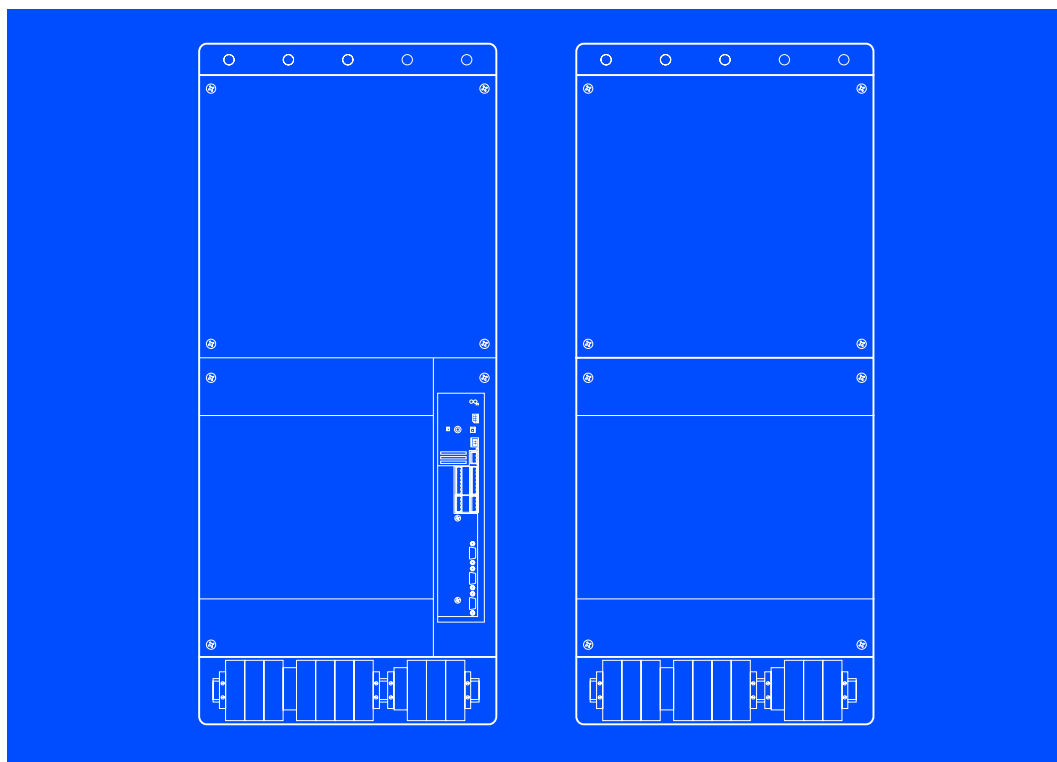


EDKVF93-05  
13218562



Information for the operator of the machine

## 9300 vector *250 ... 400 kW*



**EVF9381 ... EVF9383**

**Frequency inverter**

# This documentation is valid for ...

... 9300 vector frequency inverters as of nameplate data:

Type	①				②	③	Nameplate		
	EVF	93xx	-	x	V	Vxx		1x	7x
	EVF	93xx	-	x	V	Vxx	Vx	6x	

**Product series**

EVF = Frequency inverter  
 EVM = Master of frequency inverter  
 EVL = Slave of frequency inverter

**Type no. / rated power**

	400 V	500 V
9381 =	250 kW	315 kW
9382 =	315 kW	400 kW
9383 =	400 kW	500 kW

**Type**

E = Panel-mounted unit

**Design**

V = Vector-controlled frequency inverter

**Variant**

	400 V	Integrated RFI filter A	Integrated brake transistor
-	400 V	-	-
V030 =	400 V	•	-
V060 =	400 V	-	•
V110 =	400 V	•	•
V210 =	400 V / 500 V	-	-
V240 =	400 V / 500 V	•	-
V270 =	400 V / 500 V	-	•
V300 =	400 V / 500 V	•	•

**Hardware version**

**Software version**

xx = Slave (no software version)

**A**

<b>Lenze</b>		Hans-Lenze-Strasse 1 D-31855 Aerzen Made in EC	
Inverter			
Type:	EVF	•	①
	Master		
	EVM	•	
	Slave		
	EVL	•	
Input:			
Output:			

**B**

<b>Lenze</b>		Hans-Lenze-Strasse 1 D-31855 Aerzen Made in EC	
Inverter			
Id-No.:	①		
Prod.-No.:		Ser.-No.:	②
Type:	③		
Input:			
Output:			
33			



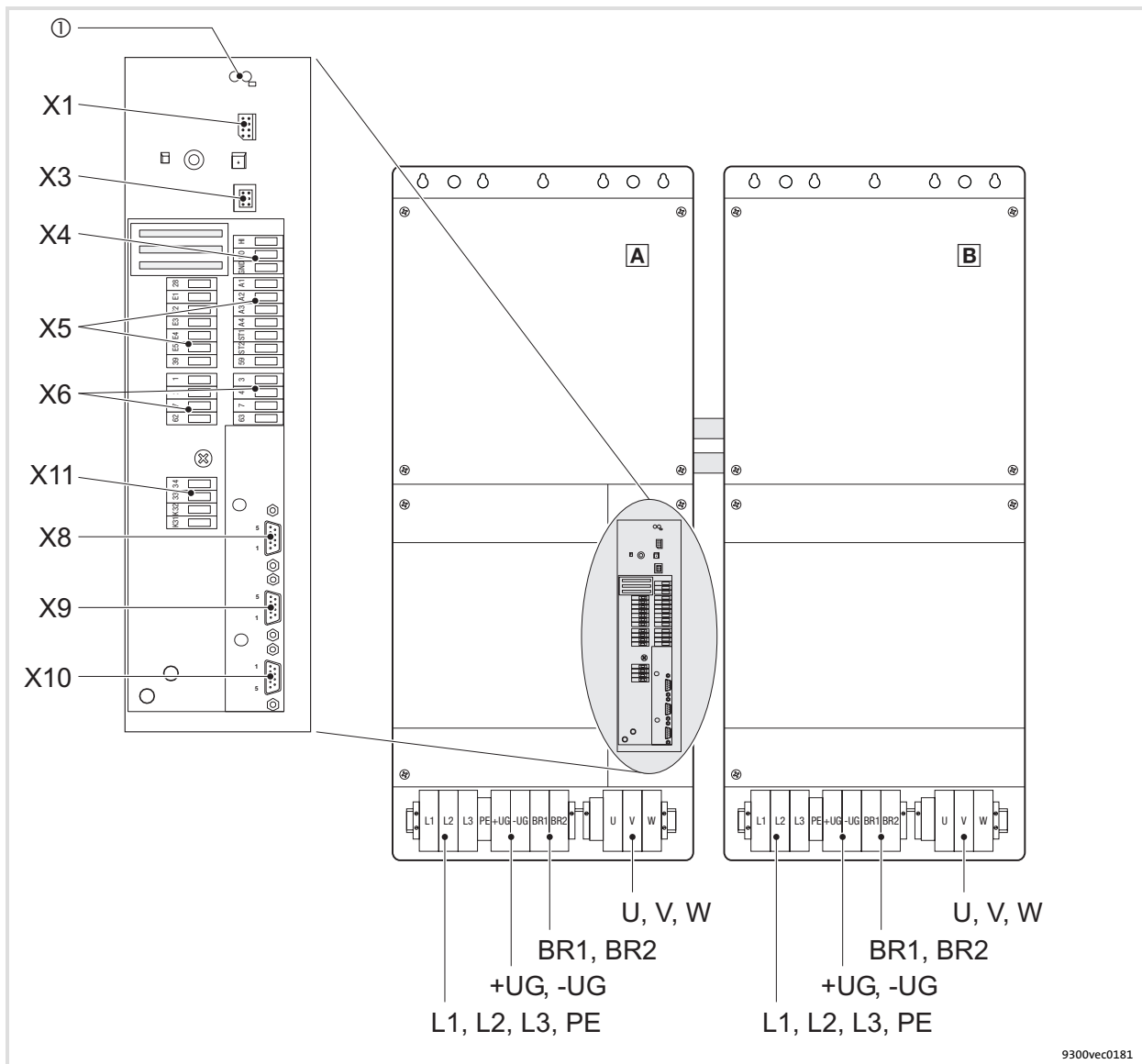
### Note!

This documentation contains all the information required by the machine operator to run the drive controllers of the 9300 vector series installed in your machine/system. You may make further use of the information contained in this documentation without asking Lenze for permission if you do not change the contents.



### Tip!

Current documentation and software updates concerning Lenze products can be found on the Internet in the "Services & Downloads" area under **<http://www.Lenze.com>**



## Key for overview

Position	Description
A	9300 vector frequency inverter - master
B	9300 vector frequency inverter - slave

## Connections and interfaces

Position	Description
L1, L2, L3, PE	Mains connection
+UG, -UG	DC supply (only for the variants V210, V240, V270, V300)
BR1, BR2	Connection of brake resistor (only for the variants V210, V240, V270, V300)
U, V, W, PE	Motor connection
X1	AIF interface (automation interface) slot for communication module (e.g. keypad XT EMZ9371BC)
X3	Jumper for setting the analog input signal at X6/1, X6/2
X4	Terminal strip for connection of system bus (CAN)
X5	Terminal strips for connection of digital inputs and outputs
X6	Terminal strips for connection of analog inputs and outputs
X8	Sub-D connector (male) for connection of incremental encoder with TTL level or sin/cos encoder and KTY thermal sensor of the motor
X9	Sub-D connector (male) for connection of digital frequency input signal
X10	Sub-D connector (female) for connection of digital frequency output signal
X11	Terminal strip for connection of relay output K <sub>SR</sub> for "safe standstill"

## Status displays

Position	LED red	LED green	Operating status
①	Off	On	Controller is enabled
	On	On	Mains is switched on and automatic start is inhibited
	Off	Blinking slowly	Controller is inhibited
	Off	On	Motor data identification is active
	Blinking quickly	Off	Undervoltage or overvoltage
	Blinking slowly	Off	Active fault

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# 1 Safety instructions

## 1.1 General safety and application instructions for Lenze controllers

(According to: Low-Voltage Directive 73/23/EEC)

### For you personal safety

Lenze controllers (frequency inverters, servo inverters, DC speed controllers) and the accessory components can include live and rotating parts - depending on their type of protection - during operation. Surfaces can be hot.

Unauthorised removal of the required cover, inappropriate use, incorrect installation or operation, create the risk of severe injury to persons or damage to material assets.

High amounts of energy are released in the controller. Thus, it is required to always wear a personal protective equipment (body protection, headgear, eye protection, ear protection, hand guard).

All operations concerning transport, installation, and commissioning as well as maintenance must be carried out by qualified, skilled personnel (IEC 364 and CENELEC HD 384 or DIN VDE 0100 and IEC report 664 or DIN VDE 0110 and national regulations for the prevention of accidents must be observed).

According to this basic safety information, qualified, skilled personnel are persons who are familiar with the assembly, installation, commissioning, and operation of the product and who have the qualifications necessary for their occupation.

### Application as directed

Drive controllers are components which are designed for installation in electrical systems or machinery. They are not to be used as household appliances. They are intended exclusively for professional and commercial purposes according to EN 61000-3-2.

When installing the controllers into machines, commissioning (i.e. starting of operation as directed) is prohibited until it is proven that the machine complies with the regulations of the EC Directive 98/37/EC (Machinery Directive); EN 60204 must be observed.

Commissioning (i.e. starting of operation as directed) is only allowed when there is compliance with the EMC Directive (89/336/EEC).

The controllers meet the requirements of the Low-Voltage Directive 73/23/EEC. The harmonised standard EN 61800-5-1 applies to the controllers.

The technical data and information on connection conditions must be obtained from the nameplate and the documentation. They must be observed in any case.

**Warning:** The controllers can be used according to EN 61800-3 in drive systems of the category C2. These products can cause radio interferences in residential areas. In this case, special measures are required.

## Safety instructions

General safety and application instructions for Lenze controllers

### Transport, storage

Please observe the notes on transport, storage and appropriate handling.

Observe the climatic conditions according the technical data.

### Installation

The controllers must be installed and cooled according to the instructions given in the corresponding documentation.

Ensure proper handling and avoid mechanical stress. Do not bend any components and do not change any insulation distances during transport or handling. Do not touch any electronic components and contacts.

Controllers contain electrostatically sensitive components, which can easily be damaged by inappropriate handling. Do not damage or destroy any electrical components since this might endanger your health!

### Electrical connection

When working on live controllers, the valid national regulations for the prevention of accidents (e.g. VBG 4) must be observed.

The electrical installation must be carried out according to the appropriate regulations (e.g. cable cross-sections, fuses, PE connection). Additional information can be obtained from the documentation.

The documentation contains information about installation in compliance with EMC (shielding, earthing, filter arrangement, and cable installation). These notes must also be observed for CE-marked controllers. The manufacturer of the system or machine is responsible for ensuring compliance with the limit values demanded by the EMC legislation. The controllers must be installed in housings (e.g. control cabinets) to comply with the limit values for radio interferences valid at the site of installation. The housings must enable an EMC-compliant installation. Make sure in particular that e.g. the control cabinet doors have a circumferential metal connection to the housing. Reduce housing openings and cutouts to a minimum.

Lenze controllers can cause a DC current in the protective conductor. If a residual current device (RCD) is used as a protective means in the case of direct or indirect contact, only a residual current device (RCD) of type B may be used on the current supply side of the controller. Otherwise, another protective measure, such as separation from the environment through double or reinforced insulation or disconnection from the mains by means of a transformer must be used.

**Operation**

If necessary, systems including controllers must be equipped with additional monitoring and protection devices according to the valid safety regulations (e.g. law on technical equipment, regulations for the prevention of accidents). The controller can be adapted to your application. Please observe the corresponding information given in the documentation.

After a controller has been disconnected from the voltage supply, all live components and power connections must not be touched immediately because capacitors can still be charged. Please observe the corresponding stickers on the controller.

All protection covers and doors must be shut during operation.

**Note for UL approved systems with integrated controllers:** UL warnings are notes that only apply to UL systems. The documentation contains special information about UL.

**Safety functions**

Certain variants of the drive controller support safety functions (e.g. "safe torque off", formerly "safe standstill") according to the requirements of Appendix I No. 1.2.7 of the EC Machinery Directive 98/37/EC, EN 954-1 Category 3 and EN 1037. You must observe the notes pertaining to the safety functions in the documentation for the variants.

**Maintenance and servicing**

The controllers do not require any maintenance if the prescribed conditions of operation are observed.

If the ambient air is polluted, the cooling surfaces of the controller may become dirty or the air vents of the controller may be obstructed. Therefore, clean the cooling surfaces and air vents periodically under these operating conditions. Do not use sharp or pointed tools for this purpose!

**Waste disposal**

Recycle metal and plastic materials. Ensure professional disposal of assembled PCBs.

**The product-specific safety and application notes given in these instructions must be observed!**

# 1 Safety instructions

## Residual hazards

### 1.2 Residual hazards

#### Protection of persons

- ▶ Before working on the controller, check that no voltage is applied to the power terminals:
  - The power terminals U, V, W, +U<sub>G</sub>, -U<sub>G</sub>, BR1, BR2 and 101 ... 104 remain live for at least five minutes after disconnecting the mains.
  - The power terminals L1, L2, L3, U, V, W, +U<sub>G</sub>, -U<sub>G</sub>, BR1, BR2 and 101 ... 104 remain live with the motor stopped.
- ▶ The leakage current to earth (PE) is > 3.5 mA. According to EN 50178 a fixed installation is required.
- ▶ The heatsink of the controller has an operating temperature of > 80 °C:
  - Contact with the heatsink results in burns.
- ▶ If you use the "flying-restart circuit" function (C0142 = 2, 3) for machines with a low moment of inertia and minimum friction:
  - After the controller is enabled at standstill, the motor can start briefly or change briefly the direction of rotation since the flying restart process is executed at zero speed as well.
- ▶ During parameter set transfer, the control terminals of the controller can have undefined states!
  - Therefore the plugs X5 and X6 must be pulled off before the transfer is executed. This ensures that the controller is inhibited and all control terminals have the specified "LOW" state.

#### Device protection

- ▶ Frequent mains switching (e.g. inching mode via mains contactor) can overload and destroy the input current limitation of the controller.
  - Thus, at least five minutes have to pass between two switch-on processes.
  - In case of frequent, safety-related disconnections use the "safe torque off" safety function (STO).

#### Motor protection

- ▶ Certain drive controller settings can overheat the connected motor:
  - E. g. long-time operation of the DC injection brake.
  - Long-time operation of self-ventilated motors at low speeds.

#### Protection of the machine/system

- ▶ Drives can reach dangerous overspeeds (e. g. setting of high output frequencies in connection with motors and machines not suitable for this purpose):
  - The drive controllers do not provide protection against such operating conditions. For this purpose, use additional components.

### 1.3 Definition of notes used

The following pictographs and signal words are used in this documentation to indicate dangers and important information:

#### Safety instructions

Structure of safety instructions:



#### **Danger!**

(characterises the type and severity of danger)

#### **Note**

(describes the danger and gives information about how to prevent dangerous situations)

Pictograph and signal word	Meaning
<b>Danger!</b>	<b>Danger of personal injury through dangerous electrical voltage.</b> Reference to an imminent danger that may result in death or serious personal injury if the corresponding measures are not taken.
<b>Danger!</b>	<b>Danger of personal injury through a general source of danger.</b> Reference to an imminent danger that may result in death or serious personal injury if the corresponding measures are not taken.
<b>Stop!</b>	<b>Danger of property damage.</b> Reference to a possible danger that may result in property damage if the corresponding measures are not taken.

#### Application notes

Pictograph and signal word	Meaning
<b>Note!</b>	Important note to ensure troublefree operation
<b>Tip!</b>	Useful tip for simple handling
	Reference to another documentation

## 2 Parameter setting

Parameter setting with the XT EMZ9371BC keypad  
General data and operating conditions

## 2 Parameter setting

### 2.1 Parameter setting with the XT EMZ9371BC keypad

#### Description

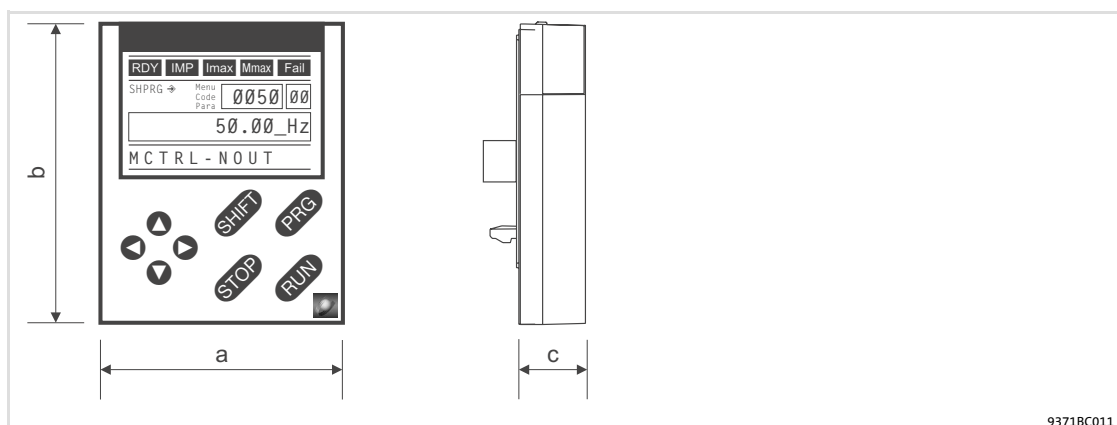
The keypad is available as an accessory. A full description of the keypad can be obtained from the Instructions included in the keypad delivery.

#### Plugging in the keypad

It is possible to plug the keypad into the AIF interface or remove it during operation.

As soon as the keypad is supplied with voltage, it carries out a self-test. The keypad is ready for operation if it is in display mode.

#### 2.1.1 General data and operating conditions



Feature	Values	
<b>Dimensions</b>		
Width	a	60 mm
Height	b	73.5 mm
Depth	c	15 mm
<b>Environmental conditions</b>		
Climate		
Storage	IEC/EN 60721-3-1	1K3 (-25 ... +60 °C)
Transport	IEC/EN 60721-3-2	2K3 (-25 ... +70 °C)
Operation	IEC/EN 60721-3-3	3K3 (-10 ... +60 °C)
Enclosure	IP 20	

2.1.2 Installation and commissioning

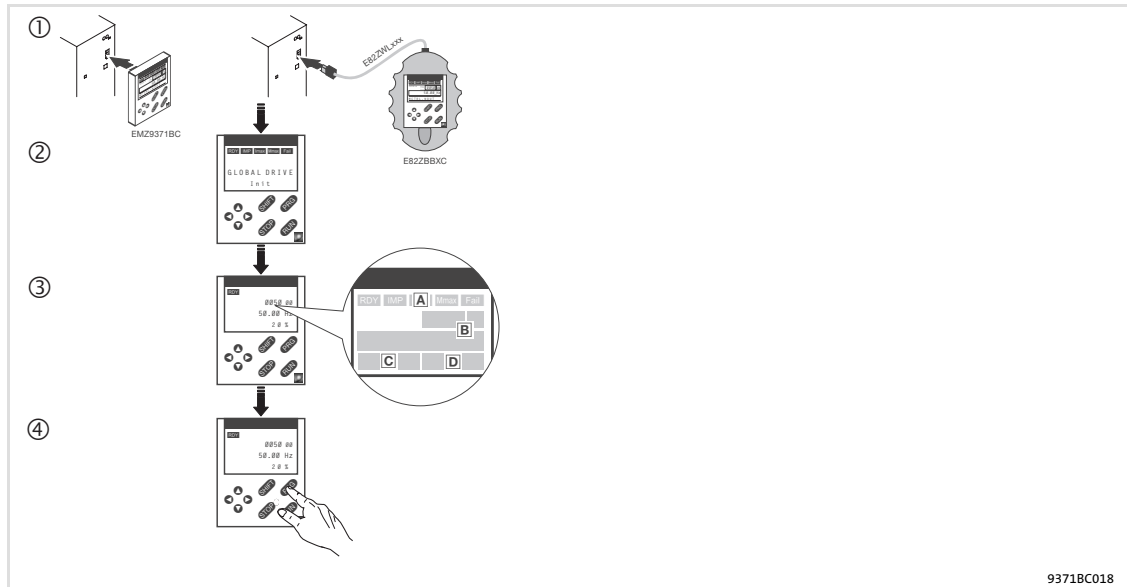


Fig.2-1 Installation and commissioning of XT EMZ9371BC keypad or E82ZBBXC diagnosis terminal

- ① Connect keypad to the AIF interface on the front of the standard device.  
The keypad can be connected/disconnected during operation.
- ② As soon as the keypad is supplied with voltage, it carries out a short self-test.
- ③ The operation level indicates, when the keypad is ready for operation:
  - A Current state of the standard device
  - B Memory location 1 of the user menu (C0517):  
Code number, subcode number, and current value
  - C Active fault message or additional status message
  - D Actual value in % of the status display defined in C0004
- ④ **PRG** must be pressed to leave the operation level

2.1.3 Display elements and function keys

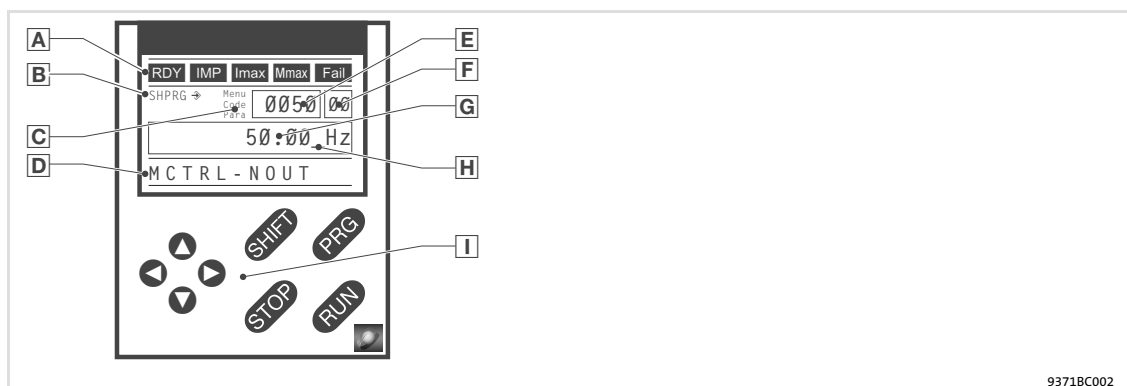


Fig.2-2 Display elements and function keys of the XT EMZ9371BC keypad

## Parameter setting

Parameter setting with the XT EMZ9371BC keypad  
Display elements and function keys

### Displays

Display	Meaning	Explanation
<b>A Status displays of standard device</b>		
<b>RDY</b>	Ready for operation	
<b>IMP</b>	Pulse inhibit is active	Power outputs are inhibited
<b>Imax</b>	Set current limit is exceeded in motor or generator mode	
<b>Mmax</b>	Speed controller 1 in its limitation	Drive is torque-controlled (Only active for operation with standard devices of 9300 series)
<b>Fail</b>	Active fault	
<b>B Parameter acceptance</b>		
↔	Parameter is accepted immediately	Standard device operates immediately with the new parameter value
SHPRG ↔	Parameter must be confirmed with <b>SHIFT</b> <b>PRG</b>	Standard device operates with the new parameter value after being confirmed
SHPRG	When the controller is inhibited the parameter must be confirmed with <b>SHIFT</b> <b>PRG</b>	Standard device operates with the new parameter value after the controller is re-enabled
None	Display parameter	Change is not possible
<b>C Active level</b>		
Menu	Menu level is active	Select main menu and submenus
Code	Code level is active	Select codes and subcodes
Para	Parameter level is active	Change parameters in the codes or subcodes
None	Operating level is active	Display operating parameters
<b>D Short text</b>		
Alphanumeric	Contents of the menus, meaning of the codes and parameters In the operating level C0004 (in %) and the active fault are displayed	
<b>E Number</b>		
Menu level	With active level: Menu number	Only active for operation with standard devices of 8200 vector or 8200 motec series
Code level	With active level: Four-digit code number	
<b>F Number</b>		
Menu level	With active level: Submenu number	Only active for operation with standard devices of 8200 vector or 8200 motec series
Code level	With active level: Two-digit subcode number	
<b>G Parameter value</b>		
	Parameter value with unit	
<b>H Cursor</b>		
		In the parameter level, the figure above the cursor can be changed directly
<b>I Function keys</b>		
		For description see the following table

## Function keys

**Note!**

Key combinations with **SHIFT**:

Press **SHIFT** and keep it pressed, then press the second key in addition.

Key	Function			
	Menu level	Code level	Parameter level	Operating level
<b>PRG</b>		Change to the parameter level	Change to the operating level	Change to the code level
<b>SHIFT PRG</b>	Load predefined configurations in the menu "Short setup" <sup>1)</sup>		Accept parameters when SHPRG ⇄ or SHPRG is displayed	
<b>▲</b> <b>▼</b>	Change between menu items	Change of code number	Change of figure above cursor	
<b>SHIFT ▲</b> <b>SHIFT ▼</b>	Quick change between the menu items	Quick change of code number	Quick change of figure above cursor	
<b>▶</b> <b>◀</b>	Change between main menu, submenus and code level		Cursor to the right Cursor to the left	
<b>RUN</b>	Cancel the function of <b>STOP</b> key, the LED in the key is off			
<b>STOP</b>	Inhibit controller, the LED in the key is lit			
	Reset the fault (TRIP reset):	1. Remedy the cause of malfunction 2. Press <b>STOP</b> 3. Press <b>RUN</b>		

<sup>1)</sup> Only active for operation with standard devices of 8200 vector or 8200 motec series

## 2.1.4

## Changing and saving parameters

**Note!**

Your settings have an effect on the current parameters in the main memory. You must save your settings in a parameter set for not losing them when switching the mains!

If you need only one parameter set, save your settings in parameter set 1, since the parameter set 1 is automatically loaded after mains connection.

Step	Key sequence	Action
1. Select the menu	<b>▲ ▼ ▶ ◀</b>	Use the arrow keys to select the desired menu
2. Change to the code level	<b>▶</b>	Display of the first code in the menu
3. Select code or subcode	<b>▼ ▲</b>	Display of the current parameter value
4. Change to the parameter level	<b>PRG</b>	
5. When SHPRG is displayed, inhibit the controller	<b>STOP</b> <sup>1)</sup>	The drive coasts
6. Change parameter	A <b>▶ ◀</b>	Move cursor below the figure to be changed
	B <b>▼ ▲</b>	Change of figure
	<b>SHIFT ▼</b>	Quick change of figure
	<b>SHIFT ▲</b>	
7. Accept the changed parameter		

## 2

## Parameter setting

Parameter setting with the XT EMZ9371BC keypad

Changing and saving parameters

Step		Key sequence	Action
	Display of SHPRG or SHPRG →	SHIFT PRG	Confirm change to accept the parameter Display "OK"
	Display →	-	The parameter has been accepted immediately
8.	Enable the controller, if required	RUN 1)	The drive runs again
9.	Change to the code level		
	A	PRG	Display of the operating level
	B	PRG	Display of the code with changed parameter
10.	Change further parameters		Restart the "loop" with step 1. or 3.
11.	Save changed parameters		
	A	▲ ▼ ▶ ◀	Select the code C0003 "PAR SAVE" in the menu "Load/Store"
	B	PRG	Change to the parameter level Display "0" and "READY"
	C	▲	Save as parameter set 1: ⇒ Set "1" "Save PS1" Save as parameter set 2: ⇒ Set "2" "Save PS2" Save as parameter set 3: ⇒ Set "3" "Save PS3" Save as parameter set 4: ⇒ Set "4" "Save PS4"
	D	SHIFT PRG	When "OK" is displayed, the settings are permanently saved in the selected parameter set.
12.	Change to the code level		
	A	PRG	Display of the operating level
	B	PRG	Display of C0003 "PAR SAVE"
13.	Set parameters for another parameter set		Restart the "loop" with step 1. or 3.

- 1) The function of the STOP key can be programmed:  
 C0469 = 1: Controller inhibit  
 C0469 = 2: Quick stop (Lenze setting)

### 2.1.5 Loading a parameter set

The keypad serves to load a saved parameter set into the main memory when the controller is inhibited. After the controller is enabled, it operates with the new parameters.



#### Danger!

- ▶ When a new parameter set is loaded, the controller is reinitialised and acts as if it had been connected to the mains:
  - System configurations and terminal assignments can be changed. Make sure that your wiring and drive configuration comply with the settings of the parameter set.
- ▶ Only use terminal X5/28 as source for the controller inhibit! Otherwise the drive may start in an uncontrolled way when switching over to another parameter set.



#### Note!

- ▶ After switching on the supply voltage, the controller always loads parameter set 1 into the main memory.
- ▶ It is also possible to load other parameter sets into the main memory via the digital inputs or bus commands.

Step		Key sequence	Action
1.	Inhibit controller		Terminal X5/28 = LOW
2.	Load the saved parameter set into the main memory		
		A ▲ ▼ ▶ ◀	Select the code C0002 "PAR LOAD" in the menu "Load/Store"
		B PRG	Change to the parameter level The active parameter set is displayed, e. g. display "0" and "Load Default" If you want to restore the delivery status, proceed with D
	Select the parameter set to be loaded	C ▲	Load parameter set 1: ⇒ Set "1" "Load PS1" Load parameter set 2: ⇒ Set "2" "Load PS2" Load parameter set 3: ⇒ Set "3" "Load PS3" Load parameter set 4: ⇒ Set "4" "Load PS4"
		D SHIFT PRG	"RDY" goes off. The parameter set is loaded completely into the main memory if "RDY" is displayed again.
3.	Change to the code level		
		A PRG	Display of the operating level
		B PRG	Display of C0002 "PAR LOAD"
4.	Enable controller		Terminal X5/28 = HIGH The drive is running with the settings of the loaded parameter set

## 2

**Parameter setting**

Parameter setting with the XT EMZ9371BC keypad  
Transferring parameters to other standard devices

## 2.1.6

**Transferring parameters to other standard devices**

The keypad enables you to copy parameter settings from one standard device to another. For this purpose use the "Load/Store" menu:

**Danger!**

During the transfer of the parameters from the keypad to the controller, the control terminals may adopt undefined states!

For this reason it is imperative you disconnect connectors X5 and X6 from the controller prior to the transfer. In this way you will ensure that the drive controller is inhibited and all control terminals are in the defined "LOW" state.

**Copying parameter sets from the standard device to the keypad****Note!**

After the parameter sets are copied to the keypad XT (C0003 = 11), the parameter set last loaded using C0002 is always activated.

So the actual parameters remain active also after copying:

- ▶ Prior to copying, save the actual parameters in the parameter set and load this parameter set into the drive controller using C0002.

Step	Key sequence	Action
1.	Connect keypad to controller 1	
2.	Inhibit controller	Terminal X5/28 = LOW The drive coasts.
3.	On the "Load/Store" menu select C0003	On the "Load/Store" menu select code C0003 "PAR SAVE" using the arrow keys.
4.	Change to the parameter level	Display "0" and "READY"
5.	Copy all parameter sets to the keypad	The settings stored in the keypad are overwritten. Set "11" "Save extern"
6.	Start copying	The "RDY" status display goes off. "BUSY" is indicated as parameter value. When "BUSY" goes off after approx. one minute, all parameter sets have been copied to the keypad. The "RDY" status display illuminates.
7.	Change to the code level	
	A	Display of the operating level
	B	Display of C0003 and "PAR SAVE"
8.	Enable controller	Terminal X5/28 = HIGH
9.	Remove keypad from controller 1	

## Parameter setting with the XT EMZ9371BC keypad Transferring parameters to other standard devices

### Copying parameter sets from the keypad to the standard device

Step	Key sequence	Action
1.	Connect keypad to controller 2	
2.	Inhibit controller	Terminal X5/28 = LOW The "IMP" status display illuminates. The drive coasts
3.	Disconnect connectors X5 and X6	All control terminals have the defined "LOW" state.
4.	On the "Load/Store" menu select C0002	On the "Load/Store" menu select code C0002 "PAR LOAD" using the arrow keys.
5.	Change to the parameter level	The active parameter set is displayed, e. g. display "0" and "Load Default"
6.	Select the correct copy function	The settings stored in the controller are overwritten.
	<ul style="list-style-type: none"> <li>Copy all available parameter sets to the controller and save in non-volatile memory.</li> </ul>	The parameters are not yet active after copying. Select parameter set and load into main memory.  17
		Set "20" "ext -> EEPROM"
	<ul style="list-style-type: none"> <li>Copy individual parameter sets to main memory.</li> </ul>	
		Copy parameter set 1: ⇒ Set "11" "Load ext PS1"
		Copy parameter set 2: ⇒ Set "12" "Load ext PS2"
		Copy parameter set 3: ⇒ Set "13" "Load ext PS3"
		Copy parameter set 4: ⇒ Set "14" "Load ext PS4"
7.	Start copying	The "RDY" status display goes off. "BUSY" is indicated as parameter value. When "BUSY" goes off, all selected parameter sets have been copied to the controller. The "RDY" status display illuminates.
8.	Change to the code level	
	A	Display of the operating level
	B	Display of C0002 and "PAR LOAD"
9.	Save individually copied parameter sets in non-volatile memory	On the "Load/Store" menu select code C0003 "PAR SAVE" using arrow keys and save contents of the main memory in non-volatile memory.
10.	Connect connectors X5 and X6	
11.	Enable controller	Terminal X5/28 = HIGH The drive runs with the new settings.

## 2

**Parameter setting**

Parameter setting with the XT EMZ9371BC keypad  
Activating password protection

## 2.1.7

**Activating password protection****Note!**

- ▶ If the password protection is activated (C0094 = 1 ... 9999), you only have free access to the user menu.
- ▶ To access the other menus, you must enter the password. By this, the password protection is annulled until you enter a new password.
- ▶ Please observe that the password-protected parameters can be overwritten as well when transferring the parameter sets to other standard devices. The password is not transferred.
- ▶ Do not forget your password! If you have forgotten your password, it can only be reset via a PC or a bus system!

**Activate password protection**

Step	Key sequence	Action
1. Select the "USER menu"	⬅ ➡ ⬆ ⬇	Change to the user menu using the arrow keys
2. Change to the code level	➡	Display of code C0051 "MCTRL-NACT"
3. Select C0094	⬆	Display of code C0094 "Password"
4. Change to the parameter level	PRG	Display "0" = no password protection
5. Set password		
	A ⬆	Select password (1 ... 9999)
	B SHIFT PRG	Confirm password
6. Change to the code level		
	A PRG	Display of the operating level
	B PRG	Display of C0094 and "Password"
7. Change to the "USER menu"	⬅ ⬆ ⬇	

The password protection is active now.

You can only quit the user menu if you re-enter the password and confirm it with SHIFT PRG.

**Remove password protection**

Step	Key sequence	Action
1. Change to the code level in the user menu	➡	
2. Select C0094	⬆	Display of code C0094 "Password"
3. Change to the parameter level	PRG	Display "9999" = password protection is active
4. Enter password		
	A ⬇	Set valid password
	B SHIFT PRG	Confirm The password protection is deactivated by entering the password once again.
5. Change to the code level		
	A PRG	Display of the operating level
	B PRG	Display of C0094 and "Password"

The password protection is deactivated now. All menus can be accessed freely again.

### 2.1.8 Diagnostics

The two submenus "Actual info" and "History" in the "Diagnostic" menu contain all codes for the

- ▶ monitoring of the drive
- ▶ error diagnosis

Status messages are additionally displayed in the operating level. If several status messages are active, the message with the highest priority is displayed:

Priority	Display	Meaning
1	GLOBAL DRIVE INIT	Initialisation or communication error between keypad and controller
2	XXX - TRIP	Active TRIP (contents of C0168/1)
3	XXX - MESSAGE	Active message (contents of C0168/1)
4	Special device states:	
		Switch-on inhibit
5	Source for controller inhibit (the value of C0004 is displayed simultaneously):	
	STP1	9300 Servo: Terminal X5/28 ECSxS/P/M/A: Terminal X6/SI1
	STP3	Operating module or LECOM A/B/LI
	STP4	INTERBUS or PROFIBUS-DP
	STP5	9300 Servo, ECSxA: System bus (CAN) ECSxS/P/M: Motion bus (CAN)
	STP6	C0040
6	Source for quick stop (QSP):	
	QSP-term-Ext	MCTRL-QSP input of the MCTRL function block is applied to HIGH signal
	QSP-C0135	Operating module or LECOM A/B/LI
	QSP-AIF	INTERBUS or PROFIBUS-DP
	QSP-CAN	9300 Servo, ECSxA: System bus (CAN) ECSxS/P/M: Motion bus (CAN)
7	XXX - WARNING	Active warning (contents of C0168/1)
8	xxxx	Value under C0004

## 2

**Parameter setting**

Parameter setting with the XT EMZ9371BC keypad

Menu structure

## 2.1.9

**Menu structure**

For simple, user-friendly operation, the codes are clearly arranged in function-related menus:

Main menu	Submenus	Description
Display	Display	
User-Menu		<b>Codes defined in C0517</b>
Code list		<b>All available codes</b>
	ALL	All available codes listed in ascending order (C0001 ... C7999)
	PS 1	Codes in parameter set 1 (C0001 ... C1999)
	PS 2	Codes in parameter set 2 (C2001 ... C3999)
	PS 3	Codes in parameter set 3 (C4001 ... C5999)
	PS 4	Codes in parameter set 4 (C6001 ... C7999)
Load/Store		<b>Parameter set management</b> Parameter set transfer, restore delivery status
Diagnostic		<b>Diagnostic</b>
	Actual info	Display codes to monitor the drive
	History	Fault analysis with history buffer
Short setup		<b>Quick configuration of predefined applications</b> <b>Configuration of the user menu</b> The predefined applications depend on the type of the standard device (frequency inverter, servo inverter, position controller, ...)
Main FB		<b>Configuration of the main function blocks</b>
	NSET	Setpoint processing
	NSET-JOG	Fixed setpoints
	NSET-RAMP1	Ramp function generator
	MCTRL	Motor control
	DFSET	Digital frequency processing
	DCTRL	Internal control
Terminal I/O		<b>Connection of inputs and outputs with internal signals</b>
	AIN1 X6.1/2	Analog input 1
	AIN2 X6.3/4	Analog input 2
	AOUT1 X6.62	Analog output 1
	AOUT2 X6.63	Analog output 2
	DIGIN	Digital inputs
	DIGOUT	Digital outputs
	DFIN	Digital frequency input
	DFOUT	Digital frequency output
	State bus	State bus (not with 9300 frequency inverter)
Controller		<b>Configuration of internal control parameters</b>
	Speed	Speed controller
	Current	Current controller or torque controller
	Phase	Phase controller (not with 9300 frequency inverter)
Motor/Feedb.		<b>Input of motor data, configuration of speed feedback</b>
	Motor adj	Motor data
	Feedback	Configuration of feedback systems
Monitoring		<b>Configuration of monitoring functions</b>

Main menu	Submenus	Description
Display	Display	
LECOM/AIF		<b>Configuration of operation with communication modules</b>
	LECOM A/B	Serial interface
	AIF interface	Process data
	Status word	Display of status words
System bus		<b>Configuration of system bus (CAN)</b>
	Management	CAN communication parameters
	CAN-IN1	CAN object 1
	CAN-OUT1	
	CAN-IN2	CAN object 2
	CAN-OUT2	
	CAN-IN3	CAN object 3
	CAN-OUT3	
	Status word	Display of status words
	FDO	Free digital outputs
	Diagnostic	CAN diagnostic
FB config		<b>Configuration of function blocks</b>
Func blocks		<b>Parameterisation of function blocks</b> The submenus contain all available function blocks
FCODE		<b>Configuration of free codes</b>
Identify		<b>Identification</b>
	Drive	Software version of standard device
	Op Keypad	Software version of keypad

### 3 Troubleshooting and fault elimination

Display of operating data, diagnostics

Display of operating data

### 3 Troubleshooting and fault elimination

#### 3.1 Display of operating data, diagnostics

##### 3.1.1 Display of operating data

###### Description

Important operating parameters are measured by the controller. They can be displayed with the keypad or PC.

Some operating data can be calibrated to be displayed or selected directly with the unit of the process quantity (e.g. pressure, temperature, speed).



###### Note!

The calibration always affects all specified codes simultaneously.

###### Codes for parameter setting

Code		Possible settings			IMPORTANT
No.	Name	Lenze	Selection		
C0051	MCTRL-NACT		-36000 {1 rpm}	36000	Actual speed value, function block MCTRL <ul style="list-style-type: none"> <li>● Read only</li> </ul>
C0052	MCTRL-Umot		0 {1 V}	800	Motor voltage, function block MCTRL <ul style="list-style-type: none"> <li>● Read only</li> <li>● MCTRL-VACT = 100 % = C0090</li> </ul>
C0053	UG-VOLTAGE		0 {1 V}	900	DC-bus voltage, function block MCTRL <ul style="list-style-type: none"> <li>● Read only</li> <li>● MCTRL-DCVOLT = 100 % = 1000 V</li> </ul>
C0054	Imot		0.0 {0.1 A}	5000.0	Actual motor current, function block MCTRL <ul style="list-style-type: none"> <li>● Read only</li> <li>● MCTRL-IACT = 100 % = C0022</li> </ul>
C0061	Heatsink temp		0 {1 °C}	100	Heatsink temperature <ul style="list-style-type: none"> <li>● Read only</li> <li>● If the temperature of the heatsink &gt; 85 °C, the controller sets TRIP <i>DH</i></li> <li>● Early warning is possible via <i>DH4</i>, temperature is set in C0122</li> </ul>
C0063	Mot temp		0 {1 °C}	200	Motor temperature <ul style="list-style-type: none"> <li>● Read only</li> <li>● Monitoring of the motor temperature must be activated.</li> <li>● KTY at X8/5, X8/8:               <ul style="list-style-type: none"> <li>– At 150 °C, TRIP <i>DH3</i> is set</li> <li>– Early warning is possible via <i>DH7</i>, temperature is set in C0121</li> </ul> </li> <li>● PTC, thermal contact at T1, T2:               <ul style="list-style-type: none"> <li>– Release sets TRIP or warning <i>DH8</i></li> </ul> </li> </ul>

Code		Possible settings			IMPORTANT	
No.	Name	Lenze	Selection			
C0064	Utilization		0	{1 %}	150	Device utilisation I×t <ul style="list-style-type: none"> <li>• Read only</li> <li>• Device utilisation during the last 180 s of operating time</li> <li>• C0064 &gt; 100 % releases warning <math>\overline{OES}</math></li> <li>• C0064 &gt;140 % limits the output current to the rated controller current</li> </ul>
C0150	Status word		Bit00 – Bit08 Status code Bit01 IMP Bit09 Status code Bit02 – Bit10 Status code Bit03 – Bit11 Status code Bit04 – Bit12 Warning Bit05 – Bit13 Message Bit06 n = 0 Bit14 – Bit07 CINH Bit15 –			Read only Decimal status word for networking via automation interface (AIF) <ul style="list-style-type: none"> <li>• Binary interpretation indicates the bit states</li> </ul>

### 3.1.2 Diagnostics

#### Description

Display codes for diagnostics

#### Codes for parameter setting

Code		Possible settings			IMPORTANT
No.	Name	Lenze	Selection		
C0093	Drive ident				Controller identification
			0	Invalid	Defective power section
			1	None	No power section
			14	9335VC 400V	Display of the controller used
			...	...	
			20	9383VC 400V	
			21	9334VC 500V	
			...	...	
			28	9383VC 500V	
9321	9321 VC				
...	...				
9333	9333VC				
C0099	S/W version		x.y		Software version
			x	Main version	• Read only
			y	Subversion	

### 3 Troubleshooting and fault elimination

#### Troubleshooting

#### Status display (LEDs on the controller)

### 3.2 Troubleshooting

#### Detecting failures

The controller LEDs and the status information displayed on the keypad immediately indicate errors or operation problems.

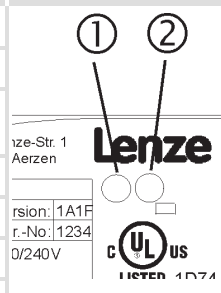
#### Analysing errors

You can analyse an error using the history buffer. The “Error messages” list helps you to eliminate the error. (📖 33)

#### 3.2.1 Status display (LEDs on the controller)

During operation, the operating status of the controller is indicated by means of two LEDs.

LED		Operating status
Red ①	Green ②	
Off	On	Controller is enabled
On	On	Mains is switched on and automatic start is inhibited
Off	Blinking slowly	Controller is inhibited
Off	On	Motor data identification is being performed
Blinking quickly	Off	Undervoltage
Blinking slowly	Off	Active fault



### 3.2.2 Fault analysis with the history buffer

#### Retracing faults

Faults can be retraced via the history buffer. Fault messages are stored in the 8 memory locations in the order of their appearance.

The memory locations can be retrieved via codes.

#### Structure of the history buffer

Code			Memory location	Entry	Note
C0168/1	C0169/1	C0170/1	Memory location 1	Active fault	If the fault is no longer pending or has been acknowledged: <ul style="list-style-type: none"> <li>• The contents of the memory locations 1 ... 7 are shifted "up" to the next memory location.</li> <li>• The content of memory location 8 is deleted from the history buffer and cannot be retrieved anymore.</li> <li>• Memory location 1 is deleted (= no active fault).</li> </ul>
C0168/2	C0169/2	C0170/2	Memory location 2	Last fault	
C0168/3	C0169/3	C0170/3	Memory location 3	Last but one fault	
C0168/4	C0169/4	C0170/4	Memory location 4	Last but two fault	
C0168/5	C0169/5	C0170/5	Memory location 5	Last but three fault	
C0168/6	C0169/6	C0170/6	Memory location 6	Last but four fault	
C0168/7	C0169/7	C0170/7	Memory location 7	Last but five fault	
C0168/8	C0169/8	C0170/8	Memory location 8	Last but six fault	

#### Explanations regarding the codes

C0168	<b>Fault indication and response</b> <ul style="list-style-type: none"> <li>• The entry is the LECOM error number</li> <li>• If several faults with different responses occur at the same time:               <ul style="list-style-type: none"> <li>– Only the fault with the highest priority response is entered (1. TRIP, 2. message, 3. warning).</li> </ul> </li> <li>• If several faults with the same response (e.g. 2 messages) occur at the same time:               <ul style="list-style-type: none"> <li>– Only the fault which occurred first is entered.</li> </ul> </li> </ul>
C0169	<b>Time of fault occurrence</b> <ul style="list-style-type: none"> <li>• The reference time is provided by the power-on time meter (C0179).</li> <li>• If the same fault occurs several times in succession, only the time of the last occurrence is stored.</li> </ul>
C0170	<b>Fault frequency</b> <ul style="list-style-type: none"> <li>• Only the time of the last occurrence is stored.</li> </ul>

#### Clear history buffer

Set C0167 = 1 to clear the history buffer.

## 3 Troubleshooting and fault elimination


Drive behaviour in the event of faults  
Fault analysis with the history buffer

### 3.3 Drive behaviour in the event of faults

The controller reacts in different ways to the three possible types of fault (TRIP, message or warning):

#### TRIP

**TRIP (display of keypad XT:  )**

- ▶ Switches the power outputs U, V, W to a high resistance until TRIP is reset
- ▶ Entry of the fault indication into the history buffer as "current fault" in C0168/1.
- ▶ The drive is coasting without control!
- ▶ After TRIP reset ( 38):
  - The drive accelerates to its setpoint along the set ramps.
  - The fault indication is moved into C0168/2 as "last fault".

#### Messages

**Message (display of keypad XT:  )**


- ▶ Switches the power outputs U, V, W to a high resistance.
- ▶ Entry of the fault indication into the history buffer as "current fault" in C0168/1.
- ▶ In case of a fault  $\leq 5$  s:
  - The drive is coasting without control as long as the message is active!
  - If the message is not active anymore, the drive accelerates to its setpoint with maximum torque.
- ▶ In case of a fault  $> 5$  s:
  - The drive is coasting without control as long as the message is active!
  - If the message is not active anymore, the drive accelerates to its setpoint along the set ramps.
- ▶ If the message is not active anymore, the fault indication is moved to C0168/2 as "last fault".

#### Warning

**"Heatsink overtemperature" (keypad XT:   )**

- ▶ The drive operates under control!
- ▶ The warning signal goes off if the fault is not active anymore.

**"Error in motor phase" (keypad XT: )**

**"PTC monitoring" (keypad XT: )**

- ▶ The drive operates under control!
- ▶ Entry of the fault indication into the history buffer as "current fault" in C0168/1.
- ▶ After TRIP reset, the fault indication is moved into C0168/2 as "last fault".

### 3.4 Error elimination

#### 3.4.1 Drive errors

Malfunction	Cause	Remedy
An asynchronous motor with feedback rotates in an uncontrolled manner and with low speed	<p>The motor phases are reversed so that the rotating field of the motor is not identical with the rotating field of the feedback system. The drive shows the following behaviour:</p> <ul style="list-style-type: none"> <li>• U/f characteristic control (C0006 = 5) <ul style="list-style-type: none"> <li>– The motor rotates faster than the speed setpoint by the value set in C0074 (influence of the speed controller, Lenze setting 10 % of <math>n_{max}</math>). After the controller is enabled, it does not stop at zero speed setpoint or quick stop (QSP).</li> <li>– The final motor current depends, among other things, on the set value of the <math>U_{min}</math> boost (C0016) and can rise to <math>I_{max}</math> (C0022). This may activate the fault message OC5.</li> </ul> </li> <li>• Vector control (C0006 = 1) <ul style="list-style-type: none"> <li>– The motor rotates slowly with maximum slip speed (depending on motor data and maximum current) and does not react to a speed setpoint. The direction of rotation, however, is determined by the sign of the speed setpoint.</li> <li>– The motor current rises up to <math>I_{max}</math> (C0022). This may activate the fault message OC5 with a time delay.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Check motor cable for correct phase relation.</li> <li>• If possible, operate the motor with deactivated feedback (C0025 = 1) and check the direction of rotation of the motor.</li> </ul>
Motor does not rotate although the controller is enabled ( $\overline{IMP}$ is off) and a speed setpoint has been specified.	The two terminal strips X5 are reversed. Since X5/A1 and X5/28 face each other, the controller can be enabled if the control terminals are internally supplied. All other connections, however, are assigned incorrectly so that the motor cannot start.	<p>Check the position of the terminal strips:</p> <ul style="list-style-type: none"> <li>• If you look at the connection unit in reading direction, the left terminal strip X5 must be connected with the input signals and the right terminal strip X5 must be connected with the output signals.</li> </ul>
The monitoring of the motor phases (LP1) does not respond if a motor phase is interrupted, although C0597 = 0 or 2	The function block MLP1 is not entered into the processing table.	Enter the function block MLP1 into the processing table. The function block MLP1 requires 30 $\mu$ s of calculating time.
If during high speeds DC-injection braking (GSB) is activated, the fault OC1 (TRIP) or OU (TRIP) occurs	During DC-injection braking the controller sets pulse inhibit for a short time (DCTRL-IMP) to reduce the magnetisation in the motor before a DC voltage is injected into the motor. At high speeds (e. g. in case of mid-frequency motors) the residual voltage which develops from the residual magnetism and high speed can generate such a high motor current that OC1 or OU are activated.	<p>Prolong the duration of the pulse inhibit:</p> <ul style="list-style-type: none"> <li>• Connect the output signal DCTRL-IMP to the function block TRANSx and adjust the desired switch-off time there (usually 500 ms). If DCTRL-CINH1 is set to HIGH, the duration of the pulse inhibit is prolonged by the time adjusted.</li> </ul>

### 3 Troubleshooting and fault elimination

Error elimination  
Controller in clamp operation

#### 3.4.2 Controller in clamp operation

The clamp operation is a permissible operating mode. But since, however, pulse inhibit is set again and again, the controller cannot provide the optimum power. Moreover, the fault OC3 (TRIP) can be activated.

If the output power is optimal, the output current mainly is right below the clamp threshold.

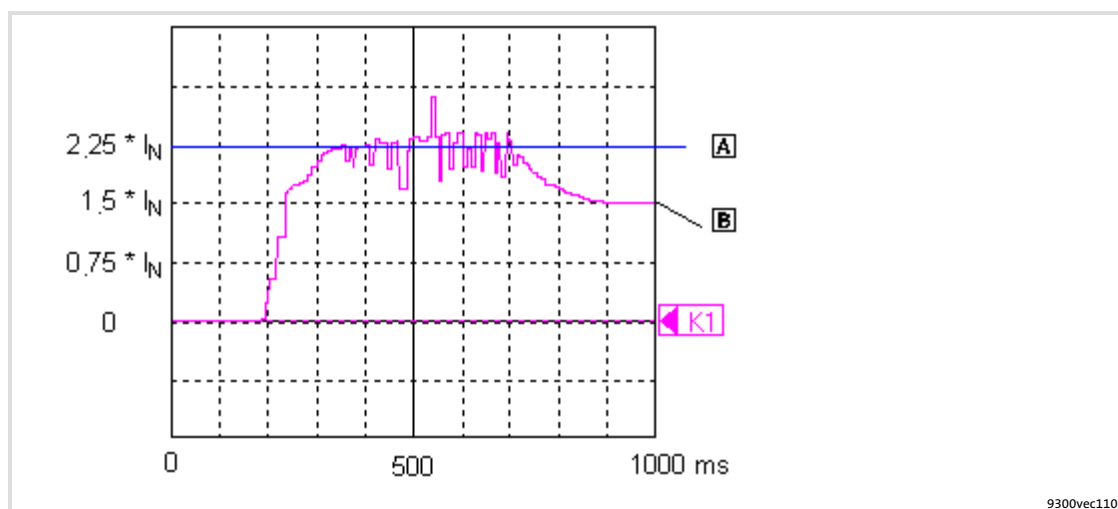


Fig.3-1 Output current when starting a motor with high load (shown with the oscilloscope in GDC)

- Ⓐ Clamp threshold
- Ⓑ Output current

#### Function

1. When the output current reaches  $2.25 \times I_r$ , a software clamp is activated.
2. The controller sets pulse inhibit for a short time. The motor current decreases as a function of the inductance in the motor circuit.
  - An internal counter is increased by the value one.
3. After max.  $250 \mu\text{s}$  the pulse inhibit is deactivated.
4. If a software clamp reoccurs within 2 s, the internal counter is again increased by the value one. Otherwise the counter is set to zero.
  - If the counter reaches the value 4300, OC3 (TRIP) is activated.

If the DC-bus voltage ( $U_{DC}$ ) exceeds the switch-off threshold OU, pulse inhibit will be set. At the same time, an internal timer for a delay time (C0912) will be started.

Pulse inhibit will be reset, if the voltage falls below the switch-on threshold OU and the delay time has elapsed.

### Thresholds for DC-bus overvoltage (OU)

Types EVF93xx-EVV210, EVF93xx-EVV240, EVF93xx-EVV270 and EVF93xx-EVV300				
Mains voltage range		C0173	Switch-off threshold OU	Switch-on threshold OU
< 400 V	Operation with or without brake transistor	0	770 V	755 V
400 V	Operation with or without brake transistor	1 *	770 V	755 V
460 V	Operation with or without brake transistor	2	770 V	755 V
480 V	Brake transistor	3	770 V	755 V
480 V	Brake transistor	4	800 V	785 V
500 V	Operation with or without brake transistor	5	900 V	885 V

\* Lenze setting

Types EVF93xx-EV, EVF93xx-EVV060 and EVF93xx-EVV110				
Mains voltage range		C0173	Switch-off threshold OU	Switch-on threshold OU
400 V	Operation with or without brake transistor	Read only	700 V	685 V

### Codes for parameter setting

Code		Possible settings		IMPORTANT
No.	Name	Lenze	Selection	
C0912	OV delay time	→	{1 ms}	- Delay time of the pulse enable after an OU message → Depending on C0082, C0086, C0087, C0088, C0089, C0090, C0091, C0092 A change of one of the codes resets C0912 to the time of the selected motor ● The time is derived from the double rotor time constant

## Troubleshooting and fault elimination

### Error elimination

#### Controller in clamp operation

#### Adjustment

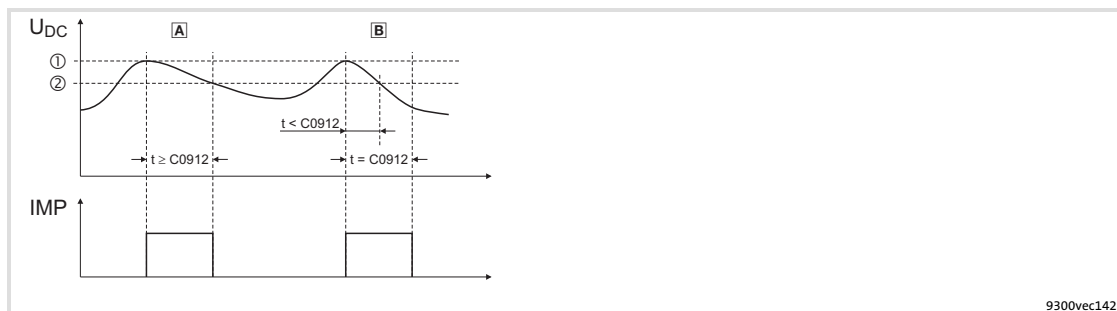


Fig.3-2 Influence of the delay time (C0912)

① Switch-off threshold OU

② Switch-on threshold OU

**A** The period of time between exceeding the switch-off threshold OU and undershooting the switch-on threshold OU equals or is higher than the delay time set in C0912.

After undershooting the switch-on threshold OU, the pulse inhibit is deactivated.

**B** The period of time between exceeding the switch-off threshold OU and undershooting the switch-on threshold OU is lower than the delay time set in C0912.

The pulse inhibit is deactivated after the delay time in C0912 has elapsed.

- ▶ In C0912 the delay time is set in [ms].The Lenze setting can be changed by the factor 0.5 ... 2.

## 3.4.3 Fault messages on the keypad or in the parameter setting program Global Drive Control

**Note!**

If you use GDC or a fieldbus module to retrieve the fault (C0168/x), the error message will be represented by an error number.


Display	Error number x = 0: TRIP x = 1: Message x = 2: Warning	Error	Cause	Remedy
---	---	No fault	–	–
CCr	x071	System fault	Processor is overloaded or there is a fault in the program processing	Reduce processor load. Remove function blocks that are not needed from the processing table
			Strong interference on control cables	Shield control cables
			Ground or earth loops in the wiring	Check wiring
CE0	x061	Communication error	Fault during transmission of control commands via automation interface X1	Plug in automation module firmly, bolt down, if necessary
CE1	x062	Communication error at the process data input object CAN-IN1	CAN-IN1 object receives faulty data, or communication is interrupted	<ul style="list-style-type: none"> <li>• Check cable at X4</li> <li>• Check sender</li> <li>• Increase monitoring time under C0357/1 if necessary</li> </ul>
CE2	x063	Communication error at the process data input object CAN-IN2	CAN-IN2 object receives faulty data, or communication is interrupted	<ul style="list-style-type: none"> <li>• Check cable at X4</li> <li>• Check sender</li> <li>• Increase monitoring time under C0357/2 if necessary</li> </ul>
CE3	x064	Communication error at the process data input object CAN-IN3	CAN-IN3 object receives faulty data, or communication is interrupted	<ul style="list-style-type: none"> <li>• Check cable at X4</li> <li>• Check sender</li> <li>• Increase monitoring time under C0357/3 if necessary</li> </ul>
CE4	x065	BUS-OFF state	Controller has received too many incorrect telegrams via system bus X4, and has disconnected from the bus	<ul style="list-style-type: none"> <li>• Check wiring</li> <li>• Check bus termination (if any)</li> <li>• Check shield contact of the cables</li> <li>• Check PE connection</li> <li>• Check bus load</li> <li>• Reduce baud rate (observe cable length)</li> </ul>
EEr	x091	External fault (TRIP-Set)	A digital input assigned with TRIP-set function has been activated (in the most basic configurations the input X5/E4 is LOW-active and linked with the TRIP-set function)	<ul style="list-style-type: none"> <li>• Check external encoder</li> <li>• Check signal at the digital input X5/E4: <ul style="list-style-type: none"> <li>– Either connect HIGH level or</li> <li>– Change polarity in C0114 to HIGH-active. CAUTION! When changing to HIGH level, the wire-break protection gets lost.</li> </ul> </li> </ul>
			The two terminal strips at X5 are reversed	Check the position of the terminal strips: <ul style="list-style-type: none"> <li>• If you look at the connection unit in reading direction, the left terminal strip X5 must be connected with the input signals and the right terminal strip X5 must be connected with the output signals.</li> </ul>
H05	x105	Internal fault		Contact Lenze
H07	x107	Wrong power stage	During initialisation of the controller, a wrong power stage was detected	Contact Lenze

### 3 Troubleshooting and fault elimination

#### Error elimination

Fault messages on the keypad or in the parameter setting program Global Drive Control

Display	Error number x = 0: TRIP x = 1: Message x = 2: Warning	Error	Cause	Remedy
H10	x110	Sensor fault - heatsink temperature	Sensor of the heatsink temperature detection indicates undefined values	Contact Lenze <ul style="list-style-type: none"> <li>Fault message can only be reset by mains switching</li> </ul>
H11	x111	Sensor fault - temperature inside the device	Sensor of the internal temperature detection indicates undefined values	Contact Lenze <ul style="list-style-type: none"> <li>Fault message can only be reset by mains switching</li> </ul>
ID1	x140	Error during motor data identification	<ul style="list-style-type: none"> <li>No motor connected</li> <li>Stator resistance too high</li> <li>Controller inhibited externally</li> </ul>	<ul style="list-style-type: none"> <li>Check motor connection</li> <li>Check motor data entry</li> <li>Enable controller and repeat motor data identification. The controller enable must be pending continuously until the end of the identification process.</li> </ul>
ID2	x141	Error during motor data identification	Motor too small	<ul style="list-style-type: none"> <li>Check entered motor data – When setting parameters with Global Drive Control, use the input assistant for motor data</li> <li>The measurements for the inverter error characteristic and the stator resistance are correct (save measured values in C0003). In the operating mode U/f characteristic control, the motor data identification can be completed.</li> </ul>
			Controller inhibited externally	Enable controller and repeat motor data identification. The controller enable must be pending continuously until the end of the identification process.
LP1	x032	Motor phase failure	A current-carrying motor phase has failed	<ul style="list-style-type: none"> <li>Check motor</li> <li>Check supply cables</li> </ul>
			The current limit is set too high	Set a lower current limit value under C0599
			This monitoring is not suitable for field frequencies >480 Hz and synchronous servo motors	Deactivate monitoring with C0597= 3
LU	x030	Undervoltage	DC bus voltage is smaller than the value set under C0173	<ul style="list-style-type: none"> <li>Check mains voltage</li> <li>Check supply module</li> </ul>
NMAX	x200	Maximum system speed exceeded (C0596)	Active load too high	Check drive dimensioning
			Drive is not speed-controlled, torque excessively limited	If required, increase torque limit
			Current speed is detected incorrectly	Check parameter setting of the incremental encoder (C0025)
OC1	x011	Overcurrent (motor current > 2.25-fold rated controller current, hardware monitoring)	Short circuit/earth fault	<ul style="list-style-type: none"> <li>Remove cause of short circuit/earth fault</li> <li>Check motor and cable</li> <li>If required, measure the insulation resistance</li> </ul>
			Capacitive charging current of the motor cable too high (especially with lower powers)	Use shorter or low-capacitance motor cable
			Acceleration/deceleration times too short in proportion to the load (C0012, C0013, C0105)	<ul style="list-style-type: none"> <li>Increase the gain (P component) of the current controller (C0075)</li> <li>Reduce integral-action time (integral action component) of the I<sub>max</sub> controller (C0076)</li> </ul>

Display	Error number x = 0: TRIP x = 1: Message x = 2: Warning	Error	Cause	Remedy
			<p>The drive is connected to the coasting machine. The coasting is caused by a short-time pulse inhibit, e.g. at</p> <ul style="list-style-type: none"> <li>● OU (overvoltage in the DC bus)</li> <li>● external or internal controller inhibit</li> </ul>	<ul style="list-style-type: none"> <li>● Activate flying restart circuit</li> <li>● Operate with speed feedback in the vector control operating mode</li> </ul>
			<ul style="list-style-type: none"> <li>● Encoder error</li> <li>● Tracks for encoder feedback of the motor speed are reversed</li> </ul>	<ul style="list-style-type: none"> <li>● Check wiring of the encoder</li> <li>● In case of drive problems with activated feedback, the feedback can be analysed. Here, the signal of the feedback is not used for control. For this test the function block DFIN must be entered into the processing table. In the Lenze setting, DFIN is entered at position 1 of the processing table (C0465/1 = 200). <ul style="list-style-type: none"> <li>– Deactivate feedback with C0025 = 1</li> <li>– Connect feedback at the digital frequency input DFIN (X9)</li> <li>– Set DFIN constant (C0425) to the number of increments of the encoder</li> <li>– In C0426, the speed detected by the encoder is indicated</li> </ul> </li> </ul>
			DC-injection braking at high speeds	<ul style="list-style-type: none"> <li>● See  29</li> </ul>
OC2	x012	Earth fault	<p>One of the motor phases has earth contact</p> <p>Excessive capacitive charging current of the motor cable</p>	<ul style="list-style-type: none"> <li>● Check motor</li> <li>● Check supply cables</li> </ul> <p>Use motor cable which is shorter or of lower capacitance</p>
OC3	x013	Overload during acceleration	Acceleration/deceleration times too short in proportion to the load (C0012, C0013, C0105)	<ul style="list-style-type: none"> <li>● Increase the gain (P component) of the current controller (C0075)</li> <li>● Reduce integral-action time (integral action component) of the <math>I_{max}</math> controller (C0076)</li> <li>● Increase ramp times</li> <li>●  30, "controller in clamp operation (fault OC3)"</li> </ul>
OC5	x015	$I \times t$ overload	<p>The utilisation of the controller exceeds 100 % (C0064 &gt; 100 %)</p> <p>The utilisation of the controller exceeds 110 % (C0064 &gt; 110 %)</p> <ul style="list-style-type: none"> <li>● The maximum current is reduced</li> </ul> <p>Reversed motor phases when operating with feedback or reversed encoder tracks so that the direction of rotation has changed</p>	<p>Check drive dimensioning</p> <ul style="list-style-type: none"> <li>● The utilisation of the controller is calculated from the mean value of the motor current over a time of 180 s. When operating with rated power (150 % overload capacity), the controller can be operated at a utilisation of up to 100 %.</li> <li>● When C0064 = 95 %, the warning is cancelled.</li> </ul> <p>Check drive dimensioning</p> <ul style="list-style-type: none"> <li>● When C0064 = 95 %, the reduction of the maximum current is cancelled. The warning is cancelled.</li> <li>● NOTE: Operation at increased rated power (120 % overload capacity) is not possible.</li> </ul> <ul style="list-style-type: none"> <li>● Check the motor cable connection for correct phase relation</li> <li>● If possible, operate the motor with deactivated feedback (C0025 = 1) and check the direction of rotation of the motor.</li> <li>● See also  29</li> </ul>

## 3

## Troubleshooting and fault elimination

### Error elimination

Fault messages on the keypad or in the parameter setting program Global Drive Control

Display	Error number x = 0: TRIP x = 1: Message x = 2: Warning	Error	Cause	Remedy
OH	x050	Heatsink temperature is higher than the value set in the controller	Ambient temperature $T_u > 40\text{ °C}$ or $50\text{ °C}$	<ul style="list-style-type: none"> <li>Allow controller to cool and ensure better ventilation</li> <li>Check ambient temperature in the control cabinet</li> </ul>
			Heatsink very dirty	Clean heatsink
			Wrong mounting position	Change mounting position
OH3	x053	Motor temperature is higher than the value set in the controller	Motor too hot because of excessive current or frequent and too long acceleration	Check drive dimensioning
			No KTY is connected to X8	Connect KTY or switch off monitoring (C0583 = 3)
OH4	x054	Heatsink temperature is higher than the value set in C0122	Ambient temperature $T_u > 40\text{ °C}$ or $50\text{ °C}$ .	<ul style="list-style-type: none"> <li>Allow controller to cool and ensure better ventilation</li> <li>Check ambient temperature in the control cabinet</li> </ul>
			Heatsink very dirty	Clean heatsink
			Wrong mounting position	Change mounting position
			The value entered in C0122 is too low	Enter higher value
OH7	x057	Motor temperature is higher than the value set in C0121	Motor too hot because of excessive current or frequent and too long acceleration	Check drive dimensioning
			No KTY is connected to X8	Connect KTY or switch off monitoring (C0584 = 3)
			The value entered in C0121 is too low	Enter higher value
OH8	x058	PTC at terminals T1, T2 indicates motor overheating	Motor too hot because of excessive current or frequent and too long acceleration	Check drive dimensioning
			Terminals T1, T2 are not assigned	Connect PTC or thermal contact or switch off monitoring (C0585=3)
OU	x020	Oversvoltage in the DC bus	Only for variants V210, V240, V270, V300: <ul style="list-style-type: none"> <li>Wrong values in C0173</li> <li>Wrong values in C0174</li> </ul>	<ul style="list-style-type: none"> <li>Set correct values in C0173</li> <li>Set correct values in C0174</li> </ul>
PEr	x074	Program fault	An error has been detected in the program flow. The parameter set 1 is loaded automatically. Parameter data which has been changed and not has been saved, will get lost.	Contact Lenze
PI	x079	Initialisation error	<ul style="list-style-type: none"> <li>A fault was detected during transfer of parameter sets between the controllers</li> <li>Parameter set does not match the controller</li> </ul>	Correct parameter set
PRO	x075	Parameter set error	Error while loading a parameter set. The parameters saved do not match the software version of the controller. <b>CAUTION! The Lenze setting is loaded automatically.</b>	<ul style="list-style-type: none"> <li>Correct parameter set</li> <li>Save all parameter sets with C0003 and reset the fault message by mains switching</li> </ul>
PR1 PR2 PR3 PR4	x072 x073 x077 x078	Parameter set error	<ul style="list-style-type: none"> <li>Fault while loading a parameter set</li> <li>The transmission of parameter sets with keypad XT has been interrupted (e.g. by an early disconnection of the keypad XT)</li> </ul> <b>CAUTION! The Lenze setting is loaded automatically.</b>	Set the required parameters and save them with C0003
Sd3	x083	Encoder error at X9	Cable interrupted	Check cable for wire breakage

**Troubleshooting and fault elimination****3**

Error elimination

Fault messages on the keypad or in the parameter setting program Global Drive Control

Display	Error number x = 0: TRIP x = 1: Message x = 2: Warning	Error	Cause	Remedy
			Pin X9/8 is not assigned	Assign pin X9/8 with 5 V or switch off monitoring (C0587 = 3)
Sd5	x085	Encoder at X6/1, X6/2 is defective	Current at X6/1, X6/2 < 2 mA	<ul style="list-style-type: none"> <li>• Check cable for wire breakage</li> <li>• Check encoder</li> </ul>
Sd6	x086	Sensor error at X8	KTY at X8 indicates undefined values	<ul style="list-style-type: none"> <li>• Check supply cable for firm connection</li> <li>• Switch off monitoring with C0594 = 3 if necessary</li> </ul>

## 3 Troubleshooting and fault elimination

### Resetting error messages

Fault messages on the keypad or in the parameter setting program Global Drive Control

### 3.5 Resetting error messages

#### Eliminate the cause of TRIP fault message

After you have eliminated the cause of a TRIP fault message, you must reset the fault message with the command "TRIP reset". Only then the drive restarts.



#### Note!

A TRIP fault message can have several causes. Only if all causes of the TRIP have been eliminated, the TRIP reset can be executed.

#### TRIP reset

- ▶ Keypad XT: Press **STOP**. Then press **RUN** to enable the controller.
- ▶ Fieldbus module: Set C0043 = 0
- ▶ Control word: C0135
- ▶ Terminal: X5/E5 = HIGH
- ▶ Control word via AIF
- ▶ Control word via system bus (CAN)

Mains switching always executes TRIP reset.

#### Codes for parameter setting

Code		Possible settings		IMPORTANT
No.	Name	Lenze	Selection	
C0043	Trip reset	0	0 no/trip reset	Reset actual error
			1 trip active	There is a TRIP error

## Troubleshooting and fault elimination

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Resetting error messages

Fault messages on the keypad or in the parameter setting program Global Drive Control



Lenze Drive Systems GmbH  
Hans-Lenze-Straße 1  
D-31855 Aerzen  
Germany

EDKVF93-05  
EN 1.0  
© 08/2007  
TD19

 +49 (0) 51 54 82-0  
 Service 00 80 00 24 4 68 77 (24 h helpline)  
 Service +49 (0) 51 54 82-1112  
E-Mail [Lenze@Lenze.de](mailto:Lenze@Lenze.de)  
Internet [www.Lenze.com](http://www.Lenze.com)