

Variable speed drives for asynchronous motors

## **Frequency inverter ER32**

### ***Short programming manual***

Retain for future use!



***BLEMO® Frequenzumrichter***

Siemensstraße 4

D-63110 Rodgau

Tel.: 06106 / 82 95-0

Fax: 06106 / 82 95-20

[www.blemo.com](http://www.blemo.com)

[info@blemo.com](mailto:info@blemo.com)

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# Important information

## WARNING

Please read these instructions carefully and examine the device in order to familiarize yourself with it prior to installation, operation or maintenance. The specific messages below can appear in the documentation or on the device. They warn of potential dangers or draw your attention to information that can clarify or simplify a procedure.



This symbol on a hazard or warning label indicates a potential risk of electrocution, which can result in bodily harm in the event of non-compliance with the accompanying instructions.



This symbol indicates a safety hazard. It warns of the potential risk of physical injury. You must observe all safety instructions accompanied by this symbol in order to avoid situations that can result in serious physical injury or even death.

### DANGER

DANGER indicates a dangerous situation that **will** result in death, serious physical injury or equipment damage.

### WARNING

WARNING indicates a dangerous situation that **can** result in death, serious physical injury or equipment damage.

### CAUTION

CAUTION indicates a potentially dangerous situation that **might possibly** result in bodily harm or equipment damage.

## IMPORTANT NOTE

Electrical equipment must only be serviced by qualified personnel. BLEMO will not accept any responsibility for consequences associated with the use of this document. This document must not be used as a training guide for beginners.

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# Before you begin

Read and understand these instructions before performing any procedure on this drive.

## **⚠ DANGER**

### **HAZARDOUS VOLTAGE**

- Read and understand this manual before installing or operating the ER32 drive. Installation, adjustment, repair, and maintenance must be performed by qualified personnel.
- The user is responsible for compliance with all international and national electrical standards in force concerning protective grounding of all equipment.
- Many parts of this variable speed drive, including the printed circuit boards, operate at the line voltage. **DO NOT TOUCH.** Use only electrically insulated tools.
- **DO NOT** touch unshielded components or terminal strip screw connections with voltage present.
- **DO NOT** short across terminals PA and PC or across the DC bus capacitors.
- Install and close all the covers before applying power or starting and stopping the drive.
- Before servicing the variable speed drive
  - Disconnect all power.
  - Place a "DO NOT TURN ON" label on the variable speed drive disconnect.
  - Lock the disconnect in the open position.
- Disconnect all power including external control power that may be present before servicing the drive. Wait for the charging LED to go off. **WAIT 10 MINUTES** to allow the DC bus capacitors to discharge. Then follow the DC bus voltage measurement procedure on page [49](#) to verify that the DC voltage is less than 45 V. The drive LEDs are not accurate indicators of the absence of DC bus voltage.

**Failure to follow these instructions will result in death, serious physical injury or equipment damage.**

## **⚠ CAUTION**

### **IMPROPER DRIVE OPERATION**

- If the drive is not switched on for a long period, the performance of its electrolytic capacitors will be reduced.
- If it is stopped for a prolonged period, turn the drive on every two years for at least 5 hours to restore the performance of the capacitors, then check its operation. It is recommended that the drive is not connected directly to the line voltage. The voltage should be increased gradually using an adjustable AC source.

**Failure to follow this instruction can result in physical injury and/or equipment damage.**

# Steps for setting up the drive

## - 1 Take delivery of the drive

- Check that the catalog number printed on the label is the same as that on the purchase order.
- Remove the ER32 from its packaging and check that it has not been damaged in transit.

## - 2 Check the line voltage.

- Check that the line voltage is compatible with the voltage range of the drive.

## - 3 Mount the drive (page 47).

- Mount the drive in accordance with the instructions in this document.
- Install any internal and external options.

## - 4 Wire the drive (page 50).

- Connect the motor, ensuring that its connections correspond to the voltage.
- Connect the line supply, after making sure that it is turned off.
- Connect the control.
- Connect the speed reference.

## - 5 Power up without run command.

## - 6 Mount the drive (page 62).

- Speed variation range
- Motor thermal protection
- Motor frequency if not equal to 50 Hz
- Motor voltage if not the same as that of the drive
- If the motor's power rating is not the same as that of the drive

## - 7 Start.

**Steps 1 to 4  
must be  
performed with  
the power off.**

### Tip:

- Perform an auto-tuning operation to optimize performance.



**Note: Check that the wiring of the drive is compatible with its configuration.**

# Preliminary recommendations

## Handling and storage

To protect the drive prior to installation, handle and store the device in its packaging. Ensure that the ambient conditions are acceptable.

### ⚠ WARNING

#### DAMAGED PACKAGING

If the packaging appears damaged, it can be dangerous to open and handle it. Take precautions against all risks when performing this operation.

**Failure to follow this instruction can result in death, serious physical injury or equipment damage.**

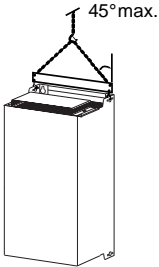
### ⚠ WARNING

#### DAMAGED EQUIPMENT

Do not operate or install any drive that appears damaged.

**Failure to follow this instruction can result in death, serious physical injury or equipment damage.**

## Handling on installation



ER32 drives up to ratings ER32-7.5/4G can be removed from their packaging and installed without a handling device.

A hoist must be used for higher ratings; for this reason they are fitted with handling "lugs". The precautions described below must be observed.

## Recommendations

### ⚠ CAUTION

#### INCOMPATIBLE LINE VOLTAGE

Before turning on and configuring the drive, ensure that the line voltage is compatible with the supply voltage range shown on the nameplate. Before powering up and configuring the drive, ensure that the line voltage is compatible with the supply voltage range shown on the drive nameplate. The drive may be damaged if the line voltage is not compatible.

**Failure to follow this instruction can result in physical injury and/or equipment damage.**

### ⚠ DANGER

#### UNINTENDED EQUIPMENT OPERATION

Before turning on the drive or on exiting the configuration menus, check that the inputs assigned to the run command are deactivated (at state 0) since they can cause the motor to start immediately.

**Failure to follow these instructions will result in death, serious physical injury or equipment damage.**

# Drive references

## Three-phase supply voltage: 380...480 V 50/60 Hz

### Drives with an integrated EMC filter

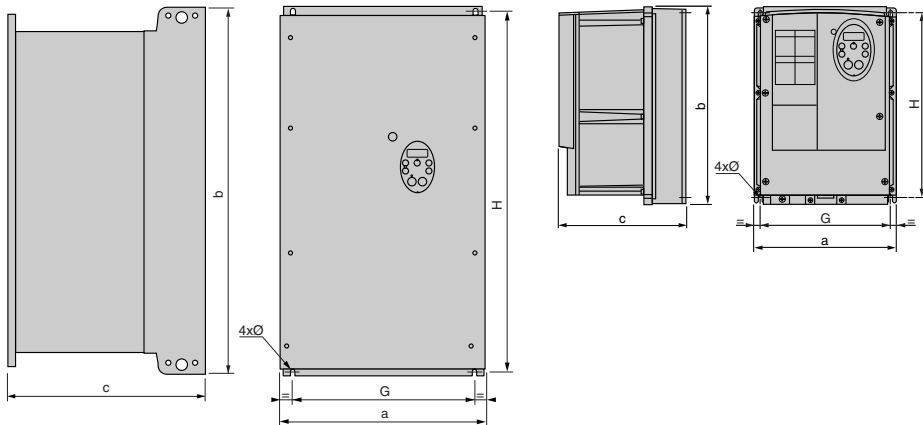
Motor		Line				ER32		Reference
Power indicated on plate (1)		Line current (2)		Apparent power	Maximum prospective line Isc	Max. continuous rated current (1)	Max. transient current for 60 s	
kW	HP	380 V	480 V	380 V		380 V/460 V		
0.75	1	1.7	1.4	1.6	5	2.2	2.4	ER32-0.75/4G
1.5	2	3.2	2.5	2.8	5	3.7	4	ER32-1.5/4G
2.2	3	4.6	3.6	3.9	5	5.1	5.6	ER32-2.2/4G
3	–	6.2	4.9	5.5	5	7.2	7.9	ER32-3.0/4G
4	5	8.1	6.4	6.9	5	9.1	10	ER32-4.0/4G
5.5	7.5	10.9	8.6	9.1	22	12	13.2	ER32-5.5/4G
7.5	10	14.7	11.7	12.2	22	16	17.6	ER32-7.5/4G
11	15	21.2	16.9	17.1	22	22.5	24.8	ER32-11.0/4G
15	20	28.4	22.6	23.2	22	30.5	33.6	ER32-15.0/4G
18.5	25	34.9	27.8	28.2	22	37	40.7	ER32-18.5/4G
22	30	41.6	33.1	33.3	22	43.5	47.9	ER32-22.0/4G
30	40	56.7	44.7	44.6	22	58.5	64.4	ER32-30.0/4G
37	50	68.9	54.4	52	22	79	86.9	ER32-37.0/4G
45	60	83.8	65.9	61.9	22	94	103.4	ER32-45.0/4G
55	75	102.7	89	76.3	22	116	127.6	ER32-55.0/4G
75	100	141.8	111.3	105.3	22	160	176	ER32-75.0/4G

(1) These values are given for a rated switching frequency of 12 kHz up to ER32-15.0/4G or 8 kHz for ER32-18.5/4G to -75.0/4G, used in continuous operation.

The switching frequency is adjustable from 6 to 16 kHz for all ratings. Above 8 or 12 kHz, depending on the rating, the drive will reduce the switching frequency automatically in the event of excessive temperature rise. For continuous operation above the rated switching frequency, derate the rated drive current.

(2) Typical value for the indicated motor power and for the maximum prospective line Isc.

# Dimensions



ER32-	a mm (in.)	b mm (in.)	c mm (in.)	G mm (in.)	H mm (in.)	Ø mm (in.)	Weight class A kg (lb.)	Weight class B kg (lb.)
<b>0.75/4G, 1.5/4G</b>	215 (8.46)	297 (11.69)	192 (7.56)	197 (7.75)	277 (10.90)	5.5 (0.22)	7 (15.43)	7.5 (16.53)
<b>2.2/4G</b>	230 (9.05)	340 (13.38)	208 (8.19)	212 (8.35)	318 (12.52)	5.5 (0.22)	7 (15.43)	7.5 (16.53)
<b>3.0...5.5/4G</b>	230 (9.05)	340 (13.38)	208 (8.19)	212 (8.35)	318 (12.52)	5.5 (0.22)	9.65 (21.26)	10.55 (23.25)
<b>7.5/4G</b>	230 (9.05)	340 (13.38)	208 (8.19)	212 (8.35)	318 (12.52)	5.5 (0.22)	10.95 (24.13)	11.85 (26.12)
<b>11.0/4G, 15.0/4G</b>	290 (11.41)	560 (22.05)	315 (12.40)	250 (9.84)	544 (21.42)	6 (0.24)	30.3 (66.78)	36.5 (80.45)
<b>18.5/4G</b>	310 (12.20)	665 (26.18)	315 (12.40)	270 (10.62)	650 (25.59)	6 (0.24)	37.4 (82.43)	45 (99.18)
<b>22.0/4G, 30.0/4G</b>	284 (11.18)	720 (28.35)	315 (12.40)	245 (9.64)	700 (27.56)	7 (0.27)	49.5 (109.10)	58.5 (128.93)
<b>37.0/4G</b>	284 (11.18)	880 (34.34)	343 (13.50)	245 (9.64)	860 (33.86)	7 (0.27)	57.4 (126.5)	77.4 (171)
<b>45.0/4G</b>	284 (11.18)	880 (34.34)	343 (13.50)	245 (9.64)	860 (33.86)	7 (0.27)	57.4 (126.5)	77.4 (171)
<b>55.0/4G</b>	362 (14.25)	1000 (39.37)	364 (14.33)	300 (11.81)	975 (38.39)	9 (0.35)	61.9 (136.5)	88.4 (195)
<b>75.0/4G</b>	362 (14.25)	1000 (39.37)	364 (14.33)	300 (11.81)	975 (38.39)	9 (0.35)	61.9 (136.5)	88.4 (195)



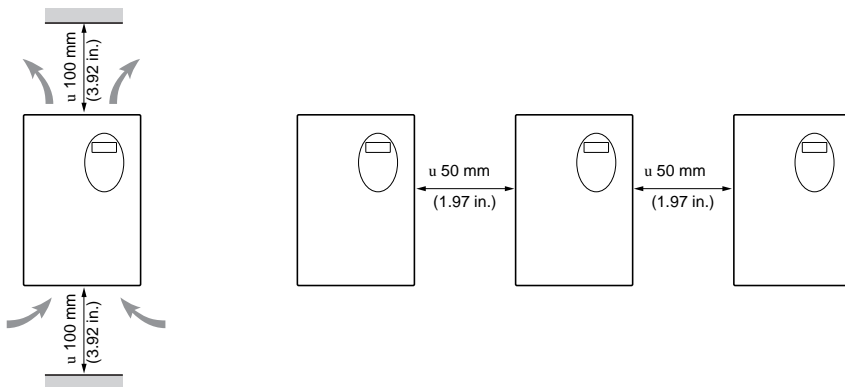
# Installation

## Installation recommendations

Depending on the conditions in which the drive is to be used, its installation will require certain precautions and the use of appropriate accessories.

Install the unit vertically:

- Do not place it close to heating elements.
- Leave sufficient free space to ensure that the air required for cooling purposes can circulate from the bottom to the top of the unit.

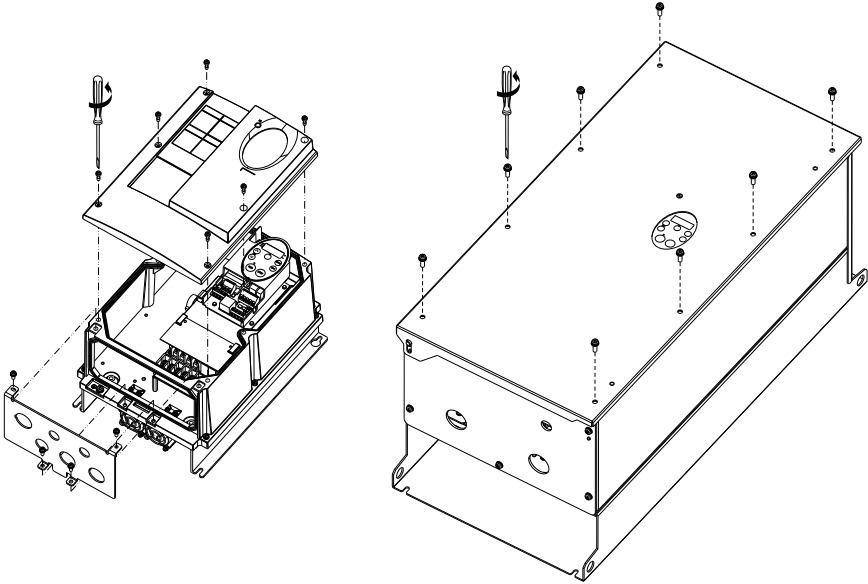


**Operating temperature:** 40°C max.

**Derating curves** based on an ambient temperature > 40°C and switching frequency.

# Opening the drive

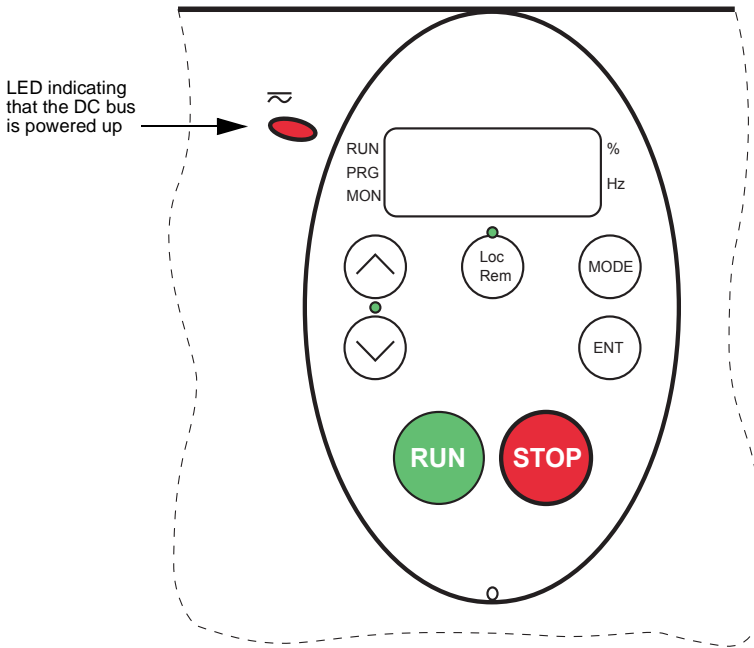
To open the drive, remove the front panel as shown in the two examples below.



ENGLISH

# Position of the capacitor charging LED

Before working on the drive, switch it off, wait until the capacitor charging LED has gone out, then measure the DC bus voltage.



## Procedure for measuring the DC bus voltage

### ⚠ DANGER

#### HAZARDOUS VOLTAGE

Read and understand the instructions on page 42 before performing this procedure.

**Failure to follow this instruction will result in death, serious physical injury or equipment damage.**

The DC bus voltage can exceed 1000 V c. Use a properly rated voltage sensing device when performing this procedure. To measure the DC bus voltage:

- 1 Disconnect the drive power supply.
- 2 WAIT 10 MINUTES to allow the DC bus capacitors to discharge.
- 3 Measure the voltage of the DC bus between the PA/+ and PC/- terminals to check whether the voltage is less than 45 V c.
- 4 If the DC bus capacitors have not discharged completely, contact your local BLEMO representative (do not repair or operate the drive).

# Wiring recommendations

## Power

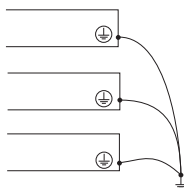
The drive must be connected to the protective ground. To comply with regulations in force concerning high leakage currents (above 3.5 mA), use at least a 10 mm<sup>2</sup> (AWG 6) protective conductor or 2 protective conductors with the same cross-section as the power section AC supply conductors.

### ▲ DANGER

#### RISK OF HAZARDOUS VOLTAGE

Ground equipment using the provided ground connecting point as shown in the figure below. The drive panel must be properly grounded before power is applied.

**Failure to follow these instructions will result in death, serious physical injury or equipment damage.**



Check whether the resistance to the protective ground is one ohm or less.  
Connect a number of variable speed drives to the protective ground, as shown opposite.  
Do not lay protective grounding cables in a loop or in series.

### ▲ WARNING

#### IMPROPER WIRING PRACTICES

- The ER32 drive will be damaged if input line voltage is applied to the output terminals (U/T1, V/T2, W/T3).
- Check the power connections before powering up the ER32 drive.
- If replacing another drive, verify that all wiring connections to the ER32 drive comply with all wiring instructions in this manual.

**Failure to follow this instruction can result in death, serious physical injury or equipment damage.**

When upstream protection by means of a "residual current device" is required by the installation standards, a type A device should be used for single phase drives and type B for 3-phase drives. Choose a suitable model integrating:

- HF current filtering
- A time delay to prevent tripping caused by the load from stray capacitance on power-up. The time delay is not possible for 30 mA devices. In this case, choose devices with immunity against nuisance tripping, for example "residual current devices" with reinforced immunity from the **s.i** range (Merlin Gerin brand).

If the installation includes several drives, provide one "residual current device" per drive.

### ▲ WARNING

#### RISK OF INAPPROPRIATE OVERCURRENTS

- Overcurrent protective devices must be properly coordinated.
- The Canadian Electricity Code and the National Electrical Code require branch circuit protection. Use the fuses recommended on the drive nameplate to achieve published short-circuit current ratings.
- Do not connect the drive to a power feeder whose short-circuit capacity exceeds the drive short-circuit current rating listed on the drive nameplate.

**Failure to follow this instruction can result in death, serious physical injury or equipment damage.**

# Power terminals

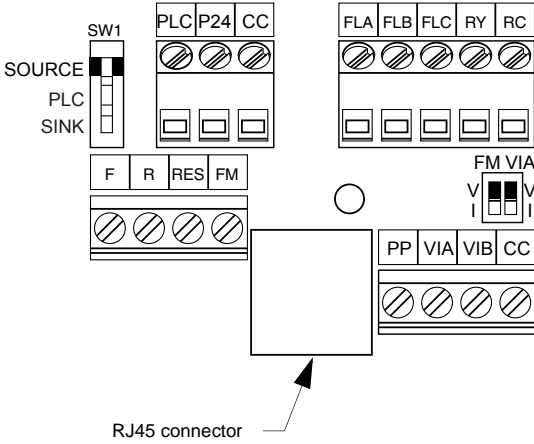
## Functions of power terminals

Terminals	Function
t	Protective ground connection terminal
R/L1 - S/L2 - T/L3	Power section line supply
U/T1 - V/T2 - W/T3	Outputs to the motor
PO	Do not use
PA/+	DC bus + polarity
PB	Do not use
PC/-	DC bus - polarity

The PO, PA/+, PB, and PC/- terminals can only be used to measure the DC bus voltage.

# Control terminals

The control card is the same for all ratings.



Switch factory settings:

- SW1: SOURCE side (positive)
- FM: V side
- VIA: V side

Maximum wire size: 2.5 mm<sup>2</sup>/AWG 14  
Tightening torque: 0.6 Nm (5.3 lb.in)

## **⚠ WARNING**

### **RISK OF IMPROPER DRIVE OPERATION**

The logic input type selector switch is set to the source position on delivery. Please consult the ER32 Drive User's Manual before changing the position of the switch.

**Failure to follow these instructions can result in death or serious injury.**

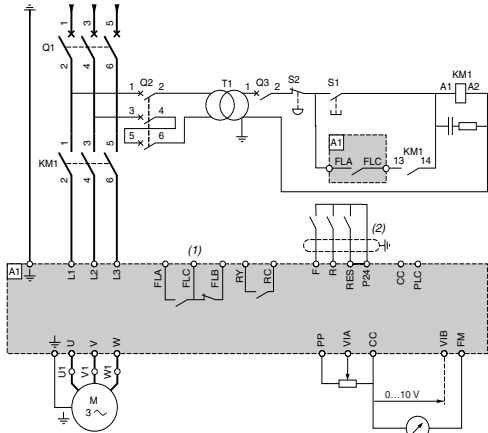
# Control terminals

## Electrical characteristics

Terminals	Function	Characteristics
PLC	External power supply input	+24 V input for external power supply to logic inputs (if there is one). Max. permissible 50 V
P24	Internal supply available	Short-circuit and overload protection: <ul style="list-style-type: none"> <li>1 x 24 V DC supply (min. 21 V, max. 27 V), maximum current 50 mA.</li> </ul>
DC	Common	0 V common (2 terminals)
FLA, FLB, FLC	Configurable relay outputs	1 relay logic output, one "N/C" contact and one "N/O" contact with common point Minimum switching capacity: 3 mA for 24 V DC Maximum switching capacity: <ul style="list-style-type: none"> <li>on resistive load (<math>\cos \varphi = 1</math>): 1 A for 250 V AC or 30 V DC</li> <li>on inductive load (<math>\cos \varphi = 0.4</math> and L/R = 7 ms): 0.5 A for 250 V AC or 30 V DC</li> </ul> Max. response time: 7 ms $\pm$ 0.5 ms Electrical service life: 100,000 operations
RY, RC		1 relay logic output, one "N/O" contact Minimum switching capacity: 3 mA for 24 V DC Maximum switching capacity: <ul style="list-style-type: none"> <li>on resistive load (<math>\cos \varphi = 1</math>): 1 A for 250 V AC or 30 V DC</li> <li>on inductive load (<math>\cos \varphi = 0.4</math> and L/R = 7 ms): 0.5 A for 250 V AC or 30 V DC</li> </ul> Max. response time: 7 ms $\pm$ 0.5 ms Electrical service life: 100,000 operations
F R RES	Logic inputs	3 programmable logic inputs, 24 V DC, compatible with level 1 PLC, IEC 65A-68 standard Impedance: 3.5 k $\Omega$ Maximum voltage: 30 V Max. sampling time: 2 ms $\pm$ 0.5 ms Multiple assignment makes it possible to configure several functions on one input
		Positive logic (Source): State 0 if 5 V or logic input not wired, state 1 if 11 V
		Negative logic (Sink): State 0 if 16 V or logic input not wired, state 1 if 10 V
FM	Analog output	1 switch-configurable voltage or current analog output: <ul style="list-style-type: none"> <li>Voltage analog output 0...10 V<sub>c</sub>, minimum load impedance 470 <math>\Omega</math></li> <li>Current analog output X-Y mA by programming X and Y from 0 to 20 mA, maximum load impedance 500 <math>\Omega</math></li> </ul> Max. sampling time: 2 ms $\pm$ 0.5 ms Resolution: 10 bits Accuracy: $\pm$ 1% for a temperature variation of 60°C Linearity: $\pm$ 0.2%
PP	Internal supply available	Short-circuit and overload protection: <ul style="list-style-type: none"> <li>1 x 10.5 V DC <math>\pm</math> 5% supply for the reference potentiometer (1 to 10 k<math>\Omega</math>), maximum current 10 mA</li> </ul>
VIA	Analog inputs	Switch-configurable current or voltage analog input: <ul style="list-style-type: none"> <li>Voltage analog input 0...10 V DC, impedance 30 k<math>\Omega</math> (max. safe voltage 24 V)</li> <li>Current analog input X-Y mA by programming X and Y from 0 to 20 mA, with impedance 242 <math>\Omega</math></li> </ul> Max. sampling time: 2 ms $\pm$ 0.5 ms Resolution: 11 bits Accuracy: $\pm$ 0,6% for a temperature variation of 60°C Linearity: $\pm$ 0,15% of the maximum value This analog input can also be configured as a logic input.
VIB		Voltage analog input, configurable as an analog input or as a PTC probe input. Voltage analog input: <ul style="list-style-type: none"> <li>0...10 V DC, impedance 30 k<math>\Omega</math> (max. safe voltage 24 V)</li> <li>Max. sampling time: 2 ms <math>\pm</math> 0.5 ms</li> <li>Resolution: 11 bits</li> <li>Accuracy: <math>\pm</math> 0,6% for a temperature variation of 60°C</li> <li>Linearity: <math>\pm</math> 0,15% of the maximum value</li> </ul> PTC probe input: <ul style="list-style-type: none"> <li>6 probes max. mounted in series</li> <li>Rated value &lt; 1.5 k<math>\Omega</math></li> <li>Trip resistance 3 k<math>\Omega</math>, reset value 1.8 k<math>\Omega</math></li> <li>Short-circuit protection &lt; 50 <math>\Omega</math></li> </ul>

# Connection diagrams

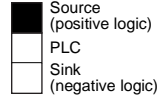
## 3-phase power supply



## Switches (factory settings)

Voltage/current selection for analog I/O (FM and VIA)

Selection of logic type



**Note:** All terminals are located at the bottom of the drive. Install interference suppressors on all inductive circuits near the drive or connected on the same circuit, such as relays, contactors, solenoid valves, fluorescent lighting, etc.

## Terminal functions (factory settings)

FLA-FLB-FLC relay	De-energized in the event of a fault or if the power supply is disconnected
RY-RC relay	Energized when the speed is greater than or equal to low speed (LL)
F	Forward (2-wire control)
R	Preset speed
RES	Clear fault (reset)
VIA	Speed reference 0-10 V
VIB	Not assigned
FM	Output frequency

- (1) Fault relay contacts, for remote signaling of drive status
- (2) The logic input common connection assumes that the "Source - PLC - Sink" switch is set to the "Source" position (factory setting).



# Operation on an IT system

IT system: Isolated or impedance grounded neutral.  
Use a permanent insulation monitor compatible with non-linear loads.

ER32 drives feature integrated RFI filters. These filters must be isolated from ground for operation on an IT system as follows:

One or two jumpers must be activated to disconnect the filters.

# Electromagnetic compatibility, wiring

## Principle and precautions

- Grounds between drive, motor and cable shielding must have "high-frequency" equipotentiality.
- Use of shielded cables with shielding connected to ground at both ends for the motor cables, braking resistor (if used) and control-signaling wiring. Metal ducting or conduit can be used for part of the shielding length provided that there is no break in continuity.
- Keep the control circuits away from the power circuits. For control and speed reference circuits, we recommend using shielded twisted cables with a pitch of between 25 and 50 mm (0.98 and 1.97 in.)
- Ensure maximum separation between the power supply cable (line supply) and the motor cable.
- The motor cables must be at least 0.5 m (20 in.) long.
- Do not use surge arresters or power factor correction capacitors on the variable speed drive output.
- The HF equipotential ground connection between the drive, motor and cable shielding does not remove the need to connect the PE protective conductors (green-yellow) to the appropriate terminals on each unit.

## ▲ DANGER

### HAZARDOUS VOLTAGE

- The cable shielding should only be stripped where connected to ground (in the metal cable glands and underneath the grounding clamps).
- Make sure that there is no risk of the shielding coming into contact with live components.

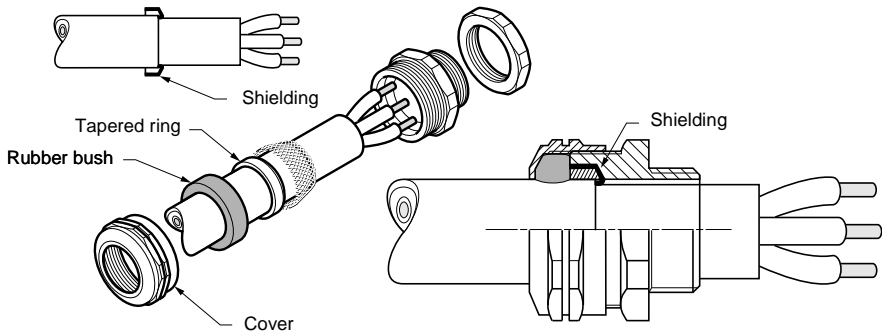
**Failure to follow these instructions will result in death, serious physical injury or equipment damage.**

## Connection plates:

There are connection plates on the lower sections of the variable speed drives. These plates are drilled in order to allow cables to be routed through them via cable glands. Cable glands must be ordered separately; **they are not supplied with the variable speed drive.**

## Mounting and connecting a shielded motor cable with metal cable gland (not supplied with the drive):

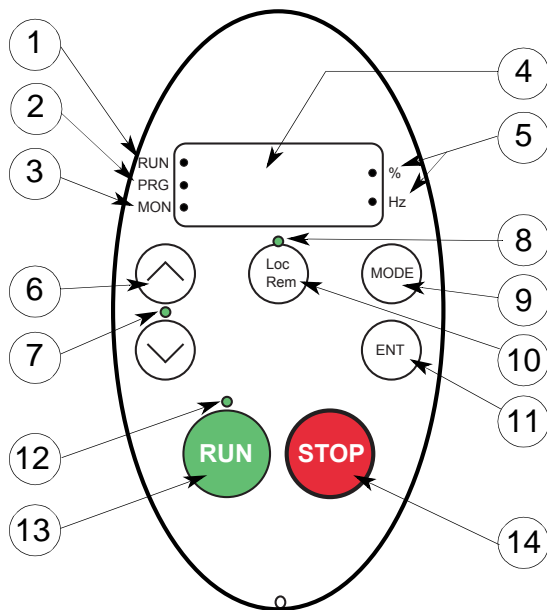
- Prepare the shielded cable by stripping both ends ready for connection.
- Loosen the cover of the cable gland.
- Attach the shielded cable to the cable gland ensuring it is fully in contact (throughout 360°).
- Fold back the shielding and clamp it between the ring and the body of the cable gland, and tighten the cover.



# Integrated display terminal

## Description of integrated display terminal

The following diagram shows the LEDs and keys on the integrated display terminal:

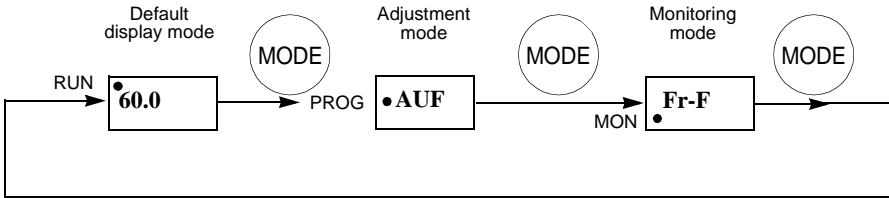


	LED/Key	Characteristics
1	Display terminal RUN LED	Lights up when the run command is active Flashes to indicate a speed reference
2	Display terminal PRG LED	Lights up in programming mode (AUF... GrU)
3	Display terminal MON LED	Lights up in monitoring mode
4	Display terminal	4 digits, 7 segments
5	Display terminal unit LED	Numerical value displayed in hertz or per cent
6	Navigation arrows	Depending on the mode: Navigate in menus Change a value Change the speed reference when the LED is lit (10)
7	Arrow LED	Lights up when the arrows are affecting the speed reference
8	Loc/Rem LED	Command and reference switching between terminals/com ↔ display terminal
9	Mode	Mode selection: <ul style="list-style-type: none"> <li>• Default display mode</li> <li>• Adjustment mode</li> <li>• Monitoring mode</li> </ul> Can also be used to go back to the previous menu
10	Loc/Rem key	Command and reference switching between terminals/com ↔ display terminal
11	ENT	Confirmation of entries
12	RUN LED	Lights up when the ER32 is in local run command mode
13	RUN	Local run command
14	STOP	Stop/Reset in the event of a fault

# Programming

## Accessing the various modes

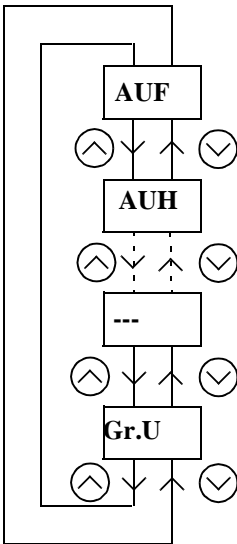
Using the "MODE" key



Default display mode	<ul style="list-style-type: none"> <li>• Active on power-up.</li> <li>• Permanent display of a drive variable, current, speed, etc., as well as alarms and faults.</li> </ul>
Adjustment mode	<ul style="list-style-type: none"> <li>• Can be used to modify all drive parameters.</li> </ul>
Monitoring mode	<ul style="list-style-type: none"> <li>• Can be used to control frequency settings, output current or voltage and information from the terminals.</li> </ul>

## Access to menus

Example in adjustment mode:

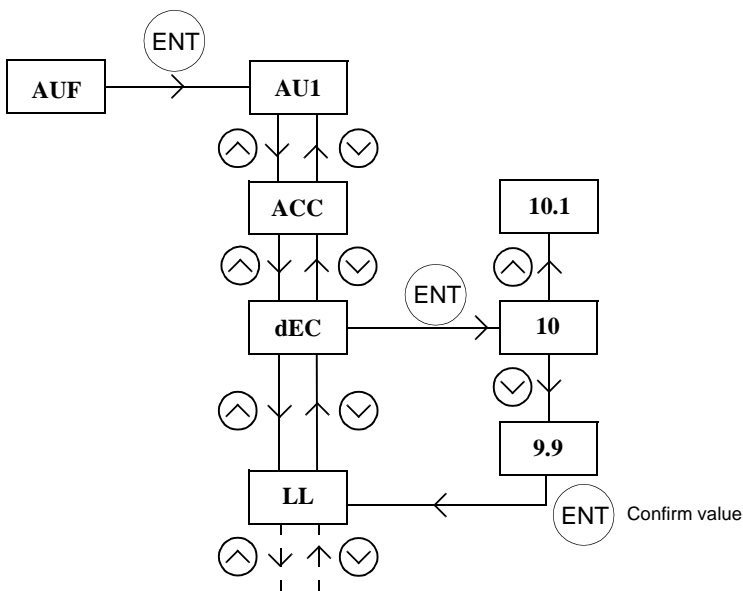


**Note:** Press the "MODE" key to go back up to the next level; here, for example: Go back to Fr-F.

# Programming

## Access to parameters

Example: Quick menu



**Note:** Press the "MODE" key to go to the previous level.

Examples:

- 9.9 to dEC
- dEC to AUF

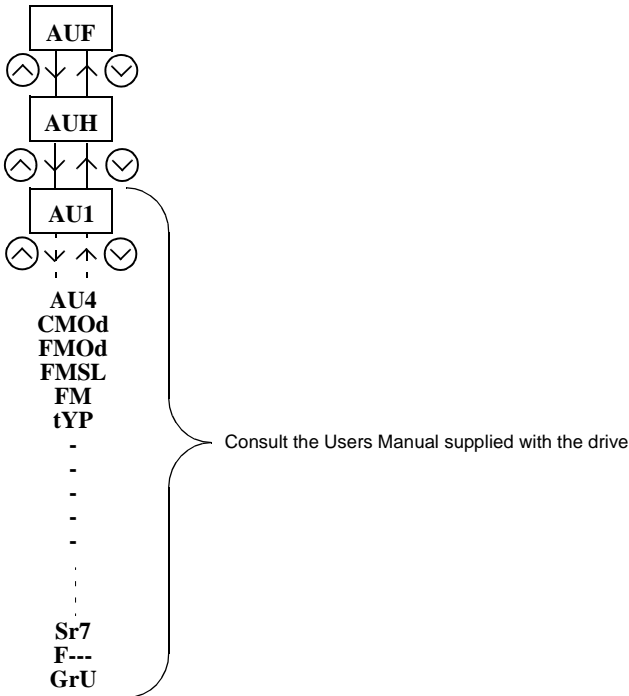
# Adjustment mode

## Description of menus

The following diagram shows the various menus that can be accessed from the quick menu AUF:

**AUF menu:** Fast startup menu providing access to current application parameters and sufficient in the majority of cases.

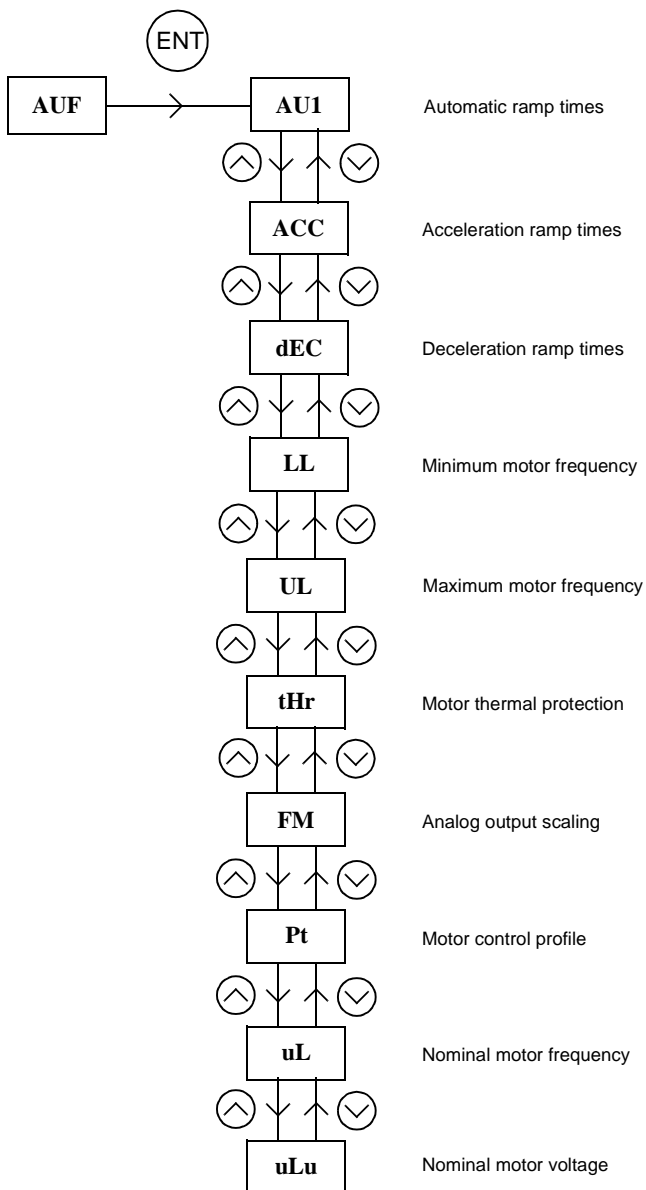
**AUH menu:** This menu provides access to the last 5 parameters modified in reverse chronological order (the last parameter modified appears first).



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# Adjustment mode

The following diagram shows the various parameters that can be accessed from the quick menu AUF.



# Adjustment mode

## AUF menu

The following diagram shows the various parameters that can be accessed from the AUF menu.

Code	Description	Adjustment ranges	Factory settings
AU1	Automatic ramp times.	0 : Deactivated 1 : Automatic acceleration and deceleration times 2 : Automatic acceleration time only	1
ACC	Acceleration time in seconds	0.0 to 3200	10.0
dEC	Deceleration time in seconds	0.0 to 3200	10.0
LL	Lower frequency limit (minimum motor frequency) in Hz.	0.0 to UL	0.0
UL	Upper frequency limit (maximum motor frequency) in Hz	0.5 to 200.0	50.0
tHr	Level of motor electronic thermal protection as a % of the rated output current indicated on the drive nameplate	10 to 100	100
FM	Measurement adjustment (analog output scaling).	-	-
Pt	Selection of V/F control mode (motor control profile)	0: Constant torque V/F 1: Variable torque V/F 2: Automatic torque "boost" 3: Flux vector control 4: Energy saving 6: Synchronous permanent magnet motor	1
uL	Base frequency (rated motor frequency) in Hz	25 to 200.0	50.0
uLu	Voltage at base frequency (rated motor voltage) in V	50 to 660	400



With the exception of ACC and dEC, the parameters cannot be modified with the drive running.



# Monitoring mode

## Display of information associated with faults

### Display of fault code

If the drive trips, a fault code will be displayed indicating the cause. As trip records are logged, information about each trip can be displayed at any time in default display mode.

The following table lists the various fault codes and what they mean.

Fault code	Description
nErr	No fault
OC1-0C1P	Overcurrent during acceleration
OC2-0C2P	Overcurrent during deceleration
OC3-0C3P	Overcurrent during operation at constant speed
OCL	Motor overcurrent during startup
OCA	Drive overcurrent during startup
EPH1	Input phase fault or overexcitation of capacitor in main circuit
EPH0	Output phase fault
OP1	Overvoltage during acceleration
OP2	Overvoltage during deceleration
OP3	Overvoltage during operation at constant speed
OL1	Drive trip due to overload
OL2	Motor trip due to overload
OLr	Overload on dynamic braking
OH	Trip due to overheating or failure of thermal detector
E	Emergency stop
EEP1	EEPROM 1 failure (write error)
EEP2	Failure of EEPROM 2 (initialization or power-up error during parameterization of tYp)
EEP3	EEPROM 3 failure (read error)
Err2	Drive RAM failure
Err3	Drive ROM failure
Err4	CPU 1 fault
Err5	Communication fault
Err7	Current sensor fault
Err8	Line fault

# Monitoring mode

Fault code	Description
UC	Low current fault
UP1	Undervoltage fault
0t	Overtorque fault
EF2	Grounding fault
Etn1	Auto-tune fault
EtYP	Drive type error
OH2	External thermal input
E-18	VIA cable break
E-19	Communication fault between CPUs
E-20	V/F control fault
E-21	CPU 2 fault
SOUt	Synchronization fault

**Note:** Records of previous trips (records of trips logged or trips that occurred in the past) can be restored.

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