Rexroth
Bosch Group

Rexroth Frequency Converter Fe

R912004884
Edition 02

Instruction Manual (Quick Start)

Record of Revision

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DOK-RCON01-FE*********-IN02-EN-P	2013.11	First release

About this Documentation

This **Instruction Manual (Quick Start)** is derived from the **Instruction Manual** which includes the product data in details.

Never work with or control the product before reading through the **Safety Instructions** in the standard delivery and the safety related chapters in the **Instruction Manual**.

Reference

For documentations available in other type or language, please consult your local sales partner or check www.boschrexroth.com/fe.

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1.1 Visual Check

After unpacking the frequency converter, perform a thorough visual check. Check the following:

- **Has the right device been supplied?**
- **Is the device damaged?**
- **Check the case for transport damage such as scratches, cracks or dents.**

  If you find a deviation from one of the above points, please contact your **Bosch Rexroth** sales partner.

1.2 Ambient Conditions

If it is to function perfectly, the frequency converter must be installed in an environment matching the data provided below.

Ambient temperature	-10 to +40 °C (No derating)
	+40 to +50 °C (Derating ①)
Max. altitude	Up to 1,000 m (No derating)
	1,000 to 4,000 m (1 % / 100 m)
Relative humidity	< 90 %
Degrees of protection	IP 20 (Control cabinet mounting)

Tab. 1-1: Ambient conditions

☞ ①: Refer to "9.2: Derating of Electrical Data" in the **Instruction Manual**.

1.3 Installation Conditions

Depending on rating, the frequency converters are available in different sizes. In order not to affect device cooling, the frequency converter must always be installed upright. For perfect heat dissipation, the minimum installation spacing to the devices shown in the drawing must be observed.
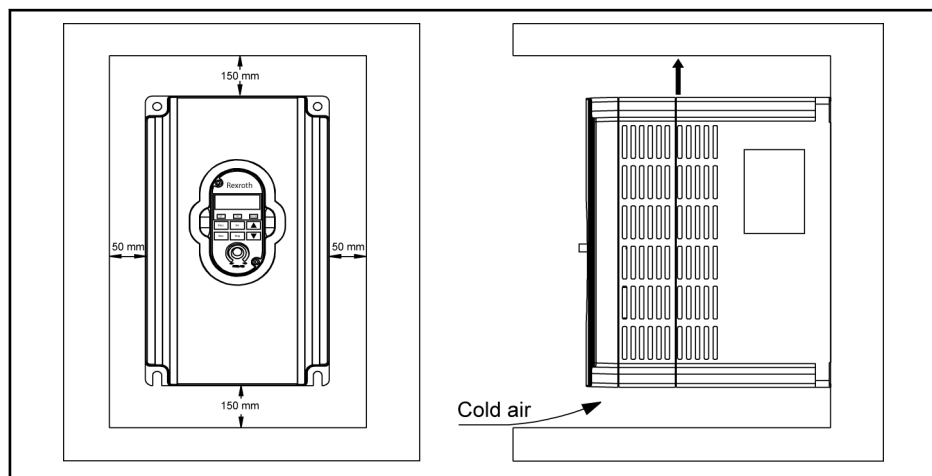

Fig. 1-1: Installation conditions

- The frequency converter shown above is Frame 1. The minimum installation spacing stated applies to Frame 1 to Frame 7.
- The frequency converter must be vertically installed.
- If one frequency converter is arranged above another, make sure the upper limit of air temperature into the inlet is not exceeded (see chapter 1.2 "Ambient Conditions" on page 1). A baffle plate is recommended between the frequency converters to prevent the rising hot air being drawn into the upper frequency converter if the upper limit of air temperature is exceeded.

1.4 Dimensions

Fe model	Frame	Width	Height	Depth	Moutning hole	Net weight
		B/b	H/h	T	Ø G	m
		[mm]	[mm]	[mm]	[mm]	[kg]
FECG02.1-0K75-...	1	125/109	220/204	176	6	3
FECG02.1-1K50-...						
FECG02.1-2K20-...						3.2
FECG02.1-4K00-...						
FECx02.1-5K50-...						3.5
FECx02.1-7K50-...						
FECx02.1-11K0-...	2	220/180	392/372	218	9.5	10.7
FECx02.1-15K0-...						10.9
FECx02.1-18K5-...	3	275/200	463/443	218	9.5	16.2
FECx02.1-22K0-...						16.9
FECx02.1-30K0-...	4	290/200	574/550	236	11	21.5
FECx02.1-37K0-...						22
FECx02.1-45K0-...	5	364/260	602/576	260	11	33.2
FECx02.1-55K0-...						33.8
FECx02.1-75K0-...	6	455/375	682/650	290	11	50.9
FECx02.1-90K0-...						52.5
FECx02.1-110K-...	7	570/450	850/825	360	11	96.5
FECx02.1-132K-...						100
FECx02.1-160K-...						102

Tab. 1-2: Fe dimensions

☞   "x" in Fe model "FECx..." is a substitute for G or P series.
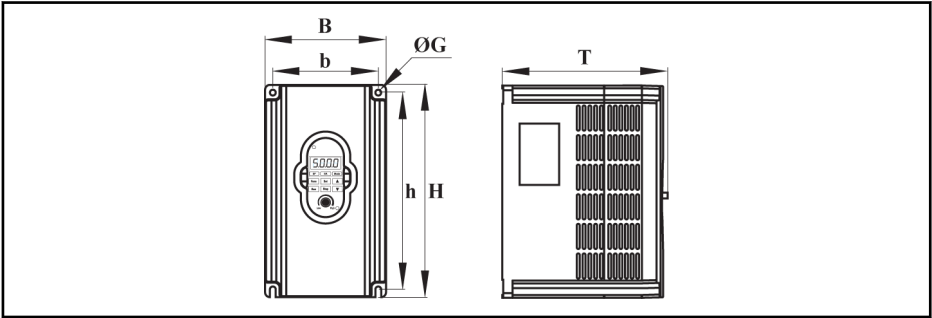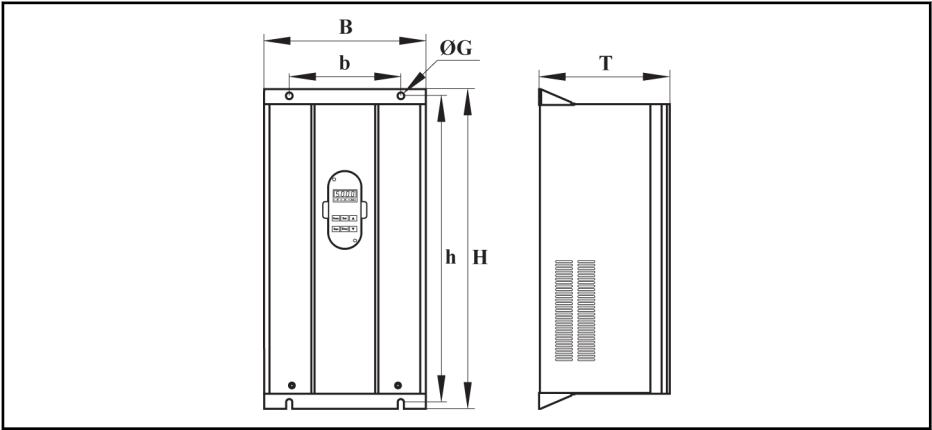
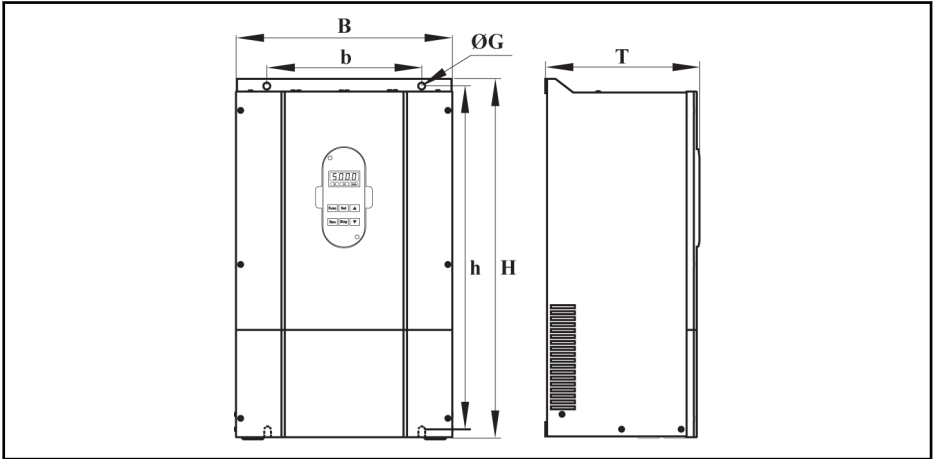**Fig. 1-2:** Frame 1

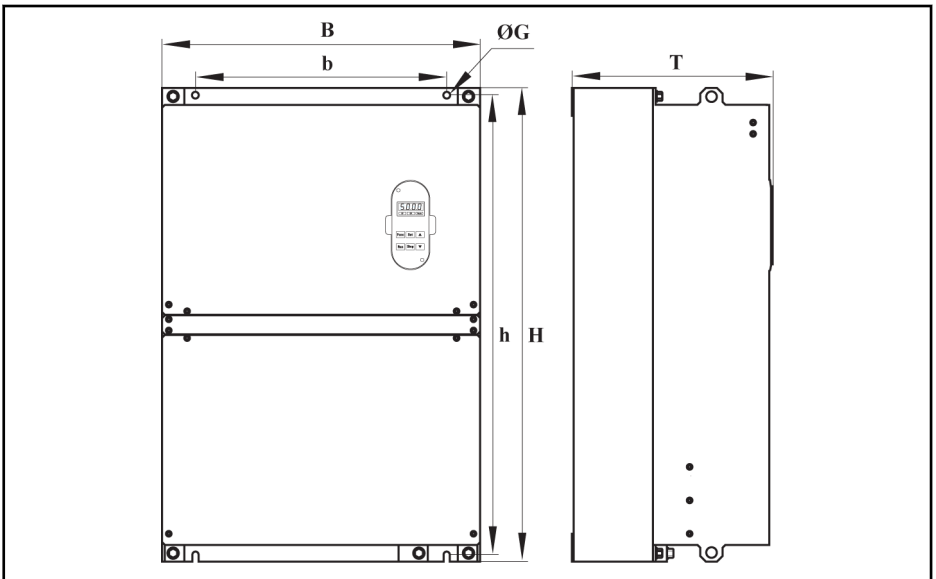**Fig. 1-3:** Frame 2, 3, 4

Fig. 1-4: Frame 5, 6

Fig. 1-5: Frame 7

2 Electric Installation

2.1 Cable Specifications

2.1.1 Connecting to the Mains

Depending on rating, the frequency converters are available in different sizes. For the device to function perfectly, flexible cables with corresponding wire end sleeves must be used during the electric installation. The fuses, cable cross-sections and tightening torques required for the mounting screws are listed below.

Input side				
International without USA / Canada				
Model	Nominal current of fuse in [A]	Installation mode B1 Cable size in [mm^2]	Installation mode B2 Cable size in [mm^2]	Installation mode E Cable size in [mm^2]
0K75	10	1.5	1	1
1K50	10	1.5	1	1
2K20	16	1.5	1	1
4K00	20	1.5	1.5	1.5
5K50	25	2.5	2.5	2.5
7K50	25	4	4	2.5
11K0	35	6	6	6
15K0	50	10	16	10
18K5	63	10	16	10
22K0	80	16	16	10
30K0	100	25	25	16
37K0	125	25	25	25
45K0	160	50	50	35
55K0	200	50	70 / 2x35	50
75K0	250	95 / 2x50	120 / 2x50	70 / 2x35
90K0	315	120 / 2x50	150 / 2x70	95 / 2x50
110K	350	150 / 2x70	240 / 2x95	120 / 2x70
132K	350	240 / 2x95	2x120	150 / 2x70
160K	450	2x120	–	240

Tab. 2-1: Recommended cable dimensions_input side_international without USA/Canada

1. Input side and output side: The dimensioning is based on the supply voltage of AC 3 x 380 V.

2. For screw torque information, please refer to the table below.

Input side				
	USA / Canada			Input PE
Model	Nominal current of fuse in [A]	Cable size in [AWG]	Screw torque for power cable terminals in [Nm / ib-in] (screw size)	Cable size in [mm²]	Torque in [Nm / ib-in] (screw size)
0K75	6	AWG14	1.8 (M4)	10	1.8 (M4)
1K50	10	AWG14	1.8 (M4)	10	1.8 (M4)
2K20	16	AWG14	1.8 (M4)	10	1.8 (M4)
4K0	25	AWG12	1.8 (M4)	10	1.8 (M4)
5K50	40	AWG10	1.8 (M4)	10	1.8 (M4)
7K50	40	AWG10	1.8 (M4)	10	1.8 (M4)
11K0	70	AWG8	2 to 2.8 (M5)	10	2 to 2.8 (M5)
15K0	80	AWG6	2 to 2.8 (M5)	10	2 to 2.8 (M5)
18K5	80	AWG6	4 to 5 (M6)	10	4 to 5 (M6)
22K0	80	AWG6*	4 to 5 (M6)	10	4 to 5 (M6)
30K0	100	2xAWG6	4 to 5 (M6)	16	4 to 5 (M6)
37K0	125	2xAWG6	4 to 5 (M6)	25	4 to 5 (M6)
45K0	150	AWG1	6 to 9 (M8)	35	6 to 9 (M8)
55K0	175	AWG1/0	6 to 9 (M8)	50	6 to 9 (M8)
75K0	225	AWG3/0 / 2xAWG1	15 to 20 (M10)	70 / 2x35	15 to 20 (M10)
90K0	300	250 kcmil / 2xAWG1/0	15 to 20 (M10)	95 / 2x50	15 to 20 (M10)
110K	300	2xAWG3/0	15 to 20 (M10)	120 / 2x70	15 to 20 (M10)
132K	2x250	2xAWG3/0	20 (M12)	150 / 2x70	15 to 20 (M10)
160K	2x300	2xAWG4/0	20 (M12)	240	15 to 20 (M10)

Tab. 2-2: Recommended cable dimensions_input side_USA/Canada

☞   *: For 22K0 frequency convertes, the AWG 6 cable is copper 75 ℃ and above only.

2.1.2 Connecting to the Motor

Output side				
Model	International without USA/Canada **Cable size in [mm²]**	USA / Canada **Cable size in [AWG]**	**Screw torque for power cable terminals in [Nm / ib-in] (screw size)**	Output PE	
				Cable size in [mm²]	**Torque in [Nm / ib-in] (screw size)**
0K75	1[(1)]	AWG14	1.8 (M4)	10	1.8 (M4)
1K50	1[(1)]	AWG14	1.8 (M4)	10	1.8 (M4)
2K20	1[(1)]	AWG14	1.8 (M4)	10	1.8 (M4)
4K00	1[(1)]	AWG12	1.8 (M4)	10	1.8 (M4)
5K50	1[(1)]	AWG10	1.8 (M4)	10	1.8 (M4)
7K50	2,5[(1)]	AWG10	1.8 (M4)	10	1.8 (M4)
11K0	6[(1)]	AWG8	2 to 2.8 (M5)	10	2 to 2.8 (M5)
15K0	6[(1)]	AWG6	2 to 2.8 (M5)	10	2 to 2.8 (M5)
18K5	10[(1)]	AWG6	4 to 5 (M6)	10	4 to 5 (M6)
22K0	10[(1)]	AWG6	4 to 5 (M6)	10	4 to 5 (M6)
30K0	16[(1)]	2xAWG6	4 to 5 (M6)	16	4 to 5 (M6)
37K0	25[(1)]	2xAWG6	4 to 5 (M6)	25	4 to 5 (M6)
45K0	35[(2)]	AWG1	6 to 9 (M8)	35	6 to 9 (M8)
55K0	35[(2)]	AWG1/0	6 to 9 (M8)	50	6 to 9 (M8)
75K0	70 / 2x 35[(2)]	AWG3/0 / 2xAWG1	15 to 20 (M10)	70 / 2x35	15 to 20 (M10)
90K0	95 / 2x 35[(2)]	250 kcmil / 2xAWG1/0	15 to 20 (M10)	95 / 2x50	15 to 20 (M10)
110K	120 / 2x50[(2)]	2xAWG3/0	15 to 20 (M10)	120 / 2x70	15 to 20 (M10)
132K	150 / 2x70[(1)]	2xAWG3/0	20 (M12)	150 / 2x70	15 to 20 (M10)
160K	240[(1)]	2xAWG4/0	20 (M12)	240	15 to 20 (M10)

Tab. 2-3: Recommended cable dimensions_output side

☞ [(1)] Installation Mode E
[(2)] Installation Mode B2

2.1.3 Signal Connection

The following requirements apply for the signal connection wiring:

- flexible cables with wire end sleeves
- cable cross-section: 0.3 to 1.0 mm^2
- cable length: max. 20 m
- analog inputs ±10 V, VR1, VR2, +I and GND: use shielded cables
- analog inputs +I and GND: to eliminate interference from external influences, connect +I and GND on the transducer with a 22 nF capacitor (50 V) and run the signal cable two or three times through a ferrite ring.
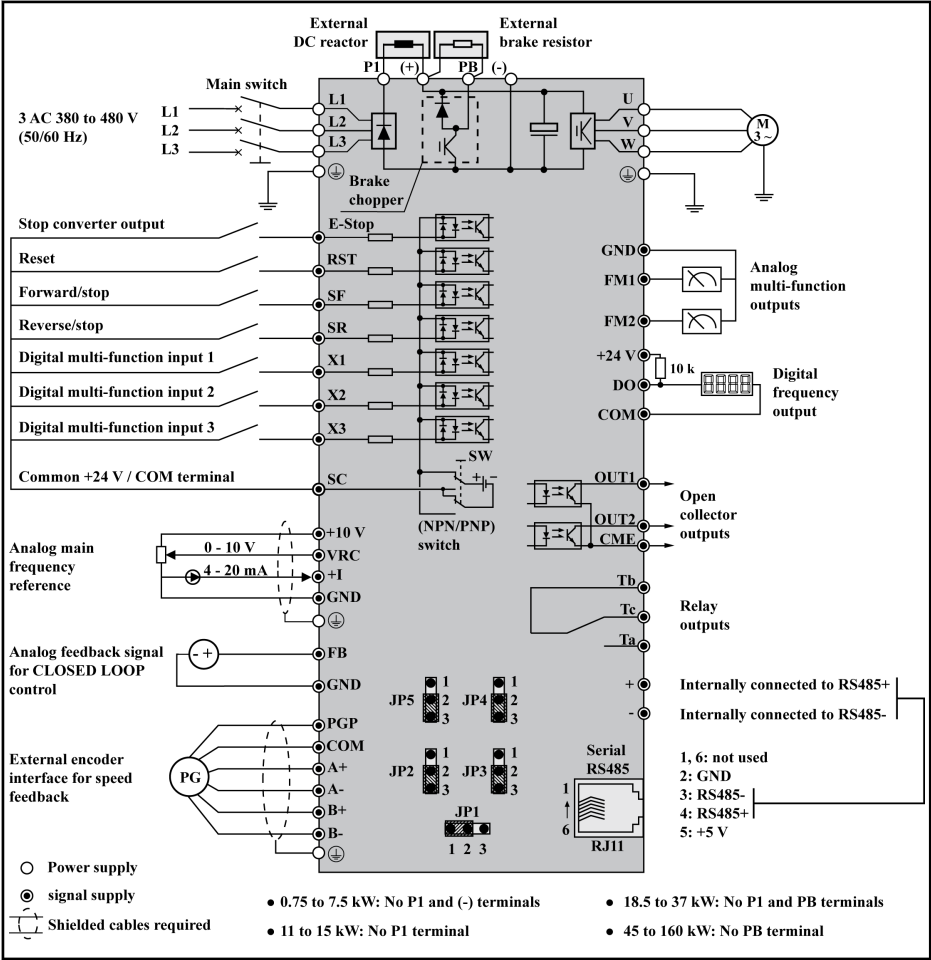
2.1.4 Overview of Electric Connections

Fig. 2-1: Block diagram

☞   Fe up to 15K0 have internal brake choppers.
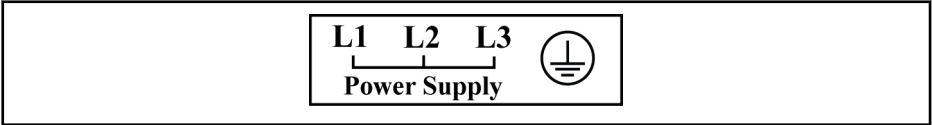
2.2 Power Terminals

The table below describes the symbols on the frequency converter's power connection terminals and their function.

| Terminal	Description
L1, L2, L3	Mains power supply inputs
U, V, W	Frequency converter outputs (to be connected to the motor)
PB	Reserved terminal for external brake resistor (applicable to 0K75 to 15K0 frequency converters)
P1, (+)	DC positive bus outputs
(–)	DC negative bus output
⏚	Grounding

Tab. 2-4: Power terminals description

Depending on size, the position and sequence of the power terminals on the individual frequency converter may differ. Refer to the graphics below for the exact connection terminal position and sequence.
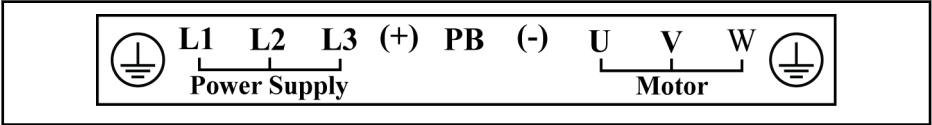
Applicable to 0K75 to 7K50

L1 L2 L3 ⏚
Power Supply

Fig. 2-2: Power terminals_Frame 1_Top

U   V   W PB (+)
Motor
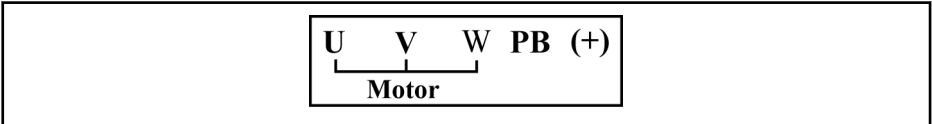
Fig. 2-3: Power terminals_Frame 1_Bottom

Applicable to 11K0 to 15K0

⏚ **L1   L2   L3 (+) PB (-) U   V   W** ⏚
Power Supply   Motor

Fig. 2-4: Power terminals_Frame 2
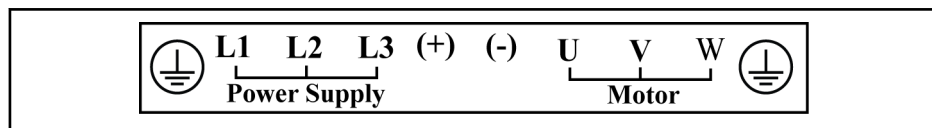
Applicable to 18K5 to 37K0

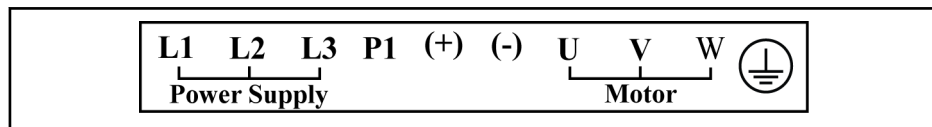**Fig. 2-5:** Power terminals_Size 3, 4

Applicable to 45K0 to 90K0

Fig. 2-6: Power terminals_Frame 5, 6
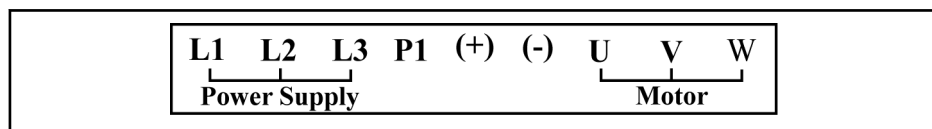
Applicable to 110K

Fig. 2-7: Power terminals_Frame 7 (110K)

Applicable to 132K to 160K

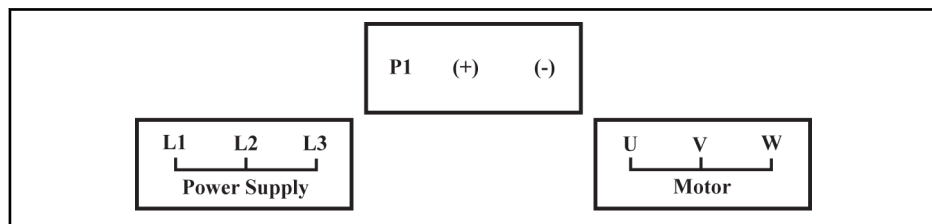**Fig. 2-8:** Power terminals_Frame 7 (132K, 160K)

1. For 11K0 to 160K, the main circuit terminals are on the bottom of the frequency converters.

2. For 45K0 to 160K, UL marked connectors and cables should be used for wiring of the terminal blocks. The connectors may be of crimp, ring or fork types or other similar types.

3. There are two grounding connections, one for the input side, the other for the output side.

2.3 Interface Connection for Signals

2.3.1 Jumper Wiring
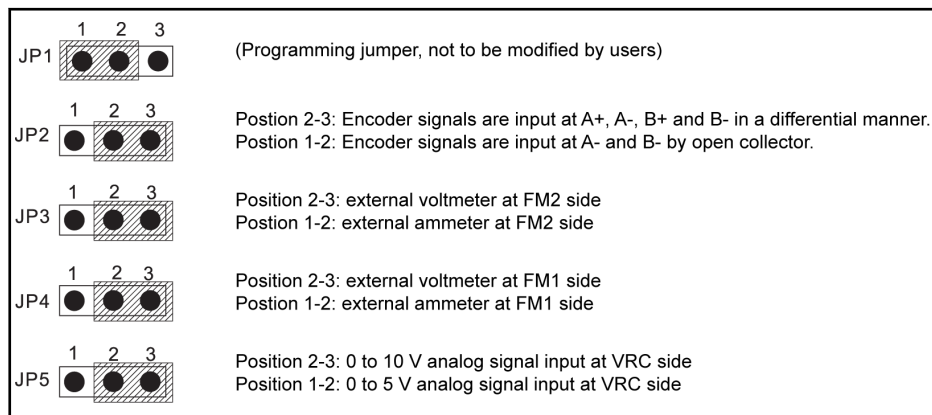
Fig. 2-9: Jumper description

☞ Shown above are factory defaults.

2.3.2 Communication Port
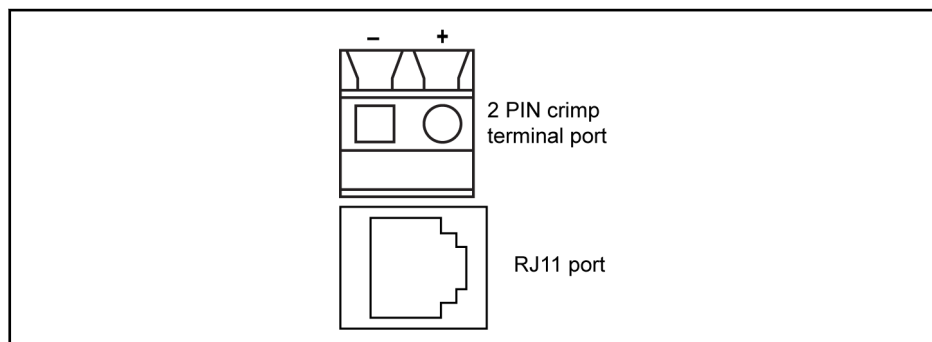
Fig. 2-10: RS485 communication port

☞ ● Crimp terminal wiring range: 22 – 12 AWG

● Crimp terminal wire type: 75 °C and above copper only

● Crimp terminal torque: 5 kgf-cm (4.3 in-ibf)

2.3.3 NPN/ PNP Mode Selection

Jumper SW
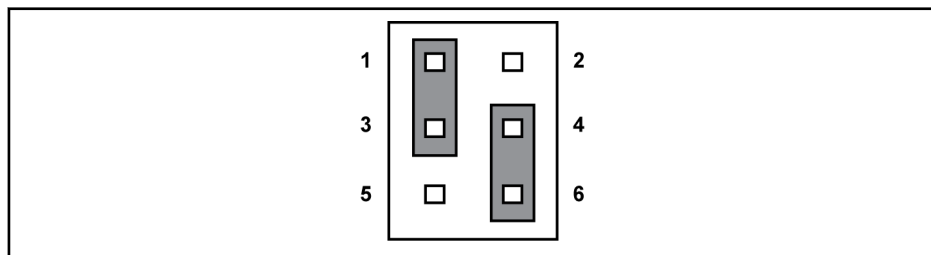
Fig. 2-11: NPN/PNP Jumper SW

☞ As shown in the figure above, the factory default setting of the jumper is NPN.

Jumper SW determines:

1. The internal 24 V power supply or an external 24 V power supply.
2. The inputs are activated by connection of 24 V to an input (PNP/ active input) or connection of 0 V to an input (NPN/ passive input).

2.3.4 Analog Input Terminal (+10 V, VRC, GND, +I)
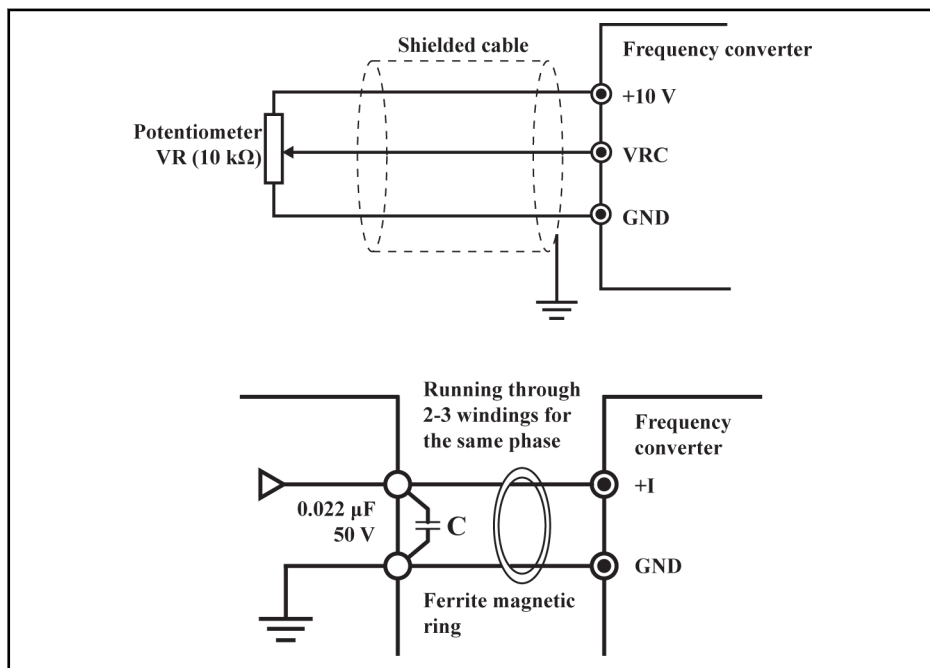
Fig. 2-12:   Analog input terminal

☞
1. For connection of low level analog signals, which are easily affected by external interference, the wiring length should be as short as possible (less than 20 m), shielded cables must be used.

2. Incorrect operation may occur due to interference on the analog signal. In such cases, connect a capacitor and ferrite core at the output side of the analog signal, as shown above.

2.3.5 Control Circuit Terminals

Control circuit terminals figure
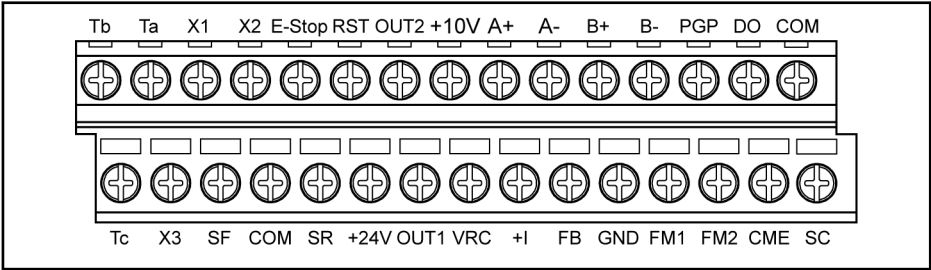
Fig. 2-13:   Control circuit terminals

☞   Applicable to 0K75 to 160K CPU board.

Control circuit terminals description

Terminal	Signal function	Description	Signal requirement
Digital inputs			
SF	Forward/stop	See parameters b00 and E38	Opto-electronic coupler isolated input, 24 VDC for external power supply NPN/PNP modes, see fig. 2-11 "NPN/PNP Jumper SW" on page 14 for details
SR	Reverse/stop	See parameters b00 and E38	
RST	Error reset	"Connected" for reset	
E-Stop	External abnormality input	[E32]=0: "Connected", coasting to stop [E32]=1, "Disconnected", coasting to stop	
X1 X2 X3	Multi-function inputs	See parameters b00, b34, b35, b45, E39, H07 and H23	
SC	Shared connection for digital signals	Shared connection for SF\SR\RST\E-Stop\X1-X3	
Analog inputs			
FB	Feedback input signal	Feedback signal, analog voltage input	Input voltage range: 0 to 5 V Input resistance: 100 kΩ Resolution: 1:1000
+10V	Power supply terminal for speed commands	Power supply for speed commands	10 V (max. current 10 mA)

Terminal	Signal function	Description	Signal requirement
VRC	Frequency commands	Analog voltage frequency command	JP5, position 2-3 Input voltage range: 0 to 10 V; Input resistance: 100 kΩ; Resolution: 1:2000 JP5, position 1-2 Input voltage range: 0 to 5 V; Input resistance: 50 kΩ; Resolution: 1:2000
+I		Analog current frequency feedback signal	Input current range: 4 to 20 mA; Input resistance: 165 Ω; Resolution: 1:1000
GND	Analog common terminal	Isolated from COM	–
Digital outputs			
OUT1	Open collector output 1	Programmable digital output with multiple functions. See parameters E16, E17 for details.	Open collector outputs isolated via opto-electronic couplers: Max. output voltage: +24 VDC Max. output current: 50 mA
OUT2	Open collector output 2		
CME	Common terminal for OUT1 and OUT2	For internal 24 V power supply: to be short circuited to the COM terminal; For external power supply: to be short circuited to the "earth" of the power supply.	
DO-COM	Pulse output	Programmable to be pulse output with multiple functions. See parameters E09 for details.	Open collector outputs isolated via opto-electronic couplers: Output frequency: depends on E10, max. 50.0 kHz; Max. output voltage: 24 VDC
Ta	Relay Ry output	Ta-Tb: N.O; Tb-Tc: N.C (Tb is the common terminal)	Contact transmitter capacity: 250 VAC, 3 A or lower 30 VDC, 3 A or lower
Tc			
Tb	Relay output common terminal	Programmable relay output with multiple functions. See parameter E18.	
+24 V	Anode 24 VDC	COM (Cathode)	–
Analog outputs			

Terminal	Signal function	Description	Signal requirement
FM1-GND	Analog multi- function output 1	Programmable analog output with multiple functions. See parameters E04 to E08 for details.	Output voltage/current settable via JP3, JP4 for FM1, FM2: Voltage signal range: 0/2 to 10 V Current signal range: 0/4 to 20 mA
FM2-GND	Analog multi- function output 2		
Encoder signal			
PGP-COM	Supply voltage non-break function	Power supply for the encoder	Max. output current: 100 mA
A+	Encoder signal A	JP2, position 2-3: select encoder differential inputs from A+, A-, B+ and B-; JP2, position 1-2: select open collector inputs from A-, B-.	Encoder voltage range for differential input: +8 to 24 V Max. input frequency: 200 kHz
A-			
B+	Encoder signal B		
B-			
Communication			
485+	Positive terminal for differential signal RS485	Standard 485 communication port. Use twisted pair or shielded cables. RJ11 port and 2 PIN crimp terminals are optional. Both connections are connected internally with the same 485 port (parallel mode).	
485-	Negative terminal for differential signal RS485		

Tab. 2-5: Control circuit terminals description

3 Parameter Settings

3.1 Operating Panel

The operating panel is at the center of the frequency converter and composed of two areas: display and keys. The display shows mode settings and state of the frequency converter. The keys allow the user to program the frequency converter.
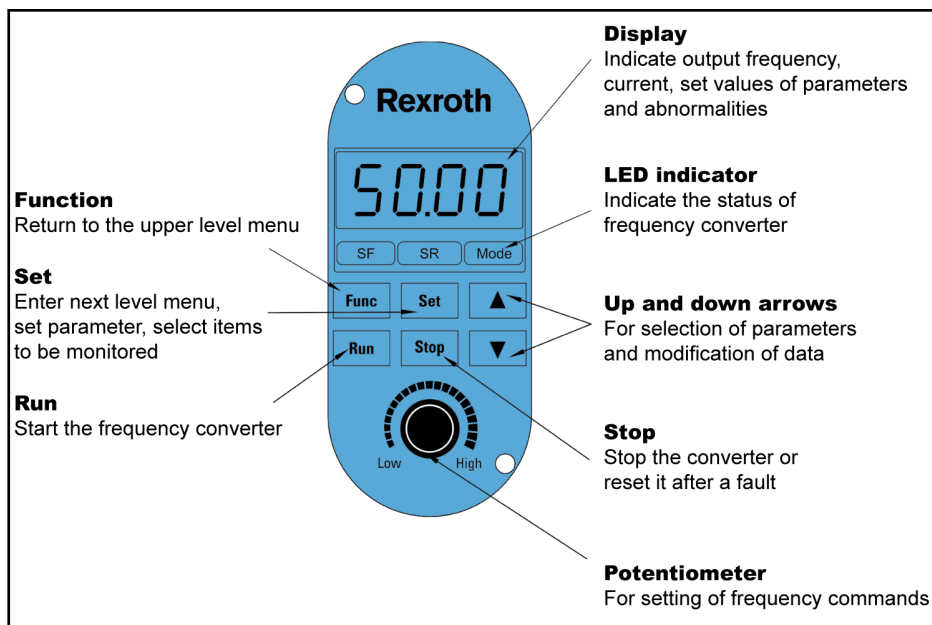
Fig. 3-1: Fe operating panel

☞ For frequency converters of 0K75 to 7K50, the potentiometer is configured as standard, while for frequency converters of 11K0 to 160K, no potentiometer is configured as standard.

3.2 Start-up

The diagram below shows the standard start-up procedure for the frequency converter.

- White boxes: check whether all the work listed has been performed correctly before beginning the start-up
- Light grey boxes: start-up (described on the following pages)
- Dark grey boxes: to prevent damage, proceed as is described after the start-up
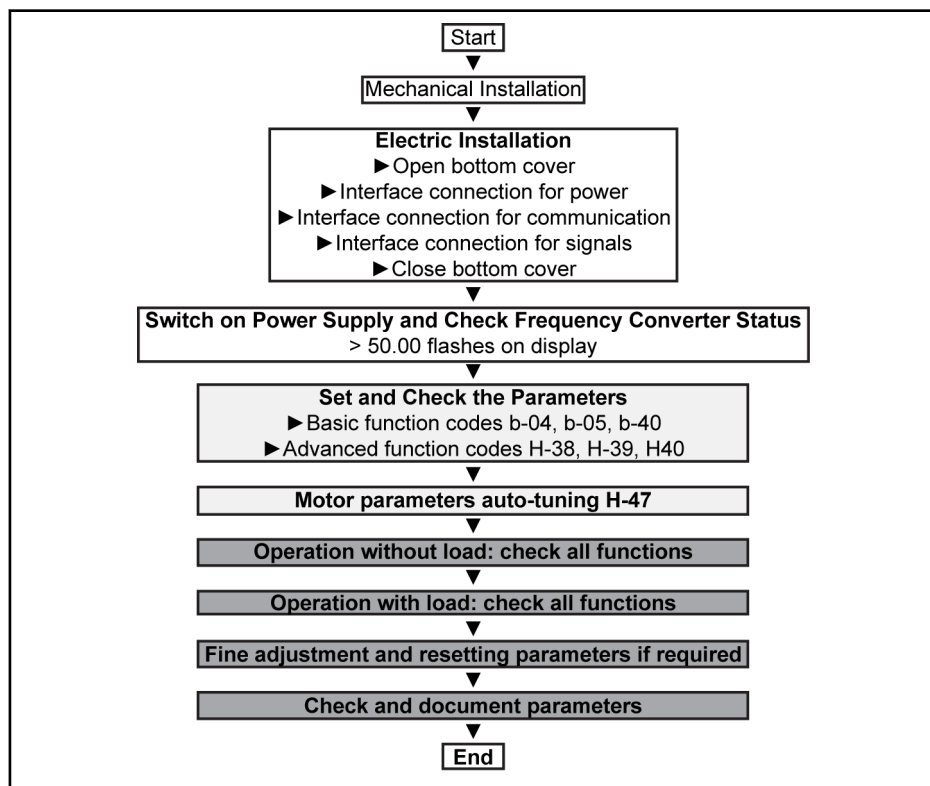
Fig. 3-2: Start-up procedure

3.3 Operating Descriptions
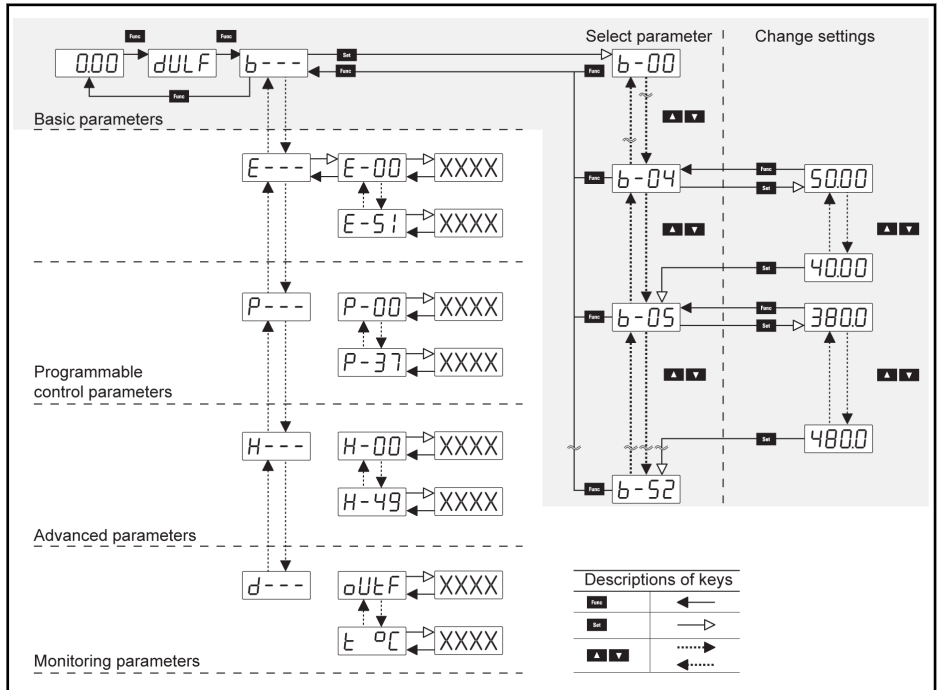
Fig. 3-3: Navigation and parameter settings

3.4 Parameters

3.4.1 Description of Attribute Symbols in Parameter Tables

Parameter attribute	Description
	Parameter setting can be modified when the frequency converter is in run mode.
●	Parameter setting cannot be modified when the frequency converter is in run mode.
	Parameter setting cannot be modified directly.

Tab. 3-1:   Parameter attributes and descriptions

☞
- Code: means function / parameter code, written in bxx, Exx, Pxx and Hxx.
- Value of function / parameter code: written in [bxx], [Exx], [Pxx] and [Hxx].
- Default: values that correspond to the factory default upon initialization at 50 Hz.
- Attrb.: means attribute.

3.4.2 Quick Start Parameters

Access & motor nameplate parameters

Code	Name	Setting range	Default	Attrb.
H39	Rated motor power	0.4 to 999.9 kW	Depends on model	●
H40	Rated motor current	0.1 to 999.9 A		●

Start-up parameters

Code	Name	Setting range	Default	Attrb.
b00	Set the source of control commands (option 1 and 3 have frequency command source)	0 to 7	0	●
b02	Set the source of frequency commands (5 types of sources)	0 to 12	1	●
b03	Highest frequency – HF	50.00 to 650.00 Hz	50.00 Hz	●
b04	Base frequency – BF	20.00 Hz to HF	50.00 Hz	●
b05	Base voltage – BV	400 V class: 240.0 to 480.0 V	380.0 V	●
b06	V/F curve mode	OFF; H-00 to H-15; P-00 to P-15	Depends on model	●
b16	Acceleration time	0.1 to 6500.0s		
b17	Deceleration time	0.1 to 6500.0s		
b32	Starting frequency	0.00 to 60.00 Hz	0.50 Hz	
b33	Starting holding time	0.0 to 10.0s	0.0s	

b00 setting range:

0: **Run/Stop** control with digital operating panel

1: External via control terminals, **Up/Down** control

2: External via control terminals (including multi-speed), while **Stop** key is activated

3: Logic control

4: External via control terminals (X3 is used to switch between internal/external sources of frequency command, while **Stop** key is activated)

5: External computer controls **Run/Stop**, while **Stop** key is activated

6: External computer controls **Run/Stop**, while **Stop** key is deactivated

7: External via control terminals (X1, X2 and X3 are used to switch between sources of frequency command, while **Stop** key is activated)

b02 setting range:

0: Set via the digital operating panel

1: Direct action of the digital operating panel's potentiometer Kv × (0 to 5 V)

2: Inverse action of the digital operating panel's potentiometer Kv × (5 to 0 V)

3: Direct action of external terminal Kv × (0 to 5 V)

4: Inverse action of external terminal Kv × (5 to 0 V)

5: Direct action of external terminal Kv × (0 to 10 V)

6: Inverse action of external terminal Kv × (10 to 0 V)

7: Direct action of external terminal Ki × (4 to 20 mA)

8: Inverse action of external terminal Ki × (20 to 4 mA)

9: External terminal Kv × (0 to 5 V) **+** Ki × (4 to 20 mA) or External terminal Kv × (0 to 10 V) **+** Ki × (4 to 20 mA)

10: VRC terminal Kv × (-10 to +10 V)

11: Kp × (Pulse frequency setting) + Kv × (VRC - 5 V) or Kp × (Pulse frequency setting) + Kv × (VRC - 2.5 V)

12: External computer frequency setting

b06 setting range:

OFF: User-defined V/F curve

H-00 to H-15: Constant torque characteristic

P-00 to P-15: Square descending torque characteristic

Input / Output terminal functions

Code	Name	Setting range	Default	Attrb.
b34	Stopping mode selection	0: OFF; 1: X1; 2: X2; 3: X3; 4: on	0	●
b35	Jogging mode selection	0: OFF; 1: X1; 2: X2; 3: X3	0	●
b45	Switching between local and remote control	0: OFF; 1: X1; 2: X2; 3: X3	0	●
E39	Self-holding function	0: OFF; 1: X1; 2: X2; 3: X3	0	●
H07	DC braking holding options	0: OFF; 1: X1; 2: X2; 3: X3; 4: ON	0	
H23	Energy saving mode	0: Disabled; 1: X1; 2: X2; 3: X3; 4: Automatic energy saving	0	●
H28	Process PI deactivation	0: OFF; 1: X1; 2: X2; 3: X3	0	●
E04	FM1 selection	0 to 4	0	
E05	FM1 gain setting	0.50 to 9.99	1.00	
E06	FM2 selection	0 to 4	1	
E07	FM2 gain setting	0.50 to 9.99	1.00	
E08	FM channel mode	0 to 3	0	
E09	Pulse output selection	0 to 3	2	
E10	Maximum output pulse frequency	0.1 to 50.0 kHz	10.0 kHz	
E11	Frequency level detection FDT1	0.00 to 650.00 Hz	50.00 Hz	
E12	FDT1 lagging frequency	0.00 to 650.00 Hz	1.00 Hz	
E13	Frequency level detection FDT2	0.00 to 650.00 Hz	25.00 Hz	
E14	FDT2 lagging frequency	0.00 to 650.00 Hz	1.00 Hz	
E15	Frequency arrival detection range	0.00 to 650.00 Hz	2.00 Hz	
E16	Open collector output OUT1	0 to 25	6	
E17	Open collector output OUT2		0	
E18	Relay Ry output selection		12	

E04, E06 setting range :

0: Output frequency

1: Output voltage

2: Output current

3: PI feedback signal

4: Set frequency

E08 setting range:

0: FM1 outputs 0 to 20 mA or 0 to 10 V, FM2 outputs 0 to 20 mA or 0 to 10 V

1: FM1 outputs 4 to 20 mA or 2 to 10 V, FM2 outputs 4 to 20 mA or 2 to 10 V

2: FM1 outputs 0 to 20 mA or 0 to 10 V, FM2 outputs 4 to 20 mA or 2 to 10 V

3: FM1 outputs 4 to 20 mA or 2 to 10 V, FM2 outputs 0 to 20 mA or 0 to 10 V

E09 setting range :

0: Output frequency

1: Output voltage

2: Output current

3: Set frequency

E16 to E18 setting range :

0: Running

1: Frequency level detection signal 1 (FDT1)

2: Frequency level detection signal 2 (FDT2)

3: Frequency arrival signal (FAR)

4: Reserved

5: Under voltage

6: Overload (O.L.)

7: Reserved

8: Zero speed (lower than starting frequency)

9: E-Stop

10: Low voltage

11: No trip action

12: Fault

13: Programmable program running

14: Programmable program run

15: Run for one stage

16: Over current stall

17: Over voltage stall

18: In forward rotation command indication

19: In reverse rotation command indication

20: Zero speed (incl. stop)

21: Being braked

22: Accelerating

23: Decelerating

24: Fan action

25: Reserved

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Fault message and diagnosis

Code	Name	Setting range	Default	Attrb.
E45	Current fault record			
E46	Last fault record	0 to 15	0	
E47	Last 2 fault records			
E48	Last 3 fault records			
b39	Data protection options and initialization	0 to 4	0	●

0: No fault record

1: O.C.-1, over current at constant speed

2: O.C.-2, over current during acceleration

3: O.C.-3, over current during deceleration

4: O.E.-1, over voltage at constant speed

5: O.E.-2, over voltage during acceleration

6: O.E.-3, over voltage during deceleration

7: O.L., motor overload

8: O.H., frequency converter overheat

9: d.r., drive protection

10: CPU-, EMI

11: IPH.L., input phase loss

12: oPH.L., output phase loss

13: E.-St., stopping by external abnormality command

14: O.T., motor overheat

15: CPUE, EMI

b39 setting range:

0: All parameters are readable and rewritable

1: All parameters are read-only except b01 and b39

2: Initialization to factory defaults at 50 Hz*

3: Initialization to factory defaults at 60 Hz

4: Clear all fault records

☞ *: Press and hold ▲ key for 2 seconds to change b39 from 1 to 2, 3 or 4.

4 Fault Indication

The frequency converter can record the reasons of the last 4 faults and can display them after resetting from faults.

Fault code	Fault name	Possible reason	Solution
O.C.-1	Over current at constant speed	Excessively reduced acceleration/ deceleration time	Increase acceleration/ deceleration time
		Load short circuit or sudden changes in load	Check the load
		Low grid voltage	Check input power supply
		A special motor or a motor larger than the maximum allowable capacity	Use a frequency converter with suitable power
O.C.-2	Over current during acceleration	Too short acceleration time	Increase acceleration time
		Improper V/F curve	Enable automatic torque increasing or manually adjust V/F curve settings
		The frequency converter power is too low	Select a frequency converter with higher power
O.C.-3	Over current during deceleration	Too short deceleration time	Increase deceleration time
		Large load inertia torque or potential load	Add an appropriate dynamic brake chopper
		The frequency converter power is too low	Select a frequency converter with higher power
O.E.-1	Over voltage at constant speed	Too high input voltage of power supply	Keep the input voltage of power supply within the specified range
		Excessively reduced acceleration/ deceleration time	Increase acceleration/ deceleration time
		Abnormality in load	Check the load
O.E.-2	Over voltage during acceleration	Abnormality in input voltage of power supply	Check input power supply
		Abnormality in load	Check the load
O.E.-3	Over voltage during deceleration	Too large moment of inertia of load	Increase the deceleration time to suit the load inertia, or purchase a dynamic brake chopper

Fault code	Fault name	Possible reason	Solution
O.L.	Motor overload	Too large load, too short acceleration/ deceleration time or cycle	Adjust the load, acceleration/ deceleration time or cycle; or increase the frequency converter capacity
		Improper V/F characteristic curve settings	Adjust V/F curve settings
		Improper setting of electronic thermal relay	Correctly set the parameters of electronic thermal relay
O.H.	frequency converter overheat	Fan failure	Check if fan works normally
		Too high ambient temperature	Lower the ambient temperature
		Ventilation outlet obstructed	Clear dust and foreign matters at ventilation outlet
d.r.	Drive protection	Damaged power component	Replace power component and seek technical support
		Incorrect operation of drive circuit protection	Remove interference and seek technical support
CPU-	EMI	CPU incorrect operation due to external interference	Remove nearby interference or other EMI
IPH.L	Phase loss at input side	Phase loss of the frequency converter's 3-phase input power supply	Check 3-phase input power supply or seek technical support
oPH.L	Phase loss at output side	Open wire or phase loss of frequency converter's 3-phase output power supply (severe asymmetry of the 3-phase's loads)	Check frequency converter's 3-phase wiring (or symmetry of loads)
–	Motor fails to start	Abnormal power supply voltage	Check input power supply
		External wiring between control terminal SF or SR is disconnected	Check external wiring between control terminal SF or SR
		Improper parameter setting	Check parameter setting
–	Motor cannot run at different speeds	The highest frequency is too low	Check the highest frequency
		Improper frequency setting mode	Confirm frequency setting mode
–	Motor stalls during acceleration	Too short acceleration time	Increase acceleration time
		Too large inertia of motor and load	Adjust acceleration time

Fault code	Fault name	Possible reason	Solution
O.T.	Motor over heat	Improper V/F curve	Adjust V/F curve settings
		Continuous running at low speed	Use a special motor if it is necessary to run at low speed for a long time
		Too large load	Check the load
CPUE	EMI	CPU incorrect operation due to internal interference or damage	Remove nearby interference or other EMI

Tab. 4-1:   Fault types and solutions

Notes

Rexroth
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