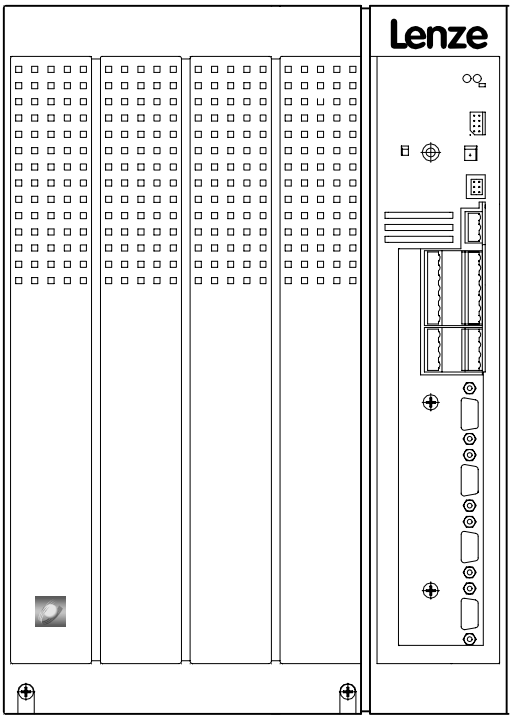
EDB9300UER
00403200

Lenze

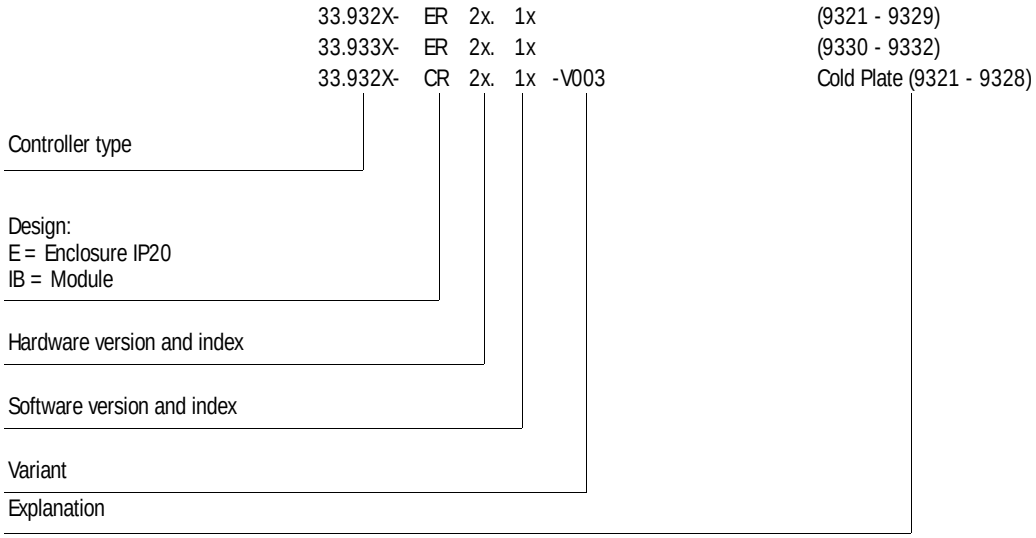
Operating Instructions



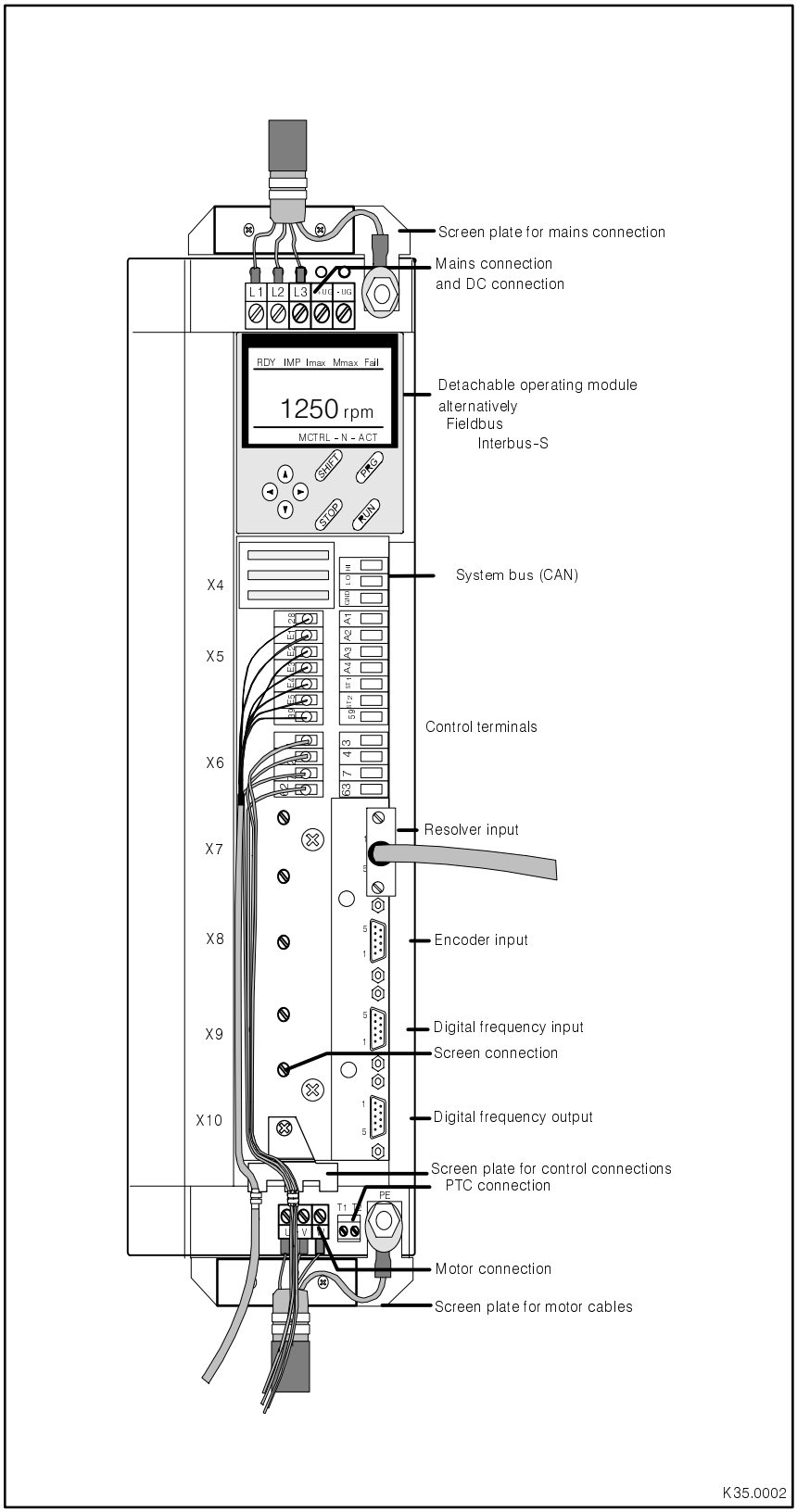
Global Drive

9300 Register control

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



Corresponds to the German edition of 01/04/1998			
Edition of:	24/08/1998		



Safety and application information for controllers

(acc. to Low-Voltage Directive 73/23/EEC)

1. General

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

Unauthorized removal of the required cover, inappropriate use, incorrect installation or operation, creates the risk of severe personal injury or damage to material assets.

Further information can be obtained from 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).

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

2. Application as directed

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

When installing in machines, commissioning of the drive controllers (i.e. the starting of operation as directed) is prohibited until it is proven that the machine corresponds to the regulations of the EC Directive 89/392/EWG (Machinery Directive); EN 60204 must be observed.

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

The drive controllers meet the requirements of the Low Voltage Directive 73/23/EWG. The harmonized standards of the prEN 50178/ DIN VDE 0160 series together with EN 60439-1/DIN VDE 0660 part 500 and EN 60146/DIN VDE 0558 are applicable to drive controllers.

The technical data and information on the connection conditions must be obtained from the nameplate and the documentation, and must be observed in all cases.

3. Transport, storage

Notes on transport, storage and appropriate handling must be observed.

Climatic conditions must be observed according to prEN 50178.

4. Erection

The devices must erected and cooled according to the regulations of the corresponding documentation.

The drive controllers must be protected from inappropriate loads. Particularly during transport and handling, components must not be bent and/or isolating distances must not be changed.Touching of electronic components and contacts must be avoided.

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

5. Electrical connection

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

The electrical installation must be carried out according to the appropriate regulations (e.g. cable cross-sections, fuses, PE connection). More detailed information is included in the documentation.

Notes concerning the installation for compliance with EMC - such as screening, grounding, arrangement of filters and laying of cables - are included in the documentation of the drive controllers.These notes must also be observed in all cases for drive controllers with the CE mark. The compliance with the required limit values demanded by the EMC legislation is in the responsibility of the manufacturer of the system or machine.

6. Operation

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

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

During operation, all covers and doors must be closed.

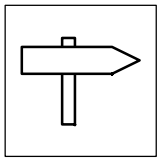
7. Maintenance and servicing

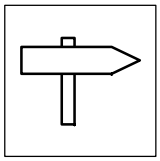
The manufacturer's documentation must be observed.

This safety information must be preserved!

The product-specific safety and application notes in these operating instructions must also be observed!

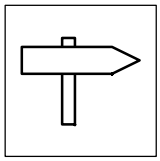
Contents

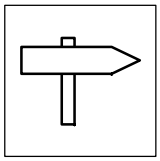




Contents

Contents





Contents

1 Preface and general information

1.1 About these Operating Instructions ...

- The present operating instructions are used for operations concerning safety measures on and with the 93XX register control. They contain safety information which must be observed.
- All persons working on and with the 93XX register control 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.

1.1.1 Terminology used

Controller

For ”93XX register control” the term ”controller” will be used in the following.

Drive system

For drive systems with 93XX register control and other Lenze drive components, the term ”drive system” is used in the following text.

1.2 Scope of supply

- The scope of supply includes:
  - 1 93XX register control
  - 1 book of operating instructions
  - 1 accessory kit with plug-in terminals, screen plates, fixing material, bus terminator for CAN, dust protection covers
- After reception of the delivery, check immediately whether the package delivered matches the accompanying papers.Lenze does not accept any liability for deficiencies claimed subsequently.Claim
  - visible transport damage immediately to the forwarder.
  - visible deficiencies/incompleteness immediately to your Lenze representative.

1.3 The 93XX register control

1.3.1 Labelling

- Lenze 93XX register controls are unambiguously designated by the contents of the nameplate.
- CE mark
  - Conforms to the EC Low Voltage Directive
  - Conformity to the EG Directive "Electromagnetic Compatibility" in preparation
- Manufacturer:
  - Lenze GmbH & Co KG
    Postfach 101352
    D-31763 Hameln

1.3.2 Application as directed

- Operate the 93XX register control only under the conditions prescribed in these operating instructions.

Register controls of the 93XX series

- 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
  - for assembly with other components to form a machine.
- are electrical equipment for installation into control cabinets or similar closed operating rooms.
- meet the protection requirements of the EC Low Voltage Directive.
- are not machinery in the sense of the EC Machinery Directive.
- are not household appliances but are intended exclusively as components for further commercial use.

Drive systems with 93XX servo inverters

- meet the EC Electromagnetic Compatibility Directive if they are installed according to the guidelines of CE-typical drive systems.
- can be operated
  - on public and non-public mains.
  - in industrial as well as residential and commercial premises.
- The compliance with the EC Directive of the machine application is in the responsibility of the user.

Any other use shall be deemed inappropriate!

1.3.3 Legal regulations

Liability

- The information, data, and notes in the operating instructions met the state of the art at the time of printing.Claims referring to drive systems which have already been supplied cannot be derived from the information, illustrations, and descriptions.
- The specifications, processes, and circuitry described in these operating instructions are for guidance only and must be adapted to your own specific application.Lenze does not guarantee the suitability of the processes and circuitry described.
- Lenze does not accept any liability for damage and operating interference caused by:
  - Disregarding these operating instructions
  - Unauthorized modifications to the controller
  - Operating mistakes
  - Improper working on and with the controller

Warranty

- Terms of warranty: see terms of sales and delivery 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

The controller consists of different materials.

The following table indicates which materials can be recycled and which must be separately disposed:

Material	recycle	dispose
Metal	●	-
Plastic	●	-
Assembled PCBs	-	●

Stop!
Dispose of the materials according to the valid law regarding environmental protection.

Preface and general information

2 Safety information

2.1 Personnel responsible for safety

Operator

- An operator is any natural or legal person who uses the drive system or on behalf of whom the drive system is used.
- The operator or his safety officer are obliged
  - to ensure that all relevant regulations, notes, and laws are observed.
  - to ensure that only qualified personnel work with and on the drive system.
  - to ensure that the personnel have the operating instructions available for all corresponding operations
  - to prohibit unqualified personnel from working with and on the drive system.

Qualified personnel

Qualified personnel are persons who are - because of their education, experience, instructions, and knowledge about corresponding standards and regulations, rules for the prevention of accidents, and operating conditions - authorized by the person responsible for the safety of the plant to perform the required actions and who are able to recognize and avoid potential hazards.
(see IEC 364, definition for qualified personnel)

2.2 General safety information

- This safety information is not claimed to be complete. In case of questions and problems please contact your Lenze representative.
- At the time of supply the controller meets the state-of-the-art and ensures basically safe operation.
- The information in these operating instructions refers to the indicated hardware and software versions of the controllers.
- The controller is a source of danger for persons, the controller itself and other material assets of the operator if
  - unqualified personnel work with and on the controller,
  - the controller is used inappropriately.
- The specifications, processes, and circuitry described in these operating instructions are for guidance only, and must be adapted to your own specific application.
- The controllers must be designed so that they perform their functions after proper erection and with application as directed in non-interfered operation, and that they do not cause hazards for persons.This is also valid for the interaction with the complete plant.
- Take additional measures to limit consequences of malfunctions which may cause hazards for persons or material assets:
  - further independent equipment which can take over the function of the controller
  - electrical or non-electrical protection (latching or mechanical blocking)
  - measures covering the complete system
- Only operate the drive system in a perfect condition.
- Retrofitting or modifications are generally prohibited. In any case, Lenze must be contacted.

2.3 Layout of the safety information

- All safety information in these operating instructions has a uniform layout:

Signal word
Note

- The icon characterizes the type of danger.
- The signal word characterizes the severity of danger.
- The note text describes the danger and gives information how to prevent dangerous situations.

Warning of damage to persons

Icons used		Signal words	
	Warning of hazardous electrical voltage	**Danger!**	Warns of **impeding danger** . Consequences if disregarded: Death or severe injuries.
		Warning!	Warns of **potential, very hazardous situation**. Possible consequences if disregarded: Death or severe injuries.
	Warning of a general danger	**Caution!**	Warns of **potential, hazardous situation**. Possible consequences if disregarded: Light or minor injuries.

Warning of damage to material

Icons used	Signal words	
	**Stop!**	Warns of **possible material damage**. Possible consequences if disregarded: Damage of the controller/drive system or its environment.

Other notes

Icons used	Signal words	
	**Tip!**	Designates a general, useful tip. If you observe it, handling of the controller/drive system is made easier.

2.4 Residual hazards

Protection of persons

After mains voltage disconnection, the power terminals U, V, W and $+U_G$, $-U_G$ carry hazardous voltages 3 minutes after mains disconnection.

Protection of devices

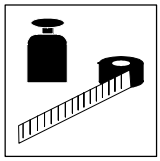
Cyclic connection and disconnection of the controller supply voltage at L1, L2, L3 or $+U_G$, $+U_G$ may overload the internal input current load:

- Allow at least 3 minutes between disconnection and reconnection.

Overspeeds

Drive systems may reach dangerous overspeeds (e.g. caused by active loads like hoists):

- The 93XX register control does not offer any protection against these operating conditions. Use additional components for this.



3 Technical data

3.1 Features

General

As a basic function, the drive controlled in the register performs a phase ratio synchronization to a master (encoder or main drive).

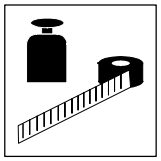
The motor shaft position is controlled using a register mark which is detected at the web. Drifting of the web mark from the sensor position, due to the process, is compensated.

Applications

- Cross-cutter with cutting register control on printing and paper processing machinery
- Coating plants for coating using register marks
- Embossing stations for metal and plastic films
- Web length control on printing machines
- Inset printing using register marks

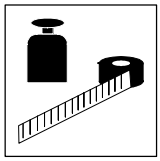
Key functions

- Register control
  - Register correction is possible during operation
  - Integrated sensor compensation for gearbox factor adaptation
  - Teach function for the selection of the significant material register mark
  - Adjustable window for the detection of the register mark
  - Monitoring of the mark sensors
  - Adjustable controller behaviour
  - Averaging, filter times, control characteristic
  - Insetter function
  - Variable manipulated variable limitation
- Parameterization in machine variables
  - Selection of cutting size and printing size in mm or inches
  - Adaptation to the previous machine using the parameters for encoder increments and material supply
- Direct reading of the register mark sensors
  - Adjustable dead time compensation for the sensors
- All functions can be operated via fieldbus
  - Interbus, Profibus and Lecom A/B modules can be plugged in
  - CAN bus is integrated into the device



3.2 General data / Operating conditions

Field	Values
Vibration resistance	Germanischer Lloyd, general conditions (in preparation)
Permissible humidity	Humidity class F without condensation (average relative humidity 85%)
Permissible temperature ranges	during transport of the controller: -25 °C ... +70 °C during storage of the controller: -25 °C ... +55 °C during operation of the controller: 0 °C ... +40 °C without derating +40 °C ... +50 °C with derating
Permissible installation height h	h ≤ 1000 m a.m.s.l. without power derating 1000 m a.m.s.l. < h ≤ 4000 m a.m.s.l. with power derating
Degree of pollution	VDE 0110 part 2 pollution degree 2
Noise emission	Requirements acc. to EN 50081-2, EN 50082-1, IEC 22G-WG4 (Cv) 21 Limit value class A acc. to EN 55011 (industrial area) with mains filter A Limit value class B acc. to EN 55022 (residential area) with mains filter B and installation in control cabinet
Noise immunity	Limit values maintained using mains filter. Requirements acc. to EN 50082-2, IEC 22G-WG4 (Cv) 21 **Requirements** / **Standard** / **Severity classe** ESD / EN61000-4-2 / 3, i. e. 8 kV for air discharge and 6 kV for contact discharge RF interference(enclosure) / EN61000-4-3 / 3, i. e. 10 V/m; 27 to 1000 MHz Burst / EN61000-4-4 / 3/4, i.e. 2 kV/5 kHz Surge (on mains cable) / EN 61000-4-5 / 3, i. e. 1.2/50 µs 1 kV phase-phase, 2 kV phase-PE
Insulation strength	Overvoltage category III according to VDE 0110
Packing	acc. to DIN 4180 - 9321 to 9326: Dust-free packing - 9327 to 9333: Delivery packing
Type of protection	IP20 IP41 on the heat-sink side for thermal separation (punching) NEMA 1: Protection against contact
Approvals	CE: Low Voltage Directive EMC Directive in preparation UL508: Industrial Control Equipment UL508C: Power Conversion Equipment



3.3 Ratings

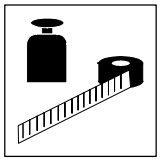
3.3.1 Controllers 9321 to 9325

	Type	EVS9321-ER	EVS9322-ER	EVS9323-ER	EVS9324-ER	EVS9325-ER
	Order no.	EVS9321-ER	EVS9322-ER	EVS9323-ER	EVS9324-ER	EVS9325-ER
	Type	**EVS9321-CRV003**	**EVS9322-CRV003**	**EVS9323-CRV003**	**ESV9324-CRV003**	**ESV9325-CRV003**
	Order no.	EVS9321-CRV003	EVS9322-CRV003	EVS9323-CRV003	EVS9324-CRV003	EVS9325-CRV003
Mains voltage	U_N [V]	320 V ± 0% ≤ U_N ≤ 528 V ± 0% ; 45 Hz … 65 Hz ± 0%				
Alternative DC supply	U_G [V]	460 V ± 0% ≤ U_G ≤ 740 V ± 0%				
Mains current with mains filter Mains current without mains filter	I_N [A]	1.5 2.1	2.5 3.5	3.9 5.5	7.0 -	12.0 16.8
Ratings for operation at a mains: 3 AC / 400V / 50Hz/60Hz						
Motor power (4-pole ASM)	P_N [kW]	0.37	0.75	1.5	3.0	5.5
	P_N [hp]	0.5	1.0	2.0	4.0	7.5
Output power U, V, W (8 kHz*)	S_{N8} [kVA]	1.0	1.7	2.7	4.8	9.0
Output power +U_G, -U_G 2)	P_{DC} [kW]	2.0	0.75	2.2	0.75	0
Output current (8 kHz*)	I_{N8} [A]	1.5	2.5	3.9	7.0	13.0
Output current (16 kHz*)	I_{N16} [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_N [kW]	0.37	0.75	1.5	3.0	5.5
	P_N [hp]	0.5	1.0	2.0	4.0	7.5
Output power U, V, W (8 kHz*)	S_{N8} [kVA]	1.2	2.1	3.2	5.8	10.8
Output power +U_G, -U_G 2)	P_{DC} [kW]	2.0	0.75	2.2	0.75	0
Output current (8 kHz*)	I_{N8} [A]	1.5	2.5	3.9	7.0	13.0
Output current (16 kHz*)	I_{N16} [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	U_M [V]	0 - 3 × U_{mains}				
Power loss (operation with I_{Nx})	P_v [W]	100	110	140	200	260
Power derating	[%/K] [%/m]	40 °C < T_U < 55 °C: 2%/K (no UL approval) 1000 m a.m.s.l. < h ≤ 4000 m a.m.s.l.: 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_{Nx}

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

* Chopping frequency of the inverter (C0018)



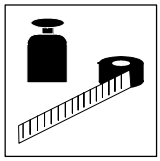
3.3.2 Ratings types 9326 to 9332

	Type	EVS9326-ER	EVS9327-ER	EVS9328-ER	EVS9329-ER	EVS9330-ER	EVS9331-ER	EVS9332-ER
	Order no.	EVS9326-ER	EVS9327-ER	EVS9328-ER	EVS9329-ER	EVS9330-ER	EVS9331-ER	EVS9332-ER
	Type	**EVS9326-CRV003**	**EVS9227-CRV003**	**EVS9328-CRV003**				
	Order no.	EVS9326-CRV003	EVS9327-CRV003	EVS9328-CRV003				
Mains voltage	U_N [V]	320 V ± 0% ≤ U_N ≤ 528 V ± 0% ; 45 Hz … 65 Hz ± 0%						
Alternative DC supply	U_G [V]	460 V ± 0% ≤ U_G ≤ 740 V ± 0%						
Mains current with mains filter Mains current without mains filter	I_N [A]	20.5 -	27.0 43.5	44.0 -	53.0 -	78.0 -	100 -	135 -
Ratings for operation at a mains: 3 AC / 400V / 50Hz/60Hz								
Motor power (4-pole ASM)	P_N [kW]	11.0	15.0	22.0	30.0	45.0	55.0	75.0
	P_N [hp]	15.0	20.5	30.0	40.0	60.0	73.5	100.0
Output power UVW (8 kHz*)	S_{N8} [kVA]	16.3	22.2	32.6	40.9	61.6	76.2	100.5
Output power + U_G, - U_G 2)	P_{DC} [kW]	0	10	4	0	5	0	0
Output current (8 kHz*) 1)	I_{N8} [A]	23.5	32.0	47.0	59.0	89.0	110.0	145.0
Output current (16 kHz*) 1)	I_{N16} [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_N [kW]	11.0	18.5	30.0	37.0	45.0	55.0	90.0
	P_N [hp]	15.0	25.0	40.0	49.5	60.0	73.5	120.0
Output power UVW (8 kHz*)	S_{N8} [kVA]	18.5	25.0	37.0	46.6	69.8	87.3	104.0
Output power + U_G, - U_G 2)	P_{DC} [kW]	0	12	4.8	0	6	0	6
Output current (8 kHz*)	I_{N8} [A]	22.3	30.4	44.7	56.0	84.0	105.0	125.0
Output current (16 kHz*)	I_{N16} [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	U_M [V]	0 - 3 × U_{mains}						
Power loss	P_V [W]	360	430	640	810	1100	1470	1960
Power derating	[%/K] [%/m]	at 40 °C < T_U < 50 °C: 2.5%/K (no UL approval) 1000 m a.m.s.l. < h ≤ 4000 m a.m.s.l.: 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_{Nx}

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

* Chopping frequency of the inverter (C0018)



3.3.3 Fuses and cable cross-sections for single drives

Type	Mains input L1, L2, L3, PE/ motor connection U, V, W										Input +UG, -UG		
	Operation without mains filter					Operation with mains filter							
	Fuse		E.l.c.b.	Cable cross-section [2]		Fuse		E.l.c.b.	Cable cross-section [2]		Fuse	Cable cross-section [2]	
	VDE	UL	VDE	mm²	AWG	VDE	UL	VDE	mm²	AWG		mm²	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	12A	1.5	15
9324	-	-	-	-	-	M 10A	10A	B 10A	1.5	15	20A	1.5	15
9325	M 32A	25A	B 32A	6	9	M 20A	20A	B 20A	4	11	32A	4	11
9326	-	-	-	-	-	M 32A	25A	B 32A	6	9	40A	6	9
9327	M 63A	63A	-	16	6	35A	35A	-	10	7	80A	10	7
9328	-	-	-	-	-	50A	50A	-	16	5	100A	16	5
9329	-	-	-	-	-	80A	80A	-	25	3	100A	25	3
9330	-	-	-	-	-	100A	100A	-	50	0	2 *100A [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 *100A [1]	3 * 16	3 * 5

[1] The DC bus fuses are connected in parallel

[2] The valid local regulations must be observed

For the 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)

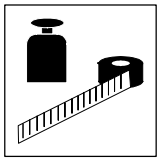
  700 V in the DC bus (DC)

  Tripping characteristic ”H” or ”K5”
- Only use 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 required for functional reasons.
- The data in the table ”operation with mains filter” are applicable.



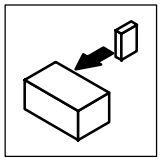
3.3.4 Mains filter

Type	Ratings (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	54 A	0.6 mH	EZN3A0060H054	EZN3B0060H054
9330	80 A	0.42 mH	EZN3A0042H080	EZN3B0042H080
9331	100 A	0.34 mH	EZN3A0034H100	EZN3B0034H100
9332	135 A	0.25 mH	EZN3A0025H135	EZN3B0025H135

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 (see chapter 4.1)



4 Installation

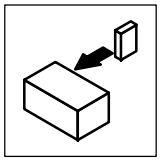
4.1 Mechanical installation

4.1.1 Important notes

- Use the controllers only as built-in devices!
- Ensure free space!
  - You can install several controllers next to each other without free space in a control cabinet.
  - Allow a free space of 100 mm at the top and at the bottom.
- Ensure unimpeded ventilation of cooling air and outlet of exhaust air.
- If the cooling air contains pollutants (dust, flakes, grease, aggressive gases), which may impair the function of the controller:
  - Take suitable preventive measures , e.g. separate air duct, installation of filters, regular cleaning, etc.
- Do not exceed the permissible range of the operating ambient temperature (see chapter 3.2).
- If the controllers are permanently subjected to vibration or shaking:
  - 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 (see chapter 4.1.2)
  - thermally separated with external heat sink
    Punching: see chapter 4.1.3
    ”Cold Plate”: see chapter 4.1.4



4.1.2 Standard assembly with fixing rails or fixing brackets

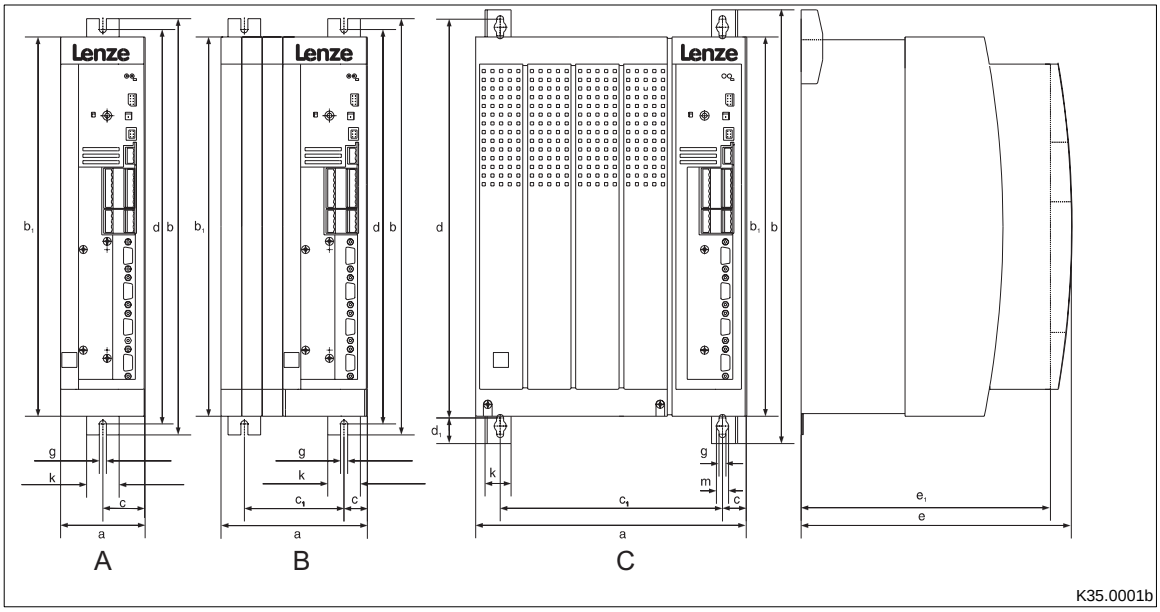


FIG 4-1 Dimensions for assembly with fixing rails/fixing brackets

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	6.5	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 field bus module:
Allow a free space for assembling the connecting cable

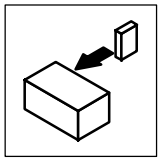
All dimensions in mm

Controllers 9321 to 9326

- Preparation for assembly:
  - 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
- Preparation for assembly:
  - 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”)

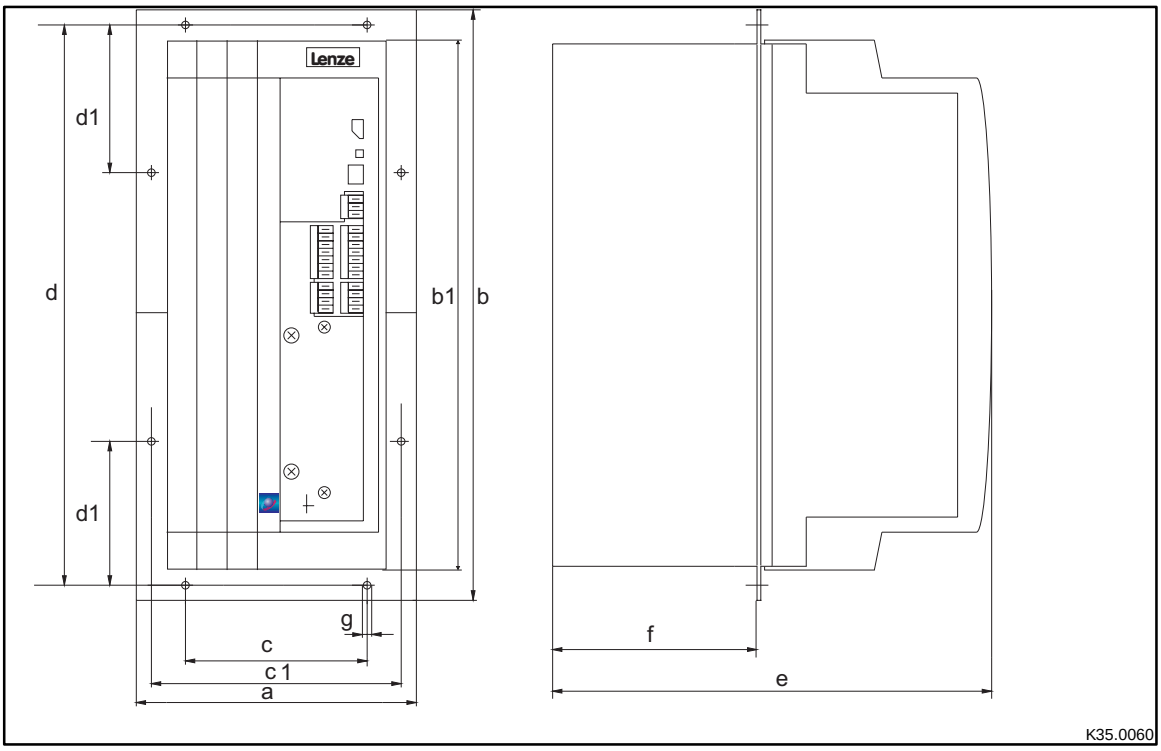
You can mount the heat sink of the controllers 9321 to 9326 outside the control cabinet to reduce the heat in the control cabinet. For this, you need an assembly frame with seal (can be ordered from Lenze).

- Distribution of the power losses:
  - approx. 65% via separate cooling unit (heatsink + blower)
  - approx. 35% in the interior of the controller
- The type of protection of the separated cooler (heat sink and blower) is IP41.
- The ratings for 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



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

* When using a plug-on field bus module:
Allow a free space for assembling the connecting cable

Assembly cut-out

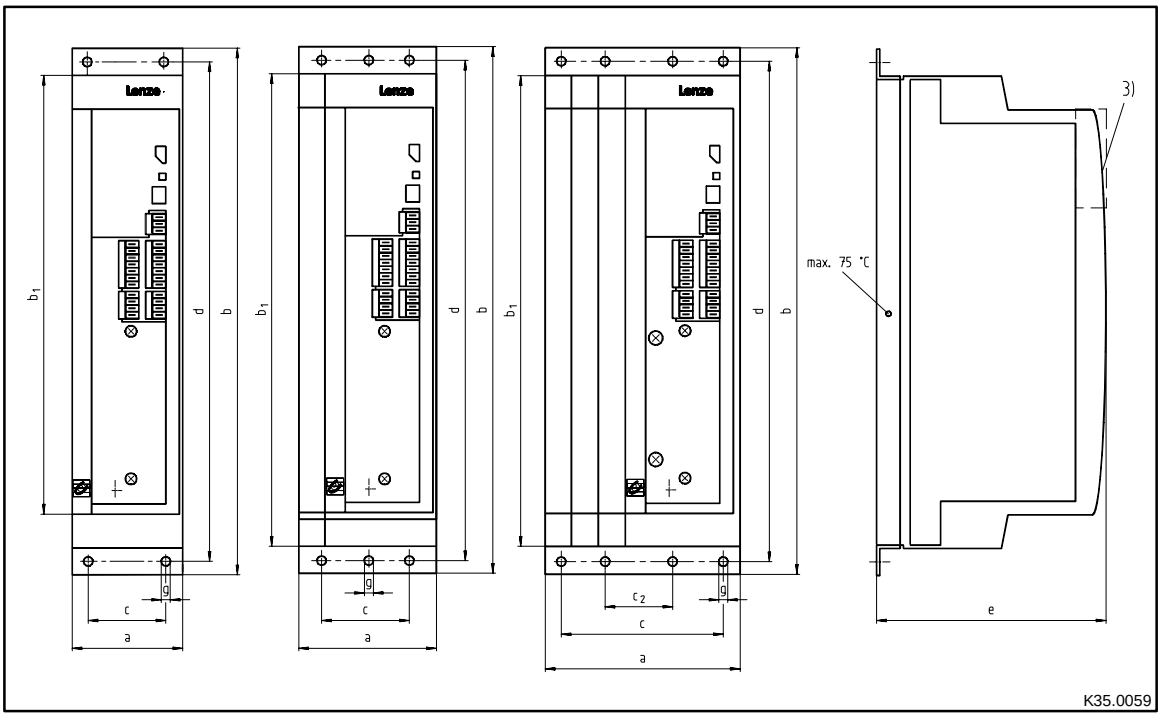
Type	9321, 9322	9323, 9324	9325, 9326
Height	350 (± 3)		
Width	82 (± 3)	101 (± 3)	139 (± 3)

All dimensions in mm

4.1.4 Assembly of variants

Variant EVS932XCSV003 (”Cold Plate”)

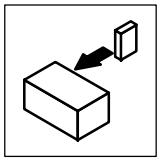
For installation in the control cabinet with other heat sinks in ”Cold Plate Technique”.



Type	a	b	b1	c	c1	d	e*	g
9321V003 9322V003	78	381	350	48	-	367	168	6.5
9323V003 9324V003	97	381	350	67	-	367	168	6.5
9325V003 9326V003	135	381	350	105	38	367	168	6.5

* When using a plug-on field bus module:
Allow a free space for assembling the connecting cable

All dimensions in mm



Installation

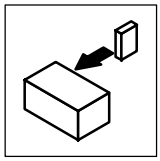
- Observe the following notes to maintain the technical data:
  - Ensure sufficient ventilation of the heat sink.
  - The free space behind the control cabinet back panel must be at least 500 mm.
- If you install several controllers in the control cabinet:
  - Do not install the controllers on top of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

Controller	Cooling path	
Type	Power to be dissipated P_V [W]	$R_{thmaxheat\ sink}$ [K/W]
9321V003	80	0.5
9322V003	80	0.5
9323V003	100	0.4
9324V003	155	0.25
9325V003	210	0.19
9326V003	360	0.1
9327V003	410	0.09
9328V003	610	0.06

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

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

- For the bore pattern and surface quality of the heat sink: please consult the factory.
- Apply heat-conductive compound to the cold plate of the controller.

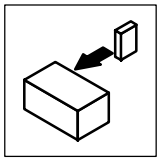


4.2 Electrical installation

4.2.1 Protection of persons

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

- Protection of persons and animals according to DIN VDE 100 with residual-current-operated protective devices:
  The devices have an internal mains rectifier. After a short-circuit to frame a DC fault current may prevent the tripping of the classic residual-current device.Therefore we recommend the use of a ”universal current sensitive e.l.c.b.”.
- For the dimensioning of the tripping current, note that capacitive compensating currents of the cable screens and RFI filters occurring during normal operation may cause false tripping.
- Note for the use for universal current sensitive e.l.c.b.:
  The preliminary standard prEN50178 (previously VDE0160) for the use of universal current sensitive e.l.c.b. has been agreed on by the German committee K226.
  The final decision on the standardized use will be made by the CENELEC/CS (European Committee for Electrotechnical Standardization) in Brussels.
  Further information on the use of a universal current sensitive e.l.c.b. can be obtained from the supplier of the e.l.c.b.
- Replace defective fuses with the prescribed type only when no voltage is applied.
  - For single drives, the controller carries a hazardous voltage up to three minutes after mains disconnection.
  - In a drive network, all controllers must be inhibited and disconnected from the mains.
- Make a safety disconnection between the controller and mains only via a contactor at the input side.
  - Please note that in a drive network all controllers must be inhibited.



Installation

Insulation

The controllers have an electrical insulation (isolating 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 isolating distance, safe insulation according to VDE0160). The protection against contact is ensured without any further measures.

Danger!

- Terminals X3, X4, X6, X7, X8, X9, X10 have a simple basic insulation (simple isolating distance).
- Protection against contact in the event of a 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.

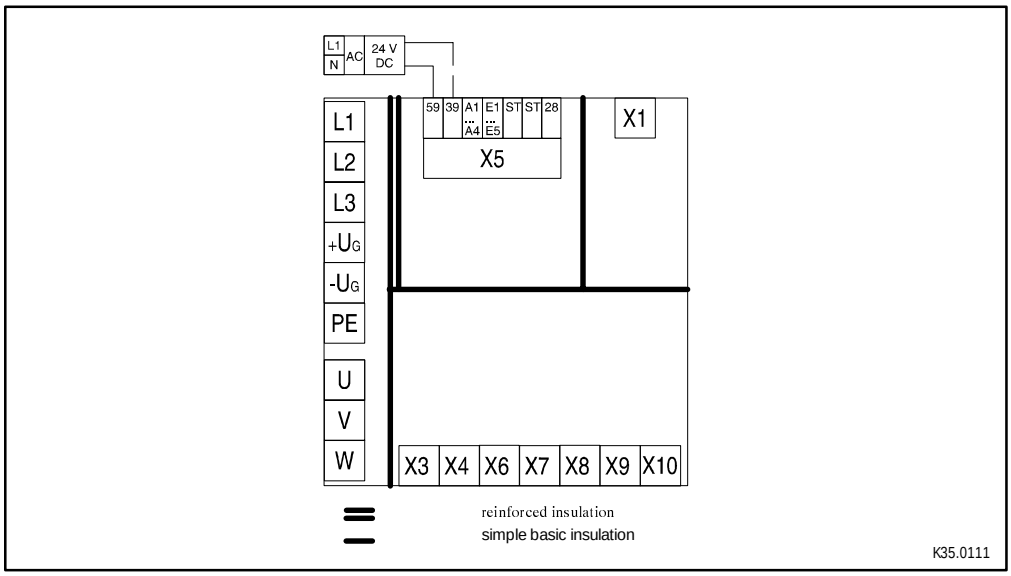
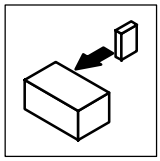


FIG 4-2 Basic insulation in the controller



4.2.2 Protection of the controller

Stop!

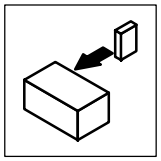
The controllers contain electrostatically sensitive components.

- Prior to working in the area of the connections, the personnel must free themselves from electrostatic charges:
  - Discharging is possible by touching the PE fixing screw or another grounded metal part in the control cabinet.

- Length of the screws for the connection of the screen cable/screen plate for the types 9327 to 9333:
  < 12 mm
- Frequent mains switching only overloads the internal switch-on current limitation.For cyclic mains switching, the controller can be switched on every three minutes as a maximum.
- Operate the controller types 9324, 9326, and 9328 only with a suitable mains filter (see chapter 3.3.4).
- The controller is protected by external fuses (see chapter 3.3.3)
- In the event of condensation, connect the controller to mains voltage only after the visible humidity has evaporated.
- Cover unused control inputs and outputs with plugs with protective covers (included in the scope of supply) for the Sub-D inputs.

4.2.3 Motor protection

- Complete motor protection according to VDE:
  - By overcurrent relays or temperature monitoring
  - required for group drives
    (motors connected in parallel to controller)
  - We recommend using a PTC or thermostat with PTC characteristic (PTCs are standard in Lenze servo motors MDXKX) for temperature monitoring of the motor.
- When using motors with inappropriate insulation 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:
  - When operating inappropriate motors, dangerous overspeeds may occur and result in the destruction of the motor.



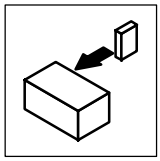
4.2.4 Mains types / Mains conditions

Please observe the restrictions for each type of mains!

Mains	Operation of the controllers	Notes
With grounded neutral	No restrictions	Maintain controller ratings
With isolated neutral (IT mains)	Operation with recommended mains filters is not possible.	Mains filter will be destroyed if an earth fault occurs.
With grounded phase	Operation is not possible.	
DC supply via $+U_G/-U_G$	The DC voltage must be symmetrical to PE.	Contact the factory Controller may be destroyed with a grounded $+U_G$ conductor or $-U_G$ conductor

4.2.5 Specification of the cables used

- The cables used must comply with the approvals required at the site (eg. 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
    Use only screens with tin- or nickel-plated copper braid!
    Screens of steel braid are not suitable.
  - the degree of coverage of the screen braid:
    at least 70% to 80% with a coverage angle of 90°



4.3 Connection

Preparation for controllers 9321 to 9326

- Remove the covers of the power connections:
  - Unlatch to the front by gentle pressure.
  - Pull upwards (mains connection) or downwards (motor connection).

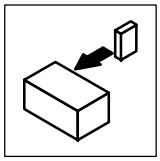
Preparation for controllers 9327 to 9328

- Remove cover:
  - Loosen screws (X) (see FIG 4-1).
  - Swing cover to the top and detach.
  - Take accessory kit out of the interior of the controller.

4.3.1 Power connection

Protection (see also chapter 3.3.3)

- The indications in chapter 3.3.3 (Fuses and cable cross-sections) are recommendations and refer to the use
  - in control cabinets and machines
  - Installation in the cable duct
  - max. ambient temperature +40 °C.
- The voltage drop under load should be considered when selecting the cable cross-section
- Protection of the cables and the controller on the AC side (L1, L2, L3):
  - By normal fuses.
  - Fuses in UL-conform plants must have UL approval.
  - The rated voltages of the fuses must be dimensioned according to the mains voltage at the site.
- Protection of the controller at the DC side (+UG, -UG):
  - By recommended DC fuses.
  - Fuses/fuse holders recommended by Lenze are listed in the UL recognition.
- In case of DC bus connection or supply by a DC source:
  - Please observe the notes in the chapter of the systems manual.
- When connected to a brake unit:
  - The fuses and cross-sections listed in chapter 3.3.3 are not applicable for brake units.
  - Please obtain these data from the documentation of the brake units.
- The compliance with other standards (e.g.: VDE 0113, VDE 0289, etc.) remains the responsibility of the user.



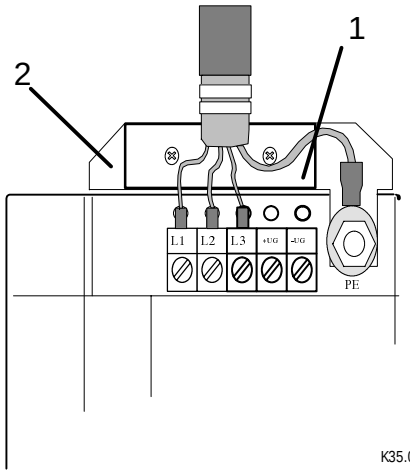
Installation

Connection

- Connect the mains cables to the screw terminals L1, L2, L3 at the top of the controller.
- 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.
- Observe screw tightening torques:

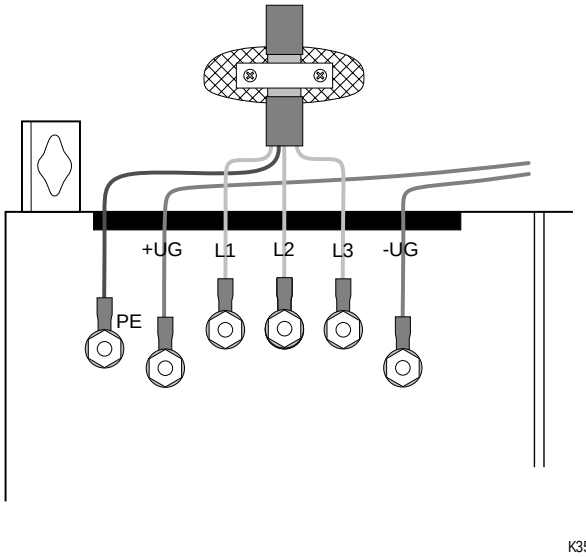
Type	9321 - 9326	9327 - 9328	9329 - 9333
Terminals L1, L2, L3, +UG, -UG	0.5 ... 0.6 Nm	4 Nm	
	4.4 ... 5.3 lbfin	35 lbfin	
PE connection	3.4 Nm	4 Nm	
	30 lbfin	35 lbfin	

Types 9321 to 9326



For screened cables
- Connect the screen correctly (required parts in the accessory kit):
  - Bolt screen plate **1** onto fixing bracket **2** .
  - Fix screen using cable lugs. Do not use as a strain relief!
  - The PE connection is made via the stud next to the power connections.

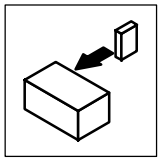
Types 9327 and 9328



For screened cables
- Connect the screen correctly:
  - Connect the screen with a suitable clamp to the conducting control cabinet mounting plate (see FIG 4-20).
  - To improve the screen connection: Connect screen additionally at the stud next to the power connections.

FIG 4-3 Power connection

Tip!
The screening of the mains supply cable is only required to comply with existing standards (e.g. VDE 0160, EN 50178).

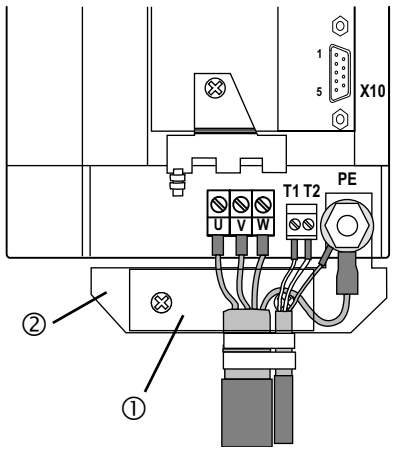


4.3.2 Motor connection

- Connect motor cables to the screw terminals U, V, W.
  - Observe the correct polarity.
  - Maximum motor cable length: 50m.
- Observe screw tightening torques:

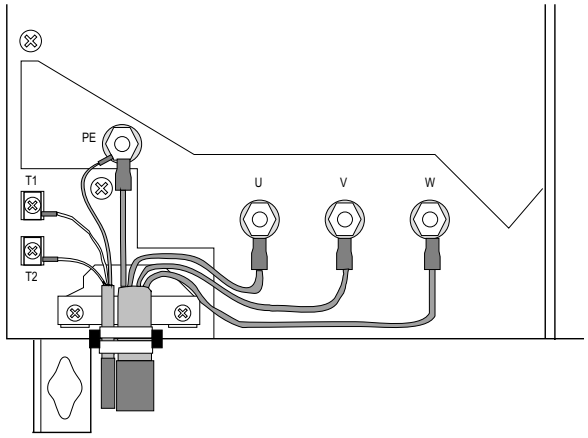
Type	9321 - 9326	9327 - 9328	9329 - 9333
Terminals U, V, W	0.5 ... 0.6 Nm	4 Nm	
	4.4 ... 5.3 lbfin	35 lbfin	
PE connection	3.4 Nm	4 Nm	
	30 lbfin	35 lbfin	
Terminals T1, T2	0.5 ... 0.6 Nm		
	4.4 ... 5.3 lbfin		

Types 9321 to 9326



For screened cables
- Connect the screen correctly (required parts in the accessory kit):
  - Bolt screen plate 1 onto fixing bracket 2.
  - Fix screen using cable lugs. Do not use as a strain relief!
  - The PE connection is made via the stud next to the power connections.

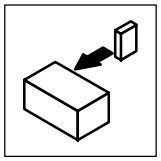
Types 9327 and 9328



For screened cables
- Connect the screen correctly:
  - Fix the screen of the motor cable and thermal contact, if necessary, under the screen plate.
  - To improve the screen connection: Connect screens additionally at the stud PE next to the motor connections.

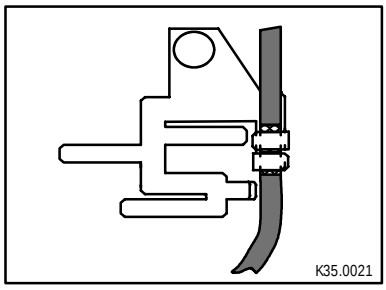
FIG 4-4 Motor connection

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



4.3.3 Control cables

- Connect the control cables to the screw terminals at X5 and X6 on the front side of the controller.
  - Tightening torque: 0.5 - 0.6 Nm (4.4 - 5.3 lbfin).
- Screen control cables.
  - The PE connection is made via the illustrated screen plate (included in the accessory kit). Do not use as a strain relief!
  - Connect the screen plate on the controller in the connecting area of the connectors X7 to X10 to the PE area using a screw.



4.3.4 Connection of a brake unit

- When connecting a brake unit (brake module 9351 with internal brake resistor or brake chopper 9351 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 released
  - the controllers are inhibited (X5/28 = LOW).
  - the mains is disconnected.
- Example: see chapter 4.4 or FIG 4-5.

4.3.5 DC bus connection of several drives

Decentralized supply with brake module

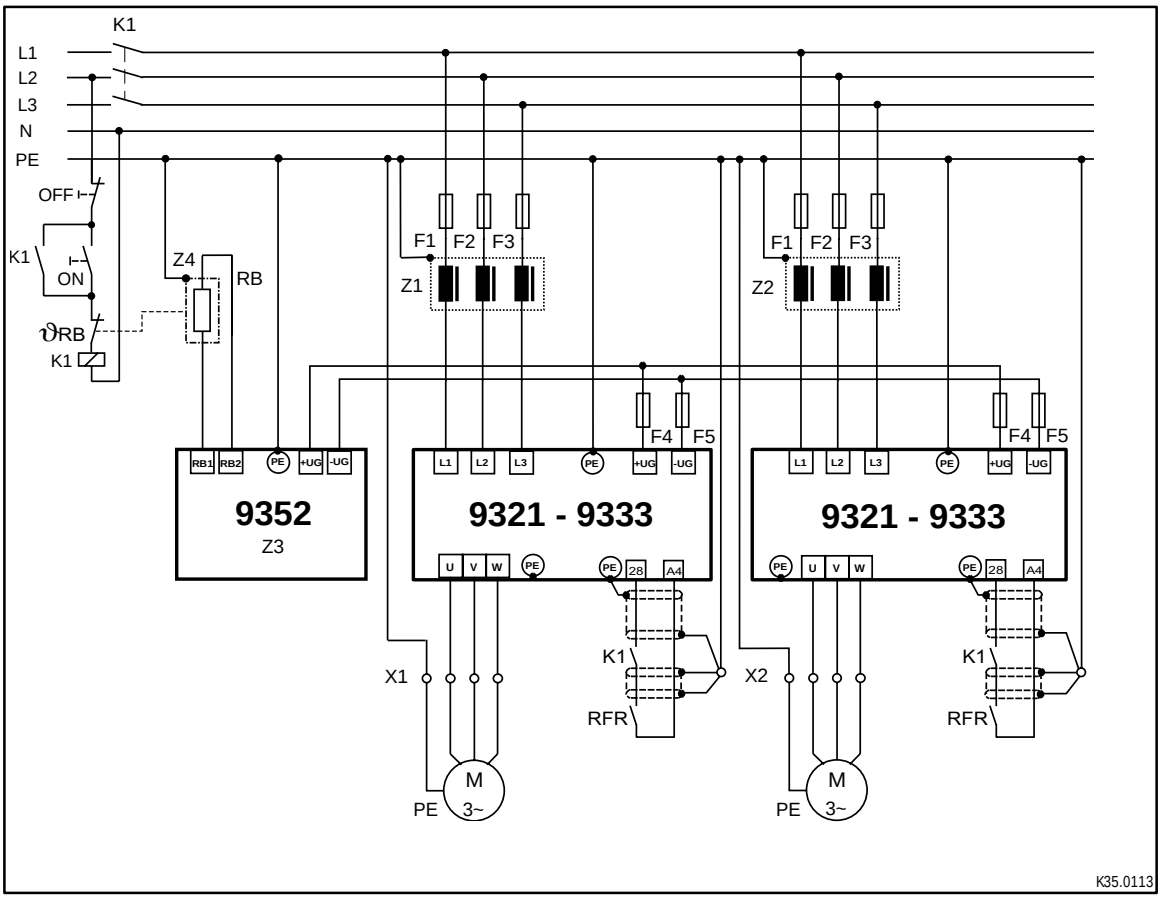


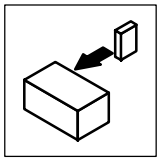
FIG 4-5 Decentralized supply for DC bus connection of several drives

Z1, Z2	Mains filter
Z3	Brake chopper
Z4	Brake resistor
F1...F5	Fuses (see chapter 3.3.3 and chapter 4.3.1)
K1	Main contactor

STOP

Stop!

- Set the DC bus voltage thresholds of controller and brake unit to the same values.
  - Controller using C0173
  - Brake unit using switches S1 and S2



Central supply with supply module

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

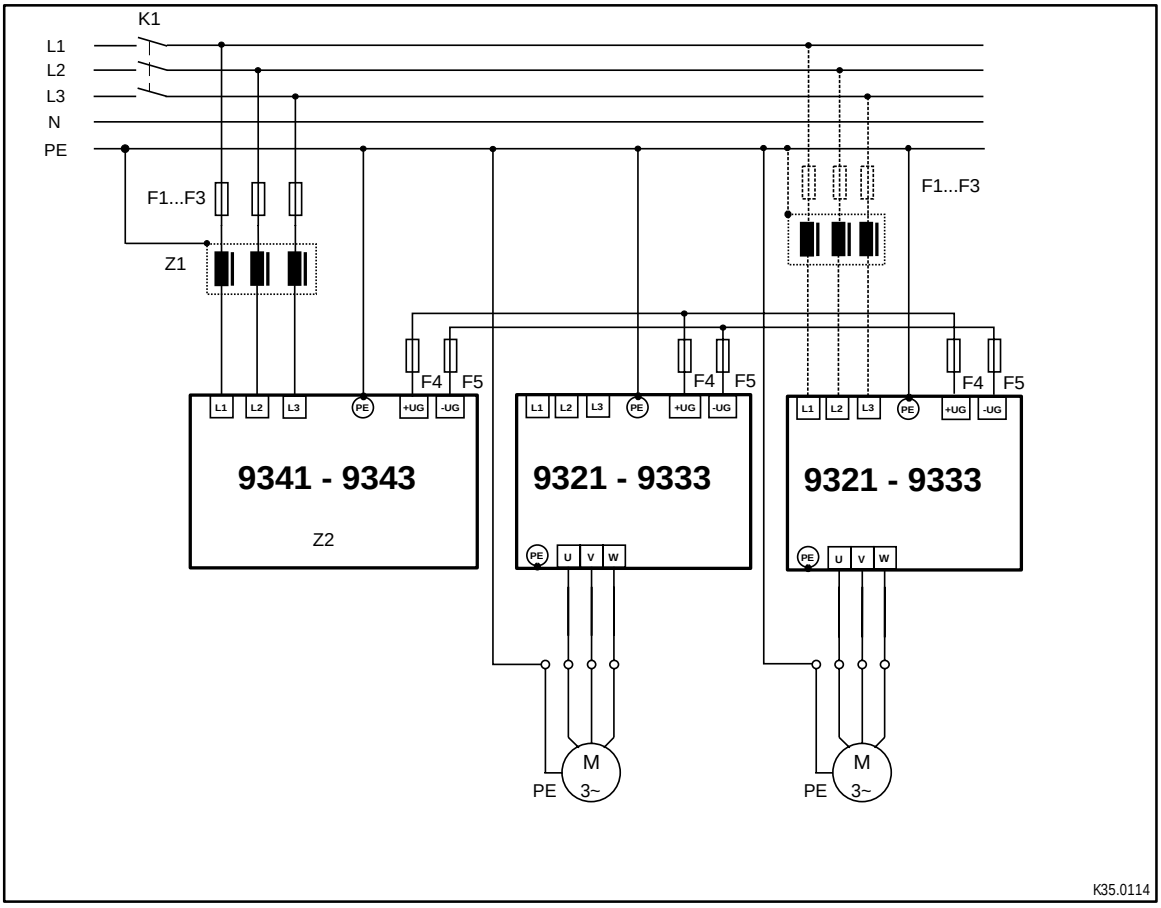


FIG 4-6 Central supply for DC bus connection of several drives

Z1	Mains filter
Z2	Supply module
F1...F5	Fuses (see chapter 3.3.3 and chapter 4.3.1)
K1	Main contactor

Tip!

If the power supply of the supply module is not sufficient, a parallel supply can be installed via the mains input of a controller (see systems manual). In this event, the controller can only be operated with the assigned mains filters (at least acc. to limit value class A).

4.3.6 Control connections

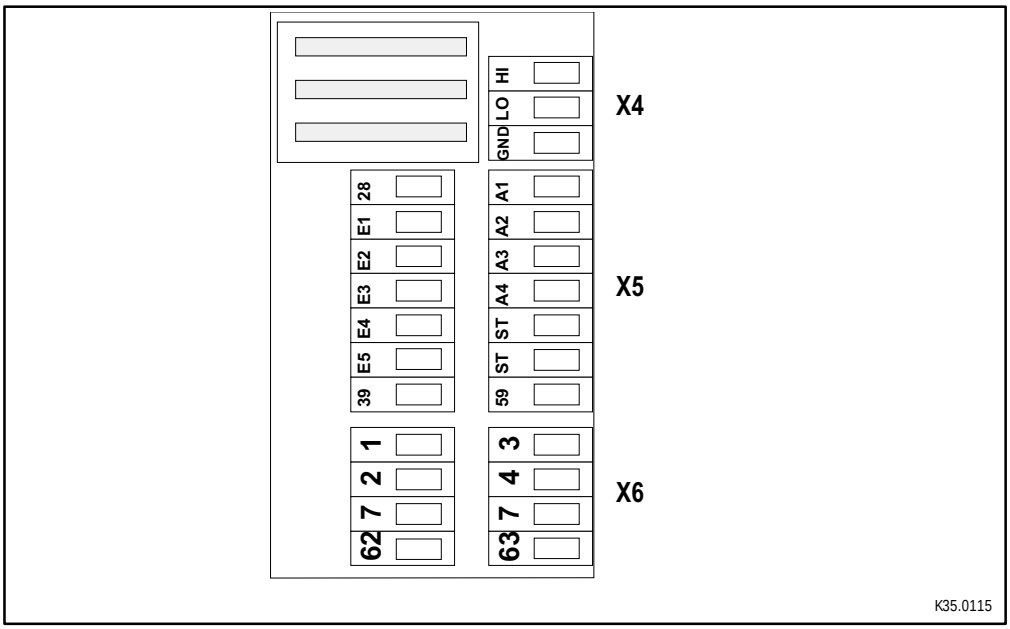


FIG 4-7 Layout of the control connections on the front side of the controller

Connection of analog signals

Analog signals are connected via the 2 × 4-pole terminal block X6.
Depending on the use of the analog inputs, the jumper of X3 must be set accordingly (see table "Analog inputs" on page 4-20).

Connection for an external power supply

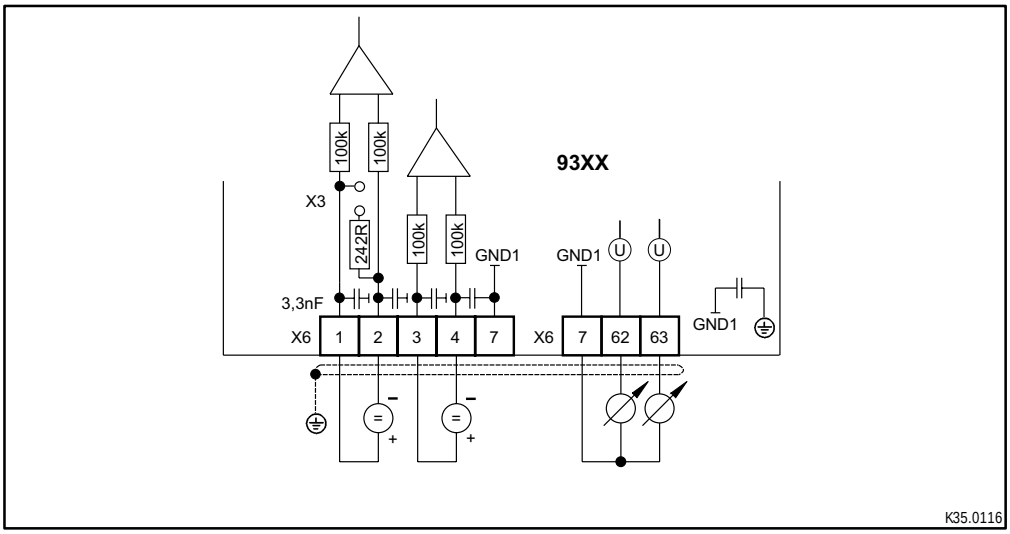
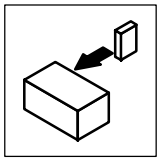


FIG 4-8 Analog inputs and outputs, inputs are supplied with external voltage



Installation

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 connefction of terminal(s) X6/2, X6/4 and X6/7 to GND1 and PE (see FIG 4-9).

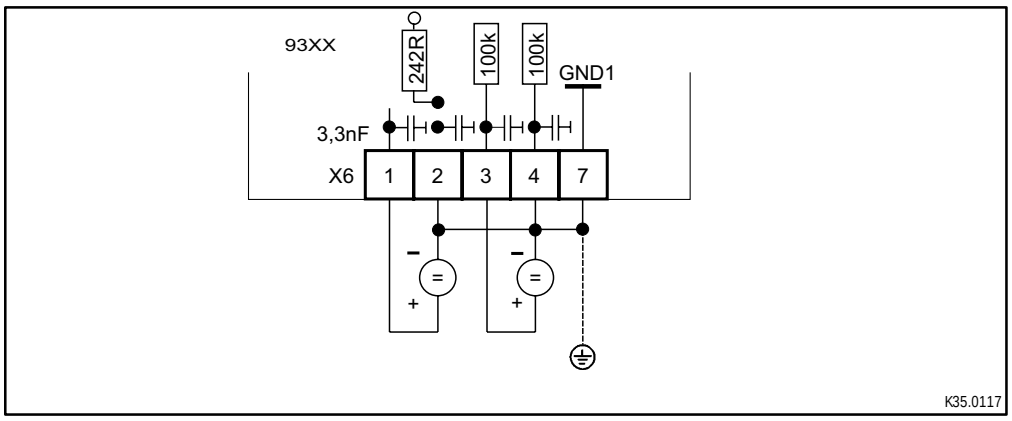


FIG 4-9 Earthing of the external supply voltage (segment of the X6 terminals)

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 C0436 with FIXED100%.10V are thus applied across terminal X6/63.

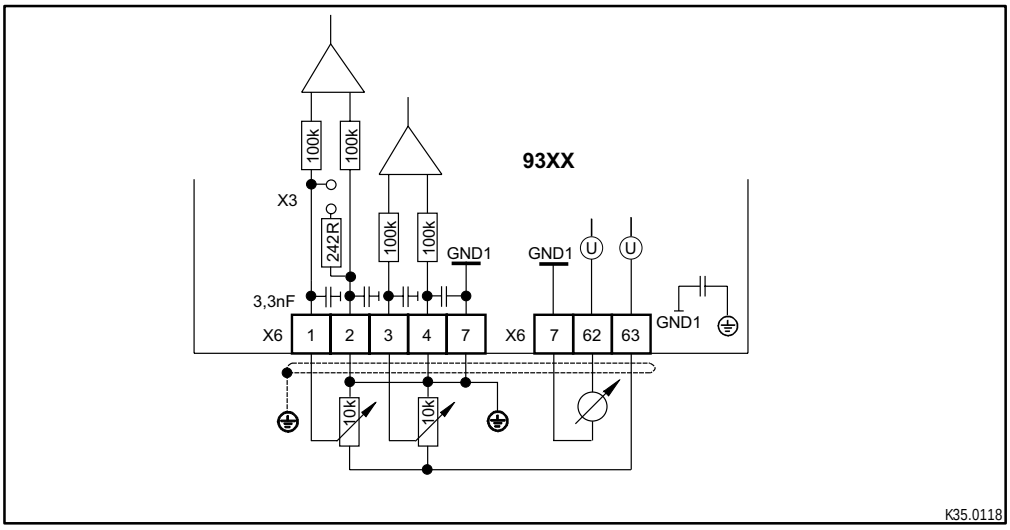
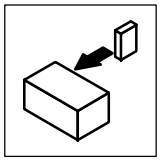


FIG 4-10 Analog inputs and outputs, inputs are supplied with internal voltage

Tip!

For this application, you may use one of the predefined configurations in C0005. The output X6/63 is assigned automatically with FIXED100% (corresponds to 10V at the output X6/63) by C0005 = XX1X (e.g. 30010 for register control with control via terminals).



Installation

Analog inputs

Analog inputs				
Terminal	Use **(factory setting)**	Jumper position X3	max. Level	Resolution
1, 2	Difference input master voltage **(not assigned)**		-10 V to +10 V	5 mV (11 bit + sign)
	Difference input master current		-20 mA to +20 mA	20 µA (10 bit + sign)
3, 4	Difference input master voltage **(not assigned)**	no influence	-10 V to +10 V	5 mV (11 bit + sign)

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

Analog outputs

Analog outputs			
Terminal	Use**(factory setting)**	Level	Resolution
62	Monitor 1 **(Actual speed)**	-10 V to +10 V; max. 2 mA	20 mV (9 bit + sign)
63	Monitor 2 (Torque set-value) **(Torque set-value)**	-10 V to +10 V; max. 2 mA	20 mV (9 bit + sign)
7	Internal ground, GND	-	-

Connection of digital signals

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

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

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

Connection for an external power supply

The external voltage source supplies the digital inputs and outputs.

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

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

- Connection of the external voltage source:
  - supply voltage at X5/59
  - external ground at X5/39

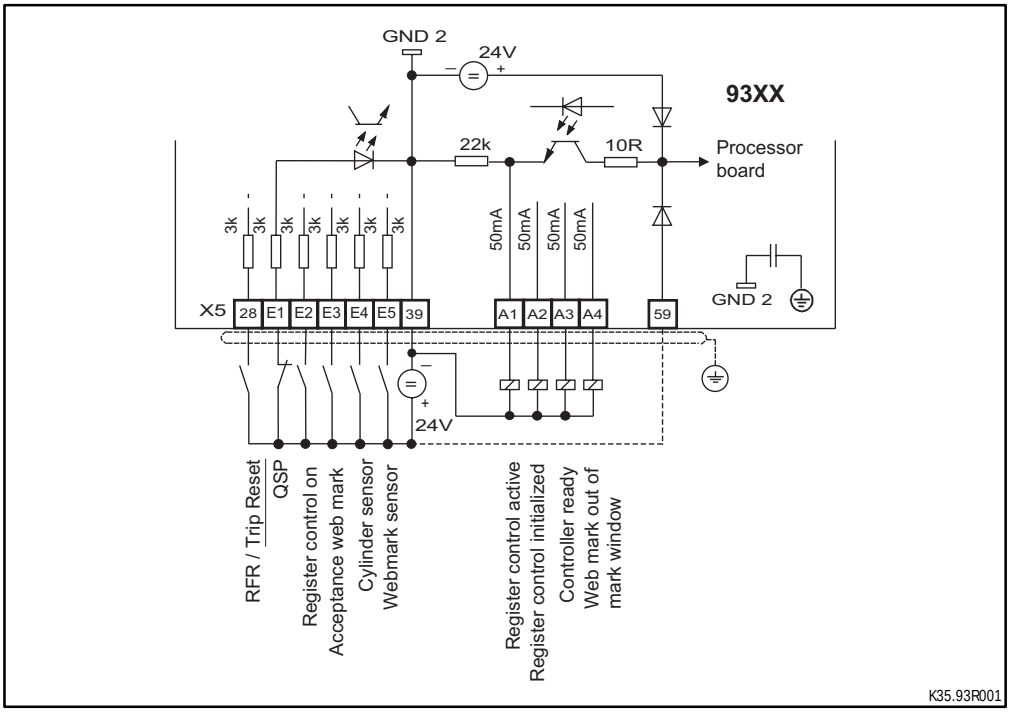
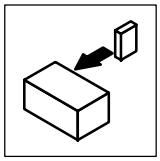


FIG 4-11 Digital inputs and outputs, supplied with external voltage



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

- Limit the voltage difference
  - by overvoltage clamping components or
  - by a direct PE connection of terminal 39 (see FIG 4-12).

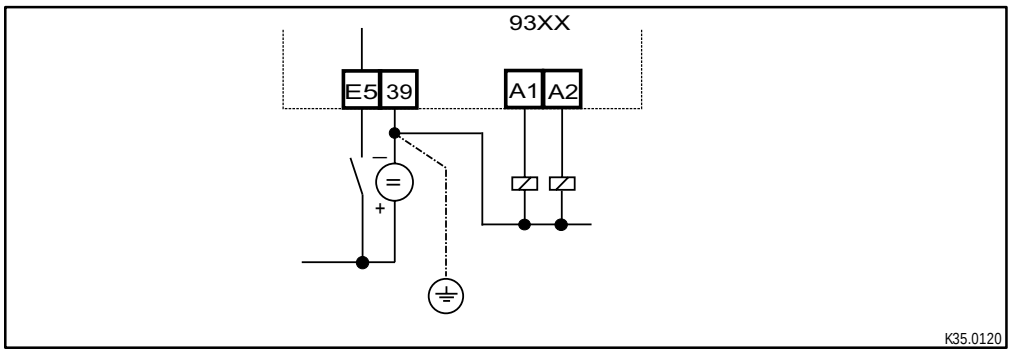


FIG 4-12 Earthing of the external supply voltage (segment of the X5 terminals)

Connection for internal voltage supply

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

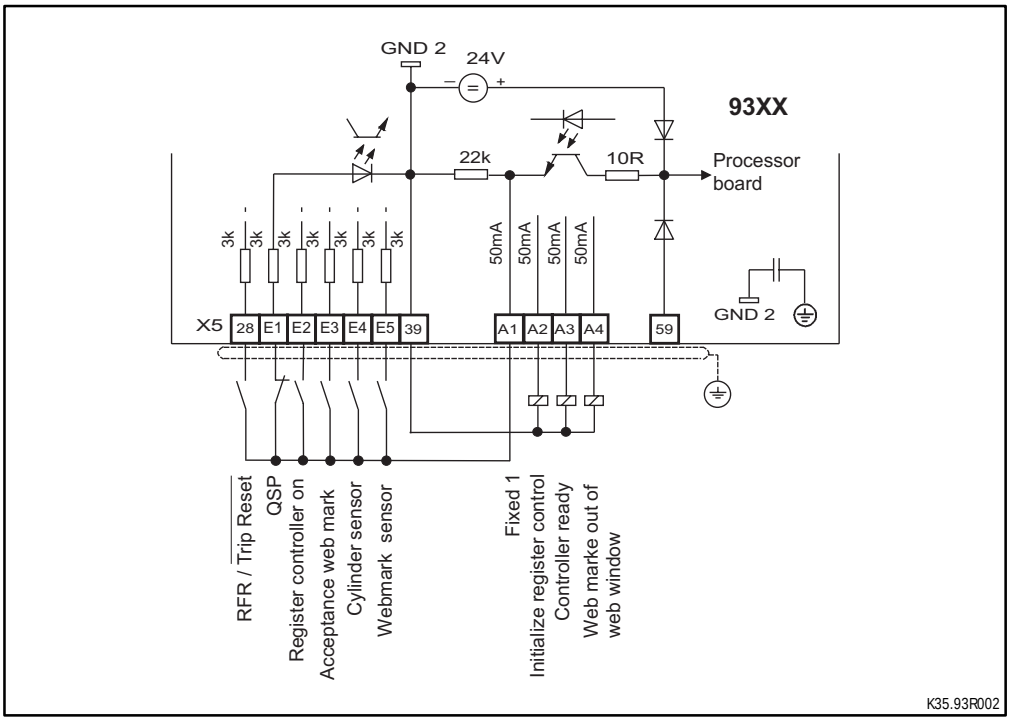
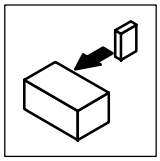


FIG 4-13 Digital inputs and outputs, supplied with internal voltage

Tip!

For this application, you may use one of the predefined configurations in C0005. The output X5/A1 is assigned automatically with FIXED1 (corresponds to 24V at terminal X5/A1) by C0005 = XX1X (e.g. 30010 for register control with control via terminals).



Installation

Digital inputs

Digital inputs			
Terminal	**Use**	**Level for activation**	**Data**
28	Controller enable, trip reset	HIGH, HIGH →LOW edge	LOW level: 0 … +4 V HIGH level: +13 … +30 V Input current for 24 V: 8 mA per input Reading and writing of the inputs: Kl. 28, E1 - E3: 1 ms (average) Kl. E4, E5: < 10µs
E1	Remove QSP	HIGH	
E2	Register control ON	HIGH	
E3	Register mark accepted	HIGH	
E4	Cylinder sensor	HIGH	
E5	Register mark sensor	HIGH	

Digital outputs

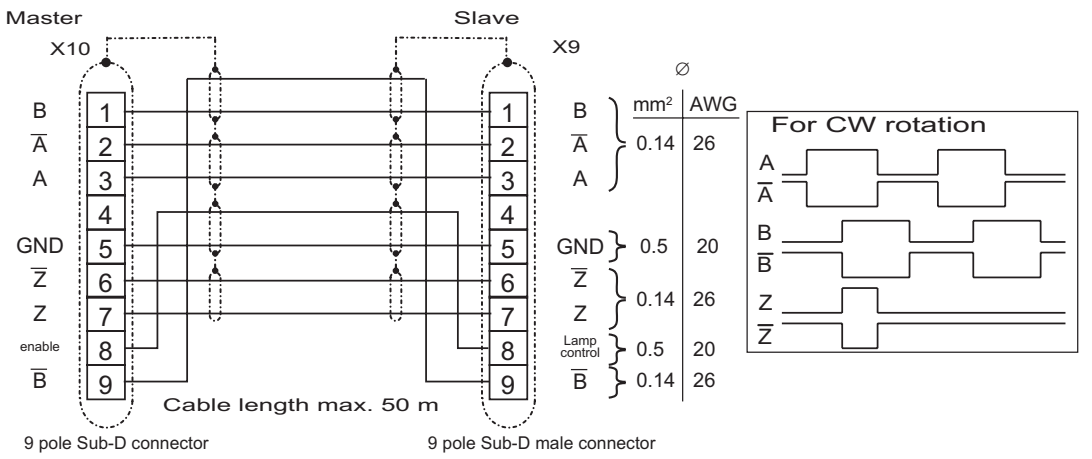
Digital outputs			
Terminal	**Use**	**Level with activated output**	**Data**
A1	Active register controller	HIGH	LOW level: 0 … +4 V HIGH level: +13 … +30 V Output current: max. 50 mA per output (external resistor at least 480 Ω for 24 V) Updating of the outputs: once per ms
A2	Register control initialized	HIGH	
A3	Controller ready	HIGH	
A4	Register mark out of mark window	HIGH	
39	Ground of the digital inputs and outputs	-	
59	Supply input of the control module: 24 V external (I > 1A)	-	

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

Tip!

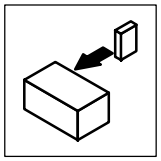
For the connection to the digital frequency input (X9) or digital frequency output (X10), use the prefabricated Lenze cable.Otherwise, only use cables with twisted pairs and screened wires (A, $\overline{A}$/ B, $\overline{B}$ / Z, $\overline{Z}$) (see connection diagram).

Digital frequency output X10	**Digital frequency input X9**
Features: • Sub-D female connector, 9-pole • Output frequency: 0 - 500 kHz • Current load per channel: max. 20 mA • Two-track with inverse 5 V signals and zero track • X10 has a different basic setting, depending on the selected configuration (C0005) - Factory setting: Encoder simulation of the resolver signal • Capacity: - For parallel connection, a maximum of three slaves can be connected. - For series connection any number of slaves can be connected. • 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. 6 mA • Two-track with inverse 5 V signals and zero track • Possible input signals: - Incremental encoder with two 5V complementary signals shifted by 90°(TTL encoder) - 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.



K35.0091

Pin assignment X10									Pin assignment X9								
1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9
6.5	A	A	+5 V	GND	Z	Z	EN	6.5	6.5	A	A	+5 V	GND	Z	Z	LC	6.5



State bus (X5/ST)

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

- Controls all networked drives in a preselected state (see systems manual).
- Up to 20 controllers can be connected.
- Connection of the state bus cables to terminals X5/ST.

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

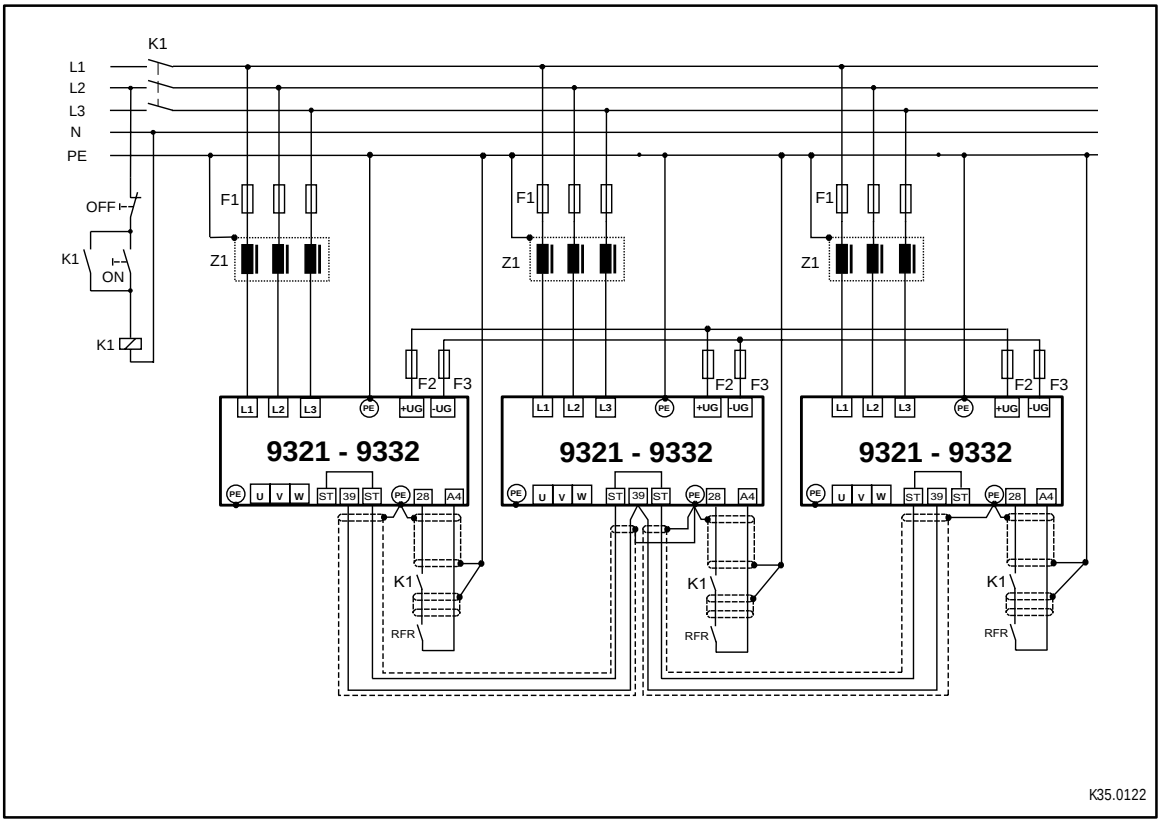


FIG 4-14 Monitoring of a network of drives with the state bus
Z1 Mains filter
F1...F5 Fuses (see chapter 3.3.3 and chapter 4.3.1)
K1 Main contactor

Tip!
For further information on the state bus as well as possible applications and commissioning please consult the systems manual.

System bus connection (X4)

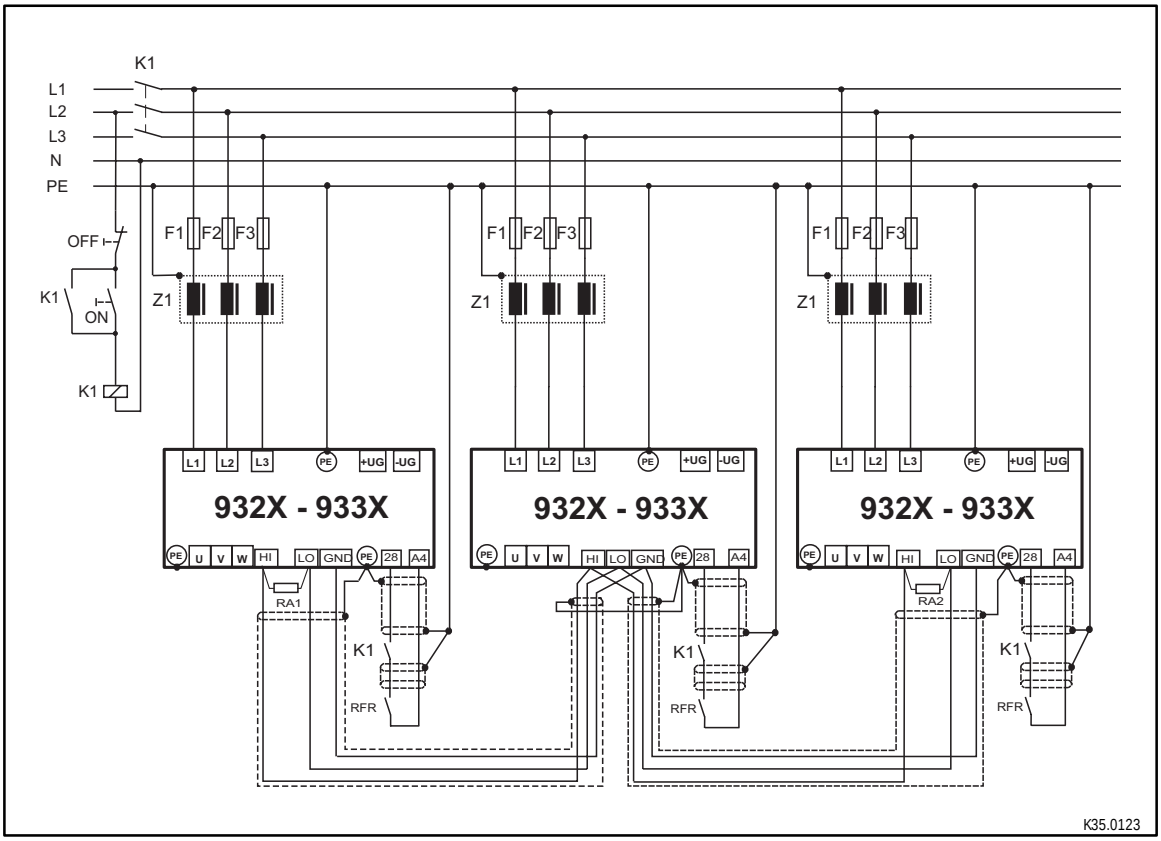
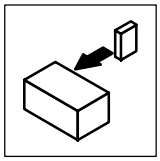


FIG 4-15 Wiring of the system bus
RA1, RA2 Bus terminating resistors 120 Ω (included in the accessory kit)

- Connection via pluggable screw terminals (double terminals can be used).
- Only connect terminals of the same designation.
- Features of the signal 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 pairs 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 pairs with screening Pair 1: CAN-LOW (LO) and CAN-HIGH (HI) Pair 2: 2*GND
Cable resistance	≤ 40 Ω/km	≤ 40 Ω/km
Capacitance per unit length	≤ 130 nF/km	≤ 60 nF/km

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



Installation

Features:

- CAN-based with bus protocol according to CANopen (CAL-based Communication Profile DS301)
- Bus extension:
  - 25 m for max. 1 Mbit/s data transmission rate
  - up to 1 km with reduced data transmission rate
- Very reliable data transmission (Hamming distance = 6)
- Signal level according to ISO 11898
- Up to 63 bus participants 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:

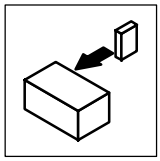
- Connection to a decentral terminal extension for digital and analog inputs and outputs
- Connection to a superimposed control (PLC, position control, operating terminal)
- Connection between several controllers

Tip!
For further information on the system bus as well as possible applications and commissioning please consult the systems manual.

Automation interface (X1)

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

- operating module
- field bus modules
  - RS232, RS485, fibre optics, type 2102 (LECOM-A/B/LI),
  - InterBus-S, type 2111
  - PROFIBUS-DP, type 2131



4.3.7 Motor temperature monitoring

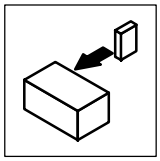
By connecting a KTY (PTC) or thermal contact (TKO) the controller can monitor the motor temperature.Depending on the type of temperature monitoring, different reactions can be provoked (see chapter 7.2.

Stop!
Do not connect an external voltage to the inputs.

Tip!

- 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.

Motor	Lenze motors MDXKX		Lenze motors with thermal contact	Motors of other brands with thermal sensor
Connection	• Resolver input X7: - Pin X7/8 = PTC+, Pin X7/9 = PTC- or • Encoder input X8: - Pin X8/8 = PTC+, Pin X8/5 = PTC-		Terminals T1/T2 next to the terminals U, V, W	
Fault indication	(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)	
Point of release	fixed at 150° C	can be set under C0121	fixed, (depending on the PTC/thermal contact): PTC: at R_Θ > 1600 Ω	
Notes	• Monitoring is active in the factory setting. • If resolver (X7) and encoder (X8) are operated together: - Connect PTC only at one connector (X7 or X8) - Do not connect PTC connection of the other connector (do not short-circuit!) • For further information on the connection of the thermal sensor, please consult the description of the corresponding feedback system.		• Deactivate monitoring via X7 or X8 under C0583=3 and C0584=3 • The connection is made according to DIN 44081 (see also FIG 4-16).	• Deactivate monitoring via X7 or X8 under C0583=3 and C0584=3 • We recommend a Ziehl PTC (up to 150 °C): K15301075 or a thermostat. • The connection is made according to DIN 44081 (see also FIG 4-16).



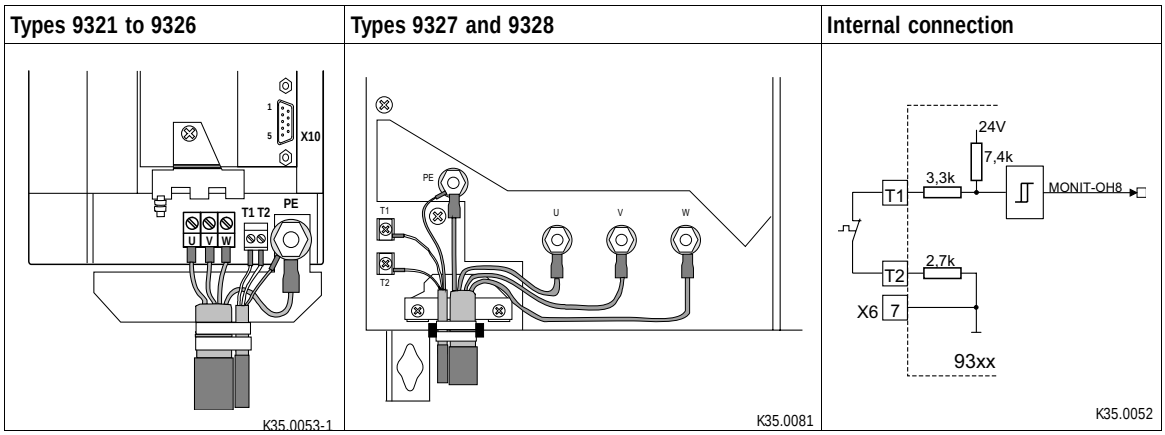


FIG 4-16 Connection of a thermal sensor to the terminals T1 and T2 and internal connection

4.3.8 Feedback systems

Different feedback systems can be connected to the controller:

- Resolver feedback (factory setting)
- Encoder feedback
  - Incremental encoder TTL
  - Sine-cosine encoder
  - Sine-cosine encoder with serial communication (single turn)
  - Sine-cosine 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.

Resolver connection (X7)

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

Tip!
Use the prefabricated Lenze system cable for the resolver connection.

Features:

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

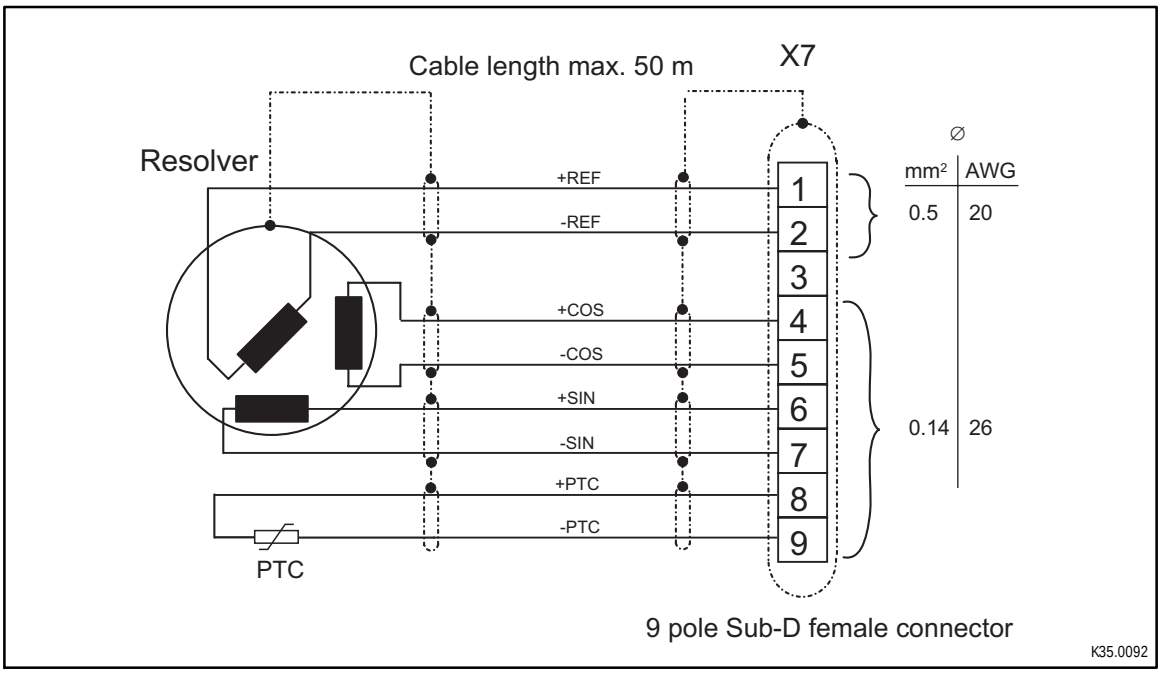
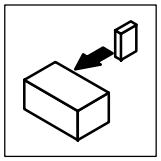


FIG 4-17 Resolver connection

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

X7/8 and X7/9 see chapter 4.3.7.



Installation

Encoder connection (X8)

An incremental encoder or a sine-cosine encoder can be connected to this input.

Tip!
Use the prefabricated Lenze system cable for the encoder connection.

- Under C0421 the encoder supply voltage V_{CC5_E} can be set within a range from 5 V to 8 V
  - to set the encoder supply
  - to compensate the voltage drop on the encoder cable if necessary
    $\Delta U \approx 2 * \text{cable length} * \text{resistance/m} * I_{encoder}$

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

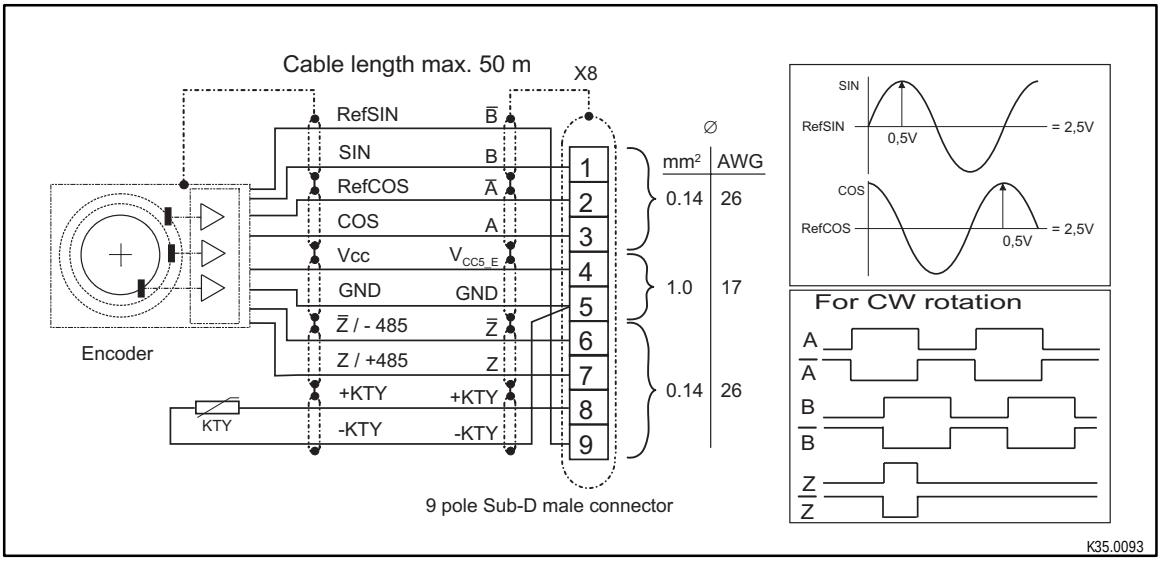
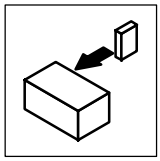


FIG 4-18 Encoder connection



Incremental encoder

Features:

- Incremental encoders with two 5V 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	6.5	A	A	V_{CC5_E}	GND (-PTC)	Z	Z	+PTC	6.5

X8/8 see chapter 4.3.7.

Sine-cosine encoder

Features:

- The following encoders can be connected
  - Simple sine-cosine encoders with rated voltage 5 V to 8 V.
  - Sine-cosine encoders with a communication interface, type Stegmann SCS/M70xxx
    (The initialization time of the controller is increased to approx. 2 seconds).
- 9-pole Sub-D female connector
- Internal resistance Ri = 221 Ω
- Voltage sine and cosine track: 1 Vss ±0.2 V
- Voltage RefSIN and RefCOS: +2.5 V

Tip!

For encoders with track indications: Sine, $\overline{\text{sine}}$ and cosine, $\overline{\text{cosine}}$:
Assign RefSIN with $\overline{\text{sine}}$ and RefCOS with $\overline{\text{cosine}}$.

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

X8/8 see chapter 4.3.7.

4.4 Installation of a CE-typical drive system

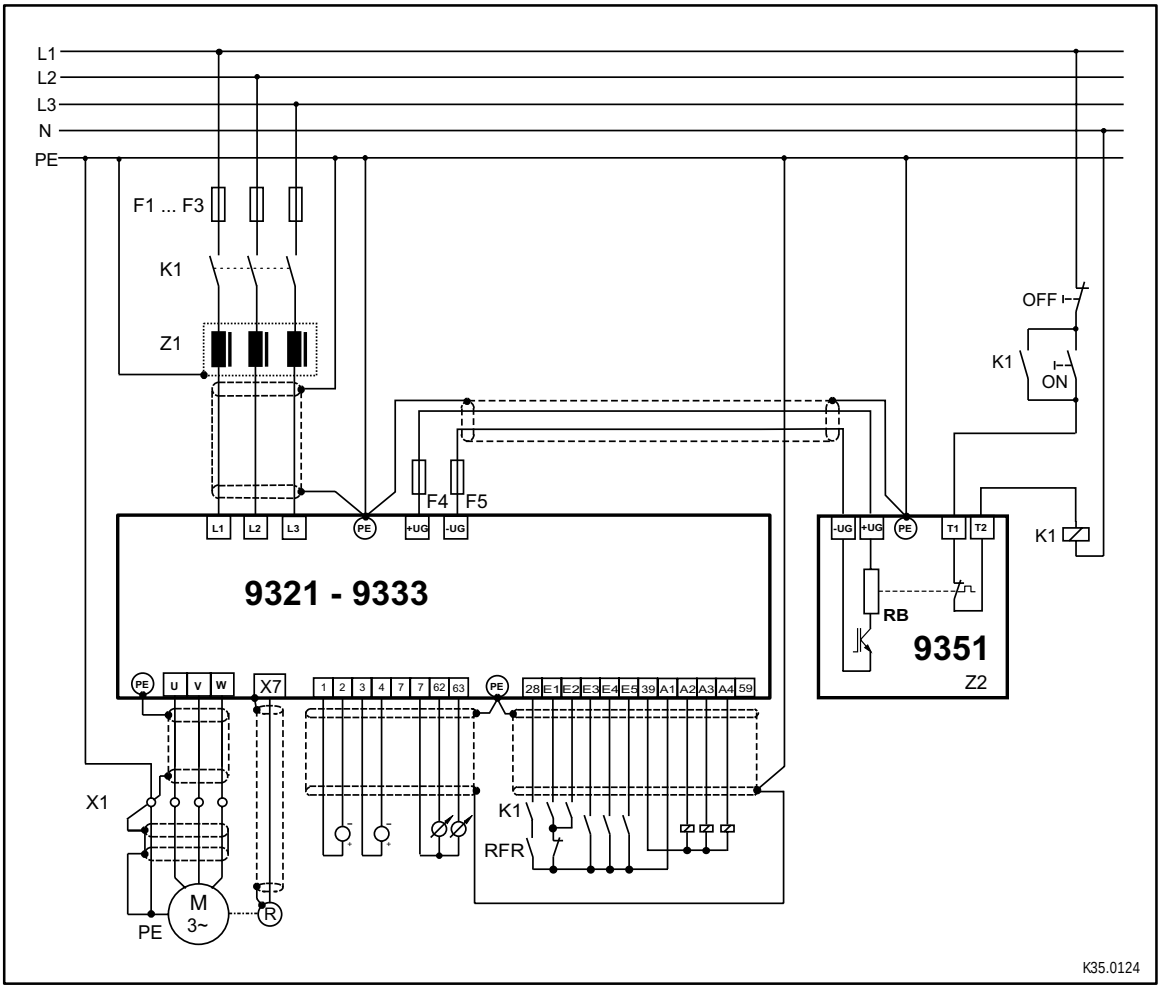
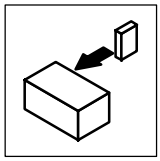


FIG 4-19 Wiring corresponding to EMC

F1...F5	Fuses (see chapter 3.3.3 and chapter 4.3.1)
K1	Mains contactor
Z1	Mains filter A or B (depending on the applicable standard)
Z2	Brake module

Tip!

The screens of the mains supply cable are only required to comply with existing standards (e.g. VDE 0160, EN 50178).



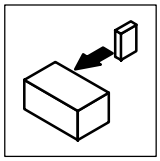
4.4.1 General notes

- The electromagnetic compatibility of a machine depends on the type of installation and care taken Please observe especially
  - assembly
  - filters
  - screens
  - grounding
- In case of a different installation, the machine or plant must be checked for compliance with the CE EMC Directive. For example when:
  - using unscreened cables,
  - using collective RFI filters instead of the designated mains filters.
  - mains filters are omitted

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.



4.4.2 Necessary measures

Control cabinet mounting plate

- For HF grounding, only use mounting plates with an excellent conductive surface (e.g. zinc-coated surface).
- If you use mounting plates with badly conductive surfaces (e.g. painted, anodized, yellow passivated):
  - Remove the paint or coating from the contact surface of the mains filters, controllers, and screen connections to provide a large-area, electrically conductive connection.
- When using several mounting plates, make a conductive connection over a large area (e.g. using copper bands).
- Make the contact between controller and mains filter to the grounded mounting plate over a large area.

Motor cables

- Screen the motor supply cables (YCY copper braid).
- Connect the screen of the motor cable to the screen connection of the controller and to the mounting plate over a large area. For a large-area connection of the screens with the mounting plate, the use of earthing clamps on bare metal mounting plates is recommended (see FIG 4-20)
- If there are contactors, motor protection switches, or terminals in the motor cable, connect the screens of the connected cables and make contact to to the mounting plate over a large area (see FIG 4-20).
- Connect the screen to PE in the motor terminal box. By using metal cable glands on the motor terminal box, a large-area connection of the screen to the motor enclosure is achieved.
- The unscreened ends should be as short as possible.

Power connection

- Use the designated mains filter.
- If the mains cable between mains filter and controller is longer than 30 cm:
  - Screen cable.
  - Lay the screen of the mains cable directly to the controller and the mains filter and connect it to the mounting plate over a large area (see FIG 4-20).

Signal cables

- Always screen digital and analog signal cables.
- Always lay the screens at both ends.
- Always connect the screens over the shortest possible distance:
  - Always use the supplied screen plates on the controller.
  - The point of connection must be as close as possible to the cable end.
  - If possible, cover the screen end with a shrink tube.
  - For long signal cables provide an additional screening point:
    Connect the screen at the control cabinet input with a suitable clamp to the conductive mounting plate of the control cabinet (see FIG 4-20).
- If potential differences are to be expected, lay an additional compensating cable.

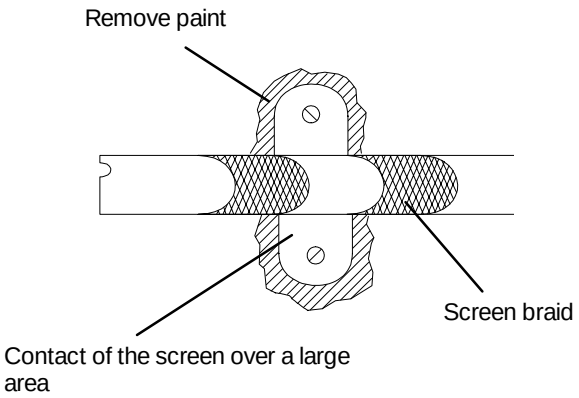
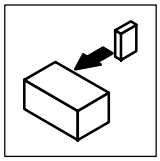


FIG 4-20 Additional screening connection on a mounting plate of the control cabinet



Filters

- Only use the mains filters and RFI filters designated for the controller:
  - RFI filters reduce impermissible high-frequency interference to a permissible value.

For compliance with the standard EN 550022 7/92 (noise emission according to limit value class B) a special mains input filter from Lenze is required. For all further information please consult the operating instructions for the mains input filter.

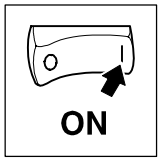
Screening

Carefully connect screens, ground connections (GND), and protective earth connection (PE) to avoid noise emissions:

- Always screen control cables (Lenze system cables meet this requirement).
- Do not interrupt screens, if possible:
  - In case of interruptions (terminal boards, relays, fuses), lay screens with a large area and with both ends to the mounting plate (see FIG 4-20)
- Do not lay control cables and mains cable in parallel to interfering motor cables.
- Avoid one common terminal board for mains input and motor output (isolation).
- Cables must be laid as close as possible to the reference potential (dangling cables are like antennas).

Grounding

- Ensure a good equipotential bonding of all system parts (controller, mains filter) by cables to a central earthing point (PE bar). The prescribed minimum cross-section must be observed in all cases.
- Make sure that no external devices are damaged by the earthing of the control electronics.



5 Commissioning

5.1 Before switching on the controller

Please check

- the wiring for
  - completeness
  - short-circuit
  - earth fault
- the power connection in case of
  - direct mains connection (supply via the terminals L1, L2 and L3) or
  - DC bus connection (terminals +UG, -UG)
- the motor for in-phase connection (direction of rotation)
- the feedback system (resolver, incremental encoder, …).
- the control terminals, particularly
  - the controller enable at terminal X5/28 (reference potential: X5/39)
- the cover of the power connections
  (Put on cover(s) and fix.

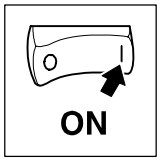
Keep to the switch-on sequence!

All commissioning steps described in chapter 5 refer to the factory setting.

5.2 Initial switch-on

Tip!

- For commissioning, use the Lenze program Global Drive Control (GDC) for Windows (3.11/95/NT). The menus include the codes for the most important settings.
- For the communication with the controller, you need the 2102 fieldbus module “RS232, RS485, LWL” (LECOM A/B).
- The GDC and the fieldbus module are not included in the scope of supply of the controller.



Commissioning

Commissioning using the example “Cross cutter with cutting register control (for basic structure see FIG 5-1)

Principle of operation

The pilot tensioning unit feeds the web to the cross-cutter. Here, the material is split into sheets using a rotating asynchronous cutting procedure (“synchro system”).

A contact switch detects the register marks on the material while a sensor detects the position on the cutting cylinder (1 pulse/rev.) as a digital 24V signal.

A master encoder (4096 increments ... 10000 pulses/rev., 5V A/B differential signal) detects the line speed and phase position of the previous machine.

Tip!

The controller also allows the commissioning of the following applications:

- Speed control
- Torque control with speed limitation
- Digital frequency master
- Digital frequency bus/digital-frequency cascade slave

For detailed information on the commissioning of these configurations see the systems manual.

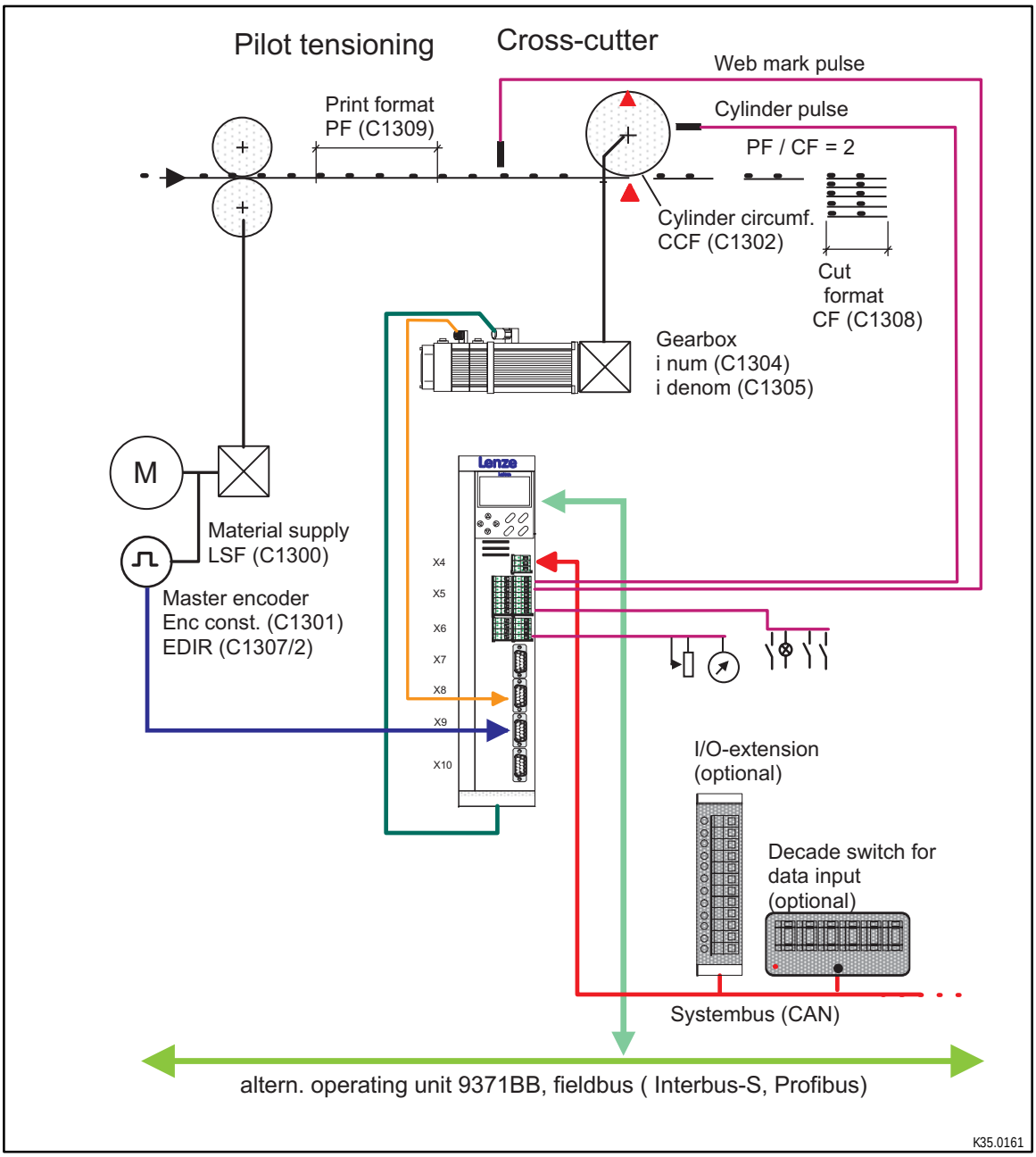
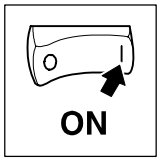


FIG 5-1 Example of a register control



Commissioning

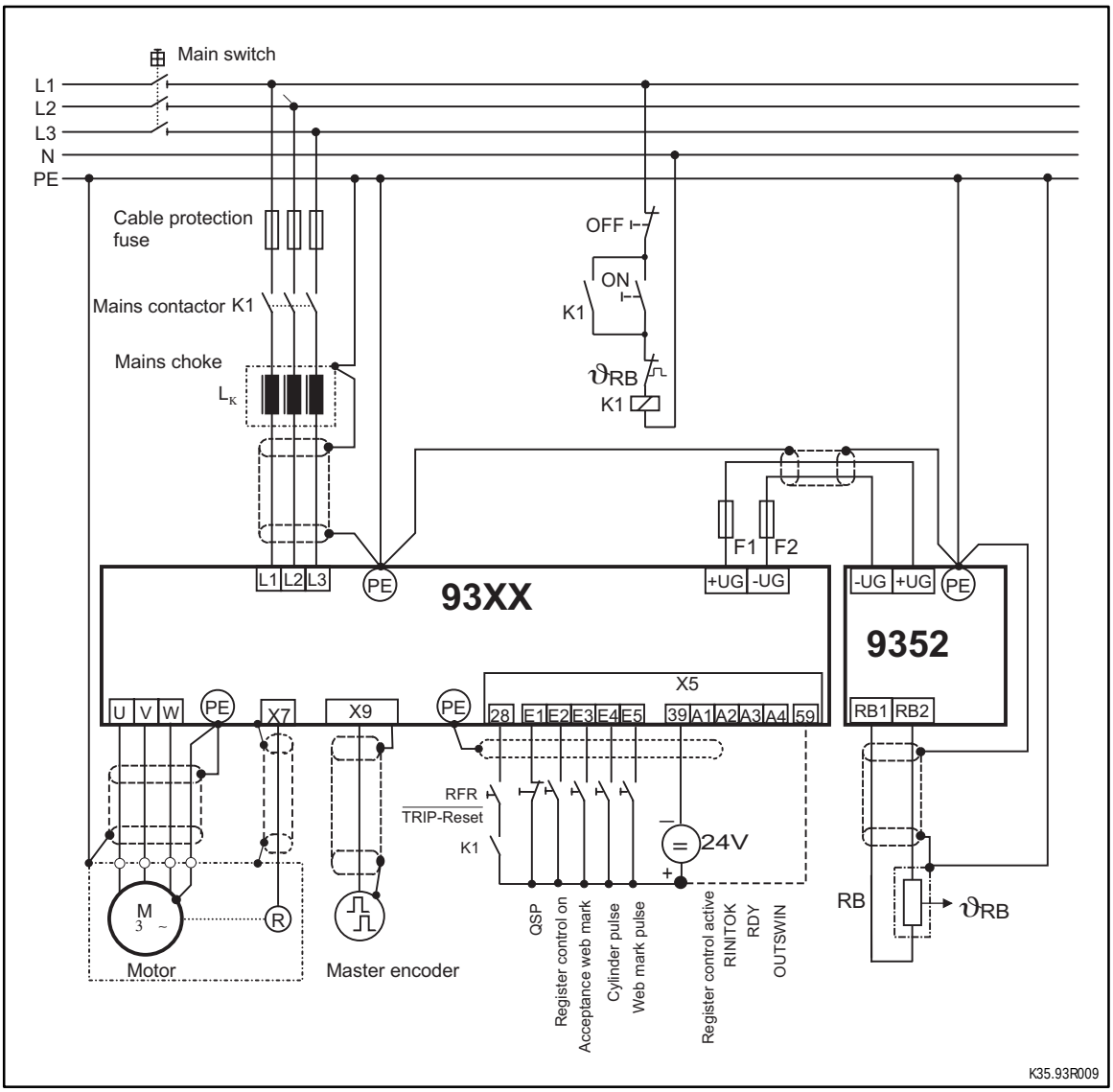
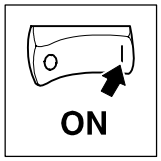


FIG 5-2 Connection diagram for configuration 30000

Tip!

A brake unit is required only if the DC bus voltage of the 93XX servo inverter in the generator mode exceeds the upper switch-off threshold set under C0173 (activation of the OU monitoring function). The brake unit avoids the activation of "OU" by converting the kinetic energy of the machine into heat, and thus keeps the DC bus voltage below the upper switch-off threshold.

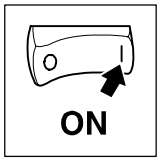


Overview

The following table lists the procedure for commissioning of a register control according to the example in FIG 5-1or FIG 5-2.

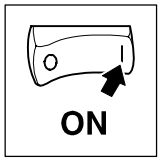
A comprehensive description of the commissioning of register controls can be obtained from the following chapters.

Section	Action	detailed description in
Switch on controller	1. X5/28 (controller enable) must be open (LOW). 2. Switch on mains: - The controller is ready for operation after approx. 0.5 s (2 s for drives with sine-cosine encoder with serial interface).	Chapter 5.3
Switch on PC	Start the GDC program - Set the communication parameters for online operation in the "Momentary drive" dialog box. Confirm with "OK". - Select the controller in the "Assign controller description" dialog box. Confirm with "OK".	Chapter 5.4
Generate parameter set	1. Adapt controller to the mains 2. Adapt controller to the motor 3. Adapt controller to the plant 4. Set product parameters	Chapter 5.5.1 Chapter 5.5.2 Chapter 5.5.3 Chapter 5.5.4
Setup machine for register control	1. Procedure for commissioning of the example 2. Other operating options	Chapter 5.5.5
Additional commissioning assistance		Chapter 5.5.6



5.3 Switch on controller

1. X5/28 (Controller enable) must be open (LOW).
2. Switch on mains:
   - The controller is ready to operate after approx.. 0.5 s
     (2 s for drives with sine-cosine encoder with serial interface).
3. Check whether the drive is ready for operation:
   - When the green LED is flashing:
     controller is ready for operation.
   - When green LED is dark and red LED is flashing:
     Interference. Before proceeding with commissioning, eliminate the fault
     (see Chapter 8”Troubleshooting and fault elimination”).
4. For operation with a fieldbus module, additional settings are necessary
   (see operating instructions of the fieldbus module).



5.4 “Start GDC” in offline or online operation

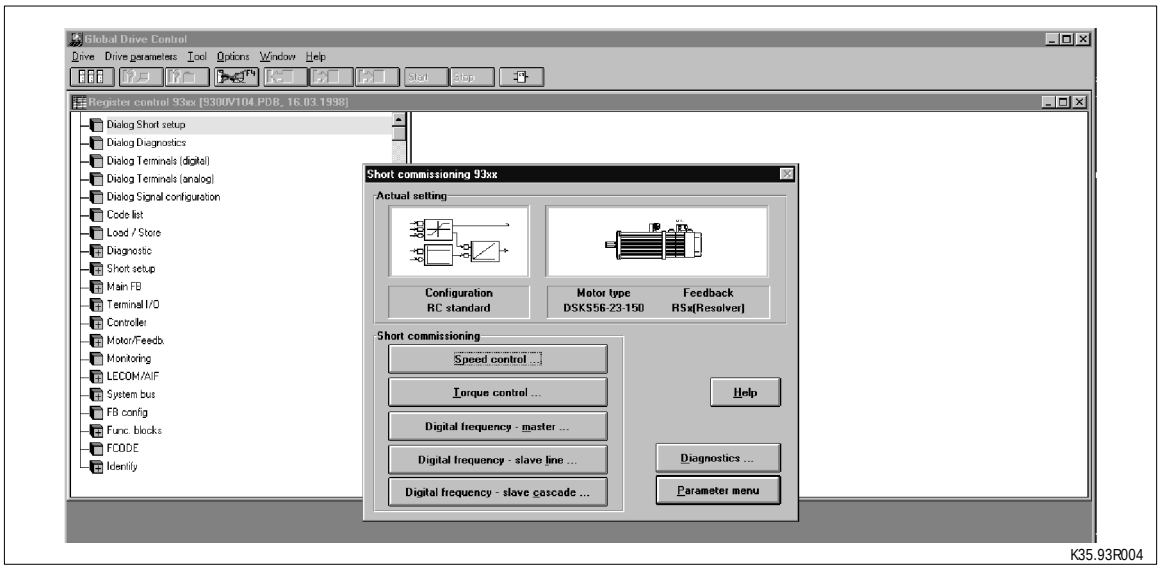
- Switch on PC
- Start GDC program under Windows

Online operation

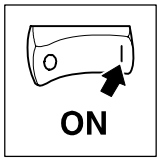
- The ”Find Lecom A/B drives” dialog box is opened.
- Click on ”Find”. GDC will now search for a controller.
- GDC selects the first controller found.
- GDC tests all baud rates which can be set.
- GDC loads the parameter set descriptions of the connected controller.
  - If GDC does not find a parameter-set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

Offline operation

- You have to select the controller manually.
- For this, open the menu “Controller” in the menu bar and select by double-clicking on “Servo inverter 9300, Register control”:



- The user interface contains the button “Parameter menu”. You access the parameterization level of the controller by clicking on this button.
- The directories of the parameterization level include graphics. Some of the graphic symbols have a “+” or “-”. If you click on the symbols, the lower-level directory opens or closes. For the commissioning of a register control please select the following path:
  - Short setup →
  - Register control (double-click)



Commissioning

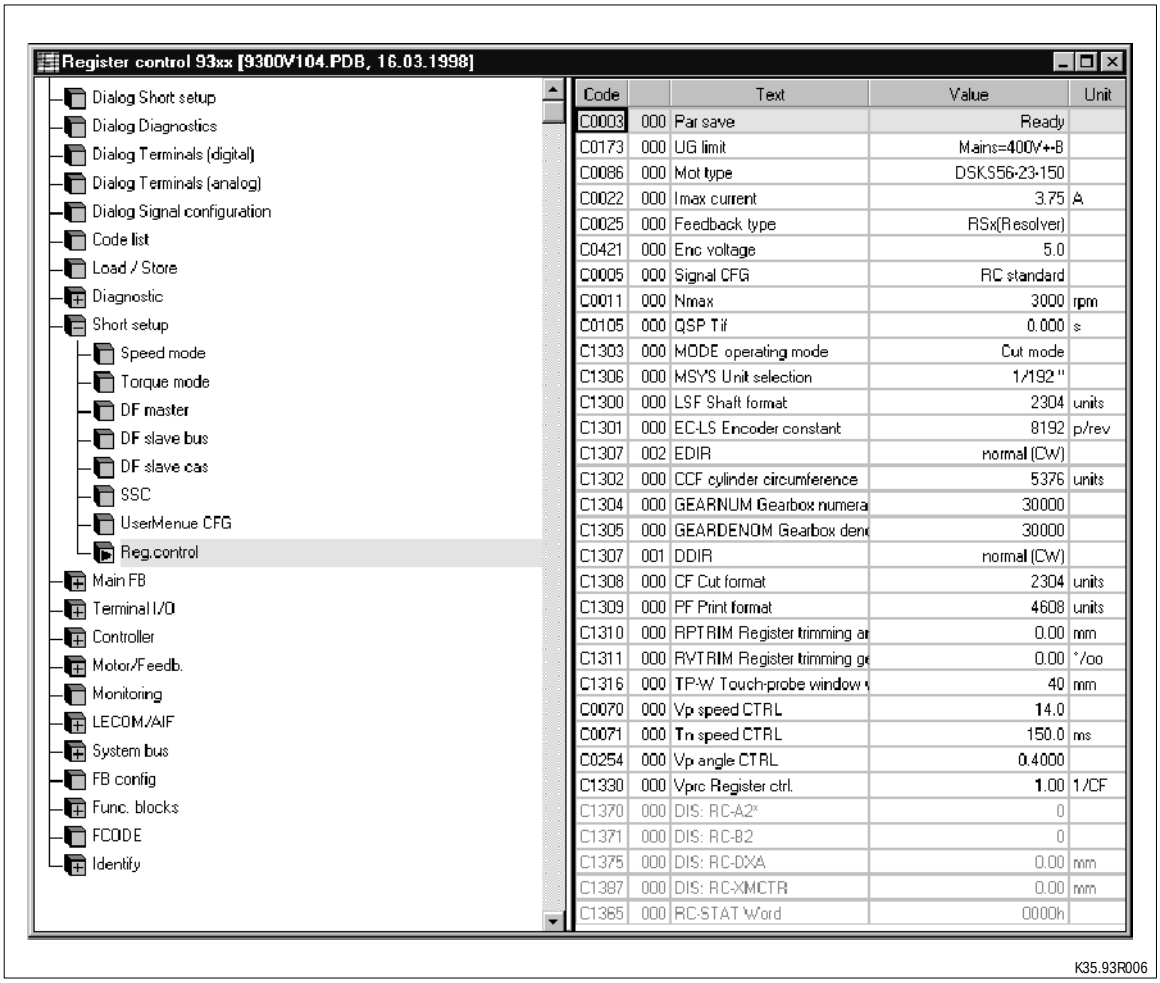
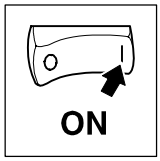


FIG 5-3 Complete code list for the commissioning of a register control



5.5 Generate parameter set

Warning!
Do not change any controller settings which are not mentioned in this chapter. For more complex tasks, please consult the manual.

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

Proceed systematically when generating a parameter set:

1. Adapt controller to the mains conditions
2. Adapt controller to the motor
3. Enter machine parameters

5.5.1 Adapt controller to the mains

- Adapt controller to the operating conditions under C0173:
  - If the controllers are not adapted, their life will be reduced.

C0173	Mains voltage	upper switch-off threshold	Operation
0	< 400 V	770 V	with or without brake unit
1 (factory setting)	400 V		
2	400 V < $U_{mains} \leq$ 460 V		
3	480 V		**without** brake unit
4	480 V	800 V	**with** brake unit

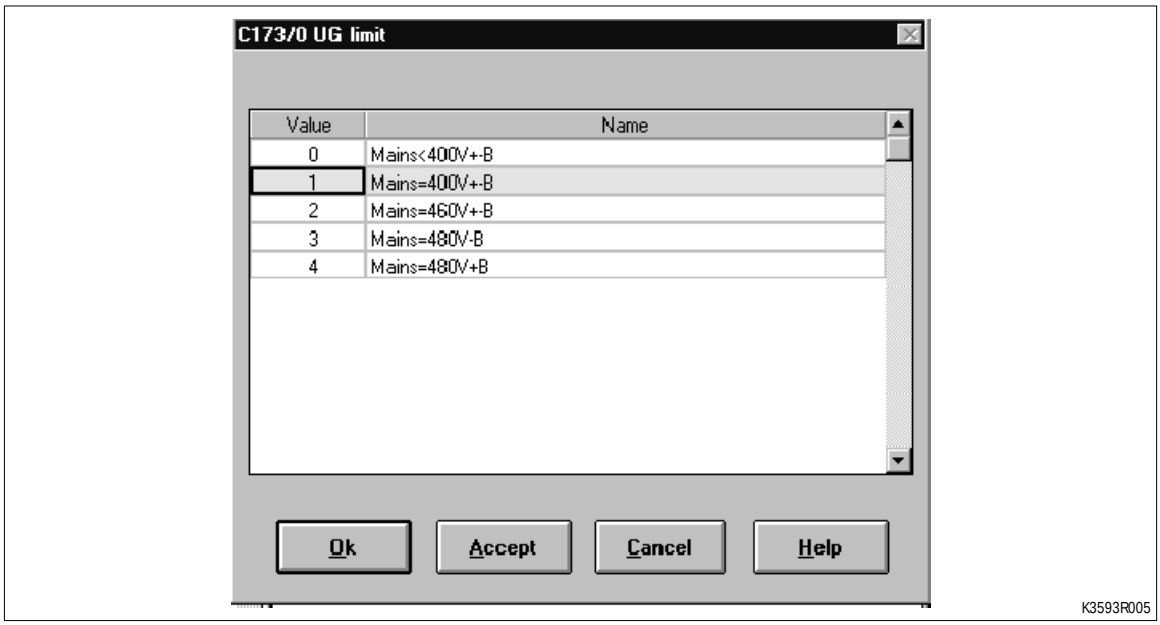


FIG 5-4 Adaptation to the operating conditions

5.5.2 Adapt controller to the motor

This commissioning step forms the basis for the subsequent setting of an optimal speed-torque behaviour.

When you use a Lenze motor:

- "Selection motor type" under C0086

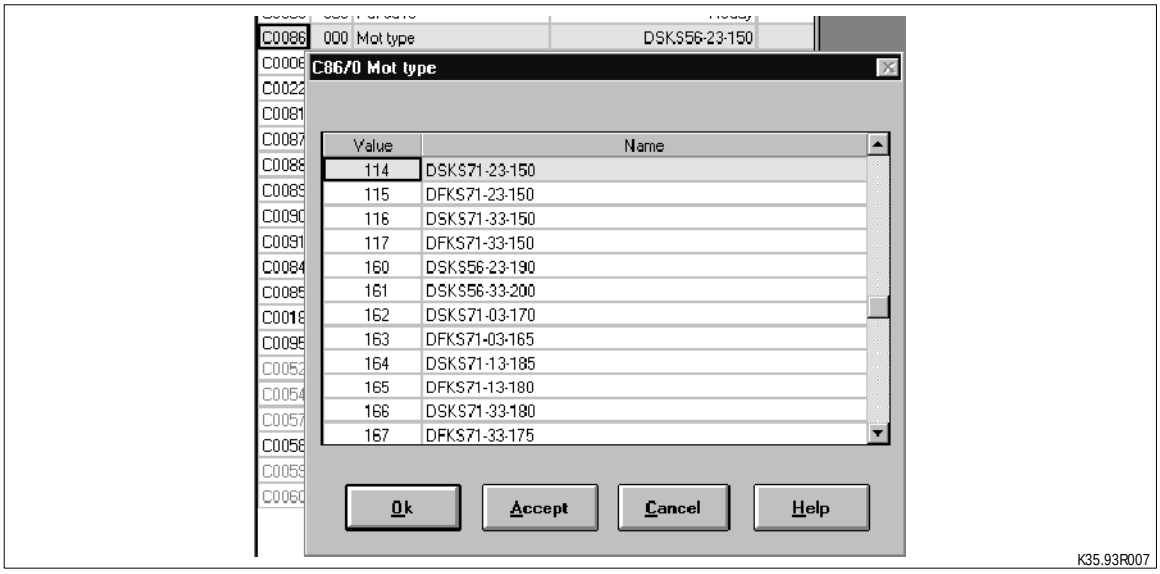
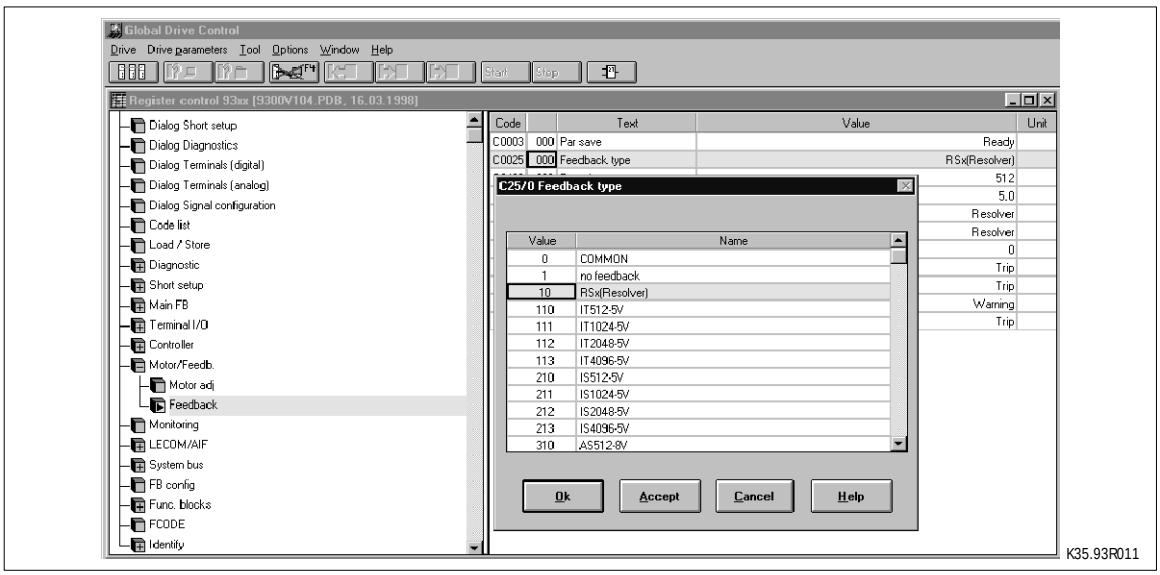
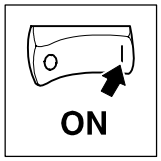


FIG 5-5 "Selection motor type" (window)

- Selection "Feedback system" under C0025



Field	Command	Function
	Select C0421	For feedback system AS 512 / AM512: Set 8V encoder supply
	Select C0003	Save data (C0003 = 1).



If you use a motor other than from Lenze:

Quit the menu item “Register control” and return to

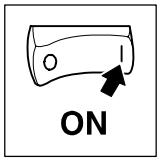
- ”Motor/Feedback system”
  - Motor adjustment

Code		Text	Value	Unit
C0003	000	Par save	Ready	
C0086	000	Mot type	DSKS56-23-150	
C0006	000	Op mode	Servo PM-SM Y	
C0022	000	Imax current	3.75	A
C0081	000	Mot power	0.80	kW
C0087	000	Mot speed	3950	rpm
C0088	000	Mot current	2.4	A
C0089	000	Mot frequency	140	Hz
C0090	000	Mot voltage	390	V
C0091	000	Mot cos phi	0.70	
C0084	000	Mot Rs	0.00	Ohm
C0085	000	Mot Ls	0.00	mH
C0018	000	fchop	8 kHz sin	
C0095	000	Rotor pos adj	Inactive	
C0052	000	MCTRL Umot	0	V
C0054	000	Imot	0.0	A
C0057	000	Max Torque	0.0	Nm
C0058	000	Rotor diff	0.0	
C0059	000	Mot pole no.	1	
C0060	000	Rotor pos	0	

K35.93R008

FIG 5-6 Parameter menu ”Motor adjustment”

Field	Command	Function
	Select C0086	Select a motor the data of which best matches with the motor used. A list of available motors can be obtained from chapter FIG 5-5.
	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 characteristic).
	Select C0085	Leakage inductance of the motor (only for very high demands on the control characteristic).
	Select C0087	Rated motor speed
	Select C0088	Rated motor current
	Select C0089	Rated motor frequency
	Select C0090	Rated motor voltage
	Select C0091	Motor-cos φ.
	Select C0003	Save data (C0003 = 1).



5.5.3 Adapt controller to the plant

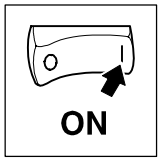
For the adaptation of the controller to the plant, please proceed according to the sequence in the following list.

Enter controller configuration		
C0005	30000	Select register control
C0025	xxx	Enter feedback system
C0421	x.x V	Enter supply voltage of the feedback system. Under C0025, set 8V for the selection of the sine-cosine encoder AS/AM512.
Plant-specific settings		
C0011	xxxx rpm	Determine max. speed
C0105	xxx.xxx s	Set QSP deceleration time
C1303	1	Set cross-cutting mode
C1306	x	Set measuring system (units)
C1300	xxxx units	Set shaft format
C1307/2	x	Set direction of the master encoder
C1302	xxxx units	Set circumference of the cutting cylinder
C1304	xxxx	Set mechanical gearbox ratio $n_{motor}/n_{cyclinder}$ numerator
C1305	xxxx	Set mechanical gearbox ratio $n_{motor}/n_{cyclinder}$ denominator
C1307/1	x	Set direction of rotation for the motor
C0070	xxx.x	V_p n-controller
C0071	xxx.x	T_n n-controller
C0254	x.xxxx	V_p phase control
C1330	xx.xx	T_{prc} register control

5.5.4 Set product parameters

Please enter here your product parameters.
For additional information on this commissioning step, please refer to chapter 5.5.6

Product parameters		
C1308	xxxx units	Cutting format (CF)
C1309	xxxx units	Print format (PF)
C1310	xxxx units	Register trimming
C0003	xxx	Save all parameters



5.5.5 Machine set-up (Start of the register evaluation)

The register evaluation is initialized together with the machine set-up.

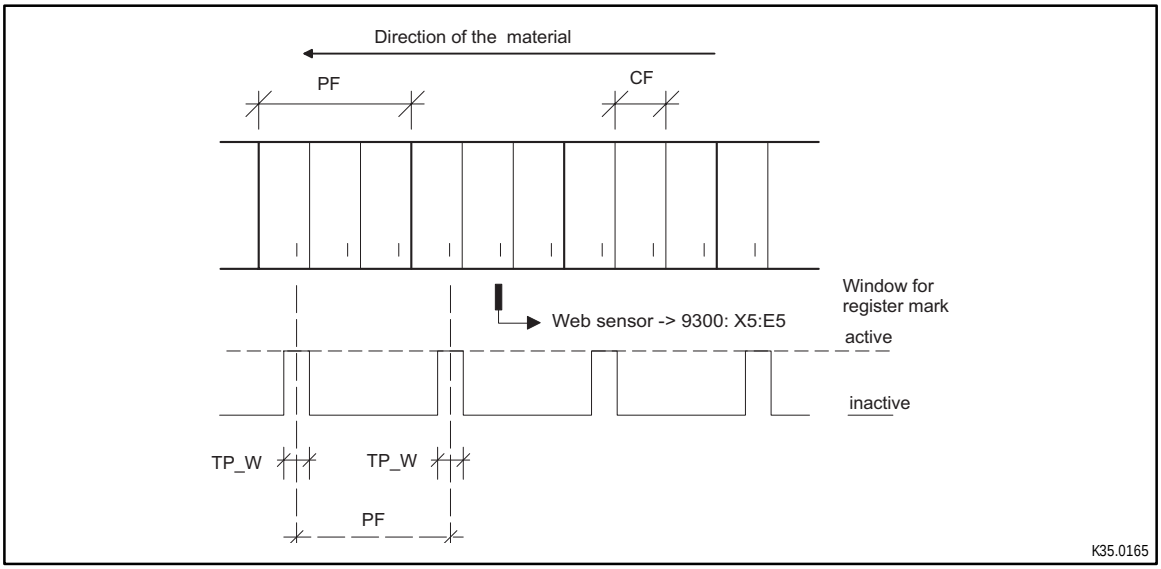


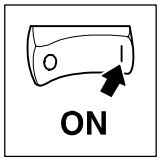
FIG 5-7 Format definitions for register control

Please maintain the following sequence:

1. **Positioning of the register mark**
   During the machine set-up, position the register mark approx. 10mm before the detection position of the contact switch (observe the web direction).
2. **Activate acceptance of the register mark**
   The 9300 register control can accept a register mark in two ways:
   - L/H edge at digital input E3 (FB input RC-RINIT; see FIG 5-2)
     Condition:C1345 bit 5 = 0
   - Enter 0/1 signal in C1345 bit 5 (CR-RINIT).
     Condition: E3 = L
3. **Start machine**
4. **Creation of the mark window** (automatically)
   The creation of a mark window is initialized when the first register mark is detected (L/H edge at E5). The mark window with the width TP_W is established symmetrically (1/2 TP_W) around the register mark.
   The period of the mark window is 1 PF (see FIG 5-7).
5. **Completion of the initialization**
   The initialization is completed with the following cylinder marks, defined by an L/H edge at E4. This is indicated:
   - H-signal at A2
   - 1-level in C1345 bit 4 (SR-RINITOK)

The detected position of the register mark relative to the cylinder mark is saved as a zero register value and displayed in X0-OFFS (C1384). It is the zero register value.

6. **Activation of the register control**
   The register control can be activated in two ways:



- H-signal at the digital input E2 (FB input RC-CON).
  Condition: C1345 Bit 1 = 0
- Enter 1-signal in C1345 bit 1 (CR-CON). Condition:E2=L

The register is kept to the zero register value.

Other operating options

- Register adjustment
  When the register control is switched on, the register can be adjusted using RSV (C1314).
  The adjustment distance is provided as a relative variable with sign. The register is adjusted when the code is written.
- Register trimming
  In the cross-cutting mode (C1303=0=, the register can be trimmed any time (even when the register control is switched off) using RPTRIM (C1310). The control can be added easily by adapting the zero register. The adjustment distance is provided as a relative variable with sign.The register is adjusted when the code is written.

5.5.6 Additional commissioning assistance

5.5.6.1 Selection of the direction of rotation for master encoder/motor

Direction of rotation for encoder	Direction of rotation for motor	EDIR (C1307/2)	DDIR (C1307/1)
CW	CW	0	0
CW	CCW	0	1
CCW	CW	1	0
CCW	CCW	1	1

CW Clockwise rotation looking at the shaft

CCW Counterclockwise rotation looking at the shaft

5.5.6.2 Format definitions

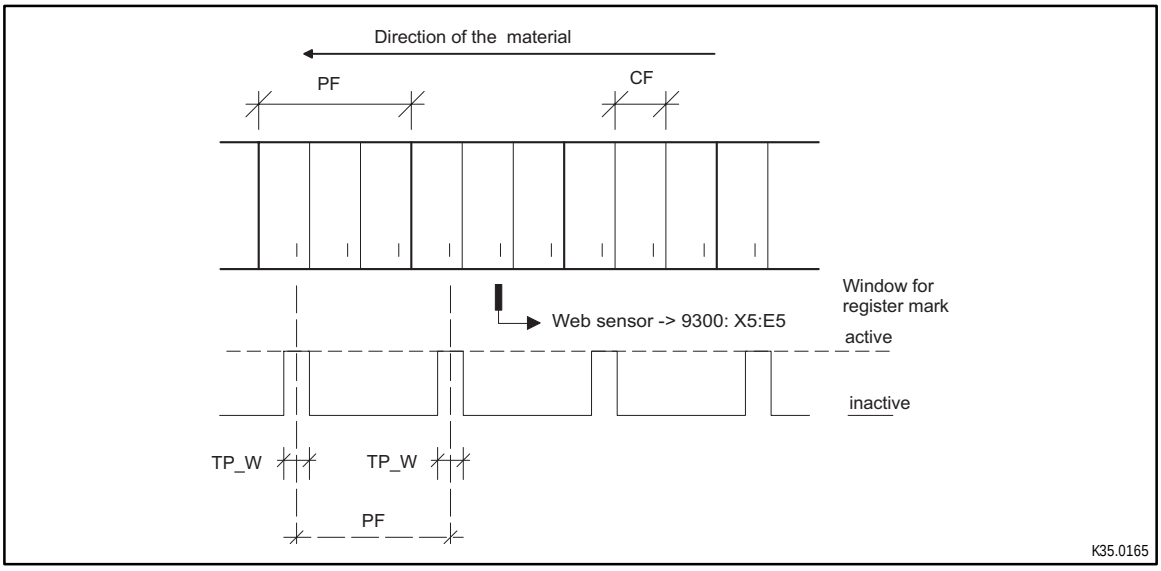
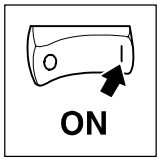


FIG 5-8 Format definitions

Code	LCD	Note
C1308	PF	Print format of the print module of the printing machine
C1309	CF	Cutting format of the cross-cutter
C1300	Shaft format	Shaft format / Material supply of the machine per revolution of the master encoder
C1316	TP-window	Window width for active register mark detection

Conditions for the 9300 register controller:

1. $PF = n_F * CF$
   mit $n_F = 1,2,3,4,....$ (integer)
   n_F -sheets per print format can be cut.
2. One register mark per print format is evaluated.



5.5.6.3 The register mark window

The width and position of the mark window can be set.

1. The window width can be set in TP-W (C1316)
2. The register mark window is centered around the register mark after the register evaluation has been started. A relative shift of the window position can be carried out as follows:
   - Input of an offset value in W-OFS (C1317). The shift is activated as soon as the code is written.
   - Configure function block input RC-WOFS to a “free code”. Enter the offset value in the “free code”. The shift is activated after a 0/1 edge at RC-WSET. The shift can be carried out several times.

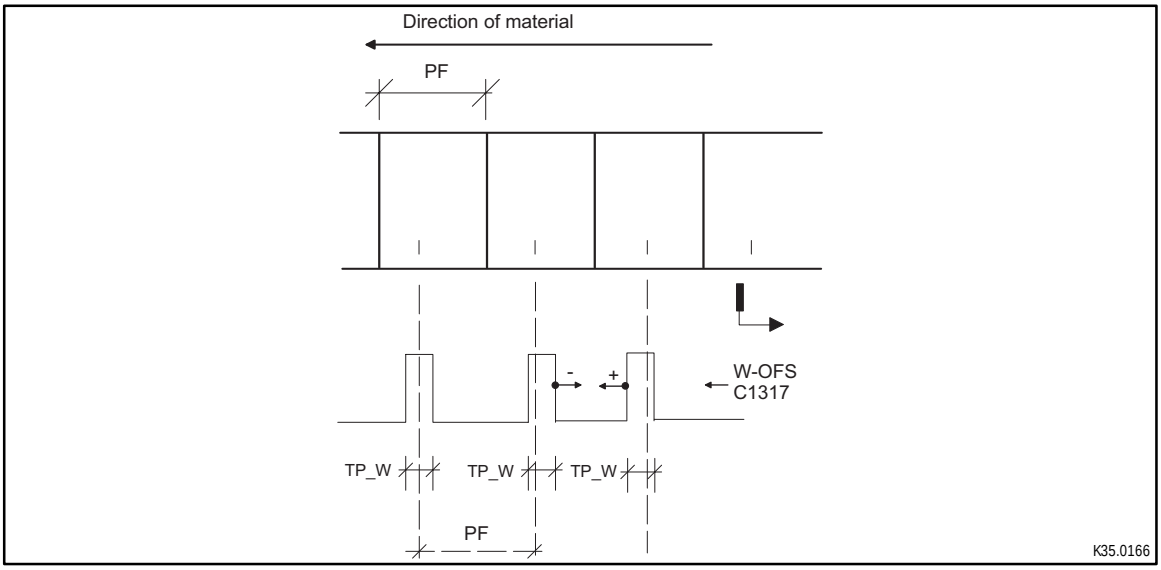


FIG 5-9 Register mark window

Tip!

You can activate an automatic window adjustment. For this, you must set the following codes.

Code	Meaning	Unit	Setting
C0473/4	Condition to execute the commands: Distance material register mark - window centre > value C0473/4 Execution: 1 command per mark	1/100 mm	500
C0473/5	Command for window adjustment in negative direction	1/100 mm	-100
C0473/6	Command for window adjustment in positive direction	1/100 mm	+100

5.5.6.4 Phase positioning commands

The register trimming, using RPTRIM as well as the compensation of register deviations, can be achieved by a phase adjustment of the motor shaft, i.e. the phase relationship between motor shaft and master encoder shaft is changed.

The direction of rotation and the sign can be obtained from the following table.

In case of register setpoint input RSV (C1314), register trimming RPTRIM (C1310)

MODEC1303	Input	Motor adjustment acc. to table 12.3.4
0 (cross-cutter)	+	in the direction of motor rotation
0 (cross-cutter)	-	opposite to the direction of motor rotation

In case of register difference

MODE C1303	Fig.	Register difference DXA DIS: C1375	Actual register value XRACT DIS: C1374	Motor adjustment acc. to table 12.3.4
0 (cross-cutter)	1	+	-	in the direction of motor rotation
0 (cross-cutter)	2	-	+	opposite to the direction of motor rotation

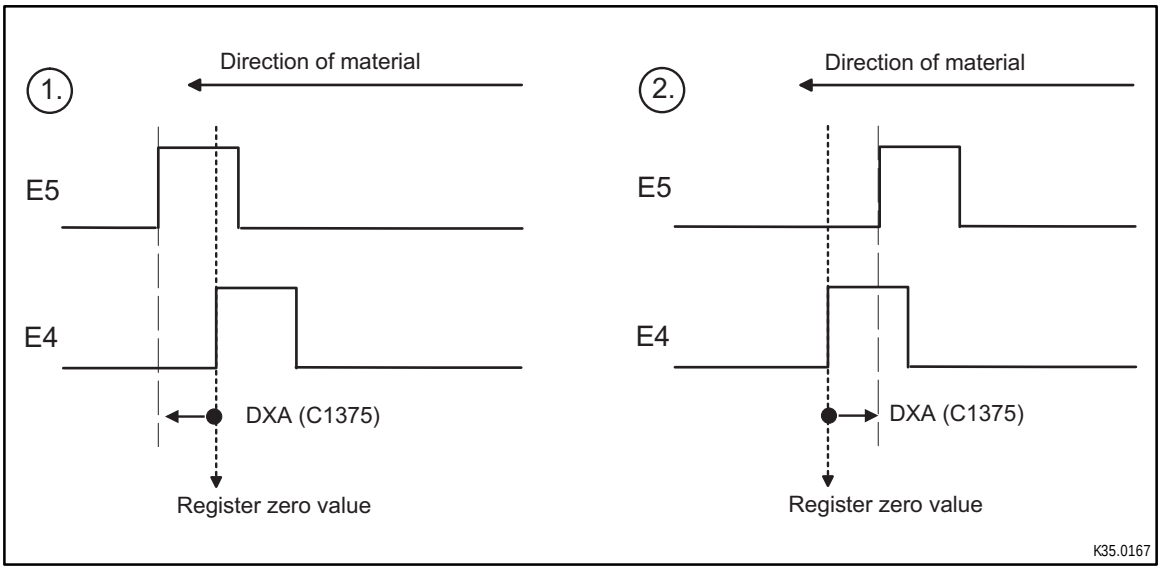


FIG 5-10 Phase positioning commands

E4: Cylinder pulse (CM)
E5: Register mark identification pulse (PM)

5.5.6.5 Phase adjustment speed

The following modes are possible:

1. FB input RC-CMODE = 0 (factory setting)
   The phase adjustment DPHI is relative to the material distance of 1 CF (cut format). The size results from the register variable DXA, the gain Vprc (proportional gain) and CCY (adapting control characteristic). The unit of the phase adjustment is mm/CF.
2. FB input RC-CMODE = 1
   The phase adjustment DPHI is based on the time. The unit of the phase adjustment is mm/s.

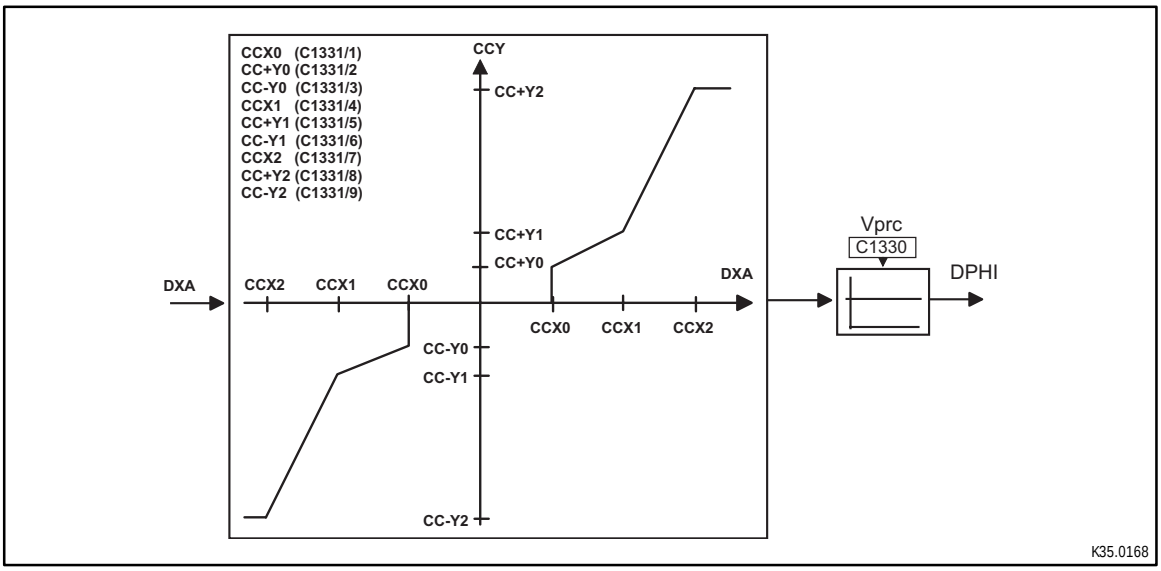
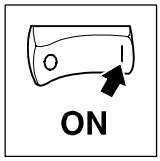


FIG 5-11 Speed of phase adjustment



5.5.6.6 Status / Control word of the register control

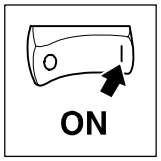
1. With the control / status word, the register control function can be performed using LECOM A/B and the parameter channels of Interbus-S, Profibus or system bus.
2. After switching on the servo controller, the control word is initialized with 00h.
3. Control word (C135) and status word (C150) of the controller are not affected.

Control word of the register control RC-CTRL, C1345

Bit	Name	OR link with FB input	State	Function
0	CR-LR	RC-LRSET	0 -> 1 0	Start setting coarse register Stop (cancel) setting coarse register
1	CR-CON	RC-CON	1 0	Register control ON Register control OFF
2	CR-GCON	RC-GCON	 0 1	Gearbox factor adjustment Off On
3	CR-CMODE	RC-CMODE	 0 1	Register position mode: CF based time-based
4	Free			
5	CR-RINIT	RC-RINIT	0 -> 1	Register mark accepted (Center window around the mark)
6	Free		0	
7	CR-DXAEXT	RC-DXAEXT	 0 1	Input register difference DXA internal external
8	Free			
:				
15	Free			

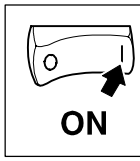
Status word register conrol RC-STAT, C1365

Bit	Name	OR link	State	Function
0	SR-LROK	RC-LROK	1	State: 1. Coarse register completed and 2. CR-LR = 0
1	SR-CSTAT	RC-CSTAT	1 0	Register control is ON Register control is OFF
2	SR-GCSTAT	RC-GCSTAT	0 1	Gearbox factor adjustment is OFF Gearbox factor adjustment is ON
3	SR-CMSTAT	RC-CMSTAT	0 1	Momentary register position mode: CF based time-based
4	SR-RINITOK	RC-RINITOK	0 1	Register mark not accepted accepted and CR-RINIT = 0
5	SR-OUTSWIN	RC-OUTSWIN	0 1	Register mark in the window Register mark out of the window
6	SR-FPM	RC-FPM	0 1	Register mark pulse OK Fault in register mark pulse (Fault in paper mark)



Commissioning

Bit	Name	OR link	State	Function
7	SR-FCM	RC-FCM	0 1	Cylinder pulse OK Fault in cylinder pulse (Fault in cylinder mark)
8	SR-RSGN	RC-RSGN	 0 1	Sign of the register difference pos. neg.
9	SR-X0LIM	RC-X0LIM	1	| Register difference | > CCX0 (C1331/1)
10	SR-X1LIM	RC-X1LIM	1	| Register difference | > CCX1 (C1331/4)
11	SR-COFFLIM	RC-COFFLIM	1	| Register difference | > C-OFFLIM (C1326)
12	SR-MLIM1	RC-MLIM1	1	| Register difference | > M-LIM1 (C1327)
13	SR-VLIM	RC-VLIM	1	Line speed >= V-LIM for register control ON reached
14	SR-TRIMOK	RC-TRIMOK	0 1	State of the phase/web length trimming (C1310, C1311) active completed
15	Free			



5.6 Signal flow chart for configuration 30000

5.6.1 Principle of operation

- FB DFIN

The master encoder signal is supplied via the connector X9 and converted into a speed/phase setpoint (DFIN-OUT) Xleit.

- FB RC

The master value Xleit is evaluated in such a way that a phase ratio synchronization between motor shaft (n_M) and master encoder ($n_{master\ encoder}$) results with the following speed ratio:

$$n_M\ [1/min] = n_{Master\ encoder}\ [1/min] \cdot \frac{LSF\ (C1300)}{CF\ (C1308)} \cdot \frac{i_{num}\ (C1304)}{i_{denom}\ (C1305)} \cdot \frac{Actual\ Increment\ Master\ enc.}{EC - LS\ (C1301)}$$

Display codes are available for the following terms:

$$LSF\ (C1300) * i_{num}\ (C1304) \rightarrow A2 * (DIS:C1370)$$

$$CF\ (C1308) * i_{denom}\ (C1305) \rightarrow B2\ (DIS:C1371)$$

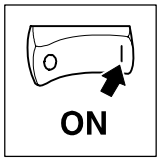
The FB RC compares the setpoint and actual phase and outputs the contouring error (RC-PSET) and the setpoint speed (RC-NOUT).

The phase variable generated by the register control is added to the setpoint phase.

- FB MCTRL

This block carries out the motor control, consisting of phase, speed, current, and current vector calculation.

The main setpoints are speed setpoint (MCTRL-N-SET) and contouring error (MCTRL-PHI-SET).



Commissioning

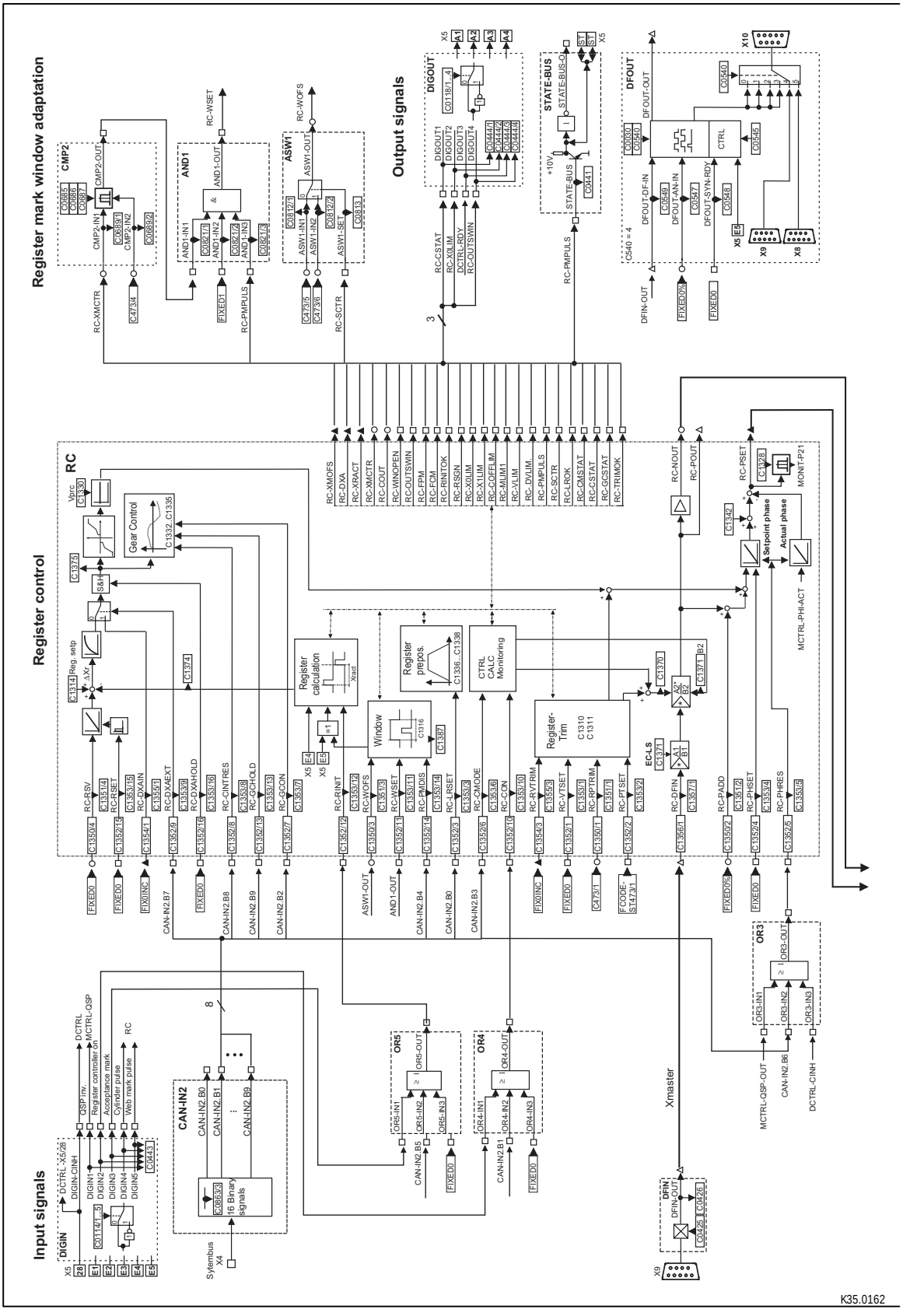


FIG 5-12 Signal flow chart for configuration 30000

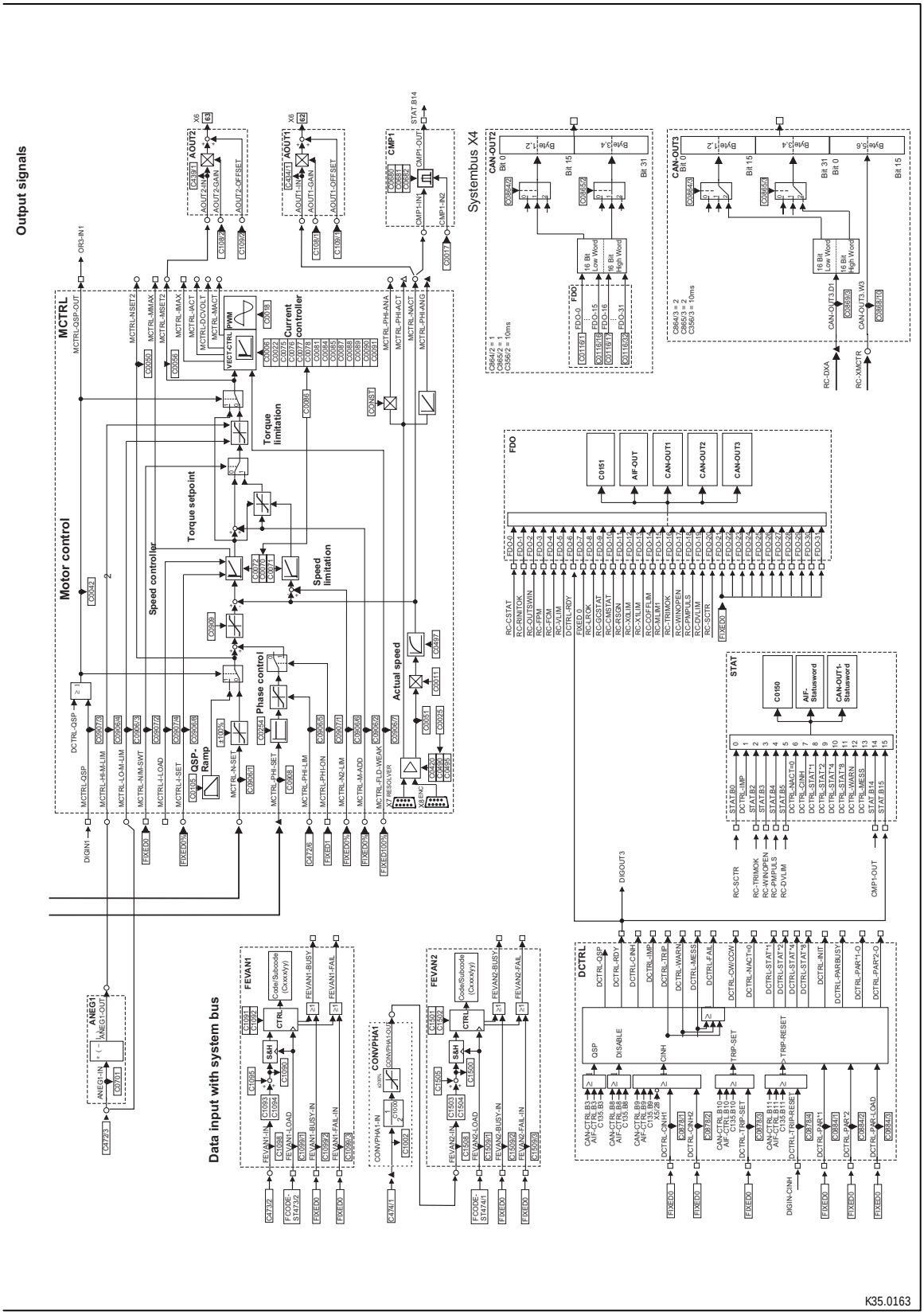
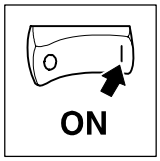
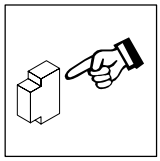


FIG 5-13 Connection diagram for configuration 30000



Commissioning



6 During operation

6.1 Status messages of the operating module

Status indications of the operating module		
Display	**on**	**off**
RDY	Ready for operation	Initializing or fault
IMP	Power outputs inhibited	Power outputs enabled
FAIL	Active fault (Trip, message, or warning)	No fault
I_{MAX}	Motor current set-value ≥ C0022	Motor current set-value < C0022
M_{MAX}	Speed controller within its limitation. Drive is torque controlled.	Drive is speed-controlled

6.2 Information on operation

When operating the controller, please observe the following notes:

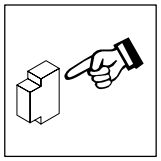
Stop!

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

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

6.2.1 Switching on the motor side

- Switching on the motor side of the inverter is permissible for emergency switch-off.
- Please note:
  - Switching while a controller is enabled may cause the fault indication ”0Cx” (short-circuit/earth fault in operating case x).
  - For long motor cables and operation of controllers with smaller output power, leakage currents through interfering cable capacitances may cause the fault indication ”OCx”.
  - Switching systems 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 according to the heatsink temperature (see FIG 6-1).
- For operation with chopping frequency = 16 KHz (C0018=2, optimum noise):
  - The current is always derated to $I_{N16} = I_{016}$.
- For operation with automatic changeover of the chopping frequency (C0018=0):
  - Below the threshold, the controller operates with 16 kHz (optimum noise). The function of the current derating follows the characteristic "Imax 16 KHz" in FIG 6-1.
  - If a higher torque is required from the machine, for example for acceleration, the controller automatically switches to 8 kHz (optimum power).The function of the current derating follows the characteristic "Imax 8 KHz" in FIG 6-1.

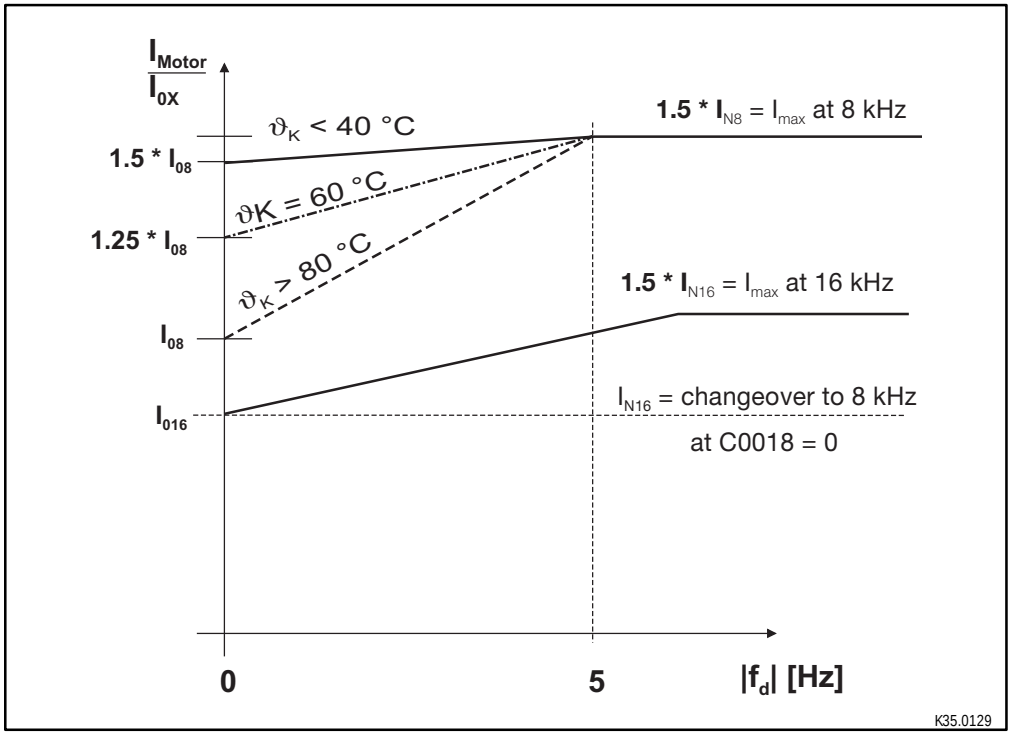
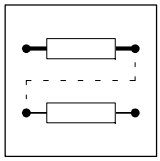


FIG 6-1 Current derating function of the controllers 9326 to 9332
ϑ_K Heatsink temperature
I_{Nx}: Rated current at U, V, W depending on the chopping frequency
f_d: Field frequency at the output U, V, W
I_{0x}: max. standstill current for field frequency = 0 Hz

See also the ratings in chapter 3.3



7 Configuration

7.1 Configuration with Global Drive Control

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

- an easy to understand,
- uncomplicated,
- convenient

tool for the configuration of your specific drive task.

Function block library

- GDC offers a library of function blocks (FB) which are available.
- 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

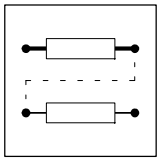
- to display every FB as a block diagram
- to see the assignment of the signal input at a glance
- to enter the FB in the processing table.
- to print your signal configuration.

Terminal assignment

For the configuration of the freely assignable terminals there is

- a simple dialog box to link the digital inputs and outputs
- a simple dialog box to link the analog inputs and outputs

A comprehensive description of the configuration with GDC can be found in the systems manual.



7.2 Monitoring

Various monitoring functions protect the drive from impermissible operating conditions.

If a monitoring function is activated,

- the corresponding set reaction is triggered (see chapter 7.2.1).
- a digital output is set if it is assigned to the corresponding reaction.
- the fault indication is entered in position 1 in the history buffer (see chapter 8.2).

7.2.1 Reactions

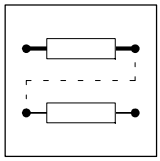
The controller can react to faults in four different ways:

- TRIP (highest priority)
- Message
- Warning
- FAIL-QSP
- OFF=no reaction (lowest priority)

For some operating faults you can determine the controller reaction (see chapter 7.2.2).

TRIP

- Switches the power outputs U, V, W to a high resistance until TRIP-Reset is done
- The drive is idling (no control!).
- After TRIP-Reset (see chapter 8.4) the drive moves to its set-value along the set ramps.



Message

- Switches the power outputs U, V, W to a high resistance as long as the fault is active.
- Short-term fault ≤ 0.5 s
  - The drive is idling (no control!), as long as the fault is active.
  - If the fault is eliminated, the drive moves to its set-value with maximum torque.
- Long-term fault > 0.5 s
  - The drive is idling (no control!), as long as the fault is active.
  - Homing points are lost,
  - If the fault is eliminated, the drive moves to its setpoint along the set ramps.

Danger
The drive restarts automatically if the fault is eliminated.

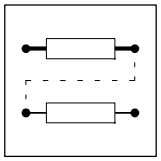
Warning

- The drive operates under control.

Off

- No reaction on operating faults! Monitoring is deactivated.

Stop!
If monitoring functions are deactivated, the drive may be destroyed.



7.2.2 Set reactions

1. Open the ”Dialog Diagnostic” menu by a doubleclick.

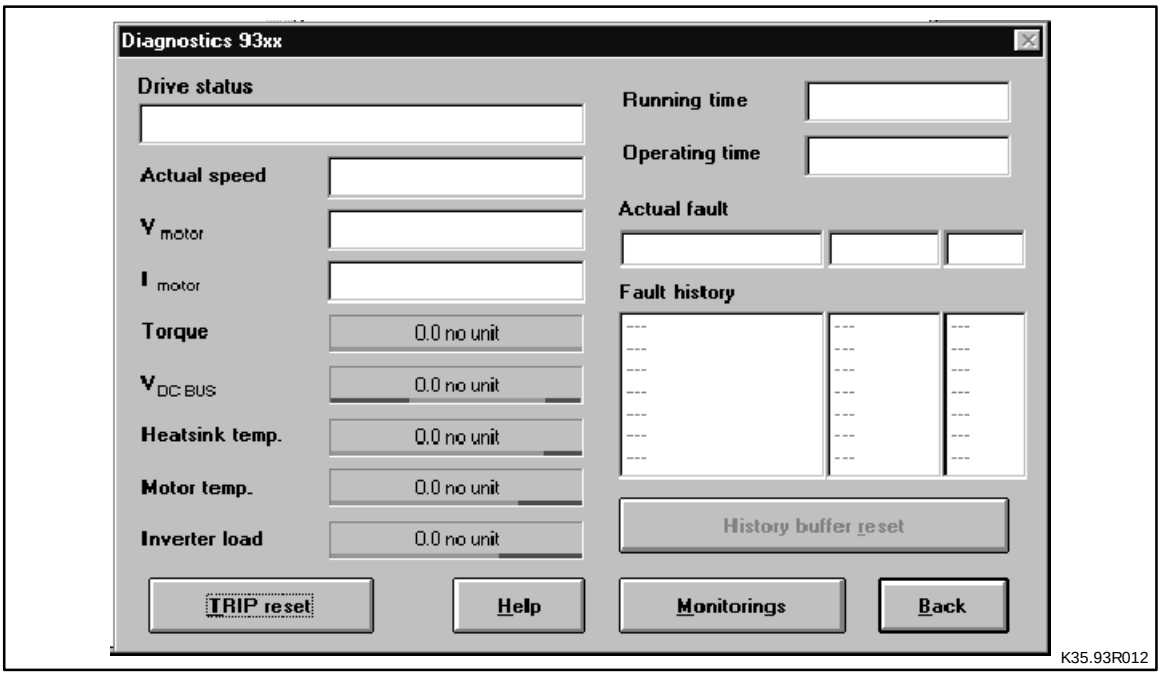


FIG 7-1 Dialog box ”Diagnostics 9300”

2. Click on the ”Monitoring...” button.

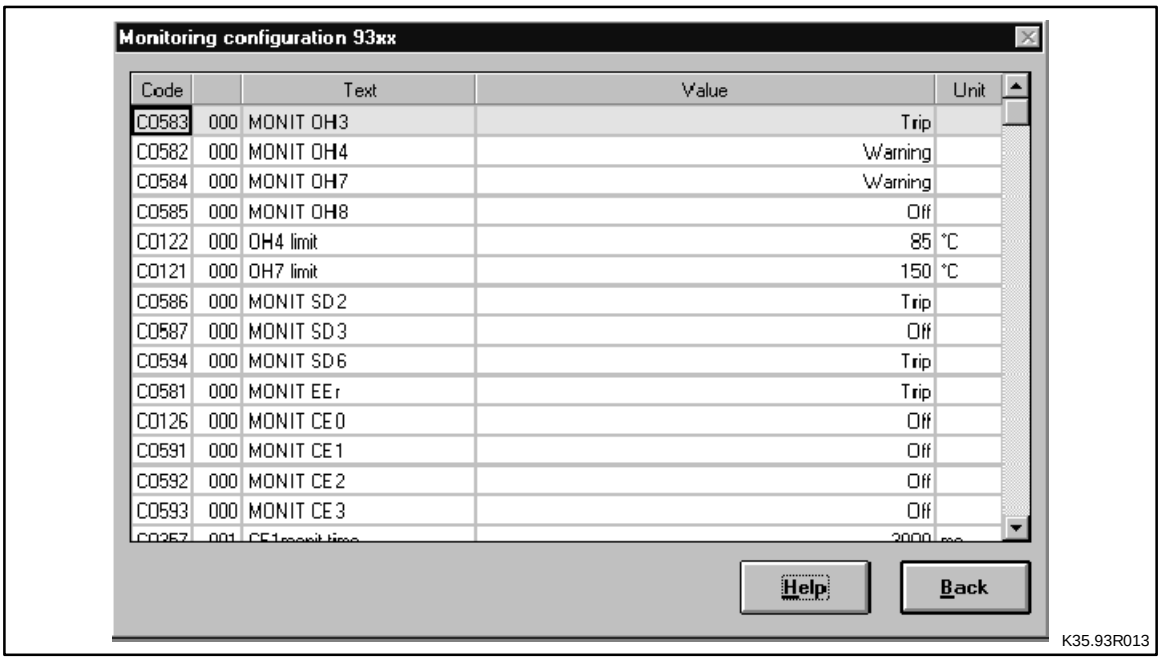
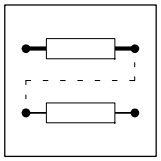


FIG 7-2 "Monitoring configuration 93xx" dialog box

3. Click on the desired monitoring function.
4. Select possible or permitted reaction and confirm with "OK".

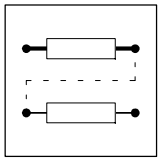
An overview of the monitoring functions and the settings can be obtained from chapter 7.2.3



7.2.3 Monitoring functions

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

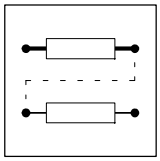
Fault indication			Possible reactions				
Display	**LECOM**	**Meaning**	**T**	**M**	**W**	**off**	**Code**
CCr	T: 71	System fault	●	-	-	-	-
CE0	T: 61 W: 2061	Communication error (AIF)	↙	-	↙	●	C0126
CE1	T: 62 W: 2062	Communication error at the process data input object CAN-IN1 (time monitoring can be set under C0357/1)	↙	-	↙	●	C0591
CE2	T: 63 W: 2063	Communication error at the process data input object CAN-IN2 (time monitoring can be set under C0357/2)	↙	-	↙	●	C0592
CE3	T: 64 W: 2064	Communication error at the process data input object CAN-IN3 (time monitoring can be set under C0357/3)	↙	-	↙	●	C0593
CE4	T: 65 W: 2065	BUS-OFF state (many communication errors occurred)	↙	-	↙	●	C0595
EEr	T: 91 W: 2091 M: 1091	External monitoring	●	↙	↙	↙	C0581
H05	T: 105	Internal fault	●	-	-	-	-
H07	T: 107	Internal fault	●	-	-	-	-
H10	T: 110	Sensor fault: heat sink temperature	●	-	-	↙	C0588
H11	T: 111	Sensor fault: indoor temperature	●	-	-	↙	
LP1	T: 32	Motor phase failure detection (function block must be entered in C0465)	↙	-	↙	●	C0597
LU	M: 1030	Undervoltage	-	●	-	-	-
NMAX	T: 200	Maximum speed exceeded (C0596)	●	-	-	-	-
OC1	T: 11	Short-circuit	●	-	-	-	-
OC2	T: 12	Earth fault	●	-	-	-	-
OC5	T: 15	I x t overload	●	-	-	-	-
OH	T: 50	Heat sink temperature 1 (max. permissible, fixed)	●	-	-	-	-
OH3	T: 53	Motor temperature 1 (max. permissible, fixed)	●	-	-	↙	C0583
OH4	W: 2054	Heat sink temperature 2 (adjustable; C0122)	-	-	●	↙	C0582
OH7	W: 2057	Motor temperature 2 (can be set; code: C0121)	-	-	●	↙	C0584
OH8	T: 58 W: 2058	Motor temperature (fixed) via inputs T1/T2	↙	-	↙*	●	C0585
OU	M: 1020	Overvoltage on the DC bus	-	●	-	-	-
P03	T: 153 W: 2153	Contouring-error function block DFSET	↙	-	●	↙	C0589
P13	T: 163 W: 2163	Phase-overflow function block DFSET	●	-	↙	↙	C0590
P21	T: 171 W: 2171	Contouring-error function block RC	↙	-	●	↙	C1329
PEr	T: 74	Program error	●	-	-	-	-
PI	T: 79	Fault during initialization	●	-	-	-	-
PR0	T: 75	General fault in parameter sets	●	-	-	-	-
PR1	T: 72	Fault in parameter set 1	●	-	-	-	-
PR2	T: 73	Fault in parameter set 2	●	-	-	-	-
PR3	T: 77	Fault in parameter set 3	●	-	-	-	-
PR4	T: 78	Fault in parameter set 4	●	-	-	-	-



Fault indication			Possible reactions				
Display	**LECOM**	**Meaning**	**T**	**M**	**W**	**off**	**Code**
Sd2	T: 82 W: 2082	Resolver fault	●	-	✓*	✓	C0586
Sd3	T: 83 W: 2083	Encoder fault at X9 PIN 8	✓	-	✓*	●	C0587
Sd5	T: 85 W: 2085	Encoder fault at X6/1 X6/2 (C0034 = 1)	✓	-	✓	●	C0598
Sd6	T: 86 W:2086	Sensor fault: motor temperature (X7 or X8)	●	-	✓	✓	C0594
Sd7	T: 87	Fault in the absolute value encoder at X8	✓	-	-	●	C0025

T: TRIP M: Message W: Warning Q: Interference/ QSP ●: Lenze

✓: possible -: not possible ✓*: possible, but can destroy the drive if the fault is not eliminated in time



Configuration

8 Troubleshooting and fault elimination

- You can recognize immediately whether a fault has occurred through the display elements or status information. (chapter 8.1).
- You can analyze the fault using the history buffer (chapter 8.2) and the list in chapter 8.3.
- The list in chapter 8.3indicates how to eliminate the fault.

8.1 Troubleshooting

Display on the controller

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

LED green	LED red	Check
■	□	Controller enabled; no fault
★	□	C0183; possibly C0168/1
□	★	C0168/1

■ : on □ : off ★ : blinking

Display on the operating module

Status messages in the display indicate the controller status.

FAIL = ■ : TRIP or message or warning is active

FAIL	RDY	IMP	Check
□	■	□	Controller enabled; no fault
■	□	■	C0168/1
□	□	■	C0183
□	■	■	C0183
■	■	□	C0168/1
■	■	■	C0168/1

■ : on □ : off

Display via the LECOM status word C0150

Four bits of the status word indicate the controller status.

Bit 7 RFR	Bit 12 Warning	Bit 13 Message	Bit 15 Ready for operation	Check
1	0	0	1	C0183
1	1	1	0	C0168/1
0	1	0	1	C0168/1
1	0	1	1	C0168/1
0	1	0	1	C0168/1

8.2 Fault analysis using the history buffer

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

Tip!
The codes of the history buffer are contained in the menu: Diagnostics

8.2.1 Structure of the history buffer

- The history buffer has eight memory units which can be called by subcodes.
- The first memory unit (subcode 1) contains information about the active fault.
  - The first memory unit is written only after the elimination or acknowledgement of the fault. The last but sixth fault is eliminated from the history buffer and can no longer be read.
- The memory units 1 to 7 contain information on the last to the last but sixth fault.
- For every fault occurred, certain information is stored which can be retrieved by codes:

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

8.2.2 Working with the history buffer

Fault recognition and reaction

- C0168 contains the fault recognition for every memory unit and the reaction to the fault.
  - It is entered as a LECOM fault number (see chapter 7.2.3).

Please note:

- If there are several faults with different reactions:
  - Only the reaction with the highest priority (TRIP → Message → Warning) is entered.
- If there are faults with the same reaction (e. g. 2 messages) simultaneously:
  - Only the fault which occurred first is entered.

Time

- The times when the faults occurred are entered under C0169:
  - Reference time is the state of the mains-on elapsed-time meter (C0179).

Please note:

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

Frequency

- The frequency of a fault immediately followed by the same fault is entered under C0170. The time of the last occurrence is stored.

Clear history buffer

Set C0167 = 1 to clear the history buffer.

8.3 Fault indications

Tip!

If the fault indication is requested by a field bus, a LECOM no. is read from C0168/x instead of the abbreviation.The meaning of the LECOM no. is listed in chapter 7.2.3”Monitoring functions”.

Display	Fault	Cause	Remedy
---	No fault	-	-
CCr	System fault	Strong interference on control cables Ground or earth loops in the wiring	Screen the control cables PE wiring (see chapter 4.4 ”Installation of a CE-typical drive system”)
CE0	Communication error	Interference during transmission of control commands via automation interface X1	Plug in automation module firmly, bolt down if necessary
CE1	Communication error in the process-data 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	Communication error in the process-data 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	Communication error in the process-data 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	BUS-OFF state	Controller has received too many incorrect telegrams by system bus X4 and has disconnected from the bus	Check wiring Check bus terminator (if any) Check screen contact of the cables Check PE connection Check bus load: Reduce baud rate (observe cable length)
EEr	External fault (TRIP-Set)	A digital input assigned to the TRIP set function has been activated	Check external encoder
H05	Internal fault		Contact Lenze
H07	Incorrect power stage	During initialization of the controller, an incorrect power stage was detected	Contact Lenze
H10	Sensor fault: heat sink temperature	Sensor of heat sink temperature detection indicates indefinite values	Contact Lenze
H11	Sensor fault: indoor temperature	Sensor of the indoor temperature detection indicates indefinite values	Contact Lenze
LP1	Motor phase failure	A current-carrying motor phase has failed The current limit is set too low This monitoring is not suitable for: • Synchronous servo motors • for field frequencies > 480 Hz	Check motor; Check supply cables Set a higher current limit under C0599 Deactivate monitoring with C0597= 3
LU	Undervoltage	DC bus voltage is smaller than the value fixed under C0173	Check mains voltage Check supply cable
N_{MAX}	max. plant 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

Display	Fault	Cause	Remedy
OC1	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 has a lower capacitance
OC2	Earth fault	One of the motor phases has earth contact Excessive capacitive charging current of the motor cable	Check motor; check cable Use motor cable which is shorter or has a lower capacitance
OC5	I x t overload	Frequent and too long acceleration with over-current Permanent overload with $I_{motor} > 1.05 \times I_{Nx}$	Check drive dimensioning.
OH	Heat sink temperature is higher than the value set in the controller	Ambient temperature T_u > 40 °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)]	Motor temperature is higher than the value set in the controller	Motor too hot because of excessive current or frequent and too long acceleration No PTC connected	Check drive dimensioning Connect PTC or switch off monitoring (C0583=3)
OH4	Heat sink temperature is higher than the value set under C0122	Ambient temperature T_u > 40 °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)]	Motor temperature is higher than the value set under C0121	Motor too hot because of excessive current or frequent and too long 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	PTC at terminals T1, T2 indicates motor overheating	Motor too hot because of excessive current or frequent and too long acceleration Terminals T1, T2 are not assigned	Check drive dimensioning Connect PTC or thermostat or switch off monitoring (C0585=3)
OU	Overvoltage	Excessive braking energy (DC bus voltage higher than the value set under C0173)	Use brake module or energy recovery module
P03	Contouring error DFSET	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 monitoring if necessary (C0589 = 3). Check drive dimensioning.
P13	Phase overflow DFSET	Phase controller limit reached. Drive cannot follow digital frequency (I_{max} limit).	Enable drive Check drive dimensioning.
P21	Contouring error RC	Phase difference between set and actual position is larger than the contouring error limit set under C1328. Drive cannot follow digital frequency (Imax limit).	Extend contouring error limit with C1328. Switch off monitoring if necessary (C1329=3) Check drive dimensioning.
PEr	Program interference	A fault in the program was detected	Send controller with data (on diskette) to Lenze
PI	Initializing error	A fault was detected during transfer of parameter set transfer between the control-lers Parameter set does not match the controller	Correct parameter set

Display	Fault	Cause	Remedy
PR0 PR1 PR2 PR3 PR4	Parameter set error	Fault when reading a parameter set CAUTION: The factory setting is loaded automatically	Set the desired parameters and save under C0003 For PR0, the supply voltage must be switched off additionally.
Sd2	Resolver fault	Resolver cable interrupted	Check resolver cable for open circuit Check resolver or switch off monitoring (C0586 = 3)
Sd3	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	Master current source defective	Master current at X6/1 X6/2 < 2mA	Check cable for open circuit Check master current source
Sd6	Sensor fault	Encoder of the motor temperature detection at X7 or X8 indicates undefined values	Check supply cable for firm connection Switch off monitoring with C0594 = 3 if necessary
Sd7	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 indications

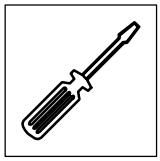
TRIP

- After eliminating the fault, the pulse inhibit is only reset after acknowledgement of TRIP.
- Acknowledge TRIP by:
  - Operating module:
    Press STOP key.
    Then press RUN to enable the controller again.
  - LECOM: Set C0043 to ”0”
  - Control word C0135
  - Terminal X5/E5
  - Control word AIF
  - Control word system bus

Note!
If the TRIP source is still active, the TRIP cannot be reset.

Message

- After eliminating the fault, the pulse inhibit is reset automatically.

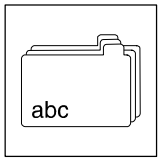


9 Maintenance

- The controller is free of maintenance if the prescribed conditions of operation are observed (see chapter 3.2).
- If the ambient air is polluted, the air vents of the controller may be obstructed.Therefore check the air vents regularly (approx. every four weeks, depending on the degree of pollution):
  - Free the obstructed air vents using a vacuum cleaner.

Stop!
Do not use sharp or pointed tools such as a knife or screwdriver 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

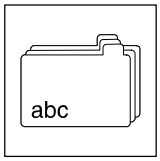
A PC can be connected to the controller via the field bus module LECOM A/B (RS232, RS485 or fibre optics). The controller can be easily parameterized using the Global Drive Control PC program.

PC program Global Drive Control

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

Further functions of the PC program:

- Process signal visualization
- Diagnostics and troubleshooting
- Commissioning support

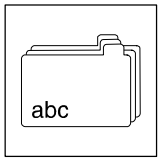


10.2 Code table

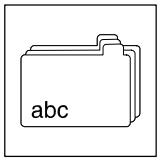
How to read the code table:

Column	Abbreviation	Meaning
Code	C0039 1 2 … 14 15	Code C0039 Subcode 1 of code C0039 Subcode 2 of code C0039 … Subcode 14 of code C0039 Subcode 15 der code C0039
	[C0005]	Parameter value of the code can only be modified when controller is inhibited
LCD		LCD display of the operating module
Lenze		Factory setting of the code
	*	The column "Important" contains further information
Selection	1 {1 %} 99	Minimum value {smallest step/unit} maximum value
Info	-	Meaning of the code
IMPORTANT	-	Additional, important explanation of the code

Code	LCD	Possible settings				IMPORTANT
		Lenze	Selection		Info	
C0002	Par load	0	0	Load default	Load factory setting into RAM	Load parameter set • Parameter set 1 is loaded automatically after every mains connection.
			1 2 3 4	Load PS1 Load PS2 Load PS3 Load PS4	Load parameter set x into the RAM and activate	
			11 12 13 14	Load ext PS1 Load ext PS2 Load ext PS3 Load ext PS4	Load parameter set x from the operating module into the RAM and activate	
			20	ext -> EEPROM	Transmit all parameter sets from the operating module to the controller and store non-volatile	
C0003	Par save	0	0	Ready	Saving completed	Save parameter set
			1 2 3 4	Save PS1 Save PS2 Save PS3 Save PS4	Save current parameter set x non-volatile	
			11	Save extern	Save all parameter sets to the operating module	
C0004	Op-display	56	All available codes		Operating display	Operating module shows selected code in the operating level if no other status indications of C0183 are active.

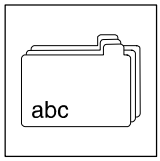


Code	LCD	Possible settings			IMPORTANT
		Lenze	Selection	Info	
[C0005]	Signal CFG	30000		Signal configuration (predefined control configurations for speed, torque and digital frequency operation)	
			0000 Common	Modified basic configuration	
			1 CFG:86xx -1- 2 CFG:86xx -2- 11 CFG:86xx -11-	compatible to frequency inverter 86xx: C005 = -1-/-2-/-11-	
			100 CFG:empty	All internal connections are removed	
			1000 Speed mode 1001 Speed 1 1003 Speed 3 1005 Speed 5 1010 Speed 10 1011 Speed 11 1013 Speed 13 1015 Speed 15 1100 Speed 100 1101 Speed 101 1103 Speed 103 1105 Speed 105 1110 Speed 110 1111 Speed 111 1113 Speed 113 1115 Speed 115	Speed control	The digit indicates the predefined controller control • xxx1: RS232, RS485 or fibre-optics • xxx3: InterBus-S or Profibus • xxx5: Systembus (CAN) The last digit but one indicates the predefined voltage source for the control terminals • xx0x: external supply voltage • xx1x: internal supply voltage via X5/A1 The last digit but two indicates additional functions • x1xx: Brake control • x9xx: in case of quick stop the complete connection of drives is phase-controlled to zero speed
			4000 Torque mode 4001 Torque 1 4003 Torque 3 4005 Torque 5 4010 Torque 10 4011 Torque 11 4013 Torque 13 4015 Torque 15	Torque control with speed limitation	
			5000 DF mst 5001 DF mst 1 5003 DF mst 3 5005 DF mst 5 5010 DF mst 10 5011 DF mst 11 5013 DF mst 13 5015 DF mst 15 5900 DF mst QSP 5901 DF mst QSP1 5903 DF mst QSP3 5905 DF mst QSP5 5910 DF mst QSP10 5911 DF mst QSP11 5913 DF mst QSP13 5915 DF mst QSP15	Master for digital frequency coupling	

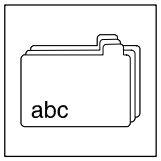


Appendix

Code	LCD	Possible settings			IMPORTANT
		Lenze	Selection	Info	
			6000 DF slv bus 6001 DF slv bus 1 6003 DF slv bus 3 6005 DF slv bus 5 6010 DF slv bus 10 6011 DF slv bus 11 6013 DF slv bus 13 6015 DF slv bus 15	Slave to digital frequency bus	
			7000 DF slv cas 7001 DF slv cas 1 7003 DF slv cas 3 7005 DF slv cas 5 7010 DF slv cas 10 7011 DF slv cas 11 7013 DF slv cas 13 7015 DF slv cas 15	Slave to digital frequency cascade	
			30000 RC standard 30003 RC 3 30010 RC 10 30013 RC 13	Register control	
[C0006]	Op mode	*		Operating mode of the motor control	* Depending on C0086 • Change of C0086 resets value to the assigned factory setting • Change of C0006 sets C0086 = 0!
[C0006]	Op mode	*	1 SSC norm	sensorless control for motors in star connection	* Depending on C0086 • Change of C0086 resets value to the assigned factory 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	
			11 SSC norm	sensorless control for motors in delta connection	
			22 Servo async	Servo control asynchronous motors in delta connection	
C0009	LECOM address	1	1 {1} 99	Device address	Bus device number when operated via interface • 10, 20, ..., 90 reserved for broadbast to device groups for RS232, RS485, fibre optics.
C0011	Nmax	3000	500 {1 rpm} 16000	Maximum speed	Reference value for the absolute and relative set-point selection for the acceleration and deceleration times. • For parameter setting via interface: Large changes in one step should only be made when the controller is inhibited.
C0012	Tir (acc)	0,000	0,000 {0.001 s} 999,900	Acceleration time T_{ir} for the main setpoint of NSET	Referred to speed change $0 \ldots n_{max.}$

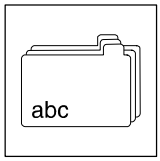


Code	LCD	Possible settings					IMPORTANT
		Lenze	Selection			Info	
C0013	Tif (dec)	0.000	0.000	{0.001 s}	999.900	Deceleration time T_{if} for the main setpoint of NSET	Referred to speed change 0…$n_{max.}$
C0017	FCODE (Qmin)	50	0	{1 rpm}	16000	Switching threshold n_{act} < n_x	n_{act} < C0017 activates the comparator output CMP1-OUT
C0018	fchop	1	0	16/8 kHz sin		Optimum noise reduction with automatic change-over to 8 kHz	Chopping frequency
			1	8 kHz sin		Operation with optimum power	
			2	16 kHz sin		Operation with optimum noise reduction	
C0019	Thresh nact=0	0	0	{1 rpm}	16000	Threshold when n_{act} = 0 is recognized.	If the actual speed falls below the reference speed in C019, the corresponding output becomes active.
C0021	Slipcomp	0.00	0.00	{0.01 %}	20.00	Slip compensation	active only in sensorless control
C0022	Imax current	*	0	{0.01 A}	1.50 I_N	I_{max}limit	* Depending on C0086 • Change of C0086 resets value to the assigned factory setting (1.5*Imotor)
[C0025]	Feedback type	10				Selection of the feedback system	• 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	
			1	no feedback		Control without feedback system (sensorless control, SSC)	
			10	RSx (Resolver)		The resolver is designated with RSxxxxxxxx.	
			110 111 112 113	IT-512-5V IT-1024-5V IT-2048-5V IT-4096-5V		Incremental encoder with TTL level	
			210 211 212 213	IS-512-5V IS-1024-5V IS-2048-5V IS-4096-5V		Sine-cosine encoder	
			310	AS-512-8V		Single turn Sine-cosine encoder with RS485 interface Stegmann	
			410	AM-512-8V		Multi turn Sine-cosine encoder with RS485 interface Stegmann	
C0026						Freely assignable code for relative analog signals	Used for:
1	FCODE (offset)	0	-199.99	{0.01 %}	199.99		Offset for terminal X6/1,2
2	FCODE (offset)	0					Offset for terminal X6/3,4
C0027						Freely assignable code for relative analog signals	Used for:
1	FCODE (gain)	100	-199.99	{0.01 %}	199.99		Gain X6/1,2
2	FCODE (gain)	100					Gain X6/3,4

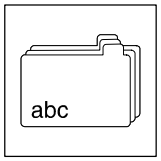


Appendix

Code	LCD	Possible settings			IMPORTANT
		Lenze	Selection	Info	
C0030	DFOUT const	3	0 256 inc/rev 1 512 inc/rev 2 1024 inc/rev 3 2048 inc/rev 4 4096 inc/rev 5 8192 inc/rev 6 16384 inc/rev	Constant for the digital frequency output in increments per revolution	
C0032	FCODE Gearbox	1	-32767 {1} 32767	Freely assignable code	Used for: gearbox factor numerator
C0033	Gearbox denom	1	1 {1} 32767	Gearbox factor (denominator) for DFSET	
C0034	Mst current	0	0 10 V... +10 V 1 4mA ... 20 mA 2 -20mA ... +20 mA	Selection: Master voltage/ master current for setpoint input	For master current selection: Observe jumper setting X3.
C0037	setpoint rpm	0	-16000 {1 rpm} 16000	Setpoint input in rpm	
C0039 1 2 3 4 5 ... 14 15	 JOG setpoint JOG setpoint JOG setpoint JOG setpoint JOG setpoint ... JOG setpoint JOG setpoint	 100.00 75.00 50.00 25.00 0.00 ... 0.00 0.00	-199.99 {0.01 } 199.99	Fixed speeds (JOG setpoints) can be selected for NSET using digital inputs.	
C0040	Ctrl enable	1	0 Ctrl inhibit 1 Ctrl enable	Controller inhibit	• write: - controls the code • read: - reads the controller status
C0042	DIS: QSP		0 QSP inactive 1 QSP active	Quick stop status	display only
C0043	Trip reset		0 no/trip reset 1 trip active	reset current trip Active trip	Reset of an active trip: • Set C0043 = 0
C0045	DIS: act JOG		0 Nset active 1 JOG 1 2 JOG 2 ... 15 JOG 15	Active JOG setpoint	display only
C0046	DIS: N		-199.99 {0.01 %} 199.99	Main setpoint of NSET	display only
C0049	DIS: NADD		-199.99 {0.01 %} 199.99	Additional setpoint of NSET	display only
C0050	MCTRL-NSET2		-100.00 {0.01 %} 100.00	n_{set} at the speed controller input	display only
C0051	MCTRL-NACT		-30000 {1 rpm} 30000	Actual speed	display only
C0052	MCTRL-Umot		0 {1 V} 800	Actual motor voltage	display only
C0053	UG-VOLTAGE		0 {1 V} 900	DC bus voltage	display only
C0054	IMot		0.0 {0.1 A} 500.0	Actual motor current	display only
C0056	MCTRL-MSET2		-100.00 {0.01 %} 100.00	Torque setpoint (output of the speed controller)	display only
C0057	Max Torque		0 {1 Nm} 500	Maximum possible torque of the drive configuration	display only • depending on C0022, C0086

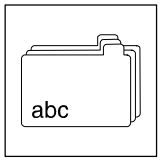


Code	LCD	Possible settings				IMPORTANT
		Lenze	Selection		Info	
C0058	Rotor diff		-180.0	{0.1°} 179.9	Zero phase of the rotor for synchronous motors (C0095)	display only
C0059	Mot pole no.		1	{1} 50	Pole pair number of the motor	display only
C0060	Rotor pos		0	{1} 2048	current rotor position	display only • 1 rev. = 2048 inc
C0061	Heatsink temp		0	{1°} 100	Heatsink temperature	display only
C0063	Mot temp		0	{1°} 200	Motor temperature	display only
C0064	Utilization	0	0	{1 %} 150	Controller load I x t during the last 180 s	display only • C0064 >100 % releases fault OC5 • Trip reset is possible only if C0064 < 95 %
C0067	Act trip		All fault indications		Momentary fault indication	display only
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 factory setting
C0071	Tn speed-CTRL	*	1.0 >512 ms	{0.5 ms} 600.0 switched off	T_{nn} speed controller	* Depending on C0086 • Change of C0086 resets value to the assigned factory setting
C0072	Td speed-CTRL	0.0	0.0	{0.1 ms} 32.0	T_{dn} speed controller	
C0075	Vp curr-CTRL	0.35	0.00	{0.01} 15.99	V_{pi} current controller	
C0076	Tn curr-CTRL	1.8	0.5 2000 ms	{0.1 ms} 2000.0 switched off	T_{ni} current controller	
C0077	Vp field-CTRL	0.25	0.00	{0.01} 15.99	V_{pF} field controller	
C0078	Tn field-CTRL	15.0	1.0 8000 ms	{0.5 ms} 8000.0 switched off	T_{nF} field controller	
[C0081]	Mot power	*	0.01	{0.01 kW} 500.00	Rated motor power acc. to nameplate	* Depending on C0086 • Change of C0086 resets value to the assigned factory setting • Change of C0081 sets C0086 = 0
[C0084]	Mot Rs	*	0.00	{0.01 Ω} 100.00	Stator resistance of the motor	* Depending on C0086 • Change of C0086 resets value to the assigned factory setting
[C0085]	Mot Ls	*	0.00	{0.01} 200.00	Stray inductance of the motor	* Depending on C0086 • Change of C0086 resets value to the assigned factory setting

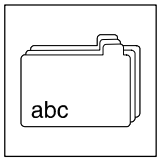


Appendix

Code	LCD	Possible settings			IMPORTANT
		Lenze	Selection	Info	
[C0086]	Mot type	*		Selection motor type	* Depending on the device • Change of C0086 resets C0006, C0022, C0070, C0071, C0081, C0084, C0085, C0087, C0088, C0089, C0090, C0091 to the assigned factory setting
			0 COMMON	no Lenze motor	
			10 DSKA56-140	MDSKAXX056-22, f_N:140Hz	New generation Lenze asynchronous servo motors 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
			11 DFKA71-120	MDFKAXX071-22, f_N:120Hz	
			12 DSKA71-140	MDSKAXX071-22, f_N:140Hz	
			13 DFKA80-60	MDFKAXX080-22, f_N: 60Hz	
			14 DSKA80-70	MDSKAXX080-22, f_N: 70Hz	
			15 DFKA80-120	MDFKAXX080-22, f_N:120Hz	
			16 DSKA80-140	MDSKAXX080-22, f_N:140Hz	
			17 DFKA90-60	MDFKAXX090-22, f_N: 60Hz	
			18 DSKA90-80	MDSKAXX090-22, f_N: 80Hz	
			19 DFKA90-120	MDFKAXX090-22, f_N:120Hz	
			20 DSKA90-140	MDSKAXX090-22, f_N:140Hz	
			21 DFKA100-60	MDFKAXX100-22, f_N: 60Hz	
			22 DSKA100-80	MDSKAXX100-22, f_N: 80Hz	
			23 DFKA100-120	MDFKAXX100-22, f_N:120Hz	
			24 DSKA100-140	MDSKAXX100-22, f_N:140Hz	
			25 DFKA112-60	MDFKAXX112-22, f_N: 60Hz	
			26 DSKA112-85	MDSKAXX112-22, f_N: 85Hz	
			27 DFKA112-120	MDFKAXX112-22, f_N:120Hz	
				MDSKAXX112-22, f_N:140Hz	
			30 DFQA100-50	MDFQAXX100, f_N: 50 Hz	Lenze inverter motors, internally ventilated • The temperature monitoring via resolver or encoder cable is activated automatically, i.e.: C0583 = 0 C0584 = 2 C0594 = 0
			31 DFQA100-100	MDFQAXX100-22,f_N: 100Hz	
			32 DFQA112-28	MDFQAXX112-22,f_N: 28 Hz	
			33 DFQA112-58	MDFQAXX112-22,f_N: 58 Hz	
			34 DFQA132-20	MDFQAXX132-32,f_N: 20 Hz	
			35 DFQA132-42	MDFQAXX132-32,f_N: 42 Hz	
			40 DFQA112-50	MDFQAXX112-22,f_N: 50 Hz	
			41 DFQA112-100	MDFQAXX112-22,f_N: 100Hz	
			42 DFQA132-36	MDFQAXX132-32,f_N: 36 Hz	
			43 DFQA132-76	MDFQAXX132-32,f_N: 76 Hz	

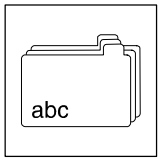


Code	LCD	Possible settings				IMPORTANT
		Lenze	Selection		Info	
			50	DSVA56-140	DSVAXX056-22, f_N: 140Hz	Lenze asynchronous servo motors without integrated temperature monitoring • The temperature monitoring via resolver or encoder cable is deactivated automatically, i.e.: C0583 = 3 C0584 = 3 C0594 = 3
			51	DFVA71-120	DFVAXX071-22, f_N: 120Hz	
			52	DSVA71-140	DSVAXX071-22, f_N: 140Hz	
			53	DFVA80-60	DFVAXX080-22, f_N: 60Hz	
			54	DSVA80-70	DSVAXX080-22, f_N: 70Hz	
			55	DFVA80-120	DFVAXX080-22, f_N: 120Hz	
			56	DSVA80-140	DSVAXX080-22, f_N: 140Hz	
			57	DFVA90-60	DFVAXX090-22, f_N: 60Hz	
			58	DSVA90-80	DSVAXX090-22, f_N: 80Hz	
			59	DFVA90-120	DFVAXX090-22, f_N: 120Hz	
			60	DSVA90-140	DSVAXX090-22, f_N: 140Hz	
			61	DFVA100-60	DFVAXX100-22, f_N: 60Hz	
			62	DSVA100-80	DSVAXX100-22, f_N: 80Hz	
			63	DFVA100-120	DFVAXX100-22, f_N: 120Hz	
			64	DSVA100-140	DSVAXX100-22, f_N: 140Hz	
			65	DFVA112-60	DFVAXX112-22, f_N: 60Hz	
			66	DSVA112-85	DSVAXX112-22, f_N: 85Hz	
			67	DFVA112-120	DFVAXX112-22, f_N: 120Hz	
			68	DSVA112-140	DSVAXX112-22, f_N: 140Hz	
			108	DSKS36-13-200	MDSKSXX036-13,f_N:200Hz	New generation Lenze synchronous servo motors 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
			109	DSKS36-23-200	MDSKSXX036-23,f_N:200Hz	
			110	DSKS56-23-150	DSKSXX056-23, f_N:150Hz	
			111	DSKS56-33-150	MDSKSXX056-33, f_N:150Hz	
			112	DSKS71-13-150	MDSKSXX071-13, f_N:150Hz	
			113	DFKS71-13-150	MDFKSXX071-13, f_N:150Hz	
			114	DSKS71-23-150	MDSKSXX071-23, f_N:150Hz	
			115	DFKS71-23-150	MDFKSXX071-23, f_N:150Hz	
			116	DSKS71-33-150	MDSKSXX071-33, f_N:150Hz	
			117	DFKS71-33-150	MDFKSXX071-33, f_N:150Hz	
			160	DSKS56-23-190	MDSKSXX56-23; f_N:190 Hz	
			161	DSKS56-33-200	MDSKSXX56-33; f_N:200 Hz	
			162	DSKS71-03-170	MDSKSXX71-03; f_N:170 Hz	
			163	DSKS71-03-165	MDSKSXX71-03; f_N:165 Hz	
			164	DSKS71-13-185	MDSKSXX71-13; f_N:185 Hz	
			165	DSKS71-13-180	MDSKSXX71-13; f_N:180 Hz	
			166	DSKS71-33-180	MDSKSXX71-33; f_N:180 Hz	
			167	DSKS71-33-175	MDSKSXX71-33; f_N:175 Hz	
			210	DXRA071-12-50	DXRAXX071-12, f_d: 50Hz	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
			211	DXRA071-22-50	DXRAXX071-22, f_d: 50Hz	
			212	DXRA080-12-50	DXRAXX080-12, f_d: 50Hz	
			214	DXRA090-12-50	DXRAXX090-12, f_d: 50Hz	
			215	DXRA090-32-50	DXRAXX090-32, f_d: 50Hz	
			216	DXRA100-22-50	DXRAXX100-22, f_d: 50Hz	
			217	DXRA100-32-50	DXRAXX100-32, f_d: 50Hz	
			218	DXRA112-12-50	DXRAXX112-12, f_d: 50Hz	
			219	DXRA132-12-50	DXRAXX132-12, f_d: 50Hz	
			220	DXRA132-22-50	DXRAXX132-22, f_d: 50Hz	
			221	DXRA160-12-50	DXRAXX160-12, f_d: 50Hz	
			222	DXRA160-22-50	DXRAXX160-22, f_d: 50Hz	
			223	DXRA180-12-50	DXRAXX180-12, f_d: 50Hz	
			224	DXRA180-22-50	DXRAXX180-22, f_d: 50Hz	

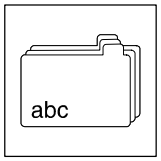


Appendix

Code	LCD	Possible settings			IMPORTANT
		Lenze	Selection	Info	
			225 30kW-ASM-50 226 37kW-ASM-50 227 45kW-ASM-50 228 55kW-ASM-50 229 75kW-ASM-50		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
			250 DXRA071-12-87 251 DXRA071-22-87 252 DXRA080-12-87 254 DXRA090-12-87 255 DXRA090-32-87 256 DXRA100-22-87 257 DXRA100-32-87 258 DXRA112-12-87 259 DXRA132-12-87 260 DXRA132-22-87 261 DXRA160-12-87 262 DXRA160-22-87 263 DXRA180-12-87 264 DXRA180-22-87 265 30kW-ASM-87 266 37kW-ASM-87 267 45kW-ASM-87 268 55kW-ASM-87 269 75kW-ASM-87	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	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
[C0087]	Mot speed	*	300 {1 rpm} 16000	Rated motor speed	* Depending on C0086 • Change of C0086 resets value to the assigned factory setting
[C0088]	Mot current	*	0.5 {0.1 A} 500.0	Rated motor current	* Depending on C0086 • Change of C0086 resets value to the assigned factory setting
[C0089]	Mot frequency	*	10 {1 Hz} 1000	Rated motor frequency	* Depending on C0086 • Change of C0086 resets value to the assigned factory setting
[C0090]	Mot voltage	*	50 {1 V} 500	Rated motor voltage	* Depending on C0086 • Change of C0086 resets value to the assigned factory setting
[C0091]	Mot cos phi	*	0.50 {0.01} 1.00	Motor cos φ	* Depending on C0086 • Change of C0086 resets value to the assigned factory setting
C0093	Drive ident		0 invalid 1 none 93xx 93xx	Controller identification Type of Lenze servo inverter	display only
C0094	Password	0	0 9999	Password	

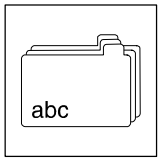


Code	LCD	Possible settings				IMPORTANT
		Lenze	Selection		Info	
[C0095]	Rotor pos adj	0	0 inactive 1 active		Rotor position adjustment of a synchronous motor	C0095 = 1 starts position adjustment
C0099	S/W version		x.xx		Software version	display only
C0101 1 2 ... 15	 add Tir add Tir ... add Tir	 0.000 0.000 ... 0.000	 0.000 {0.001 s}	999.900	Additional acceleration times T_{ir} for the main setpoint of NSET	Referred to speed change $0 \ldots n_{max.}$
C0103 1 2 ... 15	 add Tif add Tif ... add Tif	 0.000 0.000 ... 0.000	 0.000 {0.001 s}	999.900	Additional deceleration times T_{ir} for the main setpoint of NSET	Referred to speed change $0 \ldots n_{max.}$
C0105	QSP Tif	0.000	0.000 {0.001 s}	999.900	Deceleration time for quick stop (QSP)	Referred to speed change $0 \ldots n_{max.}$
C0108 1 2	 FCODE (gain) FCODE (gain)	 100.00 100.00	 -199.99 {0.01 %}	199.99	Freely assignable code for relative analog signals	
C0109 1 2	 FCODE (offset) FCODE (offset)	 0.00 0.00	 -199.99 {0.01 %}	199.99	Freely assignable code for relative analog signals	
C0114 1 2 3 4 5	 DIGIN 1 pol DIGIN 2 pol DIGIN 3 pol DIGIN 4 pol DIGIN 5 pol	 1 0 0 0 0	 0 HIGH active 1 LOW active		Terminal polarity X5/E1 X5/E2 X5/E3 X5/E4 X5/E5	
[C0116] 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 ... 31 32	 CFG: FDO-0 CFG: FDO-1 CFG: FDO-2 CFG: FDO-3 CFG: FDO-4 CFG: FDO-5 CFG: FDO-6 CFG: FDO-7 CFG: FDO-8 CFG: FDO-9 CFG: FDO-10 CFG: FDO-11 CFG: FDO-12 CFG: FDO-13 CFG: FDO-14 CFG: FDO-15 CFG: FDO-16 CFG: FDO-17 CFG: FDO-18 CFG: FDO-19 CFG: FDO-20 CFG: FDO-21 ... CFG: FDO CFG: FDO	 13203 13212 13214 13210 13211 13209 500 1000 13200 13202 13201 13204 13205 13206 13207 13208 13216 13213 13217 13218 13215 1000 ... 1000 1000	see selection list 2 RC-CSTAT RC-RINITOK RC-OUTSWIN RC-FPM RC-FCM RC-VLIM OCTRL-RDY FIXED 0 RC-LROK RC-GCSTAT RC-CMSTAT RC-RSGN RC-X0LIM RC-X1LIM RC-COFFLIM RC-MLIM1 RC-TRIMOK RC-WINOPEN RC-PMPULS RC-DVLIM RC-SCTR FIXED 0 ... FIXED 0 FIXED 0		Signal configuration FDO	Free digital outputs can only be evaluated when networked with automation interfaces.

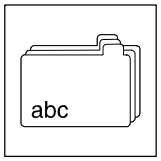


Appendix

Code	LCD	Possible settings			IMPORTANT
		Lenze	Selection	Info	
[C0117]		*	see selection list 2	Signal configuration DIGOUT	* depending on C0005
1	CFG: DIGOUT1	13203	RC-CSTAT	X5/A1	
2	CFG: DIGOUT2	13212	RC-RINITOK	X5/A2	
3	CFG: DIGOUT3	500	DCTRL-RDY	X5/A3	
4	CFG: DIGOUT4	13214	RC-OUTSWIN	X5/A4	
C0118				Terminal polarity DIGOUT	
1	DIGOUT 1 pol	1	0 High active	X5/A1	
2	DIGOUT 2 pol	1	1 Low active	X5/A2	
3	DIGOUT 3 pol	0		X5/A3	
4	DIGOUT 4 pol	0		X5/A4	
C0121	OH7 limit	150	45 {1 °C} 150	Temperature threshold for early warning motor temperature (OH7 fault)	
C0122	OH4 limit	85	45 {1 °C} 85	Temperature threshold for warning heat sink temperature (fault OH4)	
C0125	Baud rate	0	0 9600 baud 1 4800 baud 2 2400 baud 3 1200 baud 4 19200 baud	LECOM baud rate for 2102 module	
C0126	MONIT CE0	3	0 Trip 2 Warning 3 Off	Configuration communication error monitoring with automation interface CE0	
C0130	DIS: act Ti			active T_i times of NSET	• display only
			0 C12/C13	C0012/C0013 active	
			1 Ti 1	T_{ir1}/T_{if1} active	
			2 Ti 2	T_{ir2}/T_{if2} active	
			...	...	
			14 Ti 14	T_{ir14}/T_{if14} active	
			15 Ti 15	T_{ir15}/T_{if15} active	
C0134	RFG charac	0	0 linear 1 S-shaped	linear S-shaped	Ramp characteristic for setpoint
C0135	Control word	0	0 {1} 65535	Control word when networked with automation interfaces	Decimal control word • Device evaluates information 16 bit, binary coded
C0141	FCODE (setval)	0	-199.99 {0.01 %} 199.99	Freely assignable code for relative analog signals	used as main setpoint in the configurations C0005 = xxx1
C0142	Start options	1		Start options	is executed: • after mains connection • after indication (t > 0.5s) • after trip
			0 Start lock	0 = Start protection	
			1 Auto start	1 = automatic start	
C0150	Status word		0 {1} 65535	Status word when networked with automation interfaces	Decimal status word • display only • binäry interpretation indicates the bit states
C0151	DIS: FDO (DW)		output signals configured with C0116	Hexadecimal signal assignment of the free digital outputs.	• display only • binary interpretation indicates the bit states

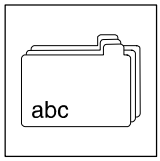


Code	LCD	Possible settings			IMPORTANT
		Lenze	Selection	Info	
C0155	Status word 2		0 {1} 65535	Status word 2	Extended decimal status word • display only • binäry interpretation indicates the bit states
[C0156]			see selection list 2	Configuration of the free bits of the status word	
1	CFG: STAT.B0	13215	RC-SCTR		
2	CFG: STAT.B2	13216	RC-TRIMOK		
3	CFG: STAT.B3	13213	RC-WINOPEN		
4	CFG: STAT.B4	13217	RC-PMPULS		
5	CFG: STAT.B5	13218	RC-DVLIM		
6	CFG: STAT.B14	10650	CMP1-OUT		
7	CFG: STAT.B15	500	DCTRL-RDY		
C0157				Status of the free bits of the status word	display only
1	DIS: STAT.B0		0 1		
2	DIS: STAT.B2				
3	DIS: STAT.B3				
4	DIS: STAT.B4				
5	DIS: STAT.B5				
6	DIS: STAT.B14				
7	DIS: STAT.B15				
C0161	Act trip		see selection list 10	momentary fault inciations (as under C0168/1)	display only All fault indications (see chapter 8.3)
C0167	Reset failmem	0	0 No reset 1 Reset	Clears the history buffer	
C0168			All fault indications	Faults occurred	History buffer • List of fault occurred • display only
1	Fail no. act		(see chapter 8.3)	now active	
2	Fail no. old1			last	
3	Fail no. old2			last but one	
4	Fail no. old3			last but two	
5	Fail no. old4			last but three	
6	Fail no. old5			last but four	
7	Fail no. old6			last but five	
8	Fail no. old7			last bus six	
C0169			corresponding mains switch-on time	Occurrence of the faults	History buffer • List of times when the faults have occurred under C0168 • referred to C0179 • display only
1	Failtime act			now active	
2	Failtime old1			last	
3	Failtime old2			last but one	
4	Failtime old3			last but two	
5	Failtime old4			last but three	
6	Failtime old5			last but four	
7	Failtime old6			last but five	
8	Failtime old7			last bus six	
C0170				Fault frequency	History buffer • List of how often the faults have occurred consecutively under C0168 • display only
1	Counter act			now active	
2	Counter old1			last	
3	Counter old2			last but one	
4	Counter old3			last but two	
5	Counter old4			last but three	
6	Counter old5			last but four	
7	Counter old6			last but five	
8	Counter old7			last bus six	

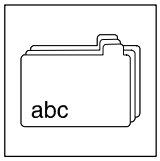


Appendix

Code	LCD	Possible settings			IMPORTANT
		Lenze	Selection	Info	
[C0172]	0V reduce	10V	0 10V 100V	Threshold to activate the brake torque reduction before OU fault	
[C0173]	UG limit	1		Adaptation of DC bus voltage thresholds	• check during commissioning and adapt, if necessary • all drive components in DC bus connections must have the same thresholds
			0 Mains<400V+-B	Operation on mains < 400 V with or without brake unit	
			1 Mains=400V+-B	Operation on 400 V mains with or without brake unit	
			2 Mains=460V+-B	Operation on 460 V mains with or without brake unit	
			3 Mains=480V-B	Operation on 480 V mains without brake unit	
			4 Mains=480V+B	Operation on 480 V mains with brake unit	
C0178	Op timer		0 {1 s} 4294967295	Elapsed operating time meter	Time when the controller was enabled
C0179	Mains timer		0 {1 s} 4294967295	Mains switch-on time meter	Time when the mains was switched on
C0182	Ti S-shaped	20.00	0.01 s {0.01 s} 50.00 s	T_i time of the S-shaped ramp generator for NSET	Determines the S-shape • small values ⇒ small S-rounding • high values ⇒ large S-rounding
C0183	Diagnostics			Drive diagnostics	• display only • indicates fault or status information • if several items or fault or status information are to be shown, the information with the smallest number is displayed
			0 OK	No fault	
			101 Init	Initialization phase	
			102 Trip	TRIP active	
			103 RFG P-OFF	Emergency stop was released	
			104 IMP Message	Message active	
			105 Power off		
			111 BSP C135		
			112 BSP AIF	Operation inhibited	
			113 BSP CAN		
			121 CINH term 28		
			122 CINH int 1	Controller inhibited via X5/28	
			123 CINH int 2	DCTRL-CINH1	
			124 CINH C135/STP	DCTRL-CINH2	
			125 CINH AIF	STOP key of 9371BB	
			126 CINH CAN	Controller inhibited via AIF	
			141 Lock mode	Controller inhibited via CAN	
				Restart protection active	
			142 IMP	Power outputs with high resistance	
			151 QSP ext term	QSP via MCTRL-QSP	
			152 QSP C135/STP	QSP via STOP key	
			153 QSP AIF	QSP via AIF	
			154 QSP CAN	QSP via CAN	
			250 Warning	Warning active	

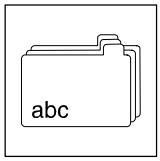


Code	LCD	Possible settings			IMPORTANT
		Lenze	Selection	Info	
C0190	NSET arit	0	0 OUT = C46 1 C46 + C49 2 C46 - C49 3 C46 * C49 4 C46 / C49 5 C46/(100 - C49)	Arithmetik block in the function block NSET	Connects main setpoint C0046 and additional setpoint C0049
C0195	BRK T act	99.9	0.0 {0.1 s} 99.9 99.9 s infinite	Brake engaging time	Engaging 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 disengaging time	Disengaging time of the mechanical holding brake (see technical data of the brake) • after the time elapsed under C0196, the status "mechanical brake open" is reached
C0200	S/W Id			Software identification	display only
C0201	S/W date			Software release date	display only
C0203	Komm.-No.	0	x / xxxx / xxxxx	Commission number	display only
C0204	Serial-No.	0	0 {1} 65535	Serial number	display only
C0220	NSET Tir add	0.000	0.000 {0.001 s} 999.900	Acceleration time T_{ir} of the additional setpoint for NSET	Referred to speed change $0 \ldots n_{max.}$
C0221	NSET Tif add	0.000	0.000 {0.001 s} 999.900	Deceleration time T_{if} of the additional setpoint for NSET	Referred to speed change $0 \ldots n_{max.}$
C0222	PCTRL Vp	1.0	0.1 {0.1} 500.0	Process controller gain V_p	
C0223	PCTRL Tn	400	20 {1 ms} 99999 99999 ms switched off	Process controller integral component T_n	
C0224	PCTRL Kd	0.0	0.0 {0.1} 5.0	Process controller differential component K_d	
C0241	NSET RFG I = O	1.00	0.00 {0.01 %} 100.00 100 % = n_{max}	Ramp generator threshold for main setpoint input = output	
C0244	BRK M set	0.00	0.00 {0.01 %} 100.00 100 % = value of C0057	Holding torque of the DC injection brake	
C0250	FCODE 1Bit				
C0252	phase offset	0	-245760000 {1 inc} 245760000	Phase offset for DFSET	Fixed phase offset for digital frequency configuration • 1 rev. = 65536 inc

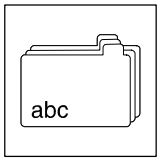


Appendix

Code	LCD	Possible settings			IMPORTANT
		Lenze	Selection	Info	
C0253	Angle n-trim	*	-32767 {1 inc} 32767	Phase trimming for DFSET	speed-dependent phase trimming * depending on C0005, C0025, C0490 • Change of C0005, C0025, or C0490 resets C0253 to the factory setting • 1 rev. = 65536 inc • C0253 is achieved at 15000 rpm
C0254	Vp angle-CTRL	0.40	0.0000{0.0001} 3.9999	V_p Phase controller in MCTRL	
C0255	Threshold P03	327680	10 {1 inc} $18 \cdot 10^8$	Contouring error limit	Contouring error limit for fault P03 • 1 rev. = 65536 inc • Contouring error > C0255 releases fault "P03"

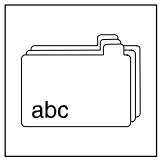


Code	LCD	Possible settings					IMPORTANT
		Lenze	Selection			Info	
C0260	MPOT1 high	100.00	-199.99	{0.01 %}	199.99	Upper limit of motor potentiometer	mandatory • C0260 > C0261
C0261	MPOT1 low	-100.0	-199.99	{0.01 %}	199.99	Lower limit of motor potentiometer	mandatory • C0261 < C0260
C0262	MPOT1 Tir	10.0	0.1	{0.1 s}	6000.0	Acceleration time of motor pot T_{ir}	Referred to a change 0…100 %
C0263	MPOT1 Tif	10.0	0.1	{0.1 s}	6000.0	Deceleration time of motor pot T_{if}	Referred to a change 0…100 %
C0264	MPOT1 on/off	0				Deactivation function of motor pot	• Function which is executed when motor pot is deactivated via the input MPOT1-INACTIVE.
			0	No function		no change	
			1	Down to 0%		Deceleration with T_{if} to 0%	
			2	Down to C261		Deceleration with T_{if} to C0261	
			3	Jump 0%		Jump with T_{if} = 0 to 0%	
			4	Jump to C261		Jump with T_{if} = 0 to C0261	
			5	Up to C260		Acceleration with T_{ir} to C0260	
C0265	MPOT1 init	0				Initialization function of motor pot	• Value which is accepted during mains switching and activated motor pot.
			0	Power off		Value during mains failure	
			1	C261		lower limit of C0261	
			2	0%		0 %	
[C0267]			see selection list 2			Configuration of the digital inputs of motor pot MPOT1	
1	CFG: UP	1000	FIXED 0			Digital input acceleration	
2	CFG: DOWN	1000	FIXED 0			Digital input deceleration	
[C0268]	CFG: INACT		see selection list 2			Configuration of the motor pot input MPOT1-INACTIVE	
		1000	FIXED 0				
C0269						Input signals motor potentiometer	display only
1	DIS: UP						
2	DIS: DOWN						
3	DIS: INACTIVE						
C0291	SSC override	0	0	{1 rpm}	16000	Override frequency for the transition from sensorless control to controlled operation	
C0292	SSC Im set	0	0	{0.01 A}	500.00	Setpoint of motor current	For sensorless control, set approx. 100% to 110% of the rated motor current.
C0293	SSC dynamic	0	0.00	{0.01 %}	199.00	Dynamic constant	dynamisch motor current boost
C0294	Vp frq	*	0.0	{0.1}	99.9	Proportional gain frequency controller	Factory setting depends on C0086
C0295	Tn frq	*	2	{1}	20000	Adjustment time frequency controller	
C0296	Dynamic const	100	0	{1}	32767	Dynamic constant	
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})	

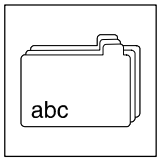


Appendix

Code	LCD	Possible settings			IMPORTANT
		Lenze	Selection	Info	
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_{set2}	Set speed threshold of the process controller adaptation mandatory • C0328 < C0327
C0329	Adapt on/off	0	0 no 1 Extern Vp 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}	Referred to setpoint change 0…100 %
C0333	PCTRL Tif	0.000	0.000 {0.001 s} 999.900	Process controller deceleration time T_{ir}	Referred to setpoint change 0…100 %
C0336	DIS: act Vp		0.0 {0.1} 500.0	Process controller momentary V_p	display only
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] 1 2	 CFG: IN1 CFG: IN2	 1000 1000	see selection list 1 FIXED 0 % FIXED 0 %	Configuration arithmetic block ARIT1	
C0340 1 2	 DIS: IN DIS: IN	0.00	-199.99 {0.01} +199.99	Input signals arithmetic block ARIT1	display only
[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	
[C0352]	CAN mst	0	0 Slave 1 Master	Install CAN bus master operation	
C0353 1 2 3	 CAN addr sel1 CAN addr sel2 CAN addr sel3	 0 0 0	 0 C350 1 C354	Source for CAN bus IN/OUT addresses	

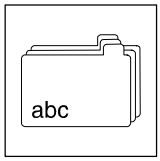


Code	LCD	Possible settings					IMPORTANT
		Lenze	Selection			Info	
C0354						CAN bus IN/OUT node addresses	
1	IN1 addr2	129	1	{1}	512		
2	OUT1 addr2	1					
3	IN2 addr2	257					
4	OUT2 addr2	258					
5	IN3 addr2	385					
6	OUT3 addr2	386					
C0355						CAN bus identifier	display only
1	CAN-IN1 Id		0	{1}	2047		
2	CAN-OUT1 Id						
3	CAN-IN2 Id						
4	CAN-OUT2 Id						
5	CAN-IN3 Id						
6	CAN-OUT3 Id						
C0356						CAN bus time settings	
1	CAN boot up	3000	0	{1 ms}	65000		
2	CAN-OUT2 Cycle	10					
3	CAN-OUT3 Cycle	10					
4	CAN delay	20					
[C0357]						CAN bus monitoring time for I_{Nx}	
1	CE1monit time	3000	0	{1 ms}	65000		
2	CE2monit time	3000					
3	CE3monit time	3000					
C0358	Reset node	0	0	no function		Install CAN bus reset node	
			1	CAN reset			
C0359	CAN state	0				CAN bus status:	display only
			0	Operational			
			1	Pre-Operat			
			2	Warning			
			3	Bus off			
C0360			0	{1}	65535	Telegram counter (number of telegrams)	display only • for values > 65535, the counting restarts with 0
1	Message OUT					1. all sent	
2	Message IN					2. all received	
3	Message OUT1					3. sent to CAN-OUT1	
4	Message OUT2					4. sent to CAN-OUT2	
5	Message OUT3					5. sent to CAN-OUT3	
6	Message POUT1					6. sent to parameter channel1	
7	Message POUT2					7. sent to parameter channel1	
8	Message IN1					8. received from CAN-IN1	
9	Message IN2					9. received from CAN-IN2	
10	Message IN3					10. received from CAN-IN3	
11	Message PIN1					11. received from parameter channel1	
12	Message PIN2					12. received from parameter channel1	

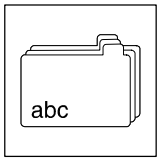


Appendix

Code	LCD	Possible settings			IMPORTANT
		Lenze	Selection	Info	
C0361			0 {1 %} 100	CAN bus load	• display only • To ensure perfect operation, the total bus load (all connected devices) should be less than 80%
1	Load OUT			1. all sent	
2	Load IN			2. all received	
3	Load OUT1			3. sent to CAN-OUT1	
4	Load OUT2			4. sent to CAN-OUT2	
5	Load OUT3			5. sent to CAN-OUT3	
6	Load POUT1			6. sent to parameter channel1	
7	Load POUT2			7. sent to parameter channel1	
8	Load IN1			8. received from CAN-IN1	
9	Load IN2			9. received from CAN-IN2	
10	Load IN3			10. received from CAN-IN3	
11	Load PIN1			11. received from parameter channel1	
12	Load PIN2			12. received from parameter channel1	
C0364	CFG:CAN activ	1000	see selection list 2 FIXED 0	Activate process data externally	change from pre-operational to operational
C0365	DIS:CAN activ		0 1	Input signal CAN active	display only

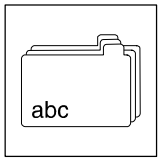


Code	LCD	Possible settings				IMPORTANT
		Lenze	Selection		Info	
C0400	DIS: OUT		-199.99	{0,01 %} 199.99	Output of AIN1	display only
[C0402]	CFG: OFFSET	19502	see selection list 1 FCODE-26/1		Configuration offset of AIN1	
[C0403]	CFG: GAIN	19504	see selection list 1 FCODE-27/1		Configuration gain of AIN1	
C0404 1 2	 DIS: OFFSET DIS: GAIN		-199.99	{0.01 %} 199.99	Input signals of AIN1	display only
C0405	DIS: OUT		-199.99	{1 %} 199.99	Output of AIN2	display only
[C0407]	CFG: OFFSET	19503	see selection list 1 FCODE-26/2		Configuration offset of AIN2	
[C0408]	CFG: GAIN	19505	see selection list 1 FCODE-27/2		Configuration gain of AIN2	
C0409 1 2	 DIS: OFFSET DIS: GAIN		-199.99	{0.01 %} 199.99	Input signals of AIN2	display only
[C0416]	Resolver adj	0	0	{1} 99999999	Correction of the resolver error	for Lenze motors • Read resolver error from the nameplate
[C0420]	Encoder const	512	256	{1 inc/rev} 8192	Encoder constant for encoder input X8 in increments per revolution	
[C0421]	Encoder volt	5,00	5,00	{0.1V} 8,00	Set supply voltage for the encoder used	CAUTION: incorrect input may destroy the encoder
C0425	DFIN const	6	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	
C0426	DIS: OUT		-32767	{1 rpm} 32767	Output signal of DFIN	display only
C0427	DFIN function	0	0 2-phase 1 A puls / B dir 2 Puls A or B		Type of the digital frequency signal 0 = Quadrature 1 = Pulse / Direction 2 = Pulse A / Pulse B	
C0429	TP5 delay	0	-32767	{1 incr} 32767	Dead time compensation for the TP function of DFSET and DFRFG	
[C0431]	CFG: IN	5001	see selection list 1 MCTRL-NACT		Configuration input of AOUT1	
[C0432]	CFG: OFFSET	19512	see selection list 1 FCODE-109/1		Configuration offset of AOUT1	
[C0433]	CFG: GAIN	19510	see selection list 1 FCODE-108/1		Configuration gain of AOUT1	
C0434 1 2 3	 DIS: IN DIS: OFFSET DIS: GAIN		-199.99	{0.01 %} 199.99	Input signals of AOUT1	display only
[C0436]	CFG: IN	5002	see selection list 1 MCTRL-MSET2		Configuration input of AOUT2	
[C0437]	CFG: OFFSET	19513	see selection list 1 FCODE-109/2		Configuration offset of AOUT2	

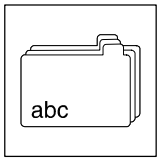


Appendix

Code	LCD	Possible settings			IMPORTANT
		Lenze	Selection	Info	
[C0438]	CFG: GAIN	19511	see selection list 1 FCODE-108/2	Configuration gain of AOUT2	
C0439 1 2 3	 DIS: IN DIS: OFFSET DIS: GAIN		 -199.99 {0.01 %} 199.99	Input signals of AOUT2	display only
[C0440]	CFG: STATE-BUS	1000	see selection list 2	Configuration state bus X5/ST	
C0441	DIS: STATE-BUS			Monitoring signal State bus	display only
C0443	DIS: DIGIN-OUT		0 {1} 255	Signals at X5/E1 to X5/E5 decimal value	display only • Binary interpretation indicates terminal signals
C0444 1 2 3 4	 DIS: DIGOUT1 DIS: DIGOUT2 DIS: DIGOUT3 DIS: DIGOUT4		 0 1	Signals at X5/A1 to X5/A4	display only
[C0450]	CFG: NX	1000	see selection list 1 FIXED 0 %	Configuration analog input of BRK1	
[C0451]	CFG: ON	1000	see selection list 2 FIXED 0	Configuration digital input of BRK1	
[C0452]	CFG: SIGN	1000	see selection list 1 FIXED 0 %	Configuration analog input of BRK1	
C0458 1 2	 DIS: NX DIS: SIGN		 -199.99 {0.01 %} 199.99	Analog input signals of BRK1	display only
C0459	DIS: ON			Digital input signal of BRK1	display only
C0464	Customer I/F		0 original 1 changed	Status of selected base configuration	display only • Reassignment of terminals in a base 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 base configuration of C0005 sets C0005 = 0 and C0464 = 1

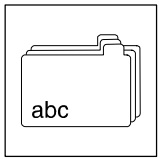


Code	LCD	Possible settings			IMPORTANT
		Lenze	Selection	Info	
[C0465]		*	See selection list 5	Processing sequence list of function blocks Contained in the program of signal processing (sequence in which the function blocks are processed)	* Depending on C0005 Change of C0005 loads assigned processing list * Valid for C0005 = 1000 • After changing the signal flow adapt 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.
1	FB list	-200	DIGIN		
2	FB list	0			
3	FB list	0			
4	FB list	0			
5	FB list	10560	OR3		
6	FB list	10565	OR4		
7	FB list	10570	OR5		
8	FB list	0			
9	FB list	0			
10	FB list	0			
11	FB list	0			
12	FB list	0			
13	FB list	0			
14	FB list	0			
15	FB list	13200	RC		
16	FB list	0			
...	...	0			
19	FB list	0			
...	...	10655	CMP2		
22	FB list	10500	AND1		
...	...	0			
25	FB list	5650	ASW1		
...	...	0			
28	FB list	0			
...	...	0			
30	FB list	13000	FEV-AN1		
31	FB list	6230	CONVPHA1		
32	FB list	13005	FEV-AN2		
33	FB list	0			
35	FB list	5700	ANEG1		
36	FB list	10650	CMP1		
40	FB list	70	AOUT1		
41	FB list	75	AOUT2		
42	FB list	2000	CAN-OUT		
C0466	CPU T remain			Residual process time for the processing of function blocks	display only
[C0469]	Fct STP key	2		Function of the STOP key of the operating module	Function is activated when pressing the STOP key.
			0 inactive	Deactivated	
			1 CINH	Controller inhibit	
			2 QSP	Quick stop	
C0470				Freely assignable code for digital signals	The data words C0470 and C0471 are in parallel and are identical
1	FCODE bit 0-7	0	0 {1} 255		
2	FCODE bit8-15	0			
3	FCODE bit 16-23	0			
4	FCODE bit 24-31	0			
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

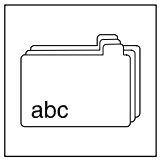


Appendix

Code	LCD	Possible settings					IMPORTANT
		Lenze	Selection			Info	
C0472						Freely assignable code for relative analog signals	
1	FCODE analog	0.00	-199.99	{0.01 %}	199.99		
2	FCODE analog	0.00					
3	FCODE analog	100.00					
6	FCODE analog	100.00					
...	...	...					
19	FCODE analog	0.00					
20	FCODE analog	0.00					
C0473						Freely assignable code for absolute analog signals	
1	FCODE abs	0	-32767	{1}	32767		
2	FCODE abs	4608					
3	FCODE abs	0					
4	FCODE abs	500					
...	...	...					
9	FCODE abs	0					
10	FCODE abs	0					
C0474						Freely assignable code for phase signals	1 rev. = 65536 inc
1	FCODE PH	2304	$-2 \cdot 10^9$	{1}	$2 \cdot 10^9$		
2	FCODE PH	0					
C0475						Freely assignable code for phase difference signals	1 rev. = 65536 inc
1	FCODE DF	0	-16000	{1rpm}	16000		
2	FCODE DF	0					
[C0490]	Feedback pos	0				Feedback system for position controller	• C0490 = 0, 1, 2 can be mixed with C0495 = 0, 1, 2 • C0490 = 3, 4 also sets C0495 to the same value
			0	Resolver		Resolver at X7	
			1	Encoder TTL		Encoder TTL at X8	
			2	Encoder sin		sin/cos encoder at X8	
			3	Absolut ST		Absolute value encoder single-turn at X8	
			4	Absolut MT		Absolute value encoder multi-turn at X8	
[C0495]	Feedback n	0				Feedback system for the speed controller	• C0495 = 0, 1, 2 can be mixed with C0490 = 0, 1, 2 • C0495 = 3, 4 also sets C0490 to the same value
			0	Resolver		Resolver at X7	
			1	Encoder TTL		Encoder TTL at X8	
			2	Encoder sin		sin/cos encoder at X8	
			3	Absolut ST		Absolute value encoder ST at X8	
			4	Absolut MT		Absolute value encoder MT at X8	
C0497	Nact-filter	2.0	0.0	{0.1 ms}	50.0	Time constant actual speed	
			0 ms	switched off			

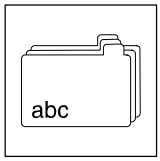


Code	LCD	Possible settings				IMPORTANT
		Lenze	Selection		Info	
[C0517]			0 {1} 199900		User menu with up to 32 entries	• Under the subcodes the numbers of the desired codes are entered. • The input is done in the format xxx.yy - xxx: Code number - yy: Subcode for code • It is not checked whether the entered code exists.
1	User menu	51	C0051/0	MCTRL-NACT		
2	User menu	1308	C1308/0	Cut format		
3	User menu	1309	C1309/0	Print format		
4	User menu	1310	C1310/0	RPTRIM		
5	User menu	1311	C13011/0	RVTRIM		
6	User menu	1314	C1314/0	Reg. setpoint		
7	User menu	1336	C1336/0	Reg. prepos.		
8	User menu	1375	C1375/0	DIS: DXA		
9	User menu	1387	C1387/0	DIS: XMCTR		
10	User menu	1384	C1384/0	DIS: X0-OFFS		
11	User menu	1365	C1365/0	DIS: RC-STAT		
12	User menu	1382.2	C1382/2	DIS: RC-DXP		
13	User menu	1383.2	C1383/2	DIS: RC-DXQ		
14	User menu	54	C54	I_{mot}		
15	User menu	183	C183	Diagnostics		
16	User menu	168.1	C168/1	Fail no. act.		
[C0520]	CFG: IN		See selection list 4		Configuration input of DFSET	
		1000	FIXEDPHI-0			
[C0521]	CFG: VP-DIV		see selection list 1		Configuration gain factor numerator of DFSET	
		1000	FIXED 0 %			
[C0522]	CFG: RAT-DIV		see selection list 1		Configuration gearbox factor numerator of DFSET	
		1000	FIXED 0 %			
[C0523]	CFG: A-TRIM		see selection list 1		Configuration phase trimming of DFSET	
		1000	FIXED 0 %			
[C0524]	CFG: N-TRIM		see selection list 1		Configuration speed trimming of DFSET	
		1000	FIXED 0 %			
[C0525]	CFG: 0-PULSE		see selection list 2		Configuration one-time zero pulse is activation of DFSET	
		1000	FIXED 0			
[C0526]	CFG: RESET		see selection list 2		Configuration reset integrators of DFSET	
		1000	FIXED 0			
[C0527]	CFG: SET		see selection list 2		Configuration set integrators of DFSET	
		1000	FIXED 0			
C0528						display only
1	DIS: 0-pulse A		$-2 \cdot 10^9$ {1 inc}	$2 \cdot 10^9$	Phase difference between two zero pulses	
2	DIS: Offset				Offset of C0523*C0529 + C0252	
C0529	Multip offset	1	-20000 {1}	20000	Offset multiplier	
C0530	DF evaluation	1	0 with g factor 1 without g factor		Evaluation of the setpoint integrator of DFSET (with/without gearbox factor)	Evaluation of the setpoint integrator of DFSET
C0531	Act 0 div	1	1 {1}	16384	Actual zero pulse divider of DFSET	
C0532	0-pulse/TP	1	1 0-pulse 2 Touch probe		Selection zero pulse of the feedback system or touch probe for DFSET	
C0533	Vp denom	1	1 {1}	32767	Gain factor denominator of DFSET	

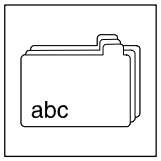


Appendix

Code	LCD	Possible settings			IMPORTANT
		Lenze	Selection	Info	
C0534	0-pulse fct	0	0 Inactive 1 Continuous + 2 Continuous - 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	
C0536 1 2 3	 DIS: VP-DIV DIS: RAT-DIV DIS: A-TRIM		 -32767 {1} 32767	Absolute analog input signals of DFSET	display only
C0537	DIS: N-TRIM		-199.99 {0.01 %} 199.99	Relative analog input signal of DFSET	display only
C0538 1 2 3	 DIS: 0-PULSE DIS: RESET DIS: SET			Digital input signals of DFSET	display only
C0539	DIS: IN		-32767 {1 rpm} 32767	Input signal of DFSET	display only
[C0540]	Function	4	0 Analog input	Analog input	
			1 PH diff input	Phase difference input	X9 is inhibited if 0, 1, 2 or 3 was selected
			2 Res + int 0	Resolver simulation + zero pulse	
			3 Res + ext 0	Resolver simulation without zero pulse	
			4 OUT = DFIN	X9 is output on X10	The input signals get a gain
			5 OUT = encoder	X8 is output on X10	
[C0541]	CFG: AN-IN	1000	see selection list 1 MCTRL-NACT	Configuration analog input of DFOUT	
[C0542]	CFG: DF-IN	50	See selection list 4 FIXEDPHI 0	Configuration digital frequency input of DFOUT	
[C0544]	CFG: SYN-RDY	1000	see selection list 2 FIXED 0	Configuration synchronization signal for the zero pulse of DFOUT	
C0545	PH offset	0	0 {1 inc} 65535	Phase offset of DFOUT	1 rev. = 65535 inc
C0546	Min inc/rev	1000	1 {1 inc} 2147483647		1 rev. = 65535 inc
C0547	DIS: AN-IN		-199.99 {0.01 %} 199.99	Relative analog input signal of DFOUT	display only
C0548	DIS: SYN-RDY			Digital input signal of DFOUT	display only
C0549	DIS: DF-IN		-32767 {1 rpm} 32767	Absolute analog input signal of DFOUT	display only
[C0570]	CFG: IN	1000	see selection list 1 FIXED 0 %	Configuration analog input of S&H1	
[C0571]	CFG: LOAD	1000	see selection list 2 FIXED 0	Configuration digital input of S&H1	
C0572	DIS: IN		-199.99 {0.01 %} 199.99	Analog input signal of S&H1	display only
C0573	DIS: LOAD			Digital input signal of S&H1	display only
C0577	Vp fld weak	3.00	0.00 {0.01 ms} 15.99	Field weakening controller gain V_p	
C0578	Tn fld weak	50.0	2.0 {0.5 ms} 8192.0 8000 ms switched off	Field weakening controller integration time constant Tn	

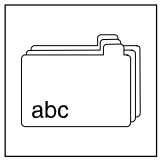


Code	LCD	Possible settings				IMPORTANT
		Lenze	Selection		Info	
C0581	MONIT EEr	0	0 Trip 1 Message 2 Warning 3 Off		Configuration monitoring EEr (external fault)	
C0582	MONIT OH4	2	2 Warning 3 Off		Configuration monitoring OH4 (heat sink temperature)	
C0583	MONIT OH3	*	0 Trip 3 Off		Configuration monitoring OH3 (motor temperature fixed)	* Depending on C0086
C0584	MONIT OH7	*	2 Warning 3 Off		Configuration monitoring OH7 (motor temperature adjustable)	* Depending on C0086 Temperature monitoring via resolver input
C0585	MONIT OH8	3	0 Trip 2 Warning 3 Off		Configuration monitoring OH8 (motor temperature adjustable)	Temperature monitoring via PTC input
C0586	MONIT SD2	0	0 Trip 2 Warning 3 Off		Configuration monitoring SD2 (resolver)	
C0587	MONIT SD3	3	0 Trip 2 Warning 3 Off		Configuration monitoring SD3 (encoder at X9)	
C0588	MONIT H10/H11	0	0 Trip 3 Off		Configuration monitoring H10 and H11 (thermal sensors in the controller)	
C0589	MONIT P03	2	0 Trip 2 Warning 3 Off		Configuration monitoring P03 (contouring error)	
C0590	MONIT P13	0	0 Trip 2 Warning 3 Off		Configuration monitoring P13 (phase error)	
C0591	MONIT CE1	3	0 Trip 2 Warning 3 Off		Configuration monitoring CE1 (CAN-IN1 fault)	
C0592	MONIT CE2	3	0 Trip 2 Warning 3 Off		Configuration monitoring CE2 (CAN-IN2 fault)	
C0593	MONIT CE3	3	0 Trip 2 Warning 3 Off		Configuration monitoring CE3 (CAN-IN3 fault)	
C0594	MONIT SD6	*	0 Trip 2 Warning 3 Off		Configuration monitoring SD6 (motor temperature sensor)	* Depending on C0086
C0595	MONIT CE4	3	0 Trip 2 Warning 3 Off		Configuration monitoring CE4 (CAN bus off)	
C0596	Nmax limit	5500	0	{1 rpm} 16000	Monitoring: Speed of the machine	
C0597	MONIT LP1	3	0 Trip 2 Warning 3 Off		Configuration monitoring motor phase failure	
C0598	MONIT SD5	3	0 Trip 2 Warning 3 Off		Configuration monitoring master current at X5/1.2 < 2mA	
C0599	Limit LP1	5.0	1.0	{0.1} 10.0	Current limit for the motor phase failure monitoring	

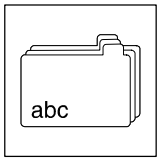


Appendix

Code	LCD	Possible settings				IMPORTANT
		Lenze	Selection		Info	
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]			see selection list 1		Configuration analog inputs of ARIT2	
1	CFG: IN	1000	FIXED 0 %			
2	CFG: IN	1000	FIXED 0 %			
C0602					Analog input signals of ARIT2	display only
1	DIS: IN		-199.99	{0.01 %} 199.99		
2	DIS: IN					
[C0610]			see selection list 1		Configuration analog inputs of adding block ADD1	Adds inputs IN1, IN2 and IN3
1	CFG: IN	1000	FIXED 0 %			
2	CFG: IN	1000	FIXED 0 %			
3	CFG: IN	1000	FIXED 0 %			
C0611					Analog input signals of ADD1	display only
1	DIS: IN		-199.99	{0.01 %} 199.99		
2	DIS: IN					
3	DIS: IN					
C0620	DB1 gain	1.00	-10.00	{0.01} 10.00	Gain dead band component DB1	
C0621	DB1 value	1.00	0.00	{0.01 %} 100.00	Dead band of DB1	
[C0622]	CFG: IN		see selection list 1		Configuration analog input of DB1	
		1000	FIXED 0 %			
C0623	DIS: IN		-199.99	{0.01 %} 199.99	Analog input signal of DB1	display only
C0630	Max limit	100.00	-199.99	{0.01 %} 199.99	Upper limit of limiter LIM1	
C0631	Min limit	-100.0	-199.99	{0.01 %} 199.99	Lower limit of limiter LIM1	
[C0632]	CFG: IN		see selection list 1		Configuration analog input of LIM1	
		1000	FIXED 0 %			
C0633	DIS: IN		-199.99	{0.01 %} 199.99	Analog input signal of LIM1	display only
C0640	Delay T	20.00	0.01	{0.01 s} 50.00	Time constant of the PT1-1 component	
[C0641]	CFG: IN		see selection list 1		Configuration analog input of PT1-1	
		1000	FIXED 0 %			
C0642	DIS: IN		-199.99	{0.01 %} 199.99	Analog input signal of PT1-1	display only
C0650	DT1-1 gain	1.00	-320.00	{0.01} 320.00	Gain of DT1-1 component	
C0651	Delay T	1.00	0.005	{0.01 s} 5.000	Time constant of DT1-1	
[C0652]	CFG: IN		see selection list 1		Configuration analog input of DT1-1	
		1000	FIXED 0 %			
C0653	Sensibility	1	1 15-bit 2 14-bit 3 13-bit 4 12-bit 5 11-bit 6 10-bit 7 9-bit		Input sensitivity of DT1-1	
C0654	DIS: IN		-199.99	{0.01 %} 199.99	Analog input signal of DT1-1	display only
C0655	Numerator	1	-32767	{1} 32767	Numerator for CONV5	
C0656	Denominator	1	1	{1} 32767	Denominator for CONV5	
[C0657]	CFG: IN		see selection list 1		Configuration analog input of CONV5	
		1000	FIXED 0 %			
C0658	DIS: IN		-199.99	{0.01 %} 199.99	Analog input signal of CONV5	display only
[C0661]	CFG: IN		see selection list 1		Configuration analog input absolute-value generator ABS1	
		1000	FIXED 0 %			



Code	LCD	Possible settings					IMPORTANT
		Lenze	Selection			Info	
C0662	DIS: IN		-199.99	{0.01 %}	199.99	Analog input signal of ABS1	display only
C0671	RFG1 Tir	0.000	0.000	{0.01 s}	999.900	Acceleration time T_{ir} of ramp generator RFG1	
C0672	RFG1 Tif	0.000	0.000	{0.01 s}	999.900	Deceleration time T_{if} of RFG1	
[C0673]	CFG: IN	1000	see selection list 1 FIXED 0 %			Configuration analog input of RFG1	
[C0674]	CFG: SET	1000	see selection list 1 FIXED 0 %			Configuration set input of RFG1	
[C0675]	CFG: LOAD	1000	see selection list 2 FIXED 0			Configuration digital input of RFG1	
C0676 1 2	 DIS: IN DIS: SET		-199.99	{0.01 %}	199.99	Analog input signals of RFG1	display only
C0677	DIS: LOAD					Digital input signal of RFG1	display only
C0680	Function	6	1 IN1 = IN 2 2 IN 1 > IN2 3 IN 1 < IN2 4 |IN1| = |IN2| 5 |IN1| > |IN2| 6 |IN1| < |IN2|			Function comparator CMP1	Compares the inputs IN1 and IN2
C0681	Hysteresis	1.00	0.00	{0.01 %}	100.00	Hysteresis of CMP1	
C0682	Window	1.00	0.00	{0.01 %}	100.00	Window of CMP1	
[C0683] 1 2	 CFG: IN CFG: IN	 5001 19500	see selection list 1 MCTRL-NACT FCODE-17			Configuration analog input of CMP1	
C0684 1 2	 DIS: IN DIS: IN		-199.99	{0.01 %}	199.99	Analog input signals of CMP1	display only
C0685	Function	5	1 IN1 = IN 2 2 IN 1 > IN2 3 IN 1 < IN2 4 |IN1| = |IN2| 5 |IN1| > |IN2| 6 |IN1| < |IN2|			Function comparator CMP2	Compares the inputs IN1 and IN2
C0686	Hysteresis	1.00	0.00	{0.01 %}	100.00	Hysteresis of CMP2	
C0687	Window	1.00	0.00	{0.01 %}	100.00	Window of CMP2	
[C0688] 1 2	 CFG: IN CFG: IN	 1000 1000	see selection list 1 FIXED 0% FIXED 0%			Configuration analog inputs of CMP2	
C0689 1 2	 DIS: IN DIS: IN		-199.99	{0.01 %}	199.99	Analog input signals of CMP2	display only
C0690	Function	1	1 IN1 = IN 2 2 IN 1 > IN2 3 IN 1 < IN2 4 |IN1| = |IN2| 5 |IN1| > |IN2| 6 |IN1| < |IN2|			Function comparator CMP3	Compares the inputs IN1 and IN2
C0691	Hysteresis	1.00	0.00	{0.01 %}	100.00	Hysteresis of CMP3	
C0692	Window	1.00	0.00	{0.01 %}	100.00	Window of CMP3	
[C0693] 1 2	 CFG: IN CFG: IN	 1000 1000	see selection list 1 FIXED 0% FIXED 0%			Configuration analog inputs of CMP3	



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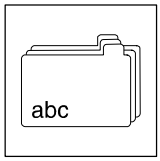
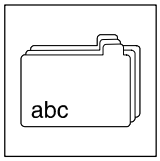
Code	LCD	Possible settings			IMPORTANT
		Lenze	Selection	Info	
C0694 1 2	 DIS: IN DIS: IN		 -199.99 {0.01 %} 199.99	Analog input signals of CMP3	display only
C0695	Function	2	1 IN 1 < IN2 2 |IN1| < |IN2|	Function comparator for phase signals PHCMP1	Compares the inputs IN1 and IN2
[C0697] 1 2	 CFG: IN CFG: IN	 1000 1000	See selection list 3 FIXED 0INC FIXED 0INC	Configuration phase inputs of PHCMP1	
C0698 1 2	 DIS: IN DIS: IN		 -2147483647 {1} 2147483647	Phase input signals of PHCMP1	display only
[C0700]	CFG: IN	 19523	see selection list 1 FCODE-472/3	Configuration input of von ANEG1	
C0701	DIS: IN		-199.99 {0.01 %} 199.99	Input signal of ANEG1	display only
[C0703]	CFG: IN	 1000	see selection list 1 FIXED 0 %	Configuration input of ANEG2	
C0704	DIS: IN		-199.99 {0.01 %} 199.99	Input signal ANEG2	display only
C0710	Function	0	0 Rising trans 1 Falling trans 2 Both trans	Function edge evaluation TRANS1	
C0711	Pulse T	0.001	0.001 {0.001 s} 60.000	Pulse time of TRANS1	
[C0713]	CFG: IN	 1000	see selection list 2 FIXED 0	Configuration digital input of TRANS1	
C0714	DIS: IN			Digital input signal of TRANS1	display only
C0715	Function	0	0 Rising trans 1 Falling trans 2 Both trans	Function edge evaluation TRANS2	
C0716	Pulse T	0.001	0.001 {0.001 s} 60.000	Pulse time of TRANS2	
[C0718]	CFG: IN	 1000	see selection list 2 FIXED 0	Configuration digital input of TRANS2	
C0719	DIS: IN			Digital input signal of TRANS2	display only
C0720	Function	2	0 On delay 1 Off delay 2 On/Off delay	Function digital delay component DIGDEL1	
C0721	Delay T	1.000	0.001 {0.001 s} 60.000	Delay time of DIGDEL1	
[C0723]	CFG: IN	 1000	see selection list 2 FIXED 0	Configuration digital input of DIGDEL1	
C0724	DIS: IN			Digital input signal of DIGDEL1	display only
C0725	Function	2	0 On delay 1 Off delay 2 On/Off delay	Function digital delay component DIGDEL2	
C0726	Delay T	1.0	0.001 {0.001 s} 60.000	Delay time of DIGDEL2	
[C0728]	CFG: IN	 1000	see selection list 2 FIXED 0	Configuration digital input of DIGDEL2	
C0729	DIS: IN			Digital input signal of DIGDEL2	display only

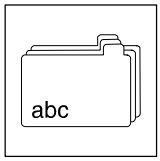


Code	LCD	Possible settings			IMPORTANT
		Lenze	Selection	Info	
C0750	Vp denom	16	1 Gain = 1 2 Gain = 1/2 4 Gain = 1/4 8 Gain = 1/8 16 Gain = 1/16 32 Gain = 1/32 64 Gain = 1/64 128 Gain = 1/128 256 Gain = 1/256 512 Gain = 1/512 1024 Gain = 1/1024 2048 Gain = 1/2048 4096 Gain = 1/4096 8192 Gain = 1/8192 16384 Gain = 1/16384	Denominator gain of position controller of DFRFG1	
C0751	DFRFG1 Tir	1.000	0.000 {0.001 s} 999.90 0	Acceleration time T_{ir} of DFRFG1	
C0752	Max speed	3000	1 {1 rpm} 16000	Maximum make up speed of DFRFG1	
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} $2 \cdot 10^9$	Contouring error of DFRFG1	* 2000000000 1 rev. = 65535 inc
C0755	Syn window	100	0 {1 rpm} 5000	Synchronization window of DFRFG1	
[C0758]	CFG: IN	1000	see selection list 4 FIXEDPHI-0	Configuration phase input of DFRFG1	
[C0759]	CFG: QSP	1000	see selection list 2 FIXED 0	Configuration digital input (triggering QSP) of DFRFG1	
[C0760]	CFG: STOP	1000	see selection list 2 FIXED 0	Configuration digital input (ramp generator stop) of DFRFG1	
[C0761]	CFG: RESET	1000	see selection list 2 FIXED 0	Configuration digital input (reset integrators) of DFRFG1	
C0764 1 2 3	 DIS: QSP DIS: STOP DIS: RESET			Digital input signals of DFRFG1	display only
C0765	DIS: IN		-32767 {1 rpm} 32767	Absolute analog input signal of DFRFG1	display only
[C0770]	CFG: D	1000	see selection list 2 FIXED 0	Configuration data input of FLIP1	
[C0771]	CFG: CLK	1000	see selection list 2 FIXED 0	Configuration clock input of FLIP1	
[C0772]	CFG: CLR	1000	see selection list 2 FIXED 0	Configuration reset input of FLIP1	
C0773 1 2 3	 DIS: D DIS: CLK DIS: CLR			Digital input signals of FLIP1	display only
[C0775]	CFG: D	1000	see selection list 2 FIXED 0	Configuration data input of FLIP2	
[C0776]	CFG: CLK	1000	see selection list 2 FIXED 0	Configuration clock input of FLIP2	

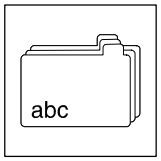


Appendix

Code	LCD	Possible settings			IMPORTANT
		Lenze	Selection	Info	
[C0777]	CFG: CLR	1000	see selection list 2 FIXED 0	Configuration reset input of FLIP2	
C0778				Digital input signals of FLIP2	display only
1	DIS: D				
2	DIS: CLK				
3	DIS: CLR				
[C0780]	CFG: N	1000	see selection list 1 AIN1-OUT	Configuration main setpoint input of NSET	
[C0781]	CFG: N-INV	1000	see selection list 2 R/L/Q-R/L	Configuration main setpoint inversion of NSET	
[C0782]	CFG: NADD	1000	see selection list 1 ASW1-OUT	Configuration additional set-point input of NSET	
[C0783]	CFG: NADD-INV	1000	see selection list 2 FIXED 0	Configuration additional set-point inversion of NSET	
[C0784]	CFG: CINH-VAL	1000	see selection list 1 MCTRL-NACT	Configuration output signal with controller inhibit of NSET	
[C0785]	CFG: SET	1000	see selection list 1 MCTRL-NSET2	Configuration ramp generator of NSET	
[C0786]	CFG: LOAD	1000	see selection list 2 MCTRL-QSP-OUT	Configuration digital input (load ramp generator) of NSET	
[C0787]			see selection list 2	Configuration JOG selection and JOG activation of NSET	Binary interpretation
1	CFG: JOG*1	1000	DIGIN3		
2	CFG: JOG*2	1000	FIXED 0		
3	CFG: JOG*4	1000	FIXED 0		
4	CFG: JOG*8	1000	FIXED 0		
[C0788]			see selection list 2	Configuration Ti selection and Ti activation of NSET	• Binary interpretation • Tir and Tif pairs are identical
1	CFG: TI*1	1000	FIXED 0		
2	CFG: TI*2	1000	FIXED 0		
3	CFG: TI*4	1000	FIXED 0		
4	CFG: TI*8	1000	FIXED 0		
[C0789]	CFG: RFG-0	1000	see selection list 2 FIXED 0	Configuration digital input (ramp generator 0) of NSET	
[C0790]	CFG: RFG-STOP	1000	see selection list 2 FIXED 0	Configuration digital input (ramp generator stop) of NSET	
C0798				Analog input signals of NSET	display only
1	DIS: CINH-VAL		-199.99 {0.01 %} 199.99		
2	DIS: SET				
C0799				Digital input signals of NSET	display only
1	DIS: N-INV				
2	DIS: NADD-INV				
3	DIS: LOAD				
4	DIS: JOG*1				
5	DIS: JOG*2				
6	DIS: JOG*4				
7	DIS: JOG*8				
8	DIS: TI*1				
9	DIS: TI*2				
10	DIS: TI*4				
11	DIS: TI*8				
12	DIS RFG-0				
13	DIS: RFG-STOP				
[C0800]	CFG: SET	1000	see selection list 1 FIXED 0 %	Configuration setpoint input of process controller PCTRL1	

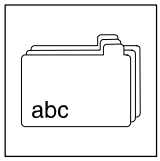


Code	LCD	Possible settings			IMPORTANT
		Lenze	Selection	Info	
[C0801]	CFG: ACT	1000	see selection list 1 FIXED 0 %	Configuration actual value input of PCTRL1	
[C0802]	CFG: INFLU	1000	see selection list 1 FIXED 0 %	Configuration evaluation input of PCTRL1	
[C0803]	CFG: ADAPT	1000	see selection list 1 FIXED 0 %	Configuration adaptation input of PCTRL1	
[C0804]	CFG: INACT	1000	see selection list 2 FIXED 0	Configuration deactivation input of PCTRL1	
[C0805]	CFG: I-OFF	1000	see selection list 2 FIXED 0	Configuration digital input (switch off I-component) of PCTRL1	
C0808 1 2 3 4	 DIS: SET DIS: ACT DIS: INFLU DIS: ADAPT		-199.99 {0.01 %} 199.99	Analog input signals of PCTRL1	display only
C809 1 2	 DIS: INACT DIS: I-OFF			Digital input signals of PCTRL1	display only
[C0810] 1 2	 CFG: IN CFG: IN	 55 1000	see selection list 1 AIN2-OUT FIXED 0 %	Configuration analog inputs of analog switch ASW1	
[C0811]	CFG: SET	1000	see selection list 2 FIXED 0	Configuration digital input of ASW1	
C0812 1 2	 DIS: IN DIS: IN		-199.99 {0.01 %} 199.99	Analog input signals of ASW1	display only
C0813	DIS: SET			Digital input signal of ASW1	display only
[C0815] 1 2	 CFG: IN CFG: IN	 1000 1000	see selection list 1 FIXED 0 % FIXED 0 %	Configuration analog inputs of analog switch ASW2	
[C0816]	CFG: SET	1000	see selection list 2 FIXED 0	Configuration digital input of ASW2	
C0817 1 2	 DIS: IN DIS: IN		-199.99 {0.01 %} 199.99	Analog input signals of ASW2	display only
C0818	DIS: SET			Digital input signal of ASW2	display only
[C0820] 1 2 3	 CFG: IN CFG: IN CFG: IN	 10655 1001 13217	see selection list 2 CMP2-OUT FIXED 1 RC-PMPLUS	Configuration digital inputs of the AND element AND1	
C0821 1 2 3	 DIS: IN DIS: IN DIS: IN			Digital input signals of AND1	display only
[C0822] 1 2 3	 CFG: IN CFG: IN CFG: IN	 1000 1000 1000	see selection list 2 FIXED 0 FIXED 0 FIXED 0	Configuration digital inputs of the AND element AND2	

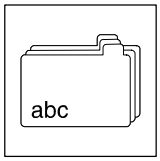


Appendix

Code	LCD	Possible settings			IMPORTANT
		Lenze	Selection	Info	
C0823				Digital input signals of AND2	display only
1	DIS: IN				
2	DIS: IN				
3	DIS: IN				
[C0824]			see selection list 2	Configuration digital inputs of the AND element AND3	
1	CFG: IN	1000	FIXED 0		
2	CFG: IN	1000	FIXED 0		
3	CFG: IN	1000	FIXED 0		
C0825				Digital input signals of AND3	display only
1	DIS: IN				
2	DIS: IN				
3	DIS: IN				
[C0826]			see selection list 2	Configuration digital inputs of the AND element AND4	
1	CFG: IN	1000	FIXED 0		
2	CFG: IN	1000	FIXED 0		
3	CFG: IN	1000	FIXED 0		
C0827				Digital input signals of AND4	display only
1	DIS: IN				
2	DIS: IN				
3	DIS: IN				
[C0828]			see selection list 2	Configuration digital inputs of the AND element AND5	
1	CFG: IN	1000	FIXED 0		
2	CFG: IN	1000	FIXED 0		
3	CFG: IN	1000	FIXED 0		
C0829				Digital input signals of AND5	display only
1	DIS: IN				
2	DIS: IN				
3	DIS: IN				
[C0830]			see selection list 2	Configuration digital inputs of the OR element OR1	
1	CFG: IN	1000	FIXED 0		
2	CFG: IN	1000	FIXED 0		
3	CFG: IN	1000	FIXED 0		
C0831				Digital input signals of OR1	display only
1	DIS: IN				
2	DIS: IN				
3	DIS: IN				
[C0832]			see selection list 2	Configuration digital inputs of the OR element OR2	
1	CFG: IN	1000	FIXED 0		
2	CFG: IN	1000	FIXED 0		
3	CFG: IN	1000	FIXED 0		
C0833				Digital input signals of OR2	display only
1	DIS: IN				
2	DIS: IN				
3	DIS: IN				
[C0834]			see selection list 2	Configuration digital inputs of the OR element OR3	
1	CFG: IN	5001	MCTRL-QSP-OUT		
2	CFG: IN	20207	CAN-FN2.B6		
3	CFG: IN	501	DCTRL-CINH		
C0835				Digital input signals of OR3	display only
1	DIS: IN				
2	DIS: IN				
3	DIS: IN				

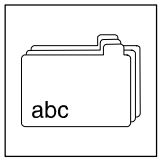


Code	LCD	Possible settings			IMPORTANT
		Lenze	Selection	Info	
[C0836]			see selection list 2	Configuration digital inputs of the OR element OR4	
1	CFG: IN	52	DIGIN2		
2	CFG: IN	20202	CAN-IN2.B1		
3	CFG: IN	1000	FIXED 0		
C0837				Digital input signals of OR4	display only
1	DIS: IN				
2	DIS: IN				
3	DIS: IN				
[C0838]			see selection list 2	Configuration digital inputs of the OR element OR5	
1	CFG: IN	53	DIGIN3		
2	CFG: IN	20206	CAN-IN2.B5		
3	CFG: IN	1000	FIXED 0		
C0839				Digital input signals of OR5	display only
1	DIS: IN				
2	DIS: IN				
3	DIS: IN				
[C0840]	CFG: IN	1000	see selection list 2 FIXED 0	Configuration digital input of the digital NOT element NOT1	
C0841	DIS: IN			Digital input signal of NOT1	display only
[C0842]	CFG: IN	1000	see selection list 2 FIXED 0	Configuration digital input of the digital NOT element NOT2	
C0843	DIS: IN			Digital input signal of NOT2	display only
[C0844]	CFG: IN	1000	see selection list 2 FIXED 0	Configuration digital input of the digital NOT element NOT3	
C0845	DIS: IN			Digital input signal of NOT3	display only
[C0846]	CFG: IN	1000	see selection list 2 FIXED 0	Configuration digital input of the digital NOT element NOT4	
C0847	DIS: IN			Digital input signal of NOT4	display only
[C0848]	CFG: IN	1000	see selection list 2 FIXED 0	Configuration digital input of the digital NOT element NOT5	
C0849	DIS: IN			Digital input signal of NOT5	display only
[C0850]			see selection list 1	Configuration process output words for automation interface AIF (X1)	
1	CFG: OUT.W1	1000	FIXED 0 %		
2	CFG: OUT.W2	1000	FIXED 0 %		
3	CFG: OUT.W3	1000	FIXED 0 %		
[C0851]			See selection list 3	Configuration 32-bit phase information	
1	CFG: OUT.D1	1000	FIXED 0INC		
C0852	Type OUT.W2	0	0 analog 1 digital 0-15 2 low 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)	
C0855	DIS: IN (0-15) DIS: IN (16-31)		0 FFFF	Process input words hexadecimal for automation interface X1	display only
C0856				Process input words decimal	display only
1	DIS: IN.W1		-199.99 {0.01%} 199.99		100% = 16384
2	DIS: IN.W2				
3	DIS: IN.W3				
C0857	DIS: IN.D1		-2147483648 {1} 2147483647	32-bit phase information	display only

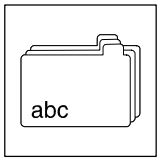


Appendix

Code	LCD	Possible settings			IMPORTANT
		Lenze	Selection	Info	
C0858				Process output words	display only
1	DIS: OUT.W1		-199.99 {0.01 %} 199.99		100% = 16384
2	DIS: OUT.W2				
3	DIS: OUT.W3				
C0859	DIS: OUT.D1		-2147483648 {1} 2147483647	32-bit phase information	display only
[C0860]			see selection list 1	Configuration process output words for system bus output blocks (CAN)	
1	CFG: OUT1.W1	1000	FIXED 0 %		
2	CFG: OUT1.W2	1000	FIXED 0 %		
3	CFG: OUT1.W3	1000	FIXED 0 %		
4	CFG: OUT2.W1	1000	FIXED 0 %		
5	CFG: OUT2.W2	1000	FIXED 0 %		
6	CFG: OUT2.W3	1000	FIXED 0 %		
7	CFG: OUT2.W4	1000	FIXED 0 %		
8	CFG: OUT3.W1	1000	FIXED 0 %		
9	CFG: OUT3.W2	1000	FIXED 0 %		
10	CFG: OUT3.W3	13201	RC-XMCTR		
11	CFG: OUT3.W4	1000	FIXED 0 %		
[C0861]			See selection list 3	Configuration 32-bit phase information for system bus output blocks (CAN)	
1	CFG: OUT1.D1	1000	FIXED 0INC		
2	CFG: OUT2.D1	1000	FIXED 0INC		
3	CFG: OUT3.D1	13202	RC-DXA		
C0863				Process input words hexadecimal for system bus (CAN)	display only
1	DIS: IN1 dig0		0 FFFF		
2	DIS: IN1 dig16				
3	DIS: IN2 dig0				
4	DIS: IN2 dig16				
5	DIS: IN3 dig0				
6	DIS: IN3 dig16				
C0864				Configuration process output words for system bus (CAN)	
1	Type OUT1.W2	0	0 analog sign		
2	Type OUT2.W1	0	1 digital 0-15		
3	Type OUT3.W1	0	2 low phase		
C0865				Configuration process output words for system bus (CAN)	
1	Type OUT1.W3	0	0 analog sign		
2	Type OUT2.W2	0	1 digital 16-31		
3	Type OUT3.W2	0	2 high phase		
C0866				Process input words for system bus (CAN)	display only
1	DIS: IN1.W1		-199.99 {0.01 %} 199.99		100% = 16384
2	DIS: IN1.W3				
3	DIS: IN2.W1				
4	DIS: IN2.W2				
5	DIS: IN2.W3				
6	DIS: IN2.W4				
7	DIS: IN3.W1				
8	DIS: IN3.W2				
9	DIS: IN3.W3				
10	DIS: IN3.W3				
11	DIS: IN3.W4				
C0867				32-bit phase information for system bus (CAN)	display only
1	DIS: IN1.D1		-2147483648 {1} 2147483647		
2	DIS: IN2.D1				
3	DIS: IN3.D1				

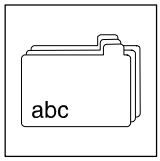


Code	LCD	Possible settings			IMPORTANT
		Lenze	Selection	Info	
C0868 1 2 3 4 5 6 7 8 9 10 11	 DIS: OUT1.W1 DIS: OUT1.W2 DIS: OUT1.W3 DIS: OUT2.W1 DIS: OUT2.W2 DIS: OUT2.W3 DIS: OUT2.W4 DIS: OUT3.W1 DIS: OUT3.W2 DIS: OUT3.W3 DIS: OUT3.W4		-199.99 {0.01 %} 199.99	Process output words system bus (CAN)	display only 100% = 16384
C0869 1 2 3	 DIS: OUT1.D1 DIS: OUT2.D1 DIS: OUT3.D1		-2147483648 {1} 2147483647	32-bit phase information for system bus (CAN)	display only
[C0870] 1 2	 CFG: CINH CFG: CINH	 1000 1000	see selection list 2 FIXED 0 FIXED 0	Configuration digital inputs (inhibit controller) of DCTRL	
[C0871]	CFG: TRIP-SET	1000	see selection list 2 FIXED 0	Configuration digital input (TRIP-Set) of DCTRL	
[C0876]	CFG: TRIP-RES	65	see selection list 2 DIGIN-CINH	Configuration digital input (TRIP-Reset) of DCTRL	
C0878 1 2 3 4	 DIS: CINH1 DIS: CINH2 DIS: TRIP-SET DIS: TRIP-RES			Digital input signals of DCTRL	display only
C0879 1 2 3	 Reset C135 Reset AIF Reset CAN		0 no reset 1 reset	Reset of control words	• C0879 = 1 performs one reset
[C0880] 1 2	 CFG: PAR*1 CFG: PAR*2	 1000 1000	see selection list 2 FIXED 0 FIXED 0	Configuration Select parameter set of DCTRL	
[C0881]	CFG:PAR-LOAD	1000	see selection list 2 FIXED 0	Configuration Load parameter set of DCTRL	
C0884 1 2 3	 DIS: PAR*1 DIS: PAR*2 DIS: PAR-LOAD			Signals for parameter set selection of DCTRL	display only
[C0885]	CFG: R	1000	see selection list 2 FIXED 0	Configuration digital input (CW rotation) of R/L/Q	
[C0886]	CFG: L	1000	see selection list 2 FIXED 0	Configuration digital input (CCW rotation) of R/L/Q	
C0889 1 2	 DIS: R DIS: L			Digital input signals of R/L/Q	display only
[C0890]	CFG: N-SET	13200	see selection list 1 RC-NOUT	Configuration speed setpoint input motor control MCTRL	
[C0891]	CFG: M-ADD	1000	see selection list 1 FIXED 0 %	Configuration torque setpoint input of MCTRL	
[C0892]	CFG: LO-M-LIM	5700	see selection list 1 ANEG1-OUT	Configuration lower torque limit of MCTRL	

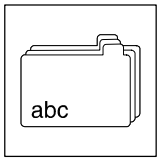


Appendix

Code	LCD	Possible settings			IMPORTANT
		Lenze	Selection	Info	
[C0893]	CFG: HI-M-LIM	19523	see selection list 1 FCODE-472/3	Configuration upper torque limit of MCTRL	
[C0894]	CFG: PHI-SET	13201	See selection list 3 RC-PSET	Configuration rotor position setpoint of MCTRL	
[C0895]	CFG: PHI-LIM	19526	see selection list 1 FCODE 472/6	Configuration phase controller limit of MCTRL	
[C0896]	CFG: N2-LIM	1000	see selection list 1 FIXED 0 %	Configuration 2nd speed limitatino of MCTRL	
[C0897]	CFG: PHI-ON	1001	see selection list 2 FIXED 1	Configuration switch-on signal phase controller of MCTRL	
[C0898]	CFG: FLD-WEAK	1006	see selection list 1 FIXED 100 %	Configuration signal for field weakening of MCTRL	
[C0899]	CFG: N/M-SWT	1000	see selection list 2 FIXED 0	Configuration change-over between speed control and torque control MCTRL	
[C0900]	CFG: QSP	51	see selection list 2 DIGIN1	Configuration control signal to activate QSP of MCTRL	
[C0901]	CFG: I-SET	1000	see selection list 1 FIXED 0 %	Configuration Load I-component of the MCTRL speed controller	
[C0902]	CFG: I-LOAD	1000	see selection list 2 FIXED 0	Configuration release signal to load the I-component of the MCTRL speed controller	
C0906 1 2 3 4 5 6 7 8	 DIS: N-SET DIS: M-ADD DIS: LO-M-LIM DIS: HI-M-LIM DIS: PHI-LIM DIS: N2-LIM DIS: FLD-WEAK DIS: I-SET		-199.99 {0.01 %} 199.99	Analog input signals of MCTRL	display only
C0907 1 2 3 4	 DIS: PHI-ON DIS: N/M-SWT DIS: QSP DIS: I-LOAD			Digital input signals of MCTRL	display only
C0908	DIS: PHI-SET		-2147483647 {1 inc} 2147483647	Set phase signal of MCTRL	display only • 1 rev. = 65536 inc
C0909	speed limit	1	1 +/- 175 % 2 0 .. +175 % 3 -175 .. 0 %	Speed limitation for the MCTRL speed setpoint	
[C0920]	CFG: ON	1000	see selection list 2 FIXED 0	Configuration activating input homing of REF	
[C0921]	CFG: MARK	1000	see selection list 2 FIXED 0	Configuration digital homing switch of REF	
[C0922]	CFG: PHI-IN	1000	See selection list 3 FIXED 0INC	Configuration phase input of REF	
[C0923]	CFG: N-IN	1000	see selection list 1 FIXED 0 %	Configuration speed input of REF	
[C0924]	CFG: POS-LOAD	1000	see selection list 2 FIXED 0	Configuration of the control "Set position" of REF	
[C0925]	CFG: ACTPOS-I	1000	see selection list 2 FIXED0INC	Configuration of the position "Set position" of REF	

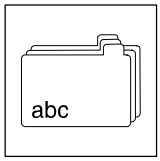


Code	LCD	Possible settings				IMPORTANT
		Lenze	Selection		Info	
C0926 1 2 3 4	 DIS: ACTPOS-I DIS: PHI-IN DIS: ACTPOS DIS: TARGET		-2147483647 {1 inc} 2147483647		Phase input signals of REF	display only
C0927 1 2 3	 DIS: ON DIS: MARK DIS: LOAD				digital input signals of REF	display only
C0928	DIS: PHI-IN		-2147483647 {1 inc} 2147483647		Phase signal (contouring error) of REF	display only • 1 rev. = 65536 inc
C0929	DIS: N-IN		-199.99 {0.01 %} 199.99		Analog input signal of REF	display only
[C0930]	Gearbox mot	1	1 {1} 65535		Gearbox factor (numerator) for REF	
[C0931]	Gearbox enc	1	1 {1} 65535		Gearbox factor (denominator) for REF	
C0932	REF mode	0	0 Mode 0 1 Mode 1 6 Mode 6 7 Mode 7 8 Mode 8 9 Mode 9 20 Mode 20 21 Mode 21		Homing mode for REF	
C0933	REF trans	0	0 Rising trans 1 Falling trans		Referfence signal edge for REF rising edge falling edge	
C0934	REF offset	0	-2140000000 {1 inc} 2140000000		Reference offset for REF	
C0935	REF speed	2.0000	0.0001 {0.0001 % N_{max}} 100,0		Homing speed for REF	
C0936	REF Ti	1.00	0.01 {0.01 s} 990.00		T_i time homing of REF	• Tir and Tif are identical
C0940	Numerator	1	-32767 {1} 32767		Numerator for CONV1	
C0941	Denominator	1	1 {1} 32767		Denominator for CONV1	
[C0942]	CFG: IN	1000	see selection list 1 FIXED 0 %		Configuration analog input CONV1	
C0943	DIS: IN		-199.99 {0.01 %} 199.99		Relative analog input signal of CONV1	display only
C0945	Numerator	1	-32767 {1} 32767		Numerator for CONV2	
C0946	Denominator	1	1 {1} 32767		Denominator for CONV2	
[C0947]	CFG: IN	1000	see selection list 1 FIXED 0 %		Configuration analog input CONV2	
C0948	DIS: IN		-199.99 {0.01 %} 199.99		Relative analog input signal of CONV2	display only
C0950	Numerator	1	-32767 {1} 32767		Numerator for CONV3	
C0951	Denominator	1	1 {1} 32767		Denominator for CONV3	
[C0952]	CFG: IN	1000	see selection list 4 FIXEDPHI0		Configuration analog input CONV3	
C0953	DIS: IN		-32767 {1 rpm} 32767		Absolute analog input signal of CONV3	display only
C0955	Numerator	1	-32767 {1} 32767		Numerator for CONV4	
C0956	Denominator	1	1 {1} 32767		Denominator for CONV4	
[C0957]	CFG: IN	1000	see selection list 4 FIXEDPHI0		Configuration analog input CONV4	

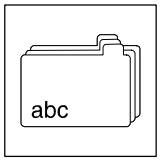


Appendix

Code	LCD	Possible settings			IMPORTANT
		Lenze	Selection	Info	
C0958	DIS: IN		-32767 {1 rpm} 32767	Absolute analog input signal of CONV4	display only
C0960	Function	1	1 Function1 2 Function2 3 Function3	Characteristic CURVE1-IN	
C0961	y0	0	0 {0.01 %} 199.99	Ordinate of the pair (x=0%/y0) of CURVE1	
C0962	y1	50	0 {0.01 %} 199.99	Ordinate of the pair (x1/y1) of CURVE1	
C0963	y2	75	0 {0.01 %} 199.99	Ordinate of the pair (x2/y2) of CURVE1	
C0964	y100	100	0 {0.01 %} 199.99	Ordinate of the pair (x=100%/y100) of CURVE1	
C0965	x1	50	0.01 {0.01 %} 100.00	Abscissa of the pair (x1/y1) of CURVE1	
C0966	x2	75	0.01 {0.01 %} 100.00	Abscissa of the pair (x2/y2) of CURVE1	
[C0967]	CFG: IN	1000	see selection list 1 FIXED 0	Configuration characteristic CURVE1-IN	
C0968	DIS: IN		-199.99 {0.01 %} 199.99	Relative analog input signal of CONV1	display only
[C0990]	CFG: IN	1000	see selection list 4 FIXEDPHI-0	Configuration input phase integrator PHINT	
[C0991]	CFG: RESET	1000	see selection list 2 FIXED 0	Configuration reset input of PHINT1	
C0992	DIS: IN		-32767 {1} 32767	Input signal of PHINT	display only
C0993	DIS: RESET			Digital input signal of PHINT1	display only
C0995	Division	1	-31 {1} 31	Division factor of phase division PHDIV1	
[C0996]	CFG: IN	1000	see selection list 3 FIXED 0INC	Configuration input phase division PHDIV1	
C0997	DIS: IN		-2147483647 {1} 2147483647	Input signal of PHDIV1	display only
C1000	Division	000000 1	0 {1} 31	Division factor PHDIV 1 Configuration of the input signal	
C1001	CFG: IN	1000	see selection list 3 100/25103	of: CONVPHA1-IN	
C1002	DIS: IN		-2147483647 {1 incr} 2147483647	CONVPHA1-IN	display only
C1010	function	1	0 {1] 14 000000: OUT = IN1 000001: IN1 + IN2 000002: IN1 - IN2 000003: IN1 * IN2 000014: IN1 / IN2	Function of ARITPH1	
C1011	01: CFG: IN 02: CFG: IN	1000 1000	see selection list 3 FIXED 0 FIXED 0	Configuration of the input signals ARITPH1-IN	
C1012	01: DIS: IN 02: DIS: IN		-2147483647 {1} 2147483647	Display of the input signals ARITPH1-IN	display only
C1030	CFG: IN	1000	see selection list 4 FIXED 0	Configuration of the input signal PHINT2-IN	
C1031	CFG: RESET	1000	see selection list 2 FIXED 0	Configuration of the input signal PHINT2-RESET	

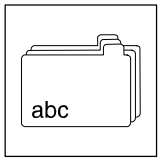


Code	LCD	Possible settings					IMPORTANT
		Lenze	Selection			Info	
C1032	DIS: IN		-32767 {1 rpm} 32767			Display of the input signals PHINT2-IN	display only
C1033	DIS: RESET		0/1			Display of the input signals PHINT2-RESET	display only
C1040	Accelaration	100.0	0.001 {0.001} 5000.000			SRFG1 Accelaration	
C1041	Jerk	0.200	0.001 {0.001s} 999.999			SRFG1 jerk	
C1042	CFG: IN	1000	see selection list 1 FIXED 0			Configuration of: SRFG1-IN	
C1043	CFG: SET	1000	see selection list 1 FIXED 0			Configuration of the signal SRFG1-SET	
C1044	CFG: LOAD	1000	see selection list 2 FIXED 0			Configuration of the signal SRFG1-LOAD	
C1045	01: DIS: IN 02: DIS: SET		-199.99	{0.01%}	199.99	Display of the signals of type “analog” of: SRFG1	display only
C1046	DIS: LOAD		0/1			Display of: SRFG1-LOAD	display only
C1091	Code	1309	2	{1}	2000	FEVAN1 Code	
C1092	Subcode	0	0	{1}	255	FEVAN1 Subcode	
C1093	Numerator	1.0000	0.0001 {0.0001} 100000.0000			FEVAN1 numerator	
C1094	Denomiator	0.0001	0.0001 {0.0001} 100000.0000			FEVAN1 denominator	
C1095	Offset	0	0 {1} 1000000000			FEVAN1 Offset	
C1096	CFG: IN	19552	see selection list 1			Configuration of the input of type “analog” of: FEVAN1	
C1097	01: CFG: LOAD 02: CFG: BUSY-IN 03: CFG: FAIL-IN	19401 1000 1000	see selection list 2			Configuration of the inputs of type “digital” of: FEVAN1	
C1100	Function	1	1/2 000001: Return 000002: Hold			Function of FCNT1	
C1101		1000 1000	see selection list 1 FIXED 0 FIXED 0			Configuration of the inputs of type “analog” of: FCNT1	
C1102	01: CFG: CLKUP 02: CFG: CLKDWN 03: CFG: LOAD	1000 100010 00	see selection list 2 FIXED 0 FIXED 0 FIXED 0			Configuration of the inputs of type “digital” of: FCNT1	
C1103			-32767	{1}	32767	Display of the signals of type “analog” of: FCNT1	display only
C1104	01: DIS: CLKUP 02: DIS: CLKDWN 03: DIS: LOAD		0/1			Display of the inputs of type “digital” of: FCNT1	display only
C1300	Shaft format	2304	192	{1 units}	16000	LSF shaft format of the machine, material feed for one revolution	
C1301	Enc const	8192	100	{1 p/rev}	32767	EC-LS, increments of the master encoder (e.g. at the mechanical machine shaft)	p/rev = pulses per revolution

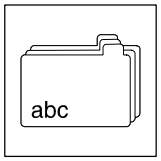


Appendix

Code	LCD	Possible settings				IMPORTANT
		Lenze	Selection		Info	
C1302	CCF	5376	192	{1 units} 16000	Cylinder circumference Circumference of the drive shaft (cutting cylinder or insetter)	
C1303	MODE	0	0 000001: Cut mode 000002: Ins mode	{1} $1 \cdot 10^6$	Cross cutter / insetter determination of the operating mode	
C1304	Gear-num	30000	-32768	{1} 32767	Gearbox "numerator", Numerator of the mechanical gearbox ratio	
C1305	Gear-denom	30000	1	{1} 32767	Gearbox "denominator", Denominator of the mechanical gearbox ratio	
C1306	Unit select	0	0/1 0: 1/192 " 1: 0.1 mm		Selection measuring system (unit) 1 unit = 1/192" 1 unit = 0.1mm	
C1307	01: DDIR 02: EDIR	0 0	0/1 0: normal (CW) 1: inverse (CCW)		Selection of the drive direction of rotation	
C1308	Cut format	2304	192	{1 units} 16000	Cut format (CF) Selection of the cut length	
C1309	Print format	4608	192	{1 units} 16000	Print format (PF), Selection of the print format	
C1310	RPTRIM	0.00	-999.99	{0.01mm} 999.99	Register trimming, relative	
C1311	RVTRIM	0.00	-999.99	{0.01 %} 999.99	Web length trimming absolute, selection of the web length (stretching factor)	% referred to the basic value A2
C1314	Reg setpoint	0.00	-999.99	{0.01mm} 999.99	Register setpoint	
C1315	N-RAV	1	1	{1} 30	Filter register difference Number of register error values which are used for averaging	
C1316	TP-window	40	0	{1mm} 999	Register mark window width for the web mark detection (E5)	0 = window switched off
C1317	TP-win offset	0.00	-99.99	{0.01mm} 99.99	Mark window offset relative	
C1318	v-line thresh	0.0	0.0	{0.1m/min} 999.9	Threshold line speed for the activation of the register control	
C1319	Time ref	1000	1	{1 ms} 1000	Time reference for RC-CMODE=1	
C1320	TDCR-E4/E5	0	-2000	{1 ` s} 2000	Relative dead time compensation of the time differences between E4 and E5	compensates line speed dependent register offset
C1321	TDC-E5	0	-2000	{1} 2000	Absolute dead time compensation of the input E5	compensates reference of the display (C1287 of the line speed)
C1322	VTRIM	0.10	-999.99	{.01 %/CF} 999.99	Speed of the gearbox adjustment for web length trimming	
C1323	ACC-COMP	0.00	-99.99	{0.01} 99.99	Acceleration compensation	
C1325	DV-LIM	0.10	0.00	{0.1} 99.99	Switching threshold ACC/DEC line, threshold for the generation of a digital signal depending on line speed changes of the master value	

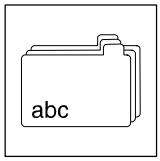


Code	LCD	Possible settings					IMPORTANT
		Lenze	Selection			Info	
C1326	COFF-LIM	100.00	0.00	{0.01mm}	999.99	Switch-off threshold register control, threshold for the disconnection of the register control depending on the momentary register error	
C1327	M-LIM1	0.50	0.00	{0.01mm}	999.99	Switching threshold register error, threshold for the generation of a digital signal depending on the momentary register error.	
C1328	Threshold P21	32768	10	{1 incr}	$18 \cdot 10^8$	Threshold P21, Switching threshold for the generation of a digital signal depending on the momentary contouring error	65536 incr = 1 rev.
C1329	MONIT P21	2	0 000000: 000002: 000003:	{1} Trip Warning Off	3	Conf. P21 Monitoring configuration P21 (contouring error of the FB RC)	
C1330	Vprc reg ctrl	1.00	-99.99 99.99	{0.01 1/CF}		Vprc, Proportional gain of the register control	
C1331	01: CCX0 02: CC+Y0 03: CC-Y0 04: CCX1 05: CC+Y1 06: CC-Y1 07: CCX2 08: CC+Y2 09: CC-Y2	0.01 0.020.0 21.000. 100.10 20.003. 003.00	0.00	{0.01mm}	99.99	Control characteristic of the register control	
C1332	GC-filter	2.00	0.01	{0.01}	50.00	GC-Filter, Filter time of the adjustment controller for the gearbox factor adjustment	
C1333	GC-DB	0.10	0.00	{0.01}	99.99	GC-DB, Dead band of the adjustment controller for the gearbox factor adjustment	
C1334	GC-CORR	1	-32768	{1}	32767	GC-CORR, manipulated variable of the adjustment controller for gearbox factor adjustment	Unit: LSB of the basic value A2
C1335	GC-PFCNT	10	0	{1}	9999	GC-PFCNT Format counter gearbox factor adjustment	Number of format pulses after which a position command is executed
C1336	Reg. prepos.	0.00	-16000.00	{0.01}	16000.00	LR, Relative distance of the function "Set coarse register"	The distance is related to the web
C1337	VLR	400	0	{1 mm/s}	16000	Final speed of the function "Set coarse register"	
C1338	ACCLR	400	0	{1 mm/s²}	32767	Acceleration / deceleration ram of the function "Set coarse register"	
C1342	Angle n-trim	-894	-32768	{1 incr}	32767	RC speed-dependent phase trimming	
C1345	RC-CTRL	0	0	{1}	65535	RC-CTRL Word Control word register control	
C1350	01: CFG: RPTRIM 02: CFG: PADD 03: CFG: WOFS 04: CFG: RSV	19551 100056 501000	see selection list			Configuration of the input of type "analog" of the function block RC	

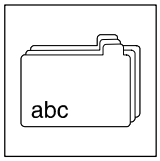


Appendix

Code	LCD	Possible settings			IMPORTANT
		Lenze	Selection	Info	
C1351	01: DIS: RPTRIM 02: DIS: PADD 03: DIS: WOFS 04: DIS: RSV	0 0 0 0	-32768 {1} 32767	Display of the input variable of type "analog of the function block RC	
C1352	01: CFG: VTSET 02: CFG: PTSET 03: CFG: LRSET 04: CFG: PHSET 05: CFG: PHRES 06: CFG: CMODE 07: CFG: GCON 08: CFG: CINTRES 09: CFG: DXAEXT 10: CFG: CON 11: CFG: WSET 12: CFG: RINIT 13: CFG: GCHOLD 14: CFG: PMDIS 15: CFG: RSET	1000 19400 20201 1000 10560 20204 20203 20209 20208 10565 10500 10570 20210 20205 1000 1000	see selection list #02	Configuration of the inputs of type "digital" of the function block RC	
C1353	01: DIS: VTSET 02: DIS: PTSET 03: DIS: LRSET 04: DIS: PHSET 05: DIS: PHRES 06: DIS: CMODE 07: DIS: GCON 08: DIS: CINTRES 09: DIS: DXAEXT 10: DIS: CON 11: DIS: WSET 12: DIS: RINIT 13: DIS: GCHOLD 14: DIS: PMDIS 15: DIS: RSET 16: DIS: DXAHOLD		0/1	Display of the input signals of type "digital" of the function block RC	
C1354	01: CFG: DXAIN 02: CFG: RVTRIM	1000 1000	see selection list #03	Configuration of the inputs of type "phase" of the function block RC	
C1355	01: DIS: DXAIN 02: DIS: RVTRIM		-2147483648 {1} 2147483647	Display of the input signals of type "phase" of the function block RC	
C1356	01: CFG: DFIN	50	see selection list #04	CFG: RC-DFIN Digital frequency input	
C1357	01: DIS: DFIN		-32768 {1 rpm} 32767	DIS: RC-DFIN Display: Digital frequency input value	
C1360	DIS: LSF/CF		-21474836.48 {0.01} 21474836.47	DIS: RC-LSF/CF Display process variable: Shaft format /Cut format	
C1361	DIS: PF/CF		-21474836.48 {0.01} 21474836.47	DIS: RC-PF/CF number of sheets Display process variable: No. of sheets	
C1365	RC-STAT		0 {1} 65535	RC-STAT Word status word register control	

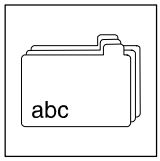


Code	LCD	Possible settings				IMPORTANT
		Lenze	Selection		Info	
C1370	DIS: A2*		-2147483648	{1} 2147483647	DIS: RC-A2* Display process variable: gearbox factor A2*	
C1371	DIS: B2		-2147483648	{1} 2147483647	DIS: RC-B2 Display process variable: gearbox factor B2*	
C1374	DIS: XRACT		-21474836.48	{0.01mm} 21474836.47	DIS: RC-XRACT Display procecess variable: Actual register value in 1/100 mm	
C1375	DIS: DXA		-2147483648	{1mm} 2147483647	DIS: RC-DXA Display process variable: Momentary register error after averaging in 1/100 mm	
C1376	DIS: RC-COUT		-2147483648	{1 incr/ms} 2147483647	DIS: RC-COUT Display process variable: register control output in incr./ ms	
C1377	DIS: RG-CORR		-2147483648	{1} 2147483647	DIS: RC-RG-CORR Display process variable: Manipulated variable of the gearbox factor adjustment	Unit: 1/100000 of the basic value A2
C1378	DIS: RTR-ACT		-21474836.48	{0.01mm} 21474836.47	DIS: RC-RTR-ACT Display process variable: Total of the performed register trimmings	
C1379	DIS: RTR-RACT		-21474836.48	{0.01mm} 21474836.47	DIS: RC-RTR-RACT Display process variable: Momentary value of the remaining correction distance after an RPTRIM input	
C1380	DIS: R-XMOFS		-2147483648	{1 incr} 2147483647	DIS: RC-R-XMOFS Display process variable: actual register offerset in incr.	
C1381	01: DIS: DXR1 02: DIS: DXR2 03: DIS: DXR3 04: DIS: DXR4 05: DIS: DXR5 06: DIS: DXR6		-21474836.48	{0.01mm} 21474836.47	DIS: RC-DXR1 Display process variable: register error history	
C1382	01: DIS: XP1 02: DIS: DXP		-2147483648	{1incr} 2147483647	Display process variable: XP1, momentary latch value E5 DXP, distance of the last two register marks E5	
C1383	01: DIS: XQ1 02: DIS: DXQ		-2147483648	{1 incr} 2147483647	Display process variable: XQ1, momentary latch value E4 DXQ, distance of the last two cylinder pulses E4	
C1384	DIS: X0-OFFS		-21474836.48	{0.01mm} 21474836.47	DIS: X0-OFFS Display process variable: zero register offset	
C1387	DIS: XMCTR		-21474836.48	{0.01mm} 21474836.47	DIS: RC-XMCTR Display process variable: Momentary position of the register mark relative to the window centre	
C1501	Code	1308	2	{1} 2000	FEVAN2 Code	
C1502	Subcode	0	0	{1} 255	FEVAN2 Subcode	
C1503	Numerator	1	0	{1} $1 \cdot 10^5$	FEVAN2 numerator	



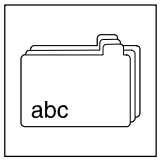
Appendix

Code	LCD	Possible settings				IMPORTANT
		Lenze	Selection		Info	
C1504	Denominator	0.0001	0.0001	{0.0001} 100000.0000	FEVAN2 denominator	
C1505	Offset	0	0	{1} $1 \cdot 10^5$	FEVAN2 Offset	
C1506	CFG: IN	6230	see selection list #01		Configuration of the input FEVAN2-IN	
C1507	01: CFG: LOAD 02: CFG: BUSY-IN 03: CFG: FAIL-IN	19450 1000 1000	see selection list #02		Configuration of the inputs of type “digital” of: FEVAN2-LOAD	
C1508	DIS: IN		-32768	{1} 32767	DIS: FEVAN2-IN	display only
C1509	01: DIS: LOAD 02: DIS: BUSY-IN 03: DIS: FAIL-IN		0/1		DIS: FEVAN2-LOAD	display only
C1510	Output signal	0	-2147483648	{1} 2147483647	Signal output	
C1511	Code	141	2	{1} 2000	FEVAN3 Code	
C1512	Subcode	0	0	{1} 255	FEVAN3 Subcode	
C1513	Numerator	1	0	{1} $1 \cdot 10^5$	FEVAN3 numerator	
C1514	Denominator	0.0001	0.0001	{0.0001} 100000.0000	FEVAN3 denominator	
C1515	Offset	0	0	{1} $1 \cdot 10^9$	FEVAN3 Offset	
C1516	CFG: IN	1000	see selection list #01		Configuration of the input CFG: FEVAN3-IN	
C1517	01: CFG: LOAD 02: CFG: BUSY-IN 03: CFG: FAIL-IN	1000 1000 1000	see selection list #02		Configuration of the inputs of type “digital” of: FEVAN3	
C1518	DIS: IN		-32768	{1} 32767	DIS: FEVAN3-IN	
C1519	01: DIS: LOAD 02: DIS: BUSY-IN 03: DIS: FAIL-IN		0/1		DIS: FEVAN3-LOAD	
C1799	DFOUT f_{max}	1250	20	{1 kHz} 1250	DFOUT f_{max} Maximum output frequency at X10 in kHz	



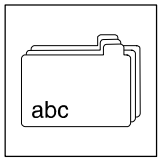
10.3 Selection lists

Selection list #01		
000050: AIN1-OUT	019500: FCODE-17	025101: AIF-IN.W1
000055: AIN2-OUT	019502: FCODE-26/1	020201: CAN-IN2.W1
000100: DFSET-NOUT	019503: FCODE-26/2	020202: CAN-IN2.W2
001000: FIXED 0%	019504: FCODE-27/1	020203: CAN-IN2.W3
001006: FIXED 100%	019505: FCODE-27/2	020204: CAN-IN2.W4
001007: FIXED -100%	019506: FCODE-32	020301: CAN-IN3.W1
005000: MCTRL-NSET2	019507: FCODE-37	020302: CAN-IN3.W2
005001: MCTRL-NACT	019510: FCODE-108/1	020303: CAN-IN3.W3
005002: MCTRL-MSET2	019511: FCODE-108/2	020304: CAN-IN3.W4
005003: MCTRL-MACT	019512: FCODE-109/1	025102: AIF-IN.W2
005004: MCTRL-IACT	019513: FCODE-109/2	025103: AIF-IN.W3
005005: MCTRL-DCVOLT	019515: FCODE-141	
005009: MCTRL-PHI-ANA	019521: FCODE-472/1	
005050: NSET-NOUT	019522: FCODE-472/2	
005051: NSET-RFG-I	019523: FCODE-472/3	
005100: MPOT1-OUT	019524: FCODE-472/4	
005150: PCTRL1-OUT	019525: FCODE-472/5	
005200: REF-N-SET	019526: FCODE-472/6	
005500: ARIT1-OUT	019527: FCODE-472/7	
005505: ARIT2-OUT	019528: FCODE-472/8	
005550: ADD1-OUT	019529: FCODE-472/9	
005600: RFG1-OUT	019530: FCODE-472/10	
005610: SRFG1-OUT	019531: FCODE-472/11	
005611: SRFG1-DIFF	019532: FCODE-472/12	
005650: ASW1-OUT	019533: FCODE-472/13	
005655: ASW2-OUT	019534: FCODE-472/14	
005700: ANEG1-OUT	019535: FCODE-472/15	
005705: ANEG2-OUT	019536: FCODE-472/16	
005800: LIM1-OUT	019537: FCODE-472/17	
005850: ABS1-OUT	019538: FCODE-472/18	
005900: PT1-1-OUT	019539: FCODE-472/19	
005950: DT1-1-OUT	019540: FCODE-472/20	
006150: DB1-OUT	019551: FCODE-473/1	
006200: CONV1-OUT	019552: FCODE-473/2	
006205: CONV2-OUT	019553: FCODE-473/3	
006210: CONV3-OUT	019554: FCODE-473/4	
006215: CONV4-OUT	019555: FCODE-473/5	
006230: CONVPHA1-OUT	019556: FCODE-473/6	
006300: S&H1-OUT	019557: FCODE-473/7	
006350: CURVE1-OUT	019558: FCODE-473/8	
006400: FCNT1-OUT	019559: FCODE-473/9	
010000: BRK1-M-SET	019560: FCODE-473/10	
013200: RC-NOUT	020101: CAN-IN1.W1	
013201: RC-XMCTR	020102: CAN-IN1.W2	
013202: RC-COUT	020103: CAN-IN1.W3	

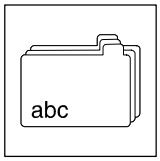


Appendix

Selection list #02		
000051: DIGIN1	010605: NOT2-OUT	015010: MONIT-LU
000052: DIGIN2	010610: NOT3-OUT	015011: MONIT-OU
000053: DIGIN3	010615: NOT4-OUT	015012: MONIT-EEr
000054: DIGIN4	010620: NOT5-OUT	015013: MONIT-OC1
000055: DIGIN5	010650: CMP1-OUT	015014: MONIT-OC2
000060: STATE-BUS-O	010655: CMP2-OUT	015015: MONIT-LP1
000065: DIGIN-CINH	010660: CMP3-OUT	015016: MONIT-OH
000100: DFSET-ACK	010680: PHCMP1-OUT	015017: MONIT-OH3
000500: DCTRL-RDY	010700: DIGDEL1-OUT	015018: MONIT-OH4
000501: DCTRL-CINH	010705: DIGDEL2-OUT	015019: MONIT-OH7
000502: DCTRL-INIT	010750: TRANS1-OUT	015020: MONIT-OH8
000503: DCTRL-IMP	010755: TRANS2-OUT	015021: MONIT-Sd2
000504: DCTRL-NACT=0	010900: FLIP1-OUT	015022: MONIT-Sd3
000505: DCTRL-CW/CCW	010905: FLIP2-OUT	015023: MONIT-P03
001000: FIXED 0	012000: PHINT1-FAIL	015024: MONIT-P13
001001: FIXED 1	012005: PHINT2-FAIL	015026: MONIT-CE0
002000: DCTRL-PAR*1-O	013000: FEVAN1-BUSY	015027: MONIT-NMAX
002001: DCTRL-PAR*2-O	013001: FEVAN1-FAIL	015028: MONIT-OC5
002002: DCTRL-PARBUSY	013005: FEVAN2-BUSY	015029: MONIT-SD5
005001: MCTRL-QSP-OUT	013006: FEVAN2-FAIL	015030: MONIT-SD6
005002: MCTRL-IMAX	013010: FEVAN3-BUSY	015031: MONIT-SD7
005003: MCTRL-MMAX	013011: FEVAN3-FAIL	015032: MONIT-H07
005050: NSET-RFG-I=0	013200: RC-LROK	015033: MONIT-H10
005200: REF-OK	013201: RC-CMSTAT	015034: MONIT-H11
005201: REF-BUSY	013202: RC-GCSTAT	015040: MONIT-CE1
006000: DFRFG1-FAIL	013203: RC-CSTAT	015041: MONIT-CE2
006001: DFRFG1-SYNC	013204: RC-RSGN	015042: MONIT-CE3
006400: FCNT1-EQUAL	013205: RC-X0LIM	015043: MONIT-CE4
010000: BRK1-OUT	013206: RC-X1LIM	015400: MONIT-P21
010001: BRK1-CINH	013207: RC-COFFLIM	019400: FCODE-ST473/1
010002: BRK1-QSP	013208: RC-MLIM1	019401: FCODE-ST473/2
010003: BRK1-M-STORE	013209: RC-VLIM	019450: FCODE-ST474/1
010250: R/L/Q-QSP	013210: RC-FPM	019451: FCODE-ST474/2
010251: R/L/Q-R/L	013211: RC-FCM	019500: FCODE-250
010500: AND1-OUT	013212: RC-RINITOK	019521: FCODE-471.B0
010505: AND2-OUT	013213: RC-WINOPEN	019522: FCODE-471.B1
010510: AND3-OUT	013214: RC-OUTSWIN	019523: FCODE-471.B2
010515: AND4-OUT	013215: RC-SCTR	019524: FCODE-471.B3
010520: AND5-OUT	013216: RC-TRIMOK	019525: FCODE-471.B4
010550: OR1-OUT	013217: RC-PMPULS	019526: FCODE-471.B5
010555: OR2-OUT	013218: RC-DVLIM	019527: FCODE-471.B6
010560: OR3-OUT	015000: DCTRL-TRIP	019528: FCODE-471.B7
010565: OR4-OUT	015001: DCTRL-MESS	019529: FCODE-471.B8
010570: OR5-OUT	015002: DCTRL-WARN	019530: FCODE-471.B9
010600: NOT1-OUT	015003: DCTRL-FAIL	019531: FCODE-471.B10

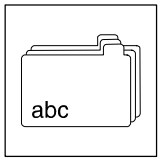


Selection list #02		
019532: FCODE-471.B11	020103: CAN-IN1.B2	020216: CAN-IN2.B15
019533: FCODE-471.B12	020104: CAN-IN1.B3	020217: CAN-IN2.B16
019534: FCODE-471.B13	020105: CAN-IN1.B4	020218: CAN-IN2.B17
019535: FCODE-471.B14	020106: CAN-IN1.B5	020219: CAN-IN2.B18
019536: FCODE-471.B15	020107: CAN-IN1.B6	020220: CAN-IN2.B19
019537: FCODE-471.B16	020108: CAN-IN1.B7	020221: CAN-IN2.B20
019538: FCODE-471.B17	020109: CAN-IN1.B8	020222: CAN-IN2.B21
019539: FCODE-471.B18	020110: CAN-IN1.B9	020223: CAN-IN2.B22
019540: FCODE-471.B19	020111: CAN-IN1.B10	020224: CAN-IN2.B23
019541: FCODE-471.B20	020112: CAN-IN1.B11	020225: CAN-IN2.B24
019542: FCODE-471.B21	020113: CAN-IN1.B12	020226: CAN-IN2.B25
019543: FCODE-471.B22	020114: CAN-IN1.B13	020227: CAN-IN2.B26
019544: FCODE-471.B23	020115: CAN-IN1.B14	020228: CAN-IN2.B27
019545: FCODE-471.B24	020116: CAN-IN1.B15	020229: CAN-IN2.B28
019546: FCODE-471.B25	020117: CAN-IN1.B16	020230: CAN-IN2.B29
019547: FCODE-471.B26	020118: CAN-IN1.B17	020231: CAN-IN2.B30
019548: FCODE-471.B27	020119: CAN-IN1.B18	020232: CAN-IN2.B31
019549: FCODE-471.B28	020120: CAN-IN1.B19	020301: CAN-IN3.B0
019550: FCODE-471.B29	020121: CAN-IN1.B20	020302: CAN-IN3.B1
019551: FCODE-471.B30	020122: CAN-IN1.B21	020303: CAN-IN3.B2
019552: FCODE-471.B31	020123: CAN-IN1.B22	020304: CAN-IN3.B3
019751: FCODE-135.B0	020124: CAN-IN1.B23	020305: CAN-IN3.B4
019752: FCODE-135.B1	020125: CAN-IN1.B24	020306: CAN-IN3.B5
019753: FCODE-135.B2	020126: CAN-IN1.B25	020307: CAN-IN3.B6
019755: FCODE-135.B4	020127: CAN-IN1.B26	020308: CAN-IN3.B7
019756: FCODE-135.B5	020128: CAN-IN1.B27	020309: CAN-IN3.B8
019757: FCODE-135.B6	020129: CAN-IN1.B28	020310: CAN-IN3.B9
019758: FCODE-135.B7	020130: CAN-IN1.B29	020311: CAN-IN3.B10
019763: FCODE-135.B12	020131: CAN-IN1.B30	020312: CAN-IN3.B11
019764: FCODE-135.B13	020132: CAN-IN1.B31	020313: CAN-IN3.B12
019765: FCODE-135.B14	020201: CAN-IN2.B0	020314: CAN-IN3.B13
019766: FCODE-135.B15	020202: CAN-IN2.B1	020315: CAN-IN3.B14
020001: CAN-CTRL.B0	020203: CAN-IN2.B2	020316: CAN-IN3.B15
020002: CAN-CTRL.B1	020204: CAN-IN2.B3	020317: CAN-IN3.B16
020003: CAN-CTRL.B2	020205: CAN-IN2.B4	020318: CAN-IN3.B17
020005: CAN-CTRL.B4	020206: CAN-IN2.B5	020319: CAN-IN3.B18
020006: CAN-CTRL.B5	020207: CAN-IN2.B6	020320: CAN-IN3.B19
020007: CAN-CTRL.B6	020208: CAN-IN2.B7	020321: CAN-IN3.B20
020008: CAN-CTRL.B7	020209: CAN-IN2.B8	020322: CAN-IN3.B21
020013: CAN-CTRL.B12	020210: CAN-IN2.B9	020323: CAN-IN3.B22
020014: CAN-CTRL.B13	020211: CAN-IN2.B10	020324: CAN-IN3.B23
020015: CAN-CTRL.B14	020212: CAN-IN2.B11	020325: CAN-IN3.B24
020016: CAN-CTRL.B15	020213: CAN-IN2.B12	020326: CAN-IN3.B25
020101: CAN-IN1.B0	020214: CAN-IN2.B13	020327: CAN-IN3.B26
020102: CAN-IN1.B1	020215: CAN-IN2.B14	020328: CAN-IN3.B27

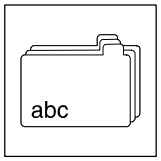


Appendix

Selection list #02	Selection list #03	Selection list #04
020329: CAN-IN3.B28	000100: DFSET-PSET	000050: DFIN-OUT
020330: CAN-IN3.B29	001000: FIXED0INC	000100: DFSET-POUT
020331: CAN-IN3.B30	005000: MCTRL-PHI-ANG	000250: DFOUT-OUT
020332: CAN-IN3.B31	005200: REF-PSET	001000: FIXEDPHI-0
025001: AIF-CTRL.B0	005520: ARITPH1-OUT	005000: MCTRL-PHI-ACT
025002: AIF-CTRL.B1	012000: PHINT1-OUT	006000: DFRFG1-OUT
025003: AIF-CTRL.B2	012005: PHINT2-OUT	006220: CONV5-OUT
025005: AIF-CTRL.B4	012050: PHDIV1-OUT	013200: RC-POUT
025006: AIF-CTRL.B5	013201: RC-PSET	019521: FCODE-475/1
025007: AIF-CTRL.B6	013202: RC-DXA	019522: FCODE-475/2
025008: AIF-CTRL.B7	013203: RC-XRACT	
025013: AIF-CTRL.B12	013206: RC-XMOFS	
025014: AIF-CTRL.B13	019521: FCODE-474/1	
025015: AIF-CTRL.B14	019522: FCODE-474/2	
025016: AIF-CTRL.B15	020103: CAN-IN1.D1	
025101: AIF-IN.B0	020201: CAN-IN2.D1	
025102: AIF-IN.B1	020301: CAN-IN3.D1	
025103: AIF-IN.B2	025103: AIF-IN.D1	
025104: AIF-IN.B3		
025105: AIF-IN.B4		
025106: AIF-IN.B5		
025107: AIF-IN.B6		
025108: AIF-IN.B7		
025109: AIF-IN.B8		
025110: AIF-IN.B9		
025111: AIF-IN.B10		
025112: AIF-IN.B11		
025113: AIF-IN.B12		
025114: AIF-IN.B13		
025115: AIF-IN.B14		
025116: AIF-IN.B15		
025117: AIF-IN.B16		
025118: AIF-IN.B17		
025119: AIF-IN.B18		
025120: AIF-IN.B19		
025121: AIF-IN.B20		
025122: AIF-IN.B21		
025123: AIF-IN.B22		
025124: AIF-IN.B23		
025125: AIF-IN.B24		
025126: AIF-IN.B25		
025127: AIF-IN.B26		
025128: AIF-IN.B27		
025129: AIF-IN.B28		
025130: AIF-IN.B29		
025131: AIF-IN.B30		
025132: AIF-IN.B31		

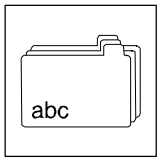


Selection list #05	
000000: empty	010555: OR2
000050: AIN1	010560: OR3
000055: AIN2	010565: OR4
000070: AOUT1	010570: OR5
000075: AOUT2	010600: NOT1
000100: DFSET	010605: NOT2
000200: DFIN	010610: NOT3
000250: DFOUT	010615: NOT4
005050: NSET	010620: NOT5
005100: MPOT1	010650: CMP1
005150: PCTRL1	010655: CMP2
005200: REF	010660: CMP3
005500: ARIT1	010680: PHCMP1
005505: ARIT2	010700: DIGDEL1
005520: ARITPH1	010705: DIGDEL2
005550: ADD1	010750: TRANS1
005600: RFG1	010755: TRANS2
005610: SRFG1	010900: FLIP1
005650: ASW1	010905: FLIP2
005655: ASW2	012000: PHINT1
005700: ANEG1	012005: PHINT2
005705: ANEG2	012050: PHDIV1
005800: LIM1	013000: FEV-AN1
005850: ABS1	013005: FEV-AN2
005900: PT1-1	013010: FEV-AN3
005950: DT1-1	013200: RC
006000: DFRFG1	015100: MLP1
006150: DB1	020000: CAN-OUT
006200: CONV1	025000: AIF-OUT
006205: CONV2	
006210: CONV3	
006215: CONV4	
006220: CONV5	
006230: CONVPHA1	
006300: S&H1	
006350: CURVE1	
006400: FCNT1	
010000: BRK1	
010250: R/L/Q	
010500: AND1	
010505: AND2	
010510: AND3	
010515: AND4	
010520: AND5	
010550: OR1	



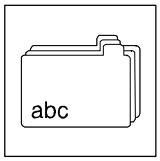
Appendix

Selection list #10	
000000: No fail	002061: CE0 warning
000011: OC1 trip	002062: CE1 warning
000012: OC2 trip	002063: CE2 warning
000015: OC5 trip	002064: CE3 warning
000022: LUQ trip	002065: CE4 warning
000032: LP1 trip	002082: Sd2 warning
000050: OH trip	002083: Sd3 warning
000053: OH3 trip	002085: Sd5 warning
000057: OH7 trip	002086: Sd6 warning
000058: OH8 trip	002091: EER warning
000061: CE0 trip	002153: P03 warning
000062: CE1 trip	002163: P13 warning
000063: CE2 trip	002171: P21 warning
000064: CE3 trip	
000065: CE4 trip	
000070: U15 trip	
000071: CCr trip	
000072: Pr1 trip	
000073: Pr2 trip	
000074: PEr trip	
000075: Pr0 trip	
000077: Pr3 trip	
000078: Pr4 trip	
000079: PI trip	
000082: Sd2 trip	
000083: Sd3 trip	
000085: Sd5 trip	
000086: Sd6 trip	
000087: Sd7 trip	
000091: EEr trip	
000105: H05 trip	
000107: H07 trip	
000110: H10 trip	
000111: H11 trip	
000153: P03 trip	
000163: P13 trip	
000171: P21 trip	
000200: NMAX trip	
001020: OU message	
001030: LU message	
001091: EEr message	
002032: LP1 warning	
002054: OH4 warning	
002057: OH7 warning	
002058: OH8 warning	



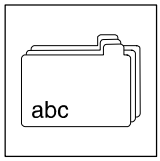
10.4 Motor selection list

C0086		Lenze motor type	C0081	C0087	C0088	C0089	C0090	Motor type	Tempera-ture sensor
No.	Display		P_N [kW]	n_N [rpm]	I_N [A]	f_N [Hz]	U_N [V]		
10	DSKA56-140	MDSKAXX056-22	0.80	3950	2.4	140	390	Asynchro-nous servo motor	KTY
11	DFKA71-120	MDFKAXX071-22	2.20	3410	6.0	120			
12	DSKA71-140	MDSKAXX071-22	1.70	4050	4.4	140			
13	DFKA80-60	MDFKAXX080-22	2.10	1635	4.8	60			
14	DSKA80-70	MDSKAXX080-22	1.40	2000	3.3	70			
15	DFKA80-120	MDFKAXX080-22	3.90	3455	9.1	120			
16	DSKA80-140	MDSKAXX080-22	2.30	4100	5.8	140			
17	DFKA90-60	MDFKAXX090-22	3.80	1680	8.5	60			
18	DSKA90-80	MDSKAXX090-22	2.60	2300	5.5	80			
19	DFKA90-120	MDFKAXX090-22	6.90	3480	15.8	120			
20	DSKA90-140	MDSKAXX090-22	4.10	4110	10.2	140	350		
21	DFKA100-60	MDFKAXX100-22	6.40	1700	13.9	60	390		
22	DSKA100-80	MDSKAXX100-22	4.00	2340	8.2	80			
23	DFKA100-120	MDFKAXX100-22	13.20	3510	28.7	120			
24	DSKA100-140	MDSKAXX100-22	5.20	4150	14.0	140	330		
25	DFKA112-60	MDFKAXX112-22	11.00	1710	22.5	60	390		
26	DSKA112-85	MDSKAXX112-22	6.40	2490	13.5	85			
27	DFKA112-120	MDFKAXX112-22	20.30	3520	42.5	120			
28	DSKA112-140	MDSKAXX112-22	7.40	4160	19.8	140	320		
50	DSVA56-140	DSVAXX056-22	0.80	3950	2.4	140	390	Asynchro-nous servo motor	TKO (Thermal contact)
51	DFVA71-120	DFVAXX071-22	2.20	3410	6.0	120			
52	DSVA71-140	DSVAXX071-22	1.70	4050	4.4	140			
53	DFVA80-60	DFVAXX080-22	2.10	1635	4.8	60			
54	DSVA80-70	DSVAXX080-22	1.40	2000	3.3	70			
55	DFVA80-120	DFVAXX080-22	3.90	3455	9.1	120			
56	DSVA80-140	DSVAXX080-22	2.30	4100	5.8	140			
57	DFVA90-60	DFVAXX090-22	3.80	1680	8.5	60			
58	DSVA90-80	DSVAXX090-22	2.60	2300	5.5	80			
59	DFVA90-120	DFVAXX090-22	6.90	3480	15.8	120			
60	DSVA90-140	DSVAXX090-22	4.10	4110	10.2	140	350		
61	DFVA100-60	DFVAXX100-22	6.40	1700	13.9	60	390		
62	DSVA100-80	DSVAXX100-22	4.00	2340	8.2	80			
63	DFVA100-120	DFVAXX100-22	13.20	3510	28.7	120			
64	DSVA100-140	DSVAXX100-22	5.20	4150	14.0	140	330		
65	DFVA112-60	DFVAXX112-22	11.00	1710	22.5	60	390		
66	DSVA112-85	DSVAXX112-22	6.40	2490	13.5	85			
67	DFVA112-120	DFVAXX112-22	20.30	3520	42.5	120			
68	DSVA112-140	DSVAXX112-22	7.40	4160	19.8	140	320		



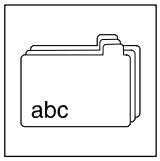
Appendix

C0086		Lenze motor type	C0081	C0087	C0088	C0089	C0090	Motor type	Temperature sensor
No.	Display		P_N [kW]	n_N [rpm]	I_N [A]	f_N [Hz]	U_N [V]		
110	DSKS56-23-150	MDSKSXX056-23	0.60	3000	1.25	150	350	Synchronous servo motor	KTY
111	DSKS56-33-150	MDSKSXX056-33	0.91	3000	2.0	150	340		
112	DSKS71-13-150	MDSKSXX071-13	1.57	3000	3.1	150	360		
113	DFKS71-13-150	MDFKSXX071-13	2.29	3000	4.35	150	385		
114	DSKS71-23-150	MDSKSXX071-23	2.33	3000	4.85	150	360		
115	DFKS71-23-150	MDFKSXX071-23	3.14	3000	6.25	150	375		
116	DSKS71-33-150	MDSKSXX071-33	3.11	3000	6.7	150	330		
117	DFKS71-33-150	MDFKSXX071-33	4.24	3000	9.1	150	345		
160	DSKS56-23-190	MDSKSXX056-23. 190	1.1	3800	2.3	190	330	Synchronous servo motor	KTY
161	DSKS56-33-200	MDSKSXX056-33. 200	1.8	4000	3.6	200	325		
162	DSKS71-03-170	MDSKSXX071-03. 170	2.0	3400	4.2	170	330		
163	DFKS71-03-165	MDFKSXX071-03. 165	2.6	3300	5.6	165	330		
164	DSKS71-13-185	MDSKSXX071-13. 185	3.2	3700	7.0	185	325		
165	DFKS71-13-180	MDFKSXX071-13. 180	4.1	3600	9.2	180	325		
166	DSKS71-33-180	MDSKSXX071-33. 180	4.6	3600	10.0	180	325		
167	DFKS71-33-175	MDFKSXX071-33. 175	5.9	3500	13.1	175	325		
210	DXRA071-12-50	DXRAXX071-12	0.25	1410	0.9	50	400	Asynchronous inverter - motor (in star connection)	TKO (Thermal contact)
211	DXRA071-22-50	DXRAXX071-22	0.37	1398	1.2				
212	DXRA080-12-50	DXRAXX080-12	0.55	1400	1.7				
213	DXRA080-22-50	DXRAXX080-22	0.75	1410	2.3				
214	DXRA090-12-50	DXRAXX090-12	1.10	1420	2.7				
215	DXRA090-32-50	DXRAXX090-32	1.50	1415	3.6				
216	DXRA100-22-50	DXRAXX100-22	2.20	1425	4.8				
217	DXRA100-32-50	DXRAXX100-32	3.00	1415	6.6				
218	DXRA112-12-50	DXRAXX112-12	4.00	1435	8.3				
219	DXRA132-12-50	DXRAXX132-12	5.50	1450	11.0				
220	DXRA132-22-50	DXRAXX132-22	7.50	1450	14.6				
221	DXRA160-12-50	DXRAXX160-12	11.00	1460	21.0				
222	DXRA160-22-50	DXRAXX160-22	15.00	1460	27.8				
223	DXRA180-12-50	DXRAXX180-12	18.50	1470	32.8				
224	DXRA180-22-50	DXRAXX180-22	22.00	1456	38.8				
250	DXRA071-12-87	DXRAXX071-12	0.43	2525	1.5	87	400	Asynchronous inverter - motor (in delta connection)	TKO (Thermal contact)
251	DXRA071-22-87	DXRAXX071-22	0.64	2515	2.0				
252	DXRA080-12-87	DXRAXX080-12	0.95	2515	2.9				
253	DXRA080-22-87	DXRAXX080-22	1.3	2525	4.0				
254	DXRA090-12-87	DXRAXX090-12	1.95	2535	4.7				
255	DXRA090-32-87	DXRAXX090-32	2.7	2530	6.2				
256	DXRA100-22-87	DXRAXX100-22	3.9	2535	8.3				
257	DXRA100-32-87	DXRAXX100-32	5.35	2530	11.4				
258	DXRA112-12-87	DXRAXX112-12	7.10	2545	14.3				
259	DXRA132-12-87	DXRAXX132-12	9.7	2555	19.1				
260	DXRA132-22-87	DXRAXX132-22	13.2	2555	25.4				
261	DXRA160-12-87	DXRAXX160-12	19.3	2565	36.5				
262	DXRA160-22-87	DXRAXX160-22	26.4	2565	48.4				
263	DXRA180-12-87	DXRAXX180-12	32.4	2575	57.8				
264	DXRA180-22-87	DXRAXX180-22	38.7	2560	67.4				



10.5 Glossary

Term	Meaning
AIF	Automation interface (X1)
CAN	Controller Area Network
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.
Contouring error	Deviation between momentary position set-value and actual position. Display for a momentary contouring error under C0908.
Contouring error monitoring	Monitors the momentary following error if the following error tolerance is exceeded and releases a fault indication, if necessary.
Contouring error tolerance	If the contouring error reaches a defined following error tolerance, a fault indication is released.
Ctrl. enable	Controller enable
Ctrl. inhibit	Controller inhibit (= $\overline{\text{Controller enable}}$)
Fieldbus	For data exchange between superimposed control and positioning control, e.g. InterBus-S or PROFIBUS DP
FPDA	freely programmable digital output
FPDE	freely programmable digital input
GDC	Global Drive Control (PC-program (Windows) for Lenze controllers)
InterBus-S	Industrial communication standard to DIN E19258
JOG	Fixed speed or input for fixed speed
LECOM	Lenze Communication
LEMOC2	PC-program (DOS) for Lenze controllers
LU	Undervoltage
Master	Masters are host systems, e.g. PLC or PC.
OU	Overvoltage
PC	Personal Computer
PLC	Programmable logic controller
PM	Permanent magnet
Process data	For instance, setpoints and actual values of controllers which must be exchanged within a minimum of time. Process data are usually small amounts of data which are to be transmitted cyclically. For PROFIBUS, these data are transmitted in the logic process data channel.
PROFIBUS	Communication standard DIN 19245, consisting of part 1, part 2 and part 3
QSP	Quick stop
RFG	Ramp generator
Slave	Bus device which may only send after a request by the master. Controllers are slaves.
SSC	Sensorless control
SSI	Synchronous serial interface
Target position	The target which is to be approached by means of a defined traversing profile.



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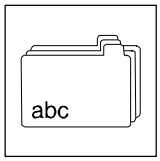

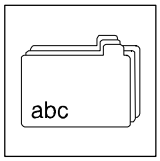

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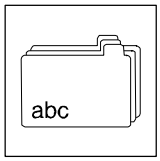

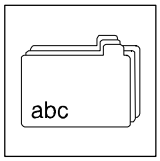

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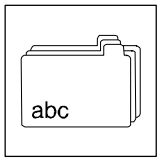

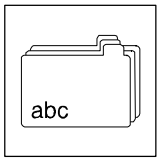

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