower 2 terminal 11 (Start / Stop P2)
- > Relay 1 of optional card to Drive Follower 3 terminal 10 (Opt. Speed P3),
- > Relay 2 of optional card to Drive Follower 3 terminal 11 (Start / Stop P3)
- > Relay 3 of optional card to Drive Follower 4 terminal 10 (Opt. Speed P4),
- > Relay 4 of optional card to Drive Follower 4 terminal 11 (Start / Stop P4)
- > Relay 5 of optional card to Drive Follower 5 terminal 10 (Opt. Speed P5),
- > Relay 6 of optional card to Drive Follower 5 terminal 11 (Start / Stop P5)
- > + 24V EXT to terminals IC1, IS1, COM ID of n Drive Follower
- > Terminal 13 of Follower 4 to Controller terminal 11
- > Terminal 13 of Follower 5 to Controller terminal 12
- > Terminal 13 of Follower 6 to terminal T1 Digital input 1 of optional card
- > + 24V EXT to terminals C7 (0V) and IS4 (+ 24V) of optional card

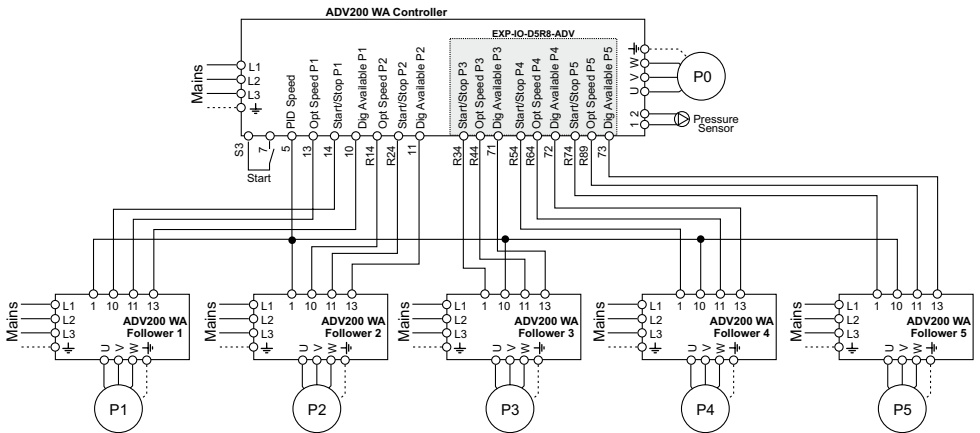


Fig 5.5.5: Typical connection diagram, WA Multidrive application (6 pumps)

Note:

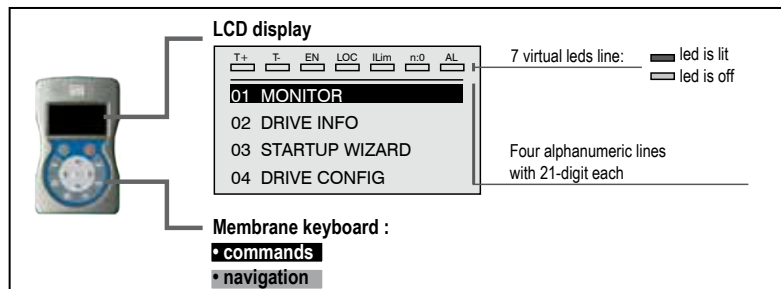
The system can operate up to a maximum of 8 pumps, but in this case can not be used for the Optimal Speed control mode. In this specific case it is not necessary to connect:

- CONTROLLER SIDE: the outputs related to Optimal speed command:
- FOLLOWER SIDE (N drives): the inputs related to Optimal speed command:

6 - Use of the keypad

This chapter describes the keypad and methods of use for display and programming of inverter parameters.

6.1 Description



Membrane keyboard

Inverter control programming menu navigation keys.

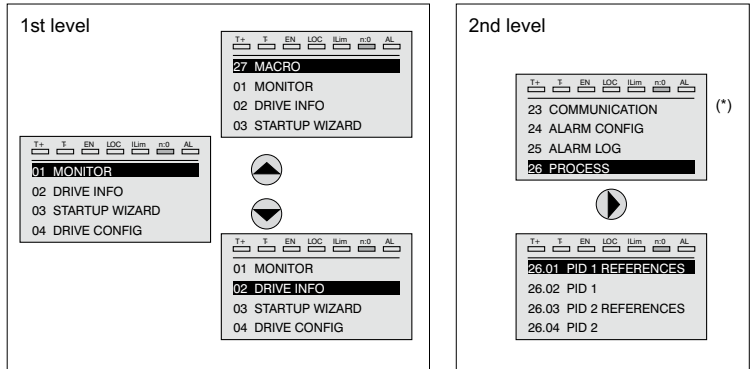
Symbol	Reference	Description
	Start	Starts the motor
	Stop	Stops the motor
ESC	Escape	Returns to the higher level menu or submenu. Exit from a parameter, a list of parameters, from the list of the last 10 parameters and from the Goto parameter function (see CUST). Can be used to exit from a message that requires use of this.
FWD REV	Forward/Reverse	Reverses the direction of rotation of the motor
LOC REM	Local/Remote	Changes the method of use from local to remote and vice versa. Is active only if the drive is not enabled.
RST	Reset	Resets alarms only if the causes have been eliminated.
CUST	Custom	The first time it is pressed, displays the list of the last 10 parameters modified. Pressing this key a second time activates the Goto parameter function for access to a parameter through its number. To exit these functions, press the ◀ key.
DISP	Display	Displays a list of drive functioning parameters.
E	Enter	Accesses the submenu or parameter selected or selects an operation, Is used during parameter modification to confirm the new value set.
▲	Up	Moves selection in a menu or a list of parameters up. During modification of a parameter, increases the value of the digit under the cursor.
▼	Down	Moves the selection in a menu or a list of parameters down. During modification of a parameter, decreases the value of the digit under the cursor.
◀	Left	Returns to the higher level menu. During modification of a parameter, moves the cursor to the left.
▶	Right	Accesses the submenu or parameter selected. During modification of a parameter, moves the cursor to the right.

LED's meaning:

- T+** the LED is lit, when the drive operates with a positive torque
- T-** the LED is lit, when the drive operates with a negative torque
- EN** the LED is lit, when the drive is enabled
- LOC** The led is lit when the drive is in local mode and OFF when in remote mode.
- Ilim** the LED is lit, when the drive operates at a current limit. During normal functioning, this led is OFF.
- n=0** the LED is lit; it signals zero speed
- AL** the LED is lit; it signals a trip

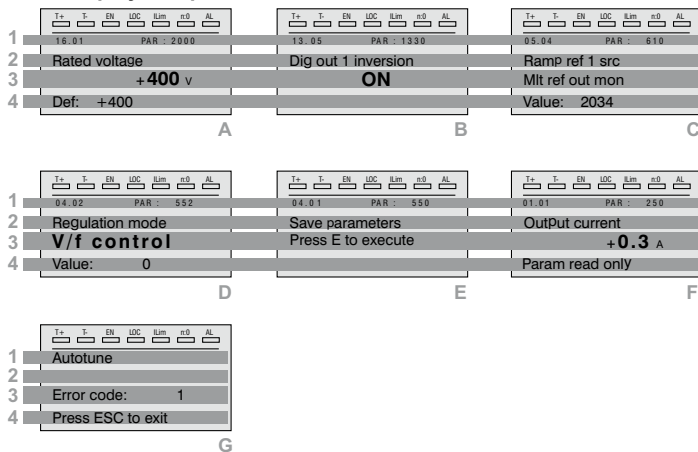
6.2 Navigation

6.2.1 Scanning of the first and second level menus



(*) This example is visible only in **Export** mode (see paragraph 6.5.2).

6.2.2 Display of a parameter

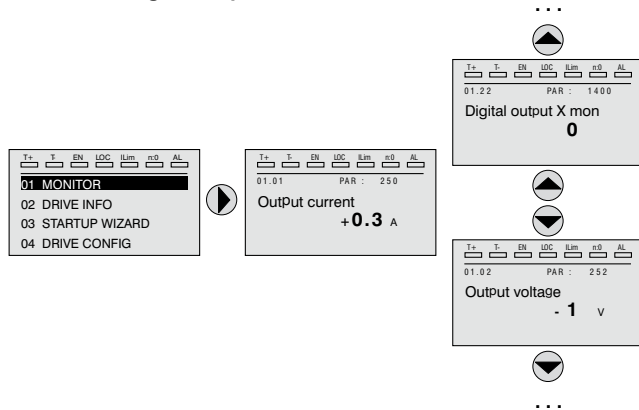


- 1 Position of the parameter in the menu structure (in figure A, 16.01); number of the parameter (in figure A, PAR: 2000).

- 2 Description of the parameter.
- 3 Depends on the type of parameter:
 - **Numeric parameter:** displays the numeric value of the parameter, in the format required, and unit of measurement (figure A).
 - **Binary selection:** the parameter may assume only 2 states, indicated as OFF-ON or 0 - 1 (figure B).
 - **LINK type parameter:** displays the description of the parameter set from the selection list (figure C).
 - **ENUM type parameter:** displays the description of the selection (figure D)
 - **Command:** displays the method of execution of the command (figure E)
- 4 In this position, the following may be displayed:
 - **Numeric parameter:** displays the default, minimum and maximum values of the parameter. These values are displayed in sequence pressing the ► key (figure A).
 - **LINK type parameter:** displays the number (PAR) of the parameter set (figure C) .
 - **ENUM type parameter:** displays the numeric value corresponding to the current selection (figure D).
 - **Command:** in the case of an error in the command, indicates that ESC must be pressed to terminate the command (figure G).
 - **Messages and error conditions** (figure F):

Param read only	attempt to modify a read-only parameter
Password active	the parameter protection password is active
Drive enabled	attempt to modify a non-modifiable parameter with the drive enabled
Input value too high	the value entered too high
Input value too low	the value entered too low
Out of range	attempt to insert a value outside the min. and max. limits

6.2.3 Scanning of the parameters



6.2.4 List of the last parameters modified

Pressing the **CUST** key, a list containing the last 10 parameters modified is accessed. One parameter at a time is displayed and the list can be scrolled using the ▲ and ▼ keys. To exit this list, press the ► key.

6.2.5 “Goto parameter” function

Pressing the **CUST** key twice, or once if already in the “List of modified parameters”, the “Goto parameter” is activated.

This function permits access to any parameter entering only the software number of the parameter (PAR).

When the parameter reached by the “Goto” command is displayed, it is possible to navigate all the parameters forming part of the same group using the ▲ and ▼ keys.

Pressing the ► key returns to the “Goto” function.

To exit the “Goto” function, press the ► key.

6.3 Parameter modification

To enter parameter modification mode, press the **E** key when the parameter to be modified is displayed.

To save the value of the parameter, following modification, press the **E** key again.

Note !

To save permanently, see [paragraph 6.4](#).

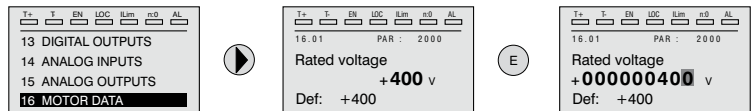
To exit from modification mode without saving the value, press the **ESC** key.

The operations to be carried out to modify the value depend on the type of the parameter, as described below.

Note !

For further information about the type of parameters displayed, see chapter Parameters List (ADV200 WA FP manual).

- **Numeric parameters**



When **E** is pressed to access modification mode, the cursor is activated on the digit corresponding to the unit.

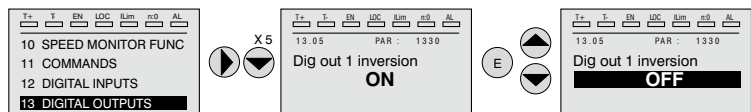
Using the ◀ and ▶ keys, the cursor can be moved to all the digits, including trailing zeros that are normally not displayed.

With the ▲ and ▼ keys, the digit under the cursor is increased or decreased.

Press **E** to confirm the modification or **ESC** to cancel.

- **Binary parameters (BIT type)**

The parameter may assume only two states which are indicated as OFF-ON or 0-1.



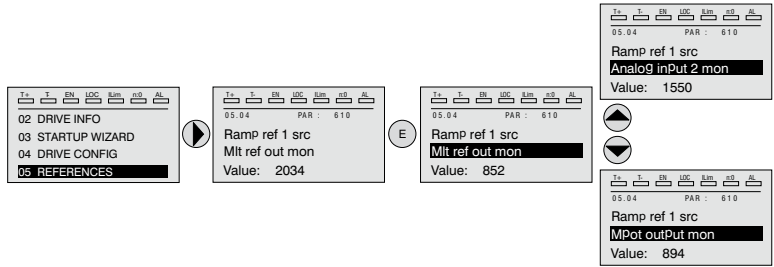
Pressing **E**, modification mode is activated. The entire line is displayed in reverse.

Use the ▲ and ▼ keys to move from one state to another.

Press **E** to confirm the modification or **ESC** to cancel.

- **LINK type parameter**

The parameter may assume the number of another parameter as value.

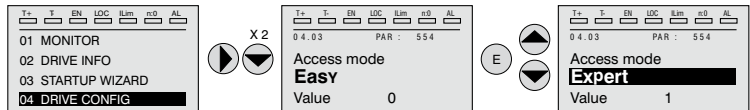


Pressing **E**, modification mode is activated. The entire line is displayed in reverse. The elements of the list of parameters associated to this parameter can be scrolled using the **▲** and **▼** keys.

Press **E** to confirm the modification or **ESC** to cancel.

- **ENUM type parameter**

The parameter may assume only the values contained in a selection list.



Pressing **E**, modification mode is activated. The entire line is displayed in reverse. The elements of the selection list can be scrolled using the **▲** and **▼** keys.

Press **E** to confirm the modification or **ESC** to cancel.

- **Execution of commands**

A parameter can be used to carry out a number of operations on the drive.

For an example, see [paragraph 6.4](#): in this case, the “Press E to execute” request is displayed instead of the value.

To perform the command, press **E**.

During execution of the command, the “In progress” caption is displayed to indicate that the operation is in course.

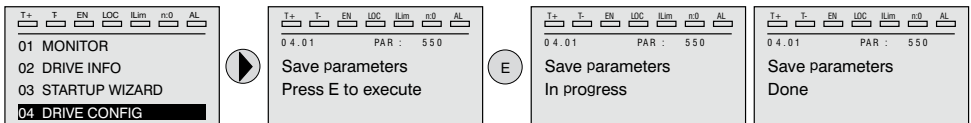
At the end of execution, if the result is positive, the “Done” caption is displayed for few seconds.

If execution has failed, an error message is displayed.

6.4 How to save parameters

Menu 04 DRIVE CONFIG, parameter 04.01 **Save parameters**, PAR : 550.

Used to save changes to parameter settings so that they are maintained also at the power-off.



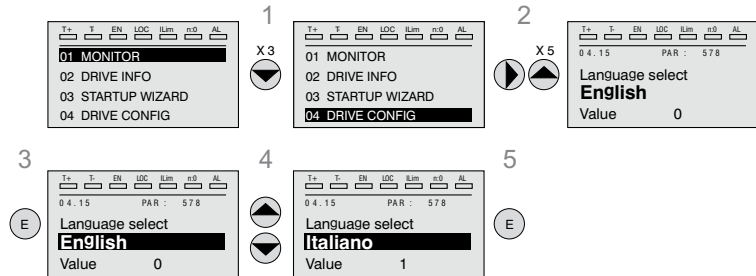
To exit, press the **◀** key.

6.5 Configuration of the display

6.5.1 Language selection

Menu 04 DRIVE CONFIG, parameter 04.15 **Language select**, PAR: 578, default=English.

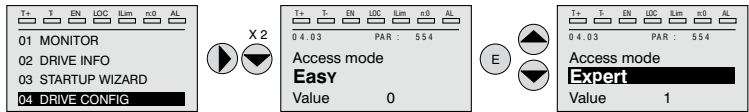
Used to set one of the languages available : English, Italian, Francais, Deutsch, Polish, Romanian, Russian, Turkish and Portuguese.



Note !

To access the Cyrillic font : 1) press the E key and hold it down while you switch the drive on, 2) select the required font using the ▲ and ▼ keys, 3) press E to confirm and return to normal operating mode.

6.5.2 Selection of Easy / Export mode



Menu 04 DRIVE CONFIG, parameter 04.03 **Access mode** , PAR: 554.

Makes it possible to configure two methods of access :

Easy (default) only the main parameters are displayed.

Expert for advanced users, all the parameters are displayed.

6.5.3 Startup display

Note !

This parameter is visible only in **Expert** mode (see [paragraph 6.5.2](#)).

Menu 04 DRIVE CONFIG, parameter 04.13 **Startup display**, PAR : 574.

Used to set the parameter that will be displayed automatically at drive power-on.

Entering the value -1 (default), the function is disabled and the main menu is displayed at power-on. Set to 0 to show the display menu.

6.5.4 Back-lighting of the display

Note !

This parameter is visible only in **Expert** mode (see [paragraph 6.5.2](#)).

Menu 04 DRIVE CONFIG, parameter 04.16 **Display backlight**, PAR : 576.

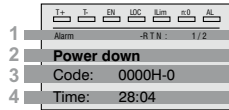
Sets lighting of the display

ON the light of the display remains always on.

OFF (default) the light switches off after approx. 3 minutes from pressing of the last key.

6.6 Alarms

The alarms page is displayed automatically when an alarm occurs.



1 Alarm: identifies the alarm page.

RTN : indicates that the alarm has been reset; if the alarm is still active, nothing is displayed.

x/y : x indicates the position of this alarm in the list of alarms and y the number of alarms (the alarm with lowest x is the most recent)

2 Description of the alarm

3 Sub-code of the alarm, provides other information in addition to the description

4 Moment of occurrence of the alarm in machine time.

The list of alarms is scrolled using the ▲ and ▼ keys.

6.6.1 Alarm reset

- If the alarm page is displayed:

Pressing the **RST** key, the alarms are reset and all alarms reset are eliminated from the list.

If, after this operation, the list of alarms is empty, the alarm page is closed.

If the list is not empty, press the ► key to exit from the alarms page.

- If the alarms page is not displayed:

Pressing the **RST** key, the alarms are reset.

If active alarms are still present following reset, the alarm page is opened.

Note !

For further information, see chapter 8.2.

6.7 Messages

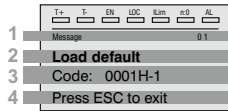
Operator messages are displayed with this page.

The messages are of two types:

- *timed* (closed automatically after a certain number of seconds),

- *fixed* (remain displayed until the operator presses the **ESC** key).

Several concurrent messages are enqueued and presented to the operator in sequence, starting from the most recent.



- 1 **MESSAGE** : identifies a message.
xx indicate show many messages are enqueued. The queue may contain a maximum of 10 messages and the message with the highest number is the most recent.
- 2 Description of the message (see [chapter 8](#) for further information)
- 3 Sub-code of the message. Provides extra information in addition to the description.
- 4 "Press ESC to exit" is displayed if the message requires acknowledgment.

When a message is closed, the next message is displayed until the queue is empty.

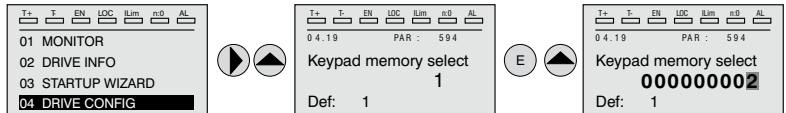
Note !

For further information, see [chapter 8.2](#).

6.8 Saving and recovery of new parameter settings

Drive parameters can be saved on the keypad in 5 different memory areas. This function is useful to obtain various sets of parameters, for safety backup or to transfer the parameters from one drive to another.

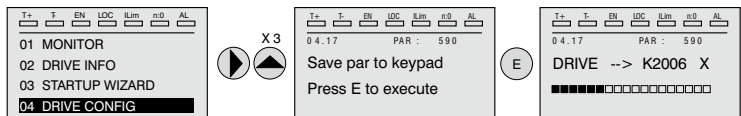
6.8.1 Selection of the keypad memory



Menu 04 DRIVE CONFIG, parameter 04.21 **Keypad memory select**, PAR : 594.

The keypad features 5 memory areas dedicated to saving parameters. The memory to be used is selected using the **Keypad memory select** parameter. Subsequent saving and recovery operations will be carried out on the memory selected.

6.8.2 Saving of parameters on the keypad

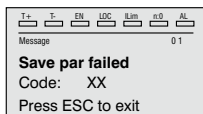


Menu 04 DRIVE CONFIG, parameter 04.19 **Save par to keypad**, PAR : 590.

Is used to transfer the parameters from the drive to the selected keypad memory. To start the operation, press the **E** key. During transfer, a bar is displayed which indicates progress of the operation. Instead of the letter **X**, the number of the currently selected keypad memory is displayed.

At the end of transfer, if this has been completed successfully, the "Done" caption is displayed for a few seconds with subsequent return to the initial page.

If an error occurs during transfer, the following message is displayed:

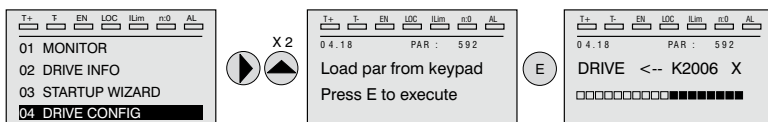


The code XX indicates the type of error, see [paragraph 8.2](#).
To exit from the error message, press the **ESC** key.

6.8.3 Load parameters from keypad

Menu 04 DRIVE CONFIG, parameter 04.20 **Load par from keypad**, PAR : 592.

Is used to transfer the parameters from the selected memory of the keypad to the drive.

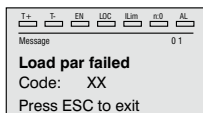


To start the operation, press the **E** key. During transfer, a bar is displayed which indicates progress of the operation.

Instead of the letter **X**, the number of the currently selected keypad memory is displayed.

At the end of transfer, if this has been completed successfully, the “Done” caption is displayed for a few seconds with subsequent return to the initial page.

If an error occurs during transfer, the following message is displayed:



The code XX indicates the type of error, see [paragraph 8.2](#).
To exit from the error message, press the **ESC** key.

6.8.4 Transfer of parameters between drives

Transfer the parameters of the source drive to the keypad memory as indicated in [paragraph 6.8.2](#), then connect the keypad to the drive on which the new setting is to be saved and proceed as indicated in [paragraph 6.8.3](#).



Caution

~~~~~  
To prevent possible damage to equipment, it is advisable to disconnect and connect the keypad with the drive OFF.

*Pour éviter tout endommagement possible des appareils, il est conseillé de débrancher et de brancher le pavé de commande une fois le drive éteint.*

~~~~~

7 - Commissioning via keypad (STARTUP WIZARD)



Adjustable frequency drives are electrical apparatus for use in industrial installations. Parts of the Drives are energized during operation. The electrical installation and the opening of the equipment should therefore only be carried out by qualified personnel. Improper installation of motors or Drives may therefore cause the failure of the device as well as serious injury to persons or material damage. Drive is not equipped with motor overspeed protection logic other than that controlled by software. Follow the instructions given in this manual and observe the local and national safety regulations applicable.

Les drives à fréquence variable sont des dispositifs électriques utilisés dans des installations industriels. Une partie des drives sont sous tension pendant l'opération. L'installation électrique et l'ouverture des drives devrait être exécuté uniquement par du personnel qualifié. De mauvaises installations de moteurs ou de drives peuvent provoquer des dommages matériels ou blesser des personnes. On doit suivre les instructions données dans ce manuel et observer les règles nationales de sécurité.

Always connect the Drive to the protective ground (PE) via the marked connection \perp . ADV Drives and AC Input filters have ground leakage currents greater than 3.5 mA. EN61800-5-1 specifies that with leakage currents greater than 3.5 mA the protective conductor ground connection (\perp) must be fixed type and doubled for redundancy if its section is lower than 10mm² CU or 16mm² AL.

Il faut toujours connecter le variateur à la terre \perp (PE). Le courant de dispersion vers la terre est supérieur à 3,5 mA sur les variateurs et sur les filtres à courant alterné. Les normes EN61800-5-1 spécifient qu'en cas de courant de dispersion vers la terre, supérieur à 3,5 ma, la mise à la terre (\perp) doit avoir une double connexion pour la redondance si sa section est inférieure à 10mm² CU ou 16mm² AL.

Only permanently-wired input power connections are allowed. This equipment must be grounded (IEC 536 Class 1, NEC and other applicable standards).

If a Residual Current-operated protective Device (RCD) is to be used, it must be an RCD type B. Machines with a three phase power supply, fitted with EMC filters, must not be connected to a supply via an ELCB (Earth Leakage Circuit-Breaker - see DIN VDE 0160, section 5.5.2 and EN 61800-5-1 section 4.3.10.).

The following terminals can carry dangerous voltages even if the inverter is inoperative:

- the power supply terminals L1, L2, L3, C, D.
- the motor terminals U, V, W.

This equipment must not be used as an 'emergency stop mechanism' (see EN 60204, 9.2.5.4).

Seuls des branchements électriques permanents par câble en entrée sont admis. Mettre l'appareil à la masse (IEC 536 Classe 1, NEC et autres normes applicables).

S'il s'avère nécessaire d'utiliser un dispositif protecteur de courant résiduel (RCD), il convient de choisir un RCD de type B. Les machines à alimentation triphasée et dotées de filtres EMC ne doivent pas être raccordées au bloc d'alimentation par le biais d'un disjoncteur ELCB (Earth Leakage Circuit-Breaker – cf. DIN VDE 0160, paragraphe 5.5.2 et 61800-5-1 paragraphe 4.3.10.).

Les bornes suivantes peuvent recevoir des tensions dangereuses, même si l'onduleur est désactivé :

- bornes d'alimentation L1, L2, L3, C, D.
- bornes du moteur U, V, W.

Ne pas utiliser cet appareil en tant que « dispositif d'arrêt d'urgence » (cf. EN 60204, 9.2.5.4).

Do not touch or damage any components when handling the device. The changing of the isolation gaps or the removing of the isolation and covers is not permissible.

Manipuler l'appareil de façon à ne pas toucher ou endommager des parties. Il n'est pas permis de changer les distances d'isolement ou bien d'enlever des matériaux isolants ou des capots.

According to the EU directives the ADV and accessories must be used only after checking that the machine has been produced using those safety devices required by the 2006/42/EC set of rules, as far as the machine industry is concerned. These standards do not apply in the Americas, but may need to be considered in equipment being shipped to Europe.

Conformément à la directives EU, les drives ADV et leurs accessoires doivent être employés seulement après avoir vérifié que la machine ait été produit avec les même dispositifs de sécurité demandés par la réglementation 2006/42/EC concernant le secteur de l'industrie.

Motor parameters must be accurately configured for the motor overload protection to operate correctly.

Configurer soigneusement les paramètres du moteur afin que la protection contre les surcharges équipée sur le moteur fonctionne convenablement.

High voltage levels are present in the drive.

Les tensions, à l'intérieur du drive, sont élevées.

Wherever faults occurring in the control equipment can lead to substantial material damage or even grievous bodily injury (i.e. potentially dangerous faults), additional external precautions must be taken or facilities provided to ensure or enforce safe operation, even when a fault occurs (e.g. independent limit switches, mechanical interlocks, etc.).

Adopter des mesures de précaution supplémentaires à l'extérieur du drive (par exemple, des interrupteurs de fin de course, des interrupteurs mécaniques, etc.) ou fournir des fonctions aptes à garantir ou à mettre en place un fonctionnement sécurisé en cas de survenue d'une panne de l'appareil de commande susceptible d'occasionner des dégâts matériels d'envergure, voire même des lésions corporelles graves (par exemple, des pannes potentiellement dangereuses).

Certain parameter settings may cause the inverter to restart automatically after an input power failure.

Certaines configurations de paramètres peuvent provoquer le redémarrage automatique de l'onduleur après une coupure de l'alimentation.

This equipment is suitable for use in a circuit capable of delivering not more than 10,000 symmetrical amperes (rms), for a maximum voltage of 480 V .

Cet appareil est conçu pour une utilisation sur un circuit d'alimentation en mesure de délivrer 10.000 ampères symétriques (rms) maximum pour une tension maximale de 480V.

This equipment must not be used as an 'emergency stop mechanism' (see EN 60204, 9.2.5.4).

Ne pas utiliser cet appareil en tant que « dispositif d'arrêt d'urgence » (cf. EN 60204, 9.2.5.4).

Do not open the device or covers with the product connected to the mains or a DC power supply. Minimum time to wait before working on the terminals or inside the device is listed in [section 9.8](#) .

Ne pas ouvrir le dispositif ou les couvercles tant que le produit est sous alimentation secteur ou DC. Le temps minimum d'attente avant de pouvoir travailler sur les bornes ou bien à l'intérieur de l'appareil est indiqué dans la [section 9.8](#) .

Fire and Explosion Hazard:

Fires or explosions might result from mounting Drives in hazardous areas such as locations where flammable or combustible vapors or dusts are present. Drives should be installed away from hazardous areas, even if used with motors suitable for use in these locations.

Risque d'incendies et d'explosions. *L'utilisation des drives dans des zones à risques (présence de vapeurs ou de poussières inflammables), peut provoquer des incendies ou des explosions. Les drives doivent être installés loin des zones dangereuses, et équipés de moteurs appropriés.*





Protect the device from impermissible environmental conditions (temperature, humidity, shock etc.).

Protéger l'appareil contre des effets extérieurs non permis (température, humidité, chocs etc.).

To the output of the drive (terminals U, V, W) :

- no voltage should be connected to the output of the drive
- the parallel connection of several drives are not permissible.
- the direct connection of the inputs and outputs (bypass) are not permissible.
- capacitive load (e.g. Var compensation capacitors) should not be connected.

À la sortie du convertisseur (bornes U, V, W) :

- aucune tension ne doit être appliquée
- aucune charge capacitive ne doit être connectée
- il n'est pas permis de raccorder la sortie de plusieurs convertisseurs en parallèle
- il n'est pas permis d'effectuer une connexion directe de l'entrée avec la sortie du convertisseur (Bypass).

The electrical commissioning should only be carried out by qualified personnel, who are also responsible for the provision of a suitable ground connection and a protected power supply feeder in accordance with the local and national regulations. The motor must be protected against overloads.

La mise en service électrique doit être effectuée par un personnel qualifié. Ce dernier est responsable de l'existence d'une connexion de terre adéquate et d'une protection des câbles d'alimentation selon les prescriptions locales et nationales. Le moteur doit être protégé contre la surcharge.

Do not connect power supply voltage that exceeds the standard specification voltage fluctuation permissible. If excessive voltage is applied to the Drive, damage to the internal components will result.

Ne pas raccorder de tension d'alimentation dépassant la fluctuation de tension permise par les normes. Dans le cas d'une alimentation en tension excessive, des composants internes peuvent être endommagés.

Do not operate the Drive without the ground wire connected.

The motor chassis should be grounded to earth through a ground lead separate from all other equipment ground leads to prevent noise coupling.

Ne pas faire fonctionner le drive sans prise de terre.

Le châssis du moteur doit être mis à la terre à l'aide d'un connecteur de terre séparé des autres pour éviter le couplage des perturbations.

No dielectric tests should be carried out on parts of the drive. A suitable measuring instrument (internal resistance of at least 10 k Ω /V) should be used for measuring the signal voltages.

Il ne faut pas exécuter de tests de rigidité diélectrique sur des parties du convertisseurs. Pour mesurer les tensions, des signaux, il faut utiliser des instruments de mesure appropriés (résistance interne minimale 10k Ω /V).

7.1 Startup Wizard

7.1.1 Startup Wizard for Asynchronous Motors

Introduction

The ADV200 WA can operate with regulation modes : V/f control (Voltage/Frequency) and Flux vector OL (open loop).

Menu 04 DRIVE CONFIG, parameter 04.2 **Regulation mode**, PAR: 552, default=V/f control.

Start-up in one mode is valid also for the other regulation modes.

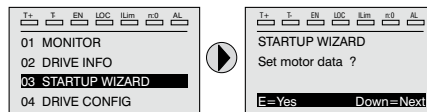
The startup wizard is a guided procedure used for quick start-up of the drive that helps to set the main parameters.

It consists of a series of questions relating to the various sequences for entering and calculating the parameters necessary for correct drive operation.

The order of these sequences is as follows:

- Basic connections See step 1
- **Setting motor parameters** See step 2
- **Self-tuning with rotating motor** See step 3A
- **Self-tuning with motor at stand-still or coupled to the load** See step 3B
- **Setting the maximum speed reference value** See step 4
- **Setting ramp parameters** See step 5
- **Saving parameters** See step 6
- **Speed regulation setting** See step 7
- **Setting the motor in Flux vector OL control mode** See step 8

The format of the function selection page is as follows:



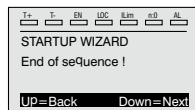
Pressing the E key, the function to be programmed is accessed.

Press the ▼ (Down) key to move to the next function skipping the current function.

Press the ▲ key to return to the previous function.

To terminate the sequence of functions and return to the menu, press the **ESC** key.

The end of the start-up sequence is indicated with the page:



Press the ▼(Down) key to exit the sequence and return to the menu.

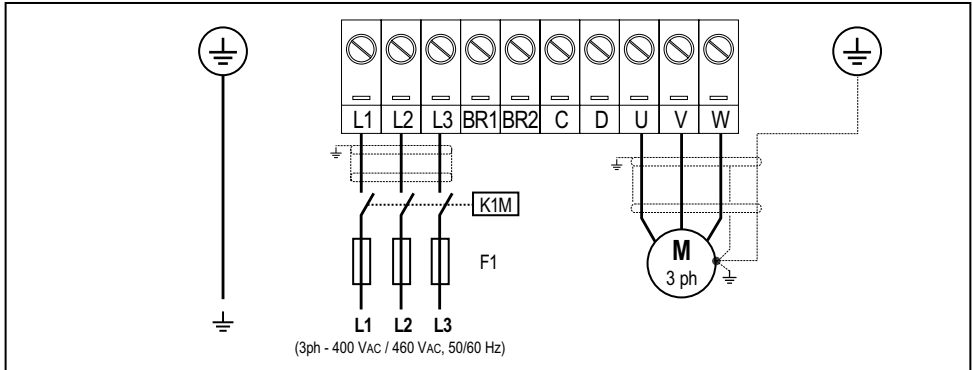
Note !

.....
In the procedures described below, the settings have been made using the ADV2075 drive and a 10 Hp (7.36 kW) asynchronous motor.
.....

Step 1 - Connections

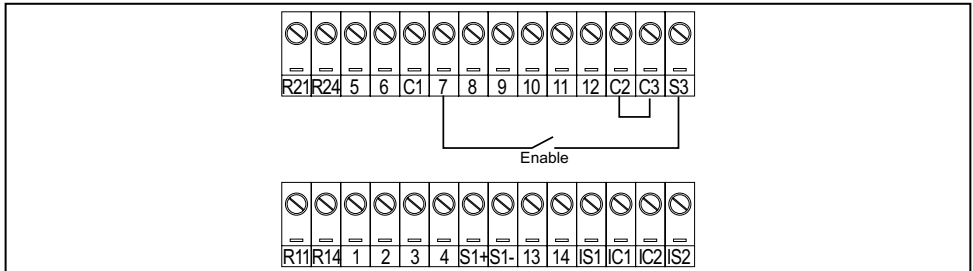
Connect the drive to the power supply as illustrated in the following diagrams:

Connection to the mains and motor

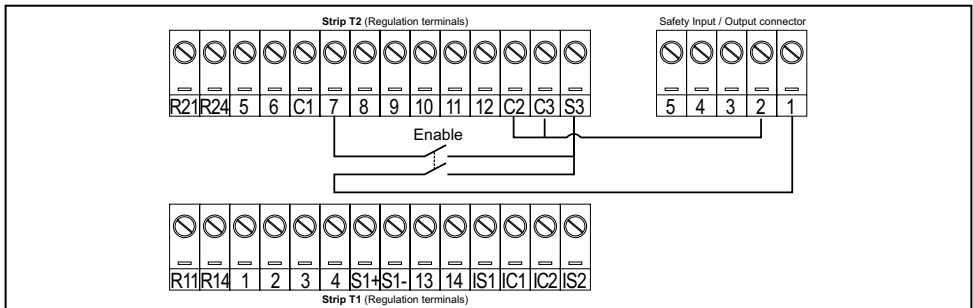


For ADV....-DC versions please refer to the diagrams in paragraph "5.1.6 Power line connection", page 36 and "5.1.8 Motor connection", page 39.

Connection of the drive enabling contact



Connection of the drive enabling contact with Safety function (SIL2 configuration)



Checks to be performed before powering the drive

- Check that the supply voltage is correct (TN,TT for ADV200 WA standard series ; IT for ADV200 WA...-IT series) and that the input terminals on the drive (L1, L2 and L3) are connected correctly.
- Check that the output terminals on the drive (U, V, and W L1, L2 and L3 or C and D for ADV-...-DC) are connected to the motor correctly.
- Check that all the drive control circuit terminals are connected correctly. Check that all control inputs are open.

Powering the drive

- After completing all the checks described above, power the drive and proceed to Step 2.

Step 2 - Setting motor parameter (Set motor data)

Set the rating data of the motor connected: rated voltage, rated frequency, rated current, rated speed, rated power, power factor (cosφ).

Motor & Co.			
Type: ABCDE		IEC 34-1 / VDE 0530	
Motor: 3 phase	50 Hz	Nr	12345-91
Rated voltage	380 V	I nom	19.0 A
Rated power	10 Hp	Power factor	0.83
Rated speed (n _r)	720 rpm		
IP54	Iso KI F	S1	
Made in			

The self-tuning procedure is described below using the data of an imaginary motor by way of example.

The screenshots show the following parameter settings:

- Rated voltage:** +400 v (Def: +400)
- Rated current:** +11.8 A (Def: +11.8)
- Rated speed:** +1450 rpm (Def: +1450)
- Rated frequency:** +50.0 Hz (Def: +50.0)
- Pole pairs:** +2 (Def: +2)
- Rated power:** +5.50 kW (Def: +5.50)
- Rated power factor:** +0.83 (Def: +0.83)

- Rated Voltage [V]:** motor rated voltage as indicated on the data plate.
- Rated current [A]:** motor rated current, approximately, the value should not be less than 0.3 times the rated current of the drive, output current class 1 @ 400V on the rating plate of the drive.
- Rated speed [rpm]:** motor rated speed, the value must reflect the speed of the motor at full load at rated frequency. If slip is indicated on the motor rating data, set the **Rated speed** parameter as follows:
 Rated speed = Synchronous speed - Slip
- Rated frequency [Hz]:** motor rated frequency, as shown on the data plate.
- Pole pairs:** Number of motor pole pairs. The number of motor pole pairs is calculated using the data on the plate and the following formula: $P = 60 [s] \times f [Hz] / nN [rpm]$
 Where: p = motor pole pairs

f = motor rated frequency (menu 16 MOTOR DATA par. 2006)
nN = motor rated speed (menu 16 MOTOR DATA par. 2004)

- Rated power [kW]:** motor rated power, for a motor rating plate with a HP power value, set the rated power
kW = 0.736 x motor power Hp value.
- Rated power factor:** leave the default value of Cos ϕ if the data are not available.

Note !

When data entry is complete the **Take parameters** command (menu 16 MOTOR DATA, PAR: 2020) is executed automatically. The motor data entered during the STARTUP WIZARD procedure are saved in a RAM memory to enable the drive to perform the necessary calculations.

These data are lost if the device is switched off. To save the motor data follow the procedure described in Step 6.

At the end of the procedure, proceed to Step 3A (motor free to rotate and uncoupled from transmission) or to Step 3B (motor coupled to transmission).

Step 3 - Autotune of the motor

The drive carries out the motor autotune procedure (real measurement of motor parameters).
Autotune may last a few minutes.


Note !

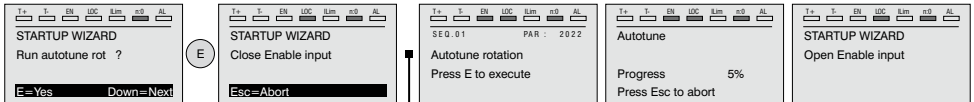
If this operation generates an error message (example Error code 1), check the connections of the power and control circuits (see Step 1 - Connections), check motor data settings (see Step 2 – Motor data setting) and then repeat the Autotune procedure (or, alternatively, select a different type of procedure (Rotation or Still))

Step 3A - Self-tuning with rotating motor (Autotune rotation)

Use this procedure when the motor is not coupled or the transmission does not represent more than 5% of the load. This procedure obtains the most accurate data.

Note !

Autotuning can be cancelled at any time by pressing 



Connect terminal 7 (Enable) to terminal S3 (+24Vdc).
To interrupt this operation, press the **ESC** key.

Note !

At the end of the self-tuning procedure there is a request to open the Enable contact (terminals 7 – S3); the **Take tune parameters** command (menu 16 MOTOR DATA, PAR: 2078) is automatically executed.

The calculated parameters are saved in a RAM memory to enable the drive to perform the necessary calculations. These data are lost if the device is switched off. To save the motor data follow the procedure described in Step 6.

When the Enable contact is opened the drive proposes Step 4 to proceed with the wizard

Step 3B - Self-tuning with motor at stand-still or coupled to the load (Autotune still)

Use this procedure when the motor is **coupled to the transmission** and cannot rotate freely.


May cause limited rotation of the shaft.

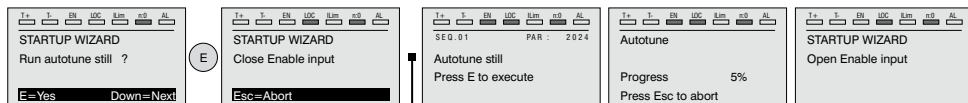
Peut entraîner une rotation de l'arbre limitée.



Caution

Note !

Autotuning can be cancelled at any time by pressing 



Connect terminal 7 (Enable) to terminal C3 (+24Vdc)

Note !

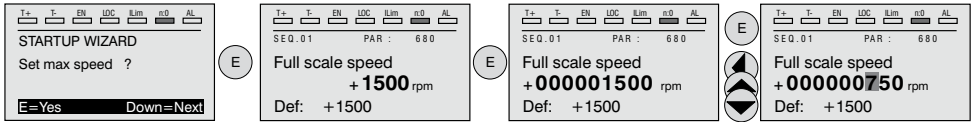
At the end of the self-tuning procedure there is a request to open the Enable contact (terminals 7 – S3); the **Take tune parameters** command (menu 16 MOTOR DATA, PAR: 2078) is automatically executed.

The calculated parameters are saved in a RAM memory to enable the drive to perform the necessary calculations. These data are lost if the device is switched off. To save the motor data follow the procedure described in Step 6.

When the Enable contact is opened the drive proposes Step 4 to proceed with the wizard.

Step 4 - Setting the maximum speed reference value (Set max speed)

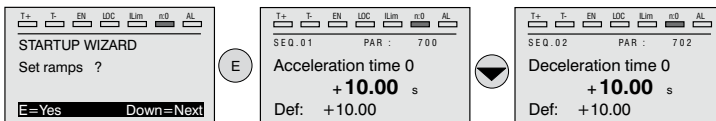
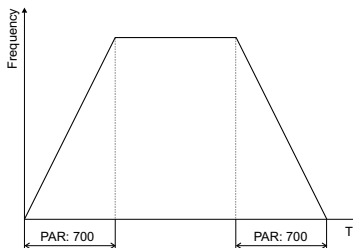
This step is used to define the maximum motor speed value that can be reached with each single reference signal (analog or digital).



After setting the speed, proceed to Step 5 to set the acceleration and deceleration ramp parameters.

Step 5 - Setting ramp parameters (Set ramps)

Set the acceleration and deceleration times for the profile of ramp 0 :

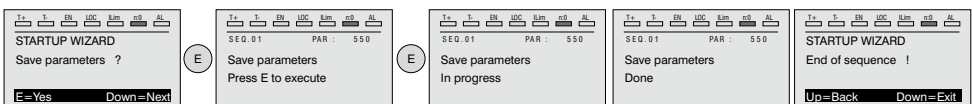


Note !

After setting the acceleration and deceleration ramps, the parameters that have been set manually and calculated using the self-tuning procedures can be saved permanently in a non-volatile flash memory. To save the parameters proceed to Step 6.

Step 6 - Saving parameters (Save parameters)

To save the new parameter settings, so that they are maintained also after power-off, proceed as follows:

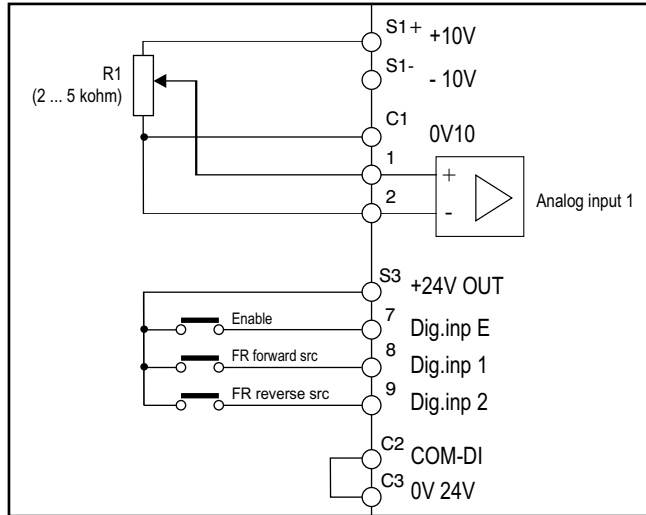


Step 7 - Speed regulation setting

In this step the basic settings in order to perform a functional test of the drive-motor system are described. This functional test uses **factory settings as far as the analog and digital commands of the drive are concerned**. The regulation mode is that set in PAR 552 **Regulation mode**, default is V/f control.

Menu 04 DRIVE CONFIG, parameter 04.2 **Regulation mode**, PAR: 552 (default: 0 = V/f control; 1 = Flux vector OL; 2 = Autotune)

• Basic connections for the speed test



After making the connections described in the previous section, proceed as follows to start the motor rotating:

1. Make sure the analog signal or potentiometer are set to the minimum value.
2. Close the **Enable** contact (terminals S3 – 7)
3. Close the **FR forward src (PAR 1042)** contact, terminals S3 – 8. The drive starts magnetizing the motor
4. Increase the reference signal gradually using the potentiometer or analog signal.
5. If the motor rotates anti-clockwise with the **FR forward src (PAR 1042)** command and a positive analog reference, stop the drive, disconnect the power supply and invert two phases between U, V and W.
6. Press the **DISP** key to check that the voltage, current and output frequency values are correct in relation to the type of motor and the set speed reference value.
7. If all the parameters are correct, increase the analog reference to the full scale value and check that the output voltage is the same as that on the motor data plate, that the current is approximately equal to the magnetizing current (for a standard asynchronous motor this is usually between 25% and 40% of the rated current) and that the output frequency is 50 Hz.
8. If the motor does not reach its maximum speed, self-tuning of the analog input may be necessary: set the input signal to its maximum value and set the **An inp 1 gain tune** parameter (PAR: 1508) to 1.

9. If the motor still rotates with a reference of zero, eliminate the condition by self-tuning the analog input offset: set the input signal to its minimum value and set 1 for **An inp 1 offset tune** (PAR: 1506).
10. To reverse the direction of rotation, keep closed the **FR forward src (PAR 1042)** contact (terminals S3 – 8) and close the **FR reverse src (PAR 1044)** contact (terminals S3 – 9). The motor will start the deceleration ramp until reaching the zero speed, after which it will reverse the direction of rotation and move to the set speed with the acceleration ramp.
11. To stop the drive, open the **FR forward src (PAR 1042)** contact (terminals S3 – 8): the motor will start the deceleration ramp and the speed will move to zero, but the motor will remain magnetized. To interrupt magnetization, open the **Enable** contact (terminals S3 – 7).
12. If the **Enable** contact is opened while the motor is running, the inverter bridge is immediately disabled and the motor stops due to inertia.

Note !

Once you have verified the correct operation of the drive-motor system, the application can be customized by changing some of the parameters.

• **Summary of parameters**

The parameters used and/or modified in the Startup Wizard procedures are listed below.

Menu	PAR	Description	
16.1	2000	Rated voltage	Motor rated voltage
16.2	2002	Rated current	Motor rated current
16.3	2004	Rated speed	Motor rated speed
16.4	2006	Rated frequency	Motor rated frequency
16.5	2008	Pole pairs	Number of pole pairs
16.6	2010	Rated power	Motor rated power
16.9	2022	Autotune rotation	Self-tuning with motor rotating
16.10	2024	Autotune still	Self-tuning with motor at stand-still or coupled to the load
5.22	680	Full scale speed	Maximum speed setting
6.1	700	Acceleration time 0	Acceleration time 0
6.2	702	Deceleration time 0	Deceleration time 0
4.1	550	Save parameters	Save parameters in the non-volatile memory

Proceed to step 8.

Step 8 - Setting the motor in “Flux Vect OL” mode (sensorless)

Menu 04 DRIVE CONFIG, parameter 04.2 **Regulation mode**, PAR: 552, set = [1] Flux vector OL.

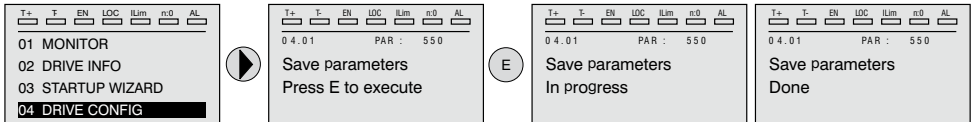
Test with no load applied to the motor

1. Set the value of PAR 2308 **OverFlux perc** to 120%.
2. Set the value of PAR 2312 **OverFlux spd thr** to approximately 25% of the rated speed.
3. Close the **Enable** contact (terminals S3 – 7).
4. Close the **FR forward src contact** (PAR 1042), terminals S3 – 8. The drive starts magnetising the motor.
5. Using the potentiometer, gradually increase the reference signal until reaching the maximum speed.
6. Open the **FR forward src contact** (PAR 1042), terminals S3 – 8, until reaching the minimum set speed requested by the application.
7. Check that the ramp is linear and, once the set value has been reached, that the minimum speed remains stable.

If the ramp is not linear and the minimum speed is not stable, reduce the value of PAR 2306 **Flux observe gain OL** in steps of 5.

Examples of values for PAR 2306 with standard 4-pole motors	
100	For motor power ratings up to 15 kW
40-50	For motor power ratings of 45-55 kW
20-30	For motor power ratings of more than 132 kW

8. To save the new parameter settings, so that they are maintained also after power-off, proceed as follows:



Test with rated load applied to the motor

1. Close the **Enable** contact (terminals S3 – 7).
2. Close the **FR forward src contact** (PAR 1042), terminals S3 – 8. The drive starts magnetising the motor.
3. Using the potentiometer, gradually increase the reference signal until reaching the maximum speed.
4. Open the **FR forward src contact** (PAR 1042), terminals S3 – 8, until reaching the minimum set speed requested by the application.
 - if current overload conditions occur at the minimum speed,
 - if the current exceeds the rated current value setting,
 - if the motor shaft is blocked at zero speed,
 reduce the value set in PAR 2306 **Flux observe gain OL** in steps of 5 until reaching the best working condition with no overload.
5. To save, repeat step 6.

7.2 First customized start-up

In this section a startup test is performed, using a standard configuration, to check drive functioning and command connections.

A programming sequence has to be run to achieve a first simple customisation in order to be able to set the drive for the requested application.

Note !

The main sections to be used, depending on the desired configuration, are described below.

• Typical connection diagrams

Auxiliary control circuits _____	see chapter 5.5, figure 5.5.1
Typical connection diagram, connection through terminals strip _____	see chapter 5.5, figure 5.5.2
Potentials of the control section, Digital I/O PNP connection _____	see chapter 5.2.4, figure 5.2.4.1
Other inputs connections (NPN-PNP) _____	see chapter 5.2.4, figure 5.2.4.2
NPN outputs connection _____	see chapter 5.2.4, figure 5.2.4.3

• Digital inputs

The table on chapter 5.2.3 shows the default settings for the analog and digital inputs and outputs.

Note !

Digital input settings can only be edited from the Expert parameters, see chapter 6.5.2.

• Selecting the regulation mode

First set the regulation mode in the **Regulation mode** parameter (04 DRIVE CONFIG menu, PAR: 552) :

- 0 V/f control.** This is the simplest and least advanced control mode. This mode can also be used to control several motors connected in parallel using a single drive.
- 1 Open loop field-oriented vector control (Flux vector OL).** In this mode, once the motor parameter self-tuning procedure has been performed, it is possible to create a mathematical model on which to perform all the necessary calculations in order to obtain high performance levels, especially high motor torque levels, even at very low speeds without the use of feedback, and achieve significant dynamic performance.

• Selecting the type of reference

After setting the regulation mode, the source of the speed reference must be set in the **Ramp ref 1 src** parameter (05 REFERENCES menu, PAR: 610). This source can be selected from among those listed in the L_MLTREF selection list:

- 1 Analog input 1 mon** parameter (PAR: 1500) to use the signal applied to terminals 1 – 2 of analog input 1 (14 - ANALOG INPUTS menu).
- 2 Dig ramp ref 1** parameter (05 - REFERENCES menu, PAR: 600) to set a digital speed inside the drive.
- 3 Multi ref out mon** parameter (07 - MULTI REFERENCE menu, PAR: 852) to select the digital speeds using the digital inputs of the drive.
- 4 Mpot output mon** parameter (08 - MOTOPOTENTIOMETER menu, PAR:

894) to use the internal motor potentiometer of the drive. If sending the command from the operator keypad, to use the motor potentiometer function enter the **Mpot setpoint** parameter (PAR: 870) modify mode and press the Up (▲) and Down (▼) keys.

- 5 **Jog output mon** parameter (09 - JOG FUNCTION menu, PAR: 920) to use one of the drive's internal jog speeds.

Signals from expansion cards, the serial line or fieldbus can also be set as speed references (see the detailed description of parameters).

• Setting the type of analog reference

If the analog input has been selected, choose the type of signal to use in the **Analog inp 1 type** parameter (14 - ANALOG INPUTS menu, PAR.1502):

0	± 10V
1	0-20mA o 0-10V
2	4-20mA

As well as programming the **Analog inp 1 type** parameter (PAR:1502) you must also verify the position of the switches on the regulation card, as showed on chapter 5.2.4.

• Ramps setting

The acceleration and deceleration ramps can be set in **Acceleration time 0** (06 - RAMPS menu, PAR: 700) and **Deceleration time 0** (PAR: 702).

The signal available on the analog input can be adjusted using **Analog inp 1 scale** parameter (14 - ANALOG INPUTS menu, PAR: 1504), **An inp 1 offset tune** parameter (PAR: 1506) and **An inp 1 gain tune** parameter (PAR: 1508).

To use a digital speed to control the drive, enter it in the **Dig ramp ref 1** parameter (05 - REFERENCES menu, PAR: 600).

The ramps are the same used with the reference signal from the analog input.

• Multispeed

To use more than one digital speed, use the multi-speed function.

First select the source of the speed signals **Multi ref 0 src** and **Multi ref 1 src** (07 - MULTI REFERENCE menu, PAR: 832 e 834) from the L_MLTREF selection list.

Next define which digital inputs are to perform switching between the various speeds; use the **Multi ref sel .. src** parameters (PAR: from 840 to 846) to select the signals to use from the L_DIGSEL2 selection list. Set the desired speeds in the **Multi reference 0...7** parameters (PAR: from 800 to 814).

Also in this case the ramps can be set in the **Acceleration time 0** parameter (06 - RAMPS menu, PAR: 700) and **Deceleration time 0** parameter (PAR: 702) parameters.

• Motor potentiometer

To use the motor potentiometer, the signals to increase or decrease the reference must be defined: set the **Mpot up src** parameter (08 - MOTOPOTENTIOMETER menu, PAR: 884) and **Mpot down src** parameter (PAR: 886) parameters respectively to increase and decrease the reference using selection list L_DIGSEL2.

Set the motor potentiometer ramps using **Mpot acceleration** (PAR: 872) and **Mpot deceleration** parameters (PAR: 874).

• Jog

Finally, for Jog mode, select the control terminal in the **Jog cmd + src** parameter (09 - JOG FUNCTION menu, PAR: 916), using a signal from selection list L_DIGSEL2.

The Jog speed must be written in the **Jog setpoint** parameter (PAR: 910), while the acceleration and deceleration ramps can be set, respectively, in **Jog acceleration** (PAR: 912) and **Jog deceleration** parameters (PAR: 914).

• Speed limits

After selecting the reference, set the speed limits in the following parameters (05 - REFERENCES menu):

- **Full scale speed** (PAR: 680). Setting of the maximum motor speed, which usually coincides with the rated speed indicated on the motor data plate.
- **Speed ref top lim** (PAR: 670). Upper speed limit: the maximum setting is 200% of the **Full scale speed**.
- **Speed ref bottom lim** (PAR: 672). Lower speed limit: the maximum setting is -200% of the **Full scale speed**.
- **Overspeed threshold** (24 - ALARM CONFIG menu, PAR: 4540). Overspeed alarm limit.

• Input and Output terminals

The default setting of the input terminals is as follows:

- Terminal 7	Digital input E	Enable
- Terminal 8	Digital input 1	FR forward src, PAR 1042
- Terminal 9	Digital input 2	FR reverse src, PAR 1044
- Terminal 10	Digital input 3	Null (not assigned)
- Terminal 11	Digital input 4	Null (not assigned)
- Terminal 12	Digital input 5	Fault reset src
- Terminal S3	+ 24V OUT	I/O supply

The default configuration of the terminals dedicated to digital outputs are as follows:

- Terminal R14	Digital output 1	Drive OK (Relay 1)
- Terminal R11	COM Digital output 1	Common digital output 1 (Relay 1)
- Terminal R24	Digital output 2	Drive ready (Relay 2)
- Terminal R21	COM Digital output 2	Common digital output 2 (Relay 2)
- Terminal I3	Digital output 3	Speed is 0 delay
- Terminal IC1	COM Digital output 3/4	Common ref. for digital outputs 3 / 4
- Terminal I4	Digital output 4	Ref is 0 delay
- Terminal IS1	PS Digital output 3/4	Digital outputs 3 / 4 power supply

Signals for the digital outputs can be programmed using the **Digital output 1...4 src** parameters (13 - DIGITAL OUTPUTS menu, PAR: from 1310 to 1316) using the settings in the L_DIGSEL1 selection list.

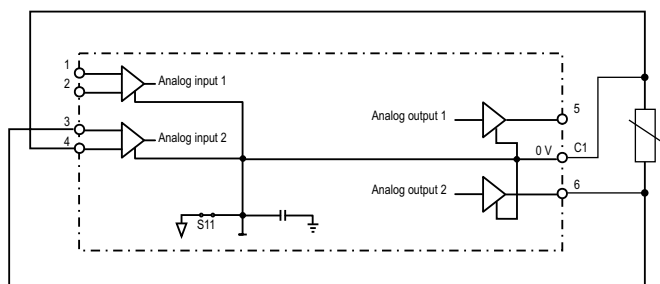
The drive also includes two analog outputs which are not factory-set. These outputs must be enabled by setting **Analog out 1 src** (15 - ANALOG OUTPUTS menu, PAR: 1800) and **Analog out 2 src** parameters (PAR: 1802) with a signal selected from selection list L_ANOUT.

The signal available on analog output 1 is $\pm 10V$, while the analog output 2 signal can be selected using the **Analog out 2 type** parameter (PAR: 1848) between:

0	0-20mA
1	4-20mA
2	$\pm 10V$

The analog output signal can be adjusted using **Analog out 1 scale** (PAR: 1808) and **Analog out 2 scale** parameters (PAR:1810).

• Setting an analog output for reading a temperature sensor



The following is a description of the commissioning procedure to use the drive's **ADV200** regulation card to acquire the temperature of a motor with **KTY84 / PTC** sensors:

- The sensor can be powered via analog output 2 of the ADV200: connect the signal to analog output 2 as shown (input 1 can be used as an alternative).
- Set analog output 2 to "current" via the Jumper (S3=I).
- Set analog output 2 (or 1) to voltage via the Jumper (S2=V or S1=V).
- On the **ANALOG OUTPUTS** menu, assign the value "**0..20mA**" to the **Analog out 2 type** parameter (PAR 1848).
- On the **ANALOG INPUTS** menu, assign the value "**-10V..+10V**" to **Analog inp 2 type** parameter (PAR 1552) or to the **Analog inp 1 type** parameter (PAR 1502).
- On the **ANALOG OUTPUTS** menu, assign the selection "**Null**" to the **Analog out 2 src** parameter (PAR 1802), which sets a null current in output.
- On the **ANALOG INPUTS** menu, run automatic calibration of the analog offset of the selected output: 1 or 2 via the **An inp 1 offset tune** parameter (PAR 1506) or the **An inp 2 offset tune** parameter (PAR 1556).
- On the **ANALOG OUTPUTS** menu, assign the selection "**KTY84/PTC current**" to the **Analog out 2 src** parameter (PAR 1802), which lets you set a current of **2mA** in output to power the temperature sensor.
- On the **ALARM CONFIG** menu, assign the value "**KTY84 An1**" or "**KTY84 An2**" ("**PTCAn1**" or "**PTC An2**"), depending on the analog output selected, to the **MotorOT probe** parameter (PAR 4530).
- On the **MONITOR** menu, the **Motor temperature** parameter (PAR 290) displays the motor temperature in °C (if KTY84 is selected).
- On the **ALARM CONFIG** menu, the **MotorOT mon** parameter (PAR 4536) displays sensor resistance in ohms or °C.
- On the **ANALOG INPUTS** menu, the **Analog inp 1 filter** parameter (PAR 1510) or **Analog inp 2 filter** parameter (PAR 1560) can be used to filter the resistance and temperature measurements.

• Keypad

Use the **LOC / REM** key with the Enable input open (terminal 7 on terminal strip T2) to control running, to stop and reverse the direction of rotation of the motor using the operator keypad on the drive. Use the potentiometer or an analog signal to control speed.

For information on how to use a digital speed reference, see the example on chap-

ter 7.3.3. The reference can have a positive or negative value, making it possible to reverse the direction of rotation of the motor.

When the Enable input is closed, to enable motor running press **START**. The motor starts the acceleration ramp and moves to the speed set in the FWD direction. With the motor running you can adjust the speed using the PAR 602 **Dig ramp ref 2** (or PAR 604 **Dig ramp ref 3**, in this case modify also the selection PAR 614 **Ramp ref 3 src** to PAR 604 **Dig ramp ref 3**) and the acceleration/deceleration ramps using **Acceleration time 0** (PAR: 700) and **Deceleration time 0** (PAR: 702).

To change the direction of rotation press **FWD/REV**.

To stop the motor with the deceleration ramp, press **STOP**.

If the Enable contact is opened the inverter bridge is immediately disabled and the motor stops for inertia

To return to control using the terminal strip commands and analog speed reference:

1. Stop the motor
2. Open the Enable terminal
3. Press **LOC / REM** key.

Note !

For more customizations and any information that is not included in this initial customization guide, see the "Function description and parameters list" manual downloadable from WEG web site ([https://www.weg.net/...](https://www.weg.net/)).

7.3 Programming

7.3.1 Menu display modes

The programming menu can be displayed in two modes, which can be selected using the **Access mode** parameter (04 - DRIVE CONFIG menu), see chapter 6.5.2:

- **Easy** (default) only the main parameters are displayed.
- **Expert** all the parameters are displayed.

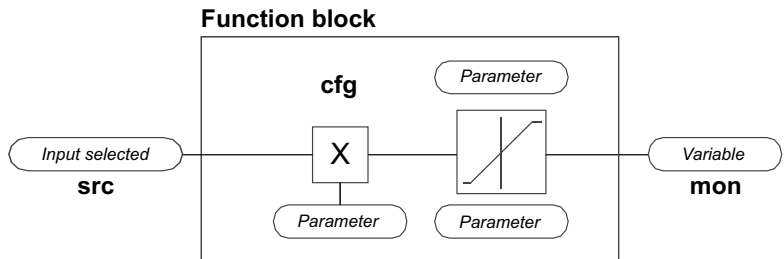
7.3.2 Programming of “function block” analog and digital input signals

The signals, variables and parameters of each single “function block” of the drive are interconnected in order to achieve the configurations and controls inside the control system.

These can be managed and modified using the keypad, PC configurator or field-bus programming.

The programming mode is based on the following logic:

- src** (source; i.e.: **Ramp ref 1 src**, PAR: 610)
This term defines **the source of the function block input**, i.e. the signal to be processed in the function block.
The different configurations are defined in the relative **selection lists**.
- cfg** (configuration; i.e.: **Mpot init cfg**, PAR: 880)
This term refers to **the parameter setting and its effect on the function block**.
For example: Ramp times, internal reference adjustment, etc...
- mon** (display; i.e.: **Ramp ref 1 mon**, PAR: 620)
This term refers to the **variable output from the function block, which is the result of the calculations performed on the actual block**.



7.3.3 Variable interconnections mode

The **source (src)** allows the desired control signal to be assigned to the function block input.

This operation is performed by using specific selection lists.

Possible control signal sources:

1 – Physical terminal

The analog and digital signals come from the terminal strip of the regulation card

and/or from those of the expansion cards.

2 – Drive internal variables

Internal drive control system variables, from “function block” calculations, sent via keypad, PC configurator or fieldbus.

Practical example

The following examples illustrate the philosophies and methods with which more or less complex operations are performed in the single “function blocks”, the results of which represent the output of the block.

• *Example: Changing the Speed Reference source*

The main drive reference (in the default configuration) **Ramp ref 1 mon** (PAR: 620) is generated by the output of the function block “**Ramp setpoint Block**”.

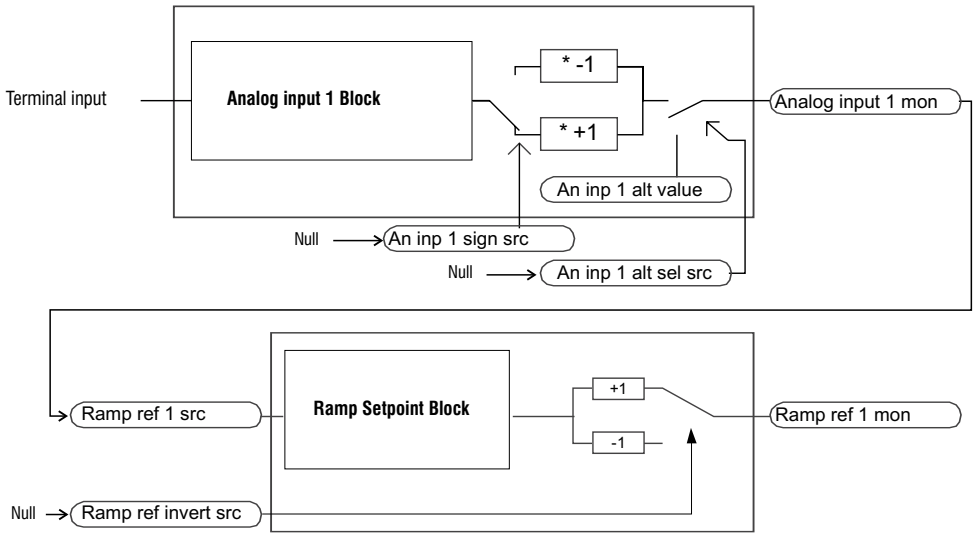
Its default source is the **Analog input 1 mon** signal (PAR: 1500), from the output of the function block “**Analog input 1 Block**”, which in this case refers to analog input 1 of the signal terminal strip.

To change the reference source from the analog input to a digital reference inside the drive, the input signal must be changed to “**Ramp setpoint Block**”.

Enter the **Ramp ref 1 src** parameter (PAR: 610) and set a new reference, selecting it from among those listed in the L_MLTREF selection list, for example **Dig ramp ref 1** (PAR: 600).

• *Example: Inverting the analog reference signal*

To invert the “**Analog input 1 Block**” output signal, the value of the **An inp 1 sign src** parameter (PAR: 1526), which has a default setting of **Null** (no operation), must be changed by selecting the source of the command signal from among those listed in the L_DIGSEL 2 selection list, for example **Digital input X mon**, **One** (function always enabled), etc.



The diagrams above illustrate the internal processing philosophy of the single “function blocks” and the result of these changes on the other interconnected “function blocks”.

Note !

.....
 This section contains a brief description of the functions of the other parameters in the function blocks not included for the changes in the example.

The **An inp 1 alt sel src** parameter (PAR: 1528) can be used to select an alternative reference for the **Analog input 1 mon** (PAR: 1500) output.

The **An inp 1 alt value** parameter (PAR: 1524) determines the alternative reference value for the **Analog input 1 mon** (PAR: 1500) output.

The **Ramp ref invert src** parameter (PAR: 616) can be used to select the source for the command to reverse the “**Ramp setpoint**” function block output.

The output signal from the “**Ramp setpoint**” block is displayed in the **Ramp ref 1 mon** parameter (PAR: 620).

7.3.4 Multiple destination

Several functions can be assigned together to each input: to display which and how many functions have been assigned to each input, check the relative “**dest**” parameter to see whether there is a number shown in square brackets to the right of the number of the selected parameter (as shown in the figure below).

T+	T-	EN	LOC	ILim	n.0	AL
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

12.09 PAR : 1 1 5 6

Digital input 3 dest
>> Multi ramp sel 0 src
Value: 722 [1]

If there is a number, press the key to display the next source applied to the selected input.

T+	T-	EN	LOC	ILim	n.0	AL
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

12.09 PAR : 1 1 5 6

Digital input 3 dest
>> Multi ramp sel 0 src
Value: 840 [2]

8 - Troubleshooting

8.1 Alarms

Note !

To reset alarms, see [paragraph 6.6.1](#).

In the following table, the Code is visible only from serial line.

Code	Error message shown on the display	Sub-code	Description
0	No alarm	Condition: No alarm present	
1	Overvoltage	Condition: DC link overvoltage alarm due to energy recovered from the motor. The voltage arriving at the drive power section is too high compared to the maximum threshold relating to the PAR 560 Mains voltage parameter setting.	
		Solution: - Extend the deceleration ramp. - Use a braking resistor between terminals BR1 and BR2 to dissipate the recovered energy - Use the VDC Control function	
2	Undervoltage	Condition: DC link undervoltage alarm. The voltage arriving at the drive power section is too low compared to the minimum threshold relating to the 560 Mains voltage parameter setting due to: - the mains voltage being too low or overextended voltage drops. - poor cable connections (e.g. loose contactor terminals, inductance, filter, etc.).	
		Solution: Check the related connections of the drive power supply and its correct range.	
3	Ground fault	Condition: Ground short circuit alarm	
		Solution: - Check drive and motor wiring. - Check that the motor is not grounded.	
4	Overcurrent	Condition: Instantaneous overcurrent protection intervention alarm. This may be due to the incorrect setting of current regulator parameters or a short circuit between phases or ground fault on the drive output.	
		Solution: - Check the current regulator parameters - Check wiring towards the motor	
5	Desaturation	Condition: Instantaneous overcurrent in the IGBT bridge alarm.	
		Solution: Switch the drive off and then switch it on again. If the alarm persists, contact the technical service centre.	
6	MultiUndervolt	Condition: The number of attempted automatic restarts after the Undervoltage alarm has exceeded the set PAR 4650 UVRep attempts value in the PAR 4652 UVRep delay time.	
		Solution: Too many Undervoltage alarms. Adopt the proposed solutions for the Undervoltage alarm.	
7	MultiOvercurr	Condition: 2 attempted automatic restarts after the Overcurrent alarm within 30 seconds. If more than 30 seconds pass after the Overcurrent alarm was generated, the attempt counter is reset.	
		Solution: Too many Overcurrent alarms. Adopt the proposed solutions for the Overcurrent alarm.	
8	MultiDesat	Condition: 2 attempted at automatic restarts after the Desaturation alarm within 30 seconds. If more than 30 seconds pass after the Desaturation alarm was generated, the attempt counter is reset.	
		Solution: Too many Desaturation alarms. Adopt the proposed solutions for the Desaturation alarm.	

9	Heatsink OT	Condition: Heatsink temperature too high alarm
		Solution: - Verify the correct operation of the cooling fan. - Check that the heatsinks are not clogged - Check that the openings for the cabinet cooling air are not blocked.
10	Heatsinks OTUT	Condition: IGBT modules temperature too high or too low alarm
		Solution: - Verify the correct operation of the cooling fan. - Check that the heatsinks are not clogged - Check that the openings for the cabinet cooling air are not blocked.
11	Intakeair OT	Solution: - Check correct fan operation - Check that the heatsinks are not clogged - Check temperature in electrical panel.
		Solution: Check correct fan operation
12	Motor OT	Condition: Motor overtemperature alarm. Possible causes: - Load cycle too heavy - The motor is installed in a place where the ambient temperature is too high - If the motor is provided with a blower: the fan is not working - If the motor is not provided with a blower: the load is too high at slow speeds. Cooling the fan on the motor shaft is not sufficient for this load cycle. - The motor is used at less than the rated frequency, causing additional magnetic losses.
		Solution: - Change the processing cycle. - Use a cooling fan to cool the motor.
13	Drive overload	Condition: Drive overload alarm. The overload threshold of the accumulator of the I ² t drive thermal image has been exceeded.
		Solution: Check that the size of the drive is suitable for the application.
14	Motor overload	Condition: Motor overload alarm. The current absorbed during operation is greater than that specified on the motor data plate. The overload threshold of the accumulator of the I ² t motor thermal image has been exceeded.
		Solution: - Reduce the motor load. - Increase the size of the motor.
15	Bres overload	Condition: Braking resistor overload alarm. The current absorbed by the resistor is greater than the rated current. The overload threshold of the accumulator of the I ² t braking resistor thermal image has been exceeded.
		Solution: Increase the Watt value of the braking resistor
16	Phase loss	Condition: Power phase loss alarm.
		Solution: Check the mains voltage and whether any protections upstream of the drive have been tripped.
17	Opt Bus fault	Condition: Error in the configuration stage or communication error.
		XXX0H-X If the first digit to the left of "H" in the alarm sub-code is 0, the error regards a communication problem.
		XXXXH-X If the first digit to the left of "H" in the alarm sub-code is other than 0, the error regards a configuration problem.
		Solution: For configuration errors, check the configuration of the bus communication, type of bus, baudrate, address, parameter setting. For communication errors verify wiring, resistance of terminations, interference immunity, timeout settings. For further details, please refer to the user guide for the specific bus.
18	Opt 1 IO fault	Condition: Error in the communication between Regulation and I/O expansion card in slot 1
		Solution: Check that it has been inserted correctly, see chapter 11.5.
19	Opt 2 IO fault	Condition: Error in the communication between Regulation and I/O expansion card in slot 2 or 3

		Solution: Check that it has been inserted correctly , see chapter 11.5.
20	Not Used 1	
21	External fault	Condition: External alarm present. A digital input has been programmed as an external alarm, but the +24V voltage is not available on the terminal.
		Solution: Check that the terminal screws are tight
22	Not Used 2	
23	Overspeed	Condition: Motor overspeed alarm. The motor speed exceeds the limits set in the PAR 4540 Overspeed threshold parameter .
		Solution: - Limit the speed reference. - Check that the motor is not driven in overspeed during rotation.
24	Speed ref loss	Condition: Speed reference loss alarm Occurs if the difference between the speed regulator reference and the actual motor speed is more than 100 rpm. This condition occurs because the drive is in the current limit condition. It is only available in the Flux Vect OL mode.
		Solution: - Check the drive load conditions
25	Emg stop alarm	Condition: Emergency stop alarm. The Stop key on the keypad was pressed with the PAR 1008 Stop key mode parameter set to EmgStop&Alarm . Active in remote control mode (PAR 1012=1) both by using "Terminals" command or "Digital" commands and, in local control mode (PAR 1012=0) by using "Terminals" command.
		Solution: Eliminate the reason for which the Stop key on the keypad was pressed and reset the drive.
26	Power down	Condition: The drive was enabled with no supply voltage at the power section.
		Solution: Emergency stop alarm. The Stop key on the keypad was pressed with the Stop key mode parameter set to EmgStop&Alarm in case of Remote->Terminal Strip or Remote->Digital or Local->Terminal Strip mode.
27	Broken belt	Condition: Occurs if torque required from motor falls below a programmed threshold (PAR 7702) and if speed exceeds a programmed threshold (PAR 7706).
		Solution: Check system mechanics.
28	End curve	Condition: The value of the feedback signal (for example, pressure transducer) is below the reference value and rotation speed is higher than the threshold set in parameter 7712. The alarm is generated if this condition persists for a time equal to the value set in parameter 7714
		Solution: <ul style="list-style-type: none"> • Check configuration of parameters on menu 26.11. • Check for system leakages. • Check the feedback sensor.
29 30	Dry pump No flow	Condition: The value of delivered power (parameter 7752) is below the limits defined by the minimum power curve.
		Solution: <ul style="list-style-type: none"> • Check configuration of parameters on menu 26.11. • Check for system leakages.
31	Clean alarm	Condition: If cleaning cycles are performed too frequently, there may be a problem with the pump that requires the attention of an operator. In that case a specific alarm is generated. Only cleaning cycles that start following an external event (digital signal) or analog measurement are considered for this alarm.
		Solution: Check the system.
32	Not Used 6	

33 ... 40	Plc1 fault ... Plc8 fault	Condition: Enabled application developed in the IEC 61131-3 environment has found the conditions for generating this specific alarm to be true. The meaning of the alarm depends on the type of application. For more information, refer to the documentation concerning the specific application..	
		XXXXH-X	The XXXXH-X code indicates the reason for the error: make a note of this to discuss it with the service centre.
		Solution: Refer to the documentation concerning the enabled application.	
52 53 54 55	Analog 1 Err Analog 2 Err Analog 3 Err Analog 4 Err	Condition: If an analog measurement is out of the allowed range an "Analog X err" alarm is generated. This control is only possible for 4-20 mA, PT100, PT1000, NI1000 probes. For temperature probes both short-circuits and power loss on the cable are detected. For 4-20 mA probes only power loss on the cable is detected. Analog 1 Err = Error on analog channel 1 Analog 2 Err = Error on analog channel 2 Analog 3 Err = Error on analog channel 1 of expansion card Analog 4 Err = Error on analog channel 2 of expansion card	
		Solution: Check connections.	

8.2 Messages

Note !

For more information see [chapter 6.7](#).

Index	Error message shown on the display	Sub-code	Description
1	Load default param	<p>Condition: may occur during loading of the parameter database saved in flash normally appears in the following conditions: at initial power-on when a new firmware version is downloaded, when the regulation is installed on a new size, when the region is changed. If this message is displayed when the drive is already operating, this means that a problem has occurred in the parameter database saved in Flash. If this message is displayed the drive restores the default database, i.e. the one downloaded.</p>	
		0001H-1	The database saved is not valid
		0002H-2	The database saved is not compatible
		0003H-3	The database saved refers to a different size from the current size
		0004H-4	The database saved refers to a different region from the current region
		Solution: Set the parameters to the value required and perform Save parameter	
2 3 4	Option detect slot 1 Option detect slot 2 Option detect slot 3	<p>Condition: at power-on, the drive recognizes the presence of an optional card in one of the three expansion slots. One of the three messages is shown on the display</p>	
		0H-0	None
		0004H-4	Can/DeviceNet
		00FFH-255	Unknown
		0104H-260	Profibus
		0204H-516	Rte
		0301H-769	I_0_1
		0701H-1793	I_0_2
		0901H-2305	I_0_3
		0D01H-3329	I_0_4
		1601H-5633	I_0_6 (EXP-IO-SENS-100-ADV)
		1901H-6401	I_0_7 (EXP-IO-D5R8-ADV)
		1E01H-7681	I_0_8 (EXP-IO-SENS-1000-ADV)
		Solution:	
5	Autotune	Condition: this may occur during the Autotune procedure	
		0	No error
		1	The commands are not configured in Local mode.
			Solution: Execute the requested configuration
		2	The Commands local sel parameter has not been configured from the keypad
			Solution: Execute the requested configuration
3	The motor plate data parameters have changed but the Take parameters command, PAR 2020, has not been executed		
	Solution: Execute the Take parameters command.		
4	Error in motor connection.		
	Solution: Check the motor connection, set the value of the direct current of the motor to 1/3 and perform the motor autotune procedure. Then increase the direct current until autotuning is executed. The penultimate value is the nominal current value at which the drive performs autotuning.		

Index	Error message shown on the display	Sub-code	Description
		5	While running self-tuning the ESC key was pressed or the enable contact was opened or an alarm occurred. The Autotune command was sent with the drive in the alarm condition
			Solution: Eliminate the reason for the alarm, remove the reason for the opening of the enable contact, reset alarms.
		6	A setting performed by the Autotune function produced a parameter value outside the min or max range.
			Solution: Check the motor plate data or drive and motor sizes have been combined incorrectly.
		7	The Autotune command was sent without being enabled.
			Solution: Close the enable contact before sending the Autotune command
		8	Internal calculation error concerning IGBT control
			Solution: Perform autotuning once more, if the problem persists, contact the WEG technical support centre.
		9	The drive has measured a stator resistance value exceeding the set limit.
			Solution: contact the WEG technical support centre.
		10	The drive has measured a stator resistance value below the set limit.
			Solution: contact the WEG technical support centre.
		11-12	Measurement of DTL internal compensation voltage outside accepted range.
			Solution: check connection between drive and motor. If correct, the drive is faulty, contact the WEG technical support centre.
		13-14	Measurement of DTS internal voltage outside accepted range.
			Solution: check connection between drive and motor. If correct, the drive is faulty, contact the WEG technical support centre.
		15 - 16 -17	LS leakage inductance value outside accepted range.
Solution: Perform autotuning once more, if the problem persists, contact the WEG technical support centre.			
18-19	Measurement of Im magnetising current outside accepted range.		
	Solution: Perform autotuning once more, if the problem persists, contact the WEG technical support centre.		
20-21	Measurement of Rr rotor resistor outside accepted range.		
	Solution: Perform autotuning once more, if the problem persists, contact the WEG technical support centre.		
			<p>Solution: If the message appears with a value other than 0, follow the instructions supplied for each particular case and repeat Autotune. This should be performed using the wizard function available from the keypad (STARTUP WIZARD) and the Tool software on the PC.</p> <p>Pay attention to all motor plate data parameters, especially:</p> <ul style="list-style-type: none"> - Rated speed, Motor rated speed in rpm. - Rated frequency, Motor rated frequency in Hz - Pole pairs, Motor pole pairs <p>Take care not to set the Rated speed parameter to the synchronous speed. The value of the Rated speed parameter must be less than: $(\text{Rated frequency} * 60) / \text{Pole pairs}$.</p> <p>If the problem persists even after following the instructions supplied, confirm the values of the motor plate data parameters, execute the Take parameters command but not Autotune.</p>
6	Power config	Condition: may occur during recognition of power cards. If this message is displayed, it is not possible to drive the motor.	
		0020H-32	The power card is configured for a drive that is incompatible with the regulation card
		0021H-33	The configuration of the power card is not compatible with the regulation card
		0017H-23	The configuration required is not available on the power card

Index	Error message shown on the display	Sub-code	Description
		Solution: Download the correct configuration on the power card	
7	Save par failed	Condition: during transfer of the parameters from the drive to the memory of the keypad	
		0H-0	Communication error
		0025H-37	The data saved on the keypad are not valid
		0026H-38	Incompatible drive series
		0027H-39	Incompatible software version
		0028H-40	Incompatible drive size
		0029H-41	Error during saving of parameters on the drive
		Solution:	
8	Load par failed	Condition: during transfer of the parameters from the memory of the keypad to the drive	
9	Load par incomplete	0H-0	Communication error
		0025H-37	The data saved on the keypad are not valid. No parameter is transferred from the keypad to the drive
		0026H-38	Incompatible control type. No parameter is transferred from the keypad to the drive
		0027H-39	Incompatible software version. All the parameters present in the memory of the keypad have been transferred to the drive. The set of parameters transferred refers to a drive with a different firmware version; therefore, certain parameters may not be updated.
		0028H-40	Incompatible control type. All the parameters present in the memory of the keypad (excluding those that depend on the size of the drive), have been transferred to the drive. The parameters that depend on size maintain their original value.
		0029H-41	Error during saving of parameters on the drive. All the parameters present in the memory of the keypad have been transferred to the drive. The transfer of one or more parameters has caused an "out of range" error, or one or more parameters does not exist. At the end of transfer, one or more parameters may not have been updated.
		002AH-42	PLC application release and version not compatible. All parameters in the keypad memory have been transferred to the drive. The transferred set of parameters relates to a drive with a PLC application in which the version and release of the application are different. As a result some of the PLC application parameters may not be updated.
		002BH-43	PLC application not compatible. All the parameters in the keypad memory except those relating to the PLC application have been transferred to the drive. The transferred set of parameters relates to a drive with a different PLC application. As a result none of the PLC application parameters are updated.
		Solution: Recover a set of parameters from a compatible drive (model and size)	
10	Options config error	Condition: may occur at drive start-up, during recognition of the optional cards installed	
		0001H-1	Non-permissible optional card in slot 1
		0002H-2	Non-permissible optional card in slot 2
		0004H-4	Non-permissible optional card in slot 3
		0010H-16	Conflict slot 1 with slot 2
		0020H-32	Conflict slot 1 with slot 3
		0040H-64	Conflict slot 2 with slot 3
		Solution: Remove the optional cards from the incorrect slots and insert them in the correct slots	

Index	Error message shown on the display	Sub-code	Description
11	Load def plc	<p>Condition: may occur during loading of the parameter database saved in the Flash of the Mdplc application Normally appears at initial power-on after downloading a new application. If this message is displayed when the drive is already operating, this means that a problem has occurred in the parameter database saved in Flash. If this message appears the drive restores the default database, i.e. the one that was downloaded.</p>	
		0001H-1	The database saved is not valid
		Solution: Set the parameters to the value required and perform Save parameter	
12	Plc cfg error	<p>Condition: may occur during loading of the Mdplc application The Mdplc application present on the drive is not run.</p>	
		0004H-4	The application downloaded has a different Crc on DataBlock and Function table
		0065H-101	The application downloaded has an invalid identifier (Info)
		0066H-102	The application downloaded has an incorrect task number (Info)
		0067H-103	The application downloaded has an incorrect software configuration
		0068H-104	The application downloaded has a different Crc on DataBlock and Function table
		0069H-105	A Trap error or System error has occurred. The drive automatically performs a Power-up operation. The application is not run. See in Alarm List for further information regarding the error occurred
		006AH-106	The application downloaded has an incorrect identifier (Task)
		006BH-107	The application downloaded has an incorrect task number (Task)
		006CH-108	The application downloaded has an incorrect Crc (Tables + Code)
Solution: Remove the Mdplc application or download a correct Mdplc application			
13	Plc 1	Reserved messages and dedicated to the PLC application. See the application manual.	
14	Plc 2		
15	Plc 3		
16	Plc 4		
17	Option bus fault	<p>Condition: this may occur when the drive is turned on, during fieldbus card setup. Error during configuration or communication error.</p>	
		XXX0H-X	If the first digit to the left of "H" in the alarm sub-code is 0, the error regards a communication problem.
		XXX0H-X	If the first digit to the left of "H" in the alarm sub-code is other than 0, the error regards a configuration problem.
		<p>Solution: For configuration errors, check the configuration of the bus communication, type of bus, baudrate, address, parameter setting. For communication errors, check wiring, termination resistors, disturbance immunity, timeout settings. For further details, please refer to the user guide for the specific bus.</p>	
18	Key failed	<p>Condition: this may occur when powering the drive, if the incorrect enable key is inserted for a given firmware function.</p>	
		0001H-1	Incorrect PLC key. PLC application not available.
		Solution: Ask WEG to supply the correct key to enable the desired firmware function.	
19	Key expiring	<p>Condition: this may occur at drive power-on if the incorrect enabling key was inserted for a given firmware function. At this stage the firmware function can still be used freely, but this time limit is about to expire.</p>	
		xxxxH-x	Number of hours for which the function can still be used freely.
		Solution: Ask WEG for the correct key to enable the desired firmware function.	

Index	Error message shown on the display	Sub-code	Description
20	Param error	Condition: if an error occurs during activation of the parameter database saved in flash; the alarm is inserted in the alarm list and alarm log.	
		XXX0H-X	The code XXXXH-X indicates the IPA of the parameter that has been set outside the range allowed when the database is enabled.
		Solution: Set the parameter causing the error to a value within the range and run Save parameters . Switch the drive off and then switch it back on again. If the IPA of the parameter is not shown in the manual, contact the service centre.	
21			
22	Options cfg changed	Condition: this may occur when powering the drive if an expansion card has been removed or replaced or the incorrect enable key is inserted for a given firmware function.	
		0064H-100	Card removed from slot 1
		0014H-20	Card removed from slot 2
		0003H-3	Card removed from slot 3
		0078H-120	Card removed from slot 1 and from slot 2
		0067H-103	Card removed from slot 1 and from slot 3
		0017H-23	Card removed from slot 2 and from slot 3
		007BH-123	Card removed from slot 1, from slot 2 and from slot 3
Solution: Check the hardware configuration, then press ESC. Save the parameters (Save parameters , menu 04.01 par 550) to save the new hardware configuration.			

Note!

.....
If any messages not included in this list are displayed, reference should be made to the manual of the application used by the drive.
.....

9 - Specification

9.1 Environmental Conditions




Installation location _____	Pollution degree 2 or lower (free from direct sunlight, vibration, dust, corrosive or inflammable gases, fog, vapour oil and dripped water, avoid saline environment)
Installation altitude _____	Up to 1000m (3280 feet) above sea level without derating. Over 1000m and up to 4000m (13123 feet): see section 9.6.1 Derating factors.
Mechanical conditions for installation _____	Vibrational stress: EN 60721-3-3 Class 3M1
Operating temperature _____	-10...+40°C (32°...104°F)
Operating temperature (1) _____	+40 ... +50°C with derating, (+104 ... +122°F with derating)
Air humidity (operating) _____	from 5 % to 85 % and from 1 g/m ³ to 25 g/m ³ without moisture condensation or icing (class 3K3 as per EN50178)
Air pressure (operating) [kPa] _____	86 to 106 (class 3K3 as per EN50178)

(1) In menu 4 - DRIVE CONFIG set the Ambient temperature parameter, PAR 564, to 1 (50°C).
10 % derating of output current.



.....
The drive is suitable for use under the environmental service conditions (climate, mechanical, pollution, etc.) defined as usual service conditions according to EN61800-2.
.....

9.2 Standards

Directive EC _____	LVD 2014/35/EU, EMC 2014/30/EU, RoHS 2011/65/EU
Electrical safety _____	EN 61800-5-1, UL508C, UL840 degree of pollution 2 Overvoltage category 3.
Operating safety _____	(for ADV200...+SI series) IEC EN 61800-5-2, SIL 3 ; ISO EN 13849-1, PL "e"
EMC compatibility _____	EN61800-3 (EMC conducted: immunity and emissions) With std integrated filters (excluded ADV200 WA...-DC models): Immunity: environment 2 Conducted emission: environment 2, category C3 and motor cable length 20 mt (up to 50 mt for sizes 5 and higher) Radiated emission: determined by cabinet of final application With external optional filters (see ch. 10.3): Immunity: environment 1 or 2 Conducted emission: sizes 1007...4450 (environment 1, cat. C2 and motor cable length 30 mt), sizes 5550 ... 73551 (environment 2, cat. C3 and motor cable length 100 mt), Radiated emission: determined by cabinet of final application
Protection degree _____	IP20, ≥ size 7: IP00
Approvals _____	  

9.3 Accuracy (Asynchronous)

9.3.1 Current control

Type _____ Flux vector OL (Open Loop Field Oriented Control)
Loop sampling time _____ 125 μ s
Response time _____ 600 - 1600 μ s
PWM frequency _____ 2, 4, 6, 8, 10, 12 kHz (size dependent)

9.3.2 Speed control

Type _____ Flux vector OL (Open Loop Field Oriented Control)
Loop sampling time _____ 125 μ s
Response time _____ 5 - 10ms
Speed measurement _____ FP, F mode
Speed regulation accuracy _____ Flux vector OL : \pm 30 % rated slip
V/F : \pm 60 % rated slip.

9.3.3 Speed control limits

Control range (1) _____ \pm 32000 rpm
Speed format (1) _____ 32 bit
Frequency range _____ \pm 2000 Hz

(1) referred to Full scale speed, PAR:680.

Sizes	Max frequency		Min frequency	
	Flux vector OL	VF	Flux vector OL	VF
1015 ... 72500	150 Hz	500 Hz	0.5 Hz	1 Hz
73150 ... 1800 kW	150 Hz	200 Hz		

9.3.4 Torque control

Torque resolution (2) _____ > 0.1 %
Direct torque control _____ yes
Current limitation _____ Limits \pm , Limits mot/gen, Limits variable

(2) referred to rated torque

9.3.5 Overload

Heavy duty (HD) _____ 150% 60 sec each 300 sec, 180% 0,5 sec each 300 sec.
Light duty (LD) _____ 110% 60 sec each 300 sec.

9.4 DC circuit

Overvoltage threshold (Overvoltage) _____ 820 V_{dc}
Undervoltage threshold (Undervoltage) _____ 390 V_{dc} (@400 V_{dc})
470 V_{dc} (@480 V_{dc})

9.5 Input electrical data

9.5.1 AC power supply

AC Input voltage, U_{LN} _____ 3 ph 380 V_{AC} -15% ... 500 V_{AC} +5%,
 AC Input frequency _____ 50/60 Hz, \pm 5%
 Choke _____ integrated (DC) up to size 61600
 Total harmonic distortion (THD) _____ 40% Light duty, 50% Heavy duty (at nominal current)
 Connection to TT and TN Networks _____ yes, standard version
 Connection to IT Networks _____ yes, special version ADV200 WA...-IT only (upon request).

Sizes	ADV200 WA-...-4 versions (Motor cos phi 0.9 @ 400 V _{AC})	
	AC Input current	
	Heavy duty (Arms)	Light duty (Arms)
1015	2.1	3.7
1022	3.7	4.9
1030	4.9	6.5
1040	6.5	8.1
1055	8.1	11.1
2075	11.1	14.0
2110	14.0	19.6
2150	19.6	26.4
3185	26.4	32.3
3220	32.3	39
3300	39	53
4370	53	64
4450	64	74
4550	74	89
5750	100	143
5900	143	171
51100	171	200
61320	200	238
61600	238	285
72000	300	350
72500	350	420
73150	420	580
73550	580	640
74000	640	710
500 kW	665	800
630 kW	800	1100
710 kW	1100	1215
800 kW	1215	1350
1000 kW	1650	1800
1200 kW	1800	2020
1500 kW	2210	2460
1800 kW	2780	3080

9.5.2 DC power supply

AC Input voltage _____ 450 - 750 V_{DC}

Sizes ADV200 WA- ...-DC	ADV200 WA-...-4-DC DC versions (Motor cos phi 0.9 @ 400 V _{AC})	
	DC Input current (*)	
	Heavy duty (Arms)	Light duty (Arms)
3220	39	48
3300	48	65
4370	65	80
4450	80	90
4550	90	125
5750	125	175
5900	175	210
51100	210	240
61320	240	290
61600	290	350
72000	370	430
72500	430	510
73150	510	710
73550	710	780
74000	780	850
500 kW	2 x 430	2 x 510
630 kW	2 x 510	2 x 710
710 kW	2 x 710	2 x 780
800 kW	2 x 780	2 x 850
1000 kW	3 x 710	3 x 780
1200 kW	3 x 780	3 x 850
1500 kW	4 x 710	4 x 780
1800 kW	5 x 780	5 x 850

(*) RMS input current in case of power from 6 impulse bridge.

Nota

.....
 Contact WEG if an AFE200 series regenerative power supply is used.

9.6 Output electrical data

U2 Max output voltage _____ 0,94 x U_{LN} (U_{LN} = AC Input voltage)
 f2 Max output frequency _____ 500 Hz (Sizes 1015 ... 72500) , 200 Hz (≥ Size 73550):
 see section 9.3.3 for more details.
 Braking IGBT Unit _____ KBX models: standard internal with external resistor,
 KXX: not included;
 braking torque 150 % MAX

Sizes	Inverter Output		Pn mot (Recommended asynchronous motor output)			
	Heavy duty (KVA)	Light duty (KVA)	Heavy duty		Light duty	
			@400 V _{AC} (kW)	@460 V _{AC} (Hp)	@400 V _{AC} (kW)	@460 V _{AC} (Hp)
1015	1.7	3.0	0.75	1	1.5	2
1022	3.0	4.0	1.5	2	2.2	3
1030	4.0	5.3	2.2	3	3	5
1040	5.3	6.6	3.0	5	4	5
1055	6.6	9	4.0	5	5.5	7.5
2075	9	11.4	5.5	7.5	7.5	10
2110	11.4	15.9	7.5	10	11	15
2150	15.9	21.5	11	15	15	20
3185	21.5	26.3	15	20	18.5	25
3220	26.3	32	18.5	25	22	30
3300	32	43	22	30	30	40
4370	43	52	30	40	37	50
4450	52	60	37	50	45	60
4550	60	73	45	60	55	75
5750	73	104	55	75	75	100
5900	104	125	75	100	90	125
51100	125	145	90	125	110	150
61320	145	173	110	150	132	175
61600	173	208	132	175	160	200
72000	208	267	160	200	200	250
72500	267	319	200	250	250	300
73150	319	409	250	300	315	400
73550	409	450	315	400	355	450
74000	450	506	355	450	400	500
500 kW	506	603	400	500	500	650
630 kW	603	776	500	650	630	850
710 kW	776	852	630	850	710	950
800 kW	852	956	710	950	800	1100
1000 kW	1108	1247	900	1200	1000	1300
1200 kW	1247	1420	1000	1300	1200	1600
1500 kW	1566	1760	1350	1800	1500	2000
1800 kW	1919	2148	1650	2200	1800	2500

Sizes	In Rated output current (For Asynchronous motors)			
	@U _{LN} =400Vac		@U _{LN} =460Vac	
	Heavy duty (A)	Light duty (A)	Heavy duty (A)	Light duty (A)
1015	2.5	4.3	2.3	3.9
1022	4.3	5.8	3.9	5.2
1030	5.8	7.6	5.2	6.8
1040	7.6	9.5	6.8	8.6
1055	9.5	13	8,6	11.7
2075	13	16.5	11.7	14.9
2110	16.5	23	14.9	20.7
2150	23	31	20.7	27.9
3185	31	38	27.9	34.2
3220	38	46	34.2	41.4
3300	46	62	41.4	55.8
4370	62	75	55.8	67.5
4450	75	87	67.5	78.3
4550	87	105	78	94,5
5750	105	150	94.5	135
5900	150	180	135	162
51100	180	210	162	189
61320	210	250	189	225
61600	250	300	225	270
72000	300	385	270	347
72500	385	460	347	414
73150	460	590	414	531
73550	590	650	531	585
74000	650	730	585	657
500 kW	730	870	657	783
630 kW	870	1120	783	1008
710 kW	1120	1230	1008	1107
800 kW	1230	1380	1107	1242
1000 kW	1600	1800	1440	1620
1200 kW	1800	2050	1620	1845
1500 kW	2260	2540	2034	2286
1800 kW	2770	3100	2493	2790

Sizes ADV200 WA-DC	I _N Rated output current (For Asynchronous motors)			
	@540 Vdc Heavy duty (A)	@540 Vdc Light duty (A)	@650 Vdc Heavy duty (A)	@650 Vdc Light duty (A)
3220	38	46	34.2	41.4
3300	46	62	41.4	55.8
4370	62	75	55.8	67.5
4450	75	87	67.5	78.3
4550	87	105	78	94.5
5750	105	150	94.5	135
5900	150	180	135	162
51100	180	210	162	189
61320	210	250	189	225
61600	250	300	225	270
72000	300	385	270	347
72500	385	460	347	414
73150	460	590	414	531
73550	590	650	531	585
74000	650	730	585	657
500 kW	730	870	657	783
630 kW	870	1120	783	1008
710 kW	1120	1230	1008	1107
800 kW	1230	1380	1107	1242
1000 kW	1600	1800	1440	1620
1200 kW	1800	2050	1620	1845
1500 kW	2260	2540	2034	2286
1800 kW	2770	3100	2493	2790

9.6.1 Derating factors

The derating factors shown below are applied to the rated DC output by the user. They are not automatically implemented by the drive.

Output current derating factors

$$I_{DRIVE} = I_N \times K_{V1} \times K_T \times K_{ALT} \times K_F$$

$K_{V1}^{(1)}$: Derating factor for mains voltage from 460VAC to 480VAC and power supply from AFE200.

$K_T^{(2)}$: Derating factor for 50°C ambient temperature (1 % each °C above 40°C)

$K_{ALT}^{(3)}$: Derating factor for installation at altitudes above 1000 meters a.s.l.. Value to be applied at each 100 m increase above 1000 m (up to a maximum of 4000 m).

I.e.: Altitude 2000 m, $K_{ALT} = 1.2 * 10 = 12\%$ di derating; I_N derated = $100 - ((12 * 100) / 100) = 88\% I_N$

$K_F^{(4)}$: Derating factor for higher switching frequency

If not all of the derating factors are considered, this could result in a drive overtemperature condition.

The specific alarm indicates this condition and normal drive operation is stopped.



Sizes	Derating factor KV ₁ (1)						
	@U _{LN} =400Vac				@U _{LN} =460...480Vac		
	T _{amb} = 40°C	from AFE200		T _{amb} ≤ 30°C	T _{amb} = 40°C	from AFE200	
		T _{amb} ≤ 30°C	T _{amb} 31 ... 40°C			T _{amb} ≤ 30°C	T _{amb} 31 ... 40°C
1015 ... 1800 kW	1	1	0.9	1	0.9	0.9	0.81

Sizes	fsw Switching frequency		Derating factor							
	Default	Higher	Kr	K _{ALT}	Kf (4)					
			(2)	(3)	2 kHz	4 kHz	6 kHz	8 kHz	10 kHz	12 Hz
1015	8	10, 12	0.9	1.2	1	1	1	1	0.85	0.7
1022	8	10, 12	0.9	1.2	1	1	1	1	0.85	0.7
1030	4	6, 8, 10, 12	0.9	1.2	1	1	0.85	0.7	0.55	0.4
1040	4	6, 8, 10, 12	0.9	1.2	1	1	0.85	0.7	0.55	0.4
1055	4	6, 8, 10, 12	0.9	1.2	1	1	0.85	0.7	0.6	0.5
2075	4	6, 8, 10, 12	0.9	1.2	1	1	0.85	0.7	0.6	0.5
2110	4	6, 8, 10, 12	0.9	1.2	1	1	0.85	0.7	0.6	0.5
2150	4	6, 8, 10, 12	0.9	1.2	1	1	0.85	0.7	0.6	0.5
3185	4	6, 8, 10, 12	0.9	1.2	1	1	0.85	0.7	0.6	0.5
3220	4	6, 8, 10, 12	0.9	1.2	1	1	0.85	0.7	0.6	0.5
3300	4	6, 8, 10, 12	0.9	1.2	1	1	0.85	0.7	0.6	0.5
4370	4	6, 8, 10, 12	0.9	1.2	1	1	0.85	0.7	0.6	0.5
4450	4	6, 8, 10, 12	0.9	1.2	1	1	0.85	0.7	0.6	0.5
4550	4	6, 8	0.9	1.2	1	1	0.85	0.7	0	0
5750	4	6, 8	0.9	1.2	1	1	0.85	0.7	0	0
5900	4	6, 8	0.9	1.2	1	1	0.85	0.7	0	0
51100	4	6, 8	0.9	1.2	1	1	0.85	0.7	0	0
61320	4	6, 8	0.9	1.2	1	1	0.85	0.7	0	0
61600	4	6, 8	0.9	1.2	1	1	0.85	0.7	0	0
72000	4	-	0.9	1.2	1	1	0	0	0	0
72500	4	-	0.9	1.2	1	1	0	0	0	0
73150	2	4	0.9	1.2	1	0.85	0	0	0	0
73550	2	-	0.9	1.2	1	0	0	0	0	0
74000	2	-	0.9	1.2	1	0	0	0	0	0
500 kW	4 (5)	-	0.9	1.2	1	1 (5)	0	0	0	0
630 kW	2	4 (5)	0.9	1.2	1	0.85 (5)	0	0	0	0
710 kW	2	-	0.9	1.2	1	0	0	0	0	0
800 kW	2	-	0.9	1.2	1	0	0	0	0	0
1000 kW	2	-	0.9	1.2	1	0	0	0	0	0
1200 kW	2	-	0.9	1.2	1	0	0	0	0	0
1500 kW	2	-	0.9	1.2	1	0	0	0	0	0
1800 kW	2	-	0.9	1.2	1	0	0	0	0	0

(5) from fw 2.1.1.

Note!

In Light Duty mode the switching frequency is set at 4 kHz for sizes up to 72500 plus size 500kW (setting to 2kHz is possible), and is fixed at 2kHz for sizes 73150 up to 1.8 MW (500kW excluded).

Note!

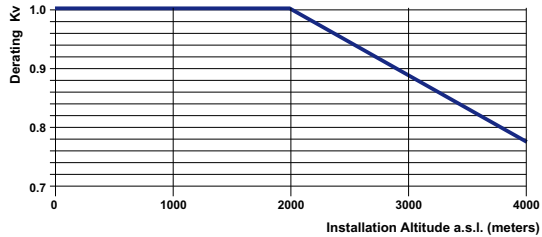
If, in the Heavy duty mode, the factory setting of **Switching freq mode** (PAR: 568) is changed from 0=Fixed to 1=Variable, the switching frequency is controlled by the temperature of the drive heat sink and the output frequency. For further information see the Functions and Parameters manual, menu 4.9.

Installation altitude above sea level	Kr Output Current derating factor at Ambient Temperature of:						
	20°C	25°C	30°C	35°C	40°C	45°C	50°C
0 ... 1000 m	1					0.95	0.90

Input voltage derating factor

Kv₂⁽⁶⁾ : Derating factor of the input voltage based on altitudes

Figure 9.6.1: Kv₂ derating factor based on altitudes



Installation altitude m (s.l.m.)	Kv ₂ Derating factor (6)					
	Mains voltage [V]					
	380 Vac	400 Vac	415 Vac	440 Vac	460 Vac	480 Vac
≤ 2000	100%	100%	100%	100%	100%	100%
≤ 2250	100%	100%	100%	100%	100%	97%
≤ 2500	100%	100%	100%	100%	98%	94%
≤ 2750	100%	100%	100%	100%	96%	92%
≤ 3000	100%	100%	100%	97%	93%	89%
≤ 3250	100%	100%	99%	94%	90%	86%
≤ 3500	100%	100%	96%	91%	87%	83%
≤ 3750	100%	96%	93%	88%	84%	80%
≤ 4000	98%	93%	90%	85%	81%	78%

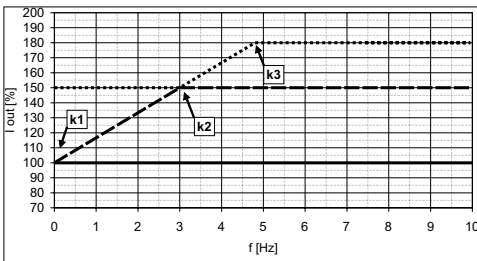


|||||
 If the voltage derating factor is not considered, may occur a drive breakdown.
 |||||

9.6.2 Overload for output frequency

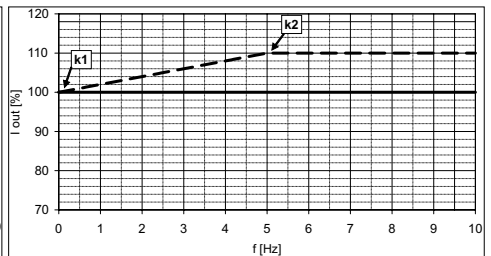
Sizes	For Asynchronous motors				
	Heavy duty			Light duty	
	K1 SP [%]	K2 SP [Hz]	K3 SP [Hz]	K1 SL [%]	K2 SL [Hz]
1015	100	3	4.8	100	3
1022	100	3	4.8	75	3
1030	100	3	4.8	75	3
1040	100	3	4.8	80	3
1055	100	3	4.8	100	3
2075	100	3	4.8	100	3
2110	100	3	4.8	75	3
2150	100	3	4.8	75	5
3185	100	5	8	75	7
3220	100	5	8	85	5
3300	100	3	4.8	80	5
4370	100	3	4.8	80	3
4450	100	3	4.8	80	3
4550	100	3	4.8	80	3
5750	100	3	4.8	85	5
5900	100	5	8	85	5
51100	100	5	8	85	5
61320	100	3	4.8	100	3
61600	100	3	4.8	100	3
72000	100	3	4.8	80	3
72500	100	3	4.8	100	3
73150	100	3	4.8	75	5
73550	100	3	4.8	100	3
74000	90	5	7.5	90	5
500 kW	100	3	4.8	100	3
630 kW	100	3	4.8	75	5
710 kW	100	3	4.8	100	3
800 kW	90	5	7.5	90	5
1000 kW	100	3	4.8	100	3
1200 kW	90	5	7.5	90	5
1500 kW	100	3	4.8	100	3
1800 kW	100	3	4.8	100	3

Figure 9.6.2.1: HD Overload (For Asynchronous motors)



-- Islow, Ifast; __ I_N

Figure 9.6.2.2: LD Overload (For Asynchronous motors)



-- Islow, __ I_N

9.7 Voltage level of the inverter for safe operations

The minimum time between the moment in which an ADV200 WA drive is disabled from the mains and that in which an operator can operate on internal parts of the drive, without the danger of electric shock, is **5 minutes**.



.....
 The value consider the time to turn-off for a drive supplied at 460VAC +10%, without any options (time indicated for disabled drive condition).

9.8 Cooling

All the Drives have internal fans.

Sizes		Dissipated power	Airflow of fan	
		W	Heatsink (m³/h)	Internal (m³/h)
	1015	60	32	26
	1022	90	32	32
	1030	100	32	32
	1040	120	32	32
	1055	160	32	32
	2075	200	32	32
	2110	250	56 x 2	32
	2150	300	56 x 2	32
	3185	380	80 x 2	32
	3220	460	80 x 2	32
	3300	600	80 x 2	32
	4370	900	2 x 250	2 x 50
	4450	1000	2 x 250	2 x 50
	4550	1290	2 x 250	2 x 50
	5750	1760	2 x 285	1 x 170
	5900	2150	2 x 355	2 x 170
	51100	2400	2 x 355	2 x 170
	61320	2850	3 x 310	2 x 170
	61600	3600	3 x 310	2 x 170
	72000	3900	1500	-
	72500	4000	1500	-
	73150	5200	1500	-
	73550	6000	2000	-
	74000	6500	2000	-
500 kW	ADV200-WA-72500-KXX-4-MS 05 -SI	4000	1500	-
	ADV200-WA-72500-XXX-4-SL	4000	1500	-
630 kW	ADV200-WA-73150-KXX-4-MS 06 -SI	5200	1500	-
	ADV200-WA-73150-XXX-4-SL	5200	1500	-
710 kW	ADV200-WA-73550-KXX-4-MS 07 -SI	6000	2000	-
	ADV200-WA-73550-XXX-4-SL	6000	2000	-

800 kW	ADV200-WA-74000-KXX-4-MS 08 -SI	6500	2000	-
	ADV200-WA-74000-XXX-4-SL	6500	2000	-
1000 kW	ADV200-WA-73550-KXX-4-MS 10 -SI	6000	2000	-
	ADV200-WA-73550-XXX-4-SL	6000	2000	-
	ADV200-WA-73550-XXX-4-SL	6000	2000	-
1200 kW	ADV200-WA-74000-KXX-4-MS 12 -SI	6500	2000	-
	ADV200-WA-74000-XXX-4-SL	6500	2000	-
	ADV200-WA-74000-XXX-4-SL	6500	2000	-
1500kW	ADV200-WA-73550-KXX-4-MS 15-SI	6000	2000	-
	ADV200-WA-73550-XXX-4-SL	6000	2000	-
	ADV200-WA-73550-XXX-4-SL	6000	2000	-
	ADV200-WA-73550-XXX-4-SL2	6000	2000	-
1500kW (DC)	ADV200-WA-74000-KXX-4-MS 15-DC-SI	6500	2000	-
	ADV200-WA-74000-XXX-4-SL-DC	6500	2000	-
	ADV200-WA-74000-XXX-4-SL-DC	6500	2000	-
	ADV200-WA-74000-XXX-4-SL2-DC	6500	2000	-
1800kW	ADV200-WA-73550-KXX-4-MS 18-SI	6000	2000	-
	ADV200-WA-73550-XXX-4-SL	6000	2000	-
	ADV200-WA-73550-XXX-4-SL	6000	2000	-
	ADV200-WA-73550-XXX-4-SL2	6000	2000	-
	ADV200-WA-73550-XXX-4-SL2	6000	2000	-
1800kW (DC)	ADV200-WA-74000-KXX-4-MS 18-DC-SI	6500	2000	-
	ADV200-WA-74000-XXX-4-SL-DC	6500	2000	-
	ADV200-WA-74000-XXX-4-SL-DC	6500	2000	-
	ADV200-WA-74000-XXX-4-SL2-DC	6500	2000	-
	ADV200-WA-74000-XXX-4-SL2-DC	6500	2000	-

9.9 Weight and dimensions

Sizes ADV200 WA-...-4	Weight (kg)	Weight (lbs)
1015 ... 1055	5,8	12,8
2075 ... 2150	10,2	22,5
3185 ... 3220	16,4	36,2
3300	22	48,5
4370 ... 4550	32	70,6
5750 ... 51100	60	132
61320 ... 61600	90	198
72000 ... 72500	130	287
73150	140	309
73550 ... 74000	150	331
500 kW	260	573
630 kW	280	617
710 ... 800 kW	300	661
1000 ... 1200 kW	450	992
1500 kW	600	1323
1800 kW	750	1653

Sizes ADV200 WA-...-4-DC	Weight (kg)	Weight (lbs)
-	-	-
-	-	-
3220	12	26,5
3300	18	39,7
4370 ... 4550	24	52,9
5750 ... 51100	40	88,2
61320 ... 61600	68	150
72000 ... 72500	120	264,5
73150	130	286,6
73550 ... 74000	140	308,6
500 kW	240	529
630 kW	260	573
710 ... 800 kW	420	617
1000 ... 1200 kW	420	926
1500 kW	560	1235
1800 kW	700	1543

Note !

Weights referred to standard drive with keypad, without options, packaging not included.

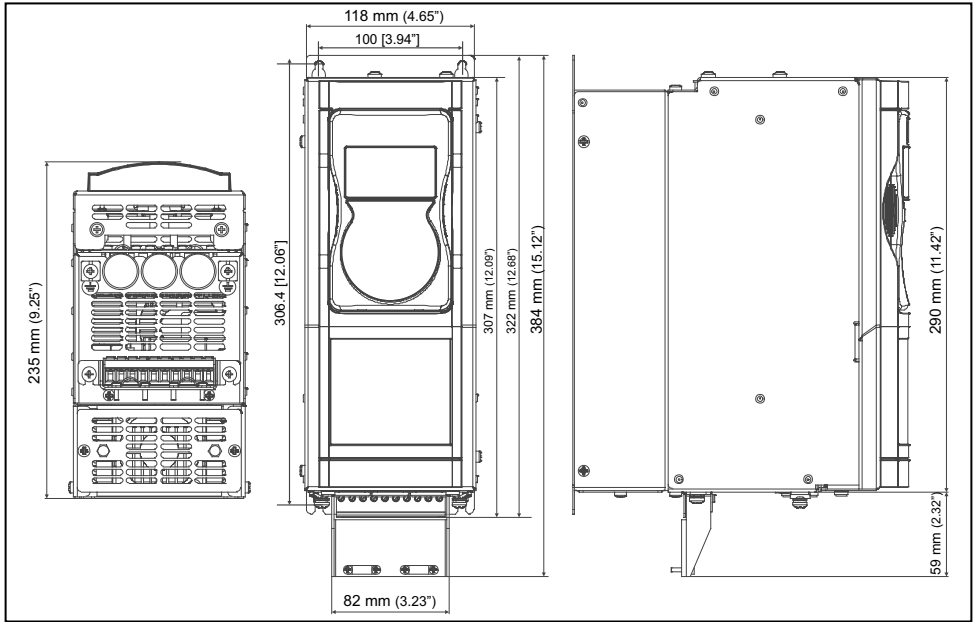


Figure 9.9.1: Size 1 Dimensions

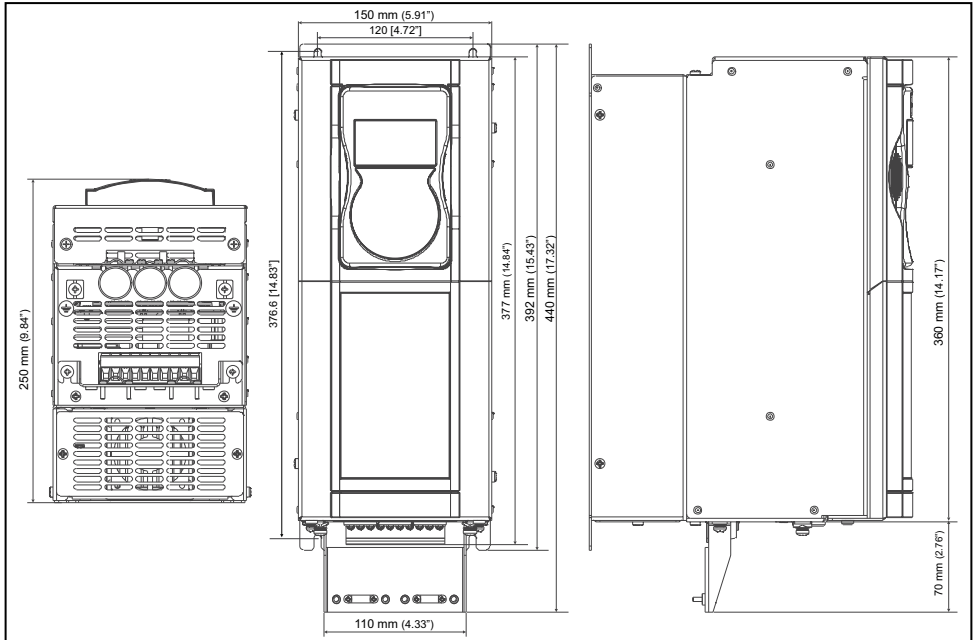


Figure 9.9.2: Size 2 dimensions

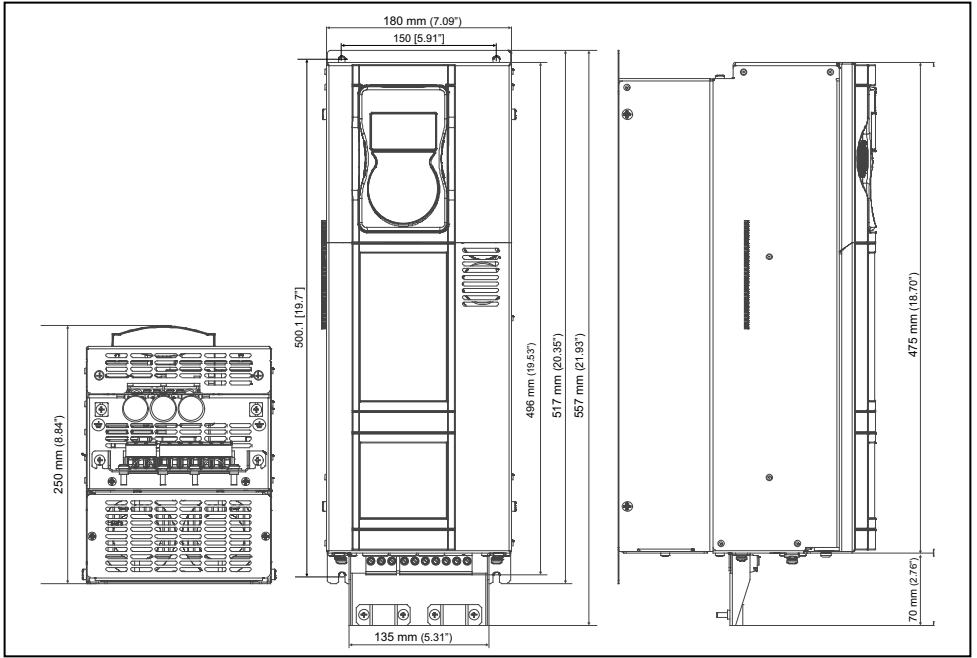


Figure 9.9.3: Size 3 dimensions (ADV200 WA-...-4)

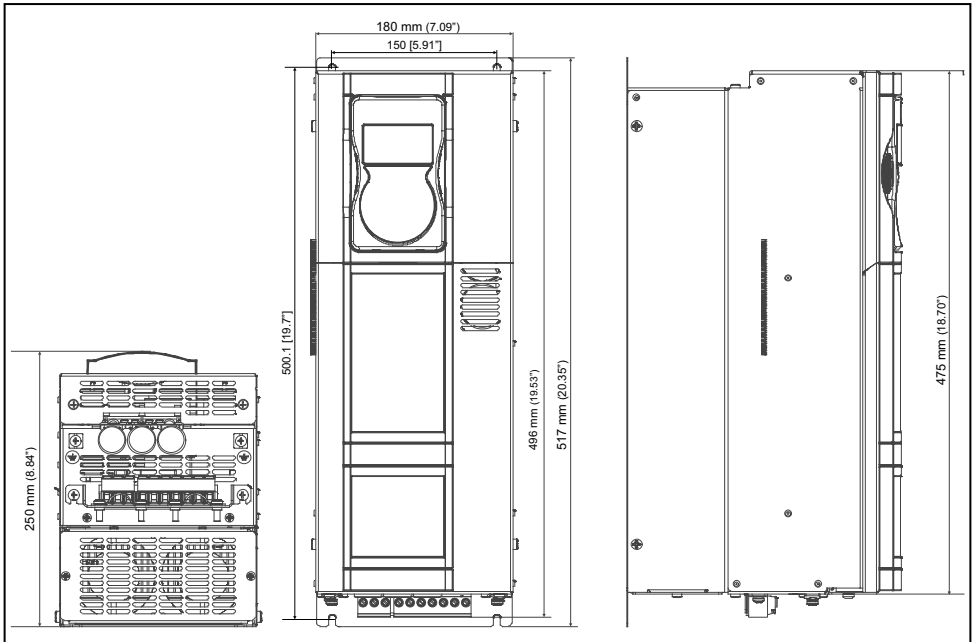


Figure 9.9.4: Size 3 dimensions (ADV200 WA-...-4-DC)

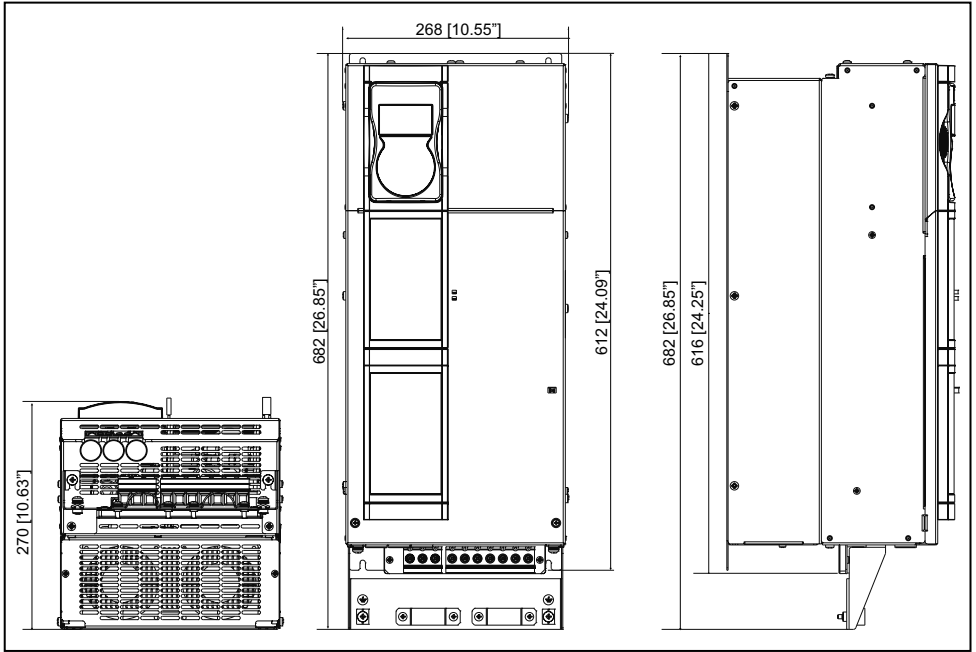


Figure 9.9.5: Size 4 dimensions (ADV200 WA-...-4)

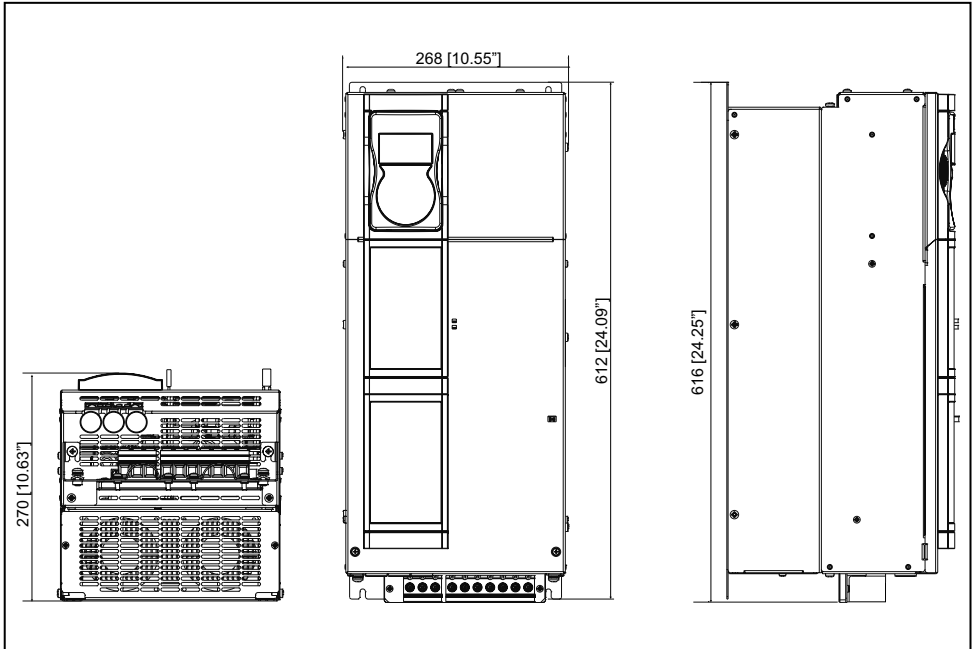


Figure 9.9.6: Size 4 dimensions (ADV200 WA-...-4-DC)

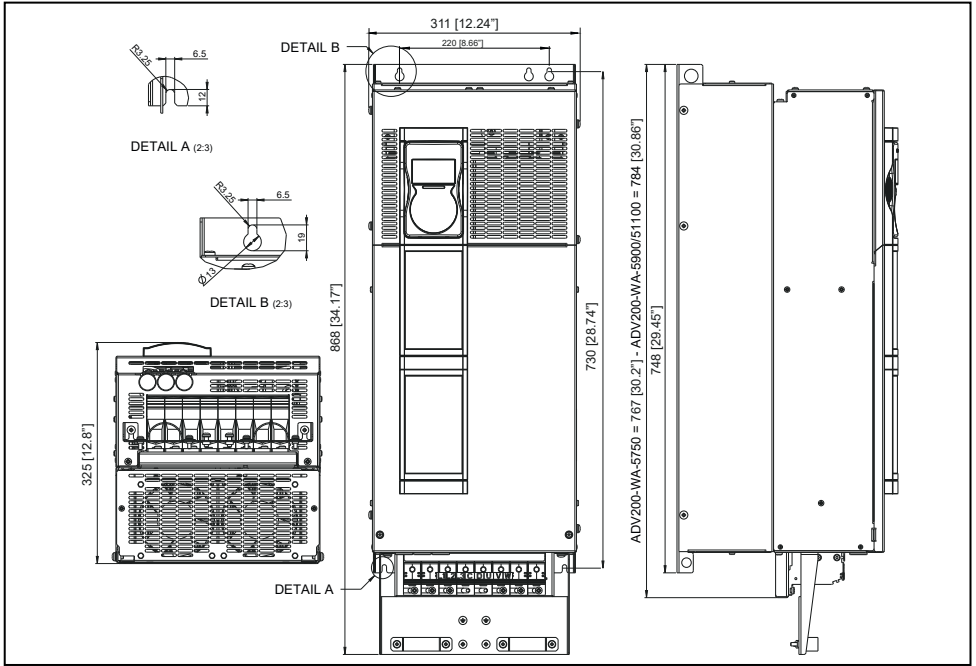


Figure 9.9.7: Size 5 dimensions (ADV200 WA-...-4)

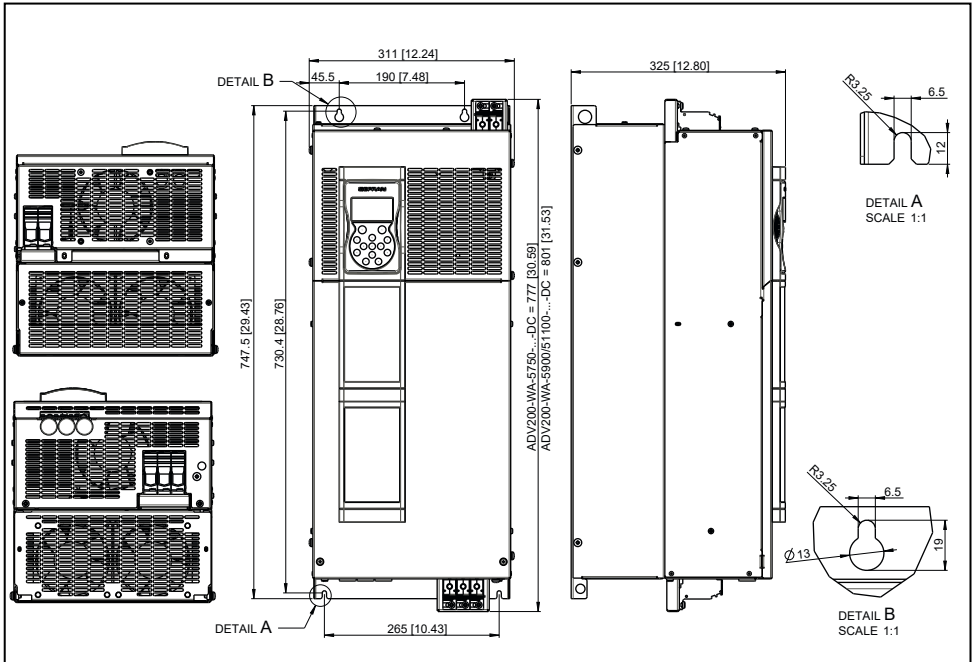


Figure 9.9.8: Size 5 dimensions (ADV200 WA-...-4-DC)

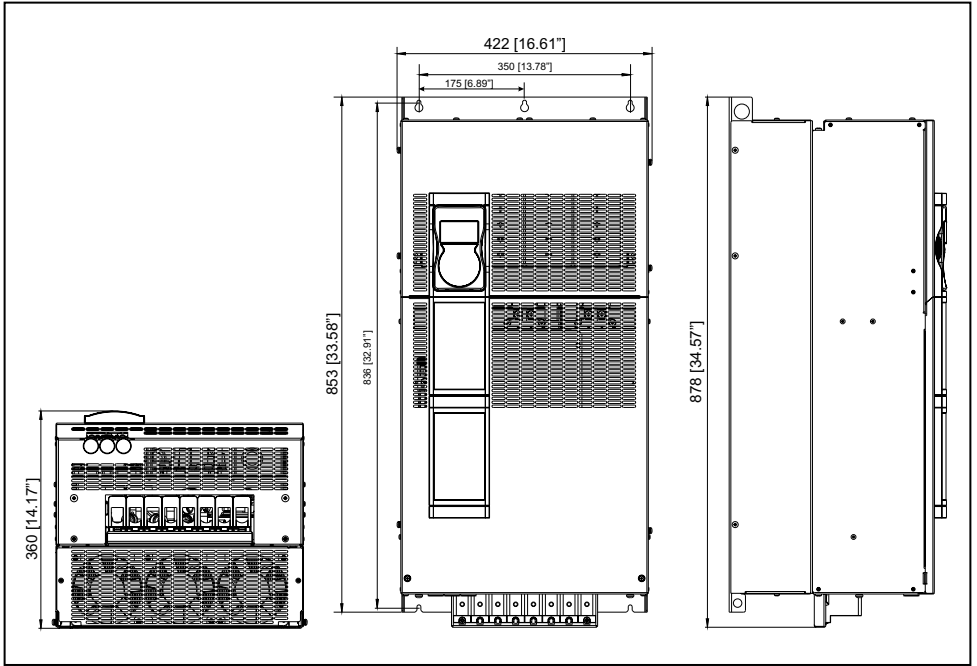


Figure 9.9.9: Size 6 dimensions (ADV200 WA-...-4)

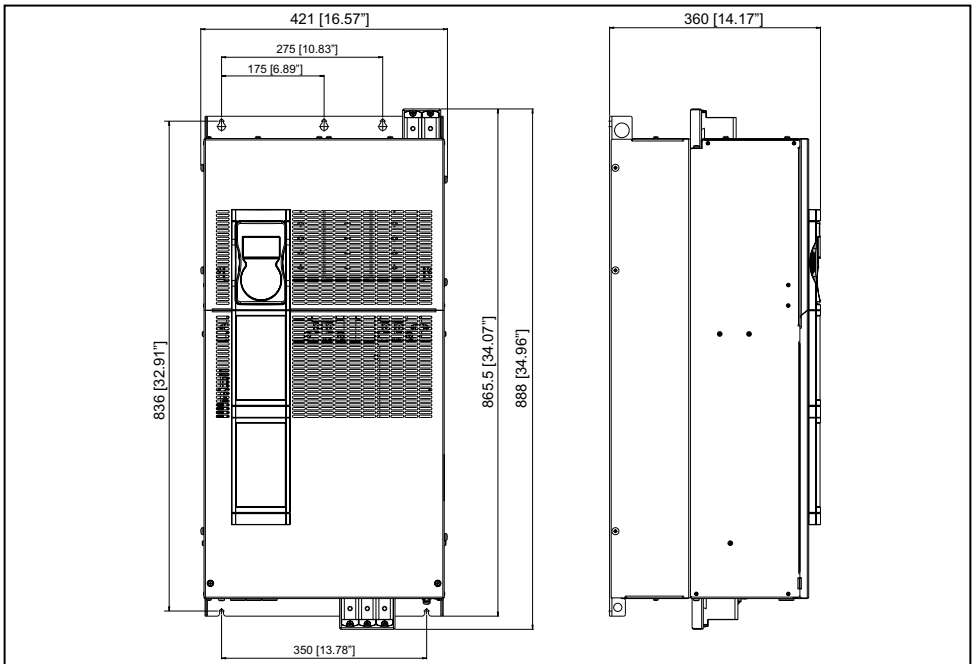


Figure 9.9.10: Size ADV200 WA-61320-...-DC dimensions

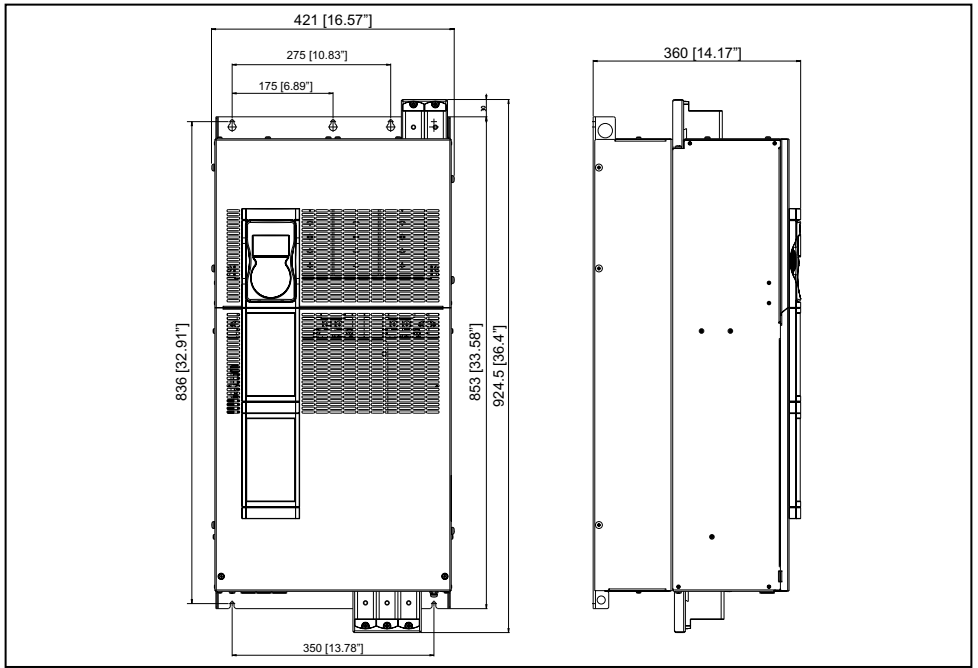


Figure 9.9.11: Size ADV200 WA-61600...-DC dimensions

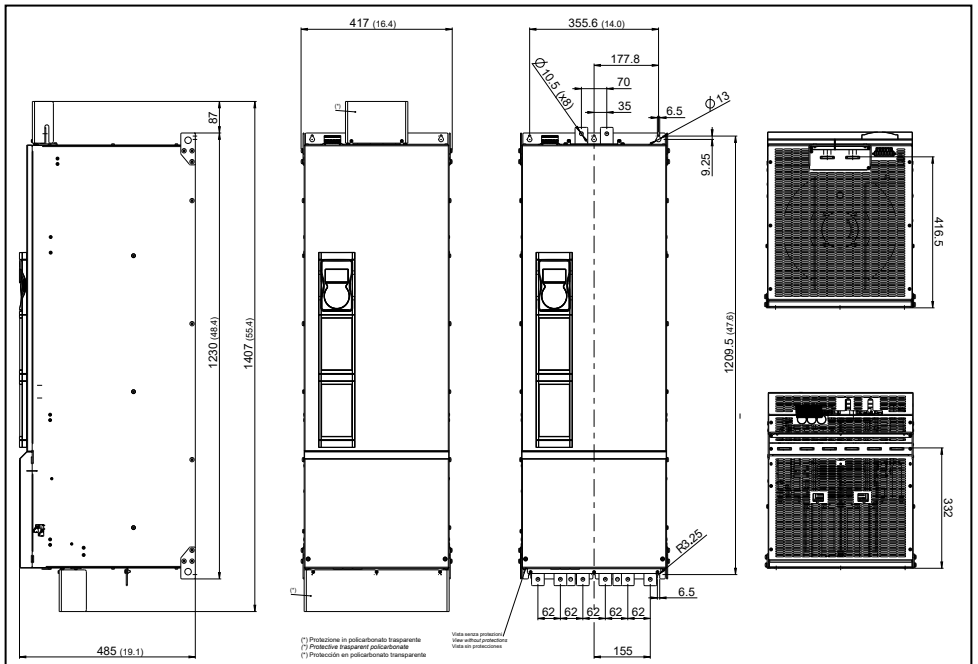


Figure 9.9.12: Size 7 dimensions

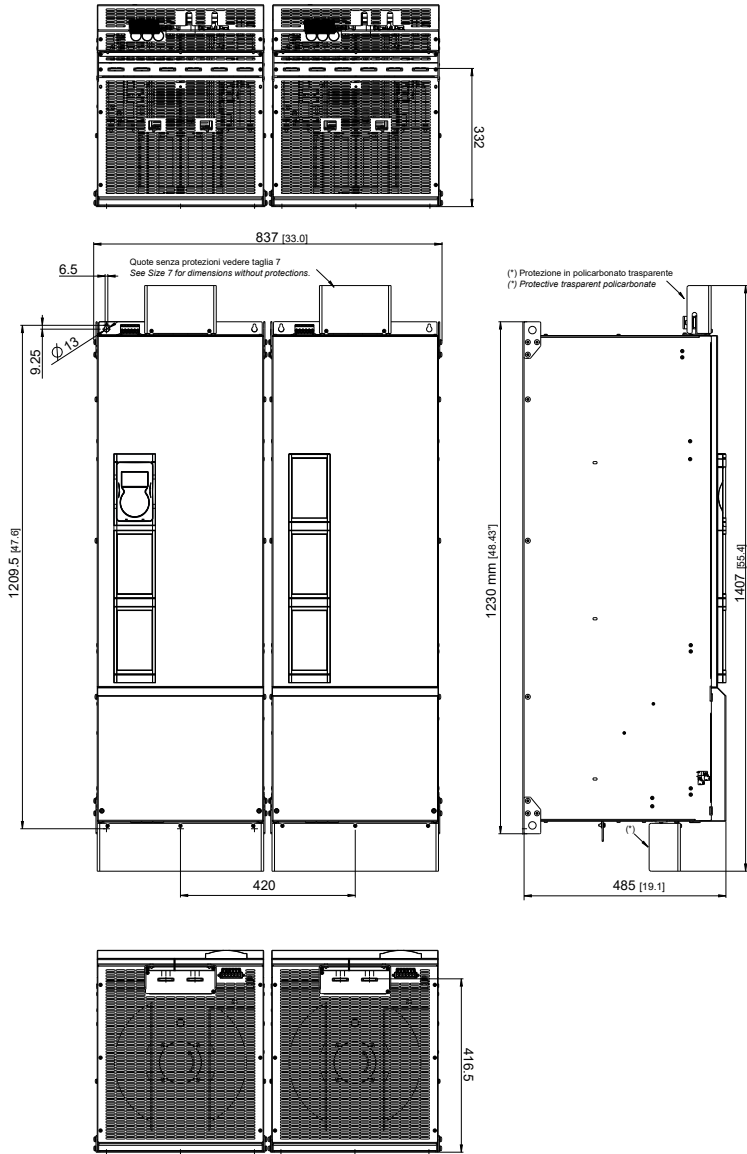


Figure 9.9.13: Sizes 500 ... 800 kW dimensions

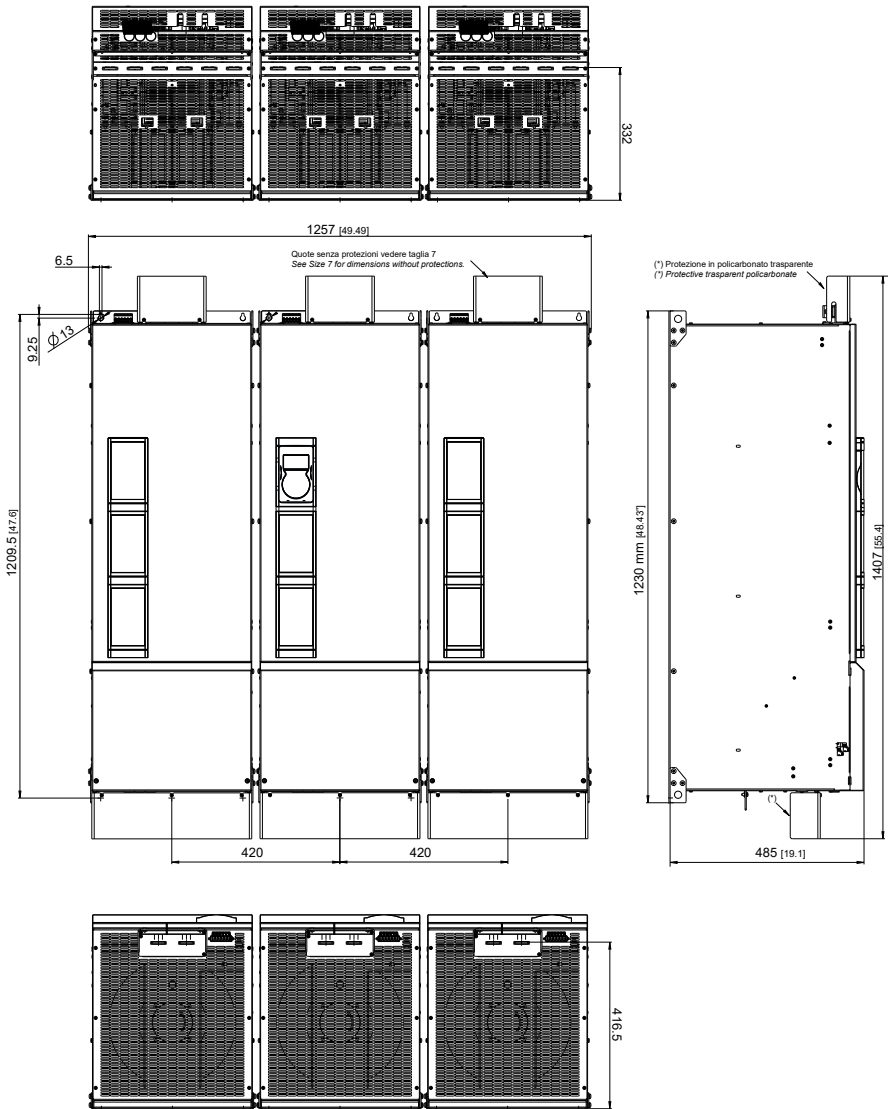


Figure 9.9.14: Sizes 1000 - 1200 kW dimensions

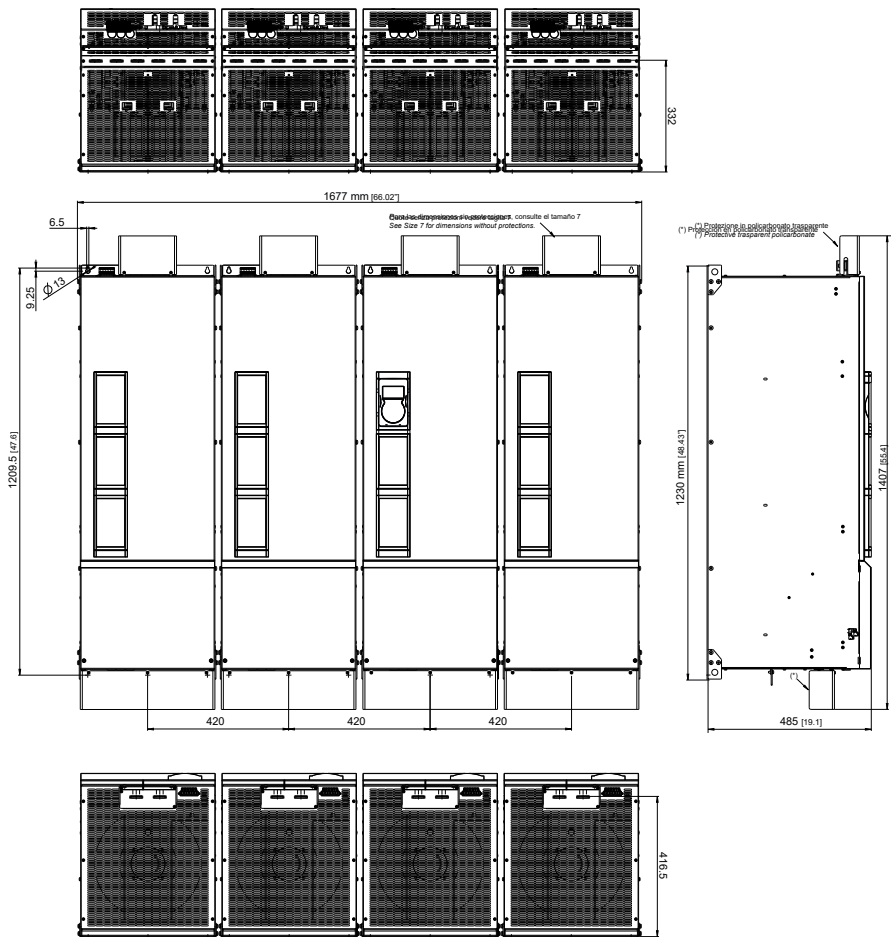


Figure 9.9.15: Sizes 1500 kW dimensions

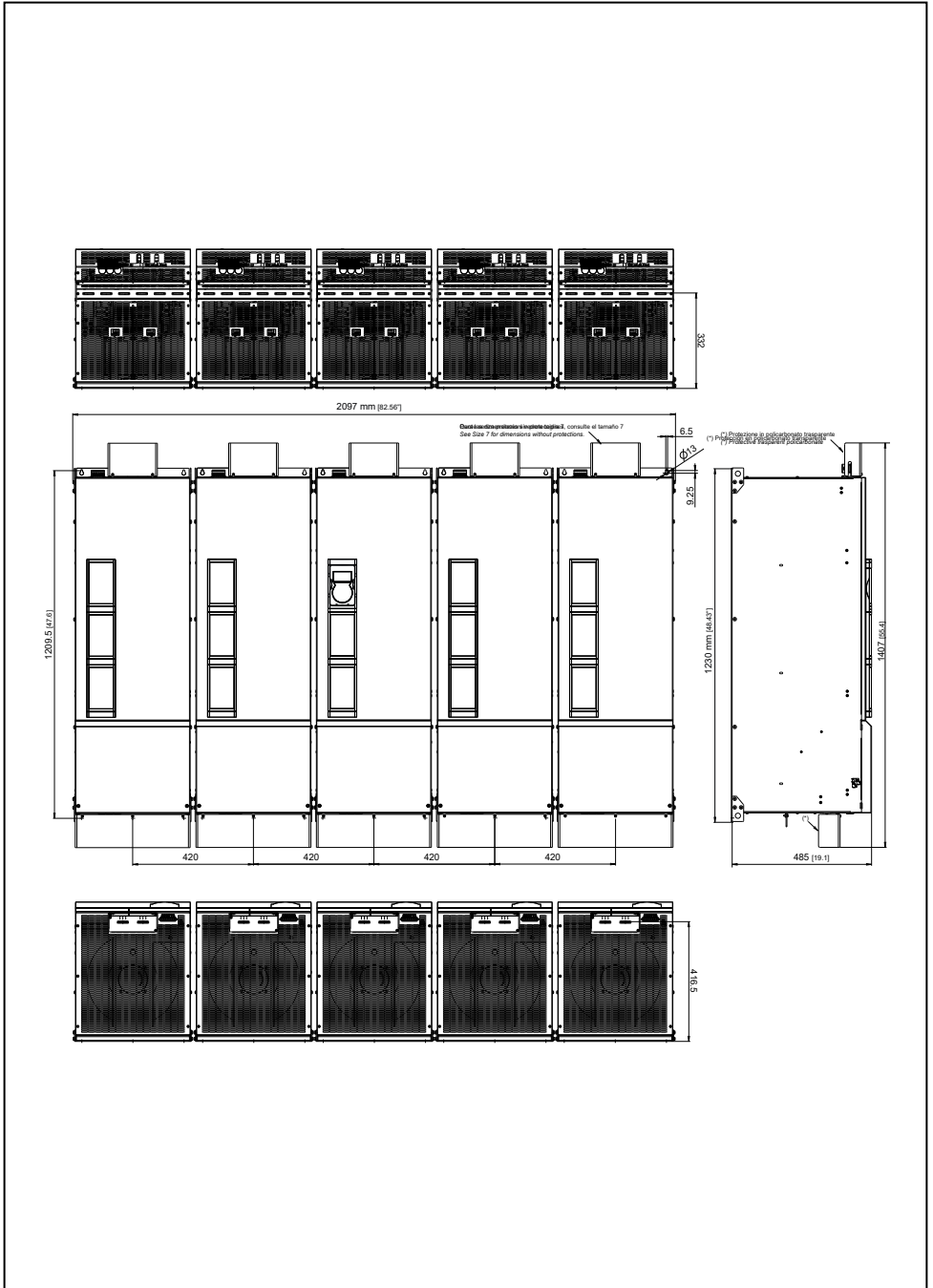


Figure 9.9.16: Sizes 1800 kW dimensions

10 - Options

10.1 Optional external fuses

10.1.1 AC input side fuses (F1)

The inverter must be fused on the AC Input side.
Use fast fuses only.

Sizes	Q.ty	F1 - AC input side fuses				
		DC link capacitors life time [h]	EUROPE		AMERICA	
			Type	Code	Type	Code
1015 ... 1030	3	50000	GRD2/10	F4D13	A70P10	S7G49
1040	3	50000	GRD2/10	F4D13	A70P10	S7G49
1055 ... 2075	3	50000	GRD2/16	F4D14	A70P20-1	S7G48
2110	3	50000	GRD2/25	F4D16	A70P40	S7G52
2150	3	50000	GRD3/35	F4D20	A70P40	S7G52
3185 - 3220	3	50000	GRD3/50	F4D21	A70P50	S7G53
3300 - 4370	3	50000	S00C+/üf1/80/80A/690V	F4EAF	A70P80	S7G54
4450	3	50000	S00C+/üf1/80/100A/690V	F4G18	A70P100	S7G55
4550	3	50000	S00C+/üf1/80/125A/690V	F4EAJ	A70P150	S7G56
5750 - 5900	3	50000	S00/üf1/80/200A/690V	F4G23	A70P200	S7G58
51100	3	50000	S1üf1/110/250A/690V	F4G28	A70P250	S7G59
61320	3	50000	S1üf1/110/315A/690V	F4G30	A70P350	S7G61
61600	3	50000	S2üf1/110/400A/690V	F4G34	A70P400	S7G62
72000	3	50000	S2üf1/110/500A/690V	F4E30	A70P500	S7G63
72500 - 73150	3	50000	S2üf1/110/630A/690V	F4E31	A70P600	S7G65
73550 - 74000	3	50000	S2üf1/110/800A/690V	F4G87	A70P800	S7813
500 kW	6	50000	S2üf1/110/630A/690V	F4E31	A70P600	S7G65
630 kW	6	50000	S2üf1/110/630A/690V	F4E31	A70P600	S7G65
710 kW	6	50000	S2üf1/110/800A/690V	F4G87	A70P800	S7813
800 kW	6	50000	S2üf1/110/800A/690V	F4G87	A70P800	S7813
1000 kW	9	50000	S2üf1/110/800A/690V	F4G87	A70P800	S7813
1200 kW	9	50000	S2üf1/110/800A/690V	F4G87	A70P800	S7813
1500 kW	12	50000	S2üf1/110/800A/690V	F4G87	A70P800	S7813
1800 kW	15	50000	S2üf1/110/800A/690V	F4G87	A70P800	S7813

The technical data of the fuses, e.g. dimensions, weights, heat dissipation, auxiliary contactors, are reported in the corresponding manufacturer data sheets.

GRD... (E27), S...

Jean Müller, Eltville

A70...

Ferraz

10.1.2 External fuses of the power section DC input side (F2)

The following fuses must be used with an external DC power supply or regenerative converter (for further details refer to the converter instruction manual):

Sizes	Q.ty	F2 - External fuses for DC input side			
		EUROPE		AMERICA	
		Type	Code	Type	Code
1015 ... 1030	2	GRD2/10	F4D13	A70P10	S7G49
1040	2	GRD2/16	F4D14	A70P20-1	S7G48
1055	2	GRD2/20	F4D15	A70P20-1	S7G48
2075	2	GRD2/20	F4D15	A70P30-1	S7I50
2110	2	GRD3/35	F4D20	A70P40	S7G52
2150	2	GRD3/50	F4D21	A70P50	S7G53
3185 ... 3300	2	S00C+/üf1/80/80A/690V	F4EAF	A70P80	S7G54
4370	2	S00C+/üf1/80/100A/690V	F4G18	A70P100	S7G55
4450	2	S00C+/üf1/80/125A/690V	F4EAJ	A70P150	S7G56
4550	2	S00C+/üf1/80/160A/690V	F4EAL	A70P150	S7G56
5750	2	S00/üf1/80/200A/690V	F4G23	A70P200	S7G58
5900	2	S1üf1/110/250A/690V	F4G28	A70P250	S7G59
51100	2	S1üf1/110/315A/690V	F4G30	A70P350	S7G61
61320	2	S2üf1/110/400A/690V	F4G34	A70P400	S7G62
61600 - 72000	2	S2üf1/110/500A/690V	F4E30	A70P500	S7G63
72500	2	S2üf1/110/630A/690V	F4E31	A70P600	S7G65
73150	2	S3üf1/110/800A/690V	F4H02	A70P800	S7813
73550 - 74000	2	S3üf1/110/1000A/690V	F4H03	A70P1000	S7812
500 kW	4	S2üf1/110/630A/690V	F4E31	A70P600	S7G65
630 kW	4	S3üf1/110/800A/690V	F4H02	A70P800	S7813
710 kW	4	S3üf1/110/1000A/690V	F4H03	A70P1000	S7812
800 kW	4	S3üf1/110/1000A/690V	F4H03	A70P1000	S7812
1000 kW	6	S3üf1/110/1000A/690V	F4H03	A70P1000	S7812
1200 kW	6	S3üf1/110/1000A/690V	F4H03	A70P1000	S7812
1500 kW	8	S3üf1/110/1000A/690V	F4H03	A70P1000	S7812
1800 kW	10	S3üf1/110/1000A/690V	F4H03	A70P1000	S7812

Note

For size 7 only, adaptation for internal mounting of fuses (DC side) on request.

The technical data of the fuses, e.g. dimensions, weights, heat dissipation, auxiliary contactors, are reported in the corresponding manufacturer data sheets.

GRD... (E27), S...

Jean Müller, Eltville

A70...

Ferraz

10.1.3 Optional internal fuses for the DC connection (F2)

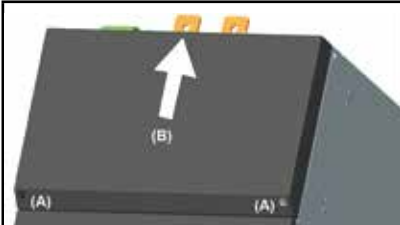
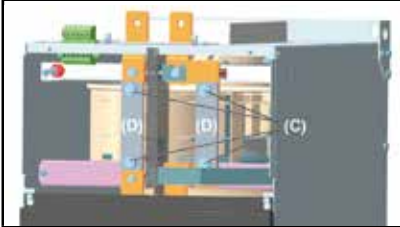

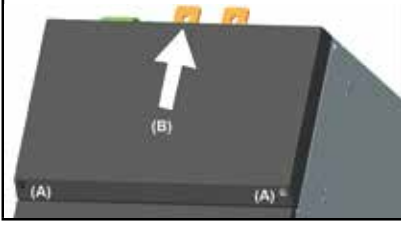
Sizes	F2 - Internal fuses for DC input side	
	EUROPE, AMERICA	
	Type	Code
72000	20 623 32.500 / 170M5160	S8B21BF
72500	20 623 32.630 / 170M5162	S8B22BF
73150	20 623 32.800 / 170M5164	S8B23BF
73550 - 74000	20 623 32.1000 / 170M5166	S8B24BF

The technical data of the fuses, e.g. dimensions, weights, heat dissipation, auxiliary contactors, are reported in the corresponding manufacturer data sheets.

170.. Bussmann (Square body)

20 ... Siba (SQB 3 DIN 110)

Installation of optional internal fuse (sizes ADV200-WA-...-7...-DC)

	<p>(1) Remove the upper cover:</p> <ul style="list-style-type: none"> > loosen the two Phillips-head screws (A), type PH2, with a Phillips-head screwdriver, > push in the direction indicated and remove the cover (B)
	<p>(2) Remove the two connection bars:</p> <ul style="list-style-type: none"> > unscrew the 4 M10 hex head screws (C) > remove the two bars (D)
	<p>(3) Secure the two fuses:</p> <ul style="list-style-type: none"> > position the two fuses (E) suitable for the inverter dimensions, see table "Internal fuses for DC input side" > tighten the 4 M10 hex head screws (C) applying a torque of 24 N
	<p>(4) Replace the upper cover:</p> <ul style="list-style-type: none"> > position the cover (B) > tighten the two Phillips-head screws (A), type PH2, applying a torque of 3 Nm

10.2 Choke

10.2.1 Optional input chokes (L1)



=====

A three-phase mains choke is mandatory for 2075 (LD) ... 4450 and \geq 72000 sizes.

=====

Use of mains chokes with an impedance of at least 3% is recommended.

The table below shows the minimum inductance values and current ratings with the codes proposed by WEG.

In case of a Master and Slave connection (500 to 1800 kW devices) the use of identical chokes (same inductance value and same current rating) for Master drive and for each Slave drive is mandatory to ensure the correct distribution of current over the drive input rectifier bridges.

Sizes	Inverter Output	Mains inductance (mH)	Rated current (A)	Saturation current (A)	Type	Q.ty	Code
1015 ... 1055	HD / LD	Integrated on DC-link					
2075	HD	Integrated on DC-link					
	LD	0.89	16.5	31	LR3y-2073-35%	1	S7F09
2110	HD / LD	1.75	23	43	LR3y-3110-35%	1	S7HB3
2150	HD / LD	1.3	30	55	LR3y-3150-35%	1	S7HB0
3185	HD / LD	1.1	36	66	LR3y-4185-35%	1	S7HB4
3220	HD / LD	0.88	44	81	LR3y-4220-35%	1	S7HB5
3300	HD / LD	0.66	59	108	LR3y-4300-35%	1	S7HB6
4370	HD / LD	0.52	75	128	LR3y-4370-35%	1	S7HB7
4450	HD	0.44	96	163	LR3-4-045-35%	1	S7FF10
	LD	Integrated on DC-link					
4550 ... 61600	HD / LD	Integrated on DC-link					
72000	HD	0.085	309	618	LR3-160	1	S7D40
	LD	0.085	420	710	LR3-200	1	S7AE9
72500	HD / LD	0.085	420	710	LR3-200	1	S7AE9
73150	HD / LD	0.06	550	1050	LR3-315	1	S7D28
73550	HD / LD	0.04	700	900	LR3-ADV-355	1	S7LR01
74000	HD / LD	0.04	700	900	LR3-ADV-355	1	S7LR01
500 kW	HD / LD	0.085	420	710	LR3-200	2	S7AE9
630 kW	HD / LD	0.06	550	1050	LR3-315	2	S7D28
710 kW	HD / LD	0.04	700	900	LR3-ADV-355	2	S7LR01
800 kW	HD / LD	0.04	700	900	LR3-ADV-355	2	S7LR01
1000 kW	HD / LD	0.04	700	900	LR3-ADV-355	3	S7LR01
1200 kW	HD / LD	0.04	700	900	LR3-ADV-355	3	S7LR01
1500 kW	HD / LD	0.04	700	900	LR3-ADV-355	4	S7LR01
1800 kW	HD / LD	0.04	700	900	LR3-ADV-355	5	S7LR01

Type	Code	Dimensions: WxHxd (mm)	Weights (kg)
LR3y-2073-35%	S7F09	150 x 155 x 94	6.2
LR3y-3110-35%	S7HB3	180 x 185 x 134	8
LR3y-3150-35%	S7HB0	180 x 185 x 144	10

Type	Code	Dimensions: WxHxd (mm)	Weights (kg)
LR3y-4185-35%	S7HB4	180 x 185 x 154	12
LR3y-4220-35%	S7HB5	180 x 165 x 190	15
LR3y-4300-35%	S7HB6	240 x 216 x 180	19
LR3y-4370-35%	S7HB7	240 x 216 x 190	22
LR3-4-045-35%	S7FF10	300 x 265 x 230	30
LR3-160	S7D40	300 x 270 x 260	44
LR3-200	S7AE9	300 x 270 x 355	54
LR3-315	S7D28	375 x 400 x 220	74
LR3-ADV-355	S7LR01	390 x 400 x 290	83

10.2.2 Input chokes for conformity to EN61000-3-12 for drives with input currents of between 16A and 75A

Sizes	Type	Code	Value [μ H]
2110	LR3y-3110-35%	S7HB3	1750
2150	LR3y-3150-35%	S7HB0	1300
3185	LR3y-4185-35%	S7HB4	1100
3220	LR3y-4220-35%	S7HB5	880
3300	LR3y-4300-35%	S7HB6	660
4370 - 4450	LR3y-4370-35%	S7HB7	520

With this combination the maximum output voltage falls to $V_{out} = 0.94 V_{in}$.

There are no limitations for inverter sizes with output current $\leq 16A$ as these are considered to be for professional use.

The applicable standard for inverters with output currents of more than 75 A is EN61000-3-4.

10.2.3 Optional external choke (L2)

On 500 kW to 1.8 MW devices, output chokes must be used: value and their technical characteristics MUST be the same for all the drive power modules (same inductance value and same current rating) to guarantee correct current sharing.

Cable length must be the same between the drive power modules.

The ADV200 WA drive can be used with general purpose standard motors or with motors specially designed for drive use. The latter usually have a higher isolation rating to better withstand PWM voltage.

Examples of reference regulations are provided below:

Motors designed for use with Adjustable Frequency Drives do not require any specific filtering of the voltage waveform from the drive. For general purpose motors, especially with long cable runs (typically over 100 m [328 feet]) an output choke is recommended to maintain the voltage waveform within the specified limits.

The rated current of the chokes should be approx. 20% above the rated current of the frequency drive in order to take into account additional losses due to PWM waveform.



Sizes 1015 ... 74000

Sizes	Inverter output	Mains inductance (mH)	Rated current (A)	Saturation current (A)	Type	Code	Dimensions (W x H x d, mm) and Weights
1015 ... 1055	HD	1.4	9.5	20	LU3-003	S7FG2	180 x 170 x 110 - 6.8 kg
	LD	0.87	16	34	LU3-005	S7FG3	
2075	HD	0.87	16	34	LU3-005	S7FG3	180 x 185 x 130 - 8 kg
	LD	0.51	27	57	LU3-011	S7FG4	
2110 - 2150	HD	0.51	27	57	LU3-011	S7FG4	180 x 185 x 140 - 7 kg
	LD	0.43	32	68	LU3-015	S7FH2	
3185	HD	0.43	32	68	LU3-015	S7FH2	180 x 185 x 160 - 8.2 kg
	LD	0.33	42	72	LU3-022	S7FH3	
3220	HD	0.33	42	72	LU3-022	S7FH3	180 x 185 x 170 - 10 kg
	LD	0.23	58	100	LU3-030	S7FH4	
3300	HD	0.23	58	100	LU3-030	S7FH4	240 x 216 x 170 - 16 kg
	LD	0.24	58	100	LU3-030	S7FH4	
4370	HD	0.24	58	100	LU3-030	S7FH4	180 x 185 x 170 - 10 kg
	LD	0.18	76	130	LU3-037	S7FH5	
4450	HD	0.18	76	130	LU3-037	S7FH5	240 x 216 x 170 - 16 kg
	LD	0.12	120	205	LU3-055	S7FH6	
4550	HD	0.12	120	205	LU3-090	S7F10	180 x 165 x 195 - 15 kg
	LD	0.07	180	310	LU3-090	S7F10	
5750 - 5900	HD / LD	0.07	180	310	LU3-090	S7F10	300 x 265 x 220 - 30 kg
51100	HD	0.07	180	310	LU3-090	S7F10	
	LD	0.041	310	540	LU3-160	S7FH8	
61320 - 61600	HD / LD	0.041	310	540	LU3-160	S7FH8	300 x 270 x 230. 33 kg
72000	HD	0.041	310	540	LU3-160	S7FH8	
	LD	0.03	400	770	LU3-200	S7AF0	
72500	HD	0.03	400	770	LU3-200	S7AF0	370 x 400 x 210. 65
	LD	0.022	580	1100	LU3-315	S7FH9	
73550	HD / LD	0.022	580	1100	LU3-315	S7FH9	370 x 400 x 210. 65
74000	HD	0.022	580	1100	LU3-315	S7FH9	
74000	LD	0.015	730	1240	LU3-400	S7F08	390 x 430 x 270. 73 kg

Note !

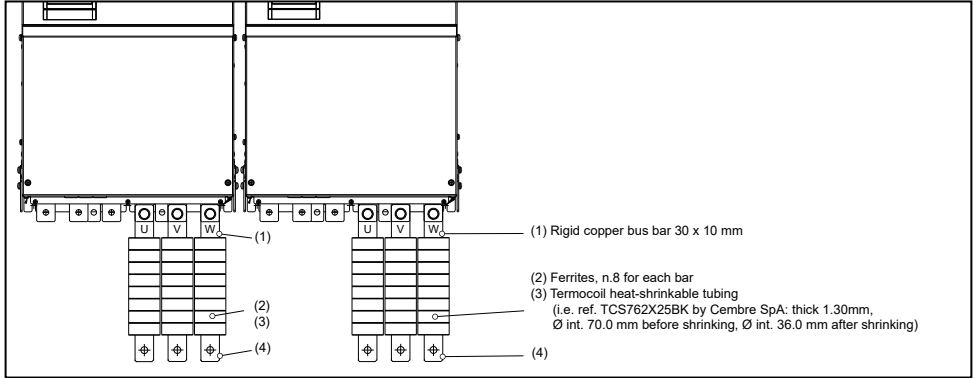
When the drive is operated at the rated current and at 50 Hz, the output chokes cause a voltage drop of approx. 2% of the output voltage.

Sizes 500 ... 1800 kW

The use of output chokes is **mandatory** for parallel units; as a function of the application/connection, according to the following criteria:

- for applications with short motor cables (≤ 100 m long) bus bars with an integrated ferrites (see Figure 2.1 and Table 1) or single distributor chokes may be used (see Table 2);
- for applications with long motor cables (> 100 m long) output choke may be used (see Table 3);

Figure 2.1: Busbars with integrated ferrites



Attention

At the output of each drive it is recommended to fix vertical straight bus bars for each phase (1), on which to mount the ferrites (2), it is also recommended to use heat-shrink tubing for insulate the ferrites (3).

One or more cables must start from each phase (4) depending on the currents and cable sections and the parallel of the cables is done directly on the motor (see "5.1.8 Motor connection", page 40).

To avoid unbalancing the cables must be the same (material, section and length).

Bars or cables can be used for the connection between C and D.

Table 1: Ferrites

Sizes	Inverter output	Motor cable length distance ≤ 100 m @400Vac ... 460Vac										
		Q.ty (1)	Type	Code	Dimensions (mm)					Weights		
					A	B	D	E	F	G	R	kg
500 kW	HD / LD	48		S7DDV	33.5	57.2	22	10	11.5 min	35 min	1.5 max	0.2
630 kW	HD / LD	48										
710 kW	HD / LD	48										
800 kW	HD / LD	48										
1000 kW	HD / LD	72										
1200 kW	HD / LD	72										
≥ 1500 kW	HD / LD	(2)										

- (1) A total of 8pcs of ferrites has to be mounted on each drive module output phase.
 (2) Solution not recommended: use output inductances.

Table 2: Current distributor output choke

Sizes	Inverter output	Motor cable length distance ≤ 100 m @400Vac ... 460Vac						
		Mains inductance (μH)	Rated current (A)	Saturation current (A)	Q.ty	Type	Code	Dimensions and Weights
500 kW	HD / LD	7,5	450	675	2	LU3-500P	S7FFI2	W = 280 mm, H = 315 mm d = 155 mm, 22 kg
630 kW	HD				2			
630 kW	LD	5,0	730	975	2	LU3-800P	S7FFI1	W = 280 mm, H = 315 mm d = 155 mm, 28 kg
710 kW	HD / LD				2			
800 kW	HD / LD				2			
1000 kW	HD / LD				3			
1200 kW	HD / LD				3			
1500 kW	HD / LD				4			
1800 kW	HD / LD				5			

Table 3: output choke

Sizes	Inverter output	Motor cable length distance > 100 m @400Vac ... 460Vac			
		Q.ty	Type	Code	Dimensions and Weights
500 kW	HD	2	LU3-200	S7AF0	W x H x d: 300 x 270 x 230 mm 33 kg
500 kW	LD	2	LU3-315	S7FH9	W x H x d: 370 x 400 x 210 mm 65 kg
630 kW	HD / LD	2	LU3-400	S7F08	W x H x d: 390 x 430 x 270 mm 73 kg
710 kW	HD / LD	2			
800 kW	HD / LD	2			
1000 kW	HD / LD	3			
1200 kW	HD / LD	3			
1500 kW	HD / LD	4			
1800 kW	HD / LD	5			



Attention

Using specific criteria regarding the choice of cables, their minimum length and laying in the ducts, is it possible to avoid the use of the output chokes.

Ask to the WEG Technical Assistance for more details..

10.3 External EMC filter (optional)

ADV200 WA series inverters are equipped with an internal EMI (except ADV200 WA-...-DC models) filter able to guarantee the performance levels required by EN 61800-3 standard (according to 2nd environment, category C3) with a maximum of 20 meters of shielded motor cable (up to 50 metres for size 5 and above).
Optional external filters for different installations are listed in the table below.

Note !

The filters indicated are for connection to networks "TT" and "TN".
In the case of supply of the inverter through IT networks, a series of special EMI filters are available.

Sizes	AC mains voltage 400V -15% ... 480V +10%				
	Heavy duty		Light duty		EN 61800-3 : Category / Environment / Motor cable length
	Type	Code	Type	Code	
1015	EMI FTF-480-7	S7GHL	EMI FTF-480-7	S7GHL	C2 / 1st / 30 m
1022	EMI FTF-480-7	S7GHL	EMI FTF-480-7	S7GHL	C2 / 1st / 30 m
1030	EMI FTF-480-7	S7GHL	EMI FTF-480-7	S7GHL	C2 / 1st / 30 m
1040	EMI FTF-480-7	S7GHL	EMI FTF-480-16	S7GHO	C2 / 1st / 30 m
1055	EMI FTF-480-16	S7GHO	EMI FTF-480-16	S7GHO	C2 / 1st / 30 m
2075	EMI FTF-480-16	S7GHO	EMI FTF-480-16	S7GHO	C2 / 1st / 30 m
2110	EMI FTF-480-16	S7GHO	EMI FTF-480-30	S7GHP	C2 / 1st / 30 m
2150	EMI FTF-480-30	S7GHP	EMI FTF-480-30	S7GHP	C2 / 1st / 30 m
3185	EMI FTF-480-30	S7GHP	EMI FTF-480-42	S7GOA	C2 / 1st / 30 m
3220	EMI FTF-480-42	S7GOA	EMI FTF-480-55	S7GOB	C2 / 1st / 30 m
3300	EMI FTF-480-55	S7GOB	EMI FTF-480-75	S7GOC	C2 / 1st / 30 m
4370	EMI FTF-480-75	S7GOC	EMI FTF-480-75	S7GOC	C2 / 1st / 30 m
4450	EMI FTF-480-75	S7GOC	EMI FTF-480-100	S7GOD	C2 / 1st / 30 m
4550	EMI FTF-480-100	S7GOD	EMI FTF-480-130	S7GOE	C2 / 1st / 30 m
5750	EMI FTF-480-130	S7GOE	EMI FTF-480-180	S7GOF	C3 / 2° / 100 m
5900	EMI FTF-480-180	S7GOF	EMI FTF-480-180	S7GOF	C3 / 2° / 100 m
51100	EMI FTF-480-180	S7GOF	EMI-480-250	S7DGG	C3 / 2° / 100 m
61320	EMI-480-250	S7DGG	EMI-480-250	S7DGG	C3 / 2° / 100 m
61600	EMI-480-250	S7DGG	EMI-480-320	S7DGH	C3 / 2° / 100 m
72000	EMI-480-400	S7DGI	EMI-480-400	S7DGI	C3 / 2° / 100 m
72500	EMI-480-400	S7DGI	EMI-480-600	S7DGL	C3 / 2° / 100 m
73150	EMI-480-600	S7DGL	EMI-480-600	S7DGL	C3 / 2° / 100 m
73550	EMI-480-600	S7DGL	EMI-480-800	S7DGM	C3 / 2° / 100 m
74000	EMI-480-800	S7DGM	EMI-480-800	S7DGM	C3 / 2° / 100 m

Sizes	AC mains voltage 400V -15% ... 480V +10%						
	Heavy duty			Light duty			EN 61800-3 : Category / Environment / Motor cable length
	Type	Code	Q.ty	Type	Code	Q.ty	
500 kW	EMI-480-400	S7DGI	2	EMI-480-600	S7DGL	2	C3 / 2nd / 100 m
630 kW	EMI-480-600	S7DGL	2	EMI-480-600	S7DGL	2	C3 / 2nd / 100 m
710 kW	EMI-480-800	S7DGM	2	EMI-480-800	S7DGM	2	C3 / 2nd / 100 m
800 kW	EMI-480-800	S7DGM	2	EMI-480-800	S7DGM	2	C3 / 2nd / 100 m
1000 kW	EMI-480-800	S7DGM	3	EMI-480-800	S7DGM	3	C3 / 2nd / 100 m
1200 kW	EMI-480-800	S7DGM	3	EMI-480-800	S7DGM	3	C3 / 2nd / 100 m
1500 kW	EMI-480-800	S7DGM	4	EMI-480-800	S7DGM	4	C3 / 2nd / 100 m
1800 kW	EMI-480-800	S7DGM	5	EMI-480-800	S7DGM	5	C3 / 2nd / 100 m
Sizes	AC mains voltage 400V -15% ... 480V +10%						
	Heavy duty			Light duty			EN 61800-3 : Category / Environment / Motor cable length
	Type	Code		Type	Code		
≥ 1015	ECF3	F4ZZ2		ECF3	F4ZZ2		C4 / 2nd / 100 m

Filters		Dimensions	Weights
Type	Code	(W x H x d) - mm	kg
ECF3	F4ZZ2	150 x 120 x 110	1,2
EMI FTF-480-7	S7GHL	190 x 40 x 70	0,6
EMI FTF-480-16	S7GHO	250 x 45 x 70	0,8
EMI FTF-480-30	S7GHP	270 x 50 x 85	1
EMI FTF-480-42	S7GOA	310 x 50 x 85	1,3
EMI FTF-480-55	S7GOB	250 x 85 x 90	1,9
EMI FTF-480-75	S7GOC	270 x 80 x 135	2,6
EMI FTF-480-100	S7GOD	270 x 90 x 150	3
EMI FTF-480-130	S7GOE	270 x 90 x 150	3,6
EMI FTF-480-180	S7GOF	400 x 120 x 170	6,2
EMI-480-250	S7DGG	300 x 260 x 135	13
EMI-480-400	S7DGI	300 x 260 x 135	13,4
EMI-480-600	S7DGL	300 x 260 x 135	13,6
EMI-480-800	S7DGM	350 x 280 x 150	23

10.4 External filters to reduce grid harmonics (optional)

ADV200-RHF filters are used to reduce total harmonic distortion (current) on the power supply line.

The choice of filter depends on the rated characteristics of the motor, on its service conditions (LD or HD), and on the performance levels you want to achieve in terms of line THDi.

The tables in section 10.4.3 show the standard performance for each motor size as defined by motor tables in efficiency class IE2 – High Efficiency (according to standard).

Considering that filters are normally required in HVAC applications, the service use of the motor (and therefore of the inverter) is always Light Duty.

The following section shows the formula and an example of calculation of line current starting from motor data. Therefore, you can always select an appropriate filter for HD service as well.

On RHF-A and RHF-B series filters, input choke inductance is integrated in the filters. On RHF-AS and RHF-BS series filters, inductance is external and is supplied with these filters

Drive efficiency = 0.975

RHF efficiency = 0.99.

10.4.1 Choice of performance and calculation of current in RHF filters

Models

RHF -X XX-XXX-XX-XX -X

Version
Protection degree (IP)
Mains frequency
Grid
Filter rated current
A: THDi ≤ 10% with mains or DC choke (THDu ≤ 2%) B: THDi ≤ 5% with mains or DC choke (THDu ≤ 2%)
Passive filter to reduce harmonics

RHF -XS XX-XXX-XX-XXX -X

Version
Fan voltage supply
Mains frequency
Grid
Filter rated current
AS: THDi ≤ 10% (THDu ≤ 2%) and supply of external input choke inductance L0 BS: THDi ≤ 5% (THDu ≤ 2%) and supply of external input choke inductance L0
Passive filter to reduce harmonics

Choice of performance

RHF-A		RHF-B	
Inverter without input choke inductance or DC	Inverter with input choke inductance or DC	Inverter without input choke inductance or DC	Inverter with input choke inductance or DC
< 16%	< 10%	< 10%	< 5%

Calculation of filter current

$$I_{\text{filter}} [\text{A}] = \frac{P_m}{U_{ln} * \sqrt{3} * \eta_f * \eta_l * \eta_m}$$

Example:

Rated motor power P_m	18.5 [kW]
Motor efficiency η_m	95%
Mains voltage U_{ln}	400 [V]
Mains frequency	50 [Hz]
Inverter efficiency η_l	98%
Passive filter efficiency η_f	99.0%
Filter current	29.0 [A]

The rated current of the chosen filter must be \geq the filter current calculated above:
RHF-A/B 29-400-50-20-A

10.4.2 Connection diagrams

Figure 10.4.1: RHF-A-... and RHF-B-... models

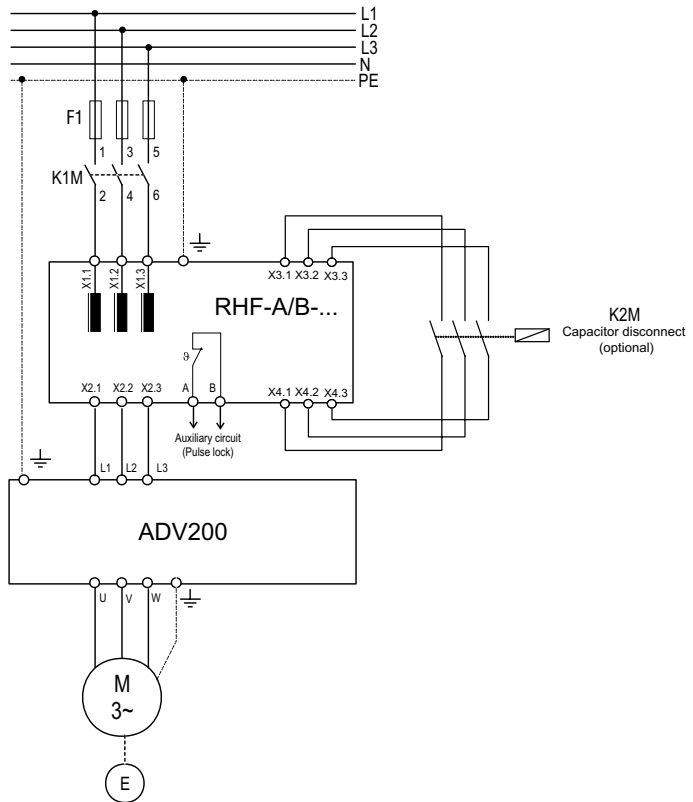


Figura 10.4.2: Parallel connection of RHF-A... and RHF-B... models

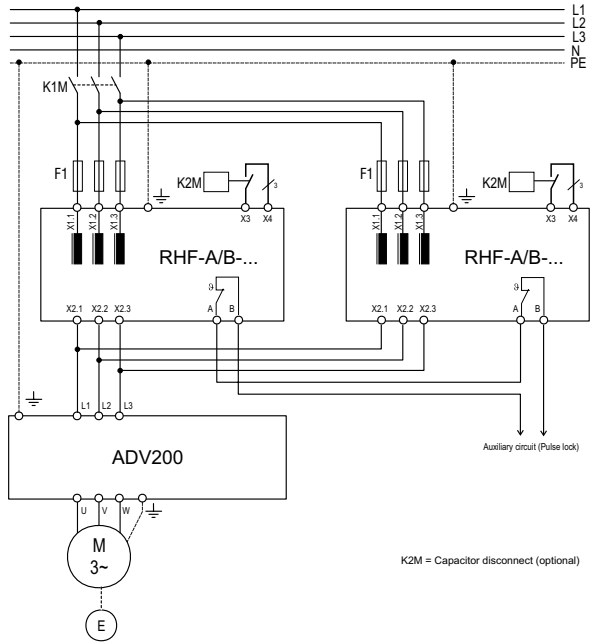
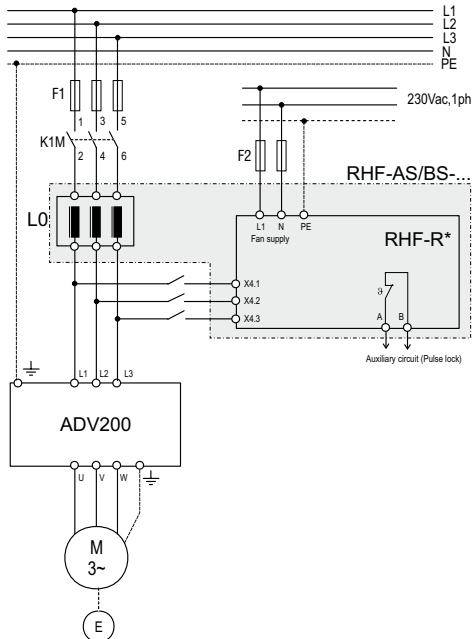


Figura 10.4.2: RHF-AS... and RHF-BS... models



10.4.3 Matching motors, RHF filters and ADV200-WA drives

Grid: 380V / 50Hz								
Motor Power 4 poles IE2	Motor Efficiency [%]	Drive Size	Drive Output: Light Duty			RHF Passive Filter		Line Input Current @ 380V [A]
			Rated Power [kW]	Rated Current [A]	Overload	Type (1)	Current [A]	
1.5	82.8	1015	1.5	4.3	(2)	RHF-A/B 6-400-50-20-A (3)	6	2.9
2.2	84.3	1022	2.2	5.8		RHF-A/B 6-400-50-20-A (3)	6	4.1
3	85.5	1030	3	7.6		RHF-A/B 6-400-50-20-A	6	5.5
4	86.6	1040	4	9.5		RHF-A/B 10-400-50-20-A	10	7.3
5.5	87.7	1055	5.5	13		RHF-A/B 10-400-50-20-A	10	9.9
7.5	88.7	2075	7.5	16.5		RHF-A/B 14-400-50-20-A	14	13.3
11	89.8	2110	11	23		RHF-A/B 22-400-50-20-A	22	19.3
15	90.6	2150	15	31		RHF-A/B 29-400-50-20-A	29	26.1
18.5	91.2	3185	18.5	38		RHF-A/B 35-400-50-20-A	35	31.9
22	91.6	3220	22	46		RHF-A/B 35-400-50-20-A	35	37.8
30	92.3	3300	30	62		RHF-A/B 58-400-50-20-A	58	51.2
37	92.7	4370	37	75		RHF-A/B 58-400-50-20-A	58	62.8
45	93.1	4450	45	87		RHF-A/B 72-400-50-20-A	72	76.1
55	93.5	4550	55	105		RHF-A/B 86-400-50-20-A	86	92.6
75	94	5750	75	150		RHF-A/B 144-400-50-20-A	144	125.6
90	94.2	5900	90	180		RHF-A/B 144-400-50-20-A	144	150.4
110	94.5	51100	110	210		RHF-A/B 180-400-50-20-A	180	183.2
132	94.7	61320	132	250		RHF-A/B 217-400-50-20-A	217	219.4
160	94.9	61600	160	300		RHF-A/B 252-400-50-20-A	252	265.4
200	95.1	72000	200	385		RHF-A/B 325-400-50-20-A	325	331.0
250	95.1	72500	250	460		RHF-A/B 433-400-50-20-A	433	413.8
315	95.1	73150	315	590		RHF-AS/BS 480-400-50-230-A	480	521.4
355	95.1	73550	355	650		RHF-AS/BS 550-400-50-230-A	550	587.6
400	95.5	74000	400	730		RHF-AS/BS 650-400-50-230-A	650	659.3
500	95.8	500 kW	500	870		RHF-AS/BS 850-400-50-230-A	850	821.5
630	96	630 kW	630	1120		RHF-AS/BS 980-400-50-230-A	980	1033.0
710	96.5	710 kW	710	1230		RHF-AS/BS 1090-400-50-230-A	1090	1158.1
800	96.7	800 kW	800	1380		RHF-AS/BS 1200-400-50-230-A	1200	1302.2
1000	96.7	1000 kW	1000	1800		On request		
1200	96.7	1200 kW	1200	2050		On request		
1500	96.7	1500 kW	1650	2540		On request		
1800	96.7	1800 kW	1800	3100		On request		

(1) RHF-A/B: RHF-A Models ... or RHF-B-..., RHF-AS/BS: RHF-AS Models ... or RHF-BS-...; see section 10.4.1.

(2) Overload 110% the Rated Current for 60s every 300s

(3) Reduced THDi performance due to part load

Grid: 400 - 415V / 50Hz								
Motor Power 4 poles IE2	Motor Efficiency [%]	Drive Size	Drive Output: Light Duty			RHF Passive Filter		Line Input Current @ 400V [A]
			Rated Power [kW]	Rated Current [A]	Overload	Type (1)	Current [A]	
1,5	82,8	1015	1,5	4,3	(2)	RHF-A/B 6-400-50-20-A (3)	6	2,7
2,2	84,3	1022	2,2	5,8		RHF-A/B 6-400-50-20-A (3)	6	3,9
3	85,5	1030	3	7,6		RHF-A/B 6-400-50-20-A	6	5,2
4	86,6	1040	4	9,5		RHF-A/B 10-400-50-20-A	10	6,9
5,5	87,7	1055	5,5	13		RHF-A/B 10-400-50-20-A	10	9,4
7,5	88,7	2075	7,5	16,5		RHF-A/B 14-400-50-20-A	14	12,6
11	89,8	2110	11	23		RHF-A/B 22-400-50-20-A	22	18,3
15	90,6	2150	15	31		RHF-A/B 29-400-50-20-A	29	24,8

Grid: 400 - 415V / 50Hz								
Motor Power 4 poles IE2	Motor Efficiency [%]	Drive Size	Drive Output: <u>Light Duty</u>			RHF Passive Filter		Line Input Current @ 400V [A]
			Rated Power [kW]	Rated Current [A]	Overload	Type (1)	Current [A]	
18,5	91,2	3185	18,5	38	(2)	RHF-A/B 29-400-50-20-A	29	30,3
22	91,6	3220	22	46		RHF-A/B 35-400-50-20-A	35	35,9
30	92,3	3300	30	62		RHF-A/B 43-400-50-20-A	43	48,6
37	92,7	4370	37	75		RHF-A/B 58-400-50-20-A	58	59,7
45	93,1	4450	45	87		RHF-A/B 72-400-50-20-A	72	72,3
55	93,5	4550	55	105		RHF-A/B 86-400-50-20-A	86	88,0
75	94	5750	75	150		RHF-A/B 144-400-50-20-A	144	119,3
90	94,2	5900	90	180		RHF-A/B 144-400-50-20-A	144	142,9
110	94,5	51100	110	210		RHF-A/B 180-400-50-20-A	180	174,1
132	94,7	61320	132	250		RHF-A/B 217-400-50-20-A	217	208,4
160	94,9	61600	160	300		RHF-A/B 252-400-50-20-A	252	252,1
200	95,1	72000	200	385		RHF-A/B 325-400-50-20-A	325	314,5
250	95,1	72500	250	460		RHF-A/B 380-400-50-20-A	380	393,1
315	95,1	73150	315	590		RHF-AS/BS 480-400-50-230-A	480	495,3
355	95,1	73550	355	650		RHF-AS/BS 550-400-50-230-A	550	558,2
400	95,5	74000	400	730		RHF-AS/BS 600-400-50-230-A	600	626,3
500	95,8	500 kW	500	870		RHF-AS/BS 750-400-50-230-A	750	780,4
630	96	630 kW	630	1120		RHF-AS/BS 980-400-50-230-A	980	981,3
710	96,5	710 kW	710	1230		RHF-AS/BS 1090-400-50-230-A	1090	1100,2
800	96,7	800 kW	800	1380		RHF-AS/BS 1200-400-50-230-A	1200	1237,1
1000	96,7	1000 kW	1000	1800		On request		
1200	96,7	1200 kW	1200	2050		On request		
1500	96,7	1500 kW	1650	2540		On request		
1800	96,7	1800 kW	1800	3100		On request		

(1) RHF-A/B: RHF-A Models ... or RHF-B-..., RHF-AS/BS: RHF-AS Models ... or RHF-BS-..., see section 10.4.1.

(2) Overload 110% the Rated Current for 60s every 300s

(3) Reduced THDI performance due to part load

Grid: 380V / 60Hz								
Motor Power 4 poles IE2	Motor Efficiency [%]	Drive Size	Drive Output: <u>Light Duty</u>			RHF Passive Filter		Line Input Current @ 380V [A]
			Rated Power [kW]	Rated Current [A]	Overload	Type (1)	Current [A]	
1.5	82.8	1015	1.5	4.3	(2)	RHF-A/B 10-380-60-20-A (3)	10.0	2.9
2.2	84.3	1022	2.2	5.8		RHF-A/B 10-380-60-20-A (3)	10.0	4.1
3	85.5	1030	3	7.6		RHF-A/B 10-380-60-20-A (3)	10.0	5.5
4	86.6	1040	4	9.5		RHF-A/B 10-380-60-20-A	10.0	7.3
5.5	87.7	1055	5.5	13		RHF-A/B 10-380-60-20-A	10.0	9.9
7.5	88.7	2075	7.5	16.5		RHF-A/B 14-380-60-20-A	14.0	13.3
11	89.8	2110	11	23		RHF-A/B 22-380-60-20-A	22.0	19.3
15	90.6	2150	15	31		RHF-A/B 29-380-60-20-A	29.0	26.1
18.5	91.2	3185	18.5	38		RHF-A/B 35-380-60-20-A	35.0	31.9
22	91.6	3220	22	46		RHF-A/B 35-380-60-20-A	35.0	37.8
30	92.3	3300	30	62		RHF-A/B 58-380-60-20-A	58.0	51.2
37	92.7	4370	37	75		RHF-A/B 58-380-60-20-A	58.0	62.8
45	93.1	4450	45	87		RHF-A/B 72-380-60-20-A	72.0	76.1
55	93.5	4550	55	105		RHF-A/B 86-380-60-20-A	86.0	92.6
75	94	5750	75	150		RHF-A/B 144-380-60-20-A	144.0	125.6
90	94.2	5900	90	180		RHF-A/B 144-380-60-20-A	144.0	150.4
110	94.5	51100	110	210		RHF-A/B 180-380-60-20-A	180.0	183.2

Grid: 380V / 60Hz								
Motor Power 4 poles IE2	Motor Efficiency [%]	Drive Size	Drive Output: <u>Light Duty</u>			RHF Passive Filter		Line Input Current @ 380V [A]
			Rated Power [kW]	Rated Current [A]	Overload	Type (1)	Current [A]	
132	94.7	61320	132	250	(2)	RHF-A/B 217-380-60-20-A	217.0	219.4
160	94.9	61600	160	300		RHF-A/B 252-380-60-20-A	252.0	265.4
200	95.1	72000	200	385		RHF-A/B 325-380-60-20-A	325.0	331.0
250	95.1	72500	250	460		RHF-A/B 433-380-60-20-A	433.0	413.8
315	95.1	73150	315	590		2 x RHF-A/B 252-380-60-20-A	504.0	521.4
355	95.1	73550	355	650		2 x RHF-A/B 304-380-60-20-A	608.0	587.6
400	95.5	74000	400	730		2 x RHF-A/B 325-380-60-20-A	650.0	659.3
500	95.8	500 kW	500	870		2 x RHF-A/B 380-380-60-20-A	760.0	821.5
630	96	630 kW	630	1120		On request	975.0	1033.0
710	96.5	710 kW	710	1230		On request	1140.0	1158.1
800	96.7	800 kW	800	1380		On request	1299.0	1302.2
1000	96.7	1000 kW	1000	1800		On request	1520.0	1627.8
1200	96.7	1200 kW	1200	2050		On request	2165.0	1953.3
1500	96.7	1500 kW	1650	2540		On request	2598.0	2441.6
1800	96.7	1800 kW	1800	3100		On request	3031.0	2930.0

(1) RHF-A/B: RHF-A Models ... or RHF-B-..., RHF-AS/BS: RHF-AS Models ... or RHF-BS-...; see section 10.4.1.

(2) Overload 110% the Rated Current for 60s every 300s

(3) Reduced THDi performance due to part load

Grid: 460V / 60Hz - Motor voltage: 460V								
Motor Power 4 poles IE2	Motor Efficiency [%]	Drive Size	Drive Output: <u>Light Duty</u>			RHF Passive Filter		Line Input Current @ 380V [A]
			Rated Power [kW]	Rated Current [A]	Overload	Type (1)	Current [A]	
1.5	82.8	1015	1.5	3.9	(2)	RHF-A/B 6-460-60-20-A (3)	6.0	2.4
2.2	84.3	1022	2.2	5.2		RHF-A/B 6-460-60-20-A (3)	6.0	3.4
3	85.5	1030	3	6.8		RHF-A/B 6-460-60-20-A	6.0	4.6
4	86.6	1040	4	8.6		RHF-A/B 6-460-60-20-A	6.0	6.0
5.5	87.7	1055	5.5	11.7		RHF-A/B 10-460-60-20-A	10.0	8.2
7.5	88.7	2075	7.5	14.9		RHF-A/B 14-460-60-20-A	14.0	11.0
11	89.8	2110	11	20.7		RHF-A/B 19-460-60-20-A	19.0	15.9
15	90.6	2150	15	27.9		RHF-A/B 25-460-60-20-A	25.0	21.5
18.5	91.2	3185	18.5	34.2		RHF-A/B 31-460-60-20-A	31.0	26.4
22	91.6	3220	22	41.4		RHF-A/B 31-460-60-20-A	31.0	31.2
30	92.3	3300	30	55.8		RHF-A/B 48-460-60-20-A	48.0	42.3
37	92.7	4370	37	67.5		RHF-A/B 60-460-60-20-A	60.0	51.9
45	93.1	4450	45	78.3		RHF-A/B 73-460-60-20-A	73.0	62.8
55	93.5	4550	55	94.5		RHF-A/B 86-460-60-20-A	86.0	76.5
75	94	5750	75	135		RHF-A/B 118-460-60-20-A	118.0	103.7
90	94.2	5900	90	162		RHF-A/B 154-460-60-20-A	154.0	124.2
110	94.5	51100	110	189		RHF-A/B 154-460-60-20-A	154.0	151.4
132	94.7	61320	132	225		RHF-A/B 183-460-60-20-A	183.0	181.2
160	94.9	61600	160	270		RHF-A/B 231-460-60-20-A	231.0	219.2
200	95.1	72000	200	347		RHF-A/B 291-460-60-20-A	291.0	273.5
250	95.1	72500	250	414		RHF-A/B 355-460-60-20-A	355.0	341.8
315	95.1	73150	315	531		RHF-A/B 436-460-60-20-A	436.0	430.7
355	95.1	73550	355	585		2 x RHF-A/B 291-460-60-20-A	582.0	485.4
400	95.5	74000	400	657		2 x RHF-A/B 291-460-60-20-A	582.0	544.6
500	95.8	500 kW	500	783		2 x RHF-A/B 355-460-60-20-A	710.0	678.7
630	96	630 kW	630	1008		2 x RHF-A/B 436-460-60-20-A	872.0	853.3

Grid: 460V / 60Hz - Motor voltage: 460V

Motor Power 4 poles IE2	Motor Efficiency [%]	Drive Size	Drive Output: <u>Light Duty</u>			RHF Passive Filter		Line Input Current @ 380V [A]
			Rated Power [kW]	Rated Cur- rent [A]	Overload	Type (1)	Current [A]	
710	96.5	710 kW	710	1107		On request		
800	96.7	800 kW	800	1242		On request		
1000	96.7	1000 kW	1000	1620		On request		
1200	96.7	1200 kW	1200	1845		On request		
1500	96.7	1500 kW	1650	2286		On request		
1800	96.7	1800 kW	1800	2790		On request		

(1) RHF-A/B: RHF-A Models ... or RHF-B-..., RHF-AS/BS: RHF-AS Models ... or RHF-BS-...; see section 10.4.1.

(2) Overload 110% the Rated Current for 60s every 300s

(3) Reduced THDi performance due to part load

10.4.4 Dimensions and weights of RHF filters

RHF Passive Filter (4)	Q.ty * Frame	Dimensions: H * W *d (mm)	Weight (kg)
RHF-A/B 6-400-50-20-A			
RHF-A/B 10-400-50-20-A	X1	347 * 190 * 206	18
RHF-A/B 14-400-50-20-A	X2	451 * 232 * 248	20
RHF-A/B 22-400-50-20-A	X2	451 * 232 * 248	30
RHF-A/B 29-400-50-20-A	X3	605 * 378 * 242	52
RHF-A/B 35-400-50-20-A	X3	605 * 378 * 242	53
RHF-A/B 43-400-50-20-A	X3	605 * 378 * 242	58
RHF-A/B 58-400-50-20-A	X4	634 * 378 * 333	76
RHF-A/B 72-400-50-20-A	X4	634 * 378 * 333	98
RHF-A/B 86-400-50-20-A	X5	747 * 418 * 333	104
RHF-A/B 144-400-50-20-A	X6	778 * 418 * 400	126
RHF-A/B 180-400-50-20-A	X6	778 * 418 * 400	135
RHF-A/B 217-400-50-20-A	X7	911 * 468 * 449	172
RHF-A 252-400-50-20-A	X7	911 * 468 * 449	136
RHF-B 252-400-50-20-A	X7	911 * 468 * 449	206
RHF-A 325-400-50-20-A	X7	911 * 468 * 449	147
RHF-B 325-400-50-20-A	X8	911 * 468 * 540	230
RHF-A 380-400-50-20-A	X7	911 * 468 * 449	172
RHF-B 380-400-50-20-A	X8	911 * 468 * 540	265
RHF-A 433-400-50-20-A	X8	911 * 468 * 540	205
RHF-B 433-400-50-20-A	X8	911 * 468 * 540	272
RHF-AS/BS 480-400-50-230-A	X38	951 * 211 * 431	
RHF-AS/BS 550-400-50-230-A	X38B	951 * 307 * 444,5	
RHF-AS/BS 600-400-50-230-A	2 * X38	951 * 211 * 431	
RHF-AS/BS 650-400-50-230-A	2 * X38	951 * 211 * 431	
RHF-AS/BS 750-400-50-230-A	2 * X38	951 * 211 * 431	
RHF-AS/BS 850-400-50-230-A	2 * X38B	951 * 307 * 444,5	
RHF-AS/BS 980-400-50-230-A	2 * X38B	951 * 307 * 444,5	
RHF-AS/BS 1090-400-50-230-A	2 * X38B	951 * 307 * 444,5	
RHF-AS/BS 1200-400-50-230-A	3 * X38B	951 * 307 * 444,5	

(4) RHF-A/B: RHF-A Models ... or RHF-B-..., RHF-AS/BS: RHF-AS Models ... or RHF-BS-.

10.4.5 Dimensions and weights of L0-RHF chokes

L0-RHF-AS/BS mais chokes are included in delivery of the RHF-AS/BS module filters series (RHF-AS/BS = L0 RHF-AS/BS choke + n filters RHF-R).

L0 RHF-AS/BS External choke	Dimensions: W * H * d (mm)	Weight (kg)
L0-RHF-AS 480-400-50-230-A	420 * 370 * 325	
L0-RHF-AS 550-400-50-230-A	420 * 370 * 340	
L0-RHF-AS 600-400-50-230-A	420 * 370 * 370	
L0-RHF-AS 650-400-50-230-A	420 * 370 * 370	
L0-RHF-AS 750-400-50-230-A	480 * 420 * 370	
L0-RHF-AS 850-400-50-230-A	480 * 420 * 385	
L0-RHF-AS 980-400-50-230-A	480 * 420 * 400	
L0-RHF-AS 1090-400-50-230-A	480 * 520 * 420	
L0-RHF-AS 1200-400-50-230-A	480 * 520 * 420	
L0-RHF-BS 480-400-50-230-A	510 * 500 * 400	
L0-RHF-BS 550-400-50-230-A	510 * 540 * 400	
L0-RHF-BS 600-400-50-230-A	570 * 620 * 360	
L0-RHF-BS 650-400-50-230-A	600 * 620 * 370	
L0-RHF-BS 750-400-50-230-A	600 * 620 * 385	
L0-RHF-BS 850-400-50-230-A	600 * 620 * 400	
L0-RHF-BS 980-400-50-230-A	600 * 620 * 420	
L0-RHF-BS 1090-400-50-230-A	600 * 640 * 440	
L0-RHF-BS 1200-400-50-230-A	600 * 640 * 460	

10.5 Braking resistor (optional)

Recommended resistors for use with internal braking unit (except ADV200 WA-DC models):

Sizes	List and technical data of standard external resistors						
	Resistor type	Code	Max Overload energy, 1"- duty-cycle 10% EBR (kJ)	Max Overload energy, 30"- duty-cycle 25% EBR (kJ)	Braking resistor nominal power P _{NBR} (W)	Resistance value R _{BR} (Ω)	Enclosure
1015	RF 220 T 100R	S8TOCE	1.5	11	220	100	IP44
1022	RF 220 T 100R	S8TOCE	1.5	11	220	100	IP44
1030	RF 300 DT 100R	S8TOCB	2.5	19	300	100	IP44
1040	RF 300 DT 100R	S8TOCB	2.5	19	300	100	IP44
1055	RFPD 750 DT 100R	S8SY4	7.5	38	750	100	IP44
2075	RFPD 750 DT 68R	S8TOCD	7.5	38	750	68	IP44
2110	RFPD 900 DT 68R	S8SY5	9	48	900	68	IP44
2150	RFPD 1100 DT 40R	S8SY6	11	58	1100	40	IP54
3185	RFPR 1900 D 28R	S8SZ5	19	75	1500	28	IP44
3220	BRT4K0-15R4	S8T00G	40	150	4000	15.4	IP20
3300	BRT4K0-15R4	S8T00G	40	150	4000	15.4	IP20
4370	BRT4K0-11R6	S8T00H	40	150	4000	11.6	IP20
4450	BRT4K0-11R6	S8T00H	40	150	4000	11.6	IP20
4550	BRT8K0-7R7	S8T00I	40	150	8000	7.7	IP20
5750	BRT8K0-7R7	S8T00I	40	150	8000	7.7	IP20
≥ 5900 and ADV200 WA-....-DC	External braking unit (BUy/BU200 series, optional)						

Resistor type	Code	Dimensions (Wx H x d) - mm	Weights (kg)
RF 220 T 100R	S8TOCE	300 x 27 x 36	0.5
RF 300 DT 100R	S8TOCB	260 x 47 x 108	1.4
RFPD 750 DT 100R	S8SY4	200 x 70 x 106	1.7
RFPD 750 DT 68R	S8TOCD	200 x 70 x 106	1.7
RFPD 900 DT 68R	S8SY5	260 x 70 x 106	2.2
RFPD 1100 DT 40R	S8SY6	310 x 75 x 100	3.5
RFPR 1900 D 28R	S8SZ5	365 x 75 x 100	4.2
BRT4K0-15R4	S8T00G	625 x 100 x 250	7.0
BRT4K0-11R6	S8T00H	625 x 100 x 250	7.0
BRT8K0-7R7	S8T00I	625 x 160 x 250	11.5



Warning!

Braking resistors may be subject to unexpected overloads due to faults. Resistors MUST be protected using thermal cutouts. These devices must not interrupt the circuit in which the resistor is inserted but their auxiliary contact must cut off the power supply to the power section of the drive. If the resistor requires a protection contact, this must be used together with that of the thermal cutout.

A la suite de pannes, les résistances de freinage peuvent être sujettes à des surcharges imprévues. La protection des résistances au moyen de dispositifs de protection thermique est absolument capitale. Ces dispositifs ne doivent pas interrompre le circuit qui abrite la résistance, mais leur contact auxiliaire doit couper l'alimentation du côté puissance du drive. Si la résistance prévoit un contact de protection, ce dernier doit être utilisé conjointement à celui du dispositif de protection thermique.

10.6 Insulation monitor

Since the ADV200 WA drive is normally used in a ground-insulated system (IT), in accordance with IEC 61557-8, use of insulation resistance monitoring is required.

The monitoring system must be able to detect insulation loss, both on the AC and DC power supply sides and on the motor side.

A ground fault must be promptly detected and removed as quickly as possible to avoid damage to either the inverter or the entire system as a unit (in the event of insulation loss, the drive must be immediately disabled and disconnected from power sources).

The insulation monitor must be selected on a case-by-case basis according to the power supply, connection system and type of drive.

Recommended insulation monitors e.g.: see the BENDER © ISOMETER® line.



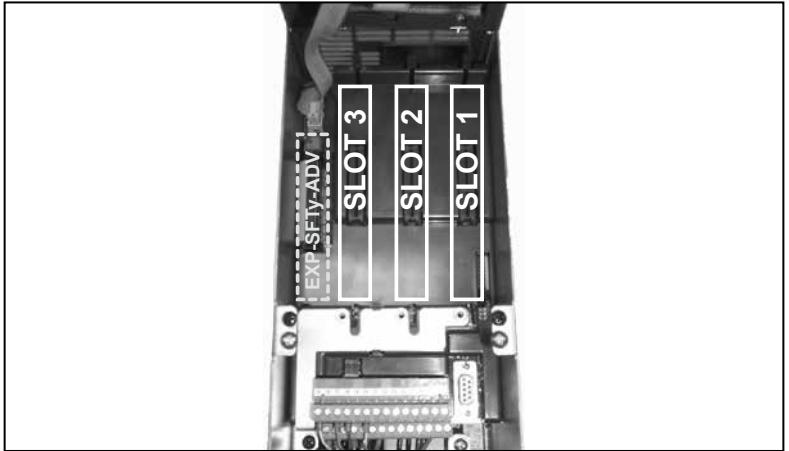
.....

The insulation monitor must be plugged into the main power supply (if ADV200 WA is AC-powered) or the DC side (if ADV200 WA is DC-powered).

The insulation monitor alarm threshold should be set to the highest possible resistance value.

.....

10.7 Installation of optional cards



Up to three optional cards can be inserted in the three slots under the top cover:

- **Slot 1-2:** dedicated to IO cards (EXP-IO-...-ADV)
- **Slot 3:** dedicated to field Bus cards (EXP-PDP-ADV, EXP-CAN-ADV, etc.).

Note!

EXP- SFTy-ADV card (models ADV-...SI): Integrated on board as the 4th option or integrated in the INT-P-ADV power card (sizes \geq 72000 and "L" HW version and above).



If an optional card is inserted in an incorrect Slot, the drive will send an error message.

The EXP-SFTy-ADV safety card can be installed and configured only in factory.

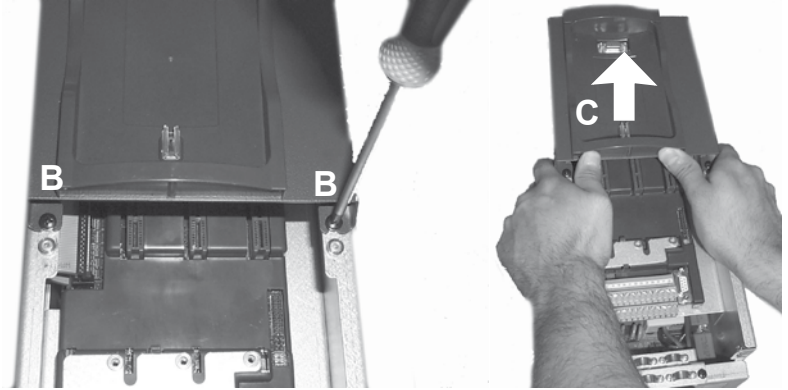


Use only the screws supplied with the optional cards.

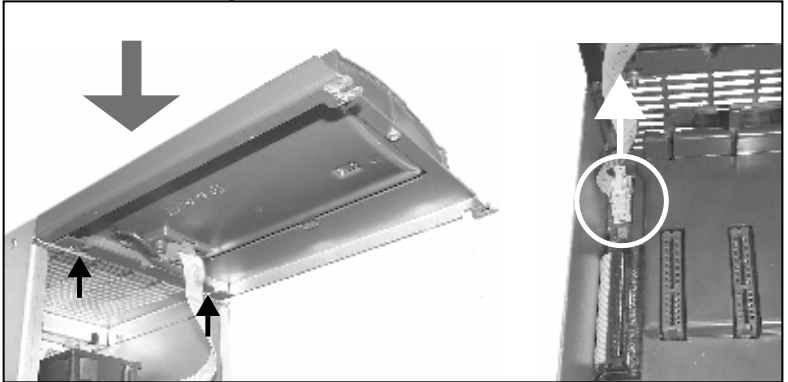
Utilisez uniquement les vis fournies avec les cartes optionnelles.

10.7.1 Procedure

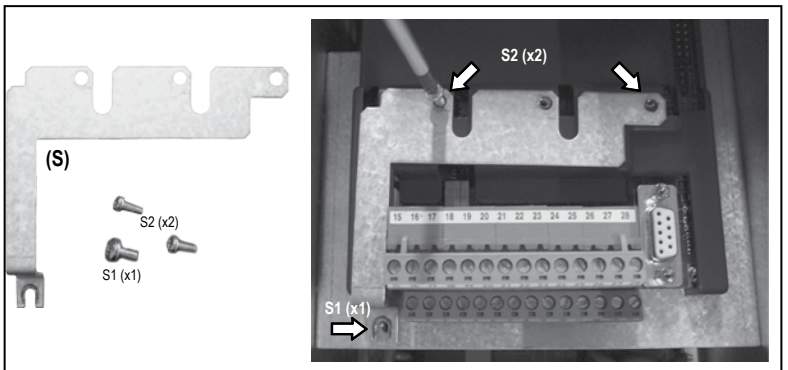
1. Remove the bottom cover as indicated in paragraph 5.2.1.



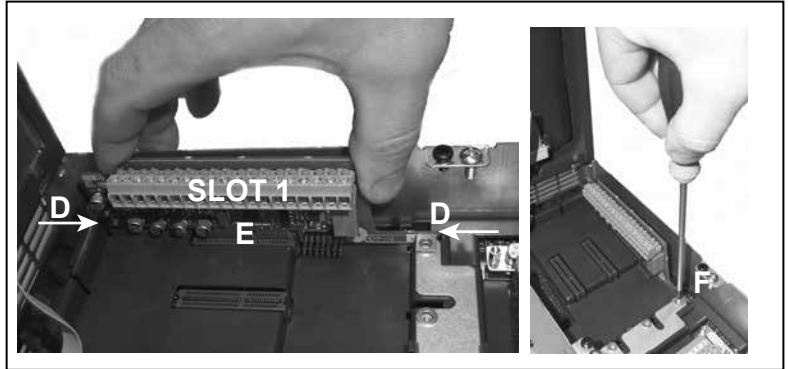
2. To remove the top cover, loosen screws B by about 2 turns and slide out cover C as shown in the figure.



3. To prevent damage to the connection of the keypad, the top cover can be positioned as indicated in the figure.
Alternatively, remove the connector of the keypad and rest the cover in a safe place.

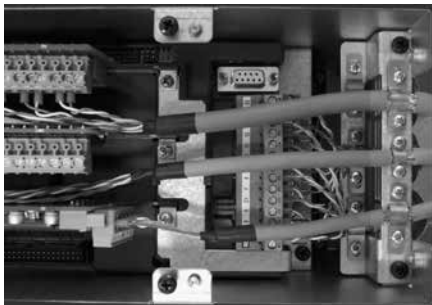


4. Position and fasten the metallic shield (S), provided with the optional card, with the screws S1 and S2 (x1) as shown in the figure.



5. Position the optional card in the dedicated Slot (in the example, the EXP-IO card is inserted in Slot 1). Align the ends of the card (D) in the slots and then fully insert the connector of the card in the connectors of the drive (E).
6. Fasten the card with the screw + washer (provided with the optional card) in housing (F) as shown in the figure.

10.7.2 Shielding of optional card connections



Fasten the shield of the cables to the omega sections as showed on figure.



Appendix 1 - Parallel connection (500 ... 1800 kW sizes)

A 1.1 Introduction

To obtain a drive of more than 400 kW connect a number of single units of between 250 kW and 400 kW in parallel.

A parallel connection of several drives basically consists of one MASTER unit and one or more SLAVE units.

Power	code	Description (Designation)	code	Description (Designation)
500kW	S9O25WM	ADV200-WA-72500-KXX-4-MS 05 -SI	S9O25WMC	ADV200-WA-72500-KXX-4- MS 05-DC- SI
	S9O25WS	ADV200-WA-72500-XXX-4-SL	S9O25WMC	ADV200-WA-72500-KXX-4- SL-DC
630kW	S9O26WM	ADV200-WA-73150-KXX-4-MS 06 -SI	S9O26WMC	ADV200-WA-73150-KXX-4-MS 06-DC-SI
	S9O26WS	ADV200-WA-73150-XXX-4-SL	S9O26WSC	ADV200-WA-73150-KXX-4-SL-DC
710kW	S9O27WM	ADV200-WA-73550-KXX-4-MS 07 -SI	S9O27WMC	ADV200-WA-73550-KXX-4-MS 07-DC-SI
	S9O27WL	ADV200-WA-73550-XXX-4-SL	S9O27WSC	ADV200-WA-73550-KXX-4-SL-DC
800kW	S9O28WM	ADV200-WA-74000-KXX-4-MS 08 -SI	S9O28WMC	ADV200-WA-74000-KXX-4- MS 08-DC-SI
	S9O28WS	ADV200-WA-74000-XXX-4-SL	S9O28WSC	ADV200-WA-74000-KXX-4- SL-DC
1000kW	S9O27WM1	ADV200-WA-73550-KXX-4-MS 10 -SI	S9O27WM2	ADV200-WA-73550-KXX-4-MS 10-DC-SI
	S9O27WL	ADV200-WA-73550-XXX-4-SL	S9O27WSC	ADV200-WA-73550-KXX-4-SL-DC
	S9O27WL	ADV200-WA-73550-XXX-4-SL	S9O27WSC	ADV200-WA-73550-KXX-4-SL-DC
1200kW	S9O28WM1	ADV200-WA-74000-KXX-4-MS 12 -SI	S9O28WM2	ADV200-WA-74000-KXX-4- MS 12-DC-SI
	S9O28WS	ADV200-WA-74000-XXX-4-SL	S9O28WSC	ADV200-WA-74000-KXX-4- SL-DC
	S9O28WS	ADV200-WA-74000-XXX-4-SL	S9O28WSC	ADV200-WA-74000-KXX-4- SL-DC
1500kW	S9O27WM3	ADV200-WA-73550-KXX-4-MS 15-SI	S9O28WM3	ADV200-WA-74000-KXX-4-MS 15-DC-SI
	S9O27WL	ADV200-WA-73550-XXX-4-SL	S9O28WSC	ADV200-WA-74000-XXX-4-SL-DC
	S9O27WL	ADV200-WA-73550-XXX-4-SL	S9O28WSC	ADV200-WA-74000-XXX-4-SL-DC
	S9O27WL1	ADV200-WA-73550-XXX-4-SL2	S8O28WSC1	ADV200-WA-74000-XXX-4-SL2-DC
1800kW	S9O27WM4	ADV200-WA-73550-KXX-4-MS 18-SI	S9O28WM4	ADV200-WA-74000-KXX-4-MS 18-DC-SI
	S9O27WL	ADV200-WA-73550-XXX-4-SL	S9O28WSC	ADV200-WA-74000-XXX-4-SL-DC
	S9O27WL	ADV200-WA-73550-XXX-4-SL	S9O28WSC	ADV200-WA-74000-XXX-4-SL-DC
	S9O27WL1	ADV200-WA-73550-XXX-4-SL2	S9O28WSC1	ADV200-WA-74000-XXX-4-SL2-DC
	S9O27WL1	ADV200-WA-73550-XXX-4-SL2	S9O28WSC1	ADV200-WA-74000-XXX-4-SL2-DC

Master unit

this is the only one to have the regulation card and keypad. It differs from the standard single unit in that the power section control card (INT-P-ADV) is reconfigured to function as MASTER and includes one or more MASTER - SLAVE (INT-SLAVE) interface cards, one card for each slave that is connected.

The MASTER - SLAVE interface is achieved via a specific signal cable included in the SLAVE drive packaging.

Slave unit

It differs from the standard single unit in that it has a dedicated power section control card (INT-P-ADV) and there is no regulation card or keypad.

INT-P-ADV-MASTER card

The INT-P-ADV-MASTER card provided with one or more INT-SLAVE cards, acts as the interface between the R-ADV regulation card and the power section of the master unit and all the slave units. It also performs the following functions:

- current signal scaling (via dip switch, factory-set)
- hardware dead time compensation
- alarm signal management (including local diagnostics via LED)
- temperature signal management.

INT-P-ADV-SLAVE card

The INT-P-ADV-SLAVE card interfaces between the power section of the slave unit and the master unit. It also performs the following functions:

- alarm signal management (including local diagnostics via LED)
- temperature signal management.

INT-SLAVE card

The INT-SLAVE interface card manages communication between a master unit and a slave unit.

The INT-SLAVE cards are mounted on the master unit, their number corresponding to that of the slaves that are connected (max. 4 slaves).

The INT-SLAVE card is factory-set.

.....
 In the event of a failure, the INT-P-ADV card may only be replaced by trained and specialized WEG personnel.

The drives mounting the INT-P-ADV cards rev L and higher, can not be connected in parallel with drives that mount the INT-P-ADV card rev F or lower.

.....



A 1.2 Compatibility of IGBT modules

Starting from July 2015, the following 690V products based on power stack 315kW and 355kW, which use IGBT modules “INFINEON” branded, will be manufactured with power modules “FUJI” branded too. Both types have same mechanical dimensions but they cannot be combined together.

MODEL	Code	Type
INFINEON	S8HRS20	MODULE-IGBT6-1K7V 450A
FUJI	S8HRS44	MODULE-IGBT6-1K7V 450A

Code	Type	Product configuration with Module INFINEON	Product configuration with Module FUJI
S9O78W	ADV200-WA-73550-KXX-6	A1...B2	B3
S9O78W1C	ADV200-WA-73550-KXX-6-MS 10-DC-SI		
S9O78WL	ADV200-WA-73550-KXX-6-SL		
S9O78WM	ADV200-WA-73550-KXX-6-MS 07-SI		
S9O78WM1	ADV200-WA-73550-KXX-6-MS 10-SI		
S9O78WMC	ADV200-WA-73550-KXX-6-MS 07-DC-SI		
S9O78WS	ADV200-WA-73550-KXX-6-SI		
S9O78WSC	ADV200-WA-73550-KXX-6-SL-DC		
S9O79W	ADV200-WA-74000-KXX-6		
S9O79W1C	ADV200-WA-74000-KXX-6-MS 12-DC-SI		
S9O79WL	ADV200-WA-74000-KXX-6-SL		
S9O79WM	ADV200-WA-74000-KXX-6-MS 08-SI		
S9O79WM1	ADV200-WA-74000-KXX-6-MS 12-SI		
S9O79WMC	ADV200-WA-74000-KXX-6-MS 08-DC-SI		
S9O79WS	ADV200-WA-74000-KXX-6-SI		
S9O79WSC	ADV200-WA-74000-KXX-6-SL-DC		
S9O85W	ADV200-WA-73550-KXX-6-DC		
S9O85WS	ADV200-WA-73550-KXX-6-DC-SI		
S9O86W	ADV200-WA-74000-KXX-6-DC		
S9O86WS	ADV200-WA-74000-KXX-6-DC-SI		

Code	Type	Product configuration with Module INFINEON	Product configuration with Module FUJI
S9O80W1C	ADV200-WA-73550-KXX-6A-MS 10-DC-SI	A1...B1	B3
S9O80WL	ADV200-WA-73550-KXX-6A-SL		
S9O80WM	ADV200-WA-73550-KXX-6-MS 06-SI		
S9O80WM1	ADV200-WA-73550-KXX-6-MS 09-SI		
S9O80WMC	ADV200-WA-73550-KXX-6A-MS 07-DC-SI		
S9O80WS	ADV200-WA-73550-KXX-6A-SI		
S9O80WSC	ADV200-WA-73550-KXX-6A-SL-DC		
S9O81W	ADV200-WA-74000-KXX-6A		
S9O81W1C	ADV200-WA-74000-KXX-6A-MS 12-DC-SI		
S9O81WL	ADV200-WA-74000-KXX-6A-SL		
S9O81WM	ADV200-WA-74000-KXX-6-MS 07-SI		
S9O81WM1	ADV200-WA-74000-KXX-6-MS 10-SI		
S9O81WMC	ADV200-WA-74000-KXX-6A-MS 08-DC-SI		
S9O81WS	ADV200-WA-74000-KXX-6A-SI		
S9O81WSC	ADV200-WA-74000-KXX-6A-SL-DC		
S9O87W	ADV200-WA-73550-KXX-6A-DC		
S9O87WS	ADV200-WA-73550-KXX-6A-DC-SI		
S9O88W	ADV200-WA-74000-KXX-6A-DC		
S9O88WS	ADV200-WA-74000-KXX-6A-DC-SI		

.....



When replacing the IGBT modules on an existing product, it must be checked the "Prod Configuration" on the label for the correct replacement. IGBT module installed in the drive must be all the same type. See "Firmware & cards revision" in chapter "2.1 Drive type designation", page 13.

.....

.....



The following rules must be strictly followed:

- IGBT modules installed in the drive must be all same type / typology.
- Master / Slave products configuration must necessarily be made with the same IGBT type. It will be not possible to use drive with different product configuration between master and slave.
- For repair in field, the replacement of an IGBT module may be carry out with same type. It will be not possible to use drive Master with Infineon power module and drive Slave with Fuji power module and vice versa.

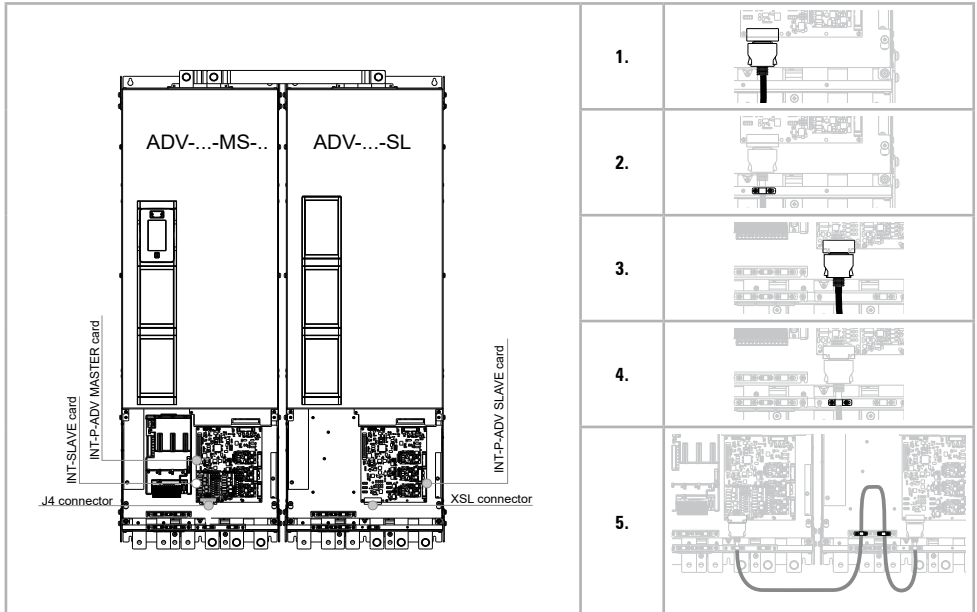
.....

A 1.2 MS-SL interface cable wiring sizes 400...800 kW

Fit the ADV200 WA MASTER and SLAVE inverters inside the electrical panel.
Connect all the power section cables and connect the signal cable for interfacing between the 2 drives.



The cable (code 8S860B) for connecting 2 drives is one metre long and has two quick coupling male MDR connectors at the ends.



Wiring instructions:

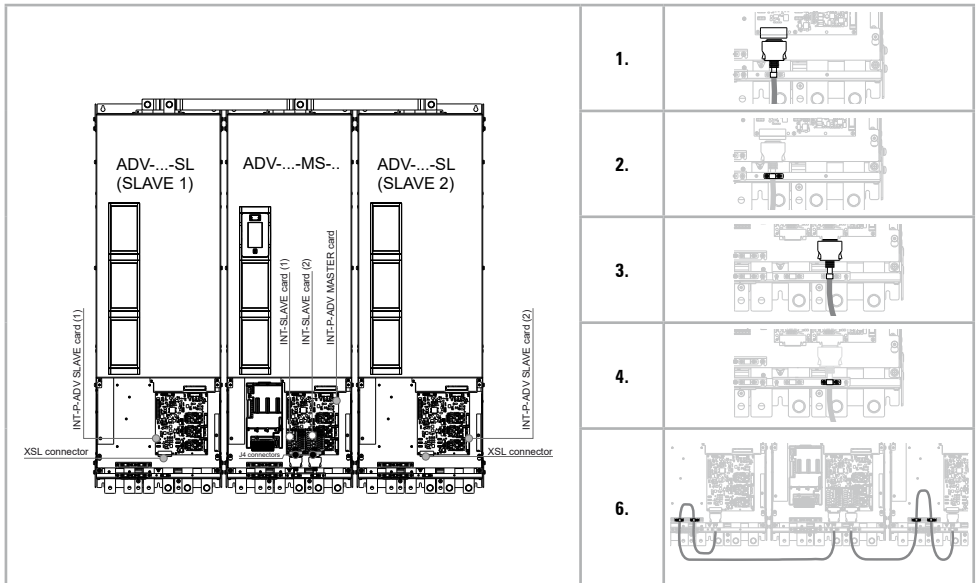
1. Connect one of the 2 ends of the interface cable to the XSL connector of the INT-P-ADV-SLAVE card.
2. Secure the cable using the specific clamp.
3. Connect the other end of the cable to connector J4 of the INT-SLAVE card mounted on the INT-P-ADV-MASTER card of the MASTER drive.
4. Secure the cable in the relative clamp
5. To prevent the interface cable from coming into contact with the power terminals, fold the excess length of cable inside the SLAVE drive as shown in the figure and secure it using the specific cable clamps.

A 1.2 MS-SL interface cable wiring sizes 900...1000 kW

Fit the ADV200 WA MASTER and SLAVE inverters inside the electrical panel.
Connect all the power section cables and connect the 2 signal cables for interfacing between the 3 drives.



The cable (code 8S860B, x 2) for connecting the drives is one metre long and has two quick coupling male MDR connectors at the ends.



Wiring instructions:

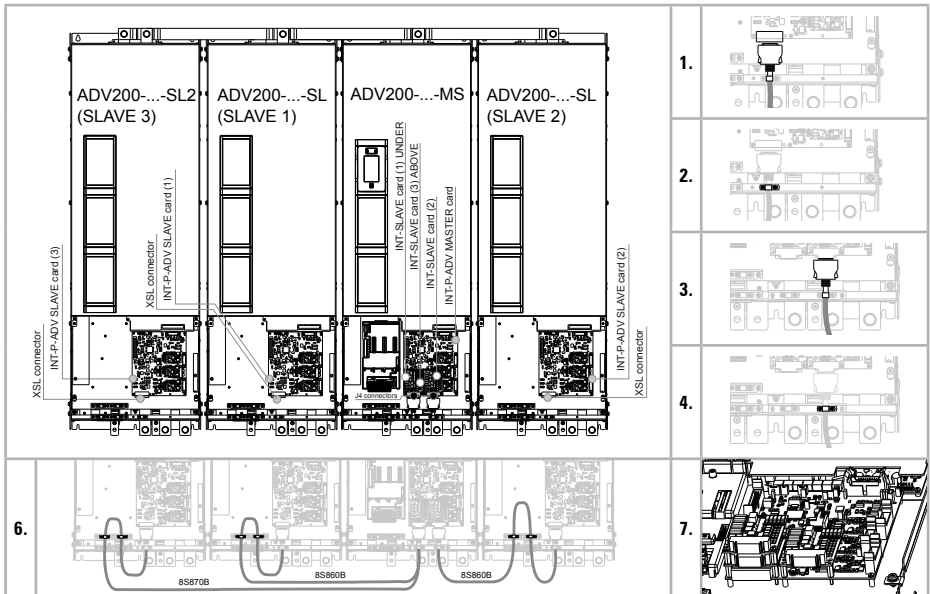
1. Connect one of the 2 ends of the interface cable to the XSL connector of the INT-P-ADV-SLAVE (SLAVE 2) card.
2. Secure the cable using the specific clamp.
3. Connect the other end of the cable to connector J4 of the INT-SLAVE (2) card mounted on the INT-P-ADV-MASTER card of the MASTER drive.
4. Secure the cable in the relative clamp
5. Repeat steps 1-2-3-4 for SLAVE 1.
6. To prevent the interface cables from coming into contact with the power terminals, fold the excess length of cable inside the SLAVE drive as shown in the figure and secure it using the specific cable clamps.

A 1.4 MS-SL interface cable wiring size 1500 kW

Fit the ADV200 WA MASTER and SLAVE inverters inside the electrical panel.
Connect all the power section cables and connect the 3 signal cables for interfacing between the 4 drives.



The cable (code 8S860B x2 + code 8S870B x1) for connecting the ADV200 WA-...-SL and ADV200 WA-...-SL2 drives are respectively one meter and two meters long and has two quick coupling male MDR connectors at the ends.

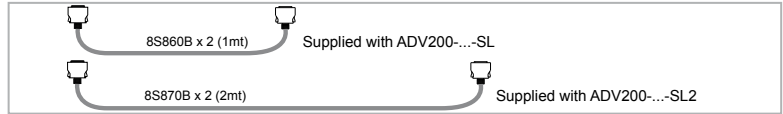


Wiring instructions:

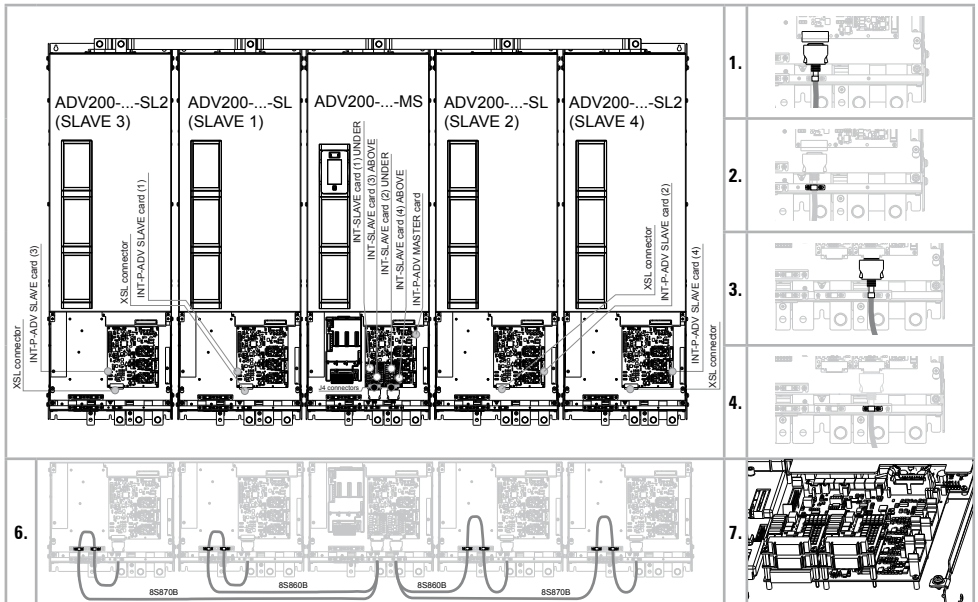
1. Connect one of the 2 ends of the interface cable to the XSL connector of the INT-P-ADV-SLAVE (SLAVE 2) card.
2. Secure the cable using the specific clamp.
3. Connect the other end of the cable to connector J4 of the INT-SLAVE (2) card mounted on the INT-P-ADV-MASTER card of the MASTER drive.
4. Secure the cable in the relative clamp
5. Repeat steps 1-2-3-4 for SLAVE 1 and SLAVE 3 (see figure 6-7 for location and wiring of INT-SLAVE card on INT-P-ADV-MASTER card).
6. To prevent the interface cables from coming into contact with the power terminals, fold the excess length of cable inside the SLAVE drive as shown in the figure and secure it using the specific cable clamps.

A 1.5 MS-SL interface cable wiring size 1800 kW

Fit the ADV200 WA MASTER and SLAVE inverters inside the electrical panel.
Connect all the power section cables and connect the 4 signal cables for interfacing between the 5 drives.



The cable (code 8S860B x2 + code 8S870B x2) for connecting the ADV200 WA-...-SL and ADV200 WA-...-SL2 drives are respectively one meter and two meters long and has two quick coupling male MDR connectors at the ends.



Wiring instructions:

1. Connect one of the 2 ends of the interface cable to the XSL connector of the INT-P-ADV-SLAVE (SLAVE 2) card.
2. Secure the cable using the specific clamp.
3. Connect the other end of the cable to connector J4 of the INT-SLAVE (2) card mounted on the INT-P-ADV-MASTER card of the MASTER drive.
4. Secure the cable in the relative clamp
5. Repeat steps 1-2-3-4 for SLAVE 1, SLAVE 3 and SLAVE 4 (see figure 6-7 for location and wiring of INT-SLAVE card on INT-P-ADV-MASTER card).
6. To prevent the interface cables from coming into contact with the power terminals, fold the excess length of cable inside the SLAVE drive as shown in the figure and secure it using the specific cable clamps.

A 1.6 Jumpers and Switches

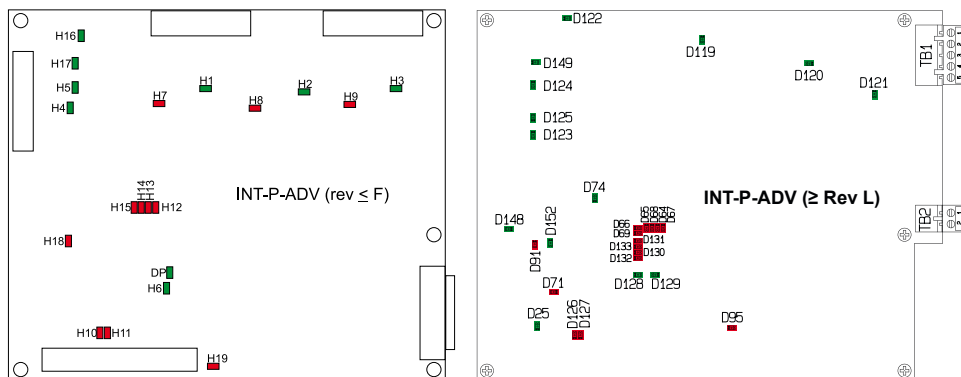
INT-P-ADV (MASTER and SLAVE) cards

The jumpers and switches on these cards are factory-set. DO NOT change these settings.

A 1.7 LEDs

The cards incorporate a LED diagnostics system for rapid analysis of everything happening on a multi-unit drive.

INT-P-ADV (MASTER and SLAVE) cards



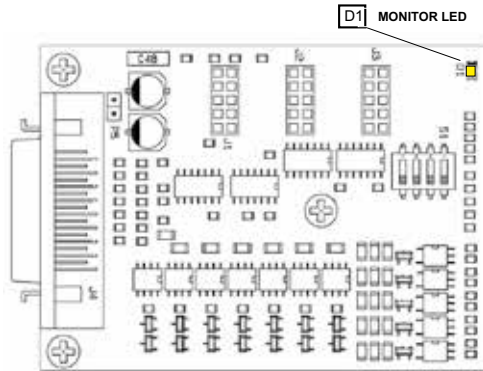
LEDS		Colour	FUNCTION	Normal functioning
≤ F (*)	≥ L (*)			
MONITOR				
H1	D119	Green	+15V_PWR_U monitor	On
H2	D120	Green	+15V_PWR_V monitor	On
H3	D121	Green	+15V_PWR_W monitor	On
H4	D123	Green	+15V monitor	On
H5	D125	Green	-15V monitor	On
H6	D129	Green	+3,3V monitor	On
	D25	Green	+3,3V R monitor	On
H16	D122	Green	+24V monitor	On
H17	D124	Green	+5V monitor	On
DP*	D128	Green	It switches on after power supply start-up when the FPGA configuration sequence is complete	On
	D149	Green	+5V safety monitor	On
ALARM				
H7	D67/D64	Red	PHASE U	Off
H8	D68/D65	Red	PHASE V	Off
H9	D69/D65	Red	PHASE W	Off
H10	D126	Red	It lights up to indicate a power rectifier heat sink overtemperature	Off

LEDS		Colour	FUNCTION		Normal functioning
≤ F (*)	≥ L (*)				
H11	D127	Red	It lights up to indicate overtemperature of the air inside the drive		Off
H12	D132	Red	IGBT U	They light up to indicate loss of the feedback signal relating to the moment the IGBT devices are switched on. The signal is used for hardware dead time compensation	Off
H13	D130	Red	IGBT V		Off
H14	D133	Red	IGBT W		Off
H15	D131	Red	<p>It lights up in case of overtemperature of one of the IGBT devices. The signal temperature relating to the hotter of the master and slave IGBT devices is sent to the regulation card.</p> <p>A temperature signal is also sent automatically to the regulation card in case of minimum temperature, which could occur in the event of a fault in one of the temperature reading circuits.</p> <p>The loss of one of the temperature signals is indicated by LED H15, with the code indicated by the number of flashes (*): the sequence of flashes to indicate the faulty PHASE or SLAVE has a 3Hz frequency and is repeated cyclically every 5 seconds.</p>		Off
H18	D91	Red	It lights up on the INT-P-ADV MASTER card to indicate that the drive's total current (master + slave) has exceeded the overcurrent value for the size of drive, whereas it lights up on the INT-P-ADV SLAVE card to indicate that the SLAVE current has only exceeded the overcurrent value of the SLAVE.		Off
H19	D95	Red	It lights up to indicate a fault on the DC-BUS power supply regulation card		Off
	D71	Red	Overvoltage / Undervoltage safety supply		Off
OPERATIONS					
	D148	Red	FPGA active reset HW		On
	D152	Green	Active PWM from regulation and sent to power (master drive or single drive only)		On
			Active PWM from regulation but cancelled (master drive or single drive only)		Blinking
			Active PWM to power (master drive and single drive only)		On
	D74	Green	Active PWM to power		On

(*) HW revision of INT-P-ADV card

(*) Led H15 code indicated by number of flashes	NO. FLASHES
PHASE U	1
PHASE V	2
PHASE W	3
SLAVE 1	4
SLAVE 2	5
SLAVE 3	6
SLAVE 4	7

INT-SLAVE cards

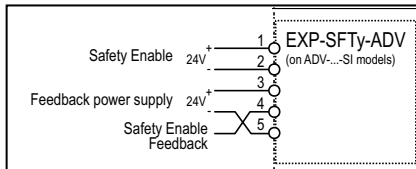


LEDS	Colour	FUNCTION	Normal functioning
MONITOR			
D1	Yellow	It flashes to indicate the presence of the temperature signal of the slave drive that is connected	Flashes

A 1.8 Safety STO Interface

A 1.8.1 ADV200 WA-...-MS-SI models (INT-P-ADV card, revision “F” and lower)

The EXP-SFTy card is integrated as standard in the master inverter of 500 to 1200 kW parallel versions.



.....
 If the safety function is not required, **the safety enable command must still be sent to terminal 1** on the EXP-SFTy-ADV card **to enable the drive**.



.....
 For instructions on connecting and commissioning the safety card with the SIL2 or SIL3 safety level function, please see chapter 7 “Application Examples” in the Safety manual (code 1S5F94) which you can download from www.weg.net.

A 1.8.2 ADV-...-MS-SI models (INT-P-ADV card, from revision “L”)

The ADV200 WA size 7 (and parallel unit ADV200 WA-...-MS) does not have the EXP-SFTy-ADV card, it is integrated and maintains all of the functions in the INT-P-ADV MASTER card (from revision “L”).

In the reference manual for “Description of functions and parameters list” (ADV200

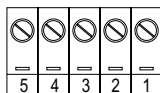
WA FP, code 1S9WPEN) safety function management parameters maintain the reference to the “EXP-SFTy-ADV card”.



If the safety function is not required, the safety enable command (**SFTy ENABLE**) must still be sent to PIN1 terminal TB1 on the INT-P-ADV card to enable the drive.

For instructions on connecting and commissioning the safety card with the SIL2 or SIL3 safety level function, please see chapter 7 “Application Examples” in the STO Safety Interface manual (code 1S5F94) which you can download from www.weg.net.

TB1 terminal



Terminal	Signal name	Function Description	Electrical limits and range
5	0-	+ 0 COM power supply for alarm feedback circuit	(IN) 0V
4	FB	+24V@100mA output feedback signal SAFETY DISABLED	(OUT) 0...35V; 150mA maximum DC current
3	0+	+24V power supply for alarm feedback circuit	(IN) +5v...35v with respect to #5
2	- (SFTy ENABLE)	0V COM for disabling the safety function	(IN) 0V
1	+ (SFTy ENABLE)	+24v for disabling the safety function	(IN) +12...+35v with respect to #2

State of feedback to terminal TB1-4 based on (**SFTy ENABLE**) command to pins 1, 2 and of ENABLE control to pin 7 of the R-ADV200 card:

CONTROLLER ENABLE	(SFTy ENABLE)	FB Feedback (SFTy ENABLE)
24V	OPEN	0-
OPEN	24V	0+
OPEN	OPEN	0-
24V	24V	0+

TB2 terminal

SAFETY STATUS digital output ad OPTOMOS: 0...35V, 150mA max



Terminal TB2 provides a digital output to OPTOMOS (SAFETY STATUS), which is not used in the safety chain but can be used to signal the STO state to the R-ADV200 control card (via digital input).

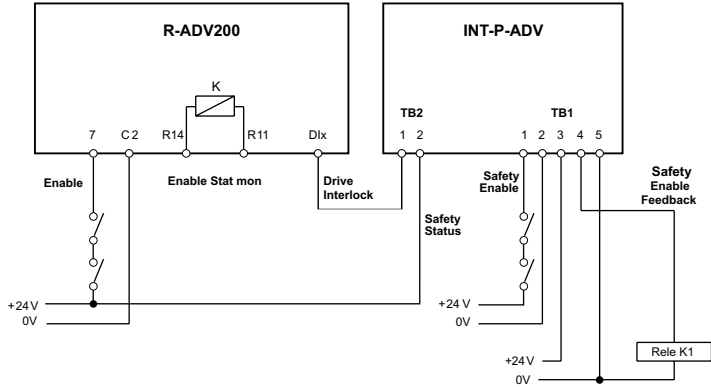
A typical application can be to program as DRIVE INTERLOCK the source of the digital input to which +24V is delivered via the SAFETY STATUS output.

When the STO function is disabled (24V present between terminals 1 and 2 of TB1), the contact (SAFETY STATUS) between pins 1 and 2 of TB2 is closed

CONTROLLER ENABLE	(SFTy ENABLE)	FB2 Feedback (SAFETY ENABLE)
24V	OPEN	Open
OPEN	24V	Close
OPEN	OPEN	Open
24V	24V	Close

In this way, when the **(SFTy ENABLE)** command is high, the control input programmed as DRIVE INTERLOCK is also high and the drive can be enabled.

Figure A1: Connection of safety terminals TB1 and TB2 on INT-P-ADV card



If the **(SFTy ENABLE)** command is removed, the DRIVE INTERLOCK input on the control card goes low and the drive is disabled instantaneously.

To re-enable the drive, you first have to set the **(SFTy ENABLE)** command to high (see parameter 1032 **Drv Interlock src** in ADV200 manual) and then remove and re-give the ENABLE and START commands to the control card.

Note!

If the **(SFTy ENABLE)** signal is removed from terminal TB1 of the INT-P-ADV card and the SAFETY STATUS signal is not connected to the control card, the PWM impulses (from the control card) are blocked by the STO interface but the control card (not having feedback on STO state) remains enabled. This irregular condition is signaled by LED D152 blinking at 3Hz, and the drive remains in this condition even when the **(SFTy ENABLE)** signal is given again.

To resume control of the motor, you first have to remove the ENABLE and START commands from the control card and re-give them only after setting the **(SFTy ENABLE)** command to high.

The **(SFTy ENABLE)** command can also be re-given before removing the ENABLE and START commands.

Appendix 2 - Miscellaneous

A 2.1 DC-link capacity

Size	DC-link capacity
	(μ F)
1015	235
1022	235
1030	340
1040	340
1055	340
2075	680
2110	680
2150	840
3185	1500
3220	1500
3300	1500
4370	2350
4450	2800
4550	3400
5750	4700
5900	5600

Size	DC-link capacity
	(μ F)
51100	6800
61320	11200
61600	13600
72000	16800
72500	16800
73150	25200
73550	25200
74000	25200
500 kW	33600
630 kW	50400
710 kW	50400
800 kW	50400
1000 kW	75600
1200 kW	75600
1500 kW	100800
1800 kW	126000



Attention

.....
 You cannot add an external capacitor on 1015 ... 61600 sizes.

You can add an external capacitor from sizes 72000 and higher (ask WEG for more details).

.....

Quick Start Manual

Series: ADV200 WA

Revision: 2.0

Date: 15-11-2022

Code: 1S9H47EN

WEG Automation Europe S.r.l.

Via Giosuè Carducci, 24

21040 Gerenzano (VA) · Italy