

PC600 / CL300 / CL400 / CL500

Digital input and output modules

Module description



Version

101



PC600 / CL300 / CL400 / CL500

Digital input and output modules

Module description

1070 072 144-101 (95.04) GB

© 1995

by Robert Bosch GmbH,
All rights reserved, including applications for protective rights.
Reproduction or handing over to third parties are subject to our written permission.

Discretionary charge 10.– DM



Safety instructions and reading help

Read this instruction manual before commissioning the digital input and output modules. Keep this manual in a place where it is always accessible to all users.

Standard operation

This instruction manual contains all of the information required for standard operation of the described products. The products described serve as digital input and output modules for a Bosch PLC.

The products described were developed, manufactured, tested and documented in accordance with the relevant safety standards. There should be no risk of danger to personnel or property if the specifications and safety instructions relating to the project phase and installation and correct operation of the product are followed.

Qualified personnel

This instruction manual is designed for specially trained PLC personnel. The relevant requirements are based on the job specifications as described by the ZVEI, see:

Anforderungsprofile für SPS-Fachkräfte

I + K SPEKTRUM 19

Hrsg.: ZVEI

Stresemannallee 19

60596 Frankfurt

Federal Republic of Germany

ISSN 0932–5018

This instruction manual is designed for PLC technicians. Specialist knowledge of the Bosch PLC is required.

Interventions in the hardware and software of our products which are not described in this instruction manual may only be performed by our skilled personnel.

Unqualified interventions in the hardware or software or non-compliance with the warnings listed in this instruction manual or indicated on the product may result in serious personal injury or damage to property.

Qualified personnel are persons who

- as **planning personnel**, are familiar with the safety guidelines used in electrical engineering and automation technology.
- as **operating personnel**, are familiar with the equipment used in the field of automation technology and are thus familiar with the operating instructions in this manual.
- as **commissioning personnel**, are authorized to commission, ground and classify electric circuits and devices/systems in accordance with the relevant safety standards.

Safety instructions on the control components

The following warnings and notices may be indicated on the control components themselves and have the following meaning:



Danger: High voltage!



Danger: Battery acid!



Electrostatically-sensitive components!



Disconnect at mains before opening!



Pin for connecting PE conductor only!



For screened conductor only!

**Safety instructions in this manual**

These symbols are used throughout this manual subject to the following conditions.

**DANGER**

This symbol is used to warn of the presence of **dangerous electrical current**. Insufficient or lacking compliance with these instructions can result in **personal injury**.

Safety instructions accompanied by this symbol are serially numbered, for example 0.1. The appendix provides translations of the safety notes shown here in all the official EC languages.

**DANGER**

This symbol is used wherever an insufficient or lacking compliance with instructions can result in **personal injury**.

Safety instructions accompanied by this symbol are serially numbered, for example 0.1. The appendix provides translations of the safety notes shown here in all the official EC languages.

**CAUTION**

This symbol is used wherever an insufficient or lacking compliance with instructions can result in **damage to equipment or files**.

Safety instructions accompanied by this symbol are serially numbered, for example 0.1. The appendix provides translations of the safety notes shown here in all the official EC languages.



This symbol is used to inform the user of special features.

Symbols used

This sign shows that the manual is describing an activity which you have to perform, e.g.:

- ★ Insert disk 1 into the floppy disk drive.

Safety instructions

**DANGER****0.1**

Danger to persons and equipment!

Test every new program before operating the system!

**CAUTION****0.2**

Danger to the module!

Do not insert or remove the module when the control is switched on! This can destroy the module. Switch off or remove the power supply module of the control, external power supply and signal voltage before inserting or removing the module!

**CAUTION****0.3**

Danger to the module!

All ESD protection measures must be observed when using the module! Avoid electrostatic discharges!

Observe the following protective measures for electrostatically endangered modules (EEM)!

- The employees responsible for the storage, transport and handling must be trained in ESD protection.
- EEMs must be stored and transported in the protective packaging specified.
- EEMs may basically only be handled at special ESD work places set up specifically for this purpose.
- Employees, work surfaces and all devices and tools, which could come into contact with EEMs must be same potential (e.g. earthed).
- Wear an approved earthing strap around your wrist. The grounding bracelet must be connected via a cable with integrated 1 M Ω resistance with the work surface.
- EEMs may on no account come into contact with chargeable objects, these include most plastics.
- When inserting EEMs into devices and removing them, the power source of the device must be switched off.



We would greatly appreciate any contributions to improve this manual. If you have any suggestions, please fill out the page provided at the end of this manual.

Contents

	Page
1	Digital input modules 1–1
1.1	Input module E 220 V~, order no. 1070 046 267 1–8
1.2	Input module E 115 V~, order no. 1070 046 427 1–10
1.3	Input module E 24 V–, order no. 1070 071 252 1–12
1.4	Input module E 24 V–, order no. 1070 047 961 Input module E 24 V– SF, order no. 1070 075 324 1–16
1.5	Input module E 24 V–, order no. 1070 047 963 Input module E 24 V– SF, order no. 1070 075 330 1–18
1.6	Input module E 24 V–, 2-pin, order no. 1070 044 312 1–20
2	Digital output modules 2–1
2.1	Output module A 24/0.2–, order no. 1070 047 964 2–8
2.2	Output module A 24/0.5–e, order no. 1070 050 560 2–10
2.3	Output module A 24/0.5–, order no. 1070 048 483 Output module A 24/0.5– SF, order no. 1070 075 333 2–13
2.4	Output module A 24/2–, order no. 1070 048 485 Output module A 24/2– SF, order no. 1070 075 337 2–15
2.5	Output module A 24/2–, order no. 1070 041 348 2–17

	Page
2.6	Output module A 24/2–, order no. 1070 044 305 2–19
2.7	Output module A 24/2–e, order no. 1070 050 634 2–21
2.8	Output module A 230/2~ order no. 1070 048 862 2–23
2.9	Output module AR/2A, order no. 1070 044 834 Output module AR/2A SF, order no. 1070 075 340 2–27
 A Appendix	
A.1	Abbreviations A–1
A.2	Index A–2
A.3	Safety instructions A–4
A.3.1	Dansk A–4
A.3.2	Deutsch A–6
A.3.3	Ελληνικά A–8
A.3.4	Español A–10
A.3.5	Français A–12
A.3.6	Italiano A–14
A.3.7	Nederlands A–16
A.3.8	Português A–18
A.3.9	Suomi A–20
A.3.10	Svenska A–22

Illustrations

Fig.		Page
1-1	Input modules, specifications	1-3
1-2	Input modules, slots PC600	1-4
1-3	Input modules, slots CL300	1-4
1-4	Input modules, slots CL400	1-5
1-5	Input modules, slots CL500	1-5
1-6	Dip switch start address	1-6
1-7	Dip switch, value	1-7
1-8	Addressing, input module example	1-7
1-9	Input module 1070 046 267, terminal assignment	1-8
1-10	Input module 1070 046 267, input circuit	1-9
1-11	Input module 1070 046 427, terminal assignment	1-10
1-12	Input module 1070 046 427, input circuit	1-11
1-13	Input module 1070 071 252, terminal assignment	1-12
1-14	Input module 1070 071 252, Switch	1-14
1-15	Rotary switch S2, input delay	1-14
1-16	Input module 1070 071 252, input circuit	1-15
1-17	Input module 1070 047 961 and 1070 075 324, terminal assignment	1-16
1-18	Input module 1070 047 961 and 1070 075 324, input circuit	1-17
1-19	Input module 1070 047 963 and 1070 075 330, terminal assignment	1-18
1-20	Input module 1070 047 963 and 1070 075 330, input circuit	1-19
1-21	Input module 1070 044 312, terminal assignment	1-20
1-22	Input module 1070 044 312, input circuit	1-21

Fig.		Page
2-1	Output modules, specifications	2-3
2-2	Output modules, slots PC600	2-4
2-3	Output modules, slots CL300	2-4
2-4	Output modules, slots CL400	2-5
2-5	Output modules, slots CL500	2-5
2-6	Dip switch start address	2-6
2-7	Dip switch, value	2-7
2-8	Addressing, output modules example	2-7
2-9	Output module 1070 047 964, terminal assignment	2-8
2-10	Output module 1070 047 964, output circuit	2-9
2-11	Output module 1070 050 560, terminal assignment	2-10
2-12	Output module 1070 050 560, simultaneity/fan unit	2-11
2-13	Output module 1070 050 560, output circuit	2-12
2-14	Output module 1070 048 483 and 1070 075 333, terminal assignment	2-13
2-15	Output module 1070 048 483 and 1070 075 333, output circuit	2-14
2-16	Output module 1070 048 485 and 1070 075 337, terminal assignment	2-15
2-17	Output module 1070 048 485 and 1070 075 337, output circuit	2-16
2-18	Output module 1070 041 348, terminal assignment	2-17
2-19	Output module 1070 041 348, output circuit	2-18
2-20	Output module 1070 044 305, terminal assignment	2-19
2-21	Output module 1070 044 305, output circuit	2-20
2-22	Output module 1070 050 634, terminal assignment	2-21



Fig.		Page
2-23	Output module 1070 050 634, output circuit	2-22
2-24	Output module 1070 048 862, terminal assignment	2-23
2-25	Output module 1070 048 862	2-25
2-26	Output module 1070 048 862, output circuit	2-26
2-27	Output module 1070 044 834 and 1070 075 340, terminal assignment	2-27
2-28	Output module 1070 044 834 and 1070 075 340, output circuit	2-28

1 Digital input modules



CAUTION

1.1

Danger to the module!

Do not insert or remove the module when the control is switched on! This can destroy the module. Switch off or remove the power supply module of the control, external power supply and signal voltage before inserting or removing the module!



CAUTION

1.2

Danger to the module!

All ESD protection measures must be observed when using the module! Avoid electrostatic discharges!

Configuration

The digital input modules have 16, 32 or 95 inputs.

The direct and alternating voltages coming from the process are galvanically isolated from the internal logic by using optocouplers.

With modules with 16 or 32 inputs, every input is allocated an LED for indicating the signal status.

- LED lit : 1
- LED not lit : 0

Input modules with increased interference immunity

The following modules are available for operations in environments particularly prone to interference.

- E 24 V– SF, 16 inputs, order no. 1070 075 330
- E 24 V– SF, 32 inputs, order no. 1070 075 324

These input modules meet or exceed the following norms when connected according to procedures:

- IEC 255-4
- IEC 801-2, -4
- DIN EN 61131, -2
- EN 60204-1
- VDE 0160

These input modules have a capacitive coupling between earth and screen of 10 nF.

Connection

The connection of the transducers takes place via plug-in terminals. This enables modules to be changed without disconnecting the wiring.

- max. cable cross section : 1.5 mm²
- max. terminal current : 6 A

Specifications

Order no.	1070							
	046 267	046 427	071 252	047 961	075 324	047 963	075 330	044 312
Designation	E 220 V~	E 115 V~	E 24 V-	E 24 V-	E 24 V- SF	E 24 V-	E 24 V- SF	E 24 V-
Inputs	16		95	32		16		
2-pin	yes		no				yes	
Input voltage	220 V~	115 V~	24 V-					
Frequency range	48 Hz to 63 Hz							
Voltage range 0	0 to 65 V	0 to 35 V	-3 V to +6 V					
Voltage range 1	175 to 255 V	88 to 133 V	+15 to +30 V					
Input delay 0 → 1	5 ms		settable	3 ms				
Input delay 1 → 0	25 ms	30 ms	settable	3 ms				
Input current	5.5 mA	6 mA	4 mA	15 mA				
Power input from 12 V intern.	0.5 mA per input set							
Simultaneity	100%							
Fan unit required	yes		no					
Width	1 division							

Fig. 1-1 Input modules, specifications

Slots



CAUTION

1.3

Danger to the module!

Do not insert or remove the module when the control is switched on! This can destroy the module. Switch off or remove the power supply module of the control, external power supply and signal voltage before inserting or removing the module!

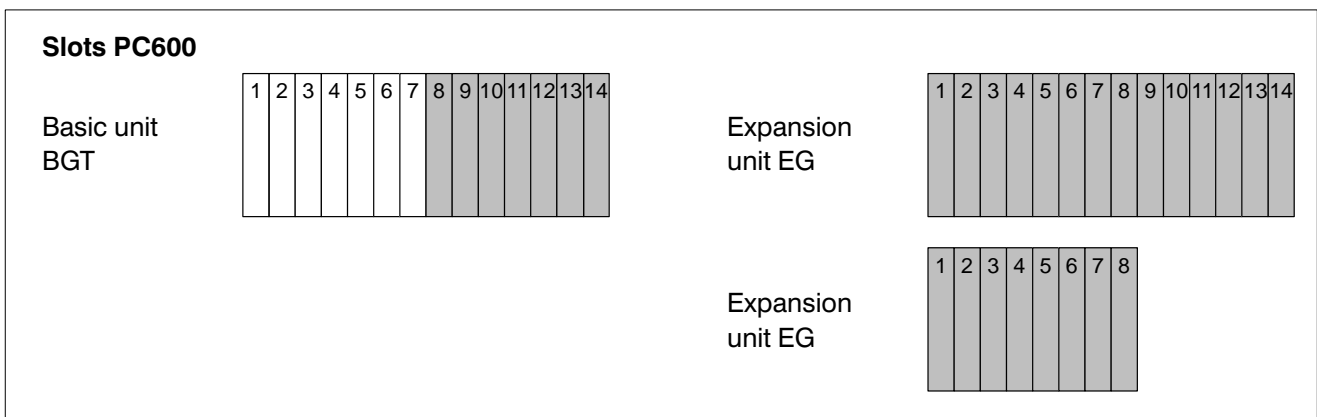


Fig. 1-2 Input modules, slots PC600

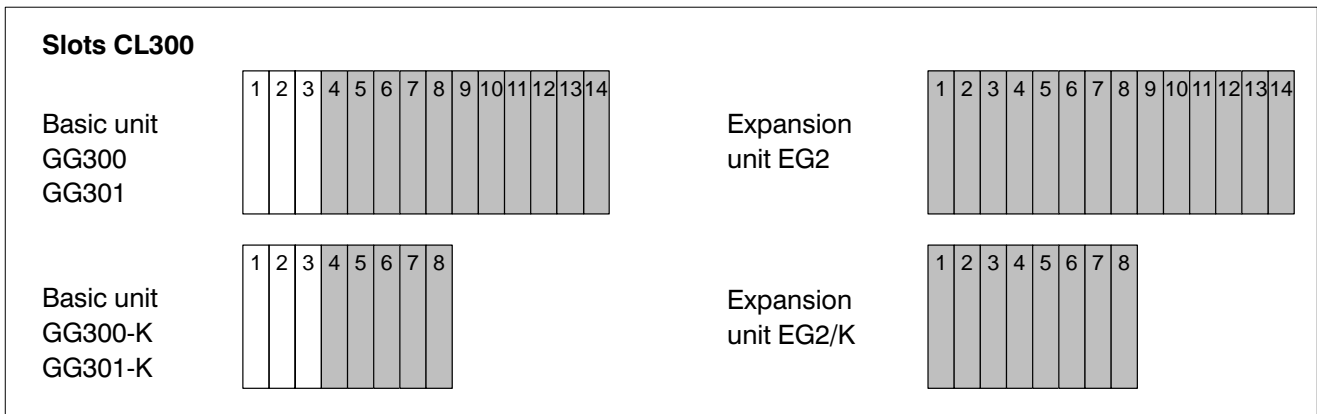


Fig. 1-3 Input modules, slots CL300

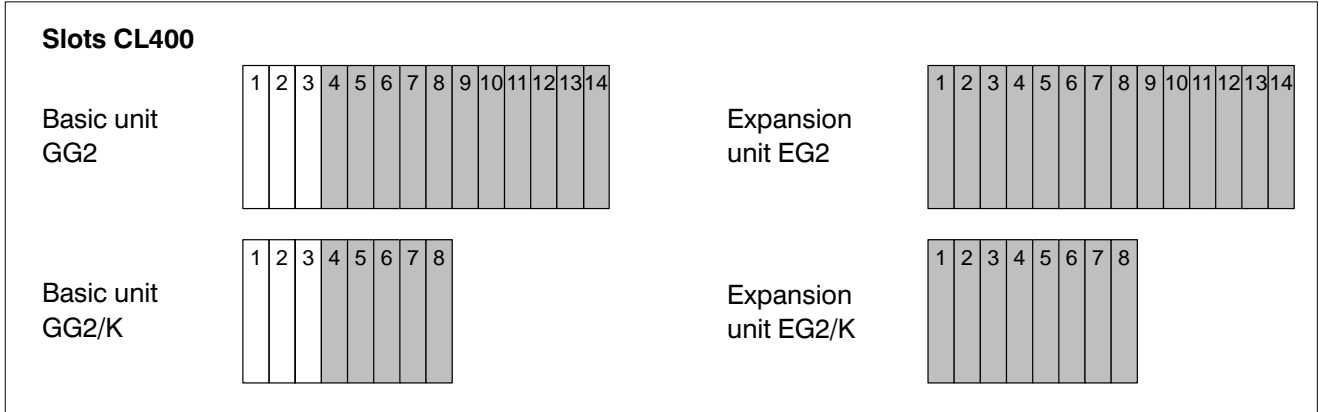


Fig. 1-4 Input modules, slots CL400

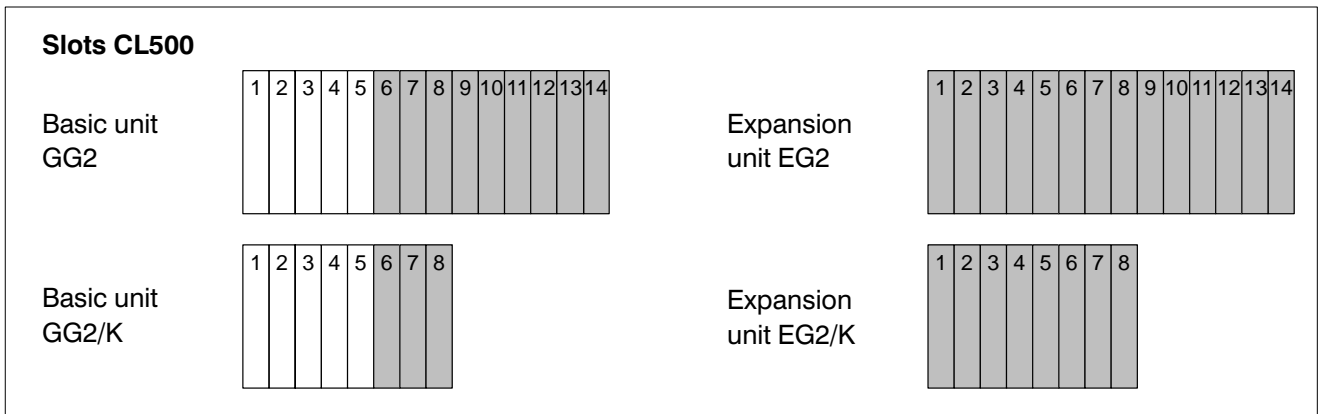


Fig. 1-5 Input modules, slots CL500

Addressing

Every input module must have a start address set on the module. The start address is set with a dip switch.



CAUTION

1.4

Danger to the module!

Do not insert or remove the module when the control is switched on! This can destroy the module. Switch off or remove the power supply module of the control, external power supply and signal voltage before inserting or removing the module!



CAUTION

1.5

Danger to the module!

All ESD protection measures must be observed when using the module! Avoid electrostatic discharges!

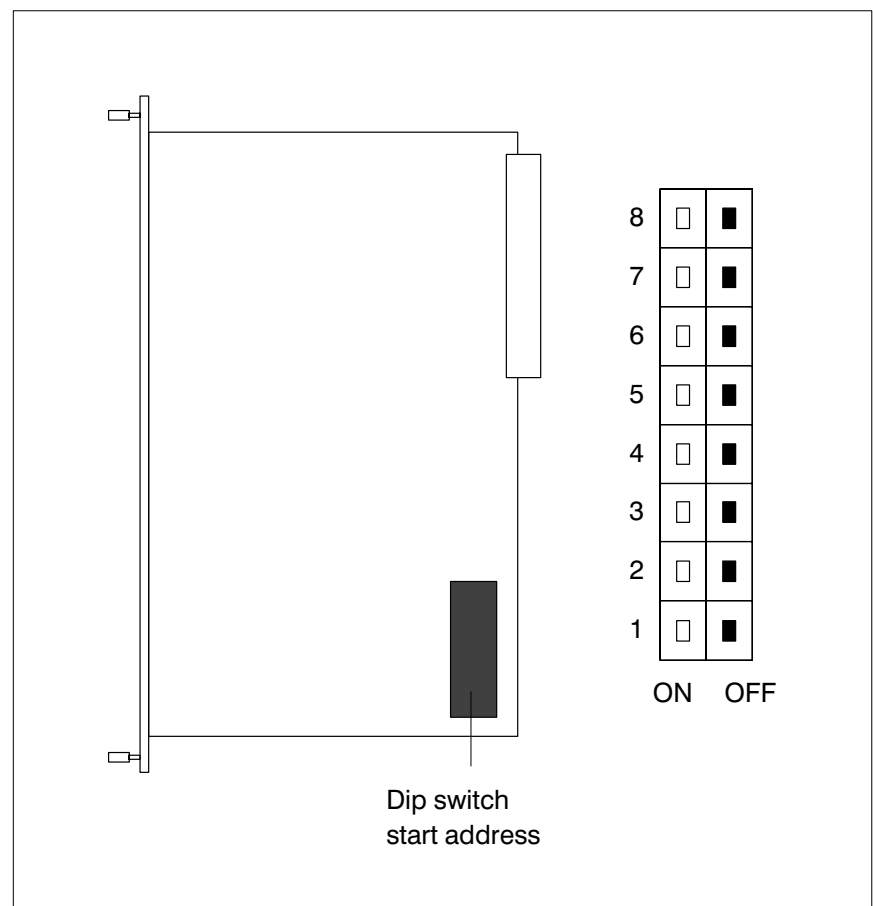


Fig. 1-6 Dip switch start address

Switch	1	2	3	4	5	6	7	8
Bit value	2 ⁰	2 ¹	2 ²	2 ³	2 ⁴	2 ⁵	2 ⁶	2 ⁷
Value	1	2	4	8	16	32	64	128

Fig. 1–7 Dip switch, value



Switch 1 must always be OFF, as only even numbers are allowed for start addresses.

The input modules occupy the following address ranges:

- Input module with 95 inputs occupies 12 bytes
- Input module with 32 inputs occupies 4 bytes
- Input module with 16 inputs occupies 2 bytes

To avoid gaps and double assignments, the start addresses should always be allocated as follows:

- Input module with 95 inputs: 0, 12, 24, ...
- Input module with 32 inputs: 0, 4, 8, ...
- Input module with 16 inputs: 0, 2, 4, ...

The following table shows a sample assignment.

Module	Start address	Dip switch setting								Bytes occupied
		1	2	3	4	5	6	7	8	
95 inputs	0	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	0.0 to 11.7
32 inputs	12	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF	12.0 to 15.7
16 inputs	16	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	16.0 to 17.7
16 inputs	18	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	18.0 to 19.7
32 inputs	20	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF	20.0 to 23.7
95 inputs	24	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF	24.0 to 35.7
16 inputs	36	OFF	OFF	ON	OFF	OFF	ON	OFF	OFF	36.0 to 37.7

Fig. 1–8 Addressing, input module example

1.1 Input module E 220 V~, order no. 1070 046 267

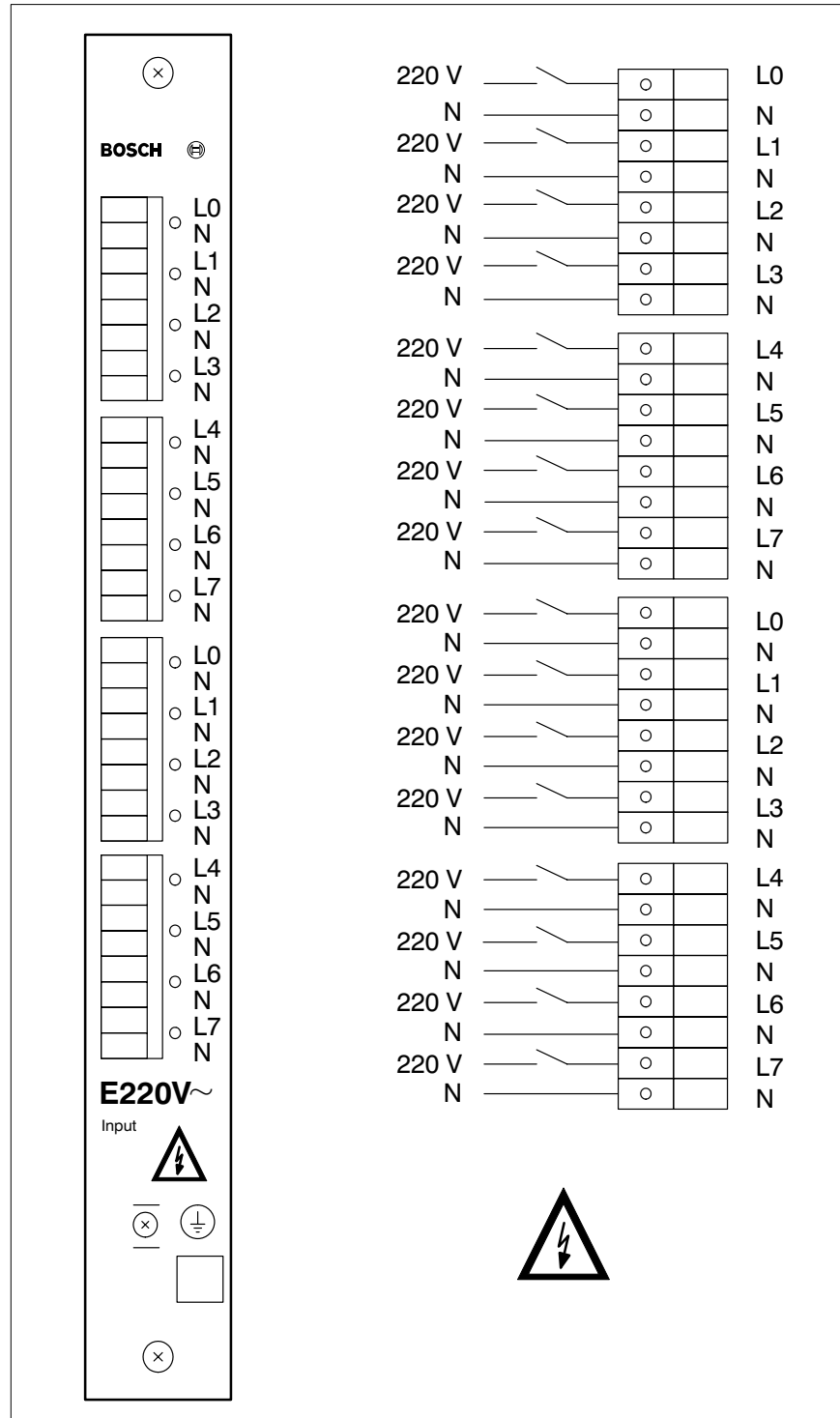


Fig. 1–9 Input module 1070 046 267, terminal assignment



DANGER

1.6
Lethal voltage!
A lethal voltage exists at the terminals of the module!
Cut off the power supply before working on the module!



CAUTION

1.7
Danger to the module!
Do not insert or remove the module when the control is switched on!
This can destroy the module. Switch off or remove the power supply module of the control, external power supply and signal voltage before inserting or removing the module!



CAUTION

1.8
Danger to the module!
All ESD protection measures must be observed when using the module! Avoid electrostatic discharges!



Fan unit required in the subrack!

Input circuit

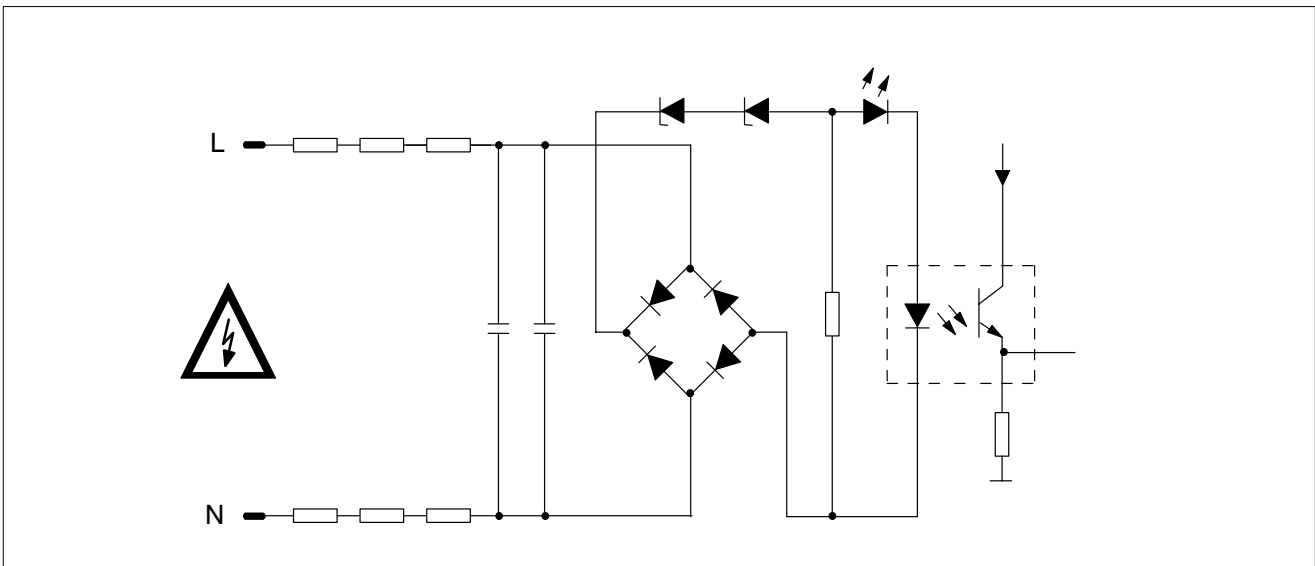


Fig. 1-10 Input module 1070 046 267, input circuit

1.2 Input module E 115 V~, order no. 1070 046 427

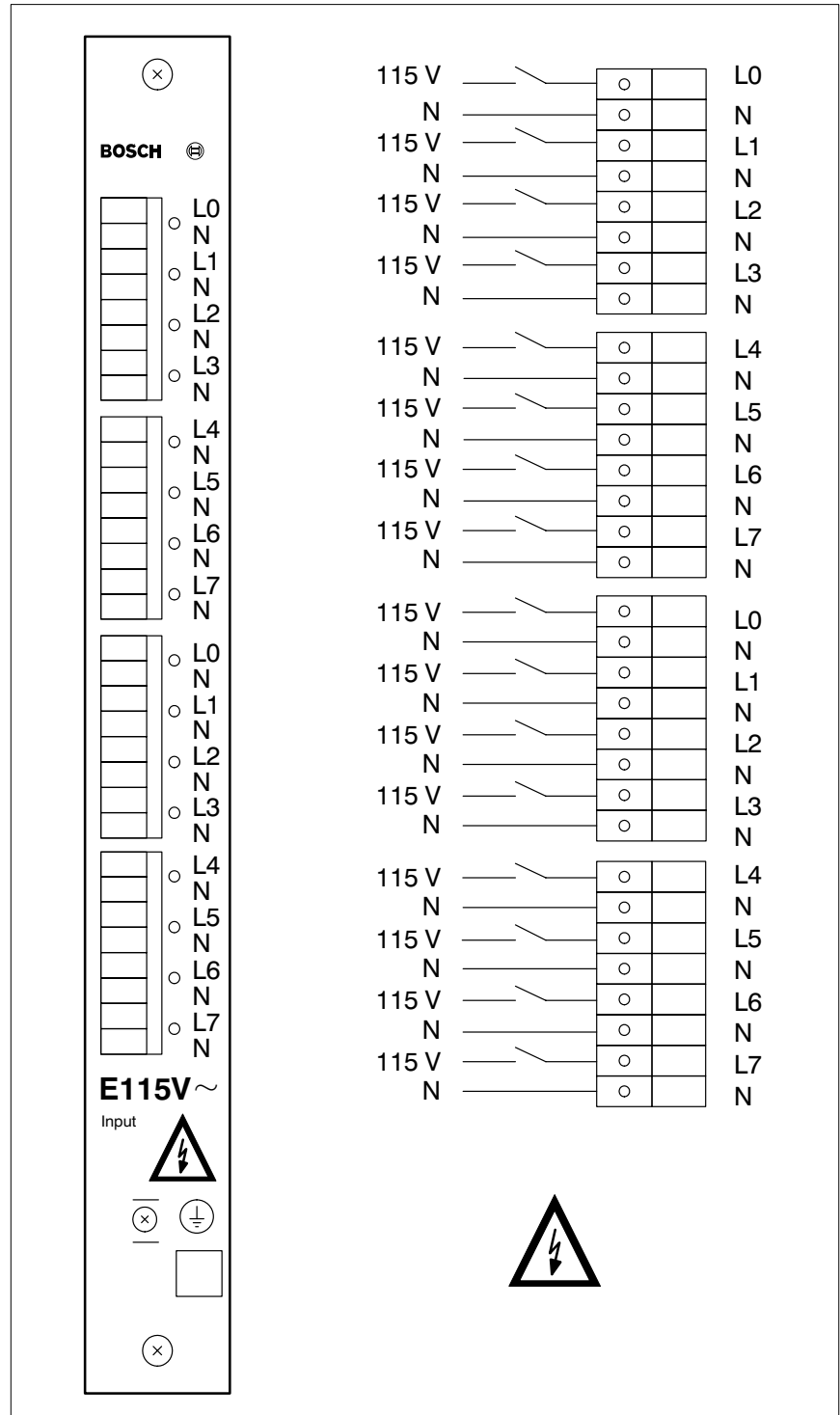


Fig. 1-11 Input module 1070 046 427, terminal assignment



DANGER

1.9
Lethal voltage!
A lethal voltage exists at the terminals of the module!
Cut off the power supply before working on the module!



CAUTION

1.10
Danger to the module!
Do not insert or remove the module when the control is switched on!
This can destroy the module. Switch off or remove the power supply module of the control, external power supply and signal voltage before inserting or removing the module!



CAUTION

1.11
Danger to the module!
All ESD protection measures must be observed when using the module! Avoid electrostatic discharges!



Fan unit required in the subrack!

Input circuit

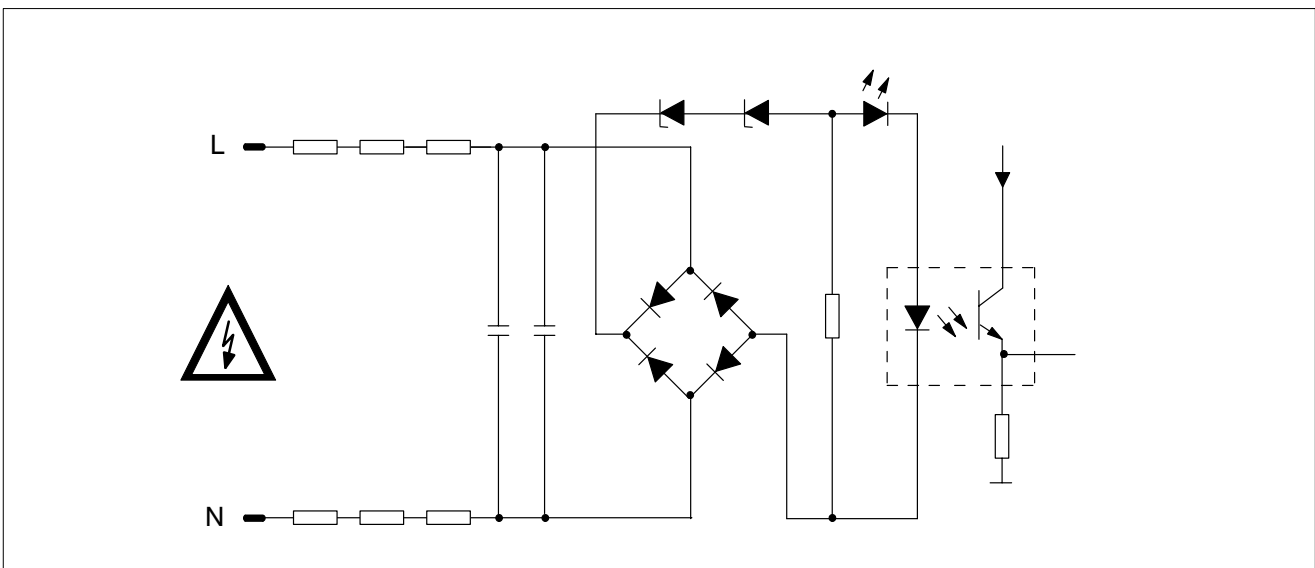


Fig. 1-12 Input module 1070 046 427, input circuit

1.3 Input module E 24 V–, order no. 1070 071 252

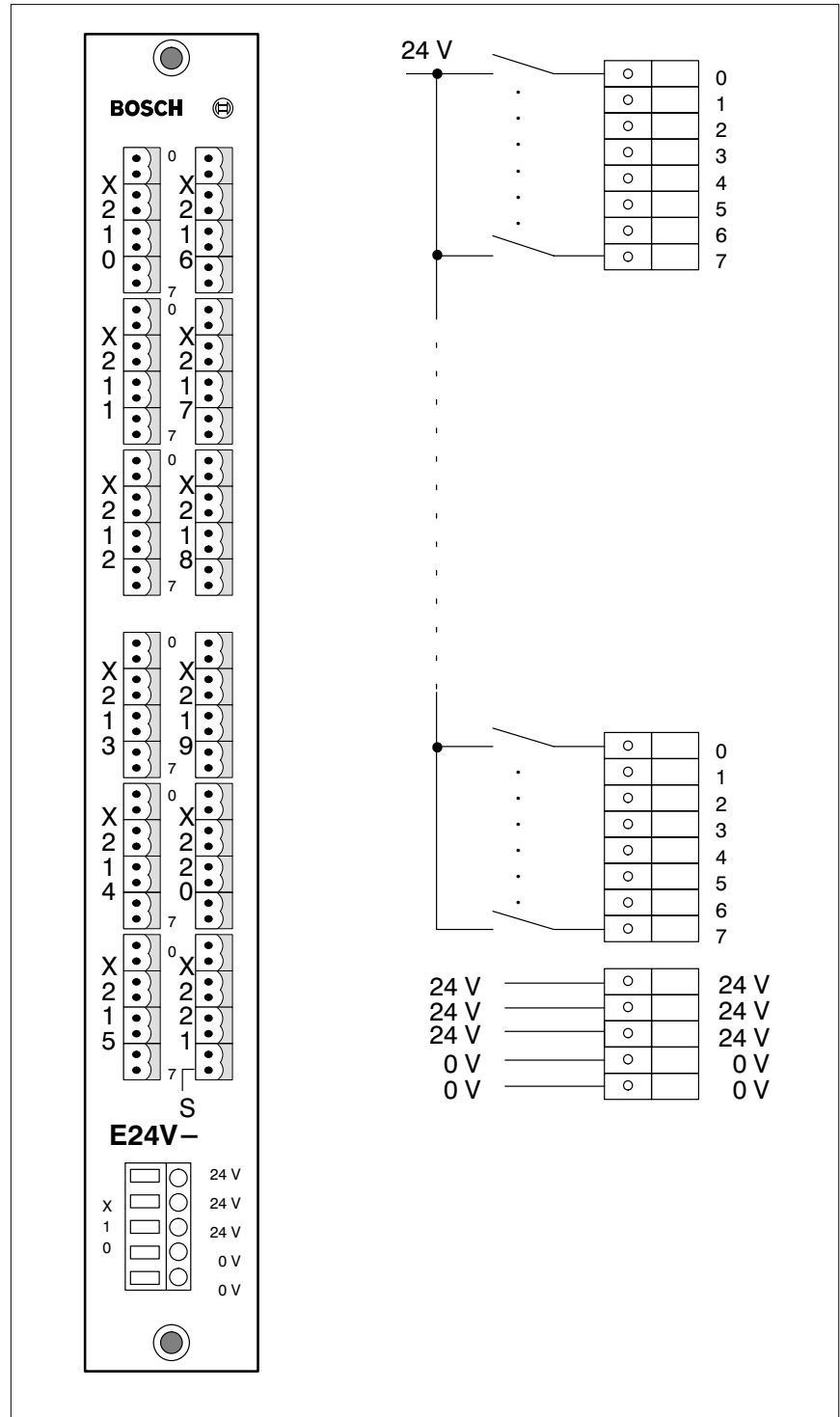


Fig. 1-13 Input module 1070 071 252, terminal assignment



CAUTION

1.12

Danger to the module!

Do not insert or remove the module when the control is switched on! This can destroy the module. Switch off or remove the power supply module of the control, external power supply and signal voltage before inserting or removing the module!



CAUTION

1.13

Danger to the module!

All ESD protection measures must be observed when using the module! Avoid electrostatic discharges!

To save space there are no LEDs on the front panel to display the logic level.

All input signals are connected via 12 8-pin plug-in terminals.



The input X221.7 is denoted on the front panel with an S and may not be used as an input.

The input X221.7 is used to monitor the 24 V supply voltage of X10. In this case,

- 0 24 V supply voltage is not present
- 1 24 V supply voltage is present

If the input module is operated in the extended input, input X221.7 must be read cyclicly, otherwise all input signals will remain at 0.



No start address may be set which houses the last byte outside the address range of the CPU. Otherwise all inputs remain at 0.

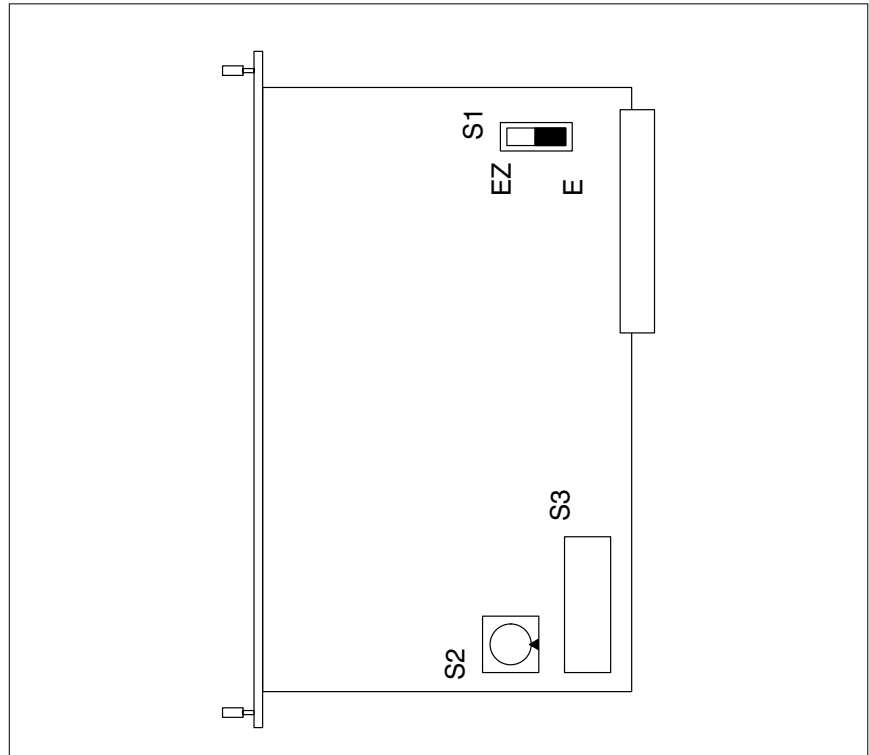


Fig. 1–14 Input module 1070 071 252, Switch

Input delay

The input delay can be set with rotary switch S2; see fig. 1–14.

Time [ms]	Switch setting									
	0	1	2	3	4	5	6	7	8	9
min. input delay	0	2.5	5	10	20	40	80	160	0	2.5
max. input delay	3.1	5.6	10	20	40	80	160	320	3.1	5.6
pulse recognised when longer	3.1	5.6	10	20	40	80	160	320	3.1	5.6

Fig. 1–15 Rotary switch S2, input delay

Addressing



Please see page 1–6.

The addresses of this input module may lie in the I or EI address range. Switch S1 is used to set the address range; see fig. 1–14.

Dip switch S3 is used to set the start address of the input module; see fig. 1–14.



No start address may be set which houses the last byte outside the address range of the CPU. Otherwise all inputs remain at 0.

Input circuit

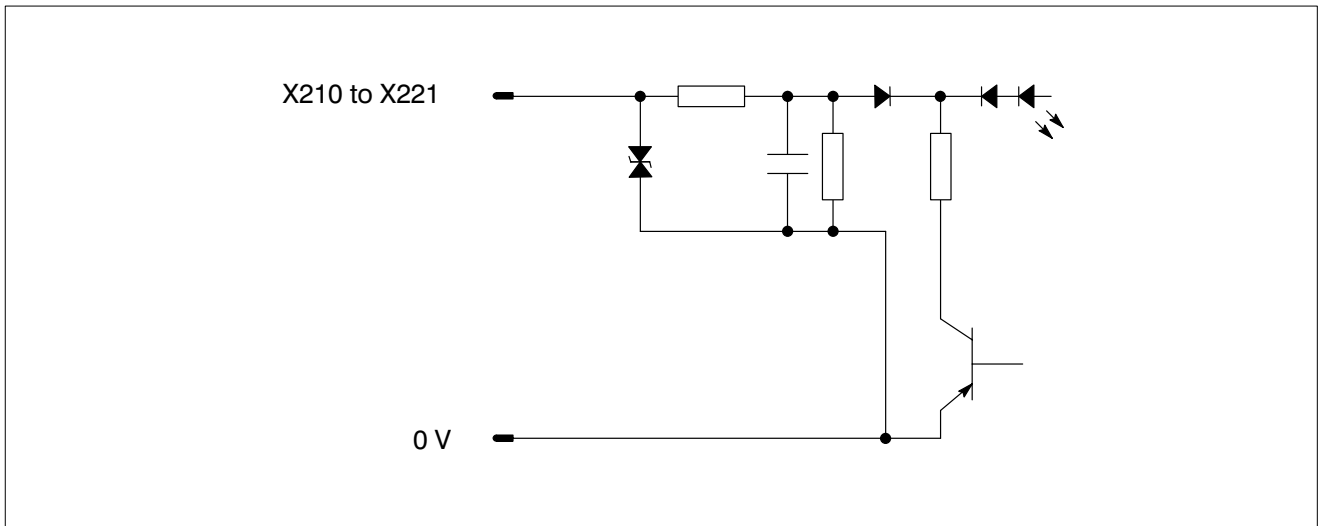


Fig. 1–16 Input module 1070 071 252, input circuit

1.4 Input module E 24 V–, order no. 1070 047 961
Input module E 24 V– SF, order no. 1070 075 324

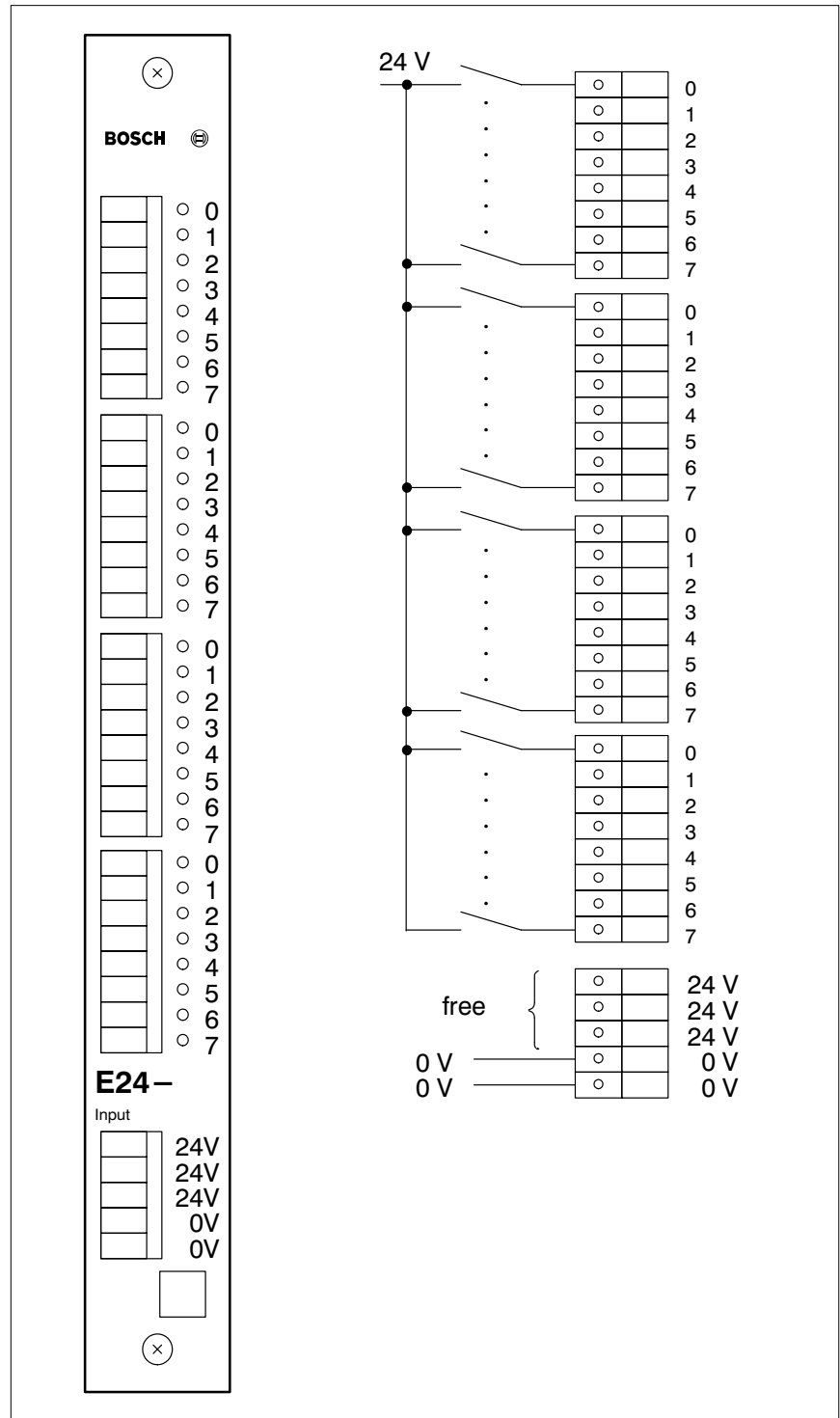


Fig. 1–17 Input module 1070 047 961 and 1070 075 324, terminal assignment



CAUTION

1.14

Danger to the module!

Do not insert or remove the module when the control is switched on! This can destroy the module. Switch off or remove the power supply module of the control, external power supply and signal voltage before inserting or removing the module!



CAUTION

1.15

Danger to the module!

All ESD protection measures must be observed when using the module! Avoid electrostatic discharges!

Input circuit

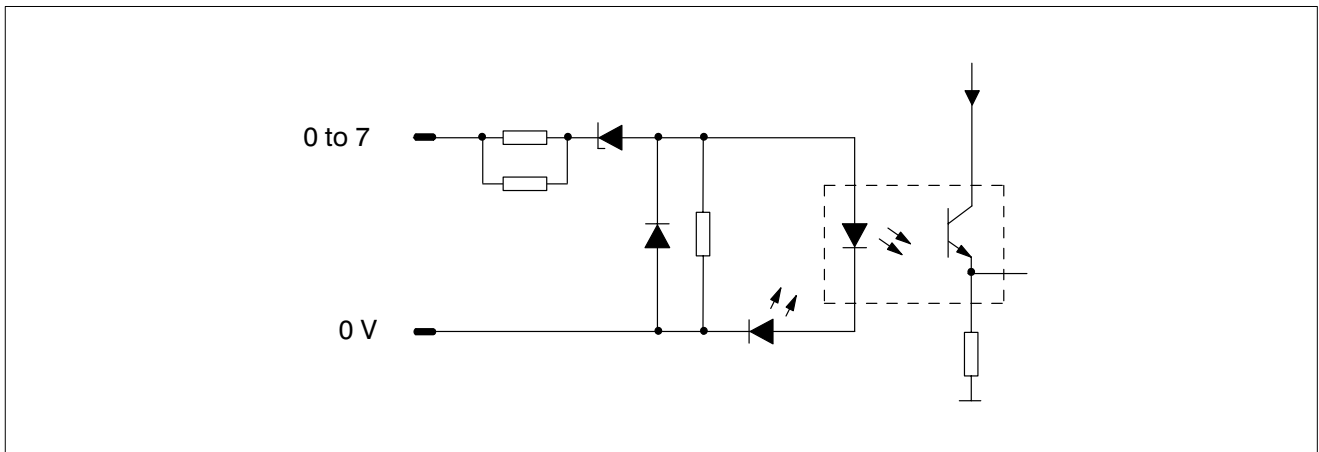


Fig. 1-18 Input module 1070 047 961 and 1070 075 324, input circuit

1.5 Input module E 24 V–, order no. 1070 047 963
Input module E 24 V– SF, order no. 1070 075 330

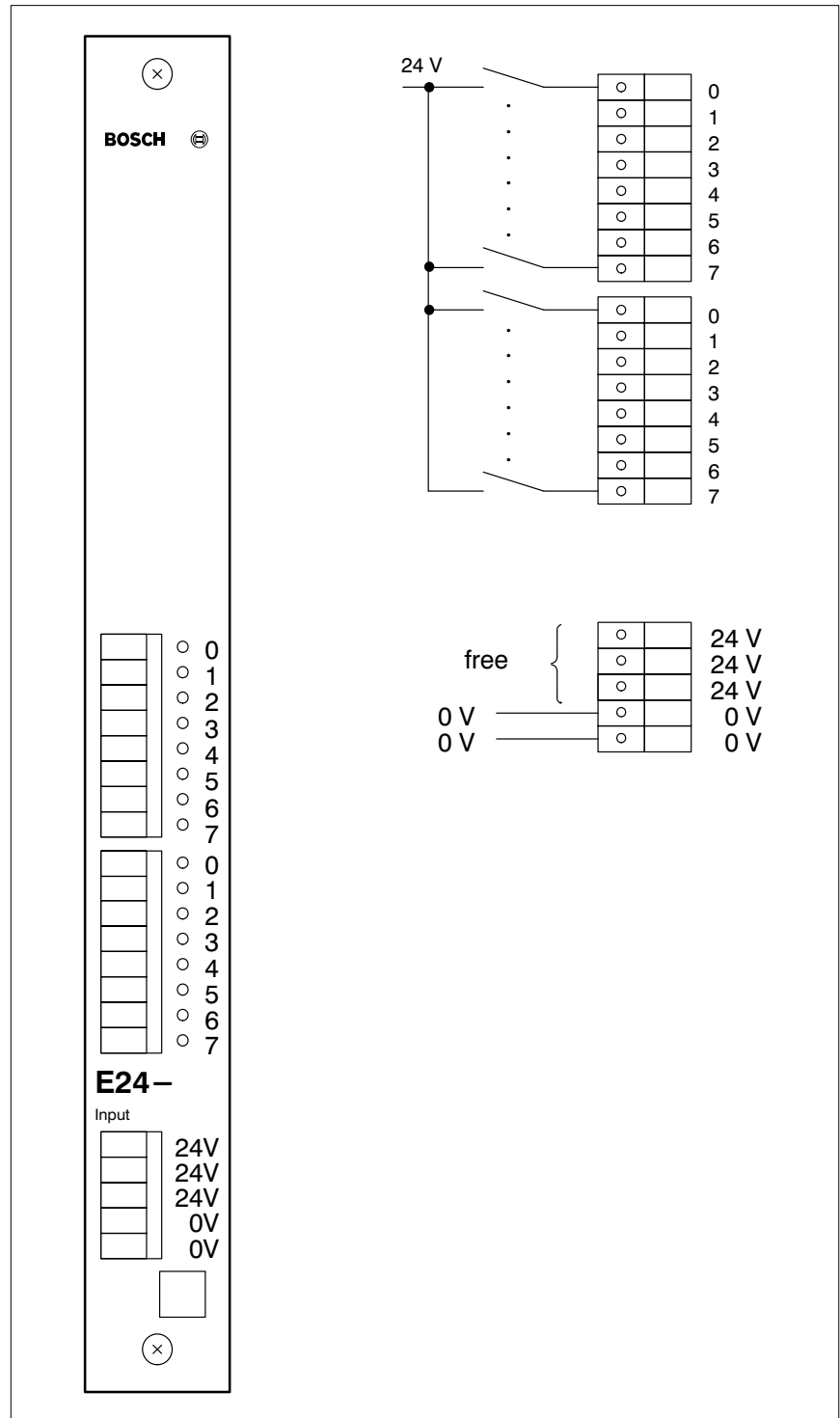


Fig. 1–19 Input module 1070 047 963 and 1070 075 330, terminal assignment



CAUTION

1.16

Danger to the module!

Do not insert or remove the module when the control is switched on! This can destroy the module. Switch off or remove the power supply module of the control, external power supply and signal voltage before inserting or removing the module!



CAUTION

1.17

Danger to the module!

All ESD protection measures must be observed when using the module! Avoid electrostatic discharges!

Input circuit

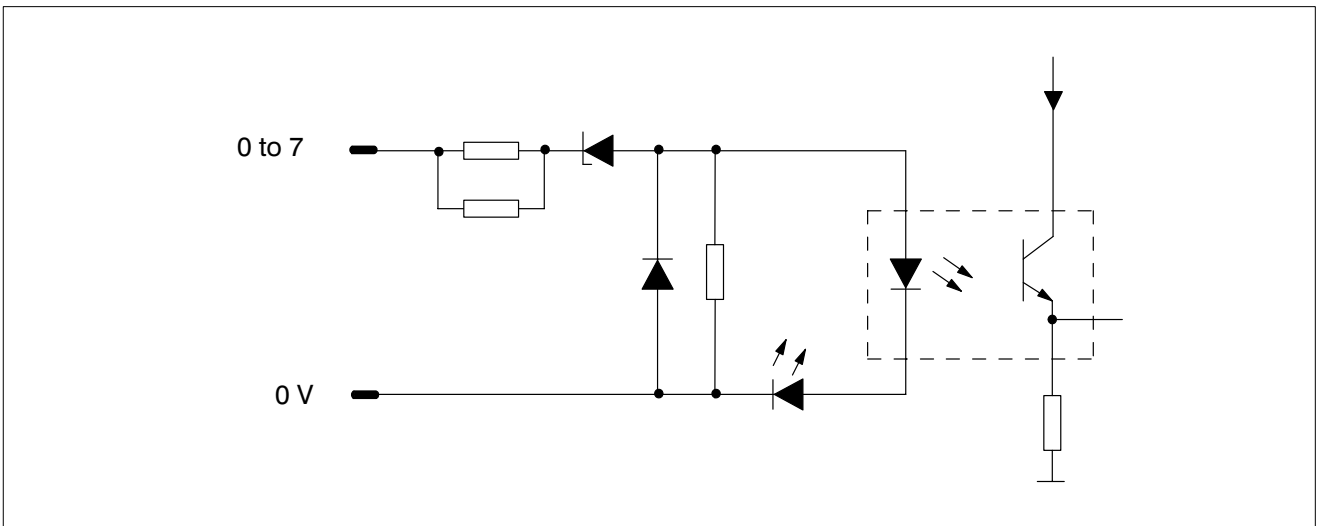


Fig. 1–20 Input module 1070 047 963 and 1070 075 330, input circuit

1.6 Input module E 24 V–, 2-pin, order no. 1070 044 312

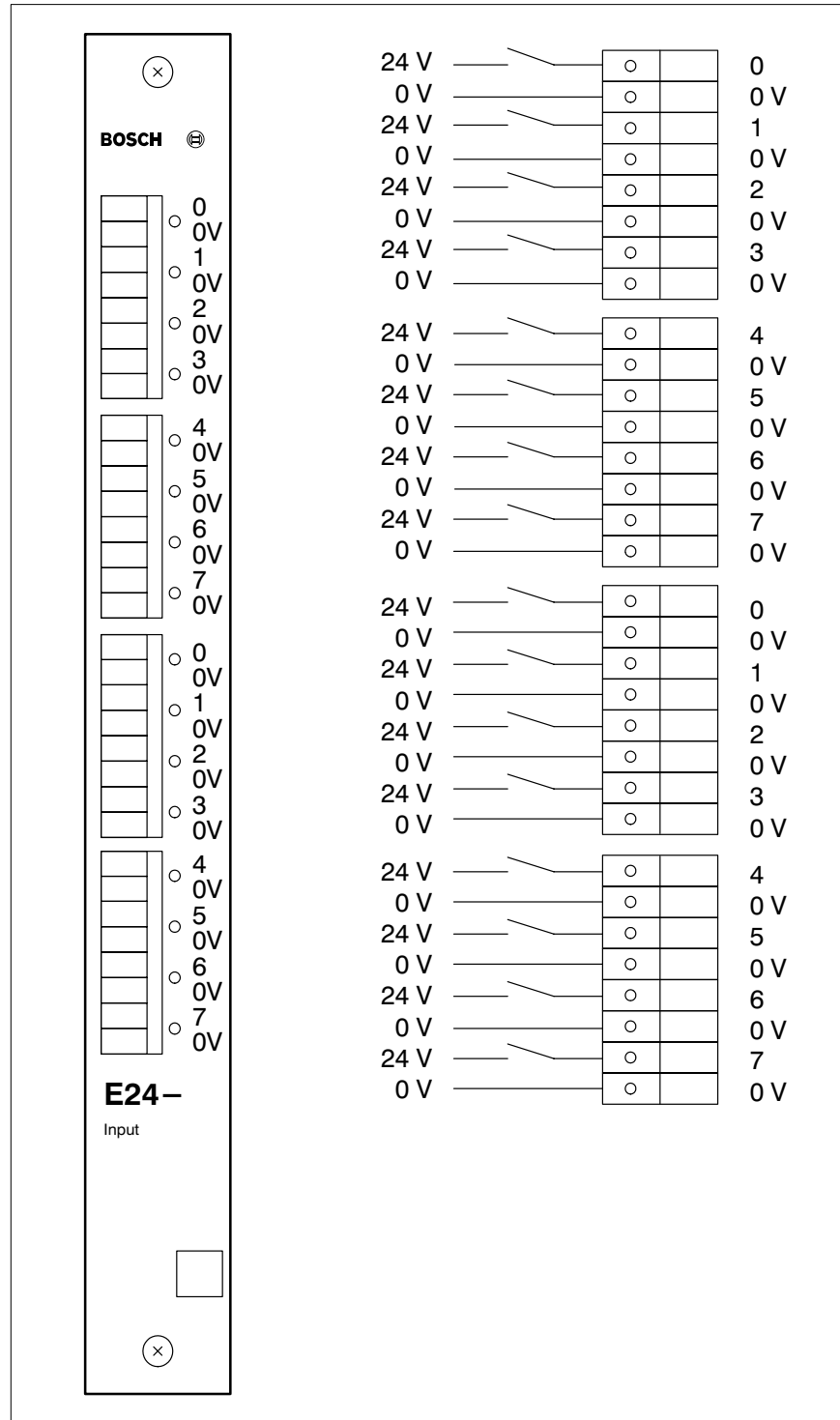


Fig. 1–21 Input module 1070 044 312, terminal assignment



CAUTION

1.18

Danger to the module!

Do not insert or remove the module when the control is switched on! This can destroy the module. Switch off or remove the power supply module of the control, external power supply and signal voltage before inserting or removing the module!



CAUTION

1.19

Danger to the module!

All ESD protection measures must be observed when using the module! Avoid electrostatic discharges!

Input circuit

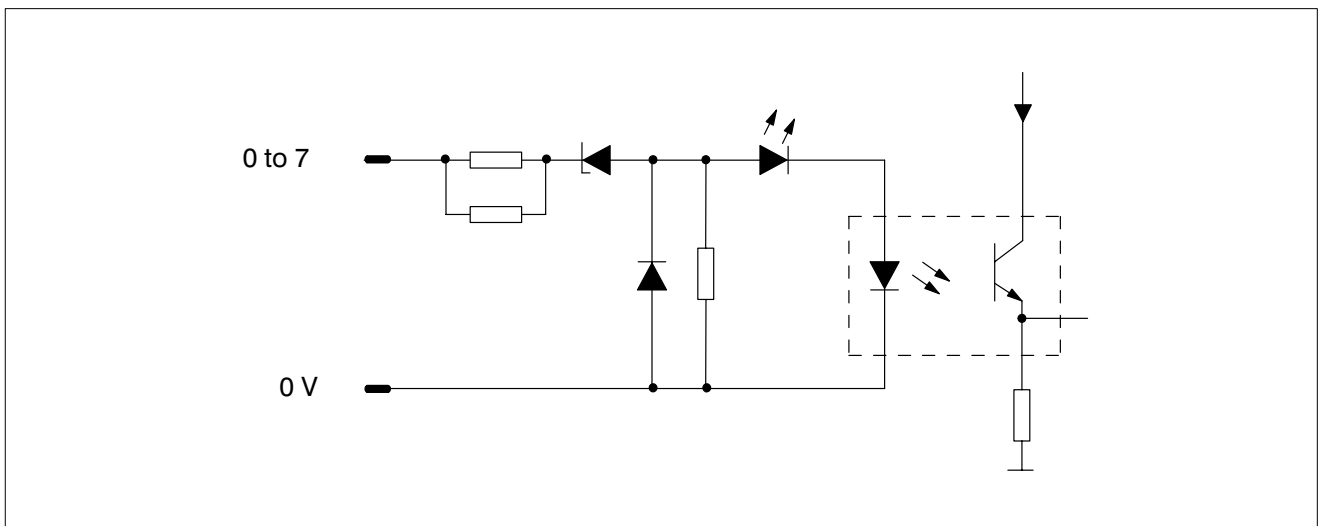


Fig. 1-22 Input module 1070 044 312, input circuit

Notes:

2 Digital output modules



CAUTION

2.1

Danger to the module!

Do not insert or remove the module when the control is switched on! This can destroy the module. Switch off or remove the power supply module of the control, external power supply and signal voltage before inserting or removing the module!



CAUTION

2.2

Danger to the module!

All ESD protection measures must be observed when using the module! Avoid electrostatic discharges!

Configuration

Output modules with 8, 16 and 32 outputs are available for selection.

The output drivers are galvanically isolated from the internal logic by using optocouplers and protected against overloading by fusible cutouts or electronic fuses.

Every output is allocated an LED for indicating the signal status.

- LED lit : 1
- LED not lit : 0

Output module with increased interference immunity

The following output modules are available for operations in environments particularly vulnerable to interference.

- A 24/0.5– SF, 16 outputs, order no. 1070 075 333
- A 24/16– SF, 16 outputs, order no. 1070 075 337
- AR/2A SF, 16 outputs, order no. 1070 075 340

These output modules meet or exceed the following norms when connected according to procedures:

- IEC 255-4
- IEC 801-2
- IEC 801-4
- IEC 1131
- IEC 1131-2
- EN 60204-1
- VDE 0160

These output modules have a capacitive coupling of 10 nF between

- earth and screen.
- and
- 24 V and screen.

Connection

The actuator is connected via the plug-in terminal. This enables an output module to be changed without disconnecting the wiring.

- max. cable cross section : 1.5 mm²
- max. terminal current : 6 A

The output modules require a 0 V connection and one additional external 24 V power supply.

Specifications

Order no.	1070											
	047 964	050 560	048 483	075 333	048 485	075 337	041 348	044 305	050 634	048 862	044 834	075 340
Designation	A 24/0.2-	A 24/0.5-e	A 24/0.5-	A 24/0.5- SF	A 24/2-	A 24/2- SF	A 24/2-	A 24/2-	A 24/2-e	A 230/2 \tilde{V}	AR/2A	AR/2A SF
Outputs	32		16				8	16, 2-pin	16	8	16	
Nominal voltage	24 V-, acc. to DIN 19 240									230/115 V \tilde{V}	Aux. voltage 24 V-	
Output current	0.2 A	0.5 A			2 A							
max. leakage current at "0"	0.2 mA	0.5 mA			2 mA				0.5 mA			
Switch-on delay	40 μ s									max. full-wave	5 ms	
Switch-off delay	450 μ s	350 μ s	300 μ s					350 μ s	max. half-wave	8 ms		
Overload protection/fuse	electr./therm.	electr.	FF 0.63 A		FF 2.5 A			electr.	M 2.5 A	FF 2.5 A		
Short-circuit current	220-500 mA	550-760 mA							2-3.7 A			
Lamp load, at 8 Hz	5 W	2 W	10 W		25 W			5 W	230 V: 500 W 115 V: 250 W	5 W		
max. protection magnitude	00		2		8				230 V : 12 115 V : 10	8		
Simultaneity	100%	see page 2-11	100%		50%		100%	50%			100%	
Fan unit required	yes		yes									
Limiting of the inductive transient voltage	-0.6 V	-15 V										-300 V
24 V reverse polarity protection	no	T 2A	conditional					T 2 A		no		
max. switching frequency										ohm. 20 Hz ind. 10 Hz cap. 1 Hz	30 Hz	
max. relay voltage											220 V \tilde{V}	
max. relay switching capacity											140 W, 500 VA	
Contact resistance											30 m Ω	
Contact bounce											1 ms	
Power input 12 V int.	2 mA per output set											
Width	1 division											

Fig. 2-1 Output modules, specifications

Slots



CAUTION

2.3

Danger to the module!

Do not insert or remove the module when the control is switched on! This can destroy the module. Switch off or remove the power supply module of the control, external power supply and signal voltage before inserting or removing the module!

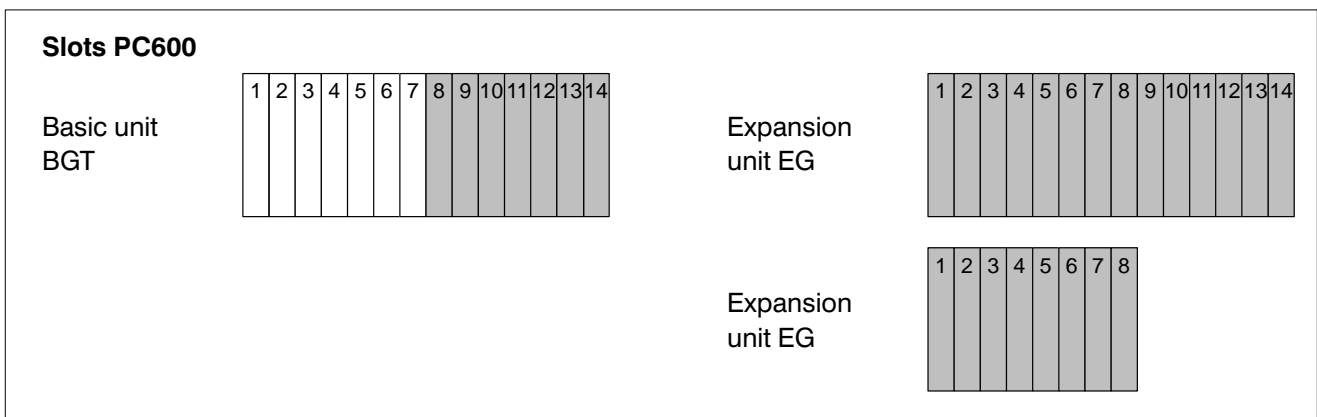


Fig. 2–2 Output modules, slots PC600

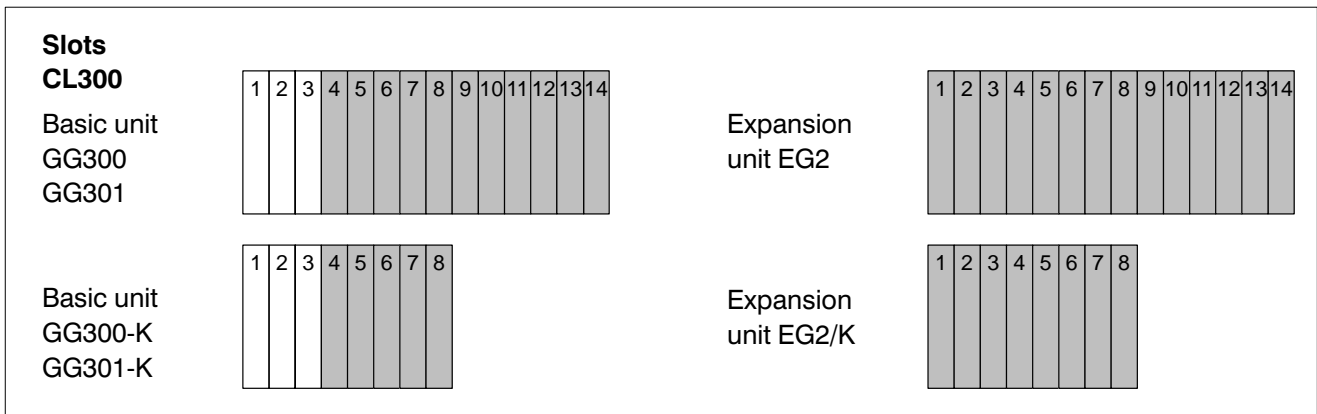


Fig. 2–3 Output modules, slots CL300

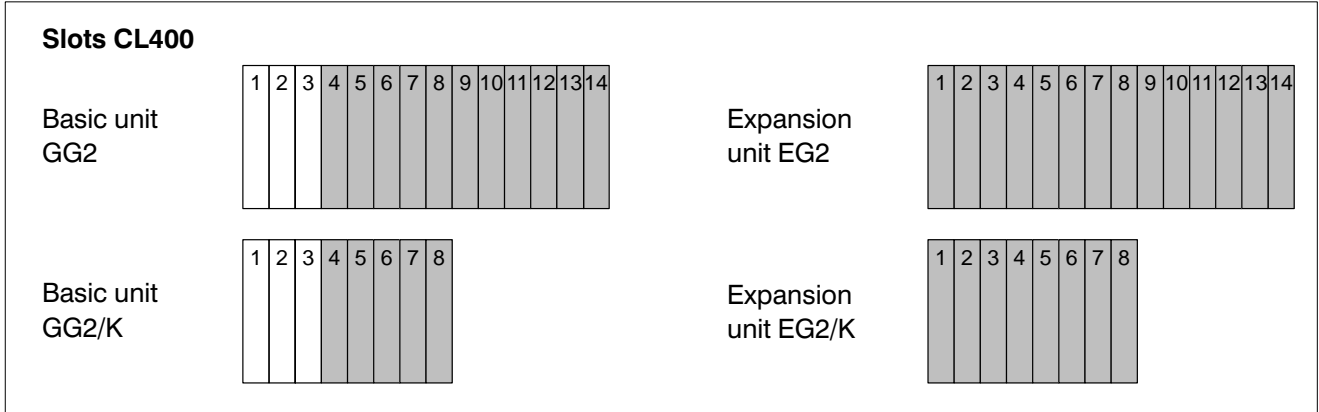


Fig. 2-4 Output modules, slots CL400

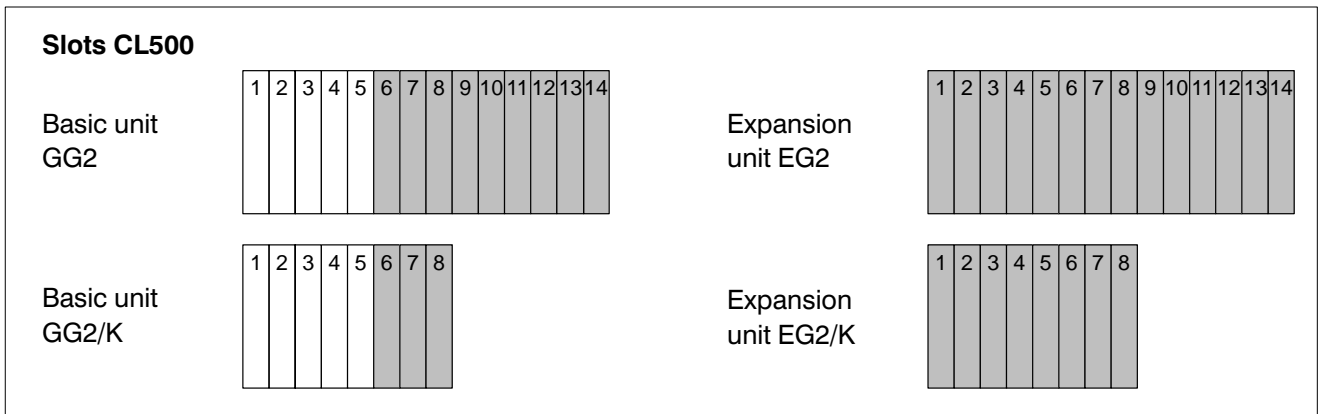


Fig. 2-5 Output modules, slots CL500

Addressing

Every output module must have a start address set on the module. The start address is set with a dip switch.



CAUTION

2.4

Danger to the module!

Do not insert or remove the module when the control is switched on! This can destroy the module. Switch off or remove the power supply module of the control, external power supply and signal voltage before inserting or removing the module!



CAUTION

2.5

Danger to the module!

All ESD protection measures must be observed when using the module! Avoid electrostatic discharges!

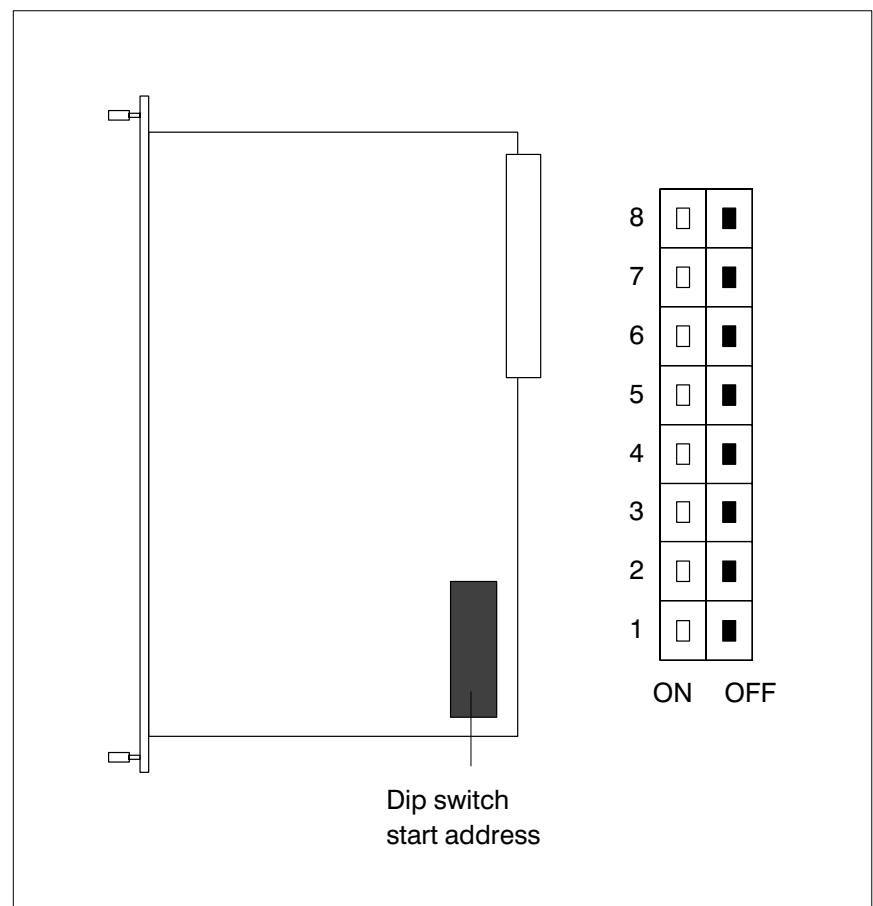


Fig. 2-6 Dip switch start address

Switch	1	2	3	4	5	6	7	8
Bit value	2 ⁰	2 ¹	2 ²	2 ³	2 ⁴	2 ⁵	2 ⁶	2 ⁷
Value	1	2	4	8	16	32	64	128

Fig. 2–7 Dip switch, value

The output modules occupy the following address ranges:

- Output module with 32 outputs occupies 4 bytes
- Output module with 16 outputs occupies 2 bytes
- Output module with 8 outputs occupies 1 byte

To avoid gaps and double assignments, the start addresses should always be allocated as follows:

- Output module with 32 outputs: 0, 4, 8, ...
- Output module with 16 outputs: 0, 2, 4, ...
- Output module with 8 outputs: 0, 1, 2, ...

The following table shows a sample assignment.

Module	Start address	Dip switch setting								Bytes occupied
		1	2	3	4	5	6	7	8	
32 outputs	0	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	0.0 to 3.7
16 outputs	4	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	4.0 to 5.7
16 outputs	6	OFF	ON	ON	OFF	OFF	OFF	OFF	OFF	6.0 to 7.7
32 inputs	8	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF	8.0 to 11.7
8 outputs	12	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF	12.0 to 12.7
8 outputs	13	ON	OFF	ON	ON	OFF	OFF	OFF	OFF	13.0 to 13.7

Fig. 2–8 Addressing, output modules example

2.1 Output module A 24/0.2–, order no. 1070 047 964

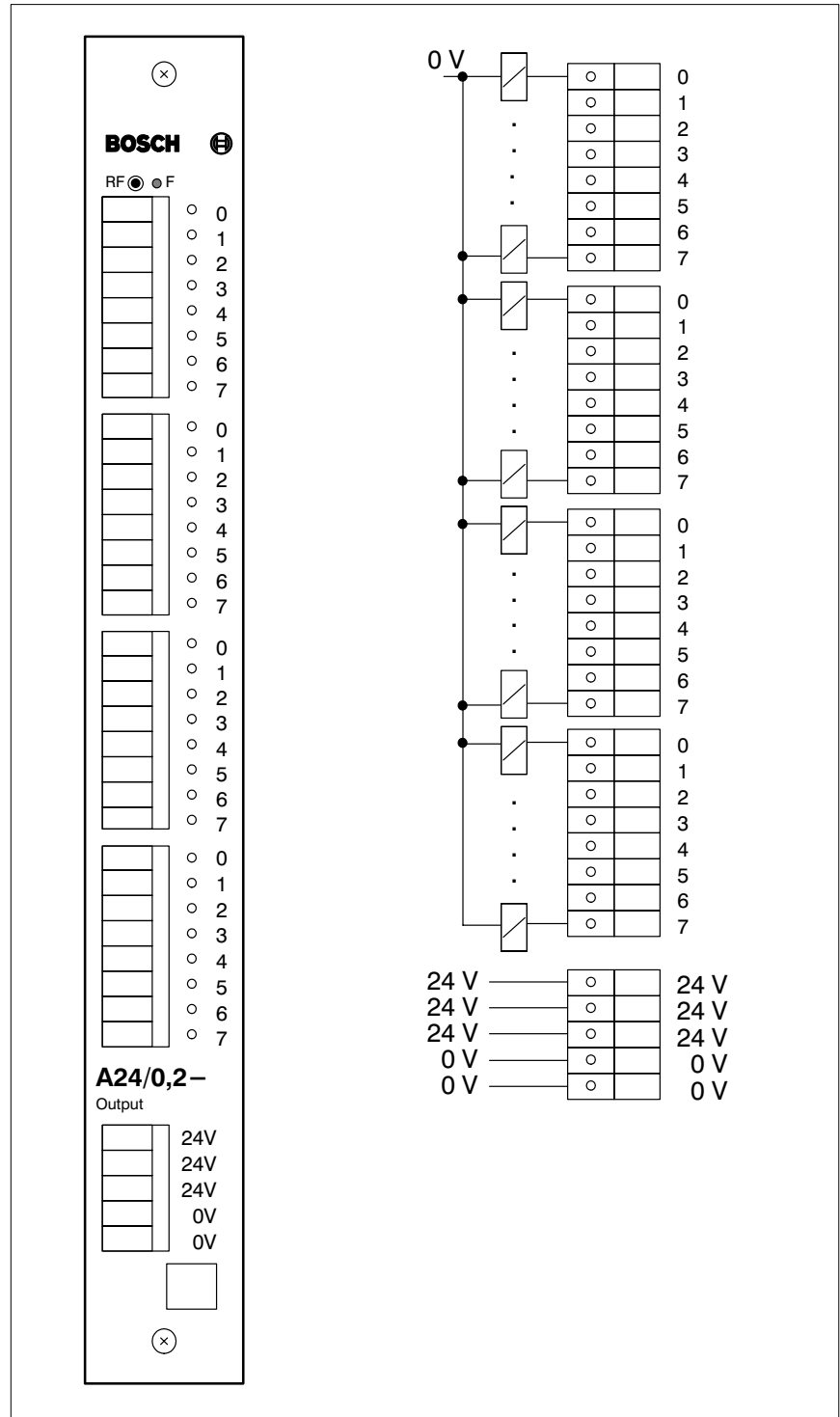


Fig. 2–9 Output module 1070 047 964, terminal assignment



CAUTION

2.6

Danger to the module!

Do not insert or remove the module when the control is switched on! This can destroy the module. Switch off or remove the power supply module of the control, external power supply and signal voltage before inserting or removing the module!



CAUTION

2.7

Danger to the module!

All ESD protection measures must be observed when using the module! Avoid electrostatic discharges!

An electronic fuse makes the outputs short circuit-proof. A short-circuit is indicated on the front panel by the LED **F**. The short-circuit message can be reset with the **RF** key.

Output circuit

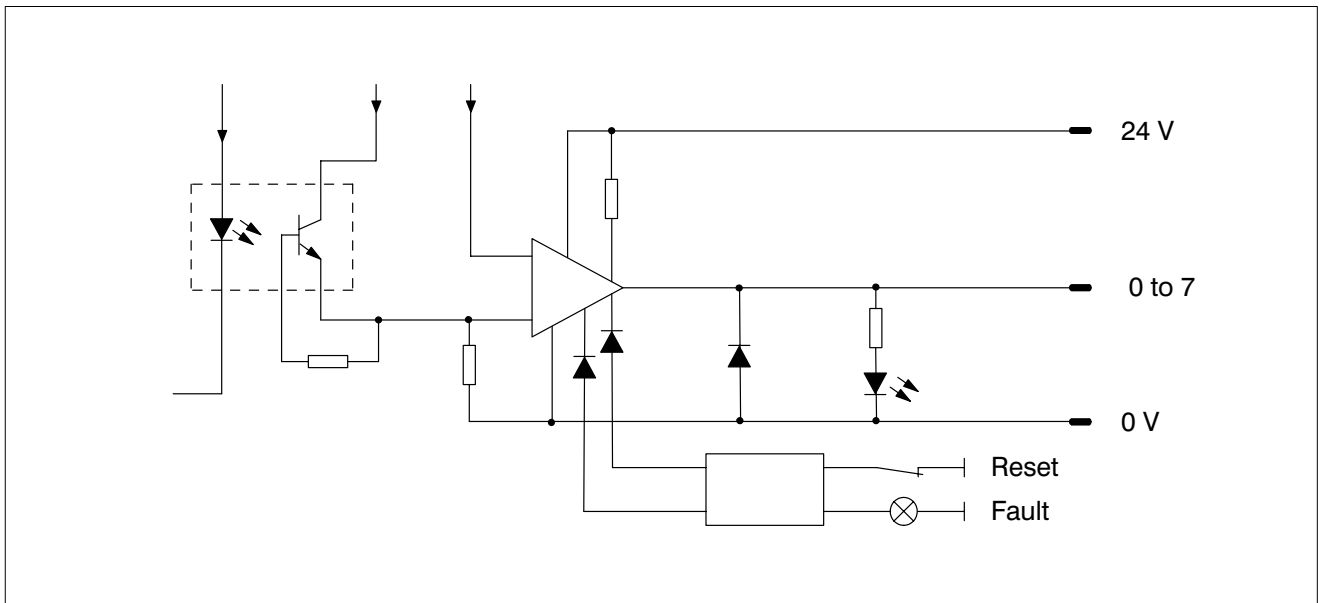


Fig. 2-10 Output module 1070 047 964, output circuit

2.2 Output module A 24/0.5–e, order no. 1070 050 560

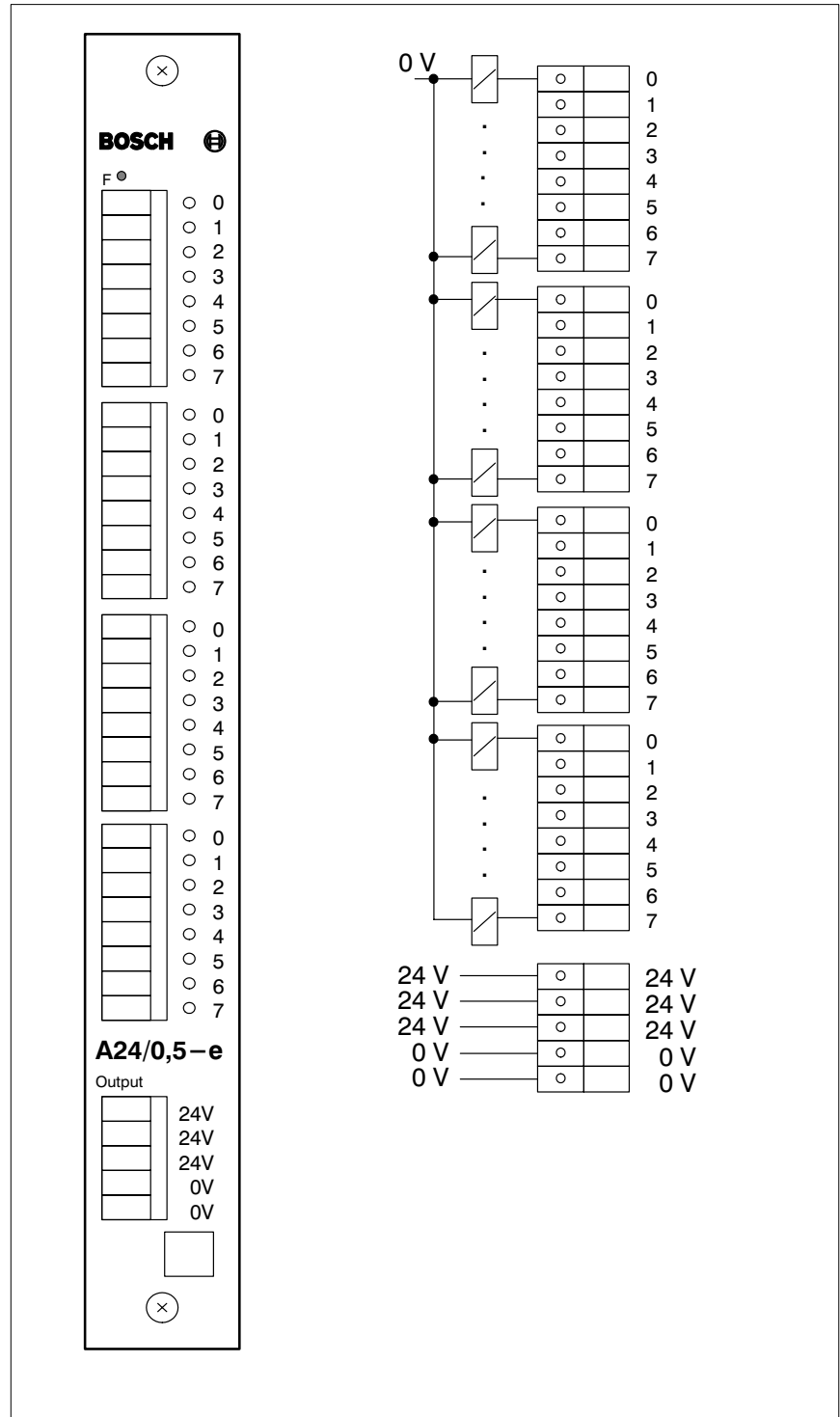


Fig. 2–11 Output module 1070 050 560, terminal assignment



CAUTION

2.8

Danger to the module!

Do not insert or remove the module when the control is switched on! This can destroy the module. Switch off or remove the power supply module of the control, external power supply and signal voltage before inserting or removing the module!



CAUTION

2.9

Danger to the module!

All ESD protection measures must be observed when using the module! Avoid electrostatic discharges!

A 2 A fused cut-out is built onto the output module for protection against polarity reversal.

This output module is short circuit-proof acc. to DIN VDE 0160.

When a short-circuit or overloading occurs, the affected output is switched off and the LED **F** on the front panel lights up. After 2 ms the output is switched back in. If the short-circuit or overloading are still present, the system is switched off again after 40 μ s. This process is repeated after 2 ms.

The simultaneous control of outputs is dependent on the ambient temperature and the use of a fan unit.

Ambient temperature	Simultaneity		
	without fan unit	Fan unit in lowest sub-rack	Fan unit in subrack
20 °C	80%	100%	100%
55 °C	50%	70%	100%

Fig. 2–12 Output module 1070 050 560, simultaneity/fan unit

Output circuit

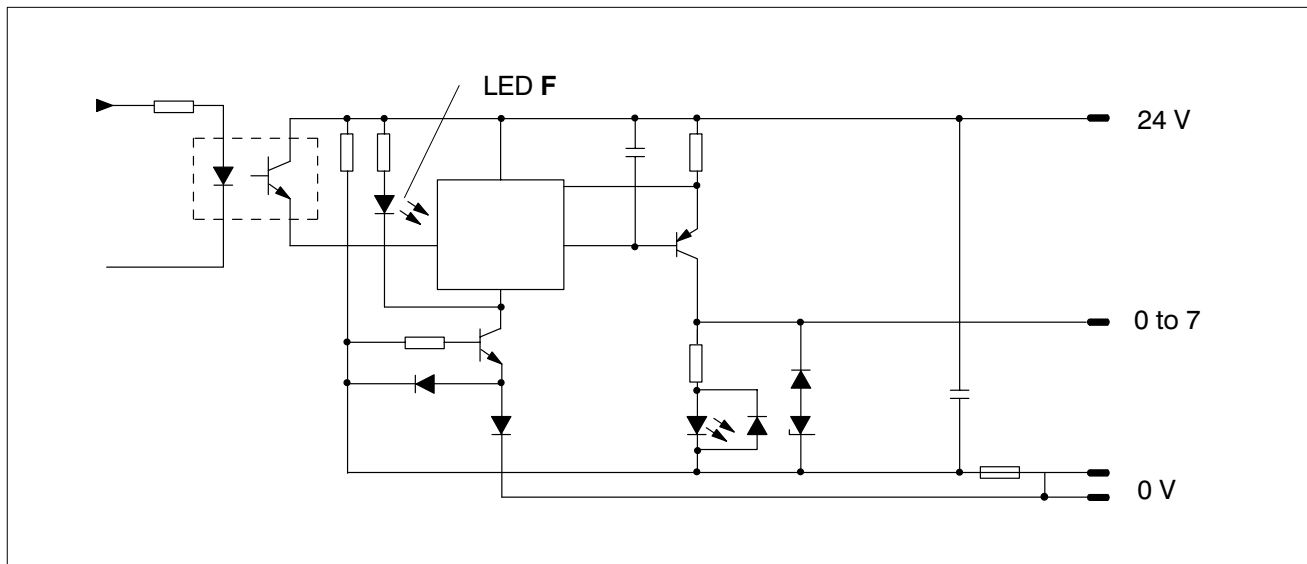


Fig. 2-13 Output module 1070 050 560, output circuit

2.3 Output module A 24/0.5–, order no. 1070 048 483
Output module A 24/0.5– SF, order no. 1070 075 333

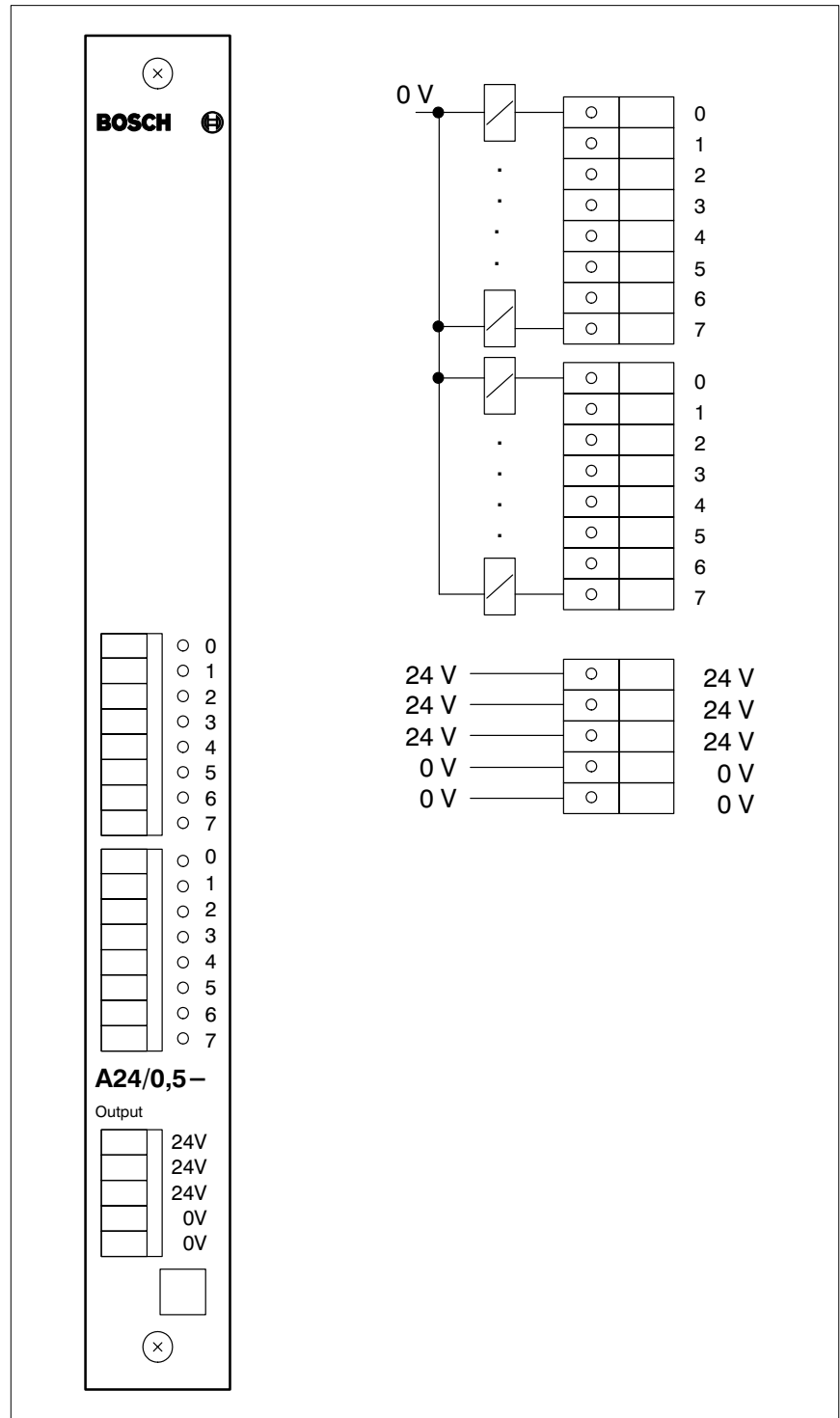


Fig. 2–14 Output module 1070 048 483 and 1070 075 333, terminal assignment



CAUTION

2.10

Danger to the module!

Do not insert or remove the module when the control is switched on! This can destroy the module. Switch off or remove the power supply module of the control, external power supply and signal voltage before inserting or removing the module!



CAUTION

2.11

Danger to the module!

All ESD protection measures must be observed when using the module! Avoid electrostatic discharges!

Output circuit

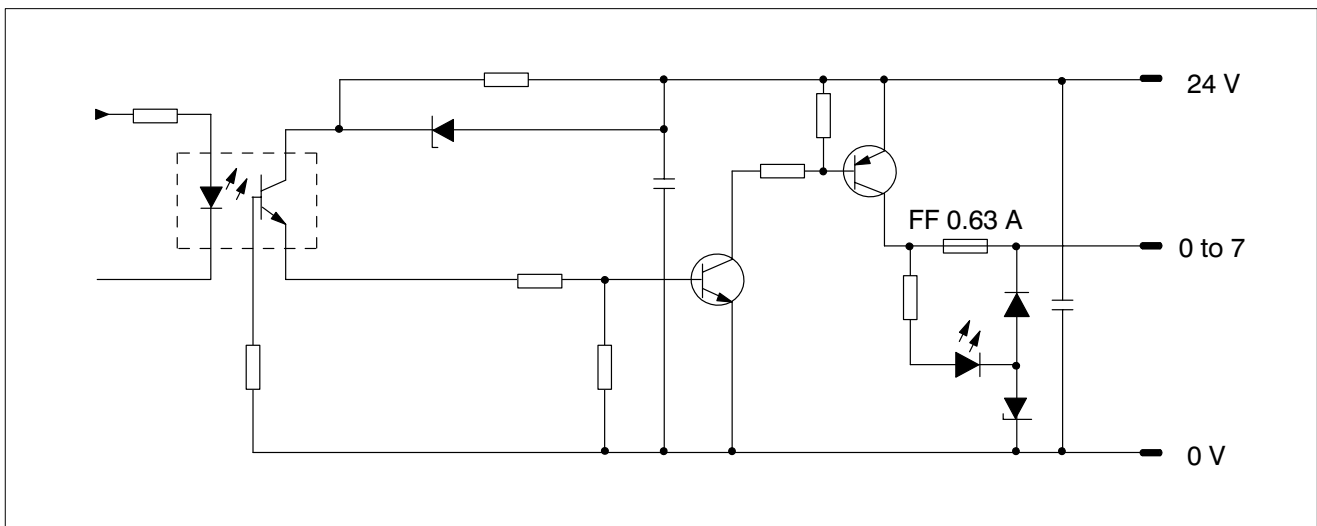


Fig. 2-15 Output module 1070 048 483 and 1070 075 333, output circuit

2.4 Output module A 24/2–, order no. 1070 048 485
Output module A 24/2– SF, order no. 1070 075 337

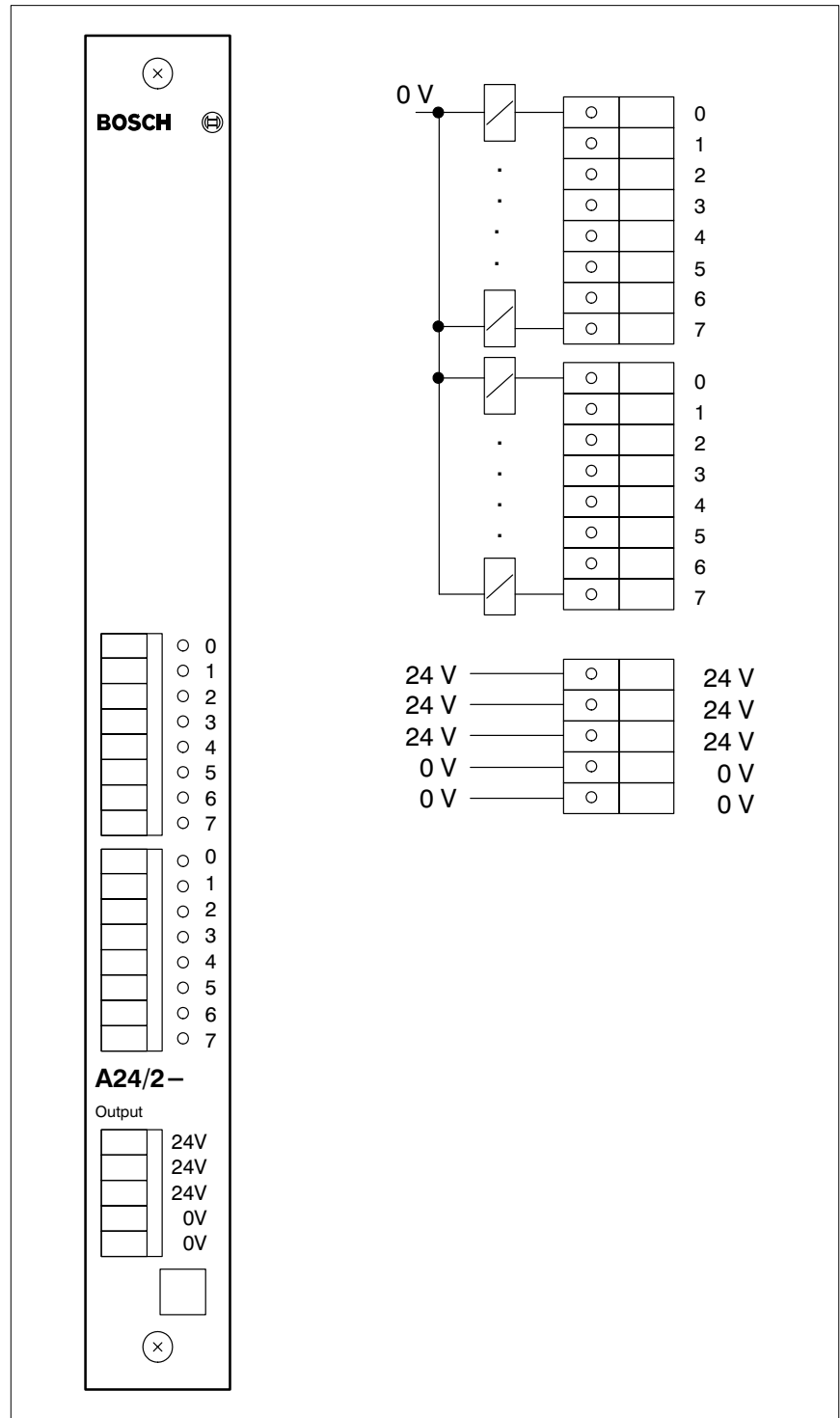


Fig. 2–16 Output module 1070 048 485 and 1070 075 337, terminal assignment



CAUTION

2.12

Danger to the module!

Do not insert or remove the module when the control is switched on! This can destroy the module. Switch off or remove the power supply module of the control, external power supply and signal voltage before inserting or removing the module!



CAUTION

2.13

Danger to the module!

All ESD protection measures must be observed when using the module! Avoid electrostatic discharges!

Output circuit

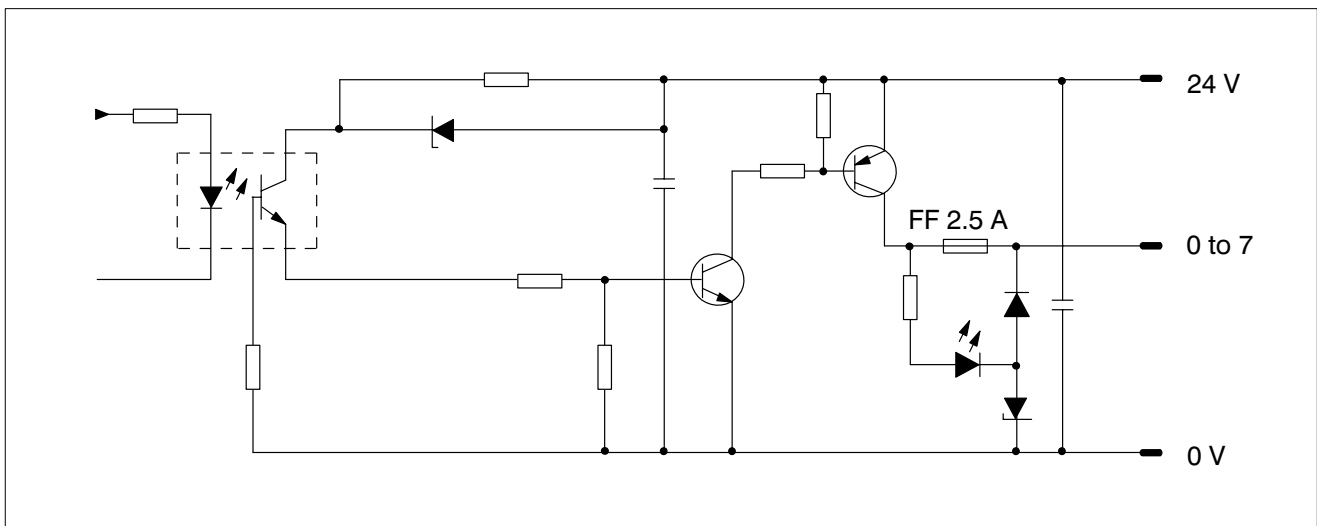


Fig. 2-17 Output module 1070 048 485 and 1070 075 337, output circuit

2.5 Output module A 24/2–, order no. 1070 041 348

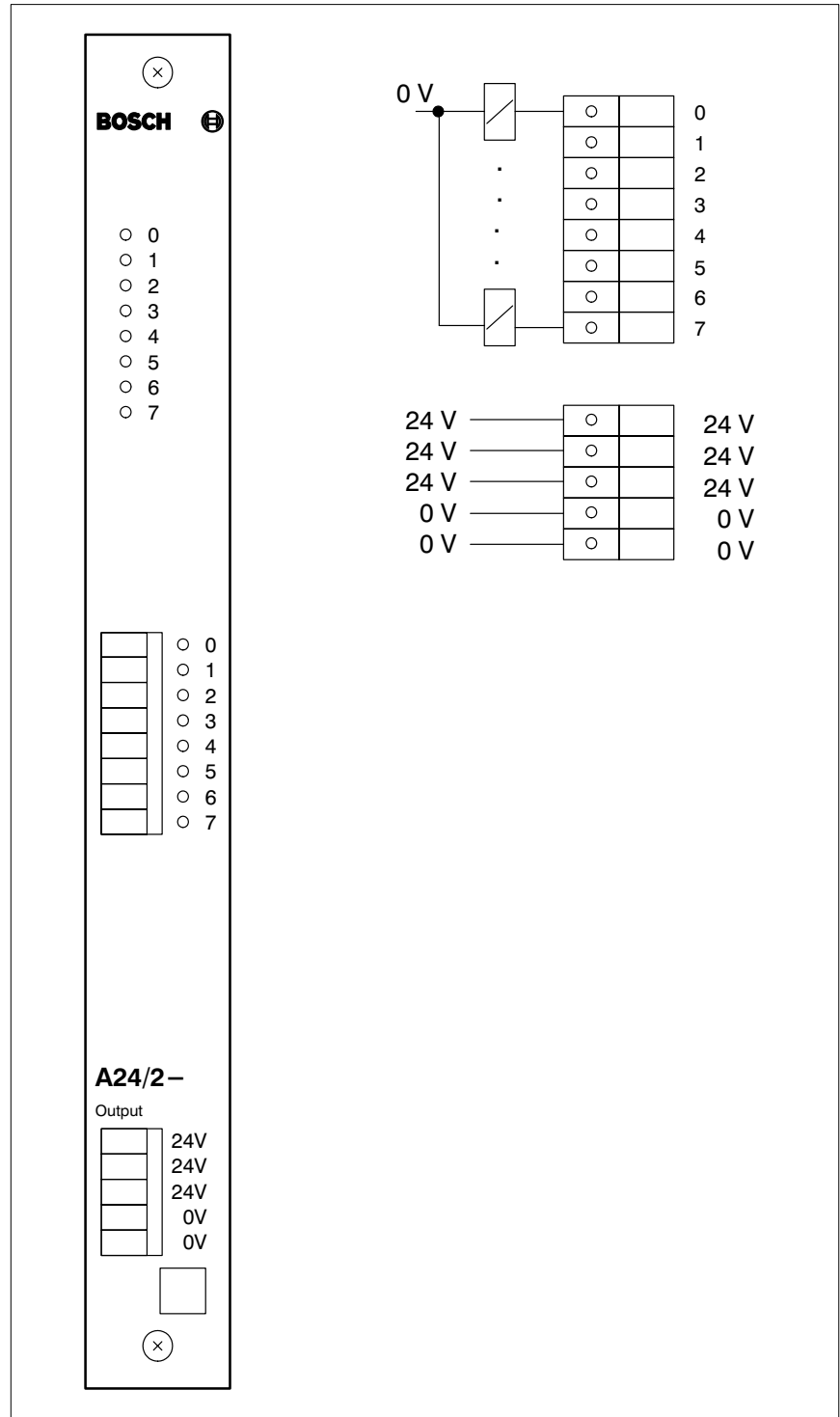


Fig. 2–18 Output module 1070 041 348, terminal assignment



CAUTION

2.14

Danger to the module!

Do not insert or remove the module when the control is switched on! This can destroy the module. Switch off or remove the power supply module of the control, external power supply and signal voltage before inserting or removing the module!



CAUTION

2.15

Danger to the module!

All ESD protection measures must be observed when using the module! Avoid electrostatic discharges!

Output circuit

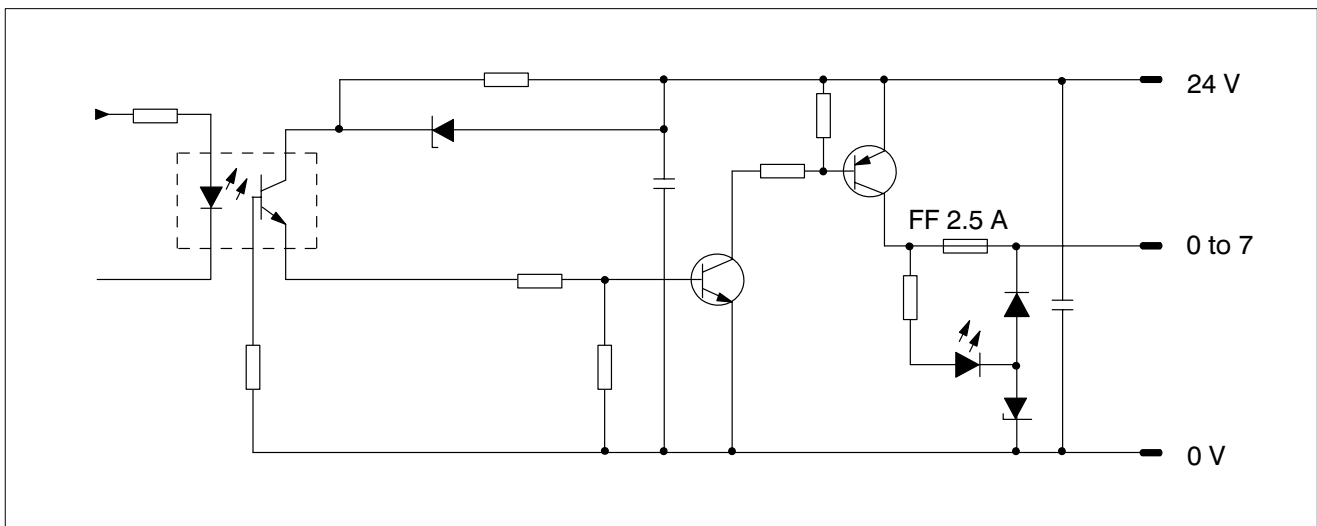


Fig. 2-19 Output module 1070 041 348, output circuit

2.6 Output module A 24/2–, order no. 1070 044 305

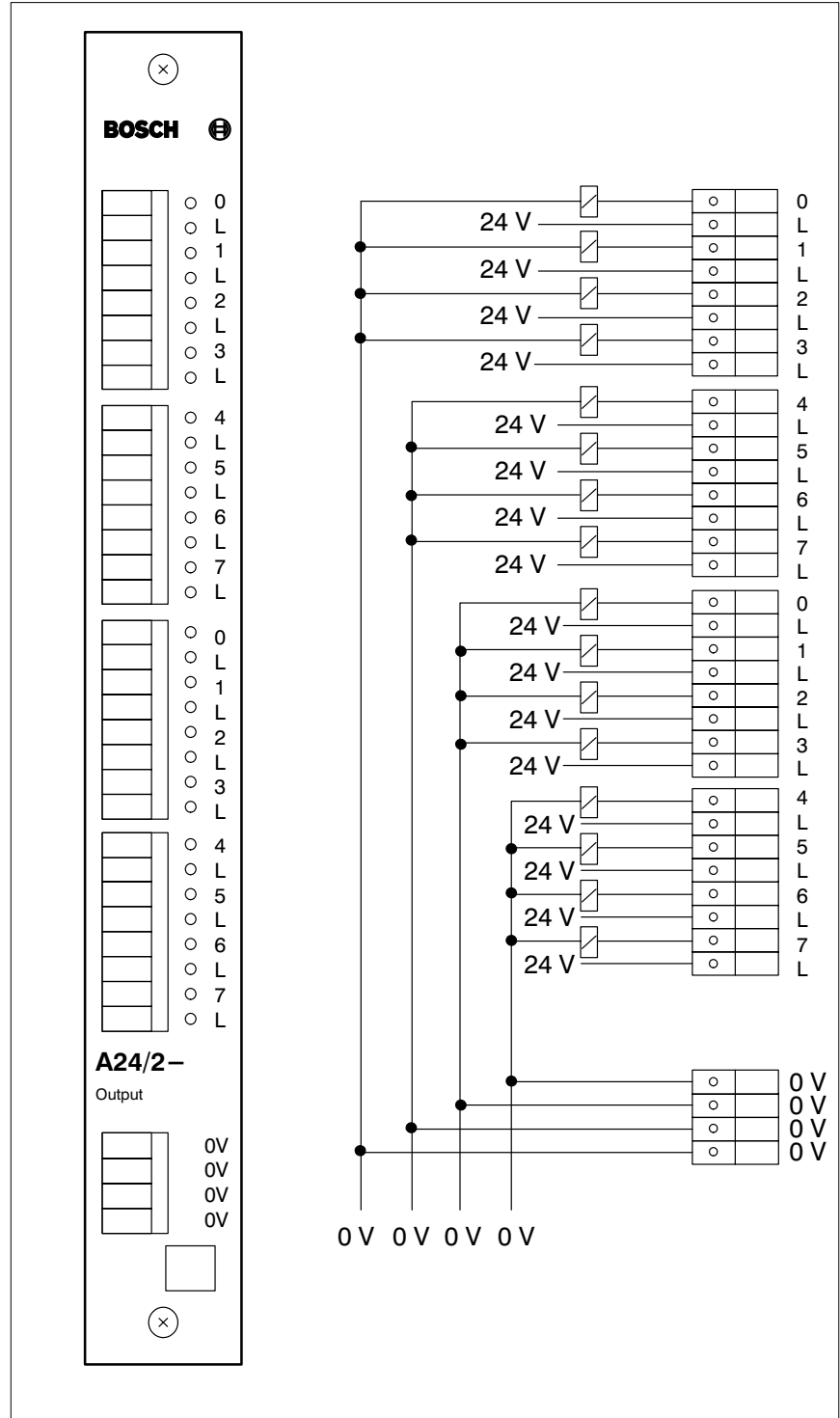


Fig. 2–20 Output module 1070 044 305, terminal assignment



CAUTION

2.16

Danger to the module!

Do not insert or remove the module when the control is switched on! This can destroy the module. Switch off or remove the power supply module of the control, external power supply and signal voltage before inserting or removing the module!



CAUTION

2.17

Danger to the module!

All ESD protection measures must be observed when using the module! Avoid electrostatic discharges!

This output module has 16 2-pin outputs. A common 0 V reference potential is available for every 4 outputs.

The status signal of the output is indicated with the green LED.

The red LED indicates failure of the fuse. The red LED can only signal a failure of the fuse when the output is set.

Output circuit

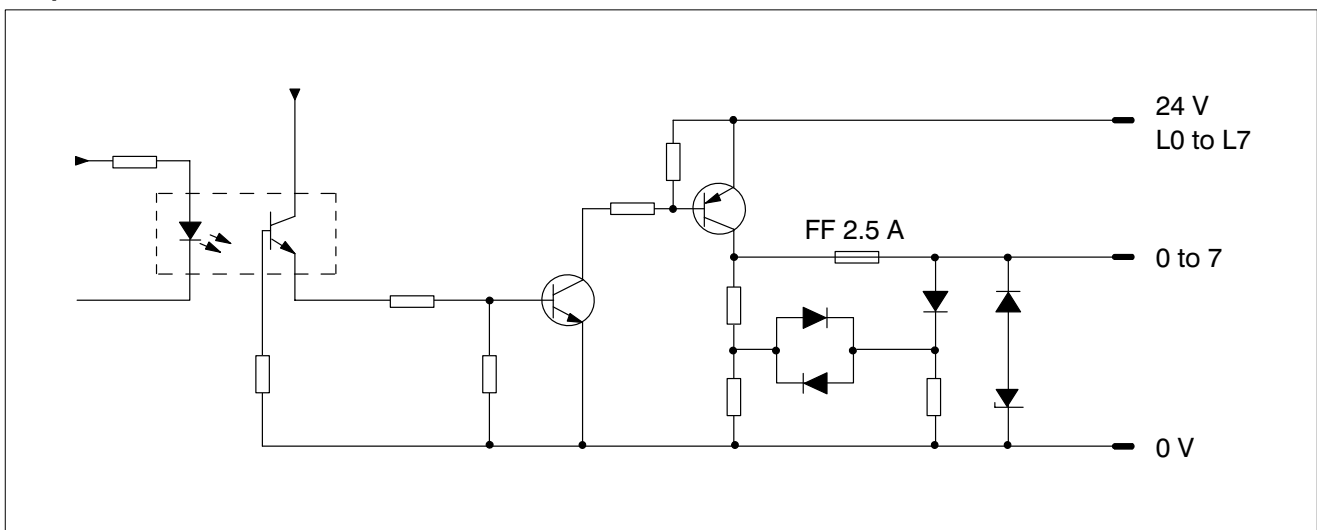


Fig. 2-21 Output module 1070 044 305, output circuit

2.7 Output module A 24/2–e, order no. 1070 050 634

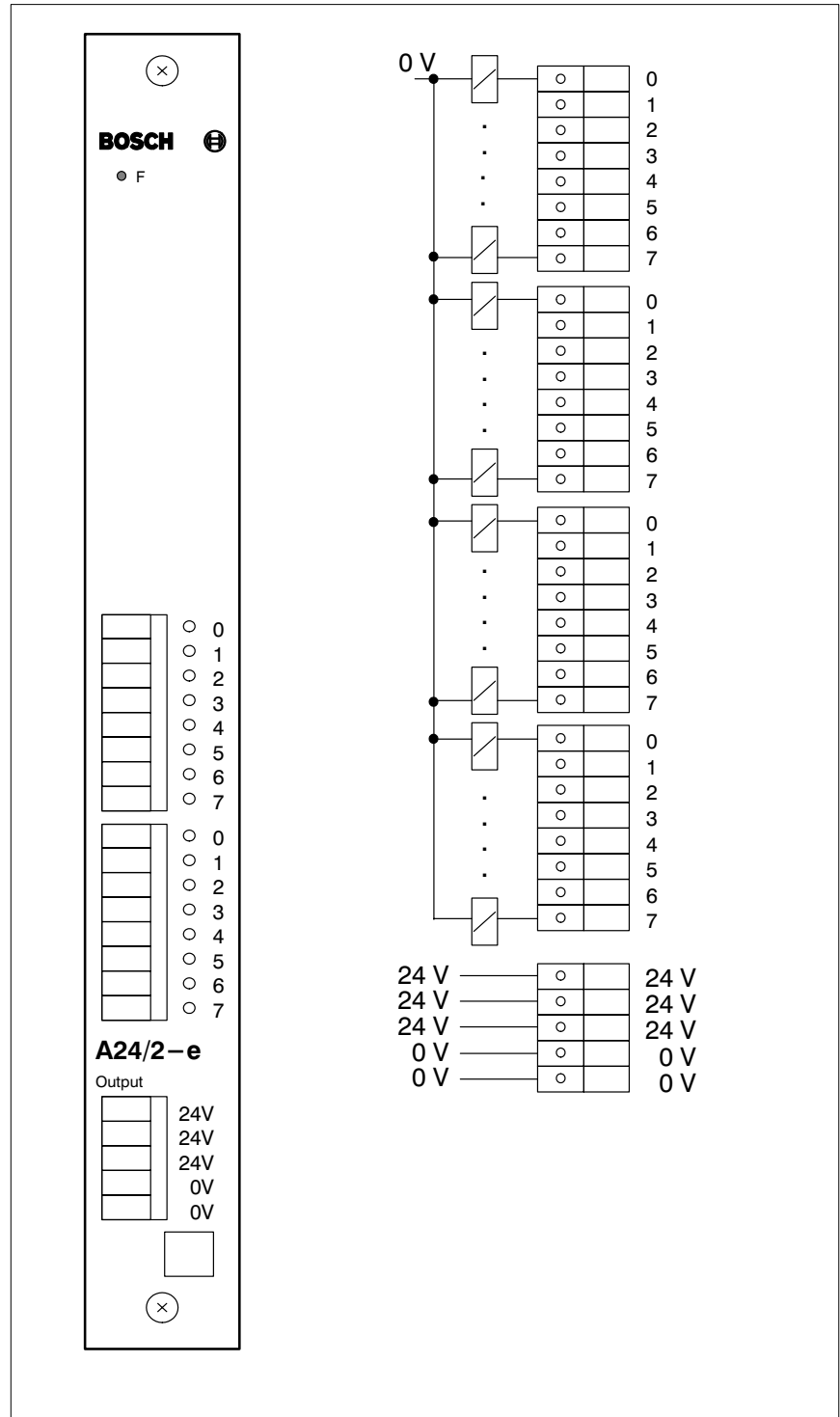


Fig. 2–22 Output module 1070 050 634, terminal assignment



CAUTION

2.18

Danger to the module!

Do not insert or remove the module when the control is switched on! This can destroy the module. Switch off or remove the power supply module of the control, external power supply and signal voltage before inserting or removing the module!



CAUTION

2.19

Danger to the module!

All ESD protection measures must be observed when using the module! Avoid electrostatic discharges!

One T 2 A fused cut-out for every 4 outputs is built onto the output module for protection against polarity reversal.

This output module is short circuit-proof acc. to DIN VDE 0160.

When an overloading or a short-circuit occurs, the affected output is switched off and the LED F on the front panel lights up. After 2 ms the output is switched back in. If the short-circuit or overloading are still present, the system is switched off again after 40 μ s. This process is repeated after 2 ms.

Output circuit

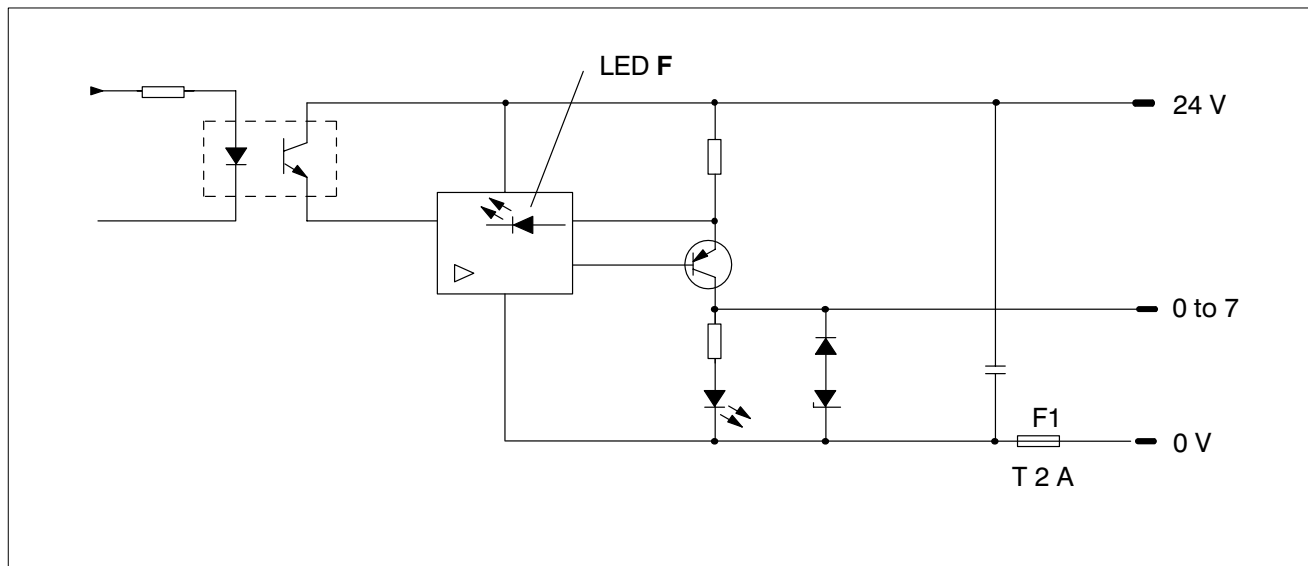


Fig. 2-23 Output module 1070 050 634, output circuit

2.8 Output module A 230/2~ order no. 1070 048 862

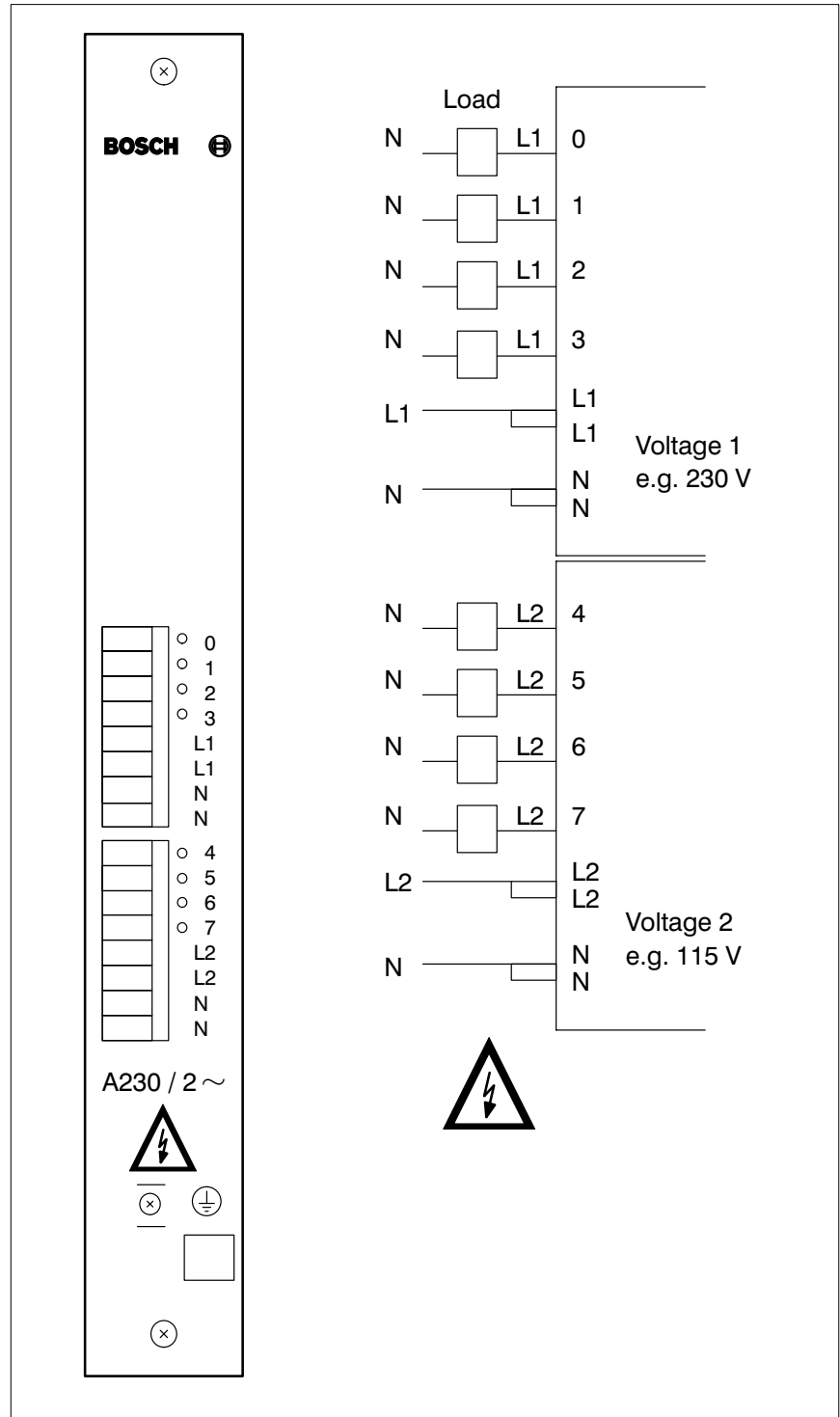


Fig. 2-24 Output module 1070 048 862, terminal assignment

The output module can be driven with 230 V or 115 V. The output module has two isolated circles, each with 4 outputs. The circuits may have a potential difference of no more than 500 V_~.

The voltage for each circuit can be set with a switch.

- ★ Switch off power supply module of the control and external power supply.



DANGER

2.20

Lethal voltage!

A lethal voltage exists at the terminals of the module!

Cut off the power supply before working on the module!



CAUTION

2.21

Danger to the module!

Do not insert or remove the module when the control is switched on! This can destroy the module. Switch off or remove the power supply module of the control, external power supply and signal voltage before inserting or removing the module!

- ★ Remove plug-in terminals.



CAUTION

2.22

Danger to the module!

All ESD protection measures must be observed when using the module! Avoid electrostatic discharges!

- ★ Unscrew knurled screws and pull out output module from the subrack.
- ★ Remove insulation covering of the module on the component side, climbing cover.

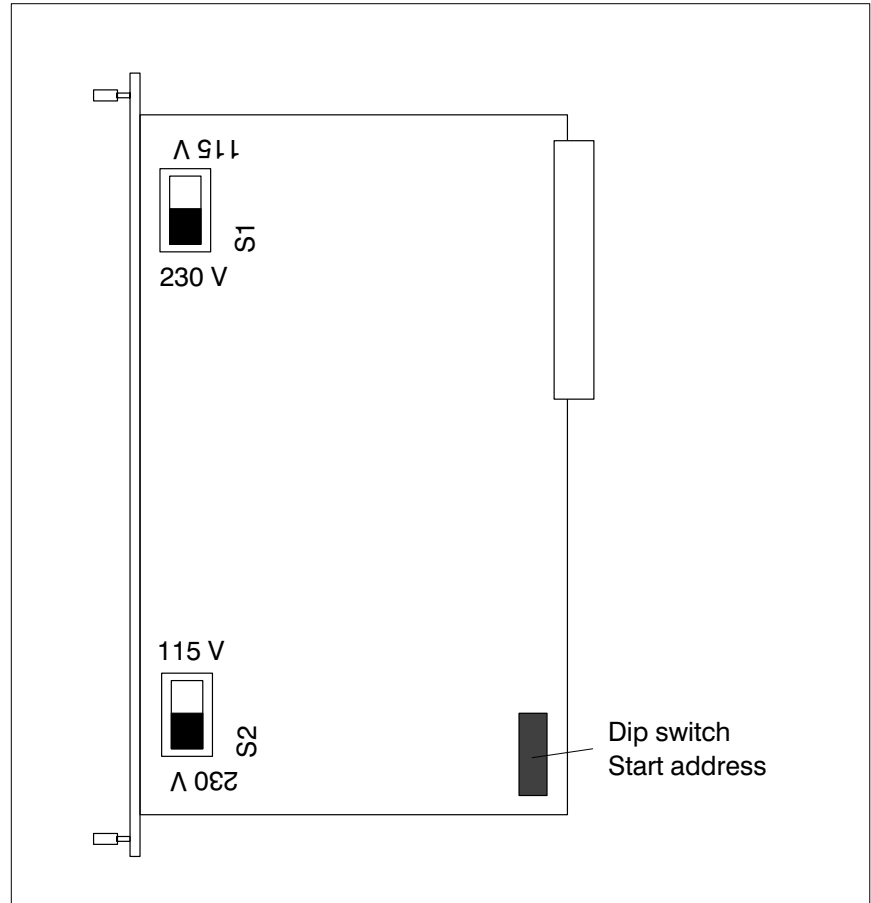


Fig. 2-25 Output module 1070 048 862

- ★ Set switch S1 and S2 to 230 V and 115 V.
 - S1 : Output 0 to 3
 - S2 : Output 4 to 7
- ★ Set start address of the output with dip switch; see page 2-6.
- ★ Reattach insulation cover.

Output circuit

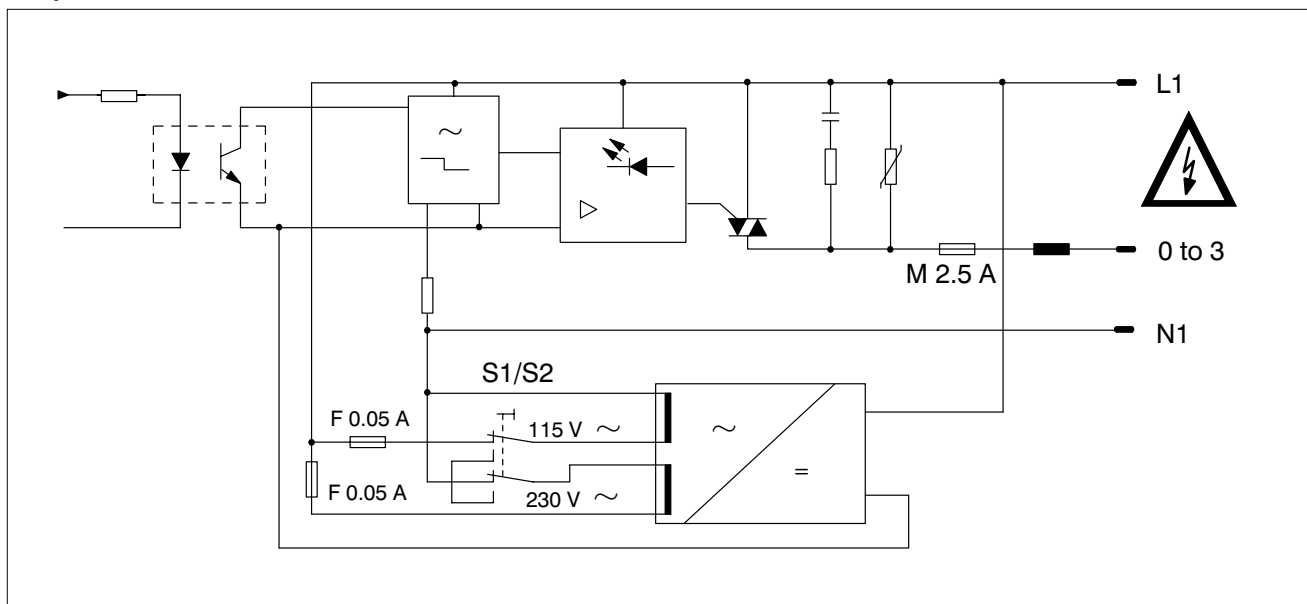


Fig. 2-26 Output module 1070 048 862, output circuit

2.9 Output module AR/2A, order no. 1070 044 834
Output module AR/2A SF, order no. 1070 075 340

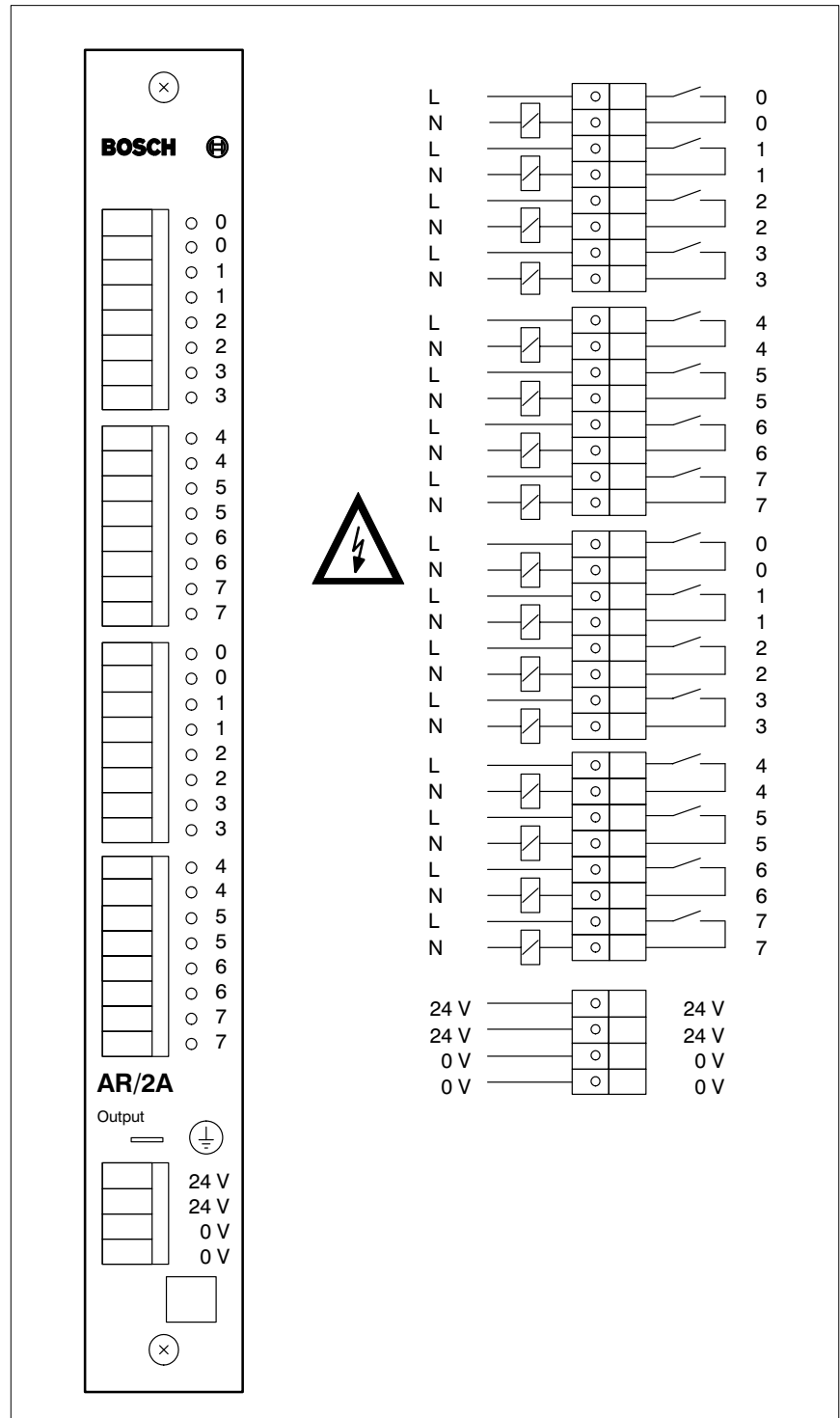


Fig. 2-27 Output module 1070 044 834 and 1070 075 340, terminal assignment



DANGER

2.23

Lethal voltage!

A lethal voltage may exist at the terminals of the module!

Switch off the power to the terminals before working on the module!



CAUTION

2.24

Danger to the module!

Do not insert or remove the module when the control is switched on!

This can destroy the module. Switch off or remove the power supply

module of the control, external power supply and signal voltage before inserting or removing the module!



CAUTION

2.25

Danger to the module!

All ESD protection measures must be observed when using the module! Avoid electrostatic discharges!



Fan unit required in the subrack.

Output circuit

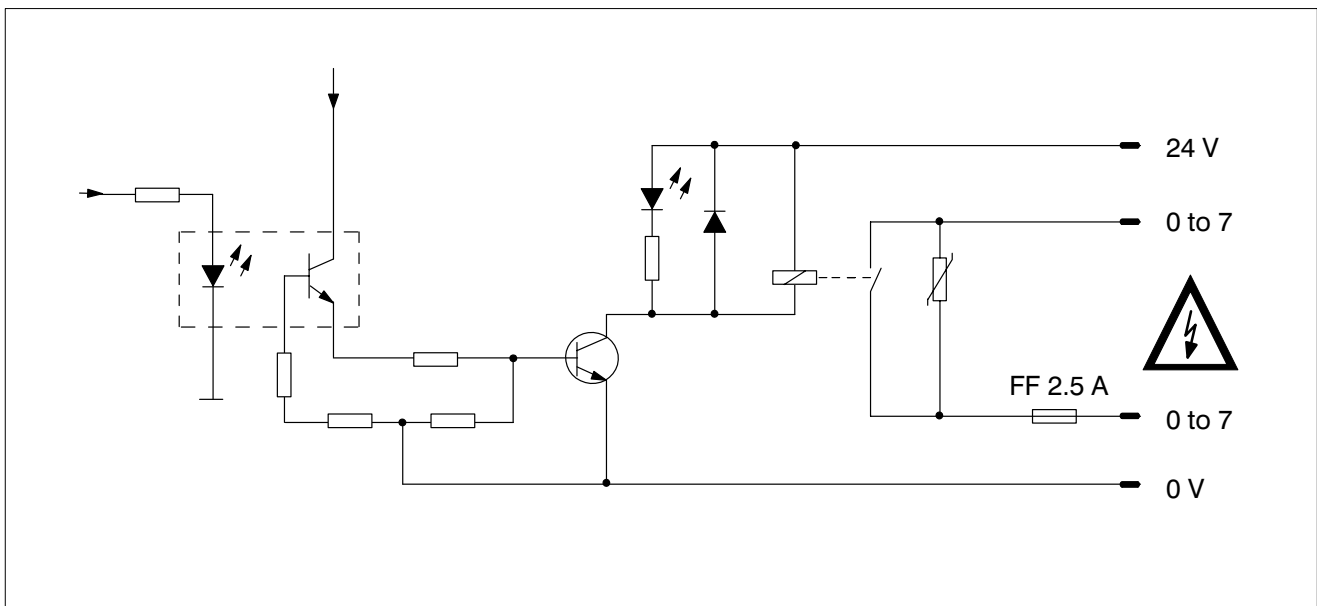


Fig. 2-28 Output module 1070 044 834 and 1070 075 340, output circuit



A Appendix

A.1 Abbreviations

EEM	Electrostatically endangered module
EI	Extended input
ESD	Electrostatic discharge Abbreviation for all designations which concern electrostatic discharges, e.g. ESD protection, ESD danger
I	Input
O	Output
PE	Protective Earth

A.2 Index

Symbols

★, VII

Numbers

0-V-reference potential, 2-20

2-pin, 1-3, 1-20, 2-20

A

address range, 1-7, 1-15, 2-7

Addressing, 1-6, 1-15, 2-6

Ambient temperature, 2-11

B

Basic unit

– BGT, 1-4, 2-4

– GG2, 1-5, 2-5

– GG2/K, 1-5, 2-5

– GG300, 1-4, 2-4

– GG300 -K, 2-4

– GG301, 1-4, 2-4

– GG301-K, 1-4, 2-4

C

Cable cross section, 1-2, 2-2

Capacitive coupling, 1-1, 2-2

CL300, 1-4, 2-4

CL400, 1-5, 2-5

CL500, 1-5, 2-5

Configuration, 1-1, 2-1

Connection, 1-2, 2-2

Contact bounce, 2-3

Contact resistance, 2-3

E

Earthing strap, VIII

Expansion unit

– EG, 2-4

– EG2, 1-4, 1-5, 2-4, 2-5

– EG2/K, 1-4, 1-5, 2-4, 2-5

EEM, VIII, A-1

Electrostatically endangered subassemblies, VIII

ESD, A-1

Extended input, 1-13

F

Fan unit, 1-3, 2-3

Frequency range, 1-3

I

Input, 1-3

– X221.7, 1-13

Input circuit, 1-9, 1-11, 1-15, 1-17, 1-19, 1-21

Input current, 1-3

Input delay, 1-3, 1-14

Input subassembly

– E 115 V?, 1-10

– E 115 V–, 1-3

– E 220 V?, 1-8

– E 220 V–, 1-3

– E 24 V–, 1-3, 1-12, 1-16, 1-18

– E 24 V– 2-pin, 1-20

– E 24 V– SF, 1-1, 1-16, 1-18

– E 24 V– SF, 1-3

Input voltage, 1-3

Interference immunity, 1-1

L

Lamp load, 2-3

Leakage current, 2-3

LED F, 2-22

Light diode, 1-1, 2-1

N

Nominal voltage, 2-3

Norm, 1-1, 2-1

O

Order- no.

– 1070 041 348, 2-3, 2-17

– 1070 044 305, 2-3, 2-19

– 1070 044 312, 1-3, 1-20

– 1070 044 834, 2-3, 2-27

– 1070 046 267, 1-3

– 1070 046 427, 1-3

– 1070 047 961, 1-3, 1-16

– 1070 047 963, 1-3, 1-18

– 1070 047 964, 2-3, 2-8

– 1070 048 483, 2-3, 2-13

– 1070 048 485, 2-3, 2-15

– 1070 048 862, 2-3, 2-23

– 1070 050 560, 2-3, 2-10

– 1070 050 634, 2-3, 2-21

– 1070 071 252, 1-3, 1-12

– 1070 075 324, 1-3, 1-16

– 1070 075 330, 1-3, 1-18

– 1070 075 333, 2-1, 2-3, 2-13

– 1070 075 337, 2-1, 2-3, 2-15

– 1070 075 340, 2-1, 2-3, 2-27

Output, 2-3
Output circuit, 2-9, 2-12, 2-14, 2-16, 2-18,
2-20, 2-26, 2-28, 2-22

Output current, 2-3

Output module

- A 230/2~, 2-3, 2-23
- A 24/0.2-, 2-8
- A 24/0.2- , 2-3
- A 24/0.5-, 2-13
- A 24/0.5- , 2-3
- A 24/0.5- SF, 2-3, 2-13
- A 24/0.5-e, 2-3, 2-10
- A 24/2-, 2-3, 2-15, 2-17, 2-19
- A 24/2- SF, 2-3, 2-15
- A 24/2-e, 2-3, 2-21
- AR/2A, 2-3, 2-27
- AR/2A SF, 2-3
- AR/2A SF , 2-27
- A 24/2- SF, 2-1
- AR/2A SF, 2-1

Overload protection, 2-3

overloading, 2-22

P

PC600, 1-4, 2-4

PE, A-1

PLC, - personnel, V

Polarity reversal, 2-11, 2-22

Power input, 1-3, 2-3

Protection magnitude, 2-3

Q

Qualified personnel, V

R

Relay switching capacity, 2-3

Relay voltage, 2-3

Reverse polarity protection, 2-3

RF, 2-9

Rotary switch S2, 1-14

S

S, 1-13

Safety instructions, VII

short circuit-proof, 2-9, 2-11, 2-22

Short-circuit, 2-9, 2-22

Short-circuit current, 2-3

Simultaneity, 1-3, 2-3, 2-11

Slot, 1-4, 2-4

Specifications, 1-3, 2-3

Standard operation, V

Start address, 1-6

start address, 1-7, 1-13, 1-15, 2-6, 2-7

Switch, - S1, 2-24

Switch-off delay, 2-3

Switch-on delay, 2-3

Switching frequency, 2-3

Symbols used, VII

T

terminal current, 1-2, 2-2

transient voltage, 2-3

V

Voltage range, 1-3

W

Width, 1-3, 2-3

X

X10, 1-13

A.3 Safety instructions

A.3.1 Dansk

Sikkerhedshenvisningerne i denne brugsanvisning



Disse symboler anvendes i den foreliggende brugsanvisning i følgende tilfælde:



FORSIGTIG

Dette symbol benyttes, hvis der skal advares mod **farlig elektrisk spænding**. Hvis advarslen ikke følges nøjagtigt eller ignoreres kan det medføre **personskader**.



FORSIGTIG

Dette symbol benyttes, hvis en unøjagtig eller manglende overholdelse af anvisningerne kan medføre beskadigelser af **personer**.



VIGTIGT

Dette symbol benyttes, hvis en unøjagtig eller manglende overholdelse af anvisningerne kan medføre beskadigelser af **apparater eller filer**.



Dette symbol benyttes for at gøre Dem opmærksom på noget særligt.



FORSIGTIG

0.1

Risiko for personer og ting!

Prøv hvert nyt program, inden De tager et anlæg i drift!



VIGTIGT

0.2/1.1/1.3/1.4/1.7/1.10/1.12/1.14/1.16/1.18/2.1/2.3/2.4/2.6/2.8/2.10/2.12/2.14/2.16/2.18/2.21/2.24

Risiko for modulet!

Modulet må ikke sættes i eller trækkes ud af stikket, når der er tændt for styringen! Modulet kan blive ødelagt. Der skal først slukkes for styringens netdelmodul, den eksterne spændingsforsyning og signalspændingen eller disse skal trækkes ud af stikket, inden modulet må sættes i eller trækkes ud af stikket!



VIGTIGT

0.3/1.2/1.5/1.8/1.11/1.13/1.15/1.17/1.19/2.2/2.5/2.7/2.9/2.11/2.13/2.15/2.17/2.19/2.22/2.25

Risiko for modulet!

Ved omgang med modulet skal alle forholdsregler til ESD-beskyttelse iagttages!

Undgå elektrostatiske udladninger!



FORSIGTIG

1.6/1.9/2.20

Livsfarlig spænding!

Der er livsfarlig spænding på modulets klemmer!

Før arbejde på modulet frakobles modulerne spænding!



FORSIGTIG

2.23

Livsfarlig spænding!

Der kan være livsfarlig spænding på modulets klemmer!

Før arbejde på modulet frakobles modulerne spænding!

**Sikkerhedshenvisninger på styrekomponenterne**

På styrekomponenterne selv kan der være anbragt følgende advarsler og henvisninger, som skal gøre Dem opmærksom på bestemte ting:



Advarsel mod farlig elektrisk spænding!



Advarsel mod farer fra batterier!



Elektrostatisk udsatte komponenter!



Træk netstikket ud, inden De åbner!



Bolt kun til tilslutning af jordledningen PE!



Kun til tilslutning af en afskærmningsledning!

A.3.2 Deutsch

Sicherheitshinweise in dieser Gebrauchsanweisung



Diese Symbole werden in dieser Gebrauchsanweisung unter den folgenden Bedingungen verwendet.



Dieses Symbol wird benutzt, wenn vor einer **gefährlichen elektrischen Spannung** gewarnt werden soll. Durch ungenaues Befolgen oder Nichtbefolgen dieser Anweisung kann es zu **Personenschäden** kommen.



Dieses Symbol wird benutzt, wenn es durch ungenaues Befolgen oder Nichtbefolgen von Anweisungen zu **Personenschäden** kommen kann.



Dieses Symbol wird benutzt, wenn es durch ungenaues Befolgen oder Nichtbefolgen von Anweisungen zu **Beschädigungen von Geräten oder Dateien** kommen kann.



Dieses Symbol wird benutzt, wenn Sie auf etwas Besonderes aufmerksam gemacht werden sollen.



0.1
Gefahr für Personen und Sachen!
Testen Sie jedes neue Programm bevor Sie eine Anlage in Betrieb nehmen!



ACHTUNG

0.2/1.1/1.3/1.4/1.7/1.10/1.12/1.14/1.16/1.18/2.1/2.3/2.4/2.6/2.8/2.10/2.12/2.14/2.16/2.18/2.21/2.24

Gefahr für die Baugruppe!

Baugruppe nicht bei eingeschalteter Steuerung stecken oder ziehen! Baugruppe kann zerstört werden. Zuerst Netzteilbaugruppe der Steuerung, externe Spannungsversorgung und Signalspannung ausschalten oder abziehen und erst dann Baugruppe stecken oder ziehen!



ACHTUNG

0.3/1.2/1.5/1.8/1.11/1.13/1.15/1.17/1.19/2.2/2.5/2.7/2.9/2.11/2.13/2.15/2.17/2.19/2.22/2.25

Gefahr für die Baugruppe!

Beim Umgang mit der Baugruppe müssen alle Vorkehrungen zum ESD-Schutz eingehalten werden! Elektrostatische Entladungen vermeiden!



VORSICHT

1.6/1.9/2.20

Lebensgefährliche Spannung!

An den Klemmen der Baugruppe liegt eine lebensgefährliche Spannung an!

Vor Arbeiten an der Baugruppe Anschlüsse spannungslos schalten!



VORSICHT

2.23

Lebensgefährliche Spannung!

An den Klemmen der Baugruppe kann eine lebensgefährliche Spannung anliegen!

Vor Arbeiten an der Baugruppe Anschlüsse spannungslos schalten!

**Sicherheitshinweise an den Steuerungskomponenten**

An den Steuerungskomponenten selbst können folgende Warnungen und Hinweise angebracht sein, die Sie auf bestimmte Dinge aufmerksam machen sollen:



Warnung vor gefährlicher elektrischer Spannung!



Warnung vor Gefahren durch Batterien!



Elektrostatisch gefährdete Bauelemente!



Vor dem Öffnen Netzstecker ziehen!



Bolzen nur für Anschluß des Schutzleiters PE!



Nur für Anschluß eines Schirmleiters!

A.3.3 Ελληνικά

Υποδείξεις ασφαλείας στις παρούσες οδηγίες χρήσεως



Τα σύμβολα αυτά στις παρούσες οδηγίες χρήσεως χρησιμοποιούνται υπό τους ακόλουθους όρους:



ΚΙΝΔΥΝΟΣ

Αυτό το σύμβολο χρησιμοποιείται για να σας προειδοποιήσει από επικίνδυνη ηλεκτρική τάση. Αν δεν τηρούνται με ακρίβεια ή δεν τηρούνται καθόλου οι οδηγίες μπορεί να προκληθούν σωματικές βλάβες.



ΚΙΝΔΥΝΟΣ

Το σύμβολο αυτό χρησιμοποιείται, όταν μπορεί να προκληθούν σωματικές βλάβες, αν δεν τηρούνται με ακρίβεια ή δεν τηρούνται καθόλου οδηγίες.



ΠΡΟΣΟΧΗ

Το σύμβολο αυτό χρησιμοποιείται, όταν μπορεί να προκληθούν ζημιές σε συσκευές ή σε αρχεία, αν δεν τηρούνται με ακρίβεια ή δεν τηρούνται καθόλου οδηγίες.



Το σύμβολο αυτό χρησιμοποιείται, όταν θα πρέπει να επιστηθεί η προσοχή σας σε κάτι το σημαντικό.



ΚΙΝΔΥΝΟΣ

0.1

Κίνδυνος για πρόσωπα και αντικείμενα!

Δοκιμάστε κάθε καινούριο πρόγραμμα πριν θέσετε μια εγκατάσταση σε λειτουργία!



ΠΡΟΣΟΧΗ

0.2/1.1/1.3/1.4/1.7/1.10/1.12/1.14/1.16/1.18/2.1/2.3/2.4/2.6/2.8/2.10/2.12/2.14/2.16/2.18/2.21/2.24

Κίνδυνος για το στοιχείο κατασκευής!

Μην αφαιρείτε ή τοποθετείτε το στοιχείο κατασκευής σε κύκλωμα που είναι σε λειτουργία! Το στοιχείο κατασκευής μπορεί να καταστραφεί. Πρώτα αφαιρείτε ή αποσυνδέετε το στοιχείο κατασκευής της ρύθμισης του ηλεκτρικού κυκλώματος, κατόπιν την παροχή τάσης και την τάση σήματος και μετά τοποθετείτε ή αφαιρείτε το στοιχείο κατασκευής.



ΠΡΟΣΟΧΗ

0.3/1.2/1.5/1.8/1.11/1.13/1.15/1.17/1.19/2.2/2.5/2.7/2.9/2.11/2.13/2.15/2.17/2.19/2.22/2.25

Κίνδυνος για το στοιχείο κατασκευής!

Όταν έχετε στα χέρια σας το στοιχείο κατασκευής πρέπει να τηρείτε όλα τα μέτρα για την ηλεκτροστατική προστασία! Αποφεύγετε ηλεκτροστατικές εκφορτίσεις!



ΚΙΝΔΥΝΟΣ

1.6/1.9/2.20

Επικίνδυνη τάση!

Στους ακροδέκτες της κάρτας υπάρχει θανάσιμα επικίνδυνη τάση!

Προτού εργαστείτε στην κάρτα, διακόψτε την τάση στις συνδέσεις!



ΚΙΝΔΥΝΟΣ

2.23

Επικίνδυνη τάση!

Στους ακροδέκτες της κάρτας υπάρχει θανάσιμα επικίνδυνη τάση!

Προτού εργαστείτε στην κάρτα, διακόψτε την τάση στις συνδέσεις!



Υποδείξεις ασφαλείας σε εξαρτήματα ρύθμισης και ελέγχου

Τα εξαρτήματα ρύθμισης και ελέγχου μπορεί να φέρουν τις ακόλουθες προειδοποιήσεις και υποδείξεις, που επιστούν την προσοχή σας σε ορισμένα πράγματα:



Προειδοποίηση σχετικά με επικίνδυνη τάση ηλεκτρικού ρεύματος!



Προειδοποίηση σχετικά με κινδύνους, που προέρχονται από μπαταρίες!



Στοιχεία κατασκευής, για τα οποία υπάρχει ηλεκτροστατικός κίνδυνος!



Πριν από το άνοιγμα βγάλτε το φως από την πρίζα!



Πείροι μόνο για σύνδεση προστατευτικού αγωγού (γείωσης) PE!



Μόνο για σύνδεση θωρακισμένου αγωγού!

A.3.4 Español

Indicaciones de seguridad en estas instrucciones de empleo



Estos símbolos se utilizan en estas instrucciones de empleo bajo las siguientes condiciones.



PRECAUCION

Este símbolo se utiliza para advertir de una **tensión eléctrica peligrosa**. La ejecución inexacta o la no ejecución de esta instrucción podrá provocar **daños a las personas**.



PRECAUCION

Este símbolo se utiliza cuando por una ejecución inexacta o la no ejecución de instrucciones se pueden llegar a producir **daños a las personas**.



ATENCION

Este símbolo se utiliza cuando por la ejecución inexacta o la no ejecución de instrucciones se pueden llegar a producir **daños en los aparatos o archivos**.



Este símbolo se utiliza cuando se le debe llamar la atención respecto a algo especial.



PRECAUCION

0.1

¡Peligro para personas y bienes materiales!
¡Compruebe cada nuevo programa antes de poner en funcionamiento una instalación!



ATENCION

0.2/1.1/1.3/1.4/1.7/1.10/1.12/1.14/1.16/1.18/2.1/2.3/
2.4/2.6/2.8/2.10/2.12/2.14/2.16/2.18/2.21/2.24

¡Peligro para el módulo!

¡No enchufe ni extraiga el módulo cuando el control está conectado! Puede destruirse el módulo. ¡Desconecte o desenchufe primero el módulo de fuente de alimentación del control, la alimentación de tensión externa y la tensión de señalización y sólo después enchufe o extraiga el módulo!



ATENCION

0.3/1.2/1.5/1.8/1.11/1.13/1.15/1.17/1.19/2.2/2.5/2.7/
2.9/2.11/2.13/2.15/2.17/2.19/2.22/2.25

¡Peligro para el módulo!

¡Observe en la manipulación del módulo todas las precauciones en cuanto a la protección ESD! ¡Evite descargas estáticas!



PRECAUCION

1.6/1.9/2.20

¡Tensión de peligro mortal!

A los bornes del módulo está aplicada una tensión de peligro mortal.

Antes de efectuar trabajos en el módulo, desconecte la tensión de los conectores.



PRECAUCION

2.23

¡Tensión de peligro mortal!

A los bornes del módulo puede estar aplicada una tensión de peligro mortal.

Antes de efectuar trabajos en el módulo, desconecte la tensión de los conectores.

**Indicaciones de seguridad en los componentes de control**

En los componentes de control mismos pueden estar dispuestos las siguientes advertencias e indicaciones que le deben llamar la atención sobre determinados temas:



¡Advertencia ante tensión eléctrica peligrosa!



¡Advertencia ante riesgos por baterías!



¡Elementos constructivos con riesgos de descargas electrostáticas!



¡Antes de abrir, desenchufar el conector de la red!



¡Perno sólo para la conexión del conductor protector PE!



¡Sólo para la conexión de un conector blindado!

A.3.5 Français

Directives de sécurité relatives au présent mode d'emploi



Ces symboles sont utilisés dans les conditions suivantes:



Ce symbole est utilisé lorsque l'on veut mettre en garde contre une **tension électrique dangereuse**. Risque de **dommage corporel** si les consignes données ne sont pas respectées ou lorsqu'elles sont mal respectées.



Ce symbole est utilisé s'il y a un risque de **dommage corporel** si les consignes données ne sont pas respectées ou lorsqu'elles sont mal respectées.



Ce symbole est utilisé s'il y a un risque de dommage matériel ou risque de destruction de fichier si les consignes données ne sont pas respectées ou lorsqu'elles sont mal respectées.



Ce symbole est utilisé lorsqu'il s'agit d'attirer votre attention sur un point particulier.



0.1
Risque pour les personnes et le matériel !
Testez chaque nouveau programme avant de mettre une installation en service!



ATTENTION

0.2/1.1/1.3/1.4/1.7/1.10/1.12/1.14/1.16/1.18/2.1/2.3/
2.4/2.6/2.8/2.10/2.12/2.14/2.16/2.18/2.21/2.24

Risque pour l'unité !

Ne branchez ou ne débranchez pas l'unité lorsque la commande est activée ! Risque de destruction de l'unité. Avant de brancher ou de débrancher l'unité, coupez ou déconnectez d'abord le bloc d'alimentation de la commande, l'alimentation en courant électrique externe et la tension de signal !



ATTENTION

0.3/1.2/1.5/1.8/1.11/1.13/1.15/1.17/1.19/2.2/2.5/2.7/
2.9/2.11/2.13/2.15/2.17/2.19/2.22/2.25

Risque pour l'unité !

Respectez toutes les mesures de protection ESD lors du maniement de l'unité ! Evitez les décharges électrostatiques !



DANGER

1.6/1.9/2.20

Tension mortelle !

Une tension mortelle est présente au niveau des bornes du sous-groupe !

Avant de procéder à des travaux sur le sous-groupe, mettez les raccords hors tension !



DANGER

2.23

Tension mortelle !

Une tension mortelle peut être présente au niveau des bornes du sous-groupe !

Avant de procéder à des travaux sur le sous-groupe, mettez les raccords hors tension !

**Mesures de sécurité relatives aux dispositifs de commande**

Les pictogrammes et messages d'avertissement suivants peuvent se trouver sur les éléments de commande afin d'attirer votre attention sur certains points:



Présence de tension électrique dangereuse



Danger lié à la présence de batteries



Modules sensibles à l'électricité statique



Enlever la fiche secteur avant l'ouverture



Uniquement pour le raccordement de la terre PE !



Uniquement pour le raccordement d'un câble blindé

A.3.6 Italiano

Avvertenze per la sicurezza in queste istruzioni per l'uso



Questi simboli vengono impiegati in queste istruzioni per l'uso nelle seguenti condizioni.



PERICOLO

Questo simbolo viene impiegato per segnalare la presenza di **tensioni elettriche pericolose**. La mancata osservanza, anche parziale, di queste istruzioni può provocare danni alle **persone**.



PERICOLO

Questo simbolo viene impiegato qualora l'osservanza imprecisa o la mancata osservanza delle istruzioni possono provocare danni alle **persone**.



ATTENZIONE

Questo simbolo viene impiegato qualora l'osservanza imprecisa o la mancata osservanza delle istruzioni può provocare danni agli **apparecchi o ai file**.



Questo simbolo viene impiegato quando si voglia richiamare l'attenzione su qualcosa di particolare.



PERICOLO

0.1

Pericolo per persone ed oggetti!

Provare ogni nuovo programma prima di mettere in funzione l'impianto!



ATTENZIONE

0.2/1.1/1.3/1.4/1.7/1.10/1.12/1.14/1.16/1.18/2.1/2.3/
2.4/2.6/2.8/2.10/2.12/2.14/2.16/2.18/2.21/2.24

Pericolo per il modulo!

Non innestare o rimuovere il modulo quando il comando è acceso! Il modulo potrebbe venire distrutto. Spegner prima il modulo d'alimentazione del comando, l'alimentazione esterna di tensione e la tensione del segnale e solo successivamente innestare o rimuovere il modulo!



ATTENZIONE

0.3/1.2/1.5/1.8/1.11/1.13/1.15/1.17/1.19/2.2/2.5/2.7/
2.9/2.11/2.13/2.15/2.17/2.19/2.22/2.25

Pericolo per i moduli!

Durante operazioni con i moduli rispettare tutte le misure di protezione ESD! Evitare scariche elettrostatiche!



PERICOLO

1.6/1.9/2.20

Pericolo di morte: tensione!

Sui morsetti del modulo è presente una tensione pericolosa (mortale)!

Disconnettere la tensione dei collegamenti prima di eseguire lavori sul modulo!



PERICOLO

2.23

Pericolo di morte: tensione!

Sui morsetti del modulo è presente una tensione pericolosa (mortale)!

Disconnettere la tensione dei collegamenti prima di eseguire lavori sul modulo!

**Avvertenze per la sicurezza sui componenti di comando**

Sui componenti di comando stessi possono essere applicate le seguenti targhette di avvertimento e di avvertenza, che richiamano l'attenzione su particolari pericoli:



Avvertimento per tensione elettrica pericolosa!



Avvertimento per pericoli dovuti alle batterie!



Elementi costruttivi danneggiabili da cariche elettrostatiche!



Sfilare la spina dalla rete prima di aprire!



Perno solo per il collegamento del conduttore di protezione PE!



Solo per il collegamento di un conduttore schermato!

A.3.7 Nederlands

Veiligheidsrichtlijnen in deze gebruiksaanwijzing



Deze symbolen worden in deze gebruiksaanwijzing onder de volgende voorwaarden gebruikt.



ATTENTIE

Dit symbool wordt gebruikt, als de aandacht op een **gevaarlijke elektrische spanning** gevestigd moet worden. Wordt deze aanwijzing niet precies gevolgd of zelfs genegeerd, dan is **lichamelijk letsel** niet uitgesloten.



ATTENTIE

Dit symbool wordt gebruikt wanneer door onnauwkeurige of niet-naleving van aanwijzingen **schade aan personen** kan worden berokkend.



LET OP

Dit symbool wordt gebruikt wanneer door onnauwkeurige of niet-naleving van aanwijzingen **schade aan toestellen of bestanden** kan worden berokkend.



Dit symbool wordt gebruikt wanneer wij u op iets bijzonders willen attent maken.



ATTENTIE

0.1

Gevaar voor lichamelijk letsel en materiële schade!
Test elk nieuw programma voor u een installatie opstart!



LET OP

0.2/1.1/1.3/1.4/1.7/1.10/1.12/1.14/1.16/1.18/2.1/2.3/
2.4/2.6/2.8/2.10/2.12/2.14/2.16/2.18/2.21/2.24

Gevaar voor de module!

Als de besturing ingeschakeld is, de module niet inste-
ken of uittrekken! De module kan hierdoor kapot gaan.
De module van het netdeel van de besturing, de ex-
terne spanningstoevoer en de signaalspanning uit-
schakelen of aftrekken en pas dan de module inste-
ken of uittrekken.



LET OP

0.3/1.2/1.5/1.8/1.11/1.13/1.15/1.17/1.19/2.2/2.5/2.7/
2.9/2.11/2.13/2.15/2.17/2.19/2.22/2.25

Gevaar voor de module!

In de omgang met de module alle voorschriften m.b.t.
de ESD-beveiliging in acht nemen! Elektrostatische
ontladingen vermijden!



ATTENTIE

1.6/1.9/2.20

Levensgevaarlijke spanning!

Op de klemmen van de module bevindt er zich een le-
vensgevaarlijke spanning!

Voor het werken aan de module moet de spanning van
de aansluitingen uitgeschakeld worden!



ATTENTIE

2.23

Levensgevaarlijke spanning!

Op de klemmen van de module kan er zich een levens-
gevaarlijke spanning bevinden!

Voor het werken aan de module moet de spanning van
de aansluiting uitgeschakeld worden!

**Veiligheidsaanwijzingen bij de besturingscomponenten**

Aan de besturingscomponenten zelf kunnen de volgende waarschuwingen en richtlijnen aangebracht zijn. Zij zijn bedoeld om u op bepaalde zaken te attenderen:



Waarschuwing voor gevaarlijke elektrische spanning.



Waarschuwing voor gevaar veroorzaakt door akku's.



Elektrostatisch gevoelige componenten.



Trek de stekker uit alvorens te openen.



Bouten alleen voor aansluiting van de veiligheidsaarding PE.



Alleen voor aansluiting van een afgeschermde kabel.

A.3.8 Português

Instruções de segurança contidas nas presentes instruções de serviço



Estes símbolos são utilizados nas presentes instruções de serviço nos seguintes casos:



CUIDADO

Este símbolo é utilizado para indicar uma **tensão eléctrica perigosa**. Em caso de não observância ou observância incorrecta desta instrução, existe **perigo de ferimento de pessoas**.



CUIDADO

Este símbolo é utilizado quando existe o perigo de ferimento de pessoas por observância incorrecta ou não observância das instruções.



ATENÇÃO

Este símbolo é utilizado quando existe o perigo de danificação de aparelhos ou ficheiros por observância incorrecta ou não observância das instruções.



Este símbolo é utilizado para chamar a atenção para algo de especial.



CUIDADO

0.1

Perigos de ferimentos de pessoas e de danos materiais!

Antes de colocar uma instalação em funcionamento há que experimentar sempre qualquer programa novo!



ATENÇÃO

0.2/1.1/1.3/1.4/1.7/1.10/1.12/1.14/1.16/1.18/2.1/2.3/2.4/2.6/2.8/2.10/2.12/2.14/2.16/2.18/2.21/2.24

Perigo para o módulo!

Não retire ou introduza o módulo quando o comando estiver ligado! O módulo poderá ser danificado. Primeiro desligue ou retire o módulo de alimentação do comando, o cabo alimentador da rede e a tensão de sinal, e em seguida, poderá introduzir ou retirar o módulo!



ATENÇÃO

0.3/1.2/1.5/1.8/1.11/1.13/1.15/1.17/1.19/2.2/2.5/2.7/2.9/2.11/2.13/2.15/2.17/2.19/2.22/2.25

Perigo para o módulo!

Na utilização do módulo, respeitar todas as prescrições para a protecção do ESD! Evitar descargas electrostáticas!



CUIDADO

1.6/1.9/2.20

Tensão muito perigosa!

Os bornes da unidade funcional contêm uma tensão muito perigosa!

Antes de trabalhar na unidade funcional, efectue as conexões sem tensão!



CUIDADO

2.23

Tensão muito perigosa!

Os bornes da unidade funcional poderão conter uma tensão muito perigosa!

Antes de trabalhar na unidade funcional, efectue as conexões sem tensão!

**Instruções de segurança nos componentes de comando**

Nos próprios componentes de comando podem estar afixados os avisos ou as instruções seguidamente descritos para chamar à atenção para determinados pontos.



Aviso referente a uma tensão eléctrica perigosa!



Aviso referente a perigos relacionados com baterias!



Módulos em perigo electrostático!



Antes de abrir tirar o cabo alimentador da rede!



Borne apenas para ligação do condutor de protecção à massa PE!



Só para ligação de um condutor blindado!

A.3.9 Suomi

Tämän käyttöohjeen turvallisuusohjeet



Näitä symboleja käytetään tässä käyttöohjeessa seuraavasti.



VAROITUS

Tätä symbolia käytetään, kun varoitetaan **vaarallisesta sähköjännitteestä**. Seurauksena voi olla **henkilövahinko**, jos ohjetta ei seurata tai sitä ei seurata tarkkaan.



VAROITUS

Tätä symbolia käytetään, jos ohjeiden noudattamatta jättäminen voi johtaa **henkilövahinkoihin**.



HUOMIO

Tätä symbolia käytetään, jos ohjeiden noudattamatta jättäminen tai niiden epätarkka seuraaminen voi johtaa **laitteiden tai tiedostojen vahingoittumiseen**.



Tätä symbolia käytetään, kun halutaan kiinnittää lukijan huomio johonkin erikoisseikkaan.



VAROITUS

0.1

Henkilö- ja tavaravahinkovaara!

Testaa jokainen uusi ohjelma, ennen laitteiston käyttöönottoa!



HUOMIO

0.2/1.1/1.3/1.4/1.7/1.10/1.12/1.14/1.16/1.18/2.1/2.3/
2.4/2.6/2.8/2.10/2.12/2.14/2.16/2.18/2.21/2.24

Rakenneosaryhmä voi vioittua!

Älä liitä tai irrota rakenneosaryhmää ohjauksen ollessa päällekytkettynä! Rakenneosaryhmä voi tuhoutua. Kytke ensin ohjauksen verkko-osarakenneryhmä, ulkoinen jännitteentulo ja signaalijännite pois päältä tai irrota ne ja liitä tai irrota rakenneosaryhmä vasta sitten!



HUOMIO

0.3/1.2/1.5/1.8/1.11/1.13/1.15/1.17/1.19/2.2/2.5/2.7/
2.9/2.11/2.13/2.15/2.17/2.19/2.22/2.25

Rakenneosaryhmä voi vioittua!

Rakenneosaryhmän kanssa toimittaessa on kaikkia ESD-suojaan liittyviä toimenpiteitä noudatettava! Elektrostaattista latausta on vältettävä!



VAROITUS

1.6/1.9/2.20

Hengenvaarallinen jännite!

Rakenneosaryhmän liittimissä on hengenvaarallinen jännite!

Ennen rakenneosaryhmässä suoritettavia töitä on liitännät tehtävä jännitteettömiksi!



VAROITUS

2.23

Hengenvaarallinen jännite!

Rakenneosaryhmän liitännöissä voi olla hengenvaarallinen jännite!

Ennen rakenneosaryhmässä suoritettavia töitä on liitännät kytkettävä jännitteettömiksi!

**Ohjauskomponenttien turvallisuusohjeet**

Ohjauskomponentteihin voi olla merkittynä seuraavat varoitukset ja ohjeet, joiden tarkoitus on kiinnittää käyttäjän huomio tiettyihin seikkoihin:



Varoitus, vaarallinen sähköjännite!



Varoitus, akkujen aiheuttamat vaarat!



Sähköstaattisesti vaarannetut rakenneosat!



Vedä verkkopistoke irti pistorasiasta ennen avaamista!



Pultti vain suojajohtimen PE liitännälle!



Vain suojajohtimen liitäntää varten!

A.3.10 Svenska

Säkerhetsanvisningar i denna driftsinstruktion



Dessa symboler används i denna driftsinstruktion för följande förutsättningar.



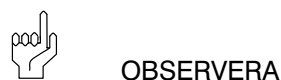
VARNING

Denna symbol används, vid varning för **farlig elektrisk spänning**. Om denna anvisning inte exakt följs eller inte följs alls kan det medföra **personskador**.



VARNING

Denna symbol används, när **personer kan skadas** om anvisningar inte exakt följs eller inte följs alls.



OBSERVERA

Denna symbol används, när **apparater eller filer kan skadas** om anvisningar inte exakt följs eller inte följs alls.



Denna symbol används, när Ni skall göras uppmärksam på något särskilt.



VARNING

0.1

Fara för person- och saksador!

Prova varje nytt program innan Ni tar en anläggning i drift!



OBSERVERA

0.2/1.1/1.3/1.4/1.7/1.10/1.12/1.14/1.16/1.18/2.1/2.3/
2.4/2.6/2.8/2.10/2.12/2.14/2.16/2.18/2.21/2.24

Fara för en komponentgrupp!

Stick inte in och drag inte heller ur en komponentgrupp när styrningen är tillkopplad! Komponentgruppen kan förstöras. Frånkoppla eller drag först ur styrningens nätdelskomponentgrupp, extern spänningsförsörjning och signalspänningen och stick in eller drag först därefter ut komponentgruppen!



OBSERVERA

0.3/1.2/1.5/1.8/1.11/1.13/1.15/1.17/1.19/2.2/2.5/2.7/
2.9/2.11/2.13/2.15/2.17/2.19/2.22/2.25

Fara för en komponentgrupp!

Vid arbeten med komponentgruppen skall alla åtgärder för ESD-skydd innehållas! Statiska urladdningar skall undvikas!



VARNING

1.6/1.9/2.20

Livsfarlig spänning!

En livsfarlig spänning ligger an på komponentgruppens plintar!

Koppla anslutningarna spänningslösa före arbeten på komponentgruppen!



VARNING

2.23

Livsfarlig spänning!

En livsfarlig spänning kan ligga an på komponentgruppens plintar!

Koppla anslutningarna spänningslösa före arbeten på komponentgruppen!

**Säkerhetsanvisningar på styrningskomponenterna**

På styrningskomponenterna kan följande varningar och anvisningar vara placerade, som vill göra Er uppmärksam på vissa saker:



Varning för farlig elektrisk spänning!



Varning för faror genom batterier!



Komponenter som kan skadas av elektrostatisk urladdning!



Drag ur kontakten innan öppning!



Bultar endast för anslutning av skyddsledaren PE!



Endast för anslutning av en avskärmningsledare!

Notes:

Bosch-Automationstechnik

Robert Bosch GmbH
Geschäftsbereich
Automationstechnik
Industriehydraulik
Postfach 30 02 40
D-70442 Stuttgart
Telefax (07 11) 8 11-18 57

Robert Bosch GmbH
Geschäftsbereich
Automationstechnik
Fahrzeughydraulik
Postfach 30 02 40
D-70442 Stuttgart
Telefax (07 11) 8 11-17 98

Robert Bosch GmbH
Geschäftsbereich
Automationstechnik
Pneumatik
Postfach 30 02 40
D-70442 Stuttgart
Telefax (07 11) 8 11-89 17

Robert Bosch GmbH
Geschäftsbereich
Automationstechnik
Montagetchnik
Postfach 30 02 07
D-70442 Stuttgart
Telefax (07 11) 8 11-77 12

Robert Bosch GmbH
Geschäftsbereich
Automationstechnik
Antriebs- und Steuerungstechnik
Postfach 11 62
D-64701 Erbach
Telefax (0 60 62) 78-4 28

Robert Bosch GmbH
Geschäftsbereich
Automationstechnik
Schraub- und Einpreßsysteme
Postfach 11 61
D-71534 Murrhardt
Telefax (0 71 92) 22-1 81

Robert Bosch GmbH
Geschäftsbereich
Automationstechnik
Entgrattechnik
Postfach 30 02 07
D-70442 Stuttgart
Telefax (07 11) 8 11-34 75

Technische Änderungen vorbehalten

Ihr Ansprechpartner

BOSCH



Robert Bosch GmbH
Geschäftsbereich
Automationstechnik
Antriebs- und Steuerungstechnik
Postfach 11 62
D-64701 Erbach
Telefax (0 60 62) 78-4 28