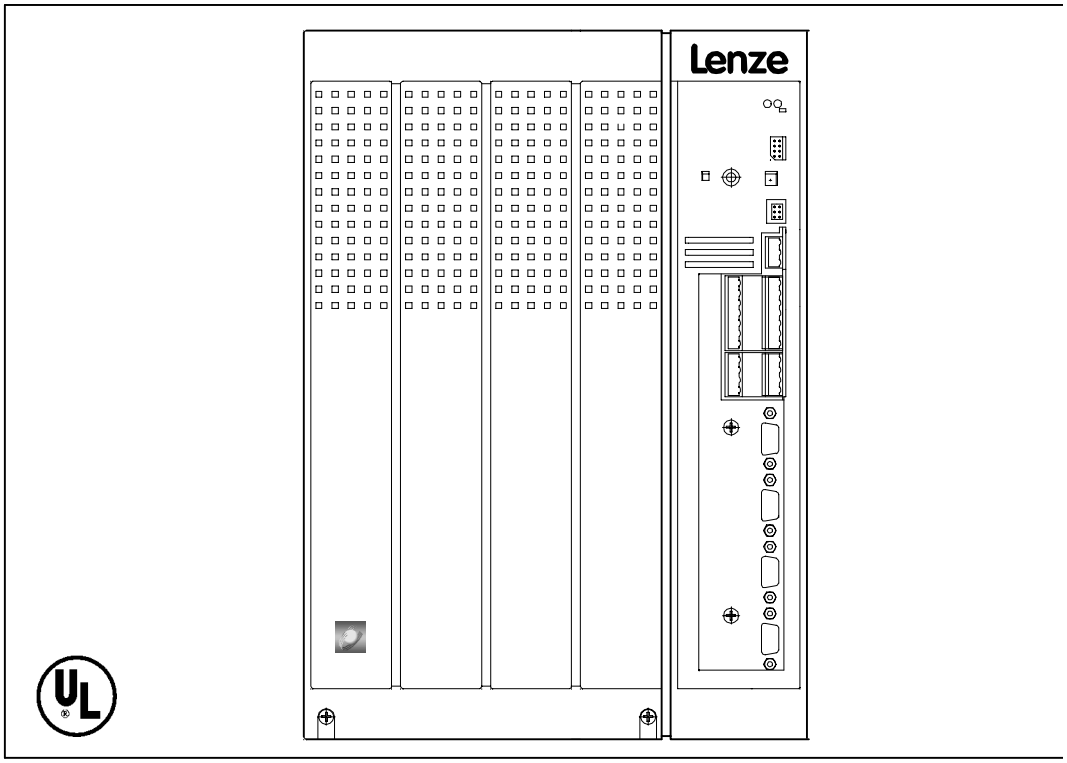
EDB9300ENP
00420052

Lenze

Operating Instructions



Global Drive

9300 servo positioning controller

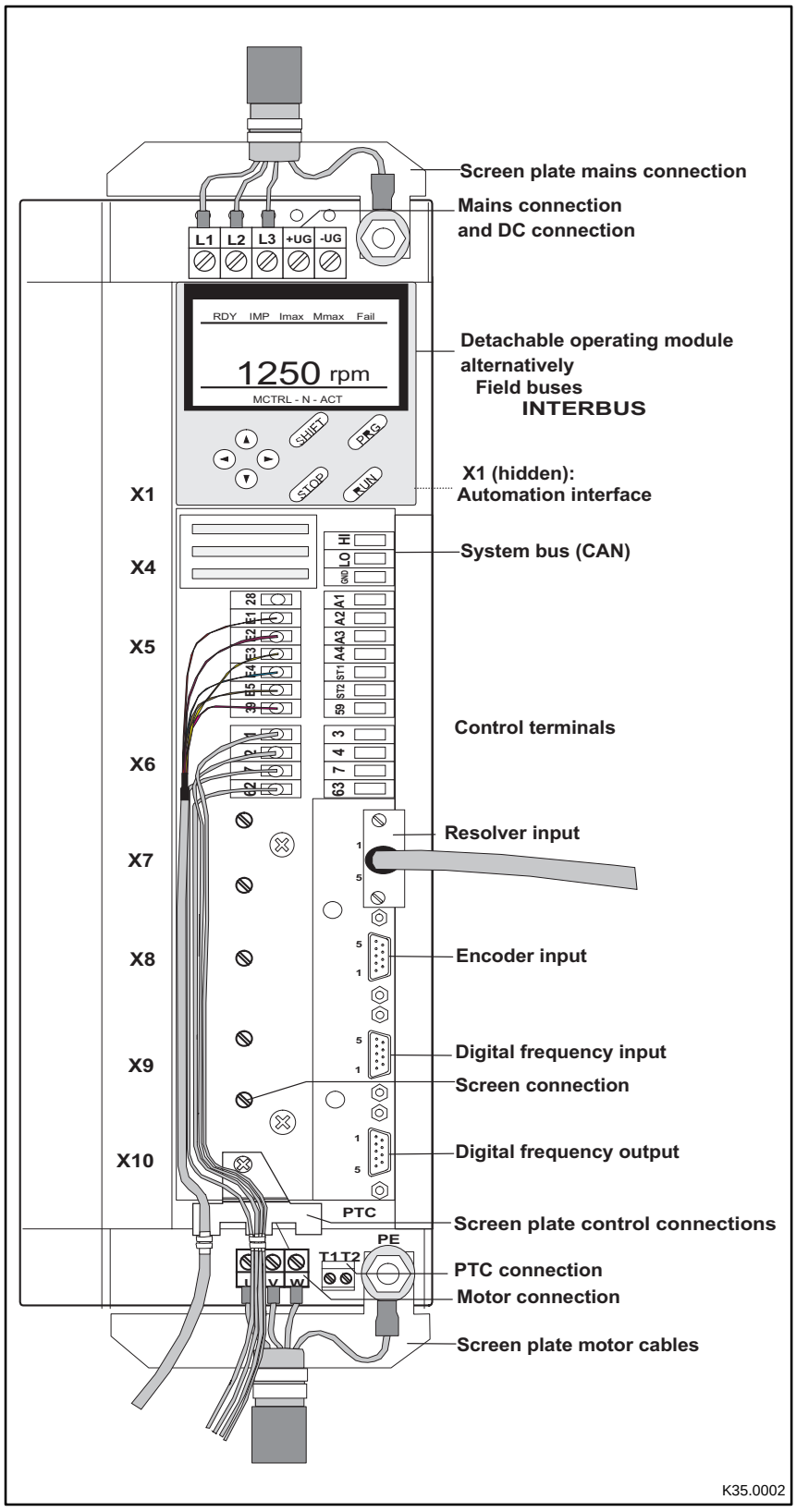
This documentation applies to 9300 servo positioning controllers as of version:

Type	Design	Hardware version and index	Software version and index	Explanation
33.932X	EP	1x	2x	(9321 - 9328)
33.9329	EP	0x	2x	(9329)
33.933X	EP	0x	2x	(9330 - 9332)
33.932X	CP	1x	2x	(9321 - 9328)

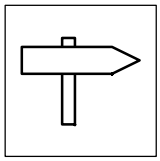
Design:
C = Cold Plate
E = Enclosure IP20
IB = Module

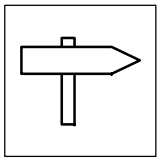
What is new / what has changed ?

Material No.	Version	Important	Contents
397404	12/97	1st edition	
404605	10/98	replaces 397404	Types 9321 to 9324 with 200 % overcurrent New function “Automatic controller parameter identification”
413320	01/00	replaces 404605	Chapters “Commissioning”, “Troubleshooting” are new
420052	2.3 02/01 TD 02	replaces 413320	• Chapter Installation: Tightening torques for motor connection/mains connection • Chapter Appendix: Motor table


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
28
E1
E2
E3
E4
B5
B9
A1
A2
A3
A4
ST1
ST2
59
X6
1
2
7
62
3
4
7
63
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
U V W
Motor connection
Screen plate motor cables
K35.0002

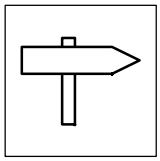
Contents

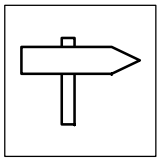




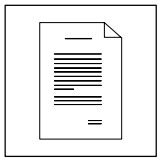
Contents

Contents





Contents



1 Preface and general information

1.1 About these Operating Instructions

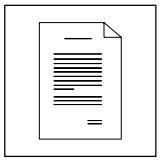
- These Operating Instructions help with the connection and the commissioning of the 93XX servo positioning controller. They contain safety information which must be observed.
- All persons working on and with the 93XX servo positioning controller must have the Operating Instructions available and must 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 type of servo positioning controller (types 9321 ... 9332)
Controller	Servo positioning controller 93XX
Drive system	Drive system with 93XX servo positioning controllers and other Lenze drive components

1.2 Packing list

Packing list	Important
• 1 93XX servo positioning controller • 1 book of Operating Instructions • 1 accessory kit (bits 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 General safety and application notes for Lenze controllers

(according to Low-Voltage Directive 73/23/EWG)

1. General

Lenze controllers (frequency inverters, servo inverter, DC controllers) can carry a voltage or parts of the controllers can rotate during operation. Surfaces can be hot.
If the required cover is removed, the controllers are used inappropriately or installed or operated incorrectly, severe damage to persons or material assets can occur.
For more information please see the documentation.
All operations concerning transport, installation, and commissioning as well as maintenance must be carried out by qualified, skilled personnel (IEC 364 and CENELEC HD 384 or DIN VDE 0100 and IEC report 664 or DIN VDE 0110 and national regulations for the prevention of accidents must be observed).
According to this basic safety information qualified, skilled personnel are persons who are familiar with the assembly, installation, commissioning, and operation of the product and who have the qualifications necessary for their occupation.

2. Application as directed

Drive controllers are components which are designed for the installation into electrical systems or machinery. They are not to be used as domestic appliances, but only for industrial purposes according to EN 61000-3-2. The documentation contains information about the compliance of the limit values to EN 61000-3-2.
When installing controllers into 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/EG (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/EWG).
The drive controllers meet the requirements of the Low-Voltage Directive 73/23/EWG. The harmonised standards EN 50178/DIN VDE 0160 apply to the controllers.
The technical data as well as the connection conditions can be obtained from the nameplate and the documentation. The instructions given must be strictly observed.
Warning: Controllers are products with restricted availability according to EN 61800-3. These products can cause interferences in residential premises. If controllers are used in residential premises, corresponding measures are required.

3. Transport, storage

The notes on transport, storage and appropriate handling must be observed.
Climatic conditions according to EN 50178 apply.

4. Installation

The controllers must be installed and cooled according to the regulations given in the corresponding Instructions.
Ensure careful handling and avoid mechanical overload. Do not bend any components and do not change the insulation distances during transport and storage. Electronic components and contacts must not be touched.
Controllers contain electrostatically sensitive components which can easily be damaged by inappropriate handling. Do not damage or destroy any electrical components since this could mean hazards for your health!

5. Electrical connection

When working on live controllers, the valid national regulations for the prevention of accidents (e. g. VBG 4) must be observed.
The electrical installation must be carried out in compliance with the corresponding regulations (e.g. cable cross-sections, fuses, PE connection). Additional notes and information can be obtained from the corresponding Instructions.
The Instructions contain notes concerning wiring according to EMC regulations (shielding, earthing, filters and cable routing). These notes must also be observed when using 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

If necessary, systems including controllers must be equipped with additional monitoring and protection devices according to the applying safety regulations (e.g. regulation for technical equipment, regulation for the prevention of accidents). The controller can be adapted to your application. Please observe the corresponding information given in the Instructions.
After a controller has been disconnected from the voltage supply, all live components and power connections must not be touched immediately because capacitors can still be charged. Please observe the corresponding stickers on the controller.
All protection covers and doors must be shut during operation.
Note for UL-approved systems with integrated controllers: UL warnings are notes which only apply to UL systems. The Instructions give UL-related information.

7. Safe standstill

The variant V004 of 9300, 9300 vector and 8220 controllers and the variant B400 of 8200 vector controllers support the function "Safe standstill", protection against unintended start, according to the requirements of Appendix I No. 1.2.7 of the EC Directive "Machinery" 98/37/EG, DIN EN 954-1 category 3 and DIN EN 1037. Please observe the notes on the function "Safe standstill" given in the corresponding Instructions.

8. Maintenance and service

Please observe the Instructions given by the manufacturer,
and the product-specific safety and application notes in these Instructions.

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.

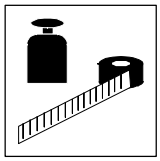
Signal word

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

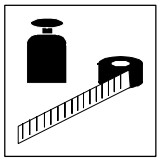
Protection of persons	After mains voltage disconnection the power terminals U, V, W and $+U_G$, $-U_G$ carry hazardous voltages at least 3 minutes after mains disconnection. • Before working on the controller, check that no voltage is applied to the power terminals.
Protection of devices	Cyclic connection 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

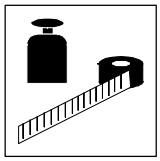
3.1 Features

- Single axis in narrow design
  – thus space-saving installation
- 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
  – the cooling can be achieved outside the control cabinet (Push-through or ”Cold Plate technique).
- Power connections from the top (supply) or from the bottom (motor)
  – simple connection for multi-axis applications
- Direct connection of resolver or encoder feedback
  – simple connection via prefabricated system cables (accessories)
  – connecting cables can be plugged
- Point-to-point positioning
  – with or without velocity changeover
- Touch probe positioning
- Absolute or relative positioning
- S-ramps.
- Homing according to different modes
- Manual homing.
- Manual positioning.
- Manual positioning with intermediate stop
- Simple programming via PC
- Application configuration for control functions and input/output signals
  – comprehensive function block library
  – high flexibility in the adaptation of the internal control structure to the application
- Integrated automation interface
  – simple extensions of the controller functions
- 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

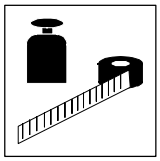
3.3.1 Types 9321 to 9325

	Type	EVS9321-EP	EVS9322-EP	EVS9323-EP	EVS9324-EP	EVS9325-EP
	Order No.	EVS9321-EP	EVS9322-EP	EVS9323-EP	EVS9324-EP	EVS9325-EP
	Type	**EVS9321-CP**	**EVS9322-CP**	**EVS9323-CP**	**EVS9324-CP**	**EVS9325-CP**
	Order No.	EVS9321-CP	EVS9322-CP	EVS9323-CP	EVS9324-CP	EVS9325-CP
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_V < 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-EP	EVS9322-EP	EVS9323-EP	EVS9324-EP
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

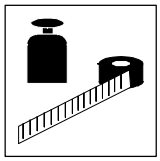
2) This output current Irx applies for a maximum current to be set under C022 which has not exceeded 150% of the rated controller current (nameplate).
If the maximum current is higher than this value, the continuous current reduces automatically to 70% of the original value.

Overcurrent diagram: 📖 7-4

All other data: 📖 3-3

Tip!

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



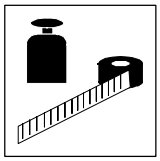
3.3.3 Types 9326 to 9332

	Type	EVS9326-EP	EVS9327-EP	EVS9328-EP	EVS9329-EP	EVS9330-EP	EVS9331-EP	EVS9332-EP
	Order No.	EVS9326-EP	EVS9327-EP	EVS9328-EP	EVS9329-EP	EVS9330-EP	EVS9331-EP	EVS9332-EP
	Type	**EVS9326-CP**	**EVS9327-CP**	**EVS9328-CP**				
	Order No.	EVS9326-CP	EVS9327-CP	EVS9328-CP				
Mains voltage	a_r [V]	320 V - 0 % ≤ V_r ≤ 528 V + 0 % ; 45 Hz - 0 % ... 65 Hz + 0 %						
Alternative DC supply	a_{DC} [V]	460 V - 0 % ≤ U_{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_a < 55 °C: 2%/K (not UL approved) 9327 - 9332: at 40 °C < T_a < 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:

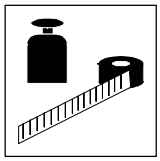
- Use only UL-approved fuses and fuse holders:
  – 500 V to 600 V in the mains input (AC)
  – 700 V in DC-bus voltage (DC)
  – The activation characteristic is defined by ”H” or ”K5”.
- Use only UL-approved cables.

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”.



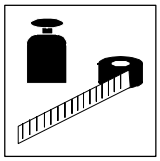
3.3.5 Mains filter

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

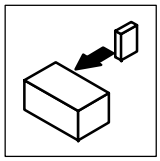
The mains filters for RFI degree B contain additional RFI suppression components.

3.4 Dimensions

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



Technical data



4 Installation

4.1 Mechanical installation

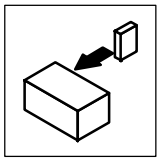
4.1.1 Important notes

- 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 technique” (📖 4-6)



4.1.2 Standard assembly with fixing rails or fixing brackets

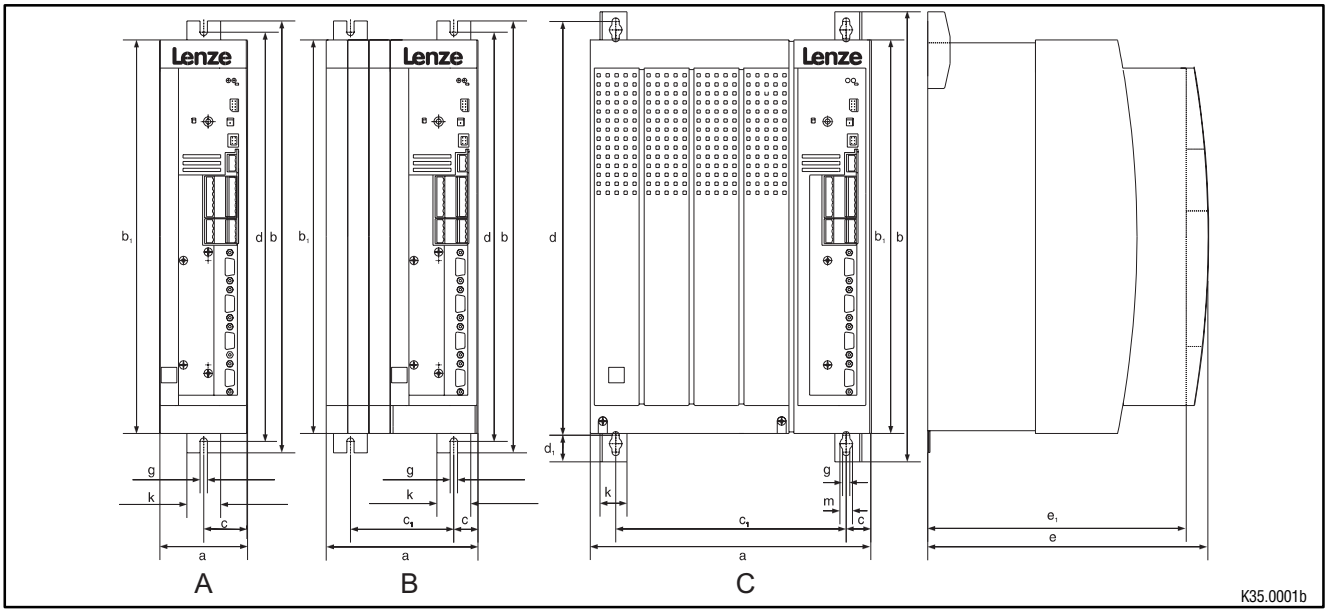


Fig. 4-1 Dimensions for assembly with fixing rails/fixing brackets

Type	Fig.	a	b	b1	c	c1	d	d1	e*	e1	g	k	m
9321, 9322	A	78	384	350	39	-	365	-	250	230	6.5	30	-
9323, 9324	A	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 a plug-on fieldbus module:
Observe the free space required for the connection cables

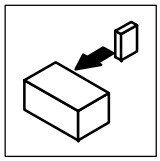
All dimensions in mm

Controllers 9321 to 9326

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

Controllers 9327 to 9332

- Remove cover:
  – Loosen screws (X)
  – Swing cover to the top and detach
  – Take accessory kit out of the interior of the controller
- Assembly preparation:
  – Take out fixing bracket and screws (accessory kit) and mount them on the controller housing



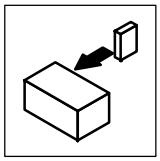
4.1.3 Assembly with thermally separated power stage (”punching”)

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.

Preparation 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

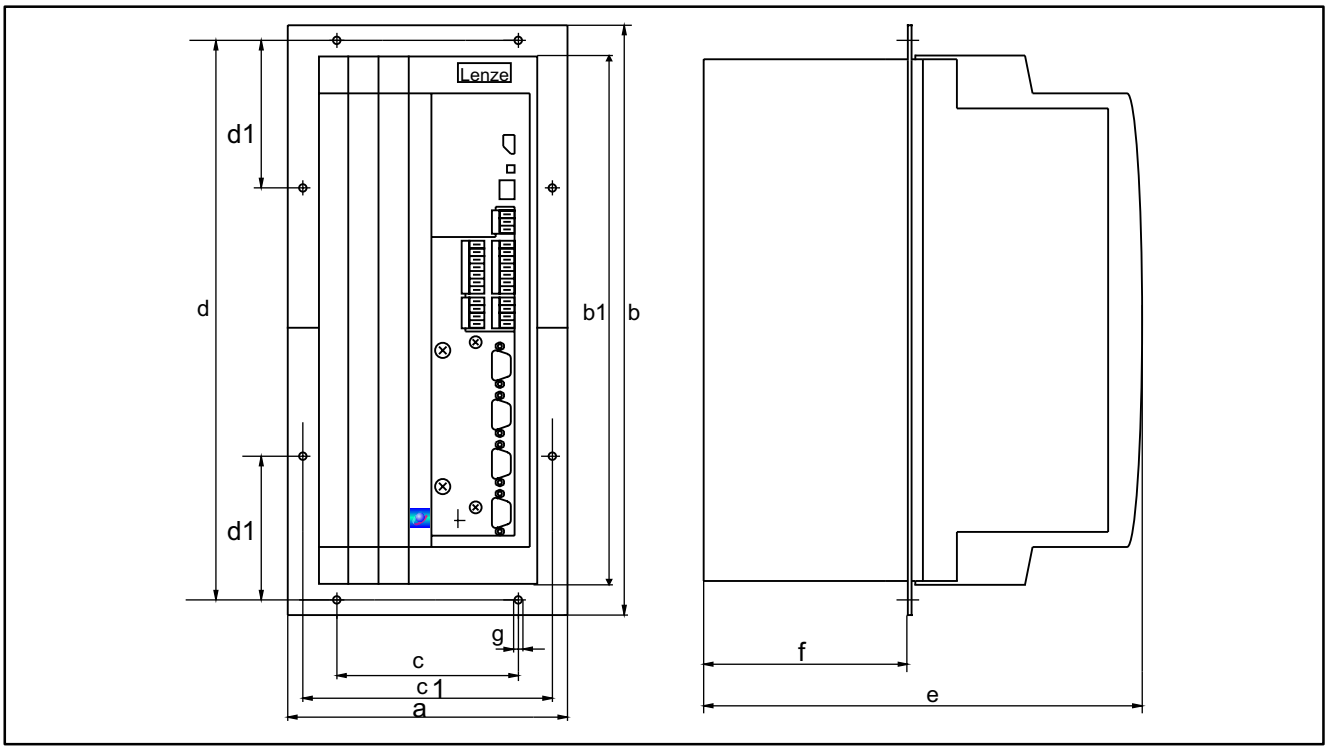


Fig. 4-2 Dimensions for assembly with thermally separated power stage

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

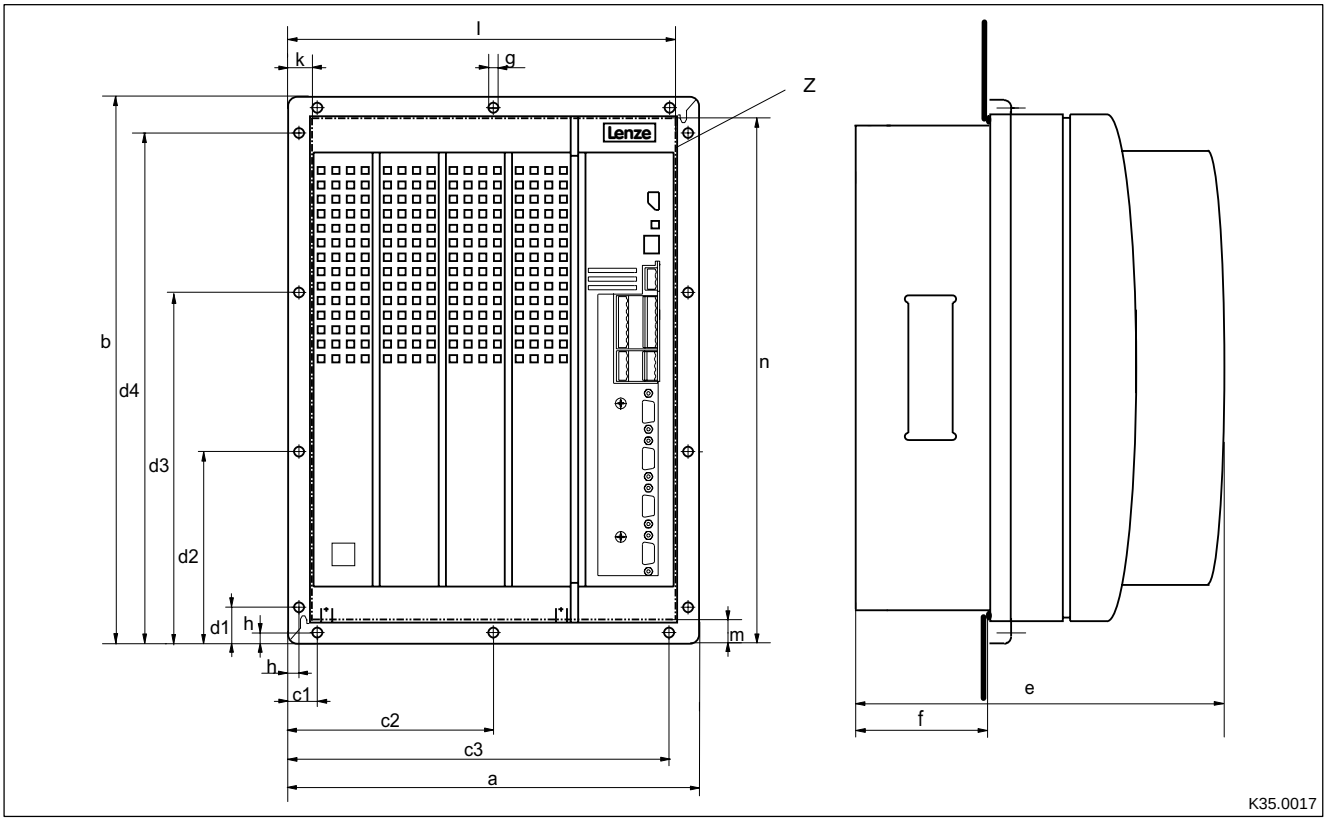


Fig. 4-3 Dimensions for assembly with thermally separated power stage

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

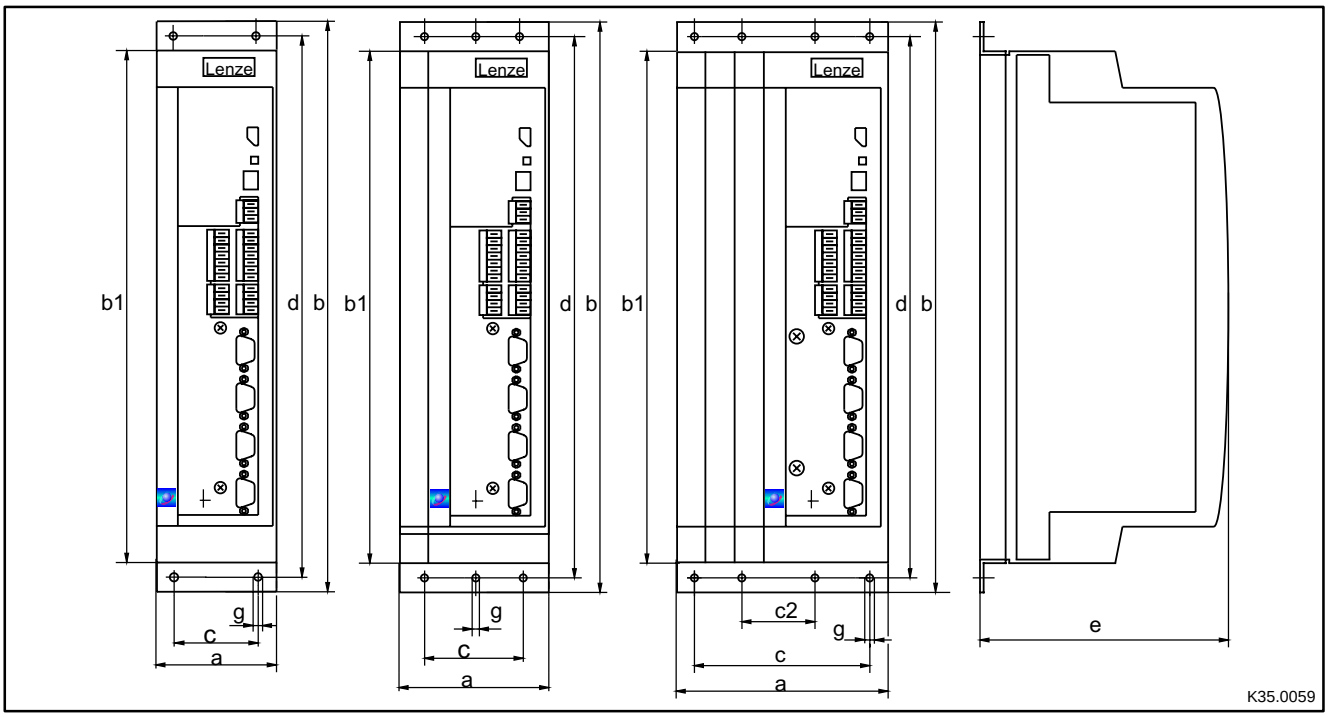


Fig. 4-4 Dimensions for assembly in ”Cold Plate technique”

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

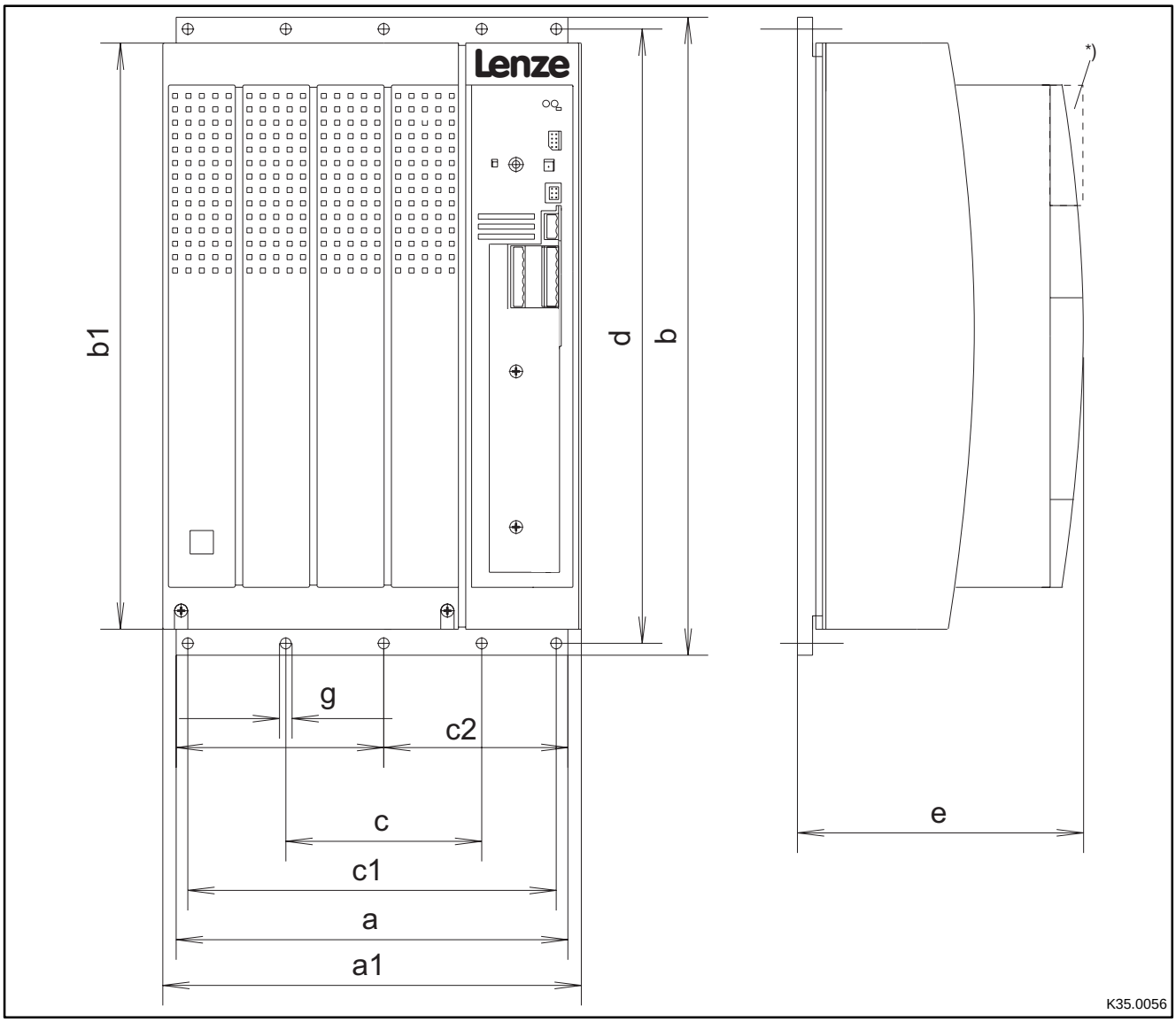
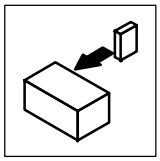


Fig. 4-5 Dimensions for assembly in "Cold Plate technique"

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

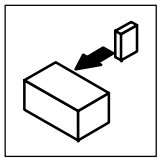
- Observe the following points to comply with the technical data:
  – Ensure sufficient ventilation of the heat sink.
  – The free space behind the control cabinet back panel must be at least 500 mm.
- If you install several controllers in the control cabinet:
  – Do not install the controllers on top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

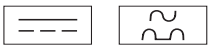
For information about the installation according to EMC, see chapter 4.3. (📖 4-34)

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:

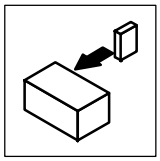
- In the event of capacitive leakage currents between the cable screens (especially with wall mounting).
- Simultaneous connection of several inverters to the mains
- If RFI filters are used.

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 Insulation

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 insulation (double insulating distance, safe mains 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 insulating 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.

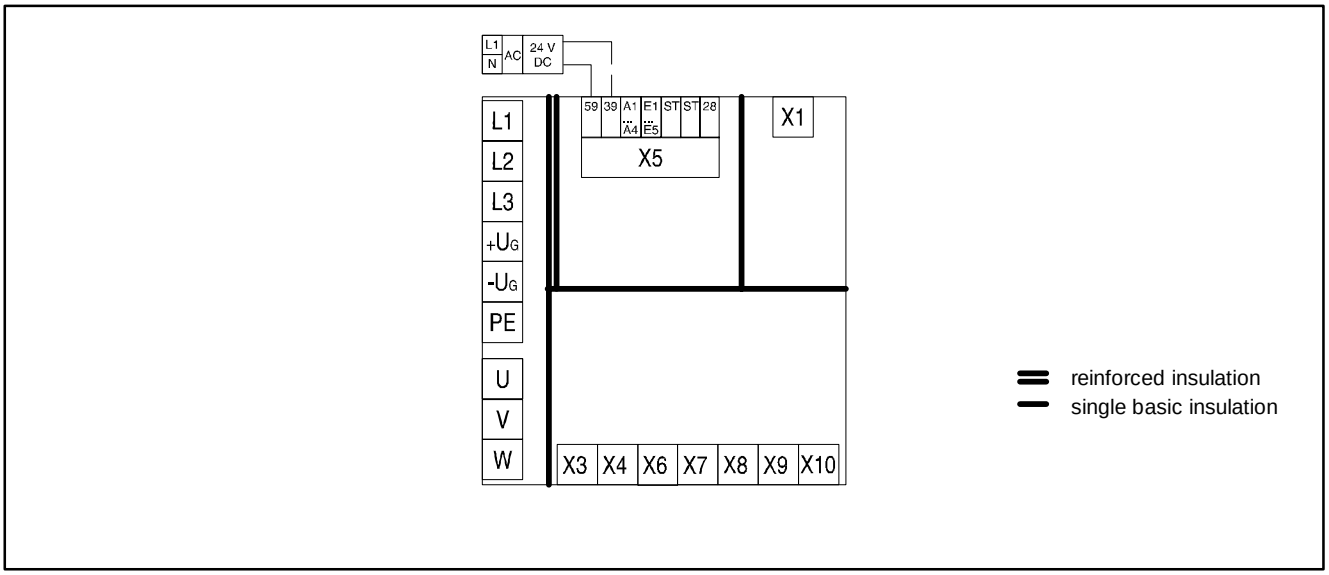


Fig. 4-6 Basic insulation in the controller

4.2.1.3 Replacement of defective fuses

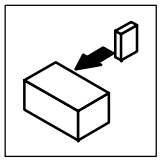
Replace defective fuses with the prescribed type only when no voltage is applied. (📖 3-6)

- 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!

The 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.

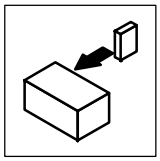
4.2.3 Motor protection

- 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!

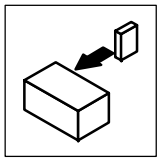
Mains	Operation of the controllers	Notes
With grounded neutral (TT/TN mains)	No restrictions	Observe controller ratings • Mains r.m.s. current: 📖 3-3
With isolated neutral (IT mains)	Possible, if the controller is protected in the event of an earth fault in the supplying mains. • Possible, if appropriate 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

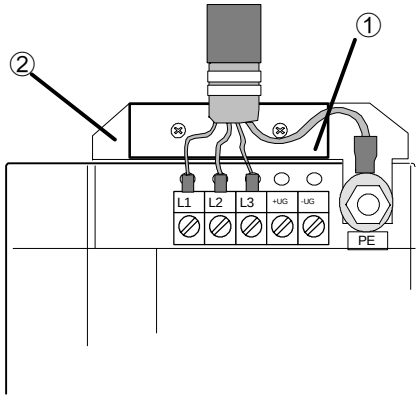
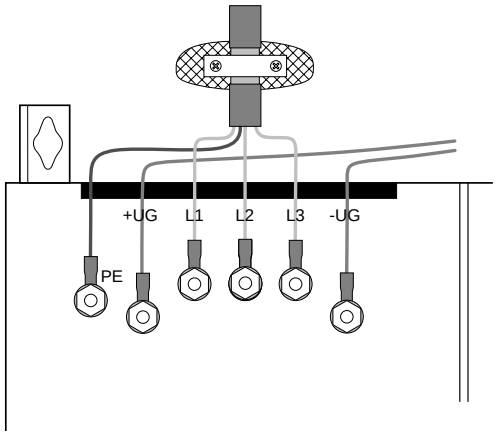
Types 9321 to 9326	Types 9327 to 9332
	
Correct screen connection with screened cables (required parts in the accessory kit): • Screw screen plate ① on fixing bracket. ② • Fix screen using cable lugs. Do not use as a strain relief! • To improve the screen connection: Connect screen additionally at the 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.

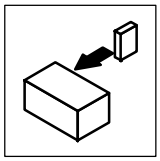
Fig. 4-7 Proposal for a mains connection

- 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

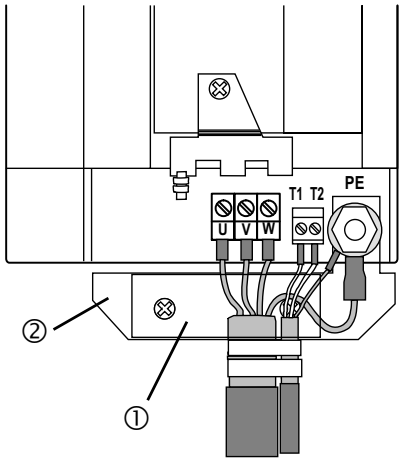
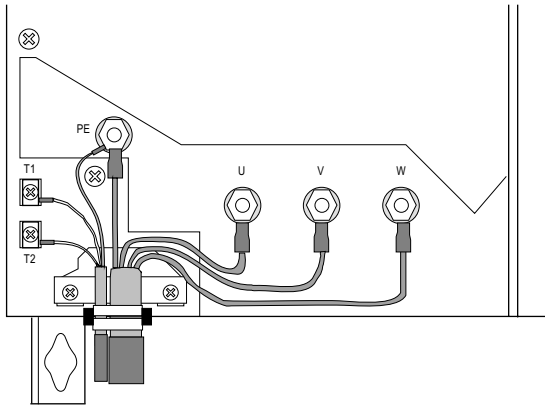
Fuses and cable cross-sections	The specifications in Chapter 3.3.4 are recommendations and refer to the use • in control cabinets and machines • installation in the cable duct • max. ambient temperature +40 °C.	🕮 3-6
Selection of the cable cross-section	Consider the voltage drop (according to DIN 18015 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.	

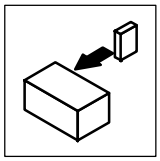
4.2.7.2 Motor connection

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

Tip!

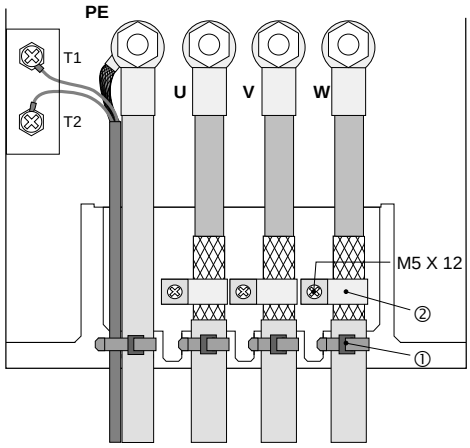
The shielding of the motor cable is only required to comply with existing standards (e.g. VDE 0160, EN 50178).

Types 9321 to 9326	
	Correct screen connection with screened cables (required parts in the accessory kit): • Screw screen plate ① on fixing bracket. ② • Fix the screen 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 screen connection: Connect screens additionally to the PE stud next to the motor connections.
Types 9327 to 9329	
	Correct screen connection with screened cables: • Fix the screen 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 screen connection: Connect screens additionally to the PE stud next to the motor connections.



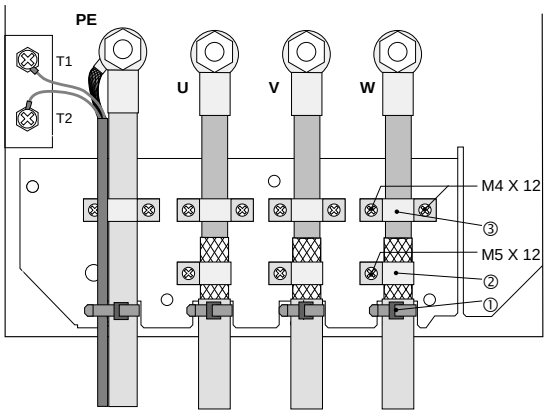
Installation

Types 9330 and 9331



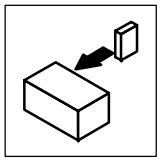
- Carry out strain relief using cable binders ①.
- Correct screen connection with screened cables:
  – Apply motor cable screen to the screening plate using clamp and M5x12 bolts ②.
  – Fix the screen of the thermal contact (see 📖 4-28) at the PE stud next to the motor connection with a surface as large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

	amb_r = 400 V (+10%)		amb_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:

	Max. permissible cable cross-sections		Tightening torques for terminals			
Type	**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

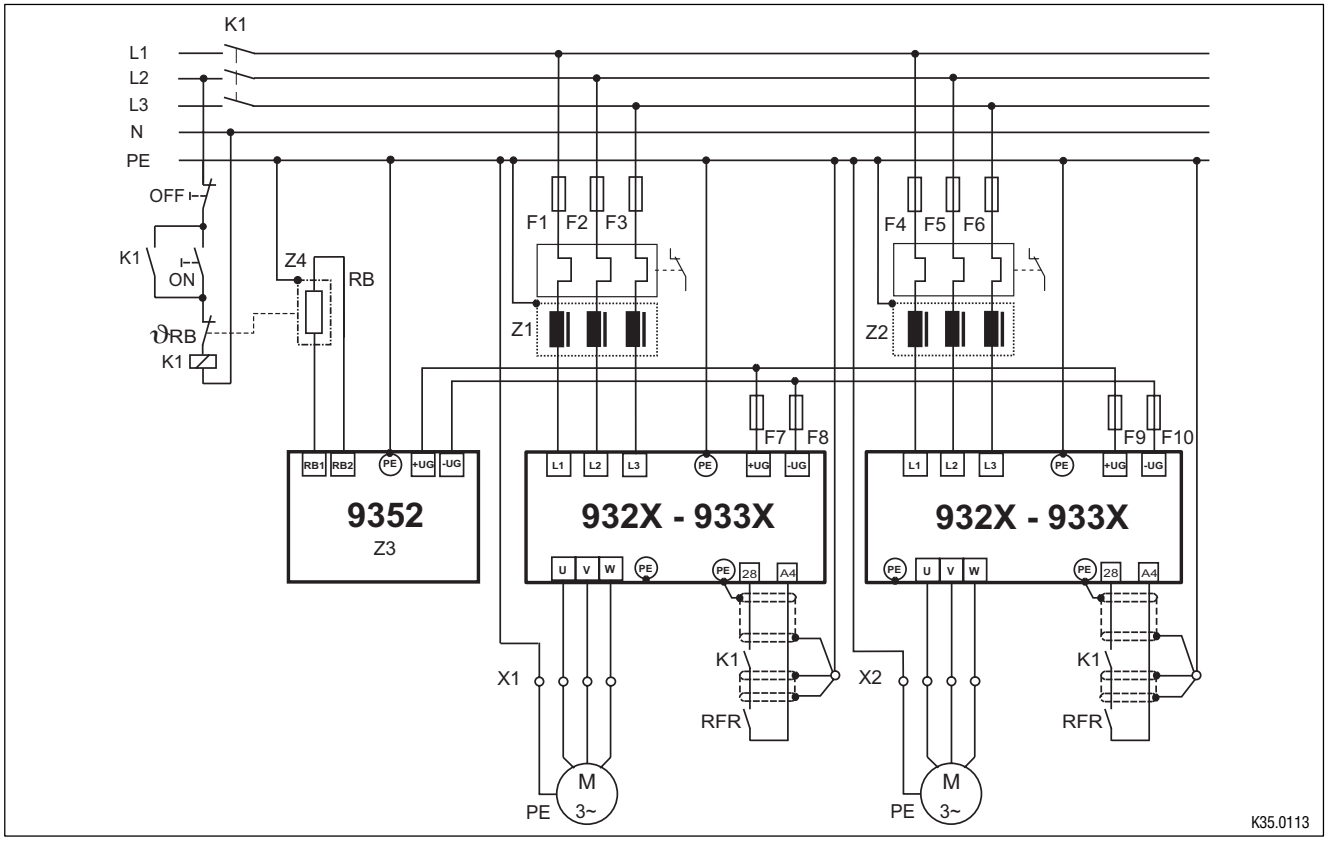


Fig. 4-9 Decentralized supply for DC-bus connection of several drives`

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.

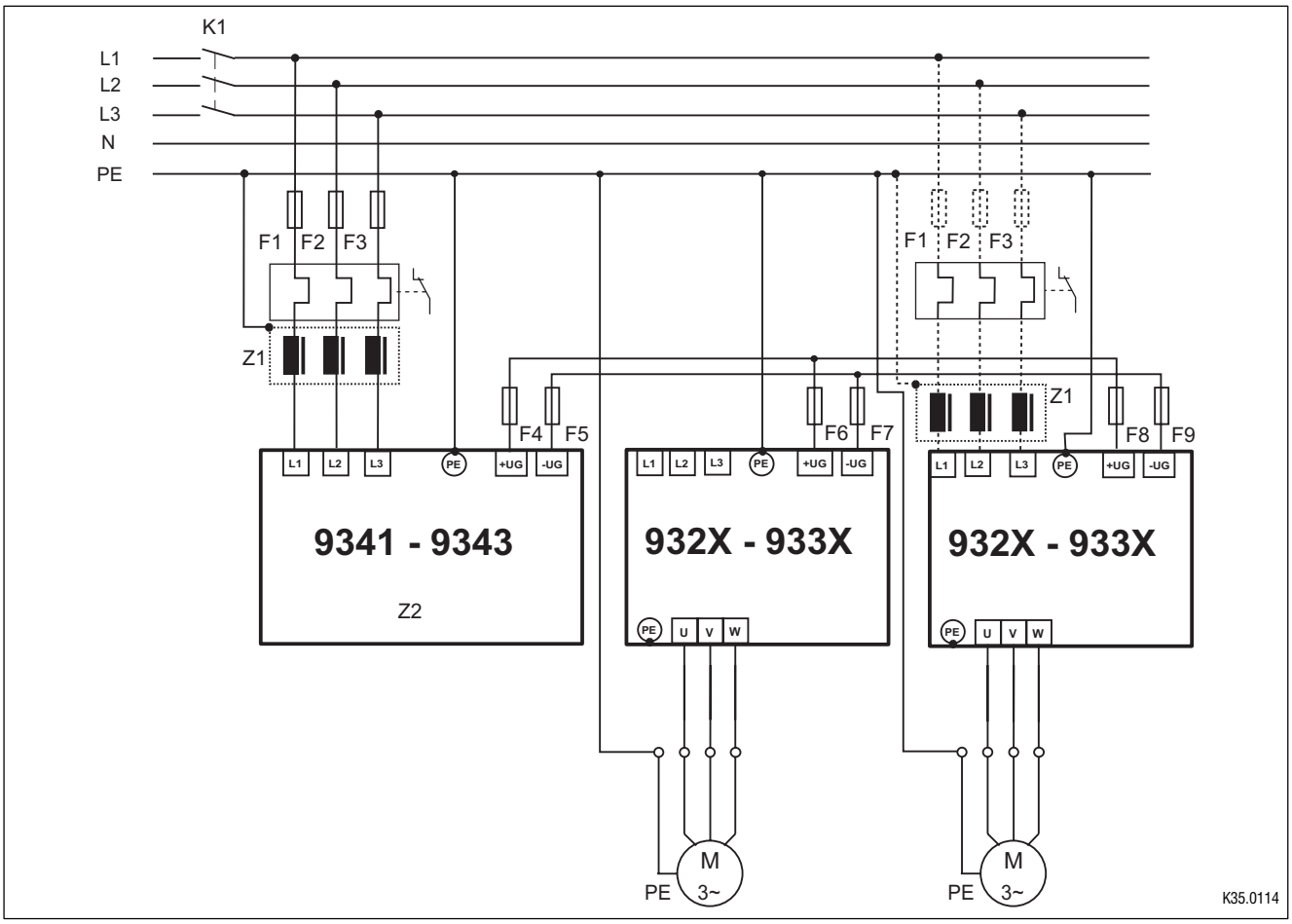
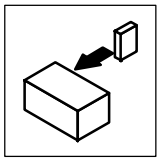


Fig. 4-10 Central supply for DC-bus connection of several drives

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.



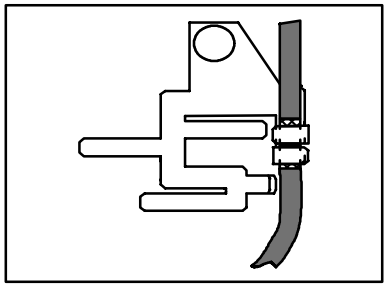
4.2.8 Control connections

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 single-ended 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).



4.2.8.2 Assignment of the control terminals

Protection against inverse polarity

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

Overview

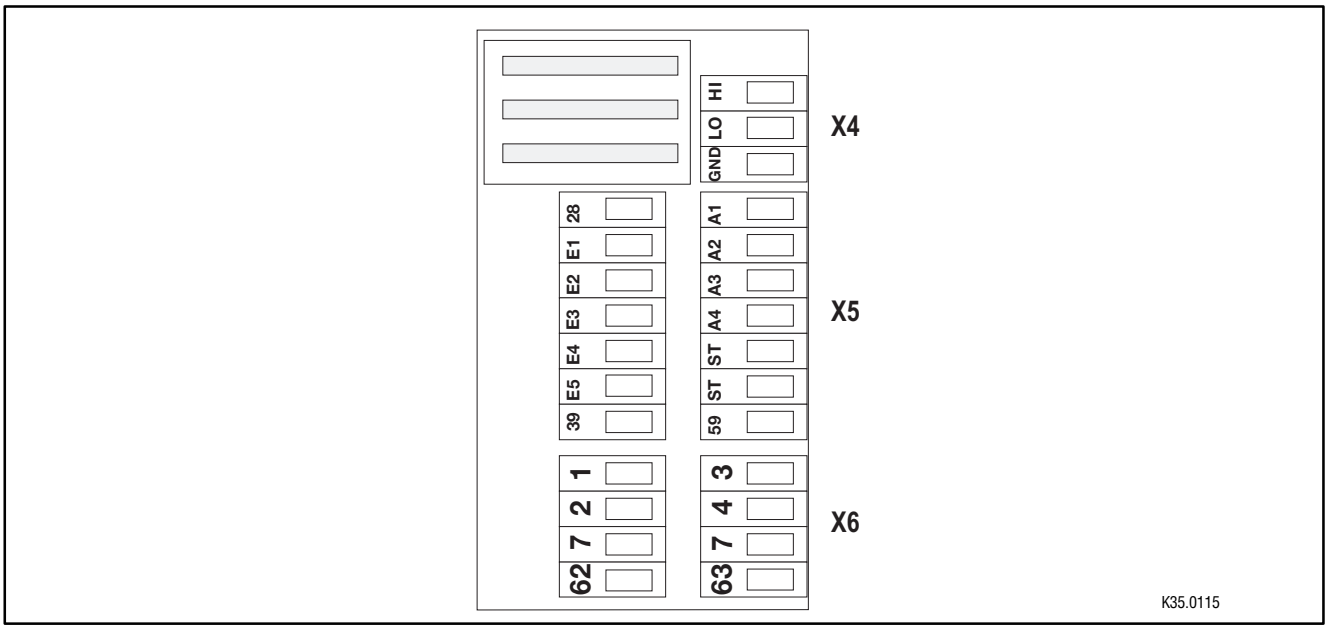
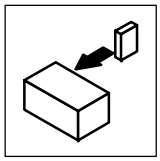
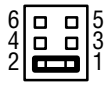
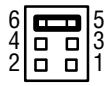


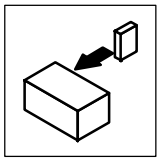
Fig. 4-11 Layout of the control connections on the front of the controller



	Terminal	Use **(Factory setting is printed in bold)**		level	Data
Analog inputs	1, 2	Differential master-voltage input **(not assigned)**	 Jumper X3	-10 V to +10 V	Resolution: 5 mV (11 bit + sign)
		Differential master-current input **(not assigned)**	 Jumper X3	-20 mA to +20 mA	Resolution: 20 µA (10 bit + sign)
	3, 4	Differential master-voltage input **(not assigned)**	Jumper X3 has no effect	-10 V to +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	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 **(limit switch / positioning in negative direction)**		LOW	
	E2	freely assignable **(limit switch / positioning in positive direction)**		LOW	
	E3	freely assignable **start positioning program:** **Condition: terminal X5/E5 = LOW)**		LOW signal →HIGH	
	E4	freely assignable **(reference switch and touch probe input)**		HIGH	
	E5	freely assignable **(program active)** **(TRIP-reset)** **(reset positioning program)** **(activate manual operation)**		LOW LOW signal →HIGH HIGH HIGH	
Digital outputs	A1	freely assignable **(reference known)**		HIGH	LOW: 0 ... +4 V HIGH: +13 ... +30 V Output current: max. 50 mA per output (external resistance at least 480 Ω for 24 V) Updating of the outputs: once per msec
	A2	freely assignable **(target position reached)**		HIGH	
	A3	freely assignable **(RDY)**		HIGH	
	A4	freely assignable **(PFO1)**		HIGH	
	39	Ground for 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.

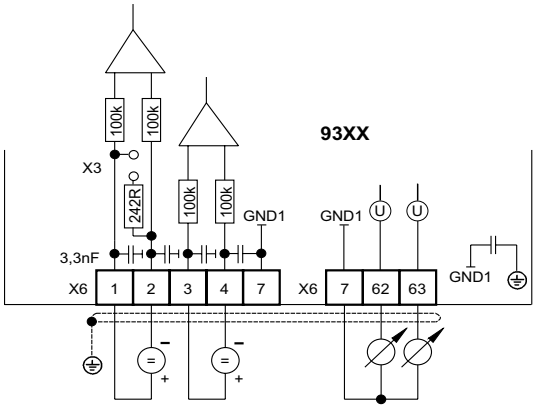
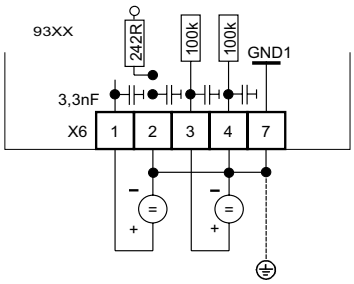


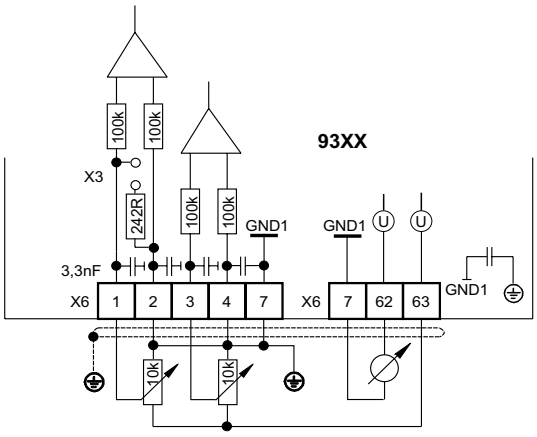
4.2.8.3 Connection diagrams

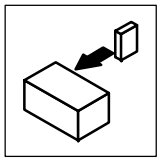
Connection of analog signals

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).



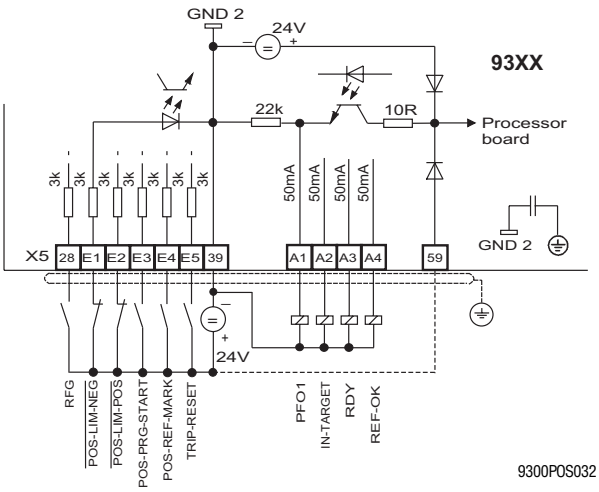
Connection of digital signals

Digital signals are connected via the 2 x 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 voltage supply



The external voltage source supplies the digital inputs and outputs.

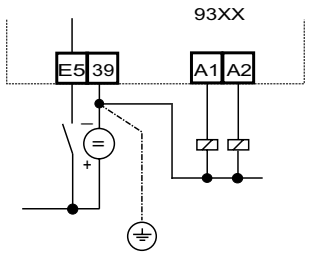
- If the external supply voltage is also to be used as an alternative supply for the control electronics (backup operation in case of mains failure):
  - Also establish the connection illustrated as a broken line.
  - The external voltage source must be able to drive a current > 1 A.

This ensures that all actual values are still detected and processed, even after mains disconnection.

- Connection of the external voltage source:
  - Supply voltage to X5/59
  - External mass to X5/39

STOP!

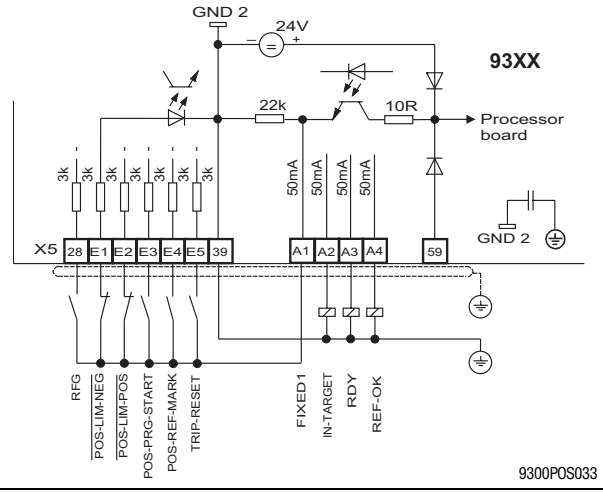
The maximum permitted voltage difference between GND2 (terminal X5/39) and the PE of the controller is 50 V.



Limit the voltage difference

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

Connection for internal voltage supply

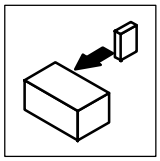


Configuration of the internal voltage supply

- 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!

Use one of the predefined configurations in C0005 for this application. 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).



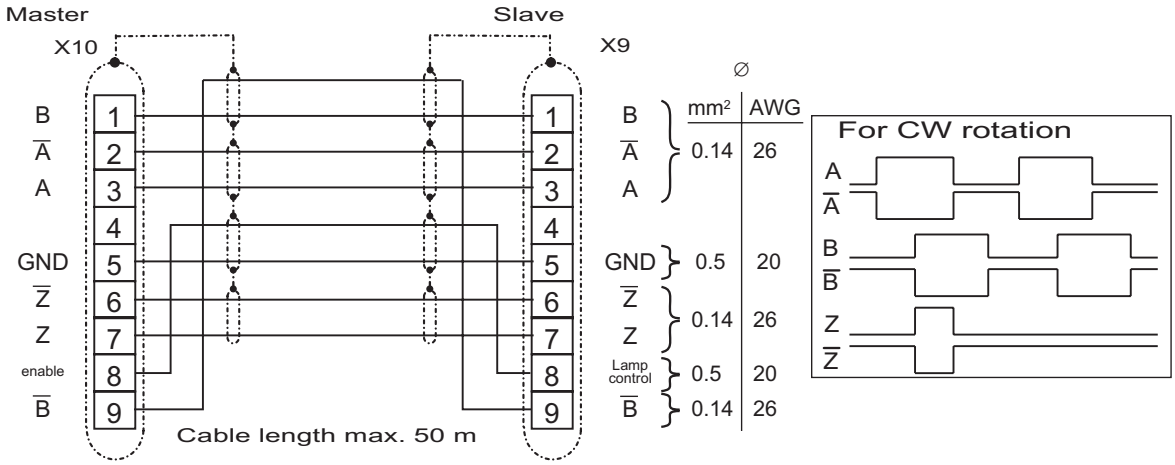
Installation

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

Tip!

For the connection to the digital frequency input (X9) or digital frequency output (X10), use prefabricated 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.

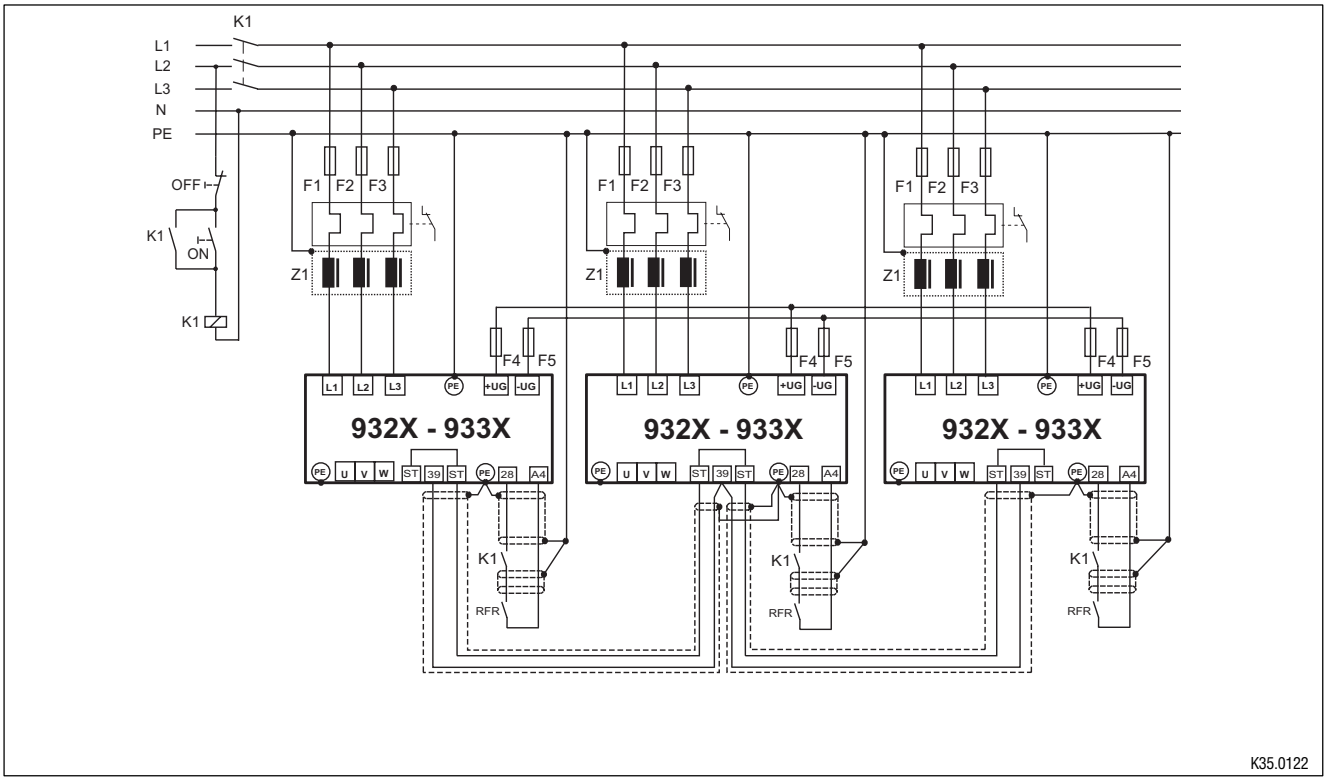
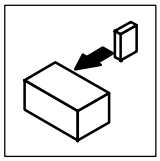


Fig. 4-12 Monitoring of a network of drives with the STATE-BUS

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 of your controller.



Installation

System bus connection (X4)

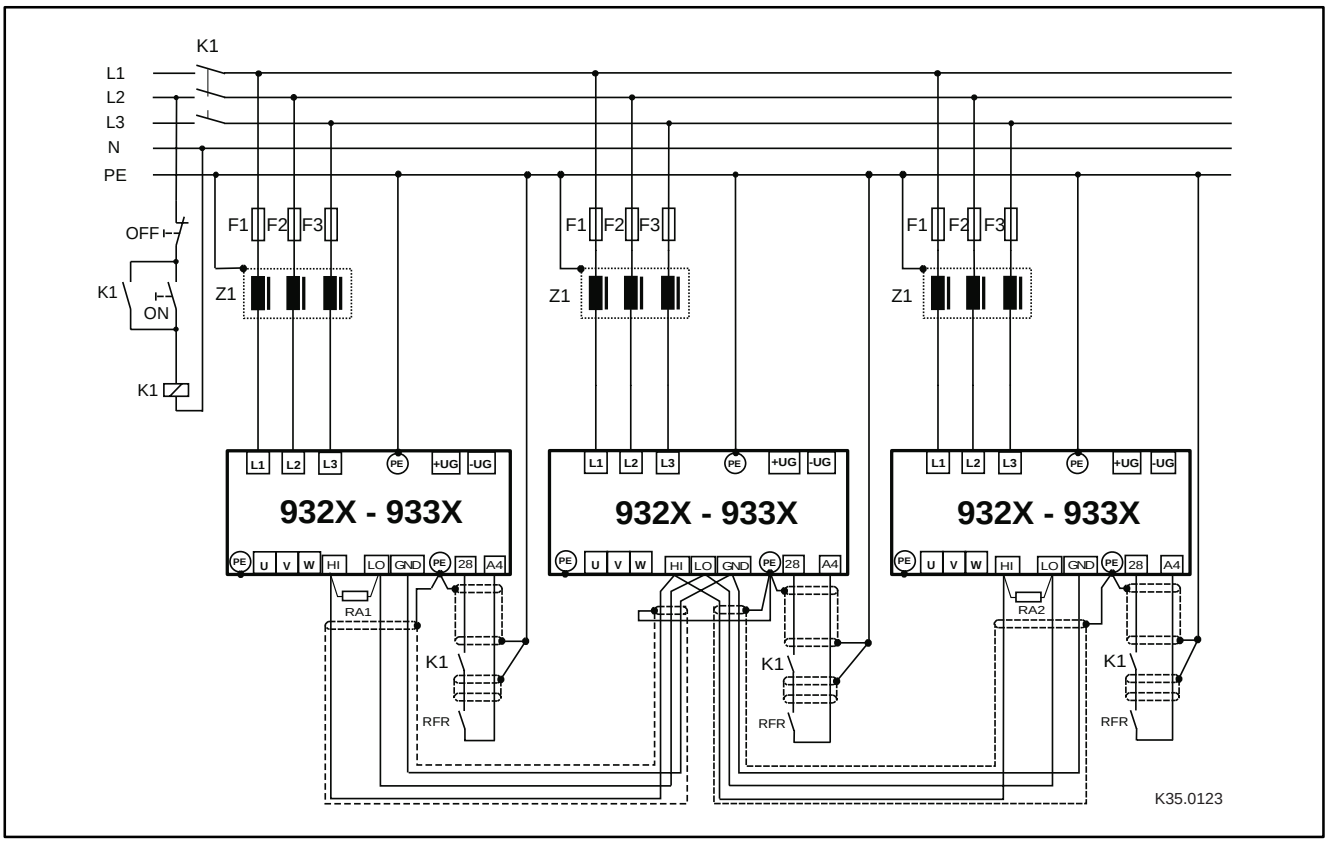


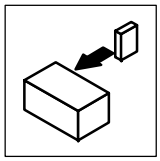
Fig. 4-13 Wiring system bus

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

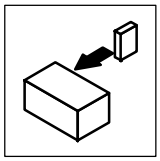
Tip!

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

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. 📖 7-2

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_{ϑ} > 1600 Ω	fixed at 150 °C	adjustable 45°C ... 150°C (C0121)	fixed, (depending on the PTC/thermal contact): PTC: at R_{ϑ} > 1600 Ω
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.

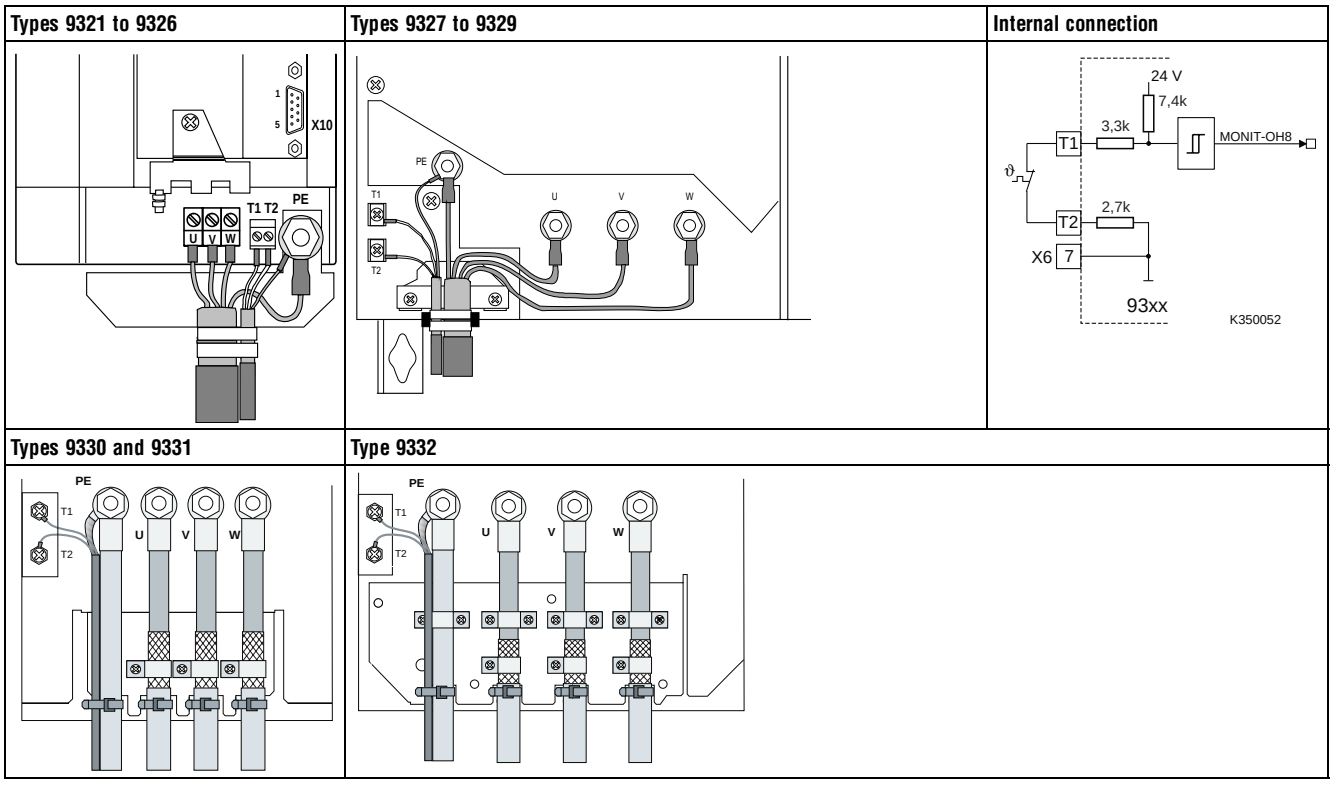
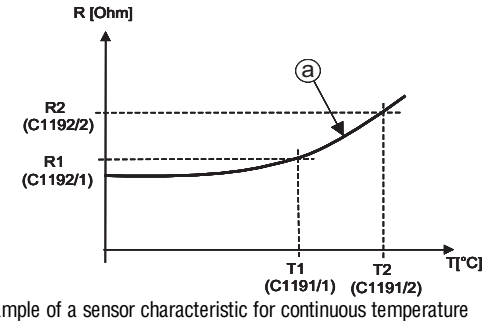


Fig. 4-14 Connection of a thermistor or PTC thermistor to terminals T1 and T2 and internal connection

Note!

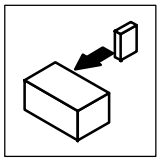
- In the prefabricated Lenze system cables for **Lenze servo motors** the cable for the temperature feedback is already included. The cables are designed for wiring according to EMC.
- If you use cables of your own:
  – Always lay cables separately from motor cables.

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)

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 indicated cable cross-sections.
- The feedback system is activated under C0025.

Sensorless control SSC

The sensorless controller (SSC) should not be used for new drive solutions (C0025 = 1).

Instead use a vector control EVF 9300 or contact Lenze.

Resolver connection (X7)

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

Note!

Use pre-cut Lenze system cables to connect the resolver.

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)

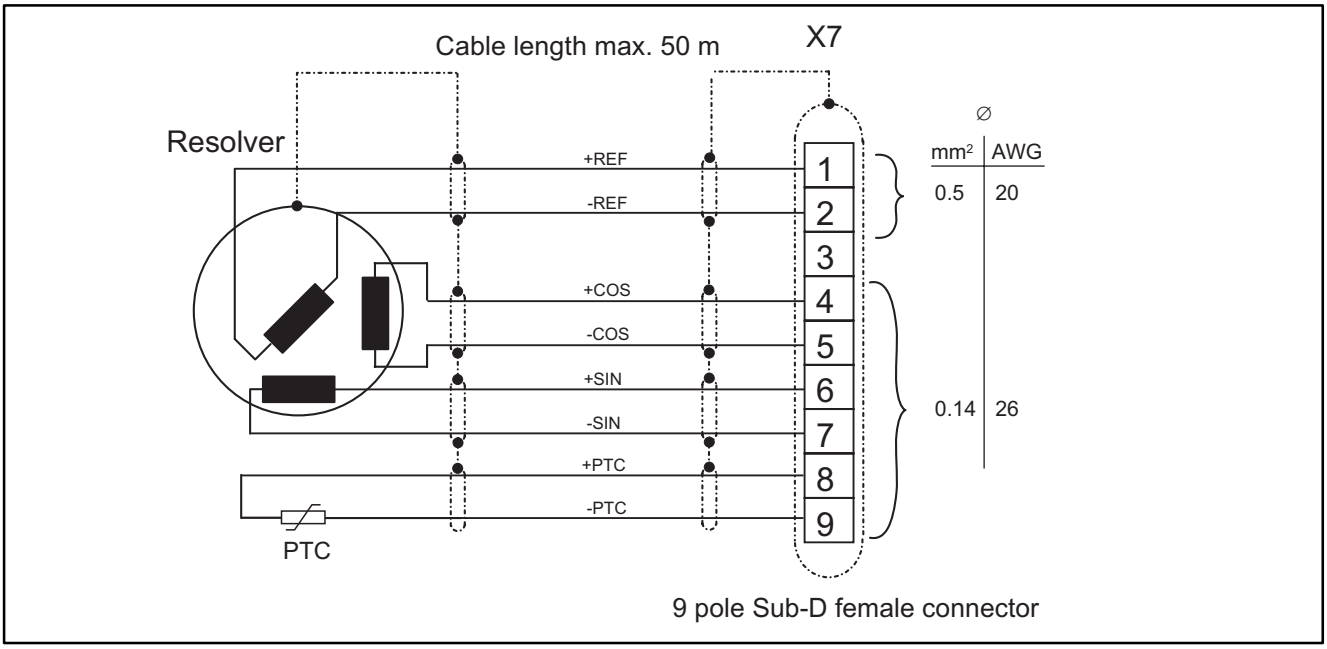
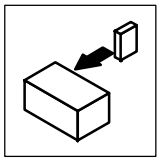


Fig. 4-15 Resolver connection

Assignment of the female connector (X7)									
Pin	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Signal	+Ref	-Ref	GND1	+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.

Note!

Use pre-cut Lenze system cables to connect the encoder.

- 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
  $\Delta U \approx 2 * \text{cable length} * \text{resistance/m} * I_{encoder}$

Stop!

Observe the connection voltage of the encoder system used. If C0421 is set too high, the encoder might be destroyed.

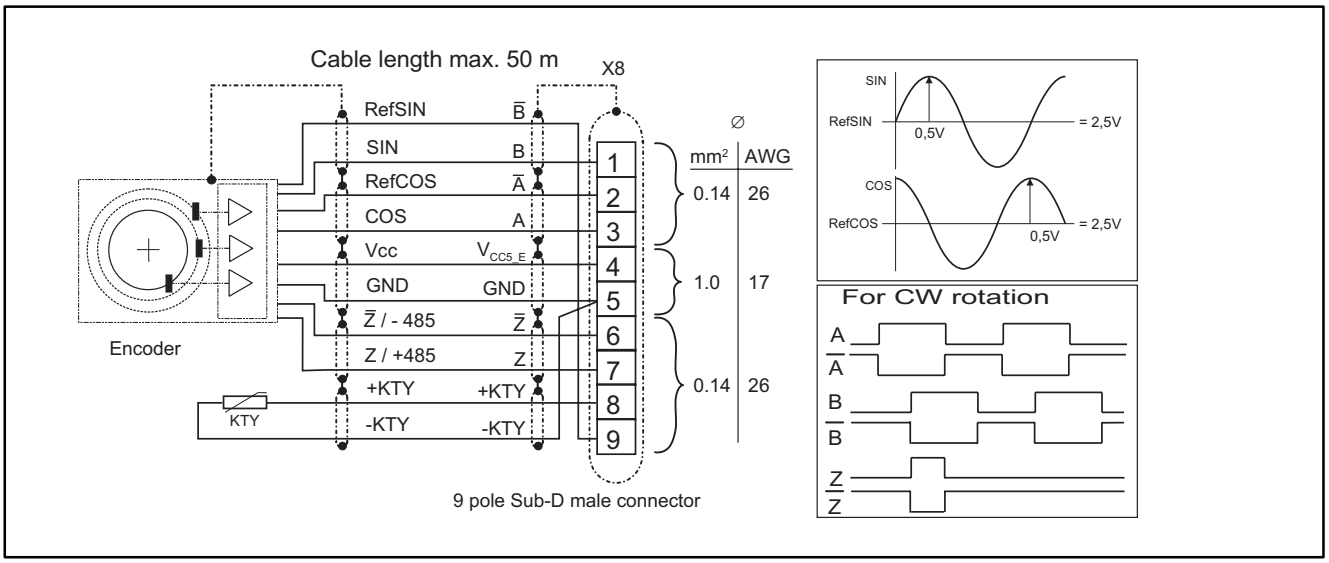
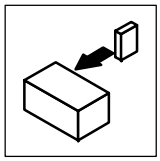


Fig. 4-16 Encoder connection



Incremental encoder

Features:

- Incremental encoders with two 5 V complementary signals which are shifted by 90 ° (TTL encoder) can be connected.
  – 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	$\overline{0}$	0	V_{CC5_E}	GND (-PTC)	$\overline{Z}$	Z	+PTC (📖 4-28)	$\overline{B}$

Sin/cos encoder

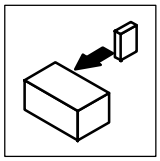
Features:

- The following encoders can be connected
  – sin/cos encoders with a rated voltage from 5 V to 8 V.
  – Sine-cosine 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 sine and cosine track: 1 Vpp ±0.2 V
- Voltage RefSIN and RefCOS: +2.5 V

Note!

For drives with track indications assign: sine, $\overline{\text{sine}}$ and cosine, $\overline{\text{cosine}}$:
Assign 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.

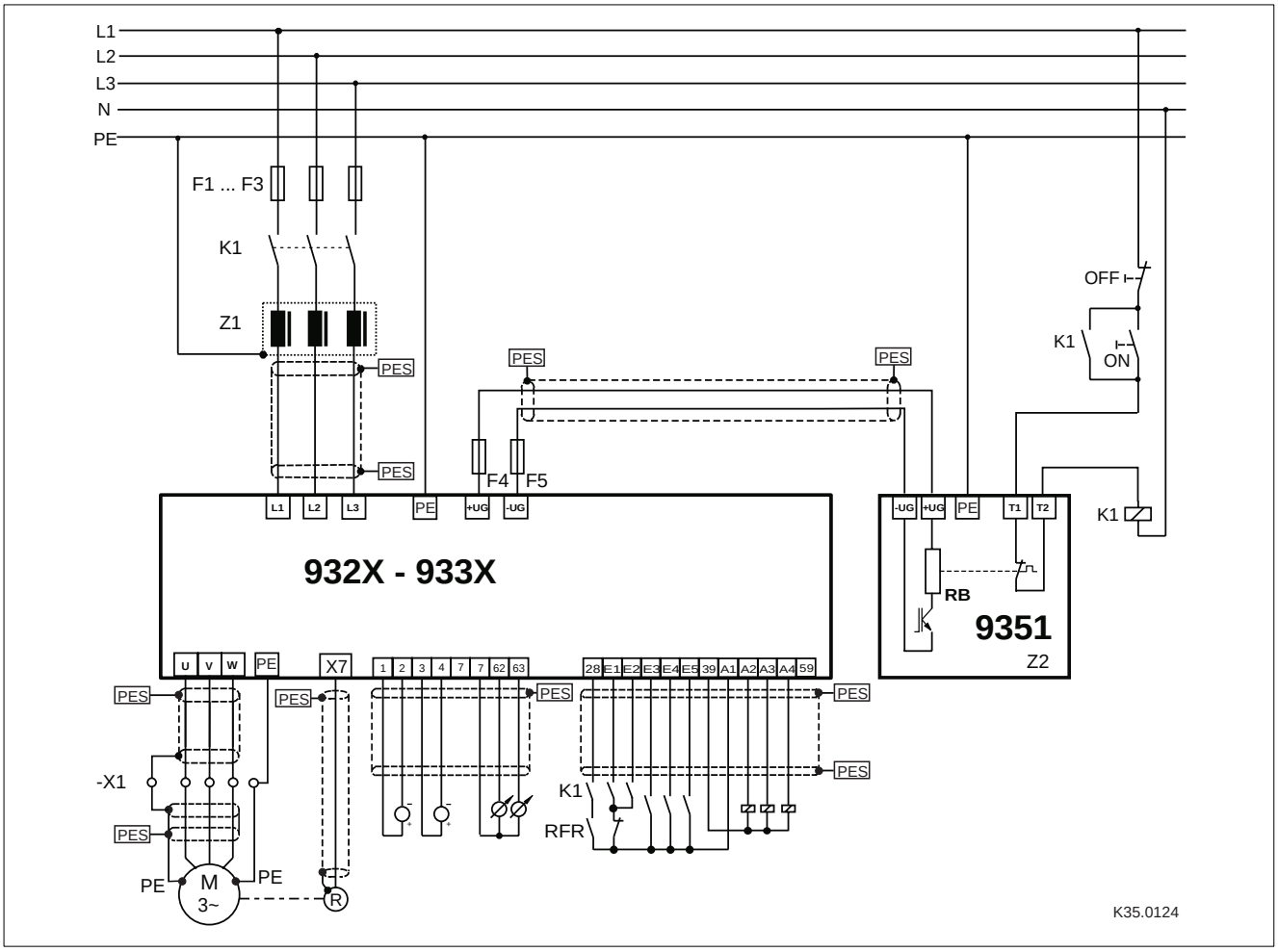
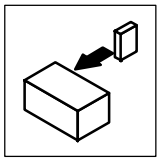
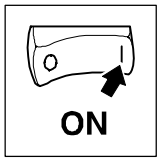


Fig. 4-17 Example for wiring in accordance with EMC regulations

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

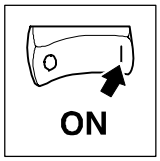
Prior to initial switch-on of the controller, check the wiring for completeness, short-circuit, and earth fault:

- 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).
- Cover of the power terminals:
  – Put on cover(s) and fix.
- **Keep to the switch-on sequence!**
- All commissioning steps described in this chapter refer to the default setting.

5.2 Initial switch-on

Tip!

- Use a PC with the Lenze program ”Global Drive Control” (GDC) under Windows for commissioning. The convenient menu includes the codes for the most important settings.
- A fieldbus module type 2102 ”RS232, RS485, fibre optics” (Lecom A/B) is required to run the GDC.
- GDC and fieldbus module are not included in the scope of supply of the controller.



Commissioning

Commissioning using an example

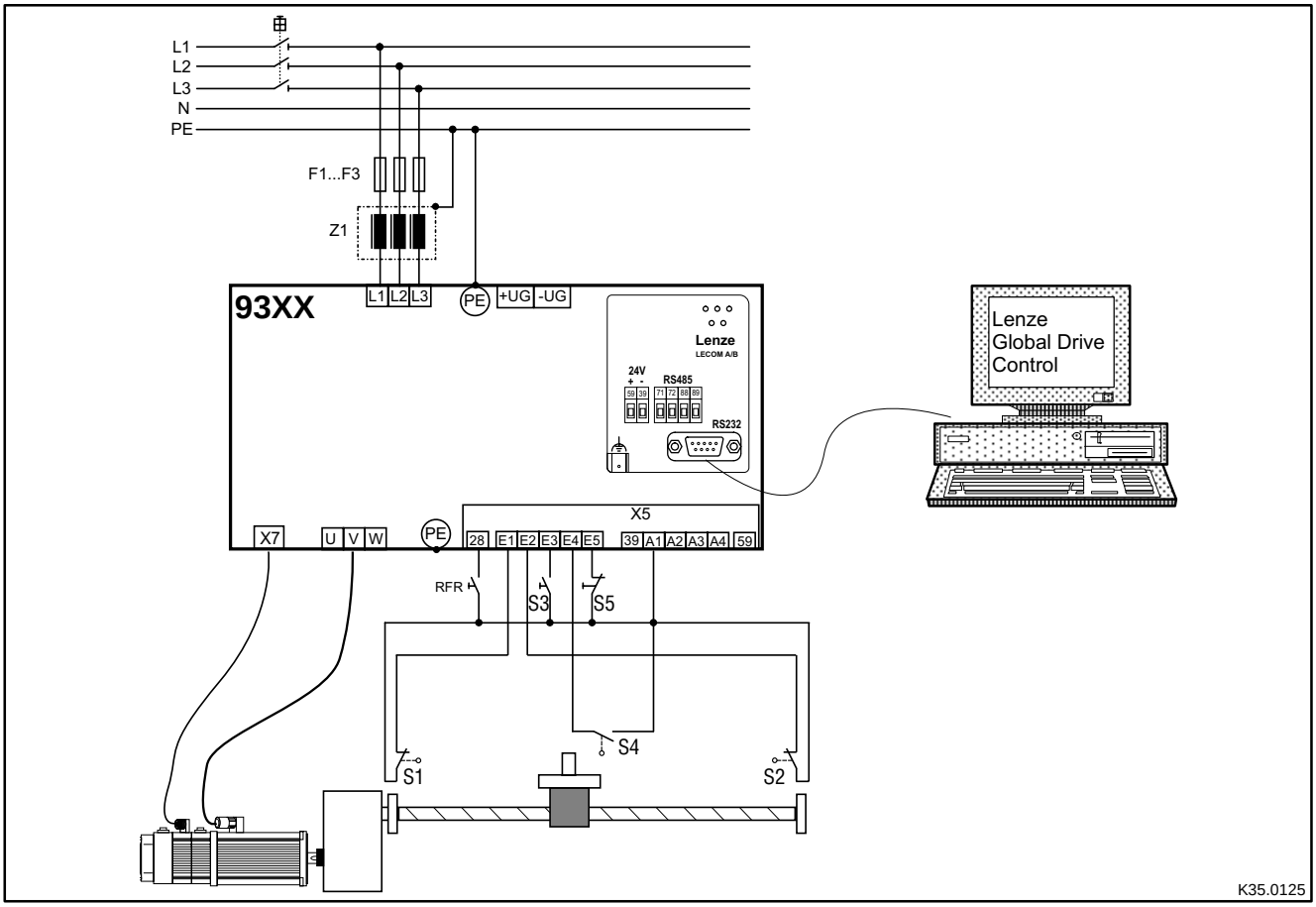
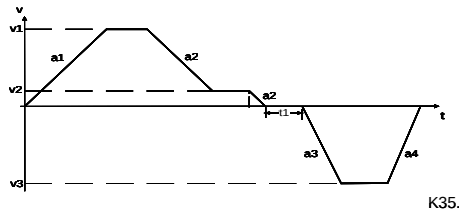
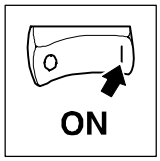


Fig. 5-1 Example of a drive control with default setting

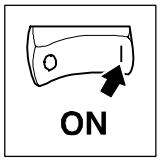
Switch	Function
S1	Limit switch for negative direction of positioning (system protection)
S2	Limit switch for positive direction of positioning (system protection)
S3	Start positioning program
S4	Reference label for homing Tip: Set E4 to HIGH if there is no homing mark.
S5	Change-over from positioning to manual operation

Positioning profile	Name	Function
	a1	Acceleration forwards
	v1	positioning speed forwards
	a2	Deceleration forwards
	v2	Creeping for target approach
	t1	Waiting time (e.g. processing of a workpiece)
	a3	Acceleration backwards
	v3	positioning speed backwards
	a4	Deceleration backwards



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

Section	Action	Detailed description
Switch on controller	1. Assign terminal X5/28 (controller enable)to LOW signal. 2. Assign terminals X5/E1 and X5/E2 to HIGH signal (+13...+30V). 3. Assign terminals X5/E3 to X5/E5 to LOW signal. 4. Switch on mains: – The controller is ready for operation after approx.1s (2 s for drives with sine-cosine encoder with serial interface).	📖 5-5
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".	📖 5-5
Generate parameter set	1. Adapt controller to the mains 2. Adapt controller to the motor 3. Enter machine parameters	📖 5-6 📖 5-7 📖 5-8
Manual control	1. Enter parameters for manual positioning or use default setting 2. Enable controller 3. Function test with manual control	📖 5-9 📖 5-10 📖 5-11
Enter parameters for positioning profile	1. Enter positioning data in the "Programming" dialog box. 2. Connect the X5 terminals in the "Terminal monitor 93XX (digital)" menu – When the digital terminals X5 are supplied with internal voltage; Assign output X5/A1 with "FIXED1". The output on terminal X5/A1 is approx. 24V. **TIP!** For this application, you may use one of the predefined configurations in C0005. C0005 = XXX1X (e.g. 20010 = absolute positioning with control via terminals) assigns FIXED1 automatically to the output X5/A1.	📖 5-13
Control drive	1. Check whether the drive is ready for operation: – When the green LED is flashing: Controller is ready for operation, go on with step 2. – When green LED is off and red LED is flashing: Interference. Before proceeding with commissioning, eliminate the fault. 2. Enable controller – Green LED is illuminated when a HIGH signal (+13...+30V) is assigned and no other source of the controller inhibit is active. 3. For operation with a fieldbus module, additional settings are necessary (see operating instructions of the fieldbus module). The motor now rotates with the provided set-value and the selected direction of rotation.	📖 5-23 📖 8-1



5.3 Commissioning sequence

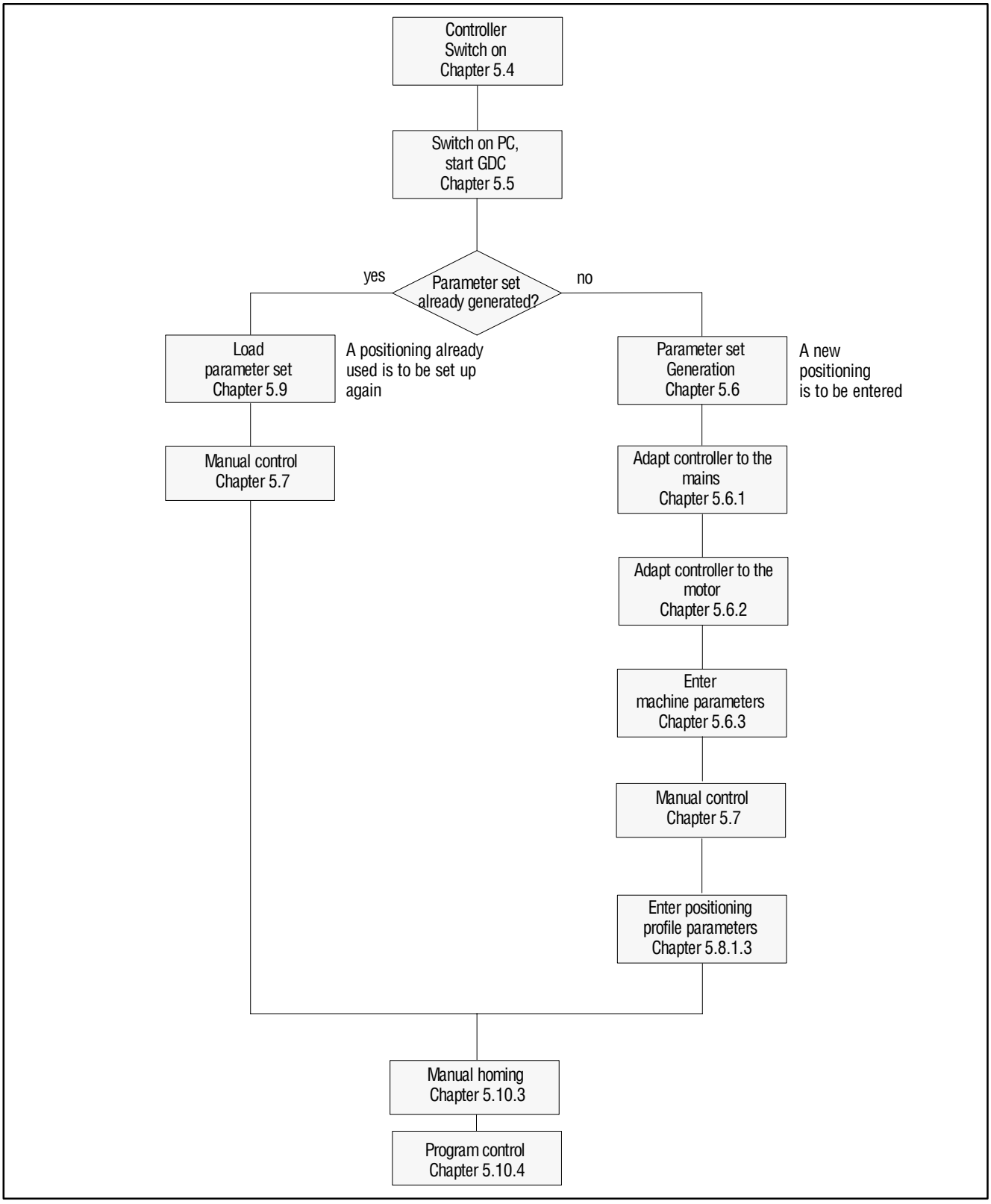
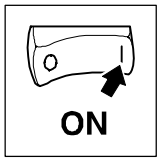


Fig. 5-2 Commissioning sequence



5.4 Switch on the controller

1. Assign LOW level to terminal X5/28 (controller enable).
2. Connect the positioning limit switch to terminals X5/E1 and X5/E2 (📖 4-20)

Note:
If you do not use positioning limit switches, assign the terminals to HIGH level.

3. Assign LOW level to terminals X5/E3 to X5/E5.
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. Check whether the controller is ready for operation:
   – If 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 commissioning, eliminate the fault. (📖 8-1)
6. For operation with a fieldbus module, additional settings are necessary (see Operating Instructions for the fieldbus module used).

5.5 Switch on PC, start GDC

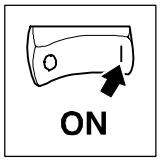
- Switch on PC.
- Start the GDC program under Windows.

When GDC is in ”online operation”

- The ”Find LECOM A/B drives” dialog box is 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.

When GDC is in ”offline operation”

- You have to select the controller 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.



5.6 Generate parameter set

Warning!

Do not change any controller settings that are not mentioned in this chapter. For more complex positioning tasks consult the Manual.

The instructions for the generation of a parameter set in this Chapter are based on the factory setting.

Proceed systematically when generating a parameter set:

1. Adapt controller to mains conditions.
2. Adapt controller to motor.
3. Enter machine parameters.
4. Enter parameters for manual positioning. (Then carry out a function test.)
5. Enter parameters for positioning profile.

Tip!

Make a positioning profile of your positioning task and, using this drawing, determine as much positioning data as possible. (📖 5-13)

5.6.1 Adapt controller to the mains

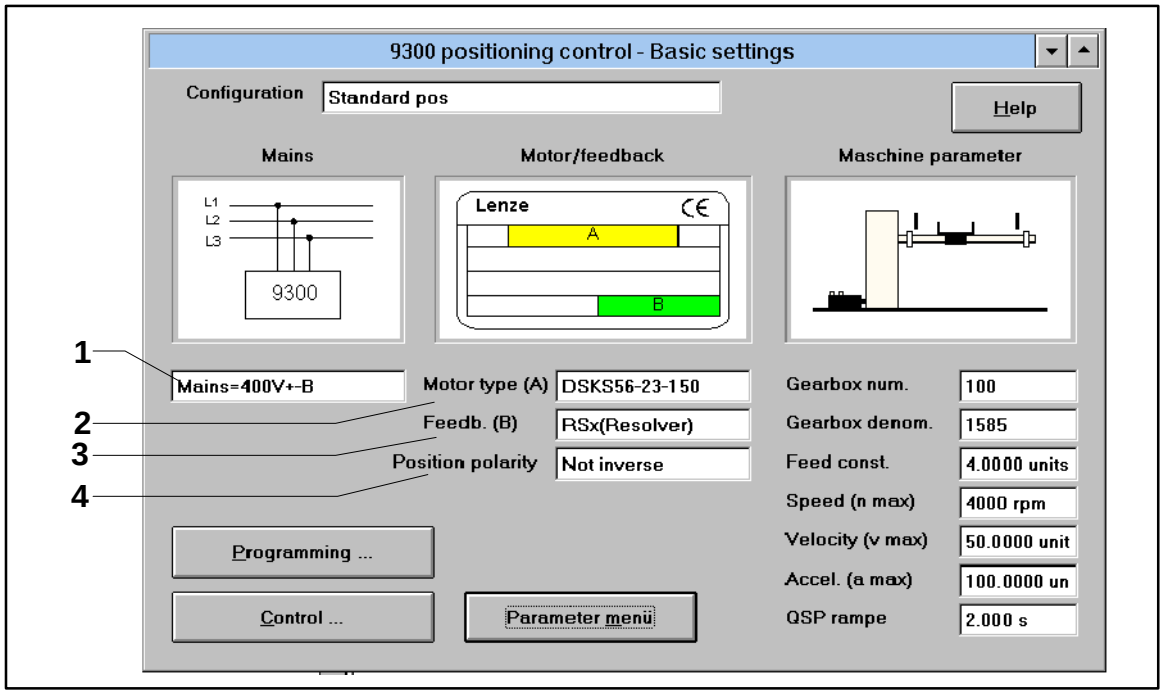
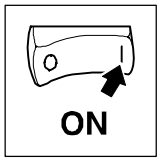


Fig. 5-3 "Basic settings" dialog box

Field	Command	Function
1	Click on field	Select values for the actual mains and operating conditions.



5.6.2 Adapt controller to the 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
2	Click "motor type (A)".	Select connected motor.
3	Click "encoder (B)".	Selected feedback system used.
4	Click on field "position polarity".	Select direction of rotation.

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. 5-4) and select the menu "Motor/feedback system".

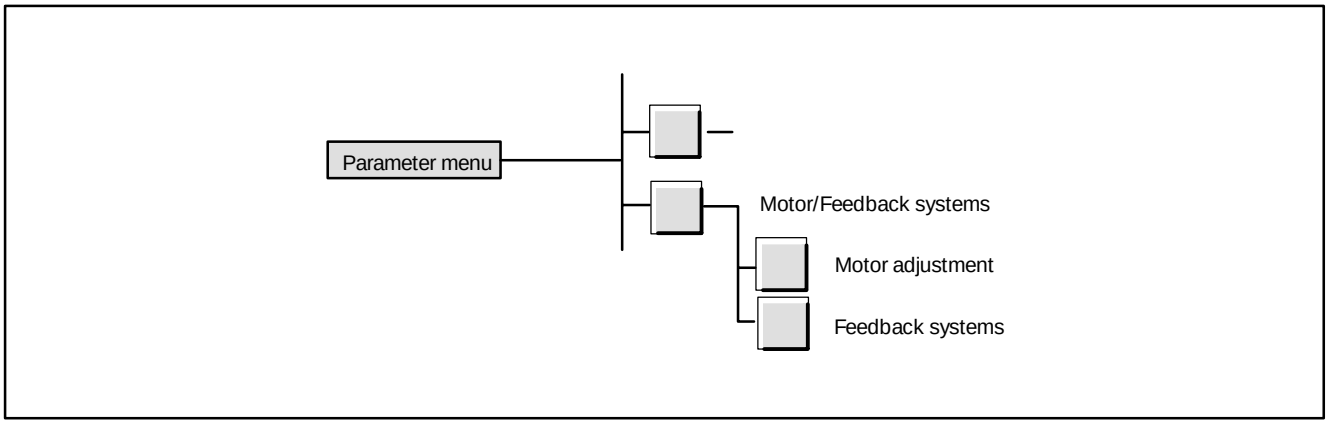


Fig. 5-4 How to find the menus "Motor setting" and "Feedback systems"

In the menu "Feedback systems":

Field	Command	Function
	Select C0416	Resolver fault. 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. 5-4).

In the menu "Motor setting":

Field	Command	Function
	Select C0086	Select a motor which best matches the motor used. List of the motors available: 10-66 .
	Select C0006	Operating mode of the motor control
	Select C0022	Adapt I_{max} 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	Stray 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).

5.6.3 Enter machine parameters

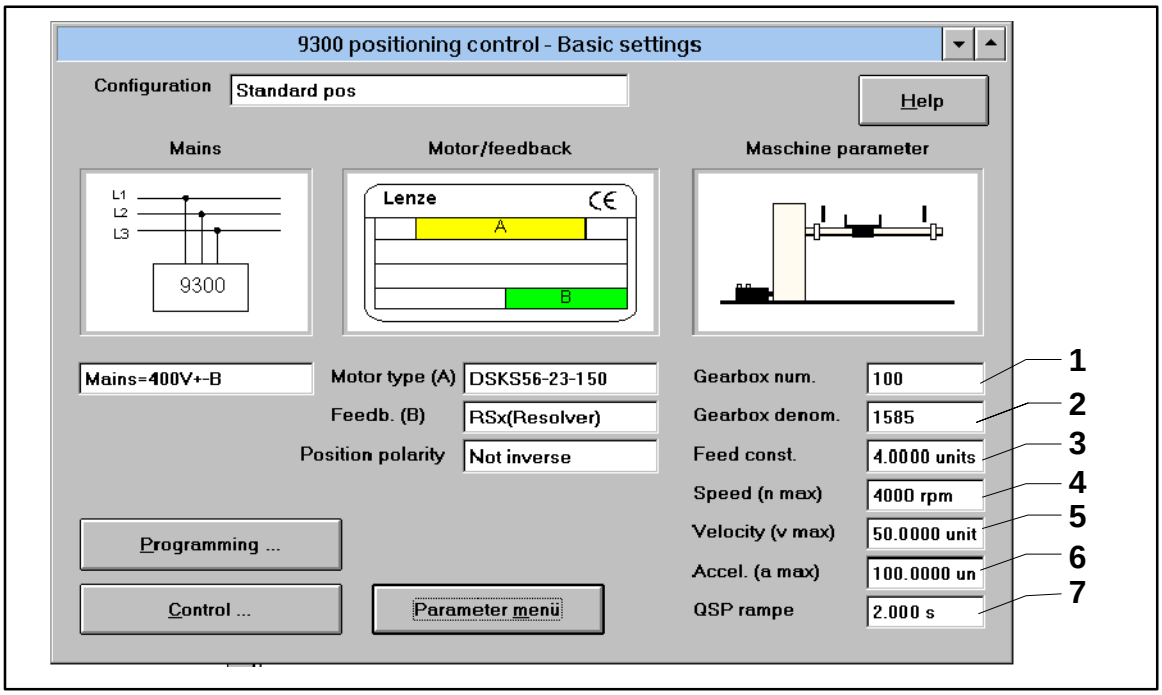
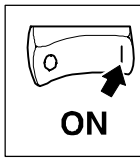


Fig. 5-5 "Base settings" dialog box

Field	Command	Function	
1	Click on field "Gearbox numerator"	Enter denominator for the gearbox ratio.	$i = \frac{n_{motor}}{n_{gearbox\ output}}$ The value results from the number of units (e. g. mm) being moved forward during one rotation at the gearbox output side.
2	Click on field "Gearbox denominator"	Enter numerator for the gearbox ratio.	
3	Click on field "Feed constant"	Enter feed of the spindle.	
4	Click on field "Speed (n-max)"	Enter upper speed limit of the motor	
5	Click on field "speed (v-max)"	Enter fastest positioning speed of the machine	
6	Click on field "Acceleration (a-max)"	Maximum permissible acceleration (with interference or during approach to position limit switches a-max cannot be activated).	
7	Click on field "QSP ramp"	Time from release of fault or approach to a position limit switch to machine standstill.	



5.6.4 Parameters for manual positioning

Stop!

Check the parameters for manual positioning. To check the configuration, select small values for acceleration and speed (e.g. factory setting).

The factory setting of the parameters is sufficient for most applications. Enter the settings as follows:

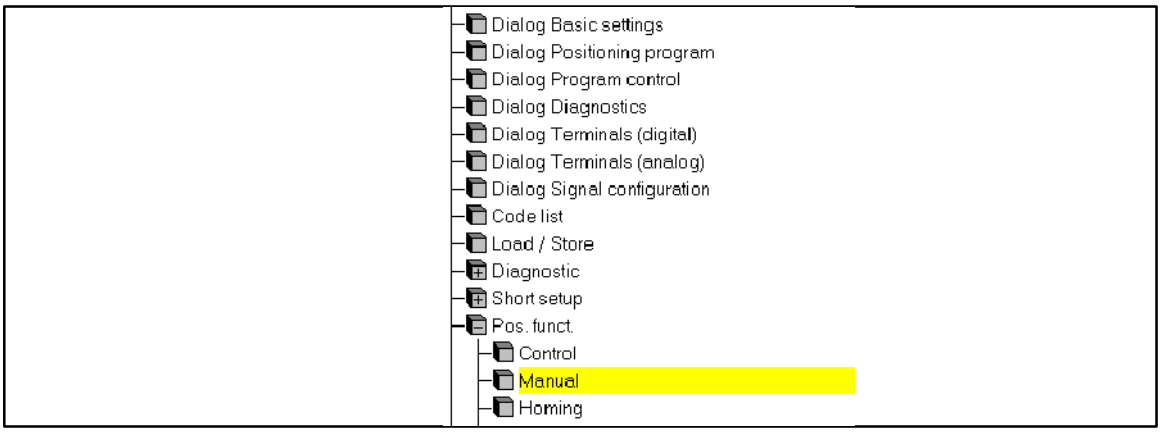
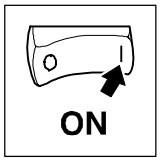


Fig. 5-6 Menu "Manual positioning" in the parameter menu

Step	Command	Function
1	Select "Basic settings" dialog box.	
2	Click on "Parameter menu" button.	Open parameter menu
3	Click on "Positioning functions" menu.	Open "Positioning functions" menu.
4	Click on "Manual positioning" menu.	Open "Manual positioning" menu.
5	Click on C1243. Enter new value.	Manual positioning speed. Factory setting: 5 % of vmax
6	Click on C1252. Enter new value.	Manual positioning acceleration. Factory setting: 10 % of amax
7	Click on C0003.	Save settings
8	Click on "Dialog control" menu.	Open "Control" dialog box.



5.6.5 Controller enable

- The controller is enabled only when all sources of the controller inhibit are reset.
  – When the controller is enabled, the green LED on the controller is illuminated.
- For the display of active sources of a controller inhibit see Chapter “Troubleshooting”. (📖 8-1)

The following table shows the conditions for controller enable:

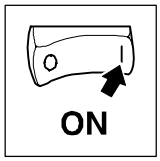
Source controller inhibit	Controller inhibited	Controller enabled	Note
Terminal X5/28	0 V ... +4 V	+13 V ... +30 V	-
Fault	In case of TRIP In case of Message	TRIP reset	Check, see 📖 8-1
System bus (CAN)	Transmission of the control information INHIBIT via C0135	Transmission of the control information ENABLE via C0135	📖 Manual
Field bus module	See operating instructions of the corresponding fieldbus module		-

Tip!

All sources of controller the inhibit act like a series connection of switches, independent of each other.

Stop!

When the internal control structure is changed, another terminal assignment may result.



5.7 Function test with manual control

Test the function with manual control after every new or modified configuration.

Warning!

Provide suitable emergency stops for manual operation so that you will be able to stop the drive in the event of unpredictable movements.

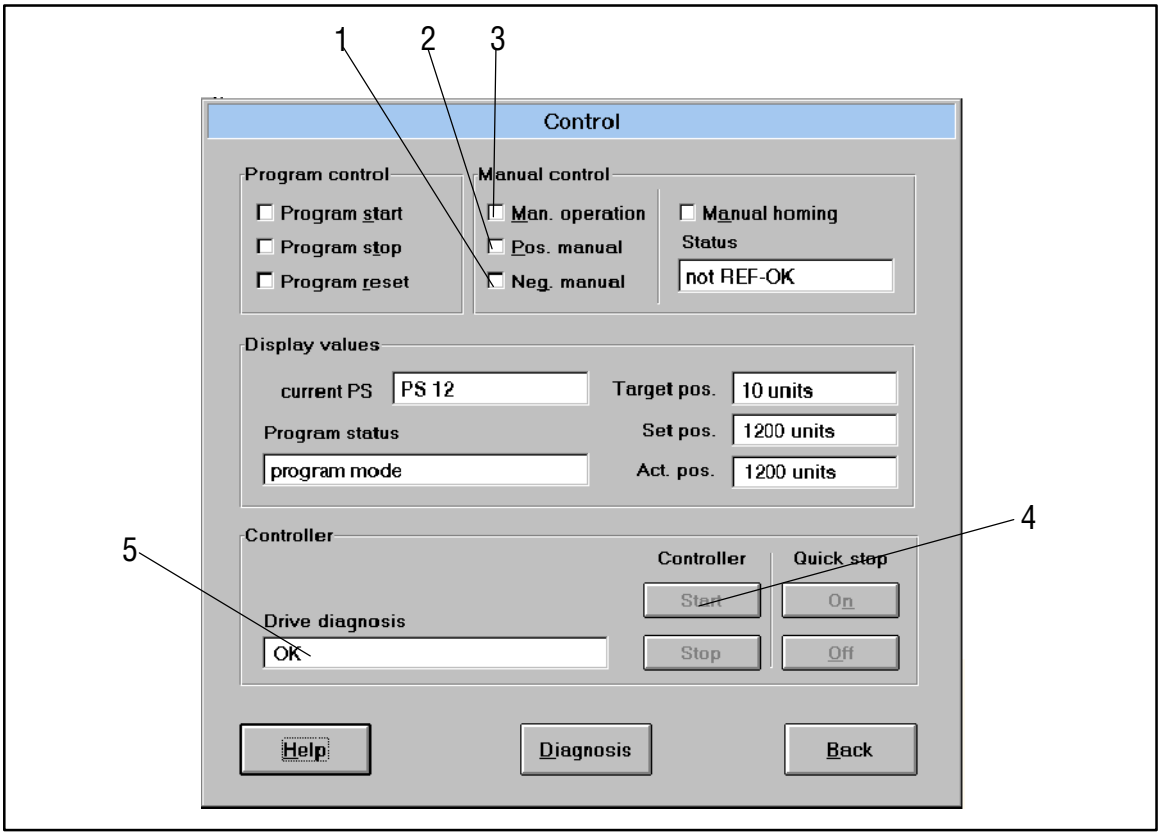
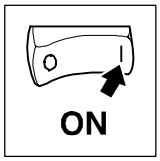


Fig. 5-7 Dialog box "Control"

Field	Command	Function
3	Select "Manual operation"	Manual operation active
5		With drive diagnostics "Ok", "Enable" is possible. 🕮 6-1
4	Controller "Enable"	Enables the controller, if there is no interference.
2	Select "Manual positive"	The drive moves in the positive direction towards the limit switch. • Test positioning limits • Overide positioning limit switch to test its function.
	Reset "Manual positive"	The drive stops.



Commissioning

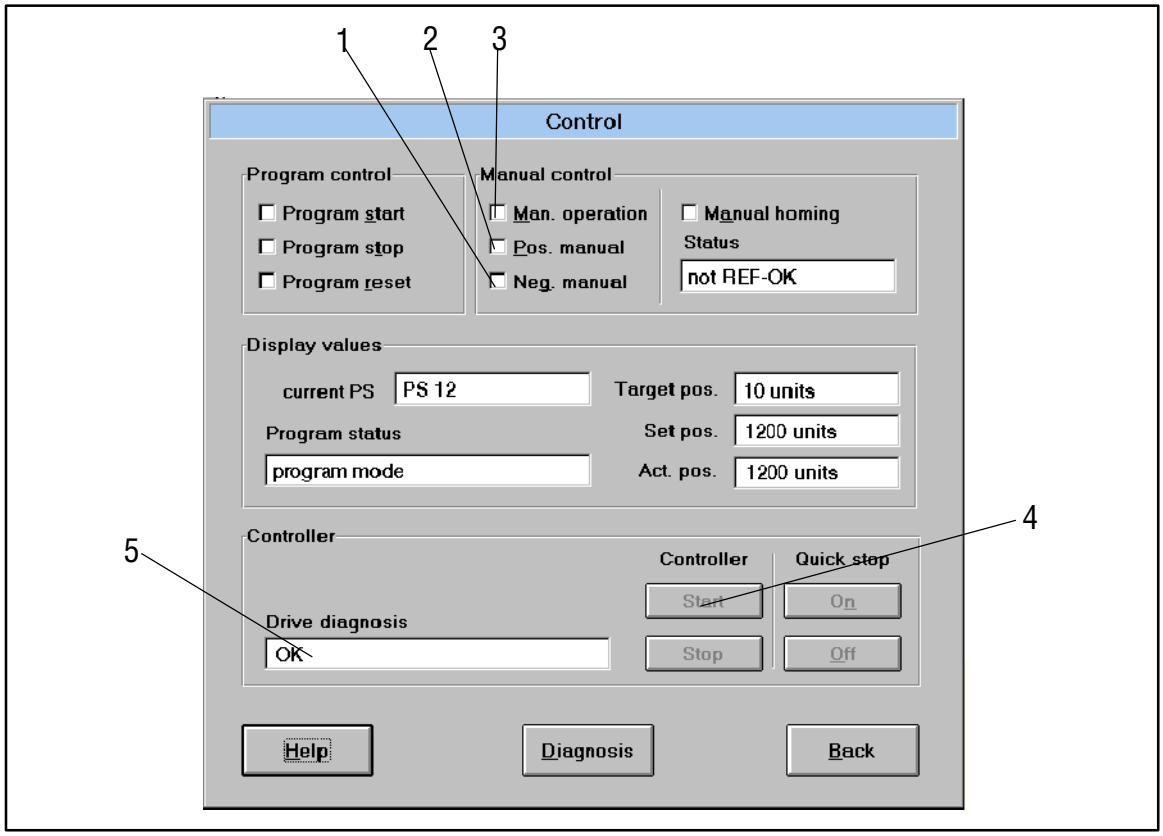


Fig. 5-8 Dialog box "Control"

Field	Command	Function
1	Select "Manual negative"	The drive positions in the negative direction towards the limit switch. • Test positioning limits • Overide positioning limit switch to test its function.
	Reset "Manual negative"	The drive stops.
1, 2	"Manual positive" and "Manual negative" selected	The drive brakes with a-max down to standstill.

Tip!

- To assign the reverse direction to the function "Manual positive" and "Manual negative", change to the dialog box "Base settings" and set the field "Position polarity" to "inverted".
- You can quit overridden limit switches only by changing the positioning direction ("Manual positive" or "Manual negative").

5.8 Enter positioning profile parameters

5.8.1 Structure of a positioning program

- The positioning program consists of max. 32 program sets (PS).
- The sequence of processing the PS within the positioning program can be freely selected.
- The PS determine the sequence of the positioning. The functions within a PS are processed according to a fixed sequence (see Fig. 5-14). These functions include:
  – Type of positioning (relative or absolute positioning with or without touch probe)
  – Speed profile of the positioning
  – Access to data in the variable tables (VT).
  – Reaction on external events via digital inputs (PFI)
  – Processing of waiting times
  – Repetition of number of pieces
  – Output of control signals via digital outputs (PFO)

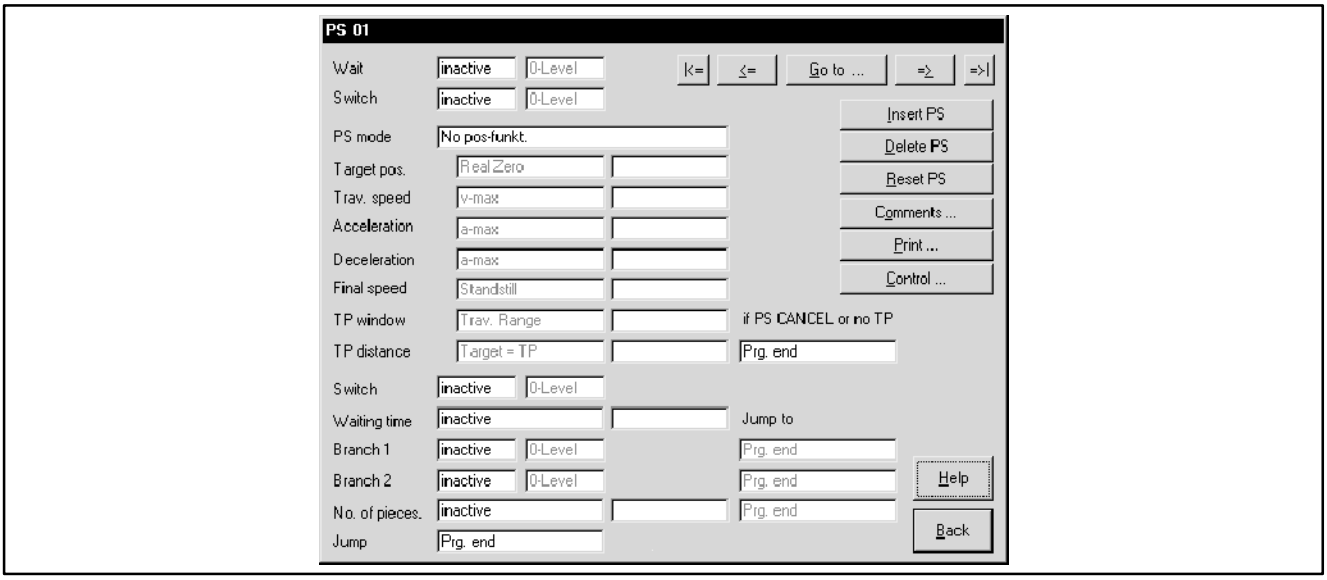


Fig. 5-9 PS input dialog

- The positioning is carried out according to the positioning profile parameters. These parameters are listed in the variable tables (VT). The following VTs are available:
  – VTPOS for the target position
  – VTVEL for the positioning speed and final speed
  – VTACC for the acceleration and deceleration
  – VTPCS for the number of pieces or repeat function
  – VTTIME for the waiting time

5.8.1.1 Tools for editing

For a simple and fast input of parameter data, GDC provides tools for editing. These are explained in the PS templates displayed in the program.

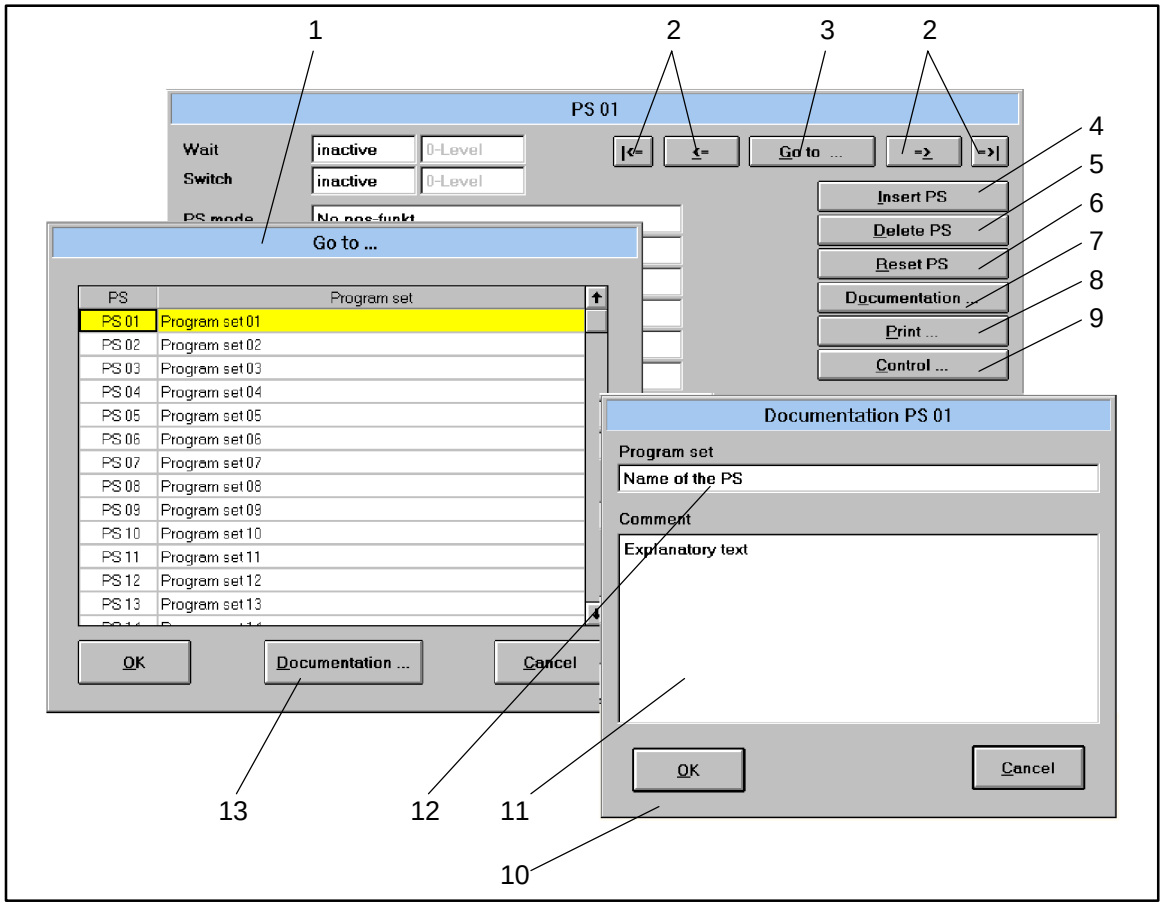


Fig. 5-10 Editing tools for the program sets

Field	Function	Description
1, 3	Selection of a PS	Click on "Go to ..." (3). The dialog box (1) is opened. Select a PS which you want to modify. At the same time you can write notes about the PS. For this, click on "Documentation" (13) (see also 7).
2	Browsing the PS	Select the previous or next PS or jump to the first or last PS.
4	Insert PS	Inserts a new PS at this place and displaces all following PS by one position. The last PS is deleted.
5	Delete PS	Deletes the current PS and displaces all following PS by one position.
6	Reset PS	Resets all parameters of the current PS to factory setting.
7, 10, 11, 12	Write comments on the PS	Documentation of current PS. In the dialog box (10) you can enter a name for the PS (12) and add an explanatory text as comment (11).
8	Print PS	Output of the current or all PS to a printer.
9	Select dialog box "Control".	Direct change to the dialog box "Control", e.g. to test modifications in manual operation. 📖 5-11

5.8.1.2 Structure of a positioning profile

- Make a positioning profile of your task (e.g. Fig. 5-11, Fig. 5-12)
- For more complex positioning profiles, generate the positioning program with several PS (e.g. for different positioning speeds).

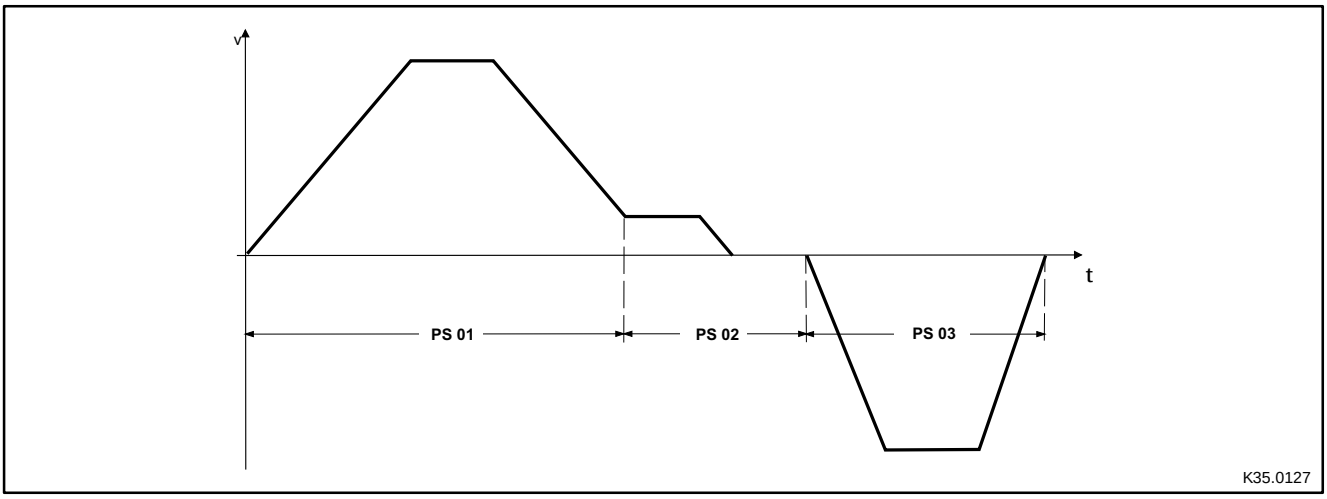


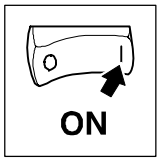
Fig. 5-11 Structure of a positioning profile (example of a point-to-point positioning)

In the example, a total of three program sets are required for the complete input of all parameters. Every PS uses the same input template. The input template is described in the next Chapter.

Program sets

The parameter data for the positioning profile are saved in the program sets.

- Thanks to the template of the program sets.
  – the sequence of the input is determined. (📖 5-19)
  – complex positionings are divided into individual sections (sets).
- Every program set can be called up again and again without further programming.
- A total of 32 program sets are available.



Commissioning

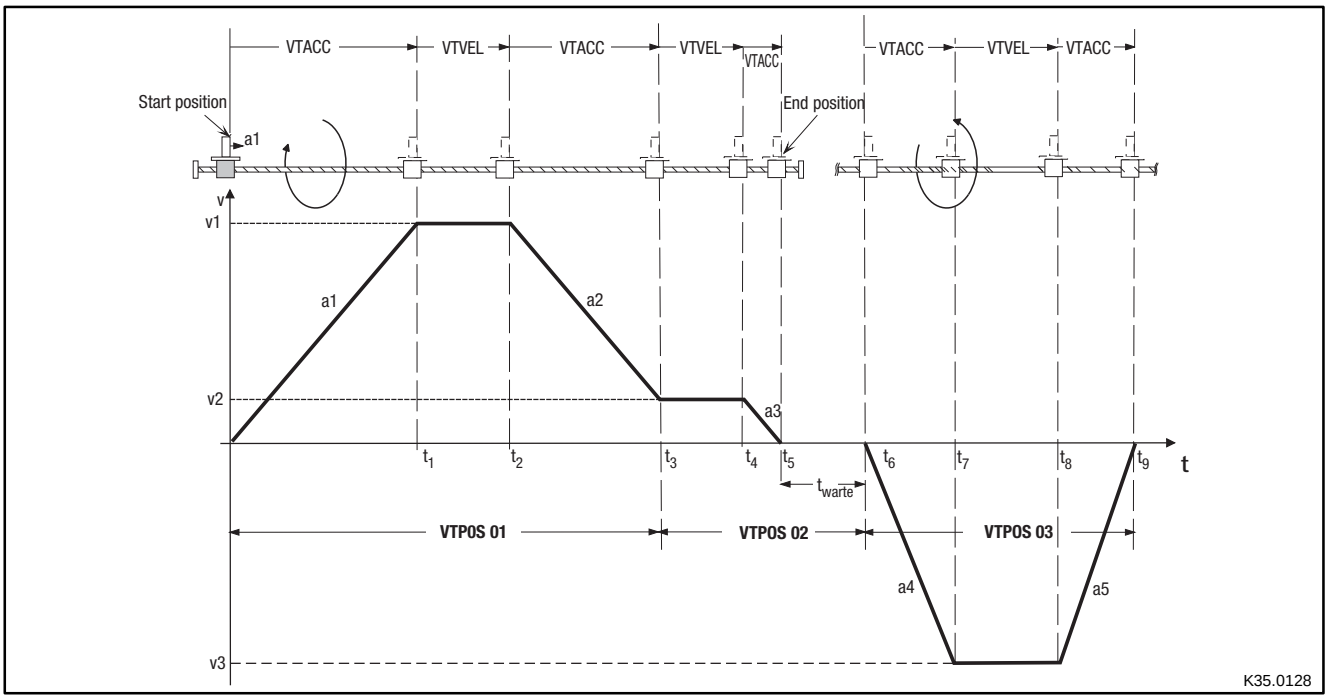


Fig. 5-12 Structure of a positioning profile (example of a point-to-point positioning)

Name	Program set (PS)	Function
a1	PS01	Acceleration forwards
t1	PS01	Time until v1 is reached
v1	PS01	Positioning speed forwards
t2	PS01	Calculated time of braking to reach v2 in t3
a2	PS01	Deceleration 1 forwards
t3	PS01	Start creeping with v2
v2	PS01, PS02	Final speed (PS01), positioning speed (PS02)
t4	PS02	Drive approaches position
a3	PS02	Deceleration 2 forwards
t5	PS02	Position reached, then waiting time (e.g. processing of a workpiece)
t6	PS03	Start backward motion
a4	PS03	Acceleration backwards
t7	PS03	Time until v3 is reached
v3	PS03	positioning speed backwards
t8	PS03	Time until a5 starts (calculated)
a5	PS03	Deceleration backwards
t9	PS03	Time until the start is reached again

Description of the input template

Click on the ”Programming” button in the ”Basic settings” dialog box.

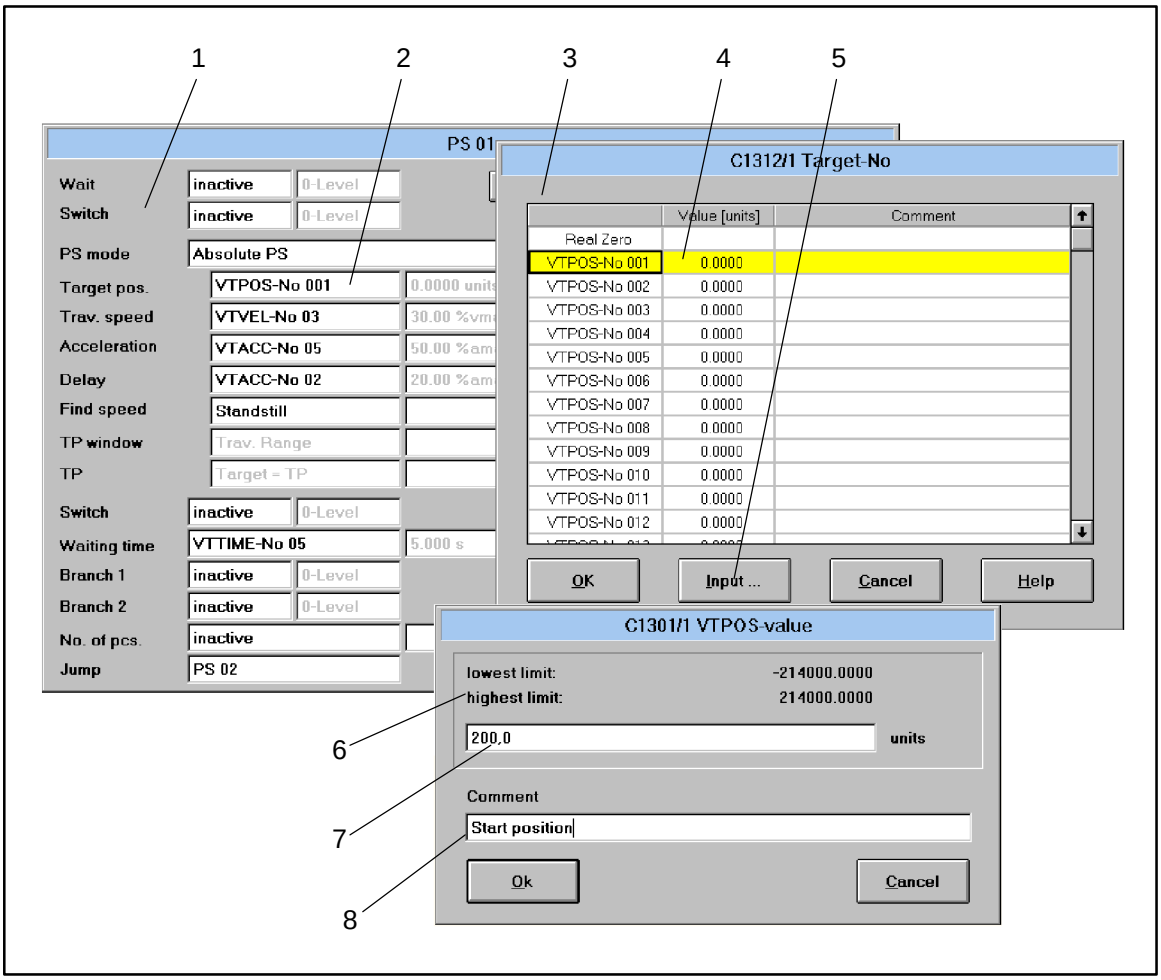
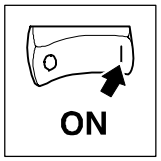


Fig. 5-13 Dialog box for entering the positioning data

Field	Function	Description
1	Dialog box for a program set (PS)	All necessary positioning profile parameters for a PS are entered as well as possible branches to further PS.
2, 3	Parameter field	Click on field. A dialog box (3) for selecting a parameter is opened.
4, 5, 6	Selection field	A parameter is selected. Click on desired parameter. For variable tables (VT) you can describe the table items. For this, click on ”Input” (5). A dialog box (6) for entering a parameter is opened.
6	Dialog box	Dialog box for entering a parameter in the variable table
7	Input field	Input of the desired parameter
8	Comment on the parameter	You can write a comment to the parameter, e.g. for which function it is required.



Processing a program set

The following chart shows the processing of a program set (PS).

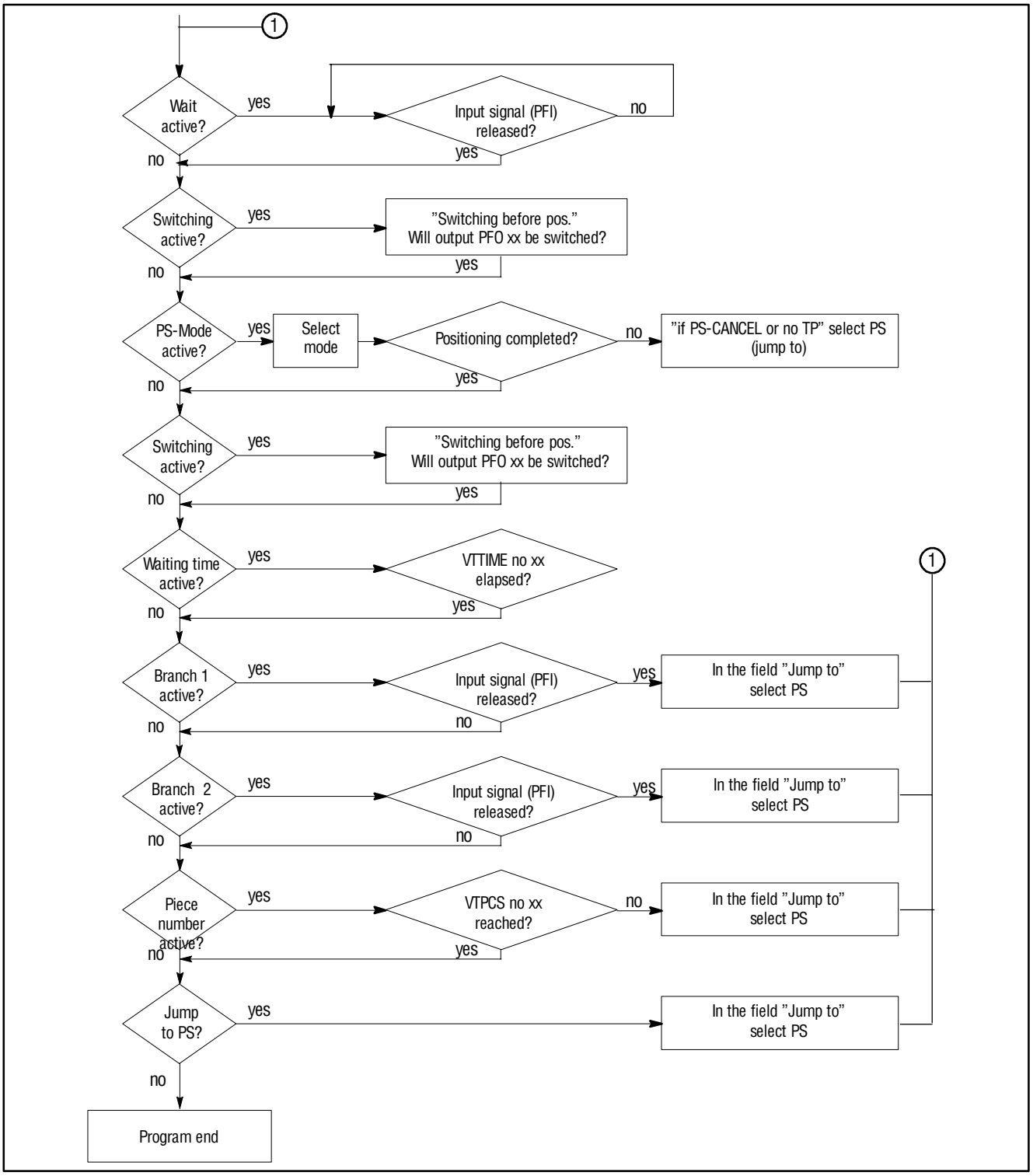


Fig. 5-14 Processing a program set

5.8.1.3 Enter parameters

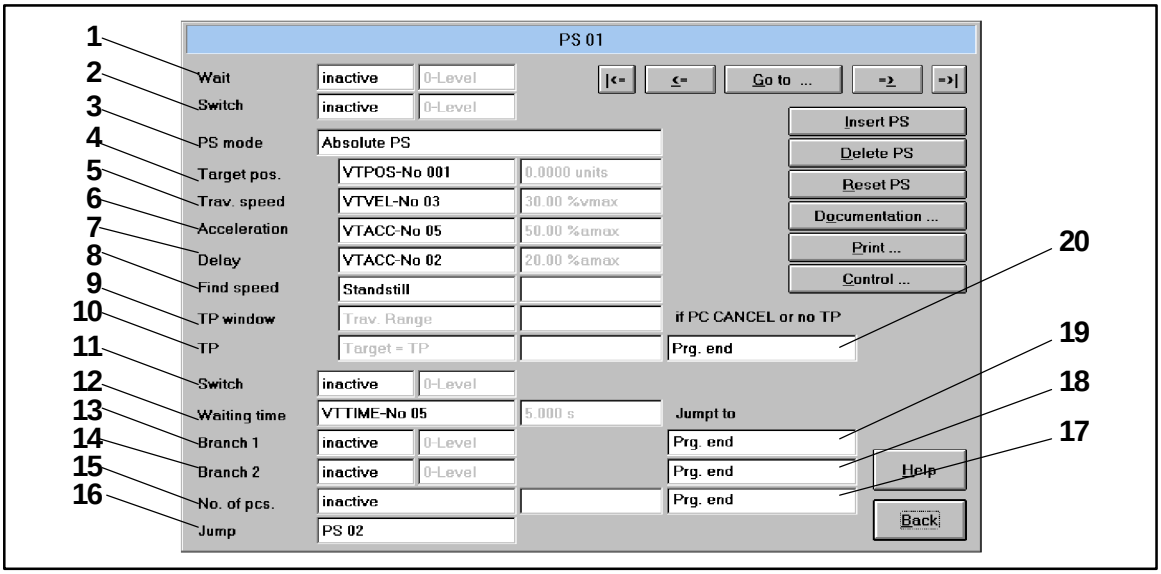


Fig. 5-15 Dialog box for entering the positioning data

Field	Function	Description
1	Inactive or no. of a PFI 0 level or 1 level	Program function input (PFI). A digital input signal via an FB or terminal initiates the processing of the PS.
2	Inactive or no. of a PFO (0 or 1 level)	Program function output (PFO). A digital output signal indicates the state via an FB or via terminal.
3	Type of positioning	e.g. absolute positioning, relative positioning or special function (set reference).
4	Position target of VTPOS	Input of a position target from the variable table VTPOS.
5	Positioning speed from VTVEL	Input of a speed from the variable table VTVEL.
6	Acceleration from VTACC	Input of an acceleration from the variable table VTACC.
7	Deceleration from VTACC	Input of a deceleration from the variable table VTACC.
8	Final speed from VTVEL	Input of a speed from the variable table VIVEL or standstill.
9	TP window from VTPOS	Input of a position value from the variable table VTPOS.
10→20	TP residual distance from VTPOS	Input of a position value from the variable table VTPOS.If there is no touch probe during a touch probe positioning, the program branches/jumps (”if PS CANCEL or no TP”) to a PS or program end.
11	Inactive or no. of a PFO (0 or 1 level)	Program function output (PFO). A digital output signal indicates the state via an FB or via terminal.
12	Inactive or time from VTTIME	Input of a waiting time from the variable table VTTIME until the next program function is processed.
13→19	Inactive or no. of a PFI 0 level or 1 level	Program function input (PFI). If a digital input signal is applied during a request (via a FB or a terminal), the program branches (”Jump to”) to a PS or to the program end.
14→18	Inactive or no. of a PFI 0 level or 1 level	Program function input (PFI). If a digital input signal is applied during a request (via a FB or a terminal), the program branches (”Jump to”) to a PS or to the program end.
15→17	Inactive or number from VTPCS	Input of a set piece number from the variable table VTPCS. As long as the set piece number is not reached, the program branches to a PS or to the program end.
16	Jump to the next PS or program end	Input of a PS or program end to which the program branches after the current PS has been processed.

5.8.2 Save parameter set

The operating menu GDC (see Fig. 5-16) allows you to save a new or modified parameter set:

- Saving on the hard drive of the PC or a diskette by
  "Write all parameter sets to file"
- Saving in the controller by
  "Write current parameter set to the controller (F5)"
  – You can save the data as non-volatile with C0003=1 in the "Parameter set management" menu.

Tip!

Comments can be entered for the parameter set when saving on the hard drive or diskette.

1. Click on "Drive parameters" in the menu bar of GDC.

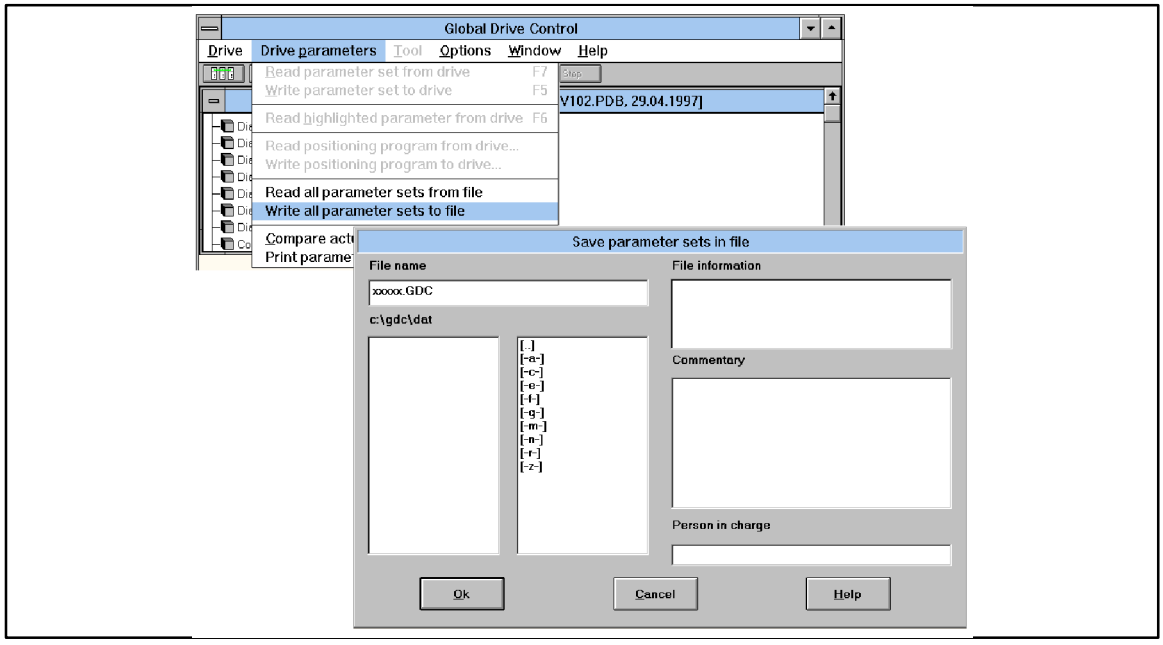
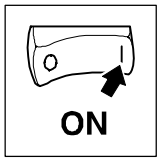


Fig. 5-16 Dialog box "Write parameter set to file"

2. Select "Write all parameter sets to file".
3. Enter the file names and select the disk drive on which you want to save the parameter set.
4. Write a comment on the parameter set in the "Commentary" field and confirm with "Ok".



5.9 Load parameter set

5.9.1 Load parameter set from the PC

The operating menu (Fig. 5-17) allows the loading of a parameter set

- from the hard disk of the PC or a diskette in GDC by
  "Read all parameter sets from file"
- from the PC to the drive by
  "Write current parameter set to the controller (F5)"

Warning!

- The controller is re-initialized by the parameter set transfer from the PC to the controller:
  – System configurations and terminal assignments may be modified. Ensure, that your wiring and drive configuration correspond to the settings of the parameter set.
- Only use terminal X5/28 or the STOP function of GDC as a source for the controller inhibit. A parameter set transfer is only possible when the controller is inhibited.

1. Insert a diskette with the parameter set into the disk drive of the PC. Click on "Drive parameters" in the menu bar of GDC.

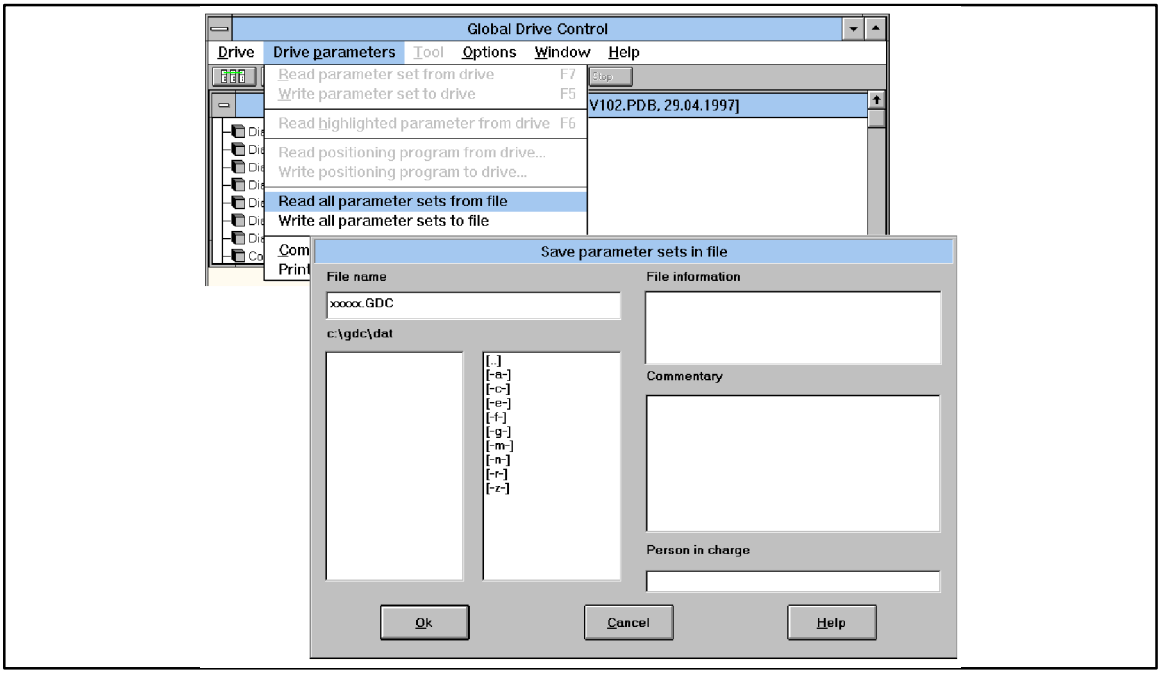
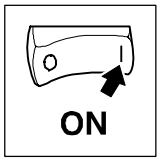


Fig. 5-17 Dialog box "Read all parameter sets from file"

2. Select "Read all parameter sets from file".
3. Select the disk drive and the parameter set which is to be loaded. Confirm with "OK".
4. Make sure that your wiring and drive configuration match the settings of the new parameter set.



5.9.2 Load parameter set from the controller

The operating menu (Fig. 5-17) allows the loading of a parameter set

- from the controller to the PC by ”Read current parameter set from the controller (F7)”
  – C0002 offers the following options in the menu ”Parameter set management”:

1. Loading of factory setting (C0002=0)
2. Loading of customer-specific parameter set (C0002=1)

Tip!

The RDY message is not displayed while the parameter set is loaded since the controller cannot be operated then.

5.10 Control drive

5.10.1 Description of the dialog box

- Click on the ”Control” button in the ”Basic settings” dialog box.

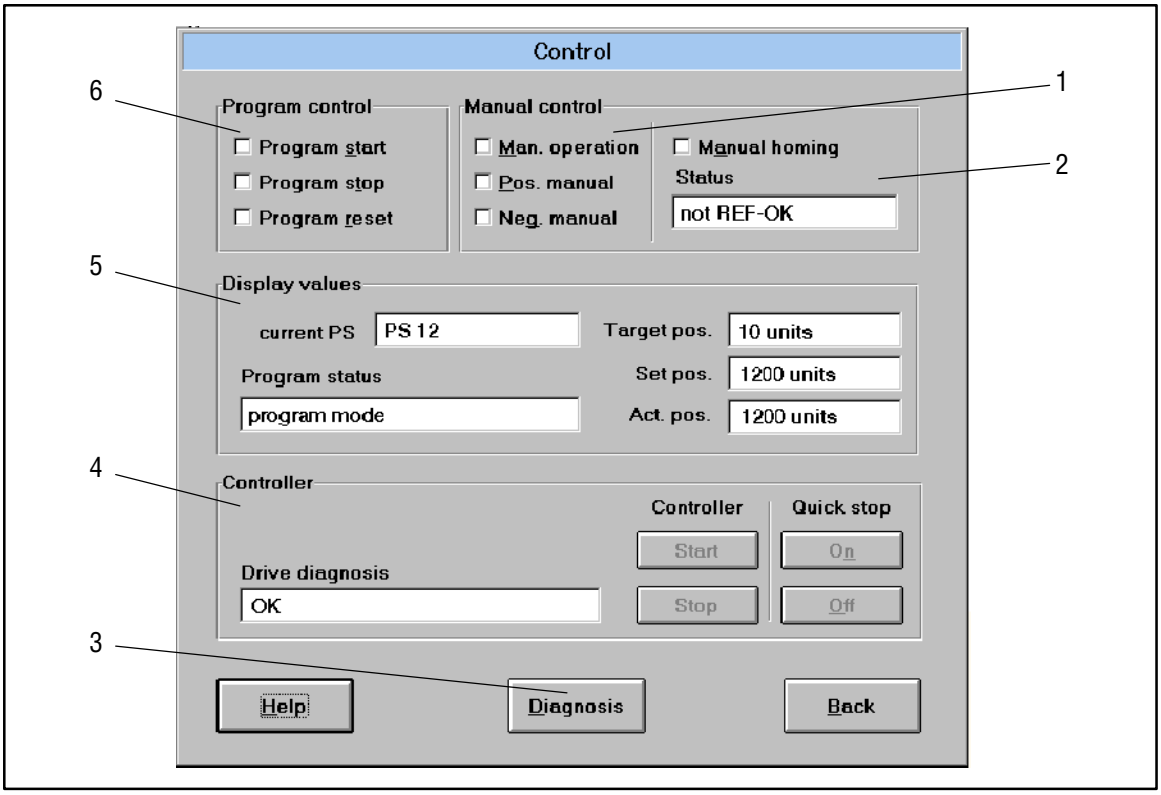
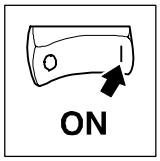


Fig. 5-18 Dialog box ”Control”

Field	Function	Description
1	Manual control	🕮 5-11
2	Manual homing	🕮 5-25
3	Menu ”Diagnostics”	🕮 6-1
4	”Enable”, ”Inhibit” controller and drive diagnostics	🕮 5-10, “Controller enable” 🕮 5-11, “Function test with manual control” 🕮 5-25, “Manual homing” 🕮 5-26, “Program control”
5	Status display	Important values for program control 🕮 5-26
6	Program control	🕮 5-26



5.10.2 Parameters for homing

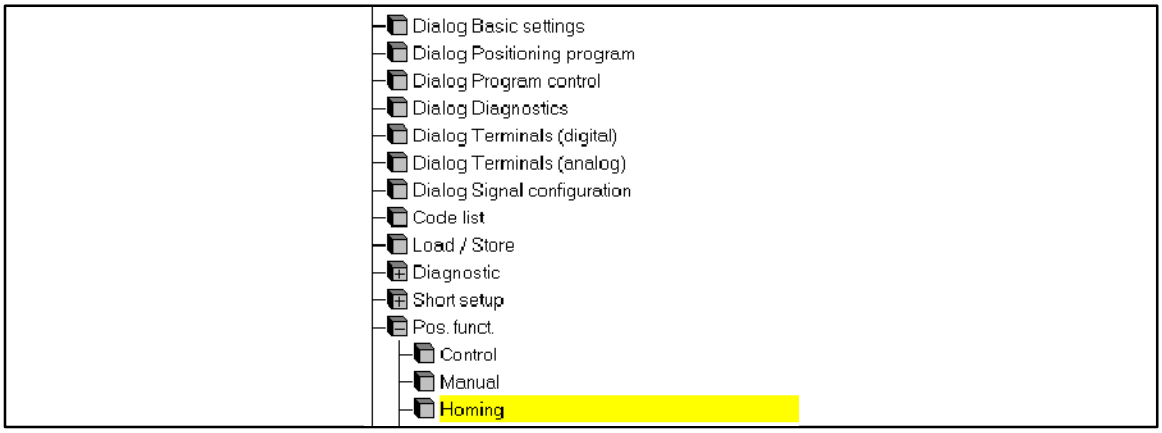
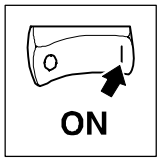


Fig. 5-19 Menu "Homing" in the parameter menu

The factory setting of the parameters is sufficient for most applications. Enter the settings as follows:

Step	Command	Function
1	Select "Basic settings" dialog box.	
2	Click on "Parameter menu" button.	Open parameter menu
3	Click on "Positioning functions" menu.	Open "Positioning functions" menu.
4	Click on "Homing" menu.	Open "Homing" menu.
5	Click on C1242. Enter new value.	Homing speed. Default setting: 5 % of vmax
6	Click on C1251. Enter new value.	Homing acceleration. Default setting: 10 % of amax
7	Click on C1213. Select positioning direction. Default setting: +home Setting: -home	Homing mode • The drive moves in the positive direction towards the limit switch. • The drive positions in the negative direction towards the limit switch.
8	Click on C0003.	Save settings
9	Click on "Dialog control" menu.	Open "Control" dialog box.



5.10.3 Manual homing

The controller can perform all positioning tasks only with a defined reference point (zero point).

- Click on the "Control" button in the "Basic settings" dialog box.

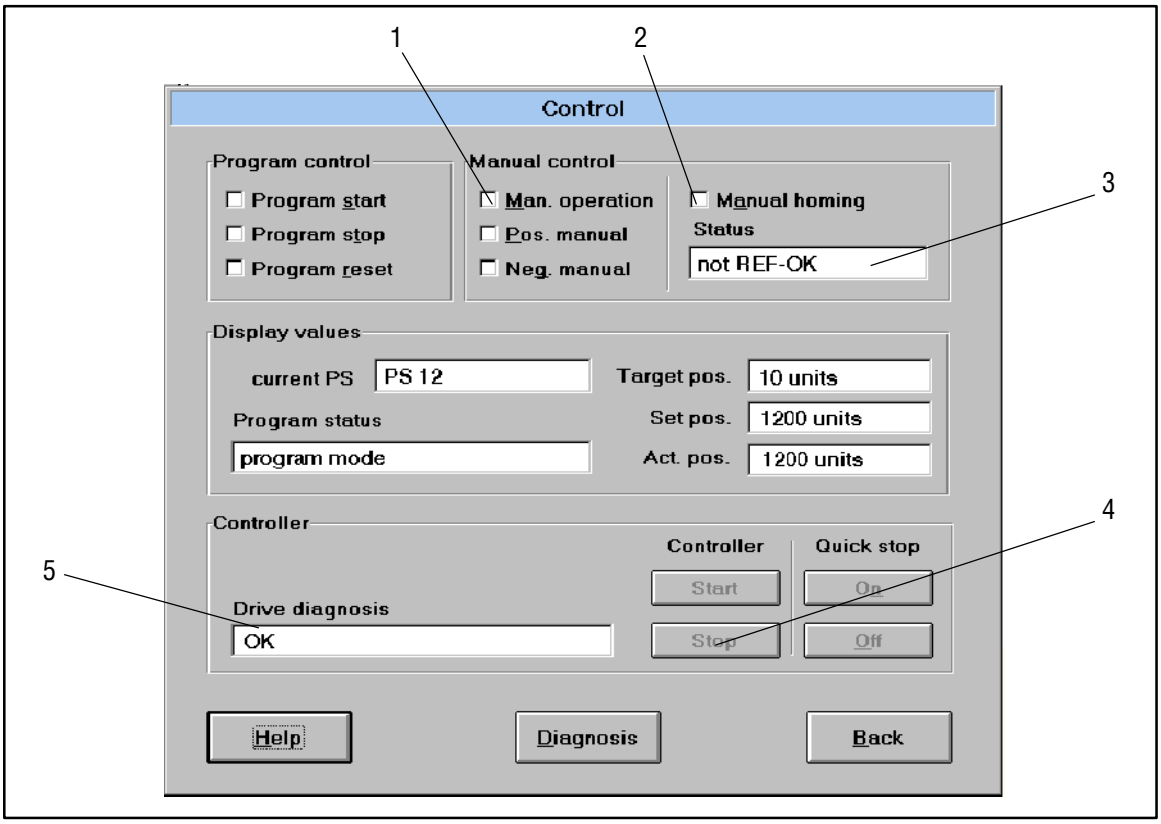
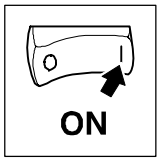


Fig. 5-20 Dialog box "Control"

Field	Command	Function
1	Select "Manual operation"	Manual operation active
5		With drive diagnostics "Ok", "Enable" is possible. 🕮 6-1
4	Controller "Enable"	Enables the controller, if there is no interference.
2	Select "Manual homing".	The drive uses the reference parameters for positioning. 🕮 5-24
	Reset "Manual homing".	The drive stops.
	Override the reference switch.	The drive positions until the next zero position of the rotor and brakes to standstill. This position is now defined to be the reference point for all position values.
3		Status display "Reference Ok" is displayed after successful reference homing.
		Terminal X5/A4 = HIGH



5.10.4 Program control

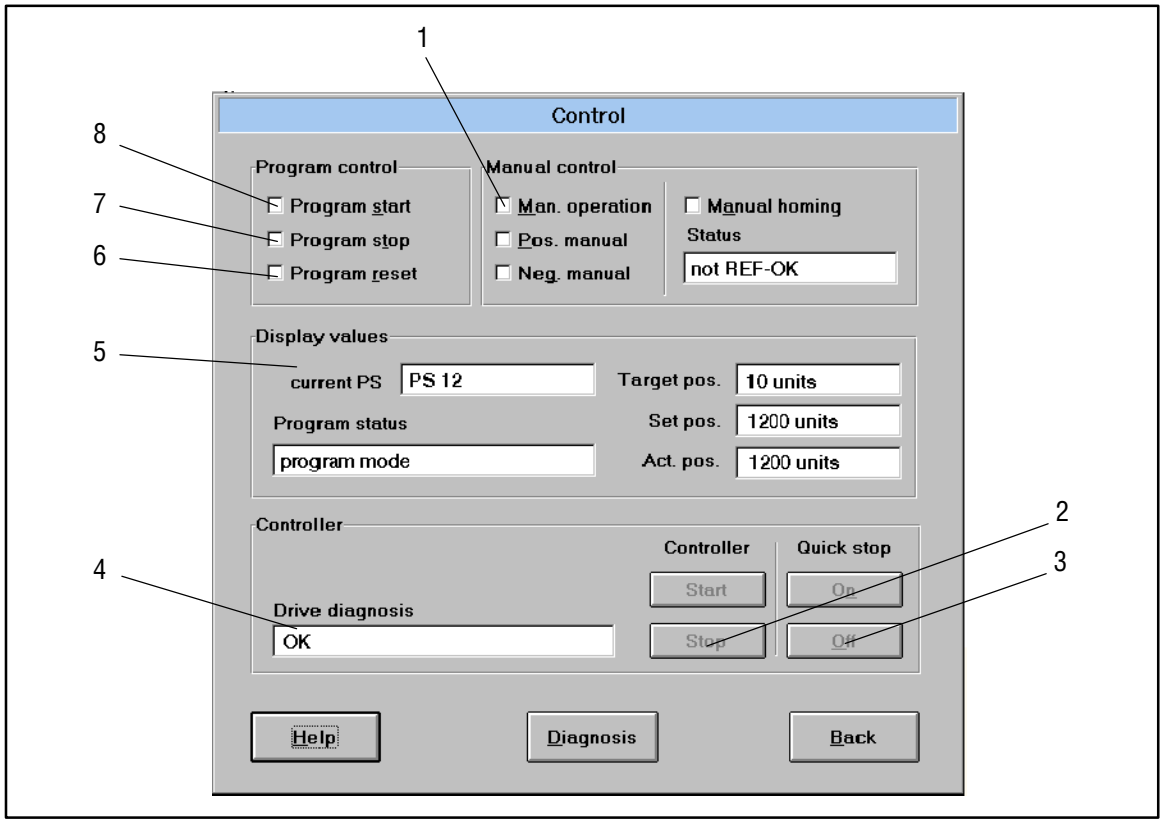
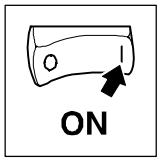


Fig. 5-21 Dialog box "Control"

Field	Command	Function
	Activate program operation	For factory setting • Switch terminal X5/E5 = HIGH.
1	Reset "Manual operation".	Manual operation switched off.
4		With drive diagnostics "Ok", "Enable" is possible. 🕮 6-1
2	Controller "Enable"	Enables the controller, if there is no interference.
8	Select "Program start".	The drive moves according to the loaded positioning profile.
	Reset "Program start" and select again.	The program restarts, or is continued after an interrupt ("Program stop").
5		Display of the current position and the current program state.
7	Select "Program stop".	The program is interrupted, the drive stops.
	Reset "Program stop".	The program can be continued with "Program start".
6	Select "Program reset".	The program interrupts, the drive stops. Resets the piece counter and all PFO. 🕮 5-13
6	Reset "Program reset".	Loads the first PS with which the program is to start. The program can be restarted with "Program start".



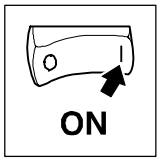
5.11 Automatic control parameter identification

With the function “Automatic control parameter identification”

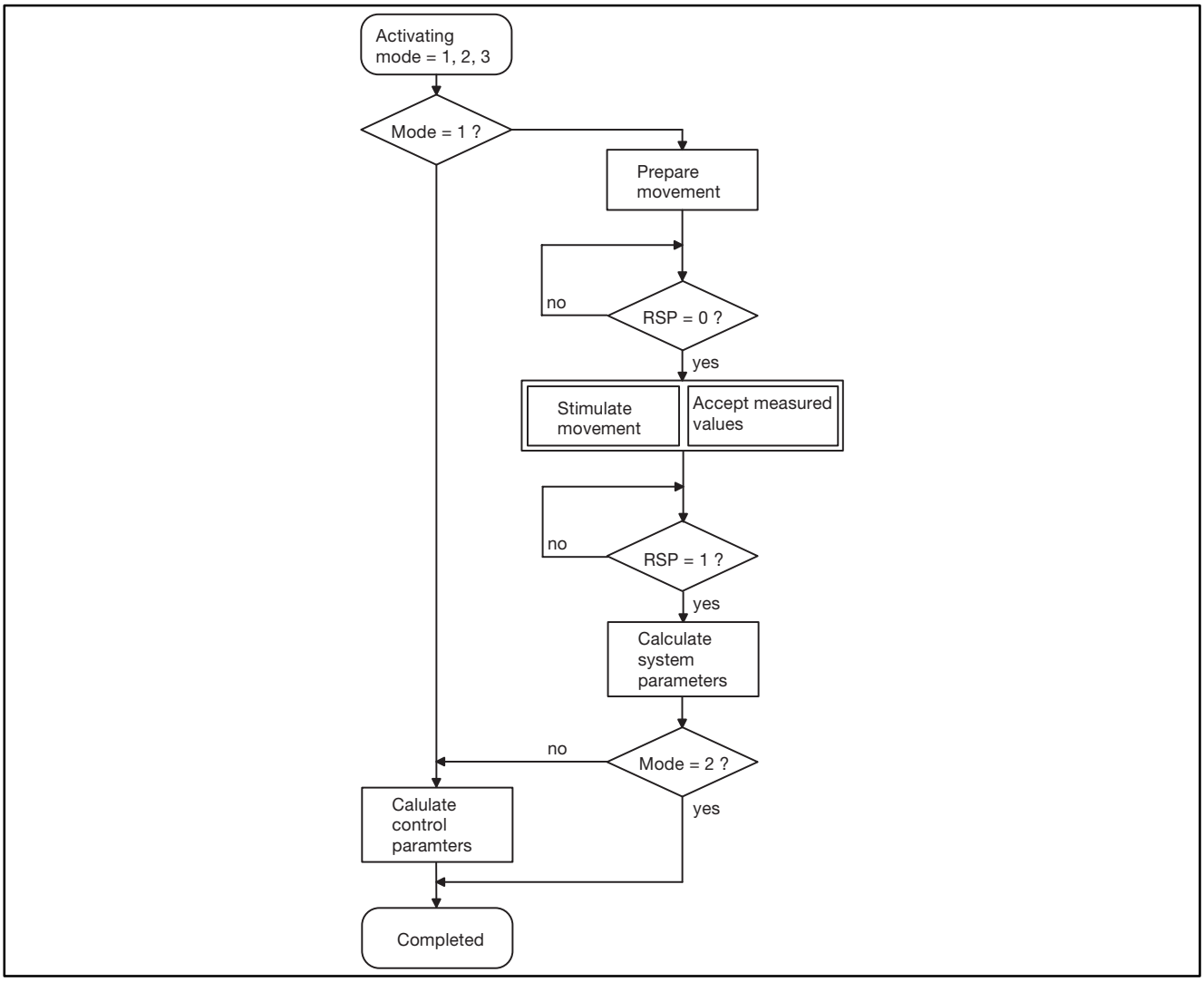
- mechanical distance parameters are identified by a short movement and
- an automatic adjustment of the speed and position encoder based on the parameters is identified or selected.

Stop!

- An identification can only be carried out if the drive is not subject to external torque. In the event of hanging loads (or similar) a motion cannot be activated through the function!
- Release the brake (if mounted) before executing this function.
- Ensure the following to keep the number of revolutions:
  – Brake resistor or regenerative power supply
    and
  – constant moment of inertia.
- If the values differ too much from the default setting of codes C1182 - C1185, deviations in the identification of distance parameters and thus controller setting may occur.
- The motion to be carried out by the function must be set in a way that even the slowest rotating element of the controller train is still clearly moving.



5.11.1 Procedure



The function is activated through mode (C1180). Inhibit the controller (Ctrl. inhibit) and stop the drive. Otherwise the function will not be executed and the status (C1181) with the corresponding error code will be set. If the function is activated again, the error will be reset, and initialization and the corresponding function will restart. Enter 0 to reset the function.

Calculation of control parameters (mode = 1)

This function only calculates control parameters.

Identification/identification and calculation of control parameters (mode = 2/3)

The function "Identification" or "Identification and calculation of control parameters" activates drive motion. Reset controller inhibit (Ctrl. inhibit) to enable the motion after the function has been activated. After the motion is completed, the controller must be inhibited again to end the function.

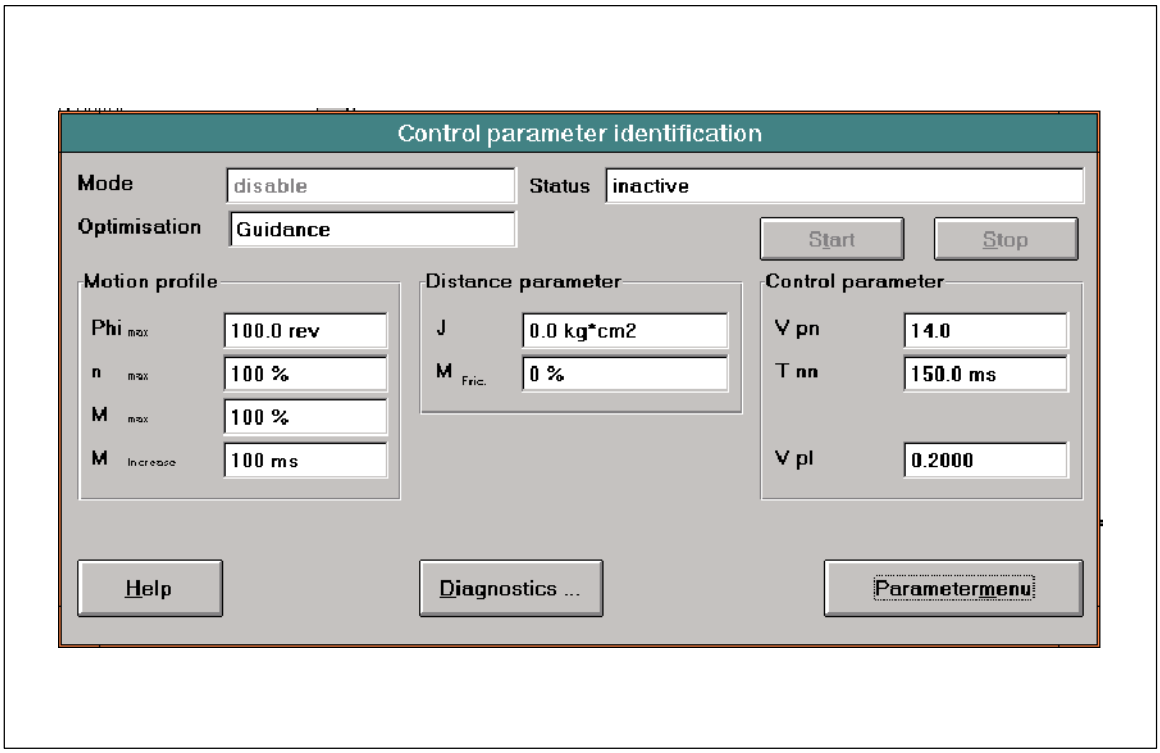
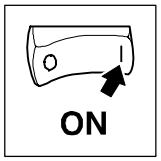


Fig. 5-22 Dialog box “Control parameter identification”

5.11.2 Troubleshooting

If an error occurs during parameter identification, the status (C1181) helps to detect the error.

Status (C1181)	Cause	Remedy
2	Control parameter calculation not possible	Check whether distance parameters are set reasonably (C1187/C1188).
3	Too few scanning points.	Change motion conditions (C1182-C1185), i. e. increase torque, increase number of revolutions, increase speed, reduce torque rise time.
4	Reference torque too low	• Increase Imax (C0022) • Check maximum torque (C0057)
5	Speed at start ≠ 0	Stop drive and reactivate function
6	Controller inhibit during motion	Repeat identification
7	Minimum brake torque not reached Torque ramp too flat or maximum torque too low	Change motion conditions (C1182-C1185), i. e. increase torque, increase number of revolutions, increase speed, reduce torque rise time.
8	Time overflow	Select higher torque or shorter torque rise time
9	Blocking	Release brake, check motor cable, eliminate blocking



5.11.2.1 Password protection

Code	LCD	Possible settings				IMPORTANT
		Lenze	Selection			
C0094	Password	0	0	{1}	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
[C0096]						Extended password protection for bus systems with activated password (C0094). • All codes in the user menu can be accessed.
1	AIF protect.	0	0	No password protection		
2	CAN protect.	0	1	Read protection		
			2	Write protection		
			3	Read/Write protection		

You can restrict the code access via the operating module using the password protection in C0094.

- Reading C0094 using the operating module:
  – C0094 = 0: password protection is not activated.
  – C0094 = 9999: password protection is activated.
- Activate password protection:
  – Enter four-digit number in C0094.
  – Confirm using SH + PRG.
- Deactivate password protection:
  – Enter four-digit number again.
  – All other inputs are refused.

Effect

- Working with the operating module:
  – The codes listed in the USER menu can still be read and changed.
  – All other codes are no longer displayed.
- Working with the fieldbus:
  – It is possible to extend the protection for codes via the fieldbus under C0096/1 (AIF) and C0096/2 (CAN).

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.

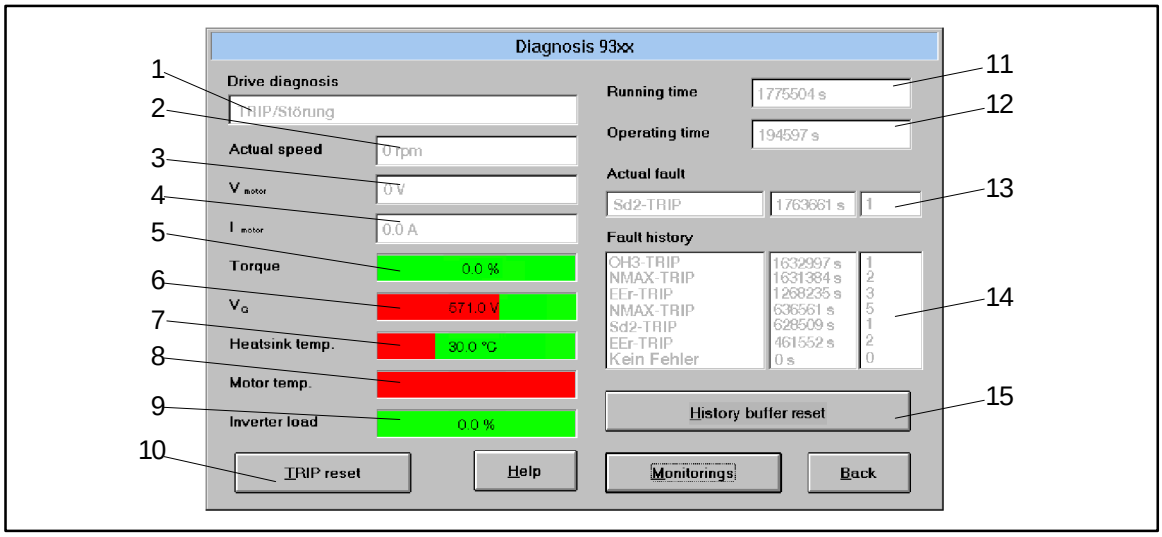
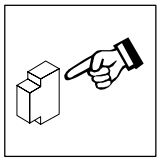


Fig. 6-1 Dialog box "Diagnostics 9300"

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. 🕮 8-3
14 Fault history with time and frequency of the fault. 🕮 8-3
15 Reset history buffer. 🕮 8-4



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, optimum noise):
  – 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).

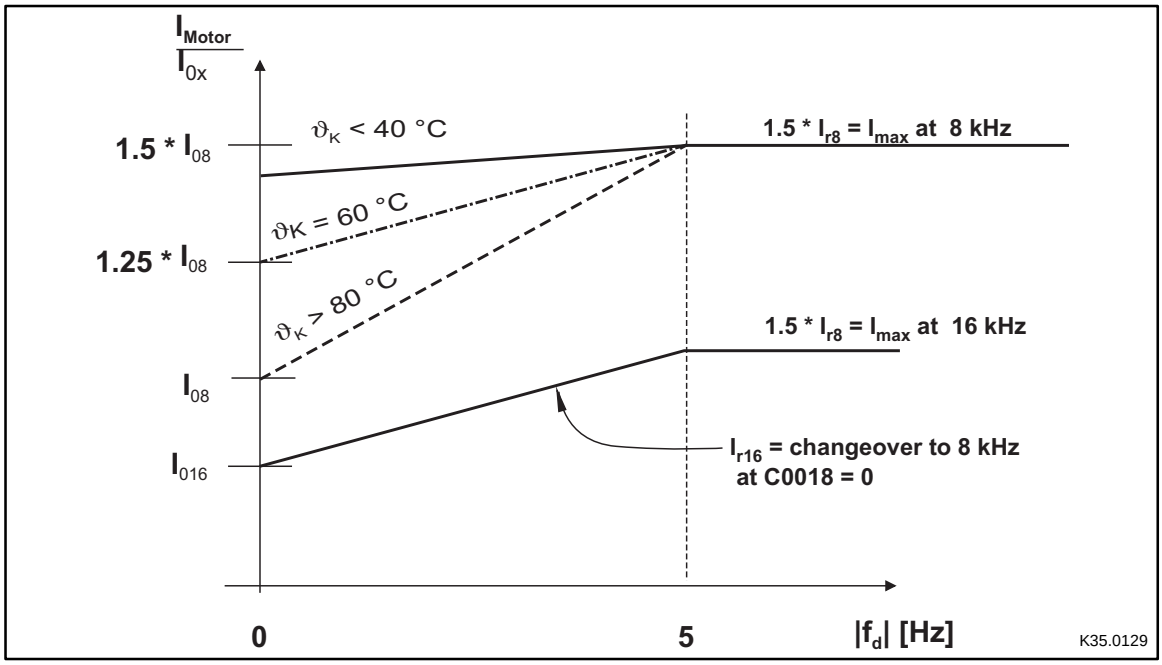
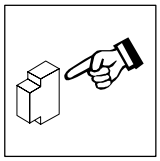


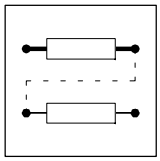
Fig. 6-2 Current derating function of the controllers 9326 to 9332.

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 Configuration

7.1 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.

Tip!

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

7.2 Monitoring

Various monitoring functions protect the drive from impermissible operating conditions. (📖 7-4) .

If a monitoring function is activated,

- a reaction to protect the drive will be activated (configuration (📖 7-3)).
- 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. (📖 8-3)

7.2.1 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

Reaction	Effects on drive or controller		Danger notes
TRIP	• 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. (📖 8-9)		
Message	• Switches the power outputs U, V, W to a high resistance as long as the message is active.		 The drive restarts automatically if the message is removed.
	• Short-term message ≤ 0.5 s	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.	
	• Long-term message > 0.5 s	The drive is idling (because of internal controller inhibit!) as long as the message is active. If necessary, restart positioning program.	
FAIL-QSP	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: (📖 8-5)		
Warning	• Only display of the operating fault • The drive operates under control.		 Since these reactions have no effect on the drive behaviour, the drive may be destroyed.
Off	• No reaction to operating faults!Monitoring is deactivated.		

7.2.2 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.

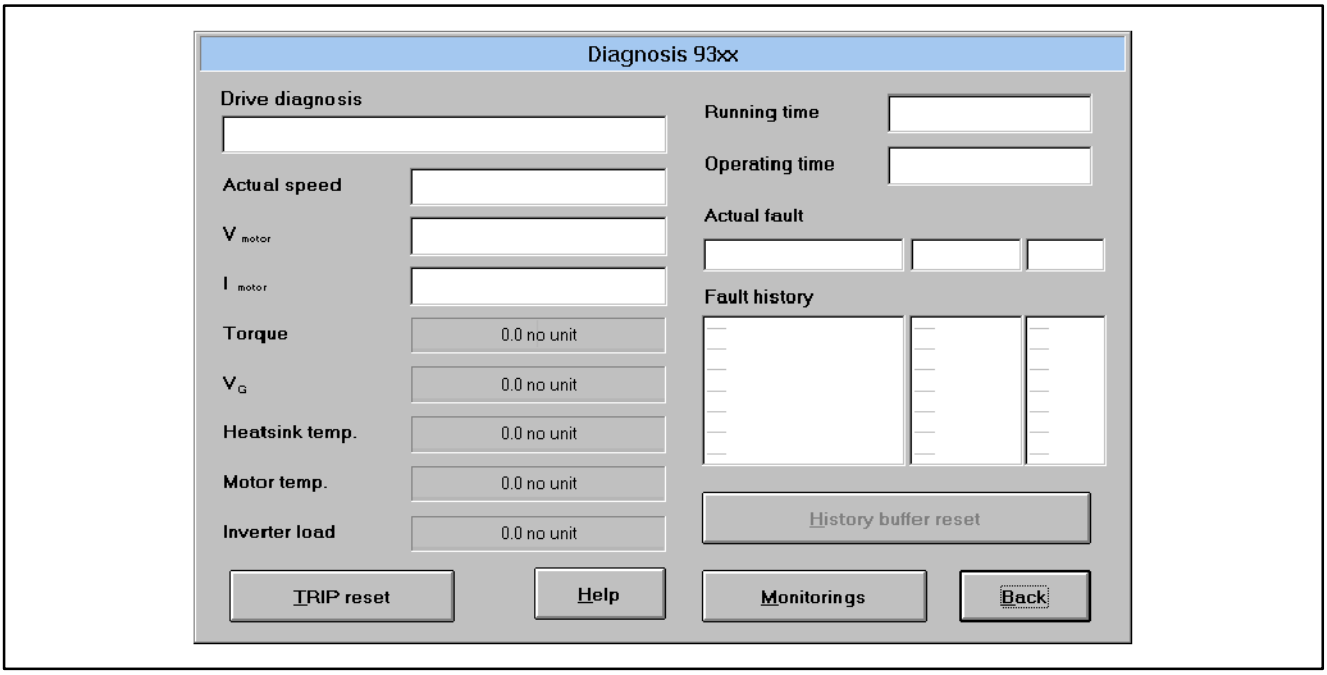


Fig. 7-1 Dialog box "Diagnostic 9300"

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

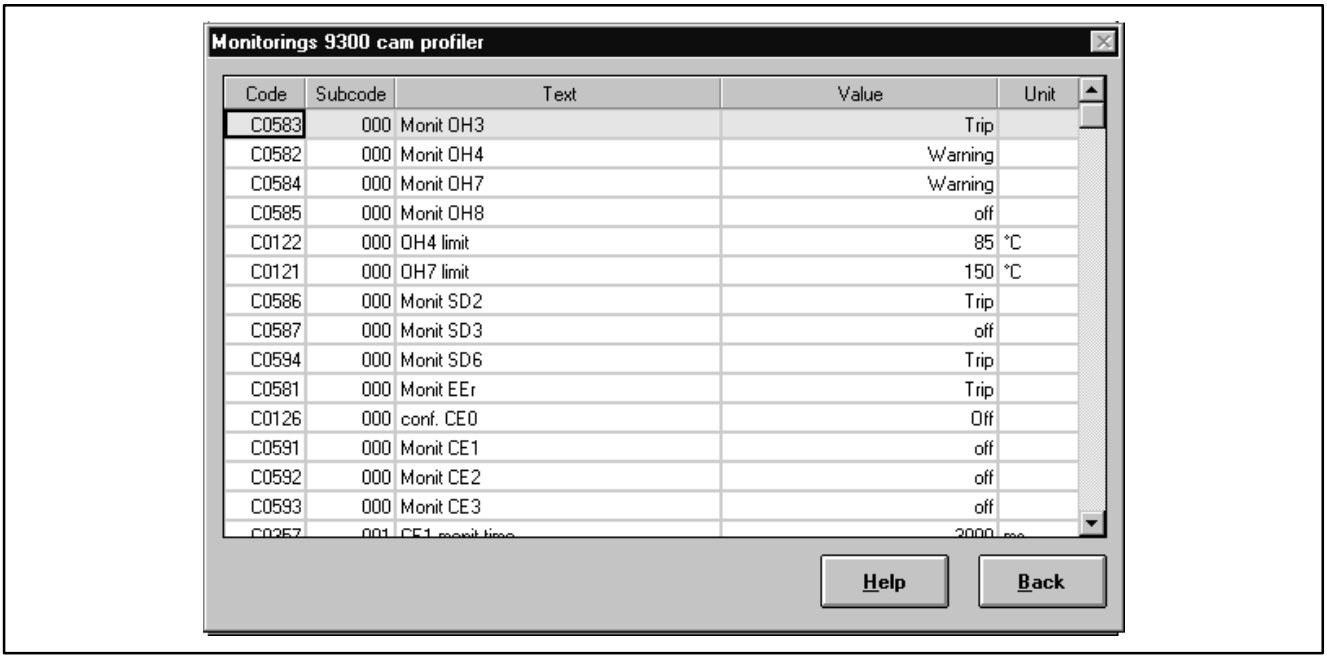
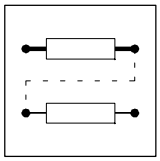


Fig. 7-2 "Monitoring configuration 93xx" dialog box

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

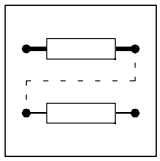
An overview of the monitoring functions and the settings can be obtained from the following chapter.



7.2.3 Monitoring functions

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

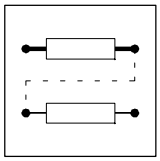
Display	Meaning	TRIP	Meldung	Warning	FAIL-QSP	off	Code
CCr	System error	•	-	-	-	-	-
CE0	Communication error (AIF)	✓	-	✓	-	•	C0126
CE1	Communication error at the process data input object CAN-IN1 (time monitoring can be set under C0357/1)	✓	-	✓	-	•	C0591
CE2	Communication error at the process data input 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.



Configuration

8 Troubleshooting and fault elimination

- You can recognize immediately whether a fault has occurred from the display elements or status information. (📖 8-1, chapter “Troubleshooting”)
- You can analyze the fault
  – by means of the history buffer (📖 8-3)
  – and by means of the list “Fault indications”. (📖 8-5)
- The list “Fault indications” indicates how to eliminate faults. (📖 8-5)

8.1 Troubleshooting

Display on the controller

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

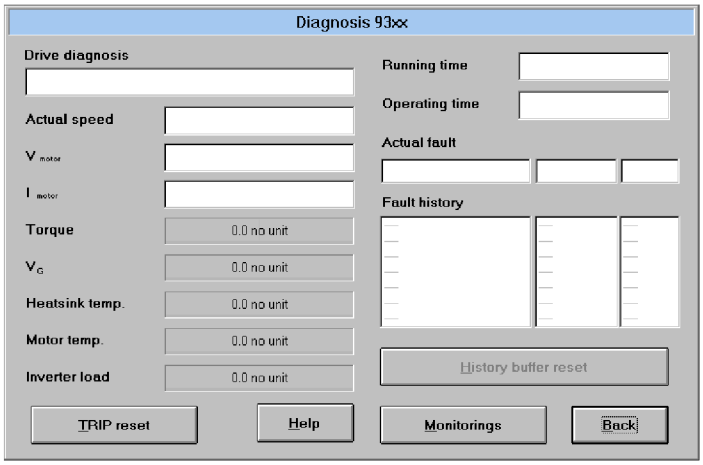
LED green	LED red	Cause	Check
■	□	Controller enabled; no fault	
★	□	Controller inhibit, switch-on inhibit	C0183; or C0168/1
□	★	Fail	C0168/1
■	★	Warning, fail-QSP	C0168/1

■ : 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

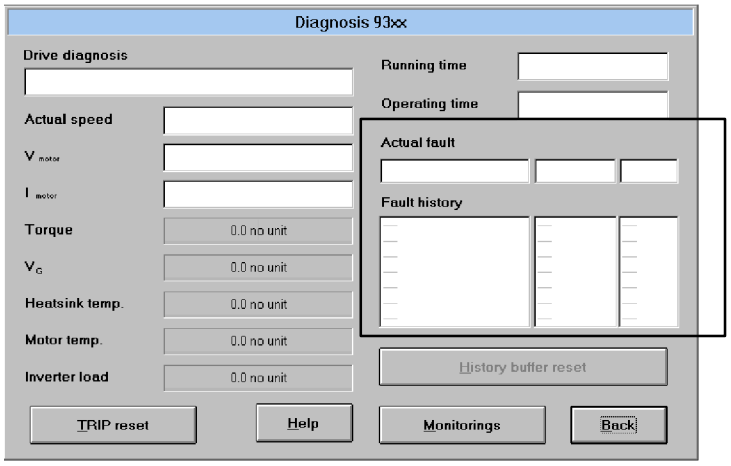
Display via the LECOM status word C0150

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		

8.2 Fault analysis with the history buffer

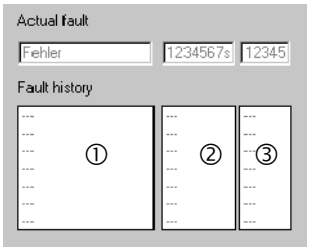
- The history buffer is used to trace faults.
- Fault messages are stored in the order of their occurrence.

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



8.2.1 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:

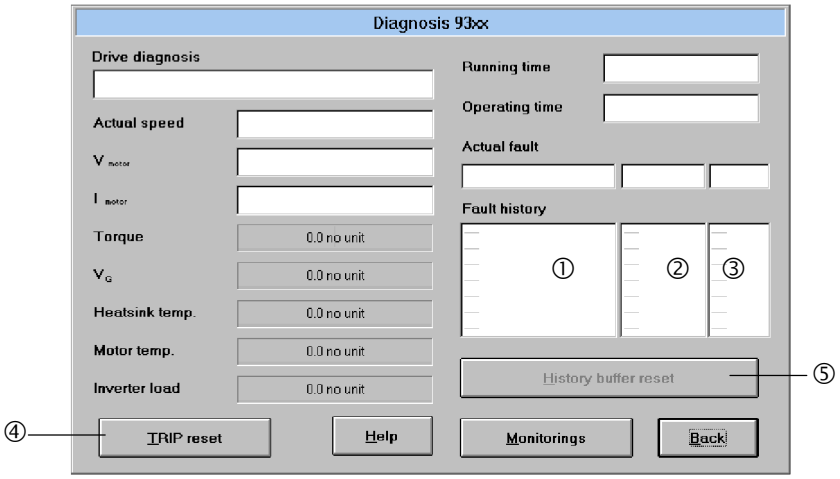


① Fault recognition and reaction
② Time of the fault
③ Frequency of the fault

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

8.2.2 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.
  (📖 8-5, 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.

8.3 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 x $I_{rx.}$	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.

8.4 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". 📖 8-4, ("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

9 Maintenance

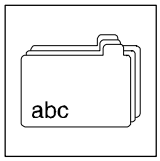
- The controller is free of maintenance if the prescribed conditions of operation are observed. (📖 3-2)
- If the ambient air is polluted, the air vents of the controller may be obstructed. Therefore, check the air vents periodically (depending on the degree of pollution approx. every four weeks):

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



10 Appendix

10.1 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).

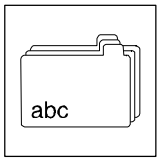
Further functions of the PC program:

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

10.2 Code table

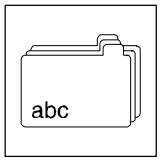
How to read the code table:

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 • Display of the short text, e.g. *PAR LOAD*
Lenze		Factory setting of the code
	*	The row "Important" contains further information
	Disp	Codes only display values. They cannot be configured.
Choice	1 {1 %} 99	Minimum value {smallest step/unit} maximum value
Important	-	Additional, important explanation of the code
		Printed in bold: Code name in GDC
	10-1	Reference to a page indicating further information on a code.

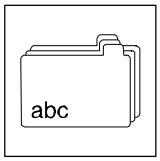


Appendix

Code	LCD	Possible settings		IMPORTANT	
		Lenze	Choice		
C0002	PAR LOAD	0		**Load parameter set**	
			0 Load default	Load factory setting into RAM	
			1 Load PS1	Load parameter set x into the RAM and activate • Parameter set is loaded automatically after every mains connection.	
			11 Load ext PS1	Load parameter set x from the keypad into the RAM and activate	
			20 ext → EEPROM	Transmit all parameter sets from the keypad to the controller and store non-volatile	
C0003	PAR SAVE	0		**Save parameter set**	
			0 Ready	Saving completed	
			1 Save PS1	Save current parameter set x non-volatile	
			11 Save extern	Transmit all parameter sets to the keypad	
C0004	OP-DISPLAY	56	All available codes	**Operating display** Keypad shows selected code in the operating level if no other status indications of C0183 are active.	
[C0005]	SIGNAL CFG	20000	0 Common 100 CFG:empty 1000 Speed mode 20000 Standard pos 20003 abs AIF 20010 abs/supply 20013 abs/supply AIF 20200 relativ 20203 rel AIF 20210 rel/supply 20213 rel/supply AIF 22000 abs/sp 22003 abs/sp AIF 22010 abs/sp/sply 22013 abs/sp/sply AIF 22200 rel/sp 22203 rel/sp AIF 22210 rel/sp/sply 22213 rel/sp/sply AIF 26000 set pos.sel 26010 set pos.sel	**Signal configuration** (Predefined basic configurations)	
[C0006]	OP MODE	*		**Operating mode of motor control** → depending on C0086 • Change of C0086 resets value to the assigned default setting • Change of C0006 sets C0086 = 0!	
			2 Servo async Y	Servo control asynchronous motors in star connection	
			3 Servo PM-SM Y	Servo control synchronous motors in star connection	
			22 Servo async	Servo control asynchronous motors in delta connection	
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.	

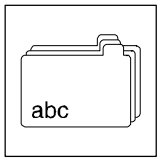


Code	LCD	Possible settings				IMPORTANT	
		Lenze	Choice				
C0011	NMAX	3000	500	{1 rpm}	16000	**Maximum speed Nmax** Reference value for the absolute and relative setpoint selection for the acceleration and deceleration times. • Parameter setting via interface: Large changes in one step should only be 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 s}	999.900	**NSET deceleration time T_{if}** for the main setpoint of NSET • Refers to speed change 0...$n_{max.}$	
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				**Chopper frequency fchop**	
			0	16/8 kHz sin		Optimum noise reduction with automatic change-over to 8 kHz	
			1	8 kHz sin		Operation with optimum power	
			2	16 kHz sin		Noise optimised operation	
C0019	NACT=0 CURRENT	0	0	{1 rpm}	16000	**Threshold nact = 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	IMAXTHRESH	*3.75	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)	
[C0025]	FEEDBACK TYPE	10				**Feedback** • Input of the encoder specified on the nameplate of the Lenze motor: • C0025 automatically changes C0420, C0490, C0495	
			0	COMMON		C0420, C0490 or C0495 was changed subsequently	
			10	RSx (Resolver)		The resolver is designated with RSxxxxxxxx.	
			110 111 112 113	IT-512-5V IT-1024-5V IT-2048-5V IT-4096-5V		Incremental encoder with TTL level	
			210 211 212 213	IS-512-5V IS-1024-5V IS-2048-5V IS-4096-5V		Sine-cosine encoder	
			310	AS-512-8V		Single turn Sine-cosine encoder with RS485 interface, Stegmann	
			410	AM-512-8V		Multi turn Sine-cosine encoder with RS485 interface, Stegmann	
C0026 1 2	 FCODE (OFFSET) FCODE (OFFSET)	 0.00 0.00	-199.99	{0.01 %}	199.99	Freely assignable code for relative analog signals • Used for: – Offset for terminal X6/1,2 – Offset for terminal X6/3,4	

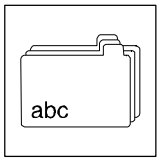


Appendix

Code	LCD	Possible settings		IMPORTANT
		Lenze	Choice	
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	0 256 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	**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 • Used for: – Gearbox factor numerator
C0033	GEARBOX DENOM	1	1 {1} 32767	**DFSET Gearbox factor denominator**
C0034	MST CURRENT	0	0 -10 V ... + 10 V 1 +4 mA ... +20 mA 2 -20 mA ... +20 mA	Selection: **Master voltage/master current** for setpoint selection
C0037	SET-VALUE RPM	0	-16000 {1 rpm} 16000	**Setpoint input in rpm**
C0039			-199.99 {0.01} 199.99	Fixed speeds selectable via digital inputs **NSET JOG setpoints**
1	JOG SET-VALUE	100.0		
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		
C0040	CTRL ENABLE	1	0 Ctrl inhibit 1 Ctrl enable	**Controller inhibit** • Write: – controls the code • Read: – reads the controller status
C0042	QSP	Disp	0 QSP inactive 1 QSP active	Status **Quick stop**
C0043	TRIP RESET			**TRIP reset**, resets an active TRIP: • Set C0043 = 0
			0 no/trip reset 1 trip active	Reset current trip Active trip
C0045	ACT JOG	Disp	0 Nset active 1 JOG 1 2 JOG 2 ... 15 JOG 15	NSET JOG selection
C0046	N	Disp	-199.99 {0.01 %} 199.99	Main setpoint
C0049	NADD	Disp	-199.99 {0.01 %} 199.99	Additional setpoint
C0050	MCTRL-NSET2	Disp	-100.00 {0.01 %} 100.00	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	Actual motor voltage
C0053	UG-VOLTAGE	Disp	0 {1 V} 900	DC-bus voltage

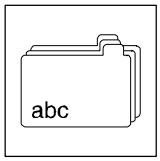


Code	LCD	Possible settings				IMPORTANT	
		Lenze	Choice				
C0054	IMOT	Disp	0.0	{0.1 A}	500.0	Actual motor current	
C0056	MCTRL-MSET2	Disp	-100.00	{0.01 %}	100.00	Torque setpoint (output of the speed controller)	
C0057	MAX TORQUE	Disp	0.0	{0.1 Nm}	500.0	Maximum possible torque of the drive configuration • depending on C0022, C0086	
C0058	ROTOR DIFF		-180.0	{0.1 °}	179.9	**Rotor angle**, zero angle of the rotor of synchronous motors (C0095)	
C0059	MOT POLE NO.	Disp	1	{1}	50	Pole pair number of the motor	
C0060	ROTOR POS	Disp	0	{1}	2047	Current 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 I x t during the last 180 s • C0064 >100 % releases Trip OC5 • Trip reset is possible only if C0064 < 95 %	
C0067	ACT TRIP	Disp	All fault indications		→ Selection list 10	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 >512 ms switched off	{0.5 ms}	600.0	**T_{nn} speed controller** → 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	*	0.00	{0.01}	15.99	**V_{pi} Current controller** → depending on C0086 • Change of C0086 resets value to the assigned default setting	
C0076	TN CURR-CTRL	*	0.5 2000 ms switched off	{0.1 ms}	1999.0	**T_{ni} Current controller** → depending on C0086 • Change of C0086 resets value to the assigned default setting	
C0077	VP FIELD-CTRL	0.25	0.00	{0.01}	15.99	**V_{pF} field controller**	
C0078	TN FIELD-CTRL	15.0	1.0 8000 ms switched off	{0.5 ms}	7999.0	**T_{nF} field controller**	
[C0081]	MOT POWER	*	0.01	{0.01 kW}	500.00	**Rated motor power**, rated motor power according to nameplate → depending on C0086 • Change of C0086 resets value to the assigned default setting • Change of C0081 sets C0086 = 0	
[C0084]	MOT RS	*	0.00	{0.01 Ω}	100.00	**Motor stator resistance** required for C0006 = 1 → depending on C0086 • Change of C0086 resets value to the assigned default setting • Change of C0084 sets C0086 = 0	
[C0085]	MOT LS	*	0.00	{0.01}	200.00	**Leakage inductance motor** required for C0006 = 1 → depending on C0086 • Change of C0086 resets value to the assigned default setting • Change of C0085 sets C0086 = 0	

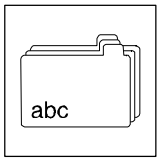


Appendix

Code	LCD	Possible settings		IMPORTANT
		Lenze	Choice	
[C0086]	MOt tYPE	*		**Selection motor type** → 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
			30 DFQA100-50	MDFQAXX100-50, f_r: 50Hz
			31 DFQA100-100	MDFQAXX100-100, f_r:100Hz
			32 DFQA112-28	MDFQAXX112-28, f_r: 28Hz
			33 DFQA112-58	MDFQAXX112-58, f_r: 58Hz
			34 DFQA132-20	MDFQAXX132-20, f_r: 20Hz
			35 DFQA132-42	MDFQAXX132-42, f_r: 42Hz
			40 DFQA112-50	MDFQAXX112-50, f_r: 50Hz
			41 DFQA112-100	MDFQAXX112-100, f_r:100Hz
			42 DFQA132-36	MDFQAXX132-36, f_r: 36Hz
			43 DFQA132-76	MDFQAXX132-76, f_r: 76Hz

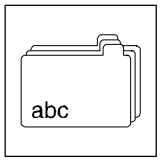


Code	LCD	Possible settings		IMPORTANT	
		Lenze	Choice		
			Lenze asynchronous servo motors	• without integrated temperature monitoring • The temperature monitoring via resolver or encoder cable is deactivated automatically, i.e.: C0583 = 3 C0584 = 3 C0594 = 3	
		*	50 DSVA56-140	DSVAXX056-22, f_r: 140Hz	
			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	
			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	
			108 DSKS36-13-200	MDSKSXX036-13, f_r:200Hz	
			109 DSKS36-23-200	MDSKSXX036-23, f_r:200Hz	
			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	
			160 DSKS56-23-190	MDSKSXX56-23-190,f_r:190Hz	
			161 DSKS56-33-200	MDSKSXX56-33-200,f_r:200Hz	
			162 DFKS71-03-170	MDFKSXX71-03-170,f_r:170Hz	
			163 DSKS71-03-165	MDSKSXX71-03-165,f_r:165Hz	
			164 DSKS71-13-185	MDSKSXX71-13-185,f_r:185Hz	
			165 DFKS71-13-180	MDFKSXX71-13-180,f_r:180Hz	
			166 DSKS71-33-180	MDSKSXX71-33-180,f_r:180Hz	
			167 DFKS71-33-175	MDFKSXX71-33-175,f_r:175Hz	

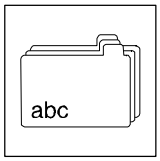


Appendix

Code	LCD	Possible settings			IMPORTANT	
		Lenze	Choice			
			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	
			225 30kW-ASM-50			
			226 37kW-ASM-50			
			227 45kW-ASM-50			
			228 55kW-ASM-50			
			229 75kW-ASM-50			
			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	
			265 30kW-ASM-87			
			266 37kW-ASM-87			
			267 45kW-ASM-87			
			268 55kW-ASM-87			
			269 75kW-ASM-87			
[C0087]	MOt SPEEd	*	300	{1 rpm} 16000	**Rated motor speed** → depending on C0086 • Change of C0086 resets value to the assigned default setting • Change of C0087 sets C0086 = 0	
[C0088]	MOt CURRENt	*	0.5	{0.1 A} 500.0	**Rated motor current** → depending on C0086 • Change of C0086 resets value to the assigned default setting • Change of C0088 sets C0086 = 0	

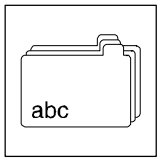


Code	LCD	Possible settings				IMPORTANT	
		Lenze	Choice				
[C0089]	MOT FREQUENCY	*	10	{1 Hz}	1000	**Rated motor frequency** → depending on C0086 • Change of C0086 resets value to the assigned default setting • Change of C0089 sets C0086 = 0	
[C0090]	MOT VOLTAGE	*	50	{1 V}	500	**Rated motor voltage** → depending on C0086 • Change of C0086 resets value to the assigned default setting • Change of C0090 sets C0086 = 0	
[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 • Change of C0091 sets C0086 = 0	
C0093	DRIVE IDENT	Disp	0 invalid 1 none 93xx 93xx			**Controller identification** 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	📖 5-30
[C0095]	ROTOR POS ADJ	0	0 inactive 1 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 No password protection 1 Read protection 2 Write protection 3 Read/Write protection			**Parameter access protection** Extended password protection for bus systems with activated password (C0094). • All codes in the user menu can be accessed.	📖 5-30
C0099	S/W VERSION	Disp	x.xx			Software version	
C0101 1 2 ... 15	 ADD TIR ADD TIR ... ADD TIR	 0.000 0.000 ... 0.000	0.000	{0.001 s}	999.900	**NSET-Tir** Additional acceleration times T_{ir} for the main setpoint of NSET • Refers to speed change 0...$n_{max.}$	
C0103 1 2 ... 15	 ADD TIF ADD TIF ... ADD TIF	 0.000 0.000 ... 0.000	0.000	{0.001 s}	999.900	**NSET-Tif**, 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 s}	999.900	**QSP deceleration time** for quick stop (QSP) • Refers to speed change 0...$n_{max.}$	
C0108 1 2	 FCODE (GAIN) FCODE (GAIN)	 100.00 100.00	-199.99	{0.01 %}	199.99	**FCOD (gain AOUT)** Freely assignable code for relative analog signals	
C0109 1 2	 FCODE (OFFSET) FCODE (OFFSET)	 0.00 0.00	-199.99	{0.01 %}	199.99	**FCOD (offset AOUT)** Freely assignable code for relative analog signals	
C0114 1 2 3 4 5	 DIGIN POL DIGIN POL DIGIN POL DIGIN POL DIGIN POL	 1 1 0 0 0	0 HIGH active 1 LOW active			**DIGINx polarity,** (terminal polarity) X5/E1 X5/E2 X5/E3 X5/E4 X5/E5	

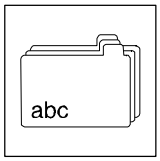


Appendix

Code	LCD	Possible settings				IMPORTANT	
		Lenze	Choice				
[C0116] 1 ... 32	 FDO-0 ... FDO-31	1000	FIXED 0		→ Selection list 2	**FDO** (free digital output) • Signal assignment of the free digital outputs. Used for LECOM or system bus.	
[C0117] 1 2 3 4	 DIGOUT DIGOUT DIGOUT DIGOUT	* 30101 30013 500 30012	 DCTRL-TRIP CMP1-OUT DCTRL-RDY MCTRL-MMAX		→ Selection list 2	Signal configuration DIGOUT → depending on C0005 X5/A1 X5/A2 X5/A3 X5/A4	
C0118 1 2 3 4	 DIGOUT POL DIGOUT POL DIGOUT POL DIGOUT POL	 0 0 0 0	 0 1	 High active Low active		Terminal polarity DIGOUT X5/A1 X5/A2 X5/A3 X5/A4	
C0121	OH7 LIMIT	150	45	{1 °C}	150	**Temperature for OH7**, Pre-warning for the motor temperature limit (fault OH7)	
C0122	OH4 LIMIT	85	45	{1 °C}	85	**Temperature for OH4**, pre-warning for the heatsink temperature limit (fault OH4)	
C0125	BAUDRATE	0	0 1 2 3 4	9600 baud 4800 baud 2400 baud 1200 baud 19200 baud		**LECOM baud rate** for accessory module 2102	
C0126	MONIT CE0	3	0 2 3	Trip Warning Off		**Conf. CE0**, configuration communication error monitoring with automation interface CE0	
C0130	Act Ti		 0 1 2 ... 14 15	 C12/C13 Ti 1 Ti 2 Ti 14 Ti 15		active T_i times of NSET C0012/C0013 active T_{ir1}/T_{if1} active T_{ir2}/T_{if2} active ... T_{ir14}/T_{if14} active T_{ir15}/T_{if15} active	
C0134	RFG CHARAC	 0	 0 1	 linear S-shaped		**NSET RFG characteristic**, ramp function generator characteristic for main setpoint linear S-shaped	
C0135	CONTROL WORD		0	{1}	65535	**Control word** decimal when networked with automation interfaces • Device evaluates information 16 bit, binary coded	
C0136 1	 CTRLWORD		 0	 {1}	 65535	Control word in DCTRL	
C0136 2	 CTRLWORD		0	{1}	65535	Control word in CAN-IN	
C0136 3	 CTRLWORD		0	{1}	65535	Control word in AIF-IN	
C0141	FCODE (SELVAL)	0.00	-199.99	{0.01 %}	199.99	**Main setpoint**, freely configurable code for relative analog signals • used as main setpoint in the configurations C0005 = xxx1	

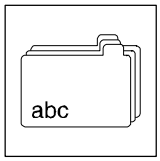


Code	LCD	Possible settings		IMPORTANT	
		Lenze	Choice		
C0142	START OPTIONS	1	0 Start lock 1 Auto start	**Start option**, 0 = start protection 1 = automatic start Start conditions are executed: • after mains connection • after message (t > 0.5s) • after trip	
C0150	STATUS WORD	Disp	Bit00 Config0* Bit08 Status code Bit01 IMP Bit09 Status code Bit02 Config2* Bit10 Status code Bit03 Config3* Bit11 Status code Bit04 Config4* Bit12 Warning Bit05 Config5* Bit13 Message Bit06 n = 0 Bit14 Config14* Bit07 Ctrl. inhibit Bit15 Config15* * freely configurable	Status word decimal when networked with automation interfaces • Binary interpretation indicates the bit states	
C0151	FDO (DW)	Disp	output signals configured with C0116	Hexadecimal signal assignment of the free digital outputs. • Binary interpretation indicates the bit states	
C0155	STATUS WORD 2	Disp	Bit00 Fail Bit08 CW/CCW Bit01 Mmax Bit09 - Bit02 Imax Bit10 - Bit03 IMP Bit11 - Bit04 RDY Bit12 - Bit05 Ctrl. inhibit Bit13 - Bit06 Trip Bit14 - Bit07 Init Bit15 -	Status word 2 Extended decimal status word • Binary interpretation indicates the bit states	
[C0156] 1 2 3 4 5 6 7	 STAT.B0 STAT.B2 STAT.B3 STAT.B4 STAT.B5 STAT.B14 STAT.B15	 1000 30012 1000 10600 30013 15004 500	→ Selection list 2 PAR*1 MCTRL-IMAX MCTRL-MMAX NSET-RFG I=0 CMP1-OUT DCTRL-CW/CCW DCTRL-RDY	Configuration of the free bits of the status word	
C0157 1 2 3 4 5 6 7	 STAT.B0 STAT.B2 STAT.B3 STAT.B4 STAT.B5 STAT.B14 STAT.B15	Disp	0 1	Status of the free bits of the status word	
C0161	ACT TRIP	Disp	All fault indications	Momentary fault indication (as under C0168/1)	📖 8-5
C0167	RESET FAILMEM	0	0 No reset 1 Reset	**History buffer reset** Clears the history buffer	
C0168 1 2 3 4 5 6 7 8	 FAIL NO. ACT FAIL NO. OLD1 FAIL NO. OLD2 FAIL NO. OLD3 FAIL NO. OLD4 FAIL NO. OLD5 FAIL NO. OLD6 FAIL NO. OLD7	Disp	All fault indications	Faults occurred History buffer • List of faults occurred 1: active 2: last 3: last but one 4: last but three 5: last but four 6: last but five 7: last but six 8: last but seven	

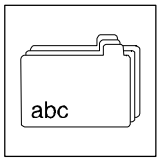


Appendix

Code	LCD	Possible settings			IMPORTANT	
		Lenze	Choice			
C0169		Disp	Corresponding mains switch-on time		Occurrence of the faults History buffer • List of times when the faults have occurred under C0168 • Related to C0179	
1	FAILTIME Act				1: active	
2	FAILTIME OLD1				2: last	
3	FAILTIME OLD2				3: last but one	
4	FAILTIME OLD3				4: last but three	
5	FAILTIME OLD4				5: last but four	
6	FAILTIME OLD5				6: last but five	
7	FAILTIME OLD6				7: last but six	
8	FAILTIME OLD7				8: last but seven	
C0170		Disp	Corresponding mains switch-on time		Fault frequency History buffer • List showing how often the faults have occurred consecutively under C0168	
1	COUNTER ACT				1: active	
2	COUNTER OLD1				2: last	
3	COUNTER OLD2				3: last but one	
4	COUNTER OLD3				4: last but three	
5	COUNTER OLD4				5: last but four	
6	COUNTER OLD5				6: last but five	
7	COUNTER OLD6				7: last but six	
8	COUNTER OLD7				8: last but seven	
[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	Mains<400V+-B		Operation on mains < 400 V with or without brake unit	
		1	Mains=400V+-B		Operation on 400 V mains with or without brake unit	
		2	Mains=460V+-B		Operation on 460 V mains with or without brake unit	
		3	Mains=480V-B		Operation on 480 V mains without brake unit	
		4	Mains=480V+B		Operation on 480 V mains with brake unit	
C0178	OP TIMER	Disp	0	{1 s} 4294967295	Elapsed operating time meter • Time when the controller was enabled	
C0179	MAINS TIMER	Disp	0	{1 s} 4294967295	Mains switch-on time meter • Time when the mains was switched on	
C0182	TI S-SHAPED	20.00	0.01 s	{0.01 s} 50.00 s	**NSET T_i-S-shaped RFG** T_i time of the S-curve ramp function generator for NSET Determines the S-shape • low values ⇒small S inaccuracy • high values ⇒big S inaccuracy	

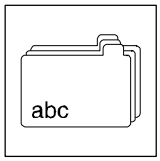


Code	LCD	Possible settings				IMPORTANT	
		Lenze	Choice				
C0183	DIAGNOSTICS	Disp				Drive diagnostics • indicates fault or status information • if several items or fault or status information are to be shown, the information with the smallest number is displayed	
			0	OK		0: No fault	
			10	Init		10: Initialisation phase	
			91	Trip-Set C135			
			92	Trip-Set AIF			
			93	Trip-Set CAN			
			102	Trip		102: TRIP active	
			103	RFG P-OFF		103: Emergency stop	
			104	IMP Message		104: Message active	
			105	Power off			
			111	BSP C135		111: Operation inhibited	
			112	BSP AIF			
			113	BSP CAN			
			121	CINH term 28		121: Controller inhibited through X5/28	
			122	CINH int 1		122: DCTRL-CINH1	
			123	CINH int 2		123: DCTRL-CINH2	
			124	CINH C135/STP		124: STOP key of 9371BB	
			125	CINH AIF		125: Controller inhibited through AIF	
			126	CINH CAN		126: Controller inhibited through CAN	
			131	FAIL-QSP		131: Fault reaction	
			141	Lock mode		141: Restart protection active	
			142	IMP		142: High resistance power outputs	
			151	QSP ext term		151: QSP via MCTRL-QSP	
			152	QSP C135/STP		152: QSP via STOP key	
			153	QSP AIF		153: QSP via AIF	
			154	QSP CAN		154: QSP via CAN	
			250	Warning		250: Warning active	
C0190	NSET ARIT	0	0	OUT = C46		**NSET arithmetic function** Arithmetics block in the function block NSET • Connects main setpoint C0046 and additional setpoint C0049	
			1	C46 + C49			
			2	C46 - C49			
			3	C46 * C49			
			4	C46 / C49			
			5	C46/(100 - C49)			
C0195	BRKI T ACC	99.9	0.0	{0.1 s}	99.9	**Brake engagement time** • Engagement time of the mechanical holding brake (see technical data of the brake). • After the time elapsed under C0195, the status "mechanical brake closed" is reached	
			99.9 s	infinite			
C0196	BRK T RELEASE	0.0	0.0	{0.1 s}	60.0	**Brake disengagement time** • Disengagement time of the mechanical holding brake (see technical data of the brake). • After the time has elapsed under C0196, the status "mechanic brake open" is reached.	
C0200	S/W ID	Disp				Software identification	
C0201	S/W DATE	Disp				Software release date	
C0202	INTERNAL ID	Disp	0	{0.001}	100	Internal identification	
C0203	KOMM.-NO.	Disp	x / xxxx / xxxxx			Commission number	
C0204	SERIAL-NO.	Disp	0	{1}	65535	Serial number	
C0206	PRODUKT DATE	Disp				Production date	
C0207	DL INFO 1	Disp				Download-info 1	
C0208	DL INFO 2	Disp				Download-info 2	
C0209	DL INFO 3	Disp				Download-info 3	

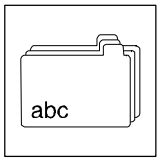


Appendix

Code	LCD	Possible settings				IMPORTANT	
		Lenze	Choice				
C0220	NSET TIR ADD	0.000	0.000	{0.001 s}	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 s}	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	Process controller **Vp gain**	
C0223	PCTRL TN	400	20 99999 ms switched off	{1 ms}	99999	Process controller **Tn integral component**	
C0224	PCTRL KD	0.0	0.0	{0.1}	5.0	Process controller **Kd differential component**	
C0241	NSET RFG I = 0	1.00	0.00 100 % = n_{max}	{0.01 %}	100.00	**NSET threshold RFG ON=OFF** for main setpoint	
C0244	BRK M SEL	0.00	-100.00 100 % = value of C0057	{0.01 %}	100.00	**Holding torque** of the DC brake	
C0250	FCODE 1BIT					**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	0.2000	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** (motor potentiometer) **upper limit** • Mandatory: C0260 > C0261	
C0261	MPOT1 LOW	-100.0	-199.99	{0.01 %}	199.99	**MPOT1** (motor potentiometer) **lower limit** • Mandatory: C0261 < C0260	
C0262	MPOT1 TIR	10.0	0.1	{0.1 s}	6000.0	**MPOT1** (motor potentiometer) **Acceleration time Tir** • Refers to change 0...100 %	
C0263	MPOT1 TIF	10.0	0.1	{0.1 s}	6000.0	**MPOT1** (motor potentiometer) **Deceleration time Tif** • Refers to change 0...100 %	
C0264	MPOT1 ON/OFF	0	0 No function 1 Down to 0% 2 Down to C261 3 Jump 0% 4 Jump to C261 5 Up to C260			**MPOT1 on/off** Deactivation function of motor potentiometer • Function which is executed when motor potentiometer is deactivated via the input MPOT1-INACTIVE. no change Deceleration with T_{if} to 0% Deceleration with T_{if} to C0261 Inhibit with T_{if} = 0 to 0% Inhibit with T_{if} = 0 to C0261 Acceleration with T_{ir} to C0260	

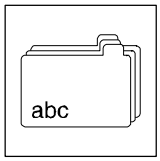


Code	LCD	Possible settings				IMPORTANT	
		Lenze	Choice				
C0265	MPOT1 INIT	0				**MPOT1 initialisation** • Value which is accepted during mains switching and activated motor pot.	
			0	Power off		Value during mains failure	
			1	C261		lower limit of C0261	
			2	0%		0 %	
[C0267]					→ Selection list 2	Configuration of the digital inputs of motor pot MPOT1	
1	UP	1000	FIXED 0			Digital input acceleration	
2	DOWN	1000	FIXED 0			Digital input deceleration	
[C0268]	INACT				→ Selection list 2	Configuration of the motor pot input MPOT1-INACTIVE	
		1000	FIXED 0				
C0269		Disp				Input signals motor potentiometer	
1	UP						
2	DOWN						
3	INACTIVE						
C0325	VP2 ADAPT	1.0	0.1	{0.1}	500.0	Process controller adaptation gain (V_{p2})	
C0326	VP3 ADAPT	1.0	0.1	{0.1}	500.0	Process controller adaptation gain (V_{p3})	
C0327	SET2 ADAPT	100.00	0.00	{0.01 %}	100.00	Process controller adaptation n_{set2} Set speed threshold of the process controller adaptation • Mandatory: C0327 > C0328	
C0328	SET1 ADAPT	0.00	0.00	{0.01 %}	100.00	Process controller adaptation n_{set1} Set speed threshold of the process controller adaptation • Mandatory: C0328 < C0327	
C0329	ADAPT ON/OFF	0				Activate process controller adaptation	
			0	no		No process controller adaptation	
			1	Extern Vp		External via input	
			2	Setpoint		Adaptation via setpoint	
			3	Ctrl diff		Adaptation via control difference	
C0332	PCTRL TIR	0.000	0.000	{0.001 s}	999.900	Process controller acceleration time T_{ir} • Related to setpoint change 0...100 %	
C0333	PCTRL TIF	0.000	0.000	{0.001 s}	999.900	Process controller deceleration time T_{ir} • Related to setpoint change 0...100 %	
C0336	Act VP	Disp	0.0	{0.1}	500.0	Process controller momentary V_p	
C0337	BI/UNIPOLAR	0	0	bipolar		Process controller range bipolar/unipolar	
			1	unipolar			
C0338	ARIT1 FUNCT	1	0	OUT = IN1		Function arithmetic block ARIT1 • links inputs IN1 and IN2	
			1	IN1 + IN2			
			2	IN1 - IN2			
			3	IN1 * IN2			
			4	IN1 / IN2			
			5	IN1/(100 - IN2)			
[C0339]					→ Selection list 1	Configuration arithmetic blockARIT1	
1	IN	1000	FIXED 0 %				
2	IN	1000	FIXED 0 %				
C0340		Disp				Input signals arithmetic block ARIT1	
1	IN						
2	IN						
[C0350]	CAN ADDRESS	1	1	{1}	63	CAN bus node address	
[C0351]	CAN BAUDRATE	0	0	500 kbit/s		CAN bus baud rate	
			1	250 kbit/s			
			2	125 kbit/s			
			3	50 kbit/s			
			4	1000 kbit/s			

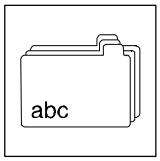


Appendix

Code	LCD	Possible settings				IMPORTANT	
		Lenze	Choice				
[C0352]	CAN MSt	0	0 1	slave Master		**CAN master operation** set up	
C0353 1 2 3	 CAN ADDR SEL1 CAN ADDR SEL2 CAN ADDR SEL3	 0 0 0	 0 1	 C350 C354		Source for CAN bus IN/OUT addresses	
C0354 1 2 3 4 5 6	 IN1 ADDR2 OUT1 ADDR2 IN2 ADDR2 OUT2 ADDR2 IN3 ADDR2 OUT3 ADDR2	 129 1 257 258 385 386	1	{1}	512	CAN bus IN/OUT node addresses	
C0355 1 2 3 4 5 6	 CAN-IN1 ID CAN-OUT1 ID CAN-IN2 ID CAN-OUT2 ID CAN-IN3 ID CAN-OUT3 ID	Disp	0	{1}	2047	CAN bus identifier	
C0356 1 2 3 4	 CAN BOOT UP CAN-OUT2 T CAN-OUT3 T CAN DELAY	 3000 0 0 20	0	{1 ms}	65000	CAN bus time settings	
[C0357] 1 2 3	 CE1MONIT TIME CE2MONIT TIME CE3MONIT TIME	 3000 3000 3000	0	{1 ms}	65000	**CE1 monitoring time** CAN bus monitoring time for I_{rx}	
C0358	RESET NODE	0	0 1	no function CAN reset		**CAN reset node** Install CAN bus reset node	
C0359	CAN StAtE	Disp	0 1 2 3	Operational Pre-Operat Warning Bus off		**CAN status**	
C0360 1 2 3 4 5 6 7 8 9 10 11 12	 MESSAGE OUT MESSAGE IN MESSAGE OUT1 MESSAGE OUT2 MESSAGE OUT3 MESSAGE POUT1 MESSAGE POUT2 MESSAGE IN1 MESSAGE IN2 MESSAGE IN3 MESSAGE PIN1 MESSAGE PIN2	Disp	0	{1}	65535	**Messages**, telegram counter (number of telegrams) • for values > 65535 the counting restarts 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	

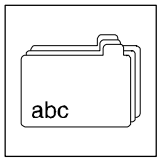


Code	LCD	Possible settings		IMPORTANT	
		Lenze	Choice		
C0361		Disp	0 {1 %} 100	**Bus load**, CAN bus load • To ensure a perfect operation, the total bus load (all connected devices) should be less than 80%	
1	LOAD OUT			1: all sent	
2	LOAD IN			2: all received	
3	LOAD OUT1			3: sent to CAN-OUT1	
4	LOAD OUT2			4: sent to CAN-OUT2	
5	LOAD OUT3			5: sent to CAN-OUT3	
6	LOAD POUT1			6: sent to parameter channel 1	
7	LOAD POUT2			7: sent to parameter channel 2	
8	LOAD IN1			8: received from CAN-IN1	
9	LOAD IN2			9: received from CAN-IN2	
10	LOAD IN3			10: received from CAN-IN3	
11	LOAD PIN1			11: received from parameter channel 1	
12	LOAD PIN2			12: received from parameter channel 2	
C0362	SYNC CYCLE	Disp	0 {1 ms} 30	Time between two sync telegrams on the system bus	
C0363	SYNC CORR	1	1 0.8 µs 2 1.6 µs 3 2.4 µs 4 3.2 µs 5 4.0 µs	**CAN Sync correction** Correction value for C0362	
[C0364]	CFG:CAN ACTIV	1000	FIXED 0 → Selection list 2	Switch from **Pre-operat. to operat.** , process data must be activated externally	📖 10-58
C0365	CAN ACTIV	Disp	0 1	Input signal CAN active	
C0366	SYNC RESPONSE	1	0 no sync response 1 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 ms} 65000	**CAN Sync Tx Time**	
C0400	OUT	Disp	-199.99 {0,01 %} 199.99	Output of AIN1	
[C0402]	OFFSET	19502	FCODE-26/1 → Selection list 1	Configuration offset of AIN1	📖 10-58
[C0403]	GAIN	19504	FCODE-27/1 → Selection list 1	Configuration gain of AIN1	📖 10-58
C0404		Disp	-199.99 {0.01 %} 199.99	Input signals of AIN1	
1	OFFSET				
2	GAIN				
C0405	OUT	Disp	-199.99 {1 %} 199.99	Output of AIN2	
[C0407]	OFFSET	19503	FCODE-26/2 → Selection list 1	Configuration offset of AIN2	📖 10-58
[C0408]	GAIN	19505	FCODE-27/2 → Selection list 1	Configuration gain of AIN2	📖 10-58
C0409		Disp	-199.99 {0.01 %} 199.99	Input signals of AIN2	
1	OFFSET				
2	GAIN				
[C0416]	RESOLVER ADJ	0	0 {1} 99999999	Correction **Resolver fault** For Lenze motors: • Read resolver error from the nameplate	
[C0420]	ENCODER CONST	512	1 {1 inc/rev} 8192	Encoder constant for **encoder input X8** in increments per revolution	
[C0421]	ENCODER VOLT	5.00	5.00 {0.1V} 8.00	**Encoder voltage supply** setting • 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	Constant for digital frequency input in increments per revolution	

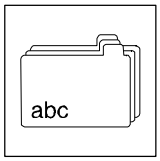


Appendix

Code	LCD	Possible settings				IMPORTANT	
		Lenze	Choice				
C0426	OUT	Disp	-32767	{1 rpm}	32767	Output signal of DFIN	
C0427	DFIN FUNKTION	0	0 2-phase 1 A puls / B dir 2 Puls A or B			**DFIN function**, type of the digital frequency signal 0 = Quadrature 1 = Pulse / Direction 2 = Pulse A / Pulse B	
C0429	TP5 DELAY	0	-32767	{1 inc}	32767	**TP5 delay**, dead time compensation for the TP function of DFSET and DFRFG	
C0429	TP5 DELAY	0	-32767	{1 inc}	32767	Dead time compensation for the TP function of DFSET and DFRFG	
C0430 1 2 3 4	 TP1 DELAY TP2 DELAY TP3 DELAY TP4 DELAY	 0.218 0.218 0.218 0.218	0.000	{0.001 ms}	2.000	**TP1 delay**	
C0430 1 2 3 4	 TP1 DELAY TP2 DELAY TP3 DELAY TP4 DELAY	 0.218 0.218 0.218 0.218	0.000	{0.001 ms}	2.000	TP1 delay	
[C0431]	IN	5001	MCTRL-NACT		→ Selection list 1	Configuration input of AOUT1	📖 10-58
[C0432]	OFFSET	19512	FCODE-109/1		→ Selection list 1	Configuration offset of AOUT1	📖 10-58
[C0433]	GAIN	19510	FCODE-108/1		→ Selection list 1	Configuration gain of AOUT1	📖 10-58
C0434 1 2 3	 IN OFFSET GAIN	Disp	-199.99	{0.01 %}	199.99	Input signals of AOUT1	
[C0436]	IN	5002	MCTRL-MSET2		→ Selection list 1	Configuration input of AOUT2	📖 10-58
[C0437]	OFFSET	19513	FCODE-109/2		→ Selection list 1	Configuration offset of AOUT2	📖 10-58
[C0438]	GAIN	19511	FCODE-108/2		→ Selection list 1	Configuration gain of AOUT2	📖 10-58
C0439 1 2 3	 IN OFFSET GAIN	Disp	-199.99	{0.01 %}	199.99	Input signals of AOUT2	
[C0440]	STATE-BUS	1000			→ Selection list 2	Configuration state bus X5/ST	📖 10-58
C0441	STATE-BUS	Disp				Monitoring signal state bus	
C0443	DIGIN-OUT	Disp	0	{1}	255	Signals at X5/E1 to X5/E5 decimal value • Binary interpretation indicates terminal signals	
C0444 1 2 3 4	 DIGOUT1 DIGOUT2 DIGOUT3 DIGOUT4	Disp	0		1	Signals at X5/A1 to X5/A4	
[C0450]	NX	1000	FIXED 0 %		→ Selection list 1	Configuration analog input of BRK1	📖 10-58
[C0451]	DN	1000	FIXED 0		→ Selection list 2	Configuration digital input of BRK1	📖 10-58
[C0452]	SIGN	1000	FIXED 0 %		→ Selection list 1	Configuration analog input of BRK1	📖 10-58
C0458 1 2	 NX SIGN	Disp	-199.99	{0.01 %}	199.99	Analog input signals of BRK1	
C0459	DN	Disp				Digital input signal of BRK1	

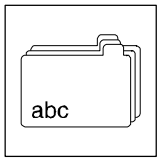


Code	LCD	Possible settings				IMPORTANT	
		Lenze	Choice				
C0464	CUSTOMER I/F	Disp	0 1	original changed		**Customer interface**, status of the selected basic configuration • Reassignment of terminals in a basic configuration from C0005 does not change C0005 and sets C0464 = 1 • Adding or removing of function blocks or changing the signal flow among the function blocks in a basic configuration of C0005 sets C0005 = 0 and C0464= 1	
[C0465] 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 ... 19 ... 22 ... 25 ... 28 ... 31 ... 41 ... 42 ... 49 ... 50	 FB LIST FB LIST FB LIST FB LIST FB LIST FB LIST FB LIST FB LIST FB LIST FB LIST FB LIST FB LIST FB LIST FB LIST FB LIST FB LIST FB LIST ... FB LIST ... FB LIST ... FB LIST ... FB LIST ... FB LIST ... FB LIST ... FB LIST FB LIST FB LIST	* 200 0 50 0 0 55 0 0 10250 0 0 0 5650 0 0 5050 0 5700 0 10650 0 70 0 75 0 250 0 25000 20000 0 0 0	→ Selection list 5		**FB processing list** Contains in 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 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.	📖 10-58
C0466	CPU T REMAIN	Disp				**Processing time** remaining for processing function blocks	
[C0469]	Fct STP KEY	2	0 1 2	inactive CINH QSP		**Function key Stop** of the operating module • Function is activated when pressing the STOP key. Deactivated Controller inhibit Quick stop	
C0470 1 2 3 4	 FCODE BIT 0-7 FCODE BIT 8-15 FCODE BIT 16-23 FCODE BIT 24-31	 0 0 0 0	0	{1}	255	Freely assignable code for digital signals • The data words C0470 and C0471 are in parallel and are identical	
C0471	FCODE 32 BIT	0	0	{1}	4294967296	Freely assignable code for digital signals • The data words C0470 and C0471 are in parallel and are identical	

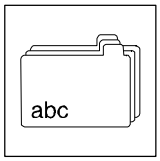


Appendix

Code	LCD	Possible settings					IMPORTANT	
		Lenze	Choice					
C0472			-199.99	{0.01 %}		199.99	Freely assignable code for relative analog signals	
1	FCODE ANALOG	0.00						
2	FCODE ANALOG	0.00						
3	FCODE ANALOG	100.00						
6	FCODE ANALOG	100.00						
...	...	...						
19	FCODE ANALOG	0.00						
20	FCODE ANALOG	0.00						
C0473			-32767	{1}		32767	Freely assignable code for absolute analog signals	
1	FCODE ABS	1						
2	FCODE ABS	1						
3	FCODE ABS	0						
...	...	...						
9	FCODE ABS	0						
10	FCODE ABS	0						
C0474			-2147483648	{1}		2147483648	**FCODE phase**, freely configurable code for phase signals • 1 turn = 65536 inc	
1	FCODE PH	0						
2	FCODE PH	0						
...	...	...						
5	FCODE PH	0						
C0475			-16000	{1 rpm}		16000	**FCODE phase difference**, freely configurable code for phase difference signals • 1 turn = 65536 inc	
1	FCODE DF	0						
2	FCODE DF	0						
[C0490]	FEEDBACK POS						**Position feedback system** controller • C0490 = 0, 1, 2 can be mixed with C0495 = 0, 1, 2 • C0490 = 3, 4 also sets C0495 to the same value	
		0	0	Resolver			Resolver at X7	
			1	Encoder TTL			Encoder TTL at X8	
			2	Encoder sin			sin/cos encoder at X8	
			3	Absolut ST			Absolute value encoder ST at X8	
			4	Absolut MT			Absolute value encoder MT at X8	
[C0495]	FEEDBACK N						**Speed feedback system** controller • C0495 = 0, 1, 2 can be mixed with C0490 = 0, 1, 2 • C0495 = 3, 4 also sets C0490 to the same value	
		0	0	Resolver			Resolver at X7	
			1	Encoder TTL			Encoder TTL at X8	
			2	Encoder sin			sin/cos encoder at X8	
			3	Absolut ST			Absolute value encoder ST at X8	
			4	Absolut MT			Absolute value encoder MT at X8	
C0497	NACT-FILTER	2.0	0.0		{0.1 ms}	50.0	**Nact-filter time constant** (for actual speed)	
			0 ms	switched off				

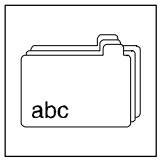


Code	LCD	Possible settings				IMPORTANT	
		Lenze	Choice				
C0517			0	{1}	199900	**User menu** with up to 32 entries • Under the subcodes the numbers of the desired codes are entered. • The input is done in the format xxx.yy – xxx: Code number – yy: Subcode for code • It is not checked whether the entered code exists.	
1	USER MENU	51.00	C0051/0 MCTRL-NACT				
2	USER MENU	54.00	C0054/0 Imot				
3	USER MENU	56.00	C0056/0 MCTRL-MSET2				
4	USER MENU	46.00	C0046/0 DIS: N				
5	USER MENU	49.00	C0049/0 DIS: NADD				
6	USER MENU	183.00	C0183/0 Diagnostics				
7	USER MENU	168.01	C0168/1 Fail no. act				
8	USER MENU	86.00	C0086/0 Mot type				
9	USER MENU	22.00	C0022/0 Imax current				
10	USER MENU	5.00	C0005/0 Signal cfg				
11	USER MENU	11.00	C0011/0 Nmax				
12	USER MENU	12.00	C0012/0 Tir				
13	USER MENU	13.00	C0013/0 Tif				
14	USER MENU	105.00	C0105/0 QSP Tif				
15	USER MENU	39.01	C0039/1 JOG setpoint				
16	USER MENU	70.00	C0070/0 Vp speed CTRL				
17	USER MENU	71.00	C0071/0 Tn speed CTRL				
18	USER MENU	0	not assigned				
...	USER MENU	...	...				
30	...	0	not assigned				
31	USER MENU	94.00	C0094/0 Password				
32	USER MENU	3.00	C0003/0 Par save				
	USER MENU						
[C0520]	IN	1000	FIXEDPHI-0		→ Selection list 4	Configuration input of DFSET	📖 10-58
[C0521]	VP-DIV	1000	FIXED 0 %		→ Selection list 1	Configuration gain factor numerator of DFSET	📖 10-58
[C0522]	RAT-DIV	1000	FIXED 0 %		→ Selection list 1	Configuration gearbox factor numerator of DFSET	📖 10-58
[C0523]	A-TRIM	1000	FIXED 0 %		→ Selection list 1	Configuration phase trimming of DFSET	📖 10-58
[C0524]	N-TRIM	1000	FIXED 0 %		→ Selection list 1	Configuration speed trimming of DFSET	📖 10-58
[C0525]	0-PULSE	1000	FIXED 0		→ Selection list 2	Configuration one-time zero pulse activation of DFSET	📖 10-58
[C0526]	RESET	1000	FIXED 0		→ Selection list 2	Configuration reset integrators of DFSET	📖 10-58
[C0527]	SEt	1000	FIXED 0		→ Selection list 2	Configuration set integrators of DFSET	📖 10-58
C0528		Disp	-2000000000	{1 inc}	2000000000	**Zero pulse phase difference** Phase difference between two zero pulses	
1	0-PULSE A						
2	OFFSEt					Offset of C0523*C0529 + C0252	
C0529	MULTIP OFFSET	1	-20000	{1}	20000	**Offset multiplier**	
C0530	DF EVALUATION	1	0 with g factor 1 without g factor			**DFSET digital frequency evaluation** Evaluation of the setpoint integrator of DFSET (with/without gearbox factor)	
C0531	ACT 0 DIV	1	1	{1}	16384	**DFSET act. zero pulse divider**	
C0532	0-PULSE/TP	1	1 0-pulse 2 Touch probe			**DFSET zero pulse/touch probe** Selection zero pulse of the feedback system or touch probe for DFSET	
C0533	VP DENOM	1	1	{1}	32767	Gain factor **Vp denominator** of DFSET	
C0534	0-PULSE FCT	0	0 Not active 1 Continuous 2 Cont. switch 10 Once, fast way 11 Once, cw 12 Once, ccw 13 Once, 2*0-puls			**Zero pulse function** of DFSET	
C0535	SET 0 DIV	1	1	{1}	16384	**Set zero pulse divider** of DFSET	

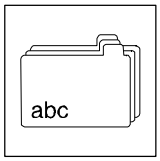


Appendix

Code	LCD	Possible settings				IMPORTANT	
		Lenze	Choice				
C0536 1 2 3	 VP-DIV RAT-DIV A-TRIM	Disp	-32767	{1}	32767	Absolute analog input signals of DFSET	
C0537	N-ERR	Disp	-199.99	{0.01 %}	199.99	Relative analog input signal of DFSET	
C0538 1 2 3	 D-PULSE RESET SEL	Disp				Digital input signals of DFSET	
C0539	IN	Disp	-32767	{1 rpm}	32767	Input signal of DFSET	
[C0540]	FUNCTION	 2	 0 Analog input 1 PH diff input 2 Res + int 0 3 Res + ext 0 4 OUT = DFIN 5 OUT = encoder			• X9 is inhibited if 0, 1, 2 or 3 was selected • The input signals get a gain Analog input Phase difference input Resolver simulation + zero pulse Resolver simulation without zero pulse X9 is output on X10 X8 is output on X10	
[C0541]	AN-IN	0	MCTRL-NACT		→ Selection list 1	Configuration analog input of DFOUT	📖 10-58
[C0542]	DF-IN	1000	FIXEDPHI 0		→ Selection list 4	Configuration digital frequency input of DFOUT	📖 10-58
[C0544]	SYN-RDY	1000	FIXED 0		→ Selection list 2	Configuration synchronization signal for the zero pulse of DFOUT	📖 10-58
C0545	PH OFFSET	0	0	{1 inc}	65535	**DFOUT phase offset** • 1 turn = 65535 inc	
C0546	MIN INC/REV	1000	1	{1 inc}	2147483647	• 1 turn = 65535 inc	
C0547	AN-IN	Disp	-199.99	{0.01 %}	199.99	Relative analog input signal of DFOUT	
C0548	SYN-RDY	Disp	0		1	Digital input signal of DFOUT	
C0549	DF-IN	Disp	-32767	{1 rpm}	32767	Absolute analog input signal of DFOUT	
C0560 1 2 3 4 5 ... 14 15	 FIX SET-VALUE FIX SET-VALUE FIX SET-VALUE FIX SET-VALUE FIX SET-VALUE ... FIX SET-VALUE FIX SET-VALUE	 100.00 75.00 50.00 25.00 0.00 ... 0.00 0.00	-199.99	{0.01 %}	199.99	**FIXSET1 Fixed setpoints**	
[C0561]	AIN	1000	FIXED 0 %		→ Selection list 1	Configuration analog input of FIXSET1	📖 10-58
[C0562] 1 2 3 4	 IN IN IN IN	 1000 1000 1000 1000	 FIXED 0 FIXED 0 FIXED 0 FIXED 0		→ Selection list 2	Configuration digital inputs of FIXSET1	📖 10-58
C0563	AIN	Disp	-199.99	{0.01 %}	199.99	Analog input signal of FIXSET1	
C0564 1 2 3 4	 IN IN IN IN	Disp				Digital input signals of FIXSET1	
[C0570]	IN	1000	FIXED 0 %		→ Selection list 1	Configuration analog input of S&H1	📖 10-58
[C0571]	LOAD	1000	FIXED 0		→ Selection list 2	Configuration digital input of S&H1	📖 10-58
C0572	IN	Disp	-199.99	{0.01 %}	199.99	Analog input signal of S&H1	
C0573	LOAD	Disp				Digital input signal of S&H1	

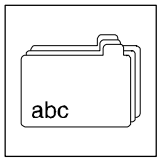


Code	LCD	Possible settings		IMPORTANT
		Lenze	Choice	
C0577	VP FLD WERK	3.0	0.00 {0.01 ms} 15.99	**VP field weakening controller** Vp = gain
C0578	TN FLD WERK	10	2.0 {0.5 ms} 8192.0 8000 ms switched off	**Tn-field weakening controller** Tn = adjustment time
C0581	MONIT EER	0	0 Trip 1 Message 2 Warning 3 Off 4 Fail-QSP	**Conf. EEr(external)** Configuration for the monitoring of external faults
C0582	MONIT OH4	2	2 Warning 3 Off	**Conf. OH4** Configuration of the heatsink temperature monitoring
C0583	MONIT OH3	*	0 Trip 3 Off	**Conf.OH3** , configuration of the fixed motor temperature monitoring → depending on C0086
C0584	MONIT OH7	*	2 Warning 3 Off	**Conf.OH7** , Configuration monitoring OH7 (Motor temperature adjustable) → depending on C0086 • Temperature monitoring via resolver input
C0585	MONIT OH8	3	0 Trip 2 Warning 3 Off	**Conf.OH8** Configuration monitoring OH8 (Motor temperature adjustable) • Temperature monitoring via PTC input
C0586	MONIT SD2	0	0 Trip 2 Warning 3 Off	**Conf. SD2** Configuration monitoring SD2 (Resolver)
C0587	MONIT SD3	3	0 Trip 2 Warning 3 Off	**Conf. SD3** Configuration monitoring SD3 (Encoder at X9)
C0588	MONIT H10/H11	3	0 Trip 2 Warning 3 Off	**Conf. H10 / H11** Configuration monitoring H10 and H11 (thermal sensors in the controller)
C0589	MONIT P03	2	0 Trip 2 Warning 3 Off	**Conf. P03 (contouring error DFSET)**
C0590	MONIT P13	0	0 Trip 2 Warning 3 Off	**Conf. P13 (phase fault DFSET)**
C0591	MONIT CE1	3	0 Trip 2 Warning 3 Off	**Conf. CE1** Configuration monitoring CE1 (CAN-IN1 fault)
C0592	MONIT CE2	3	0 Trip 2 Warning 3 Off	**Conf. CE2** Configuration monitoring CE2 (CAN-IN2 fault)
C0593	MONIT CE3	3	0 Trip 2 Warning 3 Off	**Conf. CE3** Configuration monitoring CE3 (CAN-IN3 fault)
C0594	MONIT SD6	*	0 Trip 2 Warning 3 Off	**Conf. SD6** Configuration monitoring SD6 (Sensor motor temperature) → depending on C0086
C0595	MONIT CE4	3	0 Trip 2 Warning 3 Off	**Conf. CE4** Configuration monitoring CE4 (CAN-bus Off)
C0596	NMAX LIMIT	5500	0 {1 rpm} 16000	**System speed monitoring** Monitoring: machine speed
C0597	MONIT LP1	3	0 Trip 2 Warning 3 Off	**Conf. LP1** Configuration monitoring motor phase failure

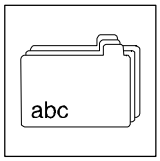


Appendix

Code	LCD	Possible settings				IMPORTANT	
		Lenze	Choice				
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)		Function arithmetic block ARIT2 • links inputs IN1 and IN2	
[C0601]					→ Selection list 1	Configuration analog inputs of ARIT2	📖 10-58
1	IN	1000	FIXED 0 %				
2	IN	1000	FIXED 0 %				
C0602		Disp	-199.99	{0.01 %}	199.99	Analog input signals of ARIT2	
1	IN						
2	IN						
[C0610]					→ Selection list 1	Configuration analog inputs of addition block ADD1 • Adds inputs IN1, IN2 and IN3	📖 10-58
1	IN	1000	FIXED 0 %				
2	IN	1000	FIXED 0 %				
3	IN	1000	FIXED 0 %				
C0611		Disp	-199.99	{0.01 %}	199.99	Analog input signals of ADD1	
1	IN						
2	IN						
3	IN						
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**	
[C0622]	IN	1000	FIXED 0 %		→ Selection list 1	Configuration analog input of DB1	📖 10-58
C0623	IN	Disp	-199.99	{0.01 %}	199.99	Analog input signal of DB1	
C0630	MAX LIMIT	100.00	-199.99	{0.01 %}	199.99	**LIM upper limit** of the limiter	
C0631	MIN LIMIT	-100.0	-199.99	{0.01 %}	199.99	**LIM lower limit** of the limiter	
[C0632]	IN	1000	FIXED 0 %		→ Selection list 1	Configuration analog input of LIM1	📖 10-58
C0633	IN	Disp	-199.99	{0.01 %}	199.99	Analog input signal of LIM1	
C0640	DELAY T	20.00	0.01	{0.01 s}	50.00	**PT1-1 time constant**	
[C0641]	IN	1000	FIXED 0 %		→ Selection list 1	Configuration analog input of PT1-1	📖 10-58
C0642	IN	Disp	-199.99	{0.01 %}	199.99	Analog input signal of PT1-1	
C0650	DT1-1 GAIN	1.00	-320.00	{0.01}	320.00	**DT1-1 gain**	
C0651	DELAY T	1.00	0.005	{0.01 s}	5.000	**DT1-1 time constant**	
[C0652]	IN	1000	FIXED 0 %		→ Selection list 1	Configuration analog input of DT1-1	📖 10-58
C0653	SENSIBILITY	1	1 2 3 4 5 6 7	15-bit 14-bit 13-bit 12-bit 11-bit 10-bit 9-bit		**DT1-1 sensitivity**	
C0654	IN	Disp	-199.99	{0.01 %}	199.99	Analog input signal of DT1-1	
C0655	NUMERATOR	1	-32767	{1}	32767	**CONV5 Numerator** Numerator for CONV5	
C0656	DENOMINATOR	1	1	{1}	32767	**CONV5 Denominator** Denominator for CONV5	
[C0657]	IN	1000	FIXED 0 %		→ Selection list 1	Configuration analog input of CONV5	📖 10-58

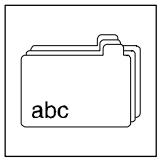


Code	LCD	Possible settings				IMPORTANT	
		Lenze	Choice				
C0658	IN	Disp	-199.99	{0.01 %}	199.99	Analog input signal of CONV5	
[C0661]	IN	1000	FIXED 0 %		→ Selection list 1	Configuration analog input absolute-value generator ABS1	📖 10-58
C0662	IN	Disp	-199.99	{0.01 %}	199.99	Analog input signal of ABS1	
C0671	RFG1 TIR	0.000	0.000	{0.01 s}	999.900	**RFG1 Tir (acceleration time)** of the ramp function generator	
C0672	RFG1 TIF	0.000	0.000	{0.01 s}	999.900	**RFG1 Tif (deceleration time)**	
[C0673]	IN	1000	FIXED 0 %		→ Selection list 1	Configuration analog input of RFG1	📖 10-58
[C0674]	SET	1000	FIXED 0 %		→ Selection list 1	Configuration set input of RFG1	📖 10-58
[C0675]	LOAD	1000	FIXED 0		→ Selection list 2	Configuration digital input of RFG1	📖 10-58
C0676 1 2	 IN SET	Disp	-199.99	{0.01 %}	199.99	Analog input signals of RFG1	
C0677	LOAD	Disp				Digital input signal of RFG1	
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 the 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**	
[C0683] 1 2	 IN IN	 1000 1000	 MCTRL-NACT FCODE-17		→ Selection list 1	Configuration analog inputs of CMP1	📖 10-58
C0684 1 2	 IN IN	Disp	-199.99	{0.01 %}	199.99	Analog input signals of CMP1	
C0685	FUNCTION	1	1 IN1 = IN 2 2 IN 1 > IN2 3 IN 1 < IN2 4 |IN1| = |IN2| 5 |IN1| > |IN2| 6 |IN1| < |IN2|			**CMP2 Comparator function** Function comparator CMP2 • Compares the inputs IN1 and 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] 1 2	 IN IN	 1000 1000	 FIXED 0% FIXED 0%		→ Selection list 1	Configuration analog inputs of CMP2	📖 10-58
C0689 1 2	 IN IN	Disp	-199.99	{0.01 %}	199.99	Analog input signals of CMP2	
C0690	FUNCTION	1	1 IN1 = IN 2 2 IN 1 > IN2 3 IN 1 < IN2 4 |IN1| = |IN2| 5 |IN1| > |IN2| 6 |IN1| < |IN2|			**CMP3 comparator function** Function comparator CMP3 • Compares the inputs IN1 and 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] 1 2	 IN IN	 1000 1000	 FIXED 0% FIXED 0%		→ Selection list 1	Configuration analog inputs of CMP3	📖 10-58

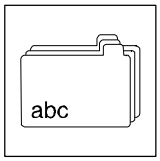


Appendix

Code	LCD	Possible settings				IMPORTANT	
		Lenze	Choice				
C0694 1 2	IN IN	Disp	-199.99	{0.01 %}	199.99	Analog input signals of CMP3	
[C0700]	IN	19523	FCODE-472/3		→ Selection list 1	Configuration input of von ANEG1	📖 10-58
C0701	IN	Disp	-199.99	{0.01 %}	199.99	Input signal of ANEG1	
[C0703]	IN	1000	FIXED 0 %		→ Selection list 1	Configuration input of ANEG2	📖 10-58
C0704	IN	Disp	-199.99	{0.01 %}	199.99	Input signal ANEG2	
C0710	FUNCTION	0	0 Rising trans 1 Falling trans 2 Both trans			**TRANS1 function** Signal evaluation	
C0711	PULSE T	0.001	0.001	{0.001 s}	60.000	**TRANS1 pulse duration**	
[C0713]	IN	1000	FIXED 0		→ Selection list 2	Configuration digital input of TRANS1	📖 10-58
C0714	IN	Disp				Digital input signal of TRANS1	
C0715	FUNCTION	0	0 Rising trans 1 Falling trans 2 Both trans			**TRANS2 function** Signal evaluation	
C0716	PULSE T	0.001	0.001	{0.001 s}	60.000	**TRANS2 pulse time**	
[C0718]	IN	1000	FIXED 0		→ Selection list 2	Configuration digital input of TRANS2	📖 10-58
C0719	IN	Disp				Digital input signal of TRANS2	
C0720	FUNCTION	2	0 On delay 1 Off delay 2 On/Off delay			**DIGDEL1 function** Function: digital delay element	
C0721	DELAY T	1.000	0.001	{0.001 s}	60.000	**DIGDEL1 delay time**	
[C0723]	IN	1000	FIXED 0		→ Selection list 2	Configuration digital input of DIGDEL1	📖 10-58
C0724	IN	Disp				Digital input signal of DIGDEL1	
C0725	FUNCTION	0	0 On delay 1 Off delay 2 On/Off delay			**DIGDEL2 function** Digital delay element	
C0726	DELAY T	1.0	0.001	{0.001 s}	60.000	**DIGDEL2 delay time**	
[C0728]	IN	1000	FIXED0		→ Selection list 2	Configuration digital input of DIGDEL2	📖 10-58
C0729	IN	Disp				Digital input signal of DIGDEL2	
C0730	MODUS	0	0 Start measurement 1 Stop measurement			**OSC mode** Start / Stop of the measurement recording of OSZ	
C0731	STATUS	Disp	0 Measurement completed 1 Measurement active 2 Trigger detected 3 Cancel 4 Cancel after trigger 5 Read memory			**OSZ status** Current operating status of OSZ	
[C0732] 1 2 3 4	 KANAL1 KANAL2 KANAL3 KANAL4	 1000 1000 1000 1000	 FIXED0% FIXED0% FIXED0% FIXED0%		→ Selection list 1	**CFG: OSZ channelx** Configuration analog inputs of OSZ	📖 10-58
[C0733] 1	 DIG. TRIGGER	 1000	 FIXED0		→ Selection list 2	**CFG: OSZ trigger input** Configuration of the OSZ trigger input	📖 10-58
C0734	TRIGGER-QUELLE	1	0 Dig. trigger input 1 Channel 1 2 Channel 2 3 Channel 3 4 Channel 4			Selection of the OSZ **trigger source**	
C0735	TRIGGER PEGEL	0	-32767	{1}	32767	**Trigger level** setting for channel 1 ... 4 of OSZ	

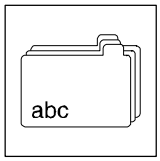


Code	LCD	Possible settings		IMPORTANT	
		Lenze	Choice		
C0736	TRIGGER FLANKE	0	0 LOW/HIGH edge 1 HIGH/LOW edge	Selection of **Trigger edge** of OSC	
C0737	TRIGGER DELAY	0.0	-100.0 {0.1 %} 999.99	**Trigger delay** Setting pre and post triggering of OSZ	
C0738	ABTASTPERIODE	3	3 1 ms 4 2 ms 5 5 ms 6 10 ms 7 20 ms 8 50 msec 9 100 ms 10 200 ms 11 500 ms 12 1 s 13 2 sec 14 5 s 15 10 s 16 20 s 17 50 s 18 1 min 19 2 min 20 5 min 21 10 min	Selection of **scanning period** of OSC	
C0739	KANALANZAHL	4	1 {1} 4	**Number of channels** to be measured (OSZ)	
C0740 1	START	0	0 {1} 16383	**Start point for reading** Determine start point when reading the data memory of OSZ Selection of a memory block	
2	FREI/SPERREN	0	0 Data reading inhibited 1 Data reading enabled	**Data reading enabled/inhibited** The data memory of OSZ must be enabled for reading	
C0741 1 2 3 4	VERSION OSZ LENGTH MEMORY DATA WIDTH ANZAHL KANÄLE	Disp		**Version OSZ** Sub1 Version Sub2 Memory size Sub3 Data width Sub4 Number of channels	
C0742	LENGTH OF DB	Disp		**Data block length** of OSC	
C0743	READ DB	Disp		**Data block reading** of a 8 byte data block	
C0744	SPEICHERGRÖSSE	2048	512 0 1024 1 1536 2 2048 3 3072 4 4096 5 8192 6	**Memory capacity** must be adapted to the measuring task	
C0749 1 2 3	INDEX ABBRUCH INDEX TRIGGER INDEX ENDE			Information about storing measured values	

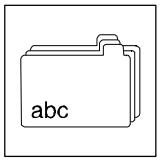


Appendix

Code	LCD	Possible settings				IMPORTANT	
		Lenze	Choice				
C0750	VP DENOM	16	1 2 4 8 16 32 64 128 256 512 1024 2048 4096 8192 16384	Gain = 1 Gain = 1/2 Gain = 1/4 Gain = 1/8 Gain = 1/16 Gain = 1/32 Gain = 1/64 Gain = 1/128 Gain = 1/256 Gain = 1/512 Gain = 1/1024 Gain = 1/2048 Gain = 1/4096 Gain = 1/8192 Gain = 1/16384		**DFRFG1 Vp denominator position** Denominator gain of position controller of DFRFG1	
C0751	DFRFG1 TIR	1.000	0.001	{0.001 s}	999.900	**DFRFG1 Tir (acceleration time)**	
C0752	MAX SPEED	3000	1	{1 rpm}	16000	**DFRFG1 max. speed** Maximum make up speed	
C0753	DFRFG1 QSP	0.000	0.000	{0.001 s}	999.900	Deceleration time T_{if} for QSP of DFRFG1	
C0754	PH ERROR	*	10	{1 inc}	2000000000	**Contouring error** of DFRFG1 → 2000000000 • 1 turn = 65535 inc	
C0755	SYN WINDOW	100	0	{1 inc}	65535	**Synchronization window** of DFRFG1	
C0756	OFFSET	0	$-1*10^9$	{1 inc}	$1*10^9$	Offset of DFRFG1	
C0757	FUNCTION	0	0 1	no TP start with TP start		Function of DFRFG1	
[C0758]	IN	1000	FIXEDPHI-0		→ Selection list 4	Configuration phase input of DFRFG1	📖 10-58
[C0759]	QSP	1000	FIXED0		→ Selection list 2	Configuration digital input (triggering QSP) of DFRFG1	📖 10-58
[C0760]	STOP	1000	FIXED0		→ Selection list 2	Configuration digital input (ramp generator stop) of DFRFG1	📖 10-58
[C0761]	RESET	1000	FIXED0		→ Selection list 2	Configuration digital input (reset integrators) of DFRFG1	📖 10-58
C0764 1 2 3	 QSP STOP RESET					Digital input signals of DFRFG1	
C0765	IN		-32767	{1 rpm}	32767	Absolute analog input signal of DFRFG1	
C0766	DREHRICHTUNG	1	1 2 3	cw/ccw cw cww		**Direction of rotation** Direction of rotation (cw/ccw) Direction of rotation (cw) Direction of rotation (ccw)	
[C0770]	D	1000	FIXED0		→ Selection list 2	Configuration data input of FLIP1	📖 10-58
[C0771]	CLK	1000	FIXED0		→ Selection list 2	Configuration clock input of FLIP1	📖 10-58
[C0772]	CLR	1000	FIXED0		→ Selection list 2	Configuration reset input of FLIP1	📖 10-58
C0773 1 2 3	 D CLK CLR					Digital input signals of FLIP1	
[C0775]	D	1000	FIXED0		→ Selection list 2	Configuration data input of FLIP2	📖 10-58
[C0776]	CLK	1000	FIXED0		→ Selection list 2	Configuration clock input of FLIP2	📖 10-58
[C0777]	CLR	1000	FIXED0		→ Selection list 2	Configuration reset input of FLIP2	📖 10-58
C0778 1 2 3	 D CLK CLR					Digital input signals of FLIP2	

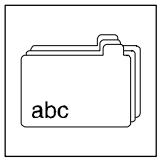


Code	LCD	Possible settings				IMPORTANT	
		Lenze	Choice				
[C0780]	N	1000	AIN1-OUT		→ Selection list 1	Configuration main setpoint input of NSET	📖 10-58
[C0781]	N-INV	1000	CW/CCW/Q-CW/CCW		→ Selection list 2	Configuration main setpoint inversion of NSET	📖 10-58
[C0782]	NADD	1000	ASW1-OUT		→ Selection list 1	Configuration additional setpoint input of NSET	📖 10-58
[C0783]	NADD-INV	1000	FIXED0		→ Selection list 2	Configuration additional setpoint inversion of NSET	📖 10-58
[C0784]	cINH-VAL	1000	MCTRL-NACT		→ Selection list 1	Configuration output signal with controller inhibit of NSET	📖 10-58
[C0785]	SEt	1000	MCTRL-NSET2		→ Selection list 1	Configuration ramp generator of NSET	📖 10-58
[C0786]	LOAD	1000	MCTRL-QSP-OUT		→ Selection list 2	Configuration digital input (load ramp generator) of NSET	📖 10-58
[C0787]					→ Selection list 2	Configuration JOG selection and JOG activation of NSET • Binary interpretation	📖 10-58
1	JOG*1	1000	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 of NSET • Binary interpretation • Tir and Tif pairs are identical	📖 10-58
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	Configuration digital input (ramp generator 0) of NSET	📖 10-58
[C0790]	RFG-StOP	1000	FIXED0		→ Selection list 2	Configuration digital input (ramp generator stop) of NSET	📖 10-58
C0798			-199.99	{0.01 %}	199.99	Analog input signals of NSET	
1	cINH-VAL						
2	SEt						
C0799						Digital input signals of NSET	
1	N-INV						
2	NADD-INV						
3	LOAD						
4	JOG*1						
5	JOG*2						
6	JOG*4						
7	JOG*8						
8	tI*1						
9	tI*2						
10	tI*4						
11	tI*8						
12	DIS RFG-0						
13	RFG-StOP						
[C0800]	SEt	1000	FIXED0%		→ Selection list 1	Configuration setpoint input of process controller PCTRL1	📖 10-58
[C0801]	Act	1000	FIXED0%		→ Selection list 1	Configuration actual value input of PCTRL1	📖 10-58
[C0802]	INFLU	1000	FIXED0%		→ Selection list 1	Configuration evaluation input of PCTRL1	📖 10-58
[C0803]	ADAPt	1000	FIXED0%		→ Selection list 1	Configuration adaptation input of PCTRL1	📖 10-58
[C0804]	INAct	1000	FIXED0		→ Selection list 2	Configuration deactivation input of PCTRL1	📖 10-58
[C0805]	I-OFF	1000	FIXED0		→ Selection list 2	Configuration digital input (switch off I-component) of PCTRL1	📖 10-58
C0808			-199.99	{0.01 %}	199.99	Analog input signals of PCTRL1	
1	SEt						
2	Act						
3	INFLU						
4	ADAPt						

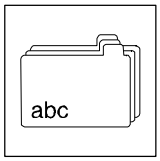


Appendix

Code	LCD	Possible settings				IMPORTANT	
		Lenze	Choice				
C0809						Digital input signals of PCTRL1	
1	INAct						
2	I-OFF						
[C0810]					→ Selection list 1	Configuration analog inputs of analog switch ASW1	📖 10-58
1	IN	1000	AIN2-OUT				
2	IN	1000	FIXED0%				
[C0811]	SEt	1000	FIXED0		→ Selection list 2	Configuration digital input of ASW1	📖 10-58
C0812			-199.99	{0.01 %}	199.99	Analog input signals of ASW1	
1	IN						
2	IN						
C0813	SEt					Digital input signal of ASW1	
[C0815]					→ Selection list 1	Configuration analog inputs of analog switch ASW2	📖 10-58
1	IN	1000	FIXED0%				
2	IN	1000	FIXED0%				
[C0816]	SEt	1000	FIXED0		→ Selection list 2	Configuration digital input of ASW2	📖 10-58
C0817			-199.99	{0.01 %}	199.99	Analog input signals of ASW2	
1	IN						
2	IN						
C0818	SEt					Digital input signal of ASW2	
[C0820]					→ Selection list 2	Configuration digital inputs of the AND element AND1	📖 10-58
1	IN	1000	FIXED0				
2	IN	1000	FIXED0				
3	IN	1000	FIXED0				
C0821						Digital input signals of AND1	
1	IN						
2	IN						
3	IN						
[C0822]					→ Selection list 2	Configuration digital inputs of the AND element AND2	📖 10-58
1	IN	1000	FIXED0				
2	IN	1000	FIXED0				
3	IN	1000	FIXED0				
C0823						Digital input signals of AND2	
1	IN						
2	IN						
3	IN						
[C0824]					→ Selection list 2	Configuration digital inputs of the AND element AND3	📖 10-58
1	IN	1000	FIXED0				
2	IN	1000	FIXED0				
3	IN	1000	FIXED0				
C0825						Digital input signals of AND3	
1	IN						
2	IN						
3	IN						
[C0826]					→ Selection list 2	Configuration digital inputs of the AND element AND4	📖 10-58
1	IN	1000	FIXED0				
2	IN	1000	FIXED0				
3	IN	1000	FIXED0				
C0827		Disp				Digital input signals of AND4	
1	IN						
2	IN						
3	IN						
[C0828]					→ Selection list 2	Configuration digital inputs of the AND element AND5	📖 10-58
1	IN	1000	FIXED0				
2	IN	1000	FIXED0				
3	IN	1000	FIXED0				

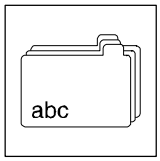


Code	LCD	Possible settings		IMPORTANT	
		Lenze	Choice		
C0829		Disp		Digital input signals of AND5	
1	IN				
2	IN				
3	IN				
[C0830]			→ Selection list 2	Configuration digital inputs of the OR element OR1	📖 10-58
1	IN	1000	FIXED0		
2	IN	1000	FIXED0		
3	IN	1000	FIXED0		
C0831		Disp		Digital input signals of OR1	
1	IN				
2	IN				
3	IN				
[C0832]			→ Selection list 2	Configuration digital inputs of the OR element OR2	📖 10-58
1	IN	1000	FIXED0		
2	IN	1000	FIXED0		
3	IN	1000	FIXED0		
C0833		Disp		Digital input signals of OR2	
1	IN				
2	IN				
3	IN				
[C0834]			→ Selection list 2	Configuration digital inputs of the OR element OR3	📖 10-58
1	IN	1000	FIXED0		
2	IN	1000	FIXED0		
3	IN	1000	FIXED0		
C0835		Disp		Digital input signals of OR3	
1	IN				
2	IN				
3	IN				
[C0836]			→ Selection list 2	Configuration digital inputs of the OR element OR4	📖 10-58
1	IN	1000	FIXED0		
2	IN	1000	FIXED0		
3	IN	1000	FIXED0		
C0837		Disp		Digital input signals of OR4	
1	IN				
2	IN				
3	IN				
[C0838]			→ Selection list 2	Configuration digital inputs of the OR element OR5	📖 10-58
1	IN	1000	FIXED0		
2	IN	1000	FIXED0		
3	IN	1000	FIXED0		
C0839		Disp		Digital input signals of OR5	
1	IN				
2	IN				
3	IN				
[C0840]	IN	1000	FIXED0 → Selection list 2	Configuration digital input of the digital NOT element NOT1	📖 10-58
C0841	IN	Disp		Digital input signal of NOT1	
[C0842]	IN	1000	FIXED0 → Selection list 2	Configuration digital input of the digital NOT element NOT2	📖 10-58
C0843	IN	Disp		Digital input signal of NOT2	
[C0844]	IN	1000	FIXED0 → Selection list 2	Configuration digital input of the digital NOT element NOT3	📖 10-58
C0845	IN	Disp		Digital input signal of NOT3	
[C0846]	IN	1000	FIXED0 → Selection list 2	Configuration digital input of the digital NOT element NOT4	📖 10-58
C0847	IN	Disp		Digital input signal of NOT4	

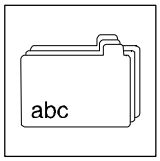


Appendix

Code	LCD	Possible settings		IMPORTANT	
		Lenze	Choice		
[C0848]	IN	1000	FIXED0 → Selection list 2	Configuration digital input of the digital NOT element NOT5	10-58
C0849	IN	Disp		Digital input signal of NOT5	
[C0850]			→ Selection list 1	Configuration process output words for automation interface AIF (X1)	10-58
1	OUT.W1	1000	FIXED0%		
2	OUT.W2	1000	FIXED0%		
3	OUT.W3	1000	FIXED0%		
[C0851]			→ Selection list 3	Configuration 32-bit phase information	10-58
1	OUT.D1	1000	FIXED0INC		
C0852	TYPE OUT.W2	0	0 Analog 1 digital 0-15 2 D1: low phase 3 D2: high phase	Configuration process output word 2 for automation interface AIF (X1)	
C0853	TYPE OUT.W3	0	0 Analog 1 digital 16-31 2 high phase	Configuration process output word 3 for automation interface AIF (X1)	
C0854	TYPE OUT.W1	0	0 Analog 3 D2: low phase	Configuration process output word 1 for automation interface AIF (X1)	
C0855	IN (0-15) IN (16-31)	Disp	0 FFFF	Process input words hexadecimal for automation interface X1	
C0856		Disp	-199.99 {0.01%} 199.99	Process input words decimal • 100% = 16384	
1	IN.W1				
2	IN.W2				
3	IN.W3				
C0857	IN.D1	Disp	-2147483648 {1} 2147483647	32-bit phase information	
C0858		Disp	-199.99 {0.01 %} 199.99	Process output words • 100% = 16384	
1	OUT.W1				
2	OUT.W2				
3	OUT.W3				
C0859	OUT.D1	Disp	-2147483648 {1} 2147483647	32-bit phase information	
[C0860]			→ Selection list 1	Configuration process output words for system bus output blocks (CAN)	10-58
1	OUT1.W1	5001	FIXED0%		
2	OUT1.W2	1000	FIXED0%		
3	OUT1.W3	1000	FIXED0%		
4	OUT2.W1	1000	FIXED0%		
5	OUT2.W2	1000	FIXED0%		
6	OUT2.W3	1000	FIXED0%		
7	OUT2.W4	1000	FIXED0%		
8	OUT3.W1	1000	FIXED0%		
9	OUT3.W2	1000	FIXED0%		
10	OUT3.W3	1000	FIXED0%		
11	OUT3.W4	1000	FIXED0%		
[C0861]			→ Selection list 3	Configuration 32-bit phase information for system bus output blocks (CAN)	10-58
1	OUT1.D1	30021	FIXED0INC		
2	OUT2.D1	1000	FIXED0INC		
3	OUT3.D1	1000	FIXED0INC		
C0863		Disp	0 FFFF	Process input words hexadecimal for system bus (CAN)	
1	IN1 DIG0				
2	IN1 DIG16				
3	IN2 DIG0				
4	IN2 DIG16				
5	IN3 DIG0				
6	IN3 DIG16				
C0864				Configuration process output words for system bus (CAN)	
1	TYPE OUT1.W2	0	0 analog sign		
2	TYPE OUT2.W1	0	1 digital 0-15		
3	TYPE OUT3.W1	0	2 low phase		

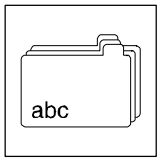


Code	LCD	Possible settings				IMPORTANT	
		Lenze	Choice				
C0865 1 2 3	TYPE OUT1.W3 TYPE OUT2.W2 TYPE OUT3.W2	 0 0 0	 0 1 2	 analog sign digital 16-31 high phase		Configuration process output words for system bus (CAN)	
C0866 1 2 3 4 5 6 7 8 9 10 11	 IN1.W1 IN1.W2 IN1.W3 IN2.W1 IN2.W2 IN2.W3 IN2.W4 IN3.W1 IN3.W2 IN3.W3 IN3.W4	Disp	-199.99	{0.01 %}	199.99	Process input words for system bus (CAN) • 100% = 16384	
C0867 1 2 3	 IN1.D1 IN2.D1 IN3.D1	Disp	-2147483648	{1}	2147483647	32-bit phase information for system bus (CAN)	
C0868 1 2 3 4 5 6 7 8 9 10 11	 OUt1.W1 OUt1.W2 OUt1.W3 OUt2.W1 OUt2.W2 OUt2.W3 OUt2.W4 OUt3.W1 OUt3.W2 OUt3.W3 OUt3.W4	Disp	-199.99	{0.01 %}	199.99	Process output words system bus (CAN) • 100% = 16384	
C0869 1 2 3	 OUt1.D1 OUt2.D1 OUt3.D1	Disp	-2147483648	{1}	2147483647	32-bit phase information for system bus (CAN)	
[C0870] 1 2	 CINH CINH	 1000 1000	 FIXED0 FIXED0	→ Selection list 2		Configuration digital inputs (inhibit controller) of DCTRL	📖 10-58
[C0871]	TRIP-SEt	1000	DIGIN 4	→ Selection list 2		Configuration digital input (TRIP-Set) of DCTRL	📖 10-58
[C0876]	TRIP-RES	55	DIGIN 5	→ Selection list 2		Configuration digital input (TRIP-Reset) of DCTRL	📖 10-58
C0878 1 2 3 4	 cINH1 cINH2 tRIP-SEt tRIP-RES	Disp				Digital input signals of DCTRL	
C0879 1 2 3	 RESEt C135 RESEt AIF RESEt CAN	0	0 1	no reset reset		**Reset control words** • C0879 = 1 performs one reset	
[C0885]	R	1000	DIGIN 1	→ Selection list 2		Configuration digital input (CW rotation) of CW/CCW/Q	📖 10-58
[C0886]	L	1000	DIGIN 2	→ Selection list 2		Configuration digital input (CCW rotation) of CW/CCW/Q	📖 10-58

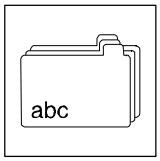


Appendix

Code	LCD	Possible settings			IMPORTANT	
		Lenze	Choice			
C0889 1 2	 R L	Disp			Digital input signals of CW/CCW/Q	
[C0890]	N-SEL	30020	NSET-NOUT	→ Selection list 1	Configuration speed setpoint input motor control of MCTRL	📖 10-58
[C0891]	M-ADD	30021	FIXED0%	→ Selection list 1	Configuration torque setpoint input of MCTRL	📖 10-58
[C0892]	LO-M-LIM	5700	ANEG1-OUT	→ Selection list 1	Configuration lower torque limit of MCTRL	📖 10-58
[C0893]	HI-M-LIM	19523	FCODE-472/3	→ Selection list 1	Configuration upper torque limit of MCTRL	📖 10-58
[C0894]	PHI-SEL	30020	FIXED0INC	→ Selection list 3	Configuration rotor position setpoint of MCTRL	📖 10-58
[C0895]	PHI-LIM	19526	FIXED100%	→ Selection list 1	Configuration phase controller limit of MCTRL	📖 10-58
[C0896]	N2-LIM	1000	FIXED0%	→ Selection list 1	Configuration second speed limitation of MCTRL	📖 10-58
[C0897]	PHI-ON	1001	FIXED0	→ Selection list 2	Configuration switch-on signal phase controller of MCTRL	📖 10-58
[C0898]	FLD-WEAK	1006	FIXED100%	→ Selection list 1	Configuration signal for field weakening of MCTRL	📖 10-58
[C0899]	M/M-SWE	1000	FIXED0	→ Selection list 2	Configuration changeover between speed control and torque control MCTRL	📖 10-58
[C0900]	QSP	1000	CW/CCW/Q-QSP	→ Selection list 2	Configuration control signal to activate QSP of MCTRL	📖 10-58
[C0901]	I-SEL	1000	FIXED0%	→ Selection list 1	Configuration load I-component of the MCTRL speed controller	📖 10-58
[C0902]	I-LOAD	1000	FIXED0	→ Selection list 2	Configuration release signal to load the I-component of the MCTRL speed controller	📖 10-58
[C0903]	P-ADAPT	1006	FIXED0	→ Selection list 1	Configuration adaptation phase controller	📖 10-58
C0906 1 2 3 4 5 6 7 8	 N-SEL M-ADD LO-M-LIM HI-M-LIM PHI-LIM N2-LIM FLD-WEAK I-SEL	Disp	-199.99	{0.01 %} 199.99	Analog input signals of MCTRL	
C0907 1 2 3 4	 PHI-ON M/M-SWE QSP I-LOAD	Disp			Digital input signals of MCTRL	
C0908	PHI-SEL	Disp	-2147483647	{1 inc} 2147483647	Set phase signal of MCTRL • 1 turn = 65536 inc	
C0909	SPEED LIMIT	1	1 +/- 175 % 2 0 .. +175 % 3 -175 .. 0 %		**Speed limitation** for the speed setpoint of MCTRL	
C0940	NUMERATOR	1	-32767	{1} 32767	**CONV1 numerator** Numerator for CONV1	
C0941	DENOMINATOR	1	1	{1} 32767	**CONV1 denominator** Denominator for CONV1	
[C0942]	IN	1000	FIXED0%	→ Selection list 1	Configuration analog input CONV1	📖 10-58
C0943	IN	Disp	-199.99	{0.01 %} 199.99	Relative analog input signal of CONV1	
C0945	NUMERATOR	1	-32767	{1} 32767	**CONV2 numerator** Numerator for CONV2	

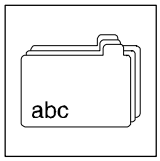


Code	LCD	Possible settings				IMPORTANT	
		Lenze	Choice				
C0946	DENOMINATOR	1	1	{1}	32767	**CONV2 denominator** Denominator for CONV2	
[C0947]	IN	1000	FIXED0%		→ Selection list 1	Configuration analog input CONV2	📖 10-58
C0948	IN	Disp	-199.99	{0.01 %}	199.99	Relative analog input signal of CONV2	
C0950	NUMERATOR	1	-32767	{1}	32767	**CONV3 numerator** Numerator for CONV3	
C0951	DENOMINATOR	1	1	{1}	32767	**CONV3 denominator** Denominator for CONV3	
[C0952]	IN	1000	FIXEDPHI0		→ Selection list 4	Configuration analog input CONV3	📖 10-58
C0953	IN	Disp	-32767	{1 rpm}	32767	Absolute analog input signal of CONV3	
C0955	NUMERATOR	1	-32767	{1}	32767	**CONV4 numerator** Numerator for CONV4	
C0956	DENOMINATOR	1	1	{1}	32767	**CONV4 denominator** Denominator for CONV4	
[C0957]	IN	1000	FIXEDPHI0		→ Selection list 4	Configuration analog input CONV4	📖 10-58
C0958	IN	Disp	-32767	{1 rpm}	32767	Absolute analog input signal of CONV4	
C0960	FUNCTION	1	1 Function1 2 Function2 3 Function3			Characteristic CURVE1-IN	
C0961	Y0	0.00	0.00	{0.01 %}	199.99	Ordinate of the pair (x=0%/y0) of CURVE1	
C0962	Y1	50.00	0.00	{0.01 %}	199.99	Ordinate of the pair (x1/y1) of CURVE1	
C0963	Y2	75.00	0.00	{0.01 %}	199.99	Ordinate of the pair (x2/y2) of CURVE1	
C0964	Y100	100.00	0.00	{0.01 %}	199.99	Ordinate of the pair (x=100%/y100) of CURVE1	
C0965	X1	50.00	0.01	{0.01 %}	100.00	Abscissa of the pair (x1/y1) of CURVE1	
C0966	X2	75.00	0.01	{0.01 %}	99.00	Abscissa of the pair (x2/y2) of CURVE1	
[C0967]	IN	1000	FIXED0%		→ Selection list 1	Configuration characteristic CURVE1-IN	📖 10-58
C0968	IN	Disp	-199.99	{0.01 %}	199.99	Display of CURVE1-IN	
[C0990]	IN	1000	FIXEDPHI0		→ Selection list 4	Configuration input phase integrator PHINT1	📖 10-58
[C0991]	RESET	1000	FIXED0		→ Selection list 2	Configuration reset input of PHINT1	📖 10-58
C0992	IN	Disp	-32767	{1}	32767	Input signal of PHINT1	
C0993	RESET	Disp				Digital input signal of PHINT1	
C0995	DIVISION	0	-31	{1}	31	**Factor**	
[C0996]	IN	1000	FIXED0INC		→ Auswahlliste 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	📖 10-58
C1002	IN	Disp	-2147483647	{1}	2147483647	Input signal of CONVPHA1	
C1010	FUNCTION	1	0 OUT = IN1 1 IN1 + IN2 2 IN1 - IN2 3 IN1 * IN2 14 IN1 / IN2 21 IN1 + IN2 (no limit) 22 IN1 - IN2 (no limit)			Function of ARITPH1	
[C1011]					→ Selection list 3	Configuration inputs ARITPH1	📖 10-58
1	IN	1000	FIXED0INC				
2	IN	1000	FIXED0INC				
C1012		Disp	-2147483647	{1}	2147483647	Input signals ARITPH1	
1	IN						
2	IN						

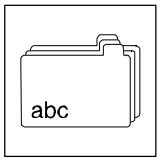


Appendix

Code	LCD	Possible settings				IMPORTANT	
		Lenze	Choice				
C1020	FUNCTION	1	0 OUT = IN1 1 IN1 + IN2 2 IN1 - IN2 3 IN1 * IN2 14 IN1 / IN2			Function of ARITPH2	
[C1021]			100	{1}	25103	Configuration inputs ARITPH2	📖 10-58
1	IN	1000			→ Selection list 3		
2	IN	1000					
C1022		Disp	-2147483647	{1}	2147483647	Input signals ARITPH2	
1	IN						
2	IN						
C1025	FUNCTION	1	0 OUT = IN1 1 IN1 + IN2 2 IN1 - IN2 3 IN1 * IN2 14 IN1 / IN2			Function of ARITPH3	
[C1026]			100	{1}	25103	Configuration inputs ARITPH3	📖 10-58
1	IN	1000			→ Selection list 3		
2	IN	1000					
C1027		Disp	-2147483648	{1}	2147483647	Input signals ARITPH3	
1	IN						
2	IN						
C1090	OUTPUT SIGNAL	Disp	-2147483648	{1}	2147483647	Output signal of FEVAN1	
C1091	CODE	141	2	{1}	2000	Code for FEVAN1	
C1092	SUBCODE	0	0	{1}	255	Subcode for FEVAN1	
C1093	NUMERATOR	1.0000	0.0001	{0.0001}	100000.0000	Numerator for FEVAN1	
C1094	DENOMINATOR	0.0001	0.0001	{1}	100000.0000	Denominator for FEVAN1	
C1095	OFFSET	0	0	{1}	1000000000	Offset for FEVAN1	
[C1096]	IN	1000	FIXED0%		→ Selection list 1	Configuration analog input of FEVAN1	📖 10-58
[C1097]			FIXED0		→ Selection list 2	Configuration digital inputs of FEVAN1	📖 10-58
1	LOAD	1000					
2	BUSY-IN	1000					
3	FAIL-IN	1000					
C1098	IN	Disp	-32768	{1}	32767	Analog input signal of FEVAN1	
C1099		Disp				Digital input signal of FEVAN1	
1	LOAD						
2	BUSY-IN						
3	FAIL-IN						
C1100	FUNCTION	1	1 Return 2 Hold			Function of FCNT1	
[C1101]					→ Selection list 1	Configuration analog inputs of FCNT1	📖 10-58
1	LO-VAL	1000	FIXED0%				
2	CMP-VAL	1000	FIXED0%				
[C1102]					→ Selection list 2	Configuration digital inputs of FCNT1	📖 10-58
1	CLKUP	1000	FIXED0				
2	CLKDWN	1000	FIXED0				
3	LOAD	1000	FIXED0				
C1103		Disp	-32768	{1}	32768	Analog input signals of FCNT1	
1	LO-VAL						
2	CMP-VAL						
C1104		Disp				Digital input signals of FCNT1	
1	CLKUP						
2	CLKDWN						
3	LOAD						
C1105	FUNCTION	1	1 Return 2 Hold			Function of FCNT2	

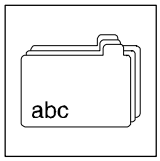


Code	LCD	Possible settings		IMPORTANT	
		Lenze	Choice		
[C1106]			50 {1} 25104	Configuration analog inputs of FCNT2	📖 10-58
1	LO-VAL	1000	→ Selection list 1		
2	CMP-VAL	1000			
[C1107]			50 {1} 25132	Configuration digital inputs of FCNT2	📖 10-58
1	CLKUP	1000	→ Selection list 1		
2	CLKDWN	1000			
3	LOAD	1000			
C1108		Disp	-32767 {1} 32767	Analog input signals of FCNT2	
1	LO-VAL				
2	CMP-VAL				
C1109		Disp	0 1	Digital input signals of FCNT2	
1	CLKUP				
2	CLKDWN				
3	LOAD				
C1110	FUNCTION	1	1 Return 2 Hold	Function of FCNT3	
[C1111]			50 {1} 25104	Configuration analog inputs of FCNT3	📖 10-58
1	LO-VAL	1000	→ Selection list 1		
2	CMP-VAL	1000			
[C1112]			51 {1} 25132	Configuration digital inputs of FCNT3	📖 10-58
1	CLKUP	1000	→ Selection list 2		
2	CLKDWN	1000			
3	LOAD	1000			
C1113		Disp	-32767 {1} 32767	Analog input signals of FCNT3	
1	LO-VAL				
2	CMP-VAL				
C1114		Disp	0 1	Digital input signals of FCNT3	
1	CLKUP				
2	CLKDWN				
3	LOAD				
C1120	SYNC MODE	2	0 off 1 CAN sync 2 Terminal sync	Function of SYNC1	
[C1121]		2	0 {1 ms} 13	SYNC1	
1	SYNC CYCLE			Definition of the cycle time of the sync signals (in the slave) • for SYSTEM BUS only	
2	INTERPOL. CYCL			Definition of the interpolation time between the sync signals (in the slave) • only for terminal • the interpolation is started with every sync signal	
C1122	SYNC TIME	0.460	0.000 {0.001 ms} 10.000	Phase shift between the CAN sync and internal control program cycle • for SYSTEM BUS only • depends on baud rate and bus load	
C1123			-0.450 {0.001 ms} 0.450		
1	PHASESHIFT	0		• **Phase shifting** between terminal sync and internal control program cycle • only for terminal sync	
2	SYNC WINDOW	0	-0.450 {0.001 ms} 0.450	**Synchronization window** for the synchronisation edge of the terminal sync (LOW/HIGH signal) • only for terminal sync • activated when the sync start window is quit	
[C1124]	IN1	1000	FIXEDOINC → Selection list 3	Configuration input 1 of SYNC1	📖 10-58
[C1125]	IN2	1000	FIXEDOINC → Selection list 3	Configuration input 2 of SYNC1	📖 10-58

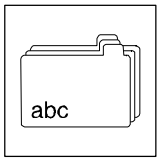


Appendix

Code	LCD	Possible settings				IMPORTANT	
		Lenze	Choice				
[C1126]	IN3	1000	FIXED0INC		→ Selection list 3	Configuration input 3 of SYNC1	📖 10-58
C1127	IN1	Disp	-2147483647	{1}	2147483647	Input signal 1 of SYNC1	
C1128	IN2	Disp	-2147483647	{1}	2147483647	Input signal 2 of SYNC1	
C1129	IN3	Disp	-2147483647	{1}	2147483647	Input signal 3 of SYNC1	
[C1130]			50	{1}	25104	CFG: CONVPHPH2-NUM	📖 10-58
1	NUM	1000			→ Selection list 1		
2	DEN	1000					
[C1131]	ACT	1000	51	{1}	25132 → Selection list 2	CFG: CONVPHPH2-ACT	📖 10-58
[C1132]	IN	1000	50	{1}	25104 → Selection list 3	CFG: CONVPHPH2-IN	📖 10-58
C1135		Disp	-32767	{1}	32767		
1	NUM					DIS: CONVPHPH2-..	
2	DEN						
C1136	ACT	Disp	0		1	DIS: CONVPHPH2-ACT	
C1137	IN	Disp	-2147483647	{1 incr}	2147483647	DIS: CONVPHPH2-IN	
[C1160]					→ Selection list 1	Configuration analog inputs of ASW3	📖 10-58
1	IN	1000	FIXED0%				
2	IN	1000	FIXED0%				
[C1161]	SET	1000	FIXED0		→ Selection list 2	Configuration digital input of ASW3	📖 10-58
C1162		Disp	-199.99	{0.01 %}	199.99	Analog input signals of ASW3	
1	IN						
2	IN						
C1163	SET	Disp				Digital input signal of ASW3	
[C1165]					→ Selection list 1	Configuration analog inputs of ASW4	📖 10-58
1	IN	1000	FIXED0%				
2	IN	1000	FIXED0%				
[C1166]	SET	1000	FIXED0		→ Selection list 2	Configuration digital input of ASW4	📖 10-58
C1167		Disp				Analog input signals of ASW4	
1	IN		-199.99	{0.01 %}	199.99		
2	IN						
C1168	SET	Disp				Digital input signal of ASW4	
C1180	IDENT MODE					**Mode: control parameter identification**	
		0	0	inactive		not active	
			1	calculate		Calculate control parameters from data set	
			2	Identify		Identify only parameters	
			3	ident&calc.		Calculate only parameters for control system and control	
C1181	ID STATE					**Status: controller ident.**	📖 5-27
		Disp	0	inactive		Not active	
			1	busy		busy	
			2	Error: no calculation		Fault	📖 5-29
			3	Error: no identification			
			4	Error: C0057 small			
			5	Error: n <> 0			
			6	Error: RSP			
			7	Error: C1185 big			
			8	Error: overtime			
			9	Error: bad condition			

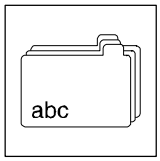


Code	LCD	Possible settings				IMPORTANT	
		Lenze	Choice				
			10	wait for start		Waiting for enable to start the movement	
			11	motion		Waiting for end of movement	
			12	wait for RSP		Waiting for controller inhibit for completion	
			99	Error: internal		Internal error	
C1182	PHI-ID PHASE	100	0.5	{0.1 rev}	3000	**phi max controller ident.**	📖 5-27
C1183	N-ID MAX	100	10	{1 %}	100	**n max controller ident.**	📖 5-27
C1184	M-ID MAX	100	10	{1 %}	100	**m max controller ident.**	📖 5-27
C1185	M RISETIME	100	10	{1 ms}	10000	**M acceleration time**	📖 5-27
C1186	OPTIMIZE ID	0	0	Optimum control		**Optimisation: controller ident.**	📖 5-27
			1	Error			
C1187	INERTIA	0	0	{0.1 kg*cm^2}	214000	**Inertia**	📖 5-27
C1188	FRICTION	0	0	{1 %}	100	**Friction load component (n-prop.)**	📖 5-27
C1190	MOT. PTC-SEL.	0	0	standard		**motor PTC selection**	
			1	Characterist.			
C1191			0	{1 °C}	255	**Characteristic: Temp. 1**	
1	CHAR.: TEMP 1	100				Selection of PTC temperature characteristic	
2	CHAR.: TEMP 2	150					
C1192			0	{1 Ω}	30000	**Characteristic: resistor 1**	
1	CHAR.: OHM 1	1670				Selection of resistance characteristic for PTC	
2	CHAR.: OHM 2	2225					
[C1195]	OUT.D2	1000	FIXEDOINC		→ Selection list 3	Configuration input phase signal of AIF	📖 10-58
C1196	OUT.D2	Disp	-2147483647	{1}	2147483647	Input signal of AIF	
C1197	IN.D2	Disp	-2147483647	{1}	2147483647	AIF-IN.D2	
C1202	RATIO NUM.	1	1	{1}	65535	**Gearbox factor numerator**	
C1203	RATIO DENUM.	1	1	{1}	65535	**Gearbox factor denominator**	
C1204	FEED CONSTANT	1.0000	0.0001	{0.0001}	214000	**Feed constant** • Feed of the machine in units per revolution of the load side of the gearbox.	
C1205	POS. RESOLUT.	Disp	0	{0.0001 incr/unit}	214000	**Position resolution** • The position resolution indicates the number of increments which resolves a unit determined by the user.	
[C1206]	SET POLARITY	0	0	Not inverse		**Polarity position setpoint** • Reversal of the position direction	
			1	Inverse			
C1207			1	{1}	65335	**Position encoder gearbox factor**	
1	FDBK RAT NUM	1				• Gearbox factor between motor and position encoder.	
2	FDBK RAT DEN	1				• Numerator/denominator corresponds to motor speed/encoder speed.	
						• Encoder to motor shaft: 1/1	
C1208	ACT POLARITY	0	0	not inverse		**Polarity actual position** • Inversion of the actual position, e.g. when using a separate position encoder behind the gearbox.	
			1	inverse			
C1209	REF END-POINT	0	0	Ref-point		**Homing end point** • Point where the drive is to be positioned after homing	
			1	Real-0			
			61	VTPOS-No 060			
			71	VTPOS-No 070			
			101	VTPOS-No 100			
C1210	POS. MODE	0	0	Absolute Pos		**Positioning mode** • With "absolute positioning", relative as well as absolute positionings are possible. With "relative positioning" however, only relative positionings are possible.	
			1	Relative Pos			
			2	Abs.Pos/Store			

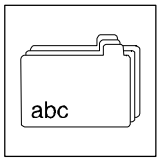


Appendix

Code	LCD	Possible settings		IMPORTANT
		Lenze	Choice	
C1211	START PS NO.	1	1 {1} 32	**Start-PS no.** • Program set no. at which the positioning program is processed after the edge at the "PRG-START" input.
C1212	ACT. PS NO.	Disp	0 Prog. end 1 PS 01 2 PS 02 3 PS 03 ... 31 PS 31 32 PS 32	**Actual PS no.** • Display of the momentary program set no. or operating mode.
C1213	REF. MODE	0	0 +home 1 -home 2 +LIM,-home 3 -LIM,+home 4 +MARK,-home 5 -MARK,+home 6 +MARK,+TP 7 -MARK,-TP 8 +TP 9 -TP 10 +LIM,-TP 11 -LIM,+TP	**Homing mode** • Mode for homing (valid for manual mode and program homing).
C1214	REF TP-INPUT	4	1 TP-IN=E01 2 TP-IN=E02 3 TP-IN=E03 4 TP-IN=E04	**Homing touch probe** • Selection of the touch probe input terminal for homing acc. to modes 6...9. When using an incremental encoder, the TP input E04 is particularly suitable.
C1215 1 ... 4	 TP-TRANS ... TP-TRANS	 0 ... 0	0 +slope 1 -slope	**TP input edge** • Selection of the edge for the touch probe input terminals (valid for homing acc. to modes 6 to 9, TP positioning, TP storing).
C1216	V-REF2 ACTIV.	0	0 inactive 1 active	**Activation of 2nd homing speed**
C1218 1 2	 FOL.TOLERANCE FOL.TOLERANCE	 4.0000 1.0000	0 {0.0001 units} 214000	**Contouring error tolerance**
C1220 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	 POS-TARGET POS-SETPOS POS-ACTPOS ACT.FOLLOWERR ACTPOS ABS. REFMARK 0-IMP ACT.HOME OFFS ACT.HOME POS. ACT. WAY ACT. C1223 ACT. C1224 ACT. C1240 ACT. C1250 ACT. VNORM ACT. ANORM	Disp	-214000 {0.0001 units} 214000	1 = Current position target 2 = Current position setpoint 3 = Current position 4 = Current contouring error 5 = Read absolute value 6 = Distance REF-MARK to zero pulse 7 = Current reference offset 8 = Current reference position 9 = Distance to be traversed 10 - 13 = Effective internal code value: C1223/C1224/C1240/C125010 (internal limitation possible: see chapter: Troubleshooting, "Message P18") 14 - 15 = Internal fault analysis value

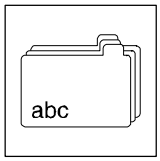


Code	LCD	Possible settings				IMPORTANT	
		Lenze	Choice				
C1221 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	 POS-TARGET POS-SETPOS POS-ACTPOS Act.FOLLOWERR ACTPOS Abs. REFMARK 0-IMP Act.HOME OFFS Act.HOME POS. Act. WAY Act. C1223 Act. C1224 Act. C1240 Act. C1250 Act. VNORM Act. ANORM	Disp	-2147483647	{1 incr}	2147483647	1 = Current position target 2 = Current position setpoint 3 = Current position 4 = Current contouring error 5 = Read absolute value 6 = Distance REF-MARK to zero pulse 7 = Current reference offset 8 = Current reference position 9 = Distance to be traversed 10 - 13 = Effective internal code value: C1223/C1224/C1240/C125010 (internal limitation possible: see chapter: Troubleshooting, “Message P18”) 14 - 15 = Internal fault analysis value	
[C1223]	POS. LIMIT+	16000	0	{0.0001 units}	214000	**Position limit positive**	
[C1224]	POS. LIMIT-	-16000	-214000	{0.0001 units}	0	**Position limit negative**	
C1225	HOME OFFSET	0	-214000	{0.0001 units}	214000	**Homing measure offset**	
C1227	HOME POSITION	0	-214000	{0.0001 units}	214000	**Home position**	
C1240	V-MAX	50	0.0001	{0.0001units/s}	214000	**v-max, maximum speed**	
C1241	V-HOMING 2	2	0.01	{0.01 %vmax}	100	**Second homing speed**	
C1242	V-HOMING	5	0.01	{0.01 %vmax}	100	**Homing speed**	
C1243	V-MANUAL	5	0.01	{0.01 %vmax}	100	**Manual speed**	
C1245 1 2 3	 POS-VSET POS-VTRAV POS-VFINAL	Disp	-199.99	{0.01 %vmax}	199.99	**POS-VSET, actual speed set-value**	
C1250	A-MAX	100	0.0001	{0.0001 units/s^2}	214000	**a-max, maximum acceleration/deceleration**	
C1251	A-HOMING	10	0.01	{0.01 %amax}	100	**Homing acceleration/deceleration**	
C1252	A-MANUAL	10	0.01	{0.01 %amax}	100	**Manual acceleration/deceleration**	
C1253	A-CANCEL	100	0.01	{0.01 %amax}	100	**PS-CANCEL delay**	
C1255 1 2 3	 POS-ASET POS-ACC POS-DCC	Disp	-199.99	{0.01 %amax}	199.99	**POS_ASET, actual acceleration/deceleration**	
C1256	S-RMP: JERK	1	0.064	{0.001 s}	10	**S-ramp: jerk-max**	
C1257	S-RMP: FILTER	10	0	{1 rpm}	1000	**S-ramp: PARAM-RD filter**	
C1260	MANUAL MODE	0	0 No stop 1 With stop			**Manual mode**	
C1261 1 ... 16	 MANU-STEP-NO ... MANU-STEP-NO	 0 ... 15	0	{1}	104 → Selection list 20	**Intermediate stop target (no. in VTPOS)**	📖 10-58
C1280	POS. CONTROL	0	0	{1}	65535	**Control word positioning**	

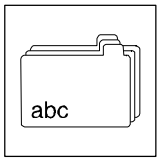


Appendix

Code	LCD	Possible settings			IMPORTANT	
		Lenze	Choice			
C1283	POS. STATUS	Disp	0	program mode	Positioning state Update only under following conditions: • The power stage is supplied (DCTRL-RDY=1), • No error (DCTRL-TRIP=0, DCTRL-FAIL-QSP=0), • The drive is enabled (DCTRL-CINH=0) • No quick stop (QSP) active (MCTRL-QSP-OUT=0) • No manual operation active (POS-MANUAL=0, C1280.B4=0)	
			5	rdy to start		
			10	started		
			11	started-dig		
			12	started-rem		
			15	started-break		
			20	program end		
			25	stopped-dig		
			26	stopped-rem		
			30	STDBY mode		
			35	reset-dig		
			36	reset-rem		
			50	manual-dig		
			51	manual-rem		
			55	manu-neg-dig		
			56	manu-neg-rem		
			57	manu-pos-dig		
			58	manu-pos-rem		
			59	neg+pos activ		
			62	manu-ref-dig		
			63	manu-ref-rem		
			80	POS-LOOP-INH		
			85	POS-PSET-SWT		
C1284	HOMING-STATUS	Disp	0	not REF-OK	**Homing status**	
			1	REF-OK		
			5	homing by prg		
			10	manu-ref-dig		
			11	manu-ref-1280		
			20	abs encoder		
			25	ext abs encod		
C1285			0	Trip	**Conf. P01 (limit switch negative)**	
1	MONIT P01	4	4	Fail-QSP		
2	MONIT P02	4				
3	MONIT P04	4				
4	MONIT P05	4				
C1286			0	Trip	**Conf. P14 (contouring error 1)**	
1	MONIT P14	4	2	Warn		
2	MONIT P15	3	3	Off		
			4	Fail-QSP		
C1287			0	Trip	**Conf. P06 (no reference)**	
1	MONIT P06	4	4	Fail-QSP		
C1288			0	Trip	**Conf. P12 (encoder range)**	
1	MONIT P12	4	4	Fail-QSP		
C1289			0	Trip	**Conf.** **P17 TP control** **P18 display range limited/exceeded** (Position limits, speeds)	
1	MONIT P17	4	2	Warn		
2	MONIT P18	2	3	Off		
			4	Fail-QSP		
C1290			0	Trip	**Conf. P16 (Sync error)**	
1	MONIT P16	4	2	Warn		
			3	Off		
			4	Fail-QSP		
C1291			0	Trip	**Conf. P07 (PS mode error)**	
1	MONIT P07	4	4	Fail-QSP		
2	MONIT P08	4				
3	MONIT P09	4				

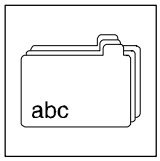


Code	LCD	Possible settings				IMPORTANT	
		Lenze	Choice				
C1298	P18-DIAGNOSIS	Disp	0 1 2 3 4 5 6	No P18 C1223 C1224 C1240 C1250 Vnorm Anorm		**P18 Diagnostics:** Display of the code which led to an internal limitation.	
C1299 1 ... 32	 Act. CNT ... Act. CNT	Disp	0	{1 pcs}	65535	**Actual state of piece counter**	
C1301 1 ... 60	 VTPOS-VALUE ... VTPOS-VALUE	 0 ... 0	-214000	{0.0001 units}	214000	**Input VTPOS position value**	
C1302 1 2 ... 10 ... 30	 VTVEL-VALUE VTVEL-VALUE ... VTVEL-VALUE ... VTVEL-VALUE	 10 20 ... 100 ... 100	0.01	{0.01 %vmax}	100	**Input VTVEL speeds**	
C1303 1 2 ... 10 ... 30	 VTACC-VALUE VTACC-VALUE ... VTACC-VALUE ... VTACC-VALUE	 10 20 ... 100 ... 100	0.01	{0.01 %amax}	100	**Input VTACC accel./decelerations**	
C1304 1 ... 30	 VTPCS-VALUE ... VTPCS-VALUE	 1 ... 30	1	{1 pcs}	65535	**Input VTPCS piece numbers**	
C1305 1 ... 30	 VTTIME-VALUE ... VTTIME-VALUE	 1 ... 30	0	{0.001 s}	65.535	**Input VTTIME waiting times**	
C1311 1 ... 32	 PS MODE ... PS MODE	 0 ... 0	0 1 2 3 4 5 6 7 8 9 11 12 13 14 16 30 31 32 33 34	No pos funct. Absolute PS Relative PS Homing Set home pos. Set target Abs.TP-PS E01 Abs.TP-PS E02 Abs.TP-PS E03 Abs.TP-PS E04 Rel.TP-PS E01 Rel.TP-PS E02 Rel.TP-PS E03 Rel.TP-PS E04 Set Ref-Pos. STDBY STDBY-TP1 STDBY-TP2 STDBY-TP3 STDBY-TP4		**Program set mode**	

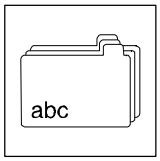


Appendix

Code	LCD	Possible settings		IMPORTANT	
		Lenze	Choice		
C1312 1 ... 32	 TARGET-NO ... TARGET-NO	 0 ... 0	0 {1} 104 → Selection list 11	**PS position target (no. in VTPOS)**	📖 10-58
C1313 1 ... 32	 V-TRAVEL-NO ... V-TRAVEL-NO	 0 ... 0	0 {1} 34 → Selection list 14	**PS positioning speed (no. in VTVEL)**	📖 10-58
C1314 1 ... 32	 ACC-NO ... ACC-NO	 0 ... 0	0 {1} 34 → Selection list 16	**PS acceleration (no. in VTACC)**	📖 10-58
C1315 1 ... 32	 DCC-NO ... DCC-NO	 0 ... 0	0 {1} 34 → Selection list 16	**PS deceleration (no. in VTACC)**	📖 10-58
C1316 1 ... 32	 V-FINAL-NO ... V-FINAL-NO	 0 ... 0	0 {1} 34 → Selection list 15	**PS final speed (no. in VTVEL)**	📖 10-58
C1318 1 ... 32	 WAIT-PFI-NO ... WAIT-PFI-NO	 0 ... 0	0 inactive 1 PFI 01 2 PFI 02 ... 32 PFI 32	**Wait for PFI (no. of the PFI)**	
C1319 1 ... 32	 WAIT-LEVEL ... WAIT-LEVEL	 0 ... 0	0 0-Level 1 1-Level	**Level for Wait-PFI**	
C1320 1 ... 32	 PFO1-NO ... PFO1-NO	 0 ... 0	0 inactive 1 PFO 01 2 PFO 02 3 PFO 03 ... 31 PFO 31 32 PFO 32 100 All PFO 101 PFO 01..08 102 PFO 09..16 103 PFO 17..24 104 PFO 25..32	**First switching PFO (no. of the PFO)** • Program function output 1: Set an output before positioning	
C1321 1 ... 32	 PFO1-LEVEL ... PFO1-LEVEL	 0 ... 0	0 0-Level 1 1-Level	**First switching PFO level**	
C1322 1 ... 32	 PFO2-NO ... PFO2-NO	 0 ... 0	0 inactive 1 PFO 01 2 PFO 02 3 PFO 03 ... 31 PFO 31 32 PFO 32 100 All PFO 101 PFO 01..08 102 PFO 09..16 103 PFO 17..24 104 PFO 25..32	**Second switching PFO (no. of the PFO)** • Program function output 2: Set an output after positioning	

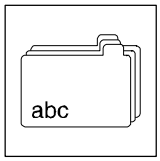


Code	LCD	Possible settings		IMPORTANT	
		Lenze	Choice		
C1323 1 ... 32	 PFO2-LEVEL ... PFO2-LEVEL	 0 ... 0	0 0-Level 1 1-Level	**Second switching PFO level**	
C1324 1 ... 32	 WAITIME-NO ... WAITIME-NO	 0 ... 0	0 {1} 34 → Selection list 18	**Waiting time (no. in VTTIME)**	📖 10-58
C1325 1 ... 32	 JMP1-PFI-NO ... JMP1-PFI-NO	 0 ... 0	0 inactive 1 PFI 01 2 PFI 02 ... 32 PFI 32	**JMP1: PFI no.** • Number of a PFI for branch 1.	
C1326 1 ... 32	 JMP1-LEVEL ... JMP1-LEVEL	 0 ... 0	0 0-Level 1 1-Level	**JMP1: PFI level** • Level of a PFI for branch 1.	
C1327 1 ... 32	 JMP1-PS ... JMP1-PS	 0 ... 0	0 {1} 32 → Selection list 19	**JMP1: PS no.** • Branch 1 to program set no. (PS). Input of the program set no.	📖 10-58
C1328 1 ... 32	 JMP-PCS-NO ... JMP-PCS-NO	 0 ... 0	0 {1} 34 → Selection list 17	**JMP-PCS no.: Set piece number (no. in VTPCS)** • Selection of a set piece number from VTPCS for the piece number repeat function.	📖 10-58
C1329 1 ... 32	 JMP-PCS-PS ... JMP-PCS-PS	 0 ... 0	0 {1} 32 → Selection list 19	**JMP-PCS-PS: PS no.** • Branch PCS if selected piece number from VTPCS was not yet reached. Input of the program set no.	📖 10-58
C1330 1 ... 32	 TP WINDOW ... TP WINDOW	 0 ... 0	0 {1} 104 → Selection list 12	**TP window (no. in VTPOS)** • Selection of a range window for TP. Within this range, the TP is "activated".	📖 10-58
C1331 1 ... 32	 TP DISTANCE ... TP DISTANCE	 0 ... 0	0 {1} 104 → Selection list 13	**TP final distance (no. in VTPOS)** • Selection of a final distance from VTPOS for TP.	📖 10-58
C1333 1 ... 32	 JMP-TP-PS ... JMP-TP-PS	 0 ... 0	0 {1} 32 → Selection list 19	**JMP-TP: PS no.** • Branch TP if no touch probe has occurred before the position target (1312) was reached. Input of the program set no.	📖 10-58
C1334 1 ... 32	 JMP2-PFI-NO ... JMP2-PFI-NO	 0 ... 0	0 inactive 1 PFI 01 2 PFI 02 ... 32 PFI 32	**JMP2: PFI-Nr.** • Number of a PFI for branch 2.	
C1335 1 ... 32	 JMP2-LEVEL ... JMP2-LEVEL	 0 ... 0	0 0-Level 1 1-Level	**JMP2: PFI level** • Level of a PFI for branch 1.	
C1336 1 ... 32	 JMP2-PS ... JMP2-PS	 0 ... 0	0 {1} 32 → Selection list 19	**JMP2: PS no.** • Branch 2 to program set no. (PS). Input of the program set no.	📖 10-58

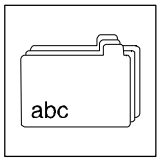


Appendix

Code	LCD	Possible settings				IMPORTANT	
		Lenze	Choice				
C1349 1 ... 32	JMP-PS ... JMP-PS		0	{1}	32 → Selection list 19	**JMP: PS no.** • Unconditioned branch to PS no.	📖 10-58
[C1350] 1 ... 10	VTPOS-IN ... VTPOS-IN	1000 ... 1000			→ Selection list 3	**CFG: VTPOS-IN**	📖 10-58
C1351 1 ... 10	VTPOS-IN ... VTPOS-IN	Disp	-2147483647	{1 incr}	2147483647	**DIS: VTPOS-IN**	
[C1352] 1 ... 4	VTVEL-IN ... VTVEL-IN	1000 ... 1000			→ Selection list 3	**CFG: VTVEL-IN**	📖 10-58
C1353 1 ... 4	VTVEL-IN ... VTVEL-IN	Disp	-2147483647	{1}	2147483647	**DIS: VTVEL-IN**	
[C1354] 1 ... 4	VTACC-IN ... VTACC-IN	1000 ... 1000			→ Selection list 3	**CFG: VTACC-IN**	📖 10-58
C1355 1 ... 4	VTACC-IN ... VTACC-IN	Disp	-2147483647	{1}	2147483647	**DIS: VTACC-IN**	
[C1356] 1 ... 4	VTPCS-IN ... VTPCS-IN	1000 ... 1000			→ Selection list 1	**CFG: VTPCS-IN**	📖 10-58
C1357 1 ... 4	VTPCS-IN ... VTPCS-IN	Disp	-32768	{1}	32767	**DIS: VTPCS-IN**	
C1358 1 ... 4	CFG:VTTIME-IN ... CFG:VTTIME-IN	1000 ... 1000			→ Selection list 1	**CFG: VTTIME-IN**	📖 10-58
C1359 1 ... 4	DIS:VTTIME-IN ... DIS:VTTIME-IN	Disp	-32768	{1}	32767	**DIS: VTTIME-IN**	

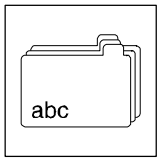


Code	LCD	Possible settings		IMPORTANT	
		Lenze	Choice		
[C1360]			→ Selection list 2	**CFG: POS-PRG-START**	📖 10-58
1	CFG:PRG-START	53			
2	CFG:PRG-STOP	20201			
3	CFG:PRG-RESET	55			
4	CFG:LIM-NEG	51			
5	CFG:LIM-POS	52			
6	CFG:MANUAL	55			
7	CFG:MANU-NEG	20202			
8	CFG:MANU-POS	20203			
9	CFG:MANU-REF	20204			
10	CFG:REF-MARK	54			
11	CFG:TP1-ENABL	1000			
12	CFG:TP2-ENABL	1000			
13	CFG:TP3-ENABL	1000			
14	CFG:TP4-ENABL	1000			
15	CFG:PS-CANCEL	20208			
16	CFG:STDBY-STP	20205			
17	CFG:S-RAMPS	19522			
18	CFG:PARAM-RD	20206			
19	CFG:LOOP-INH	20207			
20	CFG:PSET-SWT	1000			
21	CFG:ABS-SET	1000			
22	CFG:WAITSTATE	1000			
C1361		Disp		**DIS: POS-PRG-START**	
1	DIS:PRG-START				
2	DIS:PRG-STOP				
3	DIS:PRG-RESET				
4	DIS:LIM-NEG				
5	DIS:LIM-POS				
6	DIS:MANUAL				
7	DIS:MANU-NEG				
8	DIS:MANU-POS				
9	DIS:MANU-REF				
10	DIS:REF-MARK				
11	DIS:ENABL-TP1				
12	DIS:ENABL-TP2				
13	DIS:ENABL-TP3				
14	DIS:ENABL-TP4				
15	DIS:PS-CANCEL				
16	DIS:STDBY-STP				
17	DIS:S-RAMPS				
18	DIS:PARAM-RD				
19	DIS:LOOP-INH				
20	DIS:PSET-SWT				
21	DIS:ABS-SET				
22	DIS:WAITSTATE				
[C1362]			50 {1} 25104	**CFG: POS-START-PS**	📖 10-58
1	CFG:START-PS	19517	→ Selection list 1		
2	CFG:V-OVERRID	1006			
3	CFG:A-OVERRID	1006			
4	CFG:N-IN	1000			
5	CFG:NOUT-GAIN	1006			
6	CFG:M-IN	1000			
7	CFG:MOUT-GAIN	1000			
8	CFG:JERK-RED	1006			

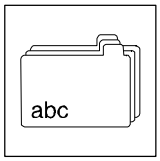


Appendix

Code	LCD	Possible settings			IMPORTANT	
		Lenze	Choice			
C1363		Disp	-32768 {1}	32767	**DIS: POS-START-PS**	
1	DIS:START-PS					
2	DIS:V-OVERRID					
3	DIS:A-OVERRID					
4	DIS:N-IN					
5	DIS:NOUT-GAIN					
6	DIS:M-IN					
7	DIS:MOUT-GAIN					
8	DIS:JERK-RED					
[C1364]			100 {1}	25103	**CFG: POS-PSET-EXT**	📖 10-58
1	CFG:PSET-EXT	1000		→ Selection list 3		
2	CFG:ABS-IN	5000				
3	CFG:P-IN	1000				
C1365		Disp	-2147483647 {1 incr}	2147483647	**DIS: POS-PSET-EXT**	
1	DIS:PSET-EXT					
2	DIS:ABS-IN					
3	DIS:P-IN					
[C1370]				→ Selection list 2	**CFG: POS-PFI**	📖 10-58
1	CFG:PFI	20201				
2	CFG:PFI	20202				
...	...	...				
30	CFG:PFI	20230				
31	CFG:PFI	53				
32	CFG:PFI	54				
C1371		Disp	0 {1 hex}	65535	**DIS: POS-PFI-LOW (01..16)**	
1	PFI-LOW					
2	PFI-HIGH					
C1372		Disp	0 {1 hex}	65535	**DIS: POS-PFO-LOW (01..16)**	
1	PFO-LOW					
2	PFO-HIGH					
C1380		Disp	-214000 {0.0001 units}	214000	**DIS: VTPOS (01..104)**	
1	VTPOS					
...	...					
104	VTPOS					
C1381		Disp	-2147483647 {1 incr}	2147483647	**DIS: VTPOS (01..104)**	
1	VTPOS					
...	...					
104	VTPOS					
C1382		Disp	0.01 {0.01 %vmax}	100	**DIS: VTVEL (01..34)**	
1	VTVEL					
...	...					
34	VTVEL					
C1383		Disp	-2147483647 {1 x/T}	2147483647	**DIS: VTVEL (01..34)**	
1	VTVEL					
...	...					
34	VTVEL					
C1384		Disp	0.01 {0.01 %amax}	100	**DIS: VTACC (01..34)**	
1	VTACC					
...	...					
34	VTACC					
C1385		Disp	-2147483647 {1 x/T2}	2147483647	**DIS: VTACC (01..34)**	
1	VTACC					
...	...					
34	VTACC					
C1386		Disp	0 {1 pcs}	65535	**DIS: VTPCS (01..34)**	
1	VTPCS					
...	...					
34	VTPCS					

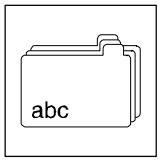


Code	LCD	Possible settings				IMPORTANT	
		Lenze	Choice				
C1387 1 ... 34	 VTTIME ... VTTIME	Disp	0	{0.001 s}	65535	**DIS: VTTIME (01..34)**	
[C1400] 1 2 3 4	 SET NEXT CLR LOAD	 1000 1000 1000 1000	5	{1}	25132 → Selection list 2	**CFG: TEACH1-SET**	📖 10-58
[C1401] 1	 L-IN	 1000	100	{1}	25103 → Selection list 3	**CFG: TEACH1-L-IN**	📖 10-58
C1402 1 2 3 4	 SET NEXT CLR LOAD	Disp	-2147483647	{1}	2147483647	**DIS: TEACH1-SET**	
C1403	CNT	Disp	0	{1}	65535	**DIS: TEACH1-CNT**	
C1404 1	 L-IN	Disp	-2147483647	{1 incr}	2147483647	**DIS: TEACH1-L-IN**	
[C1405] 1	 LDVAL	 1000	50	{1}	25104 → Selection list 1	**CFG: TEACH1-LDVAL**	📖 10-58
C1406 1	 LDVAL	Disp	-32768	{1}	32768	**DIS: TEACH1-LDVAL**	
C1500	OUTPUT SIGNAL	Disp	-2147483648	{1}	2147483647	Output signal of FEVAN2	
C1501	CODE	141	2	{1}	2000	FEVAN2 code	
C1502	SUBCODE	0	0	{1}	255	FEVAN2 subcode	
C1503	NUMERATOR	1	0	{1}	100000	FEVAN2 numerator	
C1504	DENOMINATOR	0.0001	0.0001	{0.0001}	100000	FEVAN2 denominator	
C1505	OFFSET	0	0	{1}	1000000000	FEVAN2 offset	
[C1506]	IN	1000	50	{1}	25104 → Selection list 1	CFG: FEVAN2-IN	📖 10-58
[C1507] 1 2 3	 LOAD BUSY-IN FAIL-IN	 1000 1000 1000	51	{1}	25132 → Selection list 2	CFG: FEVAN2-LOAD	📖 10-58
C1508	IN	Disp	-32768	{1}	32768	DIS: FEVAN2-IN	
C1509 1 2 3	 LOAD BUSY-IN FAIL-IN	Disp	0		1	DIS: FEVAN2-LOAD	
C1510	OUTPUT SIGNAL	Disp	-2147483647	{1}	2147483647	Output signal of FEVAN3	
C1511	CODE	141	2	{1}	2000	FEVAN3 code	
C1512	SUBCODE	0	0	{1}	255	FEVAN3 subcode	
C1513	NUMERATOR	1	0	{1}	100000	FEVAN3 numerator	
C1514	DENOMINATOR	0.0001	0.0001	{0.0001}	100000	FEVAN3 denominator	
C1515	OFFSET	0	0	{1}	1000000000	FEVAN3 Offset	
[C1516]	IN	1000	50	{1}	25104 → Selection list 1	CFG: FEVAN3-IN	📖 10-58
[C1517] 1 2 3	 LOAD BUSY-IN FAIL-IN	 1000 1000 1000	51	{1}	25132 → Selection list 2	CFG: FEVAN3-LOAD	📖 10-58
C1518	IN	Disp	-32768	{1}	32768	DIS: FEVAN3-IN	

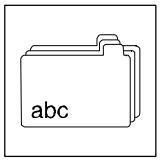


Appendix

Code	LCD	Possible settings				IMPORTANT	
		Lenze	Choice				
C1519 1 2 3	 LOAD BUSY-IN FAIL-IN	Disp	0		1	DIS: FEVAN3-LOAD	
C1520	OUTPUT SIGNAL	Disp	-2147483647	{1}	2147483647	Output signal of FEVAN4	
C1521	CODE	141	2	{1}	2000	FEVAN4 code	
C1522	SUBCODE	0	0	{1}	255	FEVAN4 subcode	
C1523	NUMERATOR	1	0	{1}	100000	FEVAN4 numerator	
C1524	DENOMINATOR	0.0001	0.0001	{0.0001}	100000	FEVAN4 denominator	
C1525	OFFSET	0	0	{1}	1000000000	FEVAN4 offset	
[C1526]	IN	1000	50	{1}	25104 → Selection list 1	CFG: FEVAN4-IN	10-58
[C1527] 1 2 3	 LOAD BUSY-IN FAIL-IN	 1000 1000 1000	51	{1}	25132 → Selection list 2	CFG: FEVAN4-LOAD	10-58
C1528	IN	Disp	-32768	{1}	32768	DIS: FEVAN4-IN	
C1529 1 2 3	 LOAD BUSY-IN FAIL-IN	Disp	0		1	DIS: FEVAN4-LOAD	
C1530	OUTPUT SIGNAL	Disp	-2147483647	{1}	2147483647	Output signal of FEVAN5	
C1531	CODE	141	2	{1}	2000	FEVAN5 code	
C1532	SUBCODE	0	0	{1}	255	FEVAN5 subcode	
C1533	NUMERATOR	1	0	{1}	100000	FEVAN5 numerator	
C1534	DENOMINATOR	0.0001	0.0001	{0.0001}	100000	FEVAN5 denominator	
C1535	OFFSET	0	0	{1}	1000000000	FEVAN5 offset	
[C1536]	IN	1000	50	{1}	25104 → Selection list 1	CFG: FEVAN5-IN	10-58
[C1537] 1 2 3	 LOAD BUSY-IN FAIL-IN	 1000 1000 1000	51	{1}	25132 → Selection list 2	CFG: FEVAN5-LOAD	10-58
C1538	IN	Disp	-32768	{1}	32768	DIS: FEVAN5-IN	
C1539 1 2 3	 LOAD BUSY-IN FAIL-IN	Disp	0		1	DIS: FEVAN5-LOAD	
C1540	OUTPUT SIGNAL	Disp	-2147483647	{1}	2147483647	Output signal of FEVAN6	
C1541	CODE	141	2	{1}	2000	FEVAN6 code	
C1542	SUBCODE	0	0	{1}	255	FEVAN6 subcode	
C1543	NUMERATOR	1	0	{1}	100000	FEVAN6 numerator	
C1544	DENOMINATOR	0.0001	0.0001	{0.0001}	100000	FEVAN6 denominator	
C1545	OFFSET	0	0	{1}	1000000000	FEVAN6 offset	
[C1546]	IN	1000	50	{1}	25104 → Selection list 1	CFG: FEVAN6-IN	10-58
[C1547] 1 2 3	 LOAD BUSY-IN FAIL-IN	 1000 1000 1000	51	{1}	25132 → Selection list 2	CFG: FEVAN6-LOAD	10-58
C1548	IN	Disp	-32768	{1}	32768	DIS: FEVAN6-IN	

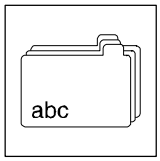


Code	LCD	Possible settings				IMPORTANT	
		Lenze	Choice				
C1549		Disp	0		1	DIS: FEVAN6-LOAD	
1	LOAD						
2	BUSY-IN						
3	FAIL-IN						
C1550	ARITPH4 FUNct	1	0 OUT = IN1 1 IN1 + IN2 2 IN1 - IN2 3 IN1 * IN2 14 IN1 / IN2			Function of ARITPH4	
[C1551]			100	{1}	25103	Configuration inputs ARITPH4	📖 10-58
1	IN	1000			→ Selection list 3		
2	IN	1000					
C1552		Disp	-2147483647	{1}	2147483647	Input signals ARITPH4	
1	IN						
2	IN						
C1555	ARITPH5 FUNct	1	0 OUT = IN1 1 IN1 + IN2 2 IN1 - IN2 3 IN1 * IN2 14 IN1 / IN2			Function of ARITPH5	
[C1556]			100	{1}	25103	Configuration inputs ARITPH5	📖 10-58
1	IN	1000			→ Selection list 3		
2	IN	1000					
C1557		Disp	-2147483647	{1}	2147483647	Input signals ARITPH5	
1	IN						
2	IN						
C1560	ARITPH6 FUNct	1	0 OUT = IN1 1 IN1 + IN2 2 IN1 - IN2 3 IN1 * IN2 14 IN1 / IN2			Function of ARITPH6	
[C1561]			100	{1}	25103	Configuration inputs ARITPH6	📖 10-58
1	IN	1000			→ Selection list 3		
2	IN	1000					
C1562		Disp	-2147483647	{1}	2147483647	Input signals ARITPH6	
1	IN						
2	IN						
[C1570]			51	{1}	25132	CFG: CONVDA1.B0	📖 10-58
1	B0	1000			→ Selection list 2		
2	B1	1000					
3	B2	1000					
4	B3	1000					
5	B4	1000					
6	B5	1000					
7	B6	1000					
8	B7	1000					
9	B8	1000					
10	B9	1000					
11	B10	1000					
12	B11	1000					
13	B12	1000					
14	B13	1000					
15	B14	1000					
16	SIGN	1000					
C1571	RESULT	Disp	0	{1 hex}	65536	DIS: result	

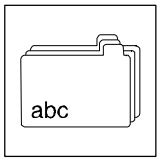


Appendix

Code	LCD	Possible settings				IMPORTANT	
		Lenze	Choice				
[C1573]			51	{1}	25132	CFG: CONVDA2.B0	📖 10-58
1	B0	1000			→ Selection list 2		
2	B1	1000					
3	B2	1000					
4	B3	1000					
5	B4	1000					
6	B5	1000					
7	B6	1000					
8	B7	1000					
9	B8	1000					
10	B9	1000					
11	B10	1000					
12	B11	1000					
13	B12	1000					
14	B13	1000					
15	B14	1000					
16	SIGN						
C1574	RESULT	Disp	0	{1 hex}	65536	DIS: result	
[C1576]			51	{1}	25132	CFG: CONVDA3.B0	📖 10-58
1	B0	1000			→ Selection list 2		
2	B1	1000					
3	B2	1000					
4	B3	1000					
5	B4	1000					
6	B5	1000					
7	B6	1000					
8	B7	1000					
9	B8	1000					
10	B9	1000					
11	B10	1000					
12	B11	1000					
13	B12	1000					
14	B13	1000					
15	B14	1000					
16	SIGN						
C1577	RESULT	Disp	0	{1 hex}	65536	DIS: result	
[C1580]	IN	1000	50	{1}	25104	CFG: CONVAD1-IN	📖 10-58
					→ Selection list 1		
C1581	IN	Disp	-32768	{1}	32768	DIS: CONVAD1-IN	
[C1582]	IN	1000	50	{1}	25104	CFG: CONVAD2-IN	📖 10-58
					→ Selection list 1		
C1583	IN	Disp	-32768	{1}	32768	DIS: CONVAD2-IN	
C1590	NUMERATOR	1	-32768	{1}	32768	CONVAPH1 numerator	
C1591	DENOMINATOR	1	1	{1}	32768	CONVAPH1 denominator	
[C1593]	IN	1000	50	{1}	25104	CFG: CONVAPH1-IN	📖 10-58
					→ Selection list 1		
C1594	IN	Disp	-32768	{1}	32768	DIS: CONVAPH1-IN	
C1595	NUMERATOR	1	-32768	{1}	32768	CONVAPH2 numerator	
C1596	DENOMINATOR	1	1	{1}	32768	CONVAPH2 denominator	
[C1598]	IN	1000	50	{1}	25104	CFG: CONVAPH2-IN	📖 10-58
					→ Selection list 1		
C1599	IN	Disp	-32768	{1}	32768	DIS: CONVAPH2-IN	
C1600	NUMERATOR	1	-32768	{1}	32768	CONVAPH3 numerator	
C1601	DENOMINATOR	1	1	{1}	32768	CONVAPH3 denominator	
[C1603]	IN	1000	50	{1}	25104	CFG: CONVAPH3-IN	📖 10-58
					→ Selection list 1		
C1604	DIS IN	Disp	-32768	{1}	32768	DIS: CONVAPH3-IN	

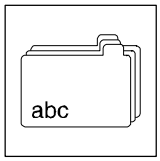


Code	LCD	Possible settings				IMPORTANT	
		Lenze	Choice				
C1610	DIVISION	1	1	{1}	31	Factor	
[C1611]	IN	1000	100	{1}	25103 → Selection list 3	Configuration input of CONVPHA2	📖 10-58
C1612	IN	Disp	-2147483647	{1 incr}	2147483647	Input signal of CONVPHA2	
C1615	DIVISION	1	1	{1}	31	Factor	
[C1616]	IN	1000	100	{1}	25103 → Selection list 3	Configuration input of CONVPHA3	📖 10-58
C1617	IN	Disp	-2147483647	{1 incr}	2147483647	Input signal of CONVPHA3	
[C1640]			51	{1}	25132	CFG: SP1-RESET	📖 10-58
1	RESET	1000			→ Selection list 2		
C1641			1	{1}	104	SP value for IN1-1	📖 10-58
1	SP-VALUE 1-1	1000			→ Selection list 11		
2	SP-VALUE 1-2	1000					
3	SP-VALUE 2-1	1000					
4	SP-VALUE 2-2	1000					
5	SP-VALUE 3-1	1000					
6	SP-VALUE 3-2	1000					
7	SP-VALUE 4-1	1000					
8	SP-VALUE 4-2	1000					
9	SP-VALUE 5-1	1000					
10	SP-VALUE 5-2	1000					
11	SP-VALUE 6-1	1000					
12	SP-VALUE 6-2	1000					
13	SP-VALUE 7-1	1000					
14	SP-VALUE 7-2	1000					
15	SP-VALUE 8-1	1000					
16	SP-VALUE 8-2	1000					
[C1642]			100	{1}	25103	CFG: SP1-L-IN	📖 10-58
1	L-IN	1000			→ Selection list 3		
C1643		Disp	0		1	DIS: SP1-RESET	
1	RESET						
C1644		Disp	-1073741824	{1 incr}	1073741823	DIS: SP1-L-IN	
1	L-IN						
C1645	MODE	0	0 on / off 1 centre/range			SP1 mode	
[C1650]			51	{1}	25132	CFG: SP2-RESET	📖 10-58
1	RESET	1000			→ Selection list 2		
C1651			1	{1}	104	SP value for IN1-1	📖 10-58
1	SP-VALUE 1-1	1000			→ Selection list 11		
2	SP-VALUE 1-2	1000					
3	SP-VALUE 2-1	1000					
4	SP-VALUE 2-2	1000					
5	SP-VALUE 3-1	1000					
6	SP-VALUE 3-2	1000					
7	SP-VALUE 4-1	1000					
8	SP-VALUE 4-2	1000					
9	SP-VALUE 5-1	1000					
10	SP-VALUE 5-2	1000					
11	SP-VALUE 6-1	1000					
12	SP-VALUE 6-2	1000					
13	SP-VALUE 7-1	1000					
14	SP-VALUE 7-2	1000					
15	SP-VALUE 8-1	1000					
16	SP-VALUE 8-2	1000					
[C1652]			100	{1}	25103	CFG: SP2-L-IN	📖 10-58
1	L-IN	1000			→ Selection list 3		

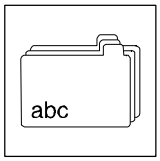


Appendix

Code	LCD	Possible settings		IMPORTANT	
		Lenze	Choice		
C1653 1	RESET	Disp	0 1	DIS: SP2-RESET	
C1654 1	L-IN	Disp	-1073741824 {1 incr} 1073741823	DIS: SP2-L-IN	
C1655	MODE	0	0 on / off 1 centre/range	SP2 mode	
C1657 1 ... 4	DEAtH tIME ... DEAtH tIME	0 ... 0	-30000 {1 ms} 30000	SP2 dead time	
C1658	HYStERESIS	0	-214000 {0.0001 units} 214000	SP2 hysteresis	
C1659	FILtER	1	0 Filter off 1 Filter 1 ms 2 Filter 2 ms 4 Filter 4 ms 8 Filter 8 ms 6 Filter 16 ms	Filters	
C1660	Act.SEL.	Disp	0 {1} 8	DIS: act. Choice	
[C1661]	SELECt	1000	50 {1} 25104 →Selection list 1	CFG: SELPH1-SELECT	📖 10-58
[C1662] 1 ... 8	IN ... IN	1000 ... 1000	50 {1} 25104 → Selection list 3	CFG: SELPH1-IN	📖 10-58
C1663	SELECt	Disp	-32768 {1} 32768	DIS: SELPH1-SELECT	
C1664 1 ... 8	IN ... IN	Disp	-2147483647 {1 incr} 2147483647	DIS: SELPH1-IN	
C1665	Act.SEL.	Disp	0 {1} 8	DIS: act. Choice	
[C1666]	SELECt	1000	50 {1} 25104 → Selection list 1	CFG: SELPH2-SELECT	📖 10-58
[C1667] 1 ... 8	IN ... IN	1000 ... 1000	50 {1} 25104 → Selection list 3	CFG: SELPH2-IN	📖 10-58
C1668	SELECt	Disp	-32768 {1} 32768	DIS: SELPH2-SELECT	
C1669 1 ... 8	IN ... IN	Disp	-2147483647 {1 incr} 2147483647	DIS: SELPH2-IN	
C1670	FUNCtION	1	1 IN1 = IN2 2 IN1 > IN2 3 IN1 < IN2 4 |IN1| = |IN2| 5 |IN1| > |IN2| 6 |IN1| < |IN2|	CMPPH1 function	
C1671	HYStERESIS	50	0 {1 incr} 1073741824	CMPPH1 hysteresis	
C1672	WINDOW	0	0 {1 incr} 1073741824	CMPPH1 window	
[C1673] 1 2	IN IN	1000 1000	50 {1} 25104 → Selection list 3	CFG: CMPPH1-IN	📖 10-58
C1674 1 2	IN IN	Disp	-2147483647 {1 incr} 2147483647	DIS: CMPPH1-IN	

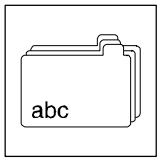


Code	LCD	Possible settings				IMPORTANT	
		Lenze	Choice				
C1675	FUNCTION	1	1 IN1 = IN2 2 IN1 > IN2 3 IN1 < IN2 4 |IN1| = |IN2| 5 |IN1| > |IN2| 6 |IN1| < |IN2|			CMPPH2 function	
C1676	HYSTERESIS	50	0	{1 incr}	1073741824	CMPPH2 hysteresis	
C1677	WINDOW	0	0	{1 incr}	1073741824	CMPPH2 window	
[C1678] 1 2	 IN IN	 1000 1000	50	{1}	25104 → Selection list 3	CFG: CMPPH2-IN	📖 10-58
C1679 1 2	 IN IN	Disp	-2147483647	{1 incr}	2147483647	DIS: CMPPH2-IN	
C1680	FUNKTION	1	1 IN1 = IN2 2 IN1 > IN2 3 IN1 < IN2 4 |IN1| = |IN2| 5 |IN1| > |IN2| 6 |IN1| < |IN2|			CMPPH3 function	
C1681	HYSTERESIS	50	0	{1 incr}	1073741824	CMPPH3 hysteresis	
C1682	WINDOW	0	0	{1 incr}	1073741824	CMPPH3 window	
[C1683] 1 2	 IN IN	 1000 1000	50	{1}	25104 → Selection list 3	CFG: CMPPH3-IN	📖 10-58
C1684 1 2	 IN IN	Disp	-2147483647	{1 incr}	2147483647	DIS: CMPPH3-IN	
[C1690] 1 ... 10	 IN ... IN	 1000 ... 1000	50	{1}	25104 → Selection list 1	CFG: DISA-IN	📖 10-58
C1691 1 ... 10	 IN (%) ... IN (%)	Disp	-199.99	{0.01 %}	199.99	DIS: DISA-IN (%)	
C1692 1 ... 10	 IN (VAL) ... IN (VAL)	Disp	-32768	{1}	32768	DIS: DISA-IN (value)	
C1693 1 ... 10	 IN (HEX) ... IN (HEX)	Disp	0	{1 hex}	65536	DIS: IN (HEX)	
[C1695] 1 ... 10	 IN ... IN	 1000 ... 1000	50	{1}	25104 → Selection list 3	CFG: DISPH-IN	📖 10-58
C1696 1 ... 10	 IN ... IN	Disp	-2147483647	{1 incr}	2147483647	DIS: DISPH-IN	
C1700 1 2	 OUTPUT SIGNAL BCD RESULT	Disp	-2147483647	{1}	2147483647	Signal output	
C1701	CODE	141	11	{1}	2000	**BCD1 Code**	

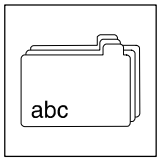


Appendix

Code	LCD	Possible settings				IMPORTANT	
		Lenze	Choice				
C1702	SUbcODE	0	0	{1}	255	**BCD1 Subcode**	
C1703	NUMERALOR	1	0	{1}	100000	**BCD1 numerator**	
C1704	DENOMINALOR	0.0001	0.0001	{0.0001}	100000	**BCD1 denominator**	
C1705	OFFSEt	0	0	{1}	1000000000	**BCD1 Offset**	
C1706	BCD MODUS	0	0 no hand-shake 1 with hand-shake			**BCD mode**	
C1707	BCD DELAY	10	0	{1 ms}	255	**BCD delay**	
[C1708]			51	{1}	25132 → Selection list 2	CFG: BCD1-READ	📖 10-58
1	READ	1000					
2	DATA1	1000					
3	DATA2	1000					
4	DATA3	1000					
5	DATA4	1000					
6	LOAD	1000					
7	BUSY-IN	1000					
8	FAIL-IN	1000					
C1709		Disp	0		1	DIS: BCD1-READ	
1	READ						
2	DATA1						
3	DATA2						
4	DATA3						
5	DATA4						
6	LOAD						
7	BUSY-IN						
8	FAIL-IN						
C1710		Disp	-2147483647	{1}	2147483647	Signal output	
1	OUtPUt SIGNAL						
2	BCD RESULt						
C1711	CODE	141	11	{1}	2000	BCD2 code	
C1712	SUbcODE	0	0	{1}	255	BCD2 subcode	
C1713	NUMERALOR	1	0	{1}	100000	BCD2 numerator	
C1714	DENOMINALOR	0.0001	0.0001	{0.0001}	100000	BCD2 denominator	
C1715	OFFSEt	0	0	{1}	1000000000	BCD2 offset	
C1716	BCD MODUS	0	0 no hand-shake 1 with hand-shake			BCD mode	
C1717	BCD DELAY	10	0	{1 ms}	255	BCD delay	
[C1718]			51	{1}	25132 → Selection list 2	CFG: BCD2-READ	📖 10-58
1	READ	1000					
2	DATA1	1000					
3	DATA2	1000					
4	DATA3	1000					
5	DATA4	1000					
6	LOAD	1000					
7	BUSY-IN	1000					
8	FAIL-IN	1000					
C1719		Disp	0		1	DIS: BCD2-READ	
1	READ						
2	DATA1						
3	DATA2						
4	DATA3						
5	DATA4						
6	LOAD						
7	LOAD						
8	BUSY-IN						



Code	LCD	Possible settings				IMPORTANT	
		Lenze	Choice				
C1720 1 2	OUTPUT SIGNAL BCD RESULT	Disp	-2147483647	{1}	2147483647	Signal output	
C1721	CODE	141	11	{1}	2000	BCD3 code	
C1722	SUBCODE	0	0	{1}	255	BCD3 subcode	
C1723	NUMERATOR	1	0	{1}	100000	BCD3 numerator	
C1724	DENOMINATOR	0.0001	0.0001	{0.0001}	100000	BCD3 denominator	
C1725	OFFSET	0	0	{1}	1000000000	BCD3 offset	
C1726	BCD MODUS	0	0 no hand-shake 1 with hand-shake			BCD mode	
C1727	BCD DELAY	10	0	{1 ms}	255	BCD delay	
[C1728] 1 2 3 4 5 6 7 8	 READ DATA1 DATA2 DATA3 DATA4 LOAD BUSY-IN FAIL-IN	 1000 1000 1000 1000 1000 1000 1000 1000	51	{1}	25132 → Selection list 2	CFG: BCD3-READ	📖 10-58
C1729 1 2 3 4 5 6 7 8	 READ DATA1 DATA2 DATA3 DATA4 LOAD BUSY-IN FAIL-IN	Disp	0		1	DIS: BCD3-READ	
C1799	DFOUT F_{MAX}	1250	20	{1 kHz}	1250	**DFOUT f max (kHz)** Maximum output frequency at X10 in kHz	



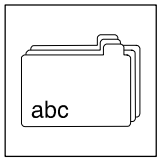
10.3 Selection list

List 1: Analog signal sources

000050	AIN1-OUT
000055:	AIN2-OUT
000100:	DFSET-NOUT
001000:	FIXED 0%
001006:	FIXED 100%
001007:	FIXED -100%
005000:	MCTRL-NSET2
005001:	MCTRL-NACT
005002:	MCTRL-MSET2
005003:	MCTRL-MACT
005004:	MCTRL-IACT
005005:	MCTRL-DCVOLT
005009:	MCTRL-PHI-ANA
005050:	NSET-NOUT
005051:	NSET-RFG-I
005100:	MPOT1-OUT
005550:	ADD1-OUT
005600:	RFG1-OUT
005650:	ASW1-OUT
005655:	ASW2-OUT
005700:	ANEG1-OUT
005705:	ANEG2-OUT
006200:	CONV1-OUT
006205:	CONV2-OUT
006210:	CONV3-OUT
006215:	CONV4-OUT
006230:	CONVPHA1-OUT
006232:	CONVPHA2-OUT
006234:	CONVPHA3-OUT
006300:	S&H1-OUT
006350:	CURVE1-OUT
006400:	FCNT1-OUT
006405:	FCNT2-OUT
006410:	FCNT3-OUT
006550:	TEACH1-CNT
006600:	SYNC1-OUT3
007200:	CONVDA1-OUT
007205:	CONVDA2-OUT
007210:	CONVDA3-OUT
010000:	BRK1-M-SET
011200:	RFGX1-OUT
011201:	RFGX1-VSOUT
011300:	SELA1-OUT1
011301:	SELA1-OUT2
011302:	SELA1-SELECT
015028:	Utilization
019500:	FCODE-17
019502:	FCODE-26/1
019503:	FCODE-26/2
019504:	FCODE-27/1
019505:	FCODE-27/2
019506:	FCODE-32
019507:	FCODE-37
019510:	FCODE-108/1
019511:	FCODE-108/2
019512:	FCODE-109/1
019513:	FCODE-109/2
019515:	FCODE-141
019517:	FCODE-1211
019521:	FCODE-472/1
019522:	FCODE-472/2
019523:	FCODE-472/3
019524:	FCODE-472/4
019525:	FCODE-472/5
019526:	FCODE-472/6
019527:	FCODE-472/7
019528:	FCODE-472/8
019529:	FCODE-472/9
019530:	FCODE-472/10
019531:	FCODE-472/11
019532:	FCODE-472/12
019533:	FCODE-472/13
019534:	FCODE-472/14
019535:	FCODE-472/15
019536:	FCODE-472/16
019537:	FCODE-472/17
019538:	FCODE-472/18
019539:	FCODE-472/19
019540:	FCODE-472/20
019551:	FCODE-473/1
019552:	FCODE-473/2
019553:	FCODE-473/3
019554:	FCODE-473/4
019555:	FCODE-473/5
019556:	FCODE-473/6
019557:	FCODE-473/7
019558:	FCODE-473/8
019559:	FCODE-473/9
019560:	FCODE-473/10
020101:	CAN-IN1.W1
020102:	CAN-IN1.W2
020103:	CAN-IN1.W3
020201:	CAN-IN2.W1
020202:	CAN-IN2.W2
020203:	CAN-IN2.W3
020204:	CAN-IN2.W4
020301:	CAN-IN3.W1
020302:	CAN-IN3.W2
020303:	CAN-IN3.W3
020304:	CAN-IN3.W4
025101:	AIF-IN.W1
025102:	AIF-IN.W2
025103:	AIF-IN.W3
030000:	POS-ACT-PS-NO
030010:	POS-NSET
030020:	POS-NOUT
030021:	POS-MOUT
030030:	POS-POUT-NORM
031301:	VTTIME-OUT1
031302:	VTTIME-OUT2
031303:	VTTIME-OUT3
031304:	VTTIME-OUT4
031351:	VTPCS-OUT1
031352:	VTPCS-OUT2
031353:	VTPCS-OUT3
031354:	VTPCS-OUT4

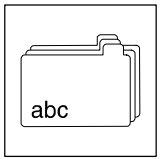
List 2: Digital signal sources

000051:	DIGIN1
000052:	DIGIN2
000053:	DIGIN3
000054:	DIGIN4
000055:	DIGIN5
000060:	STATE-BUS-0
000065:	DIGIN-CINH
000100:	DFSET-ACK
000500:	DCTRL-RDY
000501:	DCTRL-CINH
000502:	DCTRL-INIT
000503:	DCTRL-IMP
000504:	DCTRL-NACT=0
000505:	DCTRL-CW/CCW
001000:	FIXED 0
001001:	FIXED 1
005001:	MCTRL-QSP-OUT
005002:	MCTRL-IMAX
005003:	MCTRL-MMAX
005050:	NSET-RFG-I=0
006000:	DFRFG1-FAIL
006001:	DFRFG1-SYNC
006400:	FCNT1-EQUAL
006405:	FCNT2-EQUAL
006410:	FCNT3-EQUAL
006450:	SP1-STATUS-01
006451:	SP1-STATUS-02
006452:	SP1-STATUS-03
006453:	SP1-STATUS-04
006454:	SP1-STATUS-05
006455:	SP1-STATUS-06
006456:	SP1-STATUS-07
006457:	SP1-STATUS-08
006460:	SP2-STATUS-01
006461:	SP2-STATUS-02
006462:	SP2-STATUS-03
006463:	SP2-STATUS-04
006464:	SP2-STATUS-05
006465:	SP2-STATUS-06
006466:	SP2-STATUS-07
006467:	SP2-STATUS-08
006600:	SYNC1-STAT
007150:	CONVAD1-0
007151:	CONVAD1-1
007152:	CONVAD1-2
007153:	CONVAD1-3
007154:	CONVAD1-4
007155:	CONVAD1-5
007156:	CONVAD1-6
007157:	CONVAD1-7
007158:	CONVAD1-8
007159:	CONVAD1-9
007160:	CONVAD1-10
007161:	CONVAD1-11
007162:	CONVAD1-12
007163:	CONVAD1-13
007164:	CONVAD1-14
007165:	CONVAD1-SIGN
007170:	CONVAD2-0
007171:	CONVAD2-1
007172:	CONVAD2-2
007173:	CONVAD2-3
007174:	CONVAD2-4
007175:	CONVAD2-5
007176:	CONVAD2-6
007177:	CONVAD2-7
007178:	CONVAD2-8
007179:	CONVAD2-9
007180:	CONVAD2-10
007181:	CONVAD2-11
007182:	CONVAD2-12
007183:	CONVAD2-13
007184:	CONVAD2-14
007185:	CONVAD2-SIGN
010000:	BRK1-OUT
010001:	BRK1-CINH
010002:	BRK1-QSP
010003:	BRK1-M-STORE
010250:	R/L/Q-QSP
010251:	R/L/Q-R/L
010500:	AND1-OUT
010505:	AND2-OUT
010510:	AND3-OUT
010515:	AND4-OUT
010520:	AND5-OUT
010550:	OR1-OUT
010555:	OR2-OUT
010560:	OR3-OUT
010565:	OR4-OUT
010570:	OR5-OUT
010600:	NOT1-OUT
010605:	NOT2-OUT
010610:	NOT3-OUT
010615:	NOT4-OUT
010620:	NOT5-OUT
010650:	CMP1-OUT
010655:	CMP2-OUT
010700:	DIGDEL1-OUT
010705:	DIGDEL2-OUT
010750:	TRANS1-OUT
010755:	TRANS2-OUT
010900:	FLIP1-OUT
010905:	FLIP2-OUT
011000:	CMPPH1-OUT
011005:	CMPPH2-OUT
011010:	CMPPH3-OUT
012000:	PHINT1-FAIL
013000:	FEVAN1-BUSY
013001:	FEVAN1-FAIL
013005:	FEVAN2-BUSY
013006:	FEVAN2-FAIL
013010:	FEVAN3-BUSY
013011:	FEVAN3-FAIL
013015:	FEVAN4-BUSY
013016:	FEVAN4-FAIL
013020:	FEVAN5-BUSY
013021:	FEVAN5-FAIL
013025:	FEVAN6-BUSY
013026:	FEVAN6-FAIL
013050:	BCD1-SEL1
013051:	BCD1-SEL2



List 2 (continued):

013052:	BCD1-SEL3	015028:	MONIT-OC5	019756:	FCODE-135.B5	020213:	CAN-IN2.B12
013053:	BCD1-SEL4	015029:	MONIT-SD5	019757:	FCODE-135.B6	020214:	CAN-IN2.B13
013054:	BCD1-SEL5	015030:	MONIT-SD6	019758:	FCODE-135.B7	020215:	CAN-IN2.B14
013055:	BCD1-SEL6	015031:	MONIT-SD7	019763:	FCODE-135.B12	020216:	CAN-IN2.B15
013056:	BCD1-SEL7	015032:	MONIT-H07	019764:	FCODE-135.B13	020217:	CAN-IN2.B16
013057:	BCD1-SEL8	015033:	MONIT-H10	019765:	FCODE-135.B14	020218:	CAN-IN2.B17
013058:	BCD1-SIGN	015034:	MONIT-H11	019766:	FCODE-135.B15	020219:	CAN-IN2.B18
013059:	BCD1-NEW-DATA	015040:	MONIT-CE1	020001:	CAN-CTRL.B0	020220:	CAN-IN2.B19
013060:	BCD1-EOT	015041:	MONIT-CE2	020002:	CAN-CTRL.B1	020221:	CAN-IN2.B20
013061:	BCD1-DATA-FLT	015042:	MONIT-CE3	020003:	CAN-CTRL.B2	020222:	CAN-IN2.B21
013062:	BCD1-BUSY	015043:	MONIT-CE4	020005:	CAN-CTRL.B4	020223:	CAN-IN2.B22
013063:	BCD1-FAIL	015301:	MONIT-P01	020006:	CAN-CTRL.B5	020224:	CAN-IN2.B23
013065:	BCD2-SEL1	015302:	MONIT-P02	020007:	CAN-CTRL.B6	020225:	CAN-IN2.B24
013066:	BCD2-SEL2	015304:	MONIT-P04	020008:	CAN-CTRL.B7	020226:	CAN-IN2.B25
013067:	BCD2-SEL3	015305:	MONIT-P05	020013:	CAN-CTRL.B12	020227:	CAN-IN2.B26
013068:	BCD2-SEL4	015306:	MONIT-P06	020014:	CAN-CTRL.B13	020228:	CAN-IN2.B27
013069:	BCD2-SEL5	015307:	MONIT-P07	020015:	CAN-CTRL.B14	020229:	CAN-IN2.B28
013070:	BCD2-SEL6	015308:	MONIT-P08	020016:	CAN-CTRL.B15	020230:	CAN-IN2.B29
013071:	BCD2-SEL7	015309:	MONIT-P09	020101:	CAN-IN1.B0	020231:	CAN-IN2.B30
013072:	BCD2-SEL8	015312:	MONIT-P12	020102:	CAN-IN1.B1	020232:	CAN-IN2.B31
013073:	BCD2-SIGN	015314:	MONIT-P14	020103:	CAN-IN1.B2	020301:	CAN-IN3.B0
013074:	BCD2-NEW-DATA	015315:	MONIT-P15	020104:	CAN-IN1.B3	020302:	CAN-IN3.B1
013075:	BCD2-EOT	015316:	MONIT-P16	020105:	CAN-IN1.B4	020303:	CAN-IN3.B2
013076:	BCD2-DATA-FLT	015317:	MONIT-P17	020106:	CAN-IN1.B5	020304:	CAN-IN3.B3
013077:	BCD2-BUSY	015318:	MONIT-P18	020107:	CAN-IN1.B6	020305:	CAN-IN3.B4
013078:	BCD2-FAIL	019500:	FCODE-250	020108:	CAN-IN1.B7	020306:	CAN-IN3.B5
013080:	BCD3-SEL1	019521:	FCODE-471.B0	020109:	CAN-IN1.B8	020307:	CAN-IN3.B6
013081:	BCD3-SEL2	019522:	FCODE-471.B1	020110:	CAN-IN1.B9	020308:	CAN-IN3.B7
013082:	BCD3-SEL3	019523:	FCODE-471.B2	020111:	CAN-IN1.B10	020309:	CAN-IN3.B8
013083:	BCD3-SEL4	019524:	FCODE-471.B3	020112:	CAN-IN1.B11	020310:	CAN-IN3.B9
013084:	BCD3-SEL5	019525:	FCODE-471.B4	020113:	CAN-IN1.B12	020311:	CAN-IN3.B10
013085:	BCD3-SEL6	019526:	FCODE-471.B5	020114:	CAN-IN1.B13	020312:	CAN-IN3.B11
013086:	BCD3-SEL7	019527:	FCODE-471.B6	020115:	CAN-IN1.B14	020313:	CAN-IN3.B12
013087:	BCD3-SEL8	019528:	FCODE-471.B7	020116:	CAN-IN1.B15	020314:	CAN-IN3.B13
013088:	BCD3-SIGN	019529:	FCODE-471.B8	020117:	CAN-IN1.B16	020315:	CAN-IN3.B14
013089:	BCD3-NEW-DATA	019530:	FCODE-471.B9	020118:	CAN-IN1.B17	020316:	CAN-IN3.B15
013090:	BCD3-EOT	019531:	FCODE-471.B10	020119:	CAN-IN1.B18	020317:	CAN-IN3.B16
013091:	BCD3-DATA-FLT	019532:	FCODE-471.B11	020120:	CAN-IN1.B19	020318:	CAN-IN3.B17
013092:	BCD3-BUSY	019533:	FCODE-471.B12	020121:	CAN-IN1.B20	020319:	CAN-IN3.B18
013093:	BCD3-FAIL	019534:	FCODE-471.B13	020122:	CAN-IN1.B21	020320:	CAN-IN3.B19
015000:	DCTRL-TRIP	019535:	FCODE-471.B14	020123:	CAN-IN1.B22	020321:	CAN-IN3.B20
015001:	DCTRL-MESS	019536:	FCODE-471.B15	020124:	CAN-IN1.B23	020322:	CAN-IN3.B21
015002:	DCTRL-WARN	019537:	FCODE-471.B16	020125:	CAN-IN1.B24	020323:	CAN-IN3.B22
015003:	DCTRL-FAIL	019538:	FCODE-471.B17	020126:	CAN-IN1.B25	020324:	CAN-IN3.B23
015004:	DCTRL-FAILQSP	019539:	FCODE-471.B18	020127:	CAN-IN1.B26	020325:	CAN-IN3.B24
015010:	MONIT-LU	019540:	FCODE-471.B19	020128:	CAN-IN1.B27	020326:	CAN-IN3.B25
015011:	MONIT-OU	019541:	FCODE-471.B20	020129:	CAN-IN1.B28	020327:	CAN-IN3.B26
015012:	MONIT-EEr	019542:	FCODE-471.B21	020130:	CAN-IN1.B29	020328:	CAN-IN3.B27
015013:	MONIT-OC1	019543:	FCODE-471.B22	020131:	CAN-IN1.B30	020329:	CAN-IN3.B28
015014:	MONIT-OC2	019544:	FCODE-471.B23	020132:	CAN-IN1.B31	020330:	CAN-IN3.B29
015015:	MONIT-LP1	019545:	FCODE-471.B24	020201:	CAN-IN2.B0	020331:	CAN-IN3.B30
015016:	MONIT-OH	019546:	FCODE-471.B25	020202:	CAN-IN2.B1	020332:	CAN-IN3.B31
015017:	MONIT-OH3	019547:	FCODE-471.B26	020203:	CAN-IN2.B2	025001:	AIF-CTRL.B0
015018:	MONIT-OH4	019548:	FCODE-471.B27	020204:	CAN-IN2.B3	025002:	AIF-CTRL.B1
015019:	MONIT-OH7	019549:	FCODE-471.B28	020205:	CAN-IN2.B4	025003:	AIF-CTRL.B2
015020:	MONIT-OH8	019550:	FCODE-471.B29	020206:	CAN-IN2.B5	025005:	AIF-CTRL.B4
015021:	MONIT-Sd2	019551:	FCODE-471.B30	020207:	CAN-IN2.B6	025006:	AIF-CTRL.B5
015022:	MONIT-Sd3	019552:	FCODE-471.B31	020208:	CAN-IN2.B7	025007:	AIF-CTRL.B6
015023:	MONIT-P03	019751:	FCODE-135.B0	020209:	CAN-IN2.B8	025008:	AIF-CTRL.B7
015024:	MONIT-P13	019752:	FCODE-135.B1	020210:	CAN-IN2.B9	025013:	AIF-CTRL.B12
015026:	MONIT-CE0	019753:	FCODE-135.B2	020211:	CAN-IN2.B10	025014:	AIF-CTRL.B13
015027:	MONIT-NMAX	019755:	FCODE-135.B4	020212:	CAN-IN2.B11	025015:	AIF-CTRL.B14
						025016:	AIF-CTRL.B15



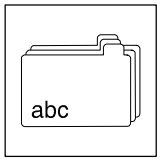
Appendix

List 2 (continued):

025101:	AIF-IN.B0
025102:	AIF-IN.B1
025103:	AIF-IN.B2
025104:	AIF-IN.B3
025105:	AIF-IN.B4
025106:	AIF-IN.B5
025107:	AIF-IN.B6
025108:	AIF-IN.B7
025109:	AIF-IN.B8
025110:	AIF-IN.B9
025111:	AIF-IN.B10
025112:	AIF-IN.B11
025113:	AIF-IN.B12
025114:	AIF-IN.B13
025115:	AIF-IN.B14
025116:	AIF-IN.B15
025117:	AIF-IN.B16
025118:	AIF-IN.B17
025119:	AIF-IN.B18
025120:	AIF-IN.B19
025121:	AIF-IN.B20
025122:	AIF-IN.B21
025123:	AIF-IN.B22
025124:	AIF-IN.B23
025125:	AIF-IN.B24
025126:	AIF-IN.B25
025127:	AIF-IN.B26
025128:	AIF-IN.B27
025129:	AIF-IN.B28
025130:	AIF-IN.B29
025131:	AIF-IN.B30
025132:	AIF-IN.B31
030000:	POS-STARTED
030001:	POS-STOPED
030002:	POS-ENDED
030003:	POS-RESETED
030010:	POS-STDBY-ACT
030011:	POS-MANU-ACT
030012:	POS-REF-OK
030013:	POS-IN-TARGET
030014:	POS-VTRAV-REA
030015:	POS-VFIN-REAC
030016:	POS-ACC-RAMP
030017:	POS-DCC-RAMP
030101:	POS-PFO1
030102:	POS-PFO2
030103:	POS-PFO3
030104:	POS-PFO4
030105:	POS-PFO5
030106:	POS-PFO6
030107:	POS-PFO7
030108:	POS-PFO8
030109:	POS-PFO9
030110:	POS-PFO10
030111:	POS-PFO11
030112:	POS-PFO12
030113:	POS-PFO13
030114:	POS-PFO14
030115:	POS-PFO15
030116:	POS-PFO16
030117:	POS-PFO17
030118:	POS-PFO18
030119:	POS-PFO19
030120:	POS-PFO20
030121:	POS-PFO21
030122:	POS-PFO22
030123:	POS-PFO23
030124:	POS-PFO24
030125:	POS-PFO25
030126:	POS-PFO26
030127:	POS-PFO27
030128:	POS-PFO28
030129:	POS-PFO29
030130:	POS-PFO30
030131:	POS-PFO31
030132:	POS-PFO32
030200:	POS-TP1-EN
030201:	POS-TP1-RECOG
030202:	POS-TP2-EN
030203:	POS-TP2-RECOG
030204:	POS-TP3-EN
030205:	POS-TP3-RECOG
030206:	POS-TP4-EN
030207:	POS-TP4-RECOG

List 3: Phase signal sources

000100:	DFSET-PSET
000101:	DFSET-PSET2
001000:	FIXED0INC
005000:	MCTRL-PHI-ANG
005520:	ARITPH1-OUT
005525:	ARITPH2-OUT
005530:	ARITPH3-OUT
005535:	ARITPH4-OUT
005540:	ARITPH5-OUT
005545:	ARITPH6-OUT
005775:	SELPH1-OUT
005780:	SELPH2-OUT
006237:	CONVPHPH2-OUT
006600:	SYNC1-OUT2
007050:	CONVAPH1-OUT
007055:	CONVAPH2-OUT
007060:	CONVAPH3-OUT
012000:	PHINT1-OUT
012050:	PHDIV1-OUT
019521:	FCODE-474/1
019522:	FCODE-474/2
019523:	FCODE-474/3
019524:	FCODE-474/4
019525:	FCODE-474/5
019526:	FCODE-474/6
019527:	FCODE-474/7
019528:	FCODE-474/8
019529:	FCODE-474/9
019530:	FCODE-474/10
020103:	CAN-IN1.D1
020201:	CAN-IN2.D1
020202:	CAN-IN2.D2
020301:	CAN-IN3.D1
020302:	CAN-IN3.D2
025103:	AIF-IN.D1
025104:	AIF-IN.D2
030010:	POS-TARGET
030011:	POS-VTRAV
030012:	POS-VFINAL
030013:	POS-ACC
030014:	POS-DCC
030015:	POS-ASET
030016:	POS-VSET
030017:	POS-SETPOS
030020:	POS-POUT
030021:	POS-ACTPOS
031001:	VTPOS-OUT1
031002:	VTPOS-OUT2
031003:	VTPOS-OUT3
031004:	VTPOS-OUT4
031005:	VTPOS-OUT5
031006:	VTPOS-OUT6
031007:	VTPOS-OUT7
031008:	VTPOS-OUT8
031009:	VTPOS-OUT9
031010:	VTPOS-OUT10
031011:	VTPOS-OUT11
031012:	VTPOS-OUT12
031013:	VTPOS-OUT13
031014:	VTPOS-OUT14
031015:	VTPOS-OUT15
031016:	VTPOS-OUT16
031017:	VTPOS-OUT17
031018:	VTPOS-OUT18
031019:	VTPOS-OUT19
031020:	VTPOS-OUT20
031021:	VTPOS-OUT21
031022:	VTPOS-OUT22
031023:	VTPOS-OUT23
031024:	VTPOS-OUT24
031025:	VTPOS-OUT25
031026:	VTPOS-OUT26
031027:	VTPOS-OUT27
031028:	VTPOS-OUT28
031029:	VTPOS-OUT29
031030:	VTPOS-OUT30
031031:	VTPOS-OUT31
031032:	VTPOS-OUT32
031033:	VTPOS-OUT33
031034:	VTPOS-OUT34
031035:	VTPOS-OUT35
031036:	VTPOS-OUT36
031037:	VTPOS-OUT37
031038:	VTPOS-OUT38
031039:	VTPOS-OUT39
031040:	VTPOS-OUT40
031041:	VTPOS-OUT41
031042:	VTPOS-OUT42
031043:	VTPOS-OUT43
031044:	VTPOS-OUT44
031045:	VTPOS-OUT45
031046:	VTPOS-OUT46
031047:	VTPOS-OUT47
031048:	VTPOS-OUT48
031049:	VTPOS-OUT49
031050:	VTPOS-OUT50
031051:	VTPOS-OUT51
031052:	VTPOS-OUT52
031053:	VTPOS-OUT53
031054:	VTPOS-OUT54
031055:	VTPOS-OUT55
031056:	VTPOS-OUT56
031057:	VTPOS-OUT57
031058:	VTPOS-OUT58
031059:	VTPOS-OUT59
031060:	VTPOS-OUT60
031061:	VTPOS-OUT61
031062:	VTPOS-OUT62
031063:	VTPOS-OUT63
031064:	VTPOS-OUT64
031065:	VTPOS-OUT65
031066:	VTPOS-OUT66
031067:	VTPOS-OUT67
031068:	VTPOS-OUT68
031069:	VTPOS-OUT69
031070:	VTPOS-OUT70
031071:	VTPOS-OUT71
031072:	VTPOS-OUT72
031073:	VTPOS-OUT73
031074:	VTPOS-OUT74
031075:	VTPOS-OUT75
031076:	VTPOS-OUT76
031077:	VTPOS-OUT77
031078:	VTPOS-OUT78
031079:	VTPOS-OUT79



List 3 (continued):

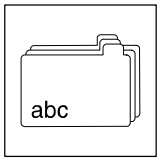
031080:	VTPOS-OUT80
031081:	VTPOS-OUT81
031082:	VTPOS-OUT82
031083:	VTPOS-OUT83
031084:	VTPOS-OUT84
031085:	VTPOS-OUT85
031086:	VTPOS-OUT86
031087:	VTPOS-OUT87
031088:	VTPOS-OUT88
031089:	VTPOS-OUT89
031090:	VTPOS-OUT90
031091:	VTPOS-OUT91
031092:	VTPOS-OUT92
031093:	VTPOS-OUT93
031094:	VTPOS-OUT94
031095:	VTPOS-OUT95
031096:	VTPOS-OUT96
031097:	VTPOS-OUT97
031098:	VTPOS-OUT98
031099:	VTPOS-OUT99
031100:	VTPOS-OUT100
031101:	VTPOS-OUT101
031102:	VTPOS-OUT102
031103:	VTPOS-OUT103
031104:	VTPOS-OUT104
031201:	VTVEL-OUT1
031202:	VTVEL-OUT2
031203:	VTVEL-OUT3
031204:	VTVEL-OUT4
031251:	VTACC-OUT1
031252:	VTACC-OUT2
031253:	VTACC-OUT3
031254:	VTACC-OUT4

List 4: Phase difference signal sources

000050:	DFIN-OUT
000100:	DFSET-POUT
000250:	DFOUT-OUT
001000:	FIXEDPHI-0
005000:	MCTRL-PHI-ACT
006000:	DFRFG1-OUT
006220:	CONV5-OUT
006600:	SYNC1-OUT1
019521:	FCODE-475/1
019522:	FCODE-475/2
030000:	POS-PHI-SET

List 5: Function blocks (see processing table)

000000:	empty
000050:	AIN1
000055:	AIN2
000070:	AOUT1
000075:	AOUT2
000100:	DFSET
000200:	DFIN
000250:	DFOUT
005050:	NSET
005100:	MPOT1
005520:	ARITPH1
005525:	ARITPH2
005530:	ARITPH3
005535:	ARITPH4
005540:	ARITPH5
005545:	ARITPH6
005550:	ADD1
005600:	RFG1
005650:	ASW1
005655:	ASW2
005700:	ANEG1
005705:	ANEG2
005775:	SELPH1
005780:	SELPH2
006000:	DFRFG1
006200:	CONV1
006205:	CONV2
006210:	CONV3
006215:	CONV4
006220:	CONV5
006230:	CONVPHA1
006232:	CONVPHA2
006234:	CONVPHA3
006237:	CONVPHPH2
006300:	S&H1
006350:	CURVE1
006400:	FCNT1
006405:	FCNT2
006410:	FCNT3
006450:	SP1
006460:	SP2
006550:	TEACH1
006600:	SYNC1
007050:	CONVAPH1
007055:	CONVAPH2
007060:	CONVAPH3
007150:	CONVAD1
007170:	CONVAD2
007200:	CONVDA1
007205:	CONVDA2
007210:	CONVDA3
008000:	DISA
008050:	DISPH
010000:	BRK1
010250:	R/L/Q
010500:	AND1
010505:	AND2
010510:	AND3
010515:	AND4
010520:	AND5
010550:	OR1
010555:	OR2
010560:	OR3
010565:	OR4
010570:	OR5
010600:	NOT1
010605:	NOT2
010610:	NOT3
010615:	NOT4
010620:	NOT5
010650:	CMP1
010655:	CMP2
010700:	DIGDEL1
010705:	DIGDEL2
010750:	TRANS1
010755:	TRANS2
010900:	FLIP1
010905:	FLIP2
011000:	CMPPH1
011005:	CMPPH2
011010:	CMPPH3
012000:	PHINT1
012050:	PHDIV1
013000:	FEVAN1
013005:	FEVAN2
013010:	FEVAN3
013015:	FEVAN4
013020:	FEVAN5
013025:	FEVAN6
013050:	BCD1
013065:	BCD2
013080:	BCD3
015100:	MLP1
020000:	CAN-OUT
025000:	AIF-OUT
030000:	POS
030050:	POS-SRAMPS
031000:	VTPOS
031200:	VTVEL
031250:	VTACC
031300:	VTTIME
031350:	VTPCS



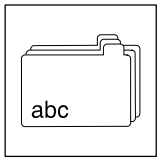
Appendix

List 10: Faults

000000:	No fail
000011:	OC1 trip
000012:	OC2 trip
000015:	OC5 trip
000022:	LUQ trip
000032:	LP1 trip
000050:	OH trip
000053:	OH3 trip
000057:	OH7 trip
000058:	OH8 trip
000061:	CE0 trip
000062:	CE1 trip
000063:	CE2 trip
000064:	CE3 trip
000065:	CE4 trip
000070:	U15 trip
000071:	CCr trip
000072:	Pr1 trip
000073:	Pr2 trip
000074:	PEr trip
000075:	Pr0 trip
000077:	Pr3 trip
000078:	Pr4 trip
000079:	PI trip
000082:	Sd2 trip
000083:	Sd3 trip
000085:	Sd5 trip
000086:	Sd6 trip
000087:	Sd7 trip
000091:	EEr trip
000105:	H05 trip
000107:	H07 trip
000110:	H10 trip
000111:	H11 trip
000151:	P01 trip
000152:	P02 trip
000153:	P03 trip
000154:	P04 trip
000155:	P05 trip
000156:	P06 trip
000157:	P07 trip
000158:	P08 trip
000159:	P09 trip
000162:	P12 trip
000163:	P13 trip
000164:	P14 trip
000165:	P15 trip
000166:	P16 trip
000167:	P17 trip
000168:	P18 trip
000200:	NMAX trip
001030:	LU message
001091:	EEr message
002032:	LP1 warning
002054:	OH4 warning
002057:	OH7 warning
002058:	OH8 warning
002061:	CE0 warning
002062:	CE1 warning
002063:	CE2 warning
002064:	CE3 warning
002065:	CE4 warning
002082:	Sd2 warning
002083:	Sd3 warning
002085:	Sd5 warning
002086:	Sd6 warning
002091:	EER warning
002153:	P03 warning
002163:	P13 warning
002164:	P14 warning
002165:	P15 warning
002166:	P16 warning
002167:	P17 warning
002168:	P18 warning
003091:	EEr QSP
003151:	P01 QSP
003152:	P02 QSP
003154:	P04 QSP
003155:	P05 QSP
003156:	P06 QSP
003157:	P07 QSP
003158:	P08 QSP
003159:	P09 QSP
003162:	P12 QSP
003163:	P13 QSP
003164:	P14 QSP
003165:	P15 QSP
003166:	P16 QSP
003167:	P17 QSP
003168:	P18 QSP

List 11:

000000:	Real Zero
000001:	VTPOS-No 001
000002:	VTPOS-No 002
000003:	VTPOS-No 003
000004:	VTPOS-No 004
000005:	VTPOS-No 005
000006:	VTPOS-No 006
000007:	VTPOS-No 007
000008:	VTPOS-No 008
000009:	VTPOS-No 009
000010:	VTPOS-No 010
000011:	VTPOS-No 011
000012:	VTPOS-No 012
000013:	VTPOS-No 013
000014:	VTPOS-No 014
000015:	VTPOS-No 015
000016:	VTPOS-No 016
000017:	VTPOS-No 017
000018:	VTPOS-No 018
000019:	VTPOS-No 019
000020:	VTPOS-No 020
000021:	VTPOS-No 021
000022:	VTPOS-No 022
000023:	VTPOS-No 023
000024:	VTPOS-No 024
000025:	VTPOS-No 025
000026:	VTPOS-No 026
000027:	VTPOS-No 027
000028:	VTPOS-No 028
000029:	VTPOS-No 029
000030:	VTPOS-No 030
000031:	VTPOS-No 031
000032:	VTPOS-No 032
000033:	VTPOS-No 033
000034:	VTPOS-No 034
000035:	VTPOS-No 035
000036:	VTPOS-No 036
000037:	VTPOS-No 037
000038:	VTPOS-No 038
000039:	VTPOS-No 039
000040:	VTPOS-No 040
000041:	VTPOS-No 041
000042:	VTPOS-No 042
000043:	VTPOS-No 043
000044:	VTPOS-No 044
000045:	VTPOS-No 045
000046:	VTPOS-No 046
000047:	VTPOS-No 047
000048:	VTPOS-No 048
000049:	VTPOS-No 049
000050:	VTPOS-No 050
000051:	VTPOS-No 051
000052:	VTPOS-No 052
000053:	VTPOS-No 053
000054:	VTPOS-No 054
000056:	VTPOS-No 056
000055:	VTPOS-No 055
000057:	VTPOS-No 057
000058:	VTPOS-No 058
000059:	VTPOS-No 059
000060:	VTPOS-No 060
000061:	VTPOS-No 061
000062:	VTPOS-No 062
000063:	VTPOS-No 063
000064:	VTPOS-No 064
000065:	VTPOS-No 065
000066:	VTPOS-No 066
000067:	VTPOS-No 067
000068:	VTPOS-No 068
000069:	VTPOS-No 069
000070:	VTPOS-No 070
000071:	VTPOS-No 071
000072:	VTPOS-No 072
000073:	VTPOS-No 073
000074:	VTPOS-No 074
000075:	VTPOS-No 075
000076:	VTPOS-No 076
000077:	VTPOS-No 077
000078:	VTPOS-No 078
000079:	VTPOS-No 079
000080:	VTPOS-No 080
000081:	VTPOS-No 081
000082:	VTPOS-No 082
000083:	VTPOS-No 083
000084:	VTPOS-No 084
000085:	VTPOS-No 085
000086:	VTPOS-No 086
000087:	VTPOS-No 087
000088:	VTPOS-No 088
000089:	VTPOS-No 089
000090:	VTPOS-No 090
000091:	VTPOS-No 091
000092:	VTPOS-No 092
000093:	VTPOS-No 093
000094:	VTPOS-No 094
000095:	VTPOS-No 095
000096:	VTPOS-No 096
000097:	VTPOS-No 097
000098:	VTPOS-No 098
000099:	VTPOS-No 099
000100:	VTPOS-No 100
000101:	VTPOS-No 101
000102:	VTPOS-No 102
000103:	VTPOS-No 103
000104:	VTPOS-No 104

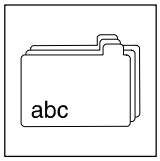


List 12:

000000:	Trav. Range
000001:	VTPOS-No 001
000002:	VTPOS-No 002
000003:	VTPOS-No 003
000004:	VTPOS-No 004
000005:	VTPOS-No 005
000006:	VTPOS-No 006
000007:	VTPOS-No 007
000008:	VTPOS-No 008
000009:	VTPOS-No 009
000010:	VTPOS-No 010
000011:	VTPOS-No 011
000012:	VTPOS-No 012
000013:	VTPOS-No 013
000014:	VTPOS-No 014
000015:	VTPOS-No 015
000016:	VTPOS-No 016
000017:	VTPOS-No 017
000018:	VTPOS-No 018
000019:	VTPOS-No 019
000020:	VTPOS-No 020
000021:	VTPOS-No 021
000022:	VTPOS-No 022
000023:	VTPOS-No 023
000024:	VTPOS-No 024
000025:	VTPOS-No 025
000026:	VTPOS-No 026
000027:	VTPOS-No 027
000028:	VTPOS-No 028
000029:	VTPOS-No 029
000030:	VTPOS-No 030
000031:	VTPOS-No 031
000032:	VTPOS-No 032
000033:	VTPOS-No 033
000034:	VTPOS-No 034
000035:	VTPOS-No 035
000036:	VTPOS-No 036
000037:	VTPOS-No 037
000038:	VTPOS-No 038
000039:	VTPOS-No 039
000040:	VTPOS-No 040
000041:	VTPOS-No 041
000042:	VTPOS-No 042
000043:	VTPOS-No 043
000044:	VTPOS-No 044
000045:	VTPOS-No 045
000046:	VTPOS-No 046
000047:	VTPOS-No 047
000048:	VTPOS-No 048
000049:	VTPOS-No 049
000050:	VTPOS-No 050
000051:	VTPOS-No 051
000052:	VTPOS-No 052
000053:	VTPOS-No 053
000054:	VTPOS-No 054
000055:	VTPOS-No 055
000056:	VTPOS-No 056
000057:	VTPOS-No 057
000058:	VTPOS-No 058
000059:	VTPOS-No 059
000060:	VTPOS-No 060
000061:	VTPOS-No 061
000062:	VTPOS-No 062
000063:	VTPOS-No 063
000064:	VTPOS-No 064
000065:	VTPOS-No 065
000066:	VTPOS-No 066
000067:	VTPOS-No 067
000068:	VTPOS-No 068
000069:	VTPOS-No 069
000070:	VTPOS-No 070
000071:	VTPOS-No 071
000072:	VTPOS-No 072
000073:	VTPOS-No 073
000074:	VTPOS-No 074
000075:	VTPOS-No 075
000076:	VTPOS-No 076
000077:	VTPOS-No 077
000078:	VTPOS-No 078
000079:	VTPOS-No 079
000080:	VTPOS-No 080
000081:	VTPOS-No 081
000082:	VTPOS-No 082
000083:	VTPOS-No 083
000084:	VTPOS-No 084
000085:	VTPOS-No 085
000086:	VTPOS-No 086
000087:	VTPOS-No 087
000088:	VTPOS-No 088
000089:	VTPOS-No 089
000090:	VTPOS-No 090
000091:	VTPOS-No 091
000092:	VTPOS-No 092
000093:	VTPOS-No 093
000094:	VTPOS-No 094
000095:	VTPOS-No 095
000096:	VTPOS-No 096
000097:	VTPOS-No 097
000098:	VTPOS-No 098
000099:	VTPOS-No 099
000100:	VTPOS-No 100
000101:	VTPOS-No 101
000102:	VTPOS-No 102
000103:	VTPOS-No 103
000104:	VTPOS-No 104

List 13:

000000:	Target = TP
000001:	VTPOS-No 001
000002:	VTPOS-No 002
000003:	VTPOS-No 003
000004:	VTPOS-No 004
000005:	VTPOS-No 005
000006:	VTPOS-No 006
000007:	VTPOS-No 007
000008:	VTPOS-No 008
000009:	VTPOS-No 009
000010:	VTPOS-No 010
000011:	VTPOS-No 011
000012:	VTPOS-No 012
000013:	VTPOS-No 013
000014:	VTPOS-No 014
000015:	VTPOS-No 015
000016:	VTPOS-No 016
000017:	VTPOS-No 017
000018:	VTPOS-No 018
000019:	VTPOS-No 019
000020:	VTPOS-No 020
000021:	VTPOS-No 021
000022:	VTPOS-No 022
000023:	VTPOS-No 023
000024:	VTPOS-No 024
000025:	VTPOS-No 025
000026:	VTPOS-No 026
000027:	VTPOS-No 027
000028:	VTPOS-No 028
000029:	VTPOS-No 029
000030:	VTPOS-No 030
000031:	VTPOS-No 031
000032:	VTPOS-No 032
000033:	VTPOS-No 033
000034:	VTPOS-No 034
000035:	VTPOS-No 035
000036:	VTPOS-No 036
000037:	VTPOS-No 037
000038:	VTPOS-No 038
000039:	VTPOS-No 039
000040:	VTPOS-No 040
000041:	VTPOS-No 041
000042:	VTPOS-No 042
000043:	VTPOS-No 043
000044:	VTPOS-No 044
000045:	VTPOS-No 045
000046:	VTPOS-No 046
000047:	VTPOS-No 047
000048:	VTPOS-No 048
000049:	VTPOS-No 049
000050:	VTPOS-No 050
000051:	VTPOS-No 051
000052:	VTPOS-No 052
000053:	VTPOS-No 053
000054:	VTPOS-No 054
000055:	VTPOS-No 055
000056:	VTPOS-No 056
000057:	VTPOS-No 057
000058:	VTPOS-No 058
000059:	VTPOS-No 059
000060:	VTPOS-No 060
000061:	VTPOS-No 061
000062:	VTPOS-No 062
000063:	VTPOS-No 063
000064:	VTPOS-No 064
000065:	VTPOS-No 065
000066:	VTPOS-No 066
000067:	VTPOS-No 067
000068:	VTPOS-No 068
000069:	VTPOS-No 069
000070:	VTPOS-No 070
000071:	VTPOS-No 071
000072:	VTPOS-No 072
000073:	VTPOS-No 073
000074:	VTPOS-No 074
000075:	VTPOS-No 075
000076:	VTPOS-No 076
000077:	VTPOS-No 077
000078:	VTPOS-No 078
000079:	VTPOS-No 079
000080:	VTPOS-No 080
000081:	VTPOS-No 081
000082:	VTPOS-No 082
000083:	VTPOS-No 083
000084:	VTPOS-No 084
000085:	VTPOS-No 085
000086:	VTPOS-No 086
000087:	VTPOS-No 087
000088:	VTPOS-No 088
000089:	VTPOS-No 089
000090:	VTPOS-No 090
000091:	VTPOS-No 091
000092:	VTPOS-No 092
000093:	VTPOS-No 093
000094:	VTPOS-No 094
000095:	VTPOS-No 095
000096:	VTPOS-No 096
000097:	VTPOS-No 097
000098:	VTPOS-No 098
000099:	VTPOS-No 099
000100:	VTPOS-No 100
000101:	VTPOS-No 101
000102:	VTPOS-No 102
000103:	VTPOS-No 103
000104:	VTPOS-No 104



Appendix

List 14:

000000:	v-max
000001:	VTVEL-No 01
000002:	VTVEL-No 02
000003:	VTVEL-No 03
000004:	VTVEL-No 04
000005:	VTVEL-No 05
000006:	VTVEL-No 06
000007:	VTVEL-No 07
000008:	VTVEL-No 08
000009:	VTVEL-No 09
000010:	VTVEL-No 10
000011:	VTVEL-No 11
000012:	VTVEL-No 12
000013:	VTVEL-No 13
000014:	VTVEL-No 14
000015:	VTVEL-No 15
000016:	VTVEL-No 16
000017:	VTVEL-No 17
000018:	VTVEL-No 18
000019:	VTVEL-No 19
000020:	VTVEL-No 20
000021:	VTVEL-No 21
000022:	VTVEL-No 22
000023:	VTVEL-No 23
000024:	VTVEL-No 24
000025:	VTVEL-No 25
000026:	VTVEL-No 26
000027:	VTVEL-No 27
000028:	VTVEL-No 28
000029:	VTVEL-No 29
000030:	VTVEL-No 30
000031:	VTVEL-No 31
000032:	VTVEL-No 32
000033:	VTVEL-No 33
000034:	VTVEL-No 34

List 15:

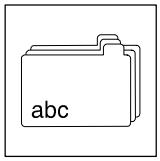
000000:	Standstill
000001:	VTVEL-No 01
000002:	VTVEL-No 02
000003:	VTVEL-No 03
000004:	VTVEL-No 04
000005:	VTVEL-No 05
000006:	VTVEL-No 06
000007:	VTVEL-No 07
000008:	VTVEL-No 08
000009:	VTVEL-No 09
000010:	VTVEL-No 10
000011:	VTVEL-No 11
000012:	VTVEL-No 12
000013:	VTVEL-No 13
000014:	VTVEL-No 14
000015:	VTVEL-No 15
000016:	VTVEL-No 16
000017:	VTVEL-No 17
000018:	VTVEL-No 18
000019:	VTVEL-No 19
000020:	VTVEL-No 20
000021:	VTVEL-No 21
000022:	VTVEL-No 22
000023:	VTVEL-No 23
000024:	VTVEL-No 24
000025:	VTVEL-No 25
000026:	VTVEL-No 26
000027:	VTVEL-No 27
000028:	VTVEL-No 28
000029:	VTVEL-No 29
000030:	VTVEL-No 30
000031:	VTVEL-No 31
000032:	VTVEL-No 32
000033:	VTVEL-No 33
000034:	VTVEL-No 34

List 16:

000000:	a-max
000001:	VTACC-No 01
000002:	VTACC-No 02
000003:	VTACC-No 03
000004:	VTACC-No 04
000005:	VTACC-No 05
000006:	VTACC-No 06
000007:	VTACC-No 07
000008:	VTACC-No 08
000009:	VTACC-No 09
000010:	VTACC-No 10
000011:	VTACC-No 11
000012:	VTACC-No 12
000013:	VTACC-No 13
000014:	VTACC-No 14
000015:	VTACC-No 15
000016:	VTACC-No 16
000017:	VTACC-No 17
000018:	VTACC-No 18
000019:	VTACC-No 19
000020:	VTACC-No 20
000021:	VTACC-No 21
000022:	VTACC-No 22
000023:	VTACC-No 23
000024:	VTACC-No 24
000025:	VTACC-No 25
000026:	VTACC-No 26
000027:	VTACC-No 27
000028:	VTACC-No 28
000029:	VTACC-No 29
000030:	VTACC-No 30
000031:	VTACC-No 31
000032:	VTACC-No 32
000033:	VTACC-No 33
000034:	VTACC-No 34

List 17:

000000:	inactive
000001:	VTPCS-No 01
000002:	VTPCS-No 02
000003:	VTPCS-No 03
000004:	VTPCS-No 04
000005:	VTPCS-No 05
000006:	VTPCS-No 06
000007:	VTPCS-No 07
000008:	VTPCS-No 08
000009:	VTPCS-No 09
000010:	VTPCS-No 10
000011:	VTPCS-No 11
000012:	VTPCS-No 12
000013:	VTPCS-No 13
000014:	VTPCS-No 14
000015:	VTPCS-No 15
000016:	VTPCS-No 16
000017:	VTPCS-No 17
000018:	VTPCS-No 18
000019:	VTPCS-No 19
000020:	VTPCS-No 20
000021:	VTPCS-No 21
000022:	VTPCS-No 22
000023:	VTPCS-No 23
000024:	VTPCS-No 24
000025:	VTPCS-No 25
000026:	VTPCS-No 26
000027:	VTPCS-No 27
000028:	VTPCS-No 28
000029:	VTPCS-No 29
000030:	VTPCS-No 30
000031:	VTPCS-No 31
000032:	VTPCS-No 32
000033:	VTPCS-No 33
000034:	VTPCS-No 34



List 18:

000000:	inactive
000001:	VTTIME-No 01
000002:	VTTIME-No 02
000003:	VTTIME-No 03
000004:	VTTIME-No 04
000005:	VTTIME-No 05
000006:	VTTIME-No 06
000007:	VTTIME-No 07
000008:	VTTIME-No 08
000009:	VTTIME-No 09
000010:	VTTIME-No 10
000011:	VTTIME-No 11
000012:	VTTIME-No 12
000013:	VTTIME-No 13
000014:	VTTIME-No 14
000015:	VTTIME-No 15
000016:	VTTIME-No 16
000017:	VTTIME-No 17
000018:	VTTIME-No 18
000019:	VTTIME-No 19
000020:	VTTIME-No 20
000021:	VTTIME-No 21
000022:	VTTIME-No 22
000023:	VTTIME-No 23
000024:	VTTIME-No 24
000025:	VTTIME-No 25
000026:	VTTIME-No 26
000027:	VTTIME-No 27
000028:	VTTIME-No 28
000029:	VTTIME-No 29
000030:	VTTIME-No 30
000031:	VTTIME-No 31
000032:	VTTIME-No 32
000033:	VTTIME-No 33
000034:	VTTIME-No 34

List 19:

000000:	Prg. end
000001:	PS 01
000002:	PS 02
000003:	PS 03
000004:	PS 04
000005:	PS 05
000006:	PS 06
000007:	PS 07
000008:	PS 08
000009:	PS 09
000010:	PS 10
000011:	PS 11
000012:	PS 12
000013:	PS 13
000014:	PS 14
000015:	PS 15
000016:	PS 16
000017:	PS 17
000018:	PS 18
000019:	PS 19
000020:	PS 20
000021:	PS 21
000022:	PS 22
000023:	PS 23
000024:	PS 24
000025:	PS 25
000026:	PS 26
000027:	PS 27
000028:	PS 28
000029:	PS 29
000030:	PS 30
000031:	PS 31
000032:	PS 32

List 20:

000000:	inactive
000001:	VTPOS-No 001
000002:	VTPOS-No 002
000003:	VTPOS-No 003
000004:	VTPOS-No 004
000005:	VTPOS-No 005
000006:	VTPOS-No 006
000007:	VTPOS-No 007
000008:	VTPOS-No 008
000009:	VTPOS-No 009
000010:	VTPOS-No 010
000011:	VTPOS-No 011
000012:	VTPOS-No 012
000013:	VTPOS-No 013
000014:	VTPOS-No 014
000015:	VTPOS-No 015
000016:	VTPOS-No 016
000017:	VTPOS-No 017
000018:	VTPOS-No 018
000019:	VTPOS-No 019
000020:	VTPOS-No 020
000021:	VTPOS-No 021
000022:	VTPOS-No 022
000023:	VTPOS-No 023
000024:	VTPOS-No 024
000025:	VTPOS-No 025
000026:	VTPOS-No 026
000027:	VTPOS-No 027
000028:	VTPOS-No 028
000029:	VTPOS-No 029
000030:	VTPOS-No 030
000031:	VTPOS-No 031
000032:	VTPOS-No 032
000033:	VTPOS-No 033
000034:	VTPOS-No 034
000035:	VTPOS-No 035
000036:	VTPOS-No 036
000037:	VTPOS-No 037
000038:	VTPOS-No 038
000039:	VTPOS-No 039
000040:	VTPOS-No 040
000041:	VTPOS-No 041
000042:	VTPOS-No 042
000043:	VTPOS-No 043
000044:	VTPOS-No 044
000045:	VTPOS-No 045
000046:	VTPOS-No 046
000047:	VTPOS-No 047
000048:	VTPOS-No 048
000049:	VTPOS-No 049
000050:	VTPOS-No 050
000051:	VTPOS-No 051
000052:	VTPOS-No 052
000053:	VTPOS-No 053
000054:	VTPOS-No 054
000055:	VTPOS-No 055
000056:	VTPOS-No 056
000057:	VTPOS-No 057
000058:	VTPOS-No 058
000059:	VTPOS-No 059
000060:	VTPOS-No 060
000061:	VTPOS-No 061
000062:	VTPOS-No 062
000063:	VTPOS-No 063
000064:	VTPOS-No 064
000065:	VTPOS-No 065
000066:	VTPOS-No 066
000067:	VTPOS-No 067
000068:	VTPOS-No 068
000069:	VTPOS-No 069
000070:	VTPOS-No 070
000071:	VTPOS-No 071
000072:	VTPOS-No 072
000073:	VTPOS-No 073
000074:	VTPOS-No 074
000075:	VTPOS-No 075
000076:	VTPOS-No 076
000077:	VTPOS-No 077
000078:	VTPOS-No 078
000079:	VTPOS-No 079
000080:	VTPOS-No 080
000081:	VTPOS-No 081
000082:	VTPOS-No 082
000083:	VTPOS-No 083
000084:	VTPOS-No 084
000085:	VTPOS-No 085
000086:	VTPOS-No 086
000087:	VTPOS-No 087
000088:	VTPOS-No 088
000089:	VTPOS-No 089
000090:	VTPOS-No 090
000091:	VTPOS-No 091
000092:	VTPOS-No 092
000093:	VTPOS-No 093
000094:	VTPOS-No 094
000095:	VTPOS-No 095
000096:	VTPOS-No 096
000097:	VTPOS-No 097
000098:	VTPOS-No 098
000099:	VTPOS-No 099
000100:	VTPOS-No 100
000101:	VTPOS-No 101
000102:	VTPOS-No 102
000103:	VTPOS-No 103
000104:	VTPOS-No 104

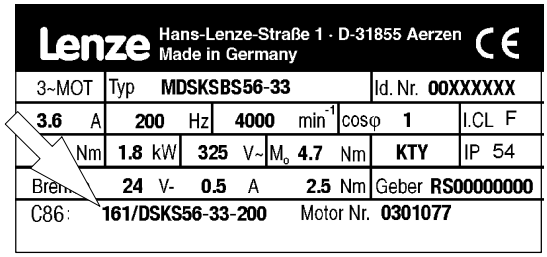
10.4 Motor selection list

10.4.1 Servo motors

Tip!

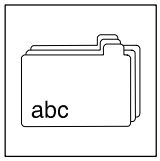
For the parameter setting of the drive the available motor type is to be entered under code C0086. This value is indicated on the nameplate.
Example: “161”. The motor designation behind this number is shown in the display ”DSKS56-33-200”.

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

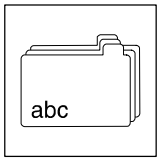


9300std201

C0086		Lenze motor type	C0081	C0087	C0088	C0089	C0090	Motor type	Thermal sensor
Value	Name		P_N [kW]	n_N [rpm]	I_N [A]	f_N [Hz]	a_N [V]		
10	MDSKA56-140	MDSKAXX056-22	0.80	3950	2.4	140	390	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			
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	390		
22	MDSKA100-80	MDSKAXX100-22	4.00	2340	8.2	80			
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	390		
26	MDSKA112-85	MDSKAXX112-22	6.40	2490	13.5	85			
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	360		
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			
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		



C0086		Lenze motor type	C0081	C0087	C0088	C0089	C0090	Motor type	Thermal sensor
Value	Name		P_N [kW]	n_N [rpm]	I_N [A]	f_N [Hz]	a_N [V]		
50	DSVA56-140	DSVAXX056-22	0.80	3950	2.4	140		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	390		
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			
62	DSVA100-80	DSVAXX100-22	4.00	2340	8.2	80	390		
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			
66	DSVA112-85	DSVAXX112-22	6.40	2490	13.5	85	390		
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		



Appendix

Reference List for servo motors

Tip!

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

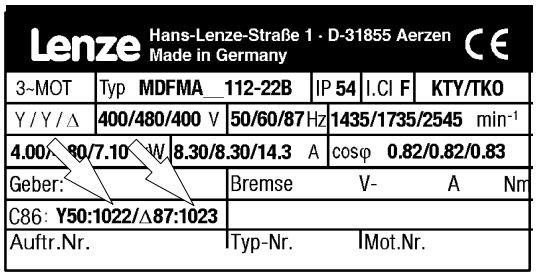
1. Please enter the value stated for your motor under C0086 in GDC or the keypad.
2. Then check all codes listed in the table.
   Overwrite the entry in GDC or the keypad with the values indicated in the table.
3. If necessary, codes C0070 and C0071 must be adapted to your machine.

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]	a_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

10.4.2 Three-phase asynchronous motors

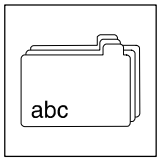
Tip!

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]	a_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				



Appendix

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]	a_r [V]		
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				

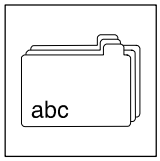
Reference List for motor types MDXMA

Tip!

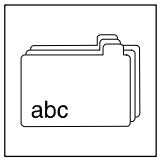
The motors listed under “Nameplate data” are available with GDC and unit software.

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_N [kW]	R_S [Ω]	L σ [mH]	n_N [rpm]	I_N [A]	f_N [Hz]	a_N [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

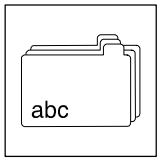


Nameplate		Data entry													
		C0086	C0022	C0081	C0084	C0085	C0087	C0088	C0089	C0090	C0091	C0070	C0071	C0075	C0076
Field: C86	Field: Motor type		Imax [A]	P_N [kW]	R_S [Ω]	L σ [mH]	n_N [rpm]	I_N [A]	f_N [Hz]	a_N [V]	cos φ	V_{pn}	T_{nn}	V_{pi}	T_{ni}
445	MDXMAXM-090-32	255	9.15	2.70	5.1	27.70	2530	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
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



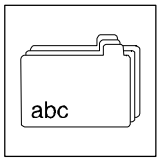
Appendix

Nameplate		Data entry													
			C0022	C0081	C0084	C0085	C0087	C0088	C0089	C0090	C0091	C0070	C0071	C0075	C0076
Field: C86	Field: Motor type	C0086	Imax [A]	P_N [kW]	R_S [Ω]	L σ [mH]	n_N [rpm]	I_N [A]	f_N [Hz]	a_N [V]	cos φ	V_{pn}	T_{nn}	V_{pi}	T_{ni}
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
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

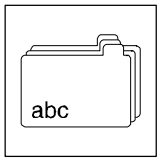


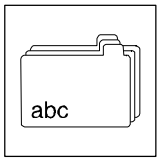
10.5 Glossary

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.

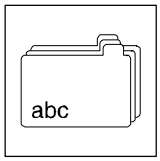


10.6 Table of keywords





Appendix



R

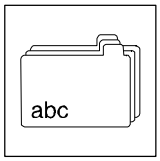
S

T

U

V

W



Appendix

Appendix