



Emotron FDU and VFX AC drives

Emotron VFX/FDU48-2P5-2Y to 038-2Y



Quick Start Guide
English

Emotron FDU and VFX AC drives

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QuickStartGuide - English

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Safety Instructions

Handling the AC drive

Installation, commissioning, demounting, taking measurements, etc. of or on the AC drive may only be carried out by personnel technically qualified for the task.

A number of national, regional and local regulations govern handling, storage and installation of the equipment. Always observe current rules and legislation.

Opening the AC drive



WARNING!

Always switch off the mains voltage before opening the AC drive and wait at least 10 minutes to allow the capacitors to discharge.

Always take adequate precautions before opening the AC drive. Although the connections for the control signals and the switches are isolated from the main voltage, do not touch the control board when the AC drive is switched on.

Precautions to be taken with a connected motor

If work must be carried out on a connected motor or on the driven machine, the mains voltage must always be disconnected from the AC drive first. Wait at least 10 minutes before starting work.

Earthing

The AC drive must always be earthed via the mains safety earth connection.

Earth leakage current



CAUTION!

This AC drive has an earth leakage current which does exceed 3.5 mA AC. Therefore the minimum size of the protective earth conductor must comply with the local safety regulations for

high leakage current equipment which means that according to the standard IEC61800-5-1 the protective earth connection must be assured by one of following conditions:

PE conductor cross-sectional area shall for phase cable size $< 16 \text{ mm}^2$ (6 AWG) be $>10 \text{ mm}^2$ Cu (16 mm^2 Al) or a second PE conductor with same area as original PE conductor.

For cable size above 16 mm^2 but smaller or equal to 35 mm^2 the PE conductor cross-sectional area shall be at least 16 mm^2 .

For cables $>35 \text{ mm}^2$ the PE conductor cross-sectional area must be at least 50 % of the used phase conductor.

When the PE conductor in the used cable type is not in accordance with the above mentioned cross-sectional area requirements, a separate PE conductor should be used to establish this.

Residual current device (RCD) compatibility

This product causes a DC current in the protective conductor. Where a residual current device (RCD) is used for protection in case of direct or indirect contact, only a Type B RCD is allowed on the supply side of this product. Use RCD of 300 mA minimum.

EMC Regulations

In order to comply with the EMC Directive, it is absolutely necessary to follow the installation instructions. All installation descriptions in this manual follow the EMC Directive.

Voltage tests (Megger)

Do not carry out voltage tests (Megger) on the motor, before all the motor cables have been disconnected from the AC drive.

Condensation

If the AC drive is moved from a cold (storage) room to a room where it will be installed, condensation can occur. This can result in sensitive components becoming damp. Do not connect the mains voltage until all visible dampness has evaporated.

Incorrect connection

The AC drive is not protected against incorrect connection of the mains voltage, and in particular against connection of the mains voltage to the motor outlets U, V and W. The AC drive can be damaged in this way.

Power factor capacitors for improving $\cos\phi$

Remove all capacitors from the motor and the motor outlet.

Precautions during Autoreset

When the automatic reset is active, the motor will restart automatically provided that the cause of the trip has been removed. If necessary take the appropriate precautions.

Transport

To avoid damage, keep the AC drive in its original packaging during transport. This packaging is specially designed to absorb shocks during transport.

IT Mains supply

The AC drives can be modified for an IT mains supply, (non-earthed neutral), please contact your supplier for details.

Alarms

Never disregard an alarm. Always check and remedy the cause of an alarm.

DC-link residual voltage



WARNING!

After switching off the mains supply, dangerous voltage can still be present in the AC drive. When opening the AC drive for installing and/or commissioning activities, wait at least 10 minutes. In case of malfunction a qualified technician should check the DC-link or wait for one hour before dismantling the AC drive for repair.

1. General

Congratulations for choosing a product from CG Drives & Automation!

This is a Quick Start Guide providing brief information about how to install this AC drive and how to get started.

Before you start mounting and installation, please read and consider the Safety chapter first.

The software instruction manual you will find in the file archive on www.emotron.com. In the software instruction manual you will find detailed information for setting up and running this AC drive.

Instruction manuals for optional boards are also found in the file archive.

All documentation is available on www.emotron.com.

1.1 Model Explanation

The Model shown on product label indicates the series name, applicable type of power supply, power class and hardware, etc. via the combination of numbers, symbols and letters.



Emotron FDU 2.0 - AC drive			
Type:	FDU48-023 2YCEB-AAVNN-NA---		
Input:	3x380-480V	27.8A	45 - 65Hz
Output:	0 - Input VAC		0-400Hz
Normal duty:	Inom 23A		
Heavy duty:	Inom 18,4A		
Enclosure:	IP20		
Fuse, amb temp & ratings:	See instruction manual		
			
PN: FDU48023			
			
SN: 18410015080221			
Made in Sweden		CG Drives & Automation Sweden AB	

Fig. 1 Product label

1.1.1 Model Type code number

Fig. 2 gives an example of the type code numbering used on all AC drives. With this code number the exact type of the drive can be determined. This identification will be required for type specific information when mounting and installing. The code number is located on the product label, on the AC drive see Fig. 1.

Type code	FLD	48	-023	-2Y	C	E	B	-	A	A	V	N	N	-	N	A	-	-	-
Position No	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19

Fig. 2 Type code number

Table 1 Type code explanation

Position	Configuration	
1	AC drive type	FLD
2	Supply voltage	48=480 V mains
3	Rated current (A) continuous	-2P5=2.5 A - -038=38 A
4	Protection class	2Y=IP20
5	Control panel	C=Standard panel
6	EMC option	E=Standard EMC (2 nd Environment, Category C3) I=IT-Net
7	Brake chopper option	B=Chopper built in, standard
8		--=Not used
9	Brand label	A=Standard
10	Painted AC drive	A=Standard paint
11	Coated boards, option	V=Coated boards, standard

Table 1 Type code explanation

Position	Configuration	
12	Option position 1	N=No option
13	Option position 2	E=Encoder- 2Y (micro) max 1 T=PTC-2Y (micro), max 1 I= Extended I/O-2Y (micro), max 2 S=Safe Stop-2Y (micro), max 1 R=RS232/485-2Y (micro), max 1 U= Standby supply-2Y(micro), max 1
14		-- Not used
15	Option position, communication	N=No option D=DeviceNet P=Profibus S=RS232/485 M=Modbus/TCP E= EtherCAT A=Profinet IO 1-port B=Profinet IO 2-port G=EtherNet/IP 2-port
16	Software type	A=Standard
17		-- Not used
18		-- Not used
19	Approval/certification	--CE approved

2. Electrical specifications

General	
Mains voltage:	3 phase 230 - 480 V +10/-15 % (-10 % at 230 V)
Mains frequency:	45 to 65 Hz
Input power factor:	0.7 - 0.8
Output voltage:	0–Mains supply voltage:
Output frequency:	0–400 Hz
Output switching frequency:	3 kHz, adjustable 1,5-6 kHz
Efficiency at nominal load:	≥93 % for frame sizes A3 and B3 ≥95 % for frame size C3
Control signal inputs: Analogue (differential)	
Analogue Voltage/current:	0±10 V/0-20 mA via switch
Max. input voltage:	+30 V/30 mA
Input impedance:	20 kOhm (voltage) 250 kOhm (current)
Resolution:	11 bits + sign
Hardware accuracy:	1% type + 1 ½ LSB fsd
Non-linearity	1½ LSB
Digital:	
Input voltage:	High: >9 VDC, Low: <4 VDC
Max. input voltage:	+30 VDC
Input impedance:	<3.3 VDC: 4.7 kOhm ≥3.3 VDC: 3.6 kOhm
Signal delay:	≤8 ms
Control signal outputs: Analogue	
Output voltage/current:	0-10 V/0-20 mA via software setting
Max. output voltage:	+15 V @5 mA cont.
Short-circuit current (∞):	+15 mA (voltage), +140 mA (current)
Output impedance:	10 Ohm (voltage)
Resolution:	10 bit
Maximum load impedance for current	500 Ohm
Hardware accuracy:	1.9% type fsd (voltage), 2.4% type fsd (current)
Offset:	3 LSB
Non-linearity:	2 LSB
Digital	
Output voltage:	High: >20 V _{DC} @50 mA, >23 V _{DC} open Low: <1 V _{DC} @50 mA
Shortcircuit current(∞):	100 mA max (together with +24 V _{DC})

Relays	
Contacts	0.1 – 2 A/Umax 250 V _{AC} or 42 V _{DC}
References	
+10 VDC	+10 V _{DC} @10 mA Short-circuit current +30 mA max
-10 VDC	- 10 V _{DC} @10 mA
+24 VDC	+24 V _{DC} Short-circuit current +100 mA max (together with Digital Outputs)

2.1 Electrical specifications related to mode

Emotron VFXI

Table 2 Typical motor power at mains voltage 400 V. AC drive main voltage range 380 - 480 V.

Model	Max. output current [A]*	Normal duty (120%, 1 min every 10 min)		Heavy duty (150%, 1 min every 10 min)		Frame size
		Power @400 V [kW]	Rated current [A]	Power @400 V [kW]	Rated current [A]	
VFX48-2P5-2Y	3.8	0.75	2.5	0.55	2.0	A3
VFX48-3P4-2Y	5.1	1.1	3.4	0.75	2.7	
VFX48-4P1-2Y	6.2	1.5	4.1	1.1	3.3	
VFX48-5P6-2Y	8.4	2.2	5.6	1.5	4.5	
VFX48-7P2-2Y	10.8	3.0	7.2	2.2	5.8	
VFX48-9P5-2Y	14.3	4.0	9.5	3.0	7.6	
VFX48-012-2Y	18.0	5.5	12	4.0	9.6	
VFX48-016-2Y	24	7.5	16	5.5	12.8	B3
VFX48-023-2Y	34.5	11	23	7.5	18.4	
VFX48-032-2Y	46.5	15	31	11	24.8	C3
VFX48-038-2Y	56	18.5	38	15	30.4	

* Available during limited time and as long as allowed by drive temperature.

Table 3 Typical motor power at mains voltage 460 V. AC drive main voltage range 380 - 480 V.

Model	Max. output current [A]*	Normal duty (120%, 1 min every 10 min)		Heavy duty (150%, 1 min every 10 min)		Frame size
		Power @460 V [hp]	Rated current [A]	Power @460 V [hp]	Rated current [A]	
VFX48-2P5-2Y	3.8	1	2.5	0.75	2.0	A3
VFX48-3P4-2Y	5.1	1.5	3.4	1	2.7	
VFX48-4P1-2Y	6.2	2	4.1	1.5	3.3	
VFX48-5P6-2Y	8.4	3	5.6	2	4.5	
VFX48-7P2-2Y	10.8	4	7.2	3	5.8	
VFX48-9P5-2Y	14.3	5	9.5	4	7.6	
VFX48-012-2Y	18.0	7.5	12	5	9.6	
VFX48-016-2Y	24	10	16	7.5	12.8	B3
VFX48-023-2Y	34.5	15	23	10	18.4	
VFX48-032-2Y	46.5	20	31	15	24.8	C3
VFX48-038-2Y	56	25	38	20	30.4	

* Available during limited time and as long as allowed by drive temperature.

Emotron FDU

Table 4 Typical motor power at mains voltage 400 V. AC drive main voltage range 380 - 480 V.

Model	Max. output current [A]*	Normal duty (120%, 1 min every 10 min)		Heavy duty (150%, 1 min every 10 min)		Frame size
		Power @400 V [kW]	Rated current [A]	Power @400 V [kW]	Rated current [A]	
FDU48-2P5-2Y	3.0	0.75	2.5	0.55	2.0	A3
FDU48-3P4-2Y	4.1	1.1	3.4	0.75	2.7	
FDU48-4P1-2Y	4.9	1.5	4.1	1.1	3.3	
FDU48-5P6-2Y	6.7	2.2	5.6	1.5	4.5	
FDU48-7P2-2Y	8.6	3.0	7.2	2.2	5.8	
FDU48-9P5-2Y	11.4	4.0	9.5	3.0	7.6	
FDU48-012-2Y	14.4	5.5	12	4.0	9.6	
FDU48-016-2Y	19.2	7.5	16	5.5	12.8	B3
FDU48-023-2Y	27.6	11	23	7.5	18.4	
FDU48-032-2Y	37.2	15	31	11	24.8	C3
FDU48-038-2Y	45.6	18.5	38	15	30.4	

* Available during limited time and as long as allowed by drive temperature.

Table 5 Typical motor power at mains voltage 460 V. AC drive main voltage range 380 - 480 V.

Model	Max. output current [A]*	Normal duty (120%, 1 min every 10 min)		Heavy duty (150%, 1 min every 10 min)		Frame size
		Power @460 V [hp]	Rated current [A]	Power @460 V [hp]	Rated current [A]	
FDU48-2P5-2Y	3.0	1	2.5	0.75	2.0	A3
FDU48-3P4-2Y	4.1	1.5	3.4	1	2.7	
FDU48-4P1-2Y	4.9	2	4.1	1.5	3.3	
FDU48-5P6-2Y	6.7	3	5.6	2	4.5	
FDU48-7P2-2Y	8.6	4	7.2	3	5.8	
FDU48-9P5-2Y	11.4	5	9.5	4	7.6	
FDU48-012-2Y	14.4	7.5	12	5	9.6	
FDU48-016-2Y	19.2	10	16	7.5	12.8	B3
FDU48-023-2Y	27.6	15	23	10	18.4	
FDU48-032-2Y	37.2	20	31	15	24.8	C3
FDU48-038-2Y	45.6	25	38	20	30.4	

* Available during limited time and as long as allowed by drive temperature.

2.2 Brake resistor

These AC drives are as standard equipped with built in Brake chopper and connection for DC+/DC-. The brake resistor must be mounted outside the AC drive.

Table 6 Minimum resistance depending on drive size and supply voltage.

Type	Rmin if supply 380–415 V _{AC} [Ohm]	Rmin if supply 440–480 V _{AC} [Ohm]
VFX/FDU48-2P5-2Y	120	150
-3P4-2Y	120	150
-4P1-2Y	120	150
-5P6-2Y	91	120
-7P2-2Y	91	120
-9P5-2Y	68	91
-012-2Y	51	68
-016-2Y	36	51
-023-2Y	27	33
-032-2Y	18	24
-038-2Y	15	20

2.3 Fuses and input current

2.3.1 According to IEC ratings

Use mains fuses of the type gL/gG conforming to IEC 269 or breakers with similar characteristics. Check the equipment first before installing the glands.

Max. Fuse = maximum fuse value that still protects the AC drive and upholds warranty.

NOTE: The dimensions of fuse and cable cross-section are dependent on the application and must be determined in accordance with local regulations.

Table 7 Fuses and input current

Model	Nominal input current		Maximum value fuse [A]
	with DC Choke [A]	without DC Choke [A]	
VFX/FDU48-2P5-2Y	2.0	3.5	10
-3P4-2Y	2.5	4.5	10
-4P1-2Y	2.7	4.7	10
-5P6-2Y	4.5	6.1	16
-7P2-2Y	6.0	9.0	16
-9P5-2Y	8.1	11.0	25
-012-2Y	10.2	15.3	25
-016-2Y	14.0	20.0	32
-023-2Y	20.4	27.8	40
-032-2Y	27.0	37.0	63
-038-2Y	34.0	46.0	63

2.4 Mounting

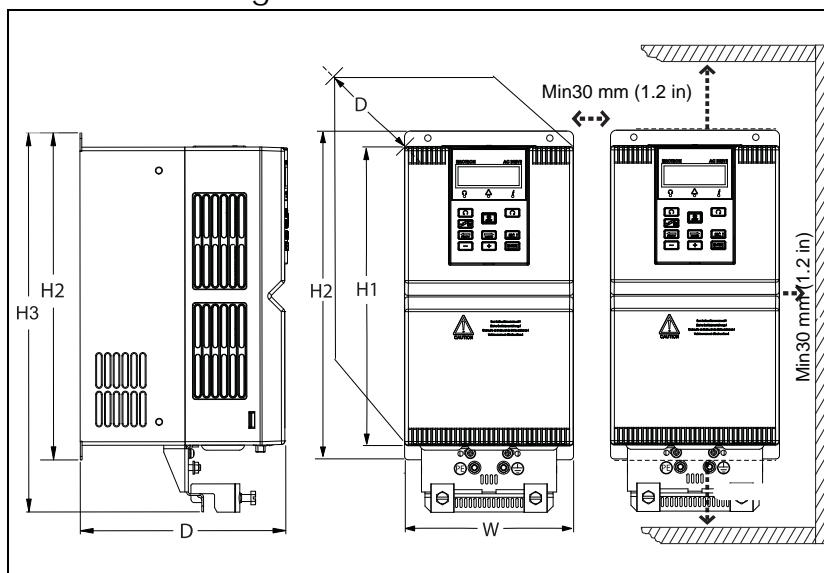


Fig. 3 Dimensions

Table 8 Dimensions

Frame size	Dim. H1/H2/H3 x W x D mm	Dim. H1/H2/H3 x W x D in	Weight kg (lbs)
A3	220/245/287 x 120 x 169	8.7/9.6/11.3 x 4.7 x 6.7	2.6 (5.7)
B3	255/280/325 x 145 x 179	9.8/11/12.8 x 5.7 x 7	3.9 (8.6)
C3	335/365/407 x 190 x 187	13.2/14.4/16 x 7.5 x 7.4	5 (11)

2.4.1 Cooling /cabinet mounting

If the AC-drive is installed in a cabinet, the rate of airflow supplied by the cooling fans must be taken into consideration.

Frame size	Emotron AC drive model	Flow rate m ³ /hour
A3	-2P5 to -012	39
B3	-016 to -023	89
C3	-032 to -038	177

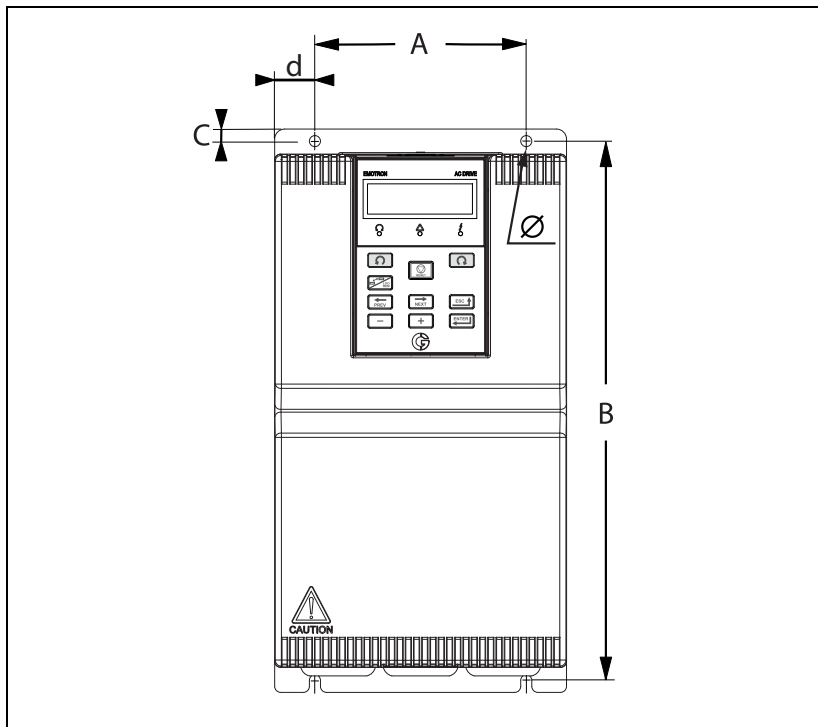


Fig. 4 Mounting dimensions.

Table 9 Mounting dimensions

Frame size	A mm (in)	B mm (in)	C mm (in)	D mm (in)	Ø mm (in)
A3	80 (3.15)	233 (9.17)	6 (0.24)	20 (0.79)	5.5 (0.20)
B3	105 (4.13)	268 (10.55)	6 (0.24)	20 (0.79)	5.5 (0.20)
C3	120 (4.72)	353 (13.89)	6 (0.24)	35 (1.38)	6 (0.24)

2.5 Remove dust cover

Remove the dust cover when installing the AC drive in a cabinet, see Fig. 5.

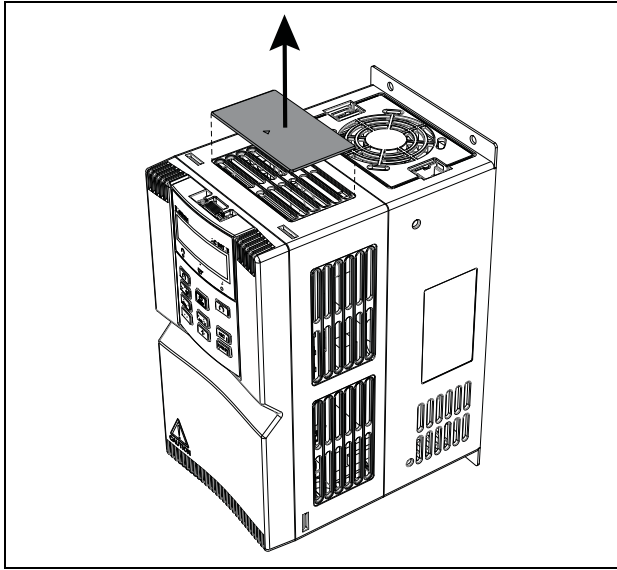


Fig. 5 Remove the dust cover

2.6 Remove Keypad and Cover

In order not to damage the keypad terminal plug, remove the keypad before you remove the front cover.

2.6.1 Remove the keypad

Press the quick-release latch of keypad as indicated by number "1" in Fig. 6, then pull the keypad out to release as indicated by "2".

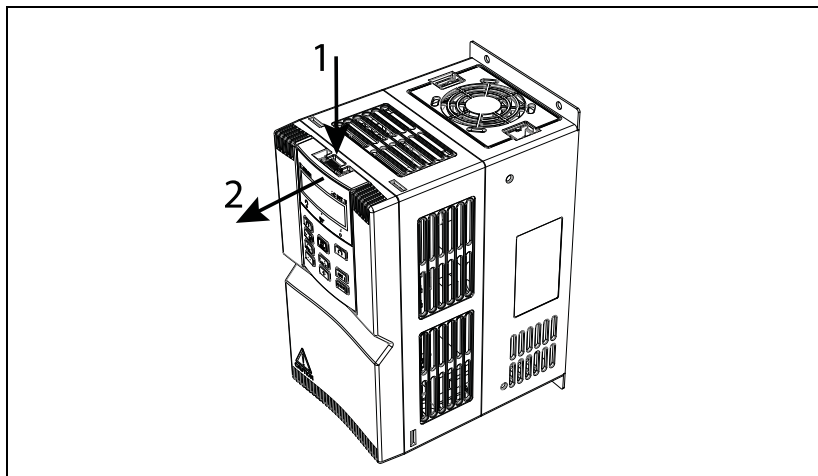


Fig. 6 Remove the keypad

2.6.2 Open the Cover

First remove the keypad according to Figure 6.

Frame size A3 and B3

Use a flat screwdriver to press in the quick-release latches at the bottom of the cover to easily remove the cover, as indicated by "2", pull the cover out to release, as indicated by number "3".

Frame size C3

Loosen the captive cover screw with your fingers, as indicated by number "1" in Fig. 7 . Then use a flat screwdriver to press in the quick-release latches at the bottom of the cover to easily remove the cover, as indicated by "2", pull the cover out to release, as indicated by number "3".

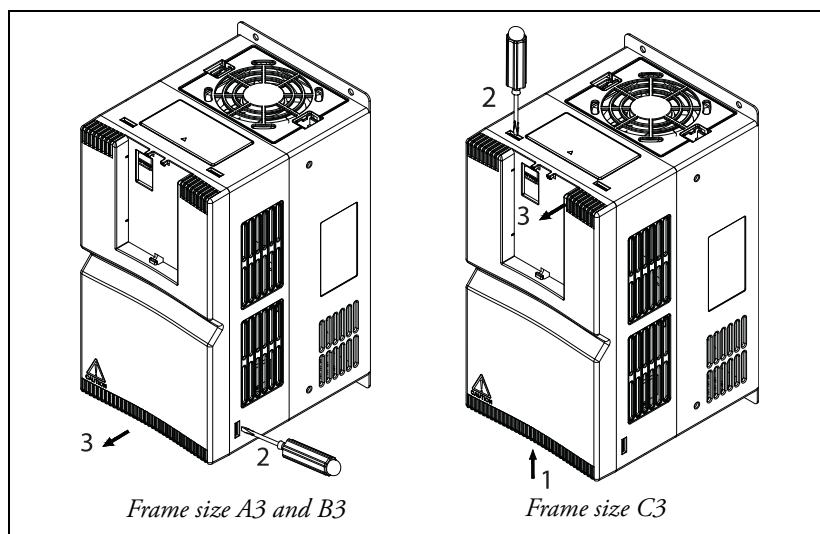


Fig. 7 Open the cover.

3. Cable connections

3.1 Mains and motor cables

Dimension the mains and motor cables according to local regulations. The cable must be able to carry the AC drive load current.

3.1.1 Cable connection data for mains, motor and PE cables according to IEC ratings

Table 10 Cable connector range and tightening torque according to IEC ratings.

Model VFX/FDU48	Frame size	Cable cross section connector range			Cable type
		Mains, motor, brake and PE			
		Cable area mm ² /AWG	Screw	Tightening torque Nm /Lb-In	
-2P5-2Y	A3	2.5 / 13	M3.5	0.8/7	Copper (Cu) 75°C
-3P4-2Y					
-4P1-2Y		2.5 / 13	M4	1.4/12	
-5P6-2Y					
-7P2-2Y					
-9P5-2Y					
-012-2Y	4 / 11	M4	1.4/12		
-016-2Y	B3			6 / 9	
-023-2Y					
-032-2Y	C3	6 / 9	M5	2.7/24	
-038-2Y					

3.1.2 Mains and motor cables connection

Connect the mains and motor cables according to Fig. 8. Secure the cables with the EMC/strain relief clamps.

There are two Ferrites included in delivery, one ferrite for Mains wires and the other ferrite for the motor wires.

Lead the PE/earth wires directly to the Earth connection screws (not through the ferrites).

Mains cable

- Use one ferrite for Mains wires L1, L2, L3. Wind the wires once around the ferrite. Connect the wires to the terminals R/L1, S/L2 and T/L3.

Motor cable

- Connect the motor cable screen to the clamp according to Fig. 8.
- Use the other ferrite for the motor wires U, V and W, let the wires go straight through the ferrite. Connect the wires to the terminals U/T1, V/T2 and W/T3.

Secure all other cables such as DC or brake cables with tie wraps by using the slots.

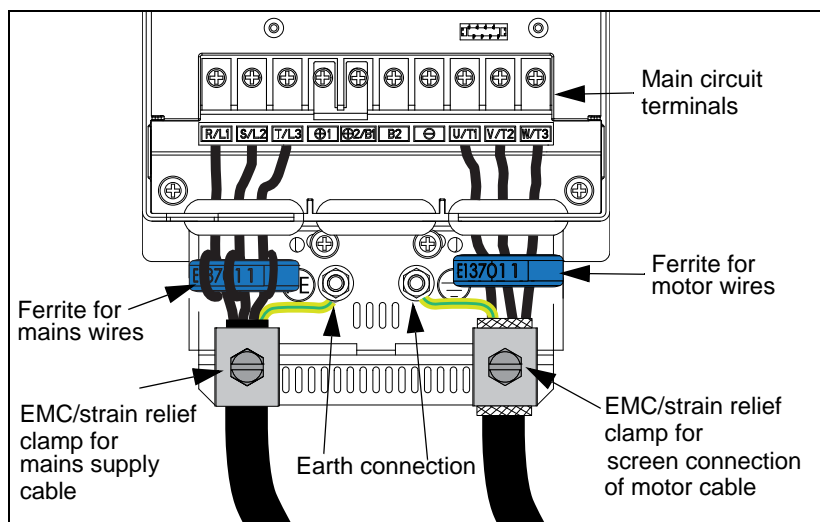


Fig. 8 Mains and motor cable connections

Main Circuit Terminals

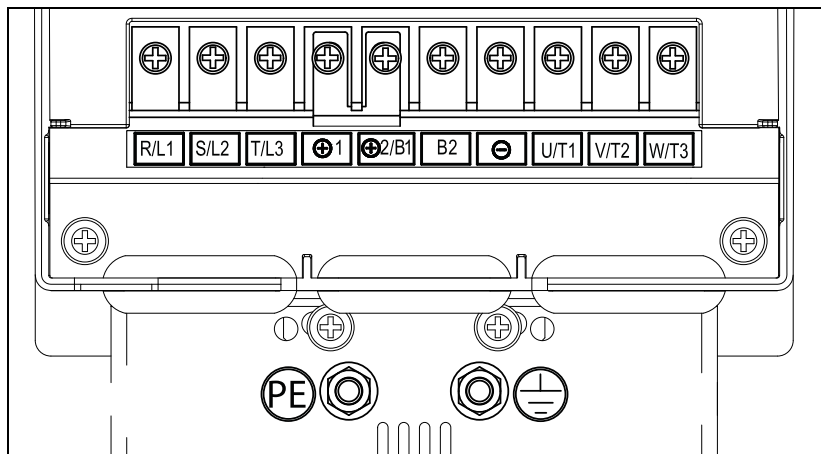


Fig. 9 Main circuit terminals.

Table 11 Terminal markings

Terminal marks	Designation and function of terminals
R/L1, S/L2, T/L3	Three-phase AC input terminals.
⊕1, ⊕2/B1	DC reactor connection terminals. Connected to +2/B1 with a jumper as factory default
⊕2/B1, B2	Braking resistor connection terminals
B2, ⊖	DC input terminals of externally mounted brake unit
⊕1, ⊖	DC power supply input terminals
U/T1, V/T2, W/T3	Three-phase AC output terminals
⊕ ⊖	Ground terminals, PE

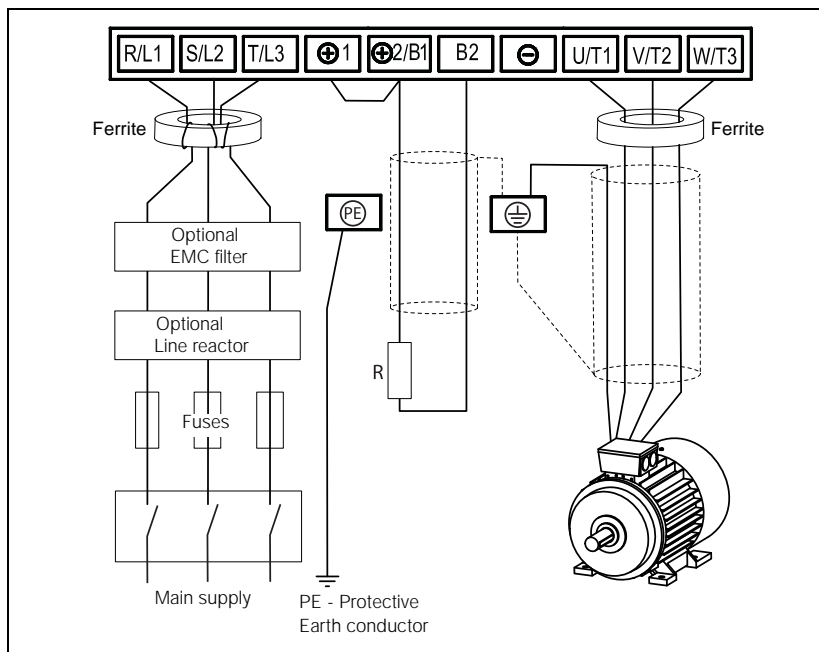


Fig. 10 Typical wiring example for 3-phase Mains supply



WARNING!

In order to work safely, the mains earth must be connected to PE and the motor earth to \perp .

3.2 Connecting the Control Signals

3.2.1 Cables

Always use screened control signal cables. The standard control signal connections are suitable for stranded flexible wire up to 1.5 mm² (AWG15) and for solid wire up to 2.5 mm²(AWG13).

Table 12 Cable connector range and tightening torque

Cable cross section connector range mm ² / AWG	Screw	Tightening torque (Nm/Lb-In)
1.5 - 2.5 / 15-13	M3	0.5 / 4.4

Screening

Connect the cable screen to the Earthing screw see Fig. 11.

For all signal cables the best results are obtained if the screen is connected to both ends: the AC drive side and at the source (e.g. PLC, or computer).

It is strongly recommended that the signal cables be allowed to cross mains and motor cables at a 90° angle. Do not let the signal cable go in parallel with the mains and motor cable.

NOTE: The screening of control signal cables must comply with the immunity levels given in the EMC Directive (reduction of noise level).

NOTE: The control cables must be separated from motor and mains cables.

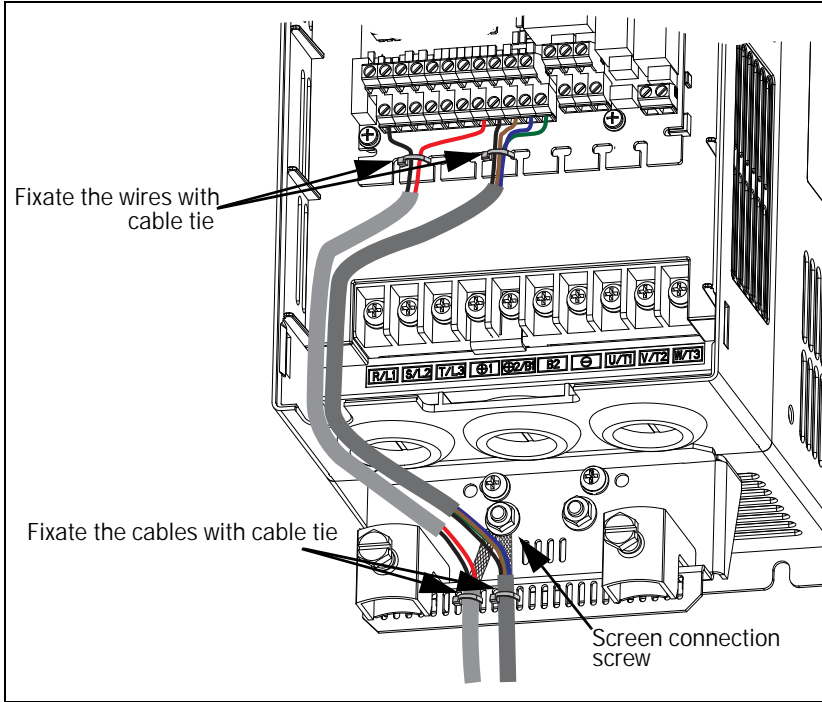


Fig. 11 Connecting the control signals and screen connection.

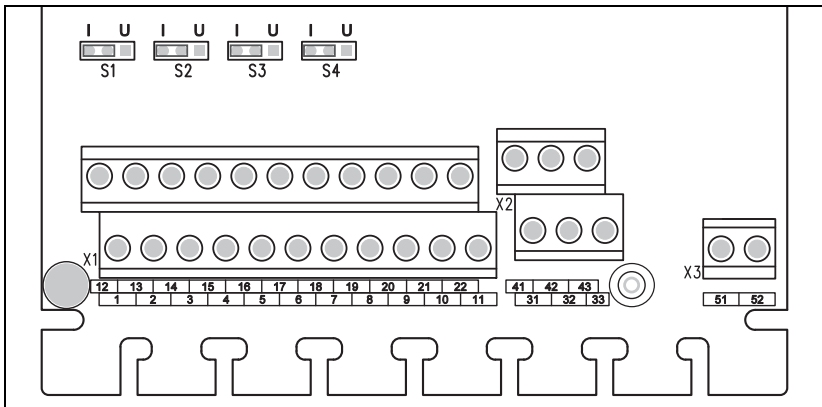


Fig. 12 Terminals for control signal connections and Jumpers S1 - S4,

3.2.2 Terminal connections

Table 13 describes the default functions for the signals. The inputs and outputs are programmable for other functions as described in the main instruction manual.

NOTE: The maximum total combined current for outputs 11, 20 and 21 is 100 mA.

NOTE: It is possible to use external 24 V DC if connection to Common (15).

Table 13 Control signals default functions

Terminal	Name	Function (Default)
Outputs		
1	+10 V	+10 V _{DC} supply voltage
6	-10 V	-10 V _{DC} supply voltage
7	Common	Signal ground
11	+24 V	+24 V _{DC} supply voltage
12	Common	Signal ground
15	Common	Signal ground
Digital inputs		
8	DigIn 1	RunL (reverse)
9	DigIn 2	RunR (forward)
10	DigIn 3	Off
16	DigIn 4	Off
17	DigIn 5	Off
18	DigIn 6	Off
19	DigIn 7	Off
22	DigIn 8	RESET

Table 13 Control signals default functions

Terminal	Name	Function (Default)
Digital outputs		
20	DigOut 1	Ready
21	DigOut 2	No trip - FDU Brake - VFX
Analogue inputs		
2	AnIn 1	Process Ref
3	AnIn 2	Off
4	AnIn 3	Off
5	AnIn 4	Off
Analogue outputs		
13	AnOut 1	Min speed to max speed
14	AnOut 2	0 to max torque
Relay outputs		
31	N/C 1	Relay 1 output Trip, active when the AC drive is in a TRIP condition.
32	COM 1	
33	N/O 1	
41	N/C 2	Relay 2 output Run, active when the AC drive is started.
42	COM 2	
43	N/O 2	
51	COM 3	Relay 3 output Off
52	N/O 3	

NOTE: N/C is opened when the relay is active and N/O is closed when the relay is active.











WARNING!

The relay terminals 31-52 are single isolated. Do NOT mix SELV voltage with e.g. 230 V_{AC} on these terminals.

4. Inputs configuration with the jumpers

The jumpers S1 to S4 are used to set the input configuration for the 4 analogue inputs AnIn1, AnIn2, AnIn3 and AnIn4 as described in table 14. See Fig. 12 for the location of the jumpers.

Table 14 Jumper settings

Input	Signal type	Jumper
AnIn1	Voltage	S1 
	Current (default)	S1 
AnIn2	Voltage	S2 
	Current (default)	S2 
AnIn3	Voltage	S3 
	Current (default)	S3 
AnIn4	Voltage	S4 
	Current (default)	S4 

5. Mount the cover

Frame size A3 and B3

On the completion of wiring, insert the quick-release latches at the upper part of the cover into the grooves in the centre housing as indicated by number "1" in Fig. 13, then push in the lower part of the cover as indicated by "2". A clicking noise indicates that the cover is correctly attached.

Frame size C3

On the completion of wiring, insert the quick-release latches at lower part of the cover, fitting the screw and the quick-release latches into the grooves in the centre housing as indicated by number "1" in Fig. 13, then push in the upper part of the cover as indicated by "2". A clicking noise indicates that the cover is correctly attached. Tighten the screw with your fingers (at position 1).

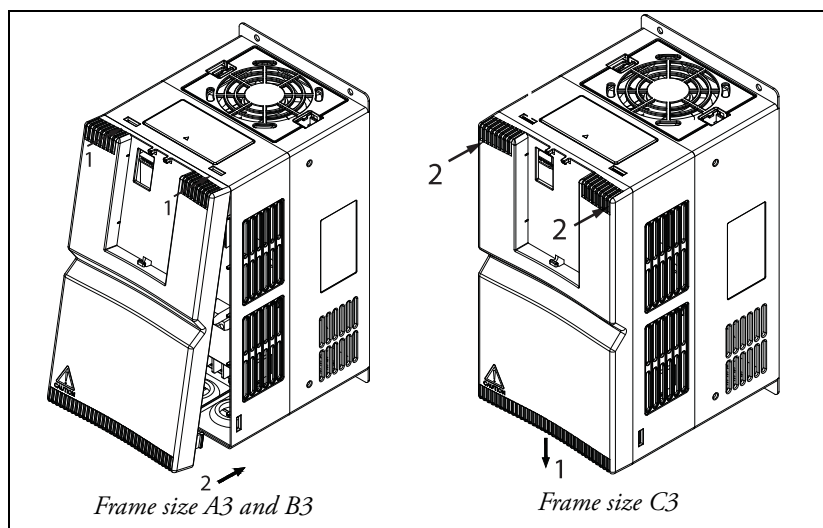


Fig. 13 Mount the cover.

5.1 Mount the keypad

Slightly tilt the keypad in the direction as indicated by number "1" in Fig. 6 and align it to quick-release latches at lower part of keypad bracket, then press it in as indicated by "2". A clicking noise indicates that the cover is correctly attached.

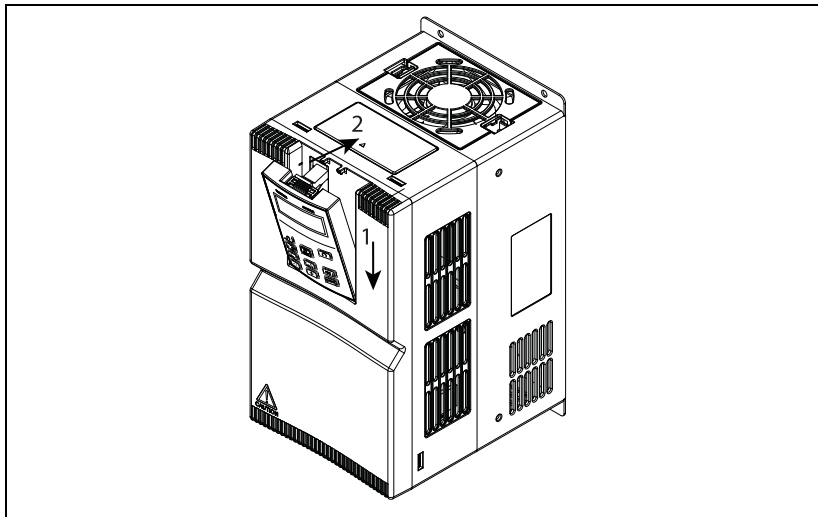


Fig. 14 Mount the keypad

6. Getting started

6.0.1 Control connection example, remote control

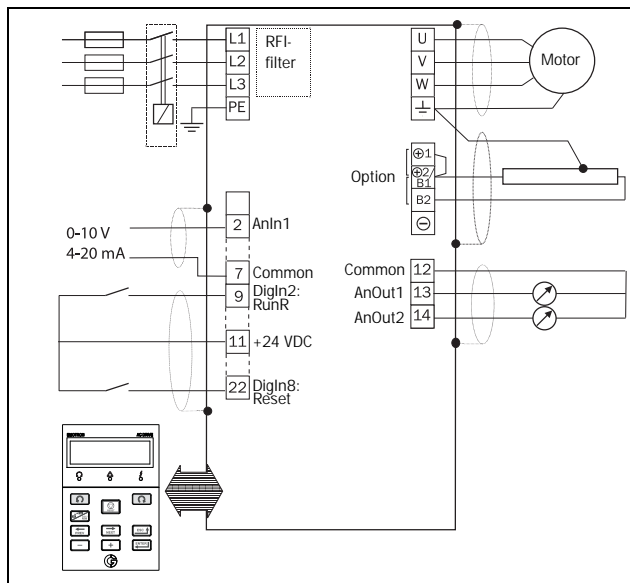


Fig. 15 Connection example for remote control.

Table 15 Description of used terminals.

Terminal	Name	Function (Default)
2	AnIn 1	Process reference, default: speed
7	Common	Signal ground
9	DigIn 2	RunR; rotation right
11	+24V	+24VDC Supply voltage
12	Common	Signal ground (If desired)
13	AnOut 1	Min speed to max speed (If desired)
14	AnOut 2	0 to max torque (If desired)
22	DigIn 8	Reset

6.1 Using the function keys

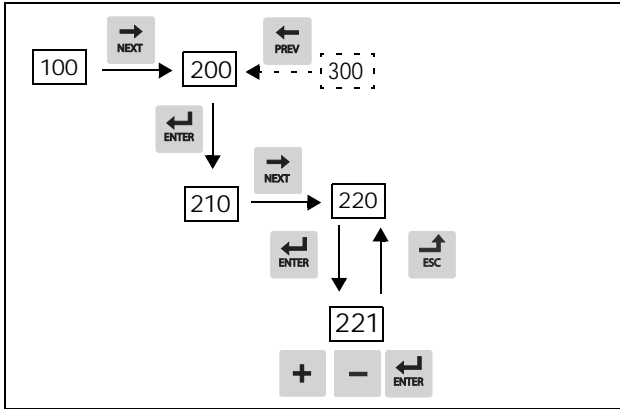


Fig. 16 Example of menu navigation when entering motor voltage



step to lower menu level or confirm changed setting



step to higher menu level or ignore changed setting



step to next menu on the same level



step to previous menu on the same level



increase value or change selection



decrease value or change selection



Toggle between menus in the toggle loop
Change the sign of a value
Switching between local and remote control

6.2 Remote control

In this example external signals are used to control the AC drive/motor.

A standard 4-pole motor for 400 V, an external start button and a reference value will also be used.

Switch on the mains









Once the mains is switched on, the internal fan in the AC drive will run for 5 seconds (In frame size A3 the fan runs continuously).


Set the Motor Data

Enter correct motor data for the connected motor. The motor data is used in the calculation of complete operational data in the AC drive.

Change settings using the keys on the control panel.

Menu [100], Preferred View is displayed when started.

1. Press  to display menu [200], Main Setup.
2. Press  and then  to display menu [220], Motor Data.
3. Press  to display menu [221] and set motor voltage.
4. Change the value using the  and  keys. Confirm with .
5. Set motor frequency [222].
6. Set motor power [223].
7. Set motor current [224].
8. Set motor speed [225].
9. Set power factor (cos ϕ) [227].
10. Select supply voltage level used [21B]
11. Set Motor type [22I]
12. [229] Motor ID run: Choose Short, confirm with ENTER and give start command .

The AC drive will now measure some motor parameters. The motor makes some beeping sounds but does not rotate. When the ID run is finished after about one minute ("Test Run OK!" is displayed), press  to continue.

13. Use AnIn1 as input for the reference value. The default range is 4-20 mA. If you need a 0-10 V reference value, change switch (S1) on control board.

14. Switch off power supply.
15. Connect digital and analogue inputs/outputs as in figure below.

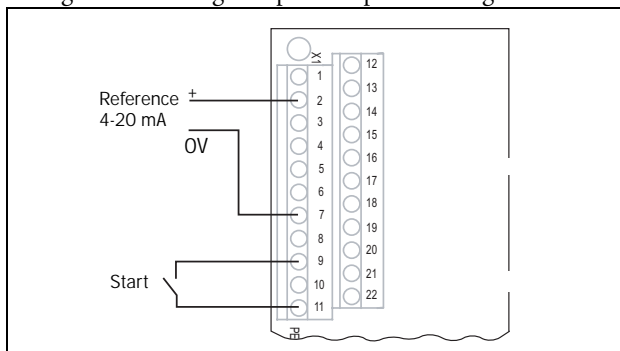


Fig. 17 Connecting reference signal

16. Ready!
17. Switch on power supply.

Run the AC drive

Now the installation is finished, and you can press the start button to start the motor. This test run will show that the main connections are OK and that the motor will run with the load.

6.2.1 Default toggle loop

Figure 18 shows the default toggle loop. This loop contains the necessary menus that need to be set before starting. Press Toggle to enter menu [211] then use the Next key to enter the sub menus [212] to [21A] and enter the parameters. When you press the Toggle key again, menu [221] is displayed.

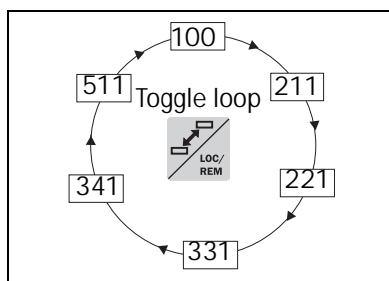


Fig. 18 Default toggle loop

6.2.2 Overview of the main menu

[100]	Preferred view. Displayed at power-up. Shows actual values (default: speed and torque).
[200]	Main Setup. Main settings to get the inverter operable e.g. motor data, autoreset and language.
[300]	Process and Application parameters. Settings more relevant to the application such as Reference Speed, torque limitations, PID control settings, etc.
[400]	Shaft power monitor and process protection. The monitor function enables the AC drive to be used as a load monitor to protect machines and processes against mechanical overload and under-load.
[500]	Inputs/outputs and virtual connections. All settings for analogue and digital inputs and outputs.
[600]	Logical functions and timers. All settings for conditional signals are entered here.
[700]	View operation and status. Viewing all the operational data like frequency, load, power, current, etc.
[800]	View Trip log. Viewing the last 10 trips in the trip memory.
[900]	Service information and AC drive data. Electronic type label for viewing the software version and AC drive type.

Menu list

On our home page in the download area, you could find a "Communication information" list and a list to note Parameter set information .

		Factory setting	Note/ Customer
100	Preferred View		
110	1st Line	Process Val	
120	2nd Line	VFX: Torque FDU: Current	
200	Main Setup		
210	Operation		
211	Language	English	
212	Select Motor	M1	
213	Drive Mode	VFX: Speed FDU: V/Hz	
214	Ref Control	Remote	
215	Run/Stp Ctrl	Remote	
216	Reset Ctrl	Remote	
217	Local/Rem		
2171	LocRefCtrl	Standard	
2172	LocRunCtrl	Standard	
218	Lock Code?	0	
219	Rotation	R+L	
21A	Level/Edge	Level	
21B	Supply Volts	Not Defined	
21C	Supply Type	AC Supply	
220	Motor Data		
221	Motor Volts	U_{NOM} V	
222	Motor Freq	50Hz	
223	Motor Power	(P_{NOM}) W	
224	Motor Curr	(I_{MOT}) A	
225	Motor Speed	(n_{MOT}) rpm	
226	Motor Poles	4	
227	Motor $\text{Cos}\phi$	$\text{Cos}\phi_{NOM}$	
228	Motor Vent	Self	
229	Motor ID-Run	Off	
22A	Motor Sound	F	FDU only
22B	Encoder	Off	
22C	Enc Pulses	1024	

		Factory setting	Note/ Customer
22D	Enc Speed	0rpm	
22E	Motor PWM		FDU only
22E1	PWM Fswitch	3.00 kHz	FDU only
22E2	PWM Mode	Standard	FDU only
22E3	PWM Random	Off	FDU only
22F	Enc Puls Ctr	0	
22G	Enc Fault		
22G1	Enc F Delay	Off	
22G2	Enc F Band	10%	
22G3	Max EncFCtr	0.000s	
22H	Phase order	Normal	
22I	Motor type	Async	VFX only
230	Mot Protect		
231	Mot I ² t Type	Trip	
232	Mot I ² t Curr	100%	
233	Mot I ² t Time	60s	
234	Thermal Prot	Off	
235	Motor Class	F 140°C	
240	Set Handling		
241	Select Set	A	
242	Copy Set	A>B	
243	Default>Set	A	
244	Copy to CP	No Copy	
245	Load from CP	No Copy	
250	Autoreset		
251	No of Trips	0	
252	Overtemp	Off	
253	Overvolt D	Off	
254	Overvolt G	Off	
255	Overvolt	Off	
256	Motor Lost	Off	
257	Locked Rotor	Off	
258	Power Fault	Off	
259	Undervoltage	Off	
25A	Motor I ² t	Off	
25B	Motor I ² t TT	Trip	
25E	PTC	Off	
25F	PTC TT	Trip	

		Factory setting	Note/ Customer
25G	Ext Trip	Off	
25H	Ext Trip TT	Trip	
25I	Com Error	Off	
25J	Com Error TT	Trip	
25K	Min Alarm	Off	
25L	Min Alarm TT	Trip	
25M	Max Alarm	Off	
25N	Max Alarm TT	Trip	
25O	Over curr F	Off	
25P	Pump	Off	
25Q	Over speed	Off	
25R	Ext Mot Temp	Off	
25S	Ext Mot TT	Trip	
25T	LC Level	Off	
25U	LC Level TT	Trip	
25V	Brk Fault	Off	
25W	Encoder	Off	
25X	Crane Deviat	Off	VFX only
25Y	Crane Comm	Off	VFX only
260	Serial Com		
261	Com Type	RS232/485	
262	RS232/485		
	2621	Baudrate	9600
	2622	Address	1
263	Fieldbus		
	2631	Address	62
	2632	PrData Mode	Basic
	2633	Read/Write	RW
	2634	AddPrValue	0
264	Comm Fault		
	2641	ComFit Mode	Off
	2642	ComFit Time	0.5 s
265	Ethernet		
	2651	IP Address	0.0.0.0
	2652	MAC Address	000000000000
	2653	Subnet Mask	0.0.0.0
	2654	Gateway	0.0.0.0
	2655	DHCP	Off

		Factory setting	Note/ Customer
266	FB Signal		
	2661	FB Signal 1	0
	2662	FB Signal 2	0
	2663	FB Signal 3	0
	2664	FB Signal 4	0
	2665	FB Signal 5	0
	2666	FB Signal 6	0
	2667	FB Signal 7	0
	2668	FB Signal 8	0
	2669	FB Signal 9	0
	266A	FB Signal 10	0
	266B	FB Signal 11	0
	266C	FB Signal 12	0
	266D	FB Signal 13	0
	266E	FB Signal 14	0
	266F	FB Signal 15	0
	266G	FB Signal 16	0
	269	FB Status	
300	Process		
	310	Set/View ref	Orpm
	320	Proc Setting	
		321	Proc Source
			Speed
		322	Proc Unit
			rpm
		323	User Unit
			0
		324	Process Min
			0
		325	Process Max
			0
		326	Ratio
			Linear
		327	F(Val) PrMin
			Min
		328	F(Val) PrMax
			Max
330	Start/Stop		
		331	Acc Time
			10.00s
		332	Dec Time
			10.00s
		333	Acc MotPot
			16.00s
		334	Dec MotPot
			16.00s
		335	Acc>Min Spd
			10.00s
		336	Dec<Min Spd
			10.00s
		337	Acc Rmp
			Linear
		338	Dec Rmp
			Linear

		Factory setting	Note/ Customer
339	Start Mode		
33A	Spinstart	Off	
33B	Stop Mode	Decel	
33C	Brk Release	0.00s	
33D	Release Spd	0rpm	
33E	Brk Engage	0.00s	
33F	Brk Wait	0.00s	
33G	Vector Brake	Off	
33H	Brk Fault	1.00s	
33I	Release Torque	0%	
340	Speed		
341	Min Speed	0rpm	
342	Stp<MinSpd	Off	
343	Max Speed	Sync Speed	
344	SkipSpd 1 Lo	0rpm	
345	SkipSpd 1 Hi	0rpm	
346	SkipSpd 2 Lo	0rpm	
347	SkipSpd 2 Hi	0rpm	
348	Jog Speed	50rpm	
350	Torques		
351	Max Torque	120%	
352	IxR Comp	Off	
353	IxR CompUsr	0%	
354	Flux optim	Off	
355	Max Power	Off	
360	Preset Ref		
361	Motor Pot	Non Volatile	
362	Preset Ref 1	0 rpm	
363	Preset Ref 2	250 rpm	
364	Preset Ref 3	500 rpm	
365	Preset Ref 4	750 rpm	
366	Preset Ref 5	1000 rpm	
367	Preset Ref 6	1250 rpm	
368	Preset Ref 7	1500 rpm	
369	Keyb Ref	Mot Pot	
370	Spd Ctrl PI		VFX only
371	Spd PI Auto	Off	VFX only
372	Spd P Gain		VFX only

		Factory setting	Note/ Customer
373	Spd I Time		VFX only
380	ProcCtrlPID		
381	PID Control	Off	
382	PID Autotune	Off	
383	PID P Gain	1.0	
384	PID I Time	1.00s	
385	PID D Time	0.00s	
386	PID<MinSpd	Off	
387	PID Act Marg	0	
388	PID Stdy Tst	Off	
389	PID Stdy Mar	0	
390	Pump/Fan Ctrl		
391	Pump enable	Off	
392	No of Drives	2	
393	Select Drive	Sequence	
394	Change Cond	Both	
395	Change Timer	50h	
396	Drives on Ch	0	
397	Upper Band	10%	
398	Lower Band	10%	
399	Start Delay	0s	
39A	Stop Delay	0s	
39B	Upp Band Lim	0%	
39C	Low Band Lim	0%	
39D	Settle Start	0s	
39E	TransS Start	60%	
39F	Settle Stop	0s	
39G	TransS Stop	60%	
39H	Run Time 1	00:00:00	
	39H1	Rst Run Tm1	No
39I	Run Time 2	00:00:00	
	39I1	Rst Run Tm2	No
39J	Run Time 3	00:00:00	
	39J1	Rst Run Tm3	No
39K	Run Time 4	00:00:00	
	39K1	Rst Run Tm4	No
39L	Run Time05	00:00:00	
	39L1	Rst Run Tm5	No

		Factory setting	Note/ Customer
39M	Run Time 6	00:00:00	
	39M1 Rst Run Tm6	No	
39N	Pump 123456		
39P	No of Backup	0	
3A0	Crane Option		VFX only
	3A1 Crane enable	Off	VFX only
	3A2 Control	4-Speed	VFX only
	3A3 Crane Relay 1	No trip	VFX only
	3A4 Crane Relay 2	Brake	VFX only
	3A5 PreLimSwSpd		VFX only
	3A6 CrawlSpd H/R		VFX only
	3A7 CrawlSpd L/L		VFX only
	3A8 Speed 2		VFX only
	3A9 Speed 3		VFX only
	3AA Speed 4		VFX only
	3AB Dev Bandwidt		VFX only
	3AC Dev Time	ms	VFX only
	3AD LAFS Load	Off	VFX only
	3AG Crane N Function	Zero Pos	VFX only
400	Monitor/Prot		
410	Load Monitor		
	411 Alarm Select	Off	
	412 Alarm trip	Off	
	413 Ramp Alarm	Off	
	414 Start Delay	2s	
	415 Load Type	Basic	
	416 Max Alarm		
	4161 MaxAlarmMar	15%	
	4162 MaxAlarmDel	0.1s	
	417 Max Pre alarm		
	4171 MaxPreAlMar	10%	
	4172 MaxPreAlDel	0.1s	
	418 Min Pre Alarm		
	4181 MinPreAlMar	10%	
	4182 MinPreAlDel	0.1s	
	419 Min Alarm		
	4191 MinAlarmMar	15%	
	4192 MinAlarmDel	0.1s	

		Factory setting	Note/ Customer
41A	Autoset Alm	No	
41B	Normal Load	100%	
41C	Load Curve		
	41C1	Load Curve 1	100%
	41C2	Load Curve 2	100%
	41C3	Load Curve 3	100%
	41C4	Load Curve 4	100%
	41C5	Load Curve 5	100%
	41C6	Load Curve 6	100%
	41C7	Load Curve 7	100%
	41C8	Load Curve 8	100%
	41C9	Load Curve 9	100%
	41D	MinAbsMarg	3%
420	Process Prot		
	421	Low Volt OR	On
	422	Rotor Locked	Off
	423	Motor lost	Off
	424	Overvolt Ctrl	On
500	I/Os		
510	An Inputs		
	511	AnIn1 Fc	Process Ref
	512	AnIn1 Setup	4-20mA
	513	AnIn1 Advn	
		5131	AnIn1 Min
		5132	AnIn1 Max
		5133	AnIn1 Bipol
		5134	AnIn1 FcMin
		5135	AnIn1 ValMin
		5136	AnIn1 FcMax
		5137	AnIn1 ValMax
		5138	AnIn1 Oper
		5139	AnIn1 Filt
		513A	AnIn1 Enabl
	514	AnIn2 Fc	Off
	515	AnIn2 Setup	4-20mA
	516	AnIn2 Advan	
		5161	AnIn2 Min
		5162	AnIn2 Max

		Factory setting	Note/ Customer
5163	AnIn2 Bipol	20.00mA	
5164	AnIn2 FcMin	Min	
5165	AnIn2 ValMin	0	
5166	AnIn2 FcMax	Max	
5167	AnIn2 ValMax	0	
5168	AnIn2 Oper	Add+	
5169	AnIn2 Filt	0.1s	
516A	AnIn2 Enabl	On	
517	AnIn3 Fc	Off	
518	AnIn3 Setup	4-20mA	
519	AnIn3 Advan		
5191	AnIn3 Min	4mA	
5192	AnIn3 Max	20.00mA	
5193	AnIn3 Bipol	20.00mA	
5194	AnIn3 FcMin	Min	
5195	AnIn3 ValMin	0	
5196	AnIn3 FcMax	Max	
5197	AnIn3 ValMax	0	
5198	AnIn3 Oper	Add+	
5199	AnIn3 Filt	0.1s	
519A	AnIn3 Enabl	On	
51A	AnIn4 Fc	Off	
51B	AnIn4 Setup	4-20mA	
51C	AnIn4 Advan		
51C1	AnIn4 Min	4mA	
51C2	AnIn4 Max	20.00mA	
51C3	AnIn4 Bipol	20.00mA	
51C4	AnIn4 FcMin	Min	
51C5	AnIn4 ValMin	0	
51C6	AnIn4 FcMax	Max	
51C7	AnIn4 ValMax	0	
51C8	AnIn4 Oper	Add+	
51C9	AnIn4 Filt	0.1s	
51CA	AnIn4 Enabl	On	

		Factory setting	Note/ Customer
520	Dig Inputs		
521	DigIn 1	RunL	
522	DigIn 2	RunR	
523	DigIn 3	Off	
524	DigIn 4	Off	
525	DigIn 5	Off	
526	DigIn 6	Off	
527	DigIn 7	Off	
528	DigIn 8	Reset	
529	B(oard)1 DigIn 1	Off	
52A	B(oard)1 DigIn 2	Off	
52B	B(oard)1 DigIn 3	Off	
52C	B(oard)2 DigIn 1	Off	
52D	B(oard)2 DigIn 2	Off	
52E	B(oard)2 DigIn 3	Off	
52F	B(oard)3 DigIn 1	Off	
52G	B(oard)3 DigIn 2	Off	
52H	B(oard)3 DigIn 3	Off	
530	An Outputs		
531	AnOut1 Fc	Speed	
532	AnOut1 Setup	4-20mA	
533	AnOut1 Adv		
5331	AnOut 1 Min	4mA	
5332	AnOut 1 Max	20.0mA	
5333	AnOut1Bipol	-10.00-10.00 V	
5334	AnOut1 FcMin	Min	
5335	AnOut1 VaMin	0	
5336	AnOut1 FcMax	Max	
5337	AnOut1 VaMax	0	
534	AnOut2 FC	Torque	
535	AnOut2 Setup	4-20mA	
536	AnOut2 Advan		
5361	AnOut 2 Min	4mA	
5362	AnOut 2 Max	20.0mA	
5363	AnOut2Bipol	-10.00-10.00 V	
5364	AnOut2 FcMin	Min	
5365	AnOut2 VaMin	0	
5366	AnOut2 FcMax	Max	

			Factory setting	Note/ Customer
	5367	AnOut2 VaMax	0	
540	Dig Outputs			
	541	DigOut 1	Ready	
	542	DigOut 2		
550	Relays			
	551	Relay 1	Trip	
	552	Relay 2	Run	
	553	Relay 3	Off	
	554	B(oard)1 Relay 1	Off	
	555	B1 Relay 2	Off	
	556	B1 Relay 3	Off	
	557	B2 Relay 1	Off	
	558	B2 Relay 2	Off	
	559	B2 Relay 3	Off	
	55A	B3 Relay 1	Off	
	55B	B3 Relay 2	Off	
	55C	B3 Relay 3	Off	
	55D	Relay Adv		
	55D1	Relay 1 Mode	N.O	
	55D2	Relay 2 Mode	N.O	
	55D3	Relay 3 Mode	N.O	
	55D4	B1R1 Mode	N.O	
	55D5	B1R2 Mode	N.O	
	55D6	B1R3 Mode	N.O	
	55D7	B2R1 Mode	N.O	
	55D8	B2R2 Mode	N.O	
	55D9	B2R3 Mode	N.O	
	55DA	B3R1 Mode	N.O	
	55DB	B3R2 Mode	N.O	
	55DC	B3R3 Mode	N.O	
560	Virtual I/Os			
	561	VIO 1 Dest	Off	
	562	VIO 1 Source	Off	
	563	VIO 2 Dest	Off	
	564	VIO 2 Source	Off	
	565	VIO 3 Dest	Off	
	566	VIO 3 Source	Off	
	567	VIO 4 Dest	Off	

		Factory setting	Note/ Customer
568	VIO 4 Source	Off	
569	VIO 5 Dest	Off	
56A	VIO 5 Source	Off	
56B	VIO 6 Dest	Off	
56C	VIO 6 Source	Off	
56D	VIO 7 Dest	Off	
56E	VIO 7 Source	Off	
56F	VIO 8 Dest	Off	
56G	VIO 8 Source	Off	
600	Logical&Timers		
610	Comparators		
611	CA1 Setup		
6111	CA1 Value	Speed	
6112	CA1 Level HI	300rpm	
6113	CA1 Level LO	200rpm	
6114	CA1 Type	Hysteresis	
6115	CA1 Polar	Unipolar	
612	CA2 Setup		
6121	CA2 Value	Torque	
6122	CA2 Level HI	20%	
6123	CA2 Level LO	10%	
6124	CA2 Type	Hysteresis	
6125	CA2 Polar	Unipolar	
613	CA3 Setup		
6131	CA3 Value	Process Val	
6132	CA3 Level HI	300rpm	
6133	CA3 Level LO	200rpm	
6134	CA3 Type	Hysteresis	
6135	CA3 Polar	Unipolar	
614	CA4 Setup		
6141	CA4 Value	Process Err	
6142	CA4 Level HI	100 rpm	
6143	CA4 Level LO	- 100 rpm	
6144	CA4 Type	Window	
6145	CA4 Polar	Bipolar	
615	CD Setup		
6151	CD1	Run	
6152	CD2	DigIn 1	

		Factory setting	Note/ Customer
	6153	CD3	Trip
	6154	CD4	Ready
620	Logic Y		
	621	Y Comp 1	CA1
	622	Y Operator 1	&
	623	Y Comp 2	IA2
	624	Y Operator 2	&
	625	Y Comp 3	CD1
630	Logic Z		
	631	Z Comp 1	CA1
	632	Z Operator 1	&
	633	Z Comp2	IA2
	634	Z Operator 2	&
	635	Z Comp 3	CD1
640	Timer1		
	641	Timer1 Trig	Off
	642	Timer1 Mode	Off
	643	Timer1 Delay	0:00:00
	644	Timer 1 T1	0:00:00
	645	Timer1 T2	0:00:00
	649	Timer1 Value	0:00:00
650	Timer2		
	651	Timer2 Trig	Off
	652	Timer2 Mode	Off
	653	Timer2 Delay	0:00:00
	654	Timer 2 T1	0:00:00
	655	Timer2 T2	0:00:00
	659	Tmer2 Value	0:00:00
660	Counters		
	661	Counter 1	
	6611	C1 Trig	Off
	6612	C1 Reset	Off
	6613	C1 High Val	0
	6614	C1 Low Val	0
	6615	C1 DecTimer	Off
	6619	C1 Value	0
	662	Counter 2	
	6621	C2 Trig	Off

		Factory setting	Note/ Customer
	6622	C2 Reset	Off
	6623	C2 High Val	0
	6624	C2 Low Val	0
	6625	C2 DecTimer	Off
	6629	C2 Value	0
700	Oper/Status		
710	Operation		
	711	Process Val	
	712	Speed	
	713	Torque	
	714	Shaft Power	
	715	El Power	
	716	Current	
	717	Output volt	
	718	Frequency	
	719	DC Voltage	
	71A	Heatsink Tmp	
720	Status		
	721	AC drive Status	
	722	Warning	
	723	DigIn Status	
	724	DigOut Status	
	725	AnIn 1 2	
	726	AnIn 3 4	
	727	AnOut 1 2	
	728	IO Status B1	
	729	IO Status B2	
	72A	IO Status B3	
	72B	Area D Stat	
	72B1	Area D LSB	
	72B2	Area D MSB	
	72C	VIO Status	
730	Stored Val		
	731	Run Time	00:00:00
	7311	Reset RunTm	No
	732	Mains Time	00:00:00
	733	Energy	kWh
	7331	Rst Energy	No

		Factory setting	Note/ Customer
800	View TripLog		
810	Trip Message (log list 1)		
	811	Process Value	
	812	Speed	
	813	Torque	
	814	Shaft Power	
	815	El Power	
	816	Current	
	817	Output voltage	
	818	Frequency	
	819	DC voltage	
	81A	Heatsink Tmp	
	81B	PT100_1, 2, 3	
	81C	VSD Status	
	81D	DigIn status	
	81E	DigOut status	
	81F	AnIn 1 2	
	81G	AnIn 3 4	
	81H	AnOut 1 2	
	81I	IO Status B1	
	81J	IO Status B2	
	81K	IO Status B3	
	81L	Run Time	
	81M	Mains Time	
	81N	Energy	
	81O	Process reference	
	81P	VIO Status	
820	Trip Message 821 - 82P (log list 2)		
830	Trip Message 831 - 83P (log list 3)		
840	Trip Message 841 - 84P (log list 4)		
850	Trip Message 851 - 85P (log list 5)		
860	Trip Message 861 - 86P (log list 6)		
870	Trip Message 871 - 87P (log list 7)		
880	Trip Message 881 - 88P (log list 8)		
890	Trip Message 891 - 89P (log list 9)		
8A0	Reset Trip	No	

		Factory setting	Note/ Customer
900	System Data		
920	AC drive Data		
921	AC drive Type		
922	Software		
	9221	Build Info	
	9222	Build ID	
923	Unit name	0	

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