SINAMICS G120C

Frequency converter

Getting Started · 03/2012

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Answers for industry.

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Getting Started

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Legal information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

⚠ DANGER
indicates that death or severe personal injury **will** result if proper precautions are not taken.

⚠ WARNING
indicates that death or severe personal injury **may** result if proper precautions are not taken.

⚠ CAUTION
with a safety alert symbol, indicates that minor personal injury can result if proper precautions are not taken.

CAUTION
without a safety alert symbol, indicates that property damage can result if proper precautions are not taken.

NOTICE
indicates that an unintended result or situation can occur if the relevant information is not taken into account.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Proper use of Siemens products

Note the following:

⚠ WARNING
Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

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We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

Table of contents

This Getting Started Guide describes how you install and commission the SINAMICS G120C converter.

Product overview

The SINAMICS G120C is a range of converters for controlling the speed of three phase motors. The converter is available in three frame sizes.

You find a label with the order number:

- On the front of the converter after removing the blind cover or the operator panel.
- On one side of the converter.

	Rated output power	Rated output current	Order number			
	based on Low Overload		Unfiltered		Filtered	
Frame Size A	0.55 kW	1.7 A	6SL3210-1KE11-8U	1	6SL3210-1KE11-8A	1
	0.75 kW	2.2 A	6SL3210-1KE12-3U	1	6SL3210-1KE12-3A	1
	1.1 kW	3.1 A	6SL3210-1KE13-2U	1	6SL3210-1KE13-2A	1
	1.5 kW	4.1 A	6SL3210-1KE14-3U	1	6SL3210-1KE14-3A	1
	2.2 kW	5.6 A	6SL3210-1KE15-8U	1	6SL3210-1KE15-8A	1
	3.0 kW	7.3 A	6SL3210-1KE17-5U	1	6SL3210-1KE17-5A	1
	4.0 kW	8.8 A	6SL3210-1KE18-8U	1	6SL3210-1KE18-8A	1
Frame Size B	5.5 kW	12.5 A	6SL3210-1KE21-3U	1	6SL3210-1KE21-3A	1
	7.5 kW	16.5 A	6SL3210-1KE21-7U	1	6SL3210-1KE21-7A	1
Frame Size C	11.0 kW	25.0 A	6SL3210-1KE22-6U	1	6SL3210-1KE22-6A	1
	15.0 kW	31.0 A	6SL3210-1KE23-2U	1	6SL3210-1KE23-2A	1
	18.5 kW	37.0 A	6SL3210-1KE23-8U	1	6SL3210-1KE23-8A	1
SINAMICS G120C USS/MB (USS, Modbus RTU)				B		B
SINAMICS G120C DP (PROFIBUS DP)				P		P
SINAMICS G120C PN (PROFINET IO)				F		F
SINAMICS G120C CANopen				C		C

Figure 1-1   Identifying the converter

Safety notes

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It has to be ensured by the machine manufacturer, that the line-side overcurrent protection equipment interrupts within 5 s (immovable equipment and modules in immovable equipment) in the case of minimum fault current (current on complete insulation failure to accessible conductive parts that are not live during operation and maximum current loop resistance).

General

⚠️ **WARNING**

This equipment controls potentially dangerous rotating mechanical parts.

Protection in case of direct contact by means of voltages < 60V (PELV = Protective Extra Low Voltage acc. to EN 61800-5-1) is only permissible in areas with equipotential bonding and in dry indoor rooms. If these conditions are not fulfilled, other protective measures against electric shock are to be taken, e.g., protective insulation.

The converter must always be properly grounded. Since the residual current for this product is greater than 3.5mA AC, a fixed ground connection is required, and the minimum size of the protective conductor must comply with local safety regulations for equipment with a high leakage current.

Install the converter on a metal mounting plate in a control cabinet. The mounting plate must not must be painted and must have good electrical conductivity.

It is strictly prohibited for any mains disconnection to be performed on the motor-side of the system, if the converter is in operation and the output current is not equal to zero.

Take particular notice of the general and regional installation and safety regulations regarding work on dangerous voltage installations (e.g. 61800-5-1) as well as the relevant regulations regarding the correct use of tools and personal protective equipment (PPE).

⚠️ **CAUTION**

Static discharges on surfaces or interfaces (e.g. terminal or connector pins) can cause malfunctions or defects. ESD protective measures should therefore be observed when working with converters or converter components.

Transport and storage

> ⚠ **CAUTION**
>
> Don't drop the converter or converter components during transport and storage. Protect the equipment from water (rainfall) and excessive temperatures.

Installation and Commissioning

> ⚠ **WARNING**
>
> Wherever faults occurring in the control equipment can lead to substantial material damage or even grievous bodily injury (that is, potentially dangerous faults), additional external precautions must be taken or facilities provided to ensure or enforce safe operation, even when a fault occurs (e.g. independent limit switches, mechanical interlocks, etc.).

Operation

> ⚠ **DANGER**
>
> Operating the converter outside the scope of the specification given in the technical specifications may cause malfunction or damage to the converter components. In exceptional cases there is the potential to cause overheating, danger of fire, damage to property, personal injury or loss of life.

> ⚠ **WARNING**
>
> Emergency stop facilities according to EN 60204, IEC 204 (VDE 0113) must remain operative in all operating modes of the control equipment. Any disengagement of the emergency stop facility must not lead to an uncontrolled or an undefined restart of the equipment.

> ⚠ **WARNING**
>
> Use of mobile radio devices (e.g. telephones, walkie-talkies) in the immediate vicinity of the devices (< 1.8 m) can interfere with the functioning of the equipment.

> ⚠ **WARNING**
>
> Filtered drives can only be used on power systems with grounded neutral point.

> ⚠ **WARNING**
>
> During operation and for a short time after switching-off the converter, the surfaces of the converter can reach a high temperature. Avoid coming into direct contact with the converter surface.

> ⚠ **WARNING**
>
> **Risk of fire**
>
> If an unsuitable braking resistor is used, this could result in a fire and severely damage, people, property and equipment. Use the adequate braking resistor and install it correctly.
>
> The temperature of a braking resistor increases significantly during operation. Avoid coming into direct contact with braking resistors.

Repair

> ⚠ **WARNING**
>
> Repairs on equipment may only be carried out by Siemens Service, by repair centers authorized by Siemens or by authorized personnel who are thoroughly acquainted with all the warnings and operating procedures contained in this manual.
>
> Any defective parts or components must be replaced using parts contained in the relevant spare parts list.

Residual risks

The control and drive components of a power drive system (PDS) are approved for industrial and commercial use in industrial supply networks. Their use in public supply networks requires a different configuration and/or additional measures.

These components may only be operated in closed housings or in higher-level control cabinets with protective covers that are closed, and when all of the protective devices are used.

When carrying out a risk assessment of a machine in accordance with the EU Machinery Directive, the machine manufacturer must consider the following residual risks associated with the control and drive components of a PDS.

1. Unintentional movements of driven machine components during commissioning, operation, maintenance, and repairs caused by, for example:

   – Hardware defects and/or software errors in the sensors, controllers, actuators, and connection technology

   – Response times of the controller and drive

   – Operating and/or ambient conditions not within the scope of the specification

   – Condensation / conductive contamination

   – Parameterization, programming, cabling, and installation errors

   – Use of radio devices / cellular phones in the immediate vicinity of the controller

   – External influences / damages

2. Exceptionally high temperatures as well as emissions of noise, particles, or gas caused by, for example:

   – Component malfunctions

   – Software errors

   – Operating and/or ambient conditions not within the scope of the specification

   – External influences / damages

3. Hazardous shock voltages caused by, for example:

   – Component malfunctions

   – Influence of electrostatic charging

   – Induction of voltages in moving motors

   – Operating and/or ambient conditions not within the scope of the specification

   – Condensation / conductive contamination

   – External influences / damages

4. Electrical, magnetic and electromagnetic fields generated in operation that can pose a risk to people with a pacemaker, implants or metal replacement joints, etc. if they are too close.

5. Release of environmental pollutants or emissions as a result of improper operation of the system and/or failure to dispose of components safely and correctly.

Installing

3

3.1   Mechanical installation

Table 3- 1   Dimensions, drill patterns and minimum distances

		Frame Size A 0.55 kW … 4.0 kW	Frame Size B 5.5 kW … 7.5 kW	Frame Size C 11 kW … 18.5 kW
	Height	196 mm	196 mm	295 mm
	Width	73 mm	100 mm	140 mm
	Depth of the converter with PROFINET interface	225.4 mm	225.4 mm	225.4 mm
	Depth of the converter with USS/MB, CANopen or PROFIBUS interface	203 mm	203 mm	203 mm
	+ Depth	+ 21 mm supplementary depth with the operator panel IOP snapped onto the converter.		
		+ 6 mm supplementary depth with the operator panel BOP-2.		
	Drill pattern			
	Fixings	3 × M4 bolts 3 × M4 nuts 3 × M4 washers	4 × M4 bolts 4 × M4 nuts 4 × M4 washers	4 × M5 bolts 4 × M5 nuts 4 × M5 washers
	Tightening torque	2.5 Nm	2.5 Nm	2.5 Nm

3.2 Electrical installation

Connecting line, motor and further components
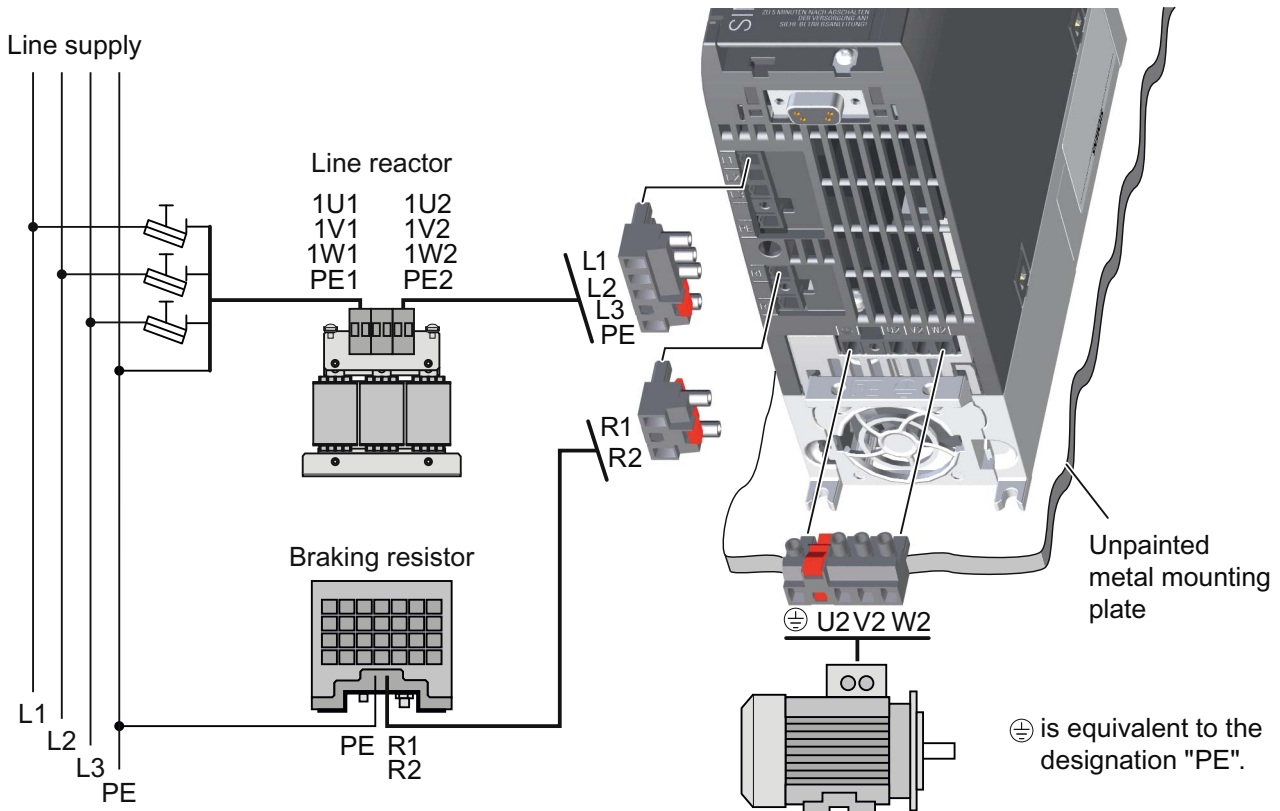
Converter		Standard fuse	UL/cUL fuse	Braking resistor	Line reactor
FSA	0.55 kW … 1.1 kW	3NA3801 (6 A)	10 A class J	6SL3201-0BE14-3AA0	6SL3203-0CE13-2AA0
	1.5 kW	3NA3803 (10 A)			6SL3203-0CE21-0AA0
	2.2 kW			6SL3201-0BE21-0AA0	
	3.0 kW … 4.0 kW	3NA3805 (16 A)	15 A class J		
FSB	5.5 kW	3NA3807 (20 A)	20 A class J	6SL3201-0BE21-8AA0	6SL3203-0CE21-8AA0
	7.5 kW	3NA3810 (25 A)	25 A class J		
FSC	11 kW	3NA3817 (40 A)	40 A class J	6SL3201-0BE23-8AA0	6SL3203-0CE23-8AA0
	15 kW	3NA3820 (50 A)	50 A class J		
	18.5 kW	3NA3822 (63 A)	60 A class J		

Converter		Cable cross section converter (tightening torque)		Line reactor (tightening torque)			Braking resistor (tightening torque)	
FSA	0.55 kW … 4 kW	2.5 mm² (0.5 Nm)	14 AWG (4.5 lbf in)	4 mm² (0.8 Nm)	12 AWG (7 lbf in)	PE M4 (3 Nm / 26.5 lbf in)	2.5 mm² (0.5 Nm)	14 AWG (4.5 lbf in)
FSB	5.5 kW … 7.5 kW	6 mm² (0.6 Nm)	10 AWG (5.5 lbf in)	10 mm² (1.8 Nm)	8 AWG (16 lbf in)	PE M5 (5 Nm / 44 lbf in)		
FSC	11 kW … 18.5 kW	16 mm² (1.5 Nm)	5 AWG (13.5 lfb in)	16 mm² (4 Nm)	5 AWG (35 lbf in)		6 mm² (0.6 Nm)	10 AWG (5.5 lbf in)

Components for United States / Canadian installations (UL/CSA)

In order that the system is UL/CSA-compliant, use UL/CSA-certified J-type fuses, overload circuit-breakers or intrinsically safe motor protection devices. For each frame size A to C use class 1 75° C copper wire only.

Install the converter with any external recommended suppressor with the following features:

● Surge-protective devices; device shall be a Listed Surge-protective device (Category code VZCA and VZCA7).

● Rated nominal voltage 480/277 V_{AC}, 50/60 Hz, 3-phase.

● Clamping voltage V_{PR} = 2000 V, I_N = 3 kA min, MCOV = 550 V_{AC}, SCCR = 40 kA.

● Suitable for Type 1 or Type 2 SPD application.

● Clamping shall be provided between phases and also between phase and ground.

EMC compliant installation

Rules for EMC-compliant installation:

● Install the converter on a metal mounting plate. The mounting plate has to be unpainted and with a good electrical conductivity.

● Use shielded cables for the following connections:

– Motor and motor temperature sensor

– Braking resistor

– Process interfaces (Field bus, digital and analog inputs and outputs)

● Use a clamp for connecting each shielded cable. Connect the shield to the mounting plate or to the shield plate through a good electrical connection and through the largest possible surface area.

1 Uncover cable screen

2 Press cable screen on shield plate

A

A

EMC clamp for cable shield

Cable from terminal strip

L1
L2
L3
PE

R1
R2

U2
V2
W2

EMC clamps for cable shield

Line supply

Braking resistor

Screening example for converter frame size A
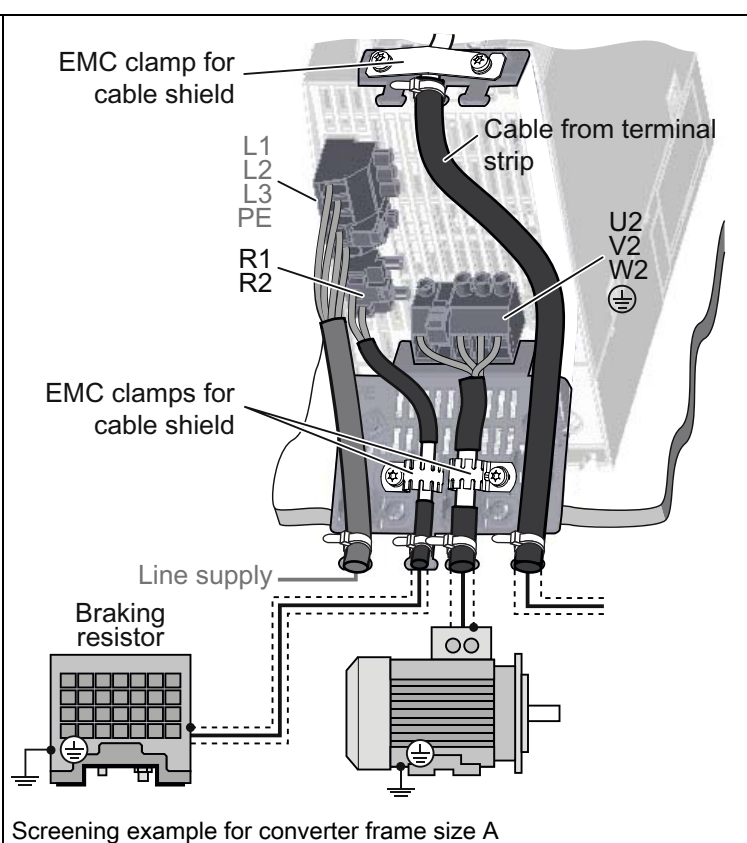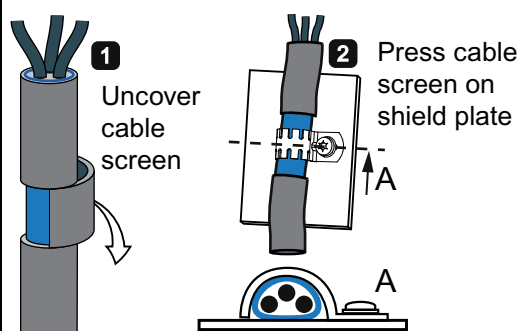
Overview of process and user interfaces

Memory card slot (MMC or SD cards)

Analog input DIP switch — Voltage / Current

Interface for operator panel (BOP-2 or IOP)

Terminal designations

Depending on field bus
  G120C DP/PN: no function
  G120C USS/MB/CAN: DIP switches for bus address

Bit 6	(64)	7
Bit 5	(32)	6
Bit 4	(16)	5
Bit 3	(8)	4
Bit 2	(4)	3
Bit 1	(2)	2
Bit 0	(1)	1
ON	OFF	

Example: Address = 5

31	+24V IN
32	GND IN
1	+10V OUT
2	GND
3	AI0+
4	AI0-
12	AO0+
13	GND
21	DO1+
22	DO0-

USB interface for STARTER

LED status

RDY
BF
SAFE
LNK1 } only for PROFI-
LNK2 } NET

14	T1 motor
15	T2 motor
28	GND
69	DI COM1
34	DI COM2
5	DI0
6	DI1
7	DI2	19	DO0 NO
8	DI3	20	DO0 COM
16	DI4	18	DO0 NC
17	DI5	9	+24V OUT

Terminal strips

Depending on field bus
  G120C DP/PN: no function
  G120C USS/MB/CAN: bus termination — on / off

Field bus interface

CANopen
1 Not used
2 CAN_L, CAN-signal (dominant low)
3 CAN_GND, CAN-reference
4 Not used
5 (CAN _SHLD), optional cable shield
6 (GND), optional CAN-reference
7 CAN_H, CAN-signal (dominant high)
8 Not used
9 Not used

USS / Modbus RTU
1 0 V, reference potential
2 RS485N, Receive and send (-)
3 RS485P, Receive and send (+)
4 Cable shield
5 Not used

PROFIBUS
1 Shield, ground connection
2 Not used
3 RxD/TxD-P, receive/send data P(B/B')
4 CNTR-P, control signal
5 DGND, data reference potential (C/C')
6 VP, supply voltage positive
7 Not used
8 RxD/TxD-N, receive/send data N(A/A')
9 Not used

PROFINET
1 RX+, receiver data +
2 RX-, receiver data -
3 TX+, transmission data +
4 Not used
5 Not used
6 TX-, transmission data -
7 Not used
8 Not used

Wiring the terminal strip

31	+24V IN.	18 V ... 30 V optional power supply
32	GND IN.	Reference potential for terminal 31
1	+10V OUT	10 V output referred to GND, max. 10 mA
2	GND	Overall reference potential
3	AI 0+	Analog input (-10 V ... 10 V, 0/4-20 mA ... 20 mA)
4	AI 0-	Reference potential for analog input 0
12	AO 0+	Analog output (0 V ... 10 V, 0 mA ... 20 mA)
13	GND	Overall reference potential
21	DO 1+	Digital output, max. 0.5 A, 30 V DC
22	DO 1-	
14	T1 MOTOR	Temperature sensor (PTC, KTY84, bimetal)
15	T2 MOTOR	
28	GND	Overall reference potential
69	DI COM1	Reference potential for digital inputs 0, 2 and 4
34	DI COM2	Reference potential for digital inputs 1, 3 and 5
5	DI 0	
6	DI 1	
7	DI 2	
8	DI 3	Digital inputs
16	DI 4	
17	DI 5	
19	DO 0 NO	Digital output,
20	DO 0 COM	max. 0.5 A, 30 V DC
18	DO 0 NC	
9	+24V OUT	24 V output refered to GND, max. 200 mA

Wiring variants

① Wiring using the internal power supply   Digital input = HIGH if switch closed

② Wiring using an external power supply   Digital input = HIGH if switch closed

③ Wiring using the internal power supply   Digital input = LOW if switch closed

④ Wiring using an external power supply   Digital input = LOW if switch closed

Permissible cable cross-section: 0.5 mm² (21 AWG) … 1.5 mm² (16 AWG)

Recommended cable cross section: 1 mm² (18 AWG)

EMC-compliant installation

- Use shielded cables for connecting the terminal strip to other components.

- Use a clamp for connecting the shielded cable. Connect the shield to the mounting plate or to the shield plate through a good electrica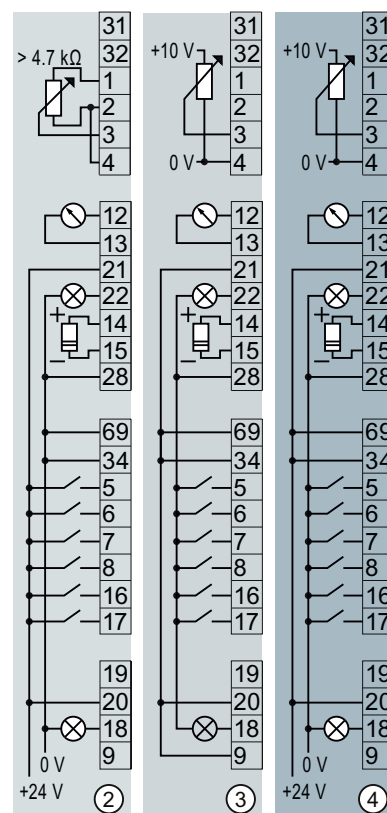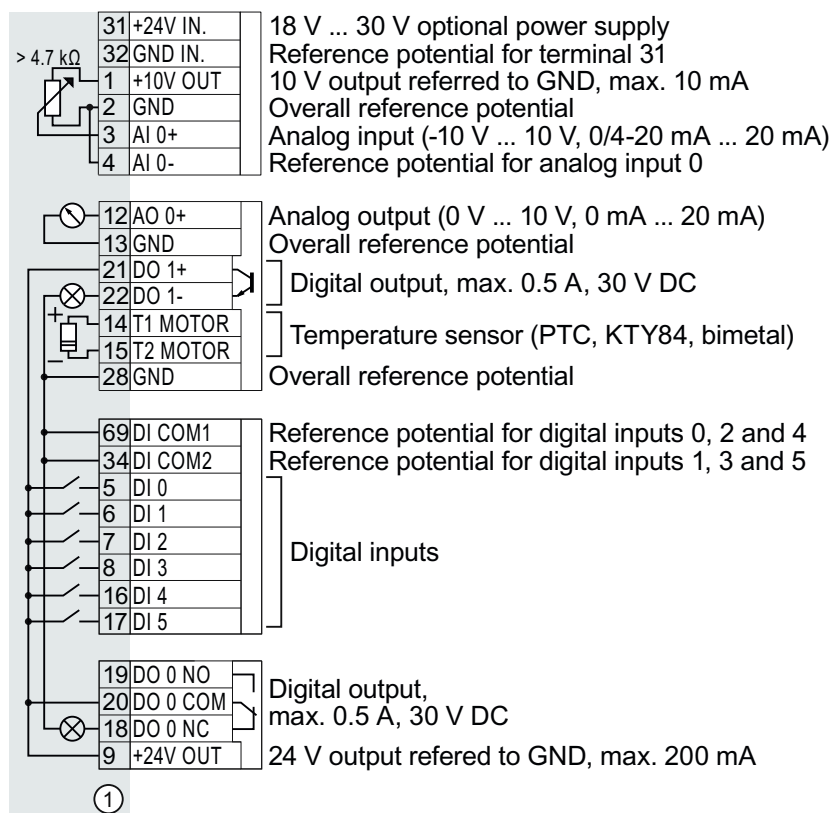l connection and through the largest possible surface area. The handling of shielded cables is shown in section Electrical installation (Page 10).

3.3 Pre-defined interface configurations

The converter offers different pre-defined settings for its interfaces. Select the appropriate setting (macro) when commissioning the inverter (see section: Commissioning (Page 19)) and wire the terminal strips according to the selection.

If none of the pre-defined settings suites your application completely, do the following steps:

1. Wire the terminal strips according to your application.

2. Choose the best fitting I/O configuration (macro).

3. Select your chosen I/O configuration (macro) during basic commissioning.

4. Change the function of the inappropriate terminals.

Fixed speeds

Macro 1		
Two fixed speeds		
p1003 = Fixed speed 3		
p1004 = Fixed speed 4		
DI 4 and DI 5 = HIGH:		
Inverter adds fixed speed 3 + fixed speed 4		

5	DI 0	ON/OFF1 right	Fault	18	DO 0
6	DI 1	ON/OFF1 left		19	
7	DI 2	Acknowledge		20	
8	DI 3	---	Alarm	21	DO 1
16	DI 4	Fixed speed 3		22	
17	DI 5	Fixed speed 4			
3	AI 0	---	Speed	12	AO 0
4			0 V ... 10 V	13	

Macro 2		
Two fixed speeds with safety function (STO)		
p1001 = Fixed speed 1		
p1002 = Fixed speed 2		
DI 0 and DI 1 = HIGH:		
Motor runs with fixed speed 1 + fixed speed 2		

5	DI 0	ON/OFF1 + Fixed speed 1	Fault	18	DO 0
6	DI 1	Fixed speed 2		19	
7	DI 2	Acknowledge		20	
8	DI 3	---	Alarm	21	DO 1
16	DI 4	Reserved for STO		22	
17	DI 5				
3	AI 0+	---	Speed	12	AO 0+
4			0 V ... 10 V	13	

See also section: Releasing "Safe Torque Off" (Page 26).

Macro 3		
Four fixed speeds		
p1001 = Fixed speed 1		
p1002 = Fixed speed 2		
p1003 = Fixed speed 3		
p1004 = Fixed speed 4		
Several DI = HIGH:		
Inverter adds corresponding fixed speeds		

5	DI 0	ON/OFF1 + Fixed speed 1	Fault	18	DO 0
6	DI 1	Fixed speed 2		19	
7	DI 2	Acknowledge		20	
8	DI 3	---	Alarm	21	DO 1
16	DI 4	Fixed speed 3		22	
17	DI 5	Fixed speed 4			
3	AI 0+	---	Speed	12	AO 0+
4			0 V ... 10 V	13	

Macro 4

Field bus PROFIBUS DP
or PROFINET

5	DI 0	---	Fault	18	DO 0
6	DI 1	---		19	
7	DI 2	Acknowledge		20	
8	DI 3	---	Alarm	21	DO 1
16	DI 4	---		22	
17	DI 5	---			
3	AI 0	---	Speed	12	AO 0
4			0 V ... 10 V	13	

PROFIBUS DP
PROFINET
Telegramm 352

See also section: Description files for fieldbus configuration (Page 18).

Macro 5

Field bus PROFIBUS DP or
PROFINET with safety function
(STO)

5	DI 0	---	Fault	18	DO 0
6	DI 1	---		19	
7	DI 2	Acknowledge		20	
8	DI 3	---	Alarm	21	DO 1
16	DI 4	Reserved for STO		22	
17	DI 5				
3	AI 0	---	Speed	12	AO 0
4			0 V ... 10 V	13	

PROFIBUS DP
PROFINET
Telegramm 352

See also sections: Releasing "Safe Torque Off" (Page 26), Description files for fieldbus
configuration (Page 18).

Automatic / Manual - change over from field bus to jog

Factory setting with G120C DP and G120C PN:

| Macro 7 | DI 3 = LOW Field bus PROFIBUS DP or PROFINET | | | DI 3 = HIGH Jog via DI 0 and DI 1 | | | |

5	DI 0	---	Fault	18	DO 0
6	DI 1	---		19	
7	DI 2	Acknowledge		20	
8	DI 3	LOW	Alarm	21	DO 1
16	DI 4	---		22	
17	DI 5	---			
3	AI 0	---	Speed	12	AO 0
4			0 V ... 10 V	13	

PROFIBUS DP
PROFINET
Telegramm 1

5	DI 0	Jog speed 1	Fault	18	DO 0
6	DI 1	Jog speed 2		19	
7	DI 2	Acknowledge		20	
8	DI 3	HIGH	Alarm	21	DO 1
16	DI 4	---		22	
17	DI 5	---			
3	AI 0	---	Speed	12	AO 0
4			0 V ... 10 V	13	

p1058 = Jog speed 1
p1059 = Jog speed 2

See also section: Description files for fieldbus configuration (Page 18).

Motorized potentiometer

Macro 8 Motorized potentiometer (MOP) with safety function (STO)		

5	DI 0	ON/OFF1	Fault	18	DO 0
6	DI 1	MOP up		19	
7	DI 2	MOP down		20	
8	DI 3	Acknowledge	Alarm	21	DO 1
16	DI 4	⌉ Reserved for STO		22	
17	DI 5	⌋			
3	AI 0	---	Speed	12	AO 0
4			0 V ... 10 V	13	

See also section: Releasing "Safe Torque Off" (Page 26).

Macro 9 Motorized potentiometer (MOP)		

5	DI 0	ON/OFF1	Fault	18	DO 0
6	DI 1	MOP up		19	
7	DI 2	MOP down		20	
8	DI 3	Acknowledge	Alarm	21	DO 1
16	DI 4	---		22	
17	DI 5	---			
3	AI 0	---	Speed	12	AO 0
4			0 V ... 10 V	13	

Analog setpoint

Macro 13 Safety function (STO)		

5	DI 0	ON/OFF1	Fault	18	DO 0
6	DI 1	Reverse		19	
7	DI 2	Acknowledge		20	
8	DI 3	---	Alarm	21	DO 1
16	DI 4	⌉ Reserved for STO		22	
17	DI 5	⌋			
3	AI 0	Setpoint	Speed	12	AO 0
4		I ▬ U -10 V ... 10 V	0 V ... 10 V	13	

See also section: Releasing "Safe Torque Off" (Page 26).

Process industry

Macro 14	DI 3 = LOW Field bus PROFIBUS DP or PROFINET		DI 3 = HIGH Motorized potentiometer (MOP)	

5	DI 0	---	Fault	18	DO 0
6	DI 1	External fault		19	
7	DI 2	Acknowledge		20	
8	DI 3	LOW	Alarm	21	DO 1
16	DI 4	---		22	
17	DI 5	---			
3	AI 0	---	Speed	12	AO 0
4			0 V ... 10 V	13	

PROFIBUS DP PROFINET Telegramm 20

5	DI 0	ON/OFF1	Fault	18	DO 0
6	DI 1	External fault		19	
7	DI 2	Acknowledge		20	
8	DI 3	HIGH	Alarm	21	DO 1
16	DI 4	MOP up		22	
17	DI 5	MOP down			
3	AI 0	---	Speed	12	AO 0
4			0 V ... 10 V	13	

See also section: Description files for fieldbus configuration (Page 18).

| Macro 15 | DI 3 = LOW | | | | DI 3 = HIGH | | | |
| | Analog setpoint | | | | Motorized potentiometer (MOP) | | | |

5 DI 0	ON/OFF1	Fault	18 DO 0		5 DI 0	ON/OFF1	Fault	18 DO 0
6 DI 1	External fault		19		6 DI 1	External fault		19
7 DI 2	Acknowledge		20		7 DI 2	Acknowledge		20
8 DI 3	LOW	Alarm	21 DO 1		8 DI 3	HIGH	Alarm	21 DO 1
16 DI 4	---		22		16 DI 4	MOP up		22
17 DI 5	---				17 DI 5	MOP down		
3 AI 0	Setpoint	Speed	12 AO 0		3 AI 0	---	Speed	12 AO 0
4	I▭◼U -10 V ... 10 V	0 V ... 10 V	13		4		0 V ... 10 V	13

Two or three wire control

Macro 12 is factory setting with the G120C USS/MB and G120C CAN.

	Macro 12	Macro 17	Macro 18
Two wire control	Mode 1	Mode 2	Mode 3
Control command 1	ON/OFF1	ON/OFF1 right	ON/OFF1 right
Control command 2	Reverse	ON/OFF1 left	ON/OFF1 left

5 DI 0	Control command 1	Fault	18 DO 0
6 DI 1	Control command 1		19
7 DI 2	Acknowledge		20
8 DI 3	---	Alarm	21 DO 1
16 DI 4	---		22
17 DI 5	---		
3 AI 0	Setpoint	Speed	12 AO 0
4	I▭◼U -10 V ... 10 V	0 V ... 10 V	13

	Macro 19	Macro 20
Three wire control	Mode 1	Mode 2
Control command 1	Release/ OFF1	Release/ OFF1
Control command 2	ON right	ON
Control command 3	ON left	Reverse

5 DI 0	Control command 1	Fault	18 DO 0
6 DI 1	Control command 2		19
7 DI 2	Control command 3		20
8 DI 3	Acknowledge	Alarm	21 DO 1
16 DI 4	---		22
17 DI 5	---		
3 AI 0	Setpoint	Speed	12 AO 0
4	I▭◼U -10 V ... 10 V	0 V ... 10 V	13

Communication with the higher-level control via USS

| Macro 21 |
| Field bus USS |

p2020 = baud rate
p2022 = Number of PZD
p2023 = Number of PKW

5 DI 0	---	Fault	18 DO 0
6 DI 1	---		19
7 DI 2	Acknowledge		20
8 DI 3	---	Alarm	21 DO 1
16 DI 4	---		22
17 DI 5	---		
3 AI 0	---	Speed	12 AO 0
4		0 V ... 10 V	13

USS
38400 baud
2 PZD, PKW variable

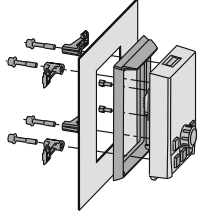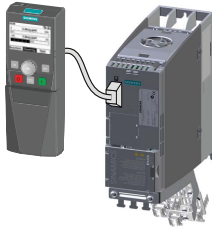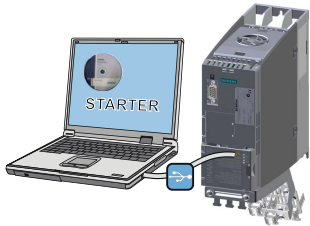## Communication with the higher-level control via CANopen

Macro 22
Field bus CANopen

p8622 = baud rate

5	DI 0	---	Fault	18	DO 0
6	DI 1	---		19	
7	DI 2	Acknowledge		20	
8	DI 3	---	Alarm	21	DO 1
16	DI 4	---		22	
17	DI 5	---			

3	AI 0	---	Speed	12	AO 0
4			0 V ... 10 V	13	

CANopen
20 kBaud
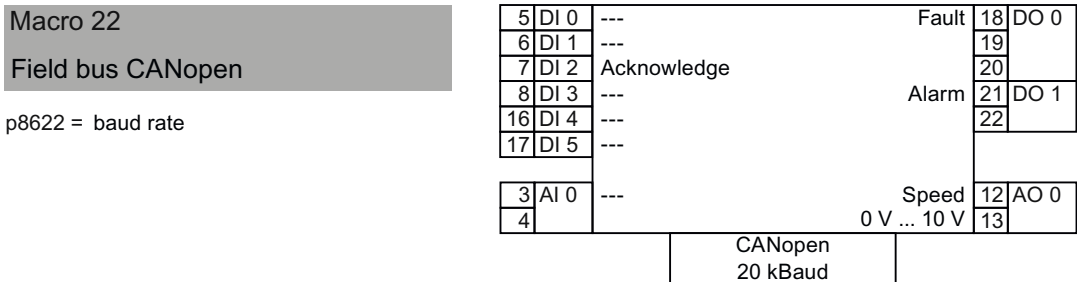
See also section: Description files for fieldbus configuration (Page 18).

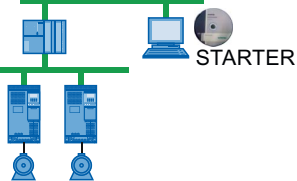## 3.4 Description files for fieldbus configuration

Description file	Note	Download	Alternative
GSD for PROFIBUS	The General Station Description (GSD) file describes the characteristics of the converter in a PROFIBUS network.	Internet: (http://support.automation.siemens.com/WW/view/en/22339653/133100)	The GSD is saved in the converter. The converter writes its GSD to the memory card if you insert the memory card in the converter and set p0804 to 12. Using the memory card, you can then transfer the GSD to your PG/your PC.
GSDML for PROFINET	The General Station Description (GSDML) file describes the characteristics of the converter in a PROFINET network.	Internet: (http://support.automation.siemens.com/WW/view/en/26641490)	The GSDML is saved in the converter. The converter writes its GSDML to the memory card if you insert the memory card in the converter and set p0804 to 12. Using the memory card, you can then transfer the GSDML to your PG/your PC.
EDS for CANopen	The EDS file for CAN is required to operate the converter as a node on a CAN bus and announce the device to the configuration tool.	Internet: (http://support.automation.siemens.com/WW/view/en/48351511)	---

Commissioning

<div style="text-align: right; font-size: 3em;">4</div>

Accessories for commissioning and data backup

Operator Panels for commissioning, diagnostics and controlling converters		Order number
	BOP-2 (Basic Operator Panel) - for snapping onto the frequency converter • Copying of drive parameters • Two-line display • Guided basic commissioning	6SL3255-0AA00-4CA1
	IOP (Intelligent Operator Panel) - for snapping onto the frequency converter • Copying of drive parameters • Plain text display • Menu-based operation and application wizards	6SL3255-0AA00-4JA0
	Door mounting kit for IOP/BOP-2 • For installation of theBOP-2 or IOP in a control cabinet door. • Degree of protection with IOP: IP54 or UL Type 12 • Degree of protection with BOP-2: IP55	6SL3256-0AP00-0JA0
	IOP - with handheld For mobile use of the IOP	6SL3255-0AA00-4HA0
PC tools for commissioning, diagnostics and controlling of the converter		
	PC Connection Kit Includes a STARTER DVD and USB port.	6SL3255-0AA00-2CA0

	STARTER Commissioning tool (PC software) connected to the converter via USB port, PROFIBUS or PROFINET Downloading: STARTER (http://support.automation.siemens.com/WW/view/en/10804985/130000)	STARTER on the DVD: 6SL3072-0AA00-0AG0
STARTER	Drive ES Basic As an option to STEP 7 with routing function via network limits for PROFIBUS and PROFINET	6SW1700-5JA00-5AA0
Memory cards: to save and transfer the converter settings		
	MMC card	6SL3254-0AM00-0AA0
	SD card	6ES7954-8LB00-0AA0

Commissioning with IOP

The commissioning with the IOP can be done intuitively by using the commissioning wizards and the help texts included in the IOP. For further information refer to the IOP Operating Instructions.

Commissioning with STARTER

The most important steps:

● Connect the PC to the converter via USB and start the STARTER tool.

● Choose the project wizard (menu "Project / New with assistent")

   – In the project wizard choose "Find drive units online"

   – Select USB as interface (Access point of the application: "DEVICE …", interface parameter assignment used: "S7USB")

   – Finish the project wizard.

● STARTER has now created your project and inserted a new drive

● Select the drive in your project and go online

● In your drive open the "Configuration" mask (double click)

● Start basic commissioning with the "Assistent" button

For further information refer to converter operating instructions.

Installing the basic operator panel BOP-2 and selecting basic commissioning

1. Remove the blind cover on the converter.
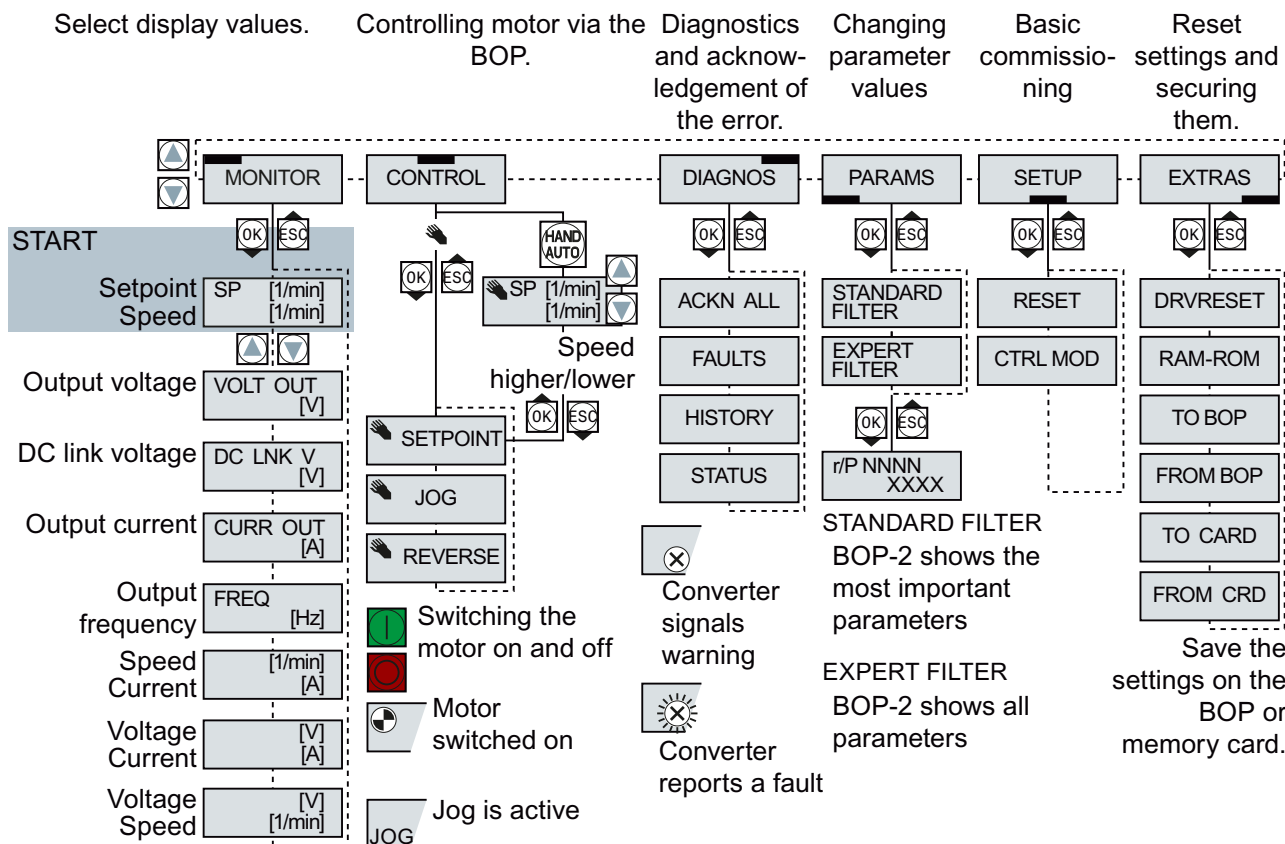2. A: Place the bottom edge of the BOP-2 casing into the lower recess of the converter housing.
   B: Push the BOP-2 towards the converter until the release-catch clicks into place on the converter housing.
3. Wait until the operator panel displays setpoint [1/min] and speed [1/min].
4. ESC Press the ESC key.
5. ▲ Press one of the arrow keys until the operator panel displays the SETUP menu.
6. SETUP [OK] In the SETUP menu press the OK button to start the basic commissioning.
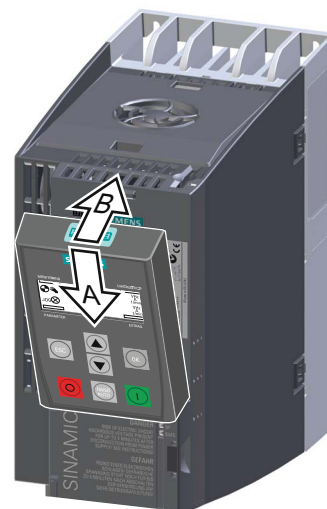
Futher steps see next section (Page 22).
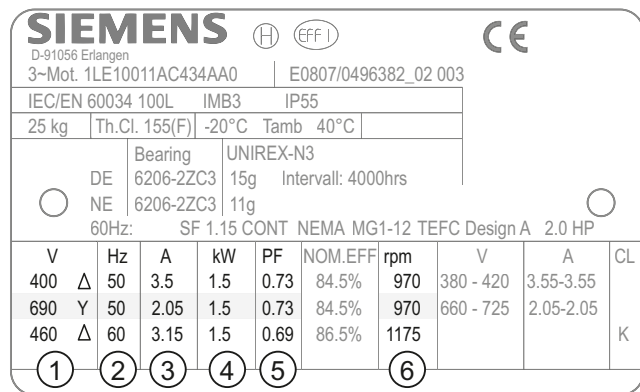
Overview of the BOP-2 menu

Select display values.

Controlling motor via the BOP.

Diagnostics and acknowledgement of the error.

Changing parameter values

Basic commissioning

Reset settings and securing them.

MONITOR CONTROL DIAGNOS PARAMS SETUP EXTRAS

START

Setpoint Speed SP [1/min] [1/min]

Output voltage VOLT OUT [V]

DC link voltage DC LNK V [V]

Output current CURR OUT [A]

Output frequency FREQ [Hz]

Speed Current [1/min] [A]

Voltage Current [V] [A]

Voltage Speed [V] [1/min]

SP [1/min] [1/min]

Speed higher/lower

SETPOINT

JOG

REVERSE

Switching the motor on and off

Motor switched on

Jog is active

ACKN ALL

FAULTS

HISTORY

STATUS

Converter signals warning

Converter reports a fault

STANDARD FILTER

EXPERT FILTER

r/P NNNN XXXX

STANDARD FILTER
BOP-2 shows the most important parameters

EXPERT FILTER
BOP-2 shows all parameters

RESET

CTRL MOD

DRVRESET

RAM-ROM

TO BOP

FROM BOP

TO CARD

FROM CRD

Save the settings on the BOP or memory card.

4.1 Basic commissioning with BOP-2

The basic commissioning sets the most important data of the drive.

	SETUP [OK]	The "SETUP" menu guides you step by step through the basic commissioning of the drive.
1.	**RESET** [OK]	Select Reset if you wish to reset all parameters to the factory setting before the basic commissioning: nO → YES → OK
2.	**CTRL MOD** P1300 [OK]	Select the motor control mode. The most important control modes are:

VF LIN	V/f control with linear characteristic
VF QUAD	V/f control with square-law characteristic
SPD N EN	Closed loop speed control (vector control)

3. **EUR/USA** P100 [OK] ② IEC or NEMA standard

4. **MOT VOLT** P304 [OK] ① Voltage

5. **MOT CURR** P305 [OK] ③ Current

6. **MOT POW** P307 [OK] ④ Power IEC (kW) ⑤ Power NEMA (HP)

Set the motor data on the rating plate

7. **MOT RPM** P311 [OK] ⑥ Speed

8.	**MOT ID** P1900 [OK]	We recommend the setting STIL ROT (Identify motor data at standstill and with the motor rotating).

If one of the following cases applies, select the setting STILL (identify motor data at standstill):

- You have selected the "Speed control" control mode, but the motor cannot rotate freely, e.g. for mechanically limited traversing sections.
- You have set "V/f control" as control mode.

9.	**MAc PAr** P15 [OK]	Select the configuration for the inputs and outputs, as well as the correct fieldbus for your application. The predefined configurations can be found in the section titled Pre-defined interface configurations (Page 14).
10.	**MIN RPM** P1080 [OK]	Set the minimum motor speed.
11.	**RAMP UP** P1120 [OK]	Set the motor ramp-up time.

12.   RAMP DWN P1121 [OK]   Set the motor ramp-down time.

13.   FINISH [OK]   Confirm that the basic commissioning has been completed:
nO → YES → OK

Motor data identification and self-optimization

If you select the MOT ID (p1900) during basic commissioning, an alarm will be issued once the basic commissioning has been completed.

For the motor data identification, the motor must be cold. A motor in a warm operational condition supplies unusable measurement results.

⚠ **CAUTION**

Motor data identification for dangerous loads

Secure dangerous plant and system parts before starting the motor data identification, e.g. by fencing off the dangerous location or lowering a suspended load to the floor.

     The converter issues an alarm (alarm A07991).

1.   HAND AUTO ⇒   Press the HAND/AUTO botton. The BOP-2 displays the HAND icon.

2. | Switch on the motor.

3.   Wait until the converter switches off the motor after the motor data identification has been completed. This procedure takes several seconds.

     If, in addition to the motor data identification, you have also selected a rotating measurement, the converter issues again alarm A07991.

4. | Switch on again the motor.

5.   Wait until the converter switches off the motor after the speed controller has been optimized. This procedure can take up to one minute.

6.   HAND AUTO   Switch over from HAND to AUTO.

Now you have finished the basic commissioning and the motor identification.

4.2 Further settings

Changing settings using BOP-2

With the BOP-2 you change your converter settings by selecting a parameter via its number (e.g. p0327) and by changing the value of the parameter change.

In the parameters starting with an "r" (for example r0020), the converter will display internal values. You cannot change the value of an r-parameter.

The converter immediately saves all settings which you made using the BOP-2 so that they are protected against power failure.
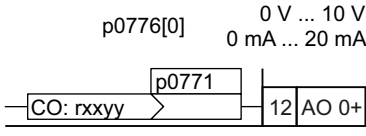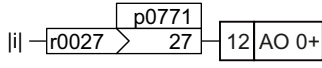
Procedure

Select the parameters		Changing a parameter value	
If the parameter number flashes in the display, you have two options for changing the number:		If the parameter value flashes in the display, you have two options of changing the value:	
1. option:	2. option:	1. option:	2. option:
• Increase or decrease the parameter number using the arrow keys until the number you want is displayed.	• Press and hold the OK key for more than two seconds and change the required parameter number digit by digit.	• Increase or decrease the parameter value using the arrow keys until the value you want is displayed.	• Press and hold the OK key for more than two seconds and enter the required value digit by digit.
• Confirm the parameter number using the OK key.		• Confirm the parameter value using the OK key.	
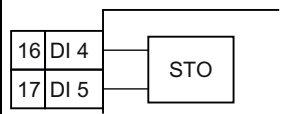
4.2.1 Changing the function of terminals

Terminals	Procedure	Examples
Digital inputs BI: pxxxx 5 DI 0 — r0722.0 6 DI 1 — r0722.1 7 DI 2 — r0722.2 8 DI 3 — r0722.3 16 DI 4 — r0722.4 17 DI 5 — r0722.5	1. Select the desired function indicated by a "BI"-parameter. 2. Set this parameter to the value of the status parameter r0722.x of the desired digital input.	*Function*: Switch on the motor with DI 2. p0840 7 DI 2 — r0722.2) 722.2 — ON/OFF1 *Setting with BOP-2:* P840 [00] r722.2
	If you have set macro 7, macro 14 or macro 15 (see page (Page 14)) for the converter interfaces, you have to input the appropriate parameter index for changing the function of a terminal: DI 3 = low: parameter index = [00] DI 3 = high: parameter index = [01]	
Digital outputs p0730 BO: ryyxx.n) — 19 DO 0 20 18 p0731) — 21 DO 1 22	1. Select the desired function indicated by a "BO"-parameter. 2. Set the parameter p073x of the desired digital output to the value of the "BO"-parameter.	Function: DO 1 proviedes the "fault" signal. p0731 ⚠ — r0052.3) 52.3 — 21 DO 1 22 *Setting with BOP-2:* P731 r52.3
Analog input -10 V ... 10 V 0 V ... 10 V I▢U -20 mA ... 20 mA 0 mA ... 20 mA I▣U p0756[0] CI: pyyyy 3 AI 0+ — r0755 >	1. Select the desired function indicated by a "CI"-parameter. 2. Set this parameter to the value of the status parameter r0755 of the analog input.	*Function*: AI 0 provides the setpoint for the PID controller. p1075 3 AI 0+ — r0755 > 755[0] *Setting with BOP-2:* P2253 [00] r755 [00]
	Use p0756[0] and the I/U switch on the converter front for setting a voltage or current input. If you have set macro 7, macro 14 or macro 15 (see page (Page 14)) for the converter interfaces, you have to input the appropriate parameter index for changing the function of a terminal: DI 3 = low: parameter index = [00] DI 3 = high: parameter index = [01]	

Terminals	Procedure	Examples
Analog output p0776[0] 0 V ... 10 V 0 mA ... 20 mA [CO: rxxyy] — [p0771] — [12	AO 0+]	1. Select the desired function indicated by a "CO"-parameter. 2. Set the parameter p0771 of the analog output to the value of the "CO"-parameter.	*Function*: AO 0 provides the "current" signal. |i| — [r0027 27] — [p0771] — [12	AO 0+] *Setting with BOP-2:* P771 [00] r27 [00]
	Use parameter p0776[0] for setting a voltage or current output.	

4.2.2   Releasing "Safe Torque Off"

Terminals	Set the following parameters for releasing STO:	
Fail-safe digital input [16	DI 4] [17	DI 5] — STO	p0010 = 95	Enter commissioning of fail-safe functions
	p9761 = …	Enter password for fail-safe function (factory setting = 0)
	p9762 = …	Enter new password, if required (0 … FFFF FFFF)
	p9763 = …	Confirm new password
	p9601.0 = 1	STO is selected via terminal strip
	p9659 = …	Set the forced checking procedure timer. To fulfill the requirements of standards ISO 13849-1 and IEC 61508 regarding timely error detection, the converter must regularly test its safety-relevant circuits to ensure that they function correctly.
	p9700 = D0	Copy fail-safe parameters
	p9701 = DC	Confirm fail-safe parameters
	p0010 = 0	Finish commissioning of fail-safe functions

4.2.3 Parameter list

The following list contains the basic parameter information with access level 1 ... 3. The complete parameter list is provided in the list manual, see Product support (Page 49).

P-No.	Note
	Operation and visualization
r0002	Drive operating display
p0003	Access level
p0010	Drive, commissioning parameter filter
p0015	Macro drive unit
	See also Pre-defined interface configurations (Page 14).
r0018	Control Unit firmware version
r0020	Speed setpoint smoothed [100 % ≙ p2000]
r0021	CO: Actual speed smoothed [100 % ≙ p2000]
r0022	Speed actual value rpm smoothed [rpm]
r0024	Output frequency smoothed [100 % ≙ p2000]
r0025	CO: Output voltage smoothed [100 % ≙ p2001]
r0026	CO: DC link voltage smoothed [100 % ≙ p2001]
r0027	CO: Absolute actual current smoothed [100 % ≙ p2002]
r0031	Actual torque smoothed [100 % ≙ p2003]
r0032	CO: Active power actual value smoothed [100 % ≙ r2004]
r0034	Motor utilization [100 ≙ 100%]
r0035	CO: Motor temperature [100°C ≙ p2006]
r0036	CO: Power unit overload I^2t [100 ≙ 100%]
r0039	Energy consumption
p0040	0 → 1	Reset the energy consumption display
r0041	Energy usage saved/energy saved
p0045	Smoothing time constant, display values [ms]
r0046	CO/BO: Missing enable signals
r0047	Motor data identification routine and speed controller optimization
r0050	CO/BO: Command Data Set CDS effective
r0051	CO/BO: Drive Data Set DDS effective
r0052	CO/BO: Status word 1
	.00	Ready to start
	.01	Ready
	.02	Operation enabled
	.03	Fault active
	.04	Coast down active (OFF2)

P-No.	Note	
	.05	Quick stop active (OFF3)
	.06	Closing lockout active
	.07	Alarm active
	.08	Deviation, setpoint/actual speed
	.09	Control requested
	.10	Maximum speed reached
	.11	I,M,P limit reached
	.12	Motor holding brake open
	.13	Alarm overtemperature motor
	.14	Motor rotates forwards
	.15	Alarm inverter overload
r0053	CO/BO: Status word 2	
r0054	CO/BO: Control word 1	
	.00	ON/OFF1
	.01	OFF2
	.02	OFF3
	.03	Enable ramp-function generator
	.04	Enable ramp-function generator
	.05	Continue ramp-function generator
	.06	Enable speed setpoint
	.07	Acknowledge fault
	.08	Jog bit 0
	.09	Jog bit 1
	.10	Master control by PLC
	.11	Direction reversal (setpoint)
	.13	Motorized potentiometer, raise
	.14	Motorized potentiometer, lower
	.15	CDS bit 0
r0055	CO/BO: Supplementary control word	
	.00	Fixed setpoint, bit 0
	.01	Fixed setpoint, bit 1
	.02	Fixed setpoint, bit 2
	.03	Fixed setpoint, bit 3
	.04	DDS selection, bit 0
	.05	DDS selection, bit 1
	.08	Technology controller enable
	.09	DC braking enable
	.11	Droop enable
	.12	Closed-loop torque control active
	.13	External fault 1 (F07860)
	.15	CDS bit 1
r0056	CO/BO: Status word, closed-loop control	

P-No.	Note	
r0060	CO: Speed setpoint before setpoint filter [100 % ≙ p2000]	
r0062	CO: Speed setpoint after filter [100 % ≙ p2000]	
r0063	CO: Speed actual value unsmoothed [100 % ≙ p2000]	
r0064	CO: Speed controller system deviation [100 % ≙ p2000]	
r0065	Slip frequency [100 % ≙ p2000]	
r0066	CO: Output frequency [100 % ≙ p2000]	
r0067	CO: Output current, maximum [100 % ≙ p2002]	
r0068	CO: Absolute current actual value unsmoothed [100 % ≙ p2002]	
r0070	CO: Actual DC link voltage [100 % ≙ p2001]	
r0071	Maximum output voltage [100 % ≙ p2001]	
r0072	CO: Output voltage [100 % ≙ p2001]	
r0075	CO: Current setpoint field-generating [100 % ≙ p2002]	
r0076	CO: Current actual value field-generating [100 % ≙ p2002]	
r0077	CO: Current setpoint torque-generating [100 % ≙ p2002]	
r0078	CO: Current actual value torque-generating [100 % ≙ p2002]	
r0079	CO: Torque setpoint, total [100 % ≙ p2003]	
Commissioning		
p0100	IEC/NEMA motor standard	
	0	IEC motor (50 Hz, SI units)
	1	NEMA motor (60 Hz, US units)
	2	NEMA motor (60 Hz, SI units)
P0124	CU Identification via LED	
p0170	Number of Command Data Sets (CDS)	
p0180	Number of Drive Data Sets (DDS)	
Power Module		
p0201	Power unit code number	
r0204	Power unit, hardware properties	
p0205	Power unit application	
	0	Load cycle with high overload
	1	Load cycle with light overload
r0206	Rated power unit power [kw/hp]	
r0207	Rated power unit current	
r0208	Rated power unit line supply voltage [V]	
r0209	Power unit, maximum current	

P-No.	Note	
p0210	Drive unit line supply voltage [V]	
p0230	Drive filter type, motor side	
	0	No filter
	1	Motor reactor
	2	dv/dt filter
	3	Siemens sine-wave filter
	4	Sine wave filter, third-party manufacturer
p0233	Power unit motor reactor [mH]	
p0234	Power unit sine-wave filter capacitance [µF]	
r0238	Internal power unit resistance	
p0278	DC link voltage undervoltage threshold reduction [V]	
p0287	Ground fault monitoring thresholds [100 % ≙ r0209]	
r0289	CO: Maximum power unit output current [100 % ≙ p2002]	
p0290	Power unit overload response	
	0	Reduce output current or output frequency
	1	No reduction, shutdown when overload threshold is reached
	2	Reduce I_output or f_output and f_pulse (not using I2t).
	3	Reduce the pulse frequency (not using I2t)
p0292	Power unit temperature alarm threshold [°C]	
p0295	Fan run-on time [s]	
Motor		
p0300	Motor type selection	
	0	No motor
	1	Induction motor
	2	Synchronous motor
	17	1LA7 standard induction motor
p0301	Motor code number selection	
p0304	Rated motor voltage [V]	
p0305	Rated motor current [A]	
p0306	Number of motors connected in parallel	
p0307	Rated motor power [kW]	
p0308	Rated motor power factor	
p0309	Rated motor efficiency [%]	
p0310	Rated motor frequency [Hz]	
p0311	Rated motor speed [rpm]	
p0320	Motor rated magnetizing current/short-circuit current [A]	
p0322	Maximum motor speed [rpm]	

P-No.	Note				
p0323	Maximum motor current [A]				
r0330	Rated motor slip				
r0331	Actual motor magnetizing current/short-circuit current				
r0333	Rated motor torque [Nm]				
p0335	Motor cooling type				
p0340	Automatic calculation of motor/control parameters				
p0341	Motor moment of inertia [kgm²]				
p0342	Ratio between the total and motor moment of inertia [kgm²]				
r0345	Nominal motor starting time				
p0346	Motor excitation build-up time [s]				
p0347	Motor de-excitation time [s]				
p0350	Motor stator resistance, cold [Ω]				
p0352	Cable resistance [Ω]				
r0395	Actual stator resistance				
r0396	Actual rotor resistance				
	Technology and units				
p0500	Technology application				
p0505	Selecting the system of units				
	1	System of units SI			
	2	Referred system of units/SI			
	3	US system of units			
	4	System of units, referred/US			
p0573	Inhibit automatic reference value calculation				
p0595	Selecting technological units				
	1	%	2	1 referred, no dimensions	
	3	bar	4	°C	5	Pa
	6	ltr/s	7	m³/s	8	ltr/min
	9	m³/min	10	ltr/h	11	m³/h
	12	kg/s	13	kg/min	14	kg/h
	15	t/min	16	t/h	17	N
	18	kN	19	Nm	20	psi
	21	°F	22	gallon/s	23	inch³/s
	24	gallon/min	25	inch³/min	26	gallon/h
	27	inch³/h	28	lb/s	29	lb/min
	30	lb/h	31	lbf	32	lbf ft
	33	K	34	rpm	35	parts/min
	36	m/s	37	ft³/s	38	ft³/min
	39	BTU/min	40	BTU/h	41	mbar
	42	inch wg	43	ft wg	44	m wg
	45	% r.h.	46	g/kg		

P-No.	Note	
p0596	Reference quantity, technological units	
	Thermal motor monitoring and motor model, maximum current	
p0601	Motor temperature sensor type	
	0	No sensor
	1	PTC warning & timer
	2	KTY84
	4	Bimetallic NC contact warning & timer
p0604	Motor temperature alarm threshold [°C]	
p0605	Motor temperature fault threshold [°C]	
p0610	Motor overtemperature response	
	0	No response, alarm only, no reduction of I_{max}
	1	Alarm with reduction of I_{max} and fault
	2	Alarm and fault, no reduction of I_{max}
p0611	I2t motor model thermal time constant [s]	
p0615	I2t motor model fault threshold [°C]	
p0625	Motor ambient temperature [°C]	
p0637	Q flux, flux gradient saturated [mH]	
p0640	Current limit [A]	
	Command sources and terminals on the Control Unit	
p0700	Command source selection	
r0720	CU number of inputs and outputs	
r0722	CO/BO: CU digital inputs, status	
	.00	DI 0 (terminal 5)
	.01	DI 1 (terminal 6)
	.02	DI 2 (terminal 7)
	.03	DI 3 (terminal 8)
	.04	DI 4 (terminal 16)
	.05	DI 5 (terminal 17)
	.11	DI 11 (terminals 3, 4) AI 0
r0723	CO/BO: CU digital inputs, status inverted	
p0730	BI: CU signal source for terminal DO 0	
	NO: Terminal 19 / NC: Terminal 18	
p0731	BI: CU signal source for terminal DO 1	
	NO: Terminal 21	
r0747	CU, digital outputs status	
p0748	CU, invert digital outputs	
r0751	BO: CU analog inputs status word	
r0752	CO: CU analog inputs input voltage/current actual AI0 (terminals 3/4)	

P-No.	Note
r0755	CO: CU analog inputs actual value in percent, AI0 (terminals 3/4) [100 ≙ 100%]
p0756	CU analog input type (terminals 3, 4)
	0	Unipolar voltage input (0 V ... +10 V)
	1	Unipolar voltage input monitored (+2 V... +10 V)
	2	Unipolar current input (0 mA … +20 mA)
	3	Unipolar current input monitored (+4 mA … +20 mA)
	4	Bipolar voltage input (-10 V...+10 V)
	8	No sensor connected

P-No.	Note
p0757	CU analog input characteristic value x1
p0758	CU analog input characteristic value y1 [%]
p0759	CU analog input characteristic value x2
p0760	CU analog input characteristic value y2 [%]
p0761	CU analog input wire break monitoring response threshold
p0771	CI: CU analog output signal source, AO 0 (terminals 12, 13) [100 ≙ 100%]
r0772	CU analog output, output value currently referred
r0774	CU analog output, output voltage/current actual [100% ≙ p2001]
p0775	CU analog output activate absolute value generation
p0776	CU analog output type
	0	Current output (0 mA ... +20 mA)
	1	Voltage output (0 V... +10 V)
	2	Current output (+4 mA ... +20 mA)

P-No.	Note
p0777	CU analog output characteristic value x1 [%]
p0778	CU analog output characteristic value y1 [V]
p0779	CU analog output characteristic value x2 [%]
p0780	CU analog output characteristic value y2 [V]
p0782	BI: CU analog output invert signal source, AO 0 (terminals 12,13)
r0785	BO: CU analog outputs status word
	.00	1 = AO 0 negative
p0795	CU digital inputs, simulation mode
p0796	CU digital inputs, simulation mode setpoint
p0797	CU analog inputs, simulation mode
p0798	CU analog inputs, simulation mode setpoint
Change over and copy data sets	
p0802	Data transfer with memory card as source/target
p0803	Data transfer with device memory as source/target
p0804	Data transfer start
	12	Start transfer of the GSD for PROFIBUS master on the memory card
p0806	BI: Inhibit master control
r0807	BO: Master control active
p0809	Copy Command Data Set CDS
p0810	BI: Command data set selection CDS bit 0
p0819	Copy drive data set DDS
p0820	BI: Drive data set selection DDS, bit 0
p0826	Motor changeover, motor number
r0835	CO/BO: Data set changeover status word
r0836	CO/BO: Command data set CDS selected
r0837	CO/BO: Drive data set DDS selected
Sequence control (e.g. ON/OFF1)	
p0840	BI: ON/OFF (OFF1)
p0844	BI: No coast down/coast down (OFF2) signal source 1
p0845	BI: No coast down/coast down (OFF2) signal source 2
p0848	BI: No quick stop/quick stop (OFF3) signal source 1
p0849	BI: No quick stop/quick stop (OFF3) signal source 1
p0852	BI: Enable operation
p0854	BI: Master control by PLC
p0855	BI: Unconditionally release holding brake

P-No.	Note	
p0856	BI: Enable speed controller	
p0858	BI: Unconditionally close holding brake	
r0898	CO/BO: Control word sequence control	
r0899	CO/BO: Status word sequence control	
PROFIBUS, PROFIdrive		
p0918	PROFIBUS address	
p0922	PROFIdrive telegram selection	
	1	Standard telegram 1, PZD-2/2
	20	Standard telegram 20, PZD-2/6
	352	SIEMENS telegram 352, PZD-6/6:
	353	SIEMENS telegram 353, PZD-2/2, PKW-4/4
	354	SIEMENS telegram 354, PZD-6/6, PKW-4/4
	999	Free telegram configuration with BICO
Faults (Part 1)		
r0944	CO: Counter for fault buffer changes	
r0945	Fault code	
r0946	Fault code list	
r0947	Fault number	
r0948	Fault time received in milliseconds [ms]	
r0949	Fault value	
p0952	Fault cases, counter	
r0963	PROFIBUS baud rate	
r0964	Device identification	
p0965	PROFIdrive profile number	
p0969	System runtime relative [ms]	
Restoring the factory setting Saving parameters		
p0970	Reset drive parameters	
	0	Inactive
	1	Reset start parameters
	5	Starts a safety parameter reset
	10	Starts to download setting 10
	11	Starts to download setting 11
	12	Starts to download setting 12
	100	Starts a BICO interconnection reset
p0971	Save parameters	
	0	Inactive
	1	Save drive object

P-No.	Note	
	10	Save in a non-volatile memory as setting 10
	11	Save in a non-volatile memory as setting 11
	12	Save in a non-volatile memory as setting 12
p0972	Drive unit reset	
Setpoint channel		
p1000	Speed setpoint selection	
p1001	CO: Fixed speed setpoint 1 [rpm]	
p1002	CO: Fixed speed setpoint 2 [rpm]	
p1003	CO: Fixed speed setpoint 3 [rpm]	
p1004	CO: Fixed speed setpoint 4 [rpm]	
p1005	CO: Fixed speed setpoint 5 [rpm]	
p1006	CO: Fixed speed setpoint 6 [rpm]	
p1007	CO: Fixed speed setpoint 7 [rpm]	
p1008	CO: Fixed speed setpoint 8 [rpm]	
p1009	CO: Fixed speed setpoint 9 [rpm]	
p1010	CO: Fixed speed setpoint 10 [rpm]	
p1011	CO: Fixed speed setpoint 11 [rpm]	
p1012	CO: Fixed speed setpoint 12 [rpm]	
p1013	CO: Fixed speed setpoint 13 [rpm]	
p1014	CO: Fixed speed setpoint 14 [rpm]	
p1015	CO: Fixed speed setpoint 15 [rpm]	
p1016	Fixed speed setpoint mode	
	1	Direct selection
	2	Selection, binary coded
p1020	BI: Fixed speed setpoint selection bit 0	
p1021	BI: Fixed speed setpoint selection bit 1	
p1022	BI: Fixed speed setpoint selection bit 2	
p1023	BI: Fixed speed setpoint selection bit 3	
r1024	CO: Fixed speed setpoint effective [100 % ≙ p2000]	
r1025	BO: Fixed speed setpoint status	
p1030	Motorized potentiometer configuration	
	00	Storage active
	01	Automatic operation, ramp-function generator active
	02	Initial rounding active
	03	Storage in NVRAM active
p1035	BI: Motorized potentiometer setpoint raise	
p1036	BI: Motorized potentiometer setpoint lower	

P-No.	Note
p1037	Motorized potentiometer maximum speed [rpm]
p1038	Motorized potentiometer minimum speed [rpm]
p1040	Motorized potentiometer start value [rpm]
p1043	BI: Motorized potentiometer, accept setting value
p1044	CI: Motorized potentiometer setting value [100 % ≙ p2000]
r1045	CO: Motorized potentiometer, setpoint in front of the ramp-function generator [rpm]
p1047	Motorized potentiometer ramp-up time [s]
p1048	Motorized potentiometer ramp-down time [s]
r1050	CO: Motorized potentiometer setpoint after the ramp-function generator [100 % ≙ p2000]
p1055	BI: Jog bit 0
p1056	BI: Jog bit 1
p1058	Jog 1 speed setpoint [rpm]
p1059	Jog 2 speed setpoint [rpm]
p1070	CI: Main setpoint [100 % ≙ p2000]
p1071	CI: Main setpoint scaling [100 ≙ 100%]
r1073	CO: Main setpoint effective [100 % ≙ p2000]
p1075	CI: Supplementary setpoint [100 % ≙ p2000]
p1076	CI: Supplementary setpoint scaling [100 ≙ 100%]
r1077	CO: Supplementary setpoint effective [100 % ≙ p2000]
r1078	CO: Total setpoint effective [100 % ≙ p2000]
p1080	Minimum speed [rpm]
p1082	Maximum speed [rpm]
p1083	CO:Speed limit in positive direction of rotation [rpm]
r1084	CO: Speed limit positive effective [100 % ≙ p2000]
p1086	CO: Speed limit in negative direction of rotation [rpm]
r1087	CO: Speed limit negative effective [100 % ≙ p2000]
p1091	Skip speed 1 [rpm]
p1092	Skip speed 2 [rpm]
p1101	Skip speed bandwidth [rpm]
p1110	BI: Inhibit negative direction
p1111	BI: Inhibit positive direction
p1113	BI: Setpoint inversion
r1114	CO: Setpoint after the direction limiting [100 % ≙ p2000]
r1119	CO: Ramp-function generator setpoint at the input [100 % ≙ p2000]

P-No.	Note
p1120	Ramp-function generator ramp-up time [s]
p1121	Ramp-function generator ramp-down time [s]
p1130	Ramp-function generator initial rounding-off time [s]
p1131	Ramp-function generator final rounding-off time [s]
p1134	Ramp-function generator rounding-off type
	0 Continuous smoothing
	1 Discontinuous smoothing
p1135	OFF3 ramp-down time [s]
p1136	OFF3 initial rounding-off time [s]
p1137	OFF3 final rounding-off time [s]
p1138	CI: Acceleration ramp scaling [100 ≙ 100%]
p1139	CI: Deceleration ramp scaling [100 ≙ 100%]
p1140	BI: Enable ramp-function generator
p1141	BI: Continue ramp-function generator
p1142	BI: Enable speed setpoint
r1149	CO: Ramp-function generator acceleration [100 % ≙ p2007]
r1170	CO: Speed controller setpoint sum [100 % ≙ p2000]
r1198	CO/BO: Control word, setpoint channel
	Functions (e.g. motor holding brake)
p1200	Flying restart operating mode
	0 Flying restart inactive
	1 Flying restart always active (start in setpoint direction)
	4 Flying restart always active (start only in setpoint direction)
p1201	BI: Flying restart enable signal source
p1202	Flying restart search current [100 % ≙ r0331]
p1203	Flying restart search rate factor [%]
	A higher value results in a longer search time.
p1206	Set fault number without automatic restart
p1210	Automatic restart mode

P-No.		Note
	0	Inhibit automatic restart
	1	Acknowledge all faults without restarting
	4	Restart after line supply failure, without additional start attempts
	6	Restart after fault with additional start attempts
	14	Restart after line supply failure following manual acknowledgement
	16	Restart after fault following manual acknowledgement
	26	Acknowledging all faults and restarting for an ON command
p1211		Automatic restart, start attempts
p1212		Automatic restart, delay time start attempts [s]
p1213		Automatic restart, monitoring time [s]
p1215		Motor holding brake configuration
	0	No motor holding brake being used
	3	Motor holding brake like sequential control, connection via BICO
p1216		Motor holding brake, opening time [ms]
p1217		Motor holding brake, closing time [ms]
p1230		BI: DC braking activation
p1231		DC braking configuration
	0	No function
	4	DC braking
	5	DC braking OFF1/OFF3
	14	DC braking below starting speed
p1232		DC braking, braking current [A]
p1233		DC braking time [s]
p1234		Speed at the start of DC braking [rpm]
r1239		CO/BO: DC braking status word
p1240		V_{DC} controller or V_{DC} monitoring configuration (vector control)
	0	Inhibit V_{DC} controller
	1	Enable V_{DC_max} controller
	2	Enable V_{DC_min} controller (kinetic buffering)
	3	Enable V_{DC_min} controller and V_{DC_max} controller
r1242		V_{DC_max} controller switch-in level [100 % ≙ p2001]
p1243		V_{DC_max} controller dynamic factor [%]
p1245		V_{DC_min} controller switch-in level (kinetic buffering) [%]
r1246		V_{DC_min} controller switch-in level (kinetic buffering) [100 % ≙ p2001]

P-No.		Note
p1247		V_{DC_min} controller dynamic factor (kinetic buffering) [%]
p1249		V_{DC_max} controller speed threshold [rpm]
p1254		V_{DC_max} controller automatic ON level detection
	0	Automatic detection inhibited
	1	Automatic detection enabled
p1255		V_{DC_min} controller time threshold [s]
p1256		V_{DC_min} controller response (kinetic buffering)
	0	Buffer V_{DC} until undervoltage, n<p1257 → F07405
	1	Buffer V_{DC} until undervoltage, n<p1257 → F07405, t>p1255 → F07406
p1257		V_{DC_min} controller speed threshold [rpm]
p1280		V_{DC} controller or V_{DC} monitoring configuration (V/f)
	0	Inhibit V_{DC} controller
	1	Enable V_{DC_max} controller
r1282		V_{DC_max} controller switch-in level (V/f) [100 % ≙ p2001]
p1283		V_{DC_max} controller dynamic factor (V/f) [%]
	V/f control	
p1300		Open-loop/closed-loop control operating mode
	0	V/f control with linear characteristic
	1	V/f control with linear characteristic and FCC
	2	V/f control with parabolic characteristic
	3	V/f control with parameterizable characteristic
	4	V/f control with linear characteristic and ECO
	5	V/f control for drive requiring a precise frequency (e.g. textiles)
	6	V/f control for drive requiring a precise frequency and FCC
	7	V/f control for parabolic characteristic and ECO
	19	V/f control with independent voltage setpoint
	20	Speed control (without encoder)

P-No.	Note
p1310	Voltage boost permanent [100 % ≙ p0305]
p1311	Voltage boost when accelerating [%]
p1312	Voltage boost when starting [%]
r1315	Voltage boost, total [100 % ≙ p2001]
p1320	V/f control programmable characteristic frequency 1 [Hz]
p1321	V/f control programmable characteristic voltage 1 [V]
p1322	Characteristic frequency 2 [Hz]
p1323	Characteristic voltage 2 [V]
p1324	Characteristic frequency 3 [Hz]
p1325	Characteristic voltage 3 [V]
p1326	Characteristic frequency 4 [Hz]
p1327	Characteristic voltage 4 [V]
p1330	CI: V/f control independent voltage setpoint [100 % ≙ p2001]
p1334	V/f control slip compensation starting frequency [Hz]
p1335	Slip compensation, scaling [100 % ≙ r0330]
p1336	Slip compensation limit value [100 % ≙ r0330]
r1337	CO: Actual slip compensation [100 ≙ 100%]
p1338	V/f mode resonance damping gain

P-No.	Note
p1340	Imax frequency controller proportional gain
p1341	Imax frequency controller integral time [s]
r1343	CO: I_max controller frequency output [100 % ≙ p2000]
p1349	U/f mode resonance damping maximum frequency [Hz]
p1351	CO: Motor holding brake starting frequency [100 ≙ 100%]
p1352	CI: Motor holding brake starting frequency [100 ≙ 100%]
Vector control	
r1438	CO: Speed controller speed setpoint [100 % ≙ p2000]
p1452	Speed controller speed actual value smoothing time (SLVC) [ms]
p1470	Speed controller encoderless operation P gain
p1472	Speed controller sensorless operation integral time [ms]
p1475	CI: Speed controller torque setting value for motor holding brake [100 % ≙ p2003]
r1482	CO: Speed controller I torque output [100 % ≙ p2003]
r1493	CO: Moment of inertia, total
p1496	Acceleration pre-control scaling [%]
p1511	CI: Supplementary torque 1 [100 % ≙ p2003]
r1516	CO: Supplementary torque and acceleration torque [100 % ≙ p2003]
p1520	CO: Torque limit upper [Nm]
p1521	CO: Torque limit lower [Nm]
p1522	CI: Torque limit upper [100 % ≙ p2003]
p1523	CI: Torque limit lower [100 % ≙ p2003]
p1524	CO: Torque limit upper/motoring scaling [100 ≙ 100%]
p1525	CO: Torque limit lower scaling [100 ≙ 100%]
r1526	CO: Torque limit upper without offset [100 % ≙ p2003]
r1527	CO: Torque limit lower without offset [100 % ≙ p2003]
p1530	Power limit motoring [kW]
p1531	Power limit regenerative [kW]
r1538	CO: Upper effective torque limit [100 % ≙ p2003]
r1539	CO: Lower effective torque limit [100 % ≙ p2003]
r1547	CO: Torque limit for speed controller output
	[0] Upper limit [100 % ≙ p2003]

P-No.	Note		
	[1]	Lower limit [100 % ≙ p2003]	
p1552	CI: Torque limit upper scaling without offset [100 ≙ 100%]		
p1554	CI: Torque limit lower scaling without offset [100 ≙ 100%]		
p1570	CO: Flux setpoint [100 ≙ 100%]		
p1580	Efficiency optimization [%]		
r1598	CO: Flux setpoint total [100 ≙ 100%]		
p1610	Torque setpoint static (SLVC) [100 % ≙ r0333]		
p1611	Supplementary accelerating torque (SLVC) [100 % ≙ r0333]		
r1732	CO: Direct-axis voltage setpoint [100 % ≙ p2001]		
r1733	CO: Quadrature-axis voltage setpoint [100 % ≙ p2001]		
p1745	Motor model error threshold stall detection [%]		
p1784	Motor model feedback scaling [%]		
	Gating unit		
p1800	Pulse frequency setpoint [kHz]		
r1801	CO: Pulse frequency [100 % ≙ p2000]		
p1820	Reverse the output phase sequence		
	0	Off	
	1	On	
	Motor identification		
p1900	Motor data identification and rotating measurement		
	0	Inhibited	
	1	Identify the motor data at standstill and with the motor rotating	
	2	Identify motor data at standstill	
	3	Identify motor data with the motor rotating	
p1909	Motor data identification control word		
p1910	Motor data identification selection		
p1959	Rotating measurement configuration		
p1960	Rotating measurement selection		
	0	Inhibited	
	1	Rotating measurement in encoderless operation	
	3	Speed controller optimization in encoderless operation	
p1961	Saturation characteristic speed to determine [%]		
p1965	Speed_ctrl_opt speed [100 % ≙ p0310]		
p1967	Speed_ctrl_opt dynamic factor [%]		

P-No.	Note		
	Reference values		
p2000	Reference speed reference frequency [rpm]		
p2001	Reference voltage [V]		
p2002	Reference current [A]		
p2003	Reference torque [Nm]		
r2004	Reference power		
p2006	Reference temperature [°C]		
p2010	Commissioning interface baud rate		
p2011	Commissioning interface address		
p2016	CI: Comm IF USS PZD send word		
	USS or Modbus RTU		
p2020	Fieldbus interface baud rate:		
	4	2400 baud	5	4800 baud
	6	9600 baud	7	19200 baud
	8	38400 baud	9	57600 baud
	10	76800 baud	11	93750 baud
	12	115200 baud	13	187500 baud
p2021	Fieldbus interface address		
p2022	Fieldbus interface USS PZD number		
p2023	Fieldbus interface USS PKW number		
	0	PKW 0 words	3	PKW 3 words
	4	PKW 4 words	127	PKW variable
p2024	Fieldbus interface times [ms]		
	[0]	Maximum processing time	
	[1]	Character delay time	
	[2]	Telegram pause time	
r2029	Fieldbus interface error statistics		
	[0]	Number of error-free telegrams	
	[1]	Number of rejected telegrams	
	[2]	Number of framing errors	
	[3]	Number of overrun errors	
	[4]	Number of parity errors	
	[5]	Number of starting character errors	
	[6]	Number of checksum errors	
	[7]	Number of length errors	
p2030	Fieldbus interface protocol selection		
	0	No protocol	
	1	USS	
	2	MODBUS	
	3	PROFIBUS	

P-No.		Note
	4	CAN
r2032		Master control, control word effective
	.00	ON / OFF1
	.01	OFF2 inactive
	.02	OFF3 inactive
	.03	Enable operation
	.04	Enable ramp-function generator
	.05	Start ramp-function generator
	.06	Enable speed setpoint
	.07	Acknowledge fault
	.08	Jog bit 0
	.09	Jog bit 1
	.10	Master control by PLC
p2037		PROFIdrive STW1.10 = 0 mode
	0	Freeze setpoints and further process sign-of-life
	1	Freeze setpoints and sign-of-life
	2	Setpoints are not frozen
p2038		PROFIdrive STW/ZSW interface mode
	0	SINAMICS
	2	VIK-NAMUR
p2040		Fieldbus interface monitoring time [ms]
PROFIBUS, PROFIdrive		
p2042		PROFIBUS ID Number
	0	SINAMICS
	2	VIK-NAMUR
r2043		BO: PROFIdrive PZD state
	.00	Setpoint failure
	.02	Fieldbus operational
p2044		PROFIdrive fault delay [s]
p2047		PROFIBUS additional monitoring time [ms]
r2050		CO: PROFIdrive PZD receive word
	[0]	PZD 1 … [7] PZD 8
p2051		CI: PROFIdrive PZD send word
	[0]	PZD 1 … [7] PZD 8
r2053		PROFIdrive diagnostics send PZD word
	[0]	PZD 1 … [7] PZD 8
r2054		PROFIBUS status
	0	Off
	1	No connection (search for baud rate)
	2	Connection OK (baud rate found)

P-No.		Note
	3	Cyclic connection with master (data exchange)
	4	Cyclic data OK
r2055		PROFIBUS diagnosis standard
	[0]	Master bus address
	[1]	Master input total length bytes
	[2]	Master output total length bytes
r2057		PROFIBUS address switch diagnostics
r2060		CO: IF1 PROFIdrive PZD receive double word
	[0]	PZD 1 + 2 … [10] PZD 11 + 12
r2061		CI: IF1 PROFIdrive PZD send double word
	[0]	PZD 1 + 2 … [10] PZD 11 + 12
r2063		IF1 PROFIdrive diagnostics PZD send double word
	[0]	PZD 1 + 2 … [10] PZD 11 + 12
r2067		IF1 PZD maximum interconnected
	[0]	Receiving
	[1]	Sending
r2074		PROFIdrive diagnostics bus address PZD receive
	[0]	PZD 1 … [7] PZD 8
r2075		PROFIdrive diagnostics telegram offset PZD receive
	[0]	PZD 1 … [7] PZD 8
r2076		PROFIdrive diagnostics telegram offset PZD send
	[0]	PZD 1 … [7] PZD 8
r2077		PROFIBUS diagnostics peer-to-peer data transfer addresses
p2079		PROFIdrive PZD telegram selection extended
		See p0922
p2080		BI: Binector-connector converter, status word 1
		The individual bits are combined to form status word 1.
p2088		Binector-connector converter, invert status word
r2089		CO: Send binector-connector converter status word
	[0]	Status word 1
	[1]	Status word 2
	[2]	Free status word 3
	[3]	Free status word 4
	[4]	Free status word 5
r2090		BO: PROFIdrive PZD1 receive bit-serial
r2091		BO: PROFIdrive PZD2 receive bit-serial
r2092		BO: PROFIdrive PZD3 receive bit-serial

P-No.	Note
r2093	BO: PROFIdrive PZD4 receive bit-serial
r2094	BO: Connector-binector converter binector output
r2095	BO: Connector-binector converter binector output

Faults (Part 2) and alarms			

P-No.	Note			
p2100	Setting the fault number for fault response			
p2101	Setting the fault response			
	0	None	1	OFF1
	2	OFF2	3	OFF3
	5	STOP2	6	DC braking
p2103	BI: 1. Acknowledge faults			
p2104	BI: 2. Acknowledge faults			
p2106	BI: External fault 1			
r2110	Alarm number			
p2111	Alarm counter			
p2112	BI: External alarm 1			
r2122	Alarm code			
r2123	Alarm time received [ms]			
r2124	Alarm value			
r2125	Alarm time removed [ms]			
p2126	Setting fault number for acknowledge mode			
p2127	Sets acknowledgement mode			
p2128	Selecting fault/alarm code for trigger			
r2129	CO/BO: Trigger word for faults and alarms			
r2130	Fault time received in days			
r2133	Fault value for float values			
r2134	Alarm value for float values			
r2135	CO/BO: Status word, faults/alarms 2			
r2136	Fault time removed in days			
r2138	CO/BO: Control word, faults/alarms			
r2139	CO/BO: Status word, faults/alarms 1			
r2169	CO: Actual speed smoothed signals			
r2197	CO/BO: Status word monitoring functions 1			
r2198	CO/BO: Status word monitoring 2			
r2199	CO/BO: Status word monitoring 3			

Technology controller	

P-No.	Note
p2200	BI: Technology controller enable
p2201	CO: Techn. controller fixed value 1 [100 ≜ 100%]
p2202	CO: Techn. controller fixed value 2 [100 ≜ 100%]
p2203	CO: Techn. controller fixed value 3 [100 ≜ 100%]
p2204	CO: Techn. controller fixed value 4 [100 ≜ 100%]

P-No.	Note	
p2205	CO: Techn. controller fixed value 5 [100 ≜ 100%]	
p2206	CO: Techn. controller fixed value 6 [100 ≜ 100%]	
p2207	CO: Techn. controller fixed value 7 [100 ≜ 100%]	
p2208	CO: Techn. controller fixed value 8 [100 ≜ 100%]	
p2209	CO: Techn. controller fixed value 9 [100 ≜ 100%]	
p2210	CO: Techn. controller fixed value 10 [100 ≜ 100%]	
p2211	CO: Techn. controller fixed value 11 [100 ≜ 100%]	
p2212	CO: Techn. controller fixed value 12 [100 ≜ 100%]	
p2213	CO: Techn. controller fixed value 13 [100 ≜ 100%]	
p2214	CO: Techn. controller fixed value 14 [100 ≜ 100%]	
p2215	CO: Techn. controller fixed value 15 [100 ≜ 100%]	
p2216	Techn. controller fixed value selection method	
	0	Fixed value selection direct
	1	Fixed value selection binary
p2220	BI: Techn. controller fixed value selection bit 0	
p2221	BI: Techn. controller fixed value selection bit 1	
p2222	BI: Techn. controller fixed value selection bit 2	
p2223	BI: Techn. controller fixed value selection bit 3	
r2224	CO: Techn. controller fixed value active [100 ≜ 100%]	
r2225	CO/BO: Techn. controller fixed value selection status word	
r2229	Techn. controller number currently	
p2230	Techn. controller motorized potentiometer configuration	
	.00	Storage active
	.02	Initial rounding active
	.03	Non-volatile data save active for p2230.0 = 1
	.04	Ramp-function generator always active
r2231	Techn. controller motorized potentiometer setpoint memory	
p2235	BI: Techn. controller motorized potentiometer setpoint up	
p2236	BI: Techn. controller motorized potentiometer setpoint down	
p2237	Techn. controller motorized potentiometer maximum value [%]	
p2238	Techn. controller motorized potentiometer minimum value [%]	

P-No.	Note			P-No.	Note		
p2240	Techn. controller motorized potentiometer start value [%]			r2272	CO: Techn. controller actual value scaled [100 ≙ 100%]		
r2245	CO: Techn. controller motorized potentiometer setpoint before RFG [100 ≙ 100%]			r2273	CO: Techn. controller error [100 ≙ 100%]		
p2247	Techn. controller motorized potentiometer ramp-up time [s]			p2274	Techn. controller actual differentiation time constant [s]		
p2248	Techn. controller motorized potentiometer ramp-down time [s]			p2280	Techn. controller proportional gain		
				p2285	Techn. controller integral time [s]		
r2250	CO: Techn. controller motorized potentiometer setpoint after RFG [100 ≙ 100%]			p2286	BI: Hold techn. controller integrator		
p2251	Techn. controller mode			p2289	CI: Techn. controller pre-control signal [100 ≙ 100%]		
	0	Techn. controller as main speed setpoint		p2291	CO: Techn. controller maximum limit [100 ≙ 100%]		
	1	Techn. controller as additional speed setpoint		p2292	CO: Techn. controller minimum limit [100 ≙ 100%]		
p2253	CI: Techn. controller setpoint 1 [100 ≙ 100%]			p2293	Techn. controller ramp-up/ramp-down time [s]		
p2254	CI: Techn. controller setpoint 2 [100 ≙ 100%]			r2294	CO: Techn. controller output signal [100 ≙ 100%]		
p2255	Techn. controller setpoint 1 scaling [100 ≙ 100%]			p2295	CO: Techn. controller output scaling [100 ≙ 100%]		
p2256	Techn. controller setpoint 2 scaling [100 ≙ 100%]			p2296	CI: Techn. controller output scaling [100 ≙ 100%]		
p2257	Techn. controller ramp-up time [s]			p2297	CI: Techn. controller maximum limit signal source [100 ≙ 100%]		
p2258	Techn. controller ramp-down time [s]						
r2260	CO: Techn. controller setpoint after ramp function generator [100 ≙ 100%]			p2298	CI: Techn. controller minimum limit signal source [100 ≙ 100%]		
p2261	Techn. controller setpoint filter time constant [s]			p2299	CI: Techn. controller limit offset [100 ≙ 100%]		
p2263	Techn. controller type			p2302	Techn. controller output signal start value [%]		
	0	D component in the actual value signal		p2306	Techn. controller fault signal inversion		
	1	D component in the fault signal			0	No inversion	
p2264	CI: Techn. controller actual value [100 ≙ 100%]				1	Inversion of the techn. controller fault signal	
p2265	Techn. controller actual value filter time constant [s]			r2344	CO: Techn. controller last speed setpoint (smoothed) [100 ≙ 100%]		
r2266	CO: Techn. controller actual value after filter [100 ≙ 100%]			p2345	Techn. controller fault response		
p2267	Techn. controller upper limit actual value [100 ≙ 100%]				0	Function inhibited	
					1	For a fault: change over to r2344 (or p2302)	
p2268	Techn. controller lower limit actual value [100 ≙ 100%]				2	For a fault: Change over to p2215	
p2269	Techn. controller gain actual value [%]			r2349	CO/BO: Techn. controller status word		
p2270	Techn. controller actual value function selection			p2900	CO: Fixed value 1 [100 ≙ 100%]		
	0	No function	1	√x	p2901	CO: Fixed value 2 [100 ≙ 100%]	
	2	x²	3	x³	r2902	CO: Fixed values [100 ≙ 100%]	
				p2930	CO: Fixed value M [Nm]		
p2271	Techn. controller actual value inversion (sensor type)			**Messages**			
	0	No inversion		r3113	CO/BO: NAMUR message bit bar		
	1	Inversion of the technology controller actual value signal		**Motor characteristic**			
				p3320	Fluid flow machine P = f(n), Y coordinate: P flow 1%, point 1		

P-No.	Note	
p3321	Fluid flow machine P = f(n), X coordinate: n flow 1%, point 1	
p3322	P = f(n), Y coordinate: P flow 2%, point 2	
p3323	P = f(n), X coordinate: n flow 2%, point 2	
p3324	P = f(n), Y coordinate: P flow 3%, point 3	
p3325	P = f(n), X coordinate: n flow 3%, point 3	
p3326	P = f(n), Y coordinate: P flow 4%, point 4	
p3327	P = f(n), X coordinate: n flow 4%, point 4	
p3328	P = f(n), Y coordinate: P flow 5%, point 5	
p3329	P = f(n), X coordinate: n flow 5%, point 5	
Two/three wire control		
p3330	BI: 2-3 wire control 1	
p3331	BI: 2-3 wire control 2	
p3332	BI: 2-3 wire control 3	
r3333	CO/BO: 2-3 wire output	
	.00	2-3 wire ON
	.01	2-3 wire reverse
	.02	2-3 wire ON / invert
	.03	2-3 wire reverse/invert
p3334	2-3 wire selection	
	0	No 2-3 wire control
	1	2-wire forward/backward 1
	2	2-wire forward/backward 2
	3	3-wire enable / forward / backward
	4	3-wire enable / ON / reverse
Compound braking		
p3856	Compound braking current [100 ≙ 100%]	
r3859	CO/BO: Compound braking status word	
Administration parameters		
p3900	Completion of quick commissioning	
r3925	Identification final display	
p3950	Service parameters	
p3981	Faults, acknowledge drive object	
p3985	Master control mode selection	
r3996	Parameter write inhibit status	
r7758	Know-how protection Control Unit serial number	
r7759	Know-how protection Control Unit reference serial number	
p7760	Write protection/know-how protection status	
	.00	1 = Write protection active

P-No.	Note	
	.01	1 = Know-how protection active
	.02	1 = Know-how protection temporarily unlocked
	.03	1 = Know-how protection cannot be deactivated
	.04	1 = Memory card copy protection active
p7761	Write protection	
	0	Deactivate write protection
	1	Activate write protection
p7762	Write access for control using multi-master third-party bus system	
	0	Free write access independent of p7761
	1	No free write access (p7761 is active)
p7763	Know-how protection OEM exception list number of parameters	
p7764	Know-how protection OEM exception list	
p7765	Know-how protection memory card copy protection	
	0	Memory card deactivate copy protection
	1	Memory card activate copy protection
p7766	Know-how protection password input	
p7767	Know-how protection password new	
p7768	Know-how protection password confirmation	
p7769	Know-how protection memory card setpoint serial number	
p7775	NVRAM data action	
r8570	Macro Drive object Display of the macro files stored in the inverter. See also p0015.	
CANopen		
r8600	CAN Device Type	
r8601	CAN Error Register	
p8602	CAN SYNC-Object	
p8603	CAN COB-ID Emergency Message [hex]	
p8604	CAN Node Guarding	
p8606	CAN Producer Heartbeat Time [ms]	
r8607	CAN Identity Object	
p8608	CAN Clear Bus Off Error	
p8609	CAN Error Behavior	
r8610	CAN First Server SDO	
p8611	CAN Pre-defined Error Field [hex]	
p8620	CAN Node-ID	
r8621	CAN Node-ID effective	

P-No.	Note						P-No.	Note		
p8622	CAN bit rate [kBit/s]						p8735	CAN Transmit Mapping for TPDO 6 [hex]		
	0	1000	1	800	2	500	p8736	CAN Transmit Mapping for TPDO 7 [hex]		
	3	250	4	125	5	50	p8737	CAN Transmit Mapping for TPDO 8 [hex]		
	6	20	7	10			p8741	CAN PDO configuration acknowledgment		
p8623	CAN Bit Timing selection [hex]						p8744	CAN PDO Mapping Configuration		
p8630	CAN virtual objects							1:	Predefined connection set	
p8641	CAN Abort Connection Option Code							2:	Free PDO mapping	
	0	No response		1	OFF1		r8750	CAN mapped receive objects 16 bit		
	2	OFF2		3	OFF3		r8751	CAN mapped receive objects 16 bit		
r8680	CAN Diagnosis Hardware						r8784	CO: CAN status word		
p8684	CAN NMT state after booting						p8785	BI: CAN status word bit 8		
p8685	CAN NMT state						p8786	BI: CAN status word bit 14		
p8699	CAN RPDO monitoring time [ms]						p8787	BI: CAN status word bit 15		
p8700	CAN Receive PDO 1 [hex]						p8790	CAN control word - auto interconnection		
p8701	CAN Receive PDO 2 [hex]						r8795	CAN control word		
p8702	CAN Receive PDO 3 [hex]						r8797	CAN Target Torque		
p8703	CAN Receive PDO 4 [hex]							PROFIdrive		
p8704	CAN Receive PDO 5 [hex]						r8820	Identification and Maintenance 0		
p8705	CAN Receive PDO 6 [hex]						p8829	CBE20 Remote Controller number		
p8706	CAN Receive PDO 7 [hex]						r8909	PN Device ID		
p8707	CAN Receive PDO 8 [hex]						p8920	PN Name of station		
p8710	CAN Receive Mapping for RPDO 1 [hex]						p8921	PN IP Address of Station		
p8711	CAN Receive Mapping for RPDO 2 [hex]						p8922	PN Default Gateway of Station		
p8712	CAN Receive Mapping for RPDO 3 [hex]						p8923	PN Subnet Mask of Station		
p8713	CAN Receive Mapping for RPDO 4 [hex]						p8925	PN interfaces configuration		
p8714	CAN Receive Mapping for RPDO 5 [hex]							0:	No function	
p8715	CAN Receive Mapping for RPDO 6 [hex]							1:	Activate the configuration	
p8716	CAN Receive Mapping for RPDO 7 [hex]							2:	Activate the configuration and save	
p8717	CAN Receive Mapping for RPDO 8 [hex]							3:	Delete configuration	
p8720	CAN Transmit PDO 1 [hex]						p8929	PN Remote Controller number		
p8721	CAN Transmit PDO 2 [hex]							0:	Automation or Safety	
p8722	CAN Transmit PDO 3 [hex]							1:	Automation and Safety	
p8723	CAN Transmit PDO 4 [hex]						r8930	PN Name of Station active		
p8724	CAN Transmit PDO 5 [hex]						r8931	PN IP Address of Station active		
p8725	CAN Transmit PDO 6 [hex]						r8932	PN Default Gateway of Station active		
p8726	CAN Transmit PDO 7 [hex]						r8933	PN Subnet Mask of Station active		
p8727	CAN Transmit PDO 8 [hex]						r8935	PN MAC Address of Station		
p8730	CAN Transmit Mapping for TPDO 1 [hex]						r8939	PN DAP ID		
p8731	CAN Transmit Mapping for TPDO 2 [hex]						r8950	CBE20 Name of Station active		
p8732	CAN Transmit Mapping for TPDO 3 [hex]						r8955	CBE20 MAC Address of Station		
p8733	CAN Transmit Mapping for TPDO 4 [hex]						r8960	PN Subslot assignment		
p8734	CAN Transmit Mapping for TPDO 5 [hex]									

P-No.	Note		
r8961	PN IP Addr Remote Controller 1		
r8962	PN IP Addr Remote Controller 2		
r8970	CBE20 Subslot assignment		
p8991	USB memory access		
	Parameter consistency and storage		
p9400	Safely remove memory card		
	0	No memory card inserted	
	1	Memory card inserted	
	2	Request "safe removal" of the memory card	
	3	"Safe removal" possible	
	100	"Safe removal" not possible due to access	
r9401	Safely remove memory card status		
r9463	Set valid macro		
p9484	BICO interconnections, search signal source		
r9485	BICO interconnections, search signal source number		
r9486	BICO interconnections, search signal source first index		
	Safety Integrated		
p9601	SI enable, functions integrated in the drive (processor 1)		
p9610	SI PROFIsafe address (processor 1)		
p9650	SI F-DI changeover, tolerance time (processor 1) [ms]		
p9651	SI STO debounce time (processor 1) [ms]		
p9659	SI forced checking procedure timer [h]		
r9660	SI forced checking procedure remaining time		
p9700	SI copy function		
p9701	Acknowledge SI data change		
p9761	SI password input [hex]		
p9762	SI password new [hex]		
p9763	SI password acknowledgment [hex]		
r9768	SI PROFIsafe control words received (processor 1)		
	[0] PZD 1	…	[7] PZD 8
r9769	SI PROFIsafe status words send (processor 1)		
	[0] PZD 1	…	[7] PZD 8
r9770	SI version, safety functions integrated in the drive (processor 1)		
r9771	SI common functions (processor 1)		
r9772	CO/BO: SI status (processor 1)		
r9773	CO/BO: SI status (processor 1 + processor 2)		

P-No.	Note		
r9780	SI monitoring clock cycle (processor 1)		
r9781	SI checksum to check changes (processor 1)		
r9782	SI time stamp to check changes (processor 1)		
r9794	SI crosswise comparison list (processor 1)		
r9795	SI diagnostics, STOP F (processor 1)		
r9798	SI actual checksum SI parameters (processor 1)		
p9799	SI reference checksum SI parameters (processor 1)		
p9801	SI enable, functions integrated in the drive (processor 2)		
p9810	SI PROFIsafe address (processor 2)		
p9850	SI F-DI changeover, tolerance time (processor 2)		
p9851	SI STO debounce time (processor 2)		
r9871	SI common functions (processor 2)		
r9872	CO/BO: SI status (Power Module)		
r9898	SI actual checksum SI parameters (processor 2)		
p9899	SI reference checksum SI parameters (processor 2)		
	Diagnostics (internal)		
r9976	System utilization		
	[1]	Computation time utilization	
	[5]	Highest gross utilization	
r61001	PROFINET IP of Station		

Trouble shooting

<div style="text-align: right; font-size: 3em;">5</div>

5.1 List of alarms and faults

Axxxxx Alarm

Fyyyyy: Fault

Table 5- 1 The most important alarms and faults of the safety functions

Number	Cause	Remedy
F01600	STOP A Triggered	STO Select and then deselect again.
F01650	Acceptance test required	Carry out acceptance test and create test certificate.
		Switch the Control Unit off and then on again.
F01659	Write task for parameter rejected	Cause: The converter should be reset to the factory setting. The resetting of the safety functions is, however, not allowed, because the safety functions are currently enabled.
		Remedy with operator panel:
		p0010 = 30 / Parameter reset
		p9761 = … / Enter password for the safety functions.
		p0970 = 5 / Reset Start Safety Parameter. The converter sets p0970 = 5 if it has reset the parameters.
		Then reset the converter to the factory setting again.
A01666	Static 1 signal atF-DI for safe acknowledgment	F-DI to a logical 0 signal.
A01698	Commissioning mode active for safety functions	This message is withdrawn after the Safety commissioning has ended.
A01699	Shutdown path test required	After the next time that the "STO" function is deselected, the message is withdrawn and the monitoring time is reset.
F30600	STOP A Triggered	STO Select and then deselect again.

Table 5- 2 The most important alarms and faults

Number	Cause	Remedy
F01018	Power-up aborted more than once	1. Switch the module off and on again. 2. After this fault has been output, the module is booted with the factory settings. 3. Recommission the converter.
A01028	Configuration error	Explanation: Parameterization on the memory card has been created with a different type of module (order number, MLFB)
		Check the module parameters and recommission if necessary.
F01033	Unit switchover: Reference parameter value invalid	Set the value of the reference parameter to a value other than 0.0 (p0304, p0305, p0310, p0596, p2000, p2001, p2002, p2003, r2004).

Number	Cause	Remedy
F01034	Unit switchover: Calculation of the parameter values after reference value change unsuccessful	Select the value of the reference parameter so that the parameters involved can be calculated in the per unit notation (p0304, p0305, p0310, p0596, p2000, p2001, p2002, p2003, r2004).
F01122	Frequency at the probe input too high	Reduce the frequency of the pulses at the probe input.
A01590	Motor maintenance interval lapsed	Carry out the maintenance.
A01900	PROFIBUS: Configuration telegram faulty	Explanation: A PROFIBUS master is attempting to establish a connection with a faulty configuration telegram. Check the bus configuration on the master and slave side.
A01910 F01910	Fieldbus SS setpoint timeout	The alarm is generated when p2040 ≠ 0 ms and one of the following causes is present: • The bus connection is interrupted • The MODBUS master is switched off • Communications error (CRC, parity bit, logical error) An excessively low value for the fieldbus monitoring time (p2040)
A01920	PROFIBUS: Cyclic connection interrupt	Explanation: The cyclic connection to PROFIBUS master is interrupted. Establish the PROFIBUS connection and activate the PROFIBUS master with cyclic operation.
F03505	Analog input, wire break	Check the connection to the signal source for interrupts. Check the level of the signal supplied. The input current measured by the analog input can be read out in r0752.
A03520	Temperature sensor fault	Check that the sensor is connected correctly.
A05000 A05001 A05002 A05004 A05006	Power Module overtemperature	Check the following: - Is the ambient temperature within the defined limit values? - Are the load conditions and duty cycle configured accordingly? - Has the cooling failed?
F06310	Supply voltage (p0210) incorrectly parameterized	Check the parameterized supply voltage and if required change (p0210). Check the line voltage.
F07011	Motor overtemperature	Reduce the motor load. Check ambient temperature. Check sensor's wiring and connection.
A07012	I2t Motor Module overtemperature	Check and if necessary reduce the motor load. Check the motor's ambient temperature. Check thermal time constant p0611. Check overtemperature fault threshold p0605.
A07015	Motor temperature sensor alarm	Check that the sensor is connected correctly. Check the parameter assignment (p0601).
F07016	Motor temperature sensor fault	Make sure that the sensor is connected correctly. Check the parameterization (p0601).
F07086 F07088	Unit switchover: Parameter limit violation	Check the adapted parameter values and if required correct.

Number	Cause	Remedy
F07320	Automatic restart aborted	Increase the number of restart attempts (p1211). The current number of start attempts is shown in r1214.
		Increase the wait time in p1212 and/or monitoring time in p1213.
		Create ON command (p0840).
		Increase the monitoring time of the power unit or switch off (p0857).
		Reduce the wait time for resetting the fault counter p1213[1] so that fewer faults are registered in the time interval.
A07321	Automatic restart active	Explanation: The automatic restart (AR) is active. During voltage recovery and/or when remedying the causes of pending faults, the drive is automatically switched back on.
F07330	Search current measured too low	Increase search current (P1202), check motor connection.
A07400	V_{DC_max} controller active	If the controller is not to intervene:
		• Increase the ramp-down times.
		• Deactivate the V_{DC_max} controller (p1240 = 0 for vector control, p1280 = 0 for V/f control).
A07409	V/f control current limiting controller active	The alarm automatically disappears after one of the following measures:
		• Increase the current limit (p0640).
		• Reduce load.
		• Increase the ramp-up time to the speed setpoint.
F07426	Technology controller actual value limited	• Adapt the limits to the signal level (p2267, p2268).
		• Check the actual value scaling (p2264).
F07801	Motor overcurrent	Check current limits (p0640).
		U/f control: Check the current limiting controller (p1340 … p1346).
		Increase acceleration ramp (p1120) or reduce load.
		Check motor and motor cables for short circuit and ground fault.
		Check motor for star-delta connection and rating plate parameterization.
		Check power unit / motor combination.
		Select flying restart function (p1200) if switched to rotating motor.
A07805	Drive: Power unit overload I2t	• Reduce the continuous load.
		• Adapt the load cycle.
		• Check the assignment of rated currents of the motor and power unit.
F07807	Short circuit detected	• Check the converter connection on the motor side for any phase-phase short-circuit.
		• Rule out that line and motor cables have been interchanged.
A07850	External alarm 1	The signal for "external alarm 1" has been triggered.
		Parameter p2112 defines the signal source of the external alarm.
		Remedy: Rectify the cause of this alarm.
F07860	External fault 1	Remove the external causes for this fault.
F07900	Motor blocked	• Make sure that the motor can rotate freely.
		• Check the torque limit: r1538 for a positive direction of rotation; r1539 for a negative direction of rotation.

Number	Cause	Remedy
F07901	Motor overspeed	Activate precontrol of the speed limiting controller (p1401 bit 7 = 1).
F07902	Motor stalled	Check whether the motor data has been parameterized correctly and perform motor identification.
		Check the current limits (p0640, r0067, r0289). If the current limits are too low, the drive cannot be magnetized.
		Check whether motor cables are disconnected during operation.
A07903	Motor speed deviation	Increase p2163 and/or p2166.
		Increase the torque, current and power limits.
A07910	Motor overtemperature	Check the motor load.
		Check the motor's ambient temperature.
		Check the KTY84 sensor.
A07920	Torque/speed too low	The torque deviates from the torque/speed envelope curve.
A07921	Torque/speed too high	• Check the connection between the motor and the load.
A07922	Torque/speed out of tolerance	• Adapt the parameterization corresponding to the load.
F07923	Torque/speed too low	• Check the connection between the motor and the load.
F07924	Torque/speed too high	• Adapt the parameterization corresponding to the load.
A07927	DC braking active	Not required
A07980	Rotary measurement activated	Not required
A07981	No enabling for rotary measurement	Acknowledge pending faults.
		Establish missing enables (see r00002, r0046).
A07991	Motor data identification activated	Switch on the motor and identify the motor data.
F08501	Setpoint timeout	• Check the PROFINET connection.
		• Set the controller to RUN mode.
		• If the error occurs repeatedly, check the monitoring time set (p2044).
F08502	Monitoring time, sign-of-life expired	• Check the PROFINET connection.
F08510	Send configuration data not valid	• Check the PROFINET configuration
A08511	Receive configuration data not valid	
A08526	No cyclic connection	• Activate the controller with cyclic operation.
		• Check the parameters "Name of Station" and "IP of Station" (r61000, r61001).
A08565	Consistency error affecting adjustable parameters	Check the following:
		• IP address, subnet mask or default gateway is not correct.
		• IP address or station name used twice in the network.
		• Station name contains invalid characters.

Number	Cause	Remedy
F08700	Communications error	A CAN communications error has occurred. Check the following: • Bus cable • Baud rate (p8622) • Bit timing (p8623) • Master Start the CAN controller manually with p8608 = 1 after the cause of the fault has been resolved!
F13100	Know-how protection: Copy protection error	The know-how protection and the copy protection for the memory card are active. An error occurred during checking of the memory card. • Insert a suitable memory card and switch the converter supply voltage temporarily off and then on again (POWER ON). • Deactivate the copy protection (p7765).
F13101	Know-how protection: Copy protection cannot be activated	Insert a valid memory card.
F30001	Overcurrent	Check the following: • Motor data, if required, carry out commissioning • Motor's connection method (Y / Δ) • U/f operation: Assignment of rated currents of motor and Power Module • Line quality • Make sure that the line commutating reactor is connected properly • Power cable connections • Power cables for short-circuit or ground fault • Power cable length • Line phases If this doesn't help: • U/f operation: Increase the acceleration ramp • Reduce the load • Replace the power unit
F30002	DC-link voltage overvoltage	Increase the ramp-down time (p1121). Set the rounding times (p1130, p1136). Activate the DC link voltage controller (p1240, p1280). Check the line voltage (p0210). Check the line phases.
F30003	DC-link voltage undervoltage	Check the line voltage (p0210).
F30004	Converter overtemperature	Check whether the converter fan is running. Check whether the ambient temperature is in the permissible range. Check whether the motor is overloaded. Reduce the pulse frequency.
F30005	I2t converter overload	Check the rated currents of the motor and Power Module. Reduce current limit p0640. When operating with U/f characteristic: Reduce p1341.

Number	Cause	Remedy
F30011	Line phase failure	Check the converter's input fuses.
		Check the motor cables.
F30015	Motor cable phase failure	Check the motor cables.
		Increase the ramp-up or ramp-down time (p1120).
F30021	Ground fault	• Check the power cable connections.
		• Check the motor.
		• Check the current transformer.
		• Check the cables and contacts of the brake connection (a wire might be broken).
F30027	Time monitoring for DC link pre-charging	Check the supply voltage on the input terminals.
		Check the line voltage setting (p0210).
F30035	Overtemperature, intake air	• Check whether the fan is running.
F30036	Overtemperature, inside area	• Check the fan filter elements.
		• Check whether the ambient temperature is in the permissible range.
F30037	Rectifier overtemperature	See F30035 and, in addition:
		• Check the motor load.
		• Check the line phases
A30049	Internal fan defective	Check the internal fan and if required replace.
F30059	Internal fan defective	Check the internal fan and if required replace.
F30074	Communications fault between Control Unit and Power Module	The 24V voltage supply of the converter (terminals 31 and 32) was interrupted briefly.
		Please check the voltage supply and the wiring.
A30502	DC link overvoltage	• Check the device supply voltage (p0210).
		• Check the line reactor dimensioning
A30920	Temperature sensor fault	Check that the sensor is connected correctly.
A50001	PROFINET configuration error	A PROFINET controller is attempting to establish a connection with a faulty configuration telegram. Check to see whether "Shared Device" is activated (p8929 = 2).
A50010	PROFINET name of station invalid	Correct name of station (p8920) and activate (p8925 = 2).
A50020	PROFINET: Second controller missing	"Shared Device" is activated (p8929 = 2). However, only the connection to a PROFINET controller is present.

For further information, please refer to the List Manual.

5.2 Product support

Table 5- 3   Technical Support

France	Germany	Italy	Spain	United Kingdom
+33 (0) 821 801 122	+49 (0)911 895 7222	+39 (02) 24362000	+34 902 237 238	+44 161 446 5545
Further service telephone numbers: Product support (http://support.automation.siemens.com/WW/view/en/4000024)				

Table 5- 4   Manuals with further information

Information level	Manual	Content	Available languages	Download or order number
+	Getting Started	(this manual)	English, German, Italian, French, Spanish, Chinese	Documentation download (http://support.automation.siemens.com/WW/view/en/36426537/133300) SINAMICS Manual Collection Documentation on DVD Order number: 6SL3097-4CA00-0YG0
++	Operating instructions - converter	Installing, commissioning and operating the converter. Description of converter functions. Technical data.		
+++	Function Manual Safety Integrated	Configuring PROFIsafe. Installing, commissioning and operating the integrated fail-safe function.	English, German	
+++	List manual	Complete list of parameters, alarms and faults. Graphic function block diagrams.	English, German, Chinese	
+++	Operating instructions - BOP-2, IOP	Description of operator panel	English, German	

5.3 Spare parts

		Order number
Spare part kit including 5 sets I/O terminals, 2 door sets and 1 blind cover		6SL3200-0SK41-0AA0
Screening plates	Frame size A	6SL3266-1EA00-0KA0
	Frame size B	6SL3266-1EB00-0KA0
	Frame size C	6SL3266-1EC00-0KA0
1 set of connector plugs (mains, motor and breaking resistor)	Frame size A	6SL3200-0ST05-0AA0
	Frame size B	6SL3200-0ST06-0AA0
	Frame size C	6SL3200-0ST07-0AA0
Fan units	Frame size A	6SL3200-0SF12-0AA0
	Frame size B	6SL3200-0SF13-0AA0
	Frame size C	6SL3200-0SF14-0AA0
Top cover with built in fan	Frame size A	6SL3200-0SF40-0AA0
	Frame size B	6SL3200-0SF41-0AA0
	Frame size C	6SL3200-0SF42-0AA0