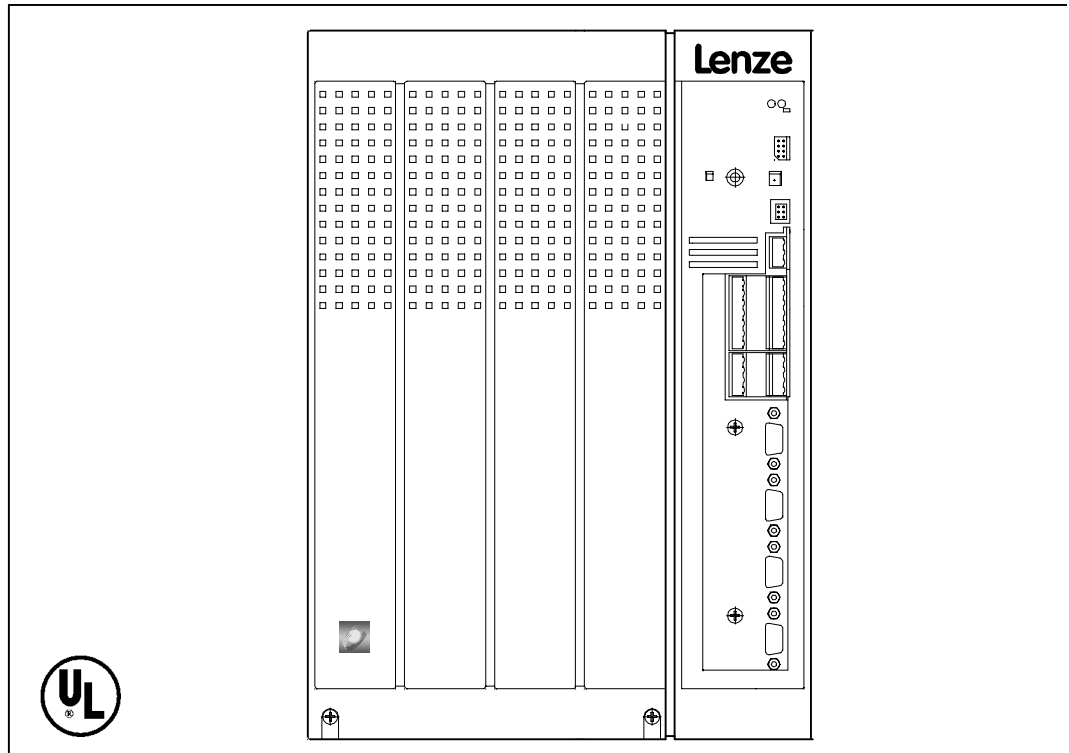


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Lenze

Operating Instructions



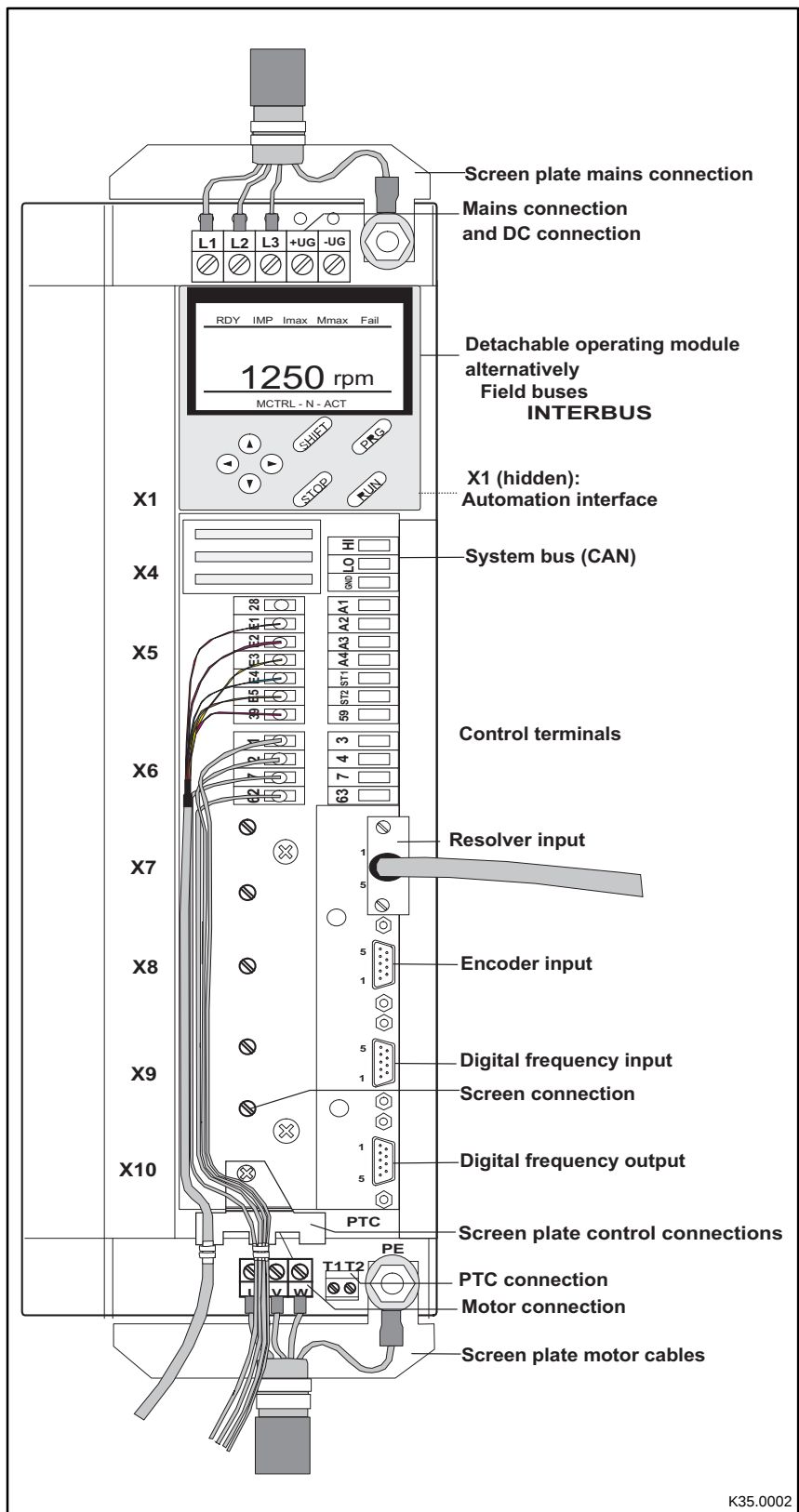
Global Drive
***9300 servo positioning
controller***

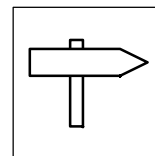
This documentation applies to 9300 servo positioning controllers as of version:

	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)
Type					
Design: C = Cold Plate E = Enclosure IP20 IB = Module					
Hardware version and index					
Software version and index					
Explanation					

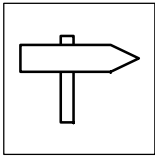
What is new / what has changed ?

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



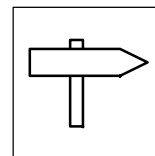


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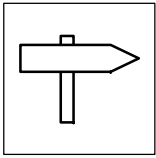


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1 Preface and general information

1.1 About these Operating Instructions

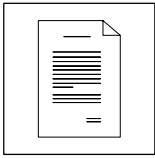
- These Operating Instructions help with the connection and the commissioning of the 93XX servo positioning controller. They contain safety information which must be observed.
- All persons working on and with the 93XX servo positioning controller must have the Operating Instructions available and must 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.



Preface and general information

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.



Safety information

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.



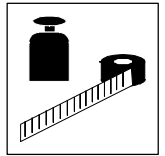
Signal word

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".

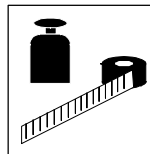


3 Technical data

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).





3.3 Rated data

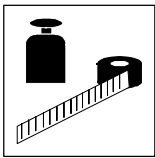
3.3.1 Types 9321 to 9325

	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 % $\leq V_r \leq$ 528 V + 0 % ; 45 Hz - 0 % ... 65 Hz + 0 %				
Alternative DC supply	V_{DC} [V]	460 V - 0 % $\leq V_{DC} \leq$ 740 V + 0 %				
Mains current with mains filter	I_r [A]	1.5	2.5	3.9	7.0	12.0
Mains current without mains filter		2.1	3.5	5.5	-	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 - $3 \times V_{Mains}$				
Power loss (operation with I_{ratedx})	P_{loss} [W]	100	110	140	200	260
Power derating	[%/K]	40 °C < T_V < 55 °C: 2%/K (not UL approved)				
	[%/m]	1000 m amsl < h $\leq$ 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)



Technical data

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} ≤ 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 I_{rx} 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.

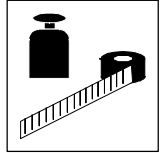
Overcurrent diagram: 7-4

All other data: 3-3



Tip!

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



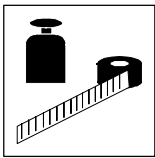
3.3.3 Types 9326 to 9332

	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 % $\leq V_r \leq$ 528 V + 0 % ; 45 Hz - 0 % ... 65 Hz + 0 %						
Alternative DC supply	a_{DC} [V]	460 V - 0 % $\leq U_{DC} \leq$ 740 V + 0 %						
Mains current with mains filter	I_r [A]	20.5	27.0	44.0	53.0	78.0	100	135
Mains current without mains filter		-	43.5	-	-	-	-	-
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 UMW (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 UMW (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 - $3 \times V_{Mains}$						
Power loss	P_{loss} [W]	360	430	640	810	1100	1470	1960
Power derating	$\begin{matrix} \text{[%/K]} \\ \text{[%/K]} \\ \text{[%/m]} \end{matrix}$	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 < $h \leq$ 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)



Technical data

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.I.c.b.	Cable cross-section 2)		Fuse		E.I.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.

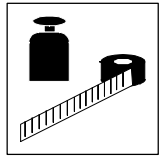


Tip!

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".



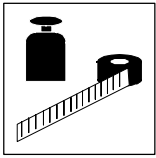
3.3.5 Mains filter

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

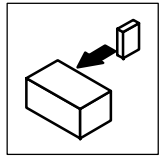
The mains filters for RFI degree B contain additional RFI suppression components.

3.4 Dimensions

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



Technical data



4 Installation

4.1 Mechanical installation

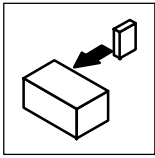
4.1.1 Important notes

- 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)



Installation

4.1.2 Standard assembly with fixing rails or fixing brackets

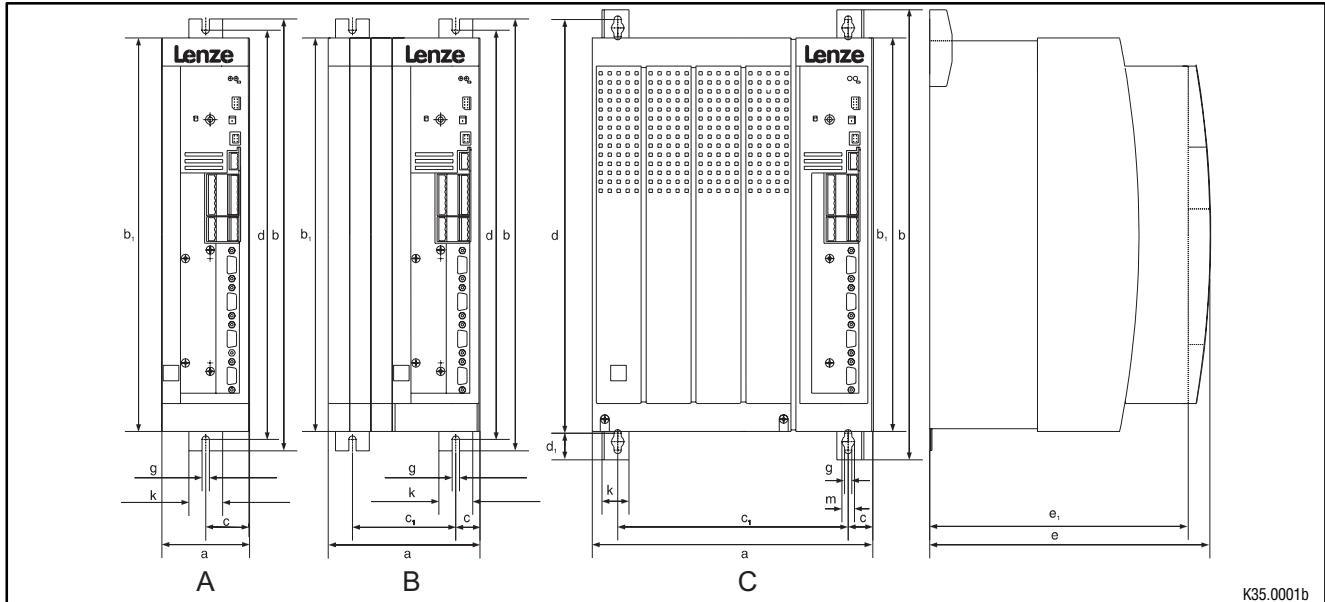


Fig. 4-1 Dimensions for assembly with fixing rails/fixing brackets

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

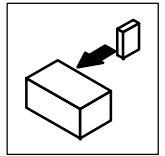
* When using a plug-on fieldbus module:
Observe the free space required for the connection cables
All dimensions in mm

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



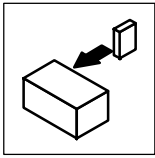
4.1.3 Assembly with thermally separated power stage ("punching")

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

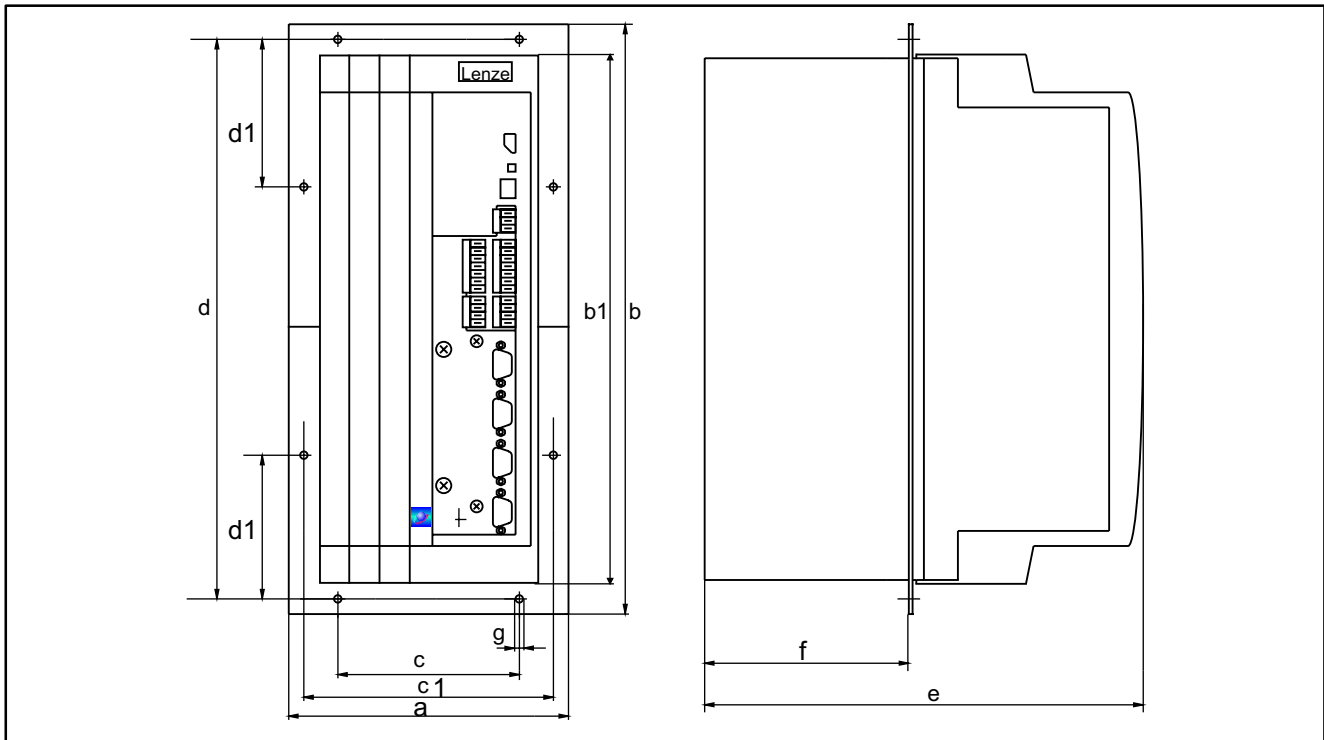


Fig. 4-2 Dimensions for assembly with thermally separated power stage

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, 9326	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



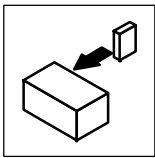
Fig. 4-3 Dimensions for assembly with thermally separated power stage

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



Installation

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

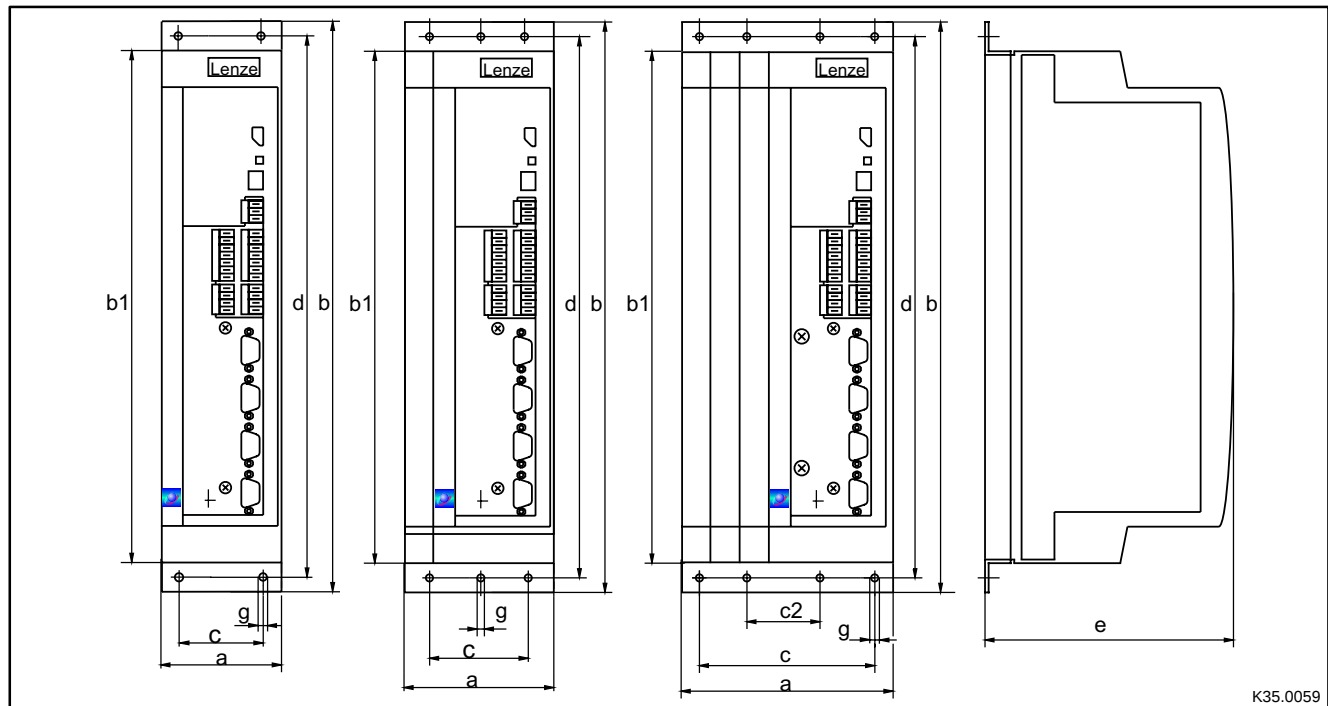
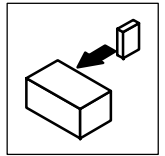


Fig. 4-4 Dimensions for assembly in "Cold Plate technique"

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

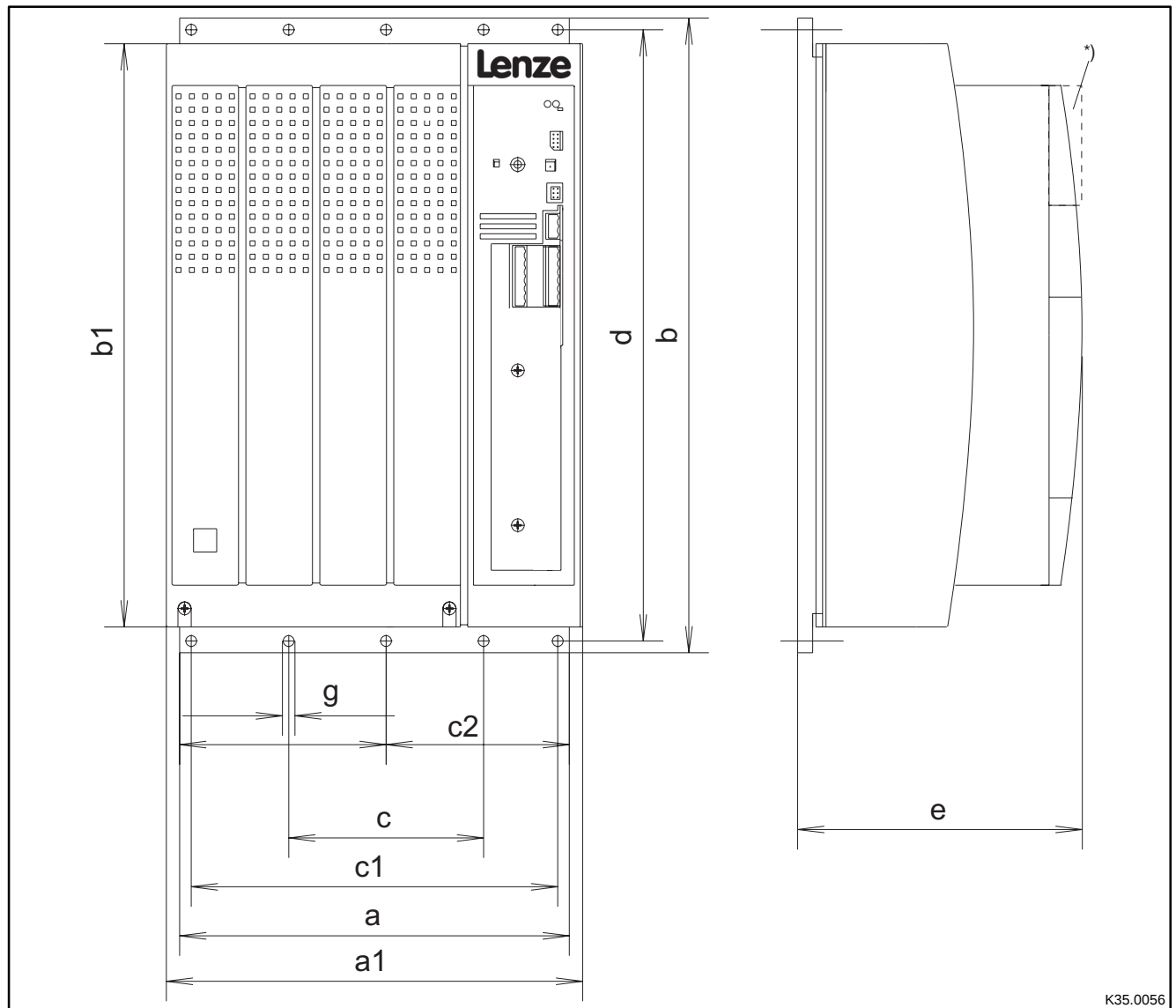
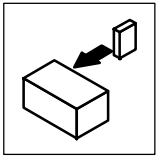


Fig. 4-5 Dimensions for assembly in "Cold Plate technique"

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



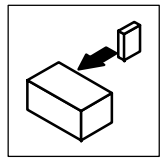
Installation

- 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 Type	Cooling path	
	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:

$$8 \text{ mm} \leq t \leq 10 \text{ mm}$$
- 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

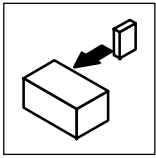
The RCCB must only be installed between the supplying mains and the controller.

Standards

(All-current sensitive RCCB)

All-current sensitive RCCBs are described in the European Standard 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.



Installation

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.

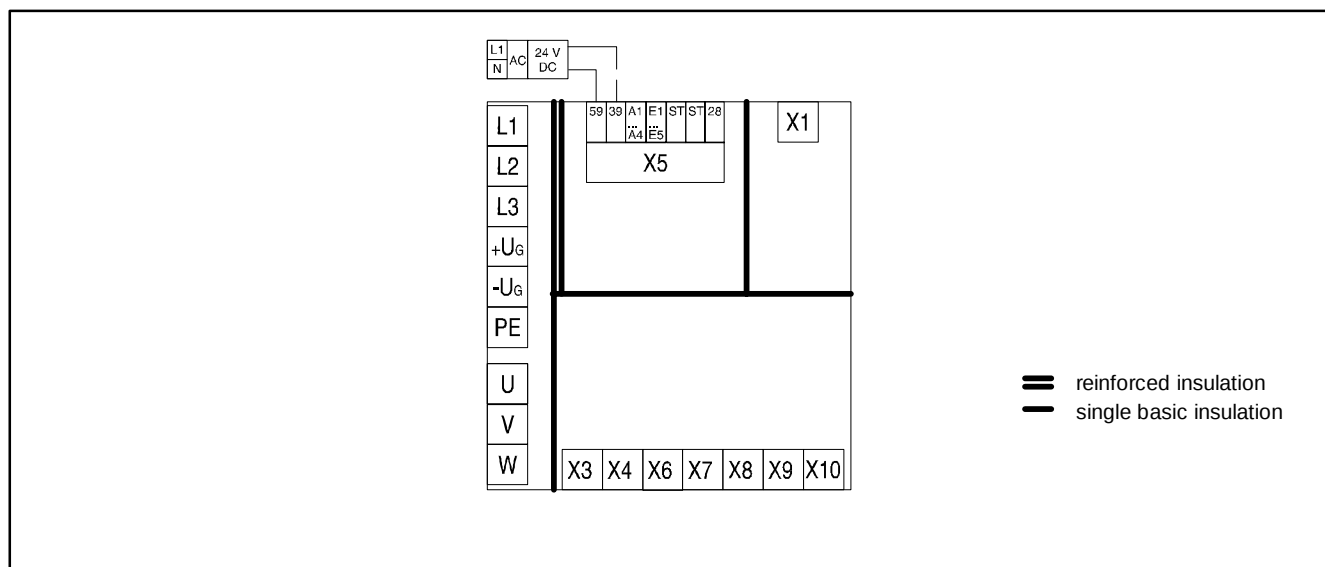


Fig. 4-6 Basic insulation in the controller

4.2.1.3 Replacement of defective fuses

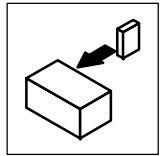
Replace defective fuses with the prescribed type only when no voltage is applied. (▢ 3-6)

- 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.

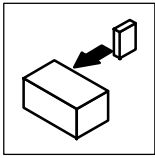
4.2.3 Motor protection



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.



Installation

4.2.4 Mains types/conditions

Please observe the restrictions for each mains type!

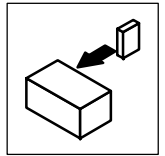
Mains	Operation of the controllers	Notes
With grounded neutral (TT/TN mains)	No restrictions	Observe controller ratings • Mains r.m.s. current:  3-3
With isolated neutral (IT mains)	Possible, if the controller is protected in the event of an earth fault in the supplying mains. • Possible, if appropriate 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 _s /-U _s	The DC voltage must be symmetrical to PE.	The controller will be destroyed when grounding +U _s or -U _s .

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.

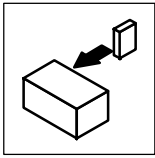
Fig. 4-7

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 mm ² 1)	0.5 ... 0.6 Nm (4.4 ... 5.3 lb-in)	3.4 Nm (30 lb-in)
9327 - 9329	25 mm ² 2)	5 Nm (44 lb-in)	
9330 - 9331	95 mm ² 2)	15 Nm (132 lb-in)	
9332	120 mm ² 2)	30 Nm (264 lb-in)	

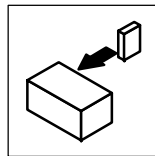
- 1) with pin cable lug: 6 mm²
with wire crimp cap 4 mm²
- 2) with ring cable lug Cross-section is limited only by the cable entry in the housing



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: $\leq 3\%$).	
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

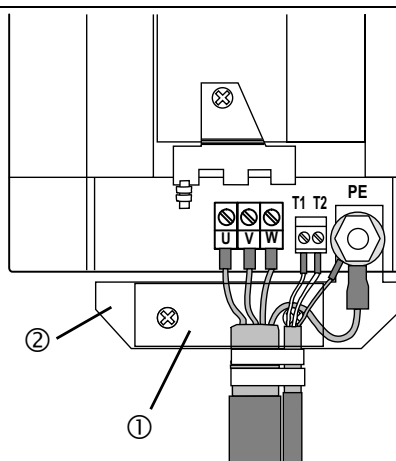
We recommend the use of screened motor cables only, because of the EMC safety.



Tip!

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

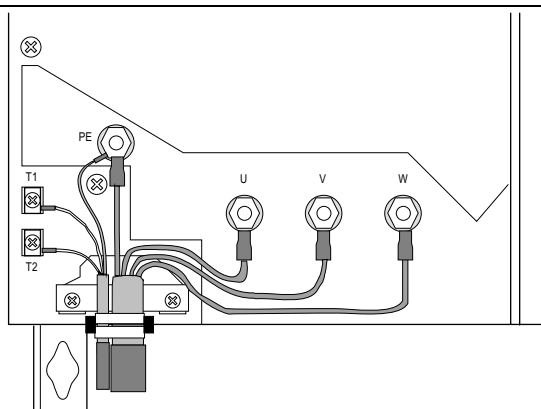
Types 9321 to 9326



Correct screen connection with screened cables (required parts in the accessory kit):

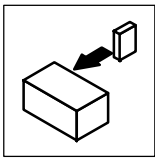
- Screw screen plate ① on fixing bracket. ②
- Fix the screen of the motor cable and thermal contact, if necessary, (see 4-28) with cable lugs. Do not use as a strain relief!
- To improve the screen connection: Connect screens additionally to the PE stud next to the motor connections.

Types 9327 to 9329



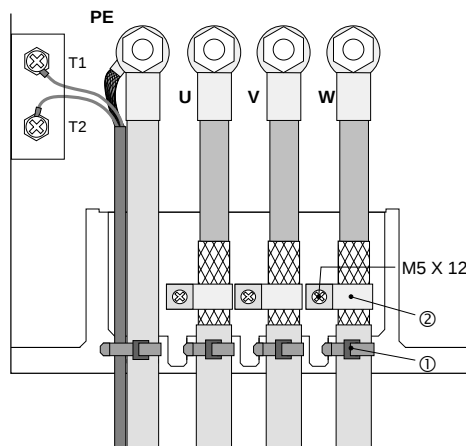
Correct screen connection with screened cables:

- 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.



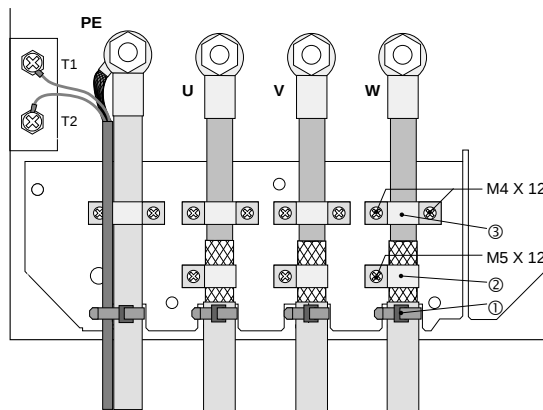
Installation

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.

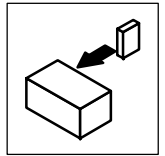
Type 9332



- 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:

	$amb_r = 400\text{ V (+10\%)}$		$amb_r = 480\text{ V (+10\%)}$	
Type	$f_{chop} = 8\text{ kHz}$	$f_{chop} = 16\text{ kHz}$	$f_{chop} = 8\text{ kHz}$	$f_{chop} = 16\text{ kHz}$
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: $L_{max} = 17\text{ m}$ • Three parallel single cores: $L_{max} = 9\text{ m}$			

- 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 mm ² 1)	1.5 mm ²	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 mm ² 2)		5 Nm (44 lb-in)			
9330 - 9331	95 mm ² 2)		15 Nm (132 lb-in)			
9332	120 mm ² 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.

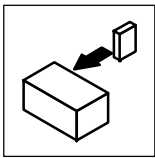
4.2.7.3 Connection of a brake unit

- 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 ($X5/28 = \text{LOW}$).
 - 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)



Installation

4.2.7.4 DC bus connection of several drives

Decentralized supply with brake module

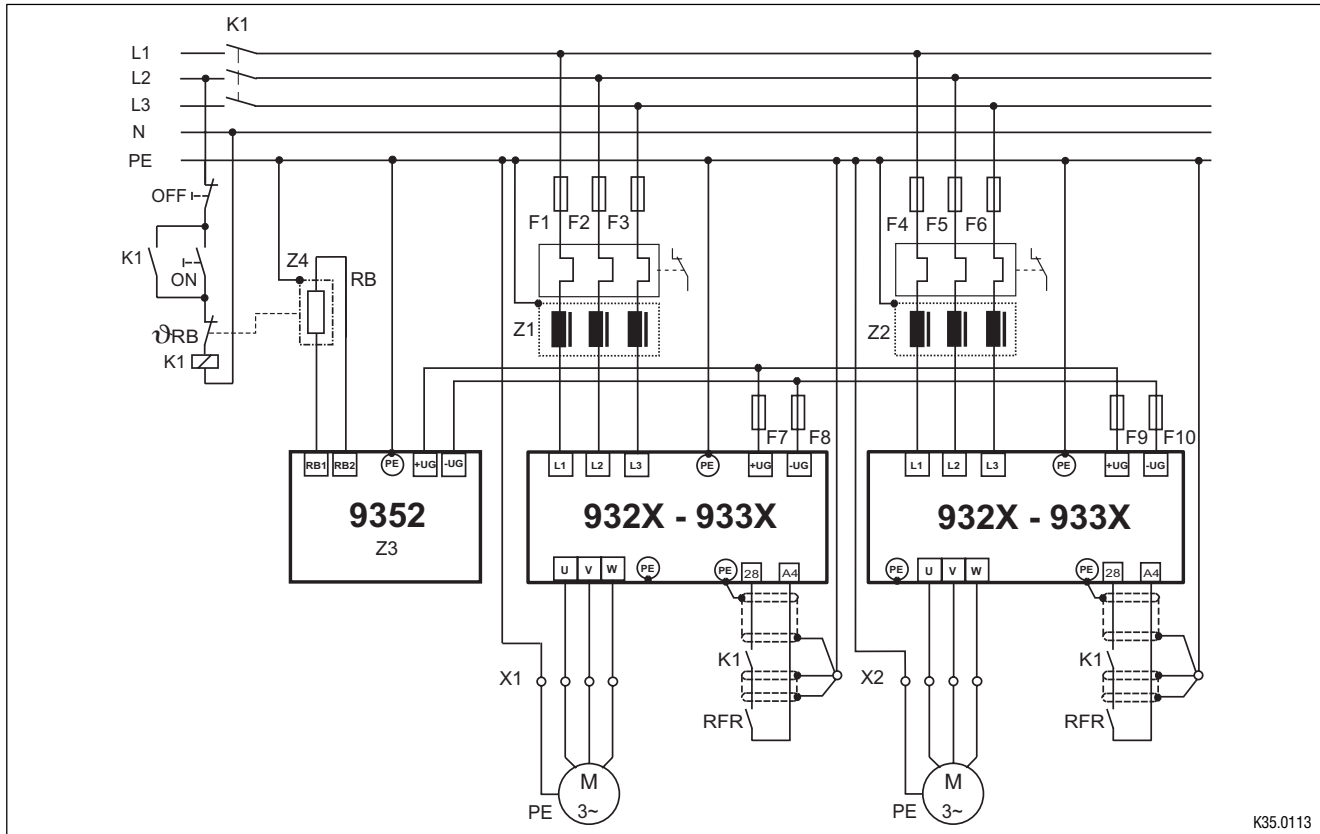


Fig. 4-9 Decentralized supply for DC-bus connection of several drives`

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



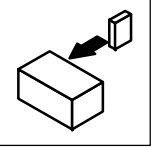
Stop!

- 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.

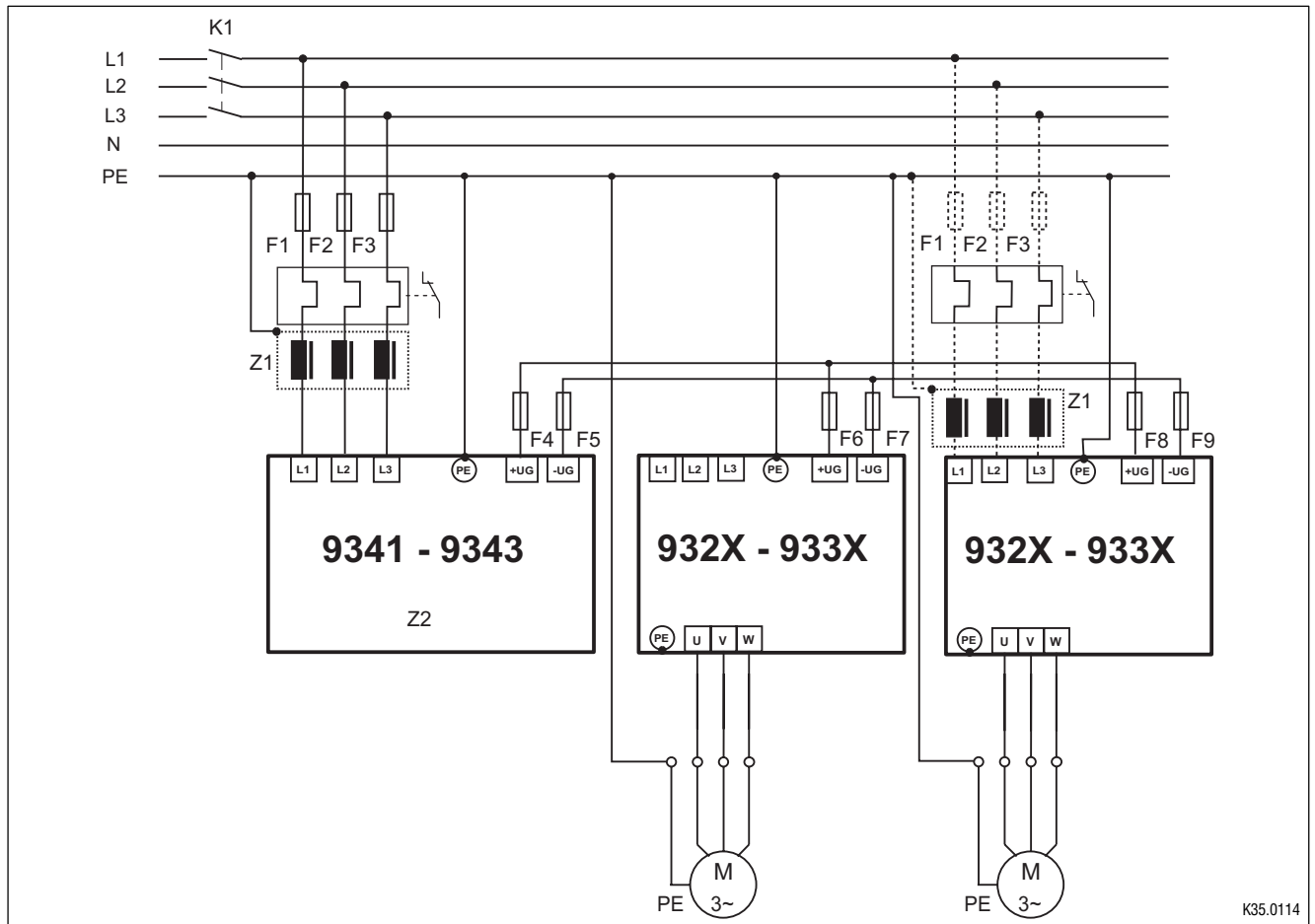


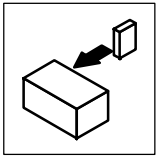
Fig. 4-10 Central supply for DC-bus connection of several drives

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.



Installation

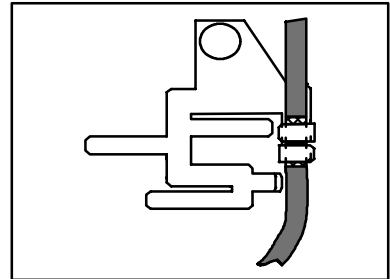
4.2.8 Control connections

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

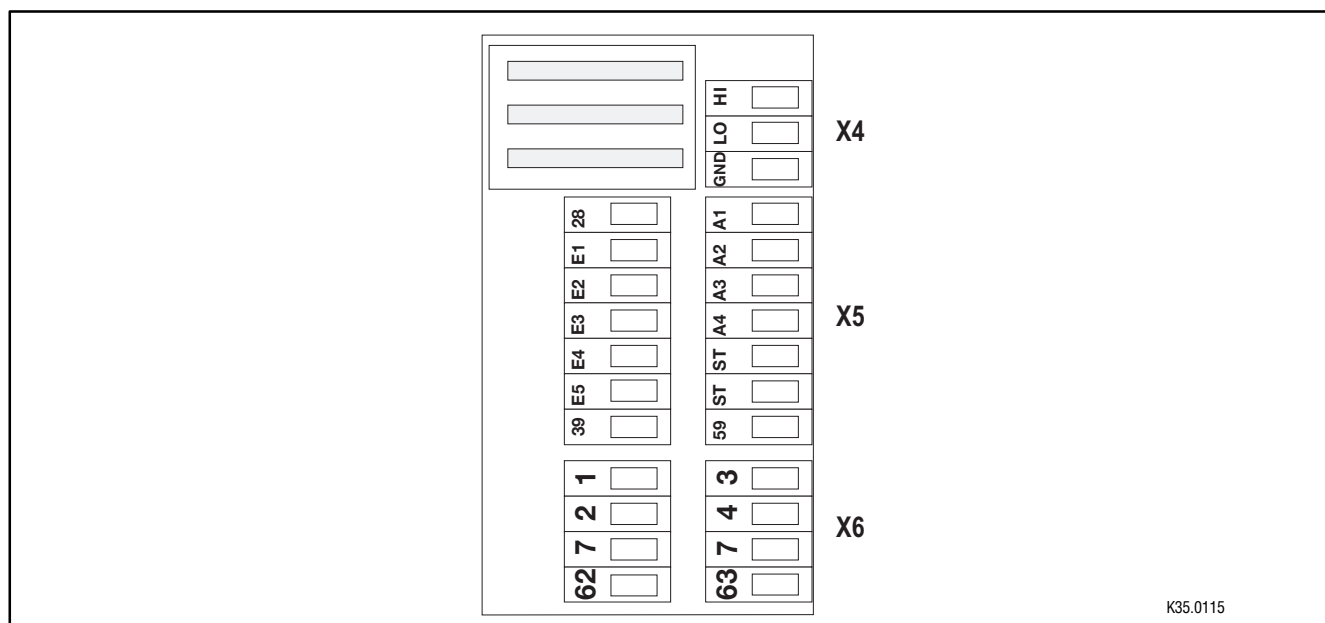
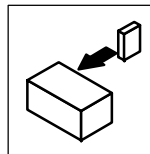


Fig. 4-11 Layout of the control connections on the front of the controller

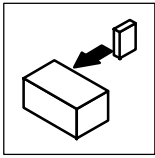


	Terminal	Use (Factory setting is printed in bold)		level	Data
Analog inputs	1, 2	Differential master-voltage input (not assigned)		-10 V to +10 V	Resolution: 5 mV (11 bit + sign)
		Differential master-current input (not assigned)		-20 mA to +20 mA	Resolution: 20 µA (10 bit + sign)
	3, 4	Differential 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 (PF01)		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.



Installation

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.

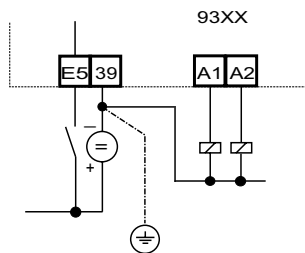
Connection for external supply voltage	
	STOP! - The maximum permitted voltage difference between an external voltage source and the GND1 (terminal X6/7) of the controller is 10V (common mode). - The maximum permitted voltage difference between GND1 (terminal X6/7) and the PE of the controller is 50V.
	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).

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

9300POS032

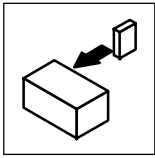
The maximum permitted voltage difference between GND2 (terminal X5/39) and the PE of the controller is 50 V.



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

9300POS033

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

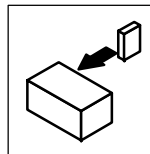
Digital frequency input (X9) / Digital frequency output (X10)



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, $\bar{O}$ / B, $\bar{B}$ / Z, $\bar{Z}$) (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	$\bar{O}$	0	+5 V	GND	Z	Z	EN	$\bar{B}$		B	$\bar{O}$	0	+5 V	GND	Z	Z	LC	$\bar{B}$	



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.

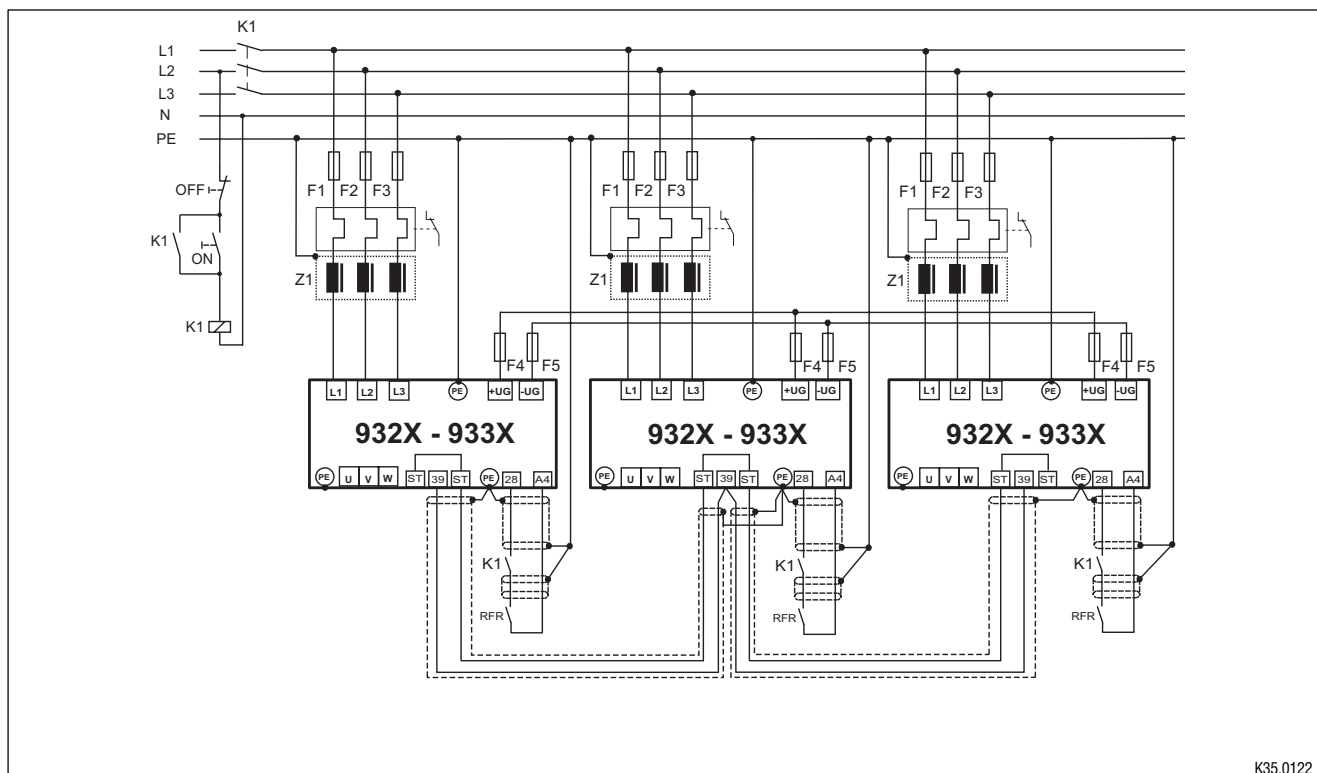


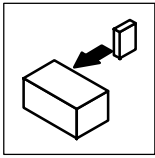
Fig. 4-12 Monitoring of a network of drives with the STATE-BUS

- | | |
|---------|--|
| 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)

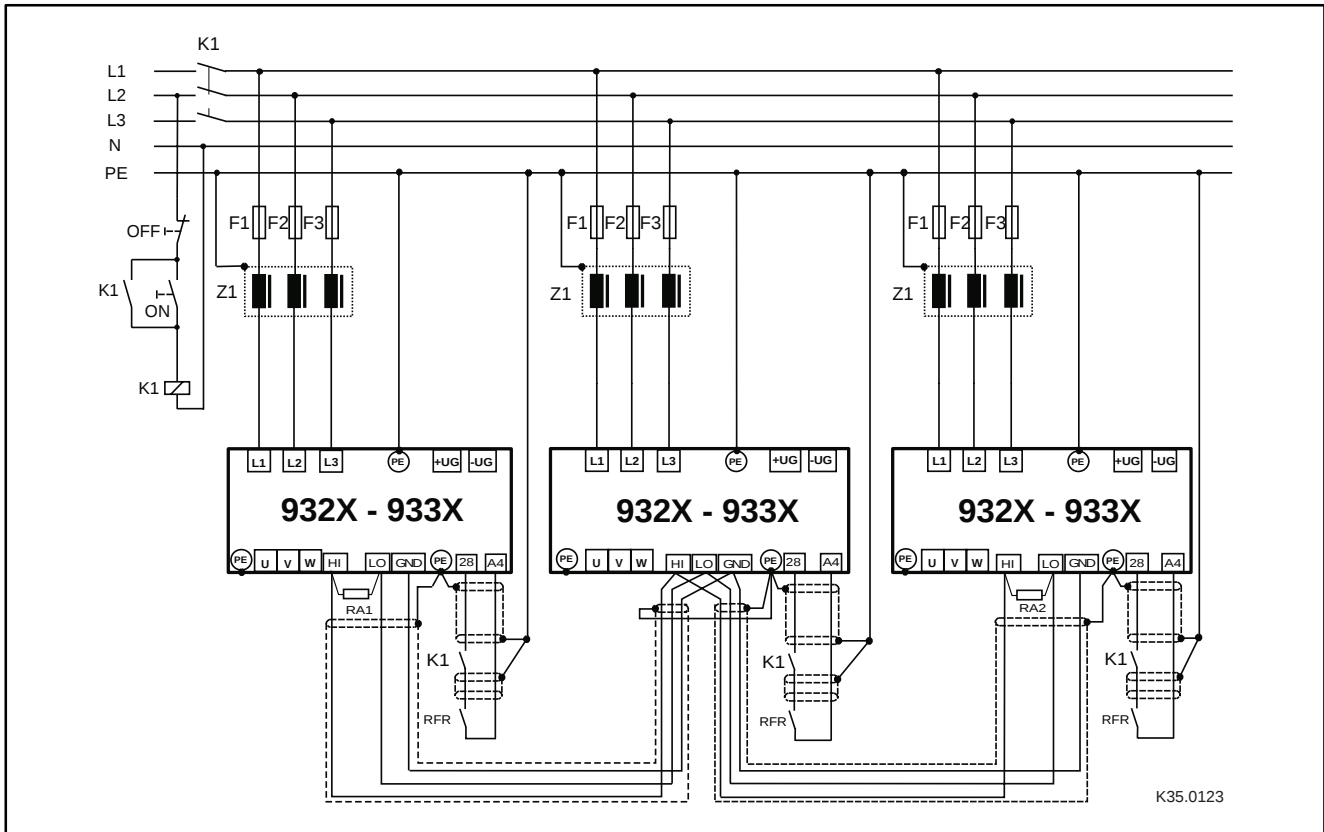


Fig. 4-13

Wiring system bus

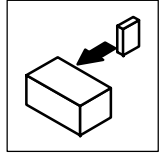
RA1, RA2

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	$\chi \leq 40 \Omega/\text{km}$	$\leq 40 \Omega/\text{km}$
Capacitance per unit length	$\leq 130 \text{ nF}/\text{km}$	$\leq 60 \text{ nF}/\text{km}$

- 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



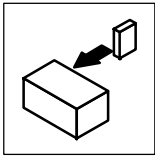
Tip!

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



Installation

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 $R_{\theta} > 1600 \Omega$	fixed at 150 °C	adjustable 45°C ... 150°C (C0121)	fixed, (depending on the PTC/thermal contact): PTC: at $R_{\theta} > 1600 \Omega$
Notes	- Monitoring is active in the default setting. - If resolver (X7) and encoder (X8) are operated together: – Connect KTY only at one connector (X7 or X8) – Do not connect KTY connection of the other female connector - For further information on the connection of the thermal sensor, please consult the description of the feedback system	- Deactivate monitoring via X7 or X8 under C0583=3 and C0584=3 - Connection to DIN 44081 (see also Fig. 4-14).		- Input characteristic. (4-29) - Deactivate monitoring via X7 or X8 under C0583=3 and C0584=3		- Deactivate monitoring via X7 or X8 under C0583=3 and C0584=3 - Connection to DIN 44081 (see also Fig. 4-14). - We recommend a Ziehl PTC (up to 150 °C): K15301075 or a thermostat.

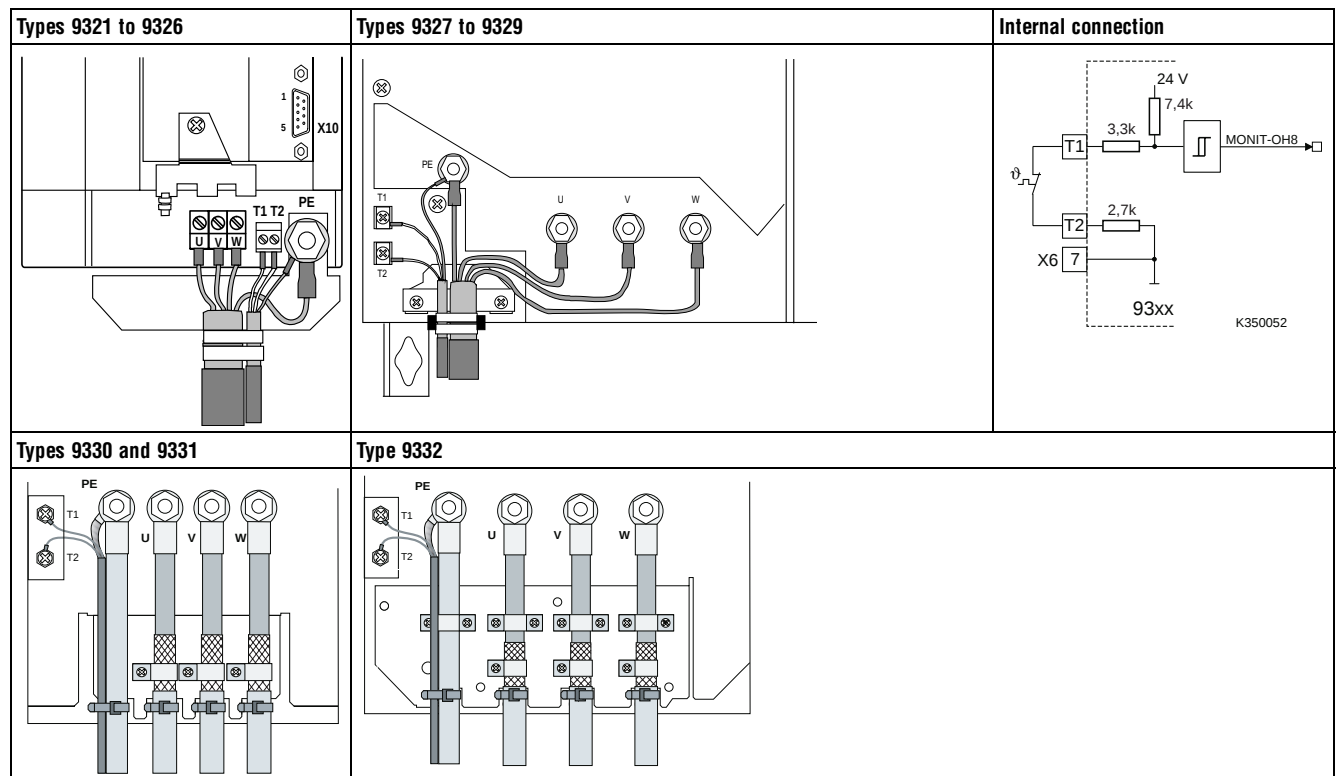
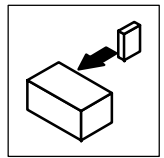


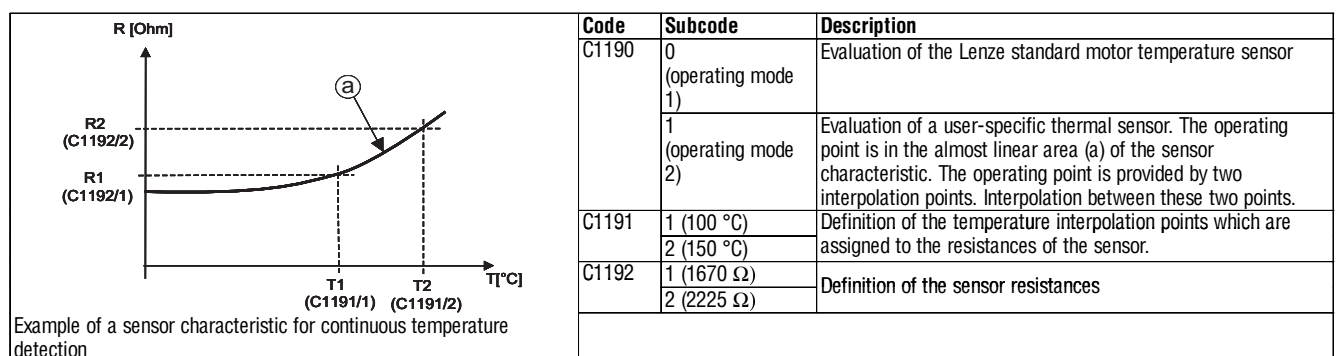
Fig. 4-14 Connection of a thermistor or PTC thermistor to terminals T1 and T2 and internal connection

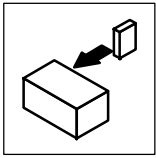


Note!

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

4.2.9.1 User-specific characteristic for a PTC thermistor





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)

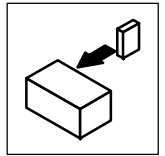
Resolver signal or encoder signal can be output for slaves at the digital frequency output X10.

- 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 ($V = 10\text{ V}$, $f = 4\text{ kHz}$)
- Resolver and resolver cable are monitored for open circuit (fault indication Sd2)

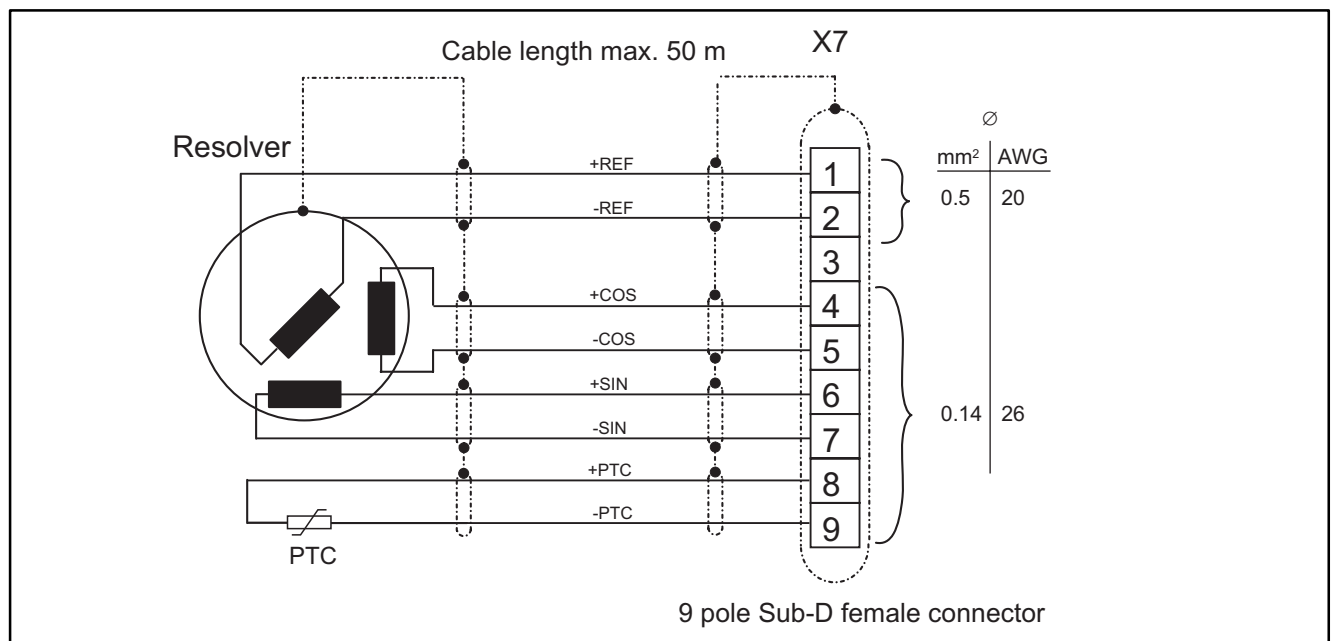
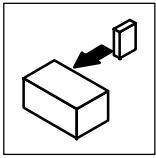


Fig. 4-15 Resolver connection

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



Stop!

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

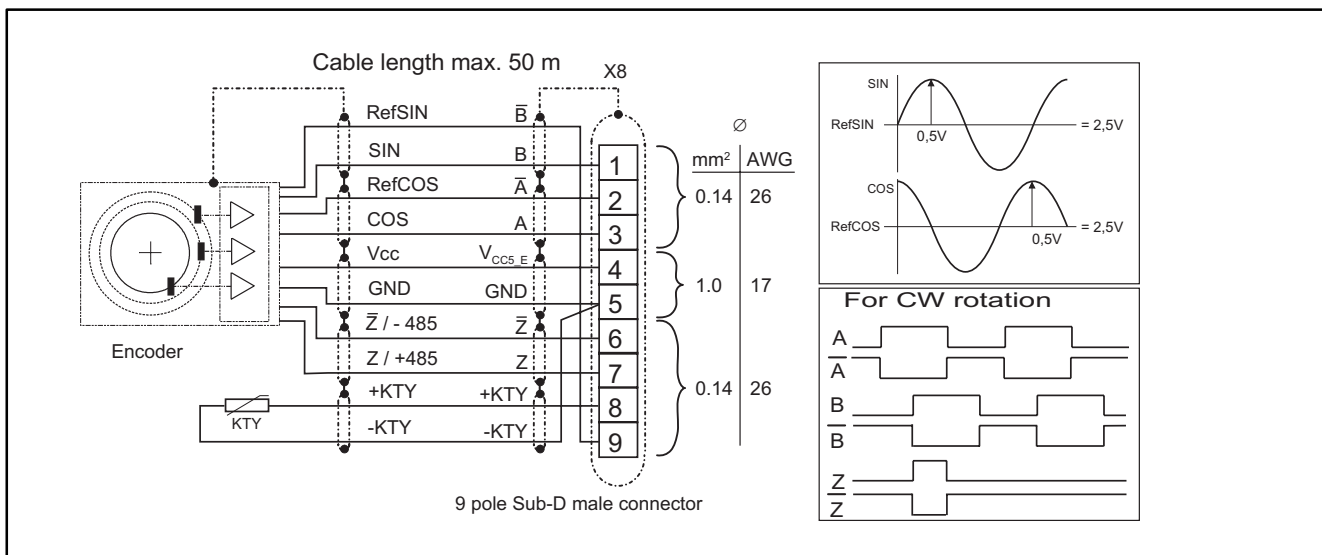
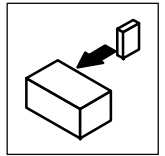


Fig. 4-16

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)	Z	Z	+ PTC (4-28)	$\overline{B}$

Sin/cos encoder

Features:

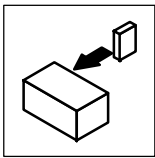
- The following encoders can be connected
 - sin/cos encoders with a rated voltage from 5 V to 8 V.
 - Sine-cosine encoders with a communication interface of type Stegmann SCS/M70xxx (The initialization time of the controller is increased to approx. 2 seconds).
- 9-pole Sub-D female connector
- Internal resistance $R_i = 221 \Omega$
- 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, $\overline{sine}$ and cosine, $\overline{cosine}$:
Assign RefSIN with sine and RefCOS with 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)	Z or -RS485	Z or +RS485	+ PTC (4-28)	RefSIN



Installation

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.

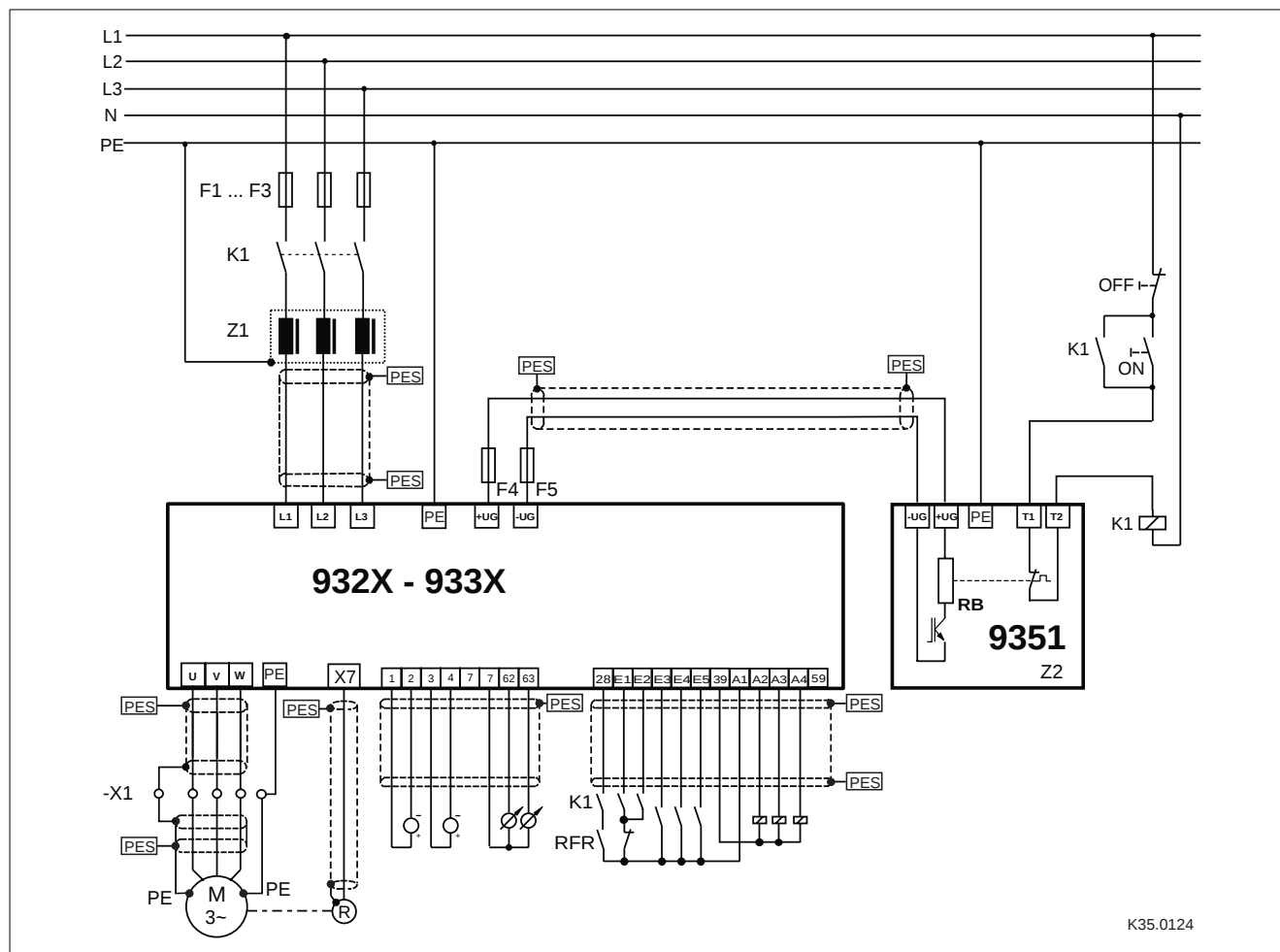
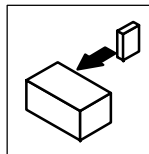
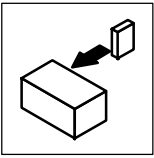


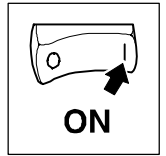
Fig. 4-17

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 shielding 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:

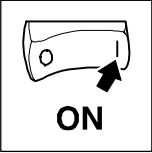
- Power connection:
 - Supply via terminals L1, L2 and L3 (direct mains connection) or alternatively via terminals +UG, -UG (DC bus connection, network of drives).
- Motor connection:
 - In-phase connection to the motor (direction of rotation).
- Feedback system (resolver, incremental encoder, ...).
- 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

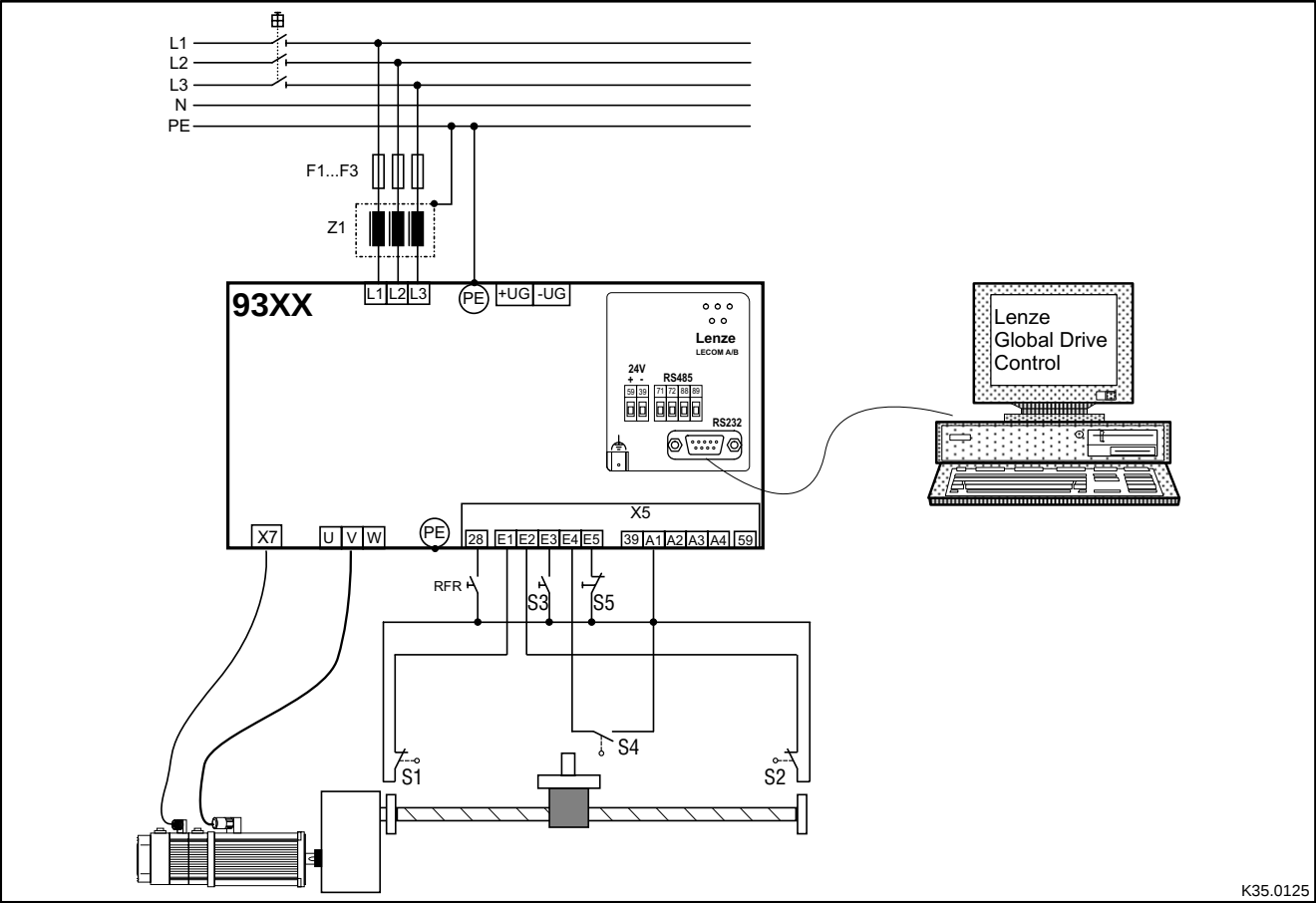
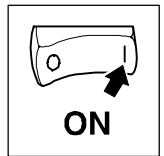


Fig. 5-1 Example of a drive control with default setting

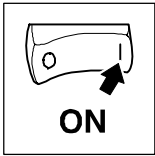
Switch	Function
S1	Limit switch for negative direction of positioning (system protection)
S2	Limit switch for positive direction of positioning (system protection)
S3	Start positioning program
S4	Reference label for homing Tip: Set E4 to HIGH if there is no homing mark.
S5	Change-over from positioning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



Commissioning

5.3 Commissioning sequence

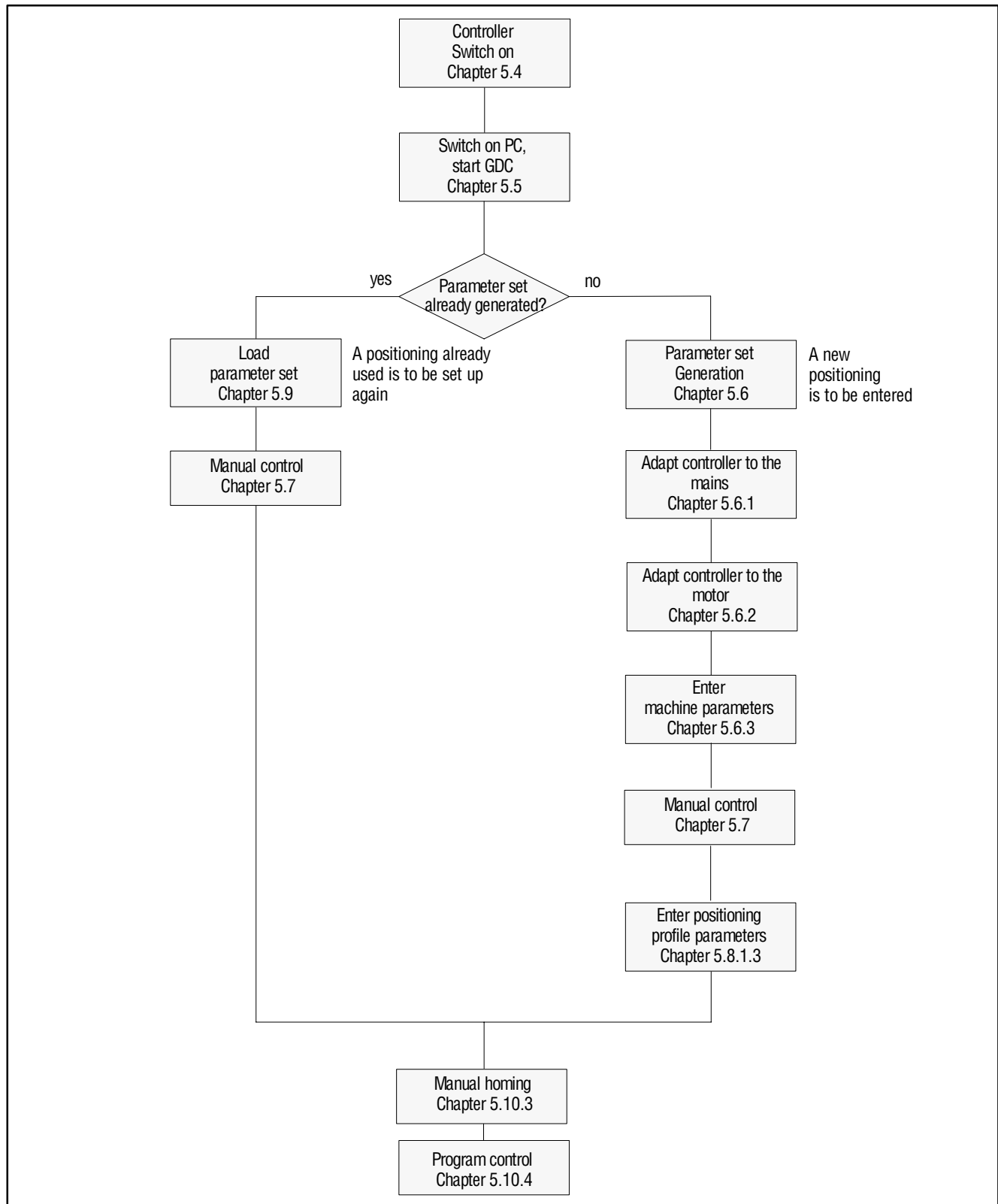
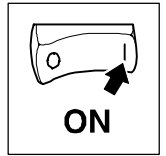


Fig. 5-2 Commissioning sequence



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

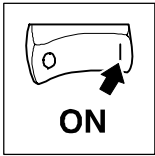
- Switch on PC.
- Start the GDC program under Windows.

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.



Commissioning

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

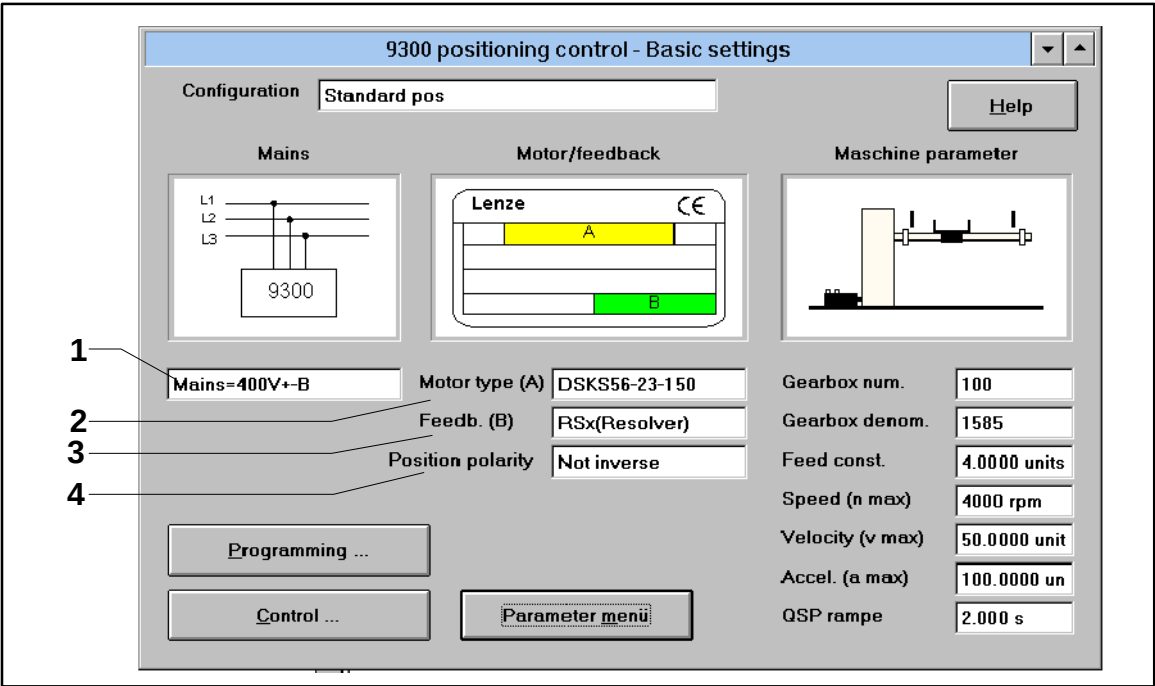
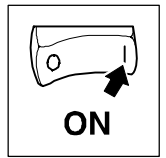


Fig. 5-3 "Basic settings" dialog box

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".

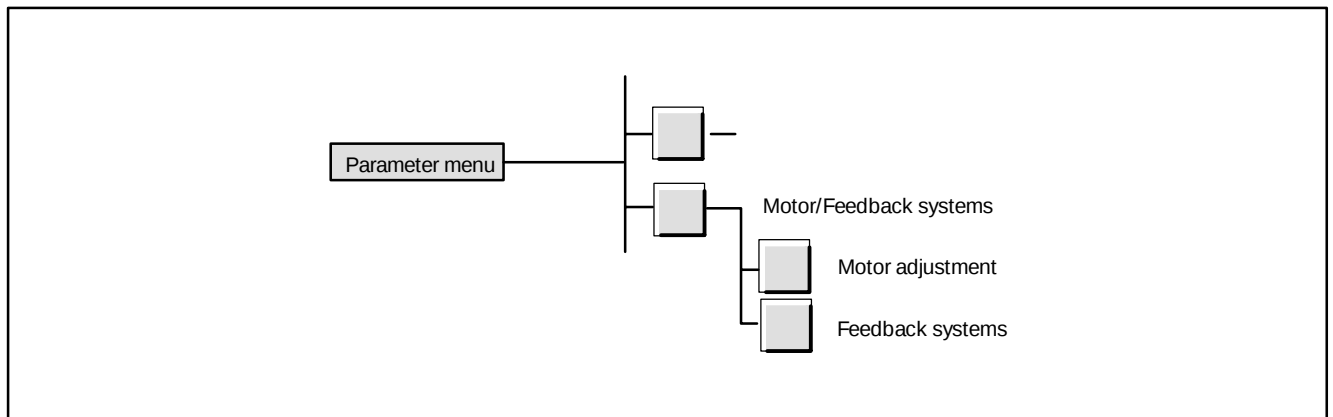


Fig. 5-4 How to find the menus "Motor setting" and "Feedback systems"

In the menu "Feedback systems":

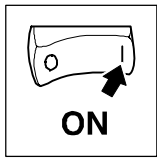
Field	Command	Function
	Select C0416	Resolver fault. Enter value from the motor nameplate
	Select C0003	Save data (C0003 = 1).

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 $\cos \varphi$.
	Select C0003	Save data (C0003 = 1).

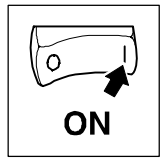


Commissioning

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:

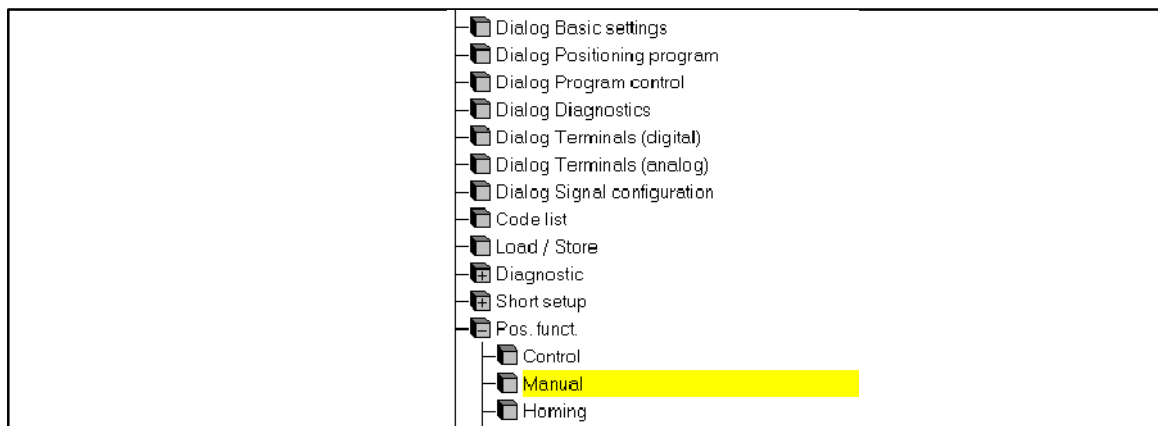
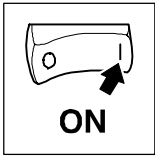


Fig. 5-6 Menu "Manual positioning" in the parameter menu

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 v _{max}
6	Click on C1252. Enter new value.	Manual positioning acceleration. Factory setting: 10 % of a _{max}
7	Click on C0003.	Save settings
8	Click on "Dialog control" menu.	Open "Control" dialog box.



Commissioning

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		-



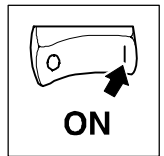
Tip!

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.

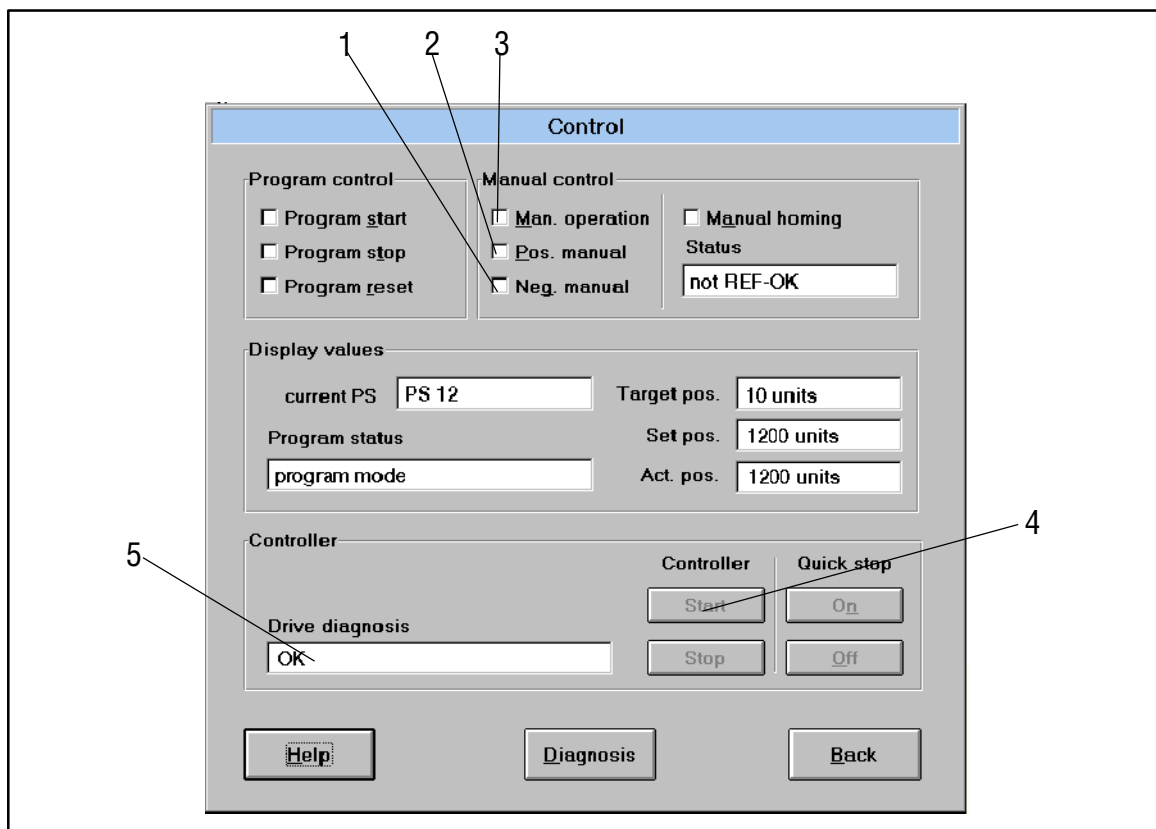
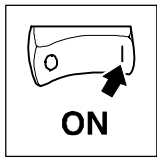


Fig. 5-7 Dialog box "Control"

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 • Override positioning limit switch to test its function.
	Reset "Manual positive"	The drive stops.



Commissioning

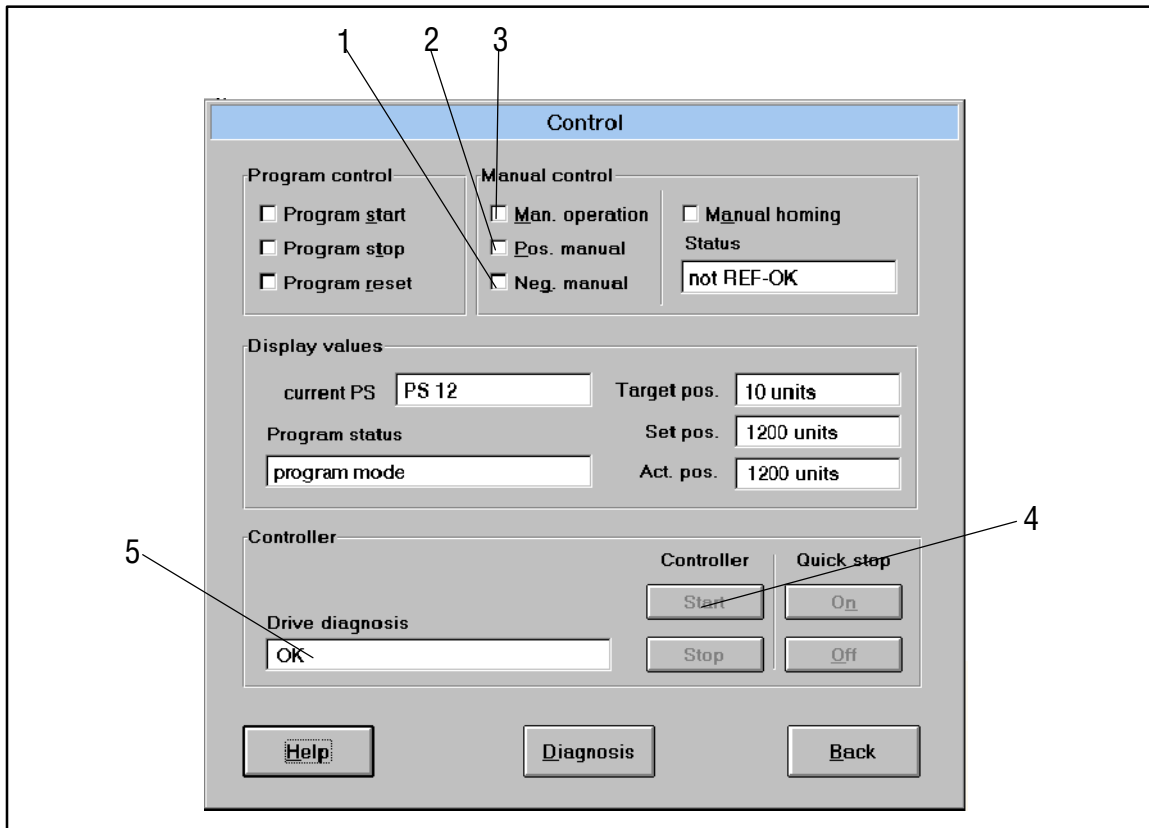


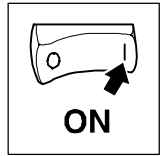
Fig. 5-8 Dialog box "Control"

Field	Command	Function
1	Select "Manual negative"	The drive positions in the negative direction towards the limit switch. • Test positioning limits • Override 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").



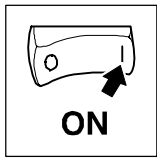
5.8 Enter positioning profile parameters

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



Commissioning

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.

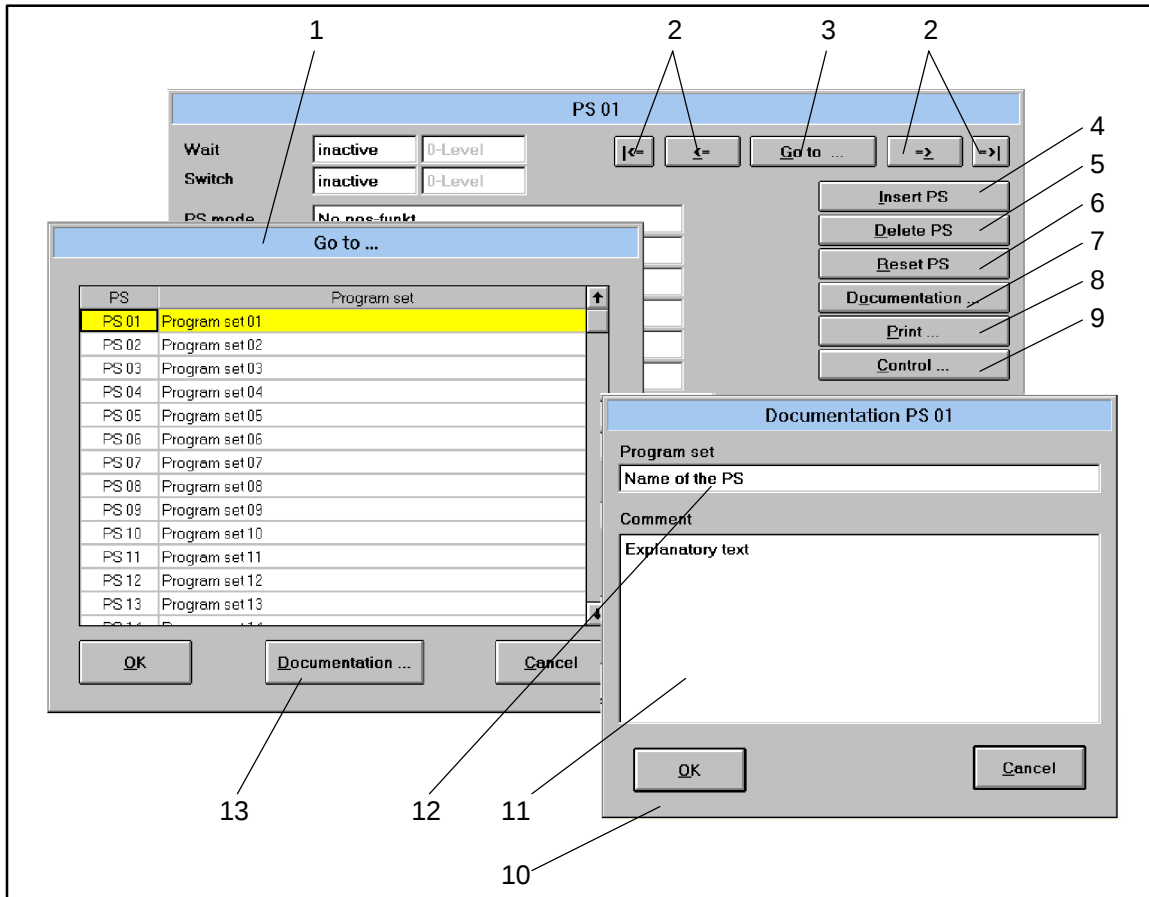
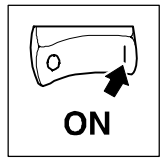


Fig. 5-10 Editing tools for the program sets

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).

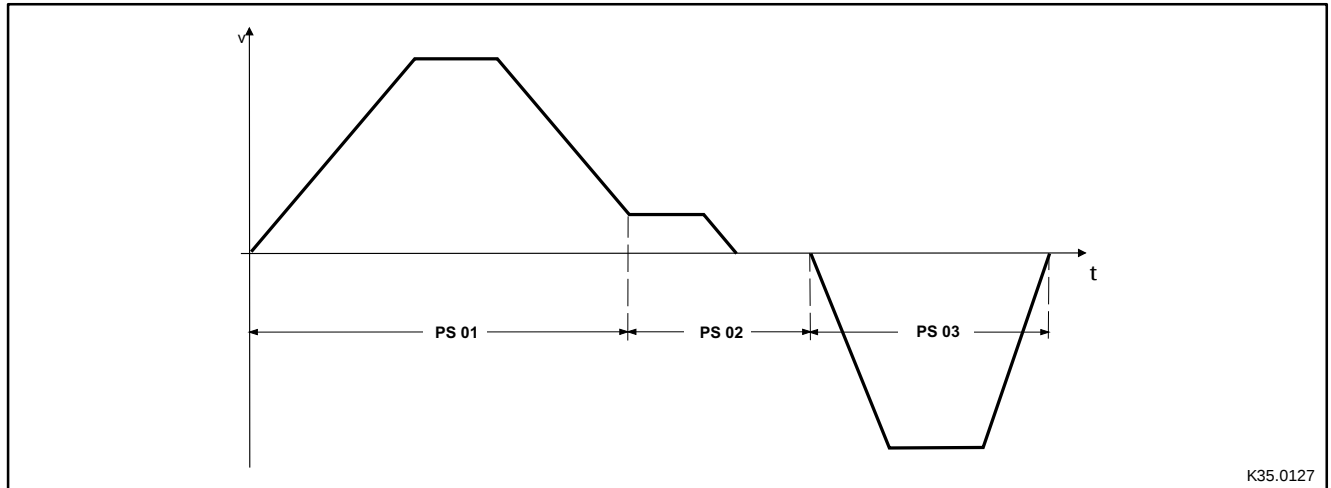


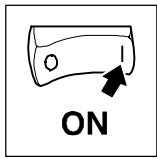
Fig. 5-11 Structure of a positioning profile (example of a point-to-point positioning)

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

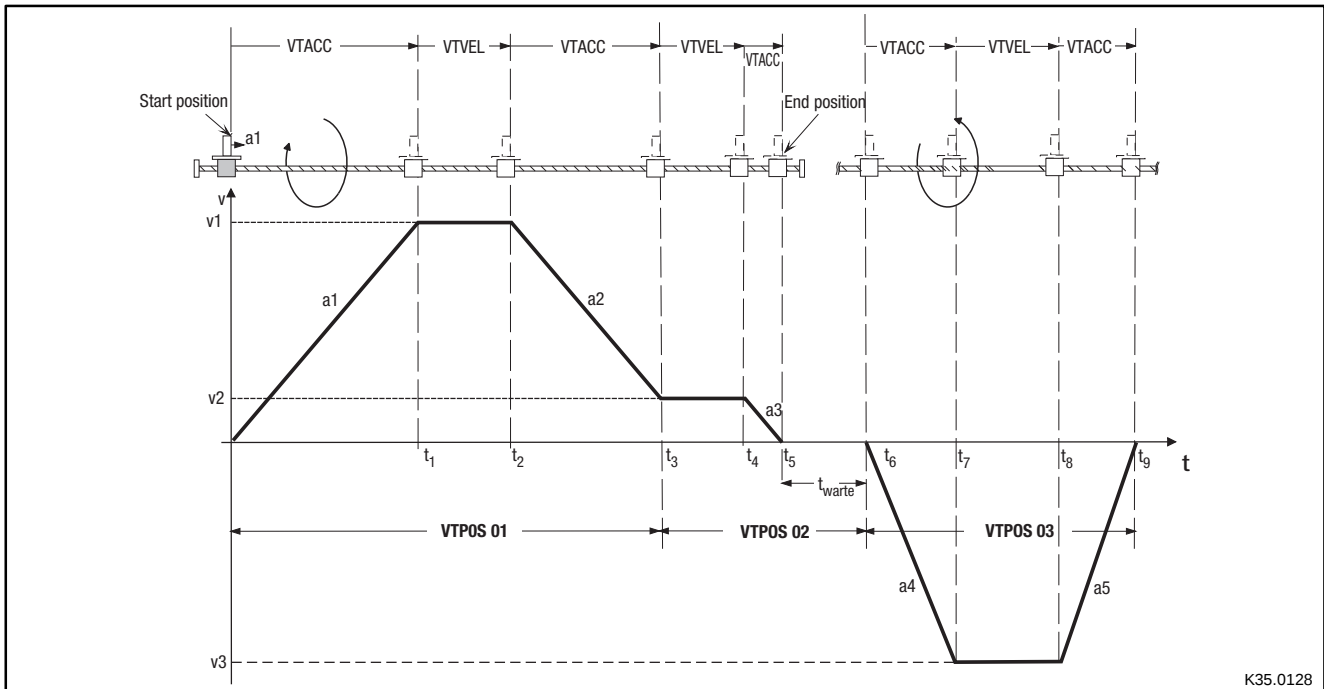
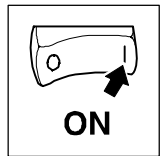


Fig. 5-12 Structure of a positioning profile (example of a point-to-point positioning)

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.

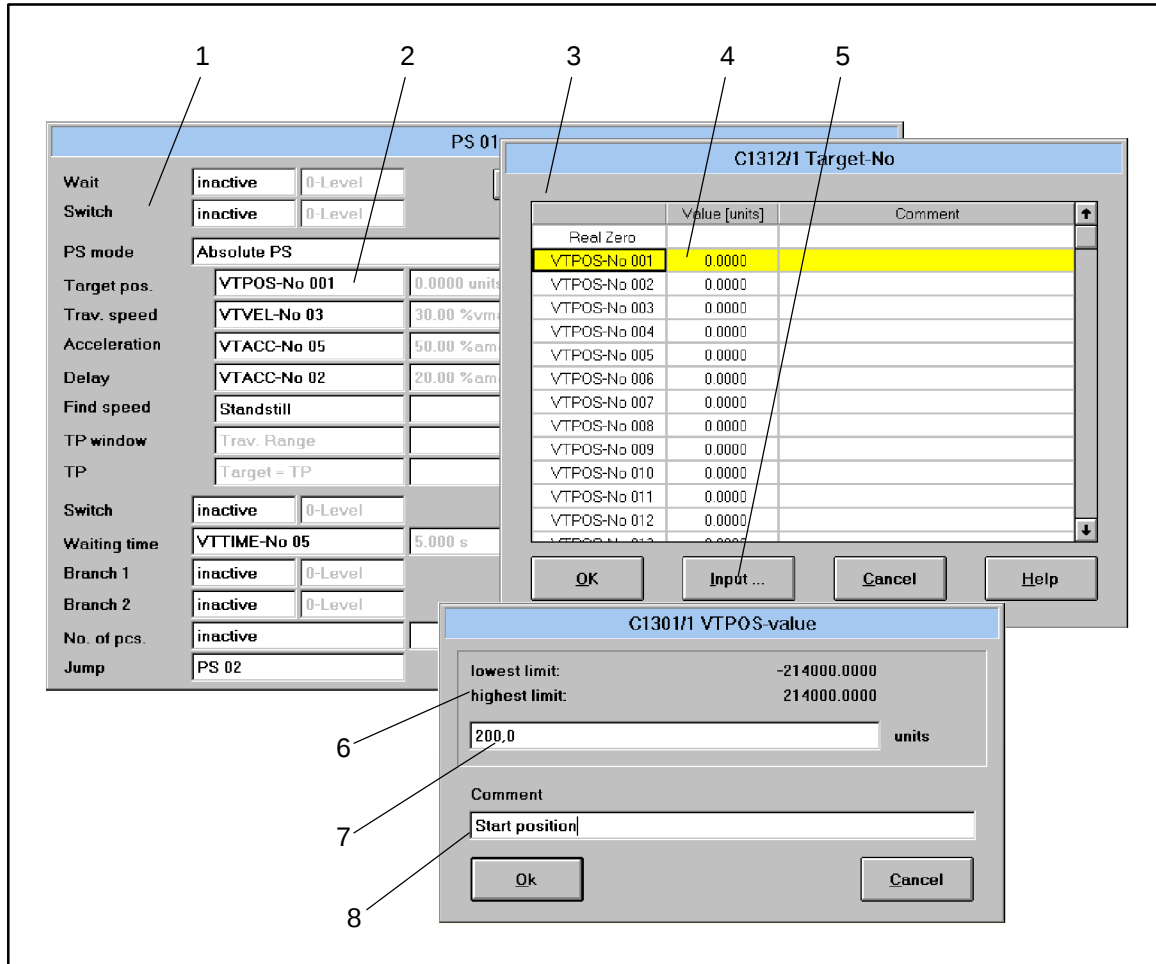
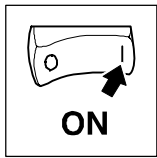


Fig. 5-13 Dialog box for entering the positioning data

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.



Commissioning

Processing a program set

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

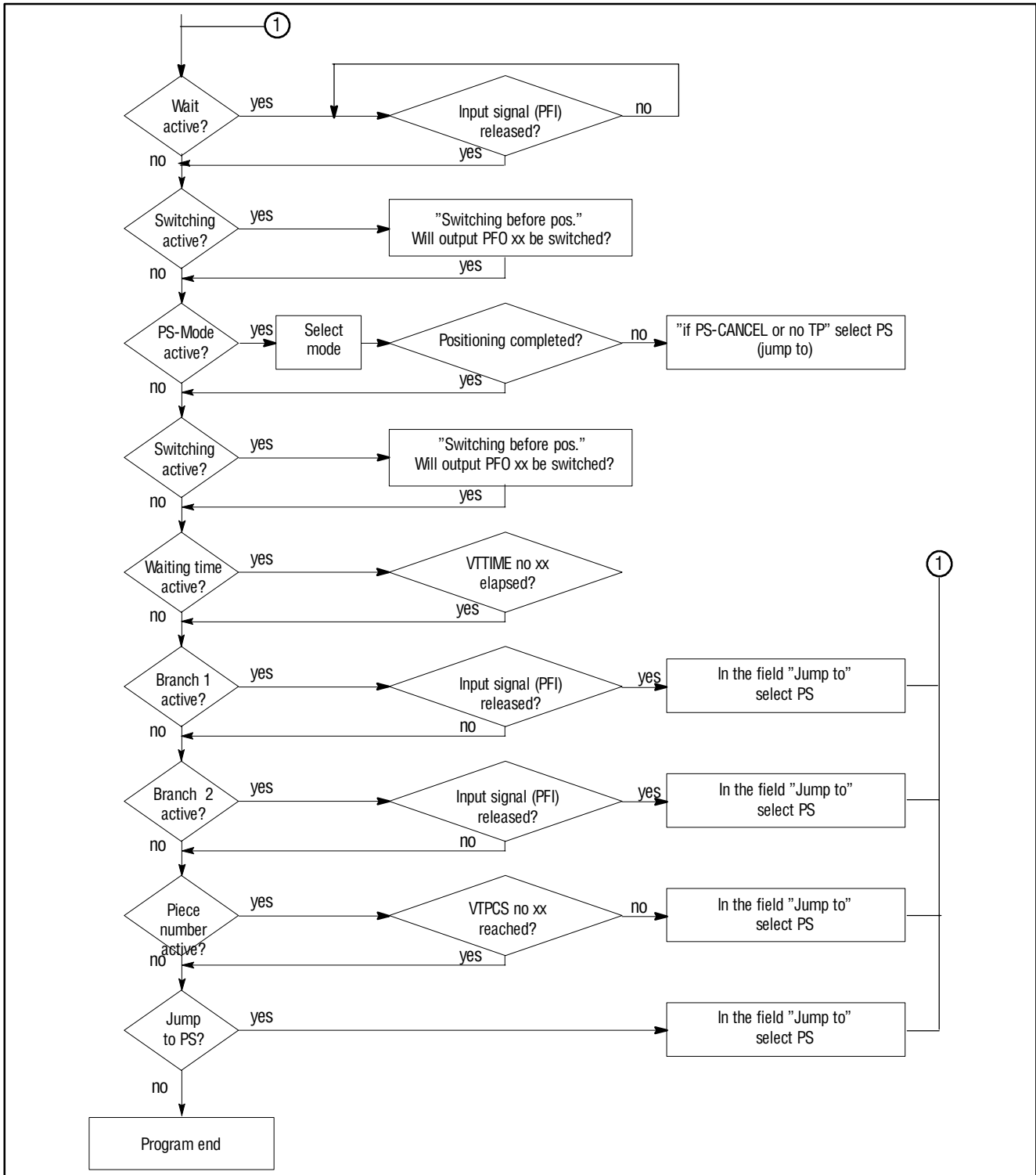
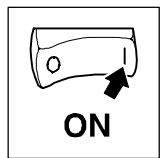


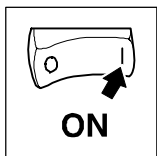
Fig. 5-14 Processing a program set



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 VTVEL 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.

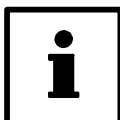


Commissioning

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.

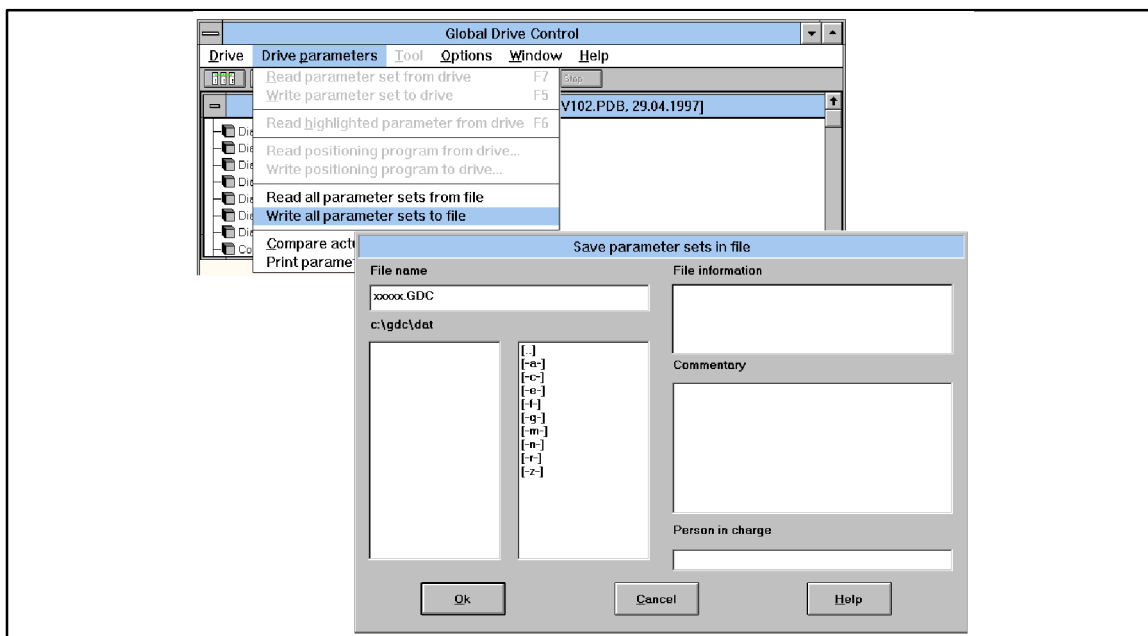
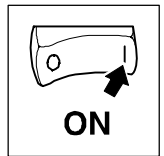


Fig. 5-16 Dialog box "Write parameter set to file"

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.

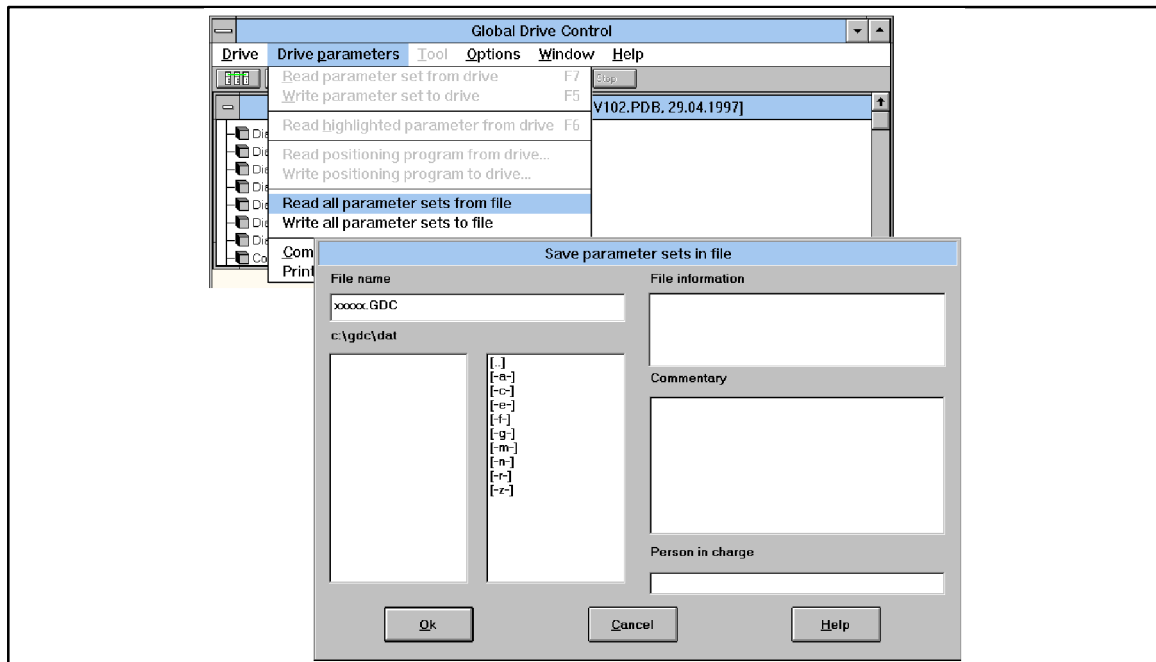
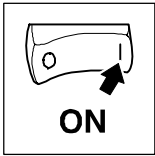


Fig. 5-17 Dialog box "Read all parameter sets from file"

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.



Commissioning

5.9.2 Load parameter set from the controller

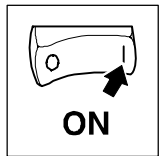
The operating menu (Fig. 5-17) allows the loading of a parameter set

- 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

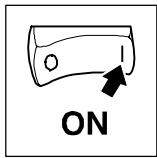
- Click on the "Control" button in the "Basic settings" dialog box.

The screenshot shows the 'Control' dialog box with the following components and callouts:

- 1**: Points to the 'Manual control' section, which includes checkboxes for 'Man. operation', 'Pos. manual', and 'Neg. manual', and a 'Manual homing' checkbox.
- 2**: Points to the 'Status' field, which displays 'not REF-OK'.
- 3**: Points to the 'Help' button at the bottom left.
- 4**: Points to the 'Controller' section, which includes a 'Drive diagnosis' field showing 'OK' and buttons for 'Start', 'Stop', 'On', and 'Off'.
- 5**: Points to the 'Display values' section, which includes fields for 'current PS' (PS 12), 'Target pos.' (10 units), 'Program status' (program mode), 'Set pos.' (1200 units), and 'Act. pos.' (1200 units).
- 6**: Points to the 'Program control' section, which includes checkboxes for 'Program start', 'Program stop', and 'Program reset'.

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



Commissioning

5.10.2 Parameters for homing

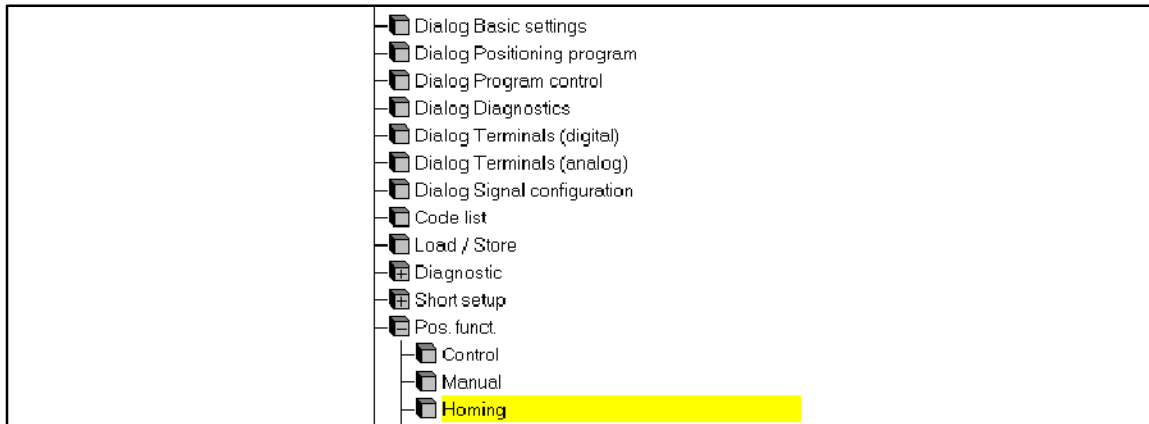
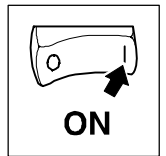


Fig. 5-19 Menu "Homing" in the parameter menu

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 v _{max}
6	Click on C1251. Enter new value.	Homing acceleration. Default setting: 10 % of a _{max}
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.

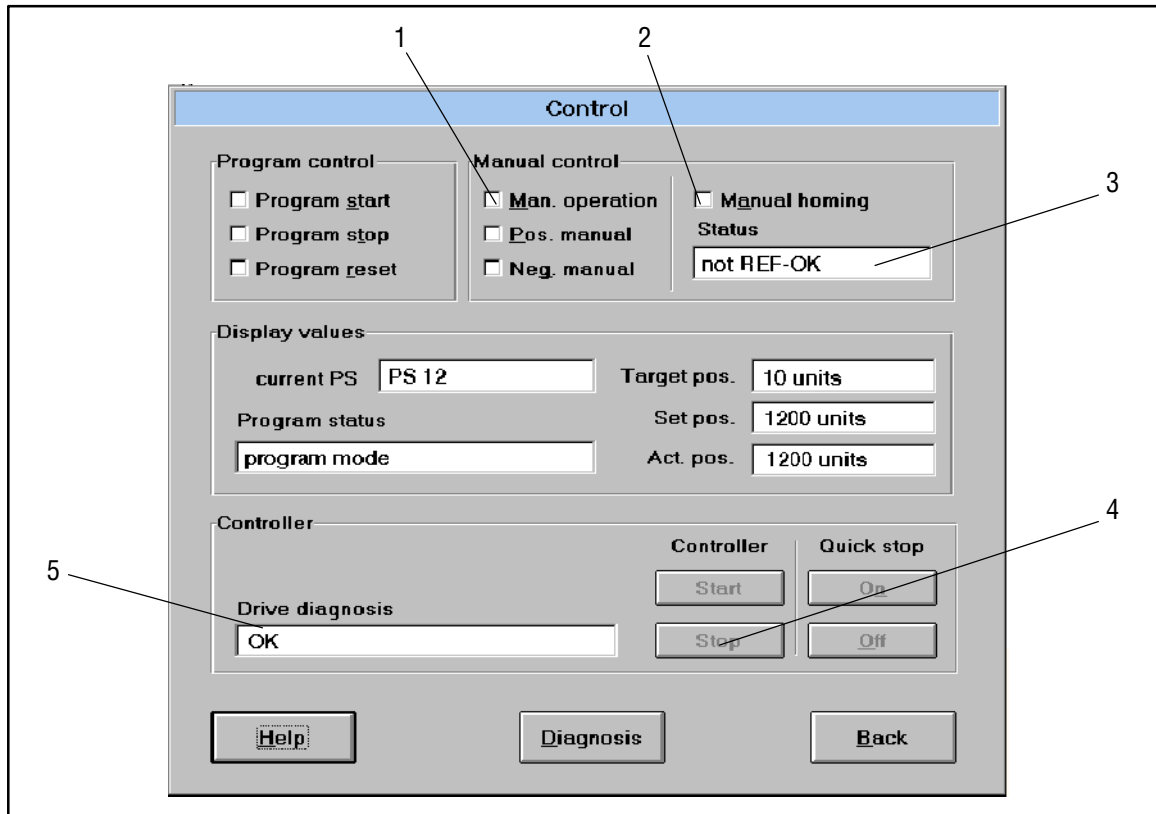
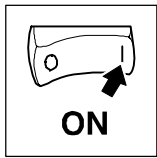


Fig. 5-20 Dialog box "Control"

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



Commissioning

5.10.4 Program control

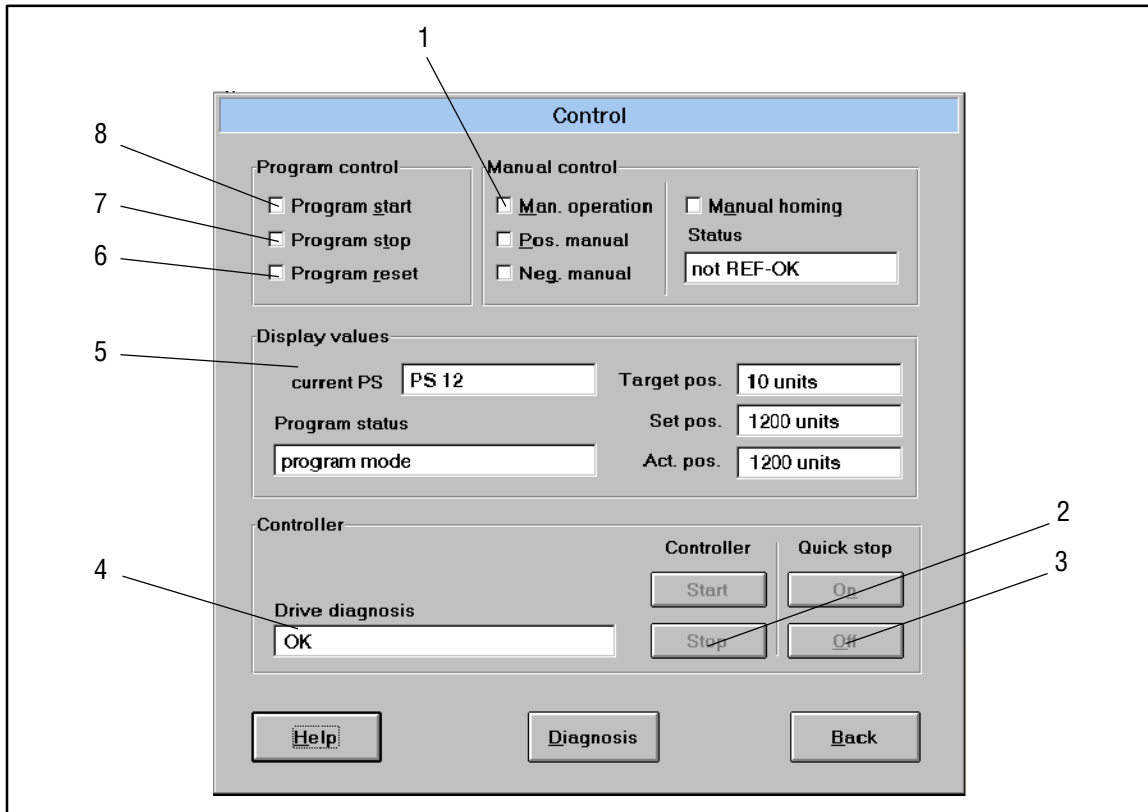
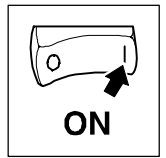


Fig. 5-21 Dialog box "Control"

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

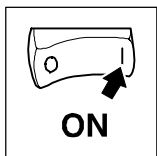
With the function “Automatic control parameter identification”

- 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.



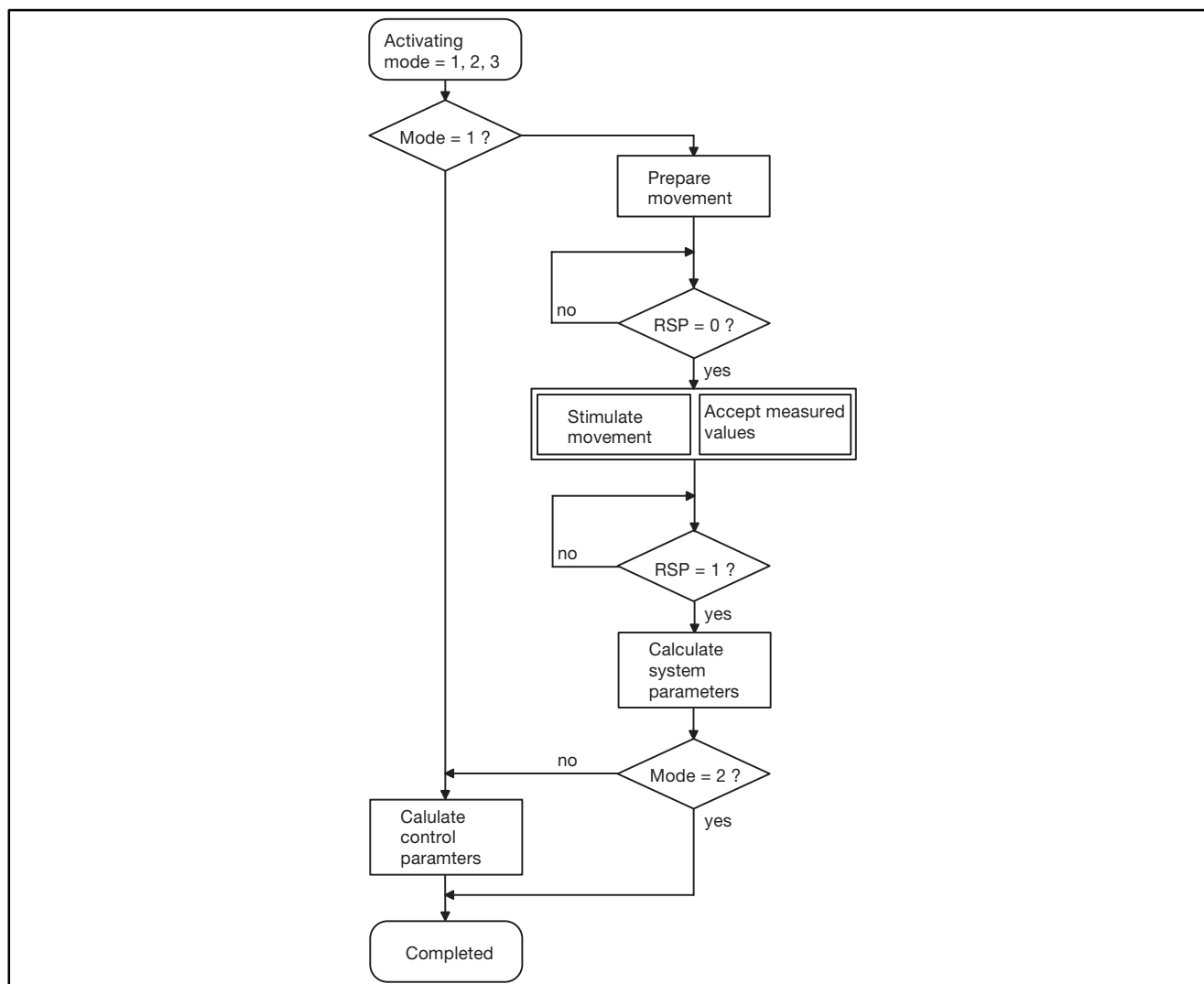
Stop!

- 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.



Commissioning

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.

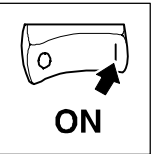
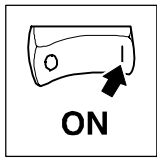


Fig. 5-22 Dialog box “Control parameter identification”

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 I_{max} (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



Commissioning

5.11.2.1 Password protection

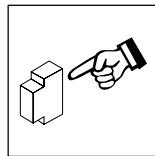
Code	LCD	Possible settings		IMPORTANT
		Lenze	Selection	
C0094	Password	0	0 {1} 9999	Password Parameter access protection for the operating module. When the password is activated, only the codes of the user menus can be accessed. For further selection possibilities see C0096
[C0096]				
1	AIF protect.	0	0 No password protection	Extended password protection for bus systems with activated password (C0094). All codes in the user menu can be accessed.
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.

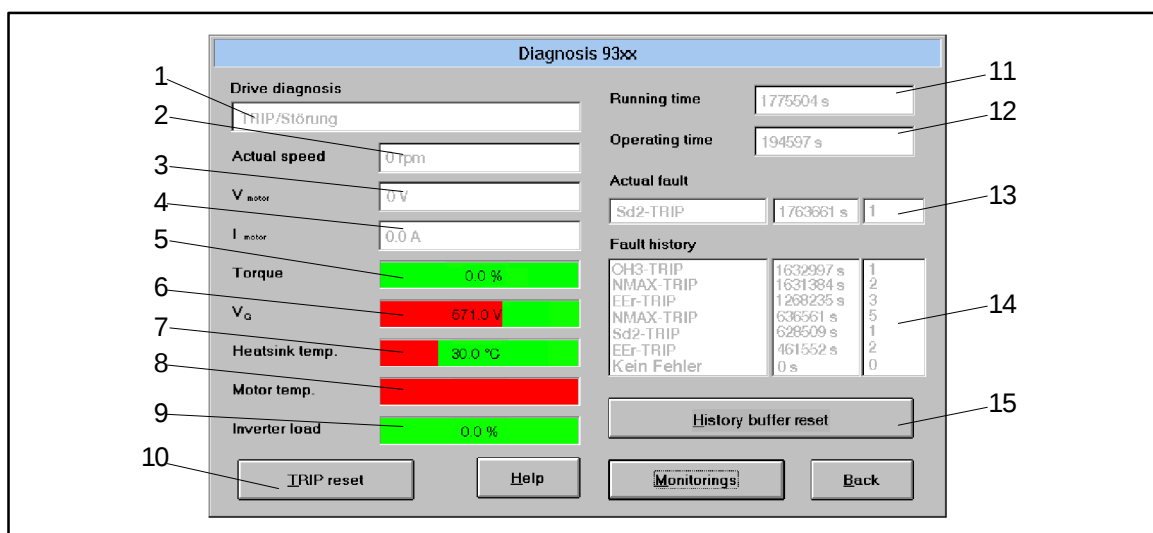
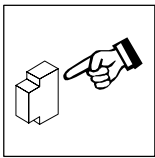


Fig. 6-1

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



During operation

6.2 Information on operation

When operating the controller, please observe the following notes:

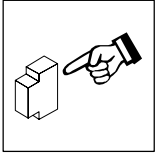


Stop!

- 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 "OCx" (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 "I_{max} 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 "I_{max} 8 kHz" (see Fig. 6-2).

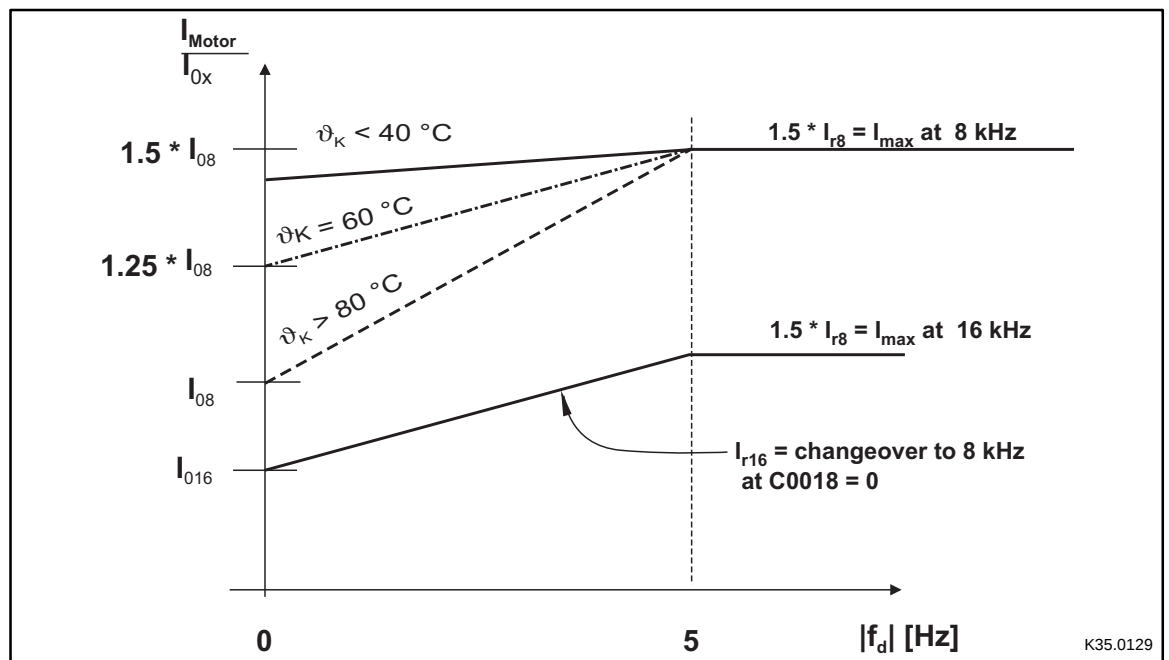
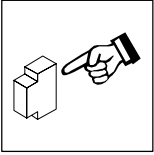


Fig. 6-2

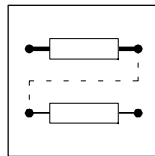
Current derating function of the controllers 9326 to 9332.

- 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

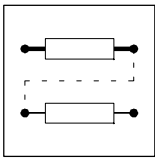
Freely assignable terminals can be configured using two dialog boxes:

- 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.



Configuration

7.2 Monitoring

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

If a monitoring function is activated,

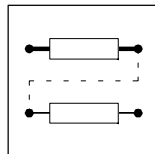
- a reaction to protect the drive will be activated (configuration (7-3)).
- a digital output is set, if it is assigned to the corresponding reaction.
- the fault indication is entered at the first position in the history buffer. (8-3)

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.

Diagnosis 93xx

Drive diagnosis

Actual speed

V_{motor}

I_{motor}

Torque 0.0 no unit

V_G 0.0 no unit

Heatsink temp. 0.0 no unit

Motor temp. 0.0 no unit

Inverter load 0.0 no unit

Running time

Operating time

Actual fault

Fault history

History buffer reset

TRIP reset Help Monitorings Back

Fig. 7-1 Dialog box "Diagnostic 9300"

3. Click the button "Monitorings..."

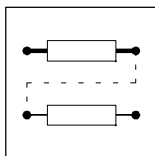
Monitorings 9300 cam profiler

Code	Subcode	Text	Value	Unit
C0583	000	Monit OH3	Trip	
C0582	000	Monit OH4	Warning	
C0584	000	Monit OH7	Warning	
C0585	000	Monit OH8	off	
C0122	000	OH4 limit	85	°C
C0121	000	OH7 limit	150	°C
C0586	000	Monit SD2	Trip	
C0587	000	Monit SD3	off	
C0594	000	Monit SD6	Trip	
C0581	000	Monit EEr	Trip	
C0126	000	conf. CE0	Off	
C0591	000	Monit CE1	off	
C0592	000	Monit CE2	off	
C0593	000	Monit CE3	off	
C0257	001	CE1 monit time	2000	ms

Help Back

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.

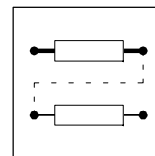


Configuration

7.2.3 Monitoring functions

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

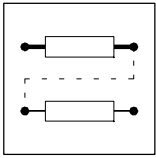
Display	Meaning	TRIP	Meldung	Warning	FAIL-QSP	off	Code
CCr	System error	•	-	-	-	-	-
CE0	Communication error (AIF)	✓	-	✓	-	•	C0126
CE1	Communication error at the process data input object CAN-IN1 (time monitoring can be set under C0357/1)	✓	-	✓	-	•	C0591
CE2	Communication error at the process data input 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 $\neq$ 0] 1 = [n = 0]	
7	RSP (controller inhibit)	0 = No controller inhibit 1 = Controller inhibit	
8-11	Controller status	hex	bin
		0	0000
		1	0001
		3	0011
		6	0110
		7	0111
		8	1000
		9	1001
		A	1010
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



Troubleshooting and fault elimination

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 Ground or earth loops in the wiring	Screen control cables For 9300 cam profiler: Reduce number of points to max. 2 points per ms) 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	Sensor 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. Excessive capacitive charging current of the motor cable.	Find out cause of short-circuit; check cable. Use motor cable which is shorter or of lower capacitance.
OC2	□012	Earth fault	One of the motor phases has earth contact. Excessive capacitive charging current of the motor cable.	- Check motor - Check supply module Use motor cable which is shorter or of lower capacitance.
OC5	□015	l x t overload	Frequent and overlong acceleration with overcurrent Continuous overload with $I_{\text{motor}} > 1.05 \times I_{\text{rx}}$.	Check drive dimensioning.
OH	□050	Heat sink temperature is higher than the value set in the controller	Ambient temperature $T_{\text{amb}} > 40^\circ\text{C}$ or 50°C . Heat sink very dirty. Incorrect mounting position.	- Allow controller to cool and ensure better ventilation. - Check ambient temperature in the control cabinet. Clean heat sink 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 No PTC connected.	Check drive dimensioning. Connect PTC or switch-off monitoring (C0583=3).
OH4	□054	Heat sink temperature is higher than the value set under C0122.	Ambient temperature $T_{\text{amb}} > 40^\circ\text{C}$ or 50°C . Heat sink very dirty. Incorrect mounting position. Value set under C0122 was too low.	- Allow controller to cool and ensure better ventilation. - Check ambient temperature in the control cabinet. Clean heat sink Change mounting position. 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 No PTC connected. Value set under C0121 was too low.	Check drive dimensioning. Connect PTC or switch-off monitoring (C0584=3). 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 Terminals T1, T2 are not assigned.	Check drive dimensioning. 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. Drive cannot follow the digital frequency (I_{max} limit).	- Extend contouring error limit under C0255 - Switch off the monitoring if necessary (C0589 = 3). 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.



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 synch 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 $1 \leq (C1223 * C1205) \leq 1.07E9 \text{ incr}$ C1298 = 2: The positive position limit in C1224 is outside the possible display range of $1 \leq (C1224 * C1205) \leq 1.07E9 \text{ incr}$ C1298 = 3: The maximum speed $v_{\max}$ under C1240 exceeds the possible display range of $1 \leq (C1240 * C1205 * 16.384) \leq 2.14E9 \text{ incr}$ or $v_{\max} \text{ not } C1240 / C1204 * 60 \leq 1.5 * n_{\max}$ C1298 = 4: The maximum acceleration $a_{\max}$ in C1250 exceeds the possible display range of $1 \leq (C1250 * C1205 * 16.384 / 1000) \leq 2.8634E7 \text{ incr}$ C1298 = 5: An internal value range has been exceeded for a speed normalization. Valid range: $1 \leq (C0011 * C1207/1 / C1207/2 * 65536/60000) \leq 32767$	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. 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. 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. 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. 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. Drive cannot follow the digital frequency ($f_{\max}$ limit).	Extend contouring error limit with C1328. If necessary, switch off the monitoring (C1329=3). 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.
PRO 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 PRO 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. Input X9 PIN 8 not assigned.	Check cable for open circuit. 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.

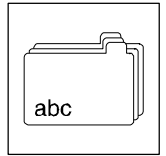


Stop!

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).

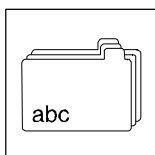
Further functions of the PC program:

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

10.2 Code table

How to read the code table:

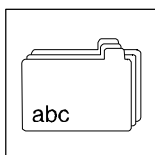
Row	Abbreviation	Meaning
Code	C0039	Code C0039
	1	Subcode 1 of code C0039
	2	Subcode 2 of code C0039
	...	...
	14	Subcode 14 of code C0039
	15	Subcode 15 of code C0039
	[C0005]	Parameter value of the code can only be modified when the controller is inhibited
LCD		Keypad LCD • Display of the short text, e.g. <i>PRR LOAD</i>
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}	LECOM controller address Bus device number when operated via interface • 10, 20, ..., 90 reserved for broadcast to device groups for RS232, RS485, fibre optics.

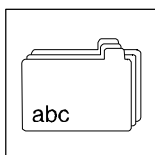
Code	LCD	Possible settings			IMPORTANT	
		Lenze	Choice			
C0011	<i>NMAX</i>	3000	500 (1 rpm)	16000	Maximum speed Nmax Reference value for the absolute and relative setpoint selection for the acceleration and deceleration times. Parameter setting via interface: Large changes in one step should only be made when the controller is inhibited.	
C0012	<i>TIR (ACC)</i>	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	<i>TIF (DEC)</i>	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	<i>F_{CODE} QMIN</i>	50	-16000 (1 rpm)	16000	F_{CODE} Qmin Switching threshold n _{act.} < n _x n_{act.} < C0017 activates the comparator output CMP1-OUT	
C0018	<i>F_{CHOP}</i>	1	0 16/8 kHz sin 1 8 kHz sin 2 16 kHz sin		Chopper frequency f_{chop} Optimum noise reduction with automatic change-over to 8 kHz Operation with optimum power Noise optimised operation	
C0019	<i>NACT=0 CURRENT</i>	0	0 {1 rpm}	16000	Threshold nact = 0 Detection of threshold at n _{act.} = 0.	
C0021	<i>SLIPCOMP</i>	0.00	0.00 {0.01 %}	20.00	Slip compensation active only in sensorless control below the value of C0291	
C0022	<i>I_{MAX}THRESH</i>	*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*I _{motor})	
[C0025]	<i>FEEDBACK TYPE</i>	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 RSxxxxxxx.	
			110 IT-512-5V 111 IT-1024-5V 112 IT-2048-5V 113 IT-4096-5V		Incremental encoder with TTL level	
			210 IS-512-5V 211 IS-1024-5V 212 IS-2048-5V 213 IS-4096-5V		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	<i>F_{CODE} (OFFSET)</i>	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	
2	<i>F_{CODE} (OFFSET)</i>	0.00				



Appendix

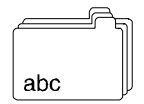
Code	LCD	Possible settings		IMPORTANT
		Lenze	Choice	
C0027	1 <i>FCODE (GAIN)</i> 2 <i>FCODE (GAIN)</i>	100.00 100.00	-199.99 {0.01 %} 199.99	FCODE (AIN) , Freely assignable code for relative analog signals • Used for: – Gain X6/1,2 – Gain X6/3,4
C0030	<i>DFOUT CONST</i>	3	0 256 inc/rev 1 512 inc/rev 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	<i>FCODE GEARBOX</i>	1	-32767 {1} 32767	FCODE (gearbox factor numerator) , freely assignable code • Used for: – Gearbox factor numerator
C0033	<i>GEARBOX DENOM</i>	1	1 {1} 32767	DFSET Gearbox factor denominator
C0034	<i>MST CURRENT</i>	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	<i>SET-VALUE RPM</i>	0	-16000 {1 rpm} 16000	Setpoint input in rpm
C0039	1 <i>JOG SET-VALUE</i> 2 <i>JOG SET-VALUE</i> 3 <i>JOG SET-VALUE</i> 4 <i>JOG SET-VALUE</i> 5 <i>JOG SET-VALUE</i> ... 14 <i>JOG SET-VALUE</i> 15 <i>JOG SET-VALUE</i>	100.0 75.00 50.00 25.00 0.00 ... 0.00 0.00	-199.99 {0.01} 199.99	Fixed speeds selectable via digital inputs NSET JOG setpoints
C0040	<i>CTRL ENABLE</i>	1	0 Ctrl inhibit 1 Ctrl enable	Controller inhibit • Write: – controls the code • Read: – reads the controller status
C0042	<i>QSP</i>	☐ Disp	0 QSP inactive 1 QSP active	Status Quick stop
C0043	<i>TRIP RESET</i>		0 no/trip reset 1 trip active	TRIP reset , resets an active TRIP: • Set C0043 = 0 Reset current trip Active trip
C0045	<i>Act JOG</i>	☐ Disp	0 Nset active 1 JOG 1 2 JOG 2 ... 15 JOG 15	NSET JOG selection
C0046	<i>n</i>	☐ Disp	-199.99 {0.01 %} 199.99	Main setpoint
C0049	<i>nADD</i>	☐ Disp	-199.99 {0.01 %} 199.99	Additional setpoint
C0050	<i>MCTRL-NSET2</i>	☐ Disp	-100.00 {0.01 %} 100.00	n_{set} at the speed controller input
C0051	<i>MCTRL-MACT</i>	☐ Disp	-30000 {1 rpm} 30000	Actual speed
C0052	<i>MCTRL-UINDE</i>	☐ Disp	0 {1 V} 800	Actual motor voltage
C0053	<i>UG-VOLTAGE</i>	☐ Disp	0 {1 V} 900	DC-bus voltage

Code	LCD	Possible settings			IMPORTANT		
		Lenze	Choice				
C0054	MOT	Disp	0.0	{0.1 A}	500.0	Actual motor current	
C0056	MOTRL-MSELT	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	{0.5 ms} switched off	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	{0.1 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	{0.1 ms} switched off	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	{0.01}	15.99	V_{pF} field controller	
C0078	TN FIELD-CTRL		15.0 8000 ms	{0.5 ms} switched off	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	

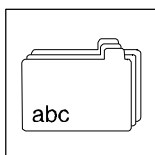


Appendix

Code	LCD	Possible settings		IMPORTANT
		Lenze	Choice	
[C0086]	MOTOR 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

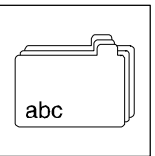


Code	LCD	Possible settings		IMPORTANT
		Lenze	Choice	
		*	Lenze asynchronous servo motors	- without integrated temperature monitoring - The temperature monitoring via resolver or encoder cable is deactivated automatically, i.e.: C0583 = 3 C0584 = 3 C0594 = 3
			50 DSA56-140 51 DFVA71-120 52 DSA71-140 53 DFVA80-60 54 DSA80-70 55 DFVA80-120 56 DSA80-140 57 DFVA90-60 58 DSA90-80 59 DFVA90-120 60 DSA90-140 61 DFVA100-60 62 DSA100-80 63 DFVA100-120 64 DSA100-140 65 DFVA112-60 66 DSA112-85 67 DFVA112-120 68 DSA112-140	DSVAXX056-22, f _r : 140Hz DFVAXX071-22, f _r : 120Hz DSVAXX071-22, f _r : 140Hz DFVAXX080-22, f _r : 60Hz DSVAXX080-22, f _r : 70Hz DFVAXX080-22, f _r : 120Hz DSVAXX080-22, f _r : 140Hz DFVAXX090-22, f _r : 60Hz DSVAXX090-22, f _r : 80Hz DFVAXX090-22, f _r : 120Hz DSVAXX090-22, f _r : 140Hz DFVAXX100-22, f _r : 60Hz DSVAXX100-22, f _r : 80Hz DFVAXX100-22, f _r : 120Hz DSVAXX100-22, f _r : 140Hz DFVAXX112-22, f _r : 60Hz DSVAXX112-22, f _r : 85Hz DFVAXX112-22, f _r : 120Hz 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 DSKS36-13-200 109 DSKS36-23-200 110 DSKS56-23-150 111 DSKS56-33-150 112 DSKS71-13-150 113 DFKS71-13-150 114 DSKS71-23-150 115 DFKS71-23-150 116 DSKS71-33-150 117 DFKS71-33-150 160 DSKS56-23-190 161 DSKS56-33-200 162 DFKS71-03-170 163 DSKS71-03-165 164 DSKS71-13-185 165 DFKS71-13-180 166 DSKS71-33-180 167 DFKS71-33-175	MDSKSXX036-13, f _r :200Hz MDSKSXX036-23, f _r :200Hz MDSKSXX056-23, f _r : 150Hz MDSKSXX056-33, f _r : 150Hz MDSKSXX071-13, f _r : 150Hz MDFSXX071-13, f _r : 150Hz MDSKSXX071-23, f _r : 150Hz MDFSXX071-23, f _r : 150Hz MDSKSXX071-33, f _r : 150Hz MDFSXX071-33, f _r : 150Hz MDSKSXX56-23-190,f _r :190Hz MDSKSXX56-33-200,f _r :200Hz MDFSXX71-03-170,f _r :170Hz MDSKSXX71-03-165,f _r :165Hz MDSKSXX71-13-185,f _r :185Hz MDFSXX71-13-180,f _r :180Hz MDSKSXX71-33-180,f _r :180Hz MDFSXX71-33-175,f _r :175Hz

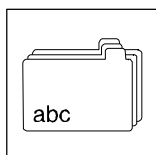


Appendix

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 DXRAXX071-12, f _d : 50Hz DXRAXX071-22, f _d : 50Hz DXRAXX080-12, f _d : 50Hz DXRAXX090-12, f _d : 50Hz DXRAXX090-32, f _d : 50Hz DXRAXX100-22, f _d : 50Hz DXRAXX100-32, f _d : 50Hz DXRAXX112-12, f _d : 50Hz DXRAXX132-12, f _d : 50Hz DXRAXX132-22, f _d : 50Hz DXRAXX160-12, f _d : 50Hz DXRAXX160-22, f _d : 50Hz DXRAXX180-12, f _d : 50Hz DXRAXX180-22, f _d : 50Hz	
			Lenze inverter motor in delta connection	The temperature monitoring via resolver or encoder cable is deactivated automatically, i.e.: C0583 = 3 C0584 = 3 C0594 = 3 DXRAXX071-12, f _d : 87Hz DXRAXX071-22, f _d : 87Hz DXRAXX080-12, f _d : 87Hz DXRAXX090-12, f _d : 87Hz DXRAXX090-32, f _d : 87Hz DXRAXX100-22, f _d : 87Hz DXRAXX100-32, f _d : 87Hz DXRAXX112-12, f _d : 87Hz DXRAXX132-12, f _d : 87Hz DXRAXX132-22, f _d : 87Hz DXRAXX160-12, f _d : 87Hz DXRAXX160-22, f _d : 87Hz DXRAXX180-12, f _d : 87Hz DXRAXX180-22, f _d : 87Hz	
[C0087]	MOT SPEED	*	300 {1 rpm}	16000	Rated motor speed → depending on C0086 - Change of C0086 resets value to the assigned default setting - 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

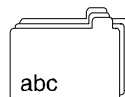


Code	LCD	Possible settings		IMPORTANT
		Lenze	Choice	
[C0089]	MOT FREQUENCY	*	10 {1 Hz} 1000	Rated motor frequency → depending on C0086 • Change of C0086 resets value to the assigned default setting • Change of C0089 sets C0086 = 0
[C0090]	MOT VOLTAGE	*	50 {1 V} 500	Rated motor voltage → depending on 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
[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 RIF PROTECT. 2 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.
C0099	S/W VERSION	☐ Disp	x.xx	Software version
C0101	1 ADD TIR 2 ADD TIR ... 15 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 ADD TIF 2 ADD TIF ... 15 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 FCODE (GAIN) 2 FCODE (GAIN)	100.00 100.00	-199.99 {0.01 %} 199.99	FCOD (gain AOUT) Freely assignable code for relative analog signals
C0109	1 FCODE (OFFSET) 2 FCODE (OFFSET)	0.00 0.00	-199.99 {0.01 %} 199.99	FCOD (offset AOUT) Freely assignable code for relative analog signals
C0114	1 DIGIN POL 2 DIGIN POL 3 DIGIN POL 4 DIGIN POL 5 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

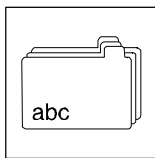


Appendix

Code	LCD	Possible settings		IMPORTANT
		Lenze	Choice	
[C0116] 1 ... 32	<i>FDO-0</i> ... <i>FDO-31</i>	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	<i>DIGOUT</i> <i>DIGOUT</i> <i>DIGOUT</i> <i>DIGOUT</i>	* 30101 30013 500 30012	→ Selection list 2 DCTRL-TRIP CMP1-OUT DCTRL-RDY MCTRL-MMAX	Signal configuration DIGOUT → depending on C0005 X5/A1 X5/A2 X5/A3 X5/A4
C0118 1 2 3 4	<i>DIGOUT POL</i> <i>DIGOUT POL</i> <i>DIGOUT POL</i> <i>DIGOUT POL</i>	0 0 0 0	0 High active 1 Low active	Terminal polarity DIGOUT X5/A1 X5/A2 X5/A3 X5/A4
C0121	<i>OH7 LIMIT</i>	150	45 {1 °C} 150	Temperature for OH7 , Pre-warning for the motor temperature limit (fault OH7)
C0122	<i>OH4 LIMIT</i>	85	45 {1 °C} 85	Temperature for OH4 , pre-warning for the heatsink temperature limit (fault OH4)
C0125	<i>BAUDRATE</i>	0	0 9600 baud 1 4800 baud 2 2400 baud 3 1200 baud 4 19200 baud	LECOM baud rate for accessory module 2102
C0126	<i>MONIT CEO</i>	3	0 Trip 2 Warning 3 Off	Conf. CEO , configuration communication error monitoring with automation interface CEO
C0130	<i>Act Ti</i>		0 C12/C13 1 Ti 1 2 Ti 2 ... 14 Ti 14 15 Ti 15	active Ti 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	<i>RFG CHARAC</i>	0	0 linear 1 S-shaped	NSET RFG characteristic , ramp function generator characteristic for main setpoint linear S-shaped
C0135	<i>CONTROL WORD</i>		0 {1} 65535	Control word decimal when networked with automation interfaces • Device evaluates information 16 bit, binary coded
C0136 1	<i>CTRLWORD</i>		0 {1} 65535	Control word in DCTRL
C0136 2	<i>CTRLWORD</i>		0 {1} 65535	Control word in CAN-IN
C0136 3	<i>CTRLWORD</i>		0 {1} 65535	Control word in AIF-IN
C0141	<i>FCODE [SELEVAL]</i>	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

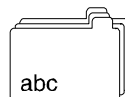


Code	LCD	Possible settings		IMPORTANT
		Lenze	Choice	
C0142	START OPTIONS	1	0 Start lock 1 Auto start	Start option , 0 = start protection 1 = automatic start Start conditions are executed: - after mains connection - after message (t > 0.5s) - after trip
C0150	STATUS WORD	☐ Disp	Bit00 Config0* Bit01 IMP Bit02 Config2* Bit03 Config3* Bit04 Config4* Bit05 Config5* Bit06 n = 0 Bit07 Ctrl. inhibit *freely configurable	Status word decimal when networked with automation interfaces Binary interpretation indicates the bit states
C0151	FDD (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 Bit01 Mmax Bit02 lmax Bit03 IMP Bit04 RDY Bit05 Ctrl. inhibit Bit06 Trip Bit07 Init	Status word 2 Extended decimal status word Binary interpretation indicates the bit states
[C0156]	1 START.B0 2 START.B2 3 START.B3 4 START.B4 5 START.B5 6 START.B14 7 START.B15	1000 30012 1000 10600 30013 15004 500	PAR*1 MCTRL-IMAX MCTRL-MMAX NSET-RFG I=0 CMP1-OUT DCTRL-CW/CCW DCTRL-RDY	→ Selection list 2 Configuration of the free bits of the status word
C0157	1 START.B0 2 START.B2 3 START.B3 4 START.B4 5 START.B5 6 START.B14 7 START.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)
C0167	RESET FAULT MEM	0	0 No reset 1 Reset	History buffer reset Clears the history buffer
C0168	1 FAIL NO. ACT 2 FAIL NO. OLD1 3 FAIL NO. OLD2 4 FAIL NO. OLD3 5 FAIL NO. OLD4 6 FAIL NO. OLD5 7 FAIL NO. OLD6 8 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

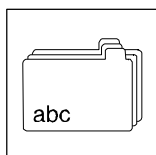


Appendix

Code	LCD	Possible settings		IMPORTANT
		Lenze	Choice	
C0169	1 <i>FAIL TIME Act</i> 2 <i>FAIL TIME OLD1</i> 3 <i>FAIL TIME OLD2</i> 4 <i>FAIL TIME OLD3</i> 5 <i>FAIL TIME OLD4</i> 6 <i>FAIL TIME OLD5</i> 7 <i>FAIL TIME OLD6</i> 8 <i>FAIL TIME OLD7</i>	☐ 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: 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
C0170	1 <i>COUNTER Act</i> 2 <i>COUNTER OLD1</i> 3 <i>COUNTER OLD2</i> 4 <i>COUNTER OLD3</i> 5 <i>COUNTER OLD4</i> 6 <i>COUNTER OLD5</i> 7 <i>COUNTER OLD6</i> 8 <i>COUNTER OLD7</i>	☐ Disp	Corresponding mains switch-on time	Fault frequency History buffer List showing how often the faults have occurred consecutively under C0168 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
[C0173]	<i>UG LIMIT</i>	1	0 Mains<400V+ -B 1 Mains=400V+ -B 2 Mains=460V+ -B 3 Mains=480V-B 4 Mains=480V+ B	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 Operation on mains < 400 V with or without brake unit Operation on 400 V mains with or without brake unit Operation on 460 V mains with or without brake unit Operation on 480 V mains without brake unit Operation on 480 V mains with brake unit
C0178	<i>OP TIMER</i>	☐ Disp	0 {1 s} 4294967295	Elapsed operating time meter Time when the controller was enabled
C0179	<i>MAINS TIMER</i>	☐ Disp	0 {1 s} 4294967295	Mains switch-on time meter Time when the mains was switched on
C0182	<i>T_i S-SHAPED</i>	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

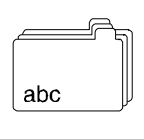


Code	LCD	Possible settings		IMPORTANT
		Lenze	Choice	
C0183	DIAGNOSTICS	[Disp]	0 OK 10 Init 91 Trip-Set C135 92 Trip-Set AIF 93 Trip-Set CAN 102 Trip 103 RFG P-OFF 104 IMP Message 105 Power off 111 BSP C135 112 BSP AIF 113 BSP CAN 121 CINH term 28 122 CINH int 1 123 CINH int 2 124 CINH C135/STP 125 CINH AIF 126 CINH CAN 131 FAIL-QSP 141 Lock mode 142 IMP 151 QSP ext term 152 QSP C135/STP 153 QSP AIF 154 QSP CAN 250 Warning	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: No fault 10: Initialisation phase 102: TRIP active 103: Emergency stop 104: Message active 111: Operation inhibited 121: Controller inhibited through X5/28 122: DCTRL-CINH1 123: DCTRL-CINH2 124: STOP key of 9371BB 125: Controller inhibited through AIF 126: Controller inhibited through CAN 131: Fault reaction 141: Restart protection active 142: High resistance power outputs 151: QSP via MCTRL-QSP 152: QSP via STOP key 153: QSP via AIF 154: QSP via CAN 250: Warning active
C0190	NSET ARIT	0	0 OUT = C46 1 C46 + C49 2 C46 - C49 3 C46 * C49 4 C46 / C49 5 C46/(100 - C49)	NSET arithmetic function Arithmetics block in the function block NSET Connects main setpoint C0046 and additional setpoint C0049
C0195	BRK T Act	99.9	0.0 {0.1 s} 99.9 s infinite	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
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

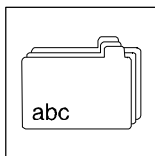


Appendix

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 {1 ms} 99999 ms switched off	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 {0.01 %} 100.00 100 % = n_{max}	NSET threshold RFG ON=OFF for main setpoint
C0244	BRK M SEL	0.00	-100.00 {0.01 %} 100.00 100 % = value of C0057	Holding torque of the DC brake
C0250	FCODE IBIT			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 re-sets 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

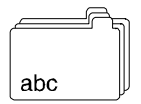


Code	LCD	Possible settings		IMPORTANT
		Lenze	Choice	
C0265	MPOT1 INIT	0	0 Power off 1 C261 2 0%	MPOT1 initialisation Value which is accepted during mains switching and activated motor pot. Value during mains failure lower limit of C0261 0 %
[C0267]			→ Selection list 2	Configuration of the digital inputs of motor pot MPOT1
1 UP 2 DOWN		1000 1000	FIXED 0 FIXED 0	Digital input acceleration Digital input deceleration
[C0268]	INACT		→ Selection list 2	Configuration of the motor pot input MPOT1-INACTIVE
C0269		1000	FIXED 0	
1 UP 2 DOWN 3 INACTIVE		[Disp]		Input signals motor potentiometer
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	0 no 1 Extern V_p 2 Setpoint 3 Ctrl diff	Activate process controller adaptation No process controller adaptation External via input Adaptation via setpoint 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 1 unipolar	Process controller range bipolar/unipolar
C0338	ARIT1 FUNCT	1	0 OUT = IN1 1 IN1 + IN2 2 IN1 - IN2 3 IN1 * IN2 4 IN1 / IN2 5 IN1/(100 - IN2)	Function arithmetic block ARIT1 links inputs IN1 and IN2
[C0339]			→ Selection list 1	Configuration arithmetic block ARIT1
1 IN 2 IN		1000 1000	FIXED 0 % 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 1 250 kbit/s 2 125 kbit/s 3 50 kbit/s 4 1000 kbit/s	CAN bus baud rate

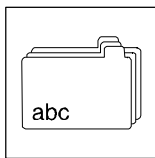


Appendix

Code	LCD	Possible settings		IMPORTANT
		Lenze	Choice	
[C0352]	CAN MSL	0	0 slave 1 Master	CAN master operation set up
C0353	1 CAN ADDR SEL1 2 CAN ADDR SEL2 3 CAN ADDR SEL3	0 0 0	0 C350 1 C354	Source for CAN bus IN/OUT addresses
C0354	1 IN1 ADDR2 2 OUT1 ADDR2 3 IN2 ADDR2 4 OUT2 ADDR2 5 IN3 ADDR2 6 OUT3 ADDR2	129 1 257 258 385 386	1 {1} 512	CAN bus IN/OUT node addresses
C0355	1 CAN-IN1 ID 2 CAN-OUT1 ID 3 CAN-IN2 ID 4 CAN-OUT2 ID 5 CAN-IN3 ID 6 CAN-OUT3 ID	[Disp]	0 {1} 2047	CAN bus identifier
C0356	1 CAN BOOT UP 2 CAN-OUT2 T 3 CAN-OUT3 T 4 CAN DELAY	3000 0 0 20	0 {1 ms} 65000	CAN bus time settings
[C0357]	1 CE1 MONIT TIME 2 CE2 MONIT TIME 3 CE3 MONIT TIME	3000 3000 3000	0 {1 ms} 65000	CE1 monitoring time CAN bus monitoring time for I _x
C0358	RESET NODE	0	0 no function 1 CAN reset	CAN reset node Install CAN bus reset node
C0359	CAN STATE	[Disp]	0 Operational 1 Pre-Operat 2 Warning 3 Bus off	CAN status
C0360	1 MESSAGE OUT 2 MESSAGE IN 3 MESSAGE OUT1 4 MESSAGE OUT2 5 MESSAGE OUT3 6 MESSAGE POUT1 7 MESSAGE POUT2 8 MESSAGE IN1 9 MESSAGE IN2 10 MESSAGE IN3 11 MESSAGE PIN1 12 MESSAGE PIN2	[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

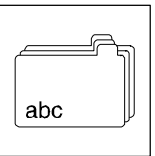


Code	LCD	Possible settings		IMPORTANT
		Lenze	Choice	
C0361	1 <i>LORD OUT</i> 2 <i>LORD IN</i> 3 <i>LORD OUT1</i> 4 <i>LORD OUT2</i> 5 <i>LORD OUT3</i> 6 <i>LORD POUT1</i> 7 <i>LORD POUT2</i> 8 <i>LORD IN1</i> 9 <i>LORD IN2</i> 10 <i>LORD IN3</i> 11 <i>LORD PIN1</i> 12 <i>LORD PIN2</i>	[Disp]	0 {1 %} 100	Bus load, CAN bus load To ensure a perfect operation, the total bus load (all connected devices) should be less than 80% 1: all sent 2: all received 3: sent to CAN-OUT1 4: sent to CAN-OUT2 5: sent to CAN-OUT3 6: sent to parameter channel 1 7: sent to parameter channel 2 8: received from CAN-IN1 9: received from CAN-IN2 10: received from CAN-IN3 11: received from parameter channel 1 12: received from parameter channel 2
C0362	<i>SYNC CYCLE</i>	[Disp]	0 {1 ms} 30	Time between two sync telegrams on the system bus
C0363	<i>SYNC CORR</i>	1	1 0.8 μ s 2 1.6 μ s 3 2.4 μ s 4 3.2 μ s 5 4.0 μ s	CAN Sync correction Correction value for C0362
[C0364]	<i>CFG:CAN ACTIV</i>	1000	FIXED 0 → Selection list 2	Switch from Pre-operat. to operat. , process data must be activated externally 10-58
C0365	<i>CAN ACTIV</i>	[Disp]	0 1	Input signal CAN active
C0366	<i>SYNC RESPONSE</i>	1	0 no sync response 1 sync response	CAN Sync Response
C0367	<i>SYNC RX ID</i>	128	1 {1} 256	CAN Sync Rx Identifier
C0368	<i>SYNC TX ID</i>	128	1 {1} 256	CAN Sync Tx Identifier
C0369	<i>SYNC TX TIME</i>	0	0 {1 ms} 65000	CAN Sync Tx Time
C0400	<i>OUT</i>	[Disp]	-199.99 {0,01 %} 199.99	Output of AIN1
[C0402]	<i>OFFSET</i>	19502	FCODE-26/1 → Selection list 1	Configuration offset of AIN1 10-58
[C0403]	<i>GAIN</i>	19504	FCODE-27/1 → Selection list 1	Configuration gain of AIN1 10-58
C0404	1 <i>OFFSET</i> 2 <i>GAIN</i>	[Disp]	-199.99 {0.01 %} 199.99	Input signals of AIN1
C0405	<i>OUT</i>	[Disp]	-199.99 {1 %} 199.99	Output of AIN2
[C0407]	<i>OFFSET</i>	19503	FCODE-26/2 → Selection list 1	Configuration offset of AIN2 10-58
[C0408]	<i>GAIN</i>	19505	FCODE-27/2 → Selection list 1	Configuration gain of AIN2 10-58
C0409	1 <i>OFFSET</i> 2 <i>GAIN</i>	[Disp]	-199.99 {0.01 %} 199.99	Input signals of AIN2
[C0416]	<i>RESOLVER ADJ</i>	0	0 {1} 99999999	Correction Resolver fault For Lenze motors: Read resolver error from the nameplate
[C0420]	<i>ENCODER CONST</i>	512	1 {1 inc/rev} 8192	Encoder constant for encoder input X8 in increments per revolution
[C0421]	<i>ENCODER VOLT</i>	5.00	5.00 {0.1V} 8.00	Encoder voltage supply setting CAUTION: incorrect input may destroy the encoder
C0425	<i>DFIN CONST</i>	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

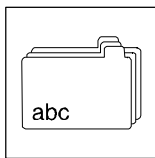


Appendix

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



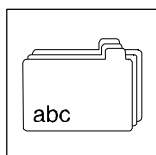
Code	LCD	Possible settings		IMPORTANT
		Lenze	Choice	
C0464	CUSTOMER I/F	☐ Disp	0 original 1 changed	Customer interface , status of the selected basic configuration - Reassignment of terminals in a basic configuration from C0005 does not change C0005 and sets C0464 = 1 - Adding or removing of function blocks or changing the signal flow among the function blocks in a basic configuration of C0005 sets C0005 = 0 and C0464 = 1
[C0465]	1 FB LIST 2 FB LIST 3 FB LIST 4 FB LIST 5 FB LIST 6 FB LIST 7 FB LIST 8 FB LIST 9 FB LIST 10 FB LIST 11 FB LIST 12 FB LIST 13 FB LIST 14 FB LIST 15 FB LIST 16 FB LIST ... 19 FB LIST 22 FB LIST 25 FB LIST 28 FB LIST 31 FB LIST 41 FB LIST 42 FB LIST ... FB LIST 49 FB LIST 50 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.
C0466	CPU T REMAIN	☐ Disp		Processing time remaining for processing function blocks
[C0469]	Fct STP KEY	2	0 inactive 1 CINH 2 QSP	Function key Stop of the operating module Function is activated when pressing the STOP key. Deactivated Controller inhibit Quick stop
C0470	1 FCODE BIT 0-7 2 FCODE BIT 8-15 3 FCODE BIT 16-23 4 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

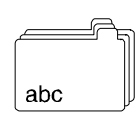
Code	LCD	Possible settings		IMPORTANT
		Lenze	Choice	
C0472	<i>FCODE ANALOG</i>	0.00	-199.99 {0.01 %} 199.99	Freely assignable code for relative analog signals
1	<i>FCODE ANALOG</i>	0.00		
2	<i>FCODE ANALOG</i>	100.00		
3	<i>FCODE ANALOG</i>	100.00		
6	<i>FCODE ANALOG</i>	...		
...	<i>FCODE ANALOG</i>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

Code	LCD	Possible settings		IMPORTANT
		Lenze	Choice	
C0517	USER MENU	51.00	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	54.00	C0051/0 MCTRL-NACT	
2	USER MENU	56.00	C0054/0 Imot	
3	USER MENU	46.00	C0056/0 MCTRL-MSET2	
4	USER MENU	49.00	C0046/0 DIS: N	
5	USER MENU	183.00	C0049/0 DIS: NADD	
6	USER MENU	168.01	C0183/0 Diagnostics	
7	USER MENU	86.00	C0168/1 Fail no. act	
8	USER MENU	22.00	C0086/0 Mot type	
9	USER MENU	5.00	C0022/0 I _{max} current	
10	USER MENU	11.00	C0005/0 Signal cfg	
11	USER MENU	12.00	C0011/0 N _{max}	
12	USER MENU	13.00	C0012/0 T _{ir}	
13	USER MENU	105.00	C0013/0 T _{if}	
14	USER MENU	39.01	C0105/0 QSP T _{if}	
15	USER MENU	70.00	C0039/1 JOG setpoint	
16	USER MENU	71.00	C0070/0 V _p speed CTRL	
17	USER MENU	0	C0071/0 T _n speed CTRL	
18	USER MENU	...	not assigned	
...	...	0	...	
30	...	94.00	not assigned	
31	USER MENU	3.00	C0094/0 Password	
32	USER MENU		C0003/0 Par save	
[C0520]	IN	1000	FIXED PHI-0 → Selection list 4	Configuration input of DFSET 10-58
[C0521]	V _P -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]	R-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]	SEL	1000	FIXED 0 → Selection list 2	Configuration set integrators of DFSET 10-58
C0528	0-PULSE R	[Disp]	-2000000000 {1 inc} 2000000000	Zero pulse phase difference Phase difference between two zero pulses Offset of C0523*C0529 + C0252
1	0-PULSE R			
2	OFFSEt			
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	V _P DENOM	1	1 {1} 32767	Gain factor V _p 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

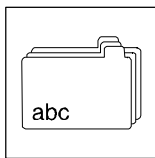


Appendix

Code	LCD	Possible settings		IMPORTANT
		Lenze	Choice	
C0536	1 <i>VP-DIV</i> 2 <i>RAT-DIV</i> 3 <i>R-TRIMM</i>	[Disp]	-32767 {1} 32767	Absolute analog input signals of DFSET
C0537	<i>NT-ERI</i>	[Disp]	-199.99 {0.01 %} 199.99	Relative analog input signal of DFSET
C0538	1 <i>D-PULSE</i> 2 <i>RESET</i> 3 <i>SEL</i>	[Disp]		Digital input signals of DFSET
C0539	<i>IN</i>	[Disp]	-32767 {1 rpm} 32767	Input signal of DFSET
[C0540]	<i>FUNCTION</i>	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]	<i>AIN-IN</i>	0	MCTRL-NACT → Selection list 1	Configuration analog input of DFOUT 10-58
[C0542]	<i>DF-IN</i>	1000	FIXEDPHI 0 → Selection list 4	Configuration digital frequency input of DFOUT 10-58
[C0544]	<i>SYN-RDY</i>	1000	FIXED 0 → Selection list 2	Configuration synchronization signal for the zero pulse of DFOUT 10-58
C0545	<i>PH OFFSET</i>	0	0 {1 inc} 65535	DFOUT phase offset • 1 turn = 65535 inc
C0546	<i>MIN INC/REV</i>	1000	1 {1 inc} 2147483647	• 1 turn = 65535 inc
C0547	<i>AIN-IN</i>	[Disp]	-199.99 {0.01 %} 199.99	Relative analog input signal of DFOUT
C0548	<i>SYN-RDY</i>	[Disp]	0 1	Digital input signal of DFOUT
C0549	<i>DF-IN</i>	[Disp]	-32767 {1 rpm} 32767	Absolute analog input signal of DFOUT
C0560	1 <i>FIX SET-VALUE</i> 2 <i>FIX SET-VALUE</i> 3 <i>FIX SET-VALUE</i> 4 <i>FIX SET-VALUE</i> 5 <i>FIX SET-VALUE</i> ... 14 <i>FIX SET-VALUE</i> 15 <i>FIX SET-VALUE</i>	100.00 75.00 50.00 25.00 0.00 ... 0.00 0.00	-199.99 {0.01 %} 199.99	FIXSET1 Fixed setpoints
[C0561]	<i>AIN</i>	1000	FIXED 0 % → Selection list 1	Configuration analog input of FIXSET1 10-58
[C0562]	1 <i>IN</i> 2 <i>IN</i> 3 <i>IN</i> 4 <i>IN</i>	1000 1000 1000 1000	FIXED 0 FIXED 0 FIXED 0 FIXED 0 → Selection list 2	Configuration digital inputs of FIXSET1 10-58
C0563	<i>AIN</i>	[Disp]	-199.99 {0.01 %} 199.99	Analog input signal of FIXSET1
C0564	1 <i>IN</i> 2 <i>IN</i> 3 <i>IN</i> 4 <i>IN</i>	[Disp]		Digital input signals of FIXSET1
[C0570]	<i>IN</i>	1000	FIXED 0 % → Selection list 1	Configuration analog input of S&H1 10-58
[C0571]	<i>LOAD</i>	1000	FIXED 0 → Selection list 2	Configuration digital input of S&H1 10-58
C0572	<i>IN</i>	[Disp]	-199.99 {0.01 %} 199.99	Analog input signal of S&H1
C0573	<i>LOAD</i>	[Disp]		Digital input signal of S&H1

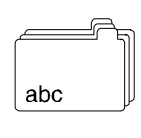


Code	LCD	Possible settings			IMPORTANT
		Lenze	Choice		
C0577	VP FLD WEAK	3.0	0.00	{0.01 ms} 15.99	VP field weakening controller Vp = gain
C0578	Tn FLD WEAK	10	2.0 8000 ms	{0.5 ms} 8192.0 switched off	Tn-field weakening controller Tn = adjustment time
C0581	MONIT EER	0	0 1 2 3 4	Trip Message Warning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

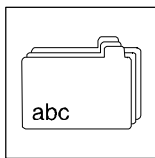


Appendix

Code	LCD	Possible settings		IMPORTANT
		Lenze	Choice	
C0598	MONIT SD5	3	0 Trip 2 Warning 3 Off	Conf. SD5 Configuration monitoring master current at X5/1.2 < 2mA
C0599	LIMITE LP 1	5.0	1.0 {0.1} 10.0	Current limit LP1 Current limit for motor phase failure monitoring
C0600	FUNCTION	1	0 OUT = IN1 1 IN1 + IN2 2 IN1 - IN2 3 IN1 * IN2 4 IN1 / IN2 5 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 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 LIMITE	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 15-bit 2 14-bit 3 13-bit 4 12-bit 5 11-bit 6 10-bit 7 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

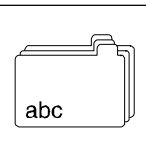


Code	LCD	Possible settings		IMPORTANT	
		Lenze	Choice		
C0658	IN	[Disp]	-199.99 {0.01 %} 199.99	Analog input signal of CONV5	
[C0661]	IN	1000	FIXED 0 % → Selection list 1	Configuration analog input absolute-value generator ABS1	📖 10-58
C0662	IN	[Disp]	-199.99 {0.01 %} 199.99	Analog input signal of ABS1	
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 IN 2 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 = IN2 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 IN 2 IN		1000 1000	MCTRL-NACT FCODE-17 → Selection list 1	Configuration analog inputs of CMP1	📖 10-58
C0684 1 IN 2 IN		[Disp]	-199.99 {0.01 %} 199.99	Analog input signals of CMP1	
C0685	FUNCTION	1	1 IN1 = IN2 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 IN 2 IN		1000 1000	FIXED 0% → Selection list 1 FIXED 0%	Configuration analog inputs of CMP2	📖 10-58
C0689 1 IN 2 IN		[Disp]	-199.99 {0.01 %} 199.99	Analog input signals of CMP2	
C0690	FUNCTION	1	1 IN1 = IN2 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 IN 2 IN		1000 1000	FIXED 0% → Selection list 1 FIXED 0%	Configuration analog inputs of CMP3	📖 10-58

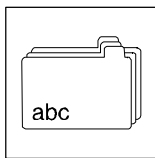


Appendix

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

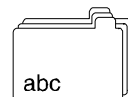


Code	LCD	Possible settings		IMPORTANT
		Lenze	Choice	
C0736	TRIGGER FLANKE	0	0 LOW/HIGH edge 1 HIGH/LOW edge	Selection of Trigger edge of OSC
C0737	TRIGGER DELAY	0.0	-100.0 {0.1 %} 999.99	Trigger delay Setting pre and post triggering of OSZ
C0738	ABTASTPERIODE	3	3 1 ms 4 2 ms 5 5 ms 6 10 ms 7 20 ms 8 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 VERSION OSZ 2 LENGTH MEMORY 3 DATA WIDTH 4 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 INDEX ABBRUCH 2 INDEX TRIGGER 3 INDEX ENDE			Information about storing measured values

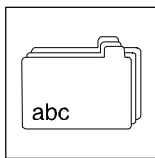


Appendix

Code	LCD	Possible settings		IMPORTANT
		Lenze	Choice	
C0750	VP DENOM	16	1 Gain = 1 2 Gain = 1/2 4 Gain = 1/4 8 Gain = 1/8 16 Gain = 1/16 32 Gain = 1/32 64 Gain = 1/64 128 Gain = 1/128 256 Gain = 1/256 512 Gain = 1/512 1024 Gain = 1/1024 2048 Gain = 1/2048 4096 Gain = 1/4096 8192 Gain = 1/8192 16384 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 no TP start 1 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 QSP 2 STOP 3 RESET			Digital input signals of DFRFG1
C0765	IN		-32767 {1 rpm} 32767	Absolute analog input signal of DFRFG1
C0766	DIRECTION	1	1 cw/ccw 2 cw 3 ccw	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 D 2 CLK 3 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 D 2 CLK 3 CLR			Digital input signals of FLIP2

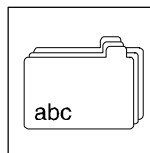


Code	LCD	Possible settings			IMPORTANT
		Lenze	Choice		
[C0780]	<i>N</i>	1000	AIN1-OUT	→ Selection list 1	Configuration main setpoint input of NSET 10-58
[C0781]	<i>N-INV</i>	1000	CW/CCW/Q-CW/CCW	→ Selection list 2	Configuration main setpoint inversion of NSET 10-58
[C0782]	<i>NADD</i>	1000	ASW1-OUT	→ Selection list 1	Configuration additional setpoint input of NSET 10-58
[C0783]	<i>NADD-INV</i>	1000	FIXED0	→ Selection list 2	Configuration additional setpoint inversion of NSET 10-58
[C0784]	<i>cINH-VAL</i>	1000	MCTRL-NACT	→ Selection list 1	Configuration output signal with controller inhibit of NSET 10-58
[C0785]	<i>SEt</i>	1000	MCTRL-NSET2	→ Selection list 1	Configuration ramp generator of NSET 10-58
[C0786]	<i>LOAD</i>	1000	MCTRL-QSP-OUT	→ Selection list 2	Configuration digital input (load ramp generator) of NSET 10-58
[C0787]	1 <i>JOG*1</i> 2 <i>JOG*2</i> 3 <i>JOG*4</i> 4 <i>JOG*8</i>	1000 1000 1000 1000	DIGIN3 FIXED0 FIXED0 FIXED0	→ Selection list 2	Configuration JOG selection and JOG activation of NSET 10-58 • Binary interpretation
[C0788]	1 <i>Et*1</i> 2 <i>Et*2</i> 3 <i>Et*4</i> 4 <i>Et*8</i>	1000 1000 1000 1000	FIXED0 FIXED0 FIXED0 FIXED0	→ Selection list 2	Configuration Ti selection and Ti activation of NSET 10-58 • Binary interpretation • Tir and Tif pairs are identical
[C0789]	<i>RFG-0</i>	1000	FIXED0	→ Selection list 2	Configuration digital input (ramp generator 0) of NSET 10-58
[C0790]	<i>RFG-STOP</i>	1000	FIXED0	→ Selection list 2	Configuration digital input (ramp generator stop) of NSET 10-58
C0798	1 <i>cINH-VAL</i> 2 <i>SEt</i>		-199.99 (0.01 %) 199.99		Analog input signals of NSET
C0799	1 <i>N-INV</i> 2 <i>NADD-INV</i> 3 <i>LOAD</i> 4 <i>JOG*1</i> 5 <i>JOG*2</i> 6 <i>JOG*4</i> 7 <i>JOG*8</i> 8 <i>Et*1</i> 9 <i>Et*2</i> 10 <i>Et*4</i> 11 <i>Et*8</i> 12 <i>DIS RFG-0</i> 13 <i>RFG-STOP</i>				Digital input signals of NSET
[C0800]	<i>SEt</i>	1000	FIXED0%	→ Selection list 1	Configuration setpoint input of process controller PCTRL1 10-58
[C0801]	<i>Act</i>	1000	FIXED0%	→ Selection list 1	Configuration actual value input of PCTRL1 10-58
[C0802]	<i>INFLU</i>	1000	FIXED0%	→ Selection list 1	Configuration evaluation input of PCTRL1 10-58
[C0803]	<i>ADAPT</i>	1000	FIXED0%	→ Selection list 1	Configuration adaptation input of PCTRL1 10-58
[C0804]	<i>INAct</i>	1000	FIXED0	→ Selection list 2	Configuration deactivation input of PCTRL1 10-58
[C0805]	<i>I-OFF</i>	1000	FIXED0	→ Selection list 2	Configuration digital input (switch off I-component) of PCTRL1 10-58
C0808	1 <i>SEt</i> 2 <i>Act</i> 3 <i>INFLU</i> 4 <i>ADAPT</i>		-199.99 (0.01 %) 199.99		Analog input signals of PCTRL1

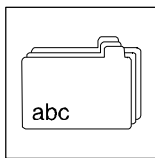


Appendix

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

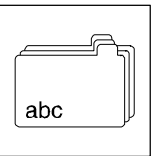


Code	LCD	Possible settings		IMPORTANT
		Lenze	Choice	
C0829	1 <i>IN</i> 2 <i>IN</i> 3 <i>IN</i>	Disp		Digital input signals of AND5
[C0830]	1 <i>IN</i> 2 <i>IN</i> 3 <i>IN</i>	1000 1000 1000	FIXED0 FIXED0 FIXED0	→ Selection list 2 Configuration digital inputs of the OR element OR1
C0831	1 <i>IN</i> 2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

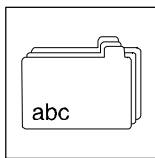


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Code	LCD	Possible settings		IMPORTANT
		Lenze	Choice	
[C0848]	IN	1000	FIXED0 → Selection list 2	Configuration digital input of the digital NOT element NOT5 10-58
C0849	IN			Digital input signal of NOT5
[C0850]	OUT.W1 OUT.W2 OUT.W3	1000 1000 1000	FIXED0%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

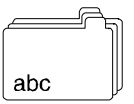


Code	LCD	Possible settings		IMPORTANT
		Lenze	Choice	
C0865	1 TYPE OUT1.W3 2 TYPE OUT2.W2 3 TYPE OUT3.W2	0 0 0	0 analog sign 1 digital 16-31 2 high phase	Configuration process output words for system bus (CAN)
C0866	1 IN1.W1 2 IN1.W2 3 IN1.W3 4 IN2.W1 5 IN2.W2 6 IN2.W3 7 IN2.W4 8 IN3.W1 9 IN3.W2 10 IN3.W3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

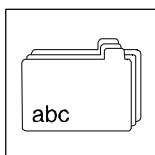


Appendix

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

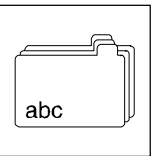


Code	LCD	Possible settings		IMPORTANT
		Lenze	Choice	
C0946	DENOMINATOR	1	1 {1} 32767	CONV2 denominator Denominator for CONV2
[C0947]	IN	1000	FIXED0% → Selection list 1	Configuration analog input CONV2 10-58
C0948	IN	[Disp]	-199.99 {0.01 %} 199.99	Relative analog input signal of CONV2
C0950	NUMERATOR	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]	1 IN 2 IN	1000 1000	FIXED0INC FIXED0INC → Selection list 3	Configuration inputs ARITPH1 10-58
C1012	1 IN 2 IN	[Disp]	-2147483647 {1} 2147483647	Input signals ARITPH1

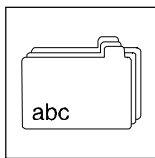


Appendix

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] 1 IN 2 IN		1000 1000	100 {1} 25103 → Selection list 3	Configuration inputs ARITPH2 10-58
C1022 1 IN 2 IN		[Disp]	-2147483647 {1} 2147483647	Input signals ARITPH2
C1025	FUNCTION	1	0 OUT = IN1 1 IN1 + IN2 2 IN1 - IN2 3 IN1 * IN2 14 IN1 / IN2	Function of ARITPH3
[C1026] 1 IN 2 IN		1000 1000	100 {1} 25103 → Selection list 3	Configuration inputs ARITPH3 10-58
C1027 1 IN 2 IN		[Disp]	-2147483648 {1} 2147483647	Input signals ARITPH3
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] 1 LOAD 2 BUSY-IN 3 FAIL-IN		1000 1000 1000	FIXED0 → Selection list 2	Configuration digital inputs of FEVAN1 10-58
C1098	IN	[Disp]	-32768 {1} 32767	Analog input signal of FEVAN1
C1099 1 LOAD 2 BUSY-IN 3 FAIL-IN		[Disp]		Digital input signal of FEVAN1
C1100	FUNCTION	1	1 Return 2 Hold	Function of FCNT1
[C1101] 1 LD-VAL 2 CMP-VAL		1000 1000	FIXED0% → Selection list 1 FIXED0%	Configuration analog inputs of FCNT1 10-58
[C1102] 1 CLKUP 2 CLKDOWN 3 LOAD		1000 1000 1000	FIXED0 → Selection list 2 FIXED0 FIXED0	Configuration digital inputs of FCNT1 10-58
C1103 1 LD-VAL 2 CMP-VAL		[Disp]	-32768 {1} 32768	Analog input signals of FCNT1
C1104 1 CLKUP 2 CLKDOWN 3 LOAD		[Disp]		Digital input signals of FCNT1
C1105	FUNCTION	1	1 Return 2 Hold	Function of FCNT2



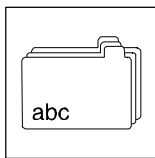
Code	LCD	Possible settings		IMPORTANT
		Lenze	Choice	
[C1106]	1 LD-VRL 2 CMP-VRL	1000 1000	50 {1} 25104 → Selection list 1	Configuration analog inputs of FCNT2 10-58
[C1107]	1 CLKUP 2 CLKDOWN 3 LOAD	1000 1000 1000	50 {1} 25132 → Selection list 1	Configuration digital inputs of FCNT2 10-58
C1108	1 LD-VRL 2 CMP-VRL	[Disp]	-32767 {1} 32767	Analog input signals of FCNT2
C1109	1 CLKUP 2 CLKDOWN 3 LOAD	[Disp]	0 1	Digital input signals of FCNT2
C1110	FUNCTION	1	1 Return 2 Hold	Function of FCNT3
[C1111]	1 LD-VRL 2 CMP-VRL	1000 1000	50 {1} 25104 → Selection list 1	Configuration analog inputs of FCNT3 10-58
[C1112]	1 CLKUP 2 CLKDOWN 3 LOAD	1000 1000 1000	51 {1} 25132 → Selection list 2	Configuration digital inputs of FCNT3 10-58
C1113	1 LD-VRL 2 CMP-VRL	[Disp]	-32767 {1} 32767	Analog input signals of FCNT3
C1114	1 CLKUP 2 CLKDOWN 3 LOAD	[Disp]	0 1	Digital input signals of FCNT3
C1120	SYNC MODE	2	0 off 1 CAN sync 2 Terminal sync	Function of SYNC1
[C1121]	1 SYNC CYCLE	2	0 {1 ms} 13	SYNC1
	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	1 PHASESHIFT	0	-0.450 {0.001 ms} 0.450	• 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

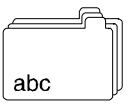
Code	LCD	Possible settings		IMPORTANT
		Lenze	Choice	
[C1126]	IN3	1000	FIXED0INC → Selection list 3	Configuration input 3 of SYNC1 10-58
C1127	IN1		-2147483647 {1} 2147483647	Input signal 1 of SYNC1
C1128	IN2		-2147483647 {1} 2147483647	Input signal 2 of SYNC1
C1129	IN3		-2147483647 {1} 2147483647	Input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

Code	LCD	Possible settings		IMPORTANT
		Lenze	Choice	
			10 wait for start 11 motion 12 wait for RSP 99 Error: internal	Waiting for enable to start the movement Waiting for end of movement Waiting for controller inhibit for completion 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 RISE TIME	100	10 {1 ms} 10000	M acceleration time  5-27
C1186	OPTIMIZE ID	0	0 Optimum control 1 Error	Optimisation: controller ident.  5-27
C1187	INERTIA	0	0 {0.1 kg*cm ² } 214000	Inertia  5-27
C1188	FRICITION	0	0 {1 %} 100	Friction load component (n-prop.)  5-27
C1190	MODE PTC-SEL.	0	0 standard 1 Characterist.	motor PTC selection
C1191	1 CHAR.: TEMP 1 2 CHAR.: TEMP 2	100 150	0 {1 °C} 255	Characteristic: Temp. 1 Selection of PTC temperature characteristic
C1192	1 CHAR.: OHM 1 2 CHAR.: OHM 2	1670 2225	0 {1 Ω} 30000	Characteristic: resistor 1 Selection of resistance characteristic for PTC
[C1195]	OUT.D2	1000	FIXED0INC → Selection list 3	Configuration input phase signal of AIF  10-58
C1196	OUT.D2		-2147483647 {1} 2147483647	Input signal of AIF
C1197	IN.D2		-2147483647 {1} 2147483647	AIF-IN.D2
C1202	RAIO NUM.	1	1 {1} 65535	Gearbox factor numerator
C1203	RAIO DENUM.	1	1 {1} 65535	Gearbox factor denominator
C1204	FEED CONSTANTE	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.		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]	SEL POLARITY	0	0 Not inverse 1 Inverse	Polarity position setpoint • Reversal of the position direction
C1207	1 FDBK RATE NUM 2 FDBK RATE DEN	1 1	1 {1} 65335	Position encoder gearbox factor • Gearbox factor between motor and position encoder. • Numerator/denominator corresponds to motor speed/encoder speed. • Encoder to motor shaft: 1/1
C1208	ACT POLARITY	0	0 not inverse 1 inverse	Polarity actual position • Inversion of the actual position, e.g. when using a separate position encoder behind the gearbox.
C1209	REF END-POINT	0	0 Ref-point 1 Real-0 61 VTPOS-No 060 71 VTPOS-No 070 101 VTPOS-No 100	Homing end point • Point where the drive is to be positioned after homing
C1210	POS. MODE	0	0 Absolute Pos 1 Relative Pos 2 Abs.Pos/Store	Positioning mode • With "absolute positioning", relative as well as absolute positionings are possible. With "relative positioning" however, only relative positionings are possible.

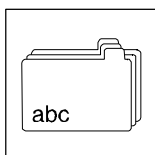


Appendix

Code	LCD	Possible settings		IMPORTANT
		Lenze	Choice	
C1211	SEARc 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 TP-TRANS ... 4 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	2-REF2 Activ.	0	0 inactive 1 active	Activation of 2nd homing speed
C1218	1 FOL.TOLERANCE 2 FOL.TOLERANCE	4.0000 1.0000	0 {0.0001 units} 214000	Contouring error tolerance
C1220	1 POS-TARGET 2 POS-SETPOS 3 POS-ACTPOS 4 Act.FOLLOWERR 5 ACTPOS Abs. 6 REFMARK Q-IMP 7 Act.HOME OFFS 8 Act.HOME POS. 9 Act. WAY 10 Act. C1223 11 Act. C1224 12 Act. C1240 13 Act. C1250 14 Act. UNORM 15 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

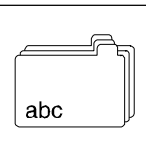


Code	LCD	Possible settings				IMPORTANT
		Lenze	Choice			
C1221	POS-TARGET 1 POS-SETPOS 2 POS-SETPOS 3 POS-ACTPOS 4 Act.FOLLOWERR 5 ACTPOS Abs. 6 REFMARK 0-IMP 7 Act.HOME OFFS 8 Act.HOME POS. 9 Act.WAY 10 Act.C1223 11 Act.C1224 12 Act.C1240 13 Act.C1250 14 Act.VNORM 15 Act.ANORM	[Disp]	-2147483647	{1 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	POS-VSET 1 POS-VSET 2 POS-VTRAV 3 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/s²}	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	PS-CANCEL	100	0.01	{0.01 %amax}	100	PS-CANCEL delay
C1255	POS-ASET 1 POS-ASET 2 POS-ACC 3 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 1	No stop With stop		Manual mode
C1261	MANU-STEP-NO 1 MANU-STEP-NO ... 16 MANU-STEP-NO	0 ... 15	0	{1} → Selection list 20	104	Intermediate stop target (no. in VTPOS)
C1280	POS. CONTROL	0	0	{1}	65535	Control word positioning

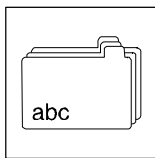


Appendix

Code	LCD	Possible settings		IMPORTANT
		Lenze	Choice	
C1283	POS. STATUS	☐ Disp	0 program mode 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	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)
C1284	HOMING-STATUS	☐ Disp	0 not REF-OK 1 REF-OK 5 homing by prg 10 manu-ref-dig 11 manu-ref-1280 20 abs encoder 25 ext abs encod	Homing status
C1285	1 MONIT P01 2 MONIT P02 3 MONIT P04 4 MONIT P05	4 4 4 4	0 Trip 4 Fail-QSP	Conf. P01 (limit switch negative)
C1286	1 MONIT P14 2 MONIT P15	4 3	0 Trip 2 Warn 3 Off 4 Fail-QSP	Conf. P14 (contouring error 1)
C1287	1 MONIT P06	4	0 Trip 4 Fail-QSP	Conf. P06 (no reference)
C1288	1 MONIT P12	4	0 Trip 4 Fail-QSP	Conf. P12 (encoder range)
C1289	1 MONIT P17 2 MONIT P18	4 2	0 Trip 2 Warn 3 Off 4 Fail-QSP	Conf. P17 TP control P18 display range limited/exceeded (Position limits, speeds)
C1290	1 MONIT P16	4	0 Trip 2 Warn 3 Off 4 Fail-QSP	Conf. P16 (Sync error)
C1291	1 MONIT P07 2 MONIT P08 3 MONIT P09	4 4 4	0 Trip 4 Fail-QSP	Conf. P07 (PS mode error)

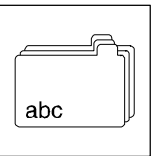


Code	LCD	Possible settings		IMPORTANT
		Lenze	Choice	
C1298	P18-DIAGNOSIS	☐ Disp	0 No P18 1 C1223 2 C1224 3 C1240 4 C1250 5 Vnorm 6 Anorm	P18 Diagnostics: Display of the code which led to an internal limitation.
C1299	1 Act. CNT ... 32 Act. CNT	☐ Disp	0 {1 pcs} 65535	Actual state of piece counter
C1301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

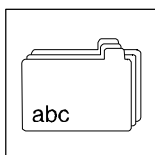


Appendix

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	∇-TRAVEL-NO ... ∇-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	∇-FINAL-NO ... ∇-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



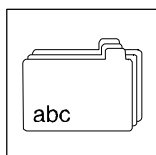
Code	LCD	Possible settings		IMPORTANT	
		Lenze	Choice		
C1323 1 ... 32	PFO2-LEVEL PFO2-LEVEL	0 ... 0	0 0-Level 1 1-Level	Second switching PFO level	
C1324 1 ... 32	WRITE-TIME-NO WRITE-TIME-NO	0 ... 0	0 {1} 34 → Selection list 18	Waiting time (no. in VTIME)	10-58
C1325 1 ... 32	JMP1-PFI-NO JMP1-PFI-NO	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

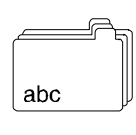
Code	LCD	Possible settings		IMPORTANT
		Lenze	Choice	
C1349 1 ... 32	JMP-PS JMP-PS		0 {1} 32 → Selection list 19	JMP: PS no. • Unconditioned branch to PS no. 📖 10-58
[C1350] 1 ... 10	VTPOS-IN VTPOS-IN	1000 ... 1000	→ Selection list 3	CFG: VTPOS-IN 📖 10-58
C1351 1 ... 10	VTPOS-IN VTPOS-IN	☐ -2147483647 {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	☐ -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	☐ -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	☐ -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	☐ -32768 {1} 32767		DIS: VTTIME-IN

Lenze BA9300POS EN 2.3 10-47

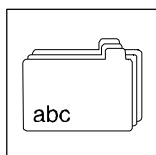


Appendix

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

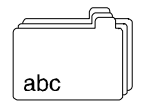


Code	LCD	Possible settings		IMPORTANT
		Lenze	Choice	
C1387 1 VTIME ... 34 VTIME		☐ Disp	0 {0.001 s} 65535	DIS: VTIME (01..34)
[C1400] 1 SET 2 NEXT 3 CLR 4 LOAD		1000 1000 1000 1000	5 {1} 25132 → Selection list 2	CFG: TEACH1-SET  10-58
[C1401] 1 L-IN		1000	100 {1} 25103 → Selection list 3	CFG: TEACH1-L-IN  10-58
C1402 1 SET 2 NEXT 3 CLR 4 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 LOAD 2 BUSY-IN 3 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 LOAD 2 BUSY-IN 3 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 LOAD 2 BUSY-IN 3 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

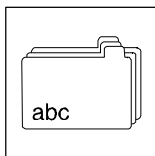


Appendix

Code	LCD	Possible settings		IMPORTANT
		Lenze	Choice	
C1519	1 LOAD 2 BUSY-IN 3 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 LOAD 2 BUSY-IN 3 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 LOAD 2 BUSY-IN 3 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 LOAD 2 BUSY-IN 3 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 LOAD 2 BUSY-IN 3 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 LOAD 2 BUSY-IN 3 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

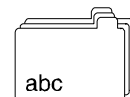


Code	LCD	Possible settings		IMPORTANT
		Lenze	Choice	
C1549 1 <i>LOAD</i> 2 <i>BUSY-IN</i> 3 <i>FAIL-IN</i>		☐ Disp	0	1 DIS: FEVAN6-LOAD
C1550 <i>ARITPH4 FUNCT</i>		1	0 OUT = IN1 1 IN1 + IN2 2 IN1 - IN2 3 IN1 * IN2 14 IN1 / IN2	Function of ARITPH4
[C1551] 1 <i>IN</i> 2 <i>IN</i>		1000 1000	100 {1} 25103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

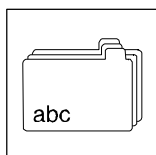


Appendix

Code	LCD	Possible settings		IMPORTANT
		Lenze	Choice	
[C1573]	1 <i>B0</i> 2 <i>B1</i> 3 <i>B2</i> 4 <i>B3</i> 5 <i>B4</i> 6 <i>B5</i> 7 <i>B6</i> 8 <i>B7</i> 9 <i>B8</i> 10 <i>B9</i> 11 <i>B10</i> 12 <i>B11</i> 13 <i>B12</i> 14 <i>B13</i> 15 <i>B14</i> 16 <i>SIGN</i>	1000	51 {1} 25132 → Selection list 2	CFG: CONVDA2.B0 10-58
C1574	RESULT	[Disp] 0	{1 hex} 65536	DIS: result
[C1576]	1 <i>B0</i> 2 <i>B1</i> 3 <i>B2</i> 4 <i>B3</i> 5 <i>B4</i> 6 <i>B5</i> 7 <i>B6</i> 8 <i>B7</i> 9 <i>B8</i> 10 <i>B9</i> 11 <i>B10</i> 12 <i>B11</i> 13 <i>B12</i> 14 <i>B13</i> 15 <i>B14</i> 16 <i>SIGN</i>	1000	51 {1} 25132 → Selection list 2	CFG: CONVDA3.B0 10-58
C1577	RESULT	[Disp] 0	{1 hex} 65536	DIS: result
[C1580]	IN	1000	50 {1} 25104 → Selection list 1	CFG: CONVAD1-IN 10-58
C1581	IN	[Disp] -32768	{1} 32768	DIS: CONVAD1-IN
[C1582]	IN	1000	50 {1} 25104 → Selection list 1	CFG: CONVAD2-IN 10-58
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 → Selection list 1	CFG: CONVAPH1-IN 10-58
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 → Selection list 1	CFG: CONVAPH2-IN 10-58
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 → Selection list 1	CFG: CONVAPH3-IN 10-58
C1604	DIS IN	[Disp] -32768	{1} 32768	DIS: CONVAPH3-IN

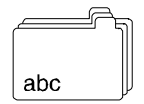


Code	LCD	Possible settings		IMPORTANT
		Lenze	Choice	
C1610	DIVISION	1	1 {1} 31	Factor
[C1611]	IN	1000	100 {1} 25103 → Selection list 3	Configuration input of CONVPHA2
C1612	IN	[Disp]	-2147483647 {1 incr} 2147483647	Input signal of CONVPHA2
C1615	DIVISION	1	1 {1} 31	Factor
[C1616]	IN	1000	100 {1} 25103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

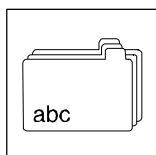


Appendix

Code	LCD	Possible settings		IMPORTANT
		Lenze	Choice	
C1653 1	RESET	☐ Disp	0	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

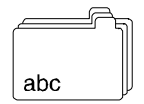


Code	LCD	Possible settings		IMPORTANT
		Lenze	Choice	
C1675	<i>FUNCTION</i>	1	1 IN1 = IN2 2 IN1 > IN2 3 IN1 < IN2 4 IN1 = IN2 5 IN1 > IN2 6 IN1 < IN2	CMPPH2 function
C1676	<i>HYSTERESIS</i>	50	0 {1 incr} 1073741824	CMPPH2 hysteresis
C1677	<i>WINDOW</i>	0	0 {1 incr} 1073741824	CMPPH2 window
[C1678] 1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

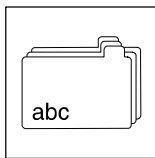


Appendix

Code	LCD	Possible settings		IMPORTANT
		Lenze	Choice	
C1702	SUBCODE	0	0 {1} 255	BCD1 Subcode
C1703	NUMERATOR	1	0 {1} 100000	BCD1 numerator
C1704	DENOMINATOR	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]	1 READ 2 DATA1 3 DATA2 4 DATA3 5 DATA4 6 LOAD 7 BUSY-IN 8 FAIL-IN	1000 1000 1000 1000 1000 1000 1000 1000	51 {1} 25132 → Selection list 2	CFG: BCD1-READ 10-58
C1709	1 READ 2 DATA1 3 DATA2 4 DATA3 5 DATA4 6 LOAD 7 BUSY-IN 8 FAIL-IN	[Disp]	0 1	DIS: BCD1-READ
C1710	1 OUTPUT SIGNAL 2 BCD RESULT	[Disp]	-2147483647 {1} 2147483647	Signal output
C1711	CODE	141	11 {1} 2000	BCD2 code
C1712	SUBCODE	0	0 {1} 255	BCD2 subcode
C1713	NUMERATOR	1	0 {1} 100000	BCD2 numerator
C1714	DENOMINATOR	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]	1 READ 2 DATA1 3 DATA2 4 DATA3 5 DATA4 6 LOAD 7 BUSY-IN 8 FAIL-IN	1000 1000 1000 1000 1000 1000 1000 1000	51 {1} 25132 → Selection list 2	CFG: BCD2-READ 10-58
C1719	1 READ 2 DATA1 3 DATA2 4 DATA3 5 DATA4 6 LOAD 7 LOAD 8 BUSY-IN	[Disp]	0 1	DIS: BCD2-READ



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



Appendix

10.3 Selection list

List 1: Analog signal sources

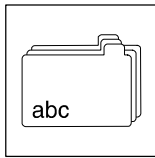
000050	AIN1-OUT	019522:	FCODE-472/2
000055:	AIN2-OUT	019523:	FCODE-472/3
000100:	DFSET-NOUT	019524:	FCODE-472/4
001000:	FIXED 0%	019525:	FCODE-472/5
001006:	FIXED 100%	019526:	FCODE-472/6
001007:	FIXED -100%	019527:	FCODE-472/7
005000:	MCTRL-NSET2	019528:	FCODE-472/8
005001:	MCTRL-NACT	019529:	FCODE-472/9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

List 2: Digital signal sources

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



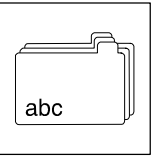
Appendix

List 2 (continued):

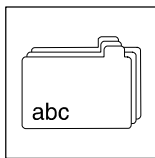
025101:	AIF-IN.B0	030119:	POS-PF019
025102:	AIF-IN.B1	030120:	POS-PF020
025103:	AIF-IN.B2	030121:	POS-PF021
025104:	AIF-IN.B3	030122:	POS-PF022
025105:	AIF-IN.B4	030123:	POS-PF023
025106:	AIF-IN.B5	030124:	POS-PF024
025107:	AIF-IN.B6	030125:	POS-PF025
025108:	AIF-IN.B7	030126:	POS-PF026
025109:	AIF-IN.B8	030127:	POS-PF027
025110:	AIF-IN.B9	030128:	POS-PF028
025111:	AIF-IN.B10	030129:	POS-PF029
025112:	AIF-IN.B11	030130:	POS-PF030
025113:	AIF-IN.B12	030131:	POS-PF031
025114:	AIF-IN.B13	030132:	POS-PF032
025115:	AIF-IN.B14	030200:	POS-TP1-EN
025116:	AIF-IN.B15	030201:	POS-TP1-RECOG
025117:	AIF-IN.B16	030202:	POS-TP2-EN
025118:	AIF-IN.B17	030203:	POS-TP2-RECOG
025119:	AIF-IN.B18	030204:	POS-TP3-EN
025120:	AIF-IN.B19	030205:	POS-TP3-RECOG
025121:	AIF-IN.B20	030206:	POS-TP4-EN
025122:	AIF-IN.B21	030207:	POS-TP4-RECOG
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-PF01		
030102:	POS-PF02		
030103:	POS-PF03		
030104:	POS-PF04		
030105:	POS-PF05		
030106:	POS-PF06		
030107:	POS-PF07		
030108:	POS-PF08		
030109:	POS-PF09		
030110:	POS-PF010		
030111:	POS-PF011		
030112:	POS-PF012		
030113:	POS-PF013		
030114:	POS-PF014		
030115:	POS-PF015		
030116:	POS-PF016		
030117:	POS-PF017		
030118:	POS-PF018		

List 3: Phase signal sources

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



List 3 (continued):	List 4:	Phase difference signal sources	List 5:	Function blocks	(see processing table)
031080: VTPOS-OUT80			000000: empty	010560: OR3	
031081: VTPOS-OUT81	000050: DFIN-OUT		000050: AIN1	010565: OR4	
031082: VTPOS-OUT82	000100: DFSET-POUT		000055: AIN2	010570: OR5	
031083: VTPOS-OUT83	000250: DFOUT-OUT		000070: AOUT1	010600: NOT1	
031084: VTPOS-OUT84	001000: FIXEDPHI-0		000075: AOUT2	010605: NOT2	
031085: VTPOS-OUT85	005000: MCTRL-PHI-ACT		000100: DFSET	010610: NOT3	
031086: VTPOS-OUT86	006000: DFRFG1-OUT		000200: DFIN	010615: NOT4	
031087: VTPOS-OUT87	006220: CONV5-OUT		000250: DFOUT	010620: NOT5	
031088: VTPOS-OUT88	006600: SYNC1-OUT1		005050: NSET	010650: CMP1	
031089: VTPOS-OUT89	019521: FCODE-475/1		005100: MPOT1	010655: CMP2	
031090: VTPOS-OUT90	019522: FCODE-475/2		005520: ARITPH1	010700: DIGDEL1	
031091: VTPOS-OUT91	030000: POS-PHI-SET		005525: ARITPH2	010705: DIGDEL2	
031092: VTPOS-OUT92			005530: ARITPH3	010750: TRANS1	
031093: VTPOS-OUT93			005535: ARITPH4	010755: TRANS2	
031094: VTPOS-OUT94			005540: ARITPH5	010900: FLIP1	
031095: VTPOS-OUT95			005545: ARITPH6	010905: FLIP2	
031096: VTPOS-OUT96			005550: ADD1	011000: CMPPH1	
031097: VTPOS-OUT97			005600: RFG1	011005: CMPPH2	
031098: VTPOS-OUT98			005650: ASW1	011010: CMPPH3	
031099: VTPOS-OUT99			005655: ASW2	012000: PHINT1	
031100: VTPOS-OUT100			005700: ANEG1	012050: PHDIV1	
031101: VTPOS-OUT101			005705: ANEG2	013000: FEVAN1	
031102: VTPOS-OUT102			005775: SELPH1	013005: FEVAN2	
031103: VTPOS-OUT103			005780: SELPH2	013010: FEVAN3	
031104: VTPOS-OUT104			006000: DFRFG1	013015: FEVAN4	
031201: VTVEL-OUT1			006200: CONV1	013020: FEVAN5	
031202: VTVEL-OUT2			006205: CONV2	013025: FEVAN6	
031203: VTVEL-OUT3			006210: CONV3	013050: BCD1	
031204: VTVEL-OUT4			006215: CONV4	013065: BCD2	
031251: VTACC-OUT1			006220: CONV5	013080: BCD3	
031252: VTACC-OUT2			006230: CONVPHA1	015100: MLP1	
031253: VTACC-OUT3			006232: CONVPHA2	020000: CAN-OUT	
031254: VTACC-OUT4			006234: CONVPHA3	025000: AIF-OUT	
			006237: CONVPHPH2	030000: POS	
			006300: S&H1	030050: POS-SRAMPS	
			006350: CURVE1	031000: VTPOS	
			006400: FCNT1	031200: VTVEL	
			006405: FCNT2	031250: VTACC	
			006410: FCNT3	031300: VTTIME	
			006450: SP1	031350: VTPCS	
			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		



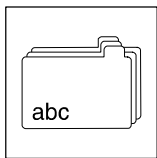
Appendix

List 10: Faults

000000:	No fail	002082:	Sd2 warning
000011:	OC1 trip	002083:	Sd3 warning
000012:	OC2 trip	002085:	Sd5 warning
000015:	OC5 trip	002086:	Sd6 warning
000022:	LUQ trip	002091:	EER warning
000032:	LP1 trip	002153:	P03 warning
000050:	OH trip	002163:	P13 warning
000053:	OH3 trip	002164:	P14 warning
000057:	OH7 trip	002165:	P15 warning
000058:	OH8 trip	002166:	P16 warning
000061:	CE0 trip	002167:	P17 warning
000062:	CE1 trip	002168:	P18 warning
000063:	CE2 trip	003091:	EER QSP
000064:	CE3 trip	003151:	P01 QSP
000065:	CE4 trip	003152:	P02 QSP
000070:	U15 trip	003154:	P04 QSP
000071:	CCr trip	003155:	P05 QSP
000072:	Pr1 trip	003156:	P06 QSP
000073:	Pr2 trip	003157:	P07 QSP
000074:	PEr trip	003158:	P08 QSP
000075:	Pr0 trip	003159:	P09 QSP
000077:	Pr3 trip	003162:	P12 QSP
000078:	Pr4 trip	003163:	P13 QSP
000079:	Pl trip	003164:	P14 QSP
000082:	Sd2 trip	003165:	P15 QSP
000083:	Sd3 trip	003166:	P16 QSP
000085:	Sd5 trip	003167:	P17 QSP
000086:	Sd6 trip	003168:	P18 QSP
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		

List 11:

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



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:

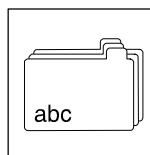
000000: Standstill
000001: VTVEL-No 01
000002: VTVEL-No 02
000003: VTVEL-No 03
000004: VTVEL-No 04
000005: VTVEL-No 05
000006: VTVEL-No 06
000007: VTVEL-No 07
000008: VTVEL-No 08
000009: VTVEL-No 09
000010: VTVEL-No 10
000011: VTVEL-No 11
000012: VTVEL-No 12
000013: VTVEL-No 13
000014: VTVEL-No 14
000015: 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

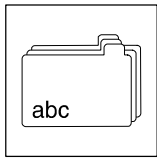
List 19:

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
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 000051: VTPOS-No 051
 000052: VTPOS-No 052
 000053: VTPOS-No 053
 000054: VTPOS-No 054
 000055: VTPOS-No 055
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 000058: VTPOS-No 058
 000059: VTPOS-No 059
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 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

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.

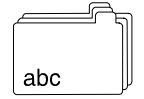
Example: "161". The motor designation behind this number is shown in the display "DSKS56-33-200".

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

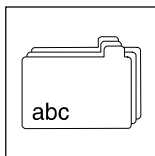
Lenze									
Hans-Lenze-Straße 1 · D-31855 Aerzen									
Made in Germany									
CE									
3-MOT	Typ	MDSKSBS56-33				Id. Nr. 00XXXXXX			
3.6	A	200	Hz	4000	min ⁻¹	cosφ	1	I.CL	F
	Nm	1.8	kW	325	V~	M ₀	4.7	Nm	KTY
								IP	54
Brenn		24	V-	0.5	A	2.5	Nm	Geber	RS00000000
C86:		161/DSKS56-33-200				Motor Nr. 0301077			

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	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		
21	MDFKA100-60	MDFKAXX100-22	6.40	1700	13.9	60		
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		
25	MDFKA112-60	MDFKAXX112-22	11.00	1710	22.5	60		
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		
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		



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	390	Asynchronous servo motor	TKO (Thermostat)
51	DFVA71-120	DFVAXX071-22	2.20	3410	6.0	120			
52	DSVA71-140	DSVAXX071-22	1.70	4050	4.4	140			
53	DFVA80-60	DFVAXX080-22	2.10	1635	4.8	60			
54	DSVA80-70	DSVAXX080-22	1.40	2000	3.3	70			
55	DFVA80-120	DFVAXX080-22	3.90	3455	9.1	120			
56	DSVA80-140	DSVAXX080-22	2.30	4100	5.8	140			
57	DFVA90-60	DFVAXX090-22	3.80	1680	8.5	60			
58	DSVA90-80	DSVAXX090-22	2.60	2300	5.5	80			
59	DFVA90-120	DFVAXX090-22	6.90	3480	15.8	120			
60	DSVA90-140	DSVAXX090-22	4.10	4110	10.2	140	350		
61	DFVA100-60	DFVAXX100-22	6.40	1700	13.9	60	390		
62	DSVA100-80	DSVAXX100-22	4.00	2340	8.2	80			
63	DFVA100-120	DFVAXX100-22	13.20	3510	28.7	120			
64	DSVA100-140	DSVAXX100-22	5.20	4150	14.0	140	330		
65	DFVA112-60	DFVAXX112-22	11.00	1710	22.5	60	390		
66	DSVA112-85	DSVAXX112-22	6.40	2490	13.5	85			
67	DFVA112-120	DFVAXX112-22	20.30	3520	42.5	120			
68	DSVA112-140	DSVAXX112-22	7.40	4160	19.8	140			
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													
Field: C86	Field: Motor type	C0086	C0022 I _{max} [A]	C0081 P _r [kW]	C0084 R _s [Ω]	C0085 L σ [mH]	C0087 n _r [rpm]	C0088 I _r [A]	C0089 f _r [Hz]	C0090 a _r [V]	C0091 cos φ	C0070 V _{pn}	C0071 T _{nn}	C0075 V _{pi}	C0076 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



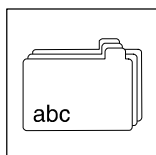
Tip!

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

Lenze Hans-Lenze-Straße 1 · D-31855 Aerzen CE Made in Germany						
3-MOT	Typ	MDFMA_112-22B	IP 54	I.CI F	KTY/TKO	
Y/Y/Δ	400/480/400 V	50/60/87 Hz	1435/1735/2545 min ⁻¹			
4.00/5.00/7.10 kW	8.30/8.30/14.3 A	cosφ	0.82/0.82/0.83			
Geber:		Bremse	V-	A	Nm	
C86: Y50:1022/Δ87:1023						
Auftr.Nr.	Typ-Nr.	Mot.Nr.				

Types DXRAXX

Value	GDC / Display	Nameplate	C0081	C0087	C0088	C0089	C0090	Motor type	Thermal sensor
	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

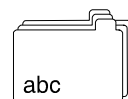


Tip!

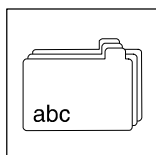
The motors listed under “Nameplate data” are available with GDC and unit software.

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													
Field: C86	Field: Motor type	C0086	C0022 I _{max} [A]	C0081 P _N [kW]	C0084 R _s [Ω]	C0085 L σ [mH]	C0087 n _N [rpm]	C0088 I _N [A]	C0089 f _N [Hz]	C0090 a _N [V]	C0091 cos φ	C0070 V _{pn}	C0071 T _{nn}	C0075 V _{pi}	C0076 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

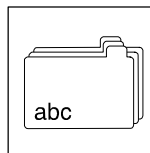


Nameplate		Data entry													
Field: C86	Field: Motor type	C0086	C0022	C0081	C0084	C0085	C0087	C0088	C0089	C0090	C0091	C0070	C0071	C0075	C0076
		I _{max} [A]	P _N [kW]	R _s [Ω]	L σ [mH]	η _N [rpm]	I _N [A]	f _N [Hz]	a _N [V]	cos φ	V _{pn}	T _{nn}	V _{pi}	T _{ni}	
445	MDXMAXM-090-32	255	9.15	2.70	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



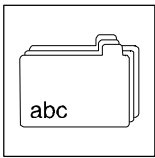
Appendix

Nameplate		Data entry													
Field: C86	Field: Motor type	C0086	C0022 I _{max} [A]	C0081 P _N [kW]	C0084 R _s [Ω]	C0085 L σ [mH]	C0087 η _N [rpm]	C0088 I _N [A]	C0089 f _N [Hz]	C0090 a _N [V]	C0091 cos φ	C0070 V _{pn}	C0071 T _{nn}	C0075 V _{pi}	C0076 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 (= 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

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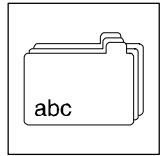
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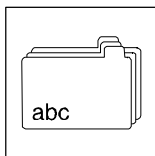
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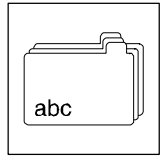
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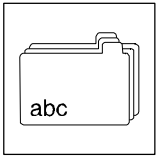
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