

*Servodyn-D*

# External load switching module Interface conditions



Edition

# 101

*Servodyn-D*

# External load switching module Interface conditions

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# Table of contents

	Page
<b>Safety instructions .....</b>	<b>VII</b>
<b>1 Application and function .....</b>	<b>1-1</b>
<b>2 Technical data .....</b>	<b>2-1</b>
<b>3 Electrical connection</b>	
3.1 Front panel .....	3-1
3.2 DC link connection .....	3-3
<b>4 Dimensioned sketch .....</b>	<b>4-1</b>



# Safety instructions

Please read this manual before commissioning the external load switching module.

Store this manual in a place to which all users have access at any time.

## Proper use

These products normally pose no danger to persons or property if they are used in accordance with the handling stipulations and safety notes prescribed for their configuration, mounting, and proper operation.

The present manual contains all instructions required for their proper use.

- Before putting the drive inverters into operation, ensure that the machine which the inverters are to be installed in meets the stipulations of the machine directive (89/392/EEC) and the EMC directive (89/336/EEC).
- The inverters themselves meet the safety objectives of the low-voltage directive (73/23/EEC) and the harmonized standards EN 50178 (VDE 0160) and EN 60146-1-1 (VDE 0558-11).
- Low-voltage motors are **components** to be installed in machines as defined by the machine directive 89/392/EEC.  
Before putting them into operation, ensure that the machine which the motors are to be installed in meets the stipulations of the machine directive (note also EN 60204-Part 1).

The products described

- have been developed, manufactured, tested, and documented in compliance with the safety standards. These products normally pose no danger to persons or property if they are used in accordance with the handling stipulations and safety notes prescribed for their configuration, mounting, and proper operation.
- meet the requirements of the EMC directive (89/336/EEC, 93/68/EEC, and 93/44/EEC) and the low-voltage directive (73/23/EEC). In particular, the EMC product standard EN 61800-3 is complied with.
- are designed for operation in industrial environments. For operation in residential environments, in trade and commercial applications and small enterprises, an individual permit of the national authority or test institution is required; in Germany, please contact the Bundesanstalt für Post und Telekommunikation or its local branch offices.

The faultless, safe functioning of the product requires proper transport, storage, erection and installation as well as careful operation.

## Qualified personnel

The requirements as to qualified personnel depend on the qualification profiles described by ZVEI (central association of the electrical industry) and VDMA (association of German machine and plant builders) in:

**Weiterbildung in der Automatisierungstechnik**

**edited by: ZVEI and VDMA**

**MaschinenbauVerlag**

**Postfach 71 08 64**

**D-60498 Frankfurt**

The present manual is designed for drive technicians.

Interventions in the hardware and software of our products, unless described otherwise in this manual, are reserved to our specialized personnel.

Tampering with the hardware or software, ignoring warning signs attached to the components, or non-compliance with the warning notes given in this manual can result in serious bodily injury or property damage.

For this reason, only **electrotechnicians** as recognized under VDE 1000-10 who are familiar with the contents of this manual may install and service the products described. Furthermore, all existing accident prevention regulations (in Germany: UVV VBG4, VDE 100, VDE 105) and installation instructions (EN 60204-Part 1, EN 50178) must be observed.

Such personnel are

- those who, being well trained and experienced in their field and familiar with the relevant norms, are able to analyze the jobs being carried out and recognize any hazards which may have arisen.
- those who have acquired the same amount of expert knowledge through years of experience that would normally be acquired through formal technical training.

Please note our comprehensive range of training courses.

Our training center will be pleased to provide you with further information, telephone: +49 (0)6062 78-258.

### Safety markings on components



Warning of dangerous electrical voltage!



Electrostatically sensitive components!



Pin for connecting PE conductor only!



Conductor shield

### Safety instructions in this manual



#### DANGEROUS ELECTRICAL VOLTAGE

This symbol is used to warn of a **dangerous electrical voltage**. The failure to observe the instructions in this manual in whole or in part may result in **personal injuries**.



#### DANGER

This symbol will be used if the failure to observe the instructions in this manual in whole or in part may result in **personal injuries**.



#### CAUTION

This symbol will be used if the failure to observe the instructions in this manual in whole or in part may result in **damages to equipment or files**.



This symbol will be used to draw the user's attention to special circumstances.

- ★ This symbol refers to an activity to be performed by the user.

#### Key operation

Special keys or combinations of keys are represented by pointed brackets

- Special keys: e.g. <enter>, <pgup>, <del>
- Key combinations (pressed simultaneously): e.g. <ctrl>+<pgup>

### Modifications

Those paragraphs in this edition which are modified versions of Edition 101 are marked by black vertical bars on the margin.

# Safety instructions



## DANGEROUS ELECTRICAL VOLTAGE

Lethal voltages of up to 375 V DC against ground on all power connections and DC link connections!

The drives must not be switched on unless all covers have been fitted! When the drive has been disconnected from mains, wait for up to 5 minutes until the system is de-energized before removing any covers. The drive must always be examined for safe isolation from supply!



## DANGEROUS ELECTRICAL VOLTAGE

Danger of life through electrical voltage!

Unless described otherwise, maintenance works must be performed on inactive systems! The system must be protected against unauthorized or accidental reclosing.

For measuring or test activities on the live system, the existing safety and accident prevention regulations must be observed in any case. Use suitable insulated tools for all types of work!



## DANGER

Health hazards through destroyed electrical components!

Do not destroy any built-in components. Dispose of destroyed components in a proper manner.

Please note your local, system-specific regulations and requirements as well as the proper use of tools, hoisting and transport equipment as well as the applicable standards, regulations, and accident prevention regulations.



## CAUTION

Danger to the module!

Observe all precautions for ESD protection when handling modules and components! Avoid electrostatic discharge!

The following protective measures must be observed for modules and components sensitive to electrostatic discharge (ESD)!

- The personnel responsible for storage, transport, and handling must have been trained for ESD protection.
- ESD-sensitive components must be stored and transported in their prescribed protective packaging.
- ESD-sensitive components may only be handled at special ESD-workplaces.
- Personnel, working surfaces, as well as all equipment and tools which get in contact with ESD-sensitive components must have the same potential (e.g., by grounding).
- Wear an approved grounding bracelet. The grounding bracelet must be connected with the working surface through a cable with an integrated resistor of 1 MΩ.



- ESD-sensitive components must by no means get in contact with chargeable objects, including most plastic materials.
- When ESD-sensitive components are installed in or removed from equipment, the equipment must be de-energized.

**DANGER**

**Danger of life through inadequate EMERGENCY-STOP devices! EMERGENCY-STOP devices must be active and within reach in all system modes. Releasing an EMERGENCY-STOP device must not result in an uncontrolled restart of the system!**

**First check the EMERGENCY-STOP circuit, then switch the system on.**

---

**DANGER**

**Retrofits or modifications may adversely affect the safety of the products described!**

**The consequences may include severe injuries, damage to equipment, or environmental hazards. Possible retrofits or modifications to the system using third-party equipment therefore have to be approved by Bosch.**

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**CAUTION**

**Repair/maintenance work is reserved to the Bosch service or repair/maintenance units authorized by Bosch!**

**Only replacement/spare parts approved by Bosch may be used!**

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## Documentation and Software

The present manual provides information on the Servodyn–D series of drives. The following documentation is additionally available:

Servodyn–D documentation	Part no.	
	German	English
Configuration manual for overview and rating	1070 066 009	1070 066 029
Servo motors SF, SR	1070 066 004	1070 066 024
Asynchronous motors DU	1070 066 007	1070 066 027
Interface conditions	1070 066 010	1070 066 030
Servodyn–D with SERCOS interface – Parameter and commissioning manual	1070 066 011	1070 066 031
Servodyn–D with analog interface – Parameter description	1070 066 013	–
Servodyn–D with analog interface – Commissioning manual	1070 066 014	1070 066 034
Diagnostics, maintenance	1070 066 012	1070 066 032
EMC manual	1070 066 072	1070 066 074
External load switching module	1070 066 077	1070 066 080

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# 1 Application and function

The external load switching module can be used in conjunction with supply modules of the Servodyn-D series.

When the DC link voltage rises, the load switching module is automatically switched on to stabilize the DC link before the drives are switched off due to overvoltage and the motors coast without being braked.

Thus, the motors can be braked even in critical situations, e.g. in the event of a system failure in connection with supply modules for power regeneration.

Your notes:

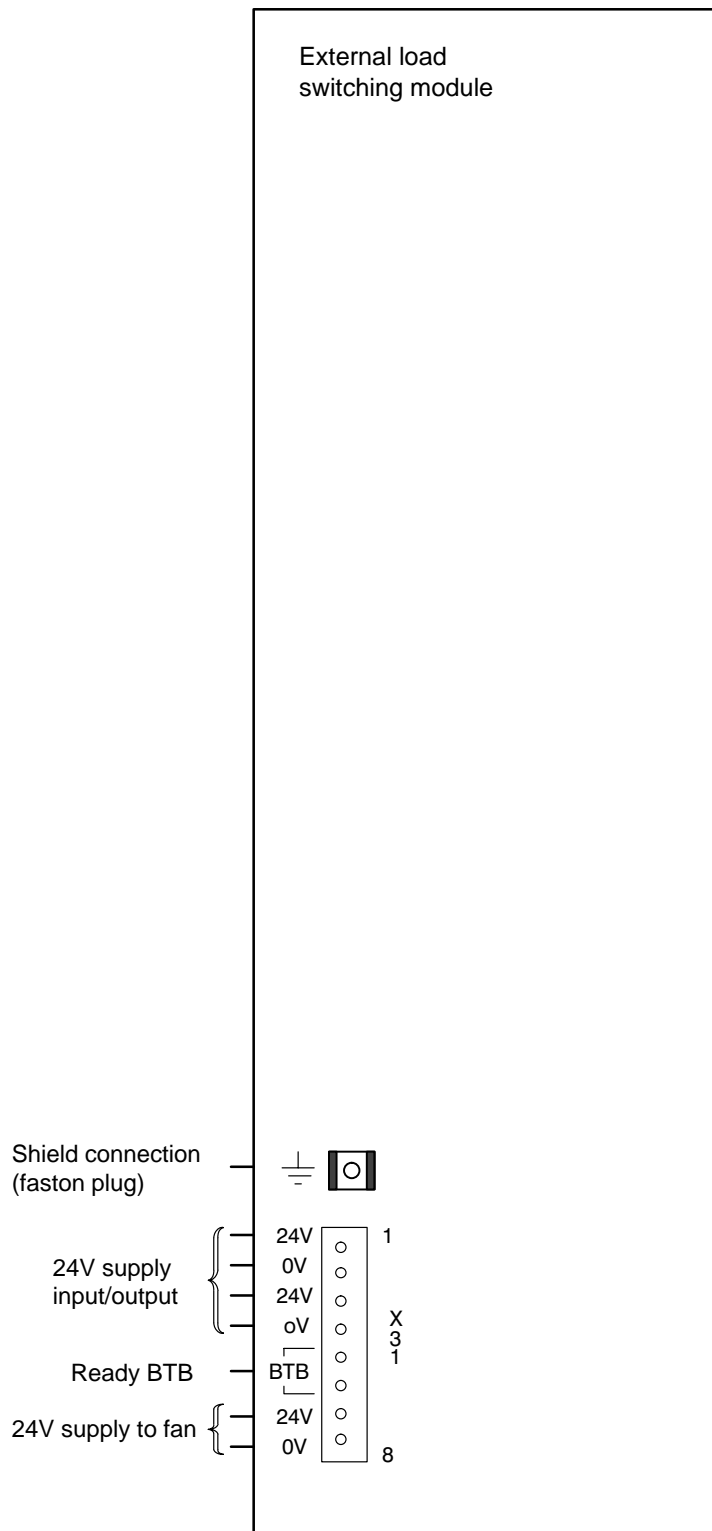
## 2 Technical data

Operating temperature range	0 °C to +45 °C 46 °C to +55 °C with derating
Storage temperature range	-25 °C to +70 °C
Protection standard	IP20 to EN 60 529
Climatic category	3K3 to EN 60 721
Installation height	1000 m above mean sea level
DC link voltage	670 V DC
Max. braking energy, one-time	7700 Ws
Max. continuous braking power with $T_A = 45\text{ °C}$	350 W
No. of fans	1
Power supply to fan	24 V DC, 100 mA

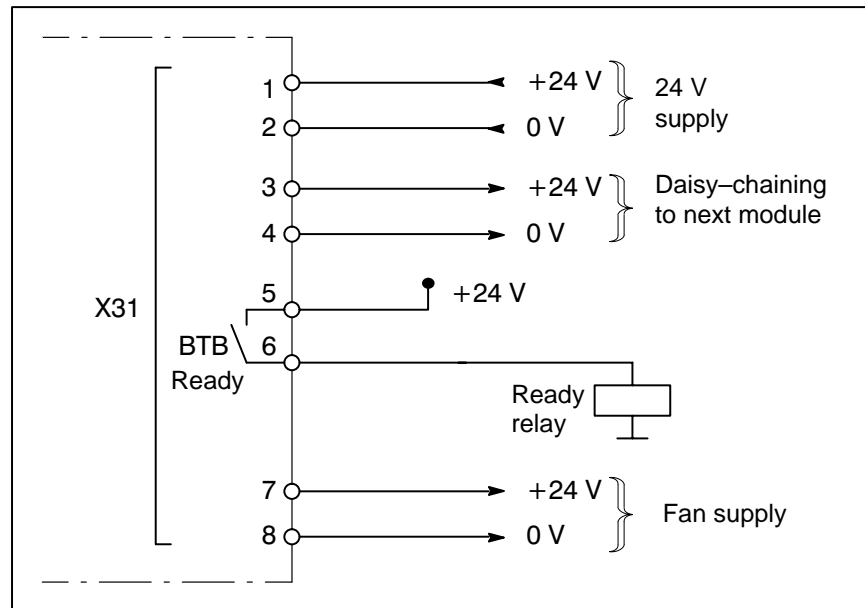
Your notes:

### 3 Electrical connection

#### 3.1 Front panel



## X31 connection terminal

**X 31.1 – 4    24 V, 0 V    Voltage supply**

X31.1–4 are two parallel inputs/outputs for connecting the 24 V supply. Unless both I/O's are used, the voltage can be daisy-chained to the next module.

**CAUTION**

To protect the PC board, the 24 V supply must be protected by a 10 A slow-blow fuse.

**X 31.5/6    BTB    Ready**

Floating relay contact. Max. load 24 V / 1000 mA.

No display.

The contact closes immediately as soon as the voltage supply has been switched on provided that the following conditions are met:

- 24 V supply available
- no undervoltage in the DC link ( $U > 400 \text{ V}$ )
- power supply unit heat sink temperature  $< 100 \text{ }^\circ\text{C}$

In the event of a fault, the Ready contact is immediately opened.

**The BTB/Ready contact of the external load switching module can be evaluated as a group error message.**

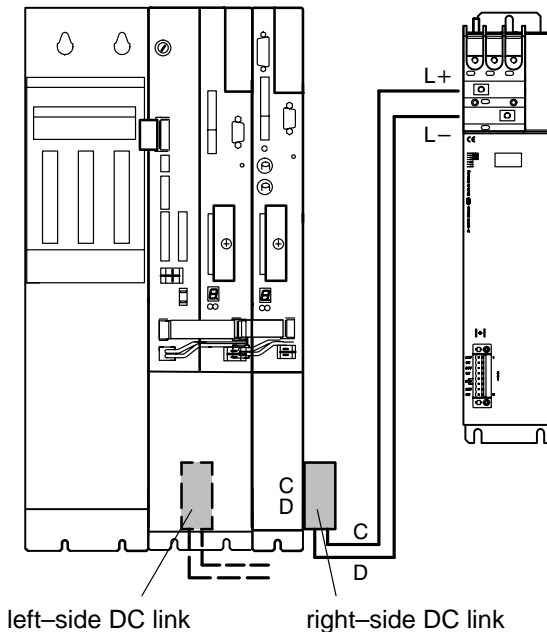
**X 31.7/8    24 V, 0 V    Fan supply**

The fan, which is to be mounted separately below the heat sink, is connected to the 24V supply at X31.1/2 by inserting the 2-pin connector into X31.7/8.



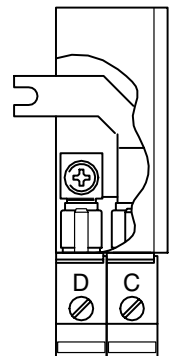
## 3.2 DC link connection

The external load switching module is connected to the terminal strip of the RM...-D backplane modules using a flexible lead and the right-side or left-side DC link connection options.



DC link connection using the **DC link**:

1. Remove end covers of the terminal blocks and the cover of the DC link.
2. Insert DC link from the side into the terminal block of the backplane module and make connection using the DC link bars.
3. Reinstall DC link cover.
4. Make DC link connection with flexible leads.  
Minimum conductor area: 2.5 mm<sup>2</sup>
5. Install the cover of the load switching module.



### DANGEROUS ELECTRICAL VOLTAGE

Conductor bars carry lethal voltages during operation.  
The shock-protection covers must always be fitted.

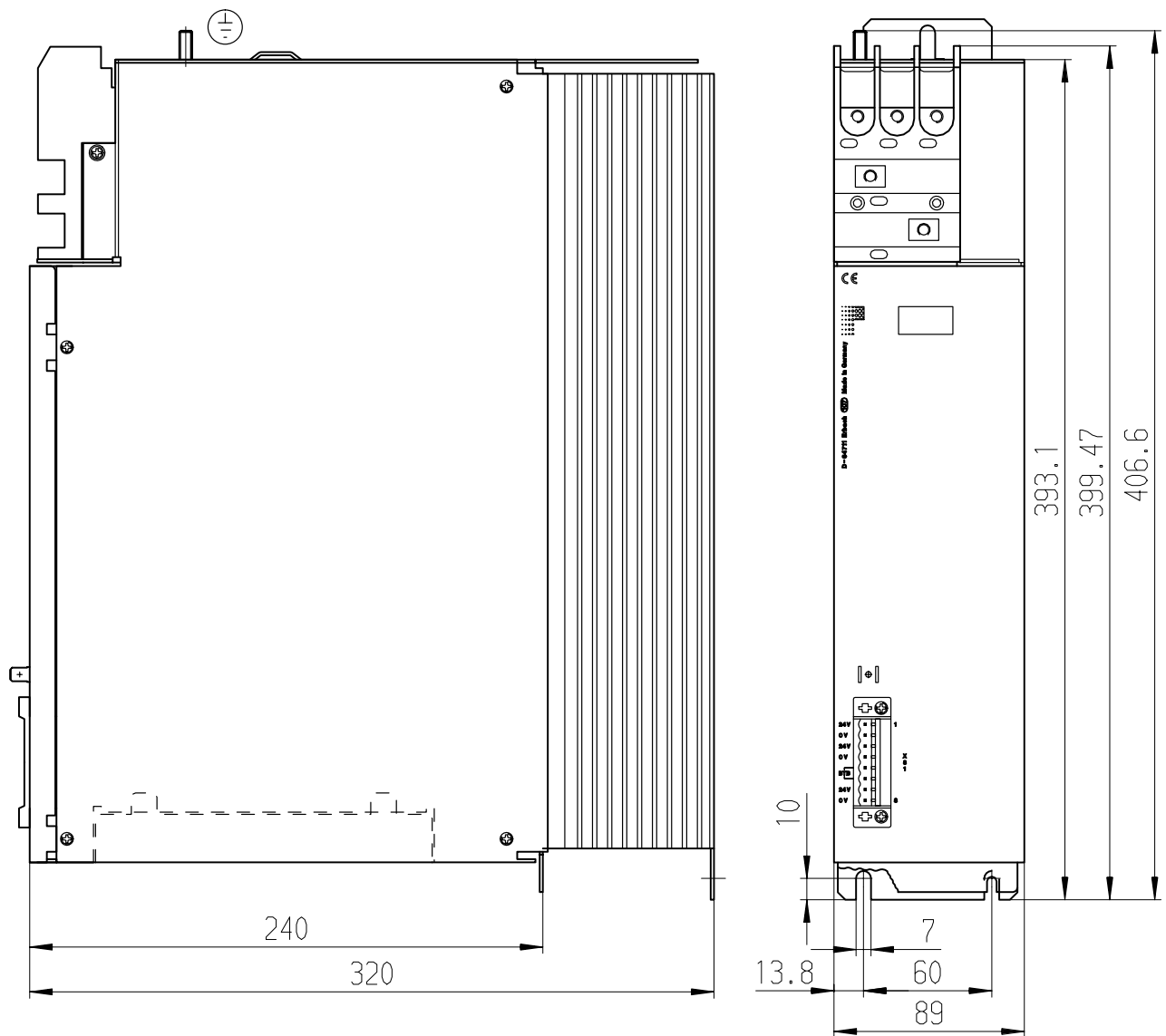


### Note

Due to the high di/dt values, the DC link lead acts like an inductive interference source. Cable shields made of copper braiding are largely inefficient. Therefore, it is important to route the lead at a distance > 100 mm from all other conductors.

Your notes:

# 4 Dimensioned sketch



Your notes:

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Technische Änderungen vorbehalten

Ihr Ansprechpartner

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