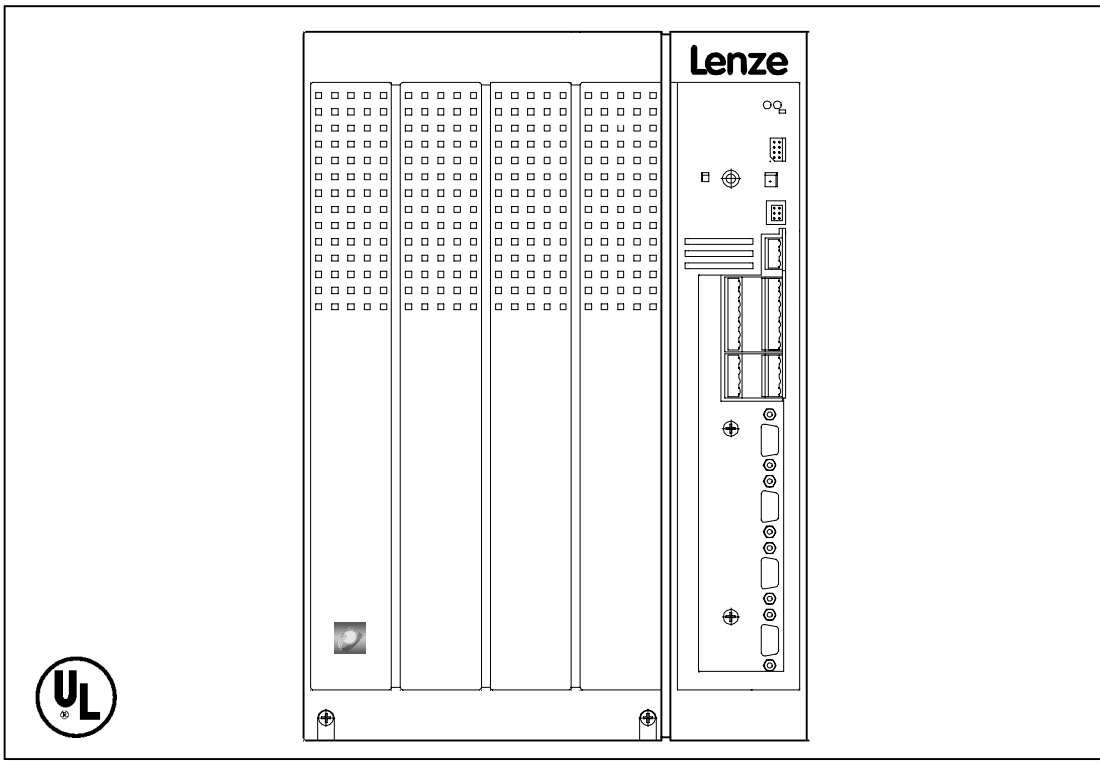
EDB9300EN
00423444

Lenze

Operating Instructions



Global Drive

9300 cam profiler

These Operating Instructions are valid for the 93XX controllers of the versions:

33.932X-	EK	2x.	3x		(9321 - 9329)
33.933X-	EK	2x.	3x		(9330 - 9332)
33.932X-	CK	2x.	3x	-V003	Cold Plate (9321 - 9328)

Type

Design:
Ex = Built-in unit IP20
Cx = Cold Plate
xK = Cam profiler
xP = Positioning controller
xR = Register controller
xS = Servo inverter

Hardware version and index

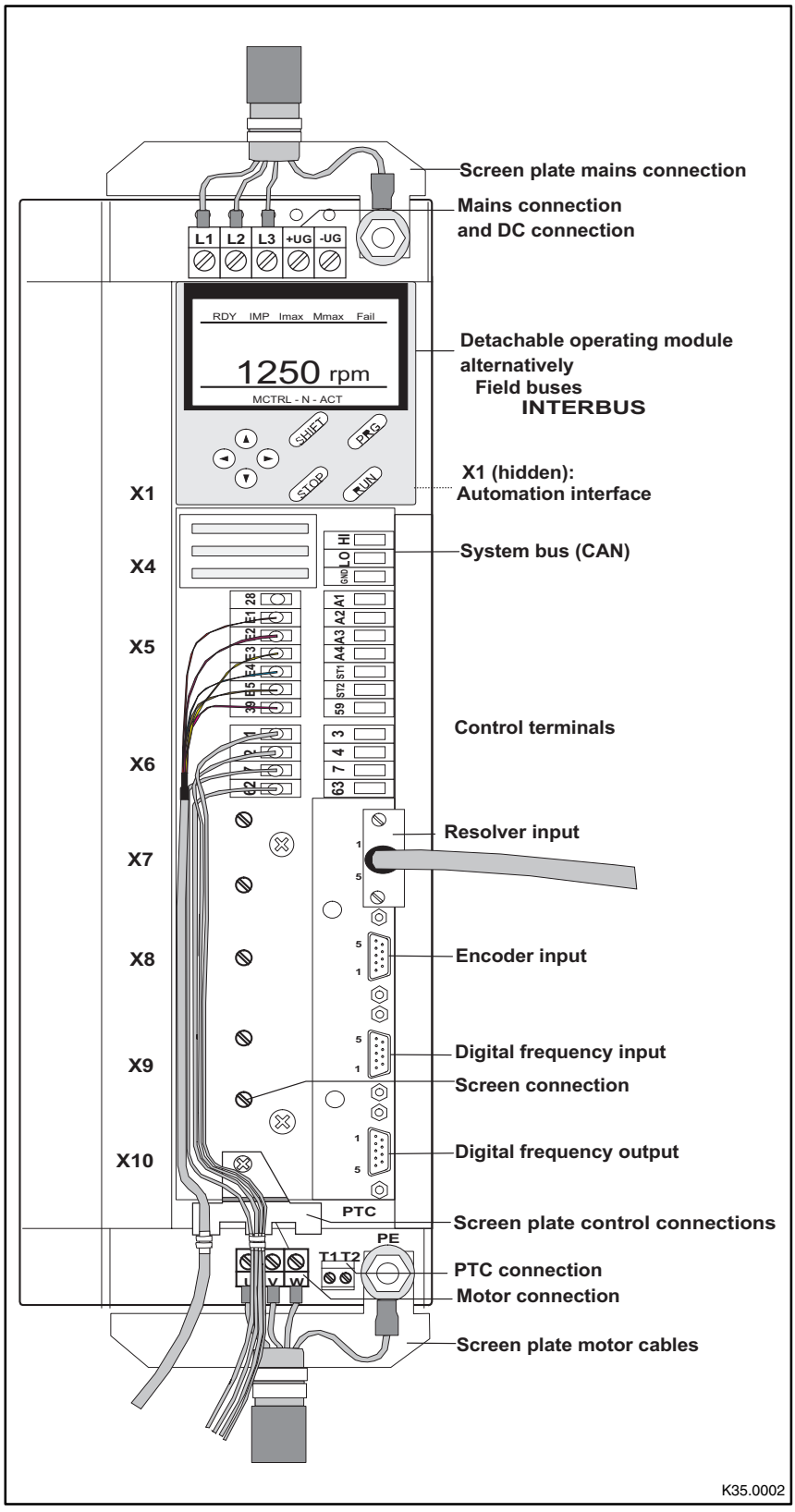
Software version and index

Version

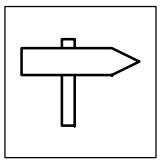
Explanation

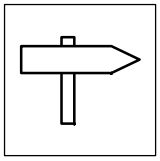
What is new / what has been changed ?

Material No.	Edition	Important	Contents
404602	01/09/1998	1st edition	
414275	02/2000	2nd edition	Code table extended by the codes for software version 2.0, revision
417631	1.10.2000	replaces 414275	New: Hand wheel function (see chapter Commissioning) More detailed description in chapter Profile creation Extension of the list “Motor table” (see chapter Appendix)
420395	2.3 04/01 TD02	replaces 417631	Added: Commissioning example for multi-axis applications (as of software version > 2.2)
423444	3.0 08/01 TD02	replaces 420395	Added: Commissioning extended by the chapter ”Motor mounting” (as of software version 3.0)


Screen plate mains connection
Mains connection
and DC connection
L1 L2 L3 +UG -UG
RDY IMP Imax Mmax Fail
1250 rpm
MCTRL - N - ACT
SHIFT
PRG
STOP
RUN
Detachable operating module
alternatively
Field buses
INTERBUS
X1
X1 (hidden):
Automation interface
X4
HI
LO
GND
System bus (CAN)
X5
X6
Control terminals
X7
Resolver input
X8
Encoder input
X9
Digital frequency input
Screen connection
X10
Digital frequency output
PTC
Screen plate control connections
PE
T1 T2
PTC connection
Motor connection
Screen plate motor cables
K35.0002

Contents





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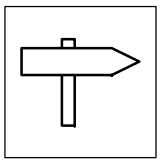

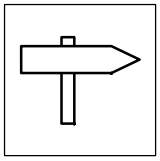

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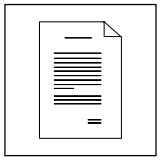


1 Preface and general information

1.1 About these Operating Instructions

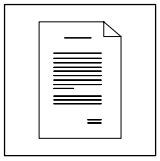
- These Operating Instructions help with the connection and commissioning of the 93xx cam profiler. They contain safety information which must be observed.
- All persons working on and with 93XX cam profilers must have these Operating Instructions available and must observe the information and notes relevant for their work.
- The Operating Instructions must always be in a complete and perfectly readable state.
- Further information on the controller can be obtained from the Catalog and the Manual.

1.1.1 Terminology used

Term	In the following text used for
93XX	Any cam profiler (types 9321 ... 9332)
Controller	93XX cam profiler
Drive system	Drive system with 93XX cam profiler and other Lenze drive components

1.2 Packing list

Packing list	Important
• 1 93XX cam profiler • 1 book of Operating Instructions • 1 accessory kit (bit and pieces for mechanical and electrical installation)	After receipt of the delivery, check immediately whether the items delivered match the accompanying papers.Lenze does not accept any liability for deficiencies claimed subsequently. Claim • visible transport damage immediately to the forwarder. • visible deficiencies/incompleteness immediately to your Lenze representative.



1.3 Legal regulations

Identification	**Nameplate**	**CE-identification**	**Manufacturer**
	Lenze controllers are unambiguously designated by the contents of the nameplate.	Conforms to the EC Low-Voltage Directive	Lenze GmbH & Co KG Postfach 101352 D-31763 Hameln
Application as directed	**The 93XX servo** • must only be operated under the conditions prescribed in these Instructions. • are components – for open and closed loop control of variable speed drives with PM synchronous motors, asynchronous servo motors or asynchronous standard motors. – for installation in a machine – used for assembly together with other components to form a machine. • are electric units for the installation into control cabinets or similar enclosed operating housing. • comply with the requirements of the Low-Voltage Directive. • are not machines for the purpose of the Machinery Directive. • are not to be used as domestic appliances, but only for industrial purposes. **Drive systems with 93XX servo inverters** • comply with the EMC Directive if they are installed according to the guidelines of CE-typical drive systems. • can be used – for operation on public and non-public mains – for operation in industrial premises and residential areas. • The user is responsible for the compliance of his application with the EC directives. **Any other use shall be deemed as inappropriate!**		
Liability	• The information, data, and notes in these instructions met the state of the art at the time of printing. Claims on modifications referring to controllers which have already been supplied cannot be derived from the information, illustrations, and descriptions. • The specifications, processes, and circuitry described in these instructions are for guidance only and must be adapted to your own specific application. Lenze does not take responsibility for the suitability of the process and circuit proposals. • The specifications in these Instructions describe the product features without guaranteeing them. • Lenze does not accept any liability for damage and operating interference caused by: – disregarding the operating instructions – unauthorized modifications to the controller – operating errors – improper working on and with the controller		
Warranty	• Warranty conditions: see Sales and Delivery Conditions of Lenze GmbH & Co KG. • Warranty claims must be made to Lenze immediately after detecting the deficiency or fault. • The warranty is void in all cases where liability claims cannot be made.		
Waste disposal	**Material**	**recycle**	**dispose**
	Metal	•	-
	Plastic	•	-
	Assembled PCBs	-	•

2 Safety information

2.1 Safety and application notes for Lenze controllers

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

1. General

During operation, drive controllers may have live, bare, in some cases also movable or rotating parts as well as hot surfaces, depending on their level of protection.

Non-authorized removal of the required cover, inappropriate use, incorrect installation or operation, creates the risk of severe injury to persons or damage to material assets.

For further information see the documentation.

All operations concerning transport, installation, and commissioning as well as maintenance must be carried out by qualified, skilled personnel (IEC 60364 or CENELEC HD384 or VDE 0100 and IEC report 664 or 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 erection, assembly, commissioning, and operation of the product and who have the qualifications necessary for their occupation.

2. Application as directed

Drive controllers are components which are designed for the installation into electrical systems or machinery.

When installing in machines, commissioning of the drive controllers (i.e. the starting of operation as directed) is prohibited until it is proven that the machine corresponds to the regulations of the EC Directive 98/37/EEC (Machinery Directive); EN 60204 (VDE 0113) 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 harmonized standards EN 50178 (VDE 0160) with EN 60439-1 (VDE 0660-500) and EN 60146 (VDE 0558) are applicable to the controllers.

The technical data as well as the connection conditions can be obtained from the nameplate and the documentation. They must be observed in all cases.

3. Transport, storage

The notes on transport, storage and appropriate handling must be observed.

The climatic conditions according to EN 50178 (VDE 0160) must be observed.

4. Installation

The units must be installed and cooled according to the regulations given in the corresponding documentation.

The controllers must be protected from inappropriate loads. Particularly during transport and handling, components must not be bent and/or insulation distances must not be changed. Avoid touching of electronic components and contacts.

Controllers contain electrostatically sensitive components, which can easily be damaged by inappropriate handling. Electrical components may not be damaged or destroyed mechanically (health risks are possible!) .

5. Electrical connection

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

Carry out the electrical installation in compliance with the corresponding regulations (e.g. cable cross-sections, fuses, PE connection). More detailed information is given in the corresponding documentation and must be observed.

Notes about wiring according to EMC regulations, such as shielding, grounding, filters and cable routing, are included in the documentation for the controllers. These notes also apply to CE-marked controllers. The compliance with limit values required by the EMC legislation is the responsibility of the manufacturer of the machine or system.

6. Operation

Systems where drive controllers are installed must be equipped, if necessary, with additional monitoring and protective devices according to the valid safety regulations, e.g. law on technical tools, regulations for the prevention of accidents, etc. Modifications on the controllers by means of the operating software are allowed.

After disconnection of the controllers from the supply voltage, live parts of the controller and power connections may not be touched immediately, because of possibly charged capacitors. For this observe the corresponding notes on the controller.

During operation, all covers and doors must be closed.

7. Maintenance and service

Observe the manufacturer's documentation.

These safety notes must be kept!
The product-specific safety and application notes given in these Operating Instructions must be observed!

2.2 Layout of the safety information

- All safety information have a uniform layout:
  – The icon characterizes the type of danger.
  – The signal word characterizes the severity of danger.
  – The note text describes the danger and gives information on how to prevent dangerous situations.

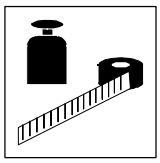
Signal word

Note

	Icons used		Signal words	
Warning of damage to persons		Warning of hazardous electrical voltage	**Danger!**	Warns of **impending danger**. Consequences if disregarded: Death or severe injuries.
		Warning of a general danger	**Warning!**	Warns of **potential, very hazardous situations**. Possible consequences if disregarded: Death or severe injuries.
			Caution!	Warns of **potential, hazardous situations**. Possible consequences if disregarded: Light or minor injuries.
Warning of damage to material			**Stop!**	Warns of **potential damage to material**. Possible consequences if disregarded: Damage of the controller/drive system or its environment**.**
Other notes			**Tip!**	This note designates general, useful notes. If you observe it, handling of the controller/drive system is made easier.

2.3 Residual hazards

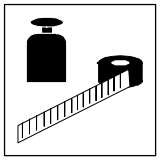
Protection of persons	After mains voltage disconnection the power terminals U, V, W and $+U_G$, $-U_G$ carry hazardous voltages at least 3 minutes after mains disconnection. • Before working on the controller, check that no voltage is applied to the power terminals.
Protection of devices	Cyclic connection and disconnection of the controller supply voltage at L1, L2, L3 or $+U_G$, $+U_G$ may overload the internal input current load: • Allow at least 3 minutes between disconnection and reconnection.
Overspeeds	Drive systems can reach dangerous overspeeds (e.g. setting high field frequencies for motors and machines which are not suitable): • The controllers do not offer any protection against these operating conditions. Use additional components for this.
Parameter set transfer	During parameter set transfer, the control terminals of the 9300 servo can have undefined states! Therefore the plugs X5 and X6 must be removed before transfer. Thus it is ensured that the controller is inhibited and all control terminals have the defined state ”LOW”.



3 Technical data

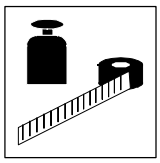
3.1 Features

- Several profiles, which have, for instance been generated with the planning tool **CamDesigner** (additional software), can be saved.
- Cam switch function
- Stretching/compression/offset in X and Y direction
- Virtual master
- Clutch replacement / overload clutch
- Welding bar control
- Integrated oscilloscope function
- Power range: 370 W to 75 kW
  – Uniform control module and thus uniform connection for the control cables over the complete power range.
- Heat sink can be separated
  – Cooling is possible outside the control cabinet (push-through technique or ”cold plate technique”)
- Direct connection of resolver or encoder feedback
  – Easy connection because of prefabricated system cables (accessories)
  – Connecting cables can be plugged
- Integrated angular controller for driftfree standstill
- Digital synchronization system via digital frequency
  – Setpoint transmission without offset and gain errors
  – Synchronization of speed and rotor position
  – Homing function
- User configuration for control functions and input and output signals
  – Comprehensive function block library
  – High flexibility in the adaptation to the internal control structure of the application
- Integrated automation interface
  – Easy extension of the controller functionality
- System bus for the connection of servo inverters and for the extension of input and output terminals
- Approval of standard devices UL 508, File No. 132659 (listed)
- Approval 9371 BB (BAE) UL 508, File No. 132659 (listed)



3.2 General data/operating conditions

Field	Values
Vibration resistance	Germanischer Lloyd, general conditions
Permissible moisture	Humidity class F without condensation (average relative humidity 85 %)
Permissible temperature ranges	during transport: -25 °C ... +70 °C during storage of the controller: -25 °C ... +55 °C during operation of the controller: 0 °C ... +40 °C without derating +40 °C ... +55 °C with power derating (controllers 9321-9326) +40 °C ... +50 °C with power derating (controllers 9327-9332)
Permissible installation height h	h ≤ 1000 m a.m.s.l. without derating 1000 m a.m.s.l. < h ≤ 4000 m a.m.s.l. with derating
Permissible pollution	VDE 0110 part 2 pollution degree 2
Noise emission	Requirements to EN 50081-2, EN 50082-1, EN 61800-3 Limit value class A to EN 55011 (industrial area) with mains filter A Limit value class B acc. to EN 55022 (residential area) with mains filter B and installation in control cabinet
Noise immunity	Limit values maintained using mains filter. Requirements to EN 50082-2, EN 61800-3 **Requirements / Standard / Severity** Running time / EN61000-4-2 / 3, i.e. 8 kV at air discharge and 6 kV at contact discharge RF interference (enclosure) / EN61000-4-3 / 3, i.e. 10 V/m; 27 to 1000 MHz Burst / EN61000-4-4 / 3/4, i.e. 2 kV/5 kHz Surge / IEC 1000-4-5 / 3, i.e. 1.2/50 µs, 1 kV phase-phase, 2 kV phase-PE
Insulation strength	Overvoltage category III to VDE 0110
Packaging	to DIN 4180 9321 to 9332: Delivery packing
Type of protection	IP20 IP41 on the heat-sink side for thermal separation (punching) NEMA 1: Protection against contact
Approvals	CE: Low-Voltage Directive UL508: Industrial Control Equipment UL508C: Power Conversion Equipment



3.3 Rated data

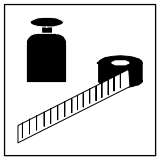
3.3.1 Types 9321 to 9325

	Type	EVS9321-EK	EVS9322-EK	EVS9323-EK	EVS9324-EK	EVS9325-EK
	Order no.	EVS9321-EK	EVS9322-EK	EVS9323-EK	EVS9324-EK	EVS9325-EK
	Type	**EVS9321-CK**	**EVS9322-CK**	**EVS9323-CK**	**EVS9324-CK**	**EVS9325-CK**
	Order no.	EVS9321-CK	EVS9322-CK	EVS9323-CK	EVS9324-CK	EVS9325-CK
Mains voltage	V_r [V]	320 V - 0 % ≤ V_r ≤ 528 V + 0 % ; 45 Hz - 0 % ... 65 Hz + 0 %				
Alternative DC supply	V_{DC} [V]	460 V - 0 % ≤ V_{DC} ≤ 740 V + 0 %				
Mains current with mains filter Mains current without mains filter	I_r [A]	1.5 2.1	2.5 3.5	3.9 5.5	7.0 -	12.0 16.8
Ratings for operation at a mains: 3 AC / 400V / 50Hz/60Hz						
Motor power (4-pole ASM)	P_r [kW]	0.37	0.75	1.5	3.0	5.5
	P_r [hp]	0.5	1.0	2.0	4.0	7.5
Output power U, V, W (8kHz*)	S_{r8} [kVA]	1.0	1.7	2.7	4.8	9.0
Output power $+U_{DC}$, $-U_{DC}$ 2)	P_{DC} [kW]	2.0	0.75	2.2	0.75	0
Output current (8 kHz*)	I_{r8} [A]	1.5	2.5	3.9	7.0	13.0
Output current (16 kHz*)	I_{r16} [A]	1.1	1.8	2.9	5.2	9.7
Max. output current (8 kHz*)1)	I_{max8} [A]	2.3	3.8	5.9	10.5	19.5
Max. output current (16 kHz*)1)	I_{max16} [A]	1.7	2.7	4.4	7.8	14.6
Max. standstill current (8 kHz*)	I_{08} [A]	2.3	3.8	5.9	10.5	19.5
Max. standstill current (16 kHz*)	I_{016} [A]	1.7	2.7	4.4	7.8	14.6
Ratings for operation at a mains: 3 AC / 480V / 50Hz/60Hz						
Motor power (4-pole ASM)	P_r [kW]	0.37	0.75	1.5	3.0	5.5
	P_r [hp]	0.5	1.0	2.0	4.0	7.5
Output power U, V, W (8kHz*)	S_{r8} [kVA]	1.2	2.1	3.2	5.8	10.8
Output power $+U_{DC}$, $-U_{DC}$ 2)	P_{DC} [kW]	2.0	0.75	2.2	0.75	0
Output current (8 kHz*)	I_{r8} [A]	1.5	2.5	3.9	7.0	13.0
Output current (16 kHz*)	I_{r16} [A]	1.1	1.8	2.9	5.2	9.7
Max. output current (8 kHz*)1)	I_{max8} [A]	2.3	3.8	5.9	10.5	19.5
Max. output current (16 kHz*)1)	I_{max16} [A]	1.7	2.7	4.4	7.8	14.6
Max. standstill current (8 kHz*)	I_{08} [A]	2.3	3.8	5.9	10.5	19.5
Max. standstill current (16 kHz*)	I_{016} [A]	1.7	2.7	4.4	7.8	14.6
Motor voltage	V_M [V]	0 - 3 × V_{Mains}				
Power loss (operation with I_{ratedx})	P_{loss} [W]	100	110	140	200	260
Power derating	[%/K] [%/m]	40 °C < T_{amb} < 55 °C: 2%/K (not UL approved) 1000 m amsl < h ≤ 4000 m amsl: 5%/1000m				
Weight	m [kg]	3.5	3.5	5.0	5.0	7.5

1) The currents apply to a periodical load cycle with 1 minute overcurrent with the current mentioned here and 2 minutes base load with 75% I_{ratedx}

2) When operated under rated load, the controller can supply this power additionally.

* Chopper frequency of the inverter (C0018)



3.3.2 Types 9321 to 9324 with 200 % overcurrent

	Type	EVS9321-EK	EVS9322-EK	EVS9323-EK	EVS9324-EK
Ratings for operation at a mains: 3 AC / 400V / 50Hz/60Hz					
Motor power (4-pole ASM)	P_r [kW]	0.37	0.75	1.5	3.0
	P_r [hp]	0.5	1.0	2.0	4.0
Output power U, V, W (8 kHz)	S_{r8} [kVA]	1.0	1.7	2.7	4.8
Output current (8 kHz) 2)	I_{r8} [A]	1.5	2.5	3.9	7.0
Output current (16 kHz) 2)	I_{r16} [A]	1.1	1.8	2.9	5.2
max output current (8 kHz)1)	I_{max8} [A]	3.0	5.0	7.8	14.0
max output current (16 kHz)1)	I_{max16} [A]	2.2	3.6	5.8	10.4
max. standstill current (8 kHz)	I_{08} [A]	3.0	5.0	7.8	14.0
max. standstill current (16 kHz)	I_{016} [A]	2.2	3.6	5.8	10.4
Ratings for operation at a mains: 3 AC / 480V / 50Hz/60Hz					
Motor power (4-pole ASM)	P_r [kW]	0.37	0.75	1.5	3.0
	P_r [hp]	0.5	1.0	2.0	4.0
Output power U, V, W (8 kHz)	S_{r8} [kVA]	1.2	2.1	3.2	5.8
Output current (8 kHz) 2)	I_{r8} [A]	1.5	2.5	3.9	7.0
Output current (16 kHz) 2)	I_{r16} [A]	1.1	1.8	2.9	5.2
max output current (8 kHz)1)	I_{max8} [A]	3.0	5.0	7.8	14.0
max output current (16 kHz)1)	I_{max16} [A]	2.2	3.6	5.8	10.4
max. standstill current (8 kHz)	I_{08} [A]	3.0	5.0	7.8	14.0
max. standstill current (16 kHz)	I_{016} [A]	2.2	3.6	5.8	10.4

1) The currents apply to a periodical load cycle with 10 seconds overcurrent with the current mentioned here and 50 seconds base load with 44 % I_{rx}

Majority in indiv. cases	Setting in code C0022	Thermal continuous current	Maximum current phase	Recovery phase
Continuous power	$I_{max} \leq 150$ % I_{rX}	100 % I_{rX}	150 % I_{rX} for 60 s	75 % I_{rX} for 120 s
Peak power	$I_{max} > 150$ % I_{rX}	70 % I_{rX}	200 % I_{rX} for 10 s	44 % I_{rX} for 50 s

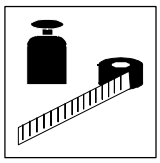
2) This output current Irx applies for a maximum current to be set under C022 which has not exceeded 150% of the rated controller current (nameplate).
If the maximum current is higher than this value, the continuous current reduces automatically to 70% of the original value.

Overcurrent diagram: 📖 8-20

All other data: 📖 3-3

Tip!

Switching to $I_{max} > 150$ % I_{rX} only if the controller is inhibited.



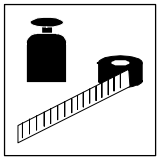
3.3.3 Types 9326 to 9332

	Type	EVS9326-EK	EVS9327-EK	EVS9328-EK	EVS9329-EK	EVS9330-EK	EVS9331-EK	EVS9332-EK
	Order no.	EVS9326-EK	EVS9327-EK	EVS9328-EK	EVS9329-EK	EVS9330-EK	EVS9331-EK	EVS9332-EK
	Type	**EVS9326-CK**	**EVS9327-CK**	**EVS9328-CK**				
	Order no.	EVS9326-CK	EVS9327-CK	EVS9328-CK				
Mains voltage	V_r [V]	320 V - 0 % ≤ V_r ≤ 528 V + 0 % ; 45 Hz - 0 % ... 65 Hz + 0 %						
Alternative DC supply	V_{DC} [V]	460 V - 0 % ≤ V_{DC} ≤ 740 V + 0 %						
Mains current with mains filter Mains current without mains filter	I_r [A]	20.5 -	27.0 43.5	44.0 -	53.0 -	78.0 -	100 -	135 -
Ratings for operation at a mains: 3 AC / 400V / 50Hz/60Hz								
Motor power (4-pole ASM)	P_r [kW]	11.0	15.0	22.0	30.0	45.0	55.0	75.0
	P_r [hp]	15.0	20.5	30.0	40.0	60.0	73.5	100.0
Output power UVW (8 kHz*)	S_{r8} [kVA]	16.3	22.2	32.6	40.9	61.6	76.2	100.5
Output power $+U_{DC}$, $-U_{DC}$ 2)	P_{DC} [kW]	0	10	4	0	5	0	0
Output current (8 kHz*) 1)	I_{r8} [A]	23.5	32.0	47.0	59.0	89.0	110.0	145.0
Output current (16 kHz*) 1)	I_{r16} [A]	15.3	20.8	30.6	38.0	58.0	70.0	90.0
Max. output current (8 kHz*)	I_{max8} [A]	35.3	48.0	70.5	88.5	133.5	165.0	217.5
Max. output current (16 kHz*)	I_{max16} [A]	23.0	31.2	45.9	57.0	87.0	105.0	135.0
Max. standstill current (8 kHz*)	I_{08} [A]	23.5	32.0	47.0	52.0	80.0	110.0	126.0
Max. standstill current (16 kHz*)	I_{016} [A]	15.3	20.8	30.6	33.0	45.0	70.0	72.0
Ratings for operation at a mains: 3 AC / 480V / 50Hz/60Hz								
Motor power (4-pole ASM)	P_r [kW]	11.0	18.5	30.0	37.0	45.0	55.0	90.0
	P_r [hp]	15.0	25.0	40.0	49.5	60.0	73.5	120.0
Output power UVW (8 kHz*)	S_{r8} [kVA]	18.5	25.0	37.0	46.6	69.8	87.3	104.0
Output power $+U_{DC}$, $-U_{DC}$ 2)	P_{DC} [kW]	0	12	4.8	0	6	0	6
Output current (8 kHz*)	I_{r8} [A]	22.3	30.4	44.7	56.0	84.0	105.0	125.0
Output current (16 kHz*)	I_{r16} [A]	14.5	19.2	28.2	35.0	55.0	65.0	80.0
Max. output current (8 kHz*)1)	I_{max8} [A]	33.5	45.6	67.1	84.0	126.0	157.5	187.5
Max. output current (16 kHz*)1)	I_{max16} [A]	21.8	28.8	42.3	52.5	82.5	97.5	120.0
Max. standstill current (8 kHz*)	I_{08} [A]	22.3	30.4	44.7	49.0	72.0	105.0	111.0
Max. standstill current (16 kHz*)	I_{016} [A]	14.5	19.2	28.2	25.0	36.0	58.0	58.0
Motor voltage	a_M [V]	0 - 3 × V_{Mains}						
Power loss	P_{loss} [W]	360	430	640	810	1100	1470	1960
Power derating	[%/K] [%/K] [%/m]	9326: at 40 °C < T_{amb} < 55 °C: 2%/K (not UL approved) 9327 - 9332: at 40 °C < T_{amb} < 50 °C: 2.5%/K (not UL approved) 1000 m amsl < h ≤ 4000 m amsl: 5%/1000m						
Weight	m [kg]	7.5	12.5	12.5	12.5	36.5	59	59

1) The currents apply to a periodical load cycle with 1 minute overcurrent with the current mentioned here and 2 minutes base load with 75% I_{ratedx}

2) When operated under rated load, the controller can supply this power additionally.

* Chopper frequency of the inverter (C0018)



3.3.4 Fuses and cable cross-sections

Type	Mains input L1, L2, L3, PE/motor connection U, V, W										Input +UG, -UG		
	Operation without mains filter					Operation with mains filter							
	Fuse		E.l.c.b.	Cable cross-section [2]		Fuse		E.l.c.b.	Cable cross-section [2]		Fuse	Cable cross-section [2]	
	VDE	UL	VDE	mm^2	AWG	VDE	UL	VDE	mm^2	AWG		mm^2	AWG
9321	M 6A	5A	B 6A	1	17	M 6A	5A	B 6A	1	17	6.3A	1	17
9322	M 6A	5A	B 6A	1	17	M 6A	5A	B 6A	1	17	6.3A	1	17
9323	M 10A	10A	B 10A	1.5	15	M 10A	10A	B 10A	1.5	15	8A	1.5	15
9324	-	-	-	-	-	M 10A	10A	B 10A	1.5	15	12A	1.5	15
9325	M 32A	25A	B 32A	6	9	M 20A	20A	B 20A	4	11	20A	4	11
9326	-	-	-	-	-	M 32A	25A	B 32A	6	9	40A	6	9
9327	M 63A	63A	-	16	6	35A	35A	-	10	7	50A	10	7
9328	-	-	-	-	-	50A	50A	-	16	5	80A	16	5
9329	-	-	-	-	-	80A	80A	-	25	3	100A	25	3
9330	-	-	-	-	-	100A	100A	-	50	0	2 * 80A [1]	2 * 16	2 * 5
9331	-	-	-	-	-	125A	125 A	-	70	2/0	2 * 100A [1]	2 * 25	2 * 3
9332	-	-	-	-	-	160A	175 A	-	95	3/0	3 * 80A [1]	3 * 16	3 * 5

[1] The DC bus fuses are connected in parallel

[2] The valid local regulations must be observed

For operation of the controllers in a UL-approved plant:

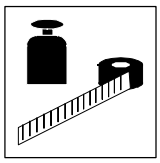
- Use only UL-approved fuses and fuse holders:
  – 500 V to 600 V in the mains input (AC)
  – 700 V in DC-bus voltage (DC)
  – The activation characteristic is defined by ”H” or ”K5”.
- Use only UL-approved cables.

Tip!

UL-approved fuses and fuse holders can be obtained from, e.g. Bussmann or Ferraz.

Connection of the motor cables

- The protection of the motor cables is not necessary for functional reasons.
- Refer to the data listed in the table ”Operation with mains filter”.



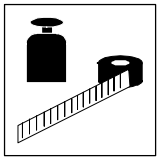
3.3.5 Mains filter

Type	Rated data (uk ≈ 6%)		Lenze order number	
	Mains current	Inductance	for RFI degree A	for RFI degree B
9321	1.5 A	24 mH	EZN3A2400H002	EZN3B2400H002
9322	2.5 A	15 mH	EZN3A1500H003	EZN3B1500H003
9323	4 A	9 mH	EZN3A0900H004	EZN3B0900H004
9324	7 A	5 mH	EZN3A0500H007	EZN3B0500H007
9325	13 A	3 mH	EZN3A0300H013	EZN3B0300H013
9326	24 A	1.5 mH	EZN3A0150H024	EZN3B0150H024
9327	30 A	1.1 mH	EZN3A0110H030	EZN3B0110H030
9328	42 A	0.8 mH	EZN3A0080H042	EZN3B0080H042
9329	60 A	0.54 mH	EZN3A0055H060	EZN3B0055H060
9330	90 A	0.37 mH	EZN3A0037H090	EZN3B0037H090
9331	150 A	0.22 mH	EZN3A0022H150	EZN3B0022H150
9332	150 A	0.22 mH	EZN3A0022H150	EZN3B0022H150

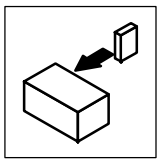
The mains filters for RFI degree B contain additional RFI suppression components.

3.4 Dimensions

The dimensions of the controllers depend on the mechanical installation. (📖 4-1)



Technical data



4 Installation

4.1 Mechanical installation

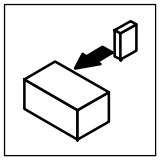
4.1.1 Important notes

- Use the controllers only as built-in devices!
- If the cooling air contains pollutants (dust, fluff, grease, aggressive gases):
  – Take suitable preventive measures , e.g. separate air duct, installation of filters, regular cleaning, etc.
- Observe free space!
  – You can install several controllers next to each other without free space in a control cabinet.
  – Ensure unimpeded ventilation of cooling air and outlet of exhaust air!
  – Allow a free space of 100 mm at the top and at the bottom.
- Do not exceed the ambient temperature permissible during operation. (📖 3-2)
- With continuous oscillations or vibrations:
  – Check whether shock absorbers are necessary.

Possible mounting positions

Vertically on the control cabinet back panel with mains connections at the top:

- With enclosed fixing rails or fixing brackets. (📖 4-2)
- Thermally separated with external heat sink
  – Punching (📖 4-3)
  – ”Cold Plate technology” (📖 4-6)



4.1.2 Standard assembly with fixing rails or mounting brackets

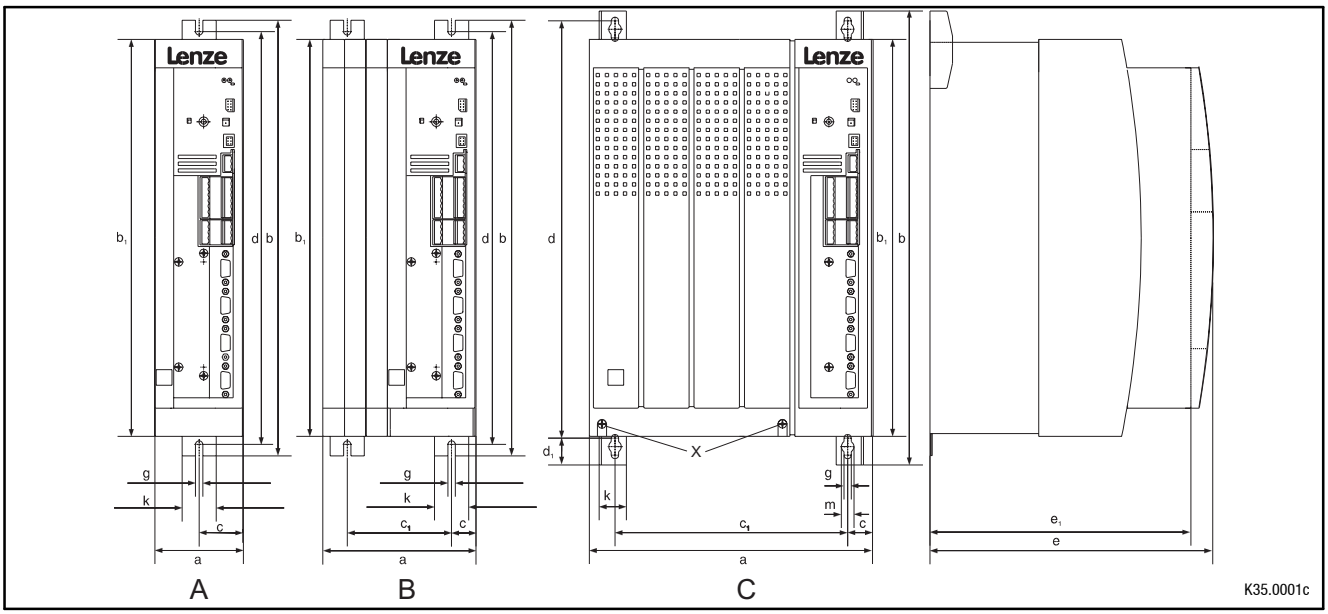


Fig. 4-1 Dimensions for assembly with fixing rails / fixing brackets

Type	Fig.	a	b	b1	c	c1	d	d1	e*	e1	g	k	m
9321, 9322	0	78	384	350	39	-	365	-	250	230	6.5	30	-
9323, 9324	0	97	384	350	48.5	-	365	-	250	230	6.5	30	-
9325, 9326	B	135	384	350	21.5	92	365	-	250	230	6.5	30	-
9327, 9328, 9329	C	250	402	350	22	206	370	24	250	230	6.5	24	11
9330	C	340	672	591	28.5	283	624	38	285	265	11	28	18
9331, 9332	C	450	748.5	680	30.5	389	702	38	285	265	11	28	18

* When using an attachable fieldbus module:
Observe the free space required for the connection cables

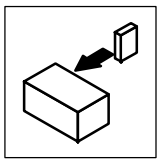
All dimensions in mm

Controllers 9321 to 9326

- Assembly preparation:
  – Take out fixing rail(s) (accessory kit in the box) and mount onto the controller housing

Controllers: 9327 to 9332

- Remove cover:
  – Loosen screws (X)
  – Swing cover upwards, and detach.
  – Take accessory kit out of the interior of the controller
- Assembly preparation:
  – Take out fixing bracket and screws (accessory kit) and mount onto the controller housing



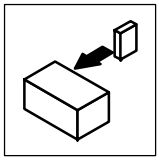
4.1.3 Assembly with thermally separated power stage (”punching”)

The heat sink of the controllers 9321 ... 9329 can be mounted outside the control cabinet to reduce the heat generated in the control cabinet. For this, you need an assembly frame with seal (can be ordered from Lenze).

- Distribution of the power loss:
  – approx. 65% via the separated heat sink (heat sink + blower)
  – approx. 35% inside the controller
- The type of protection of the separated cooler (heat sink and blower) is IP41.
- The ratings of the controller are still applicable.

Preparations for assembly:

1. Lay the halves of the assembly frame into the slot provided on the controller.
2. Push the frame halves together until the ends lock.
3. Slip the seal over the heat sink and lay into the slot provided.



Installation

Dimensions of the types 9321 to 9326

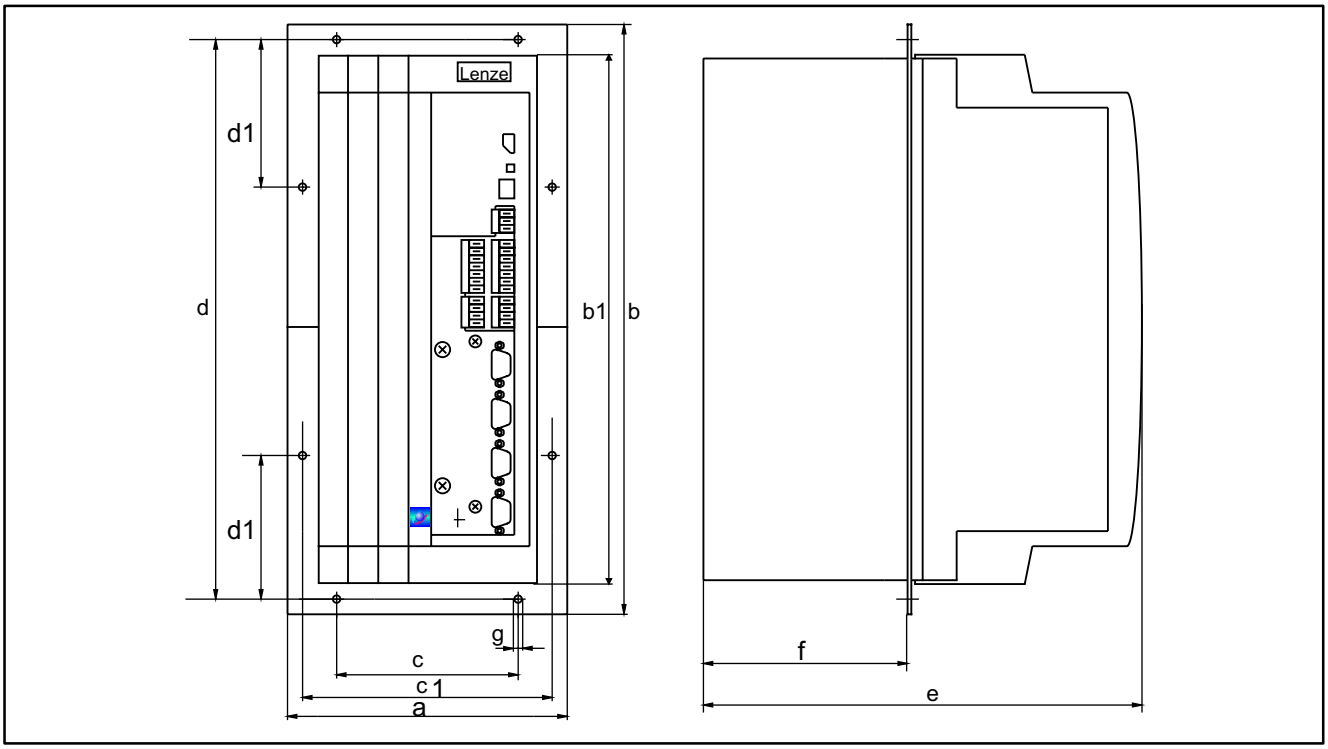


Fig. 4-2 Dimensions for assembly with thermally separated power stage

Type	a	b	b1	c	c1	d	d1	e*	f	g
9321, 9322	112.5	385.5	350	60	95.5	365.5	105.5	250	92	6.5
9323, 9324	131.5	385.5	350	79	114.5	365.5	105.5	250	92	6.5
9325, 9226	135	385.5	350	117	137.5	365.5	105.5	250	92	6.5

Assembly cut-out

Type	Height	Width
9321, 9322	350 ±3	82 ±3
9323, 9324		101 ±3
9325, 9326		139 ±3

* When using an attachable fieldbus module:
Observe the free space required for the connection cables

All dimensions in mm

Dimensions of the types 9327 to 9329

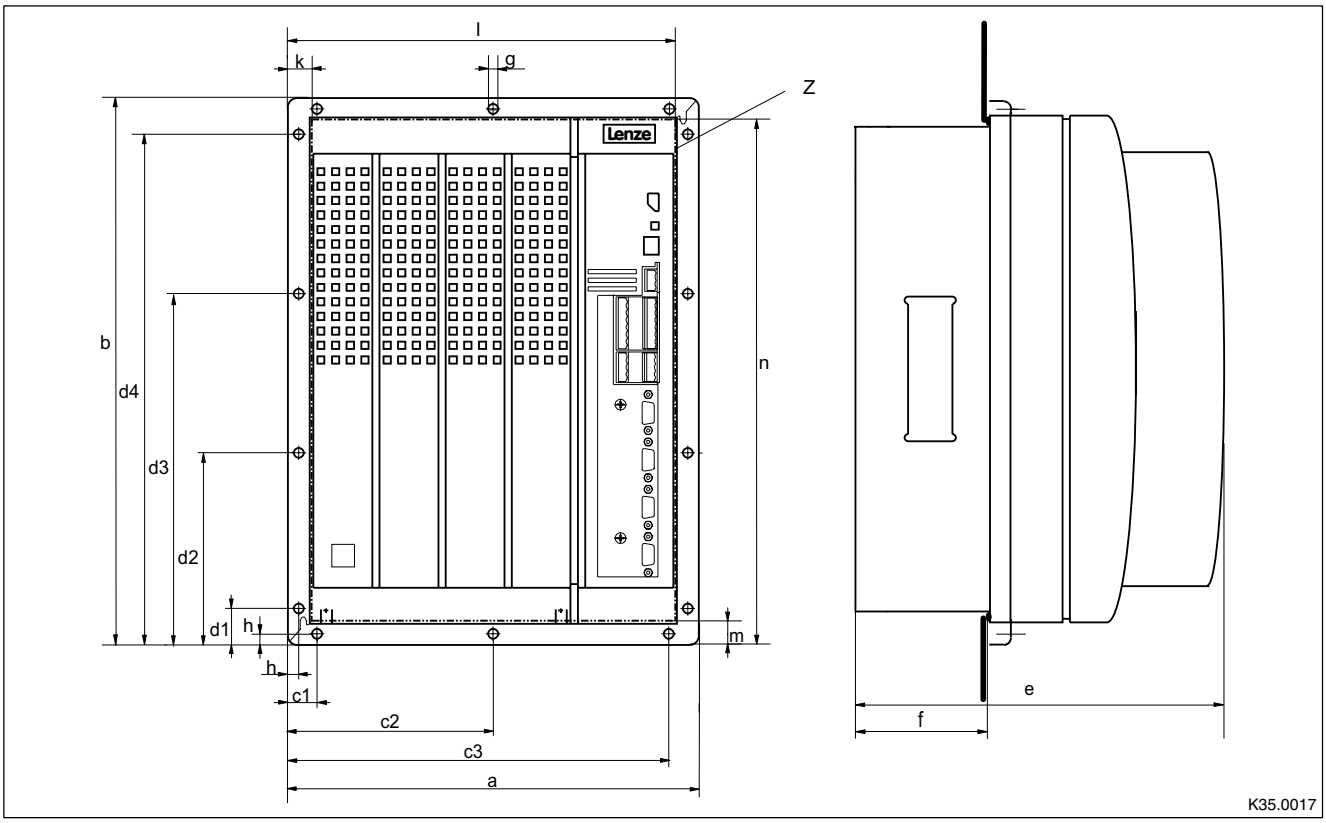


Fig. 4-3 Dimensions for assembly with thermally separated power stage

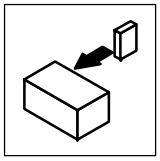
Type	a	b	c1	c2	c3	d1	d2	d3	d4	e *)	f	g	h
9327, 9328, 9329	280	379	28	140	252	41	141	238	338	250	90	6	9

Cut-out Z

Type	Height	Width	k	l	m	n
9327, 9328, 9329	338 ±1	238 ±1	20 ±2	259 ±2	20 ±2	359 ±2

* When using an attachable fieldbus module:
Observe the free space required for the connection cables

All dimensions in mm



4.1.4 Assembly of variants

Variant EVS932X-Cx (”Cold plate”)

For installation in control cabinets together with other heat sinks in ”Cold plate technology” (x = order abbreviation; see inner Instructions cover).

Dimensions for types 9321-Cx bis 9326-Cx

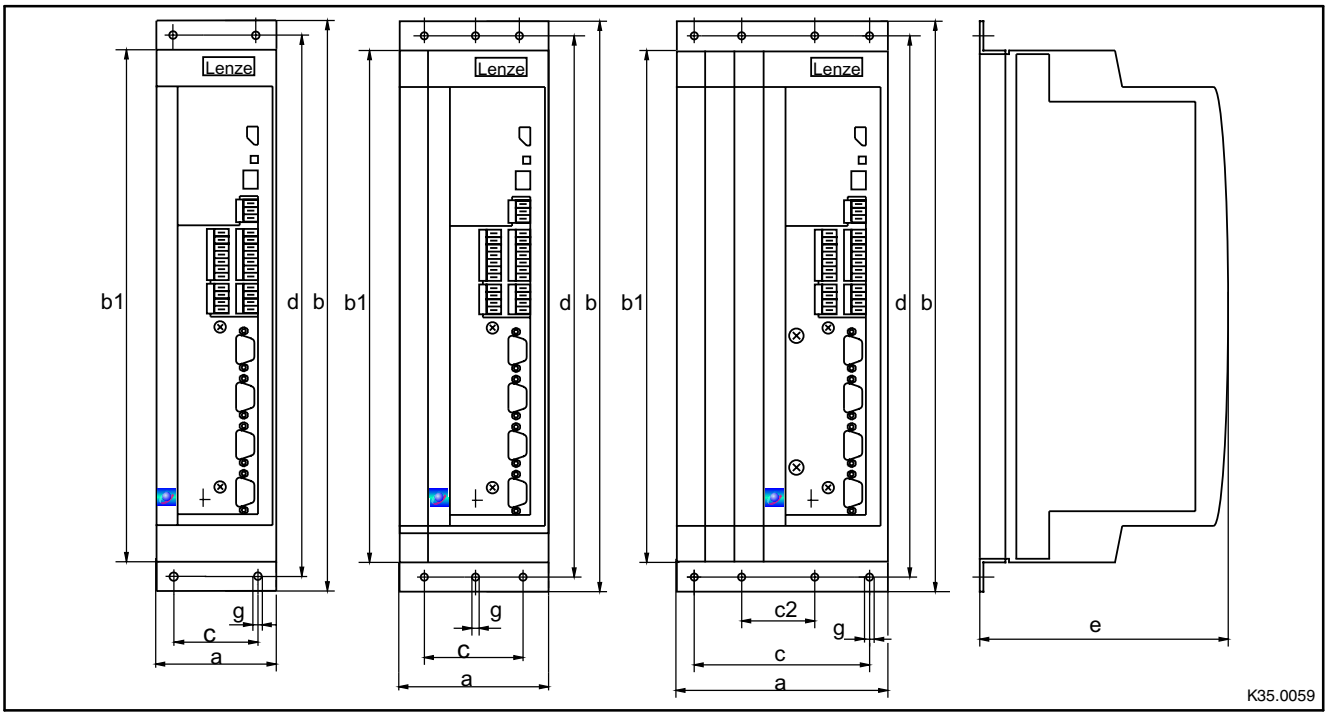


Fig. 4-4 Dimensions for assembly in ”Cold Plate technology”

Type	a	b	b1	c	c2	d	e*	g
9321-Cx 9322-Cx	78	381	350	48	-	367	168	6.5
9323-Cx 9324-Cx	97	381	350	67	-	367	168	6.5
9325-Cx 9326-Cx	135	381	350	105	38	367	168	6.5

* When using an attachable fieldbus module:
Observe the free space required for the connection cables

All dimensions in mm

Dimensions of the types 9327-Cx and 9328-Cx

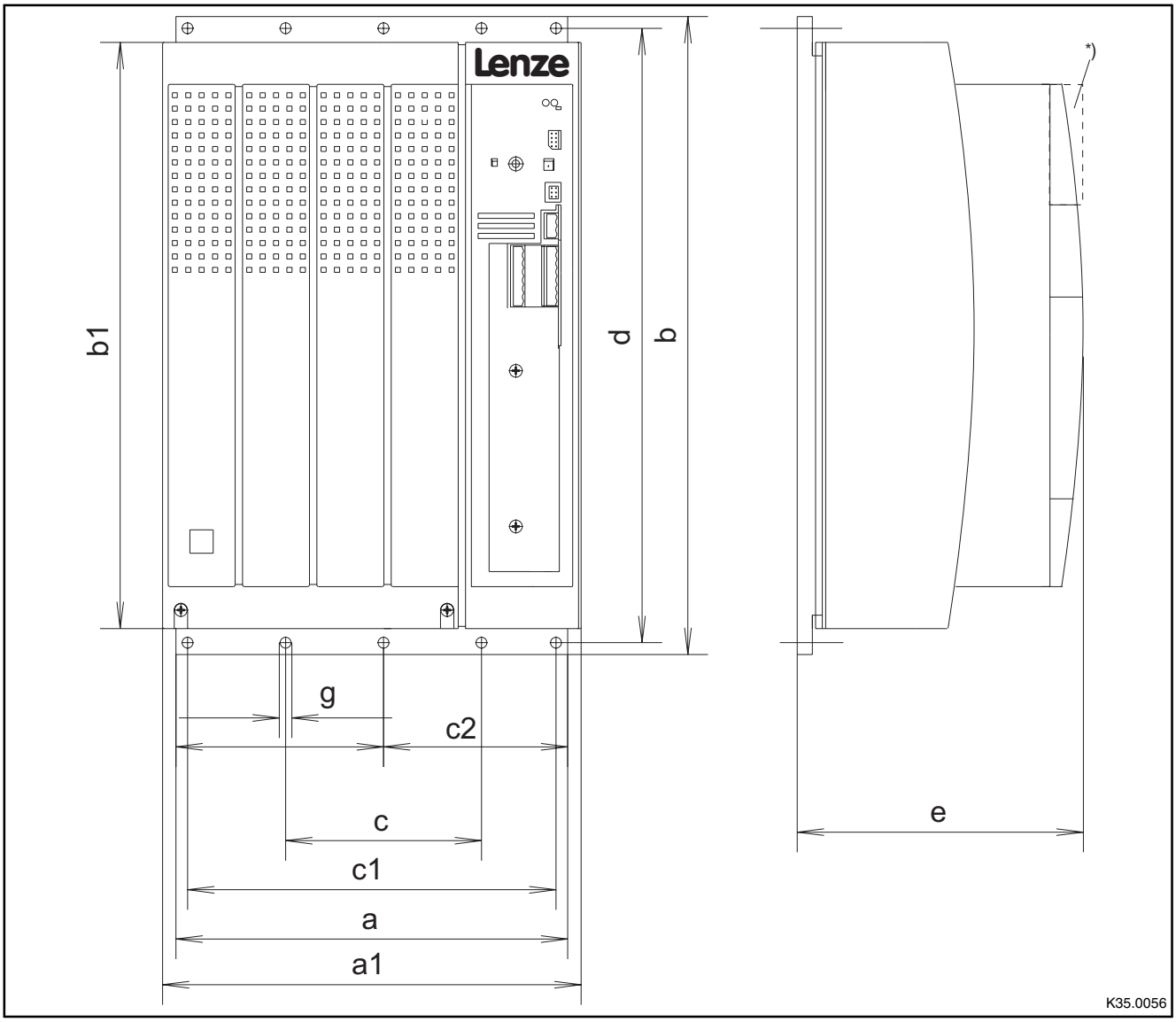
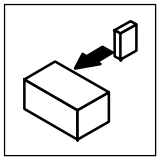


Fig. 4-5 Dimensions for assembly in "Cold Plate technology"

Type	a	a1	b	b1	c	c1	c2	d	e*	g
9327-Cx 9328-Cx	234	250	381	350	110	220	117	367	171	6.5

* When using an attachable fieldbus module:
Observe the free space required for the connection cables

All dimensions in mm



Installation

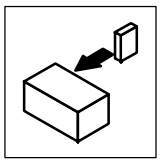
- Observe the following points to comply with the technical data:
  – Ensure sufficient ventilation of the heat sink.
  – The free space behind the control cabinet back panel must be at least 500 mm.
- If you install several controllers in the control cabinet:
  – Do not install the controllers on top of each other.
- The cooling path must not exceed the thermal resistances in the table:

Controller	Cooling path	
Type	Power to be dissipated P_{loss} [W]	$R_{thmax\ heat\ sink}$ [K/W]
9321-Cx	80	0.50
9322-Cx	80	0.50
9323-Cx	100	0.40
9324-Cx	155	0.25
9325-Cx	210	0.19
9326-Cx	360	0.10
9327-Cx	410	0.09
9328-Cx	610	0.06

- The temperature of the cold plate must not exceed +85 °C.
- Penetration depth t of the screws into the basic plate of the controller:

  $8\ mm \leq t \leq 10\ mm$

- For the bore pattern and surface quality of the heat sink please consult the factory.
- Apply the heat conducting paste (accessory kit) to the cold plate of the controller.



4.2 Electrical installation

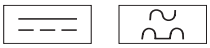
For information about the installation according to EMC, see chapter 4.3. (📖 4-34)

4.2.1 Protection of persons

Danger!

All power terminals carry voltage up to 3 minutes after mains disconnection.

4.2.1.1 Residual-current circuit breakers

Labelling of RCCBs	Meaning
	AC-sensitive residual-current circuit breaker (RCCB, type AC)
	Pulse-current sensitive residual-current circuit breaker (RCCB, type A)
	All-current sensitive residual-current circuit breaker (RCCB, type B)

Definition

In the following text “RCCB” is used for “residual-current circuit breaker”.

Protection of persons and animals

DIN VDE 0100 with residual-current operated protective devices (RCCB):

- The controllers are equipped with a mains rectifier. If a short-circuit to frame occurs, a smooth DC residual current can block the activation of the DC sensitive or pulse-current sensitive RCCBs and thus destroy the protective function for all units connected. We therefore recommend:
  - ”pulse-current sensitive RCCB” or ”all-current RCCB” in systems equipped with controllers with single-phase mains connection (L1/N).
  - ”all-current sensitive RCCB” in systems equipped with controllers with three-phase mains connection (L1/L2/L3).

Rated residual current

Please observe the rated residual current for the selection of the RCCB:

- Controller with single-phase mains connection: 30 mA rated residual current
- Controller with three-phase mains connection: 300 mA rated residual current

The RCCB can be activated unintentionally under the following conditions:

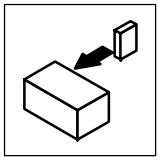
- In the event of capacitive leakage currents between the cable screens (especially with wall mounting).
- Simultaneous connection of several inverters to the mains
- If RFI filters are used.

Installation

The RCCB must only be installed between the supplying mains and the controller.

Standards (All-current sentitive RCCB)

All-current sensitive RCCBs are described in the European Standard EN EN 50178 and in the IEC 755.
The EN 50178 has been harmonized and has been effective since October 1997. It replaces the national standard VDE 0160.



4.2.1.2 Isolation

The controllers have an electrical isolation (insulating distance) between the power terminals and the control terminals as well as to the housing:

- Terminals X1 and X5 have a double basic isolation (double insulating distance, safe electrical isolation to VDE0160, EN50178). The protection against contact is ensured without any further measures.
- The control inputs and outputs of all controllers are electrically isolated.

Danger!

- Terminals X3, X4, X6, X7, X8, X9, X10 have a single basic insulation (single isolating distance).
- Protection against contact in the event of fault is ensured only by additional measures.
- If an external voltage supply (24V DC) is used, the insulation level of the controller depends on the insulation level of the voltage source.

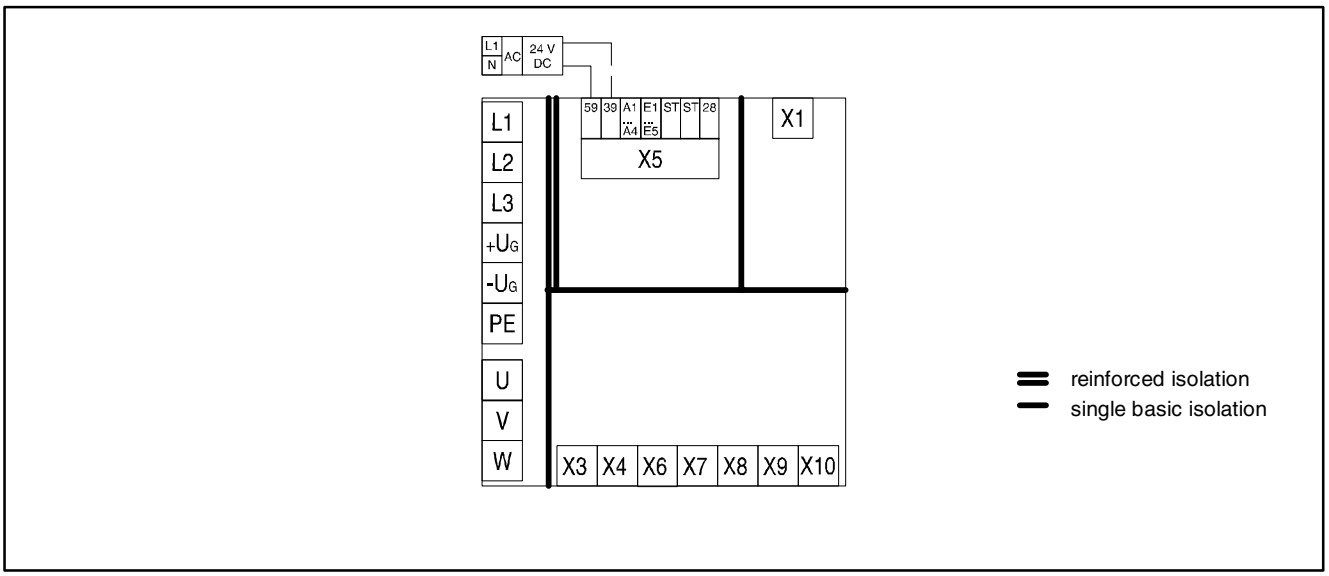


Fig. 4-6 Basic insulation in the controller

4.2.1.3 Replacement of defective fuses

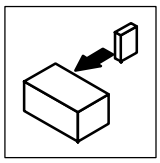
Replace defective fuses with the prescribed type only when no voltage is applied. (📖 3-6)

- For single drives, the controller carries a hazardous voltage up to three minutes after mains disconnection.
- In a DC-bus connection, all controllers must be inhibited and separated from the mains.

4.2.1.4 Mains disconnection

Make a safety disconnection between the controller and the mains only via a contactor at the input side.

- Please observe that all drives connected to the DC bus must be inhibited.



4.2.2 Protection of the controller

Stop!

Controllers contain electrostatically sensitive components.

- Prior to assembly and service operations, the personnel must be free of electrostatic charge:
  – Discharge by touching the PE fixing screw or another grounded metal part in the control cabinet.

- Length of the screws for the connection to the screen cable/screen plate for the types 9327 to 9332: < 12 mm
- Controller protection by means of external fuses. (📖 3-6)
- Protect unused control inputs and outputs with plugs or covers (included in the contents of delivery) for the Sub-D inputs.
- Frequent mains switching can overload the internal switch-on current limitation. For cyclic mains switching, the controller can be switched on every three minutes as a maximum.
- The controllers 9324, 9326, 9328 and 9329 must only be operated with the appropriate mains filters. (📖 3-7)
- In case of condensation, connect the controller to the mains voltage only after the visible humidity has evaporated.

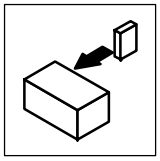
4.2.3 Motor protection

- Complete motor protection according to VDE:
  – By overcurrent relays or temperature monitoring.
  – Required for group drives (motors connected in parallel to a controller)
  – We recommend the use of PTC thermistors or thermostats with PTC characteristic to monitor the motor temperature.

Stop!

As standard Lenze three-phase AC motors are equipped with PTC thermistors. If motors from other manufacturers are used, carry out all steps required for the adaptation to the controller. (📖 4-28)

- When using motors with insulation which is not suitable for inverter operation:
  – Please contact your motor supplier.
  Lenze AC motors are designed for inverter operation.
- With the corresponding parameter setting, the controllers generate field frequencies up to 600 Hz:
  – With motors not suited for the application, dangerous overspeeds may occur and destroy the drive.



4.2.4 Mains types/conditions

Please observe the restrictions for each mains type!

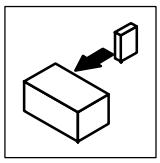
Mains	Operation of the controllers	Notes
With grounded neutral (TT/TN mains)	No restrictions	Observe controller ratings • Mains r.m.s. current: 🕮 3-3
With insulated neutral (IT mains)	Possible, if the controller is protected in the event of an earth fault in the supplying mains. • Possible, if appropriate earth fault detections are available and • the controller is separated from the mains immediately.	Safe operation in the event of an earth fault at the inverter output cannot be guaranteed.
With grounded phase	Operation is only possible with one variant	Contact Lenze
DC-supply via $+U_G$/$-U_G$	The DC voltage must be symmetrical to PE.	The controller will be destroyed when grounding $+U_G$ or $-U_G$.

4.2.5 Interaction with compensation equipment

- The controllers take up a very low fundamental reactive power from the supplying AC mains. Therefore compensation is not necessary.
- If the controllers are operated at mains with compensation, this equipment must be used with chokes.
  – For this, contact the supplier of the compensation equipment.

4.2.6 Specification of all cables used

- The cables used must comply with the required approvals of the application site (e. g. UL).
- The prescribed minimum cross-sections of PE conductors must be maintained in all cases. The cross-section of the PE conductor must be at least as large as the cross-section of the power connections.
- The screening quality of a cable is determined by
  – a good screen connection
  – a low screen resistance
    Only use screens with tin-plated or nickel-plated copper braids!
    Screens of steel braid are not suitable.
  – For the overlapping degree of the screen braid:
    A min. of 70 % to 80 % with an overlapping angle of 90°



4.2.7 Power connections

Controller	Preparations for the power connection
9321 ... 9326	• Remove the covers of the power connections: – Unlatch to the front by gentle pressure. – Pull upwards (mains connection) or downwards (motor connection).
9327 ... 9332	• Remove cover: – Loosen screws (X) (see Fig. 4-1). – Swing cover to the top and detach. – Take the accessory kit out of the interior of the controller.

4.2.7.1 Mains connection

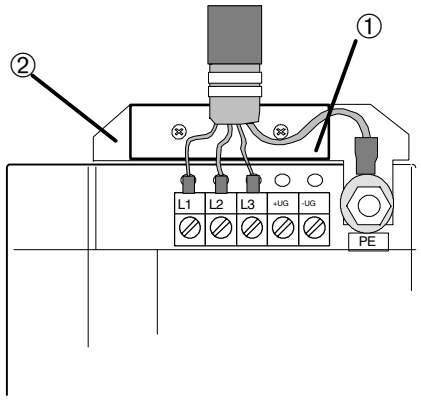
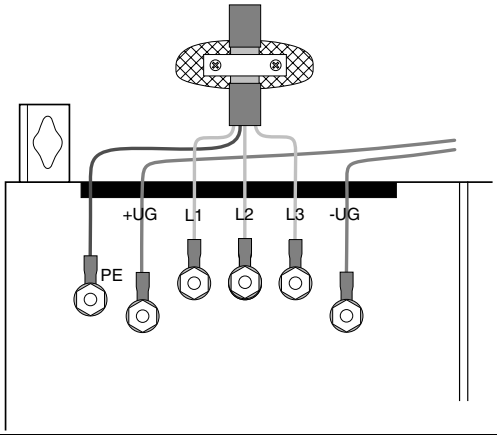
Types 9321 to 9326	Types 9327 to 9332
	
Correct screen connection with screened cables (required parts in the accessory kit): • Screw screen plate ① on fixing bracket. ② • Fix screen using cable lugs. Do not use as a strain relief! • To improve the screen connection: Connect screen additionally at the PE stud next to the power connections.	Make a correct screen connection with screened cables: • Connect the screen with suitable clamp on the conducting control cabinet mounting plate. • To improve the screen connection: Connect screen additionally to the PE stud next to the power connections.

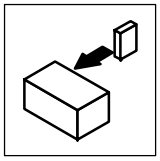
Fig. 4-7 Proposal for a mains connection

- Connect mains cables to the screw terminals L1, L2, L3.
- Connect cables for brake unit (935X), supply module (934X) or further controllers in the DC bus connection to the screw terminals +UG, -UG at the top of the controller.
- Max. permissible cable cross-sections and screw tightening torques:

Type	Terminals		
	max. permissible cable cross-sections	L1, L2, L3, +UG, -UG	PE connection
9321 - 9326	4 mm² 1)	0.5 ... 0.6 Nm (4.4 ... 5.3 lb-in)	3.4 Nm (30 lb-in)
9327 - 9329	25 mm² 2)	5 Nm (44 lb-in)	
9330 - 9331	95 mm² 2)	15 Nm (132 lb-in)	
9332	120 mm² 2)	30 Nm (264 lb-in)	

1) with pin cable lug: 6 mm²
with wire crimp cap 4 mm²

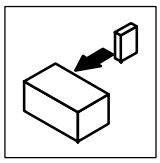
2) with ring cable lug Cross-section is limited only by the cable entry in the housing



Installation

Fuses

Fuses and cable cross-sections	The specifications in Chapter 3.3.4 are recommendations and refer to the use • in control cabinets and machines • installation in the cable duct • max. ambient temperature +40 °C.	📖 3-6
Selection of the cable cross-section	Consider the voltage drop (according to DIN 18015 part 1: ≤ 3 %).	
Protection of the cables and the controller on the AC side (L1, L2, L3)	• By standard commercial fuses. • Fuses in UL-conform plant must have UL approval. • The rated voltages of the fuses must be dimensioned according to the mains voltage at the site. The activation characteristic is defined by ”H” or ”K5”.	
Protection of the cables and the controller on the DC side (+UG, -UG)	• By means of recommended DC fuses. • The fuses/fuse holders recommended by Lenze are all UL approved.	
For DC bus connection or supply by means of a DC source	Please observe the notes in Part F of the Systems Manual.	
Connection of a brake unit	If a brake unit is connected to the terminals +UG / -UG, the fuses and cross-sections listed in Chapter 3.3.4 do not apply. These unit-specific data can be obtained from the technical documentation of the brake unit.	
Further information	For the protection of cables and the controller please see the chapter ”Accessories” under “Planning”.	
Other standards	The compliance with other standards (e.g.: VDE 0113, VDE 0289, etc.) remains the responsibility of the user.	

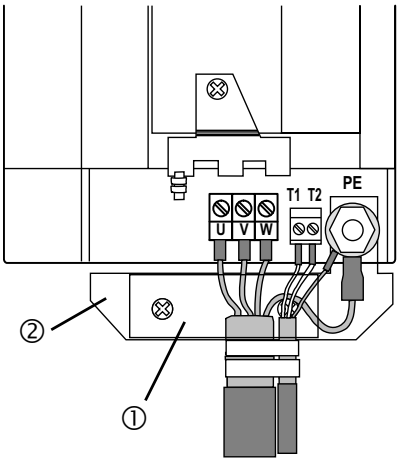
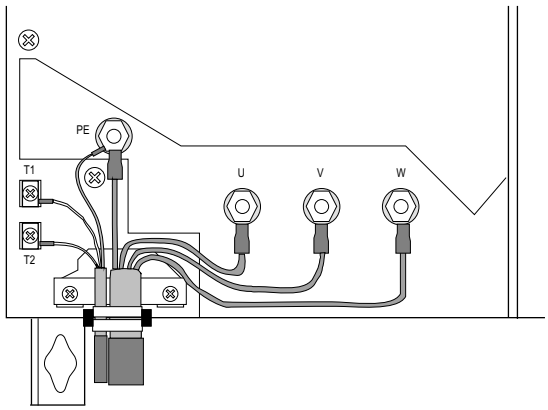


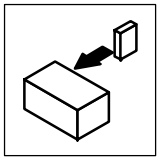
4.2.7.2 Motor connection

We recommend the use of shielded motor cables only, because of the EMC safety.

Tip!

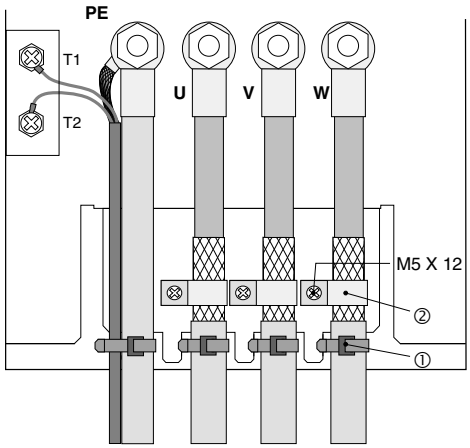
The shielding of the motor cable is only required to comply with existing standards (e.g. VDE 0160, EN 50178).

Types 9321 to 9326	
	Correct shield connection with shielded cables (required parts in the accessory kit): • Screw shield plate ① on fixing bracket. ② • Fix the shield of the motor cable and thermal contact, if necessary, (see 📖 4-28) with cable lugs. Do not use as a strain relief! • To improve the shield connection: Connect shields additionally to the PE stud next to the motor connections.
Types 9327 to 9329	
	Correct shield connection with shielded cables: • Fix the shield of the motor cable and thermal contact, if necessary, (see 📖 4-28) with cable lugs. Do not use as a strain relief! • To improve the shield connection: Connect shields additionally to the PE stud next to the motor connections.



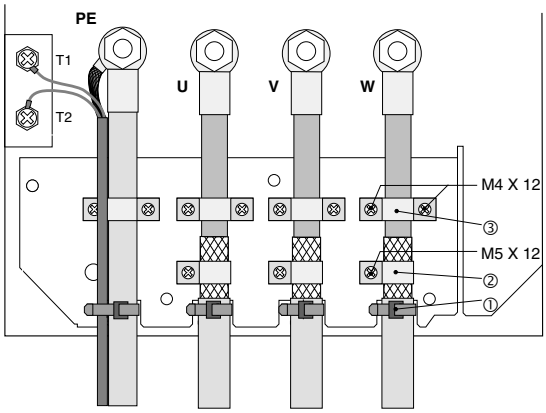
Installation

Types 9330 and 9331



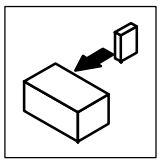
- Carry out strain relief using cable binders ①.
- Correct shield connection with shielded cables:
  – Apply motor cable shield to the screening plate using clamp and M5x12 bolts ②.
  – Fix the shield of the thermal contact (see 📖 4-28) at the PE stud next to the motor connection with a surface as large as possible.

Type 9332



- Carry out strain relief using clamps and M4x12 bolts ③.
  – An additional strain relief/fixing is possible with cable binders ①.
- Correct shield connection with shielded cables:
  – Apply motor cable shield to the shielding plate using clamp and M5x12 bolts ②.
  – Fix the shield of the thermal contact (see 📖 4-28) at the PE stud next to the motor connection with a surface as large as possible.

Fig. 4-8 Proposal for the motor connection



- Observe the max. permissible motor cable length:

	V_r = 400 V (+10%)		V_r = 480 V (+10%)	
Type	**f_{chop} = 8 kHz**	**f_{chop} = 16 kHz**	**f_{chop} = 8 kHz**	**f_{chop} = 16 kHz**
9321/9322	up to 50 m	up to 45 m	up to 50 m	up to 25 m
9323 - 9332	up to 50 m	up to 50 m	up to 50 m	up to 50 m
	The max. permissible motor cable length of types 9323 - 9332 will be reduced if the motor cable has more than a single core. • Two parallel single cores: L_{max} = 17 m • Three parallel single cores: L_{max} = 9 m			

- Connect motor cables to the screw terminals U, V, W.
  – Observe correct pole connection.
  – Maximum motor cable length: 50 m.
  – Max. permissible cable cross-sections and screw tightening torques:

Type	**Max. permissible cable cross-sections**		**Tightening torques for terminals**			
	Power connections	**T1, T2**	**U, V, W**	**PE connection**	**Screen/ Strain relief**	**T1, T2**
9321 - 9326	4 mm² 1)	1.5 mm²	0.5 ... 0.6 Nm (4.4 ... 5.3 lb-in)	3.4 Nm (30 lb-in)	M4: 1.7 Nm (15 lb-in) M5: 3.4 Nm (30 lb-in)	0.5 ... 0.6 Nm (4.4...5.3 lb-in)
9327 - 9329	25 mm² 2)		5 Nm (44 lb-in)			
9330 - 9331	95 mm² 2)		15 Nm (132 lb-in)			
9332	120 mm² 2)		30 Nm (264 lb-in)			

1) with pin cable lug: 6 mm²
with wire crimp cap: 4 mm²

2) with ring cable lug: Cross-section is limited only by the cable duct in the housing

Tip!

Switching on the motor side of the controller is permitted only for emergency switch-off.

4.2.7.3 Connection of a brake unit

- When connecting a brake unit (brake module with internal brake resistor or brake chopper with external brake resistor) observe the corresponding Operating Instructions in all cases.

Stop!

- Design the circuit so that, if the temperature monitoring of the brake unit is activated,
  – the controllers are inhibited (X5/28 = LOW).
  – the mains is disconnected.
- Examples:
  – Chapter 4.3, “Installation of a CE-typical drive system”. (📖 4-34)
  – Fig. 4-9, “Decentralized supply for DC-bus connection of several drives”. (📖 4-18)

4.2.7.4 DC bus connection of several drives

Decentralized supply with brake module

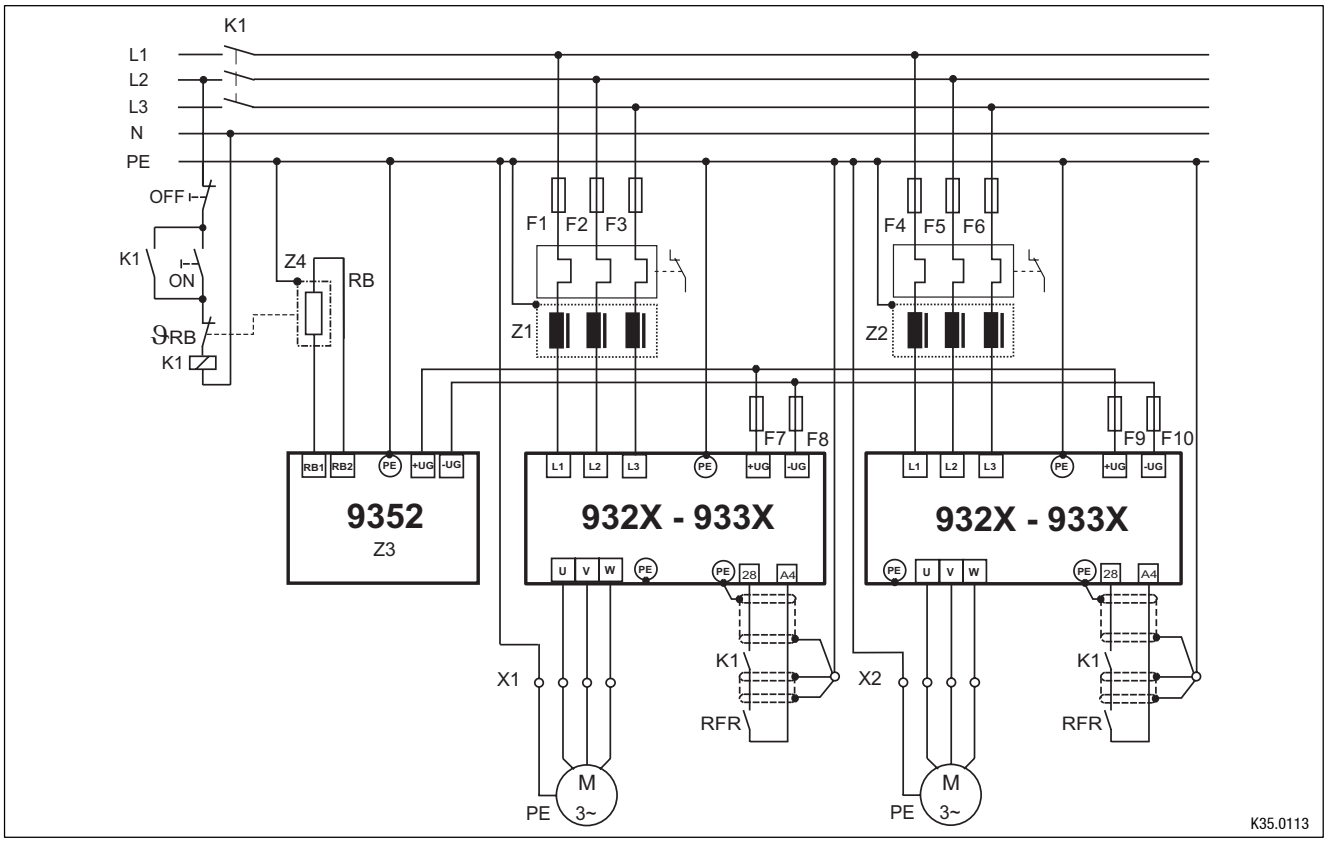


Fig. 4-9 Decentralized supply for DC-bus connection of several drives

Z1, Z2	Mains filter
Z3	Brake chopper
Z4	Brake resistor
F1...F6	Protection, see “Cable protection” (📖 3-6) / “Mains connection” (📖 4-13)
F7...F10	DC bus fuse; fuse holder with / without alarm contact, see “Cable protection” (📖 3-6) / “Mains connection” (📖 4-13)
K1	Main contactor

STOP

Stop!

- Set the DC-bus voltage thresholds of controller and brake unit to the same values.
  – Controller using C0173
  – Brake unit using switches S1 and S2
- A bimetal relais is required for the monitoring of the mains supply.

Tip!

Please observe the specifications in part F of the Manual and the application report “DC bus connection” for the dimensioning and rating of the components.

Central supply with supply module

- When connecting the supply module, the corresponding operating instructions must be observed.

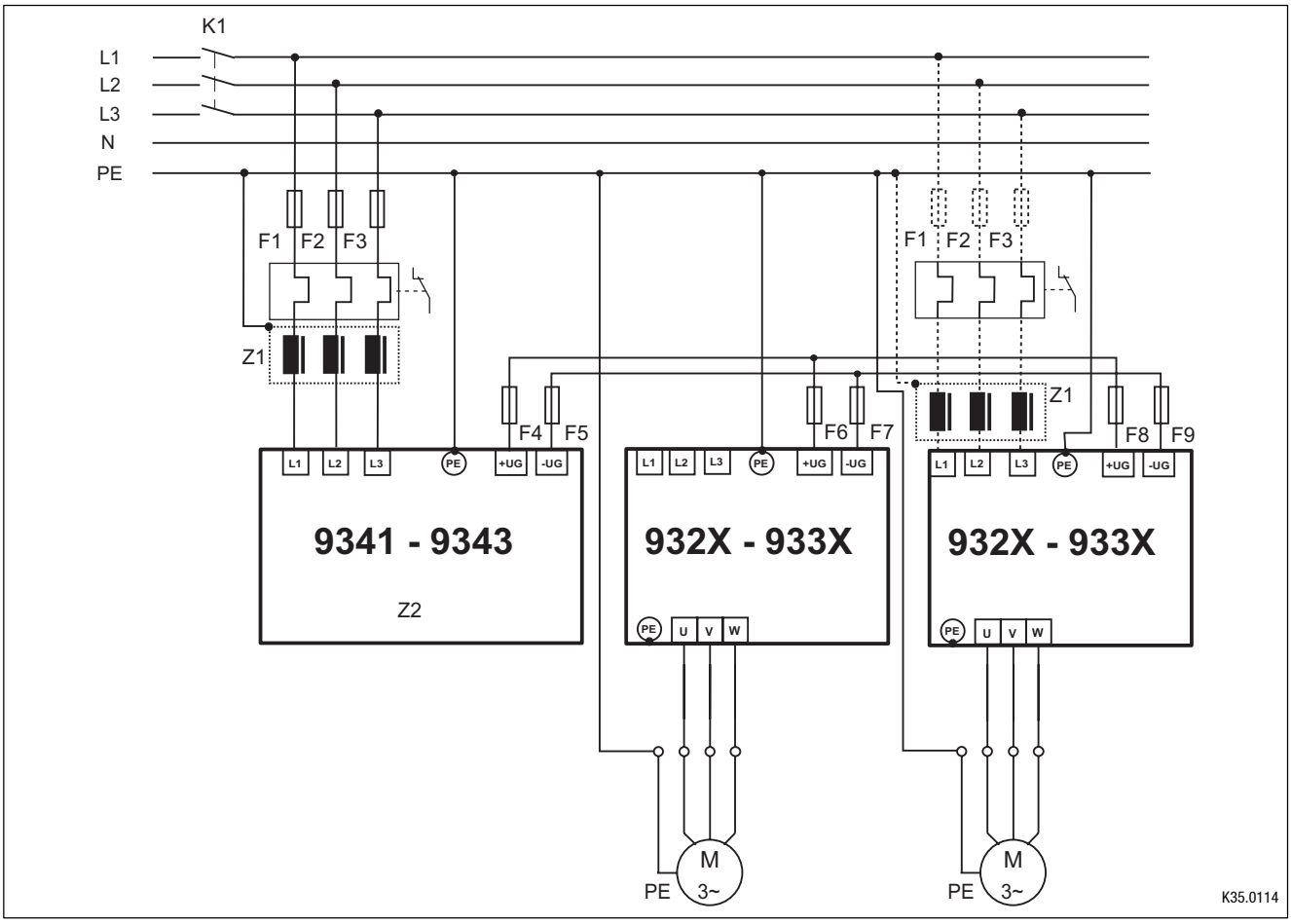
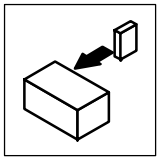


Fig. 4-10 Central supply for DC-bus connection of several drives

Z1	Mains supply filter
Z2	Supply module
F1...F6	Protection, see “Cable protection” (📖 3-6) / “Mains connection” (📖 4-13)
F4...F9	DC bus fuse; fuse holder with / without alarm contact, see “Cable protection” (📖 3-6) / “Mains connection” (📖 4-13)
K1	Main contactor

Tip!

If the power supply of the supply module is not sufficient, a parallel supply can be installed via the mains supply input of a controller (see Manual, Part F). In this case, the controllers can only be operated with the assigned mains filters.



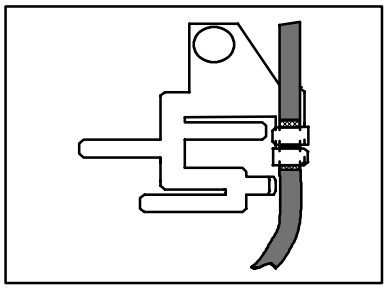
4.2.8 Control connections

4.2.8.1 Control cables

- Connect control cables to the screw terminals:

max. permissible cable cross-section	Screw-tightening torques
1.5 mm^2	0.5 ... 0.6 Nm (4.4 ... 5.3 lbin)

- We recommend a one-sided screening of all cables for analog signals, to avoid signal distortion.
- Connect the screens of the control cables
  – with the collective screen plate to the front metal surface (max. screw length 12 mm).
  (max screw length 12 mm).



4.2.8.2 Assignment of control terminals

Protection against inverse polarity

- This protection prevents the wrong connection of the internal control inputs. It is, however, possible to overcome the protection against polarity reversal by applying great force. If so, the controller cannot be enabled.

Overview

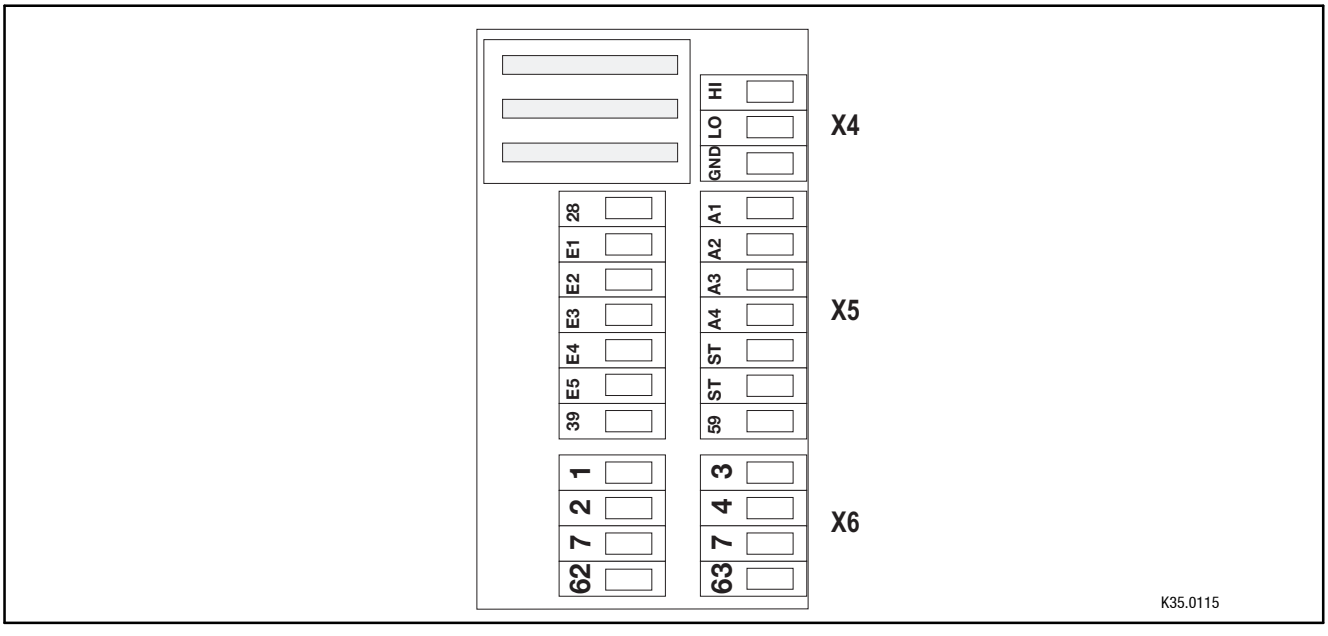
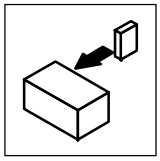
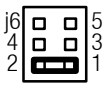
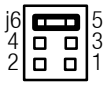


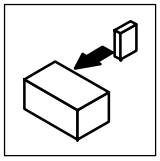
Fig. 4-11 Layout of the control connections on the front of the controller



	Terminal		Use (Factory setting is printed in bold)		Level	Data
Analog inputs	X6	1, 2	Differential master-voltage input **(Main speed setpoint)**	 Jumper X3	-10 V bis +10 V	Resolution: 5 mV (11 bit + sign)
			Differential master-current input	 Jumper X3	-20 mA to +20 mA	Resolution: 20 µA (10 bit + sign)
		3, 4	Differential master-voltage input **(additional speed setpoint)**	Jumper X3 has no effect	-10 V bis +10 V	Resolution: 5 mV (11 bit + sign)
Analog outputs		62	Monitor 1 **(Actual speed)**		-10 V to +10 V; max. 2 mA	Resolution: 20 mV (9 bit + sign)
		63	Monitor 2 **(torque setpoint)**		-10 V to +10 V; max. 2 mA	Resolution: 20 mV (9 bit + sign)
		7	Internal ground, GND		-	-
Digital inputs	X5	28	Controller enable (RFR)		HIGH	LOW: 0 ... +4 V HIGH: +13 ... +30 V Input current for 24V: 8 mA per input Reading and writing of the inputs: once per msec (average value)
		E1	freely assignable **(remove CW rotation / QSP)**		HIGH	
		E2	freely assignable **(remove CCW rotation / QSP)**		HIGH	
		E3	freely assignable **(enable JOG-setpoint 1)**		HIGH	
		E4	freely assignable **(TRIP set)**		LOW	
		E5	freely assignable **(TRIP-reset)**		Signal LOW →HIGH	
Digital outputs		A1	freely assignable **(TRIP)**		LOW	LOW: 0 ... +4 V HIGH: +13 ... +30 V Output current: max. 50 mA per output (external resistance at least 480 Ω at 24 V) Updating of the outputs: once per msec
		A2	freely assignable **($n_{act.} < n_{x)}$**		LOW	
		A3	freely assignable **(RDY)**		HIGH	
		A4	freely assignable **(M_{max})**		HIGH	
		39	Ground of the digital inputs and outputs		-	
		59	Supply input for the control module: 24 V external (I > 1A)		-	

Tip!

To change the jumper, remove plug-on module, if necessary.

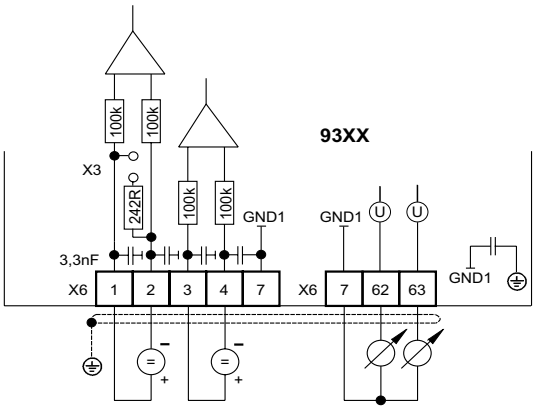
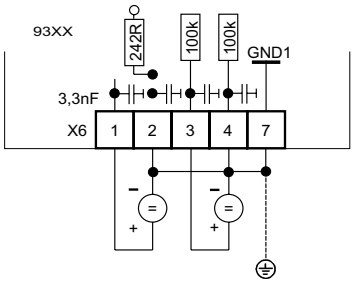


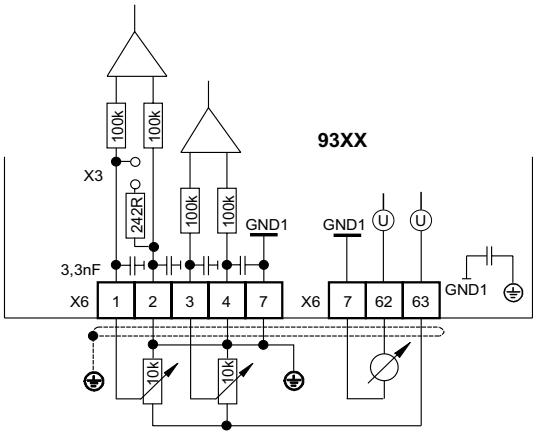
4.2.8.3 Connection diagrams

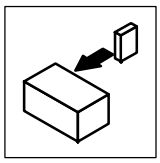
Connection of analog signals

Analog signals are connected via the 2 x 4-pole terminal block X6.

Depending on the use of the analog inputs, the jumper of X3 must be set accordingly.

Connection for external supply voltage	
	**STOP!** • The maximum permitted voltage difference between an external voltage source and the GND1 (terminal X6/7) of the controller is 10V (common mode). • The maximum permitted voltage difference between GND1 (terminal X6/7) and the PE of the controller is 50V.
	Limit the voltage difference • by overvoltage clamping components or • by direct connection of terminal(s) X6/2, X6/4 and X6/7 to GND1 and PE (see figure).

Connection for internal voltage supply	
	Configuration of the internal voltage supply: • Set a freely assignable analog output (AOUTx) to HIGH level. • E. g. terminal X6/63: Assign FIXED100% to C0436 📖 4-20 10V are thus applied to terminal X6/63. **Tip!** Use one of the predefined configurations in C0005 for this application. The output X3/63 is assigned automatically with FIXED100% (corresponds to 10 V at output X6/63) by C005 = XX1X (e. g. 1010 for speed control with control via terminals).



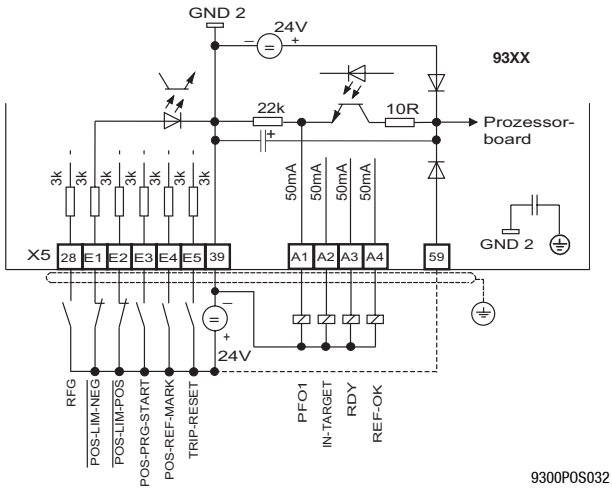
Connection of digital signals

Digital signals are connected via the 2 7-pole terminal block X5.

The levels of the digital inputs and outputs are PLC compatible.

Only use relays with low-current contacts for the switching of the signal cables (recommendation: relays with gold-plated contacts).

Connection for external supply voltage



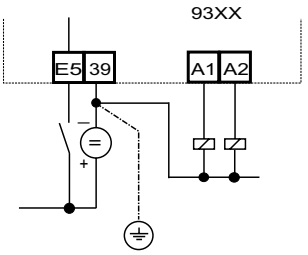
The external voltage source supplies the digital inputs and outputs.

Connection

- Supply voltage to X5/59
- External mass to X5/39

Alternative supply of control electronics by external supply voltage (bakkup operation in the event of a mains failure)

- This ensures that all actual values are still detected and processed, even after mains disconnection.
- Also establish the connection illustrated as a broken line.
- The external voltage source must be able to drive a current > 1 A.
- The switch-on current of the external voltage source is not limited by the controller
  We therefore recommend the use of voltage sources which provide a current limitation or an internal impedance of Z > 1 Ω .



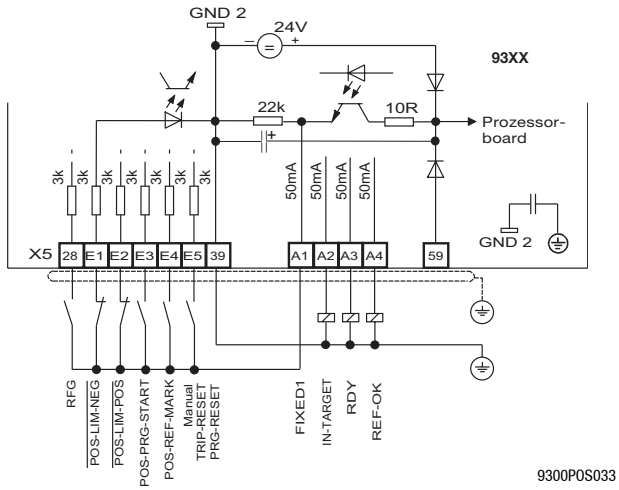
Limit the voltage difference

- by overvoltage clamping components or
- by direct PE connection of terminal 39 (see figure).

STOP!

The maximum permitted voltage difference between GND2 (terminal X5/39) and the PE of the controller is 50 V.

Connection for internal voltage supply

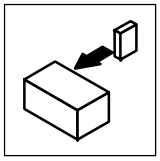


Configuration of the internal voltage supply

- Set a freely assignable digital output (DIGOUTx) to HIGH level.
- For instance terminal X5/A1: Assign C0117/1 with FIXED1. 24V are thus applied to terminal X5/A1.

Tip!

For this application, you may use one of the predefined configurations in C0005.With C0005 = XX1X (e. g. 20010 for absolute positioning; limited travelling range) FIXED1 is automatically assigned to the output X5/A1 (corresponds to 24 V at terminal X5/A1).



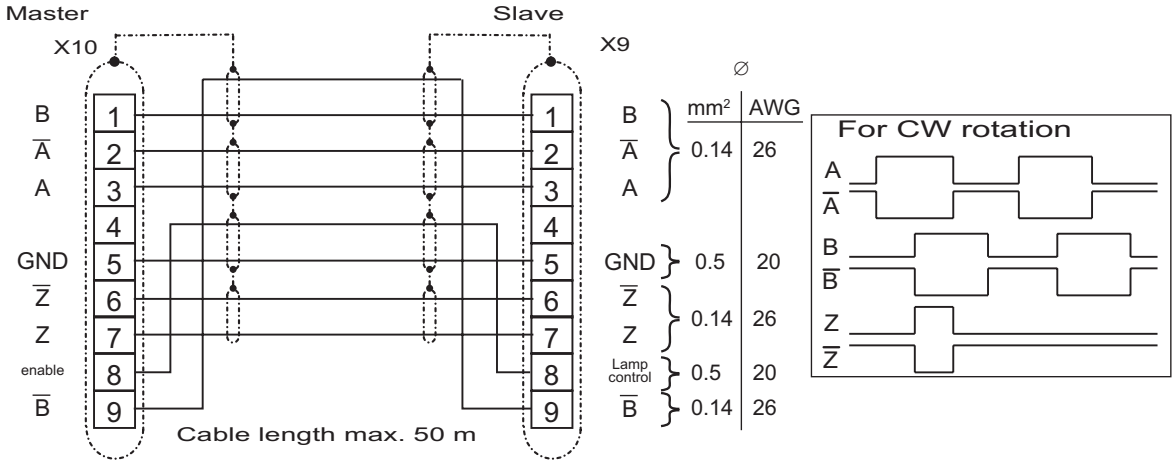
Installation

Digital frequency input (X9) / digital frequency output (X10)

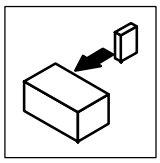
Tip!

For the connection to the digital frequency input (X9) or digital frequency output (X10), use pre-cut Lenze cables. Otherwise, only use cables with twisted pairs and screened cores (A, $\overline{A}$ / B, $\overline{B}$ / Z, $\overline{Z}$) (see connection diagram).

Digital frequency output X10	**Digital frequency input X9**
Features: • Sub-D female connector, 9-pole • Output frequency: 0 - 500 kHz • Current consumption per channel: max 20mA. • Two-track with inverse 5 V signals and zero track • X10 has a different basic setting depending on the selected configuration (C0005) – Default setting: Encoder simulation of the resolver signal • Load capacity: – Parallel connection: Up to 3 slave drives – Series connection: 250 kHz digital master frequency: up to 22 slave drives 500 kHz digital master frequency: up to 10 slave drives • When PIN 8 (EN) shows a LOW level, the master is initialized (e.g. if the mains was disconnected). The slave can thus monitor the master.	Features: • Sub-D male connector, 9-pole • Input frequency: 0 - 500 kHz • Current consumption per channel: max 6mA. • Two-track with inverse 5 V signals and zero track • Possible input signals: – Incremental encoder with two 5V complementary signals (TTL encoder) shifted by 90 ° – Encoder simulation of the master • PIN 8 serves to monitor the cable or the connected controller: – When this PIN shows a LOW level, the SD3 monitoring responds. – If the monitoring is not required, this input can be connected to +5V. • The input is disconnected at C0540 = 0, 1, 2 or 3.



Pin assignment X10									Pin assignment X9								
1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9
B	$\overline{0}$	0	+5 V	GND	$\overline{Z}$	Z	EN	$\overline{B}$	B	$\overline{0}$	0	+5 V	GND	$\overline{Z}$	Z	LC	$\overline{B}$



STATE-BUS (X5/ST)

The state bus is a controller-specific bus system for simple monitoring in a network of drives:

- Controls all drives connected to the network according to the preselected state.
- Up to 20 controllers can be connected (total cable length STATE-BUS < 5m).
- Connection of STATE-BUS cables to terminals X5/ST.

Stop!

Do not apply an external voltage across terminals X5/ST.

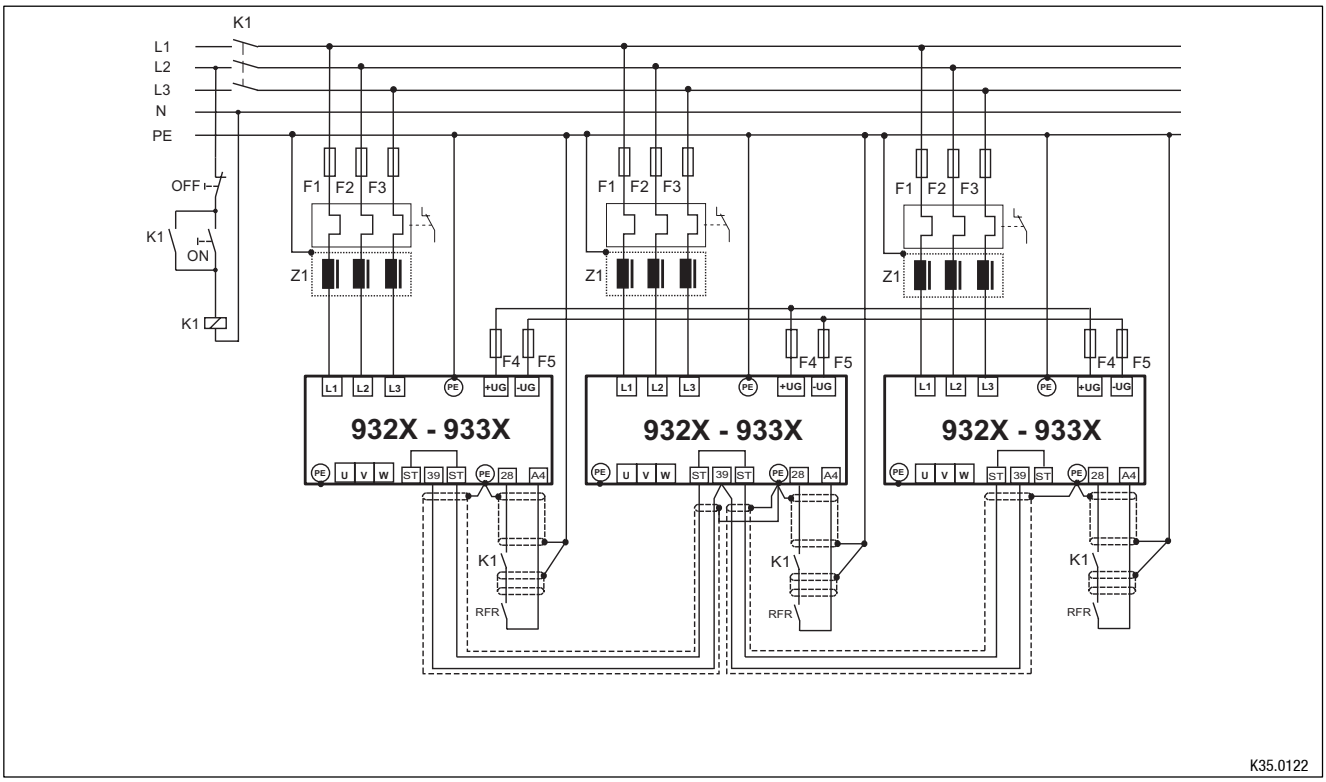
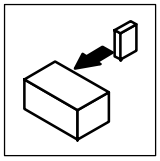


Fig. 4-12 Monitoring of a network of drives with the STATE-BUS

Z1	Mains filter
F1...F5	Protection, see “Cable protection” (📖 3-6) / “Mains connection” (📖 4-13)
K1	Main contactor

Tip!

Further information can be obtained from the Manual for your controller.



Installation

System bus connection (X4)

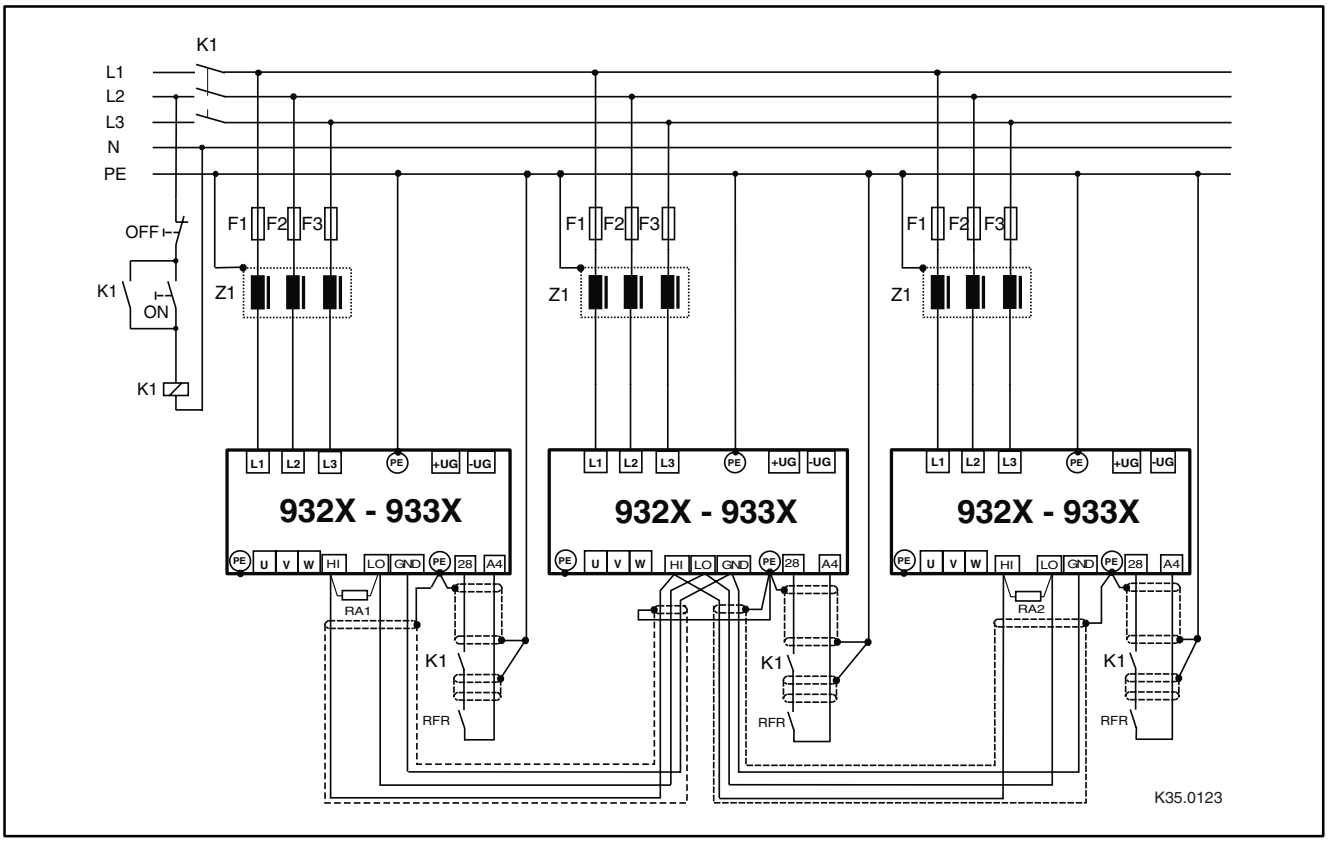


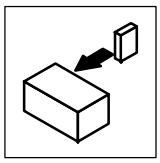
Fig. 4-13 Wiring system bus

RA1, RA2 Bus terminating resistors 120 Ω (included in the accessory kit)

- Connection via pluggable screw terminals (double terminals can be used).
- Only connect terminals of the same designation.
- Features of the system cable:

Total cable length	**up to 300 m**	**300 m to 1000 m**
Cable type	LIYCY 2 x 2 x 0.5 mm^2 twisted-pair with screening Pair 1: CAN-LOW (LO) and CAN-HIGH (HI) Pair 2: 2*GND	CYPIMF 2 x 2 x 0.5 mm^2 twisted-pair with screening Pair 1: CAN-LOW (LO) and CAN-HIGH (HI) Pair 2: 2*GND
Cable resistance	$\chi \leq$ 40 Ω/km	≤40 Ω/km
Capacitance per unit length	≤ 130 nF/km	≤60 nF/km

- Connection of the bus terminating resistors:
  - One resistor 120 Ω each on the first and last bus device.
  - On the 93XX controller the resistor can be screwed directly under the terminals X4/HI and X4/LO.



Features:

- CAN-based with bus protocol according to CANopen (CAL-based Communication Profile DS301)
- Bus extension:
  – 25 m for max. 1 Mbit/s baud rate
  – up to 1 km with reduced baud rate
- Very reliable data transmission (Hamming distance = 6)
- Signal level according to ISO 11898
- Up to 63 bus devices are possible
- Access to all Lenze parameters
- Master functions are integrated into the controller
  – Data exchange possible between controllers without participation of a master system (current ratio control, speed synchronization, etc.)

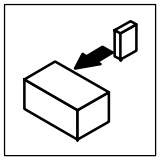
The following connections of the system bus connection are possible:

- Connection to a decentral terminal extension for digital and analog inputs and outputs
- Connection to a superimposed control (PLC, position control, operating terminal)
- Connection between several controllers

Automation interface (X1)

The automation interface (X1) is used for the connection of different plug-on modules

- Operating module
- Fieldbus modules
  – 2102 LECOM-A/B/LI
  – 2111 INTERBUS
  – 2112 INTERBUS loop
  – 2131 PROFIBUS-DP and 2133 PROFIBUS-DP
  – 2174 CAN addressing module
  – 2175 DeviceNet / CANopen



4.2.9 Motor temperature monitoring

Selection of the feedback system	• Continuous temperature sensor KTY – "Linear" temperature sensor in the motor winding (standard for Lenze motors MDXKX, MDXQA and MDXMA) • Temperature sensor PTC – PTC thermistor with defined tripping temperature (acc. to DIN 44081 and DIN 44082) • Thermal contact TKO – Thermostat/normally closed contact
Other monitoring	KTY, PTC and TKO do not offer full protection. To improve the monitoring, Lenze recommends a bimetal relay.
Alternative monitoring	Comparators (CMP1 ... CMP3) monitor and a time element (TRANS1 ... TRANS4) limits the motor current for small speeds or motor standstill. This function can be implemented by interconnecting the corresponding function blocks.
Reactions	different, depending on the temperature monitoring. 📖 8-18

Stop!

Do not connect an external voltage to the inputs.

	Lenze motors			**Motors of other manufacturers**		
	MDXKX, MDXQA and MDXMA		**with thermal contact**	**with sensor for continuous temperature detection**		**with thermal contact or PTC acc. to DIN 44081/44082**
Connection	• Resolver input X7: – Pin X7/8 = +, Pin X7/9 = - • Encoder input X8: – Pin X8/8 = +, Pin X8/5 = -		Terminals T1/T2 next to the terminals U, V, W	• Resolver input X7: – Pin X7/8 = +, Pin X7/9 = - • Encoder input X8: – Pin X8/8 = +, Pin X8/5 = -		Terminals T1/T2 next to the terminals U, V, W
Fault messages	(MONIT-)OH3	(MONIT-)OH7	(MONIT-)OH8	(MONIT-)OH3	(MONIT-)OH7	(MONIT-)OH8
Possible reactions	The corresponding monitoring and thus the following codes are preset under C0086					
	• Trip (C0583 = 0) • OFF (C0583 = 3)	• Warning (C0584 = 2) • OFF (C0584 = 3)	• Trip (C0585 = 0) • Warning (C0585 = 2) • OFF (C0585 = 3)	• Trip (C0583 = 0) • OFF (C0583 = 3)	• Warning (C0584 = 2) • OFF (C0584 = 3)	• Trip (C0585 = 0) • Warning (C0585 = 2) • OFF (C0585 = 3)
Tripping temperature	fixed at 150 ° C	adjustable 45°C ... 150°C (C0121)	fixed, (depending on the PTC/thermal contact): PTC: at $R\vartheta > 1600\ \Omega$	fixed at 150 °C	adjustable 45°C ... 150°C (C0121)	fixed, (depending on the PTC/thermal contact): PTC: at $R\vartheta > 1600\ \Omega$
Notes	• Monitoring is active in the default setting. • If resolver (X7) and encoder (X8) are operated together: – Connect KTY only at one connector (X7 or X8) – Do not connect KTY connection of the other female connector • For further information on the connection of the thermal sensor, please consult the description of the feedback system		• Deactivate monitoring via X7 or X8 under C0583=3 and C0584=3 • Connection to DIN 44081 (see also Fig. 4-14).	• Input characteristic. (📖 4-29) • Deactivate monitoring via X7 or X8 under C0583=3 and C0584=3		• Deactivate monitoring via X7 or X8 under C0583=3 and C0584=3 • Connection to DIN 44081 (see also Fig. 4-14). • We recommend a Ziehl PTC (up to 150 °C): K15301075 or a thermostat.

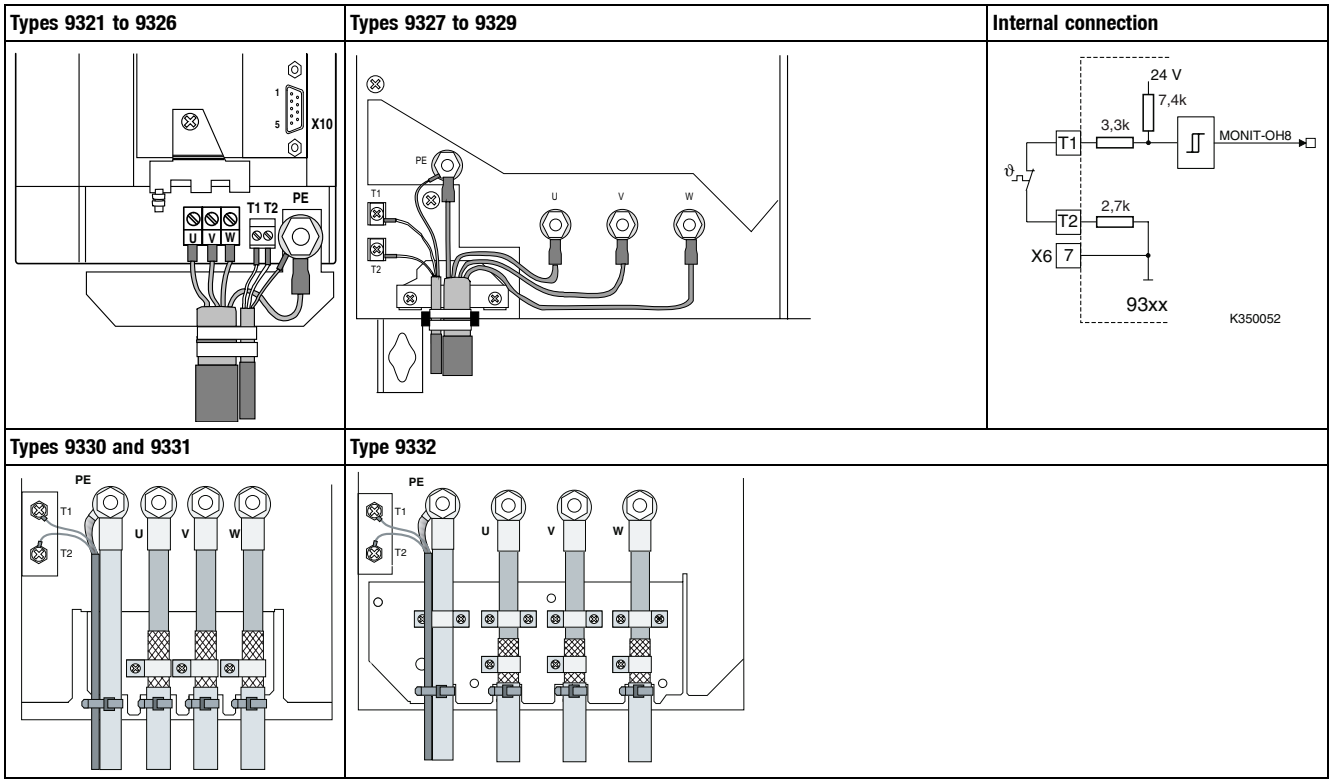
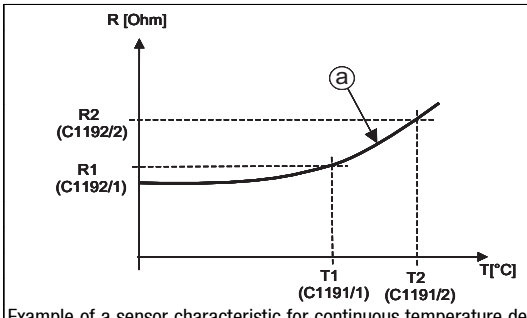


Fig. 4-14 Connection of a thermistor or PTC thermistor to terminals T1 and T2 and internal connection

Note!

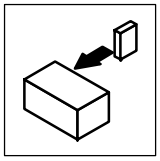
- In the prefabricated Lenze system cables for **Lenze servo motors** the cable for the temperature feedback is already included. The cables are designed for wiring according to EMC.
- If you use cables of your own:
  – Always lay cables separately from motor cables.

4.2.9.1 User-specific characteristic for a PTC thermistor



Example of a sensor characteristic for continuous temperature detection

Code	Subcode	Description
C1190	0 (operating mode 1)	Evaluation of the Lenze standard motor temperature sensor
	1 (operating mode 2)	Evaluation of a user-specific thermal sensor. The operating point is in the almost linear area (a) of the sensor characteristic. The operating point is provided by two interpolation points. Interpolation between these two points.
C1191	1 (100 °C)	Definition of the temperature interpolation points which are assigned to the resistances of the sensor.
	2 (150 °C)	
C1192	1 (1670 Ω)	Definition of the sensor resistances
	2 (2225 Ω)	



4.2.10 Feedback systems

Different feedback systems can be connected to the controller:

- Resolver feedback (factory setting)
- Encoder feedback
  – Incremental encoder TTL
  – Sin/cos encoder
  – Sin/cos encoder with serial communication (single turn)
  – Sin/cos encoder with serial communication (multi turn)

Tip!

If homing is not possible, use a sin/cos encoder with serial communication (multi-turn). Please indicate the motor/encoder combination for your order.

Resolver signal or encoder signal can be output for slaves at the digital frequency output X10.

- Connection as shown in the figures:
  – Use twisted pair cables and screened pair cables.
  – Connect the screen at both ends.
  – Use the indicated cable cross-sections.
- The feedback system is activated under C0025.

Resolver connection (X7)

- In all configurations predefined under C0005, a resolver can be used as feedback system. An adjustment is not necessary.

Tip!

Use pre-cut Lenze system cables for the resolver connection.

Please contact Lenze before you use other resolvers.

Features:

- 2-pole resolver (V = 10 V, f = 4 kHz)
- Resolver and resolver cable are monitored for open circuit (fault indication Sd2)

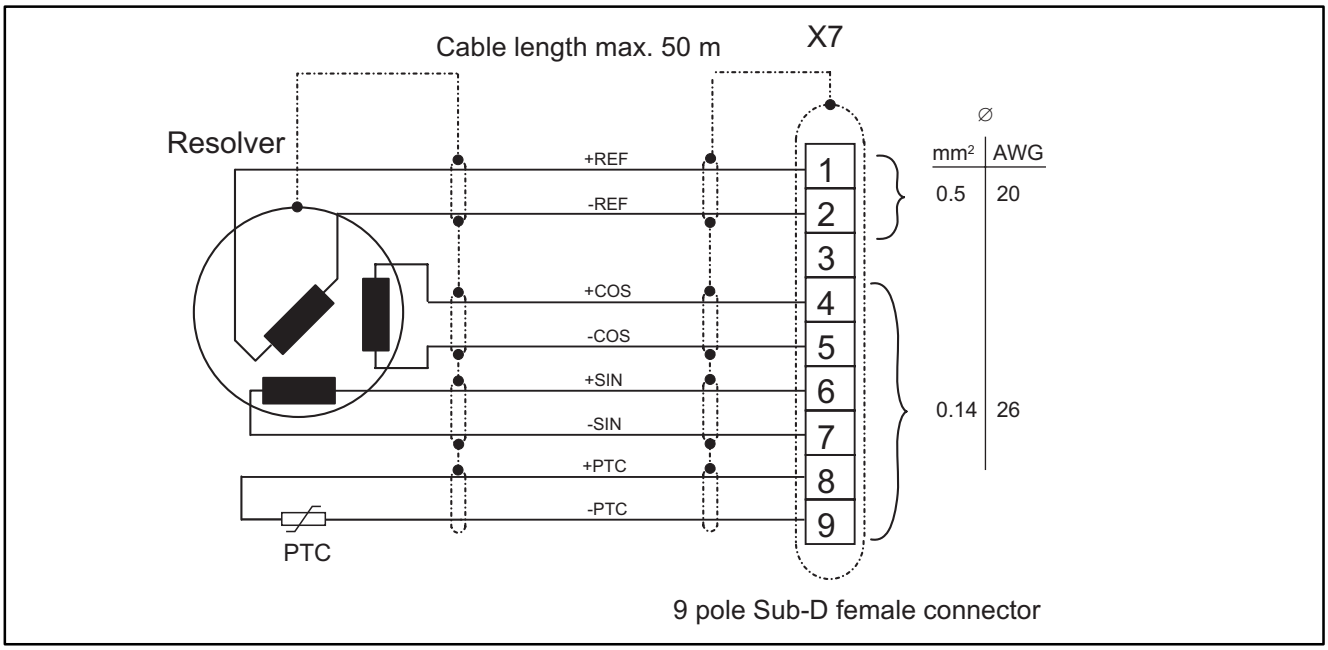
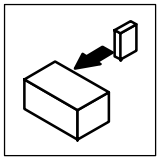


Fig. 4-15 Resolver connection

Assignment of the female connector (X7)									
Pin	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Signal	+Ref	-Ref	GND	+COS	-COS	+SIN	-SIN	+PTC (📖 4-28)	-PTC (📖 4-28)



Installation

Encoder connection (X8)

An incremental encoder or a sin/cos encoder can be connected to this input.

Tip!

Use the prefabricated Lenze system cable for the encoder connection.

- The encoder supply voltage V_{CC5_E} can be adjusted in the range from 5 V to 8 V under C0421
  – to set the encoder supply
  – to compensate the voltage drop on the encoder cable, if necessary
  $\Delta U \approx 2 * \text{Leitungslänge} * \text{Widerstand/m} * I_{encoder}$

Stop!

Observe the connection voltage of the encoder system used. An excessive setting under C0421 can destroy the encoder.

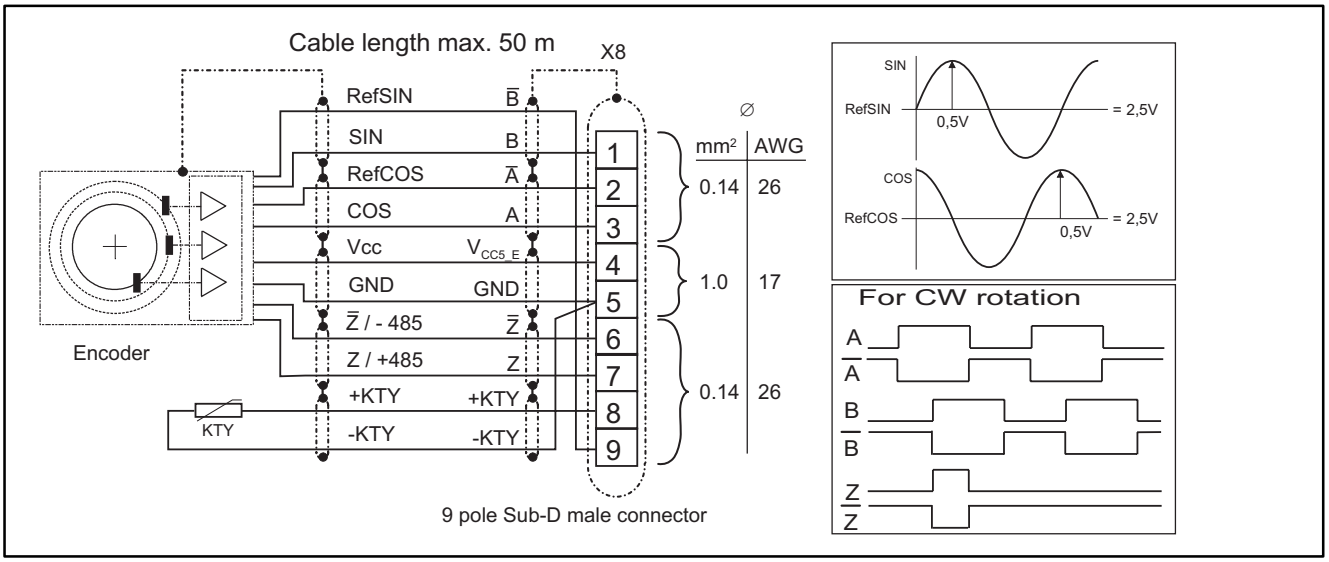
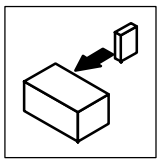


Fig. 4-16 Encoder connection



Incremental encoder

Features:

- Incremental encoders with two 5 V complementary signals shifted by 90 ° can be connected (TTL encoder).
  – The zero track can be connected (as option).
- 9-pole Sub-D female connector
- Input frequency: 0 - 500 kHz
- Current consumption per channel: 6 mA

Assignment of the male connector (X8)									
Pin	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Signal	B	$\overline{A}$	A	V_{CC5_E}	GND (-PTC)	$\overline{Z}$	Z	+PTC (📖 4-28)	$\overline{B}$

Sin/cos encoder

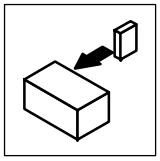
Features:

- The following encoders can be connected
  – sin/cos encoders with a rated voltage from 5 V to 8 V.
  – Sin/cos encoders with a communication interface of type Stegmann SCS/M70xxx (The initialization time of the controller is increased to approx. 2 seconds).
- 9-pole Sub-D female connector
- Internal resistance Ri = 221 Ω
- Voltage of sine and cosine track: 1 Vss ±0,2 V
- Voltage RefSIN and RefCOS: +2.5 V

Tip!

For encoder with tracks: sine, $\overline{\text{sine}}$ and cosine, $\overline{\text{cosine}}$:
RefSIN with $\overline{\text{sine}}$ and RefCOS with $\overline{\text{cosine}}$

Assignment of the male connector (X8)									
Pin	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Signal	SIN	RefCOS	COS	V_{CC5_E}	GND (-PTC)	$\overline{Z}$ or -RS485	Z or +RS485	+PTC (📖 4-28)	RefSIN



4.3 Installation of a CE-typical drive system

General notes	• The electromagnetic compatibility of a machine depends on the type of installation and care taken. Please observe: – Assembly – Filters – Shielding – Grounding • For diverging installations, the conformity to the CE EMC Directive requires a check of the machine or system regarding the EMC limit values. This is for instance valid for – Use of unscreened cables – Use of group RFI filters instead of assigned RFI filters – Operation without mains filter • **The compliance of the machine application with the EMC Directive is in the responsibility of the user.** – If you observe the following measures, you can assume that the machine will operate without any EMC problems caused by the drive system, and that compliance with the EMC Directive and the EMC law is achieved. – If devices which do not comply with the CE requirement concerning noise immunity EN 50082-2 are operated close to the controller, these devices may be disturbed electromagnetically by the controllers.
Assembly	• Connect controller, mains choke, and mains filter to the grounded mounting plate with a wire of large a cross-section as possible: – Mounting plates with conductive surfaces (zinc-coated, stainless steel) allow permanent contact. – Painted plates are not suitable for installation in accordance with the EMC. • If you use several mounting plates: – Connect as much surface as possible of the mounting plates (e.g. with copper bands). • Ensure the separation of motor cable and signal or mains cable. • Do not use the same terminal strip for mains input and motor output. • Cable guides as close as possible to the reference potential. Unguided cables have the same effect as aerials.
Filters	• Use mains filters or RFI filters and mains chokes which are assigned to the controller: – RFI filters reduce impermissible high-frequency interference to a permissible value. – Mains chokes reduce low-frequency interferences which depend on the motor cable and its length. – Mains filters combine the functions of mains choke and RFI filter.
Shielding	• Connect the screen of the motor cable to the controller – to the screen connection of the controller. – additionally to the mounting plate with a surface as large as possible. – Recommendation: For the connection, use ground clamps on bare metal mounting surfaces. • If contactors, motor-protecting switches or terminals are located in the motor cable: – Connect the screens of the connected cables also to the mounting plate, with a surface as large as possible. • Connect the screen in the motor terminal box or on the motor housing to PE: – Metal glands at the motor terminal box ensure a connection of the screen and the motor housing. • If the mains cable between mains filter and controller is longer than 300mm: – Screen mains cables. – Connect the screen of the mains cable directly to the inverter and to the mains filter and connect it to the mounting plate with as large a surface as possible. • Use of a brake chopper: – Connect the screen of the brake resistor cable directly to the mounting plate, at the brake chopper and the brake resistor with as large a surface as possible. – Connect the screen of the cable between controller and brake chopper directly to the mounting plate, at the inverter and the brake chopper with a surface as large as possible. • Screen the control cables: – Connect both screen ends of the digital control cables. – Connect one screen end of the analog control cables. – Always connect the screens to the screen connection at the controller over the shortest possible distance. • Application of controllers in residential areas: – To limit the radio interference, use an additional screen damping ≥ 10 dB. This is usually achieved by installation in enclosed and grounded control cabinets made of metal.
Grounding	• Ground all metallically conductive components (controller, mains filter, motor filter, mains choke) using suitable cables connected to a central point (PE bar). • Maintain the minimum cross-sections prescribed in the safety regulations: – For the EMC, not the cable cross-section is important, but the surface and the contact with a cross-section as large as possible, i.e. large surface.

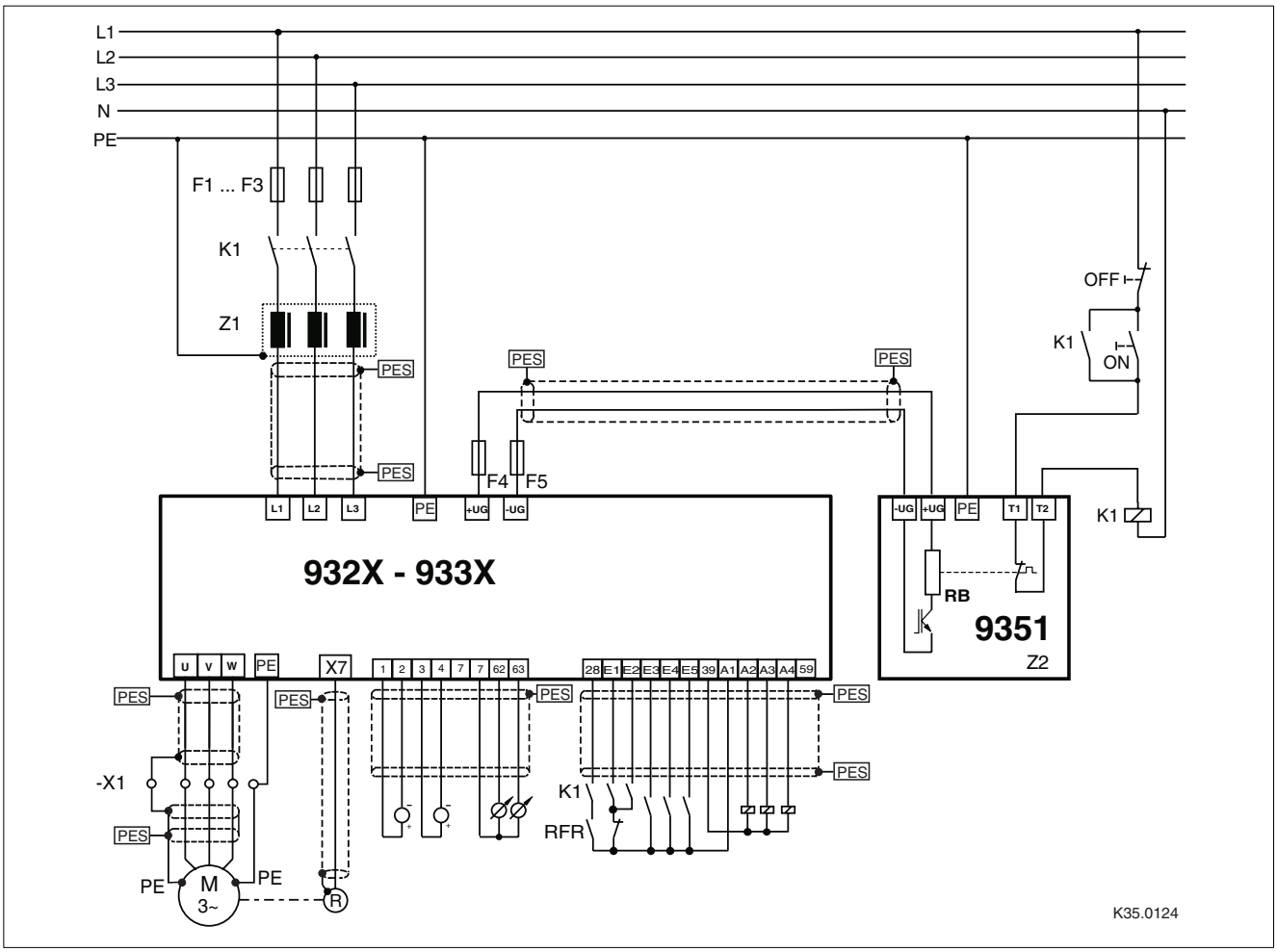
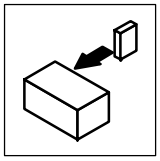
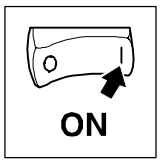


Fig. 4-17 Example for wiring in accordance with EMC regulations

F1...F5	Protection, see “Cable protection” (📖 3-6) / “Mains connection” (📖 4-13)
K1	Mains contactor
Z1	For mains filter “A” or “B” see Accessories.
Z2	Brake mode, see Accessories.
-X1	Terminal strip in control cabinet
PES	HF screening by connection to PE with a surface as large as possible (see ”Shielding”) 📖 4-34)



Installation



5 Commissioning

5.1 Before switching on

Prior to initial switch-on of the controller, check the wiring for completeness, short-circuit, and earth fault:

- Power connection:
  – Supply via terminals L1, L2 and L3 (direct mains connection) or alternatively via terminals +UG, -UG (DC bus connection, network of drives).
- Motor connection:
  – In-phase connection to the motor (direction of rotation).
- Feedback system (resolver, incremental encoder, ...).
- Control terminals:
  – Controller enable: terminal X5/28 (reference potential: X5/39).
- Covering the power connections:
  – Put on cover(s) and fix.
- **Do not change the switch-on sequence!**
- The commissioning steps described in chapter 5 refer to configuration C0005 = 10000. Please change the factory setting to this configuration!

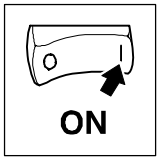
Tip!

The signal flow for configuration 1000 is described and shown in chapter 'Configuration'. (See chapter 5.8).

5.2 Initial switch on

Tip!

- Use a PC with the Lenze program "Global Drive Control" (GDC) under Windows for commissioning. The convenient menus include all codes required for the most important settings.
- A communication module type 2102 "RS232, RS485, optical fibre" (Lecom A/B/LI) is required to run the GDC.
- GDC and the communication module(s) are not included in the delivery package of the controller.
- The "Electronic cam profiler" requires the GDC version ≥ 3.6 erforderlich.



Commissioning

Commissioning using an example

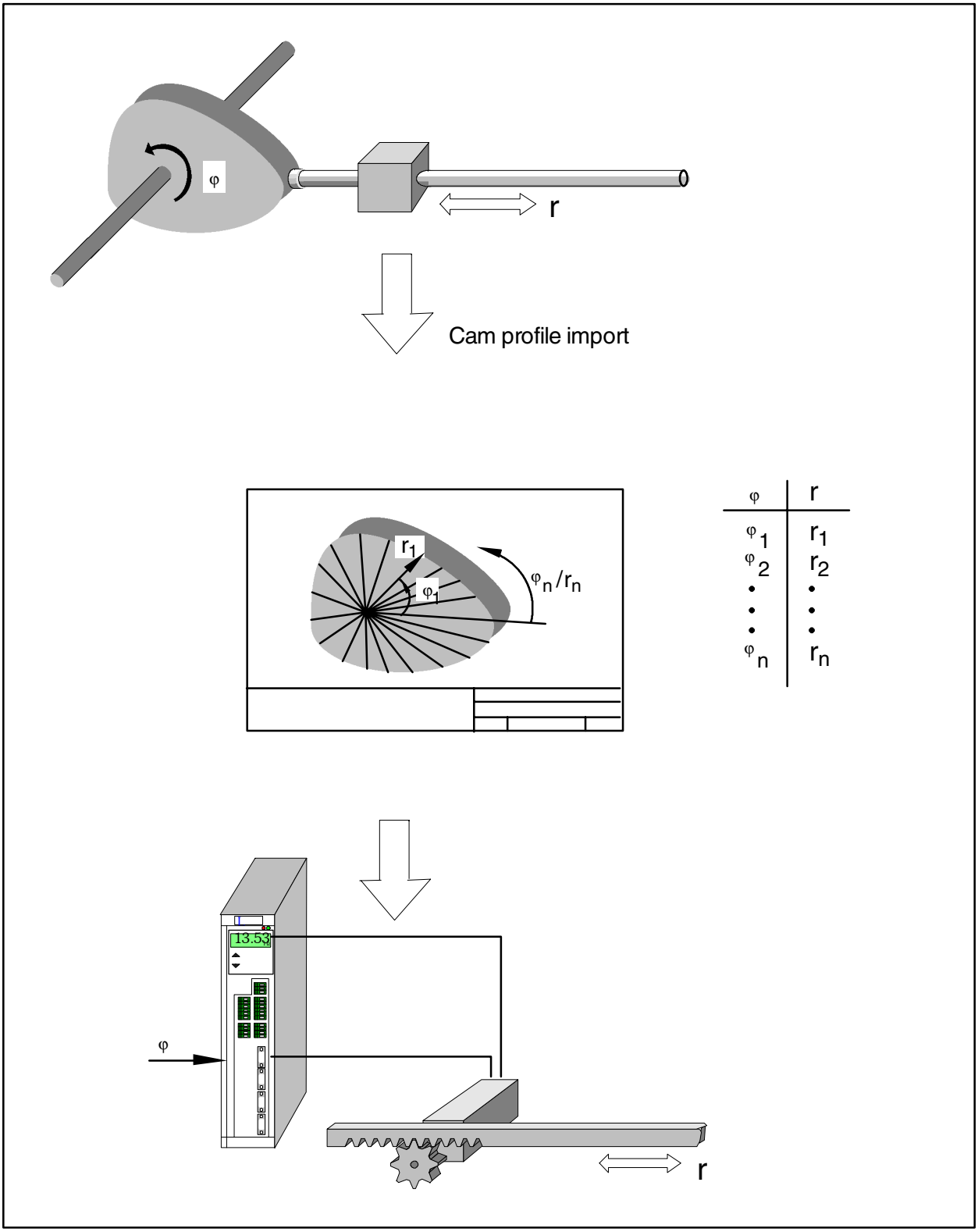
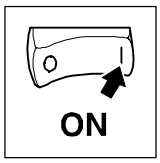


Fig. 5-1 Retrofitting of a mechanical cam



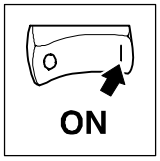
The following table lists the procedure for commissioning according to the example in Fig. 5-1. A detailed description of the commissioning can be obtained from the following chapters.

Stop!

- The sequence listed below must be observed when commissioning the drive.
- Create or load the parameter set before the profile data are transferred!

Section	Action	detailed description in
Switch on controller	1. Assign terminal X5/28 (controller enable)to LOW signal. 2. Apply digital terminal signals 3. Apply analog input signals 4. Switch on mains: – The controller is ready for operation after approx. 1s. (2 s for drives with sin/cos encoders with serial interface).	Chapter 5.3
Switch on PC	Start GDC on the PC – Set the communication parameters for online operation in the ”Momentary drive” dialog box. Confirm with ”OK”. – Select the controller in the ”Assign controller description” dialog box.Confirm with ”OK”.	Chapter 5.4
Generate parameter set	1. Adapt controller to the mains 2. Adapt controller to the motor 3. Enter machine parameters	Chapter 5.5.1 Chapter 5.5.2 Chapter 5.5.3
Basic cam data	1. Determine the data model 2. Determine the number of profiles required. 3. Enter all required data for cam profiles selected.	Chapter 5.6
Cam profile creation	1. Open the dialog “Cam profile editor” 2. Import the profile data or enter the formula to describe the profile. 3. Save the data set 4. Protect your profile data by assigning a User-PIN under code C0503/1	Chapter 5.7
Basic configuration	1. Load the basic configuration ’Replacement of a mechanical cam” via the code C0005 = 10000. Use the codes listed in chapter 5.8 to adapt the drive to your application. 2. Store the data in the controller.	Chapter 5.8

Tab. 5-1 Commissioning of the 9300 cam profiler



5.3 Switch on the controller

1. Assign LOW level to terminal X5/28 (controller enable).
2. Digital inputs:
   The following terminal signals are to be applied to the digital terminals:

E1	E2	E3	E4	E5
LOW	LOW	LOW	HIGH	LOW

3. Analog inputs:
   X6/1 and X6/2: not assigned
   X6/3 and X6/4: not assigned
4. Switch on mains:
   – The controller is ready for operation after approx. 1s.
   (2 s for drives with sin/cos encoders with serial interface).
5. Controller is ready for operation:
   – When the green LED is flashing:
   Controller is ready for operation.
   – When green LED is off and red LED is blinking:
   There is a fault. Before proceeding with the commissioning, eliminate the fault (see chapter 9 ”Troubleshooting and fault elimination”).
6. For operation with a fieldbus module, additional settings are necessary
   (see Operating Instructions for the fieldbus module used).

5.4 Switch on the PC, start GDC

- Switch on PC.
- Start the GDC program under Windows.

If GDC is in ”online operation”

- the ”Find Lecom A/B drives” dialog box will be opened.
- Click ”Find”.GDC will now search for a controller.
- GDC selects the first controller found.
- GDC tests all baud rates which can be set.
- GDC loads the parameter set description for the connected controller.
  – If GDC does not find a parameter set description, you are asked which description you want to load alternatively.
- GDC automatically reads the parameter set from the controller.

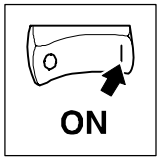
If GDC is in ”offline operation”

- the controller must be selected manually.
  – You can change to ”online operation”. GDC automatically selects a controller.
- Open the ”Controller” menu in the menu bar and click ”Select”. Make your choice for:
  – the desired parameter set description.
  – Baud rate.
  – Controller address.

5.5 Create parameter set

Warning!

Do not change any controller settings not mentioned in this chapter.



Proceed systematically when generating a parameter set:

1. Selection of a basic configuration matching the application.
2. Adapt controller to mains conditions.
3. Adapt controller to motor.
4. Enter machine parameters.

5.5.1 Adapt controller to mains

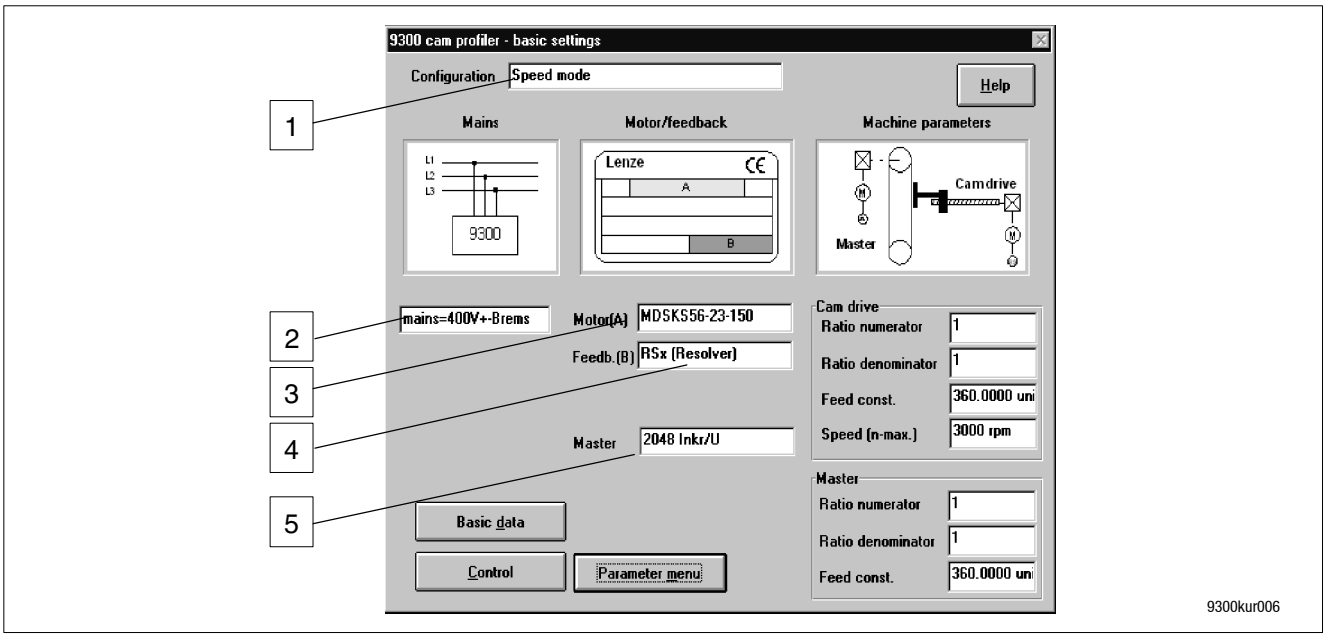


Fig. 5-2 ”Basic settings” dialog box

Field	Command	Function
1	Click on field	Selection of configuration “10000”; cam profiler
2	Click on field	Select values for the actual mains and operating conditions.

5.5.2 Adapt controller to motor

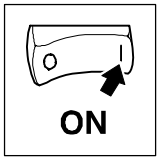
To achieve an optimum speed-torque characteristic for the drive, it is necessary to enter the nameplate data of the connected motor.

When you use a Lenze motor:

Field	Command	Function
3	Click ”motor type (A)”.	Select connected motor.
4	Click ”encoder (B)”.	Selected feedback system used.
5	Click ”master value”.	Setting of the master-value incremental encoder

For motors with a resolver, use the eight-digit designation of the motor nameplate ”encoder” (as an option).

- For this, change to the parameter menu (see button Fig. 5-3) and select the menu ”Motor/feedback system”.



Commissioning

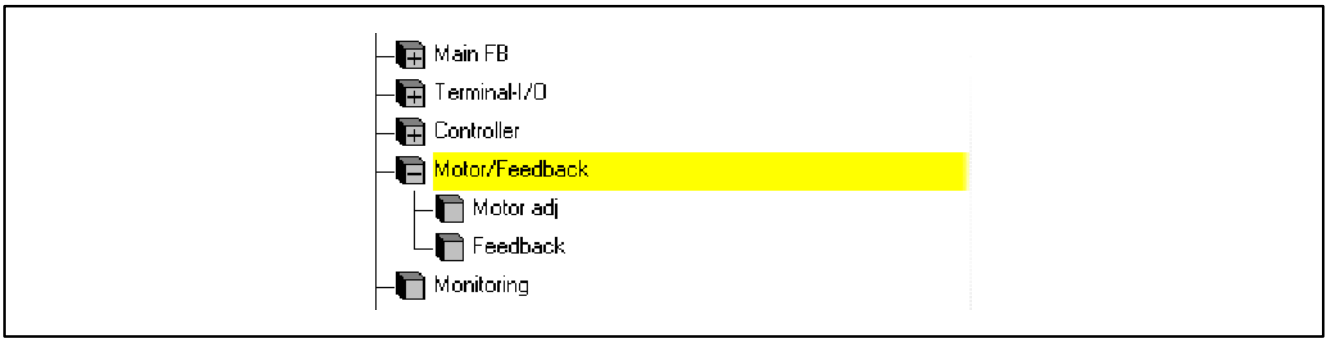


Fig. 5-3 How to find the menus "Motor setting" and "Feedback systems"

In the menu "Feedback systems":

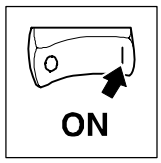
Command	Function
Select C0416	Resolver error Enter value from the motor nameplate
Select C0003	Save data (C0003 = 1).

If you use a motor other than from Lenze:

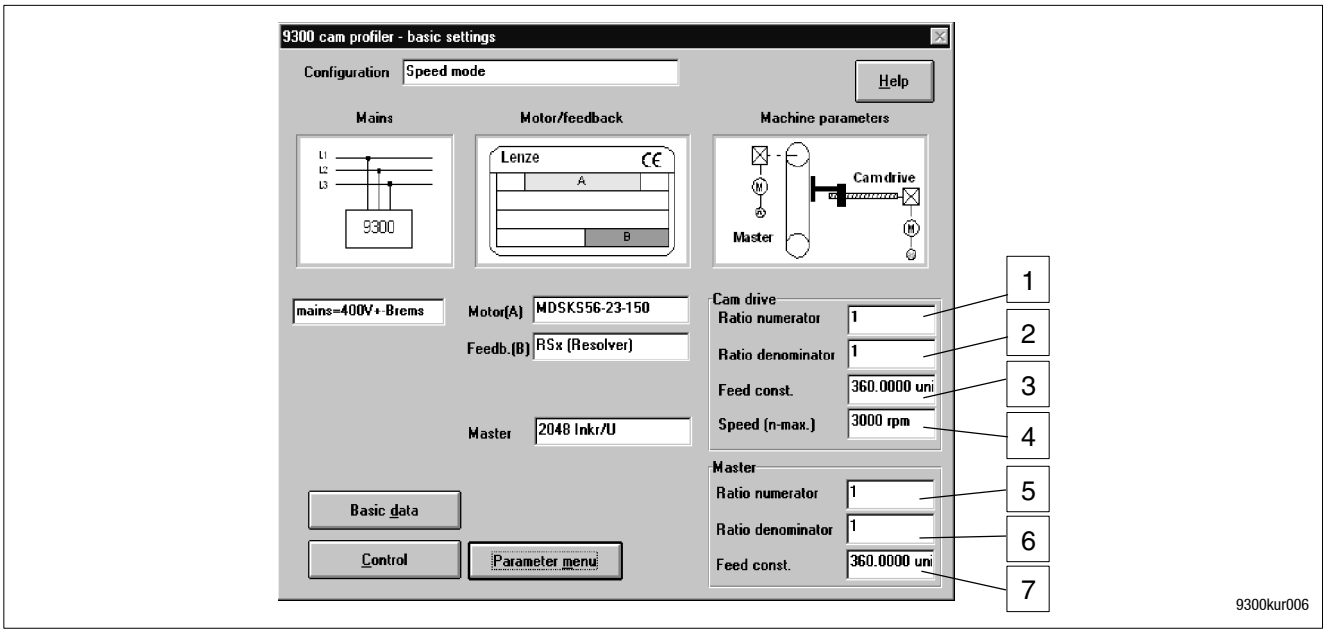
Change to the menu "Motor setting" (see Fig. 5-3).

In the menu "Motor setting":

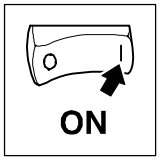
Command	Function
Select C0086	Select a motor which best matches the motor used. A list of available motors can be obtained from chapter 11.3
Select C0006	Operating mode of the motor control
Select C0022	I_{max} must be adapted to the maximum motor current.
Select C0081	Rated motor power
Select C0084	Stator resistance of the motor (only for very high demands on the control characteristics).
Select C0085	Leakage inductance of the motor (only for very high demands on the control characteristics).
Select C0087	Rated motor speed
Select C0088	Rated motor current
Select C0089	Rated motor frequency
Select C0090	Rated motor voltage
Select C0091	Motor-cos φ.
Select C0003	Save data (C0003 = 1).



5.5.3 Enter machine parameters



Field	Drive	Function
1	Cam drive	Enter numerator for the gear ratio of the cam drive
2		Enter denominator for the gear ratio of the cam drive
3		Output feed
4		Enter upper speed limit for the cam drive
5	Master drive	Enter numerator for the gear ratio of the master drive
j6		Enter denominator for the gear ratio of the master drive
7		Input feed



Commissioning

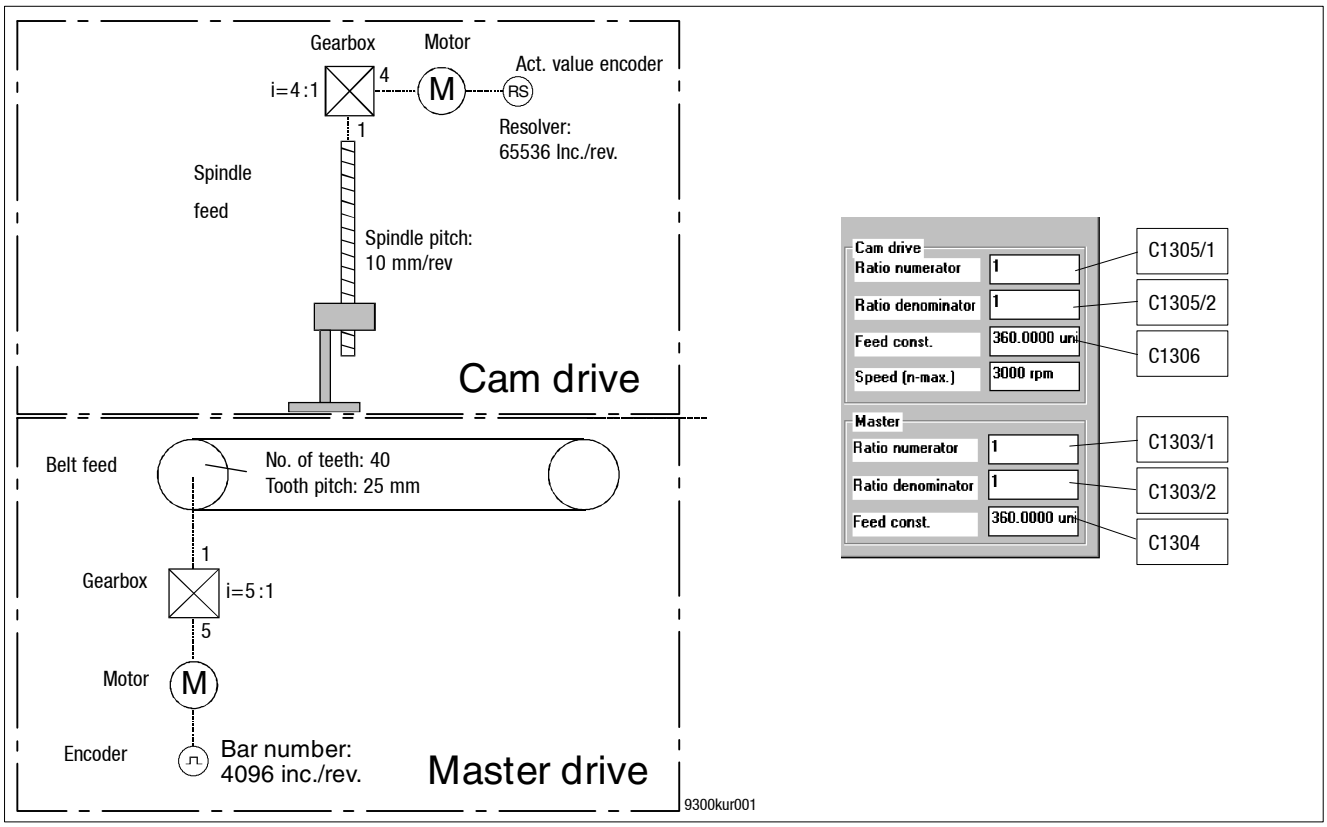
Normalization of machine parameters

For normalization, mechanical system variables and encoder system variables are input. The units of the master drive (m-units) and the cam drive (s-units) are freely selectable (e.g. mm, pieces, etc.)

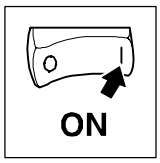
Normalized machine parameters of the cam and master drive are entered under the dialog 'basic data' (see Fig. 5-4). Normalized machine parameter and cam profile data are closely related.

Stop!

This note informs you about the need to recalculate and save the profiles already created when the machine parameters have been changed later.



Master drive: Belt feed [m-unit] master-unit = 1 mm		**Cam drive: Spindle feed** [s-unit] slave-unit = 1 mm	
C1303/1	= 5	C1305/1	= 4
C1303/2	= 1	C1305/2	= 1
C1304	= 1000 mm/rev (= 40 teeth x 25 mm per tooth)	C1306	= 10 mm/rev (spindle pitch)
The incremental reference is determined by the position feedback system that is selected.			



Motor mounting

The machine design determines the direction of rotation of the motor.

The cam profile position (code C1339/1) is indicated as positive value, independently of the direction of rotation of the motor, if the mounting position is considered in code C1368.

- 0 = Motor mounting on right-hand side (factory setting)
- 1 = Motor mounting on left-hand side

Stop!

Code C1368/0 influences the homing function (📖 8-14) and the direction of rotation of the motor. If necessary, the function "Set home position" must be carried out again after a change.

5.6 Basic cam profile data

When using the 9300 cam profiler, Lenze “Global-Drive-Control” (GDC) supports the setting of the profile required.

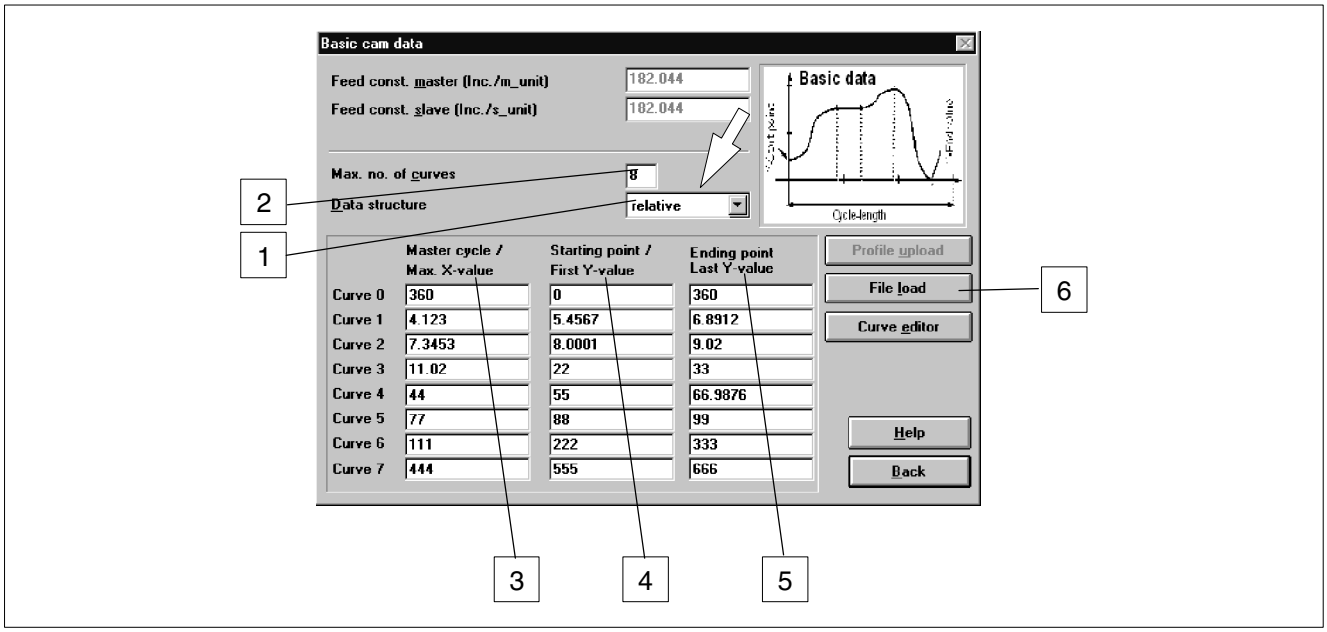


Fig. 5-4 Display on screen - basic cam profile data

Field	Function	Notes
1	Determination of the data model	We recommend to determine the data model for the profile before the key data of the profile is entered under’basic data’ in GDC. Two different models are available (Fig. 5-4, see arrow): • relative data model – The relative data model provides more points than the absolute data model. The point can however not be changed later, since they are saved as compressed data. • absolute data model – This data model provides the possibility to change single points of the profile later.
2	Enter the number of profiles:	It is possible to select between 1, 2, 4 and 8 different profiles. The number of points available depends on the data model selected and the profile:

Enter the number of profiles:	relative data model	absolute data model
1	2048	512
2	1024	256
4	512	128
8 (default setting)	256	64

3	Length of a profile in X direction	Unit: m_units STOP **The profile length must be at least 1/4 master encoder revolutions in X direction.** **The incremental profile length is displayed under code C1315/X.**
4	Movement in Y direction	Unit: s_units
5	Profile limit value in Y direction	Unit: s_units
j6	’Profile import’	see chapter 5.7.1
7	Initial point for import data	When the button for determining the initial point of import data is clicked, the first Y value from the imported file is copied to the field for the initial point for the first Y value.
All fields not used are not relevant for commissioning. For further information see on-line help.		

Tip!

Please observe when distributing the points, that max. 2 $^{points}/_{ms}$ will be crossed at max. line speed.

This motion profile can consist of

- one single profile
- or several profiles.

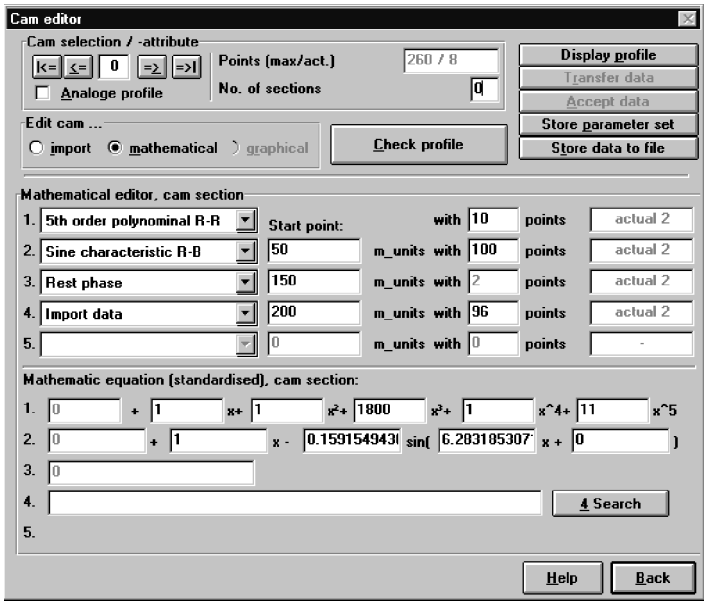
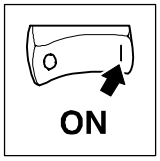


Fig. 5-5 profile editor

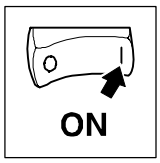


5.7 Cam profile creation

Three methods are available:

1. Graphical profile selection (e.g. with planning tool **CamDesigner**)
   – All current Operating Instructions, Manuals, etc. for Lenze products can be found on our homepage. **http://www.Lenze.de** under **Service** ⇒ **Downloads**
2. Cam profile import (📖 5-13)
   – The cam profile import enables the use of already existing cam data, e.g. from calculation programs or design data. The ASCII format is supported. The ASCII file must contain X/Y value pairs. For further information see the on-line help of GDC.
3. Mathematical cam profile generation (📖 5-15)
   – The profile is determined by the input of mathematical functions. The basis is the 5th order polynomial, the offset sine curve and standstill, which are indicated in the German regulation VDI 2143.

- Exception: Creation of feed constant (📖 5-17)



5.7.1 Cam profile import

The example shows how to replace a mechanical cam by the Lenze technology function "Electronic cam". The 'mechanical cam' must be numerically described by value pairs. These values must then be stored in the controller.

The source data for the numerical description of the cam profile can be generated in two ways from already existing data:

- Cam profile import
- Mathematical cam profile generation

For this commissioning, **Cam profile import** has been selected, i.e. the source data can be obtained, for instance, from an already existing ASCII file. The file must contain X/Y value pairs. Please separate the X/Y-value pairs by TAB, comma or semicolon.
(For the description of the mathematical cam profile creation see chapter 5.7.2).

All commissioning steps, including parameter setting, are carried out using the operation and parameter setting program "Global Drive Control" (GDC).

Tip!

Please save all settings for the controller via code C0003 to ensure that they will not be lost in the event of a mains failure.

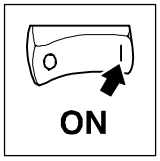
Additional information about the Lenze planning tool 'CamDesigner'

Use the mouse to calculate synchronous distances and interpolation:

With the planning tool **CamDesigner** (software in addition to GDC) to create cam profiles easily as graphics. After having drawn 'Your Profile' it must only be transferred to the controller.

Some CamDesigner features:

- Generation of the drawing by means of graphic objects (lines, polynomials).
- Data input directly as physical unit
- Automatic generation of connections according to the Laws of Motion to VDI 2143 by experts (generation of smooth motion to protect the mechanics)
- Display of speed, acceleration torque and jolt
- Generation of value pairs (either position, speed or acceleration) for the direct acceptance of cam profiles in GDC
- Complete project management
- Printing of cam profile graphics with planning information



Commissioning

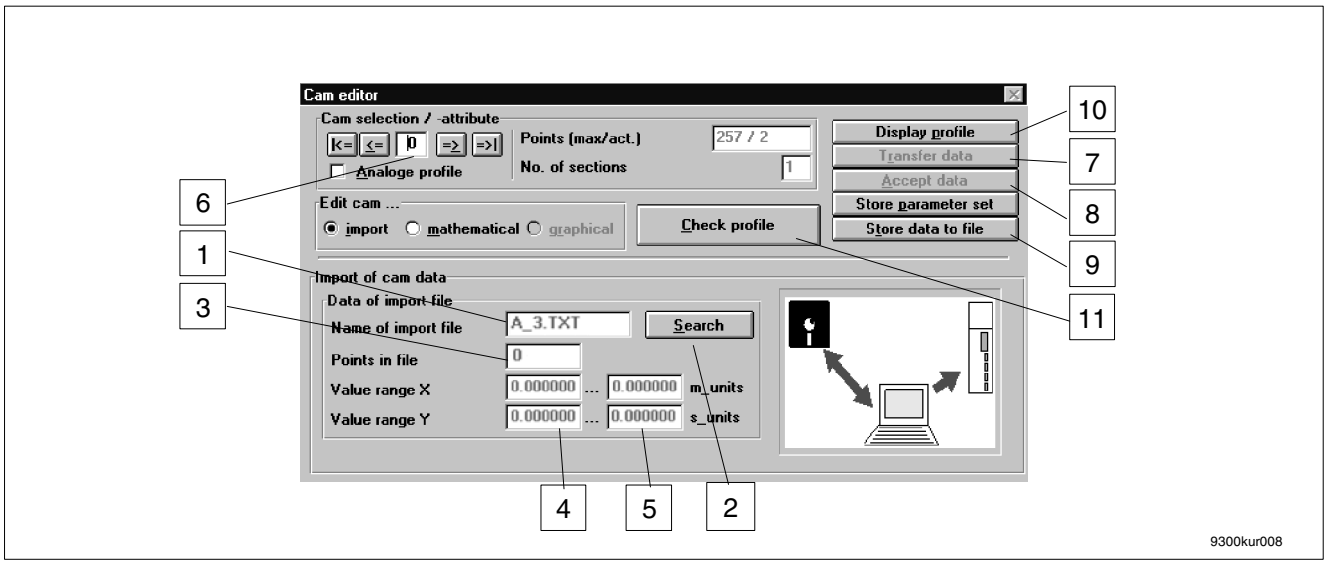


Fig. 5-6 Dialog “Cam profile editor”

Commissioning procedure

1	A name for an ASCII file (*.txt) to be imported can be entered directly or...
2	..selected from a disk by using the button “Find”.
3	After the selection of a file, a number of information about the data read in is indicated in the middle left screen area. Indicated are the value pairs (points) and
4	the minimum values in X and Y direction
5	as well as the maximum values in X and Y direction.
j6	Select the target profile for the imported data in the upper screen area.
7	The data are transferred to the controller. Please observe that the parameter set must be transferred before the profile data.
8	After data transfer, the data must be accepted from the active data range of the controller (button “Accept data”). For this, connect the signal CDATA-LOAD (C1322/7) temporarily to FIXED1; reset to FIXED0 afterwards.
9	The converted data can be stored on a data carrier by pressing the button “Save”
10	The button “Display profile” leads to the corresponding program dialog (see Online Help).
11	The button “Check profile” starts the calculation of the profile characteristic and checks whether the required conditions are met.

5.7.2 Mathematical cam profile generation

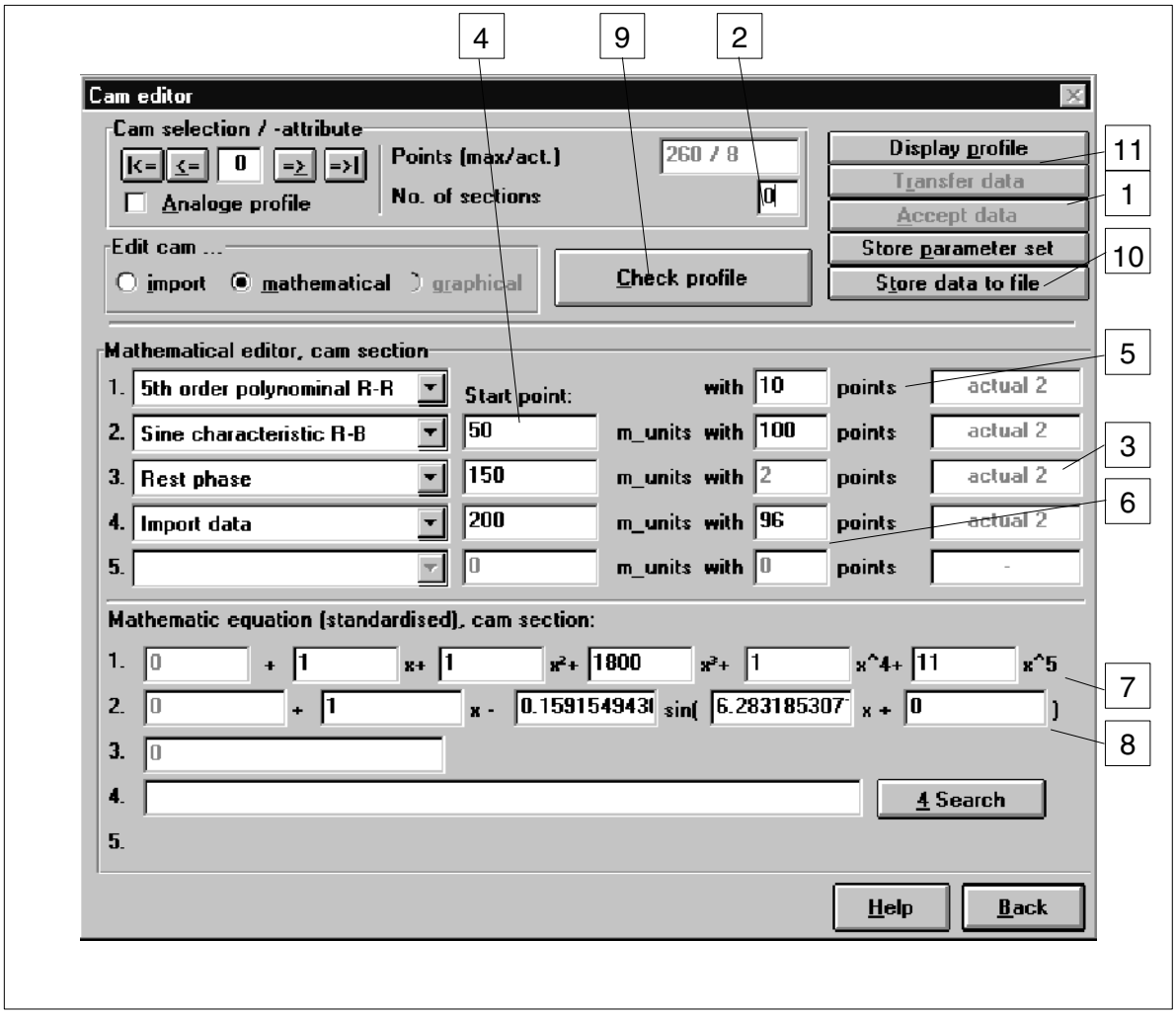


Fig. 5-7 Dialog “Mathematical profile generation”

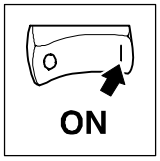
Select the profile to be processed in the upper dialog area (1). Depending on the number of sections (2), the corresponding number of possible selections is provided in the middle dialog (3). Available are:

1. 5th degree polynomial
2. offset sine curve
3. standstill and
4. synchronous ranges (import data)

The length of a section is indicated in (4). The calculation is based on the first section starting at X=0 and the last section ending at $X=X_{max}$. Enter the number of points required for every section under (5). “Standstill” and synchronous ranges are exceptions because the required number of points is automatically selected depending on the section length. The number of points for the last section is also determined automatically by the remaining number of points (see basic data dialog).

Tip!

Observe the number of points available (6).



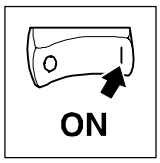
Commissioning

The input fields assigned to the selected equation are indicated in the lower dialog area (7). The upper range value of each section is output in the right area of input fields (8). The profile characteristic is automatically calculated in the background. The status display (9) indicates whether the cam data have been input correctly or not (e.g. discontinuous profile).

After the calculation, the data can be stored on any data medium (10) transmitted to the controller (11) by using the corresponding buttons.

Tip!

First process all the profiles used. Cam profile data are always transferred as a block. The transmission time is thus approx. 1-2 minutes.
Please observe, that the data must be accepted by the active data range of the controller after data transmission (see chapter 5.7.1).
If the data are to be used after mains disconnection, they must be stored via code C0003 after transmission.



5.7.3 Creation of feed profiles

Creation of a single profile

- Jolts of the drive can be avoided if the motion profile does not start with $y_0 \neq 0$.
  – For this, the **default value** of all profiles (= **0**) must not be changed in the columns “Initial point/first Y value”.

The example of a motion profile for a single profile is shown in Fig. 5-8.
The motion profiles set as default values have their initial points in $x_0 = 0$ and $y_0 = 0$ (see arrow).

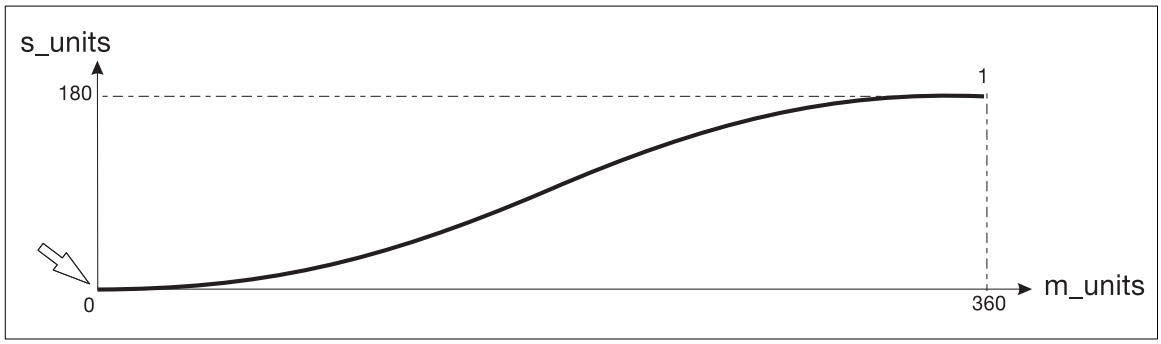


Fig. 5-8 Cam profile for a feed movement

Creation of a motion profile consisting of several profiles

GDC provides the possibility to combine up to 8 profiles. The motion profile for future operation is generated from the cyclic processing of the individual profiles. Thus, profile sections can also have the initial value $y_0 \neq 0$ sind (siehe Fig. 5-9).

Stop!

For smooth transition the rising and height of the cyclic profile section sequence must match (see arrow in Fig. 5-9) !

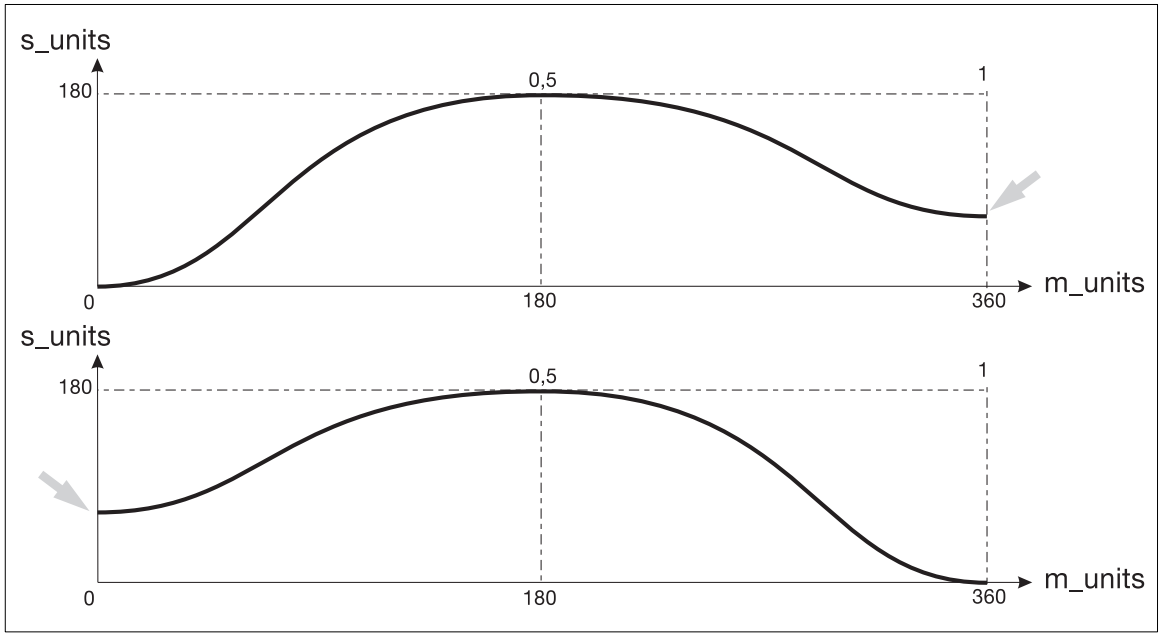
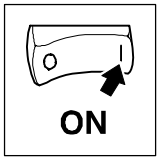


Fig. 5-9 Transition between two profile processed cyclically one after the other

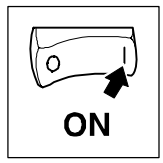


Commissioning

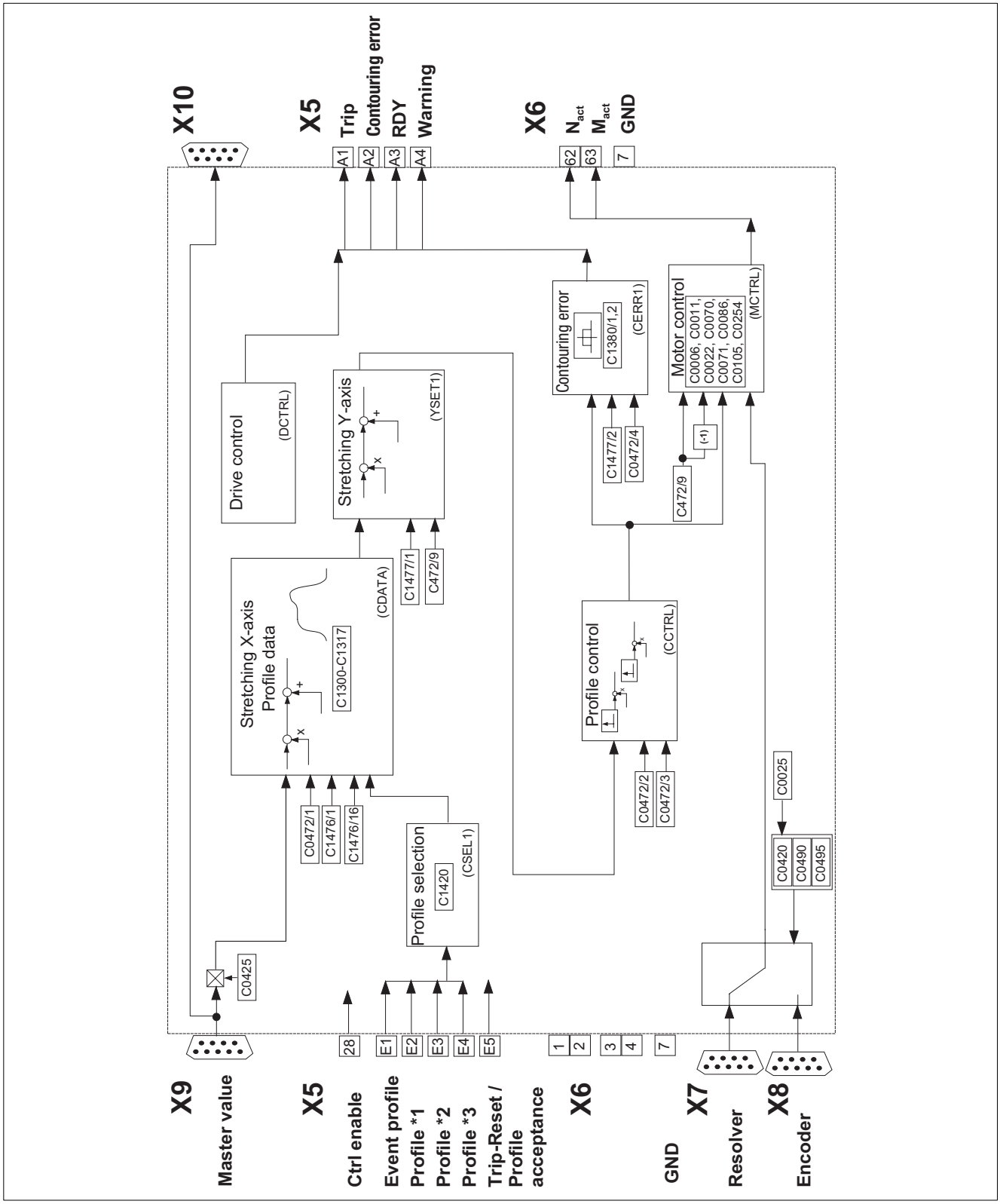
Procedure

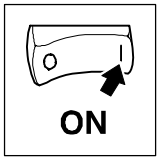
1. Select a basic configuration that matches your application.
2. Then change the basic configuration as described in the following:

- Activate automatic cam profile processing
  – C1322/1 (CDATA-Cycle) = Fixed 1
- Start profile and range of the processing are to be set under
  – C1311
  – C1312
- Deactivate feed function
  – C1322/3 (CDATA-REL-SEL) = Fixed 0
- Change stretching/compression mode of the y-axis
  – C1313/0 = 0



5.8 Configuration C0005 = 10000
Substitution of a mechanical cam



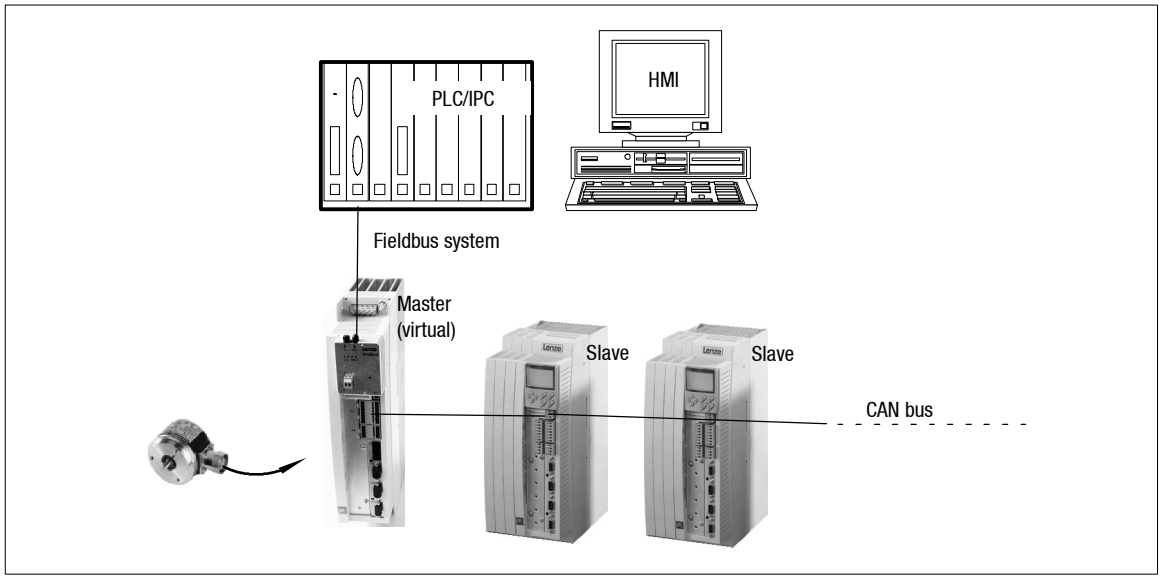


Commissioning

Code	Description
C0005=10000	The configuration C0005=10000 allows an electronical solution for a mechanical cam. Additional features and functions such as stretching / compression / phase trimming in X- and Y-direction are made available.
• Master value	
C0425	Encoder constant of the master value
• Cam profile data	
C1300-C1317	The cam profile data are determined with the generation of the profile. Usually, they do not have to be changed separately.
C1420	Determines the profile to be used when a event input is activated (digital input E1 = LOW).
• Contouring error evaluation	
C1380/1 and C1380/2	Determine comparison window and hysteresis of the contouring error evaluation.
• Adjustment values	
C0472/2	Influence of speed precontrol
C0472/3	Influence of torque precontrol
C1477/2	Contouring error limit (in s_units)
C0472/4	Reduction factor for contouring error warning Warning limit C0472/4 x C1477/2
• Profile influence	
C0472/1	Stretching / compression X axis (100% = no stretching / compression)
C1476/1	Phase trimming in X-direction
C1477/1	Phase trimming in Y-direction
C1476/16	TOUCH-PROBE position in X-direction
C0472/9	Stretching/compression of Y-axis
C0472/10	Torque limit value

5.9 Hand wheel function

The hand wheel function can be compared with turning a vertical shaft in mechanical cam applications. To reduce the danger of damage, the vertical shaft is slowly turned by hand during set-up while the operating personnel watches the combined actions of the vertical shaft and the mechanically coupled axes. Later, in production, only the line speed changes, the distances between the moving parts remain the same.

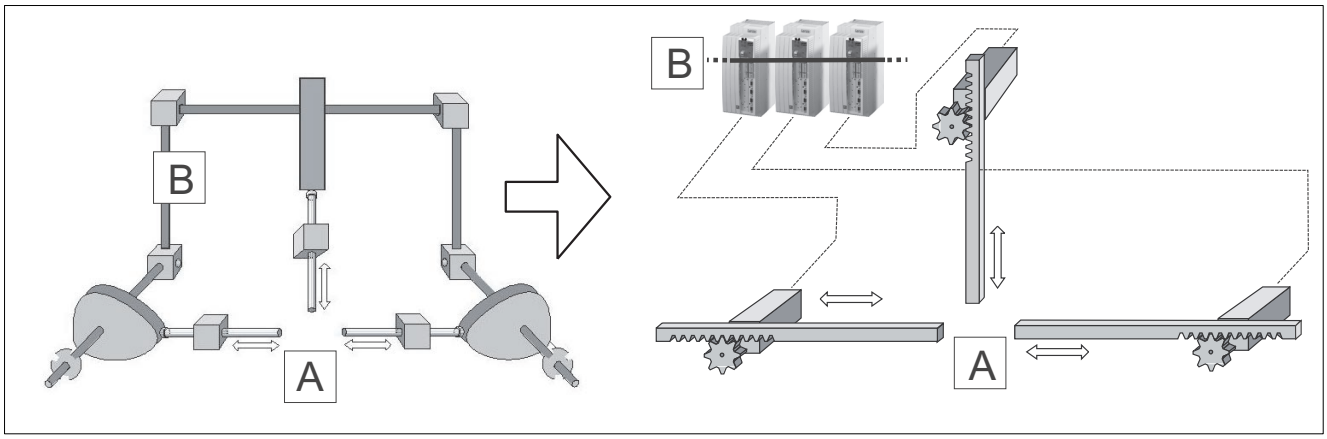


9300 cam profilers provide the same possibility of set-up operation as mechanical cams:

- For this, a simple incremental encoder is connected to the master as hand wheel (see diagram).
- The hand wheel determines the angle of rotation for master and slaves (“vertical shaft”).
- The cams follow the rotation speed and direction of the hand wheel.
- The 9300 cam profiler can be easily and quickly optimised for your application.

5.10 Commissioning example: Multi-axis application

(as of software version > 2.2)



The connecting element between mechanical cams is a line shaft [B].

With the 9300 cam profiler the connection between the drives is implemented by the system bus (CAN).

With view from the workpiece to be machined [A] all communicating drives have the same sequence of motion.
For the user this means an even more flexible machinery concept.

The following drawing shows the simple structure of the drives connected via a system bus:

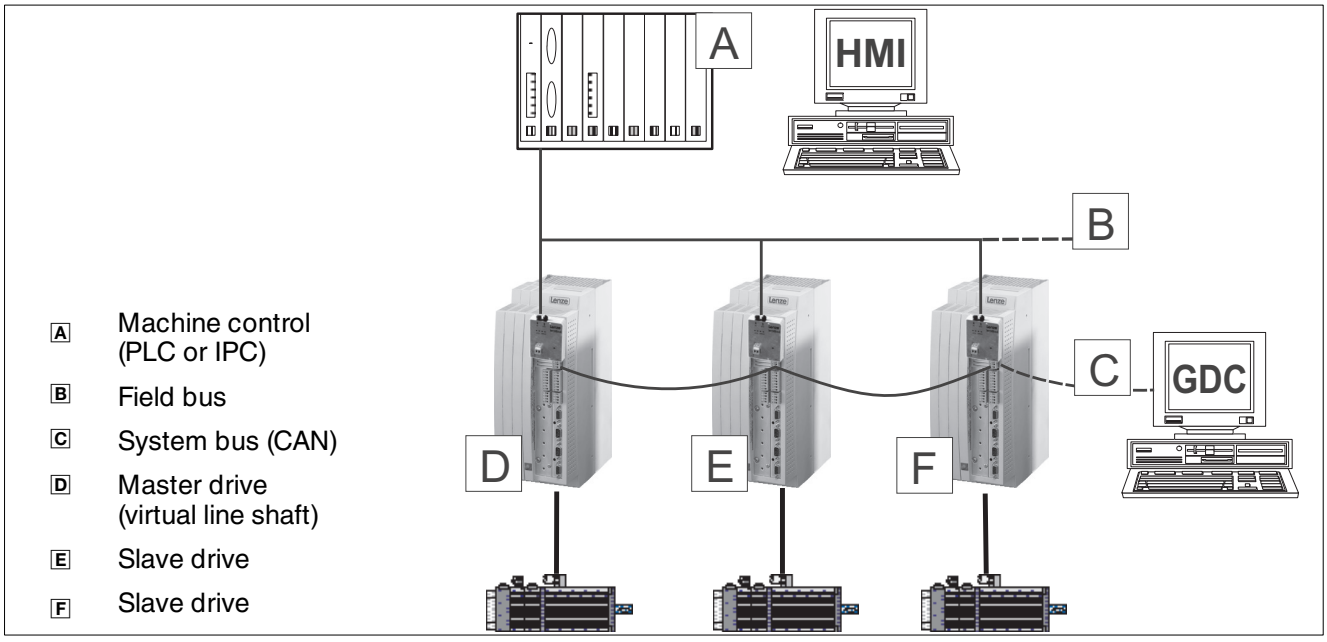
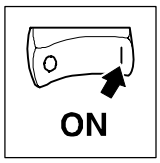


Fig. 5-10 System bus network between master and slaves



Here we use the Lenze operating program GDC for commissioning.

Tip!

- Use a PC with the Lenze program "Global Drive Control" (GDC) under Windows for commissioning. The convenient menus include all codes required for the most important settings.
- You need the 2173 PC system bus module to access your controller via GDC online.
- GDC and the communication module(s) are not included in the delivery package of the controller.
- The "Electronic cam profiler" requires the GDC version ≥ 3.6 erforderlich.

In this example it is assumed that the controller is in default setting.

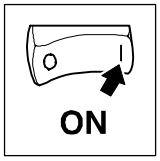
The system bus (CAN) is parameterized at every controller. Afterwards, the parameters of the master and slave drives are described. Depending on the user's experience also different procedures are also possible.

Please ensure that the PC used for parameter setting and configuration is only connected to one controller during commissioning.

Before switching on

Prior to initial switch-on of the controller, check the wiring for completeness, short-circuit, and earth fault:

- Power connection:
  – Supply via terminals L1, L2 and L3 (direct mains connection) or alternatively via terminals +UG, -UG (DC bus connection, network of drives).
- Motor connection:
  – In-phase connection to the motor (direction of rotation).
- Feedback system (resolver, incremental encoder, ...).
- Control terminals:
  – Controller enable: terminal X5/28 (reference potential: X5/39).
- Covering the power connections:
  – Put on cover(s) and fix.
- **Keep to the switch-on sequence!**
  Please observe the corresponding information given in the Operating Instructions for the 9300 cam profiler.



Commissioning

Initial settings for the system bus (CAN)

Tip!

Code C0366/000 should be set to “No Sync Response” (see menu item: Sync Management) to reduce the bus load..

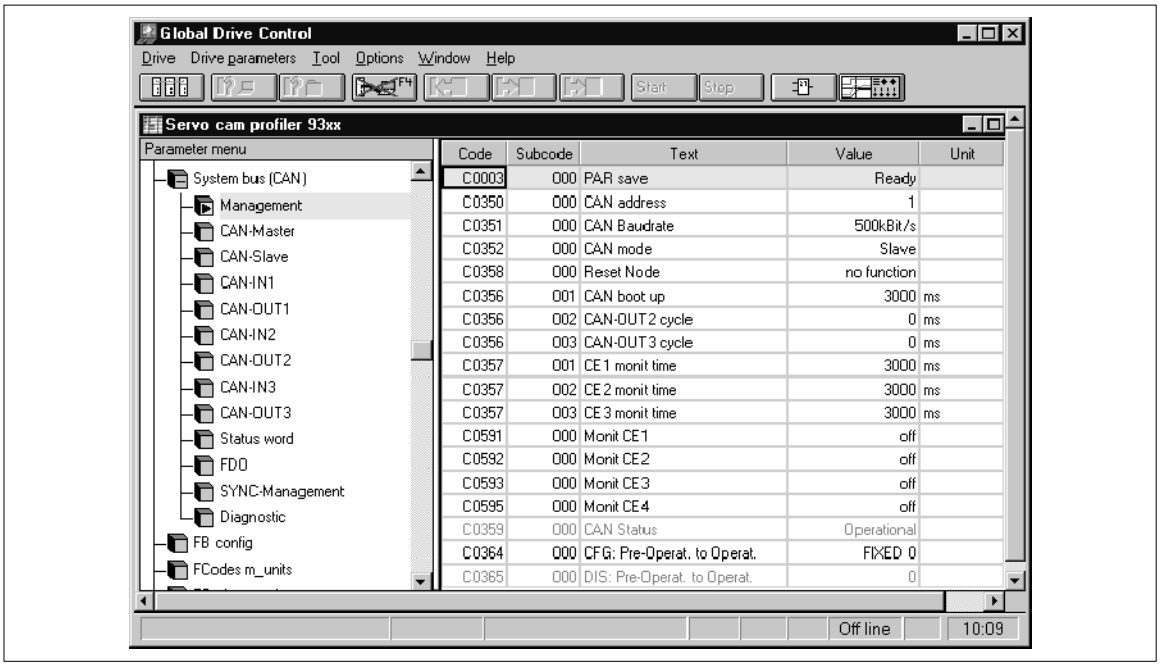


Fig. 5-11 Parameters important for the CAN configuration (this example shows the settings for the slave)

Go to the menu item “CAN Management” (see figure) and set the codes for every drives as described in the following:

- C0350/000: Node address
  – Master = 1
  – Slave = 2, 3 etc. (the address is counted in ascending order for every slave, starting at 2)
- C0351/000: Baud rate
  – The baud rate must be set identically for all controllers. (Recommendation: 500 kbit/s at max. 100 m cable length)
- C0352/000: CAN master operation
  – Master = 1
  – Slave = 0
- C0003: Mains failure protected storage of the settings

Bus connection

If all controllers are configured as described, they can be interconnected via the system bus terminals (X4) on the front.

The settings are activated by

- a “Reset node” send from the master via the bus or
- mains switching (also 24V – supply).

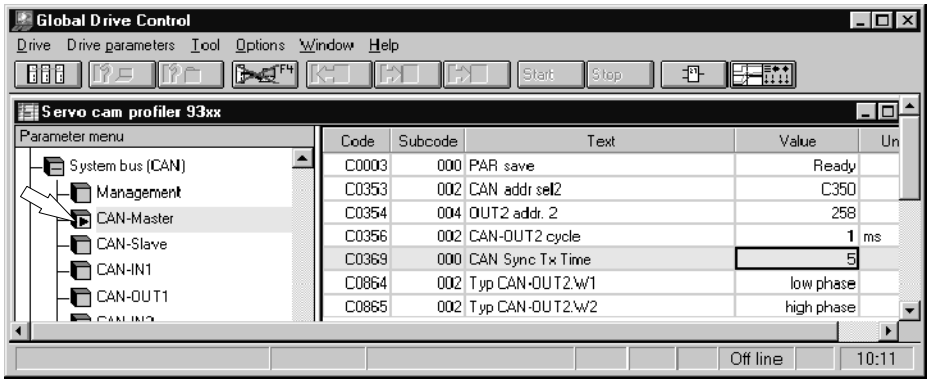
If all settings are correct, the bus will be in “Operational“ status. Use code C0359 to check the status.

The transmission of the (virtual) line shaft uses the process data objects of the master CAN-OUT2 and the slave CAN-IN2 (see Parameter setting for master and slave).

Tip!

Before you start to set the parameters for the master, select the configuration wanted from the dialog box Short Commissioning.

Settings for the master



Parameter setting

In GDC the menu point “CAN master” is used for parameter setting (see arrow).

- C0353/002
  – Unlike the slaves, the master’s address remains the same.
- C0356/002
  – Set t = 1 [ms] under “CAN-OUT2 cycle” at the master.
- C0369/000

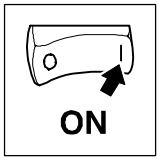
Synchronise the drives to ensure phase-synchronous drive operation in multi-axis applications. For synchronising the drives, the master sends a Sync telegram via the bus.

  – Only the master drive can send Sync telegrams via the system bus. Enter 5 ms (recommendation) as time between two Sync telegrams.

- C0864/002 and C0865/002
  – Configuration of the CAN output words W1 and W2:
  CAN-OUT2 W1: Low phase
  CAN-OUT2 W2: High phase
- C0003: Mains failure protected storage of the settings

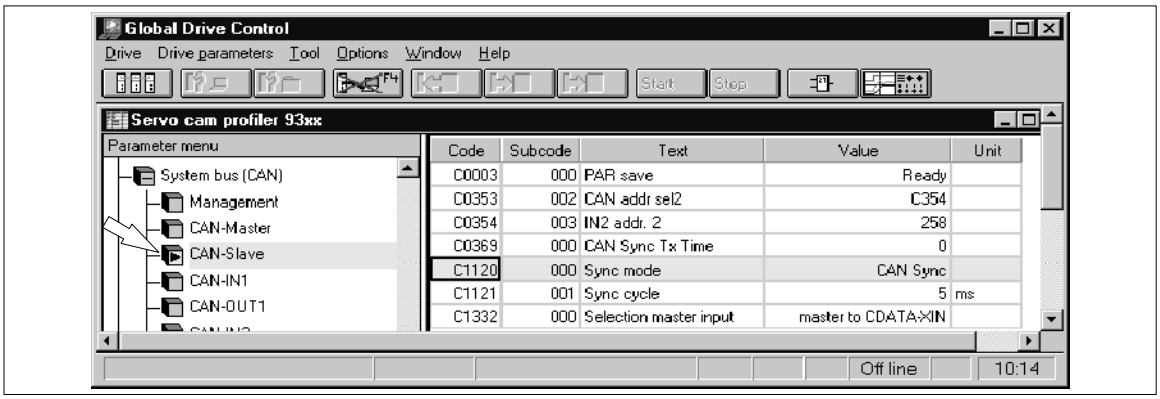
Configuration of the function block editor

- If possible, enter the CAN-OUT block as last element in the processing table.
- Link between function blocks CDATA-X-ACT and input CAN-OUT2-D1.
- C0003: Mains failure protected storage of the settings



Commissioning

Settings for the slaves



Parameter setting

In GDC the menu point “CAN slave” is used for parameter setting (see arrow).

- C0353/002
  – Set the code to 1 = “Extra address C354”. Thus, the slaves will be linked to the master’s address (see settings under C0354/003).
- C0354/003
  – The slaves’ code thus accepts the value under the master’s code C0354/004 (i.e. the value under C0354/004 (menu “CAN master”) must be copied to all slaves).
- C0369/000
  – Enter “0”! Slave drive are now disabled to send sync telegrams (see C0369/000 under menu point: CAN master).
- C1120
  – The synchronisation of the sync telegram must be activated (1 = “CAN sync is activated“) .
- C1121
  – The value under “Sync cycle” informs the slaves about the frequency the master sends sync telegrams. This entry must be identical with the entry under “CAN Sync Tx time” of the menu point CAN master. With this example it is 5 ms.
- C1332/000
  – CDATA-XIN accepts the master value (value entered = “1”).
- Storage of the settings with C0003.

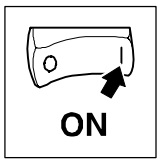
Configuration of the function block editor

- Link the FB CAN-IN2.D1 and the FB CDATA-XIN.
- If possible, the FB SYNC2 must be in position 1 or entered at the beginning of the processing table.

Tip!

Unlike the outputs, the inputs CAN-IN are already integrated into the operating program and do not need to be entered again into the processing table.

If the function block CAN-OUTx is not used for the slaves, it is necessary to check that the CAN-OUT address is not the same used for the master (code C0354-004).



- Storage of the settings with C0003.

End of commissioning

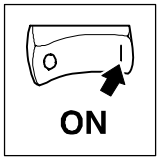
After all drives have been parameterized,

- a “Reset node” must be send from the master via the bus or
- the mains must be switched (also 24V – supply).

Tip!

The STATE-BUS function can be used to monitor the CAN bus transfer.

In the event of a bus-system failure, the function block controls the drive network as stipulated by the user (e.g. TRIP or quick stop).



Commissioning

6 During operation

6.1 Status indications

6.1.1 In Global Drive Control

1. Click on the ”Control” button in the ”Basic settings” dialog box.
2. Click on the ”Diagnostics” button in the ”Control” dialog box.

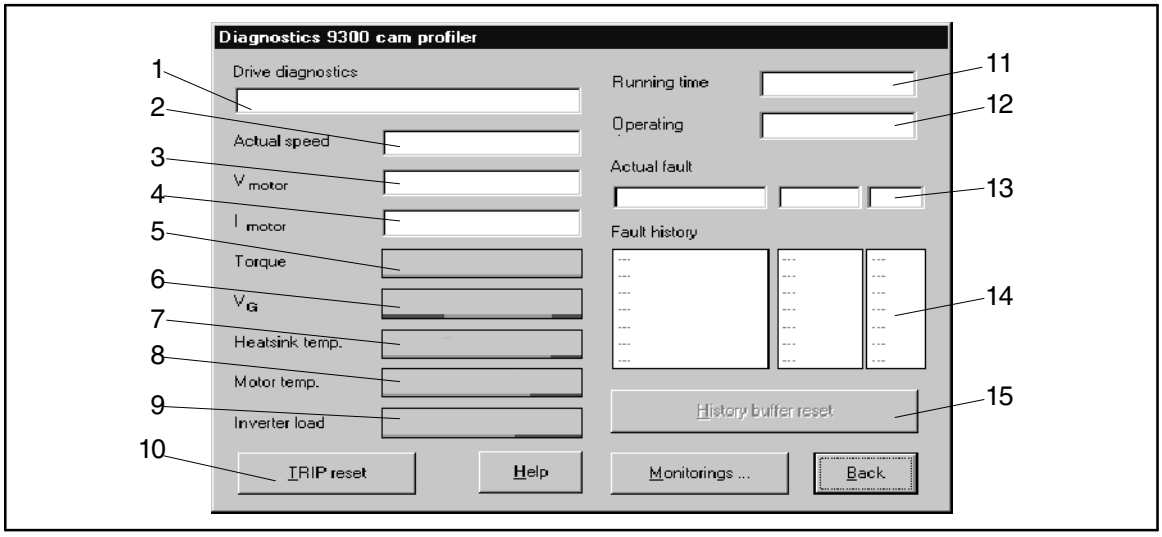
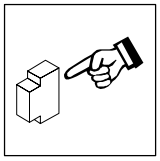


Fig. 6-1 Dialog box ”Diagnostics 9300”

1	Type of fault
2	Actual speed
3	Actual motor voltage
4	Actual motor current
5	Motor torque
6	DC-bus voltage
7	Heatsink temperature
8	Motor temperature
9	Controller load
10	Reset fault
11	Time when the supply voltage was applied
12	Time when the controller was enabled
13	Actual fault with time and frequency of the fault. 🕮 9-3
14	Fault history with time and frequency of the fault. 🕮 9-3
15	Reset history buffer. 🕮 9-4



6.2 Information on operation

When operating the controller, please observe the following notes:

Stop!

- Cyclic connection and disconnection of the controller supply voltage at L1, L2, L3 or $+U_G$, $-U_G$ may overload the internal input current load:
  – Allow at least 3 minutes between disconnection and reconnection.

- During mains switching (L1,L2,L3) it is not important whether further controllers are supplied via the DC bus.

6.2.1 Switching on the motor side

- Switching on the motor side of the inverter is permissible for emergency switch-off.
- Please note:
  – Switching while a controller is enabled may cause the fault indication ”0Cx” (short-circuit/earth fault in operating case x).
  – For long motor cables and operation of controllers with smaller output power, leakage currents through interfering cable capacitances may cause the fault indication ”OCx”.
  – Switching equipment on the motor side must be dimensioned for DC voltages ($U_{DC\ max}$ = 800 V).

6.2.2 Controller protection by current derating

Valid for the types 9326 to 9332.

For field frequencies < 5 Hz the controller automatically derates the maximum permissible output current.

- For operation with chopping frequency = 8 kHz (C0018=1, optimum power):
  – The current is derated, depending on the heat sink temperature (see Fig. 6-2).
- For operation with chopping frequency = 16 kHz (C0018=2, noise optimised):
  – The current is always derated to $I_{r16} = I_{016}$.
- For operation with automatic change-over of the chopping frequency (C0018=0):
  – Below the threshold, the controller operates with 16 kHz (optimum noise). The function of the current derating follows the characteristic "Imax 16 kHz" (see Fig. 6-2).
  – If a higher torque is required from the machine for example for acceleration, the controller automatically switches to 8 kHz (optimum power). The function of the current derating follows the characteristic "Imax 8 kHz" (see Fig. 6-2).

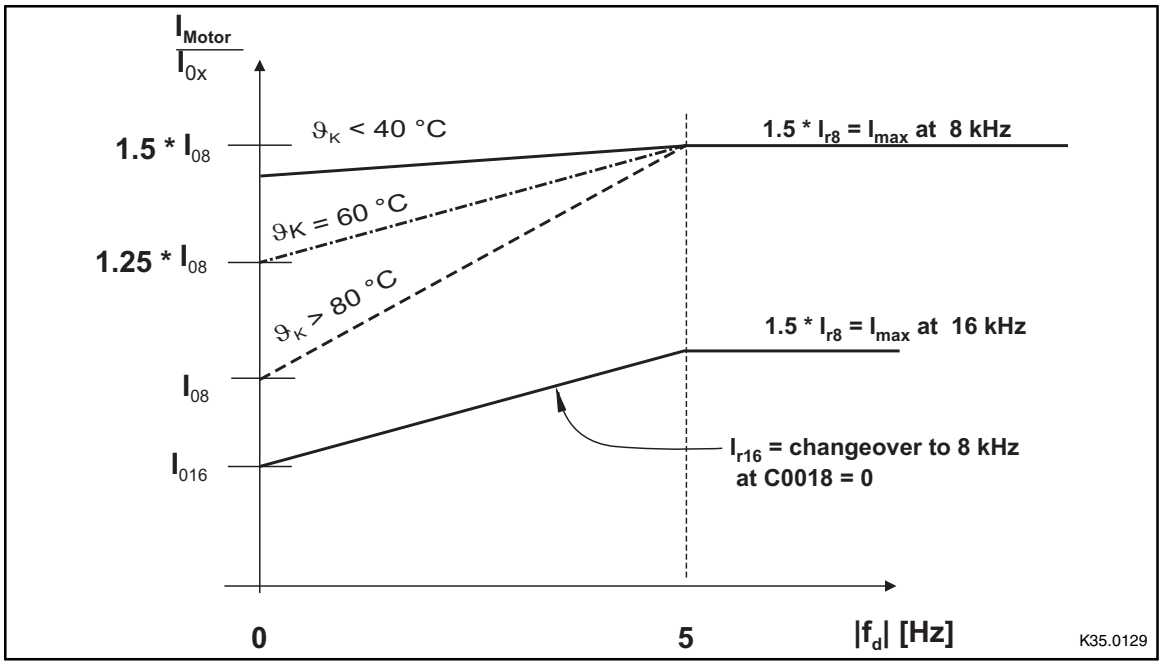
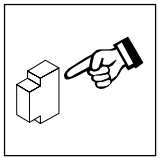


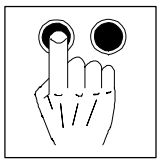
Fig. 6-2 Current derating function of the controllers 9326 to 9332.

ϑ_K	Heat sink temperature
I_{rx}	Rated current at U, V, W depending on the chopping frequency
f_d	Field frequency at the output U, V, W
I_{0x}	max. standstill current for field frequency = 0 Hz

See chapter "Rated data". (3-3)



During operation



7 Parameter setting

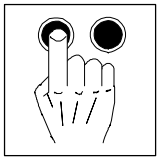
- The parameter setting of the controller is used to adapt the drive to your applications.
- The complete parameter set is organised in codes which are consecutively numbered and begin with ”C”.
  (see code table, chapter 11.2).
- You can save the parameter set of an application.
  – One parameter set is available.
  – The parameter sets are factory-set when delivered.

7.1 Ways of parameter setting

There are two ways of changing parameters:

- With the keypad for slight changes of the parameter set.
- Using a superimposed host (PC or PLC) via fieldbus modules and operating programs (see accessories chapter 11.1).

Cam profile data cannot be changed via the keypad!



Parameter setting

7.1.1 Structure of a parameter set

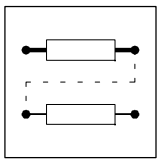
For easy operation, menu levels for the 9371BB keypad and the PC program GLOBAL-DRIVE-CONTROL lead you quickly to the codes required:

- Main menu
  - – contains submenus
  - – contains the complete code list
- Submenus
  - – contain the codes which are assigned to them

Codes consist of:

- Code level
  - – Codes without subcodes contain one parameter
  - – Codes with subcodes contain several parameters
- Parameter level/operating level
  There are 4 different parameter types:
  - – Absolute values of a physical variable
    (e. g. 400 V, 10 s)
  - – Relative values of unit variables
    (e. g. 50 % setpoint)
  - – Numbers for certain states
    (e. g. 0 = controller inhibited, 1 = controller enabled)
  - – Display values
    These values can only be displayed but not changed.
    (E. g. act. value of the motor current under C0054)

You can modify absolute and relative values in discrete steps.



8 Configuration

Every application needs a certain application-specific configuration (program).

For this, function blocks can be linked individually for the application. The function blocks are linked by means of codes.

8.1 Predefined configurations

Basic configurations are already defined for standard applications of the controller. These basic configurations can be selected via code C0005. The signal flow charts for the most important basic configurations are listed in the appendix.

8.1.1 Working with predefined configurations

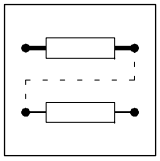
To adapt predefined configurations to your application, proceed as follows:

1. Select basic configuration under C0005.
2. Select the operating mode under C0005. (📖 11-2)
3. Configure different signal flow chart, if necessary:
   – Integrate or remove function blocks.
   – Set parameters for function blocks.
   – Change configuration of terminals

Note!

If the signal flow for the basic configuration is changed, e.g. by adding function blocks, C0005 is set to ”0”. The message ”COMMON” is displayed.

If only the assignment of the control inputs and outputs is changed, C0005 remains the same. Under code C0464 an identification is also displayed.



8.2 Operating modes

Determine the operating mode, the interface you want to use for parameter setting or control of the controller, by choosing an operating module.

8.2.1 Parameter setting

Parameters can be set with one of the following modules:

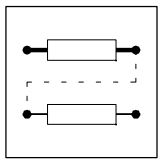
- Communication module
  – 2102 (LECOM A/B/LI)
  – 2111 (INTERBUS)
  – 2131 (PROFIBUS)
  – 2133 (PROFIBUS)
- PC system bus module
  – 2173

8.2.2 Control

Control via terminals (X5 and X6), via the fieldbus module at X1 or via the system bus (X4). Mixed modes are also possible.

Note!

C0005 contains predefined configurations which allow a very easy change of the operating mode.



8.2.3 Configuration with Global Drive Control

With the PC program Global Drive Control (GDC) LENZE offers

- an easy to understand,
- well structured,
- convenient

tool for the configuration of your specific drive task.

Function block library

- GDC provides an easy-to-read library of available function blocks (FB).
- GDC also displays the complete assignment of a FB.

Signal configuration

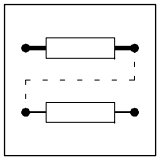
The signal configuration is done with only one dialog box. It is a convenient way

- to display every FB as a block diagram.
- to see the assignment of all signal inputs at a glance.
- to enter the FB in the processing table.
- to print your signal configuration.

Terminal assignment

Freely assignable terminals can be configured using two dialog boxes:

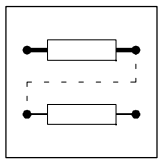
- Dialog box - to link digital inputs and outputs.
- Dialog box - to link analog inputs and outputs.



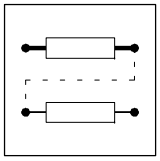
8.3 Description of function blocks

Function blocks

Function block	Description	CPU time [µs]	Used in basic configuration C0005			
			1000	10000	11000	12000
ABS1	Absolute value generator	4		•	•	•
ADD1	Addition block 1	8				
AIF-OUT	Field bus	56	•	•	•	•
AIN1	Analog input X6/1, X6/2	10				
AIN2	Analog input X6/3, X6/4	28				
AND1	Logic AND, block1	6				
AND2	Logic AND, block2					
AND3	Logic AND, block3					
AND4	Logic AND, block4					
AND5	Logic AND, block5					
AND6	Logic AND, block6					
AND7	Logic AND, block7					
ANEG1	Analog inverter 1	3	•	•	•	•
ANEG2	Analog inverter 2					
AOUT1	Analog output X6/62	12	•	•	•	•
AOUT2	Analog output X6/63		•	•	•	•
ARIT1	Arithmetic block 1	11				
ARIT2	Arithmetic block 2					
ARITPH1	32-bit arithmetic block	15				
ARITPH2	32-bit arithmetic block					
ARITPH3	32-bit arithmetic block					
ARITPH4	32-bit arithmetic block					
ARITPH5	32-bit arithmetic block					
ARITPH6	32-bit arithmetic block					
ASW1	Analog changeover 1	4	•			
ASW2	Analog changeover 2					
ASW3	Analog changeover 3					
ASW4	Analog changeover 4					
BRK	Trigger holding brake	15				
CAN-OUT	System bus	56	•	•	•	•
CCTRL	Setpoint conditioning	30		•	•	•
CDATA	Cam data conditioning	140		•	•	•
CERR	Contouring error monitoring	15		•	•	•
CLUTCH1	Virtual clutch	47				
CLUTCH2	Virtual clutch	30				
CMP1	Comparator 1	15	•			
CMP2	Comparator 2					
CMP3	Comparator 3					
CONV1	Conversion	8				
CONV2	Conversion					
CONV3	Conversion					
CONV4	Conversion					
CONV5	Conversion					
CONV6	Conversion					
CONVAD1	Conversion	4				
CONVAD2	Conversion	4				
CONVAPH1	Conversion	10				
CONVPHA1	32-bit conversion	6				
CONVPHD1	Conversion - stretching factor	50				

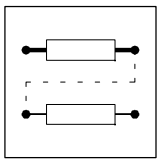


Function block	Description	CPU time [µs]	Used in basic configuration C0005			
			1000	10000	11000	12000
CONVPHPH1	32-bit conversion	80				
CONVPHPHD1	Conversion - phase change into speed	27				
CONVPHPHD2	Conversion - phase change into speed	7				
CONVPP1	32 bit / 16 bit conversion	55				
CSEL1	Cam profile selection	10		•	•	•
CURVE1	Curve function	15				
CURVEC1	Curve function	75				
DB1	Dead band	7				
DCTRL	Device control	-	•			
DFIN	Digital frequency input	5	•	•	•	•
DFOUT	Digital frequency output	35	•		•	•
DFRFG1	Digital frequency ramp generator	40				
DFSET	Digital frequency processing	85				
DIGDEL1	Binary delay element 1	9				
DIGDEL2	Binary delay element 2					
DIGIN	Input terminals X5/E1...X5/E5	-	•	•	•	•
DIGOUT	Output terminals X5/A1...X5/A4	-	•	•	•	•
DT1-1	Differential element	12				
EXPOL1	Extrapolation	5				
EXPOL2	Extrapolation	10				
FCNT1	Piece counter	11				
FCODE 108/1	Free control codes	-	•	•	•	•
FCODE 108/2			•	•	•	•
FCODE 109/1			•	•	•	•
FCODE 109/2			•	•	•	•
FCODE 141						
FCODE 17			•			
FCODE 175						
FCODE 250						
FCODE 26/1			•	•	•	•
FCODE 26/2			•	•	•	•
FCODE 27/1			•	•	•	•
FCODE 27/2			•	•	•	•
FCODE 32						
FCODE 37						
FCODE 471						
FCODE 472/1				•	•	•
FCODE 472/2				•	•	•
FCODE 472/3			•	•	•	•
FCODE 472/4				•	•	•
FCODE 472/5						
FCODE 472/6						
FCODE 472/7						
FCODE 472/8						
FCODE 472/9						
FCODE 472/10				•	•	•
FCODE 472/11						
FCODE 472/12						
FCODE 472/13						
FCODE 472/14						
FCODE 472/15						
FCODE 472/16						

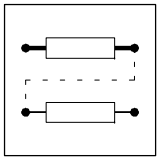


Configuration

Function block	Description	CPU time [µs]	Used in basic configuration C0005			
			1000	10000	11000	12000
FCODE 472/17						
“FCODE 472/18						
FCODE 472/19						
FCODE 472/20						
FCODE 473/1						
FCODE 473/2						
FCODE 473/3						
FCODE 473/4						
FCODE 473/5						
FCODE 473/6						
FCODE 473/7						
FCODE 473/8						
FCODE 473/9						
FCODE 473/10						
FCODE 474/1					•	
FCODE 474/2						
FCODE 474/3						
FCODE 474/4						
FCODE 474/5						
FCODE 474/6						
FCODE 474/7						
FCODE 474/8						
FCODE 474/9						
FCODE 474/10						
FCODE 475/1						
FCODE 475/2						
FCODE 1476/1				•	•	•
FCODE 1476/2						
FCODE 1476/3						
FCODE 1476/4						
FCODE 1476/5						
FCODE 1476/6						
FCODE 1476/7						
FCODE 1476/8						
FCODE 1476/9						
FCODE 1476/10						
FCODE 1476/11						
FCODE 1476/12						
FCODE 1476/13						
FCODE 1476/14						
FCODE 1476/15						
FCODE 1476/16				•	•	•
FCODE 1477/1				•		•
FCODE 1477/2				•	•	•
FCODE 1477/3						
FCODE 1477/4						
FCODE 1477/5						
FCODE 1477/6						
FCODE 1477/7						
FCODE 1477/8						
FCODE 1477/9						
FCODE 1477/10						

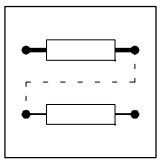


Function block	Description	CPU time [µs]	Used in basic configuration C0005			
			1000	10000	11000	12000
FCODE 1477/11						
FCODE 1477/12						
FCODE 1477/13						
FCODE 1477/14						
FCODE 1477/15						
FCODE 1477/16						
FDO		-				
FEVAN1	Free analog input variable	4				
FEVAN2	Free analog input variable					
FIXSET1	Fixed setpoints	9				
FLIP1	D-flipflop 1	6				
FLIP2	D-flipflop 2					
FLIP3	D-Flipflop 3					
FLIP4	D-Flipflop 4					
GEARCOMP	Gear torsion	1				
LIM1	Limiter	5				
LIMPHD1	Speed limitation	12				
MCTRL	Servo control	-	•	•	•	•
MFAIL	Mains failure control	40				
MLP1	Motor phase failure	30				
MONIT	Monitoring	-	•	•	•	•
MPOT1	motor potentiometer	20				
MSEL1	Master selection	12				
MSEL2	Master selection	15				
NOT1	Logic NOT, block1	4				•
NOT2	Logic NOT, block2					
NOT3	Logic NOT, block3					
NOT4	Logic NOT, block4					
NOT5	Logic NOT, block5					
NSET	Speed setpoint conditioning	70	•			
OR1	Logic OR, block1	6				•
OR2	Logic OR, block2					
OR3	Logic OR, block3					
OR4	Logic OR, block4					
OR5	Logic OR, block5					
OSZ	Oscilloscope function	70				
PCTRL1	Process controller	58				
PHADD1	32 bit addition block	10				
PHCMP1	Comparator	8				
PHCMP2	Comparator					
PHCMP3	Comparator					
PHDIFF1	32 bit setpoint/act. value comparison	10				
PHDIV1	Conversion	8				
PHINT1	Phase integrator	7				
PHINT2	Phase integrator					
PHINT3	Phase integrator	10				
PHINT4	Phase integrator	11				
PSAVE1	Position memory	10				•
PT1-1	1st order delay element	8				
R/L/Q	QSP / setpoint inversion		•			
REFC	Homing function	100				
RFG1	Ramp generator	16				
RFGPH1	Ramp function generator for phase signals	40				



Configuration

Function block	Description	CPU time [µs]	Used in basic configuration C0005			
			1000	10000	11000	12000
RFGPH2	Profile generator (ramp function generator for phase signals)	32				
RFGPH3						
S&H1	Sample and Hold	4				
SELPH1	Long-value selection	6				
SELPH2	Long-value selection					
SPC1	Switch points	80				
SPC2	Switch points	130				
SRFG1	S-shaped ramp generator	15				
STAT	Output of digital status signals	-				
STATE-BUS	Control of a drive network	-				
STORE1	Memory 1	35				
STORE2	Memory 2	20				
SYNC1	Multi-axis positioning	55				
SYNC2	Multi-axis positioning	20				
SWPH1	Phase changeover	4				
SWPH2	Phase changeover					
SWPHD1	Switch - digital frequency	4				
SWPHD2	Switch - digital frequency					
TRANS1	Binary flank evaluation	7				
TRANS2	Binary flank evaluation					
TRANS3	Binary flank evaluation					
TRANS4	Binary flank evaluation					
VMAS1	Virtual master	20				
VTPOSC	Positioning control (cam profiler)	45				
WELD1	Welding bar control	20			•	
YSET1	Stretching, compression, offset in Y direction	30		•		•



8.4 Basic configuration

8.4.1 Predefined basic configurations

Several predefined signal configuration can be loaded by using C005. The numbers are used according to the following:

C0005 = 1 X X X X

X – Control
- 0 Terminal control
- 1 Control via LECOM A/B/LI
- 3 Control via AIF (INTERBUS,PROFIBUS)
- 5 Control via system bus (CAN)

X – Terminal supply
- 0 - External supply of control terminals
- 1 - Internal supply of control terminals

X – Additional functions (see chapter 8.4.5 ff.)
- 0 - None
- 1 - Homing function
- 2 - Clutch function
- 3 - Switch points
- 8 - Mark-controlled correction of the master value
- 9 - Mark-controlled correction of the act. value

X – Operating mode
- 0 - Instead of a mechanical cam* (see chapter 5.8)
- 1 - Welding bar drive* (see chapter 8.4.3)
- 2 - Operation with position storage* (see chapter 8.4.4)

* - Incremental master value

X – Identification
- 1 - Cam profile

Cam profile data

Before commissioning, the cam data must be generated with Global Drive Control and then transmitted to the drive. The following cam profiles are in factory setting. They are effective independently of the basic parameter setting.

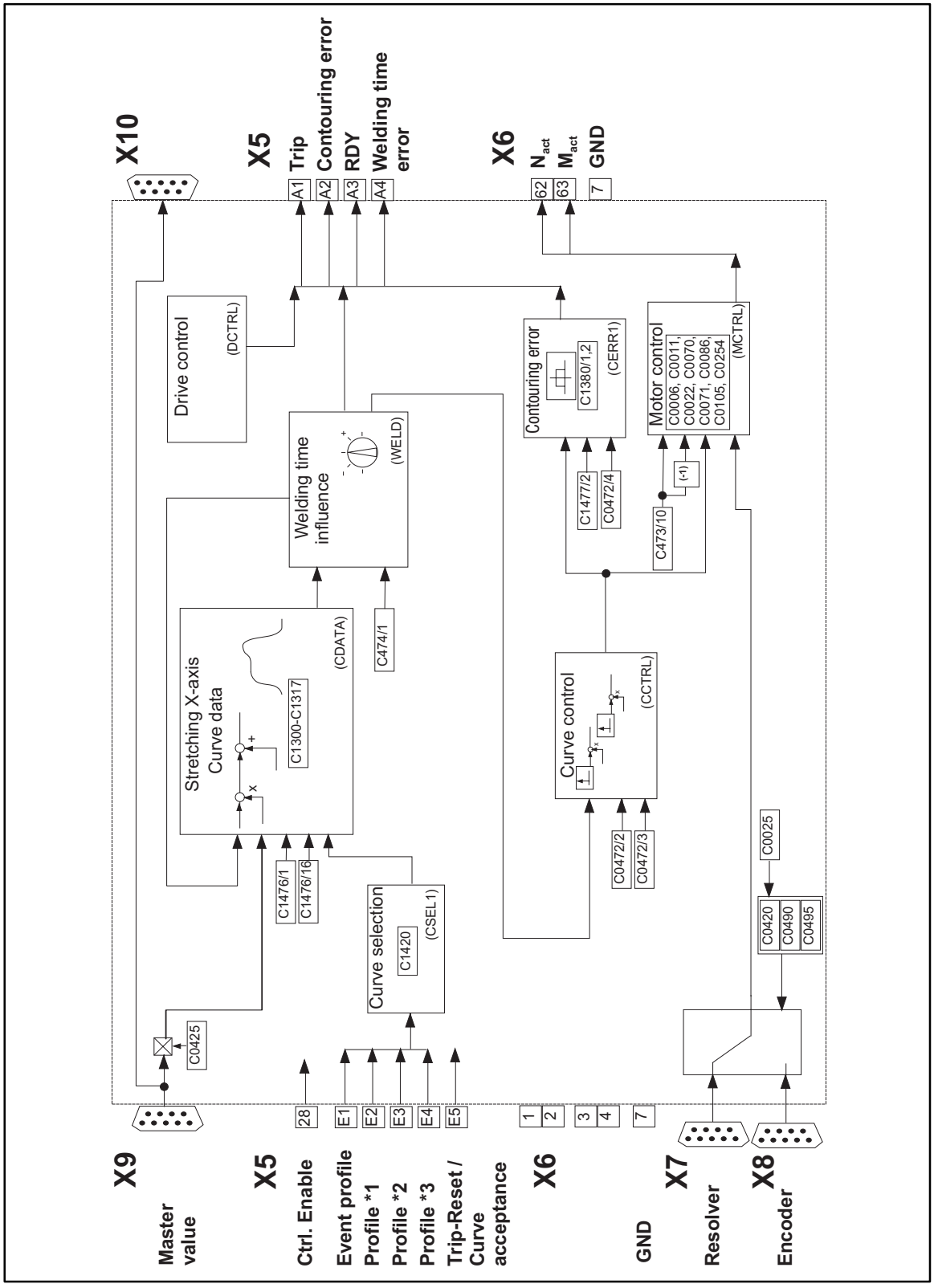
Profile 1	Electronic gear (linear position profile)
Profile 2	Forward / backward movement with a standstill in the intersection of the motion
Profile 3	Forward / backward movement with a standstill at the end of motion
Profile 4	Smooth feed
Profiles 5 - 8	No motion

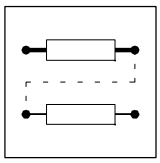
Warning!
With factory setting, the motor must be off load, i.e. it must have a mechanical connection with the machine.

8.4.2 Configuration C0005 = 10000 cam profiler

(see chapter 5.8, (📖 5-19))

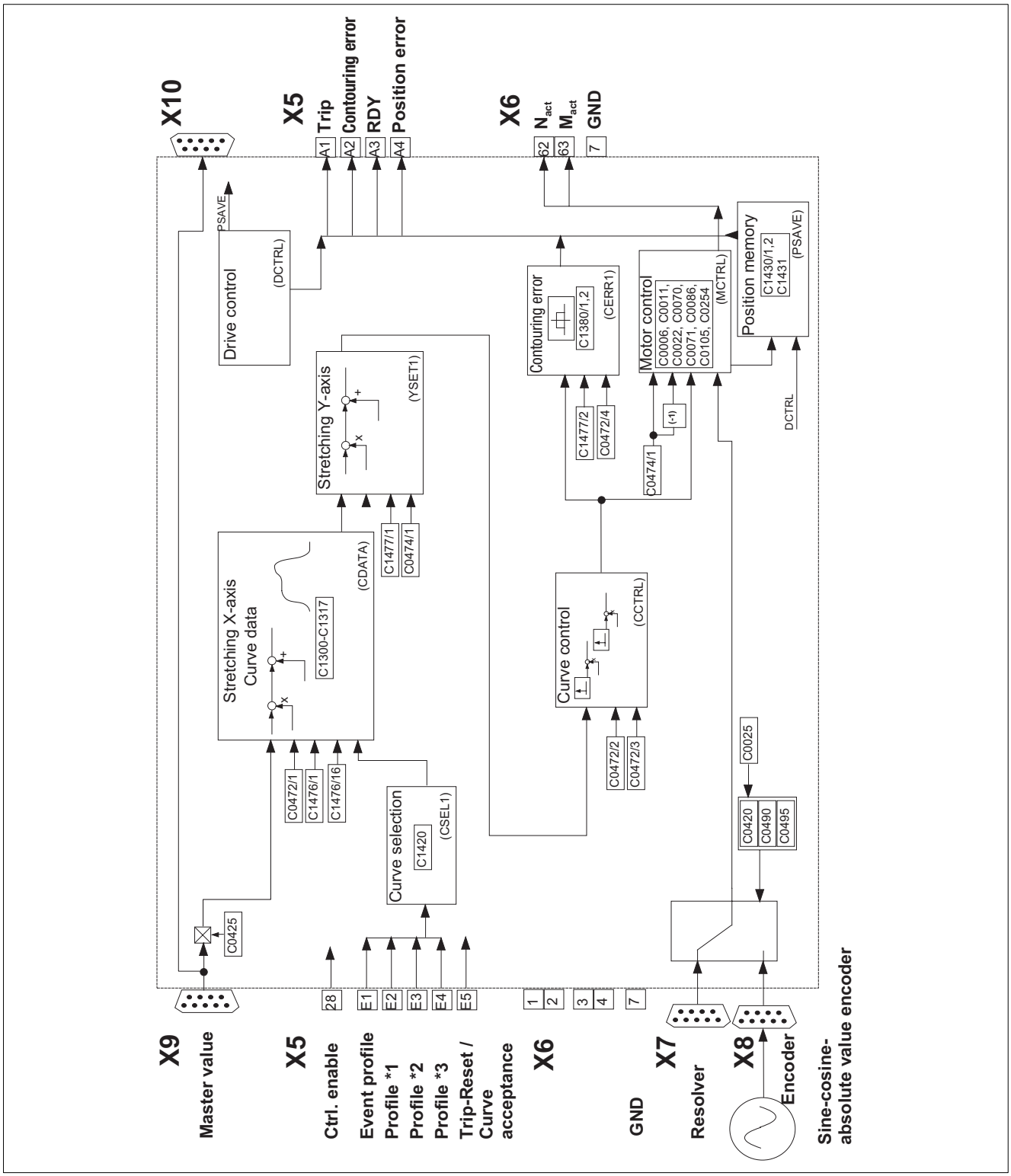
8.4.3 Configuration C0005 = 11000 welding bar drive



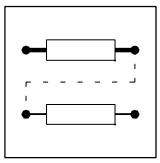


Code	Description
C0005=11000	This configuration enables operation of a welding bar with changeable welding times. The minimum values for closing, welding and opening of the welding bar, which are determined by the user, are monitored. As soon as the values fall below a minimum threshold, a fault message will be sent.
• Master value	
C0425	Encoder constant of the master value cam profile data
C1300-C1317	The cam profile data are determined when generating cam profile data. Usually, the don't have to be changed separately.
C1420	Determines the profile to be used when a event input is activated (digital input E1 = LOW).
• Contouring error evaluation	
C1380/1 and C1380/2	Determine comparison window and hysteresis of the following error evaluation.
• Adjustment values	
C0472/2	Influence of speed precontrol
C0472/3	Influence of torque precontrol
C1477/2	Contouring error limit (in s_units)
C0472/4	Reduction factor for contouring error warning; warning limit = C0472/4 x C1477/2
Profile influence	
C1476/1	Phase trimming in X-direction
C1476/16	TOUCH-PROBE position in X-direction
C0472/9	Stretching/compression of Y-axis
C0472/10	Torque limit value
C0474/1	Adjustment of the welding time (incr. ≡1 ms)

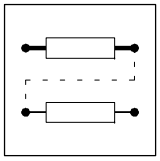
8.4.4 Configuration C0005 = 12000 operation with position memory



Incremental encoders cannot be used as *feedback system* with this configuration.



Code	Description
C0005=12000	With this configuration and an absolute feedback system (resolver or sin/cos encoder), the position values of the motor shaft can be stored when switching off the mains. When the mains is switched on again, the actual values will compared to the stored values.
• Master value	
C0425	Encoder constant of the master value
• Cam profile data	
C1300-C1317	The cam profile data are determined when generating cam profile data. Usually, the don't have to be changed separately.
C1420	Determines the profile to be used when a event input is activated (digital input E1 = LOW).
• Contouring error evaluation	
C1380/1 and C1380/2	Determine comparison window and hysteresis of the following error evaluation.
• Adjustment values	
C0472/2	Influence of speed precontrol
C0472/3	Influence of torque precontrol
C1477/2	Contouring error limit (in s_units)
C0472/4	Reduction factor for contouring error warning; warning limit = C0472/4 x C1477/2
• Profile influence	
C1472/1	Stretching / compression X axis (100% = no stretching / compression)
C1476/1	Phase trimming in X-direction
C1477/1	Phase trimming in Y-direction
• Position memory	
C1430/1,2	Tolerance window of the comparison functions
C1431	Determination of values to be stored (master and/or actual value)
C1476/16	TOUCH-PROBE position in X-direction
C472/9	Stretching/compression of Y-axis
C472/10	Torque limit value



8.4.5 Basic configuration C0005 = 1xXxx

8.4.5.1 Configurations 1X0XX: No additional function

The signal flow corresponds to the basic functions described in chapters X.1 - X.3.

8.4.5.2 Configurations 1X1XX: Homing function

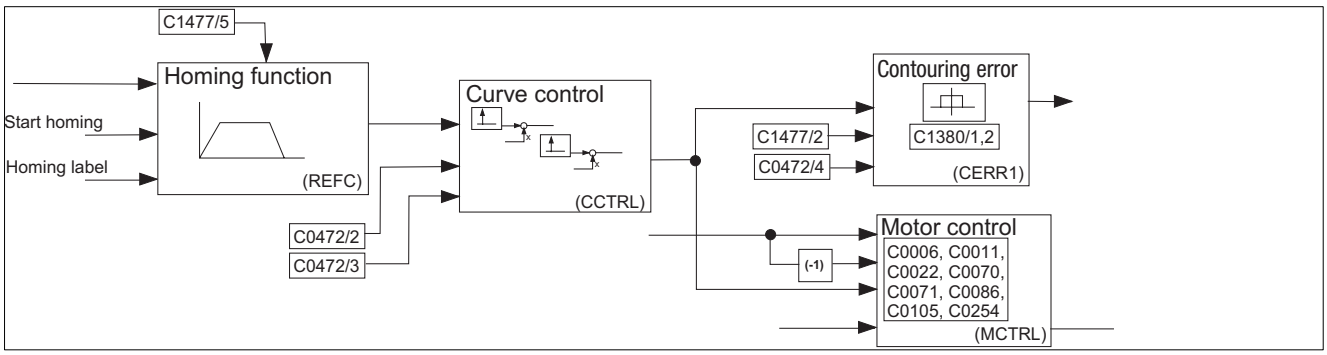
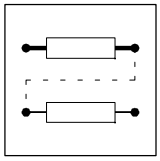


Fig. 8-1 Section of the signal flow chart showing the homing function

Digital term. X5			Analog term. X6	
input	Function		input	Function
Terminal 28	Ctrl. enable		Terminals 1, 2	
E1	Event profile		Terminals 3, 4	
E2	Profile *1			
E3	Start homing			
E4	Homing label			
E5	Trip reset / profile acceptance			
Output	Function		Output	Function
A1	Trip		Terminal 62	Actual speed
A2	Contouring error		Terminal 63	Act. torque value
A3	RDY			
A4	Reference O.K.			
Additionally relevant codes: C1477/5	Home position			
Parameter of FB REFC: C0011	Max. speed n_{max}			



8.4.5.3 Configurations 1x2xx: Clutch function

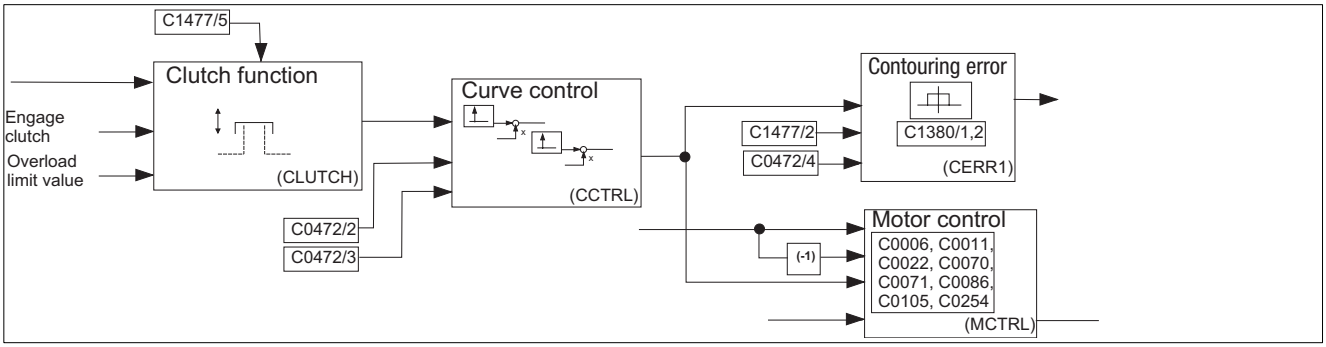
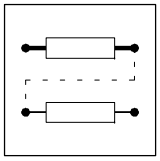


Fig. 8-2 Section of the signal flow chart showing the clutch function

Digital term. X5			Analog term. X6	
input	Function		input	Function
Terminal 28	Ctrl. enable		Terminals 1, 2	
E1	Event profile		Terminals 3, 4	
E2	Profile *1			
E3	Profile *2			
E4	Engage clutch			
E5	Trip reset / profile acceptance			
Output	Function		Output	Function
A1	Trip		Terminal 62	Actual speed
A2	Contouring error		Terminal 63	Act. torque value
A3	RDY			
A4	Clutch disengaged			

Additionally relevant codes:	
C1477/5	Home position

Parameter of FB Clutch:	
C1410	Clutch mode
C1411	Max. velocity
C1412/1	Open time ramp
C1412/2	Ramp profile generator
C1412/3	Time delay overload
C1413	Catch hysteresis



8.4.5.4 Configurations 1x3xx: Switching points (cam)

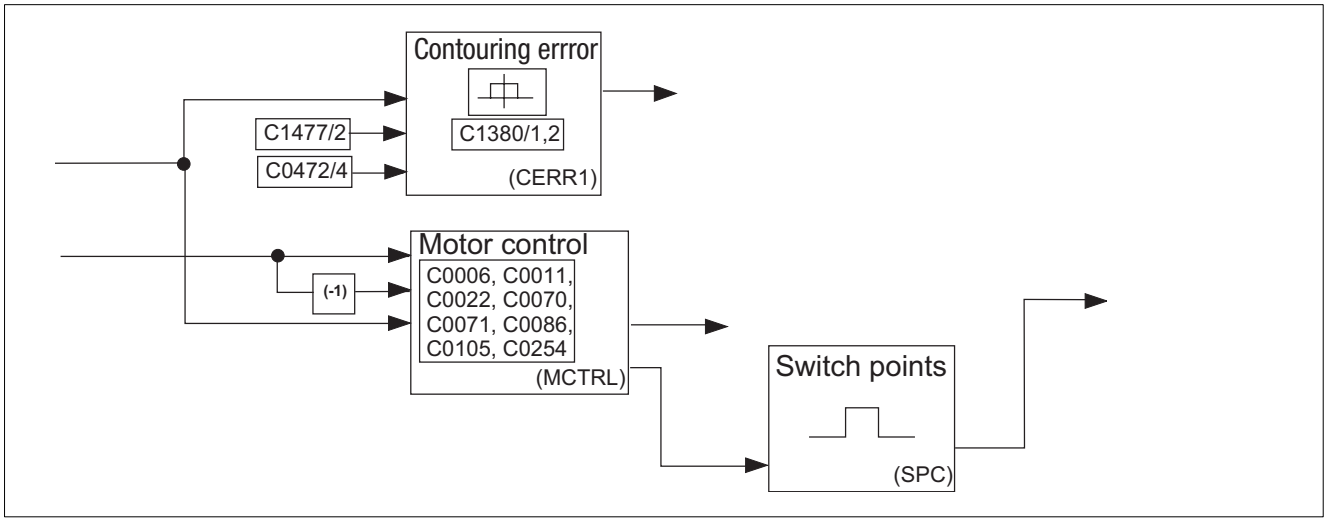


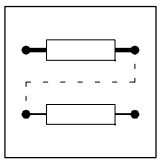
Fig. 8-3 Section of the signal flow chart showing switching points

Digital term. X5			Analog term. X6	
input	Function		input	Function
Terminal 28	Ctrl. enable		Terminals 1, 2	
E1	Event profile		Terminals 3, 4	
E2	Profile *1			
E3	Profile *2			
E4	Profile *4			
E5	Trip reset / profile acceptance			

Output	Function		Output	Function
A1	Trip		Terminal 62	Actual speed
A2	Contouring error		Terminal 63	Act. torque value
A3	RDY			
A4	Point 1			

Additionally relevant codes: C1476/x or C1477/x can be used as switch point value.	

Parameter of FB SPC1 / SPC2:	
C1645	SPC1 mode
C1655	SPC2 mode
C1657/1 ... 4	SPC2 dead time
C1658	SPC2 hysteresis
C1659	Filters

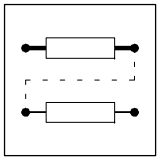


8.4.5.5 Configurations 1x8xx: Mark-controlled correction of the master value

Changed terminal assignment	
E1	Event
E2	Profile *1
E3	Profile *2
E4	Trip reset / profile acceptance
E5	TOUCH-PROBE signal input
C1476/16	TOUCH-PROBE position X

8.4.5.6 Configurations 1x9xx: Mark-controlled correction of the actual value

Changed terminal assignment	
E1	Event
E2	Profile *1
E3	Profile *2
E4	TOUCH-PROBE signal input: X
E5	TOUCH-PROBE / profile acceptance: Y
C1477/16	TOUCH-PROBE position : Y



8.5 Monitoring

Various monitoring functions protect the drive from impermissible operating conditions. (📖 8-20).

If a monitoring function is activated,

- a reaction to protect the drive will be activated (configuration (📖 8-19)).
- a digital output is set, if it is assigned to the corresponding reaction.
- the fault indication is entered at the first position in the history buffer. (📖 9-3)

8.5.1 Reactions

According to the interferences one or several of the following reactions are possible via the monitoring function:

- TRIP (highest priority)
- Message
- FAIL-QSP
- Warning
- Off

<table>
<tr><th>Reaction</th><th colspan="2">Effects on drive or controller</th><th>Danger notes</th></tr>
<tr><td>TRIP</td><td colspan="2">• Switches the power outputs U, V, W to a high resistance until TRIP is reset
• The drive is idling (no control!).
• After TRIP reset the drive accelerates to its setpoint along the set ramps. (📖 9-9)</td><td></td></tr>
<tr><td rowspan="3">Message</td><td colspan="2">• Switches the power outputs U, V, W to a high resistance as long as the message is active.</td><td rowspan="3">  The drive restarts automatically if the message is removed.</td></tr>
<tr><td>• Short-term message ≤ 0.5 s</td><td>The drive is idling (no control!) as long as the message is active
If the message is removed, the drive accelerates to its setpoint with maximum torque.</td></tr>
<tr><td>• Long-term message > 0.5 s</td><td>The drive is idling (because of internal controller inhibit!) as long as the message is active.
If necessary, restart positioning program.</td></tr>
<tr><td>FAIL-QSP</td><td colspan="2">Brakes the drive to standstill via the QSP ramp via code C0105.
• The time for the QSP ramp is set in the ”Basic settings” dialog box.
• Default setting of FAIL-QSP: (📖 9-5)</td><td></td></tr>
<tr><td>Warning</td><td colspan="2">• Only display of the operating fault
• The drive operates under control.</td><td rowspan="2">  Since these reactions have no effect on the drive behaviour, the drive may be destroyed.</td></tr>
<tr><td>Off</td><td colspan="2">• No reaction to operating faults!Monitoring is deactivated.</td></tr>
</table>

8.5.2 Set reactions

1. Click on the "Parameter menu" button in the "Basic settings" dialog box.
2. Open the "Dialog Diagnostics" menu by a double-click.

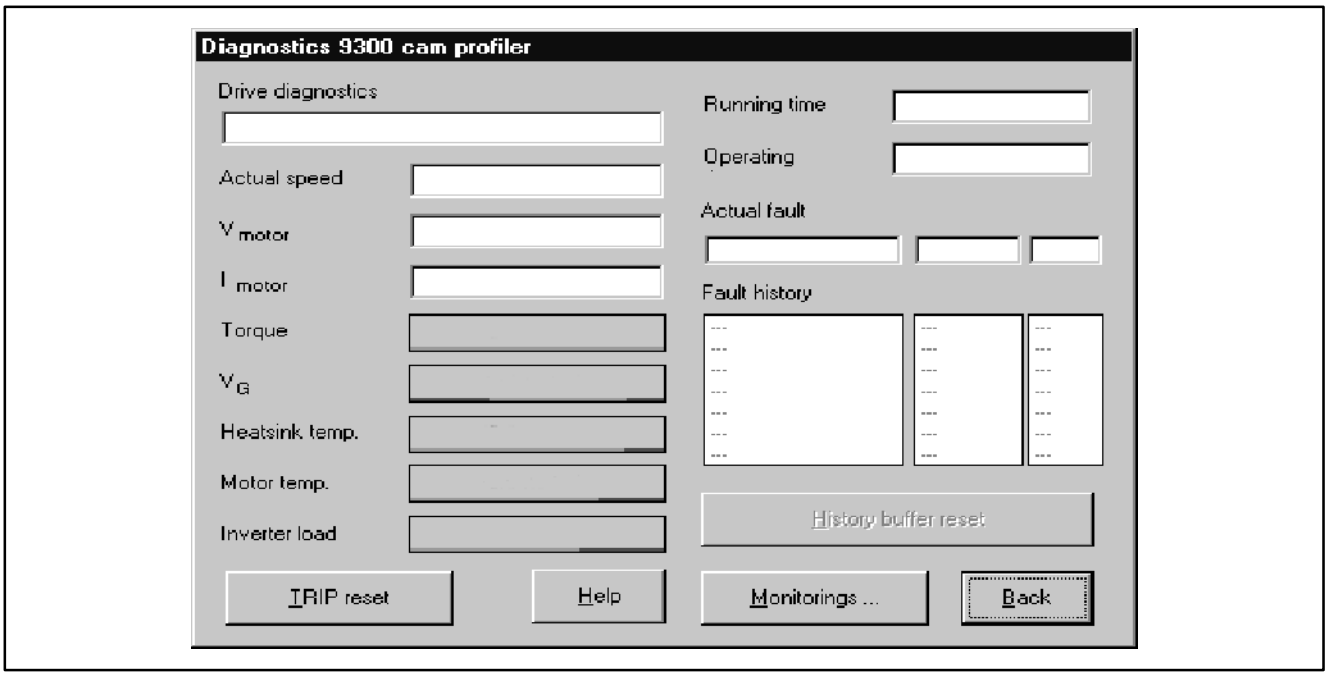


Fig. 8-4 Dialog box "Diagnostic 9300"

3. Click the button "Monitorings...".

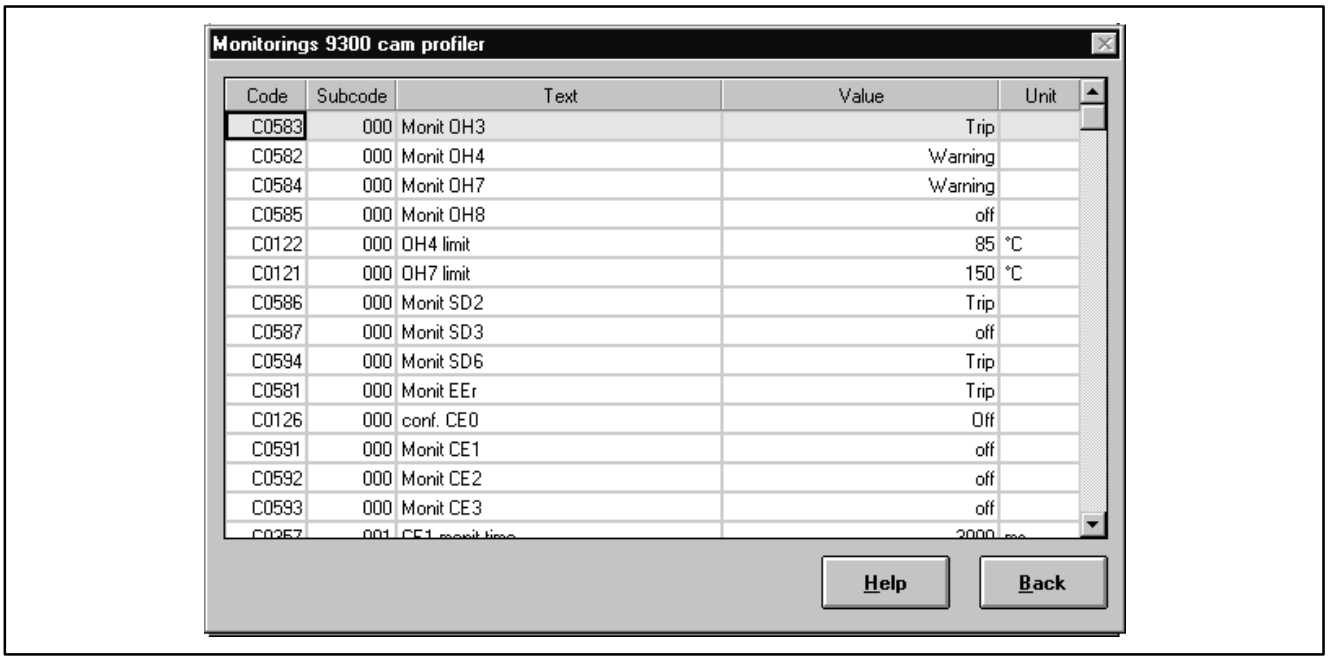
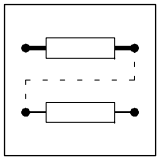


Fig. 8-5 "Monitoring configuration 93xx" dialog box

4. Click on the required monitoring function.
5. Select the possible or permitted reaction and confirm it with "OK".

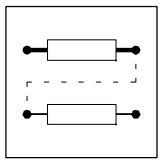
An overview of the monitoring functions and the settings can be obtained from the following chapter.



8.5.3 Monitoring functions

Overview of the fault sources detected by the controller, and the corresponding reactions

Display	Meaning	TRIP	Meldung	Warning	FAIL-QSP	off	Code
CCr	System error	•	-	-	-	-	-
CE0	Communication error (AIF)	✓	-	✓	-	•	C0126
CE1	Communication error at the process data input object CAN-IN1 (time monitoring can be set under C0357/1)	✓	-	✓	-	•	C0591
CE2	Communication error at the process data input object CAN-IN2 (time monitoring can be set under C0357/2)	✓	-	✓	-	•	C0592
CE3	Communication error at the process data input object CAN-IN3 (time monitoring can be set under C0357/3)	✓	-	✓	-	•	C0593
CE4	BUS-OFF state (many communication errors occurred)	✓	-	✓	-	•	C0595
EEr	External monitoring	•	✓	✓	✓	✓	C0581
H05, H07	Internal error	•	-	-	-	-	-
H10	Sensor fault heatsink temperature	•	-	-	-	✓	C0588
H11	Sensor fault: internal temperature	•	-	-	-	✓	
LP1	Motor phase failure detection (function block must be entered in C0465)	✓	-	✓	-	•	C0597
LU	Undervoltage	-	•	-	-	-	-
NMAX	Maximum speed exceeded (C0596)	•	-	-	-	-	-
OC1	Short circuit	•	-	-	-	-	-
OC2	Earth fault	•	-	-	-	-	-
OC5	I x t overload	•	-	-	-	-	-
OH	Heatsink temperature 1 (max. permissible, fixed)	•	-	-	-	-	-
OH3	Motor temperature 1 (max. permissible, fixed)	•	-	-	-	✓	C0583
OH4	Heatsink temperature 2 (adjustable; C0122)	-	-	•	-	✓	C0582
OH7	Motor temperature 2 (can be set; code: C0121)	-	-	•	-	✓	C0584
OH8	Motor temperature (fixed) via inputs T1/T2	✓	-	✓*	-	•	C0585
OU	Overvoltage in the DC bus	-	•	-	-	-	-
P01	Limit switch negative = LOW	✓	-	-	•	-	C1285/1
P02	Limit switch positive = LOW	✓	-	-	•	-	C1285/2
P03	Contouring error - digital frequency > C0255	✓	-	•	-	✓	C0589
P04	Position limit exceeded in negative direction	✓	-	-	•	-	C1285/3
P05	Position limit exceeded in positive direction	✓	-	-	•	-	C1285/4
P06	No reference	✓	-	-	•	-	C1287/1
P07	Parameter set mode absolute	✓	-	-	•	-	C1291/1
P08	Actual offset out of range	✓	-	-	•	-	C1291/2
P09	Impermissible programming	✓	-	-	•	-	C1291/3
P12	Encoder range exceeded	✓	-	-	•	-	C1288/1
P13	Phase overflow	•	-	✓	-	✓	C0590
P14	1st contouring error POS > C1218/1	✓	-	✓	•	✓	C1286/1
P15	2nd contouring error POS > C1218/2	✓	-	✓	✓	•	C1286/2
P16	Sync error	✓	-	✓	•	✓	C1290/1
P17	TP control error	✓	-	✓	•	✓	C1289/1
P18	Internal limitation	✓	-	•	✓	✓	C1289/2
PEr	Program error	•	-	-	-	-	-
PI	Fault during initialization	•	-	-	-	-	-
PR0	General fault in parameter sets	•	-	-	-	-	-
PR1	Fault in parameter set 1	•	-	-	-	-	-
Sd2	Resolver fault	•	-	✓*	-	✓	C0586
Sd3	Encoder fault at X9 PIN 8	✓	-	✓*	-	•	C0587



Display	Meaning	TRIP	Meldung	Warning	FAIL-QSP	off	Code
Sd5	Encoder fault at X6/1 X6/2 (C0034 = 1)	✓	-	✓	-	•	C0598
Sd6	Sensor fault: motor temperature (X7 or X8)	•	-	✓	-	✓	C0594
Sd7	Fault in the absolute value encoder at X8	✓	-	-	-	•	C0025

Configuration

- • Default setting
- ✓ possible
- - not possible
- ✓* possible, but the drive can be destroyed if the fault is not removed immediately.

8.5.4 Fault indication via digital output

In the function block DIGOUT the fault messages TRIP, message and warning can be assigned to the digital outputs (e. g. terminals X5/A1...X5/A4).

Display TRIP or Message or Warning individually (individual indication):

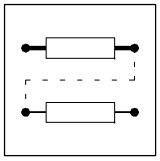
1. Select digital output in the code level under C0117 and subcode.
2. Assign TRIP or Message or Warning to the parameter level.

Display TRIP, Message, Warning collectively (collective indication):

1. Assign TRIP, Message and Warning to an OR element.
2. Select digital output in the code level under C0117 and subcode.
3. Assign output of the OR-element in the parameter level.

Display monitoring functions individually:

1. Select digital output in the code level under C0117 and subcode.
2. Assign monitoring function (e.g. MONIT-OH7).



Configuration

9 Troubleshooting and fault elimination

- You can recognize immediately whether a fault has occurred from the display elements or status information. (📖 9-1, chapter “Troubleshooting”)
- You can analyze the fault
  – by means of the history buffer (📖 9-3)
  – and by means of the list “Fault indications”. (📖 9-5)
- The list “Fault indications” indicates how to eliminate faults. (📖 9-5)

9.1 Troubleshooting

Display on the controller

Two LEDs on the front of the controller indicate the controller status.

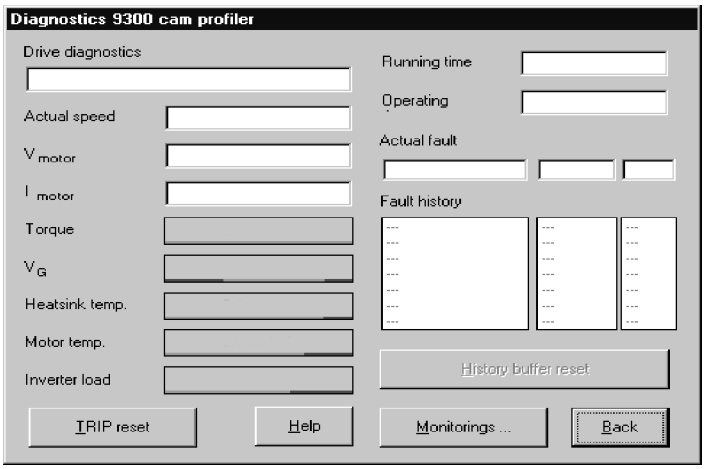
LED green	LED red	Cause	Check
■	☐	Controller enabled; no fault	
★	☐	Controller inhibit, switch-on inhibit	C0183; or C0168/1
☐	★	Fail	C0168/1
■	★	Warning, fail-QSP	C0168/1

■ : on ☐ : off ★ : blinking

Display in Global-Drive-Control

Double-click ”Dialog Diagnostic” in the parameter menu of the GDC to open the dialog box *Diagnostic 9300* .

- The dialog box *Diagnostic 9300* informs about the controller status:



Display on the keypad

Status messages in the display indicate the controller status.

Display	Controller status	Check
RDY	Controller ready for operation, controller can be inhibited	C0183, C0168/1
IMP	Pulses at the power stage inhibited	C0183, C0168/1
I_{max}	Max. current reached	
M_{max}	Max. torque reached	
Fail	Fault through TRIP, message, fail QSP or warning	C0183, C0168/1

Troubleshooting and fault elimination

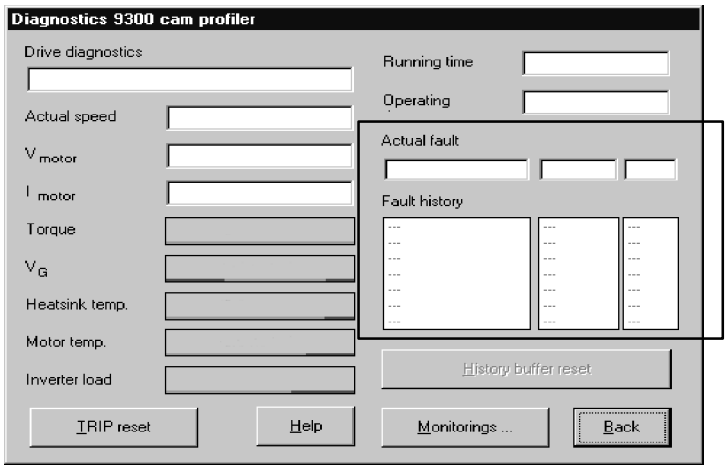
Display via the LECOM status word C0150

Bit	Meaning			
0	FREE 0	freely combinable		
1	IMP (pulse inhibit)	0 = Pulses enabled for power stage 1 = Pulses inhibited for power stage		
2	FREE 2	freely combinable		
3	FREE 3	freely combinable		
4	FREE 4	freely combinable		
5	FREE 5	freely combinable		
6	$f_d = 0$ (actual speed value = 0)	0 = [n ≠ 0] 1 = [n = 0]		
7	RSP (controller inhibit)	0 = No controller inhibit 1 = Controller inhibit		
8-11	Controller status	**hex**	**bin**	
		0	0000	Unit initialisation
		1	0001	Switch-on inhibit
		3	0011	Operation inhibited (controller inhibit)
		6	0110	Operation enabled
		7	0111	Message active
		8	1000	Active fault
		9	1001	Power off
		A	1010	Fail-QSP
12	Warning	0 = No warning 1 = Warning		
13	Meldung	0 = No message 1 = Message		
14	FREE 14	freely combinable		
15	FREE 15	freely combinable		

9.2 Fault analysis with the history buffer

- The history buffer is used to trace faults.
- Fault messages are stored in the order of their occurrence.

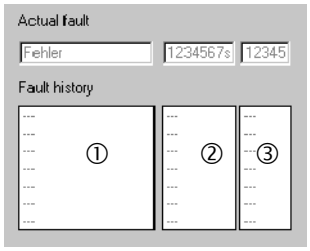
Double click "Dialog Diagnostics" in the parameter menu of the GDC to open the dialog box *Diagnostic 9300* :



History buffer

9.2.1 Structure of the history buffer

- The history buffer has 8 memory units. The fields under "fault history" show the memory units 2 to 7.
- The fields under "Actual fault" show memory unit 1. It contains information on the active fault.
  – The first memory unit is written only after the elimination or acknowledgement of the active fault. This entry eliminates the last fault from the history buffer so that it can no longer be read.
- The history buffer contains three information items for every fault occurred:

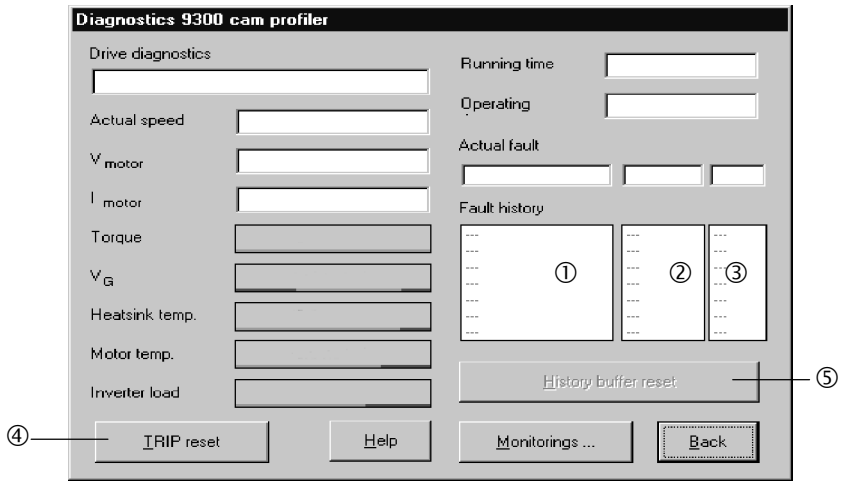


① Fault recognition and reaction
② Time of the fault
③ Frequency of the fault

The following table shows the assignment of information to the codes.

Code and information to be called				Memory unit
C0168	C0169	C0170	Subcode	
Fault recognition and reaction	Time of the last occurrence	Frequency of the immediately following occurrence	1	Active fault
			2	Memory unit 1
			3	Memory unit 2
			4	Memory unit 3
			5	Memory unit 4
			6	Memory unit 5
			7	Memory unit 6
			8	Memory unit 7

9.2.2 Working with the history buffer



Fault recognition and reaction ①

- Contains the fault recognition for every memory unit and the reaction to the fault.
  – e. g. ”OH3 TRIP”
  – For a fieldbus, the fault indications are always represented by a fault number.
  (📖 9-5, column 2)

Please note:

- For faults occurring at the same time with different reactions:
  – Only the reaction with the highest priority is entered in the history buffer (Priority = TRIP → Message → FAIL-QSP → Warning).
- For faults occurring at the same time with the same reaction (e. g. 2 messages):
  – Only the fault which occurred first is entered in the history buffer.

Time ②

- Contains the times when the faults occurred.
  – e.g. ”1234567 s”
  – Reference time is the mains switch-on time (see dialog box *Diagnostic 9300* , field top right)

Please note:

- If a fault is immediately followed by another fault for several times, only the time of the last occurrence is stored.

Frequency ③

- Contains the frequency of a fault immediately followed by the same fault. The time of the last occurrence is stored.

Reset fault ④

- Click the **TRIP reset** button to reset the fault.

Clear history buffer ⑤

- This function is only possible when no fault is active.
- Click the **Fault history reset** button to clear the history buffer.

9.3 Fault indications

Note!

If the fault indication is requested by a fieldbus (C0168/x), the fault indication is represented by a fault number in column 2 of the table.

Display	Fault No.: ❑xxx 0 - TRIP 1 - Message 2 - Warning 3 - FAIL-QSP	Error	Cause	Remedy
---	---	No fault	-	-
CCr	❑071	System error	Strong interference on control cables For 9300 cam profiler: Selection of too many points	Screen control cables For 9300 cam profiler: Reduce number of points to max. 2 points per ms)
			Ground or earth loops in the wiring	PE wiring. 📖 4-34
CDA	❑220	Data error	Attempt to accept faulty data	New data transfer.
	❑221	Data error warning	The checksum of the data transferred is not correct.	New data transfer and check.
CE0	❑061	Communication error	Interference during transmission of control commands via automation interface X1	Plug in automation module firmly, bolt down, if necessary
CE1	❑062	Communication error at the process data input object CAN_IN_1	CAN_IN_1 object receives faulty data, or communication is interrupted	• Check cable at X4 • Check transmitter • Increase monitoring time under C0357/1 if necessary
CE2	❑063	Communication error at the process data input object CAN_IN_2	CAN_IN_2 object receives faulty data, or communication is interrupted	• Check cable at X4 • Check transmitter • Increase monitoring time under C0357/2 if necessary
CE3	❑064	Communication error at the process data input object CAN_IN_3	CAN_IN_3 object receives faulty data, or communication is interrupted	• Check cable at X4 • Check transmitter • Increase monitoring time under C0357/3 if necessary
CE4	❑065	BUS-OFF state	Controller has received too many incorrect telegrams via system bus X4, and has disconnected from the bus	• Check wiring • Check bus termination (if any) • Check screen contact of the cables • Check PE connection • Check bus load: • Reduce baud rate (observe cable length)
EEr	❑091	External fault (TRIP-Set)	A digital input assigned to the TRIP-Set function has been activated.	Check external encoder
H05	❑105	Internal error		Contact Lenze
H07	❑107	Incorrect power stage	During initialization of the controller, an incorrect power stage was detected	Contact Lenze
H10	❑110	Sensor fault heat sink temperature	Sensor for heat sink temperature detection indicates indefinite values	Contact Lenze
H11	❑111	Senso fault indoor temperature	Sensor for indoor temperature detection indicates indefinite values	Contact Lenze
LP1	❑032	Motor phase failure	A current-carrying motor phase has failed	• Check motor • Check supply module
			The current limit is set too high	Set a lower current limit value under C0599
			This monitoring is not suitable for: • Synchronous servo motors • at field frequencies > 480 Hz	Deactivate monitoring with C0597= 3
LU	❑030	Undervoltage	DC bus voltage is smaller than the value fixed under C0173	• Check mains voltage • Check supply cable
r_{MAX}	❑200	Max. speed exceeded (C0596)	Active load (e.g. for hoists) too high Drive is not speed-controlled, torque excessively limited.	Check drive dimensioning. Increase torque limit if necessary.

Troubleshooting and fault elimination

Display	Fault No.: ❑xxx 0 - TRIP 1 - Message 2 - Warning 3 - FAIL-QSP	Error	Cause	Remedy
OC1	❑011	Short-circuit	Short-circuit.	Find out cause of short-circuit; check cable.
			Excessive capacitive charging current of the motor cable.	Use motor cable which is shorter or of lower capacitance.
OC2	❑012	Earth fault	One of the motor phases has earth contact.	• Check motor • Check supply module
			Excessive capacitive charging current of the motor cable.	Use motor cable which is shorter or of lower capacitance.
OC5	❑015	I x t overload	Frequent and overlong acceleration with overcurrent Continuous overload with $I_{motor} > 1.05 \times I_{rx.}$	Check drive dimensioning.
OH	❑050	Heat sink temperature is higher than the value set in the controller	Ambient temperature $T_{amb} > 40$ °C or 50 °C.	• Allow controller to cool and ensure better ventilation. • Check ambient temperature in the control cabinet.
			Heat sink very dirty.	Clean heat sink
			Incorrect mounting position.	Change mounting position.
OH3 [1]	❑053	Heat sink temperature is higher than the value set in the controller	Motor too hot because of excessive current or frequent and overlong acceleration	Check drive dimensioning.
			No PTC connected.	Connect PTC or switch-off monitoring (C0583=3).
OH4	❑054	Heat sink temperature is higher than the value set under C0122.	Ambient temperature $T_{amb} > 40$ °C or 50 °C.	• Allow controller to cool and ensure better ventilation. • Check ambient temperature in the control cabinet.
			Heat sink very dirty.	Clean heat sink
			Incorrect mounting position.	Change mounting position.
			Value set under C0122 was too low.	Enter higher value.
OH7 [1]	❑057	Motor temperature is higher than the value set under C0121.	Motor too hot because of excessive current or frequent and overlong acceleration	Check drive dimensioning.
			No PTC connected.	Connect PTC or switch-off monitoring (C0584=3).
			Value set under C0121 was too low.	Enter higher value.
OH8	❑058	PTC at terminals T1, T2 indicates motor overheat.	Motor too hot because of excessive current or frequent and overlong acceleration	Check drive dimensioning.
			Terminals T1, T2 are not assigned.	Connect PTC or thermostat or switch off monitoring (C0585=3).
OU	❑020	Overvoltage	Excessive brake energy (DC bus voltage higher than set under C0173).	Use brake module or energy recovery module.
P01	❑151	Limit switch negative	Negative limit switch was reached.	• Control drive in positive direction • Check terminal connection X5/E2.
P02	❑152	Positive limit switch	Positive limit switch was reached.	• Control drive in negative direction • Check terminal connection X5/E1.
P03	❑153	Second contouring error	Phase difference between set and actual position is larger than the contouring error limit set under C0255.	• Extend contouring error limit under C0255 • Switch off the monitoring if necessary (C0589 = 3).
			Drive cannot follow the digital frequency (I_{max} limit).	Check drive dimensioning.
P04	❑154	Negative position limit	Negative position limit (C1224) was not reached.	Find out why the value was not reached (e.g. "incorrect" position targets, set function position value) and adjust the negative position limit (C1224) if necessary.
P05	❑155	Positive position limit	Positive position limit (C1223) was exceeded.	Find out why the value was exceeded (e.g. "incorrect" position targets, set function position value) and adjust the positive position limit (C1223) if necessary.
P06	❑156	No reference	The homing point is unknown. For absolute positioning no homing was performed before the first positioning.	Perform one of the following functions and restart: • Manual homing. • Start homing in the program. • Set reference.

Troubleshooting and fault elimination

Display	Fault No.: ❑xxx 0 - TRIP 1 - Message 2 - Warning 3 - FAIL-QSP	Error	Cause	Remedy
P07	❑157	PS Absolute mode instead of relative mode.	An absolute PS (C1311) was performed during relative positioning (position mode C1210).	Perform one of the following functions and restart: • Change from absolute PS to relative PS. • Change position mode.
P08	❑158	Actual offset out of range.	Actual home offset (C1226) out of position limits. Fault of the program function "Set position value".	Adjust position limits if necessary, or check whether program function "Set position value" is to be applied.
P09	❑159	Impermissible programming	Impermissible programming	Check position program: • After a PS with final speed a PS with positioning has to follow; waiting for input is not permissible.
P12	❑162	Encoder range	The range of the absolute encoder was exceeded.	• Return drive by manual positioning. • Check position limits and adjustment of the encoder. • The absolute encoder has to be dimensioned and mounted such that its range is not exceeded over the complete positioning range.
P13	❑163	Phase overflow	• Phase controller limit reached • Drive cannot follow the digital frequency (I_{max} limit).	• Enable drive • Check drive dimensioning
P14	❑164	1st contouring error	The drive cannot follow the setpoint. Contouring error is higher than limit value in C1218/1.	• Increase current limit C0022 (observe max. motor current). • Reduce acceleration. • Check drive dimensioning. • Increase limit value under C1218.
P15	❑165	2nd contouring error	The drive cannot follow the setpoint. Contouring error is higher than limit value in C1218/2.	• Increase current limit C0022 (observe max. motor current). • Reduce acceleration. • Check drive dimensioning. • Increase limit value under C1218.
P16	❑166	Transmission error of a synch telegram on the system bus.	Sync telegram from master (PLC) is out of time pattern. *	Set C1121 (Sync cycle) to the transmission cycle of the master (PLC).
			Sync telegram of master (PLC) is not received. *	• Check communication channel. • Check baud rate, controller address.
			Controller enable (RFR) too soon.	Enable controller with delay. The required delay depends on the time between the synch telegrams.
			* C0362 displays the delay between two 2 sync telegrams (C0362 = 0, communication interrupted).	
P17	❑167	TP control error	Simultaneous use of the TP input by different function blocks (e.g. FB DFSET and POS). A conflict occurs.	Configure another TP input for FB POS (not possible for DFSET) or switch off monitoring under C0580.

Troubleshooting and fault elimination

Display	Fault No.: ❑xxx 0 - TRIP 1 - Message 2 - Warning 3 - FAIL-QSP	Error	Cause	Remedy
P18	❑168	Internal limitation	Data generated by calculations of the 9300 servo positioning controller cannot be varied arbitrarily. If the value falls below or exceeds the internal limit value the warning “P18” will be set and the value is limited to the minimum or maximum.	
			C1298 = 1: The negative position limit in C1223 is outside the possible display range of 1 ≤ (C1223∗ C1205) ≤ 1.07E9 incr	Check the entries under C1202-4, C1207/1.2. If necessary, read the value decreased in the event of a fault under C1220/10 and overwrite the value entered under C1223.
			C1298 = 2: The positive position limit in C1224 is outside the possible display range of 1 ≤ (C1224∗ C1205) ≤ 1.07E9 incr	Check the entries under C1202-4, C1207/1.2. If necessary, read the value decreased in the event of a fault under C1220/11 and overwrite the value entered under C1224.
			C1298 = 3: The maximum speed v_{max} under C1240 exceeds the possible display range of 1 ≤ (C1240 ∗ C1205 ∗ 16,384) ≤ 2.14E9 incr or v_{max}not C1240 / C1204 ∗ 60 ≤ 1.5 ∗ n_{max}	Check the entries under C0011, C1202-4, C1207/1.2. If necessary, read the value decreased in the event of a fault under C1220/12 and overwrite the value entered under C1240. Adapt the value under C1240 to C0011.
			C1298 = 4: The maximum acceleration a_{max} in C1250 exceeds the possible display range of 1 ≤ (C1250 ∗ C1205 ∗ 16.384 / 1000) ≤ 2.8634E7 incr	Check the entries under C1202-4, C1207/1.2. If necessary, read the value decreased in the event of a fault under C1220/13 and overwrite the value entered under C1250.
			C1298 = 5: An internal value range has been exceeded for a speed normalization. Valid range: 1 ≤(C0011 ∗C1207/1 /C1207/2 ∗65536/60000) ≤32 767	Check the entries under C0011, C1207/1.2.
P21	❑171	Contouring error RC	Phase difference between set and actual position is larger than the contouring error limit set under C1328.	Extend contouring error limit with C1328. If necessary, switch off the monitoring (C1329=3).
			Drive cannot follow the digital frequency (I_{max} limit).	Check drive dimensioning.
PEr	❑074	Program fault	A fault in the program was detected.	Send controller with data (on diskette) to Lenze.
PI	❑079	Initializing error	• A fault was detected during transfer of parameter set between the controllers • Parameter set does not match controller.	Correct parameter set.
PR0 PR1	❑075 ❑072	Parameter set error	Fault when loading a parameter set. CAUTION: The factory setting loaded automatically.	• Set the required parameters and store them under C0003. • For PR0 the supply voltage must be switched off additionally.
Sd2	❑082	Resolver fault	Resolver cable interrupted.	• Check the resolver cable for open circuit • Check resolver. • or switch off monitoring (C0586 = 3).
Sd3	❑083	Encoder fault at X9/8	Cable interrupted.	Check cable for open circuit.
			Input X9 PIN 8 not assigned.	Assign input X9 PIN 8 with 5V or switch off monitoring (C0587 = 3).
Sd5	❑085	Master current source defective	Master current at X6/1 X6/2 < 2mA.	• Check cable for open circuit. • Check master current source.
Sd6	❑086	Sensor fault	Encoder of the motor temperature detection at X7 or X8 indicates indefinite values.	Check supply cable for firm connection. Switch off monitoring with C0594 = 3 if necessary.
Sd7	❑087	Encoder fault	Absolute encoder with RS485 interface does not transmit data.	Check supply cable. Check encoder. Check voltage supply C0421. No Stegmann encoder connected.

1) Temperature detection via resolver or incremental encoder.

9.4 Reset of fault messages

Reaction on operating errors	Measures for re-commissioning	Danger notes
TRIP/ FAIL-QSP	• After the error has been eliminated, the drive can be restarted when an acknowledgement has been sent. • TRIP / FAIL-QSP acknowledgement by: – Global-Drive-Control: Click "Trip reset" in dialog box "Diagnostics 9300". 📖 9-4, ("Working with the history buffer") – Keypad 9371 BB: Press STOP key. Then press RUN to enable the controller again. – Fieldbus module: Set C0043 = 0 – Control word C0135 – Terminal X5/E5 (default setting) or "DCTRL-TRIP-RESET" – Control word AIF – Control word system bus (CAN)	 If a TRIP source is still active, TRIP cannot be reset.
Message	• After eliminating the fault, the message is reset automatically.	 The drive restarts automatically if the fault is eliminated.
Warning	• After eliminating the fault, the warning is reset automatically.	

Troubleshooting and fault elimination

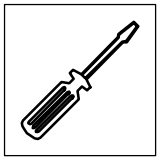
10 Maintenance

- The controller is free of maintenance if the prescribed conditions of operation are observed. (📖 3-2)
- If the ambient air is polluted, the air vents of the controller may be obstructed. Therefore, check the air vents periodically (depending on the degree of pollution approx. every four weeks):

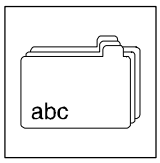
Free the obstructed air vents using a vacuum cleaner.

Stop!

Do not use sharp or pointed tools such as knives or screwdrivers to clean the air vents.



Maintenance



11 Appendix

11.1 Accessories

For the controllers, Lenze offers the following accessories:

- Mains filter
- Fuses
- Fuse holders
- System cable for resolver
- System cable for digital frequency coupling

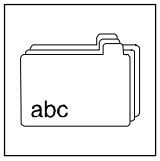
A PC can be connected to the controller via the field bus module LECOM A/B (RS232, RS485 or fibre optics). The Global-Drive-Control (GDC) PC program allows a simple programming of the controller.

Global Drive Control (GDC) PC program

The program runs under Windows and is supplied with drivers for LECOM A/B (RS232, RS485 or optical fibre).

Further functions of the PC program:

- Process signal visualization
- Diagnostics and troubleshooting
- Commissioning support
- Oscilloscope function



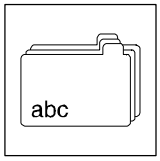
Appendix

11.2 Code table

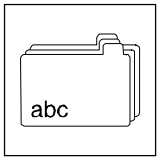
How to read the code table:

Row	Abbreviation	Meaning
Code	C0039 1 2 … 14 15	Code C0039 Subcode 1 of code C0039 Subcode 2 of code C0039 … Subcode 14 of code C0039 Subcode 15 of code C0039
	[C0005]	Parameter value of the code can only be modified when the controller is inhibited
LCD		Keypad LCD
Lenze		Default setting of the code or reference to display code by: Disp.
	*	The row "Important" contains further information
Choice	1 {1 %} 99	Minimum value {smallest step/unit} maximum value
IMPORTANT	-	• Additional, important notes about the code. • If the code name in GDC differs from the LCD display on the keypad, the code is printed in bold in this column.

Code	LCD	Possible settings				Important
		Lenze	Selection			
C0002	PAR LOAD	0	0 1 11	Factory (default) setting Load PSet 1 Ext. load PSet 1		**Load parameter set** 0: Load factory setting into RAM 1: Load parameter set x into RAM and activate • Parameter set1 is loaded automatically after every mains connection. 2: Load parameter set x from the operating module into the RAM and activate
C0003	PAR SAVE	0	0 1	executed Save PSet 1		**Save parameter set** 0: Saving is completed 1: Save current parameter set x non-volatile
C0004	OP DISPLAY	56	1	{1}	1999	**Operating display** Keypad shows selected code in the operating level if no other status indications of C0183 are active.
[C0005]	SIGNAL CFG	1000	0 = COMMON 100 = empty 1000 = speed control 1xxx = Speed xx			**Signal configuration** (Predefined basic configurations)

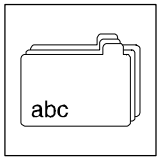


Code	LCD	Possible settings		Important
		Lenze	Selection	
[C0005]	SIGNAL CFG	1000	10000 = Cam profile 10001 = Cam profile Lecom A/B 10003 = Cam profile AIF 10005 = Cam profile system bus 10010 = Cam profiler internal 24V supply 10011 = Cam profiler Lecom A/B internal 24V supply 10013 = Cam profiler AIF internal 24V supply 10015 = Cam profiler System bus internal 24V supply 10100 = Cam profiler with homing function 10101 = Cam profiler, homing function, Lecom A/B 10103 = Cam profiler, homing function, AIF 10105 = Cam profiler, homing function, system bus 10110 = Cam profiler, homing function, internal 24V 10111 = Cam profiler, homing function, Lecom A/B,internal 24V 10113 = Cam profiler, homing function, AIF, internal 24V 10115 = Cam profiler, homing function, system bus, internal 24V 10200 = Cam profiler with clutch function 10201 = Cam profiler, clutch function, Lecom A/B 10203 = Cam profiler, clutch function, AIF 10205 = Cam profiler, clutch function, system bus 10210 = Cam profiler, clutch function, internal 24V 10211 = Cam profiler, clutch function, Lecom A/B, internal 24V 10213 = Cam profiler, clutch function, AIF, internal 24V 10215 = Cam profiler, clutch function, system bus, internal 24V 10300 = Cam profiler with switching points 10301 = Cam profiler, switching points, Lecom A/B 10303 = Cam profiler, switching points, AIF 10305 = Cam profiler, switching points, system bus 10310 = Cam profiler, switching points, internal 24V 10311 = Cam profiler, switching points, Lecom A/B internal 24V 10313 = Cam profiler, switching points, AIF, internal 24V 10315 = Cam profiler, switching points, system bus, internal 24V 10800 = Cam profiler with touch probe correction of the master value 10801 = Cam profiler, touch probe, Lecom A/B 10803 = Cam profiler, touch probe master value, AIF 10805 = Cam profiler, touch probe master value, system bus 10810 = Cam profiler, touch probe master value, internal 24V 10811 = Cam profiler, touch probe master value, Lecom A/B, internal 24V 10813 = Cam profiler, touch probe master value, AIF, internal 24V 10815 = Cam profiler, touch probe master value, system bus, internal 24V 10900 = Cam profiler with touch probe correction of the master value 10901 = Cam profiler, touch probe actual value, Lecom A/B 10903 = Cam profiler, touch probe actual value, AIF 10905 = Cam profiler, touch probe actual value, system bus 10910 = Cam profiler, touch probe actual value, internal 24V 10911 = Cam profiler, touch probe actual value, Lecom A/B, internal 24V 10913 = Cam profiler, touch probe actual value, AIF, internal 24V 10915 = Cam profiler, touch probe actual value, system bus, internal 24V	Signal configuration (Predefined basic configurations)

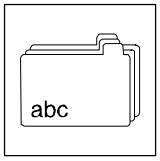


Appendix

Code	LCD	Possible settings		Important
		Lenze	Selection	
[C0005]	SIGNAL CFG	1000	11000 = Welding bar 11001 = Welding bar Lecom A/B 11003 = Welding bar AIF 11005 = Welding bar system bus 11010 = Welding bar internal 24V supply 11011 = Welding bar Lecom A/B internal 24V supply 11013 = Welding bar AIF internal 24V supply 11015 = Welding bar system bus internal 24V supply 11100 = Welding bar with homing function 11101 = Welding bar, homing function, Lecom A/B 11103 = Welding bar, homing function, AIF 11105 = Welding bar, homing function, system bus 11110 = Welding bar, homing function, internal 24V 11111 = Welding bar, homing, Lecom A/B,int. 24V 11113 = Welding bar, homing, AIF, internal 24V 11115 = Welding bar, homing, system bus, int. 24V 11200 = Welding bar with clutch function 11201 = Welding bar, clutch function, Lecom A/B 11203 = Welding bar, clutch function, AIF 11205 = Welding bar, clutch function, system bus 11210 = Welding bar, clutch function, internal 24V 11211 = Welding bar, clutch, Lecom A/B, internal 24V 11213 = Welding bar, clutch function, AIF, internal 24V 11215 = Welding bar, clutch, system bus, internal 24V 11300 = Welding bar with switching points 11301 = Welding bar, switching points, Lecom A/B 11303 = Welding bar, switching points, AIF 11305 = Welding bar, switching points, system bus 11310 = Welding bar, switching points, internal 24V 11311 = Welding bar, switching points, Lecom A/B int. 24V 11313 = Welding bar, switching points, AIF, internal 24V 11315 = Welding bar, switching points, system bus, int. 24V 11800 = Welding bar, touch probe correction of the master value 11801 = Welding bar, TP master value, Lecom A/B 11803 = Welding bar,TP master value, AIF 11805 = Welding bar, TP master value, system bus 11810 = Welding bar, TP master value, internal 24V 11811 = Welding bar, TP master value, Lecom A/B, internal 24V 11813 = Welding bar, TP master value,AIF,internal 24V 11815 = Welding bar, TP master value, system bus, internal 24V 11900 = Welding bar, TP correction of the master value 11901 = Welding bar, TP actual value, Lecom A/B 11903 = Welding bar, TP actual value, AIF 11905 = Welding bar, TP actual value, system bus 11910 = Welding bar, TP actual value, internal 24V 11911 = Welding bar, TP actual value, Lecom A/B, internal 24V 11913 = Welding bar, TP actual value, AIF, internal 24V 11915 = Welding bar, TP actual value, system bus, internal 24V	Signal configuration (Predefined basic configurations)

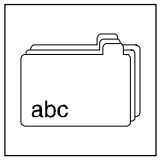


Code	LCD	Possible settings		Important
		Lenze	Selection	
[C0005]	SIGNAL CFG	1000	12000 = Cam profiler with position memory 12001 = Position storage, Lecom A/B 12003 = Position storage, AIF 12005 = Position storage, system bus 12010 = Position storage, internal 24V 12011 = Position storage, Lecom A/B, internal 24V 12013 = Position storage, AIF, internal 24V 12015 = Position storage, system bus, internal 24V 12100 = Position storage with homing function 12101 = Position storage, homing function, Lecom A/B 12103 = Position storage, homing function, AIF 12105 = Position storage, homing function, system bus 12110 = Position storage, homing, internal 24V 12111 = Position storage, homing, Lecom A/B, internal 24V 12113 = Position storage, homing, AIF, internal 24V 12115 = Position storage, homing, system bus, internal 24V 12200 = Position storage with clutch function 12201 = Position storage, clutch function, Lecom A/B 12203 = Position storage, clutch function, AIF 12205 = Position storage, clutch function, system bus 12210 = Position storage, clutch function, internal 24V 12211 = Position storage, clutch, Lecom A/B, internal 24V 12213 = Position storage, clutch, AIF, internal 24V 12215 = Position storage, clutch, system bus, internal 24V 12300 = Position storage with switching points 12301 = Position storage, switching points, Lecom A/B 12303 = Position storage, switching points, AIF 12305 = Position storage, switching points, system bus 12310 = Position storage, switching points, internal 24V 12311 = Position storage, switching points, Lecom A/B, internal 24V 12313 = Position storage, switching points, AIF, internal 24V 12315 = Position storage, switching points, system bus, internal 24V 12800 = Position storage, TP correction of the master value 12801 = Position storage, TP master value, Lecom A/B 12803 = Position storage, TP master value, AIF 12805 = Position storage, TP master value, system bus 12810 = Position storage, TP master value, internal 24V 12811 = Position storage, TP master value, Lecom A/B, int. 24V 12813 = Position storage, TP master value, AIF, internal 24V 12815 = Position storage, TP master value, system bus, int. 24V 12900 = Position storage with TP correction of actual value 12901 = Position storage, TP actual value, Lecom A/B 12903 = Position storage, TP actual value, AIF 12905 = Position storage, TP actual value, system bus 12910 = Position storage, TP actual value, internal 24V 12911 = Position storage, TP actual value, Lecom A/B, int. 24V 12913 = Position storage, TP actual value, AIF, internal 24V 12915 = Position storage, TP actual value, system bus, int. 24V	Signal configuration (Predefined basic configurations)

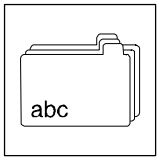


Appendix

Code	LCD	Possible settings		Important
		Lenze	Selection	
[C0005]	SIGNAL CFG	1000	13000 = Cam profiler with virtual master 13001 = Virtual master, Lecom A/B 13003 = Virtual master, AIF 13005 = Virtual master, system bus 13010 = Virtual master, internal 24V 13011 = Virtual master, Lecom A/B, internal 24V 13013 = Virtual master, AIF, internal 24V 13015 = Virtual master, system bus, internal 24V 13100 = Virtual master with homing function 13101 = Virtual master, homing function, Lecom A/B 13103 = Virtual master, homing function, AIF 13105 = Virtual master, homing function, system bus 13110 = Virtual master, homing function, internal 24V 13111 = Virtual master, homing, Lecom A/B, int. 24V 13113 = Virtual master, homing, AIF, internal 24V 13115 = Virtual master, homing, system bus, int. 24V 13200 = Virtual master with clutch function 13201 = Virtual master, clutch function, Lecom A/B 13203 = Virtual master, clutch function, AIF 13205 = Virtual master, clutch function, system bus 13210 = Virtual master, clutch function, internal 24V 13211 = Virtual master, clutch, Lecom A/B, internal 24V 13213 = Virtual master, clutch function, AIF, internal 24V 13215 = Virtual master, clutch, system bus, internal 24V 13300 = Virtual master with switching points 13301 = Virtual master, switching points, Lecom A/B 13303 = Virtual master, switching points, AIF 13305 = Virtual master, switching points, system bus 13310 = Virtual master, switching points, internal 24V 13311 = Virtual master, switching points, Lecom A/B int. 24V 13313 = Virtual master, switching points, AIF, internal 24V 13315 = Virtual master, switching points, system bus, int. 24V 13800 = Virtual master with TP correction of the master value 13801 = Virtual master, TP master value, Lecom A/B 13803 = Virtual master, TP master value, AIF 13805 = Virtual master, TP master value, system bus 13810 = Virtual master, TP master value, internal 24V 13811 = Virtual master, TP master value, Lecom A/B, internal 24V 13813 = Virtual master, TP master value, AIF, internal 24V 13815 = Virtual master, TP master value, system bus, internal 24V 13900 = Virtual master with TP correction of the actual value 13901 = Virtual master, TP actual value, Lecom A/B 13903 = Virtual master, TP actual value, AIF 13905 = Virtual master, TP actual value, system bus 13910 = Virtual master, TP actual value, internal 24V 13911 = Virtual master, TP actual value, Lecom A/B, internal 24V 13913 = Virtual master, TP actual value, AIF, internal 24V 13915 = Virtual master, TP actual value, system bus, internal 24V	Signal configuration (Predefined basic configurations)

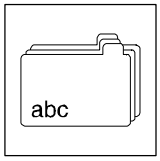


Code	LCD	Possible settings		Important
		Lenze	Selection	
[C0005]	SIGNAL CFG	1000	14000 = Cam profiler with virtual master 14001 = Virtual master, welding bar, Lecom A/B 14003 = Virtual master, welding bar, AIF 14005 = Virtual master, welding bar, system bus 14010 = Virtual master, welding bar, internal 24V 14011 = Virtual master, welding bar, Lecom A/B, internal 24V 14013 = Virtual master, welding bar, AIF , internal 24V 14015 = Virtual master, welding bar, system bus, internal 24V 14100 = Virtual master, welding bar, home 14101 = Virtual master, welding bar, home, Lecom A/B 14103 = Virtual master, welding bar, home, AIF 14105 = Virtual master, welding bar, home, system bus 14110 = Virtual master, welding bar, home, internal 24V 14111 = Virtual master, welding bar, home, Lecom, internal 24V 14113 = Virtual master, welding bar, home, AIF, internal 24V 14115 = Virtual master, welding bar, home, internal 24V 14200 = Virtual master, welding bar, clutch function 14201 = Virtual master, welding bar, clutch, Lecom A/B 14203 = Virtual master, welding bar, clutch, AIF 14205 = Virtual master, welding bar, clutch system bus 14210 = Virtual master, welding bar, clutch, internal 24V 14211 = Virtual master, welding bar, clutch, Lecom, internal 24V 14213 = Virtual master, welding bar, clutch, AIF, internal 24V 14215 = Virtual master, welding bar, clutch, system bus, internal 24V 14300 = Virtual master, welding bar, switching points 14301 = Virtual master, welding bar, switching points, Lecom A/B 14303 = Virtual master, welding bar, switching points, AIF 14305 = Virtual master, welding bar, switching points, system bus 14310 = Virtual master, welding bar, switching points, internal 24V 14311 = Virtual master, welding bar, switching points, LECOM, internal 24V 14313 = Virtual master, welding bar, switching points, AIF, internal 24V 14315 = Virtual master, welding bar, switching points, system bus, internal 24V 14800 = Virtual master, welding bar, TP correction of the master value 14801 = Virtual master, welding bar, TP master value, Lecom A/B 14803 = Virtual master, welding bar, TP master value, AIF 14805 = Virtual master, welding bar, TP master value, system bus 14810 = Virtual master, welding bar, TP master value, internal 24V 14811 = Virtual master, welding bar, TP master value, Lecom, internal 24V 14813 = Virtual master, welding bar, TP master value, AIF, internal 24V 14815 = Virtual master, welding bar, TP master value, system bus, internal 24V 14900 = Virtual master, welding bar, TP correction of the actual value 14901 = Virtual master, welding bar, TP actual value, Lecom A/B 14903 = Virtual master, welding bar, TP actual value, AIF 14905 = Virtual master, welding bar, TP actual value, system bus 14910 = Virtual master, welding bar, TP actual value, internal 24V 14911 = Virtual master, welding bar, TP actual value, Lecom, internal 24V 14913 = Virtual master, welding bar, TP actual value, AIF, internal 24V 14915 = Virtual master, welding bar, TP actual value, system bus, internal 24V	Signal configuration (Predefined basic configurations)

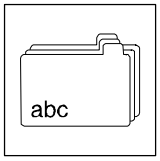


Appendix

Code	LCD	Possible settings		Important
		Lenze	Selection	
[C0005]	SIGNAL CFG	1000	15000 = Cam profiler with position storage 15001 = Virtual master, position storage, Lecom A/B 15003 = Virtual master, position storage, AIF 15005 = Virtual master, position storage, system bus 15010 = Virtual master, position storage, internal 24V 15011 = Virtual master, position storage, Lecom A/B, internal 24V 15013 = Virtual master, position storage, AIF, internal 24V 15015 = Virtual master, position storage, system bus, internal 24V 15100 = Virtual master, position storage, home 15101 = Virtual master, position storage, home, Lecom A/B 15103 = Virtual master, position storage, home,AIF 15105 = Virtual master, position storage, home, system bus 15110 = Virtual master, position storage, home, internal 24V 15100 = Virtual master, position storage, home, Lecom, internal 24V 15113 = Virtual master, position storage, home, AIF, internal 24V 15115 = Virtual master, position storage, home, system bus, internal 24V 15200 = Virtual master, position storage with clutch 15201 = Virtual master, position storage, clutch, Lecom A/B 15203 = Virtual master, position storage, clutch, AIF 15205 = Virtual master, position storage, clutch, system bus 15210 = Virtual master, position storage, clutch, internal 24V 15211 = Virtual master, position storage, clutch, Lecom, internal 24V 15213 = Virtual master, position storage, clutch, AIF, internal 24V 15215 = Virtual master, position storage, clutch, system bus, internal 24V 15300 = Virtual master, position storage with switching points 15301 = Virtual master, position storage, switching points, Lecom A/B 15303 = Virtual master, position storage, switching points, AIF 15305 = Virtual master, position storage, switching points, system bus 15310 = Virtual master, position storage, switching points, internal 24V 15311 = Virtual master, position storage, switching points, Lecom, internal 24V 15313 = Virtual master, position storage, switching points, AIF, internal 24V 15315 = Virtual master, position storage, switching points, CAN, internal 24V	Signal configuration (Predefined basic configurations)

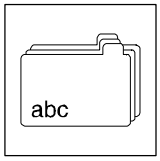


Code	LCD	Possible settings		Important
		Lenze	Selection	
[C0005]	SIGNAL CFG	1000	15800 = Virtual master, position storage, TP correction master value 15801 = Virtual master, position storage, TP master value, Lecom A/B 15803 = Virtual master, position storage, TP master value, AIF 15805 = Virtual master, position storage, TP master value, system bus 15810 = Virtual master, position storage, TP master value, internal 24V 15811 = Virtual master, position storage, TP master value, Lecom, internal 24V 15813 = Virtual master, position storage, TP master value, AIF, internal 24V 15815 = Virtual master, position storage, TP master value, system bus, 24V 15900 = Virtual master, position storage, TP correction actual value 15901 = Virtual master, position storage, TP actual value, Lecom A/B 15903 = Virtual master, position storage, TP actual value, AIF 15905 = Virtual master, position storage, TP actual value, system bus 15910 = Virtual master, position storage, TP actual value, internal 24V 15911 = Virtual master, position storage, TP actual value, Lecom, internal 24V 15913 = Virtual master, position storage, TP actual value, AIF, internal 24V 15915 = Virtual master, position storage, TP actual value, system bus, internal 24V	Signal configuration (Predefined basic configurations)

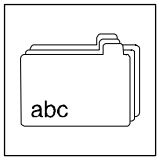


Appendix

Code	LCD	Possible settings		Important
		Lenze	Selection	
[C0005]	SIGNAL CFG	1000	16000 = Cam profiler, absolute master value 16001 = Cam profiler, absolute master value, Lecom A/B 16003 = Cam profiler, absolute master value,AIF 16005 = Cam profiler, absolute master value, system bus 16010 = Cam profiler, absolute master value, internal 24V 16011 = Cam profiler, absolute master value, Lecom A/B, internal 24V 16013 = Cam profiler, absolute master value, AIF, internal 24V 16015 = Cam profiler, absolute master value, system bus, internal 24V 16100 = Cam profiler, absolute master value, with homing function 16101 = Cam profiler, absolute master value, home, Lecom A/B 16103 = Cam profiler, absolute master value, homing function, AIF 16105 = Cam profiler, absolute master value, home, system bus 16110 = Cam profiler, absolute master value, home, internal 24V 16111 = Cam profiler, absolute master value, home, Lecom A/B, internal 24V 16113 = Cam profiler, absolute master value, home, AIF, internal 24V 16115 = Cam profiler, absolute master value, home, system bus, internal 24V 16200 = Cam profiler, absolute master value with clutch function 16201 = Cam profiler, absolute master value, clutch, Lecom A/B 16203 = Cam profiler, absolute master value, clutch, AIF 16205 = Cam profiler, absolute master value, clutch, system bus 16210 = Cam profiler, absolute master value, clutch, internal 24V 16211 = Cam profiler, absolute master value, clutch, Lecom A/B, internal 24V 16213 = Cam profiler, absolute master value, clutch, AIF, internal 24V 16215 = Cam profiler, absolute master value, clutch, system bus, internal, internal 24V 16300 = Cam profiler, absolute master value with switching points 16301 = Cam profiler, absolute master value, switching points, Lecom A/B 16303 = Cam profiler, absolute master value, switching points, AIF 16305 = Cam profiler, absolute master value, switching points, system bus 16310 = Cam profiler, absolute master value, switching points, internal 24V 16311 = Cam profiler, absolute master value, switching points, Lecom A/B, internal 24V 16313 = Cam profiler, absolute master value, switching points, AIF, internal 24V 16315 = Cam profiler, absolute master value, switching points, system bus, internal 24V 16900 = Cam profiler, absolute master value, TP correction of the act. value 16901 = Cam profiler, absolute master value, TP act. value, Lecom A/B 16903 = Cam profiler, absolute master value, TP act. value, AIF 16905 = Cam profiler, absolute master value, TP act. value, system bus 16910 = Cam profiler, absolute master value, TP act. value, internal 24V 16911 = Cam profiler, absolute master value, TP act. value, Lecom A/B,int. 24V 16913 = Cam profiler, absolute master value, TP act. value, AIF, internal 24V 16915 = Cam profiler, absolute master value, TP act. value, system bus, internal 24V	Signal configuration (Predefined basic configurations)

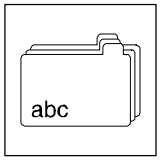


Code	LCD	Possible settings		Important
		Lenze	Selection	
[C0005]	SIGNAL CFG	1000	17000 = Welding bar, absolute master value 17001 = Welding bar, absolute master value, Lecom A/B 17003 = Welding bar, absolute master value, AIF 17005 = Welding bar, absolute master value, system bus 17010 = Welding bar, absolute master value, internal 24 V 17011 = Welding bar, absolute master value, Lecom A/B, internal 24V 17013 = Welding bar, absolute master value, AIF, internal 24 V 17015 = Welding bar, absolute master value, system bus, internal 24V 17100 = Welding bar, absolute master value, homing function 17101 = Welding bar, absolute master value, home, Lecom A/B 17103 = Welding bar, absolute master value, home, AIF 17105 = Welding bar, absolute master value, home, system bus 17110 = Welding bar, absolute master value, home, internal 24V 17111 = Welding bar, absolute master value, home, Lecom, internal 24V 17113 = Welding bar, absolute master value, home, AIF, internal 24 V 17115 = Welding bar, absolute master value, home, system bus, internal 24 V 17200 = Welding bar, absolute master value, clutch function 17201 = Welding bar, absolute master value, clutch, Lecom A/B 17203 = Welding bar, absolute master value, clutch, AIF 17205 = Welding bar, absolute master value, clutch, system bus 17210 = Welding bar, absolute master value, clutch, internal 24V 17211 = Welding bar, absolute master value, clutch, Lecom, internal 24V 17213 = Welding bar, absolute master value, clutch, AIF, internal 24V 17215 = Welding bar, absolute master value, clutch, system bus, internal 24V 17300 = Welding bar, absolute master value, switching points 17301 = Welding bar, absolute master value, switching points, Lecom 17303 = Welding bar, absolute master value, switching points, AIF 17305 = Welding bar, absolute master value, switching points, system bus 17310 = Welding bar, absolute master value, switching points, internal 24V 17311 = Welding bar, absolute master value, switching points, Lecom, internal 24V 17313 = Welding bar, absolute master value, switching points, AIF, internal 24V 17315 = Welding bar, absolute master value, switching points, system bus, internal 24V 17900 = Welding bar, absolute master value, TP correction, actual value 17901 = Welding bar, absolute master value, TP act. value, Lecom A/B 17903 = Welding bar, absolute master value, TP act. value, AIF 17905 = Welding bar, absolute master value, TP act. value, system bus 17910 = Welding bar, absolute master value, TP act. value, internal 24V 17911 = Welding bar, absolute master value, TP act. value, Lecom, internal 24V 17913 = Welding bar, absolute master value, TP act. value, AIF, internal 24V 17915 = Welding bar, absolute master value, TP act. value, system bus, internal 24V	Signal configuration

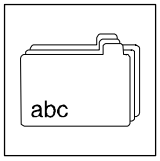


Appendix

Code	LCD	Possible settings		Important
		Lenze	Selection	
[C0005]	SIGNAL CFG	1000	18000 = Cam profiler, position memory, absolute master value 18001 = Position storage, absolute master value, Lecom A/B 18003 = Position storage, absolute master value, AIF 18005 = Position storage, absolute master value, system bus 18010 = Position storage, absolute master value, internal 24V 18011 = Position storage, absolute master value, Lecom, internal 24V 18013 = Position storage, absolute master value, AIF, internal 24V 18015 = Position storage, absolute master value, system bus, internal 24V 18100 = Position storage, absolute master value, home 18101 = Position storage, absolute master value, home, Lecom A/B 18103 = Position storage, absolute master value, home, AIF 18105 = Position storage, absolute master value, home, system bus 18110 = Position storage, absolute master value, home, internal 24V 18111 = Position storage, absolute master value, home, Lecom, internal 24V 18113 = Position storage, absolute master value, home, AIF, internal 24V 18115 = Position storage, absolute master value, home, system bus, internal 24V 18200 = Position storage, absolute master value, clutch function 18201 = Position storage, absolute master value, clutch, Lecom A/B 18203 = Position storage, absolute master value, clutch, AIF 18205 = Position storage, absolute master value, clutch, system bus 18210 = Position storage, absolute master value, clutch, internal 24V 18211 = Position storage, absolute master value, clutch, Lecom, internal 24V 18213 = Position storage, absolute master value, clutch, AIF, internal 24V 18215 = Position storage, absolute master value, clutch, system bus, internal 24V 18300 = Position storage, absolute master value, switching points 18301 = Position storage, absolute master value, switching points, Lecom A/B 18303 = Position storage, absolute master value, switching points, AIF 18305 = Position storage, absolute master value, switching points, system bus 18310 = Position storage, absolute master value, switching points, internal 24V 18311 = Position storage, absolute master value, switching points, Lecom, internal 24V 18313 = Position storage, absolute master value, switching points, AIF, internal 24V 18900 = Position storage, absolute master value, TP correction actual value 18901 = Position storage, absolute master value, TP correction actual value, Lecom A/B 18903 = Position storage, absolute master value, TP actual value, AIF 18905 = Position storage, absolute master value, TP correction actual value, system bus 18910 = Position storage, absolute master value, TP actual value, internal 24V 18911 = Position storage, absolute master value, TP actual value, Lecom A/B, internal 24V 18913 = Position storage, absolute master value, TP actual value, AIF internal 24V 18915 = Position storage, absolute master value, TP actual value, system bus, internal 24V	Signal configuration (Predefined basic configurations)

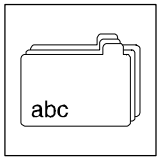


Code	LCD	Possible settings				Important
		Lenze	Selection			
[C0006]	OP MODE	*	1 = SSC norm Y sensorless standard motor - star 2 = Servo async. Y asynchronous motor - star 3 = Servo PM-SM Y PM synchronous motor - star 11 = SSC standard motor, sensorless standard motor - delta 22 = Servo asyn Asynchronous motor - delta			**Motor control operation** → depending on C0086 • Change of C0086 resets value to the assigned default setting • Change of C0006 sets C0086 = 0!
C0009	LECOM ADDRESS	1	1	{1}	99	**LECOM controller address** Bus device number when operated via interface • 10, 20, ..., 90 reserved for broadcast to device groups for RS232, RS485, fibre optics.
C0011	NMAX	3000	500	{1 rpm}	16000	**Maximum speed Nmax** Reference value for the absolute and relative setpoint selection for the acceleration and deceleration times. • Parameter setting via interface: Large changes in one step should only be made when the controller is inhibited.
C0012	TIR (ACC)	0,000	0,000	{0,001 s}	999.900	**NSET acceleration time T_{ir}** for the main setpoint of NSET (refers to speed change 0 ... n_{max})
C0013	TIF (DEC)	0.000	0.000	{0.001 sec}	999.900	**NSET Deceleration time Tif** for the main setpoint of NSET (refers to speed change n_{max} ... 0)
C0017	FCODE (QMIN)	50	-16000	{1 rpm}	16000	**FCODE (Qmin)** Switching threshold $n_{act.} < n_x$ • $n_{act.} <$ C0017 activates the comparator output CMP1-OUT
C0018	FcHOP	1	0	{1}	2	**Chopper frequency fchop** Noise optimised operation with automatic changeover to 8 kHz 0 16/8 kHz 1 8 kHz sine 2 16 kHz sine
C0019	THRESH NACT=0	0	0	{1 rpm}	16000	**Threshold $n_{act.}$ =0** Detection of threshold at $n_{act.} = 0$
C0021	SLIPcOMP	0.00	0.00	{0.01 %}	20.00	**Slip compensation** • active only in sensorless control below the value of C0291
C0022	IMAX CURRENT	*	0	{0,01 A}	1.50 I_r	**I_{max} limit current** → depending on C0086 • Change of C0086 resets value to the assigned factory setting (1.5*Imotor)

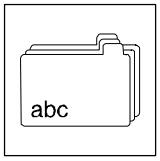


Appendix

Code	LCD	Possible settings				Important
		Lenze	Selection			
[C0025]	FEEDBACK TYPE	10	0 1 10 110 111 112 113 210 211 212 213 310 410	COMMON no feedback RSx (Resolver) IT-512-5V IT-1024-5V IT-2048-5V IT-4096-5V IS-512-5V IS-1024-5V IS-2048-5V IS-4096-5V AS-512-8V AM-512-8V		**Feedback** Input of the encoder specified on the nameplate of the Lenze motor: C0025 automatically changes C0420, C0490, C0495 • 0: C0420, C0490 or C0495 was changed subsequently • 1: Control without feedback system (sensorless control, SSC) • 10: The resolver is designated with RSxxxxxxxx. • 110: IT-512-5V • 111: IT-1024-5V • 112: IT-2048-5V 113: IT-4096-5V Incremental encoder with TTL level • 210: IS-512-5V 211: IS-1024-5V 212: IS-2048-5V 213: IS-4096-5V Sin/cos encoder • 310: AS-512-8V Multi turn Sin/cos encoder with RS485 interface Stegmann • 410: AM-512-8V single-turn Sin-Cos encoder, Stegmann
C0026			-199.99	{0.01 %}	199.99	**FCODE (OffsetAIN)** Freely assignable code for relative analog signals • Used for: – Offset for terminal X6/1,2 – Offset for terminal X6/3,4
1	FCODE (OFFSET)	0.00				
2	FCODE (OFFSET)	0.00				
C0027			-199.99	{0.01 %}	199.99	**FCODE (AIN)** Freely assignable code for relative analog signals • Used for: – Gain X6/1,2 – Gain X6/3,4
1	FCODE (GAIN)	100.00				
2	FCODE (GAIN)	100.00				
C0030	DFOUT CONST	3	0 1 2 3 4 5 6	256 inc/rev 512 inc/rev 1024 inc/rev 2048 inc/rev 4096 inc/rev 8192 inc/rev 16384 inc/rev		**DFOUT constant** Constant for the digital frequency output in increments per revolution
C0032	FCODE GEARBOX	1	-32767	{1}	32767	**FCODE (gearbox factor numerator)** Freely assignable code
C0033	GEARBOX DENOM	1	1	{1}	32767	**Gearbox factor denominator**
C0034	MST CURRENT	0	0 1 2	-10 V ... + 10 V +4 mA ... +20 mA -20 mA ... +20 mA		Selection **Master voltage/master current** for setpoint selection
C0037	SET-VALUE RPM	0	-16000	{1 rpm}	16000	**Setpoint selection (rpm)**
C0039			-199.99	{0.01 }	199.99	**NSET JOG setpoints** Fixed speeds (JOG setpoints) can be selected for NSET using digital inputs
1	JOG SET-VALUE	100.00				
2	JOG SET-VALUE	75.00				
3	JOG SET-VALUE	50.00				
4	JOG SET-VALUE	25.00				
5	JOG SET-VALUE	0.00				
...	..	...				
14	JOG SET-VALUE	0.00				
15	JOG SET-VALUE	0.00				

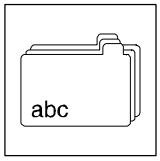


Code	LCD	Possible settings				Important
		Lenze	Selection			
C0040	CTRL ENABLE	1			0/1	**Controller enable** • 0: "Write", controls the code table • 1: "Read", reads the controller status
C0042	QSP	Disp	0 1	QSP inactive QSP active		**Quick stop**
C0043	TRIP RESET	0	0 1	Trip reset Fault		**Fault reset** Reset of an active trip: • Set C0043 = 0
C0045	Act JOG	Disp	0 1 2 ... 15	Nset active JOG 1 JOG 2 JOG 15		**NSET JOG selection**
C0046	N	Disp	-199.99	{0.01 %}	199.99	**NSET-N** Main setpoint
C0049	NADD	Disp	-199.99	{0.01 %}	199.99	**NSET-NADD** Additional setpoint
C0050	MCTRL-NSET2	Disp	-100.00	{0.01 %}	100.00	**MCTRL-NSET2** n_{set} at the speed controller input
C0051	MCTRL-NACT	Disp	-30000	{1 rpm}	30000	**Actual speed**
C0052	MCTRL-UMOT	Disp	0	{1 V}	800	**Motor voltage**
C0053	UG-VOLTAGE	Disp	0	{1 V}	900	**DC-bus voltage**
C0054	IMOT	Disp	0.0	{0.1 A}	300.0	**Imot (motor current)**
C0056	MCTRL-MSET2	Disp	-150.00	{0.01 %}	150.00	**MCTRL-MSET2 (Mset)** Torque setpoint (output n-controller)
C0057	MAX TORQUE	Disp	0	{1 Nm}	400	**Maximum torque (C86/C22)** Maximum possible torque of the drive configuration • depending on C0022, C0086
C0058	ROTOR DIFF	0.0	-180.0	{0.1 °}	179.9	**Rotor angle** Zero phase of the rotor for synchronous motors (C0095)
C0059	MOT POLE NO.	Disp	1	{1}	50	**Motor pole pair number**
C0060	ROTOR POS	Disp	0	{1}	2047	**Motor rotor position** • 1 turn = 2048 inc
C0061	HEATSINK TEMP	Disp	0	{1 °C}	100	**Heatsink temperature**
C0063	MOt tEMP	Disp	0	{1 °C}	200	**Motor temperature**
C0064	UTILIZATION	Disp	0	{1 %}	150	**Controller load Ixt** of the last 180 s • C0064 >100 % releases Trip OC5 • Trip reset only possible if C0064 < 95 %
C0067	ACT TRIP	Disp	all fault messages		→ Selection list 10	**Fault message TRIP** Momentary fault indication
C0070	VP SPEED CTRL	*	0.0	{0.5}	255.0	**V_{pn} speed controller** → depending on C0086 • Change of C0086 resets value to the assigned default setting
C0071	TN SPEED CTRL	*	1.0	{0.5 ms}	600.0	**T_{nn} speed controller** >512 ms switched off → depending on C0086 • Change of C0086 resets value to the assigned default setting
C0072	TD SPEED CTRL	0.0	0.0	{0.1 ms}	32.0	**T_{dn} speed controller**
C0075	VP CURR CTRL	0.35	0.00	{0.01}	15.99	**V_{pi} current controller**
C0076	TN CURR CTRL	1.8	0.5	{0.1 ms}	1999.0	**T_{ni} current controller** 2000 ms switched off
C0077	VP FIELD CTRL	0.25	0.00	{0.01}	15.99	**V_{pF} field controller**
C0078	TN FIELD CTRL	15.0	1.0	{0.5 ms}	7999.0	**T_{nF} field controller** 8000 ms switched off
[C0081]	MOT POWER	*	0.01	{0.01 kW}	150.00	**Rated motor power** to nameplate → depending on C0086 • Change of C0086 resets value to the assigned default setting • Change of C0081 sets C0086 = 0

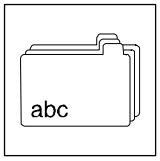


Appendix

Code	LCD	Possible settings			Important
		Lenze	Selection		
[C0084]	MOt RS	*	0.00	{0.01 Ω} 100.00	**Motor stator resistance** → depending on C0086 • Change of C0086 resets value to the assigned default setting
[C0085]	MOt LS	*	0.00	{0.01} 200.00	**Leakage inductivity of motor** → depending on C0086 • Change of C0086 resets value to the assigned default setting
[C0086]	MOt tYPE	*			**Motor type selection** → depends on the controller • Change of C0086 resets C0006, C0022, C0070, C0071, C0081, C0084, C0085, C0087, C0088, C0089, C0090, C0091 to the assigned default setting
			0	COMMON	no Lenze motor
			New generation Lenze asynchronous servo motors with integrated temperature monitoring via resolver or encoder cable. • The temperature monitoring via resolver or encoder cable is activated automatically, i.e.: C0583 = 0 C0584 = 2 C0594 = 0		
			10	DSKA56-140	MDSKAXX056-22, f_r: 140Hz
			11	DFKA71-120	MDFKAXX071-22, f_r: 120Hz
			12	DSKA71-140	MDSKAXX071-22, f_r: 140Hz
			13	DFKA80-60	MDFKAXX080-22, f_r: 60Hz
			14	DSKA80-70	MDSKAXX080-22, f_r: 70Hz
			15	DFKA80-120	MDFKAXX080-22, f_r: 120Hz
			16	DSKA80-140	MDSKAXX080-22, f_r: 140Hz
			17	DFKA90-60	MDFKAXX090-22, f_r: 60Hz
			18	DSKA90-80	MDSKAXX090-22, f_r: 80Hz
			19	DFKA90-120	MDFKAXX090-22, f_r: 120Hz
			20	DSKA90-140	MDSKAXX090-22, f_r: 140Hz
			21	DFKA100-60	MDFKAXX100-22, f_r: 60Hz
			22	DSKA100-80	MDSKAXX100-22, f_r: 80Hz
			23	DFKA100-120	MDFKAXX100-22, f_r: 120Hz
			24	DSKA100-140	MDSKAXX100-22, f_r: 140Hz
			25	DFKA112-60	MDFKAXX112-22, f_r: 60Hz
			26	DSKA112-85	MDSKAXX112-22, f_r: 85Hz
			27	DFKA112-120	MDFKAXX112-22, f_r: 120Hz
			28	DSKA112-140	MDSKAXX112-22, f_r: 140Hz
			Lenze asynchronous servo motors without integrated temperature monitoring • The temperature monitoring via resolver or encoder cable is deactivated automatically, i.e.: C0583 = 3 C0584 = 3 C0594 = 3		
			50	DSVA56-140	DSVAXX056-22, f_r: 140Hz
			51	DFVA71-120	DFVAXX071-22, f_r: 120Hz
			52	DSVA71-140	DSVAXX071-22, f_r: 140Hz
			53	DFVA80-60	DFVAXX080-22, f_r: 60Hz
			54	DSVA80-70	DSVAXX080-22, f_r: 70Hz
			55	DFVA80-120	DFVAXX080-22, f_r: 120Hz
			56	DSVA80-140	DSVAXX080-22, f_r: 140Hz
			57	DFVA90-60	DFVAXX090-22, f_r: 60Hz
			58	DSVA90-80	DSVAXX090-22, f_r: 80Hz
			59	DFVA90-120	DFVAXX090-22, f_r: 120Hz
			60	DSVA90-140	DSVAXX090-22, f_r: 140Hz
			61	DFVA100-60	DFVAXX100-22, f_r: 60Hz
			62	DSVA100-80	DSVAXX100-22, f_r: 80Hz
			63	DFVA100-120	DFVAXX100-22, f_r: 120Hz
			64	DSVA100-140	DSVAXX100-22, f_r: 140Hz
			65	DFVA112-60	DFVAXX112-22, f_r: 60Hz
			66	DSVA112-85	DSVAXX112-22, f_r: 85Hz
			67	DFVA112-120	DFVAXX112-22, f_r: 120Hz
			68	DSVA112-140	DSVAXX112-22, f_r: 140Hz

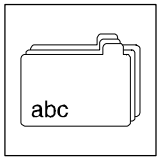


Code	LCD	Possible settings			Important
		Lenze	Selection		
			New generation Lenze synchronous servo motors with integrated temperature monitoring via resolver or encoder cable. • The temperature monitoring via resolver or encoder cable is activated automatically, i.e.: C0583 = 0 C0584 = 2 C0594 = 0		
			110	DSKS56-23-150	MDSKSXX056-23, f_r: 150Hz
			111	DSKS56-33-150	MDSKSXX056-33, f_r: 150Hz
			112	DSKS71-13-150	MDSKSXX071-13, f_r: 150Hz
			113	DFKS71-13-150	MDFKSXX071-13, f_r: 150Hz
			114	DSKS71-23-150	MDSKSXX071-23, f_r: 150Hz
			115	DFKS71-23-150	MDFKSXX071-23, f_r: 150Hz
			116	DSKS71-33-150	MDSKSXX071-33, f_r: 150Hz
			117	DFKS71-33-150	MDFKSXX071-33, f_r: 150Hz
			Lenze inverter motor in star connection • The temperature monitoring via resolver or encoder cable is deactivated automatically, i.e.: C0583 = 3 C0584 = 3 C0594 = 3		
			210	DXRA071-12-50	DXRAXX071-12, f_d: 50Hz
			211	DXRA071-22-50	DXRAXX071-22, f_d: 50Hz
			212	DXRA080-12-50	DXRAXX080-12, f_d: 50Hz
			214	DXRA090-12-50	DXRAXX090-12, f_d: 50Hz
			215	DXRA090-32-50	DXRAXX090-32, f_d: 50Hz
			216	DXRA100-22-50	DXRAXX100-22, f_d: 50Hz
			217	DXRA100-32-50	DXRAXX100-32, f_d: 50Hz
			218	DXRA112-12-50	DXRAXX112-12, f_d: 50Hz
			219	DXRA132-12-50	DXRAXX132-12, f_d: 50Hz
			220	DXRA132-22-50	DXRAXX132-22, f_d: 50Hz
			221	DXRA160-12-50	DXRAXX160-12, f_d: 50Hz
			222	DXRA160-22-50	DXRAXX160-22, f_d: 50Hz
			223	DXRA180-12-50	DXRAXX180-12, f_d: 50Hz
			224	DXRA180-22-50	DXRAXX180-22, f_d: 50Hz
			Lenze inverter motor in delta connection • The temperature monitoring via resolver or encoder cable is deactivated automatically, i.e.: C0583 = 3 C0584 = 3 C0594 = 3		
			250	DXRA071-12-87	DXRAXX071-12, f_d: 87Hz
			251	DXRA071-22-87	DXRAXX071-22, f_d: 87Hz
			252	DXRA080-12-87	DXRAXX080-12, f_d: 87Hz
			254	DXRA090-12-87	DXRAXX090-12, f_d: 87Hz
			255	DXRA090-32-87	DXRAXX090-32, f_d: 87Hz
			256	DXRA100-22-87	DXRAXX100-22, f_d: 87Hz
			257	DXRA100-32-87	DXRAXX100-32, f_d: 87Hz
			258	DXRA112-12-87	DXRAXX112-12, f_d: 87Hz
			259	DXRA132-12-87	DXRAXX132-12, f_d: 87Hz
			260	DXRA132-22-87	DXRAXX132-22, f_d: 87Hz
			261	DXRA160-12-87	DXRAXX160-12, f_d: 87Hz
			262	DXRA160-22-87	DXRAXX160-22, f_d: 87Hz
			263	DXRA180-12-87	DXRAXX180-12, f_d: 87Hz
			264	DXRA180-22-87	DXRAXX180-22, f_d: 87Hz
[C0087]	MOT SPEED	*	300	{1 rpm} 16000	**Rated motor speed** → depending on C0086 • Change of C0086 resets value to the assigned default setting
[C0088]	MOT CURRENT	*	0.5	{0.1 A} 300.0	**Rated motor current** → depending on C0086 • Change of C0086 resets value to the assigned default setting
[C0089]	MOT FREQUENCY	*	10	{1 Hz} 1000	**Rated motor frequency**
[C0090]	MOt VOLtAGE	*	50	{1 V} 500	**Rated motor voltage** → depending on C0086 • Change of C0086 resets value to the assigned default setting

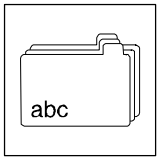


Appendix

Code	LCD	Possible settings				Important
		Lenze	Selection			
[C0091]	MOt cOS PHI	*	0.50	{0.01}	1.00	**Motor cos φ** → depending on C0086 • Change of C0086 resets value to the assigned default setting
C0093	DRIVE IDENT	Disp	0 1 93xx	invalid none 93xx		**Controller identification** 93xx: Type Lenze Positioning Controller
C0094	PASSWORD	0	0		9999	**Password** • Parameter access protection for the operating module. When the password is activated, only the codes of the user menus can be accessed. For further selection possibilities see C0096
[C0095]	ROTOR POS ADJ	0	0 1	inactive active		**Rotor position adjustment** of a synchronous motor • C0058 displays the zero angle of the rotor • C0095 = 1 starts position adjustment
[C0096] 1 2	AIF PROTECT. CAN PROTECT.	0 0	0 1 2 3	No password protection Read protection Write protection Read/Write protection		**/1: AIF access protection** **/2: CAN access protection** Extended password protection for bus systems with activated password (C0094). • All codes in the user menu can be accessed.
C0099	S/W VERSION	Disp	x.xx			**Software version**
C0100 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16	CDATA CCTRL VMAS YSET CLUTCH1 CSEL CSEL CONVPHD1 ? MSEL1 MSEL2 CCTRL WELD RFGPH1 CONVPHPHD1 CURVEC1	Disp	1	{1 ns}	32767	Power-optimised operation
C0101 1 2 ... 15	NSET-Tir (HOcHLF.) NSET Tir ... NSET-Tir	 0.000 0.000 ... 0.000	0.000	{0.001 sec}	999.900	**NSET-Tir (additional acceleration)** for the main setpoint of NSET (refers to speed change 0...$n_{max.}$)
C0103 1 2 ... 15	NSET-TIF NSET-TIF ... NSET-TIF	 0.000 0.000 ... 0.000	0.000	{0.001 sec}	999.900	**NSET-Tif (additional deceleration)** Additional deceleration times T_{if} for the main setpoint of NSET (refers to speed change 0...$n_{max.}$)
C0105	QSP TIF	0.000	0.000	{0.001 sec}	999.900	**QSP deceleration time** Deceleration time quick stop (QSP) Refers to speed change 0...$n_{max.}$
C0108 1 2	FCOD (VERST.AOUT) FCOD (VERST.AOUT)	100.00	-199.99	{0.01 %}	199.99	**FCOD (gain AOUT)**
C0109	FCODE (OFFSET) FCODE (OFFSET)	 0.00 0.00	-199.99	{0.01 %}	199.99	**FCODE (offset AOUT)**

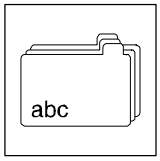


Code	LCD	Possible settings					Important
		Lenze	Selection				
C0114							**DIGIN Polarity**
1	DIGIN1 POL	0	1	X5/E1			Terminal polarity
2		0	2	X5/E2			0:HIGH active; 1: LOW active
3	..	0	3	X5/E3			
4		1	4	X5/E4			
5	DIGIN5 POL	0	5	X5/E5			
[C0116]		1000	FIXED 0			→ Selection list 2	Signal configuration **FD0-xx**
1	FD0-00						Free digital outputs can only be evaluated when networked with automation interfaces.
...	...						
32	FD0-31						
[C0117]		*				→ Selection list 2	Signal configuration **DIGOUT-x**
1	DIGOUT1	15000	DCTRL-TRIP				→ depending on C0005
2	DIGOUT2	10650	CMP1-OUT				1 X5/A1
3	DIGOUT3	500	DCTRL-RDY				2 X5/A2
4	DIGOUT4	5003	MCTRL-MMAX				3 X5/A3
							4 X5/A4
C0118					0/1		**DIGOUTx polarity** Terminal polarity
1	DIGOUT1 POL	1					0 HIGH active
2	DIGOUT2 POL	1					1 LOW active
3	DIGOUT3 POL	0					1: X5/A1, 2: X5/A2, 3: X5/A3, 4: X5/A4
4	DIGOUT4 POL	0					
C0121	OH7 LIMIT	150	45		{1 °C}	150	**Temperature for OH7**
							Threshold for motor temperature warning
C0122	OH4 LIMIT	85	45		{1 °C}	85	**Temperature for OH4**
							Threshold for heatsink temperature warning
C0125	BAUDRATE	0	0	9600 baud			**LECOM baud rate**
			1	4800 baud			LECOM baud rate for 2102 module
			2	2400 baud			
			3	1200 baud			
			4	19200 baud			
C0126	MONIT CE0	3	0	Trip			**Conf. CE0**
			2	Warning			Configuration monitoring: communication error with automation interface CE0
			3	Off			
C0130	Act Ti	Disp					**NSET act. Ti times**
							active $T_i$times of NSET
C0134	RFG CHARAC	0	0	linear			**NSET RFG characteristic**
			1	S-shaped			Ramp characteristic for main setpoint
C0135	CONTROL WORD	0	0		{1}	65535	**Control word**
							Controller control word for LECOM-A/B/LI or operating module.
C0136		Disp					
1	CTRLWORD C135						**Control word C135**
2	CTRLWORD CAN						**Control word CAN**
3	CTRLWORD AIF						**Control word AIF**
C0141	FCODE (SEtVAL)	0.0	-199.9		{0.1}	199.9	**Main setpoint**
C0142	START OPTIONS	1	0	Start lock			**Start option**
			1	Autostart			Start conditions are executed:
							• after mains connection
							• after message (t > 0.5s)
							• after trip
C0150	STATUS WORD	Disp	0		{1}	65535	**Status word** when networked with automation interfaces
							• Binary interpretation indicates the bit states
C0151	FD0 (DW)	Disp					Display (hex.) of the free digital output signals configured through C0116
							• Binary interpretation indicates the bit states

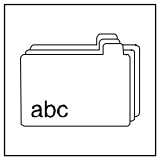


Appendix

Code	LCD	Possible settings				Important
		Lenze	Selection			
[C0156]					→ Selection list 2	Configuration of the free bits of the status word
1	STAT.B0	1000	DCTRL-PAR*1-0			
2	STAT.B2	5002	MCTRL-IMAX			
3	STAT.B3	5003	MCTRL-MMAX			
4	STAT.B4	5050	NSET-RFG I=0			
5	STAT.B5	10650	CMP1-OUT			
6	STAT.B14	505	DCTRL-CW/CCW			
7	STAT.B15	500	DCTRL-RDY			
C0157	(C0156)	Disp	0		1	
C0161	ACT TRIP	Disp	All fault indications			**Fault indication trip** Momentary fault indication (as under C0168/1)
C0167	RESET FAILMEM	0	0	No reset		**History buffer reset** Clears the history buffer
			1	Reset		
C0168		Disp	All fault indications			List of faults
1	FAIL NO. ACT					**C1: Actual fault** (active)
2	FAIL NO. OLD1					**2 ... 8: Fault history 1 .. 7** (2: last fault in history buffer, 3: last but one fault in history buffer, etc.)
..	..					
8	FAIL NO. OLD7					
C0169		Disp	Corresponding mains switch-on time			List, if fault occurred in C0168 (ref.: C0179)
1	FAILTIME Act					**1: F time, current**
2	FAILTIME OLD1					**2 .. 8: F time, history 1 .. 7**
..	..					
8	FAILTIME OLD7					
C0170		Disp	Corresponding mains switch-on time			List, how often the faults under C0168 occurred. History buffer
1	COUNTER ACT					**1: F counter, current** (active)
2	COUNTER OLD1					**2 .. 8: F counter history** (history buffer 2: last fault in history buffer, 3: last but one fault in history buffer, etc.)
..	..					
8	COUNTER OLD7					
[C0172]	OV REDUCE	10	0	{10 V}	100	**OV reduce** Threshold to activate the brake torque reduction before OU fault
[C0173]	UG LIMIT	1				**Adaptation UG thresholds** (UG = DC-bus voltage) Check during commissioning and adapt, if necessary! All drive components in DC bus connections must have the same thresholds! • 0: Operation on mains <400 V with or without brake unit • 1: Operation on 400 V mains with or without brake unit • 2: Operation on 460 V mains with or without brake unit • 3: Operation on 480 V mains without brake unit • 4: Operation on 480 V mains with brake unit
			0	Mains<400V+-B		
			1	Mains=400V+-B		
			2	Mains=460V+-B		
			3	Mains=480V-B		
			4	Mains=480V+B		
C0178	OP TIMER	Disp	0	{1 sec}	4294967295	**Elapsed operating time meter** • Time when the controller was enabled
C0179	MAINS TIMER	Disp	0	{1 sec}	4294967295	**Mains switch-on time meter** • Time when the mains was switched on
C0182	TI S-SHAPED	20.00	0.01 sec	{0.01 sec}	50.00 sec	**NSET Ti-S shape RFG** T_i time of the S-shape ramp function generator for NSET (determines the shape of the S-curve) • low values ⇒kleiner S-Verschliff • high values ⇒großer S-Verschliff
C0190	NSET ARIT	0	0	OUT = C46		**NSET Arithmetic function** Arithmetic block in the function block NSET. Connects main setpoint C0046 and additional setpoint C0040
			1	C46 + C49		
			2	C46 - C49		
			3	C46 * C49		
			4	C46 / C49		
			5	C46/(100 - C49)		

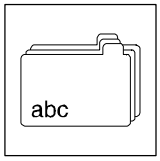


Code	LCD	Possible settings				Important
		Lenze	Selection			
C0195	BRK1 T Act	99.9	0.0	{0.1 sec}	99.9	**BRK1 Brake engagement time** Engagement time of the mechanical holding brake • After the time elapsed under C0195, the status "mechanical brake closed" is reached
C0196	BRK T RELEASE	0.0	0.0	{0.1 sec}	60.0	**BRK1 Disengagement time of the brake** Disengagement time of the mechanical holding brake (Technical data of brakes) • After the time has elapsed under C0196, the status "mechanic brake open" is reached.
C0200	S/W ID	Disp				**Software ID number** (identification of software)
C0201	S/W DATE	Disp				Date of **software generation**
C0203	KOMM.-NO.	Disp	x / xxxx / xxxxx			**Commission number**
C0204	SERIAL-NO.	Disp	0	{1}	65535	**Serial number**
C0207	DL INFO 1	Disp				**Download-info 1**
C0208	DL INFO 2	Disp				**Download-info 2**
C0209	DL INFO 3	Disp				**Download-info 3**
C0220	NSET TIR ADD	0.000	0.000	{0.001 sec}	999.900	**NSET Tir additional setpoint** Acceleration time T_{ir} of the additional setpoint for NSET (refers to speed change 0...$n_{max.}$)
C0221	NSET TIF ADD	0.000	0.000	{0.001 sec}	999.900	**NSET Tif additional setpoint** Deceleration time T_{if} of the additional setpoint for NSET (refers to speed change 0...$n_{max.}$)
C0222	PCTRL VP	1.0	0.1	{0.1}	500.0	**PCTRL Vp gain**
C0223	PCTRL TN	400	20	{1 msec}	99998	**PCTRL Tn integral component** 99999 ms: switched off
C0224	PCTRL KD	0.0	0.0	{0.1}	5.0	**PCTRL Kd differential component**
C0241	cMP RFG-I = 0	1.00	0.00	{0.01 %}	100.00	**NSET threshold RFG on=off** Threshold ramp function generator for main setpoint Input = output , (100 % = n_{max})
C0244	BRK M SET	0.00	-100.00	{0.01 %}	100.00	**BRK1 holding torque** Holding torque of the DC injection brake 100 % = value of C0057
C0250	FCODE 1BIT	0	0 lower limit 1 upper limit			**FCODE 1 bit digital**
C0252	ANGLE OFFSET	0	-245760000	{1 inc}	245760000	**DFSET phase offset** Fixed phase offset for digital frequency configuration • 1 turn = 65536 inc
C0253	ANGLE N-TRIM	*	-32767	{1 inc}	32767	**DFSET n-dependent phase trimming** speed-dependent phase trimming → depending on C0005, C0025, C0490 • Change of C0005, C0025, or C0490 resets C0253 to the default setting • 1 turn = 65536 inc • C0253 is reached at 15000 rpm
C0254	VP ANGLE CTRL	0.40	0.0000	{0.0001}	3.9999	**MCTRL Vp phase controller**
C0255	THRESHOLD P03	327680	10	{1 inc}	1800000000	**Contouring error limit P03** • 1 turn = 65536 inc • Following error > C0255 releases fault "P03"
C0260	MPOT1 HIGH	100.00	-199.99	{0.01 %}	199.99	**MPOT1 upper limit** Condition: C0260 > C0261
C0261	MPOT1 LOW	-100.0	-199.99	{0.01 %}	199.99	**MPOT1 lower limit** Condition: C0261 < C0260
C0262	MPOT1 TIR	10.0	0.1	{0.1 sec}	6000.0	**MPOT1 Tir Acceleration time** refers to change 0...100 %
C0263	MPOT1 TIF	10.0	0.1	{0.1 sec}	6000.0	**MPOT1 Tif Deceleration time** Refers to change 0...100 %

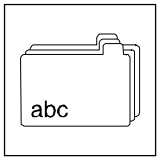


Appendix

Code	LCD	Possible settings				Important
		Lenze	Selection			
C0264	MPOT1 ON/OFF	0	0	no change		**MPOT1 on/off** Deactivation function of motor potentiometer • Function which is executed when motor potentiometer is deactivated via the input MPOT1-INACTIVE.
			1	Deceleration with T_{if} to 0%		
			2	Deceleration with T_{if} to C0261		
			3	Inhibit with T_{if} = 0 to 0%		
			4	Inhibit with T_{if} = 0 to C0261		
			5	Acceleration with T_{ir} to C0260		
C0265	MPOT1 INIT	0	0	Value during mains failure		**MPOT1 initialisation** • Value which is accepted during mains switching and activated motor potentiometer.
			1	lower limit of C0261		
			2	0 %		
[C0267]		1000	FIXED0		→ Selection list 2	Digital inputs motor potentiometers **1: Mpot-UP** **2: MPOT-Down**
1	UP					
2	DOWN					
[C0268]	INACT	1000	FIXED 0		→ Selection list 2	**MPOT1-INACT** Configuration motor potentiometer input
C0269		Disp				
1	(C0267/1)					
2	(C0267/2)					
3	(C0268)					
C0291	SSC OVERRIDE	0	0	{1 rpm}	16000	**SSC-override frequency** Override frequency for the transition from sensorless control to controlled operation
C0292	SSC IM SET	0.00	0.00	{0.01 A}	500.00	**SSC Im-setpoint** Motor current - Set approx. 1.0 to 1.1 times rated motor current for sensorless speed control. Setpoint
C0293	SSC DYNAMIC	0.00	0.00	{0.01 %}	199.00	**SSC dynamic** Dynamic motor current constant boost
C0294	VP FRQ CTRL	*	0.0	{0.1}	99.9	**SSC dynamic constant** Proportional gain controller * depending on C0086
C0295	TN FRQ CTRL	*	2	{1 msec}	20000	**Tn Frequency controller** Adjustment time frequency controller * depending on C0086
C0296	DYNAMIC CONST	100	0	{0.1}	32767	**Dynamic constant**
C0325	VP2 ADAPT	1.0	0.1	{0.1}	500.0	**PCTRL Adaptation Vp2** Process controller adaptation gain (V_{p2})
C0326	VP3 ADAPT	1.0	0.1	{0.1}	500.0	**PCTRL Adaptation Vp3** Process controller adaptation gain (V_{p3})
C0327	SET2 ADAPT	100.00	0.00	{0.01 %}	100.00	**PCTRL Adaptation nset2** Speed setpoint threshold of process controller adaptation (condition: C0327 > C0328)
C0328	SET1 ADAPT	0.00	0.00	{0.01 %}	100.00	**PCTRL Adaptation nset1** Speed setpoint threshold of process controller adaptation (condition: C0328 < C0327)
C0329	ADAPT ON/OFF	0	0	No process controller adaptation		**PCTRL Adaptation on/off** Activate process controller adaptation
			1	External via input		
			2	Adaptation via setpoint		
			3	Adaptation via control difference		
C0332	PCTRL TIR	0.000	0.000	{0.001 sec}	999.900	**PCTRL Tir (acceleration time)** Refers to setpoint change 0...100 %
C0333	PCTRL TIF	0.000	0.000	{0.001 sec}	999.900	**PCTRL Tif (deceleration time)** Refers to setpoint change 0...100 %
C0336	ACT VP	Disp	0.0	{0.1}	500.0	**PCTRL actual Vp**
C0337	BI/UNIPOLAR	0	0	bipolar		**PCTRL bipolar/unipolar** Range bipolar/unipolar
			1	unipolar		
C0338	ARIT1 FUNCT	1	0	OUT = IN1		**ARIT1 function**
			1	IN1 + IN2		
			2	IN1 - IN2		
			3	IN1 * IN2		
			4	IN1 / IN2		
			5	IN1/(100% - IN2)		

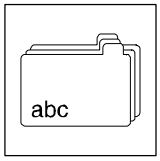


Code	LCD	Possible settings					Important
		Lenze	Selection				
[C0339]		1000	FIXED 0 %			→ Selection list 1	Configuration arithmetic block ARIT1
1	ARIT1-IN1						**1: ARIT1-IN1**
2	ARIT1-IN2						**2: ARIT1-IN2**
C0340	(C0339)	Disp					
[C0350]	CAN ADDRESS	1	1		{1}	63	**CAN node address**
[C0351]	CAN BAUDRATE	0	0	500 kbit/s			**CAN Baud rate**
			1	250 kbit/s			
			2	125 kbit/s			
			3	50 kbit/s			
			4	1000 kbit/s			
[C0352]	CAN MST	0	0	Slave			**CAN master operation** set up
			1	Master			
C0353			0	C350			Source for CAN bus IN/OUT addresses
1	CAN ADDR SEL1	0	1	C354			**1: CAN IN1/OUT1 Adr**
2	CAN ADDR SEL2	0					**2: CAN IN2/OUT2 Adr**
3	CAN ADDR SEL3	0					**3: CAN IN3/OUT3 Adr**
C0354			1		{1}	513	CAN-Bus OUT node addresses 2
1	IN1 ADDR2	1					
2	OUT2 ADDR2	129					
3	IN2 ADDR2	257					
4	OUT2 ADDR2	258					
5	IN3 ADDR2	385					
6	OUT2 ADDR2	386					
C0355		Disp	0		{1}	2047	CAN bus identifier
1	IN1 ID						
2	OUT1 ID						
3	IN2 ID						
4	OUT2 ID						
5	IN3 ID						
6	OUT3 ID						
C0356			0		{1 msec}	65000	CAN bus time settings
1	CAN BOOT UP	3000					**1: CAN Boot-Up**
2	OUT2 CYCLE	0					**2: CAN-OUT2 cycle**
3	OUT3 CYCLE	0					**3: CAN-OUT3 cycle**
4	CAN DELAY	20					**4: CAN OUT 2/3 delay time**
[C0357]		3000	0		{1 msec}	65000	CAN bus monitoring time for I_{rx}
1	CE1MONIT TIME						**1: CE1 monit. time**
2	CE2MONIT TIME						**2: CE2 monit. time**
3	CE3MONIT TIME						**3: CE3 monit. time**
C0358	RESET NODE	0	0	No function			**CAN reset node**
			1	CAN reset			Install CAN bus reset node
C0359	CAN STATE	Disp					**CAN status**
			0	Operational			
			1	Pre-operational			
			2	Warning			
			3	Bus off			
C0360		Disp	0	65535			Telegram counter (number of telegrams) Counter > 65535: start at 0 • 1: all sent • 2: all received • 3: sent to CAN-OUT1 • 4: sent to CAN-OUT2 • 5: sent to CAN-OUT3 • 6: sent to parameter channel 1 • 7: sent to parameter channel 2 • 8: received from CAN-IN1 • 9: received from CAN-IN2 • 10: received from CAN-IN3 • 11: received from parameter channel 1 • 12: received from parameter channel 2
1	MESSAGE OUT						
2	MESSAGE IN						
3	MESSAGE OUT1						
4	MESSAGE OUT2						
5	MESSAGE OUT3						
6	MESSAGE POUT1						
7	MESSAGE POUT2						
8	MESSAGE IN1						
9	MESSAGE IN2						
10	MESSAGE IN3						
11	MESSAGE PIN1						
12	MESSAGE PIN2						

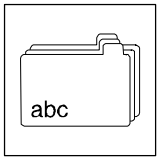


Appendix

Code	LCD	Possible settings				Important
		Lenze	Selection			
C0361 1 2 3 4 5 6 7 8 9 10 11 12		Disp	0	100 %		CAN bus load To ensure a perfect operation, the total bus load (all connected devices) should be less than 80% • 1: all sent • 2: all received • 3: sent to CAN-OUT1 • 4: sent to CAN-OUT2 • 5: sent to CAN-OUT3 • 6: sent to parameter channel 1 • 7: sent to parameter channel 2 • 8: received from CAN-IN1 • 9: received from CAN-IN2 • 10: received from CAN-IN3 • 11: received from parameter channel 1 • 12: received from parameter channel 2
C0362	SYNC CYCLE	1.0	-32.0	{0.1 ms}	32.0	**CAN Sycn cycle** Time between two sync telegrams on the system bus
C0363	SYNC CORR	1	1 2 3 4 5	0.8 µs 1.6 µs 2.4 µs 3.2 µs 4.0 µs		**CAN Sync correction** Correction value for C0362
[C0364]	CAN ACTIV	1000			→ Selection list 2	**Pre-operat. after operat.** Activate process data externally. Changeover from pre-operation to operation
C0365	(C0364)	Disp				Input signal CAN active
C0366	SYNC RESPONSE	1	0 1	no sync response sync response		**CAN Sync Response**
C0367	SYNC RX ID	128	1	{1}	256	**CAN Sync Rx Identifier**
C0368	SYNC TX ID	128	1	{1}	256	**CAN Sync Tx Identifier**
C0369	SYNC TX TIME	0	0	{1}	65000	**CAN Sync Tx Time**
C0387	-	0	0 1	Current data field Background data field		**Profile data field**
C0389	-	0	0 1	CAM-DATA offline CAM-DATA online		**Cam profile data**
C0390/0		2	1 / 2 / 4 / 8			**No. of profiles**
C0391 1 2 ... 8		-	2	{1}	512	Number of points 1: Profile 0 2: profile 1 ... 8: Profile 7 The number of points can be changed ONLINE if C0389/0 = 1 has been set before. A default setting is not available since the number of points is preset by the profile download which is always carried out before. The number of points available depends on the number of profiles selected.
C0392 1 2 ... 128		-	0	{1}	+2147483647	X coordinate, part 1 The coordinate is addressed via the subcode. E.g.: C0392/1 = X1, C0392/2 = X2, ... of profile 0 (entries for C0390/0 =2, see graphics) The values must be entered in ascending order, otherwise NAK

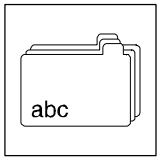


Code	LCD	Possible settings				Important
		Lenze	Selection			
C0393 1 2 ... 128		-	0	{1}	+2147483647	X coordinates, part 2 The coordinate is addressed via the subcode. E.g.: C0393/1 = X129, C0393/2 = X130, C393/3 = X131, ... of profile 0 (entries for C0390/0 =2, see graphics) The values must be entered in ascending order, otherwise NAK
C0394 1 2 ... 128		-	0	{1}	+2147483647	X coordinate, part 3 The coordinate is addressed via the subcode. E.g.: C0394/1 = X1, C0394/2 = X2, ... of profile 1 (entries for C0390/0 =2, see graphics) The values must be entered in ascending order, otherwise NAK
C0395 1 2 ... 128		-	0	{1}	+2147483647	X coordinates, part 4 The coordinate is addressed via the subcode. E.g.: C0395/1 = X129, C0395/2 = X130, ... of profile 1 (entries for C0390/0 =2, see graphics) The values must be entered in ascending order, otherwise NAK
C0396 1 2 ... 128		-	-2147483647	{1}	+2147483647	Y coordinates, part 1 The coordinate is addressed via the subcode. E.g.: C0396/1 = Y1, C0364/2 = Y2, ... of profile 0 (entries for C0390/0 =2, see graphics)
C0397 1 2 ... 128		-	-2147483647	{1}	+2147483647	Y coordinates, part 2 The coordinate is addressed via the subcode. E.g.: C0397/1 = Y129, C0397/2 = Y130, ... of profile 0 (entries for C0390/0 =2, see graphics)
C0398 1 2 ... 128		-	-2147483647	{1}	+2147483647	Y coordinate, part 3 The coordinate is addressed via the subcode. E.g.: C0398/1 = Y1, C0398/2 = Y2, ... of profile 1 (entries for C0390/0 =2, see graphics)
C0399 1 2 ... 128		-	-2147483647	{1}	+2147483647	Y coordinates, part 4 The coordinate is addressed via the subcode. E.g.: C0399/1 = Y129, C0399/2 = Y130, ... of profile 1 (entries for C0390/0 =2, see graphics)
C0400	OUT	Disp	-199.99	{0,01 %}	199.99	Output of **AIN1-OUT**
[C0402]	OFFSEt	19502	FCODE-26/1		→ Selection list 1	**AIN1-OFFSET** Configuration offset of AIN1
[C0403]	GAIN	19504	FCODE-27/1		→ Selection list 1	**AIN1-GAIN** Configuration gain of AIN1
C0404 1 2	(C0402) (C0403)	Disp	-199.99 ... 199.99			Input signals of AIN1
C0405	OUT	Disp	-199.99 ... 199.99			**AIN2-OUT** (output of AIN2)
[C0407]	OFFSEt	19503	FCODE-26/2		→ Selection list 1	**AIN2-OFFSET** Configuration offset of AIN2
[C0408]	GAIN	19505	FCODE-27/2		→ Selection list 1	**AIN2-GAIN** Configuration gain of AIN2
C0409 1 2	(C0407) (C0408)	Disp	-199.99	{0.01 %}	199.99	Input signals of AIN2
[C0416]	RESOLVER ADJ	0	0	{1}	99999999	Correction **Resolver error** For Lenze motors: • Read resolver error from the nameplate
[C0420]	ENCODER CONST	512	256	{1 inc/rev}	8192	Encoder constant for **encoder input X8** in increments per revolution

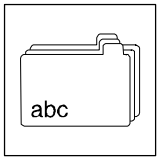


Appendix

Code	LCD	Possible settings					Important
		Lenze	Selection				
[C0421]	ENC VOLTAGE	5.00	5.00	{0.1V}		8.00	Setting the **encoder voltage supply** • CAUTION: incorrect input may destroy the encoder
C0425	DFIN CONST	3	0 256 inc/rev 1 512 inc/rev 2 1024 inc/rev 3 2048 inc/rev 4 4096 inc/rev 5 8192 inc/rev 6 16384 inc/rev				**DFIN const. LF input** Increment of the digital frequency input
C0426	DFIN-OUT	Disp	-32767	{1rpm}		32767	Output signal of DFIN
C0427	DFIN FUNCTION	0	0 2 phases 1 A pulse / B dir 2 Pulse A or B				**DFIN function** Type of the digital frequency signal
C0430 1 .. 5	 TP1 DELAY .. TP5 DELAY	0.218	0.000	{0.001ms}		2.000	 **1: TP1 delay (X5/E1)** .. **2: TP5 delay (X5/E1)**
[C0431]	IN	5001	MCTRL-NACT		→ Selection list 1		**AOUT1-IN** (Input AOUT1)
[C0432]	OFFSET	19512	FCODE-109/1		→ Selection list 1		**AOUT1-OFFSET**
[C0433]	GAIN	19510	FCODE-108/1		→ Selection list 1		**AOUT1-GAIN** (Gain AOUT1)
C0434 1 2 3	 (C0431) (C0432) (C0433)	Disp	-199.99	{0.01 %}		199.99	
[C0436]	IN	5002	MCTRL-MSET2		→ Selection list 1		**AOUT2-IN** (Input AOUT2)
[C0437]	OFFSET	19513	FCODE-109/2		→ Selection list 1		Offset AOUT2
[C0438]	GAIN	19511	FCODE-108/2		→ Selection list 1		**AOUT2-GAIN** (Gain AOUT2)
C0439 1 2 3	 (C0436) (C0437) (C0438)	Disp	-199.99	{0.01 %}		199.99	
[C0440]	STATE-BUS	1000			→ Selection list 2		Configuration state bus X5/ST
C0441	(C0440)	Disp					
C0443	DIGIN-OUT	Disp	0	{1}		255	Signals at X5/E1 to X5/E5, decimal value • Binary interpretation indicates terminal signals
C0444	(C0118)	Disp	0			1	
[C0450]	NX	1000	FIXED 0 %		→ Selection list 1		**BRK1-NX** Configuration analog input of BRK1
[C0451]	SET	1000	FIXED 0		→ Selection list 2		**BRK1-ON** Digital input of BRK1
[C0452]	SIGN	1000	FIXED 0 %		→ Selection list 1		**BRK1-sign** Configuration analog input of BRK1
C0458 1 2	 (C0450) (C0452)	Disp	-199.99	{0.01 %}		199.99	
C0459	(C0451)	Disp					
C0464	CUSTOMER I/F	Disp	0 original 1 changed				**Customer interface** Status of selected basic configuration • Reassignment of terminals in a basic configuration from C0005 does not change C0005 and sets C0464 = 1 • Adding or removing function blocks or changing the signal flow among the function blocks in a basic configuration of C0005 sets C0005 = 0 and C0464= 1

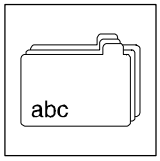


Code	LCD	Possible settings				Important
		Lenze	Selection			
[C0465]	FB LIST	*			→ Selection list 5	**FB processing list** Contains the program of signal processing (sequence in which the function blocks are processed) → depending on C0005 Change of C0005 loads assigned processing list → valid for C0005 = 1000 • After changing the signal flow correct the processing list in every case. Otherwise, the device may use the wrong signals! • The function blocks DIGIN, DIGOUT, AIF-IN, CAN-IN, and MCTRL are always processed, and do not have to be entered in the list.
1		200				
2		0				
3		50				
4		0				
5		0				
6		55				
7		0				
8		0				
9		10250				
10		0				
11		0				
12		0				
13		5650				
14		0				
15		0				
16		5050				
...		0				
19		5700				
...		0				
22		10650				
...		0				
25		70				
...		0				
28		75				
...		0				
31		250				
...		0				
41		25000				
42		20000				
...		0				
49		0				
50		0				
C0466	CPU T REMAIN	Disp				**Processing time** remaining for processing function blocks
[C0469]	FCT STP KEY	2	0	switched off		**Function key Stop** (keypad) • Function is activated when pressing the STOP key.
			1	Controller inhibit		
			2	Quick stop		
C0470			0		{1} 255	Freely assignable code for digital signals • The data words C0470 and C0471 are in parallel and are identical
0	FCODE 8BIT DIGITAL	0				
1	FCODE BIT 0-7	0				
2	FCODE BIT8-15	0				
3	FCODE BIT16-23	0				
4	FCODE BIT24-31	0				
C0471	FCODE 32 BIT	0	0		{1} 4294967296	**FCODE 32 bit digital** Freely assignable code for digital signals • The data words C0470 and C0471 are in parallel and are identical
C0472	FCODE ANALOG		-199.99		{0.01 %} 199.99	Freely assignable code for relative analog signals
1		0.00				
2		0.00				
3		100.00				
6		100.00				
...		...				
19		0.00				
20		0.00				
C0473	FCODE ABS		-32767		{1} 32767	**FCODE An.-absolute** Freely assignable code for absolute analog signals
1		1				
2		1				
3		0				
...		...				
9		0				
10		0				

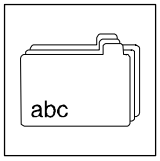


Appendix

Code	LCD	Possible settings				Important
		Lenze	Selection			
C0474 1 .. 8	FCODE PH	0	-2147483648	{1}	2147483648	**FCODE phase** Freely assignable code for phase signals 1 turn = 65536 inc
C0475 1 2	FCODE DF	0	-16000	{1 rpm}	16000	**FCODE speed/digital frequency** Freely assignable code for phase difference signals • 1 turn = 65536 inc
[C0490]	FEEDBACK POS	0	0 Resolver at X7 1 Encoder TTL at X8 2 Encoder sin at X8 3 Absolute ST at X8 4 Absolute MT at X8			**Position feedback system** Feedback system for position controller • C0490 = 0, 1, 2 can be mixed with C0495 = 0, 1, 2 • C0490 = 3, 4 sets C0495 to the same value
[C0495]	FEEDBACK N	0	0 Resolver at X7 1 Encoder TTL at X8 2 Encoder sin at X8 3 Absolute ST at X8 4 Absolute MT at X8			**Speed feedback system** Feedback system for the speed controller • C0495 = 0, 1, 2 can be mixed with C0490 = 0, 1, 2 • C0495 = 3, 4 also sets C0490 to the same value
C0497	NACT-FILTER	2.0	0.0 (0 ms: switched off)	{0.1 ms}	50.0	**Nact-filter time constant** Time constant for actual speed
C0503 1 2	-	0	0.0	{1}	65535	Password protection for profile data **1: PIN profile data** Avoids copying of profile data an the parameter set **2: Master PIN profile data** Deletion of PIN (e.g. if you cannot remember the PIN) through Master PIN.
C0504 1 2	-	0	0.0	{1}	65535	Profile data block transfer **1: Reading of block data** Transfer 0 with C0505/1: Set the pointer in the controller at the beginning of the profile data field · Then transfer the profile data to the superimposed control by reading code C0504/2 several times. Please observe: • With every datum output, the pointer is set to the next element in the profile data field. • 1241 data (32 bit values) must be read. • If the version ID is to be read too, set C0506/1 accordingly. • The corresponding check sum can be read from C0509/0. **2: Writing of block data** Transfer 0 with C0505/2: Set the pointer at the beginning of the profile data field. Then all lines will be written to code C0504/1. Before sending more data, the transfer must be acknowledged by the controller. Observe: • Every line (except version ID and check sum) must be transferred. • Every line can only be transferred once. If a fault occurs during transfer, the whole procedure must be repeated. ·The datum sent last can be checked by reading code C0504/1. The pointer in the controller will not be influenced.
C0505 1 2	-	0	0.0	{1}	65535	Start address for the profile data field **1: Start address for reading data** **2: Start address for writing data**
C0506 1 2	- -	Disp				

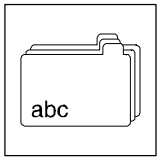


Code	LCD	Possible settings					Important
		Lenze	Selection				
C0517	USER MENU		0.00		{0.01}	1999.00	**User menu**
1		51.00					
2		54.00					
3		56.00					
4		46.00					
5		49.00					
6		183.00					
7		168.01					
8		86.00					
9		22.00					
10		5.00					
11		11.00					
12		12.00					
13		13.00					
14		105.00					
15		39.01					
16		70.00					
17		71.00					
31		94.00					
32		3.00					
[C0520]	IN	1000	FIXEDPHI-0			→ Selection list 4	**DFSET-IN** (configuration input)
[C0521]	VP-DIV	1000	FIXED 0 %			→ Selection list 1	**DFSET-VP-DIV** Configuration gain factor numerator
[C0522]	RAT-DIV	1000	FIXED 0 %			→ Selection list 1	**DFSET-RAT-DIV** Configuration gear factor numerator
[C0523]	A-TRIM	1000	FIXED 0 %			→ Selection list 1	**DFSET-A-TRIM** Configuration phase trimming
[C0524]	N-TRIM	1000	FIXED 0 %			→ Selection list 1	**DFSET-N-TRIM** Speed trimming of DFSET
[C0525]	0-PULSE	1000	FIXED 0			→ Selection list 2	**DFSET-0-PULSE** Configuration one-time zero pulse activation
[C0526]	RESET	1000	FIXED0			→ Selection list 2	**DFSET-RESET** Reset integrators
[C0527]	SEt	1000	FIXED 0			→ Selection list 2	**DFSET-SET** Configuration - set integrators
C0528		Disp	$-2 \cdot 10^9$		{1}	$2 \cdot 10^9$	Zero pulse phase difference
1	0-PULSE A						**1: 0 pulse phase difference**
2	OFFSEt						**2: total offset**
C0529	MULTIP OFFSET	1	-20000		{1}	20000	**Offset multiplier**
C0530	OF EVALUATION	0	0	with factor			**DFSET LF evaluation** Evaluation of the digital frequency
			1	no factor			
C0531	ACT 0 DIV	1	1		{1}	16384	**DFSET act. zero pulse divider**
C0532	0-PULSE/TP	1	1	0-pulse			**DFSET zero pulse/touch probe** Selection of zero pulse or touch probe
			2	Touch probe			
C0533	VP DENOM	1	1		{1}	32767	**DFSET Vp denominator** Gain factor denominator
C0534	0 PULSE FCT	0	0	not active			**DFSET zero pulse function**
			1	continuously			
			2	cont. switchable			
			10	1 time, short			
			11	1 time, direction +			
			12	1 time, direction -			
			13	1 time, 2* zero pulse			
C0535	SET 0 DIV	1	1		{1}	16384	**DFSET set zero pulse divider**
C0536		Disp	-32767		{1}	32767	
1	(C0521)						
2	(C0522)						
3	(C0523)						
C0537	(C0524)	Disp	-199.99		{0.01 %}	199.99	
C0538		Disp					
1	(C0525)						
2	(C0526)						
3	(C0527)						

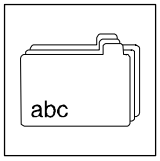


Appendix

Code	LCD	Possible settings				Important
		Lenze	Selection			
C0539	(C0520)	Disp	-32767	{1 rpm}	32767	
[C0540]	FUNCTION	2	0 Analog input 1 Phase difference input 2 Resolver simulation + zero pulse 3 Resolver simulation without zero pulse 4 X10 = X9 5 X10 = X8			**DFOUT function** Function of the encoder outputs
[C0541]	AN-IN	5001	MCTRL-NACT		→ Selection list 1	**DFOUT-AN-IN** Of the analog input of DFOUT
[C0542]	DF-IN	1000	FIXEDPHI 0		→ Selection list 4	**DFOUT-DF-IN** Configuration of the dig. frequency input
[C0544]	SYN-RDY	1000	FIXED 0		→ Selection list 2	**DFOUT-SYNC-RDY** Synchronisation signal for the zero pulse
C0545	PH OFFSET	0	0	{1 inc}	65535	**DFOUT phase offset**
C0546	MIN INC/REV	1000	-245760000	{1inc}	245760000	**Min. incr. per rev.**
C0547	(C0541)	Disp	-199.99	{0.01 %}	199.99	
C0548	(C0544)	Disp	0		1	
C0549	(C0542)	Disp	-32767	{1 rpm}	32767	
C0560 1 2 3 4 5 .. 15	FIX SET-VALUE	 100 75 50 25 0 .. 0	-199.99	{0.01 %}	199.99	**Fixed setpoints**
[C0561]	AIN	1000	FIXED 0 %		→ Selection list 1	**FIXSET1-AIN** Configuration analog input of FIXSET1
[C0562] 1 .. 4	IN	1000	FIXED 0		→ Selection list 2	Configuration of digital inputs 1 .. 4: **FIXSET1-IN** 1...4
C0563	(C0561)	Disp	-199.99	{0.01 %}	199.99	
C0564	(C0562)	Disp				
[C0570]	IN	1000	FIXED 0 %		→ Selection list 1	**S&H1 IN** Configuration analog input of S&H1
[C0571]	LOAD	1000	FIXED 0		→ Selection list 2	**S&H1 LOAD** Digital input of S&H1
C0572	(C0570)	Disp	-199.99	{0.01 %}	199.99	
C0573	(C0571)	Disp				
C0577	VP FLD WEAK	3.0	0.00	{0.01 ms}	15.99	**VP field weakening controller**
C0578	TN FLD WEAK	10	2.0 (8000 ms switched off)	{0.5 ms}	8192.0	**Tn-field weakening controller** Field weakening controller adjustment time Tn
C0581	MONIT EER	0	0 Trip 1 Message 2 Warning 3 Off			**Conf. EEr(external)** Configuration monitoring EEr (external fault)
C0582	MONIT OH4	2	2 Warning 3 Off			**Conf. OH4(heatsink temp.)** Configuration monitoring OH4 (Heat sink temperature)
C0583	MONIT OH3	*	0 Trip 3 Off			**Conf.OH3(Motor temp.fixed)** Configuration monitoring OH3 (Motor temperature fixed) → depending on C0086

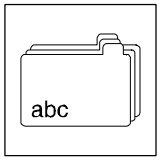


Code	LCD	Possible settings				Important
		Lenze	Selection			
C0584	MONIT OH7	*	2 3	Warning Off		**Conf.OH7(Motor temp.variable)** Configuration monitoring OH7 (Motor temperature adjustable) → depending on C0086 • Temperature monitoring via resolver input
C0585	MONIT OH8	3	0 2 3	Trip Warning Off		**Conf.OH8(Motor temp.variable)** Configuration monitoring OH8 (Motor temperature adjustable) • Temperature monitoring via PTC input
C0586	MONIT SD2	0	0 2 3	Trip Warning Off		**Conf. SD2 (Resolver)** Configuration monitoring SD2 (resolver)
C0587	MONIT SD3	3	0 2 3	Trip Warning Off		**Conf. SD3 (encoder monitoring)** Configuration monitoring SD3 (Encoder at X9)
C0588	MONIT H10/H11	3	0 2 3	Trip Warning Off		**Conf. H10 / H11** Configuration monitoring H10 and H11 (Temperature sensors in the controller)
C0589	MONIT P03	2	0 2 3	Trip Warning Off		**Conf. P03 (contouring error DFSET)** Configuration monitoring P03 (Contouring error)
C0590	MONIT P13	0	0 2 3	Trip Warning Off		**Conf. P13 (phase fault DFSET)** Configuration monitoring P13 (Phase fault)
C0591	MONIT CE1	3	0 2 3	Trip Warning Off		**Conf. CE1 (CAN-IN1)** Configuration monitoring CE1 (CAN-IN1 fault)
C0592	MONIT CE2	3	0 2 3	Trip Warning Off		**Conf. CE2 (CAN-IN2)** Configuration monitoring CE2 (CAN-IN2 fault)
C0593	MONIT CE3	3	0 2 3	Trip Warning Off		**Conf. CE3 (CAN-IN3)** Configuration monitoring CE3 (CAN-IN3 fault)
C0594	MONIT SD6	*	0 2 3	Trip Warning Off		**Conf. SD6(Motor temp. sensor)** Configuration monitoring SD6 (Sensor motor temperature) → depending on C0086
C0595	MONIT CE4	3	0 2 3	Trip Warning Off		**Conf. CE4 (CAN Bus-Off)** Configuration monitoring CE4 (CAN-bus Off)
C0596	NMAX LIMIT	5500	0	{1 rpm}	16000	**System speed monitoring**
C0597	MONIT LP1	3	0 2 3	Trip Warning Off		**Conf. LP1** Configuration monitoring motor phase failure
C0598	MONIT SD5	3	0 2 3	Trip Warning Off		**Conf. SD5** Configuration monitoring master current at X5/1.2 < 2mA
C0599	LIMIT LP 1	5.0	1.0	{0.1}	10.0	**Current limit LP1** Current limit for motor phase failure monitoring
C0600	FUNCTION	1	0 1 2 3 4 5	OUT = IN1 IN1 + IN2 IN1 - IN2 IN1 * IN2 IN1 / IN2 IN1/(100% - IN2)		**ARIT2 function**
[C0601] 1 2	IN	1000	FIXED 0 %		→ Selection list 1	Analog inputs of ARIT2 **1: ARIT2-IN1** **2: ARIT2-IN2**
C0602	(C0602)	Disp	-199.99	{0.01 %}	199.99	
[C0610] 1 2 3	IN	1000	FIXED0%		→ Selection list 1	Adds inputs IN1, IN2 and IN3 **1: ADD1-IN1** **2: ADD1-IN2** **3: ADD1-IN3**

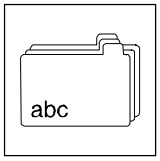


Appendix

Code	LCD	Possible settings				Important
		Lenze	Selection			
C0611	(C0610)	Disp	-199.99	{0.01 %}	199.99	
C0620	DB1 GAIN	1.00	-10.00	{0.01}	10.00	**DB gain** Gain dead band component DB1
C0621	DB1 VALUE	1.00	0.00	{0.01 %}	100.00	**DB1 dead band** Dead band of DB1
[C0622]	IN	1000	FIXED 0 %		→ Selection list 1	**DB1-IN** Configuration analog input of DB1
C0623	(C0622)	Disp	-199.99	{0.01 %}	199.99	
C0630	MAX LIMIT	100.00	-199.99	{0.01 %}	199.99	**LIM upper limit** Upper limit of limiter LIM1
C0631	MIN LIMIT	-100.0	-199.99	{0.01 %}	199.99	**LIM lower limit** Lower limit of limiter LIM1
[C0632]	IN	1000	FIXED 0 %		→ Selection list 1	**LIM1-IN** Configuration analog input of LIM1
C0633	(C0632)	Disp	-199.99	{0.01 %}	199.99	
C0640	DELAY T	20.00	0.01	{0.01 sec}	50.00	**PT1-1 time constant** Time constant of the PT1-1 component
[C0641]	IN	1000	FIXED 0 %		→ Selection list 1	**PT1-1-IN** Configuration analog input of PT1-1
C0642	(C0641)		-199.99	{0.01 %}	199.99	
C0650	DT1-1 GAIN	1.00	-320.00	{0.01}	320.00	**DT1-1 gain**
C0651	DELAY T	1.00	0.005	{0.01 sec}	5.000	**DT1-1 time constant**
[C0652]	IN	1000	FIXED 0 %		→ Selection list 1	**DT1-1-IN** Configuration analog input of DT1-1
C0653	SENSIBILITY	1	1 15-bit 2 14-bit 3 13-bit 4 12-bit 5 11-bit 6 10-bit 7 9-bit			**DT1-1 sensitivity**
C0654	(C0652)	Disp	-199.99	{0.01 %}	199.99	
C0655	NUMERATOR	1	-32767	{1}	32767	**CONV5 Numerator**
C0656	DENOMINATOR	1	1	{1}	32767	**CONV5 Denominator**
[C0657]	IN	1000	FIXED 0 %		→ Selection list 1	**CONV5-IN**
C0658	(C0657)	Disp	-199.99	{0.01 %}	199.99	
[C0661]	IN	1000	FIXED 0 %		→ Selection list 1	**ABS1-IN** Analog input absolute value generator
C0662	(C0661)	Disp	-199.99	{0.01 %}	199.99	
C0671	RFG1 TIR	0.000	0.000	{0.01 sec}	999.900	**RFG1 Tir (acceleration time)** Acceleration time T_{ir} of ramp function generator RFG1
C0672	RFG1 TIF	0.000	0.000	{0.01 sec}	999.900	**RFG1 Tif (deceleration time)** Deceleration time T_{if} of RFG1
[C0673]	IN	1000	FIXED 0 %		→ Selection list 1	**RFG1-IN** Configuration analog input of RFG1
[C0674]	SET	1000	FIXED 0 %		→ Selection list 1	**RFG1-SET** Configuration set input of RFG1
[C0675]	LOAD	1000	FIXED 0		→ Selection list 2	**RFG1-LOAD** Digital input of RFG1
C0676 1 (C0673) 2 (C0674)		Disp	-199.99	{0.01 %}	199.99	
C0677	(C0675)	Disp				
C0680	FUNCTION	6	1 IN1 = IN 2 2 IN 1 > IN2 3 IN 1 < IN2 4 |IN1| = |IN2| 5 |IN1| > |IN2| 6 |IN1| < |IN2|			**CMP1 comparator function** Function comparator CMP1, compares inputs IN1 and IN2
C0681	HYSTERESIS	1.00	0.00	{0.01 %}	100.00 %	**CMP1 hysteresis**
C0682	WINDOW	1.00	0.00	{0.01 %}	100.00 %	**CMP1 window**



Code	LCD	Possible settings					Important
		Lenze	Selection				
[C0683]						→ Selection list 1	Configuration analog inputs of CMP1
1	IN	5001	MCTRL-NACT				**1: CMP1-IN1**
2	IN	19500	FCODE-17				**2: CMP1-IN2**
C0684	(C0683)	Disp	-199.99		{0.01 %}	199.99	
C0685	FUNCTION	00001	1	IN1 = IN2			**CMP2 comparison function**
			2	IN1 > IN2			
			3	IN1 < IN2			
			4	|IN1| = |IN2|			
			5	|IN1| > |IN2|			
			6	|IN1| < |IN2|			
C0686	HYSTERESIS	1.00	0.00		{0.01 %}	100.00	**CMP2 hysteresis**
C0687	WINDOW	1.00	0.00		{0.01 %}	100.00	CMP2 window
[C0688]		1000	FIXED 0%			→ Selection list 1	Configuration analog inputs of CMP2
1	IN						
2	IN						
C0689	(C0688)	Disp	-199.99		{0.01 %}	199.99	
C0690	FUNCTION	1	1	IN1 = IN 2			**CMP3 comparator function**
			2	IN 1 > IN2			Comparator CMP3, compares inputs IN1 and IN2
			3	IN 1 < IN2			
			4	|IN1| = |IN2|			
			5	|IN1| > |IN2|			
			6	|IN1| < |IN2|			
C0691	HYSTERESIS	1.00	0.00		{0.01 %}	100.00 %	**CMP3 hysteresis**
C0692	WINDOW	1.00	0.00		{0.01 %}	100.00 %	**CMP3 window**
[C0693]		1000	FIXED 0%			→ Selection list 1	Configuration analog inputs of CMP3
1	IN						
2	IN						
C0694	(C0693)	Disp	-199.99		{0.01 %}	199.99	
C0695	FUNCTION	2	1	IN 1 < IN2			**Function PHCMP1**
			2	|IN1| < |IN2|			Compares the inputs IN1 and IN2
[C0697]		1000	FIXED 0INC			→ Selection list 3	Configuration phase inputs of PHCMP1
1	IN						
2	IN						
C0698	(C0697)	Disp	-2147483647		{1}	2147483647	
[C0700]	IN	19523	FCODE-472/3			→ Selection list 1	**ANEG1-IN** (Input ANEG1)
C0701	(C0700)	Disp	-199.99		{0.01 %}	199.99	
[C0703]	IN	1000	FIXED 0 %			→ Selection list 1	**ANEG2-IN** (Input ANEG2)
C0704	(C0703)	Disp	-199.99		{0.01 %}	199.99	
C0710	FUNCTION	0	0	rising transition			**TRANS1 function**
			1	falling transition			Transition evaluation TRANS1
			2	both transitions			
C0711	PULSE T	0.001	0.001		{0.001 sec}	60.000	**TRANS1 pulse duration**
							Pulse time of TRANS1
[C0713]	IN	1000	FIXED 0			→ Selection list 2	**TRANS1-IN**
							Digital input of TRANS1
C0714	(C0713)	Disp					
C0715	FUNCTION	0	0	rising transition			**TRANS2 function**
			1	falling transition			Transition evaluation TRANS2
			2	Both transitions			
C0716	PULSE T	0.001	0.001		{0.001 sec}	60.000	**TRANS2 pulse time**
[C0718]	IN	1000	FIXED 0			→ Selection list 2	**TRANS2-IN**
							Digital input of TRANS2
C0719	(C0718)	Disp					
C0720	FUNCTION	2	0	On delayed			**DIGDEL1 function**
			1	Off delayed			Selection of the function
			2	On/off delay			
C0721	DELAY T	1.000	0.001		{0.001 sec}	60.000	**DIGDEL1 delay time**
[C0723]	IN	1000	FIXED 0			→ Selection list 2	**DIGDEL1-IN**
							Digital input of DIGDEL1



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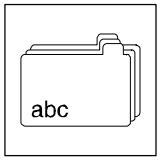
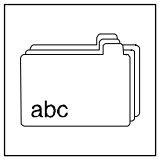
Code	LCD	Possible settings				Important
		Lenze	Selection			
C0724	(C0723)	Disp				
C0725	FUNCTION	2	0 1 2	ON delay OFF delay ON/OFF delay		**DIGDEL2 function** Selection of the function
C0726	DELAY T	1.000	0.001	{0.001 sec}	60.000	**DIGDEL2 delay time**
[C0728]	IN	1000	FIXED0		→ Selection list 2	**DIGDEL2-IN** (digital input)
C0729	(C0728)	Disp				
C0730	OSZ MODUS	0	0 1	Start measurement Stop measurement		**OSC mode** Start / stop of the measuring value recording
C0731	OSZ STATUS		0 1 2 3 4 5	Measurement completed Measurement active Trigger detected Cancel Cancel after trigger Read memory		**OSC status** Actual operating status
[C0732] 1 2 3 4	 KANAL1 KANAL2 KANAL3 KANAL4	1000	FIXED0%		→ Selection list 1	Configuration analog inputs
[C0733] 1	 TRIG INP	1000	FIXED0		→ Selection list 2	**OSC trigger input**
C0734	TRIG-SOURCE	0	0 1 2 3 4	Dig. trigger input Channel 1 Channel 2 Channel 3 Channel 4		**Trigger source** Selection of trigger source
C0735	TRIGGER-LEVEL	0	-32767	{1}	32767	**Trigger level** Adjust trigger level to channel 1 ... 4
C0736	TRIGGER-SLOPE	0	0 1	LOW/HIGH edge HIGH/LOW edge		**Trigger signal** Selection of trigger signal
C0737	TRIGGER-DELAY	0.0	-100.0	{0.1 %}	999.99	**Trigger delay** Setting of pretriggering and posttriggering
C0738	PROBE PERIOD	3	3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21	1 msec 2 msec 5 msec 10 msec 20 msec 50 msec 100 msec 200 msec 500 msec 1 sec 2 sec 5 sec 10 sec 20 sec 50 sec 1 min 2 min 5 min 10 min		Selection of **scanning period**
C0739	KANALANZAHL	4	1	{1}	4	**Number of channels** Number of channels to be measured
C0740	DATA READ	0		0/16383		**during start** Determine the start point for reading the data memory Selection of a memory block
C0741 1 2 3 4	 VERSION OSZ LENGTH MEMORY DATA WIDTH NO. CHANNELS	Disp	 1 2 3 4	 Version Memory size Data width Number of channels		

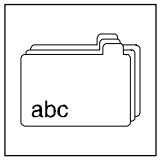


Code	LCD	Possible settings				Important
		Lenze	Selection			
C0742	LENGTH OF DB	Disp				**Data block length** of OSC
C0743	READ DB	Disp				**Read data block length** Reading an 8 byte data block
C0744	MEM: DEPTH	2048	0 512 1 1024 2 1536 3 2048 4 3072 5 4096 6 8192			**Memory capacity** Adapt memory capacity to the measuring task
C0749 1 2 3	 BRK:OFF INDEX TRIGGER INDEX END INDEX	Disp				Information about storing measured values
C0750	VP DENOM	16	1 Vp = 1 2 Vp = 1/2 4 Vp = 1/4 8 Vp = 1/8 16 Vp = 1/16 32 Vp = 1/32 64 Vp = 1/64 128 Vp = 1/128 256 Vp = 1/256 512 Vp = 1/512 1024 Vp = 1/1024 2048 Vp = 1/2048 4096 Vp = 1/4096 8192 Vp = 1/8192 16384 Vp = 1/16384			**Vp denominator position** (denominator of position controller gain)
C0751	DFRFG1 TIR	1.000	0.000	{0.001s}	999.900	**DFRFG1 Tir (acceleration time)**
C0752	MAX SPEED	3000	1	{1 rpm}	16000	**DFRFG1 max. speed** here: maximum make-up speed
C0753	DFRFG1 QSP	0.000	0.000	{0.001s}	999.900	**DFRFG1 QSP-Tif** Deceleration time when deceleration ramp is activated
C0754	PH ERROR	$2 \cdot 10^{9}$	10	{1}	$2 \cdot 10^{9}$	**DFRFG1 contouring error**
C0755	SYN WINDOW	100	0	{1 inc}	65535	**Synchronisation window**
C0756	OFFSET	0	$-1 \cdot 10^{9}$	{1 inc}	$/1 \cdot 10^{9}$	**DFRFG1 Offset**
C0757	FUNCTION	0	0 No TP start 1 With TP start			**Function**
[C0758]	IN	1000	FIXEDPHI-0		→ Selection list 4	**DFRFG1-IN** Configuration phase input
[C0759]	QSP	1000	FIXED0		→ Selection list 2	**DFRFG1-QSP** Digital input (control QSP)
[C0760]	STOP	1000	FIXED0		→ Selection list 2	**DFRFG1-STOP** Digital input (ramp function generator stop)
[C0761]	RESET	1000	FIXED0		→ Selection list 2	**DFRFG1-RESET** Digital input (reset integrators)
C0764 1 2 3	 (C0759) (C0760) (C0761)	Disp				
C0765	(C0758)	Disp	-32767	{1 rpm}	32767	
C0766	SPEED DIR:	1	1	{1}	3	1 Direction of rotation CW/CCW 2 CW rotation 3 CCW rotation
[C0770]	D	1000	FIXED0		→ Selection list 2	**FLIP1-D** Data input of FLIP1
[C0771]	CLK	1000	FIXED0		→ Selection list 2	**FLIP1-CLK** Configuration clock input of FLIP1
[C0772]	CLR	1000	FIXED0		→ Selection list 2	**FLIP1-CLR** Configuration reset input of FLIP1

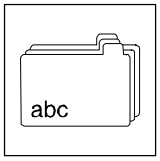


Appendix

Code	LCD	Possible settings				Important
		Lenze	Selection			
C0773		Disp				
1	(C0770)					
2	(C0771)					
3	(C0772)					
[C0775]	D	1000	FIXED0		→ Selection list 2	**FLIP2-D** Data input of FLIP2
[C0776]	CLK	1000	FIXED0		→ Selection list 2	**FLIP2-CLK** Configuration clock input of FLIP2
[C0777]	CLR	1000	FIXED0		→ Selection list 2	**FLIP2-CLR** Configuration reset input of FLIP2
C0778		Disp				
1	(C0775)					
2	(C0776)					
3	(C0777)					
[C0780]	N	50	AIN1-OUT		→ Selection list 1	**NSET-N** Configuration main setpoint input
[C0781]	N-INV	10251	CW/CCW/Q-CW/CCW		→ Selection list 2	**NSET-N-INV** Configuration main setpoint inversion
[C0782]	NADD	5650	ASW1-OUT		→ Selection list 1	**NSET-NADD** Configuration additional setpoint input
[C0783]	NADD-INV	1000	FIXED0		→ Selection list 2	**Nset-Nadd-INV** Configuration additional setpoint inversion
[C0784]	CINH-VAL	5001	MCTRL-NACT		→ Selection list 1	**NSET-CINH-VAL** Configuration output signal with controller inhibit
[C0785]	SEt	5000	MCTRL-NSET2		→ Selection list 1	**set** Configuration ramp function generator
[C0786]	LOAD	5001	MCTRL-QSP-OUT		→ Selection list 2	**load** Digital input (load ramp function generator)
[C0787]					→ Selection list 2	Configuration JOG selection and JOG activation Binary interpretation
1	JOG*1	53	DIGIN3			
2	JOG*2	1000	FIXED0			
3	JOG*4	1000	FIXED0			
4	JOG*8	1000	FIXED0			
[C0788]					→ Selection list 2	Configuration Ti selection and Ti activation • Binary interpretation • Tir and Tif pairs are identical
1	TI*1	1000	FIXED0			
2	TI*2	1000	FIXED0			
3	TI*4	1000	FIXED0			
4	TI*8	1000	FIXED0			
[C0789]	RFG-0	1000	FIXED0		→ Selection list 2	**RFG-0** Digital input (ramp function generator 0)
[C0790]	RFG-STOP	1000	FIXED0		→ Selection list 2	**RFG-stop** Digital input (ramp function generator stop)
C0798		Disp	-199.99	{0.01 %}	199.99	analog input signals
1	CINH-VAL					
2	SEt					
C0799		Disp				Display digital input signals of NSET
1	(781)					
2	(783)					
3	(786)					
4	(787/1)					
5	(787/2)					
6	(787/3)					
7	(787/4)					
8	(788/1)					
9	(788/2)					
10	(788/3)					
11	(788/4)					
12	(789)					
13	(790)					
[C0800]	SEt	1000	FIXED0%		→ Selection list 1	**PCTRL1-SET** Configuration setpoint input

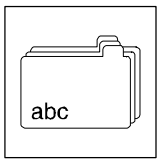


Code	LCD	Possible settings				Important
		Lenze	Selection			
[C0801]	Act	1000	FIXED0%		→ Selection list 1	**PCTRL1-ACT** Configuration actual value input
[C0802]	INFLU	1000	FIXED0%		→ Selection list 1	**PCTRL1-INFLU** Configuration evaluation input
[C0803]	ADAPT	1000	FIXED0%		→ Selection list 1	**PCTRL1-ADAPT** Configuration adaptation input
[C0804]	INACT	1000	FIXED0		→ Selection list 2	**PCTRL1-INACT** Configuration inactivation input
[C0805]	I-OFF	1000	FIXED0		→ Selection list 2	**PCTRL1-I-OFF** Digital input (switch-off I component)
C0808 1 2 3 4	 (C0800) (C0801) (C0802) (C0803)	Disp	-199.99	{0.01 %}	199.99	
C0809 1 2	 (C0804) (C0805)	Disp				
[C0810] 1 2	 IN IN	 55 1000	 AIN2-OUT FIXED0%		→ Selection list 1	Analog inputs ASW1
[C0811]	SET	1000	FIXED0		→ Selection list 2	Digital input ASW1
C0812	(C0810)	Disp	-199.99	{0.01 %}	199.99	
C0813	(C0811)	Disp				
[C0815] 1 2	 IN IN	 1000 1000	FIXED0%		→ Selection list 1	Analog input ASW2
[C0816]	SET	1000	FIXED0		→ Selection list 2	Digital input ASW2
C0817	(C0815)	Disp	-199.99	{0.01%}	199.99	
C0818	(C0816)	Disp				
[C0820] 1 2 3	 IN IN IN	1000	FIXED0		→ Selection list 2	Digital inputs AND1
C0821	(C0820)	Disp				Display of C0820
[C0822] 1 2 3	 IN IN IN	1000	FIXED0		→ Selection list 2	Digital inputs AND2
C0823	(C0822)	Disp				
[C0824] 1 2 3	 IN IN IN	1000	FIXED0		→ Selection list 2	Digital inputs AND3
C0825	(C0824)	Disp				
[C0826] 1 2 3	 IN IN IN	1000	FIXED0		→ Selection list 2	Digital inputs AND4
C0827	(C0826)	Disp				
[C0828] 1 2 3	 IN IN IN	1000	FIXED0		→ Selection list 2	Digital inputs AND5
C0829	(C0828)	Disp				
[C0830] 1 2 3	 IN IN IN	1000	FIXED0		→ Selection list 2	Digital inputs OR1
C0831	(C0830)	Disp				

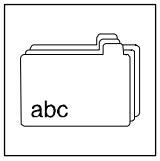


Appendix

Code	LCD	Possible settings				Important
		Lenze	Selection			
[C0832] 1 2 3	 IN IN IN	1000	FIXED0		→ Selection list 2	Digital inputs OR2
C0833	(C0832)	Disp				
[C0834] 1 2 3	 IN IN IN	1000	FIXED0		→ Selection list 2	Digital inputs of the OR element OR3
C0835	(C0834)	Disp				
[C0836] 1 2 3	 IN IN IN	1000	FIXED0		→ Selection list 2	Digital inputs of the OR element OR4
C0837	(C0836)	Disp				
[C0838] 1 2 3	 IN IN IN	1000	FIXED0		→ Selection list 2	Digital inputs of the OR element OR5
C0839	(C0838)	Disp				
[C0840]	IN	1000	FIXED0		→ Selection list 2	Digital input NOT1
C0841	(C0840)	Disp				
[C0842]	IN	1000	FIXED0		→ Selection list 2	Digital input NOT2
C0843	(C0842)	Disp				
[C0844]	IN	1000	FIXED0		→ Selection list 2	Digital input NOT3
C0845	(C0844)	Disp				
[C0846]	IN	1000	FIXED0		→ Selection list 2	Digital input NOT4
C0847	(C0846)	Disp				
[C0848]	IN	1000	FIXED0		→ Selection list 2	Digital input NOT5
C0849	(C0848)	Disp				
[C0850] 1 2 3	 OUT.W1 OUT.W2 OUT.W3	1000	FIXED 0 %		→ Selection list 1	Configuration process output words for automation interface AIF (X1)
[C0851]	OUT.D1	1000	FIXED 0INC		→ Selection list 3	Configuration 32-bit phase information
C0852	TYPE OUT.W2	0	0 Analog signal 1 Digital 0-15 2 LOW phase 3 HIGH phase			**AIF signal type AIF-OUT.W2** Configuration process output word 2 for automation interface AIF (X1)
C0853	TYPE OUT.W3	0	0 Analog signal 1 Digital 16-31 2 HIGH phase			**AIF signal type AIF-OUT.W3** Configuration process output word 3 for automation interface AIF (X1)
C0854	TYPE OUT.W1	0	0 Analog signal 3 D2: LOW phase			**AIF signal type AIF-OUT.W1** Configuration process output word 1 for automation interface AIF (X1)
C0855	IN	Disp	Bit 00	{1}	Bit 15	Process input words hexadecimal for automation interface X1 **AIF-IN (dig. 0-15)** **AIF-IN (dig. 16-31)**
C0856 1 2 3	 IN.W1 IN.W2 IN.W3	Disp	-199.99	{0.01%}	199.99	Process input words decimal Display: 100% = 16384
C0857	IN.D1	Disp	-2147483648	{1}	2147483647	32-bit phase information
C0858 1 2 3	 OUT.W1 OUT.W2 OUT.W3	Disp	-199.99	{0.01 %}	199.99	Process output words Display: 100% = 16384
C0859	OUT.D1	Disp	-2147483648	{1}	2147483647	**AIF-OUT.D1** 32-bit phase information



Code	LCD	Possible settings				Important
		Lenze	Selection			
[C0860]			→ Selection list 1			
1	OUT1.W1	5001				
2	OUT1.W2	1000				
3	OUT1.W3	1000				
4	OUT2.W1	1000				
5	OUT2.W2	1000				
6	OUT2.W3	1000				
7	OUT2.W4	1000				
8	OUT3.W1	1000				
9	OUT3.W2	1000				
10	OUT3.W3	1000				
11	OUT3.W4	1000				
[C0861]		1000	→ Selection list 3			
1	OUT1.DI					
2	OUT2.DI					
3	OUT3.DI					
C0863		Disp	0	1		
1	IN1 (0-15)					
2	IN1 (16-31)					
3	IN2 (0-15)					
4	IN2 (16-31)					
5	IN3 (0-15)					
6	IN3 (16-31)					
C0864		0				Configuration process output words for system bus (CAN)
1	TYPEOUT1.W2		0	Analog signal		
2	TYPEOUT2.W1		1	Digital 0-15		
3	TYPEOUT3.W1		2	LOW phase		
C0865						Configuration process output words for system bus (CAN)
1	TYPEOUT1.W3	0	0	Analog signal		
2	TYPEOUT2.W2	0	1	Digital 16-31		
3	TYPEOUT3.W2	0	2	HIGH phase		
C0866		Disp	-32768.00	{0.01%}	32767.00	
1	IN1.W1					
2	IN1.W2					
3	IN1.W3					
4	IN2.W1					
5	IN2.W2					
6	IN2.W3					
7	IN2.W4					
8	IN3.W1					
9	IN3.W2					
10	IN3.W3					
11	IN3.W4					
C0867		Disp				
1	IN1.DI					
2	IN2.DI					
3	IN3.DI					
C0868		Disp	-199.99	{0.01%}	199.99	
1	OUT1.W1					
2	OUT1.W2					
3	OUT1.W3					
4	OUT2.W1					
5	OUT2.W2					
6	OUT2.W3					
7	OUT2.W4					
8	OUT3.W1					
9	OUT3.W2					
10	OUT3.W3					
11	OUT3.W4					



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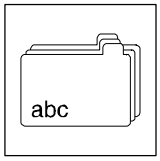
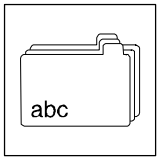
Code	LCD	Possible settings				Important
		Lenze	Selection			
C0869 1 2 3	 OUT1.DI OUT2.DI OUT3.DI	Disp	-2147483648/	{1}	2147483647	
[C0870] 1 2	 CINH1 CINH2	1000	FIXED0		→ Selection list 2	Digital inputs (inhibit controller)
[C0871]	ERIP-SET	54	DIGIN 4		→ Selection list 2	Digital input (TRIP set) of DCTRL
[C0876]	TRIP-RES	55	DIGIN 5		→ Selection list 2	Digital input (TRIP reset) of DCTRL
C0878 1 2 3 4	 (C0870/1) (C0870/2) (C0871) (C0876)	Disp				
C0879 1 2 3	 RESET C135 RESET RIF RESET CAN	0	0 1	no reset reset		Reset control words
[C0885]	R	51	DIGIN 1		→ Selection list 2	Digital input (CW rotation) of R/L/Q
[C0886]	L	52	DIGIN 2		→ Selection list 2	Digital input (CCW rotation) of R/L/Q
C0889 1 2	 (C0885) (C0886)	Disp				
[C0890]	N-SET	 5050	 NSET-NOUT		→ Selection list 1	**MCTRL-N-SET** Speed setpoint input
[C0891]	M-ADD	1000	FIXED0%		→ Selection list 1	**MCTRL-M-ADD** Configuration torque setpoint input
[C0892]	LO-M-LIM	5700	ANEG1-OUT		→ Selection list 1	**MCTRL-LO-M-LIM** Configuration lower torque limit
[C0893]	HI-M-LIM	19523	FCODE-472/3		→ Selection list 1	**MCTRL-HI-M-LIM** Configuration upper torque limit
[C0894]	PHI-SET	1000	FIXED0INC		→ Selection list 3	**MCTRL-PHI-SET** Configuration rotor position setpoint
[C0895]	PHI-LIM	1006	FIXED100%		→ Selection list 1	**MCTRL-PHI-LIM** Configuration phase controller limit
[C0896]	N2-LIM	1000	FIXED0%		→ Selection list 1	**MCTRL-N2-LIM** Configuration 2nd speed limit value
[C0897]	PHI-ON	1000	FIXED0		→ Selection list 2	**MCTRL-PHI-ON** Configuration switch-on signal phase controller
[C0898]	FLD-WEAK	1006	FIXED100%		→ Selection list 1	**MCTRL-FLD-WEAK** Signal for field weakening
[C0899]	N/M-SWT	1000	FIXED0		→ Selection list 2	**MCTRL-N/M-SWT** Changeover between n and M control
[C0900]	QSP	10250	CW/CCW/Q-QSP		→ Selection list 2	**MCTRL-QSP** Control signal for release
[C0901]	I-SET	1000	FIXED0%		→ Selection list 1	**MCTRL-I-SET** Load I-component of the speed controller
[C0902]	I-LOAD	1000	FIXED0		→ Selection list 2	**MCTRL-I-LOAD** Activation signal for loading the I-component of the speed controller
[C0903]	P-ADAPT	1006	FIXED0%		→ Selection list 1	**MCTRL-P-ADAPT** Adaptation phase controller
C0906 1 2 3 4 5 6 7 8 9	 (C0890) (C0891) (C0892) (C0893) (C0895) (C0896) (C0898) (C0901) (C0903)	Disp	-199.99	{0.01 %}	199.99	

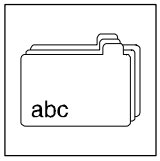


Code	LCD	Possible settings				Important
		Lenze	Selection			
C0907 1 2 3 4	 (C0897) (C0899) (C0900) (C0902)	Disp				
C0908	(C0494)	Disp	-2147483647	{1 inc}	2147483647	Set phase signal • 1 turn = 65536 inc
C0909	SPEED LIMIT	1	1 +/- 175 % 2 0 .. +175 % 3 -175 .. 0 %			**Limitation of direction of rotation** for the speed setpoint
[C0920]	ON	1000	FIXED0		→ Selection list 2	Activation input homing
[C0921]	MARK	1000	FIXED0		→ Selection list 2	**REFC-MARK** Digital reference switch
[C0922]	PHI-IN	1000	FIXED0INC		→ Selection list 3	Phase input
[C0923]	N-IN	1000	FIXED0%		→ Selection list 1	**N-IN** Speed input
[C0924]	POS-LOAD	1000	FIXED0		→ Selection list 2	Control "set position"
[C0925]	ACTPOS-I	1000	FIXED0INC		→ Selection list 3	Position "set position"
C0926 1 2 3 4	 (C0925) (C0922) ACTPOS TARGET	Disp	-2147483647	{1 inc}	2147483647	Display of 3. current position 4. Target position
C0927 1 2 3	 (C0920) (C0921) (C0924)	Disp				
C0928	(C0922)	Disp	-2147483647	{1 inc}	2147483647	Phase signal (contouring error) of REF • 1 turn = 65536 inc
C0929		Disp	-199.99	{0.01 %}	199.99	Analog input signal
[C0930]	GEARBOX MOT	1	1	{1}	65535	**REFC Gearbox numerator motor side** Gearbox factor (numerator)
[C0931]	GEARBOX ENC	1	1	{1}	65535	**REFC Gearbox denominator encoder side** Gearbox factor (denominator)
C0932	REF MODE	0	0 Mode 0 1 Mode 1 6 Mode 6 7 Mode 7 8 Mode 8 9 Mode 9 20 Mode 20 21 Mode 21			Homing mode
C0933	REF TRANS	0	0 Rising transition 1 Falling transition			**REFC Ref. signal transition** Reference signal transition
C0934	REF OFFSET	0	-2140000000	{1 inc}	2140000000	**REFC Reference point offset**
C0935	REF SPEED	2.0000	0.0001	{0.0001 % N_{max}}	100.0000	**REFC Homing speed** Homing speed
C0936	REF TI	1.00	0.01	{0.01 sec}	990.00	**REFC Homing Ti time** • Tir and Tif are identical
C0937	REFC-DFIN	1000	FIXEDPHI-0			
C0938	(C0937)	Disp				
C0940	NUMERATOR	1	-32767	{1}	32767	**CONV1 numerator**
C0941	DENOMITATOR	1	1	{1}	32767	**CONV1 denominator**
[C0942]	CONV1-IN	1000	FIXED 0 %		→ Selection list 1	Configuration analog input CONV1
C0943	(C0942)	Disp	-199.99	{0.01 %}	199.99	
C0945	NUMERATOR	1	-32767	{1}	32767	**CONV2 Nominator**
C0946	DENOMINATOR	1	1	{1}	32767	CONV2 denominator
[C0947]	IN	1000	FIXED 0 %		→ Selection list 1	**CONV2 denominator** Configuration analog input CONV2
C0948	(C0947)	Disp	-199.99	{0.01 %}	199.99	

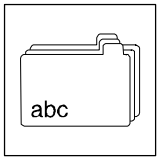


Appendix

Code	LCD	Possible settings				Important
		Lenze	Selection			
C0950	NUMERATOR	1	-32767	{1}	32767	**CONV3 Nominator**
C0951	DENOMINATOR	1	1	{1}	32767	**CONV3 denominator**
[C0952]	IN	1000	FIXEDPHI0		→ Selection list 4	Configuration analog input CONV3
C0953	(C0952)	Disp	-32767	{1 rpm}	32767	
C0955	NUMERATOR	1	-32767	{1}	32767	**CONV4 Nominator**
C0956	DENOMINATOR	1	1	{1}	32767	**CONV4 denominator**
[C0957]	IN	1000	FIXEDPHI0		→ Selection list 4	Configuration analog input CONV4
C0958	(C0957)	Disp	-32767	{1 rpm}	32767	
C0960	FUNCTION	1	1 Characteristic 1 2 Characteristic 2 3 Characteristic 3			Function
C0961	Y0	0.00	0.00	{0.01 %}	199.99	
C0962	Y1	50.00	0.00	{0.01 %}	199.99	
C0963	Y2	75.00	0.00	{0.01 %}	199.99	
C0964	Y100	100.00	0.00	{0.01 %}	199.99	
C0965	X1	50.00	0.01	{0.01 %}	100.00	
C0966	X2	75.00	0.01	{0.01 %}	100.00	
[C0967]	IN	1000	FIXED0%		→ Selection list 1	Characteristic CURVE1-IN
C0968	(C0967)	Disp	-199.99	{0.01 %}	199.99	
[C0970]	N-SET	1000	FIXED0%		→ Selection list 1	**MFAIL-N-SET** Speed input of the mains failure control Setpoint path
[C0971]	FAULT	1000	FIXED0		→ Selection list 2	**MFAIL-FAULT** Input mains failure detected, input for activation
[C0972]	RESET	1000	FIXED0		→ Selection list 2	**MFAIL-RESET** Reset input mains failure control
[C0973]	ADAPT	1000	FIXED0%		→ Selection list 1	**MFAIL-ADAPT** Adaptation of P-gain of the voltage controller
[C0974]	CONST	1000	FIXED0%		→ Selection list 1	**MFAIL-CONST** Adaptation of P-gain of the voltage controller
[C0975]	THRESHLD	1000	FIXED0%		→ Selection list 1	**MFAIL-THRESHOLD** Restart protection when the value falls below the speed threshold
[C0976]	NACT	1000	FIXED0%		→ Selection list 1	**MFAIL-NACT** Comparison of threshold function • Start for V_2 controller
[C0977]	SEt	1000	FIXED0%		→ Selection list 1	**MFAIL-SET** Speed start value
[C0978]	DC-SET	1000	FIXED0%		→ Selection list 1	**MFAIL-DC-SET** Setpoint DC-bus voltage
C0980	MFAIL VP	0.500	0.001	{0.001}	31.000	**MFAIL Vp (gain)**
C0981	MFAIL TN	100	20	{1 msec}	2000	**MFAIL Tn (adjustment time)**
C0982	MFAIL TIR	2.000	0.001	{0.001 sec}	16.000	**MFAIL Tir (acceleration time)**
C0983	RETRIGGER T	1.000	0.001	{0.001 sec}	60.000	**MFAIL retrigger time**
C0988 1 2 3 4 5 6 7	 (C0970) (C0973) (C0974) (C0975) (C0976) (C0977) (C0978)	Disp	-199.99	{0.01 %}	199.99	
C0989 1 2	 (C0971) (C0972)	Disp				
[C0990]	IN	1000	FIXEDPHI0		→ Selection list 4	Input phase integrator PHINT1
[C0991]	RESET	1000	FIXED0		→ Selection list 2	Reset input of PHINT1
C0992	(C0990)	Disp	-32767	{1}	32767	
C0993	(C0991)	Disp				
C0995	DIVISION	0	-31	{1}	31	

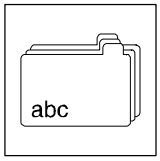


Code	LCD	Possible settings				Important
		Lenze	Selection			
[C0996]	IN	1000	FIXED0INC		→ Selection list 3	Configuration input phase division PHDIV1
C0997	(C0996)	Disp	-2147483647	{1}	2147483647	
C1000	DIVISION	1	0	{1}	31	**Factor**
[C1001]	IN	1000	FIXED0INC		→ Selection list 3	Configuration input of CONVPHA1
C1002	(C1001)	Disp	-2147483647	{1}	2147483647	
C1010	FUNCTION	1	0 / 1 / 2 / 3 / 13 / 14 / 21 / 22			**ARITPH1 function**
[C1011] 1 2	 IN IN	1000	FIXED0INC		→ Selection list 3	Inputs ARITPH1
C1012	(C1011)	Disp	-2147483647	{1}	2147483647	
C1020	ARITPH2 FUNCT	1	0 OUT = IN1 1 IN1 + IN2 2 IN1 - IN2 3 IN1 * IN2 / 2^{30} 13 IN1 * IN2 14 IN1 / IN2 21 IN1 + IN2 (no limit) 22 IN1 - IN2 (no limit)			**ARITPH2 function** 0 OUT = IN1 1 IN1 + IN2 2 IN1 - IN2 3 IN1 * IN2 / 2^{30} 13 IN1 * IN2 14 IN1 / IN2 21 IN1 + IN2 (no limit) 22 IN1 - IN2 (no limit)
[C1021] 1 2	 IN IN	1000	FIXED0INC		→ Selection list 3	Inputs ARITPH2
C1022	(C1021)	Disp	-2147483647	{1}	2147483647	
C1025	ARITPH3 FUNCT	1	0 OUT = IN1 1 IN1 + IN2 2 IN1 - IN2 3 IN1 * IN2 / 2^{30} 13 IN1 * IN2 14 IN1 / IN2 21 IN1 + IN2 (no limit) 22 IN1 - IN2 (no limit)			ARITPH3 function
[C1026] 1 2	 IN IN	1000	FIXED0INC		→ Selection list 3	Inputs ARITPH3
C1027	(C1026)	Disp	-2147483647	{1}	2147483647	
[C1030]	IN	1000	FIXEDPHI0		→ Selection list 4	Input PHINT2
[C1031]	RESET	1000	FIXED0		→ Selection list 2	**PHINT2-RESET** Reset input of PHINT2
C1032	(C1030)	Disp	-32767	{1}	32767	
C1033	(C1031)	Disp				
C1040	ACCELARATION	100.00	0.001	{0.001}	5000.000	**SRFG1 Acceleration** Acceleration of SRFG1
C1041	JERK	0.200	0.001	{0.001 sec}	999.999	**SRFG1 jerk** Adjust jolt of SRFG1
[C1042]	IN	1000	FIXED0%		→ Selection list 1	Configuration input of SRFG1
[C1043]	SET	1000	FIXED0%		→ Selection list 1	Configuration input of SRFG1
[C1044]	LOAD	1000	FIXED0		→ Selection list 2	Digital input of SRFG1
C1045 1 2	 (C1042) (C1043)	Disp	-199.99	{0.01 %}	199.99	
C1046	(C1044)	Disp				
C1060 1 2 3 4 5 6	- 	1000	FIXED0		→ Selection list 2	 **1: FLIP3-D** **2: FLIP3-CLK** **3: FLIP3-CLR** **4: FLIP4-D** **5: FLIP4-CLK** **6: FLIP4-CLR**
C1061	(C1060)	Disp				

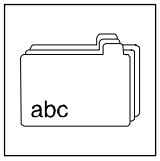


Appendix

Code	LCD	Possible settings				Important
		Lenze	Selection			
C1070	-	1000	FIXED0		→ Selection list 2	
1						**1: RFGPH2-RESET**
2						**2: RFGPH2-STOP**
3						**3: RFGPH2-RFG-0**
4						**4: RFGPH3-RESET**
5						**5: RFGPH3-STOP**
6						**6: RFGPH3-RFG-0**
C1071	(C1070)					
C1072	-	1000	FIXED0INC		→ Selection list 3	
1						**1: RFGPH2-SET**
2						**2: RFGPH2-ACT**
3						**3: RFGPH3-SET**
4						**4: RFGPH3-ACT**
C1073	(C1072)					
C1075		0	0	Without end switch off		**RFGPH2-MODE**
			1	With end switch off		
C1076		0	0	Without end switch off		**RFGPH3-MODE**
			1	With end switch off		
C1077		163	0	{1 inc}	32767	
1						**1: RFGPH2 Catch**
2						**2: RFGPH3 Catch**
C1078		200	-1600.0000	{0.0001 rpm}	1600.0000	
1						**1: $N_{max.}$ forward** (RFGPH2)
2						**2: $N_{max.}$ return** (RFGPH2)
3						**3: $N_{max.}$ forward** (RFGPH3)
4						**4: $N_{max.}$ return** (RFGPH3)
C1079		1.0000	0.010	{0.001 sec}	130.000	
1						**1: Ramp STOP** (RFGPH2)
2						**2: Ramp acceleration** (RFGPH2)
3						**3: Ramp deceleration** (RFGPH2)
4						**4: Ramp STOP** (RFGPH3)
5						**5: Ramp accekeration** (RFGPH3)
6						**6: Ramp deceleration** (RFGPH3)
C1080		1000	FIXED0		→ Selection list 2	
1						**1: LIMPHD1-RESET** (LIMPHD1)
2						**2: LIMPHD1-NO-LIM** (LIMPHD1)
C1081	(C1080)	Disp				
C1082		1000	FIXEDPHI0		→ Selection list 4	**LIMPHD1-DFIN**
C1083	(C1082)	Disp				
C1084		1000	-16000.0000	{0.0001 rpm}	16000.0000	
1						**1: $N_{max.}$ upper limit**
2						**2: $N_{max.}$ lower limit**
C1090	OUTPUT SIGNAL		-2147483648	{1}	2147483647	**Signal output** of FEVAN1
C1091	CODE	141	2	{1}	2000	**FEVAN1 Code**
C1092	SUBCODE	0	0	{1}	255	**FEVAN1 Subcode**
C1093	NUMERATOR	1.0000	0.0001	{0.0001}	100000.0000	**FEVAN1 numerator**
C1094	DENOMINATOR	0.0001	0.0001	{0.0001}	100000.0000	**FEVAN1 denominator**
C1095	OFFSEt	0		0/1000000000		**FEVAN1 Offset**
[C1096]	IN	1000	FIXED0%		→ Selection list 1	**FEVAN1-IN** Configuration analog input of FEVAN1
[C1097]	FEVAN1-LOAD	1000	FIXED0		→ Selection list 2	Digital inputs of FEVAN1
C1098	(C1096)	Disp	-32768	{1}	32767	
C1099	(C1097)	Disp				
C1100	FUNcTION	1	1	Return		**FCNT1 function**
			2	Hold		
[C1101]		1000	FIXED0%		→ Selection list 1	Configuration analog inputs
1	LO-VAL					
2	CMP-VAL					
[C1102]		1000	FIXED0		→ Selection list 2	Digital inputs
1	CLKUP					**1: FCNT1-CLKUP**
2	CLKDWN					**2: FCNT1-CLKDWN**
3	LOAD					**3: FCNT1-LOAD**

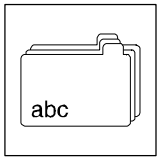


Code	LCD	Possible settings					Important
		Lenze	Selection				
C1103	(C1101)	Disp	-32768	{1}		32768	
C1104	(C1102)	Disp					
C1106 1 2	-	1000	FIXED0		→ Selection list 2		**1: SWPH1-SET** **2: SWPH2-SET**
C1107	(C1106)	Disp					
C1108 1 2 3 4	-	1000	FIXED0INC		→ Selection list 3		**1: SWPH1-IN1** **2: SWPH1-IN2** **3: SWPH2-IN1** **4: SWPH2-IN2**
C1109	(C1108)	Disp					
C1120	SYNC MODE	2	0 off 1 CAN sync 2 Terminal sync				Function
[C1121] 1 2	SYNC CYCLE INTERPOL. CYCL	2	0	{1 msec}		13	The interpolation is restarted with every sync signal • Definition of the cycle time of sync signals (slave); for SYSTEMBUS only • Definition of the cycle time of sync signals (slave); for terminal only
C1122	SYNC TIME	0.460	0.000	{0.001 ms}		10.000	Phase shifting between CAN-Sync and internal control program cycle • for SYSTEM BUS only • depends on baud rate and bus load
C1123 1 2	PHASESHIFt SYNC WINDOW	0	-1.000	{0.001 ms}		1.000	• 1: **Phase shifting** between terminal-Sync and internal control program cycle. For terminal-Sync only. • 2: **Synchronisation window** . Window for the synchronization transition of the terminal sync (LOW/HIGH transition) For terminal-Sync only. – activates when the sync start window is quit
[C1124]	IN1!	1000	FIXED0INC		→ Selection list 3		**SYNC1-IN11** (input)
[C1125]	IN2!	1000	FIXED0INC		→ Selection list 3		**SYNC1-IN21** (input)
[C1126]	IN3!	1000	FIXED0INC		→ Selection list 3		**SYNC1-IN31** (input)
C1127	(C1124)	Disp	-2147483647	{1}		2147483647	
C1128	(C1125)	Disp	-2147483647	{1}		2147483647	
C1129	(C1126)	Disp	-2147483647	{1}		2147483647	
C1140	FUNCTION	0	0 rising transition 1 falling transition 2 both transitions				**TRANS3 Function** Transition evaluation TRANS3
C1141	PULSE T	0.001	0.001	{0.001 sec}		60.000	**TRANS3 pulse time**
[C1143]	IN	1000	FIXED 0		→ Selection list 2		**TRANS3-IN** (digital input)
C1144	(C1143)	Disp					
C1145	FUNCTION	0	0 rising transition 1 falling transition 2 both transitions				**TRANS4 function**
C1146	PULSE T	0.001	0.001	{0.001 sec}		60.000	**TRANS4 pulse time**
[C1148]	IN	1000	FIXED 0		→ Selection list 2		**TRANS4-IN** (digital input)
C1149	(C1148)	Disp					
C1150	FUNCTION	0	0 Load perm 1 Load edge 2 Cmp & sub				**Selection of the function** Function of PHINT3
C1151	CMP. VALUE	$2 \cdot 10^9$	0	{1}		2000000000	**Comparison value** of PHINT3
[C1153]	IN	1000	FIXEDPHI0		→ Selection list 4		**PHINT3-IN** (input phase integrator)
[C1154]	LOAD	1000	FIXED0		→ Selection list 2		**PHINT3-LOAD** (input)
[C1155]	SET	1000	FIXED0INC		→ Selection list 3		**PHINT3-SET** Input of PHINT3
C1157	(C1153)	Disp	-32767	{1}		32767	
C1158	(C1154)	Disp					
C1159	(C1155)	Disp	-2147483647	{1}		2147483647	

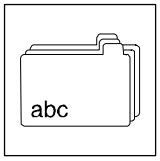


Appendix

Code	LCD	Possible settings					Important
		Lenze	Selection				
[C1160]		1000	FIXED0%			→ Selection list 1	Analog inputs ASW3
1	IN						**1: ASW3-IN1**
2	IN						**2: ASW3-IN2**
[C1161]	SET	1000	FIXED0			→ Selection list 2	**ASW3-SET** (digital input)
C1162	(C1160)	Disp	-199.99	{0.01 %}		199.99	
C1163	(C1161)	Disp					
[C1165]		1000	FIXED0%			→ Selection list 1	Analog inputs ASW4
1	IN						**1: ASW4-IN1**
2	IN						**2: ASW4-IN2**
[C1166]	SET	1000	FIXED0			→ Selection list 2	**ASW4-SET** (digital input)
C1167	(C1165)	Disp	-199.99	{0.01 %}		199.99	
C1168	(C1166)	Disp					
C1170	NUMERATOR	1	-32767	{1}		32767	**CONV6 Numerator** (numerator)
C1171	DENOMINATOR	1	1	{1}		32767	**CONV6 Denominator** (denominator)
[C1172]	IN	1000	FIXED 0 %			→ Selection list 1	**CONV6-IN** (Configuration analog input)
C1173	(C1172)	Disp	-199.99	{0.01 %}		199.99	
[C1175]		1000	FIXED0			→ Selection list 2	Digital inputs AND6
1	IN						**1: AND6-IN1**
2	IN						**2: AND6-IN2**
3	IN						**3: AND6-IN3**
C1176	(C1175)	Disp					
[C1178]		1000	FIXED0			→ Selection list 2	Digital inputs AND7
1	IN						**1: AND7-IN1**
2	IN						**2: AND7-IN2**
3	IN						**3: AND7-IN3**
C1179	(C1178)	Disp					
C1180	-	1000	FIXED0			→ Selection list 2	
1							**1: PHINT4-LOAD**
2							**2: PHINT4-RESET**
C1181		Disp					
1	(C1180/1)						
2	(C1180/2)						
C1182	-	1000	FIXED0INC			→ Selection list 3	
1							**1: PHINT4-H-VALUE**
2							**2: PHINT4-L-VALUE**
3							**3: PHINT4-SET**
C1183		Disp					
1	(C1182/1)						
2	(C1182/2)						
3	(C1182/3)						
C1184	-	1000	FIXEDPHI0			→ Selection list 4	**PHINT4-DFIN**
C1185	(C1184)						
C1190	-	0	0	Standard			**motor PTC selection**
			1	Characteristic			
C1191			0		{1 °C}	255	
1		100					**1: Characteristic: Temp. 1**
2		150					**2: Characteristic: Temp. 2**
C1192			0		{1 Ω}	3000	
1		1670					**1: Characteristic: resistor 1**
2		2225					**2: Characteristic: resistor 2**
[C1195]	OUT.D2					→ Selection list 3	**AIF-OUT.D2** (input phase signal)
		1000	FIXED0INC				
C1196	(C1195)	Disp	-2147483647	{1}		2147483647	
C1197	IN.D2	Disp					Input signal of AIF-IN
[C1200]		1000	FIXED0INC			→ Selection list 3	Configuration input of PHADD1
1	IN						**1: PHADD1-IN1**
2	IN						**2: PHADD1-IN2**
3	IN						**3: PHADD1-IN3**
C1201	(C1200)	Disp	-2147483647	{1}		2147483647	
[C1205]		1000	FIXED0INC			→ Selection list 3	Configuration inputs of PHCMP2
1	IN						**1: PHCMP2-IN1**
2	IN						**2: PHADD1-IN2**

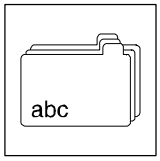


Code	LCD	Possible settings				Important
		Lenze	Selection			
C1206	(C1205)	Disp	-2147483647	{1}	2147483647	
C1207	FUNCTION	2	1 IN1 < IN2 2 |IN1| < |IN2|			**Function PHCMP2**
[C1210]		1000	FIXED0		→ Selection list 2	Digital inputs of STORE1
1	RESET					**1: STORE1-RESET**
2	ENTP					**2: STORE1-ENTP**
3	ENWIN					**3: STORE1-ENWIN**
4	LOAD0					**4: STORE1-LOAD0**
5	LOAD1					**5: STORE1-LOAD1**
[C1211]		1000	FIXEDPHI-0		→ Selection list 4	Configuration inputs of STORE1
1	IN					**1: STORE1-IN**
2	MASKI					**2: STORE1-MASKI**
[C1212]	MASKV	1000	FIXED0INC		→ Selection list 3	**STORE1-MASKV** Configuration input of STORE1
C1215	(C1210/1 ... 5)	Disp				
C1216	(C1211/1 ... 2)	Disp	-32767	32767		
C1217	(C1212)	Disp	-2147483647	2147483647		
[C1220]		1000	FIXED0		→ Selection list 2	Digital inputs of STORE2
1	RESET					**1: STORE2-RESET**
2	ENTP					**2: STORE2-ENTP**
C1223	(C1220/1 ... 2)	Disp				
[C1230]		1000	FIXED0		→ Selection list 2	Digital inputs of PHDIFF1
1	EN					**1: PHDIFF1-EN**
2	RES					**2: PHDIFF1-RES**
[C1231]	IN	1000	FIXEDPHI-0		→ Selection list 4	**PHDIFF1-IN** (configuration input)
[C1232]		1000	FIXED0INC		→ Selection list 3	Configuration inputs of PHDIFF1
1	SET					**1: PHDIFF1-SET**
2	ADD					**2: PHDIFF1-ADD**
C1235	(C1230)	Disp				
C1236	(C1231)	Disp	-32767	32767		
C1237	(C1232)	Disp	-2147483647	2147483647		
[C1240]		1000	FIXED0%		→ Selection list 1	
1	NUM					**1: CONVPHPH1-NUM**
2	DEN					**2: CONVPHPH1-DEN**
[C1241]	ACT	1000	FIXED0		→ Selection list 2	**CONVPHPH1-ACT**
C1242]	IN	1000	FIXED0INC		→ Selection list 3	**CONVPHPH1-IN**
C1245		Disp	-199.99	{0.01 %}	1999.99	
1	(C1240/1)					
2	(C1240/2)					
C1246	(C1241)	Disp				
C1247	(C1242)	Disp	-2147483647	{1}	2147483647	
[C1250]	IN	1000	FIXEDPHI-0		→ Selection list 4	**CONVPP1-IN**
[C1251]		1000	FIXED0INC		→ Selection list 3	
1	NUM					**1: CONVPP1-NUM**
2	DEN					**2: CONVPP1-DEN**
C1253	(C1250)	Disp	-32767	{1 rpm }	32767	
C1254	(C1251/1..2)	Disp	-2147483647	{1}	2147483647	
C1255	N-TRIM2	1000			→ Selection list 4	**DFSET-N-TRIM2**
C1258	(C1255)	Disp	-32767	32767 {rpm}		
C1260	OFFSET	0	-16383	{1}	16383	**GEARCOMP Offset**
C1261	NUM	1	-32767	{1}	32767	**GEARCOMP numerator**
C1262	DENUM	1	1	{1}	32767	**GEARCOMP denominator**
[C1265]	TORQUE	1000	FIXED0%		→ Selection list 1	**GEARCOMP-TORQUE** Configuration correction input
[C1266]	PHI-IN	1000	FIXED0INC		→ Selection list 3	**GEARCOMP-PHI-IN** (configuration input)
C1268	(C1265)	Disp	-199.99	{0.01 %}	199.99	
C1269	(C1266)	Disp	-2147483647	{1}	2147483647	
[C1270]		1000	FIXED0INC		→ Selection list 3	Configuration inputs of PHCMP3
1	IN					**1: PHCMP3-IN1**
2	IN					**2: PHCMP3-IN2**
C1271	(C1270)	Disp	-2147483647	{1}	2147483647	

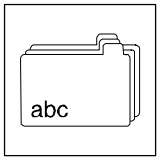


Appendix

Code	LCD	Possible settings				Important
		Lenze	Selection			
C1272	FUNCTION	2	1 2	IN1 < IN2 |IN1| < |IN2|		**Function PHCMP3**
C1290	MONIT P16	3	0 2 3	Trip Warning Off		**Conf. P16 (Sync error)** Monitoring of the synchronisation test
C1300	-	Disp	1/ ... /8			**CDATA number of profiles** Number of profiles used
C1301 1 .. 8		Disp	0 ... 2048			**Number of points in** **1: Profile 0** .. **8: Profile 7** → Depends on the number of profiles selected.
C1303 1 2	-	1	1	{1}	65535	Gearbox factor **1: Gearbox factor numerator master value** **2: Gearbox factor denominator master value**
C1304	-	360	0.0001	{0.0001 units/rev.}	214000.0000	**Output side feed constant master value** Output feed constant - master value
C1305 1 2	-	1	1	{1}	65535	Gearbox factor **1: Gearbox factor numerator actual value** **2: Gearbox factor denominator actual value**
C1306	-	1.0000	0.0001	{0.0001 units/rev.}	214000.0000	**Output side feed constant act. value** Output feed constant - act. value
C1309	-	10	1	{1 inc.}	$18 \cdot 10^8$	**Window for zero crossing** Window for zero crossing of the master value
C1310	-	0	0	{1}	7	**Profile selection CURVEC1**
C1311	-	0.0	0	{1}	7	**CDATA Start profile cycle** Start profile for cyclic cam profile processing 0 = 1st profile, 1 = 2nd profile, ... Input CDATA-CYCLE must be on 'H'. Is internally limited to a profile.
C1312	-	0.0	0	{1}	7	**CDATA range cycle** Range of cam profile processing More x profiles (starting with C1311) will be processed
C1313	-	0	0 1	Asynchronous stretching/compression Synchronous stretching/compression		**Stretching/compression (actual value)**
C1314		0	0 1	CW rotation: CCW rotation:		**Direction of master value**
C1315 1 .. 8	-	Disp				**Clock pulse length of the master value** **1: Profile 0** .. **8: Profile 7**
C1316 1 .. 8	-	Disp				**Y-limit value of** **1: Profile 0** .. **8: Profile 7**
C1317		0	0 1	Load with ctrl. inhibit Load without ctrl. inhibit		**Profile data acceptance**

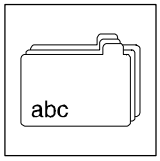


Code	LCD	Possible settings		Important
		Lenze	Selection	
C1319		0	0 DFIN * XFACT / 100% 1 DFIN * 100% / XFACT	**Stretching/compression mode** • 0: Use XFACT as multiplier: XFACT = +100% → keine Dehnung/Stauchung, XFACT = -100% → keine Dehnung/Stauchung jedoch Richtungsumkehr für die X- Position. Damit wird die Kurve "rückwärts" durchlaufen. XFACT > 100% führt zu einer Stauchung. XFACT < 100% → führt zu einer Dehnung. • 1: Use XFACT as divisor (reciprocal value): Values < 1% at input XFACT will be internally limited to +1%. If stretching/compression is not wanted: connect XFACT with FIXED100% (default setting).
C1320 1 2 3	-	 1000 1006 1000	FIXED 0 % → Selection list 1	 • 1: CURVEC1-AIN • 2: CURVEC1-XFACT Factor (stretching/compression) +100% = no compression/stretching, > 100% = compression, < 100% = stretching • 3: CURVEC1-SEL Profile selection, 0 = profile 0 (1st profile)
C1321	(C1320)	Disp		
C1322 1 2 3 4 5 6 7 8 9 10 11 12 13	-	1000	FIXED 0 → Selection list 2	Auto. cam profile processing • 1: CDATA-CYCLE HIGH = Profiles (C1311 and C1312) are cyclically processed. • 2: CDATA-RESET HIGH, if CDATA-CYCLE = LOW, the input CDATA-SEL is immediately evaluated; if CDATA-CYCLE = HIGH, the profile from C1311 will be processed. • 3: CDATA-REL-SEL HIGH, feed function active • 4: CDATA-XRESET HIGH, sets master value integrator to 0 • 5: CDATA-X-TP HIGH, sets master value integrator to TP-POS, if input X-TP/E5 = LOW • 6: CDATA-HOLD HIGH, inhibits cam profile processing, input has priority • 7: CDATA-LOAD Signal LOW →H: aktiviert die nachgeladenen bzw. neue Kurven • 8: CDATA-X-TP/E5 Selection of TP initiator: LOW= Initiator at X-TP HIGH = Connect initiator to term. X5/E5 • 9: CDATA-HOLD HIGH = Outputs AOUT and OUT are stored; DFOUT = 0 • 10: CDATA-SEL-IN Selection input AIN ↔ IN LOW = AIN HIGH = IN • 11: CDATA-REL-SEL • 12: CDATA-XRESET
C1323	(C1322)	Disp		

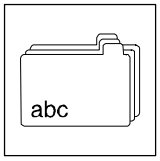


Appendix

Code	LCD	Possible settings				Important
		Lenze	Selection			
C1324 1 2 3 4 5 7	-	 1000 1000 1000 19616 1000 1000	 FIXED0 INC FIXED0 INC FIXED0 INC FCODE 1476/16 FIXED0 INC FIXED0 INC	 → Selection list 3 → Selection list 3 → Selection list 3 → Selection list → Selection list 3 → Selection list 3		• 1: CDATA-X-START • 2: CDATA-XIN Input for the master value position if C1332 = 1 • 3: CDATA-XOFFS Input for offset in X direction (only if C1332 = 0) • 4: CDATA-TP-POS TP position of the master value • 5: CURVEC1-IN • 7: OFFS-XIN
C1325	(C1324)	Disp				
C1326	-	1000	FIXEDPHI-0	→ Selection list 3		**CDATA-DFIN** Input for digital frequency if C1332 = 0
C1327	(C1326)	Disp				
C1329 1 2 3 4		Disp				Display of x values in [m_units] • /1: X axis position CDATA-X-ACT • / 2: X integrator position CDATA-XPOS • /3: Distance between two marks • /4: Offset to mark
C1330 1 2		Disp				Display of x values in [s_units] • /1: Cam profile position CDATA-YOUT • /2: Cam profile position CDATA-YOUT-CYCLE
C1331	-	100	0	{1 rpm}	15000	**max. TP compensation speed** only valid if • C1335 = 1 (with compensation limitation) and • C1335 = 2 (cross-cutter)
C1332	-	0	0 CDATA-DFIN 1 CDATA-XIN			**Selection of master value** • 0: Master frequency, internal master • 1: External selection of the X position
C1333	-	Disp				**Current X position**
C1334	-	Disp				**Current Y position**
C1335	-	0	0: without compensation limitation 1: with compensation limitation 2: cross-cutter			**CDATA-TP-SPEED-MODE**
C1336 1 2	-	Disp				 **1: DY** **2: DX**
C1337		Disp				**No. of point**
C1338			0 Do not use input OFFS-XIN 1 Use input OFFS-XIN			XIN mode· • 0 (without OFFS-XIN): XOFFS and XFACT have no effect If master position > Xmax → CDATA-X>XMAX = HIGH: Leitposition wird intern auf Xmax begrenzt. Wenn Leitposition < 0 → ·CDATA-X<0 = HIGH: Leitposition wird intern auf 0 begrenzt. • 1 (with OFFS-XIN): Mode for absolute value encoder as master position encoder. Thus the profile can be shifted by max. ± one profile clock pulse compared to the encoder. Activation of offset at input OFFS-XIN. XOFFS and XFACT have no effect Master position + offset > Xmax ((XIN + OFFS-XIN > ACTLEN * 2)) → ·CDATA-X>XMAX = HIGH: Leitposition wird intern auf Xmax begrenzt. Leitposition < 0 → CDATA-X<0 = HIGH: Leitposition wird intern auf 0 begrenzt.

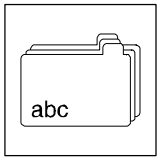


Code	LCD	Possible settings		Important
		Lenze	Selection	
C1339 1 2 3 4		Disp		Display of y values in [s_units] • /1: Cam profile position CCTRL-PHI-SET • /2: Second position setpoint CCTRL-PHI-SET2 • /3: Current position value CCTRL-PHI-ACT • /4: Current following error CCTRL-POUT
C1340 1 2	-	1000	FIXED 0% → Selection list 1	• 1: CCTRL-NRED Gain for speed setpoint precontrol • 2: CCTRL-MRED Gain for torque setpoint precontrol
C1341	(C1340)	Disp	-199.99 {0.01%} 199.99	
C1342 1 2 3 4 5	-	1000	FIXED 0 → Selection list 2	• 1: CCTRL-RESET HIGH: Set phase = act. phase -> CCTRL-POUT = 0 • 2: CCTRL-TPIN External mark to set the position • 3: CCTRL-N2-SET HIGH = input -NSET2 active • 4: CCTRL-TPIN/E4 Selection: Input TPIN ↔ KI. X5/E4 (TOUCH-PROBE-Initiator) • 5: CCTRL-SUB-Y-END Acceptance clock pulse for profile end
C1343	(C1342)	Disp		
C1344 1 2	-	1000	FIXED0 INC → Selection list 3	Upper range value of the profile (only required for touch probe) **1: CCTRL-Y-END** **2: CCTRL-TP-POS**
C1345	(C1344)	Disp		
C1346 1 2	-	1000	FIXEDPHI-0 INC → Selection list 4	• 1: CCTRL-IN Input for mains setpoint • 2: CCTRL-NSET2 Input for alternative setpoint (2nd setpoint)
C1347	(C1346)	Disp		
C1348 1 2	-	 100 1	1 {1} 32767	Adaptation of torque pre-control to moment of inertia of machine **/1: M-Vst. numerator** **/2: M-Vst. denominator**
C1350	-	0	0 CW rotation: 1 CCW rotation:	**Direction of rotation of actual value**
C1352	-	1000	FIXED 0% → Selection list 1	**YSET1-FACT** Stretching/compression factor: +100% = no compression/stretching > 100% = compression < 100% = stretching
C1353	(C1352)	Disp		
C1354 1 2		1000	FIXED 0 → Selection list 2	• 1: YSET1-RESET Reset of the -OFFS input • 2: YSET1-SYNCH Clock pulse input for synchronous switching of the stretching/compression factor
C1355	(C1354)	Disp		
C1356		1000	FIXED0 INC → Selection list 3	**YSET1-OFFS** (Offset value)
C1357	(C1356)	Disp		
C1358 1 2	-	1000	FIXEDPHI-0 → Selection list 4	Input in rpm **1: YSET1-IN** **2: YSET1-IN-SYNCH**
C1359	(C1358)	Disp		

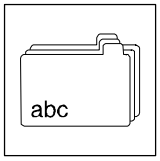


Appendix

Code	LCD	Possible settings				Important
		Lenze	Selection			
[C1360] 1 2 3 4 5 6 7 8 9 10	-	1000	FIXED0INC		→ Selection list 3	 **1: VTPOSC-IN1** **2: VTPOSC-IN2** **3: VTPOSC-IN3** **4: VTPOSC-IN4** **5: VTPOSC-IN5** **6: VTPOSC-IN6** **7: VTPOSC-IN7** **8: 7VTPOSC-IN8** **9: VTPOSC-IN9** **10: VTPOSC-IN10**
C1361	(C1360)	Disp		0/1		
C1364		Disp	0: OFFS reset 1: OFFS disable			**OFFSET-RESET mode** Function block YSET1 0: Offset is internally stored with YSET1-RESET = HIGH 1: Offset is internally set to "0" with YSET1-RESET = HIGH
C1365	-		0	{1 rpm}	15000	**max. TP compensation speed** only valid if C1366 = 0 (without compensation limitation)
C1366	-	0	0: without compensation limitation 1: with compensation limitation			**CCTRL-TP-SPEED-MODE**
C1367	-	0	-214000	{0.0001 s-units}	214000	**Set homing value** When using an absolute-value encoder as feedback: Enter the distance between tool and machine zero. The y value refers to machine zero.
C1368	-	0	0: Motor mounted on the right-hand side 1: Motor mounted on the left-hand side			**Motor mounting**
C1369	-	1	1	{1 msec}	100	**M-Tv-CCTRL-MOUT** Holding time for torque pre-control
C1370		1000	FIXED0%		→ Selection list 1	**EXTPOL1-AIN**
C1371	(C1370)	Disp				
C1374 1 2		1000	FIXED0INC		→ Selection list 3	 **1: EXTPOL1-PHIN** **2: EXTPOL2-PHIN**
C1375	(C1374)	Disp				
C1379		2	1	{1}	127	**max. extra polation cycle**
C1380 1 2		10	10	{1 inc}	1800000000	 • 1: Hysteresis fault signal (output-ERR) • 2: Hysteresis warning signal (output-WARN)
C1384	-	1000	FIXED0		→ Selection list 1	**CERR1-WFAC** (reduction factor) +100% = no reduction < 100% = reduction > 100% = increase
C1385	(C1384)	Disp				
C1386		1000	FIXED0%		→ Selection list 1	**CERR1-DISABLE** HIGH sets CERR1-WARN and CERR1-EER = 0
C1387	(C1386)	Disp				
C1388 1 2		1000	FIXED0INC		→ Selection list 4	• 1: CERR1-PHI-IN input • 2: CERR1-LIM Threshold; the absolute value is generated from the input value
C1389	(C1388)	Disp				

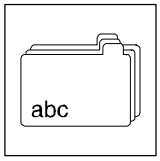


Code	LCD	Possible settings		Important
		Lenze	Selection	
C1394 1 2 3 4 5 6 7 8 9 10	-	1000	FIXED 0 → Selection list 2	• 1: MSEL1-EN-M1 Activation master value 1 • 2: MSEL1-EN-M2 Activation master value 2 • 3: MSEL1-EN-M3 Activation master value 3 • 4: MSEL1-EN-M4 Activation master value 4 • 5: MSEL1-LOCK Locking • 6: MSEL2-EN-M1 Activation master position 1 • 7: MSEL2-EN-M2 Activation master position 2 • 8: MSEL2-EN-M3 Activation master position 3 • 9: MSEL2-EN-M4 Activation master position 4 • 10: MSEL2-LOCK Locking
C1395	(C1394/1 ... 10)	Disp		
C1396 1 2 3 4	-	1000	FIXED0 INC → Selection list 3	• 1: MSEL2-M1POS Master position input 1 • 2: MSEL2-M2POS Master position input 2 • 3: MSEL2-M3POS Master position input 3 • 4: MSEL2-M4POS Master position input 4
C1397	(C1396/1 ... 4)	Disp		
C1398 1 2 3 4		1000	FIXEDPHI-0 → Selection list 4	• 1: MSEL1-DFIN1 Master value input 1 • 2: MSEL1-DFIN2 Master value input 2 • 3: MSEL1-DFIN3 Master value input 3 • 4: MSEL1-DFIN4 Master value input 4
C1399	(C1398/1 ... 4)	Disp		Display of C1398
C1400 1 2 3	-	1000	FIXED 0 → Selection list 2	• 1: RFGPH1-RESET HIGH = sets RFGPH1-OUT = 0 (jump) LOW = RFGPH1-OUT is set to the value at RFGPH1-IN according to the selected function Input has priority over RFGPH1-RFG-0 • 2: RFGPH1-RFG-0 HIGH = proceeds according to the selected function RFGPH1-OUT = 0 LOW = RFGPH1-OUT is set to the value at RFGPH1-IN according to the selected function • 3: RFGPH1-T/DIST Function changeover HIGH = path-based path change LOW = time-based path change
C1401	(C1400/1 ... 3)	Disp		
C1402 1 2		1000	FIXED0 INC → Selection list 3	• 1: RFGPH1-IN Position setpoint (65536 inc = 1 rev.) • 2: RFGPH1-DIST Path difference by which the path is to be changed at the input -IN (65536 inc = 1 rev.)
C1403	(C1402/1 ... 2)	Disp		
C1404		1000	FIXEDPHI-0 → Selection list 4	**RFGPH1-DFIN** (master frequency input)

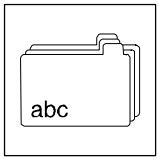


Appendix

Code	LCD	Possible settings				Important
		Lenze	Selection			
C1405	(C1404)	Disp				
C1408		300.0	-16000.0000	{0.0001 rpm}	16000.0000	**Speed**
C1409						**RFGPH mode**
C1410		0	0 directly engaged 1 to open position 2 to target position 3 latch at set position			**CLUTCH1 clutch mode**
C1411		200.00	1	{0.0000 rpm}	16000.0000	**max. speed CLUTCH1**
C1412 1 2 3 4 5		1.0	0.010	{0.010 s}	130.000	**1: Release time/ramp** **2: Ramp profile generator** **3: Time delay overload** **4: Release time CLUTCH2** **5: Ramp profile generator CLUTCH2**
C1413 1 2		163	5	{1 inc}	$18 \cdot 10^8$	**1: Catch hysteresis CLUTCH1** **2: Catch hysteresis CHLUTCH2**
C1414 1 2		1000	FIXED 0%	→ Selection list 1		• 1: CLUTCH1-MLIM Threshold for monitoring “overload” • 2: CLUTCH1-MACT Act. value for monitoring “overload”
C1415	(C1414)	Disp				
C1416 1 2 3 4	-	1000	FIXED 0	→ Selection list 2		• 1: CLUTCH1-CLOSE HIGH = engage clutch LOW = disengage clutch • 2: CLUTCH1-OL-DET HIGH = activate overload monitoring • 3: CLUTCH2-CLOSE • 4: CLUTCH2-SEL
C1417	(C1416)	Disp				Display of C1416
C1418 1 2 3 4 5		1000	FIXED0 INC	→ Selection list 3		• 1: CLUTCH1-PHI-SET Set drive position • 2: CLUTCH1-PHI-ACT Act. drive position • 3: CLUTCH2-PHI-SET • 4: CLUTCH2-PHI-ACT • 5: CLUTCH2-LEN
C1419	(C1418)	Disp				
C1420		0	0 Profile 0 1 Profile 1 2 Profile 2 3 Profile 3 4 Profile 4 5 Profile 5 6 Profile 6 7 Profile 7			**Event profile**
C1424 1 2 3 4 5		1000	FIXED 0	→ Selection list 2		• 1: CSEL1-CAM*1 (selection bit 0) • 2: CSEL1-CAM*2 (selection bit 1) • 3: CSEL1-CAM*4 (selection bit 2) • 4: CSEL1-LOAD Acceptance signal = LOW->HIGH transition • 5: CSEL1-EVENT (event profile)
C1425	(C1424)	Disp				
C1430 1 2		1.0000	0	{0.0001 units}	214000.0000	**1: Window for master value comparison** **2: Window for actual value comparison**
C1431		0	0 Compare MPOS and ACTPOS 1 Compare MPOS only 2 Compare ACTPOS only			**Memory function**

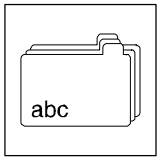


Code	LCD	Possible settings				Important
		Lenze	Selection			
C1434 1 2		1000	FIEXED0		→ Selection list 2	• 1: PSAVE1-ON HIGH = Comparison of inputs MPOS/ACTPOS with values saved and difference output • 2: PSAVE1-SAVE HIGH = Acceptance of the inputs MPOS and ACTPOS
C1435	(C1434/1 ... 2)	Disp				Disply of C1434
C1436 1 2		1000	FIXED0INC		→ Selection list 3	• 1: PSAVE1-MPOS Input for master position • 2: PSAVE1-ACTPOS Input for actual position (e.g. rotor position)
C1437	(C1436/1 ... 2)	Disp				
C1440 1 2		1000	FIXED 0		→ Selection list 2	**1: SWPHD1-SET** **2: SWPHD2-SET**
C1441	(C1440/1 ... 2)	Disp				
C1442 1 2 3 4		1000	FIXEDPHI-0		→ Selection list 4	**1: SWPHD1-IN1** **2: SWPHD1-IN2** **3: SWPHD2-IN1** **4: SWPHD2-IN2**
C1443	(C1442/1 ... 4)	Disp				
C1444 1 2 3 4 5		1000	FIXED0INC		→ Selection list 3	• 1: WELD1-XIN Input X position • 2: WELD1-LEN-O Time of the closing phase • 3: WELD1-LEN-C Time of the opening phase • 4: WELD1-LEN Time of the cam profile • 5: WELD1-TIME Welding time in ms (1 inc = 1 ms)
C1445	(C1444)	Disp				
C1450 1 2		1000	FIXED0INC		→ Selection list 3	Phase input **1: CONVPHPHD1-IN** **2: CONVPHPHD2-IN**
C1451	(C1450)	Disp				
C1452		1	-32767	{1}	32767	**numerator**
C1453		1	1	{1}	32767	**denominator**
C1454						**CONVPHPHD2-RESET**
C1455	(C1454)	Disp				
C1460		0	0 Analog setpoint AIN 1 Phase difference setpoint DFIN			**Selection setpoint source**
C1461 1 2		300	-16000.0000	{0.0001 rpm}	16000.0000	**1: Speed CW** **2: Speed CCW**
C1462 1 2		1.000	0.010	{0.001 sec}	999.990	**1: Acceleration time** **2: Deceleration time** **3: Deceleration time when RFG=0=1**
C1463 1 2		100	0	{1 rpm}	16000	**1: Window ramp function generator** **2: Hysteresis ramp function generator**
C1466 1 2		1000	FIXED 0%		→ Selection list 1	• 1: VMAS1-AIN Analog setpoint • 2: VMAS1-RED-VAL Alternative analog setpoint, target for speed reduction
C1467	(C1466)	Disp				

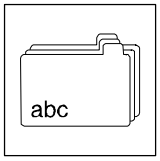


Appendix

Code	LCD	Possible settings				Important
		Lenze	Selection			
C1468 1 2 3 4 5		1000	FIXED 0		→ Selection list 2	• 1: VMAS1-EN-AIN HIGH = Activate the analog input VMAS1-AIN or VMAS1-DFIN (depending on the selection under C1460) • 2: VMAS1-EN-RED HIGH = Activate the analog input VMAS1-RED-VAL • 3: VMAS1-EN-RFG HIGH = Active the ramp function generator LOW = Input values are processed directly • 4: VMAS1-CW Input CW rotation (determine speed in C1461/1) • 5: VMAS1-CCW Input CCW rotation (determine speed in C1461/2) • 6: VMAS1-RFG=0 Controlled deceleration to n=0
C1469	(C1468)	Disp				
C1472		1000	FIXEDPHI-0		→ Selection list 4	**VMAS1-DFIN** Master speed input (digital frequency)
C1473	(C1472)	Disp				
C1476		0.0000	0.0000	{0.0001 m-units}	214000.0000	**FCODE - master value**
C1477		0.0000	-214000.0000	{0.0001 s-units}	214000.0000	**FCODE - actual value**
C1480		512	10	{1}	32767	**CONVPHD1-encoder constant**
C1486 1 2		 19521 19522	 FCODE-474/1 FCODE-474/2		→ Selection list 3	• 1: CONVPHD1-NOM Stretchin factor numerator, input limited to ±1000000 • 2: CONVPHD1-DEN Stretching factor denominator, input limited to +1 to +200000000
C1487	(C1486)	Disp				
C1488		1000	FIXEDPHI-0		→ Selection list 4	Input in rpm
C1489	(C1488)	Disp				
C1500	OUTPUT SIGNAL		-2147483648	{1}	2147483647	**Signal output**
C1501	CODE	141	2	{1}	2000	**FEVAN2 code** Target code of FEVAN2
C1502	SUBCODE	0	0	{1}	255	**FEVAN2 subcode** Target subcode FEVAN2
C1503	NUMERATOR	1.0000	0.0001	{0.0001}	100000.0000	**FEVAN2 numerator**
C1504	DENOMINATOR	0.0001	0.0001	{0.0001}	100000.0000	**FEVAN2 denominator**
C1505	OFFSET	0		0/1000000000		**FEVAN2 offset**
[C1506]	IN	1000	FIXED0%		→ Selection list 1	**FEVAN2-IN** Configuration analog input
[C1507]	LOAD	1000	FIXED0		→ Selection list 2	**FEVAN2-LOAD** (digital input)
C1508	(C1506)	Disp	-32768	{1}	32767	
C1509	(C1507)	Disp				
C1550	ARITPH4 FUNCT	1	0 OUT = IN1 1 IN1 + IN2 2 IN1 - IN2 3 IN1 * IN2 / 2^{30} 13 IN1 * IN2 14 IN1 / IN2 21 IN1 + IN2 (no limit) 22 IN1 - IN2 (no limit)			**ARITPH4 function**
[C1551] 1 2	 IN IN	1000	FIXED0INC		→ Selection list 3	Inputs ARITPH4 **1: ARITPH4-IN1** **2: ARITPH4-IN2**
C1552	(C1551)	Disp	-2147483647	{1}	2147483647	



Code	LCD	Possible settings				Important
		Lenze	Selection			
C1555	ARITPH5 FUNCT	1	0 OUT = IN1 1 IN1 + IN2 2 IN1 - IN2 3 IN1 * IN2 / 2^{30} 13 IN1 * IN2 14 IN1 / IN2 21 IN1 + IN2 (no limit) 22 IN1 - IN2 (no limit)			**ARITPH5 function**
[C1556] 1 2	 IN IN	1000	FIXED0INC		→ Selection list 3	Inputs ARITPH5 **1: ARITPH5-IN1** **2: ARITPH5-IN2**
C1557	(C1556)	Disp	-2147483647	{1}	2147483647	
C1560	ARITPH6 FUNCT	1	0 OUT = IN1 1 IN1 + IN2 2 IN1 - IN2 3 IN1 * IN2 / 2^{30} 13 IN1 * IN2 14 IN1 / IN2 21 IN1 + IN2 (no limit) 22 IN1 - IN2 (no limit)			**ARITPH6 funct**
[C1561] 1 2	 IN IN	1000	FIXED0INC		→ Selection list 3	Inputs ARITPH6 **1: ARITPH5-IN1** **2: ARITPH5-IN2**
C1562	(C1561)	Disp	-2147483647	{1}	2147483647	
[C1580]	IN	1000	FIXED0%		→ Selection list 1	**CONVAD1-IN**
C1581	(C1580)	Disp	-32768	{1}	32767	
[C1582]	IN	1000	FIXED0%		→ Selection list 1	**CONVAD2-IN**
C1583	(C1582)	Disp	-32768	{1}	32767	
C1590	NUMERRATOR	1	-32768	{1}	32767	**CONVAPH1 numerator**
C1591	DENUMERRATOR	1	1	{1}	32767	**CONVAPH1 denominator**
C1593	IN	1000				**CONVAPH1-IN**
C1594	(C01593)					
[C1640]	RESET	1000	FIXED0		→ Selection list 2	**SPC1-RESET1**
C1641 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16	 SP-VALUE 1-1 SP-VALUE 1-2 SP-WERT 2-1 SP-VALUE 2-2 SP-VALUE 3-1 SP-VALUE 3-2 SP-VALUE 4-1 SP-VALUE 4-2 SP-VALUE 5-1 SP-VALUE 5-2 SP-VALUE 6-1 SP-VALUE 6-2 SP-VALUE 7-1 SP-VALUE 7-2 SP-VALUE 8-1 SP-VALUE 8-2	1	FCODE1476/x FCODE1477/x FCODE0474/x VTPOSC-No.x			SPC1 • 1: Switching point value 1-1 Switching points output STATUS-01 • 2: Switcing point value 1-2 Switching points output STATUS-01 ... ... • 15: Switching point value 8-1 Switching points output STATUS-08 • 16: Switching point value 8-2 Switching points output STATUS-08
[C1642]	IN	1000	FIXED0INC		→ Selection list 3	**SPC1-L-IN**
C1643	(C1640)	Disp		0/1		
C1644	(C1642)	Disp	-1073741824	{1 inc}	1073741823	
C1645	MODE	0	0 on / off 1 centre/range			**SPC1 mode**
[C1650]	RESET	1000	FIXED0		→ Selection list 2	**SPC2-RESET1**



Appendix

Code	LCD	Possible settings				Important
		Lenze	Selection			
C1651		1	FCODE 1476/1		→ Selection list 1	• 1: Switching point value 1-1 Switching points output STATUS-01 • 2: Switcng point value 1-2 Switching points output STATUS-01 ... ... • 15: Switching point value 8-1 Switching points output STATUS-08 • 16: Switching point value 8-2 Switching points output STATUS-08
1	SP-VALUE 1-1					
2	SP-VALUE 1-2					
3	SP-VALUE 2-1					
4	SP-VALUE 2-2					
5	SP-VALUE 3-1					
6	SP-VALUE 3-2					
7	SP-VALUE 4-1					
8	SP-VALUE 4-2					
9	SP-VALUE 5-1					
10	SP-VALUE 5-2					
11	SP-VALUE 6-1					
12	SP-VALUE 6-2					
13	SP-VALUE 7-1					
14	SP-VALUE 7-2					
15	SP-VALUE 8-1					
16	SP-VALUE 8-2					
[C1652]	IN	1000	FIXED0INC		→ Selection list 3	**SPC2-L-IN**
C1653	(C1650)	Disp		0/1		
C1654	(C1652)	Disp	-1073741824	{1 inc}	1073741823	
C1655	MODE	0	0 on / off 1 centre/range			**SPC2 mode**
C1657		0	-30000	{1 msec}	30000	**SPC2 dead time**
1	DEAtH tIME					**Dead time**
..	..					**..**
4	DEAtH tIME					**Dead time**
C1658	HYSTERESIS	0	-32767	{1 inc}	32767	**SPC2 hysteresis**
C1659	FILTER	1	0 Filter off 1 Filter 1 ms 2 Filter 2 ms 4 Filter 4 ms 8 Filter 8 ms 16 Filter 16 ms			**Filters**
C1660	Act.SEL.	Disp	0		8	**act.sel.** (Display of the current selection)
[C1661]	SELECT	1000	FIXED0%		→ Selection list 1	**SELPH1-SLECT**
[C1662]		1000	FIXED0INC		→ Selection list 3	
1	IN					**1: SELPH1-IN1**
..	...					**...**
8	IN					**8: SELPH1-IN8**
C1663	(C1661)	Disp	-32768	{1}	32767	
C1664	(C1662)	Disp	-2147483648	{1 inc}	147483647	
C1665	Act.SEL.	Disp	0	{1}	8	**act.sel.** (Display of the current selection)
[C1666]	SELECT	1000	FIXED0%		→ Selection list 1	**SELPH2-SELECT**
[C1667]		1000	FIXED0INC		→ Selection list 3	
1	IN					**1: SELPH2-IN1**
..	...					**...**
8	IN					**8: SELPH2IN8**
C1668	(C1666)	Disp	-32768	{1}	32767	
C1669	(C1667)	Disp	-2147483648	{1 inc}	2147483647	
C1799		1250	20	{1}	1250	**DFOUT f_{max} (kHz)**
C1810		Disp				**SW-code LECOM**
C1811		Disp				**SW-generation**

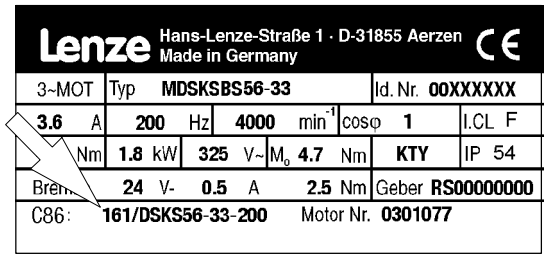
11.3 Motor selection list

11.3.1 Servo motors

Tip!

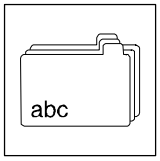
For the parameter setting of the drive the available motor type is to be entered under code C0086. This value is indicated on the nameplate.
Example: “161”. The motor designation behind this number is shown in the display ”DSKS56-33-200”.

If the code value is > 269: See Reference List for servo motors



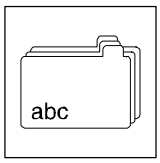
9300std201

C0086		Lenze motor type	C0081	C0087	C0088	C0089	C0090	Motor type	Thermal sensor
Value	Name		P_r [kW]	n_r [rpm]	I_r [A]	f_r [Hz]	V_r [V]		
10	MDSKA56-140	MDSKAXX056-22	0.80	3950	2.4	140		Asynchronous servo motor	KTY
11	MDFKA71-120	MDFKAXX071-22	2.20	3410	6.0	120			
12	MDSKA71-140	MDSKAXX071-22	1.70	4050	4.4	140			
13	MDFKA80-60	MDFKAXX080-22	2.10	1635	4.8	60			
14	MDSKA80-70	MDSKAXX080-22	1.40	2000	3.3	70			
15	MDFKA80-120	MDFKAXX080-22	3.90	3455	9.1	120	390		
16	MDSKA80-140	MDSKAXX080-22	2.30	4100	5.8	140			
17	MDFKA90-60	MDFKAXX090-22	3.80	1680	8.5	60			
18	MDSKA90-80	MDSKAXX090-22	2.60	2300	5.5	80			
19	MDFKA90-120	MDFKAXX090-22	6.90	3480	15.8	120			
20	MDSKA90-140	MDSKAXX090-22	4.10	4110	10.2	140	350		
21	MDFKA100-60	MDFKAXX100-22	6.40	1700	13.9	60			
22	MDSKA100-80	MDSKAXX100-22	4.00	2340	8.2	80	390		
23	MDFKA100-120	MDFKAXX100-22	13.20	3510	28.7	120			
24	MDSKA100-140	MDSKAXX100-22	5.20	4150	14.0	140	330		
25	MDFKA112-60	MDFKAXX112-22	11.00	1710	22.5	60			
26	MDSKA112-85	MDSKAXX112-22	6.40	2490	13.5	85	390		
27	MDFKA112-120	MDFKAXX112-22	20.30	3520	42.5	120			
28	MDSKA112-140	MDSKAXX112-22	7.40	4160	19.8	140	320		
30	DFQA100-50	MDFQAXX100-22	10.60	1420	26.5	50			
31	DFQA100-100	MDFQAXX100-22	20.30	2930	46.9	100			
32	DFQA112-28	MDFQAXX112-22	11.50	760	27.2	28			
33	DFQA112-58	MDFQAXX112-22	22.70	1670	49.1	58			
34	DFQA132-20	MDFQAXX132-32	17.00	550	45.2	20	360		
35	DFQA132-42	MDFQAXX132-32	40.30	1200	88.8	42			
40	DFQA112-50	MDFQAXX112-22	20.10	1425	43.7	50			
41	DFQA112-100	MDFQAXX112-22	38.40	2935	81.9	100			
42	DFQA132-36	MDFQAXX132-32	36.40	1030	77.4	39			
43	DFQA132-76	MDFQAXX132-32	60.10	2235	144.8	76	340		



Appendix

C0086		Lenze motor type	C0081	C0087	C0088	C0089	C0090	Motor type	Thermal sensor
Value	Name		P_r [kW]	n_r [rpm]	I_r [A]	f_r [Hz]	V_r [V]		
50	DSVA56-140	DSVAXX056-22	0.80	3950	2.4	140	390	Asynchronous servo motor	TKO (Thermostat)
51	DFVA71-120	DFVAXX071-22	2.20	3410	6.0	120			
52	DSVA71-140	DSVAXX071-22	1.70	4050	4.4	140			
53	DFVA80-60	DFVAXX080-22	2.10	1635	4.8	60			
54	DSVA80-70	DSVAXX080-22	1.40	2000	3.3	70			
55	DFVA80-120	DFVAXX080-22	3.90	3455	9.1	120			
56	DSVA80-140	DSVAXX080-22	2.30	4100	5.8	140			
57	DFVA90-60	DFVAXX090-22	3.80	1680	8.5	60			
58	DSVA90-80	DSVAXX090-22	2.60	2300	5.5	80			
59	DFVA90-120	DFVAXX090-22	6.90	3480	15.8	120			
60	DSVA90-140	DSVAXX090-22	4.10	4110	10.2	140	350		
61	DFVA100-60	DFVAXX100-22	6.40	1700	13.9	60	390		
62	DSVA100-80	DSVAXX100-22	4.00	2340	8.2	80			
63	DFVA100-120	DFVAXX100-22	13.20	3510	28.7	120			
64	DSVA100-140	DSVAXX100-22	5.20	4150	14.0	140	330		
65	DFVA112-60	DFVAXX112-22	11.00	1710	22.5	60	390		
66	DSVA112-85	DSVAXX112-22	6.40	2490	13.5	85			
67	DFVA112-120	DFVAXX112-22	20.30	3520	42.5	120			
68	DSVA112-140	DSVAXX112-22	7.40	4160	19.8	140	320		
108	DSKS36-13-200	MDSKSXX036-13	0.25	4000	0.9	200	245	Synchronous servo motor	KTY
109	DSKS36-23-200	MDSKSXX036-23	0.54	4000	1.1	200	345		
110	MDSKS56-23-150	MDSKSXX056-23	0.60	3000	1.25	150	350		
111	MDSKS56-33-150	MDSKSXX056-33	0.91	3000	2.0	150	340		
112	MDSKS71-13-150	MDSKSXX071-13	1.57	3000	3.1	150	360		
113	MDFKS71-13-150	MDFKSXX071-13	2.29	3000	4.35	150	385		
114	MDSKS71-23-150	MDSKSXX071-23	2.33	3000	4.85	150	360		
115	MDFKS71-23-150	MDFKSXX071-23	3.14	3000	6.25	150	375		
116	MDSKS71-33-150	MDSKSXX071-33	3.11	3000	6.7	150	330		
117	MDFKS71-33-150	MDFKSXX071-33	4.24	3000	9.1	150	345		
160	DSKS56-23-190	MDSKSXX056-23	1.1	3800	2.3	190	330		
161	DSKS56-33-200	MDSKSXX056-33	1.8	4000	3.6	200	325		
162	DSKS71-03-170	MDSKSXX071-03	2.0	3400	4.2	170	330		
163	DFKS71-03-165	MDFKSXX071-03	2.6	3300	5.6	165	330		
164	DSKS71-13-185	MDSKSXX071-13	3.2	3700	7.0	185	325		
165	DFKS71-13-180	MDFKSXX071-13	4.1	3600	9.2	180	325		
166	DSKS71-33-180	MDSKSXX071-33	4.6	3600	10.0	180	325		
167	DFKS71-33-175	MDFKSXX071-33	5.9	3500	13.1	175	325		



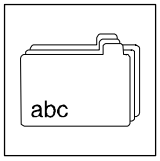
Reference list for servo motors

Tip!

The motors listed under “Nameplate data” are available with GDC and unit software.

1. Please enter the value stated for your motor under C0086 in GDC or the keypad.
2. Then check all codes listed in the table.
   Overwrite the entry in GDC or the keypad with the values indicated in the table.
3. If necessary, codes C0070 and C0071 must be adapted to your machine.

Nameplate		Data entry													
		C0086	C0022	C0081	C0084	C0085	C0087	C0088	C0089	C0090	C0091	C0070	C0071	C0075	C0076
Field: C86	Field: Motor type		Imax [A]	P_r [kW]	R_s [Ω]	L σ [mH]	n_r [rpm]	I_r [A]	f_r [Hz]	V_r [V]	cos φ	V_{pn}	T_{nn}	V_{pi}	T_{ni}
1000	MDSKA-71-22	54	3.75	0.88	8.4	34.98	1950	2.50	70	390	0.82	2	100	1.5	1.5
1001	MDFQA-112-12	33	42.60	12.90	0.45	4.3	1660	28.40	58	360	0.85	20	21	2	1
1002	MDFQA-112-12	41	70.50	21.80	0.45	4.3	2930	47.00	100	360	0.83	14	21	1.3	1
1003	MDSKA-56-22	50	6.75	1.57	2.25	6.5	6000	4.50	202	280	0.72	3	50	1.3	1.5
1004	MDSKS071-33-39	112	5.10	0.95	7.2	34.5	780	3.40	39	325	1.00	3	20	2.5	1.5
1005	MDSKS071-33-41	112	2.25	0.45	16.3	68	820	1.50	41	330	1.00	2	20	2.5	1.5
1076	MDSKS071-33-90	112	5.85	1.60	3.67	17.7	1800	3.90	90	310	1.00	10	20	0.7	1.7
1077	MDSKA-71-22	51	2.18	0.33	35.7	131.8	725	1.45	30	360	0.78	10	70	1.5	2
1103	SDSGA056-22	50	1.20	0.24	29.3	123	2790	0.80	100	390	0.71	14	150	0.35	1.8
1104	SDSGA056-22	40	2.55	0.24	29.3	123	2790	1.70	100	230	0.71	14	150	0.35	1.8
1105	SDSGA063-22	50	1.80	0.40	29.3	123	2800	1.20	100	390	0.70	14	150	0.35	1.8
1106	SDSGA063-22	40	3.15	0.40	29.3	123	2800	2.10	100	230	0.70	14	150	0.35	1.8
1107	SDSGA063-32	50	2.55	0.60	29.3	123	2800	1.70	100	390	0.70	14	150	0.35	1.8
1108	SDSGA063-32	40	4.50	0.6	29.3	123	2800	3	100	230	0.70	14	150	0.35	1.8
1109	MDSKS056-23-280	114	8.00	1.10	6.72	8.34	5600	2.30	280	320	1.00	10	20	1.3	1.5
1110	MDSKS056-23-310	114	9.00	1.10	5.42	6.78	6200	2.30	310	320	1.00	10	20	1.3	1.5
1111	MDSKS056-33-300	114	10.00	1.75	3.31	4.62	6000	3.60	300	320	1.00	10	20	1.3	1.5
1112	MDSKS056-33-265	114	8.00	1.72	4.1	5.73	5300	3.60	265	320	1.00	10	20	1.3	1.5
1113	MDSKS071-13-265	114	23.00	3.20	0.54	2.56	5300	7.00	265	320	1.00	10	20	1.3	1.5
1116	MDSKS071-33-270	114	25.00	5.70	0.38	1.91	5400	12.50	270	320	1.00	10	20	1.3	1.5

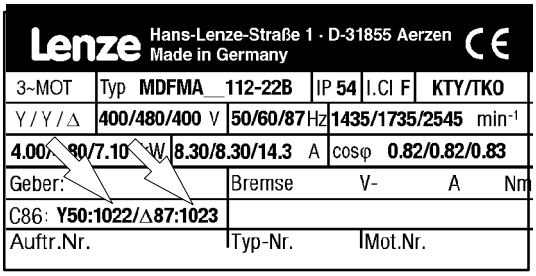


Appendix

11.3.2 Three-phase asynchronous motors

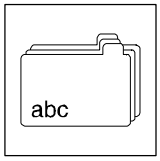
Tip!

If the code is > 269:
See Reference List for motor types MDXMA



Types DXRAXX

GDC / Display		Nameplate	C0081	C0087	C0088	C0089	C0090	Motor type	Thermal sensor
Value	Name		P_r [kW]	n_r [rpm]	I_r [A]	f_r [Hz]	V_r [V]		
210	DXRAXX071-12-50	DXRAXX071-12	0.25	1410	0.9	50	400	Asynchronous inverter motor (in star connection)	TKO (Thermostat)
211	DXRAXX071-22-50	DXRAXX071-22	0.37	1398	1.2				
212	DXRAXX080-12-50	DXRAXX080-12	0.55	1400	1.7				
213	DXRAXX080-22-50	DXRAXX080-22	0.75	1410	2.3				
214	DXRAXX090-12-50	DXRAXX090-12	1.10	1420	2.7				
215	DXRAXX090-32-50	DXRAXX090-32	1.50	1415	3.6				
216	DXRAXX100-22-50	DXRAXX100-22	2.20	1425	4.8				
217	DXRAXX100-32-50	DXRAXX100-32	3.00	1415	6.6				
218	DXRAXX112-12-50	DXRAXX112-12	4.00	1435	8.3				
219	DXRAXX132-12-50	DXRAXX132-12	5.50	1450	11.0				
220	DXRAXX132-22-50	DXRAXX132-22	7.50	1450	14.6				
221	DXRAXX160-12-50	DXRAXX160-12	11.00	1460	21.0				
222	DXRAXX160-22-50	DXRAXX160-22	15.00	1460	27.8				
223	DXRAXX180-12-50	DXRAXX180-12	18.50	1470	32.8				
224	DXRAXX180-22-50	DXRAXX180-22	22.00	1456	38.8				
225	30kW-ASM-50	-	30.00	1470	52.0				–
226	37kW-ASM-50	-	37.00	1470	66.0				
227	45kW-ASM-50	-	45.00	1480	82.0				
228	55kW-ASM-50	-	55.00	1480	93.0				
229	75kW-ASM-50	-	75.00	1480	132.0				
250	DXRAXX071-12-87	DXRAXX071-12	0.43	2525	1.5	87	400	Asynchronous inverter motor (in delta connection)	TKO (Thermostat)
251	DXRAXX071-22-87	DXRAXX071-22	0.64	2515	2.0				
252	DXRAXX080-12-87	DXRAXX080-12	0.95	2515	2.9				
253	DXRAXX080-22-87	DXRAXX080-22	1.3	2525	4.0				
254	DXRAXX090-12-87	DXRAXX090-12	2.0	2535	4.7				
255	DXRAXX090-32-87	DXRAXX090-32	2.7	2530	6.2				
256	DXRAXX100-22-87	DXRAXX100-22	3.9	2535	8.3				
257	DXRAXX100-32-87	DXRAXX100-32	5.35	2530	11.4				
258	DXRAXX112-12-87	DXRAXX112-12	7.10	2545	14.3				
259	DXRAXX132-12-87	DXRAXX132-12	9.7	2555	19.1				
260	DXRAXX132-22-87	DXRAXX132-22	13.2	2555	25.4				
261	DXRAXX160-12-87	DXRAXX160-12	19.3	2565	36.5				
262	DXRAXX160-22-87	DXRAXX160-22	26.4	2565	48.4				
263	DXRAXX180-12-87	DXRAXX180-12	32.4	2575	57.8				
264	DXRAXX180-22-87	DXRAXX180-22	38.7	2560	67.4				
265	30kW-ASM-50	-	52.00	2546	90.0				–
266	37kW-ASM-50	-	64.00	2546	114.0				
267	45kW-ASM-50	-	78.00	2563	142.0				
268	55kW-ASM-50	-	95.00	2563	161.0				
269	75kW-ASM-50	-	130.00	2563	228.0				



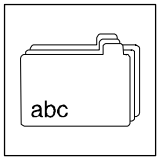
Reference List for motor types MDXMA

Tip!

The motors listed under “Nameplate data” are available with GDC and unit software.

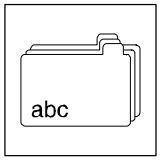
1. Please enter the value stated for your motor under C0086 in GDC or the keypad.
2. Then check all codes listed in the table.
   Overwrite the entry in GDC or the keypad with the values indicated in the table.
3. If necessary, codes C0070 and C0071 must be adapted to your machine.

Nameplate		Data entry													
		C0086	C0022	C0081	C0084	C0085	C0087	C0088	C0089	C0090	C0091	C0070	C0071	C0075	C0076
Field: C86	Field: Motor type		Imax [A]	P_r [kW]	R_s [Ω]	L σ [mH]	n_r [rpm]	I_r [A]	f_r [Hz]	V_r [V]	cos φ	V_{pn}	T_{nn}	V_{pi}	T_{ni}
410	MDXMAXM-071-12	210	1.23	0.25	35.80	116.80	1400	0.82	50	400	0.70	6	300	1.5	10
411	MDXMAXM-071-32	211	1.80	0.37	27.00	112.70	1400	1.20	50	400	0.71	6	300	1.5	10
412	MDXMAXM-080-12	212	2.40	0.55	16.30	78.60	1400	1.60	50	400	0.72	6	300	1.5	10
413	MDXMAXM-080-32	213	3.00	0.75	11.20	59.30	1380	2.00	50	400	0.76	6	300	1.5	10
414	MDXMAXM-090-12	214	3.90	1.10	9.14	41.80	1410	2.60	50	400	0.80	6	300	1.5	10
415	MDXMAXM-090-32	215	5.25	1.50	5.10	27.70	1420	3.50	50	400	0.80	6	300	1.5	10
416	MDXMAXM-100-12	216	8.40	2.20	2.96	18.20	1400	5.60	50	400	0.78	6	300	1.5	10
417	MDXMAXM-100-32	217	10.95	3.00	2.20	13.40	1400	7.30	50	400	0.81	6	300	1.5	10
418	MDXMAXM-112-22	218	12.75	4.00	1.50	10.80	1430	8.50	50	400	0.85	6	300	1.5	10
440	MDXMAXM-071-12	250	2.10	0.43	35.8	116.80	2510	1.40	87	400	0.70	6	300	1.5	10
441	MDXMAXM-071-32	251	3.15	0.64	27.0	112.70	2510	2.10	87	400	0.71	6	300	1.5	10
442	MDXMAXM-080-12	252	4.20	0.95	16.3	78.60	2510	2.80	87	400	0.72	6	300	1.5	10
443	MDXMAXM-080-32	253	5.25	1.30	11.2	59.30	2490	3.50	87	400	0.76	6	300	1.5	10
444	MDXMAXM-090-12	254	6.75	2.00	9.14	41.80	2520	4.50	87	400	0.80	6	300	1.5	10
445	MDXMAXM-090-32	255	9.15	2.70	5.1	27.70	2530	6.10	87	400	0.78	6	300	1.5	10
446	MDXMAXM-100-12	256	14.55	3.90	2.96	18.20	2510	9.70	87	400	0.81	6	300	1.5	10
447	MDXMAXM-100-32	257	19.05	5.40	2.2	13.40	2510	12.70	87	400	0.85	6	300	1.5	10
448	MDXMAXM-112-22	258	22.20	7.10	1.5	10.80	2540	14.80	87	400	0.78	6	300	1.5	10
449	MDXMAXM-112-32	259	18.75	5.50	2.45	21.40	1440	12.50	50	400	0.78	6	300	1.5	10
450	MDXMAXM-132-22	259	25.20	7.50	1.42	15.00	1460	16.80	50	400	0.77	6	300	1.5	10
451	MDXMAXM-132-32	259	29.25	9.20	1.34	14.00	1450	19.50	50	400	0.85	6	300	1.5	10
1006	MDXMAxx-071-12	210	1.28	0.25	39.90	157.20	1355	0.85	50	400	0.70	6	300	3.6	2
1007	MDXMAxx-071-12	250	2.25	0.47	39.90	157.20	2475	1.50	87	400	0.66	6	300	2	2
1008	MDXMAxx-071-32	211	1.73	0.37	25.03	122.60	1345	1.15	50	400	0.74	6	300	3.4	2
1009	MDXMAxx-071-32	251	3.00	0.67	25.03	122.60	2470	2.00	87	400	0.70	6	300	2.5	2
1010	MDXMAxx-080-12	212	2.40	0.55	20.69	89.00	1370	1.60	50	400	0.78	6	300	3.2	2
1011	MDXMAxx-080-12	252	3.90	1.00	20.69	89.00	2480	2.60	87	400	0.73	6	300	1.6	2
1012	MDXMAxx-080-32	213	2.85	0.75	11.69	65.20	1390	1.90	50	400	0.80	6	300	3.5	2
1013	MDXMAxx-080-32	253	4.95	1.35	11.69	65.20	2510	3.30	87	400	0.77	6	300	1.9	3
1014	MDXMAxx-090-12	214	3.90	1.10	10.01	40.20	1405	2.60	50	400	0.80	6	300	2.5	2
1015	MDXMAxx-090-12	254	6.75	2.00	10.01	40.20	2520	4.50	87	400	0.77	6	300	2	2
1016	MDXMAxx-090-32	215	5.25	1.50	5.85	28.80	1410	3.50	50	400	0.78	6	300	2	2
1017	MDXMAxx-090-32	255	9.15	2.70	5.85	28.80	2525	6.10	87	400	0.76	6	300	1	2
1018	MDXMAxx-100-12	216	7.20	2.20	2.90	20.00	1425	4.80	50	400	0.80	6	300	1	1.5
1019	MDXMAxx-100-12	256	12.45	3.90	2.90	20.00	2535	8.30	87	400	0.76	6	300	0.8	1.5
1020	MDXMAxx-100-32	217	9.75	3.00	2.10	17.00	1415	6.50	50	400	0.81	6	300	2.5	1.5
1021	MDXMAxx-100-32	257	17.10	5.40	2.10	17.00	2530	11.40	87	400	0.78	6	300	1.4	1.8
1022	MDXMAxx-112-22	218	12.45	4.00	1.50	11.00	1435	8.30	50	400	0.82	6	300	2	2
1023	MDXMAxx-112-22	258	21.45	7.10	1.50	11.00	2545	14.30	87	400	0.83	6	300	1	2

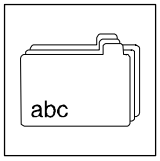


Appendix

Nameplate		Data entry													
		C0086	C0022	C0081	C0084	C0085	C0087	C0088	C0089	C0090	C0091	C0070	C0071	C0075	C0076
Field: C86	Field: Motor type		Imax [A]	P_r [kW]	R_s [Ω]	L σ [mH]	n_r [rpm]	I_r [A]	f_r [Hz]	V_r [V]	cos φ	V_{pn}	T_{nn}	V_{pi}	T_{ni}
1024	MDXMAxx-132-12	219	16.50	5.50	0.86	13.00	1450	11.00	50	400	0.84	6	300	1.5	2
1025	MDXMAxx-132-12	259	28.65	9.70	0.86	13.00	2555	19.10	87	400	0.83	6	300	1.3	2
1026	MDXMAxx-132-22	220	21.90	7.50	0.80	11.00	1450	14.60	50	400	0.85	6	300	1.5	2
1027	MDXMAxx-132-22	260	38.10	13.20	0.80	11.00	2555	25.40	87	400	0.84	6	300	0.95	1.8
1028	MDXMAxx-160-22	221	31.50	11.00	0.50	7.00	1460	21.00	50	400	0.85	6	300	1.9	2.2
1029	MDXMAxx-160-22	261	54.75	19.30	0.50	7.00	2565	36.50	87	400	0.85	6	300	1	2
1030	MDXMAxx-160-32	222	41.70	15.00	0.40	5.50	1460	27.80	50	400	0.87	6	300	1.7	2.5
1031	MDXMAxx-160-32	262	72.60	26.40	0.40	5.50	2565	48.40	87	400	0.86	6	300	1	1.8
1032	MDXMAxx-180-12	223	49.20	18.50	0.40	4.00	1470	32.80	50	400	0.90	6	300	1.4	1.7
1033	MDXMAxx-180-12	263	86.70	32.40	0.40	4.00	2575	57.80	87	400	0.89	6	300	1	1.7
1034	MDXMAxx-180-22	224	58.20	22.00	0.20	3.80	1456	38.80	50	400	0.90	6	300	1	1.5
1035	MDXMAxx-180-22	264	101.1	38.70	0.20	3.80	2560	67.40	87	400	0.89	6	300	1	1.5
1036	MDXMAXM-63-12	210	0.68	0.12	87.58	610.53	1390	0.45	50	400	0.65	6	300	1.5	10
1037	MDXMAXM-63-12	250	1.17	0.21	87.58	610.53	2500	0.78	87	400	0.65	6	300	1.5	10
1038	MDXMAXM-63-32	210	0.98	0.18	56.90	342.11	1400	0.65	50	400	0.65	6	300	1.5	10
1039	MDXMAXM-63-32	250	1.70	0.31	56.90	342.11	2510	1.13	87	400	0.65	6	300	1.5	10
1040	MDXMAXM-112-32	219	18.75	5.50	0.86	7.20	1440	12.50	50	400	0.78	6	300	1.5	10
1041	MDXMAXM-112-32	259	32.55	9.60	0.86	7.20	2550	21.70	87	400	0.78	6	300	1.5	10
1042	MDXMAXM-132-22	220	25.20	7.50	0.54	4.80	1460	16.80	50	400	0.77	6	300	1.5	10
1043	MDXMAXM-132-22	260	43.80	13.10	0.54	4.80	2570	29.20	87	400	0.77	6	300	1.5	10
1044	MDXMAXM-132-32	221	29.25	9.20	0.46	4.70	1450	19.50	50	400	0.85	6	300	1.5	10
1045	MDXMAXM-132-32	261	50.70	16.00	0.46	4.70	2560	33.80	87	400	0.85	6	300	1.5	10
1046	MDXMAXM-160-22	260	31.50	11.00	1.27	18.97	1466	21.00	50	400	0.86	6	300	1.5	10
1047	MDXMAXM-160-32	260	42.30	15.00	0.87	14.28	1466	28.20	50	400	0.87	6	300	1.5	10
1048	MDXMAXM-180-22	260	54.60	18.50	0.40	4.00	1440	36.40	50	400	0.87	6	300	1.5	10
1049	MDXMAXM-180-32	260	66.15	22.00	0.20	3.80	1465	44.10	50	400	0.85	6	300	1.5	10
1050	MDXMAXM-200-32	260	90.00	30.00	0.17	3.50	1455	60.00	50	400	0.85	6	300	1.5	10
1051	MDXMAXM-225-12	260	108.0	37.00	0.15	2.00	1460	72.00	50	400	0.86	6	300	1.5	10
1052	MDXMAXM-225-22	260	128.25	45.00	0.15	2.00	1475	85.50	50	400	0.84	6	300	1.5	10
1053	MDXMAXM-063-11	210	1.43	0.18	51.00	273.7	2760	0.95	50	400	0.80	6	300	1.5	10
1054	MDXMAXM-063-31	210	1.65	0.25	33.00	93.4	2760	1.10	50	400	0.83	6	300	1.5	10
1055	MDXMAXM-071-11	211	1.50	0.37	22.50	90.2	2840	1.00	50	400	0.78	6	300	1.5	10
1056	MDXMAXM-071-31	212	2.25	0.55	16.90	62.9	2840	1.50	50	400	0.82	6	300	1.5	10
1057	MDXMAXM-080-11	213	2.85	0.75	11.36	47.4	2850	1.90	50	400	0.80	6	300	1.5	10
1058	MDXMAXM-080-31	214	4.20	1.10	6.86	33.4	2810	2.80	50	400	0.82	6	300	1.5	10
1059	MDXMAXM-090-11	215	4.80	1.50	5.10	22.2	2840	3.20	50	400	0.85	6	300	1.5	10
1060	MDXMAXM-090-31	216	7.20	2.20	3.20	14.5	2840	4.80	50	400	0.86	6	300	1.5	10
1061	MDXMAXM-100-31	217	9.30	3.00	1.81	10.7	2850	6.20	50	400	0.88	6	300	1.5	10
1062	MDXMAXM-100-41	218	12.75	4.00	1.45	8.6	2830	8.50	50	400	0.85	6	300	1.5	10
1063	MDXMAXM-112-31	250	18.30	5.50	3.10	17	2890	12.20	50	400	0.83	6	300	1.5	10
1064	MDXMAXM-112-41	250	23.25	7.50	1.96	12	2900	15.50	50	400	0.87	6	300	1.5	10
1065	MDXMAXM-132-21	250	28.05	9.00	1.41	11.292	2925	18.70	50	400	0.89	6	300	1.5	10
1066	MDXMAXM-071-13	210	1.13	0.18	58.93	342	870	0.75	50	400	0.71	6	300	1.5	10
1067	MDXMAXM-071-13	250	1.95	0.31	58.93	342	1610	1.30	87	400	0.71	6	300	1.5	10
1068	MDXMAXM-071-33	210	1.50	0.25	37.90	116.8	920	1.00	50	400	0.63	6	300	1.5	10
1069	MDXMAXM-071-33	250	2.55	0.43	37.90	116.8	1660	1.70	87	400	0.63	6	300	1.5	10
1070	MDXMAXM-080-13	211	2.10	0.37	28.00	112.7	900	1.40	50	400	0.67	6	300	1.5	10
1071	MDXMAXM-080-13	251	3.60	0.64	28.00	112.7	1640	2.40	87	400	0.67	6	300	1.5	10
1072	MDXMAXM-080-33	212	2.85	0.55	16.60	78.6	900	1.90	50	400	0.68	6	300	1.5	10
1073	MDXMAXM-080-33	252	4.95	0.95	16.60	78.6	1640	3.30	87	400	0.68	6	300	1.5	10
1078	MDFMAxx-250-22	224	147.75	55.00	0.04	1.92	1475	98.50	50	400	0.86	6	300	1	2
1079	MDFMAxx-250-22	264	255.90	95.00	0.04	1.92	2585	170.60	87	400	0.86	6	300	1	2

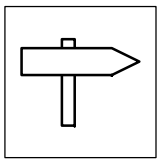


Nameplate		Data entry													
		C0086	C0022	C0081	C0084	C0085	C0087	C0088	C0089	C0090	C0091	C0070	C0071	C0075	C0076
Field: C86	Field: Motor type		Imax [A]	P_r [kW]	R_s [Ω]	L σ [mH]	n_r [rpm]	I_r [A]	f_r [Hz]	V_r [V]	cos φ	V_{pn}	T_{nn}	V_{pi}	T_{ni}
1080	MDEBAXM-063-12	210	0.68	0.12	87.58	610.53	1390	0.45	50	400	0.65	6	300	1.5	10
1081	MDEBAXM-063-12	250	1.17	0.21	87.58	610.53	2500	0.78	87	400	0.65	6	300	1.5	10
1082	MDEBAXM-063-32	210	0.98	0.18	56.90	342.11	1400	0.65	50	400	0.65	6	300	1.5	10
1083	MDEBAXM-063-32	250	1.70	0.31	56.90	342.11	2510	1.13	87	400	0.65	6	300	1.5	10
1084	MDEBAXM-071-12	210	1.35	0.25	39.90	157.20	1390	0.90	50	400	0.64	6	300	3.6	2
1085	MDEBAXM-071-12	250	2.34	0.43	39.90	157.20	2500	1.56	87	400	0.64	6	300	2	2
1086	MDEBAXM-071-32	211	1.95	0.37	25.03	122.60	1380	1.30	50	400	0.64	6	300	3.4	2
1087	MDEBAXM-071-32	251	3.38	0.64	25.03	122.60	2490	2.25	87	400	0.64	6	300	2.5	2
1088	MDEBAXM-080-12	212	2.40	0.55	20.69	89.00	1400	1.60	50	400	0.68	6	300	3.2	2
1089	MDEBAXM-080-12	252	4.16	0.95	20.69	89.00	2510	2.77	87	400	0.68	6	300	1.6	2
1090	MDEBAXM-080-32	213	3.00	0.75	11.69	65.20	1400	2.00	50	400	0.72	6	300	3.5	2
1091	MDEBAXM-080-32	253	5.20	1.30	11.69	65.20	2510	3.46	87	400	0.72	6	300	1.9	3
1092	MDEBAXM-090-12	214	4.05	1.10	6.40	37.00	1420	2.70	50	400	0.77	6	300	2.5	2
1093	MDEBAXM-090-12	254	7.05	2.00	6.40	37.00	2535	4.70	87	400	0.77	6	300	2	2
1094	MDEBAXM-090-32	215	5.40	1.50	4.80	26.00	1415	3.60	50	400	0.77	6	300	2	2
1095	MDEBAXM-090-32	255	9.30	2.70	4.80	26.00	2530	6.20	87	400	0.77	6	300	1	2
1096	MDEBAXM-100-12	216	7.20	2.20	2.90	20.00	1425	4.80	50	400	0.80	6	300	1	1.5
1097	MDEBAXM-100-12	256	12.45	3.90	2.90	20.00	2535	8.30	87	400	0.80	6	300	0.8	1.5
1098	MDEBAXM-100-32	217	9.90	3.00	2.10	17.00	1415	6.60	50	400	0.81	6	300	2.5	1.5
1099	MDEBAXM-100-32	257	17.10	5.35	2.10	17.00	2530	11.40	87	400	0.81	6	300	1.4	1.8
1100	MDEBAXM-112-22	218	12.45	4.00	1.50	11.00	1435	8.30	50	400	0.82	6	300	2	2
1101	MDEBAXM-112-22	258	21.45	7.10	1.50	11.00	2545	14.30	87	400	0.82	6	300	1	2
1102	MDEBAXM-112-32	219	17.85	5.50	2.71	21.40	1425	11.90	50	400	0.84	6	300	1.5	10
1114	MDFMAxx-200-32	224	83.25	30.00			1465	55.50	50	400	0.85	6	300	1	2
1115	MDFMAxx-200-32	264	145.50	52.00			2575	97.00	87	400	0.85	6	300	1	2



11.4 Glossary

Term	Meaning
CE	Communauté Européenne (English: European Community)
Code	For entry and display (access) of parameter values. Variable addressing according to the format "code/subcode" (Cxxxx/xx). All variables can be addressed via the code digits.
Fieldbus	For data exchange between superimposed control and positioning control, e.g. InterBus-S or PROFIBUS DP
GDC	Global Drive Control (PC-program (Windows) for Lenze controllers)
RFG	Ramp function generator
INTERBUS	Industrial communication standard to DIN E19258
Select target position	The target which is to be approached by means of a defined traversing profile.
LECOM	Lenze Communication
LU	Undervoltage
OU	Overvoltage
PC	Personal Computer
PM	Permanent magnet
QSP	Quick stop
Ctrl. enable	Controller enable
Ctrl. inhibit	Controller inhibit (= $\overline{\text{Controller enable}}$)
Contouring error	Deviation between momentary position setpoint and actual position. Display for a momentary following error under C0908.
Contouring error tolerance	If the contouring error reaches a defined contouring error tolerance, a fault indication is released.
Contouring error monitoring	Monitors the momentary following error if the contouring error tolerance is exceeded and releases a fault indication, if necessary.



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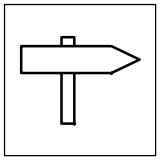

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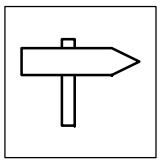

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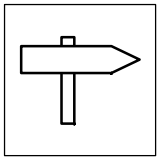

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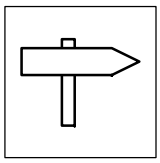

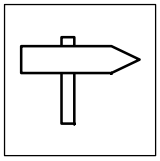

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