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Advantys STB distributed I/O solution
Digital I/O modules

Applications		**Digital (discrete) input modules**		
		Direct current		
				
Voltage		24 V ⎓		
Number of channels		2	4	
Sensor type		2 or 3-wire + earth	2 or 3-wire	
Inputs	Default logic	Positive		
	Configurable logic	Yes *(1)*	No	Yes *(1)*
	Type (IEC/EN 61131-2)	Type 2	Type 1+	
	Internal power supply for 3-wire sensors	Yes (2 outputs)	Yes (4 outputs)	
Response time	Off-to-on	610 µs at 0.2 ms input filter time	3.5 ms	925 µs at 0.5 ms input filter time
	On-to-off	625 µs at 0.2 ms input filter time	3.8 ms	1.35 µs at 0.5 ms input filter time
Filter time		0.2...16 ms	3 ms	0.5...16 ms
Connection (connectors included in kits)		Two connectors (6-way): STB XTS 1100 (screw-type) or STB XTS 2100 (spring-type)		
Base (included in kits)		STB XBA 1000		
Power Distribution Modules (PDM) *(2)*	Voltage	24 V ⎓		
	Reference	STB PDT 3100/3105		
Isolation	Channel-to-bus	1500 V ⎓ for 1 minute		
	Channel-to-channel	–		
Protection against	Reverse polarity	Yes		
	Short circuit and overload	Yes, time-lag fuse on the Power Distribution Module (PDM)		
	Electronic protection of sensor power supply	Yes	No	Yes
Operating temperature *(3)*		-25…70°C	0…60°C	-25…70°C
Module range		Standard	Basic	Standard
Type of module		**STB DDI 3230 K**	**STB DDI 3425 K**	**STB DDI 3420 K**
Page		48		

(1) Adjustable with STB SPU 1●●● configuration software.
(2) One Power Distribution Module (PDM) is required per voltage type.
(3) Horizontal mounting.

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Digital (discrete) input modules

Direct current





24 V ⎓		
6		16
2-wire		2 or 3-wire
Positive		
No	Yes *(1)*	No
Type 1		Type 3
Non		Yes (4 outputs)
5.25 ms	1.21 ms	2 ms
5.75 ms	1.74 ms	2 ms
5 ms	1 ms	
Two connectors (6-way): STB XTS 1100 (screw-type) or STB XTS 2100 (spring-type)		Two connectors (18-way): STB XTS 1180 (screw-type) or STB XTS 2180 (spring-type)
STB XBA 1000		STB XBA 3000
24 V ⎓		
STB PDT 3100/3105		
1500 V ⎓ for 1 minute		
–		
Yes		
Yes, time-lag fuse on the Power Distribution Module (PDM)		
No		
0…60°C	-25…70°C	-25…70°C
Basic	Standard	Basic
STB DDI 3615 K	**STB DDI 3610 K**	**STB DDI 3725 KS, KC**
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Advantys STB distributed I/O solution

Digital I/O modules

Applications		**Digital (discrete) output modules**			
		Direct current (transistor)			
					
Voltage		24 V ⎓			
Number of channels		2		4	
Outputs	Default logic	Positive			
	Configurable logic	Yes		No	Yes
	Internal power supply for 3-wire actuators	Yes		No	
Load current		0.5 A	2 A	0.25 A	0.5 A
Response time	Off-to-on	620 µs at 0.5 A load	520 µs	560 µs at 0.25 A load	560 µs at 0.5 A load
	On-to-off	575 µs at 0.5 A load	720 µs	870 µs at 0.25 A load	870 µs at 0.5 A load
Fault recovery response		User-configurable setting *(1)*		Manual reset	User-configurable setting *(1)*
Fallback modes		User-configurable setting *(1)*		All channels to 0	User-configurable setting *(1)*
Connection (connectors included in kits)		Two connectors (6-way): STB XTS 1100 (screw-type) or STB XTS 2100 (spring-type)			
Base (included in kits)		STB XBA 1000			
Power Distribution Modules (PDM) *(2)*	Voltage	24 V ⎓			
	Reference	STB PDT 3100/3105			
Isolation	Channel-to-bus	1500 V ⎓ for 1 minute			
	Channel-to-channel	–	500 V ⎓ for 1 minute	–	
Protection against	Reverse polarity	Yes			
	Short circuit and overload	Yes *(3)*	*(4)*	Yes *(3)*	
	Electronic protection of actuator power supply	Yes	Yes, with internal power supply	No	No
Operating temperature *(5)*		-25…70°C	-25…70°C	0…60°C	-25…70°C
Module range		Standard		Basic	Standard
Type of module		**STB DDO 3200 K**	**STB DDO 3230 K**	**STB DDO 3415 K**	**STB DDO 3410 K**
Page		48			

(1) Requires the STB SPU 1●●● configuration software.
(2) One Power Distribution Module (PDM) is required per voltage type.
(3) Built-in time-lag fuses on the Power Distribution Module (PDM).
(4) If an external power supply is used 2.5 A time-lag fuses are recommended on each channel, to be supplied by the user.
(5) Horizontal mounting.

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Digital (discrete) output modules

Direct current (transistor)





24 V ⎓		
6		16
Positive		
No	Yes	No
No		No
0.25 A	0.5 A	0.5 max. per channel
550 µs at 250 mA resistive load	715 µs at 0.5 A load	2 ms at 0.5 A load
900 µs at 250 mA resistive load	955 µs at 0.5 A load	2 ms at 0.5 A load
Manual reset	User-configurable setting *(1)*	Manual reset
All channels to 0	User-configurable setting *(1)*	All channels to 0
Two connectors (6-way): STB XTS 1100 (screw-type) or STB XTS 2100 (spring-type)		Two connectors (18-way): STB XTS 1180 (screw-type) or STB XTS 2180 (spring-type)
STB XBA 1000		STB XBA 3000
24 V ⎓		
STB PDT 3100/3105		
1500 V ⎓ for 1 minute		
–		
Yes		
Yes *(3)*		
No		
0…60°C	-25…70°C	-25…70°C
Basic	Standard	Basic
STB DDO 3605 K	**STB DDO 3600 K**	**STB DDO 3705 KS, KC**
48		

Advantys STB distributed I/O solution

Digital I/O modules

Applications		**Digital (discrete) input modules**		
		Alternating current		
				
Voltage		115 V ∼		230 V ∼
Number of channels		2		
Sensor type		2 or 3-wire + earth	2-wire	2 or 3-wire + earth
Inputs	Default logic	–		
	Configurable logic	Yes *(1)*		
	Type (IEC/EN 61131-2)	Type 1		
	Internal power supply for 3-wire sensors	Yes		
Response time	Off-to-on	1.5 line cycles		
	On-to-off	1.5 line cycles		
Filter time		–		
Connection (connectors included in kits)		Two connectors (5-way): STB XTS 1110 (screw-type) or STB XTS 2110 (spring-type)		
Base (included in kits)		STB XBA 2000		
Power Distribution Modules (PDM) *(2)*	Voltage	115 V ∼	115 V ∼ external supply	230 V ∼
	Reference	STB PDT 2100/2105		
Isolation	Channel-to-bus	1780 V ∼ for 1 minute		
	Channel-to-channel	–	1780 V ∼, 1 minute	–
Protection against	Reverse polarity	Yes		
	Short circuit and overload	Yes, 5 A time-lag fuse on the Power Distribution Module (PDM)		
	Electronic protection of sensor power supply	Yes	No	Yes
Operating temperature *(3)*		0…60°C		
Module range		Standard		
Type of module		**STB DAI 5230 K**	**STB DAI 5260 K**	**STB DAI 7220 K**
Page		48		

(1) Requires the STB SPU 1●●● configuration software.
(2) One PDM Power Distribution Module is required per voltage type.
(3) Horizontal mounting.

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Advantys STB distributed I/O solution

Digital I/O modules

Applications		Digital (discrete) output modules			
		Direct/alternating current (relay)		Alternating current (triac)	
					
Voltage		24 V ⎓ (relay contact) 115/230 V ∿ (relay contact)		115 V ∿	115/230 V ∿
Number of channels		2 C/O relays	2 relays (N/C + N/O)	2	
Outputs	Default logic	–		Positive	–
	Configurable logic	–		Yes *(1)*	–
	Internal power supply for 3-wire actuators	No		Yes	
Load current		2 A per contact	7 A per contact	2 A at 30°C 1 A at 60°C	
Response time	Off-to-on	5.25 ms	10 ms	0.5 line cycles	10 ms
	On-to-off	6.75 ms	10 ms	0.5 line cycles	10.5 ms
Fault recovery response		Manual reset		Automatic reset	User-configurable setting *(1)*
Fallback modes		User-configurable setting *(1)*			
Connection (connectors included in kits)		Two connectors (5-way): STB XTS 1100 (screw-type) or STB XTS 2110 (spring-type)			
Base (included in kits)		STB XBA 2000	STB XBA 3000	STB XBA 2000	
Power Distribution Modules (PDM) *(2)*	Voltage	24 V ⎓ (relay coil)		–	115/230 V ∿
	Reference	STB PDT 3100/3105		–	STB PDT 2100/2105
Isolation	Channel-to-bus	1780 V ∿ for 1 minute		1780 V ∿ for 1 minute	
	Channel-to-channel	500 V ∿ for 1 minute		1780 V ∿ for 1 minute	–
Protection against	Reverse polarity	–		Yes	
	Short circuit and overload	Yes *(3)*		*(4)*	Yes *(3)*
	Electronic protection of actuator power supply	No		No	
Operating temperature *(5)*		-25…70°C *(6)*		0…60°C	
Module range		Standard			
Type of module		**STB DRC 3210 K**	**STB DRA 3290 K**	**STB DAO 5260 K**	**STB DAO 8210 K**
Page		48			

(1) Requires the STB SPU 1●●● configuration software.
(2) One Power Distribution Module (PDM) is required per voltage type.
(3) Built-in time-lag fuses on the Power Distribution Module (PDM).
(4) 2.5 A time-lag fuses recommended on each channel, to be supplied by the user.
(5) Horizontal mounting.
(6) With limiting between 60°C and 70°C (see page 47).

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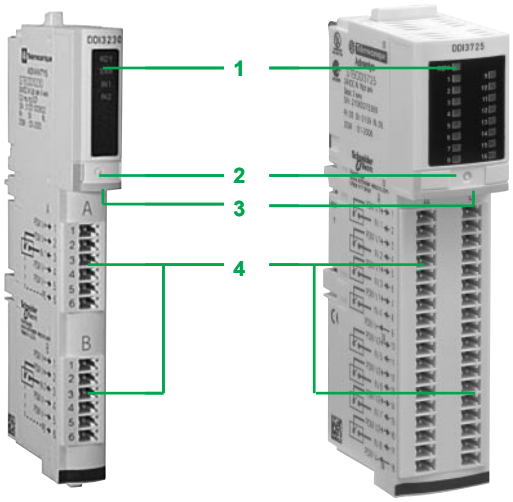
Advantys STB distributed I/O solution
Digital I/O modules

Presentation

Advantys STB digital input/output modules comprise:
- ■ Input modules
- ■ Solid state output modules
- ■ Relay output modules

The basic digital I/O module offer comprises:
- ■ 3 digital input modules:
- □ 4, 6, and 16 x 24 V ⎓ input channels
- ■ 3 digital output modules:
- □ 4, 6, and 16 x 24 V ⎓ output channels

The standard digital I/O module offer comprises:
- ■ 6 digital input modules:
- □ 2, 4, and 6 x 24 V ⎓ input channels
- □ 2 x 115 V ∿ input channels (2 modules)
- □ 2 x 230 V ∿ input channels
- ■ 6 solid state digital output modules:
- □ 2 x 24 V ⎓ output channels (2 modules)
- □ 4 and 6 x 24 V ⎓ output channels
- □ 2 x 115 V ∿ output channels
- □ 2 x 115/230 V ∿ output channels
- ■ 2 relay output modules:
- □ 2 relays with 1 N/C contact and 1 N/O contact
- □ 2 relays with 1 C/O contact



Description

Digital I/O modules have the following on the front panel:

1 A display block providing the following indication:

Indication	Basic I/O modules	Standard I/O modules
Module status: ready, pre-operational, operational	Green RDY LED	Green RDY LED
Module error *(1)*	– *(2)*	Red ERR LED
Status of each channel	Green LEDs IN1 to IN16 or OUT1 to OUT16 depending on module	Green LEDs IN1 to IN16 or OUT1 to OUT16 depending on module

2 A slot for a user-customizable label STB XMP 6700

3 A colour-coded module identification stripe (see colour codes on page 6)

4 Two connectors for screw- or spring-type terminals

(1) RDY is permanently on if the module is operational and flashes in different ways in the other states.
If ERR is on or flashing, there is a fault on this module.
For information about module and channel status indication, refer to the "System Hardware Components Reference Guide" included on the STB SUS 8800 CD-ROM or available on our website www.schneider-electric.com.

(2) Basic I/O modules: A module error is indicated by the ERR LED on the island's NIM network interface module.

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Advantys STB distributed I/O solution
Digital I/O modules

Description (continued)

Mandatory parts to be ordered separately or included in kits

I/O module bases in 3 widths depending on the module:

Module size	Width	Base reference
1	13.9 mm	**STB XBA 1000**
2	18.4 mm	**STB XBA 2000**
3	28.1 mm	**STB XBA 3000**

These bases have:
- A slot for a user-customizable label STB XMP 6700 *(1)*
- 4 locations for placing the module/base keying pins *(1)*.

Removable terminals

Connector type (2 connectors per module)	**5-way**	**6-way**	**18-way**
Screw terminals	STB XTS 1110 (pack of 20)	STB XTS 1100 (pack of 20)	STB XTS 1180 (pack of 2)
Spring terminals	STB XTS 2110 (pack of 20)	STB XTS 2100 (pack of 20)	STB XTS 2180 (pack of 2)

These removable terminals have between 5 and 18 different ways of coding the module/connector keying pins *(1)*.

Optional parts to be ordered separately

Mechanical keying pins and identifiers

These devices ensure that each I/O module, base and wiring connectors are properly matched after dismantling or replacement.

Keying of module and base *(1)*	Keying of module and connectors *(1)*	Module identification *(2)*	Base identification *(2)*
STB XMP 7700	STB XMP 7800	STB XMP 6700	STB XMP 6700

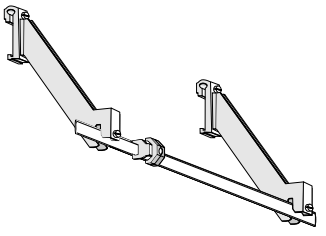
The user-customizable labels STB XMP 6700 make it much easier to recognize I/O modules and their bases.

External cable shielding connector

This optional device allows quick and easy connection of the external cable shielding *(1)*.

Connection and shielding kit Lateral supports and metal bar, length 1 m	STB XSP 3000
Cable clamp size 1 (pack of 10) for shielded cable with external diameter 1.5 to 6 mm²	STB XSP 3010
Cable clamp size 2 (pack of 10) for shielded cable with external diameter 5 to 11 mm²	STB XSP 3020

Digital input modules and digital output modules (24 V ⎓, 115/220 V ∿ and 2 A relay) include an earth connection, in which case this accessory is optional.
For analog modules, it is advisable to use this device as it allows quick and easy connection of the external cable shielding *(1)*.



STB XSP 3000



STB XSP 3010/3020

(1) To find out
- How to code the keying pins
- How to use the EMC kit
refer to the System Planning and Installation Guide included on the STB SUS 8800 CD-ROM or available on our website www.schneider-electric.com.

(2) Template file for printing labels on a laser printer (colour or black and white) or manual marking with indelible felt pen: included on the mini CD-ROM supplied with each NIM network interface module or available on our website www.schneider-electric.com.

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Digital output module operating modes

Output protection and reset following overload or short-circuit

Advantys STB digital output module	Short-circuit and thermal overload protection	Actuator power supply protection	Reset	Diagnostics
Basic modules STB DDO 3415, 3605, 3705	Internal electronic	Via PDM fuse	On elimination of the fault	Per group of 2 channels
Standard modules STB DDO 3200, 3230 Actuator powered by the module	Internal electronic	Internal electronic	User-configurable *(1)*	Per channel
Standard modules STB DDO 3200, 3230 Actuator powered externally	Internal electronic	Via external fuse	User-configurable *(1)*	Per channel
Standard modules STB DDO 3410, 3600	Internal electronic	–	–	Per group of 2 channels
Standard modules STB DRC 3210, STB DRA 3290	External fuse	–	User-configurable *(1)*	–
Standard modules STB DAO 8210	External fuse	Via external fuse	User-configurable *(1)*	–
Standard modules STB DAO 5260	External fuse	–	User-configurable *(1)*	–

Behaviour of digital output modules upon internal communication fault on the island or between PLC and NIM

Digital output STB module	Output fallback
Basic modules STB DDO 3415, 3605, 3705	0 (open output)
Standard modules STB DDO 3200, 3230, 3410, 3600 STB DRC 3210, STB DRA 3290 STB DAO 8210, STB DAO 5260	User-configurable *(2)*

(1) Reset is user-configurable: automatic on elimination of the fault (default factory configuration) or intentional by the PLC.
Each model is independently configurable. This operation requires the Advantys STB SPU 1●●● configuration software.
The tripping data is transmitted to the PLC via the NIM network interface module.
(2) Fallback is user-configurable: to 0 (default factory configuration), to 1, or to "hold last value" for warm standby and hot standby applications.
Each output channel of each module is independently configurable.
This operation requires the Advantys STB SPU 1●●● configuration software.

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Hot swapping and cold swapping of output modules

Swapping a module	Hot swap		Cold swap
	Basic NIM	**Standard NIM** *(3)*	**Any type of NIM**
Basic digital output module	The other I/O modules fall back to level 0 *(1)*	The other I/O modules remain operational *(2)*	All I/O modules and Power Distribution Modules (PDM) can be removed from the island. The removable connectors make it easier to do this.
Standard digital output module not configured "mandatory"	Not applicable *(1)*	The other I/O modules remain operational *(1) (2)*	
Standard digital output module configured "mandatory"	Not applicable *(1)*	Output fallback according to configuration *(2) (3)* Island in pre-operational mode. The inputs are no longer updated on the network/ fieldbus.	
Power Distribution Module (PDM)	Illegal	Illegal	

(1) The STB SPU 1●●● configuration software cannot be connected to a basic NIM. Any basic or standard I/O module is reconfigured according to the default factory settings.
(2) The STB SPU 1●●● configuration software can be connected via a standard NIM. All standard I/O modules can be configured. Basic modules are not configurable (default factory settings only).
(3) For standard digital output modules, the fallback state is configurable:
- Fallback to level 0
- Fallback to level 1
- Fallback to predefined level of the output range for analog modules
- Hold last value

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Advantys STB distributed I/O solution
Direct current digital input modules

Characteristics of DC digital input modules

Type of module			STB	DDI 3230	DDI 3425	DDI 3420	DDI 3615	DDI 3610	DDI 3725
Range				Standard	Basic	Standard	Basic	Standard	Basic
Number of channels				2	4		6		16
Nominal input values	Voltage		**V**	24 ⎓					
Type (IEC/EN 61131-2)				Type 2	Type 1+		Type 1		Type 3
Input limit values	Frequency		**Hz**	–					
	At state 1	Voltage	**V**	11 to 30 ⎓			15 to 30 ⎓		11 to 30 ⎓
		Min. current	**mA**	6	2.5		2		
	At state 0	Voltage	**V**	-3 to +5 ⎓					
		Max. current	**mA**	2	1.2		0.5		1.5
Input voltage values	Permanent voltage		**V**	30 ⎓					
	Absolute maximum voltage		**V**	56 ⎓ for 1.3 ms, decaying pulse					
Typical input current (at 24 V ⎓)			**mA**	7.5	8		4.5		
Input logic	Default			Positive on each channel					
	User-configurable setting *(1)*			Positive or negative, selection by channel	–	Positive or negative, selection by channel	–	Positive or negative, selection by channel	–
Input response time	Off-to-on		**ms**	0.610 with 0.2 input filter time	3.5	0.925 with 0.5 input filter time	5.25	1.21	2.0
	On-to-off		**ms**	0.625 with 0.2 input filter time	3.8	1.35 with 0.5 input filter time	5.75	1.74	2.0
Swapping	Cold swap			Yes					
	Hot swap			Yes, depending on NIM and whether module is mandatory. See table on page 43					
Protection against reverse polarity				Yes					
Isolation	Between channels and logic bus		**V**	2000 ⎓ for 1 minute	1500 ⎓ for 1 minute				
	Channel-to-channel		**V**	–					
Input protection				Resistor-limited					
Current supplied by the sensor Electronic short-circuit protection (SCP)			**mA**	100 per channel	50 per channel	100 per channel	–		
Input filter	Default		**ms**	1	3	1	5	1	
	User-configurable setting *(1)*		**ms**	0.20 0.50 1 2 4 8 16	–	0.50 1 2 4 8 16	–		
	Tolerance		**ms**	± 0.1	–	± 0.25	–		
I/O base (included in kits)				STB XBA 1000					XBT XBA 3000
Power Distribution Module (PDM)	Voltage		**V**	24 ⎓					
	Model			STB PDT 3100/3105					
	Power supply protection			Integrated time-lag fuse on the PDM module *(2)*					
Operating temperature, horizontal mounting			**°C**	-25…70	0…60	-25…70	0…60	-25…70	
Current consumption on 5 V ⎓ logic bus			**mA**	55	45		45	55	100

(1) Requires the Advantys STB SPU 1●●● configuration software
(2) Basic module: 5 A fuse
Standard module: 10 A fuse

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Characteristics of DC digital output modules

Type of module		STB	DDO 3200	DDO 3230	DDO 3415	DDO 3410	DDO 3605	DDO 3600	DDO 3705
Range			Standard		Basic	Standard	Basic	Standard	Basic
Number of channels			2		4		6		16
Nominal output values	Voltage	**V**	24 ⎓						
	Current per channel	**A**	0.5	2	0.25	0.5	0.25	0.5	
Output logic	Default		Positive for each channel						
	User-configurable setting *(1)*		*(2)*		–	*(2)*	–	*(2)*	–
Output voltage values	Permanent voltage	**V**	19.2 to 30 ⎓						
	Absolute maximum voltage	**V**	56 ⎓ for 1.3 ms, decaying voltage pulse						35 ⎓ for 1.3 ms, decaying voltage pulse
Response time	Off-to-on		620 µs at 0.5 A load	520 µs	560 µs at 0.25 A load	560 µs at 0.5 A load	550 µs at 0.25 A load	715 µs at 0.5 A load	2 ms at 0.5 A load
	On-to-off		575 µs at 0.5 A load	720 µs	870 µs at 0.25 A load	870 µs at 0.5 A load	900 µs at 0.25 A load	955 µs at 0.5 A load	2 ms at 0.5 A load
Swapping	Cold swap		Yes						
	Hot swap		Yes, depending on NIM and whether module is mandatory. See table on page 43						
Protection against reverse polarity			Yes						
Isolation	Between channels and logic bus	**V**	1500 ⎓ for 1 minute						
	Channel-to-channel	**V**	–	1500 ⎓ for 1 minute	–				
Electronic protection of outputs against short-circuits and thermal overloads			Per group of 2 channels						Per group of 8 channels
	Feedback		Per channel	2 per channel, 4 or 6 per group (2 channels per group)					Per group of 8 channels
	Reset		User-configurable reset with standard output modules and tripping data transmitted to NIM network interface module. Automatic reset on elimination of the fault with basic output modules *(4)*						
Leakage current (at state 0)		**mA**	0.4 at 30 V ⎓ max.	1 at 30 V ⎓ max.	0.4 at 30 V ⎓ max.				
Maximum peak current		**A**	5 at 500 µs (up to 6 per minute)	10 at 500 µs (up to 6 per minute)	2.5 at 500 µs (up to 6 per minute)	5 at 500 µs (up to 6 per minute)	2.5 at 500 µs (up to 6 per minute)	5 at 500 µs (up to 6 per minute)	Automatic limit per channel
Maximum load	Capacity	**µF**	50						10
	Inductance		0.5 H at 4 Hz switching frequency $L = 0.5/I^2 \times F$ *(5)*						1.0 at 4 Hz
Minimum load current		**mA**	0.5	2	–	0.5	–	0.5	–
Fallback on COM fault	Default state		0 on all channels						
	User-configurable setting *(1)*		Yes *(6)*			–	Yes *(6)*	–	
Reset on COM fault	Default state		Manual reset by user required						
	User-configurable setting *(1)*		Yes *(7)*			–	Yes *(7)*	–	
I/O base (included in kits)			STB XBA 1000						STB XBA 3000
Power Distribution Module (PDM)	Voltage	**V**	24 ⎓						
	Model		STB PDT 3100/3105						
	Power supply protection		Integrated time-lag fuse on the PDM module *(8)*	*(9)*	Integrated time-lag fuse on the PDM module *(8)*				
Operating temperature, horizontal mounting		**°C**	-25…70		0…60	-25…70	0…60	-25…70	
Current consumption on 5 V ⎓ logic bus		**mA**	50	45	70		90		135

(1) Requires the Advantys STB SPU 1●●● configuration software
(2) Positive or negative, selection by channel
(3) With standard NIM module only
(4) For basic module STB DDO 3705: automatic reset per groups of 8 channels, 1 to 8 and 9 to 16
(5) L = load inductance (H), I = load current (A), F = switching frequency (Hz)
(6) Fallback state: hold last value, set to predefined value (0 or 1) on each channel individually
(7) Manual or automatic reset, configurable for standard output modules on an island equipped with a standard NIM module
(8) Standard modules: 10 A fuse; basic modules: 5 A fuse
(9) 2.5 A time-lag fuses recommended on each channel, supplied by the user

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Advantys STB distributed I/O solution

Alternating current digital input modules

Characteristics of AC digital input modules

Type of module			STB	DAI 5230	DAI 5260	DAI 7220
Range				Standard		
Number of channels				2		
Nominal input values	Voltage		**V**	115 ∿ (50/60 Hz)		230 ∿ (50/60 Hz)
Type (IEC/EN 61131-2)				Type 1		
Input logic	Default			–	Positive	–
	User-configurable setting *(1)*			–	Yes, per channel *(1)*	–
Input response time	Off-to-on		**ms**	1.5 network period		
	On-to-off		**ms**	1.5 network period		
Input limit values	Frequency		**Hz**	47 to 63		
	At state 1	Voltage	**V**	74 to 132 ∿		159 to 256 ∿
		Min. current	**mA**	4		
	At state 0	Voltage	**V**	0 to 20 ∿		0 to 40 ∿
		Max. current	**mA**	2		
Input voltage values	Permanent voltage		**V**	132 ∿		265 ∿
	SFIb		**V**	200 ∿ for 1 cycle		400 ∿ for 1 cycle
Swapping	Cold swap			Yes		
	Hot swap			Yes, depending on NIM and whether module is mandatory. See table on page 43		
Protection against reverse polarity				–		
Isolation	Between channels and logic bus		**V**	1780 ∿ for 1 minute		
	Channel-to-channel		**V**	–	1780 ∿ for 1 minute	–
Input protection				Resistor-limited	Metal oxide varistor-limited	Resistor-limited
Current supplied by the sensor Electronic short-circuit protection (SCP)			**mA**	60 max.	–	
Input filter	Default		**ms**	–		
	User-configurable setting *(1)*		**ms**	–		
	Tolerance		**ms**	–		
I/O base (included in kits)				STB XBA 2000		
Power Distribution Module (PDM)	Voltage		**V**	115/230 ∿		
	Model			STB PDT 2100/2105		
	Power supply protection		**A**	Time-lag fuse on the PDM module *(3)*	External 0.5 A fuse required	Time-lag fuse on the PDM module *(3)*
Operating temperature, horizontal mounting			**°C**	0…60		
Current consumption on 5 V ⎓ logic bus			**mA**	40	45	40

(1) Requires the Advantys STB SPU 1●●● configuration software
(2) Basic NIM modules do not support hot swapping of input/output modules.
(3) Basic module: 5 A fuse
Standard module: 10 A fuse

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Characteristics of AC and relay output modules

Type of module		STB	DRC 3210	DRA 3290	DAO 5260	DAO 8210
Range			Standard			
Number of channels			2 C/O	2 N/C and N/O	2	
Output nominal values	Voltage	**V**	24 ⎓, 115/230 ∿		115 ∿	115/230 ∿
	Current per channel/contact	**A**	2 at 24 V ⎓	7 at 24 V ⎓	2 at 30°C	
			2 at 230 V ∿	7 at 230 V ∿	1 at 60°C	
Output logic	Default		Positive on both channels			
	User-configurable setting *(2)*		Positive or negative by channel			
Limit voltage	Permanent	**V**	5 to 30 ⎓, 20 to 250 ∿		74 to 132 ∿	20 to 265 ∿
	Absolute maximum	**V**	–		132 ∿	300 ∿ for 10 s 400 ∿ for 1 cycle
Response time	Off-to-on		5.25 ms	10 ms	0.5 ∿ period	10 ms
	On-to-off		6.75 ms	10 ms	0.5 ∿ period	10.5 ms
Switching capability		**VA**	600 (resistive load)	2100 (resistive load)	–	
Relay contact life	Mechanical		10^6 operations		–	
	Electrical		10^5 operations (resistive load at max. voltage and current)		–	
Swapping	Cold swap		Yes			
	Hot swap		Yes, depending on NIM and whether module is mandatory. See table on page 43			
Isolation	Between channels and logic bus	**V**	1780 ∿ for 1 minute			
	Channel-to-channel	**V**	500 ∿ for 1 minute		1780 ∿ for 1 minute	–
	Logic bus to actuator bus	**V**	1500 ⎓ for 1 minute		–	
Output surge protection (internal)			Yes, by GMOV (300 V rms, 385 V ⎓, 400 Joules max. for 20 µs, 0.1 W max.) *(1)*		External 5 A fuse required	Transient voltage by varistance and RC
Leakage current (at state 0)		**mA**	–		2 at 132 V ∿ max.	2.5 at 230 V ∿ 2 at 115 V ∿
Maximum peak current per relay/channel		**A**	Capacitive load of 20 at t = 10 ms		30 over 1 period 20 over 2 periods	
Minimum load current		**mA**	50		1	5
Fallback onCOM fault	Default state		2 relays de-energized		Both channels to 0	
	User-configurable setting *(2)*		Fallback state: hold last value or set to predefined value (0 or 1) on each channel individually			
Reset on COM fault	Default state		Manual: Reset by user required			
	User-configurable setting *(2)*		–		Manual or automatic reset	
I/O base (included in kits)			STB XBA 2000	STB XBA 3000	STB XBA 2000	
Power Distribution Module (PDM)	Coil voltage	**V**	24 ⎓		–	
	Model		STB PDT 3100/3105		STB PDT 2100/2105	
	Coil protection		10 A time-lag fuse on PDM module		–	
Operating temperature, horizontal mounting		**°C**	-25…60 *(3)*		0…60	
Current consumption on 5 V ⎓ logic bus		**mA**	55	55	70	45

(1) For greater protection, an RC circuit, a freewheel diode or a GMOV peak limiter appropriate to the voltage should be mounted in parallel across the terminals of each actuator.
(2) Requires the Advantys STP SPU 1●●● configuration software.
(3) -25…70°C in the following conditions:
- *only one N/O channel at any time, to be ensured by the application. Example: control of both directions of motor travel*
- *Maximum load: 2 A for STB DRC 3210, 4 A for STB DRA 3290*
- *Maximum supply voltage 24.5 V ⎓*

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Advantys STB distributed I/O solution
Digital I/O modules
Connection kits

References

The references for input or output modules with connection kit include all the items needed to use the modules:
- Suitable base for the module
- "K" references: screw-type connectors and spring-type connectors
- "KS" references: screw-type connectors
- "KC" references: spring-type connectors

Basic digital input modules: connection kits

Input voltage	Connectors	Number of channels	Compliance with IEC/EN 61131-2	Reference	Weight kg
24 V ⎓	screw-type and spring-type	4	Type 1+	**STB DDI 3425 K**	0.111
		6	Type 1	**STB DDI 3615 K**	0.112
	screw-type	16	Type 3	**STB DDI 3725 KS**	0.086
	spring-type			**STB DDI 3725 KC**	

Standard digital input modules: connection kits

Input voltage	Connectors	Number of channels	Compliance with IEC/EN 61131-2	Reference	Weight kg
24 V ⎓	screw-type and spring-type	2	Type 2	**STB DDI 3230 K**	0.110
		4	Type 1+	**STB DDI 3420 K**	0.111
		6	Type 1	**STB DDI 3610 K**	0.112
115 V ∿		2	Type 1	**STB DAI 5230 K**	0.120
115 V ∿ (external supply)		2 (isolated)	Type 1	**STB DAI 5260 K**	0.065
230 V ∿		2	Type 1	**STB DAI 7220 K**	0.122

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Advantys STB distributed I/O solution
Digital I/O modules
Connection kits

References (continued)

Basic digital output modules: connection kits

Output voltage	Connectors	Output current	Number of channels	Compliance with IEC/EN 61131-2	Reference	Weight kg
24 V ⎓	screw-type and spring-type	0.25 A	4	Yes	**STB DDO 3415 K**	0.110
			6	Yes	**STB DDO 3605 K**	0.114
	screw-type spring-type	0.5 A	16	Yes	**STB DDO 3705 KS** **STB DDO 3705 KC**	0.086

Standard digital output modules: connection kits

Output voltage	Connectors	Output current	Number of channels	Compliance with IEC/EN 61131-2	Reference	Weight kg
24 V ⎓	screw-type and spring-type	0.5 A	2	Yes	**STB DDO 3200 K**	0.112
		2 A	2	Yes	**STB DDO 3230 K**	0.116
		0.5 A	4	Yes	**STB DDO 3410 K**	0.110
			6	Yes	**STB DDO 3600 K**	0.114

Standard relay output modules: connection kits

Output voltage	Connectors	Output current	Number of channels	Compliance with IEC/EN 61131-2	Reference	Weight kg
24 V ⎓ or 115/ 230 V ∼ (relay)	screw-type and spring-type	2 A	2	Yes	**STB DRC 3210 K**	0.130
		7 A	2	Yes	**STB DRA 3290 K**	0.130

Standard triac output modules: connection kits

Output voltage	Connectors	Output current	Number of channels	Compliance with IEC/EN 61131-2	Reference	Weight kg
115 V ∼	screw-type and spring-type	2 A	2 (isolated)	Yes	**STB DAO 5260 K**	0.067
115/ 230 V ∼			2	Yes	**STB DAO 8210 K**	0.125

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Advantys STB distributed I/O solution

Digital I/O modules

Modules only



STB DDI 3230



STB DDO 3200



STB DRC 3210



STB DRA 3290

References

Basic digital input modules: modules only

Input voltage	Number of channels	Compliance with IEC/EN 61131-2	Reference	Weight kg
24 V ⎓	4	Type 1+	**STB DDI 3425**	0.111
	6	Type 1	**STB DDI 3615**	0.112
	16	Type 3	**STB DDI 3725**	0.086

Standard digital input modules: modules only

Input voltage	Number of channels	Compliance with IEC/EN 61131-2	Reference	Weight kg
24 V ⎓	2	Type 2	**STB DDI 3230**	0.110
	4	Type 1+	**STB DDI 3420**	0.111
	6	Type 1	**STB DDI 3610**	0.112
115 V ∿	2	Type 1	**STB DAI 5230**	0.120
115 V ∿ (external supply)	2 (isolated)	Type 1	**STB DAI 5260**	0.065
230 V ∿	2	Type 1	**STB DAI 7220**	0.122

Basic digital output modules: modules only

Output voltage	Output current	Number of channels	Compliance with IEC/EN 61131-2	Reference	Weight kg
24 V ⎓	0.25 A	4	Yes	**STB DDO 3415**	0.110
		6	Yes	**STB DDO 3605**	0.114
	0.5 A	16	Yes	**STB DDO 3705**	0.086

Standard digital output modules: modules only

Output voltage	Output current	Number of channels	Compliance with IEC/EN 61131-2	Reference	Weight kg
24 V ⎓	0.5 A	2	Yes	**STB DDO 3200**	0.112
	2 A	2	Yes	**STB DDO 3230**	0.116
	0.5 A	4	Yes	**STB DDO 3410**	0.110
		6	Yes	**STB DDO 3600**	0.114

Standard relay output modules: modules only

Output voltage	Output current	Number of channels	Compliance with IEC/EN 61131-2	Reference	Weight kg
24 V ⎓ or 115/230 V ∿ (relay)	2 A	2	Yes	**STB DRC 3210**	0.130
	7 A	2	Yes	**STB DRA 3290**	0.130

Standard triac output modules: modules only

Output voltage	Output current	Number of channels	Compliance with IEC/EN 61131-2	Reference	Weight kg
115 V ∿	2 A	2 (isolated)	Yes	**STB DAO 5260**	0.067
115/230 V ∿	2 A	2	Yes	**STB DAO 8210**	0.125

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Advantys STB distributed I/O solution

Digital I/O modules

Separate parts



STB XBA 1000



STB DDI 3230



STB DDO 3200



STB XBA 2000



STB DRC 3210



STB XBA 3000



STB DRA 3290

References (continued)

Mandatory separate parts *(1)*

Description	Base width	For I/O modules	Reference	Weight kg
I/O bases	13.9 mm	STB DDI STB DDO	**STB XBA 1000**	0.024
	18.4 mm	STB DAI STB DAO STB DRC	**STB XBA 2000**	0.028
	28.1 mm	STB DRA	**STB XBA 3000**	0.048

Description	Characteristics	Connection type	For I/O modules	Reference	Weight kg
Removable terminals Sold in lots of 20 *(2)*	6-way	Screw-type	STB DDI STB DDO	**STB XTS 1100**	0.006
		Spring-type	STB DDI STB DDO	**STB XTS 2100**	0.006
	5-way	Screw-type	STB DAI STB DAO STB DRC STB DRA	**STB XTS 1110**	0.006
		Spring-type	STB DAI STB DAO STB DRC STB DRA	**STB XTS 2110**	0.006
Removable terminals Sold in lots of 2 *(2)*	18-way	Screw-type	STB DDI 3725 STB DDO 3705	**XBT XTS 1180**	0.047
		Spring-type	STB DDI 3725 STB DDO 3705	**STB XTS 2180**	0.034

Optional separate parts

Description	Used for	Sold in lots of	Reference	Weight kg
Keying pins	Modules	60	**STB XMP 7700**	–
	Removable terminals	96	**STB XMP 7800**	–
User-customizable label sheets *(3)*	I/O bases and modules	25	**STB XMP 6700**	–

(1) Except for module/base/connector kits STB D●● ●●●● K/KS/KC
(2) All connectors can accommodate a flexible wire with a maximum cross-section of 1.5 mm², including the cable end. For screw connectors, max. tightening torque = 0.25 Nm.
(3) The template for the user-customizable labels is supplied on the documentation mini-CD-ROM.

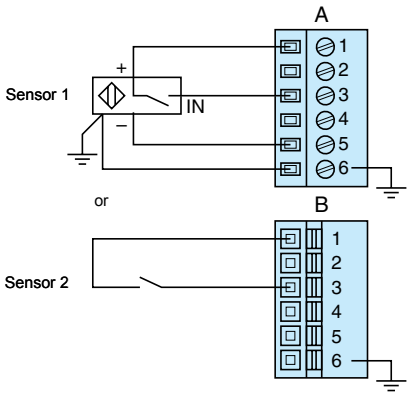
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Digital I/O modules

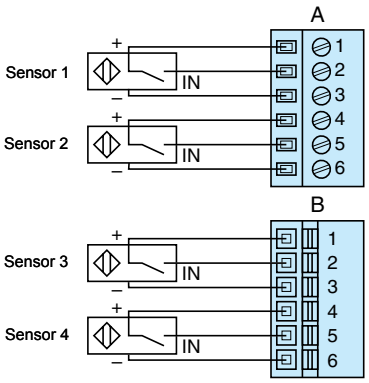
Connections

DC digital input modules

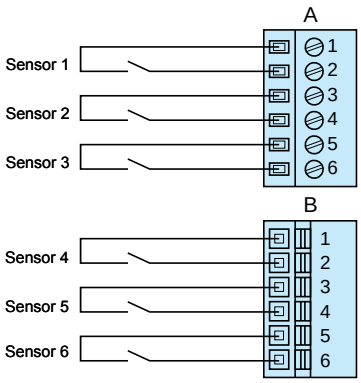
STB DDI 3230



STB DDI 3420/3425

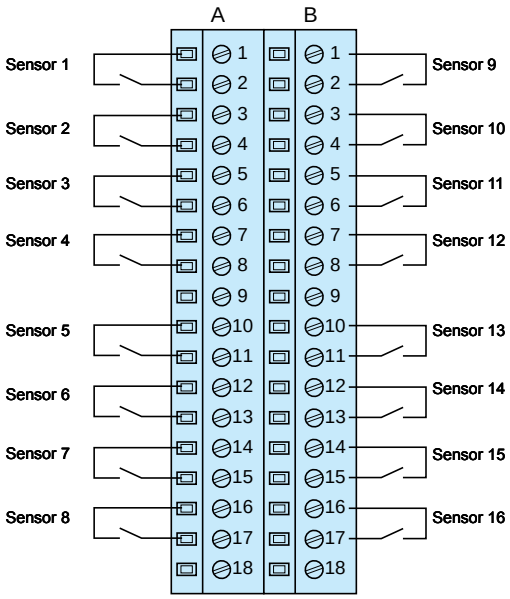


STB DDI 3610/3615

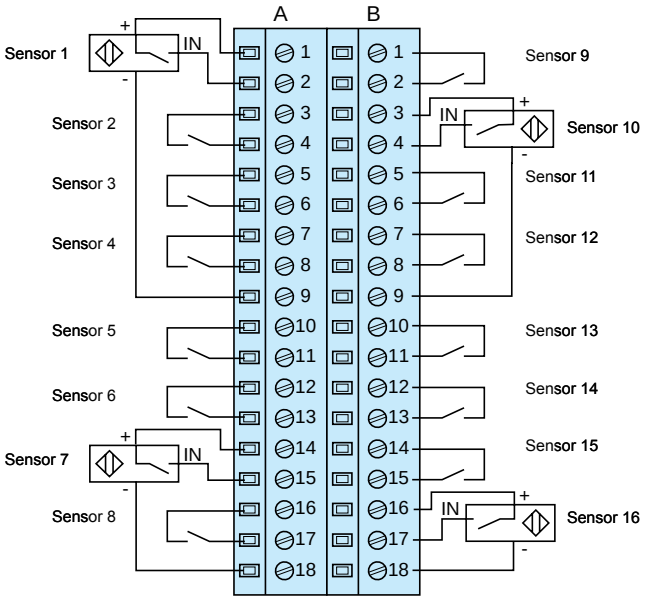


STB DDI 3725

16 two-wire sensors



1 three-wire sensor per input group *(1)*



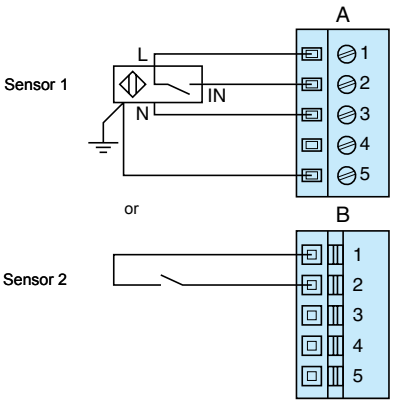
(1) Group 1: Contacts 1 to 9 on connector A
Group 2: Contacts 10 to 18 on connector A
Group 3: Contacts 1 to 9 on connector B
Group 4: Contacts 10 to 18 on connector B

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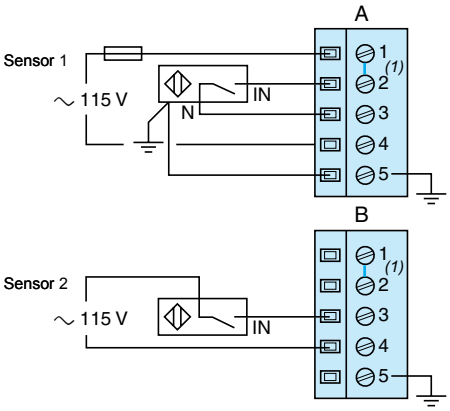
Connections (continued)

AC digital input modules

STB DAI 5230

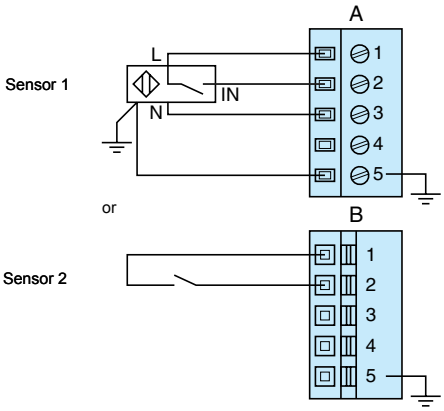


STB DAI 5260



(1) Link internal to module

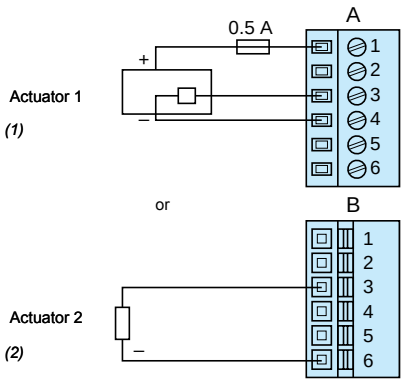
STB DAI 7220



Connections (continued)

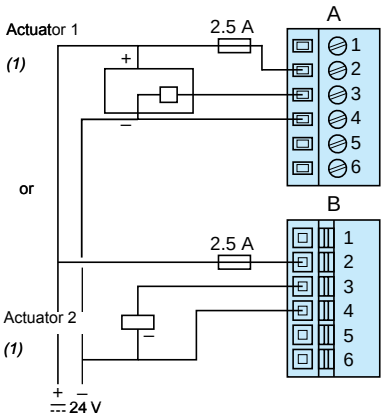
DC digital output modules

STB DDO 3200

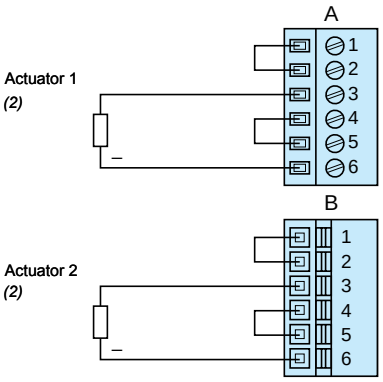


STB DDO 3230

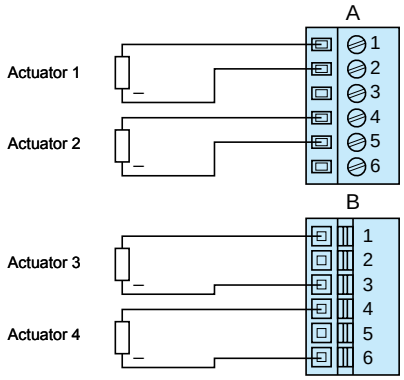
1 three-wire actuator and 1 two-wire actuator with external 24 V ⎓ power supply



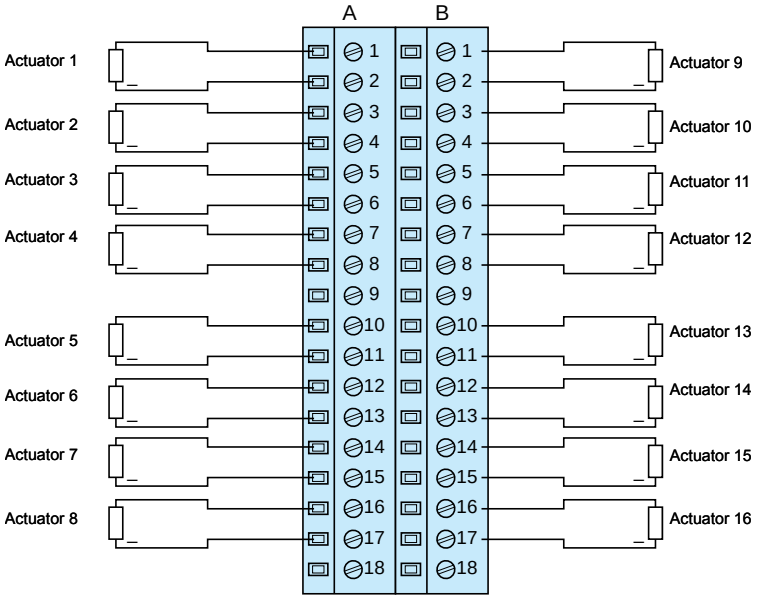
2 two-wire actuators powered via the PDM module



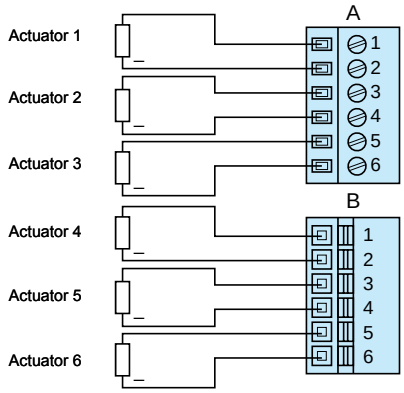
STB DDO 3410/3415



STB DDO 3705



STB DDO 3600/3605



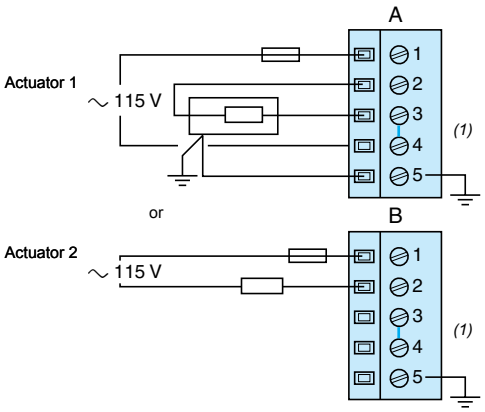
(1) Actuator protected by external fuse (depending on use)
(2) Actuator protected by fuse integrated in Power Distribution Module (10 A fuse with STB PDT 3100/2100 or 5 A fuse with STB PDT 3105/2105)

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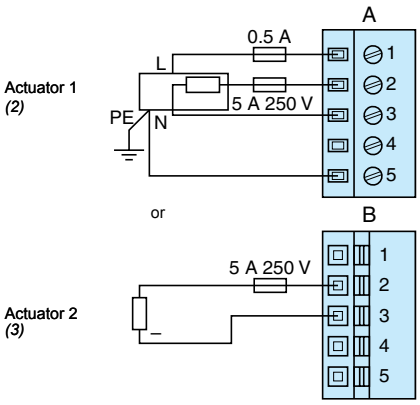
Connections (continued)

AC digital output modules

STB DAO 5260

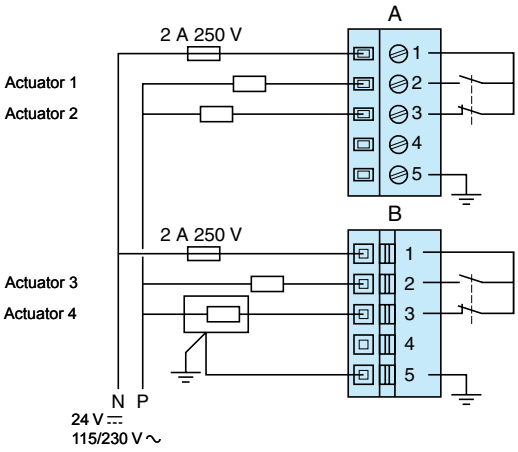


STB DAO 8210

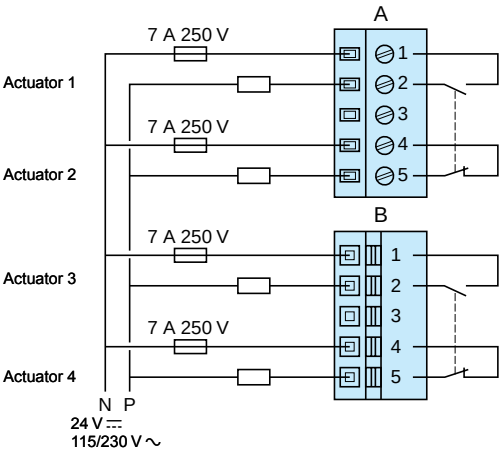


DC/AC (relay) digital output modules

STB DRC 3210



STB DRA 3290



(1) Link internal to module
(2) Actuator protected by external fuse (depending on use)
(3) Actuator protected by fuse integrated in Power Distribution Module (10 A fuse with STB PDT 3100/2100 or 5 A fuse with STB PDT 3105/2105)

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