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# JUMO TYA 203

## Three-phase

### Thyristor power controller

#### for control of resistive/inductive loads

The JUMO TYA 203 is the result of consistent development of JUMO power controller technology and switches resistive and resistive/inductive (transformer) loads via a three-wire circuit. It enables the wiring of the load in a star connection (with and without N conductor) or a delta connection. An open delta connection (six-conductor connection) can also be implemented. The microprocessor controlled power controller displays all parameters in an LCD display with background lighting. It can be operated using the four keys at the front.

Thyristor power controllers are used where larger resistive and resistive/inductive loads have to be switched, e.g. in industrial furnace construction and plastics processing.

The Thyristor power controller with a load current of 20 A can either be clipped to a 35 mm mounting rail or fitted to the wall on a mounting plate.

Devices with a load current greater than 20 A can only be mounted on the wall.

The TYA 203 works in phase angle control mode or in burst firing mode. In burst firing mode, the phase angle of the first half-wave can be cut so that transformer loads can also be operated. All Thyristor power controllers are fitted with a semiconductor fuse.

Available subordinate control loops are U, U<sup>2</sup>, I, I<sup>2</sup>, or P control.

When using the subordinate control loop, power voltage fluctuations during control processes have no influence on the line segment to be controlled.

The option of specifying a base load is available.

To avoid high starting currents, a soft start can be set.

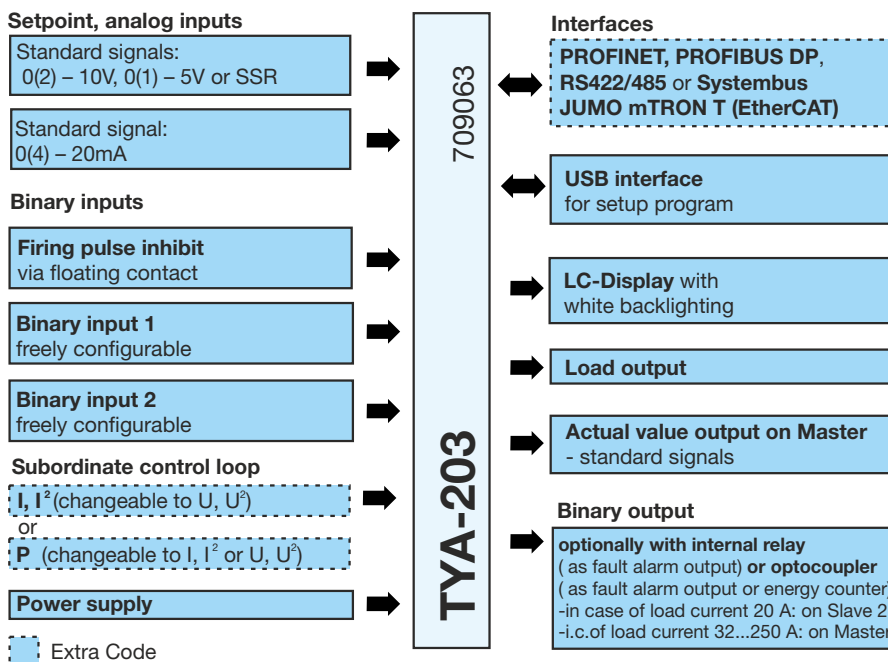
The Thyristor power controllers meet the operating conditions of DIN EN 50178.

The device has to be grounded in accordance with the regulations of the responsible energy supply company.



Type 709063/...

### Block diagram



### Special features

- LCD display with info line
- Simple configuration of the device through plain text display
- Setup program for configuration via USB interface
- Transmission of the setup data is possible even without voltage supply to the device (USB port supplies power)
- Close mounting possible
- Network load optimization through dual energy management
- RS422/485 interface or
- PROFINET, PROFIBUS DP for connection to process control systems
- Systembus JUMO mTRON T or EtherCAT
- Current limiting
- Soft start function
- Phase angle mode
- Alpha start for transformer loads
- Burst firing mode
- Resistance monitoring and limitation for MoSi<sub>2</sub> heating elements
- All versions feature protection type IP20
- Load monitoring for the detection of partial load failure or load short-circuit "Teach-In"
- Integrated diagnostic systems, e.g. rotating field detection
- Dynamic alarm limit monitoring for SIC heating elements
- Energy counter
- UL 508 approval

Approvals/approval marks (see "Technical data")



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## Technical data

### Voltage supply, load current, fan voltage only with 250 A, load current

Code	Voltage supply for control electronics = mains voltage	Fan specifications Type 709063/X-0X-250...
024	AC 24 V -20% to +15%, 48 to 63 Hz	AC 24 V / 3x30 VA
042	AC 42 V -20% to +15%, 48 to 63 Hz	AC 24 V / 3x30 VA
115	AC 115 V -20% to +15%, 48 to 63 Hz	AC 115 V / 3x30 VA
230	AC 230 V -20% to +15%, 48 to 63 Hz	AC 230 V / 3x30 VA
265	AC 265 V -20% to +15%, 48 to 63 Hz	AC 230 V / 3x30 VA
400	AC 400 V -20% to +15%, 48 to 63 Hz	AC 230 V / 3x30 VA
460	AC 460 V -20% to +15%, 48 to 63 Hz	AC 230 V / 3x30 VA
500	AC 500 V -20% to +15%, 48 to 63 Hz	AC 230 V / 3x30 VA
Load current $I_{L\ rms}$	AC 20, 32, 50, 100, 150, 200, 250 A	
Load type	Resistive and resistive/inductive (transformer) loads	
Power consumption of control sections	max. 60 VA	

### Analog inputs

Control signal	0(4) to 20 mA	$R_i = 50\ \Omega$
	0(2) to 10 V	$R_i = 25\ k\Omega$
	0(1) to 5 V	$R_i = 25\ k\Omega$
Setpoint specification	Via standard signals (current, voltage) or interface	
	Base load:	Output as minimum actuating variable
	Maximum actuating variable:	Output as maximum actuating variable
Example: P control		

### Digital inputs

Digital input 1, 2	For connection to potential-free contact or optocoupler, surge proof up to max. DC 32 V
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### Digital outputs, actual value output

Relay (changeover contact) without contact protection circuit	30000 switching operations at a switching capacity of AC 230 V / 3 A (1.5 A), 50 Hz B300 (UL 508)
Optocoupler output	$I_{Cmax} = 2\ mA$ , $U_{CE0max} = 32\ V$
Optocoupler as energy counter	Adjustment range: Number of pulses per kWh: 1...10000 Pulse length: 30 ms to 2 sec.
Actual value output	Switched off as standard With standard signal, voltage: 0 to 10 V, 2 to 10 V, 0 to 5 V, or 1 to 5 V With standard signal, current: 0 to 20 mA or 4 to 20 mA (burden max. 500 $\Omega$ ) Depending on the device type, various internal measured variables such as load current, load voltage, or power can be output

Thyristor control	Setpoint specification Current input (can carry current up to 25 mA)	Setpoint specification Voltage input (surge proof up to max. DC 32 V)	Setpoint specification Digital input1, 2 (surge proof up to max. DC 32 V)	Via interface
Continuous	The power controller provides the power for the load continuously depending on the configured setpoint specification.	-	-	Possible

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Logic (Solid state relay SSR)	The power controller acts like a switch and switches the load ON and OFF. The switching threshold is always in the middle of the configured current/voltage range. At 4 to 20 mA, it is 12 mA; at 0 to 10 V, it is 5 V.	OFF logical "0" = 0 to 0.8 V; ON logical "1" = 2 to 32 V	Possible
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## General specifications

Circuit options	- Delta connection (three-wire circuit) - Star connection without neutral wire (three-wire circuit) - Star connection with neutral wire (four-wire circuit) - Open delta connection (six-wire circuit)
Operating modes	- Phase angle control and burst firing mode for resistive or transformer load with soft start - Alpha start for transformer loads
Load types	All resistive loads up to and including transformer loads are permitted. In the case of transformer loads, the nominal induction of 1.2 tesla must not be exceeded (value is 1.45 T in the case of mains overvoltage).
Special features	In the case of phase angle control operation, symmetrical current flow in all three phases
Subordinate control loop	U <sup>2</sup> configured as standard, can be freely adjusted to U, I, I <sup>2</sup> , P control depending on device type
Electrical connection	For type 709063/X -0X-020... Control and load leads are connected via screw terminals From type 709063/X -0X-032... Control cables are connected via screw terminals and load leads via cable lugs DIN 46235 and DIN 46234 or tubular cable lugs
Operating conditions	The power controller is designed as a built-in device according to EN 50178, pollution degree 2, overvoltage category Ü III
Electromagnetic compatibility	According to DIN 61326
Interference emission	Class B
Interference immunity	Industrial requirements
Protection type	All device types IP20 according to EN 60529
Protection rating	Protection rating I, with isolated control circuitry for connection to SELV circuits
Admissible ambient temperature range	0 to 40°C with forced air cooling using fan for type 709063/X-0X-250... 0 to 45°C with air self-cooling (expanded temperature range class 3K3 according to EN 60721-3-3) At higher temperatures, use with reduced type current is possible (as of 45°C with type current -2%/°C)
Admissible storage temperature range	-30 to +70°C (1K5 according to EN 60721-3-1)
Altitude	≤ 2000 m above MSL Caution: At site altitudes > 1000 m above MSL, the ampacity of the power controller decreases by 0.86% per 100 m
Cooling	- Natural convection up to a load current of 200 A - Above 200 A of load current, forced convection with installed fan - At installation heights over 1000 m, the ampacity of the power controller decreases
Resistance to climatic conditions	Relative humidity ≤ 85% annual average, no condensation 3K3 according to EN 60721
Installation position	Vertical
Test voltage	According to EN 50178
Creepage distances	8 mm between mains circuit and SELV circuits with type 709063/X -0X-020..., 12.7 mm between mains circuit and SELV circuits with type 709063/X -0X-032..., SELV = Separate Extra Low Voltage
Housing	Plastic, flammability class UL94 V0, color: cobalt blue RAL 5013
Power loss	The power loss can be calculated using the following empirical formula: $P_v = 3 \times (20 W + 1.3 V \times I_{Load} A)$
Maximum temperature of the cooling body	110°C
A/D converter resolution	12 bit

## Weight

Load current	20 A	32 A	50 A	100 A	150 A	200 A	250 A
Weight	Approx. 3.3 kg	Approx. 6.3 kg	Approx. 8.1 kg	Approx. 11.4 kg	Approx. 25.5 kg	Approx. 28.5 kg	Approx. 30.6 kg

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**Approvals / approval marks**

Approval mark	Testing agency	Certificates/certification numbers	Inspection basis	Valid for type
	Underwriters Laboratories	20150630-E223137	UL 508 (Category NRNT), pollution degree 2 C22.2 NO. 14-10 Industrial Control Equipment (Category NRNT7)	709063/X-XX-020-... Load current 20 A
			UL 508 (Category NRNT) C22.2 NO. 14-10 Industrial Control Equipment (Category NRNT7)	709063/X-XX-032-... 709063/X-XX-050-... 709063/X-XX-100-... 709063/X-XX-150-... 709063/X-XX-200-... 709063/X-XX-250-... Load current 32 to 250 A

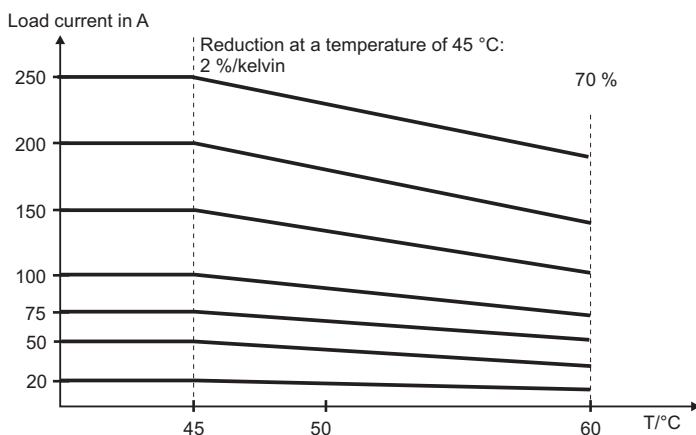
**Display and measuring accuracy**

All specifications refer to the controller nominal data.

The values in brackets apply to the three-wire circuit as of a phase angle of  $\leq 120^\circ$ el.

<b>Mains voltage: <math>\pm 2.5\%</math></b> 	<b>Load current: <math>\pm 1\%</math> (2%)</b> 	<b>Load voltage: <math>\pm 1\%</math> (2.5%)</b> 	<b>Power: <math>\pm 2\%</math> (4%)</b> 
<b>Analog input Voltage/current: <math>\pm 1\%</math></b> 	<b>Analog output Voltage/current: <math>\pm 1\%</math> (2.5%)</b> 	<b>Load resistance: <math>\pm 2\%</math> (4%) (for resistive load)</b> 	

**Permissible load current depending on the ambient temperature and the site altitude**



**Important information:**

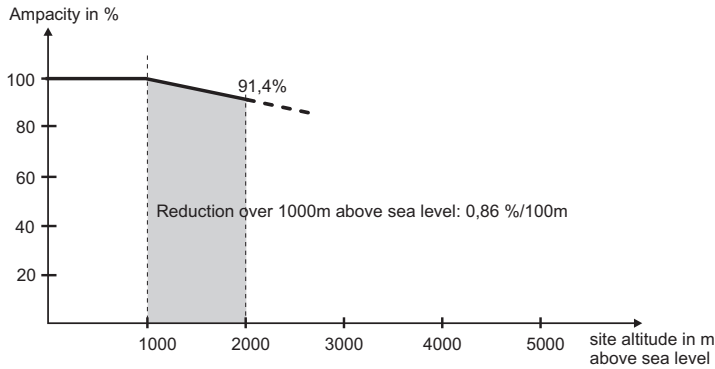
If a device temperature exceeds 105°C, the load current is gradually reduced each time the temperature increases by one degree.

At a device temperature of > 115°C, the power controller current is completely switched off.

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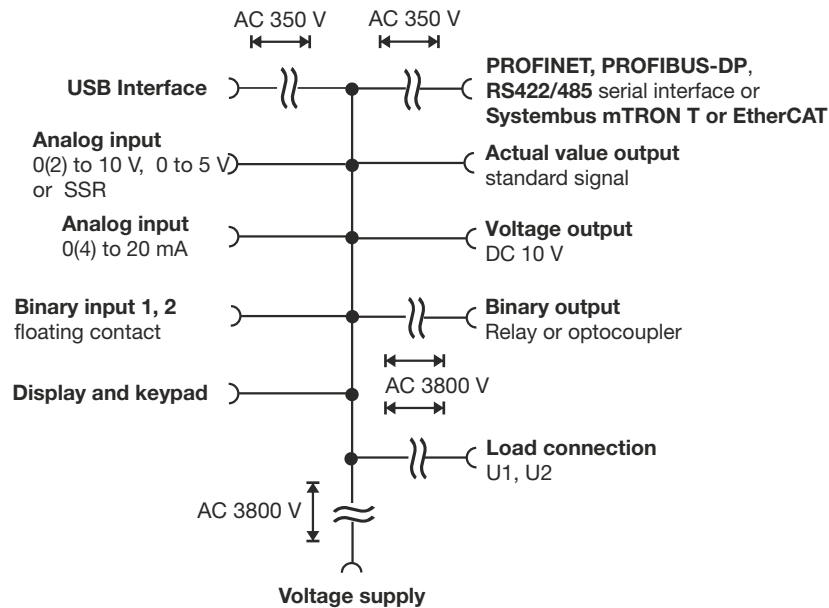


**Important information:**

The altitude is ≤ 2000 m above MSL.

In the case of air cooling, it must be noted that the effectiveness of the cooling is reduced the higher up the site altitude at which the device is installed. As a result, the ampacity of the Thyristor controller decreases with the stated cooler as the site altitude increases, as shown here in the diagram.

**Galvanic isolation**



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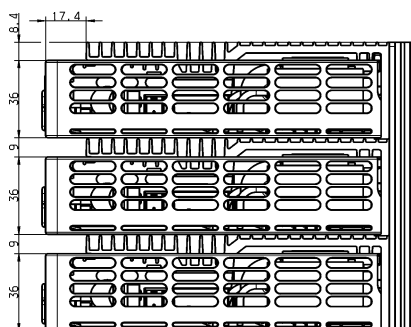
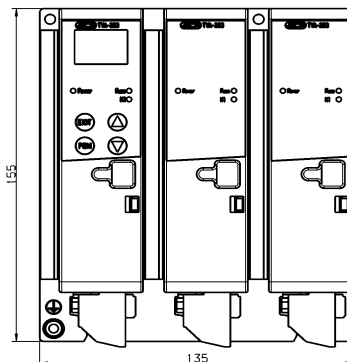
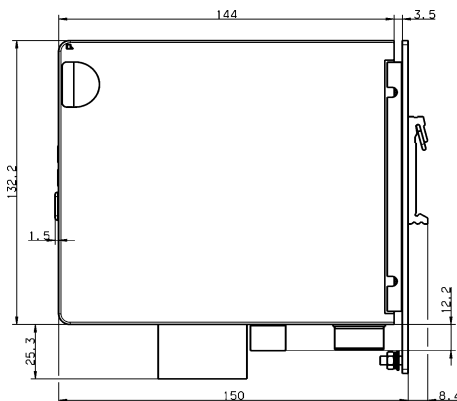


## Display, operating, and connection elements

Legend	Comment	Diagram
1	The Power LED (green) is permanently lit when the voltage supply is connected.	
2	LCD display with white backlight (96 x 64 pixels) (no LCD display on slave devices on the right). The information line at the bottom of the display shows the current settings and error messages.	
3	Fuse LED (red) is lit in the event of a defective semiconductor fuse.	
4	LED K1 (yellow) fault signal output	
5	<b>Keys:</b> Value increase / previous parameter Value reduction / next parameter Cancel / back one level Programming / one level deeper (no keys on slave devices on the right)	
6	<b>USB setup interface</b> The configuration is made on the left device (master) and automatically transferred to both slaves via a 1:1 patch cable.	
7	Spring clip to release the plastic housing (press toward right)	

## Dimensions

Type 709063/X-0X-20A-XXX-XXX-XX-25X



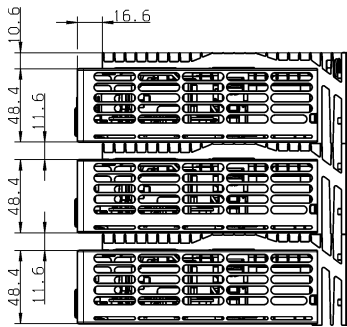
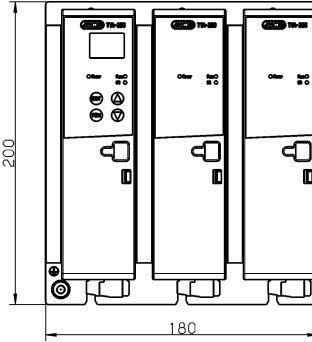
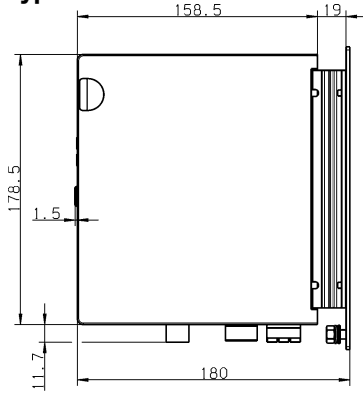
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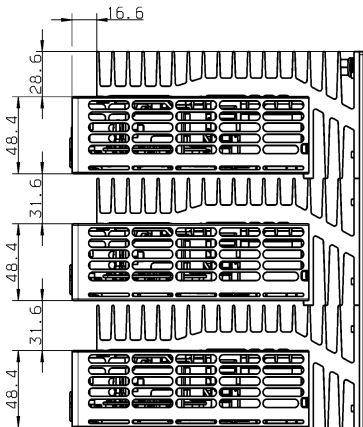
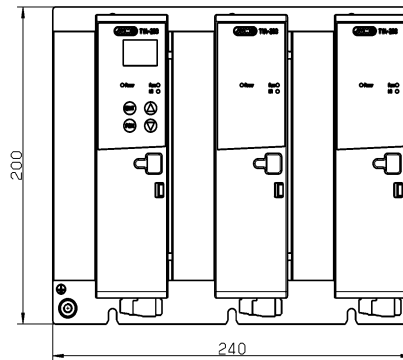
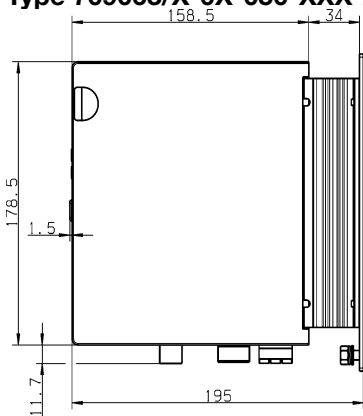
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**Type 709063/X-0X-032-XXX-XXX-XX-25X**



**Type 709063/X-0X-050-XXX-XXX-XX-25X**



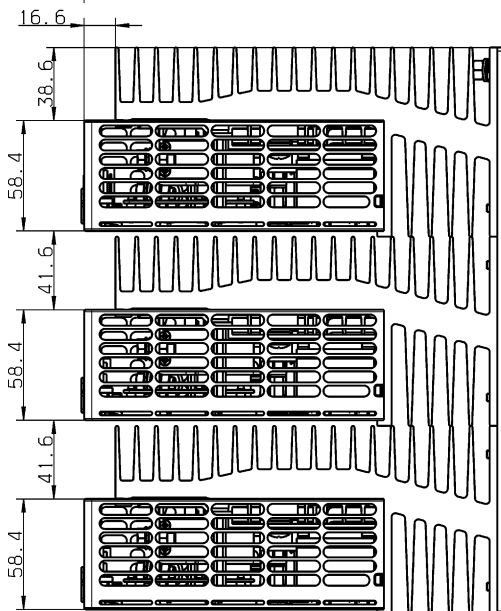
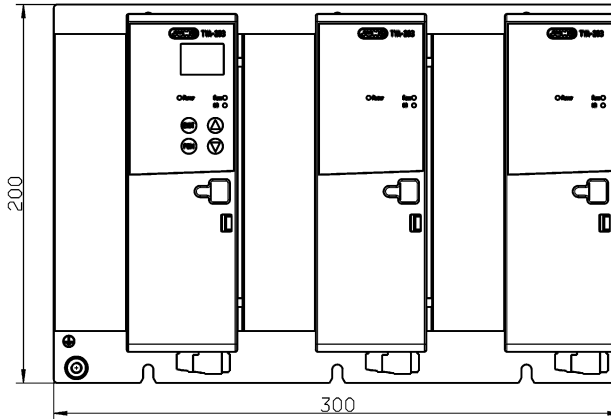
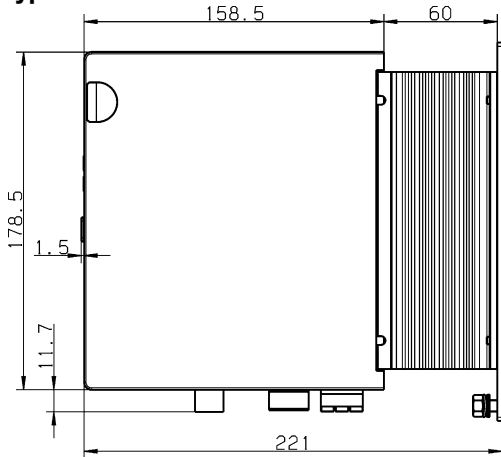
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**Type 709063/X-0X-100-XXX-XXX-XX-25X**





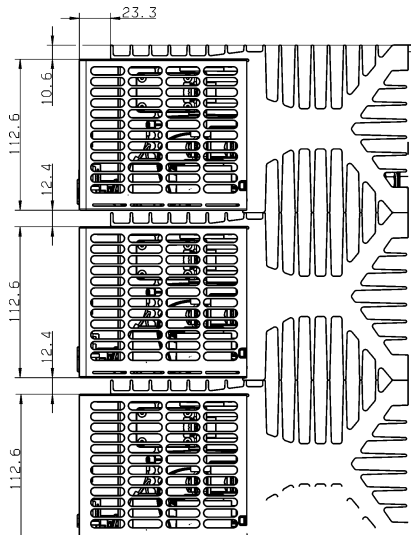
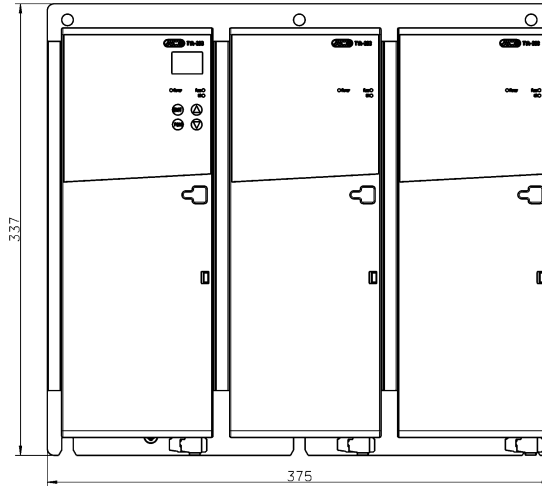
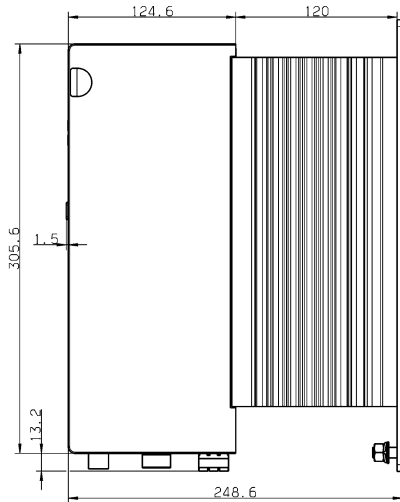
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**Type 709063/X-0X-150-XXX-XXX-XX-25X**  
**Type 709063/X-0X-200-XXX-XXX-XX-25X**



**Clearances (all types)**

- Allow a clearance of 10 cm from the floor
- Allow a clearance of 15 cm from the ceiling
- When devices are fitted in close mounting, no spacing is required

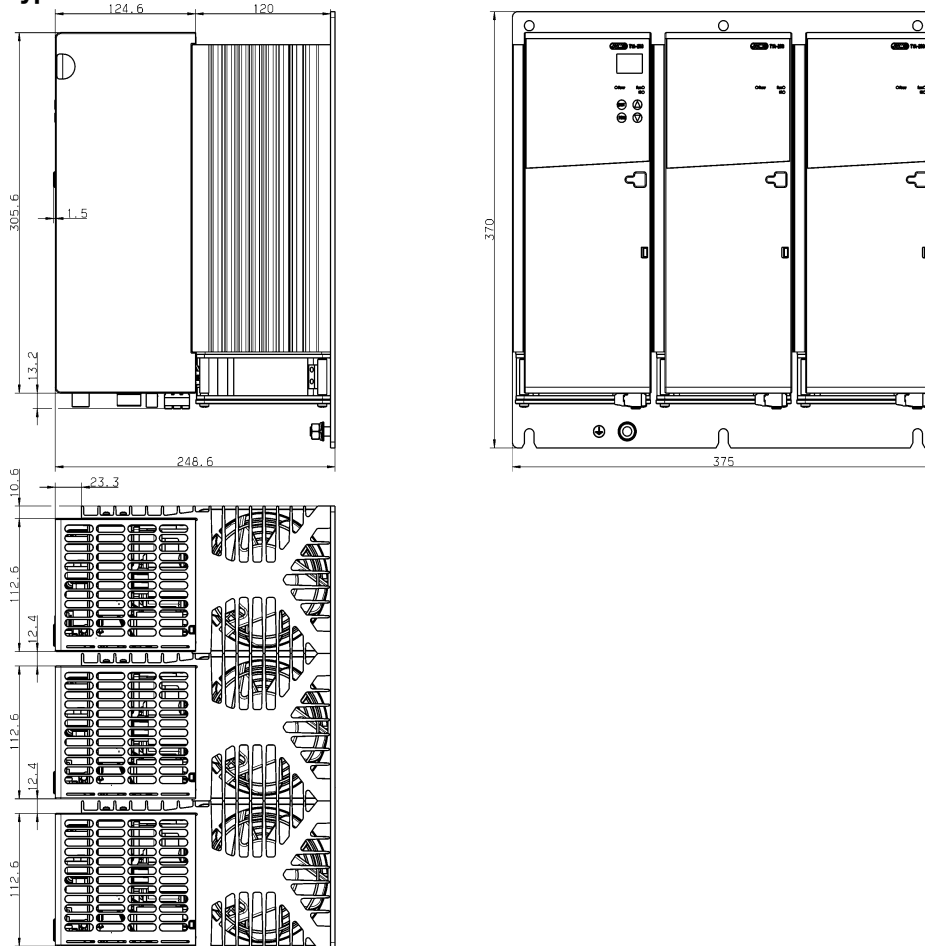
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**Type 709063/X-0X-250-XXX-XXX-XX-25X**



**Maximum tightening torques for screw connections**

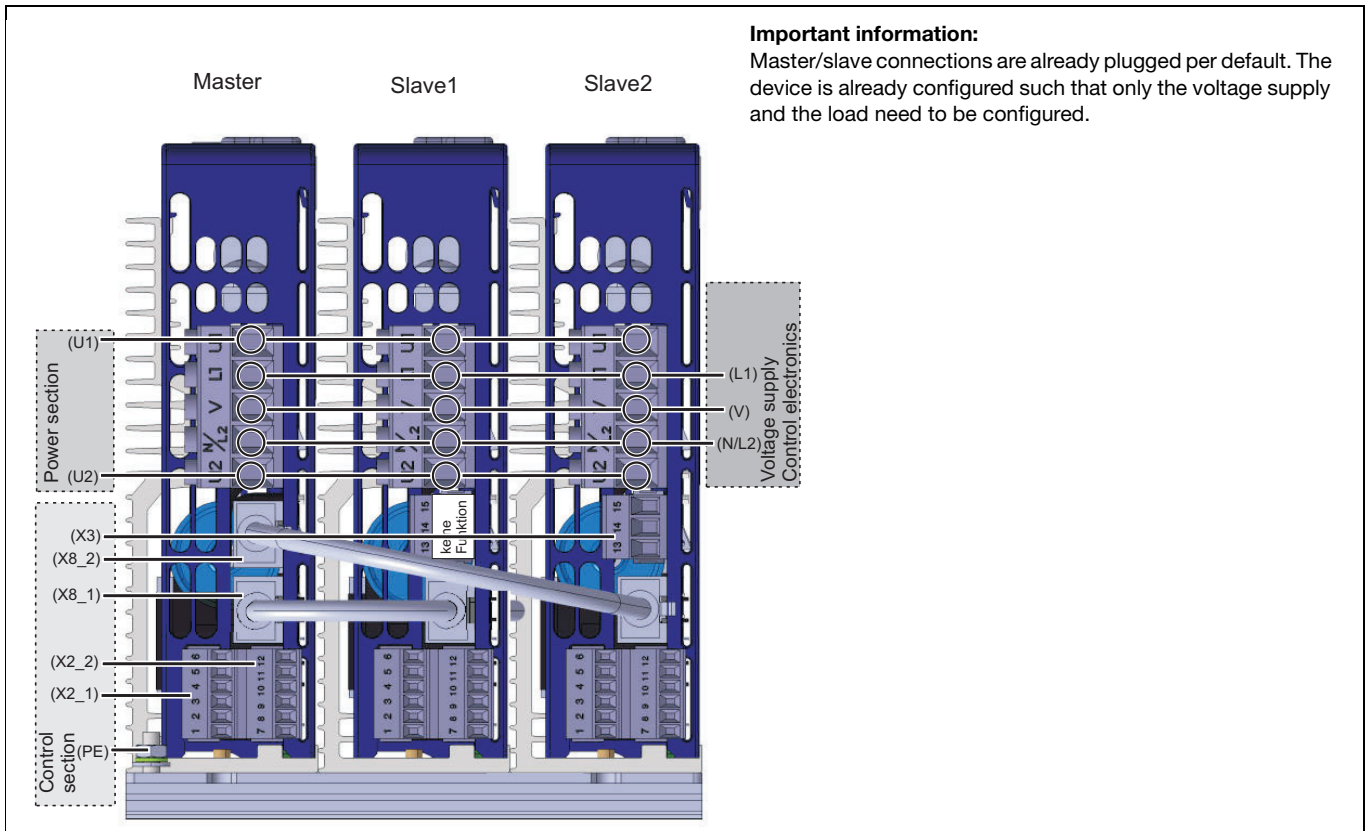
Terminals	Version	Tightening torque
<b>For all types</b> X2_1 number 1 to 6, X2_2 number 7 to 12, and Modbus RS422/485 (terminal 16, 17, 18, 19)	Pluggable screw terminals (slotted screws)	0.25 Nm
X3 number 13, 14, 15	Pluggable screw terminals (slotted screws)	0.5 Nm
<b>Type 709063/X-0X-020...</b> Terminal block U1, U2, N/L2, V, L1 Ground terminal PE:	Pluggable screw terminals (recessed head screws) Threaded pin M4 with nut	0.6 Nm 3 Nm
<b>Type 709063/X-0X-032 and type 709063/X-0X-050...</b> U1, U2: Terminal block N/L2, V, L1 Ground terminal PE:	M6 recessed head screws Pluggable screw terminals (slotted screws) Threaded pin M6 with nut	5 Nm 0.5 Nm 5 Nm
<b>Type 709063/X-0X-100...</b> U1, U2: Terminal block N/L2, V, L1 Ground terminal PE:	Hex-headed screw M6, width across flats 10 mm Pluggable screw terminals (slotted screws) Threaded pin M6 with nut	5 Nm 0.5 Nm 5 Nm
<b>Type 709063/X-0X-150..., 709063/X-0X-200, and type 709063/X-0X-250...</b> U1, U2: Terminal block N/L2, V, L1 Ground terminal PE:	Hex-headed screw M8, width across flats 13 mm Pluggable screw terminals (slotted screws) Threaded pin M8 with nut	12 Nm 0.5 Nm 12 Nm
<b>Type 709063/X-0X-250...</b> X14 number 20, 21	Pluggable screw terminals (slotted screws)	0.5 Nm



## Connection diagram

The connection diagram in the data sheet provides preliminary information about the connection options. For the electrical connection only use the installation instructions or the operating manual. The knowledge and the correct technical execution of the safety information and warnings contained in these documents are mandatory for mounting, electrical connection, startup, and for safety during operation.

### Type 709063/X-0X-20-XXX-XXX-XX-25X



Power section		
Connection for	Screw terminals, control section/power section	Detail
Voltage supply for control electronics (corresponds to mains voltage of ordered device type)	L1 N/L2 V	
Load connection	U1 U2	
Protection conductor	PE	
Fan X14	20, 21 (only for load current of 250 A)	

### Control section

Connection for	Screw terminal X2_1	Detail
Setpoint specification for current input	1 2	

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Setpoint specification for voltage input (surge proof up to max. DC 32 V)	3 (GND) 4	(for continuous control)	
Binary input SPS 0/24 V ON logical „1“ = DC +5...32 V OFF logical „0“ = DC 0...< 5 V	3 (GND) 4	(for SPS-Logic signals)	
Output DC 10 V fixed voltage	5		
Ground potential	6 (GND)		

Connection for	Screw terminal X2_2	Detail
Firing pulse inhibit ON logical "1" = DC 2 to 32 V OFF logical "0" = DC 0 to 0.8 V	8 7 (GND)	
Digital input1 ON logical "1" = DC 2 to 32 V OFF logical "0" = DC 0 to 0.8 V	9 11 (GND)	
Digital input2 ON logical "1" = DC 2 to 32 V OFF logical "0" = DC 0 to 0.8 V	10 11 (GND)	
GND	7, 11	Ground potential
Analog output for various internal controller variables	12	

**Master-slave connection**

Connection for	RJ 45 socket X8_1 and X8_2
Master-Slave1 and Master-Slave2	Both 1:1 patch cables (included in scope of delivery) must be plugged for correct operation (X8_1 connection to Slave1, X8_2 connection to Slave2). If the patch cables are mixed up on the master, the device reports a rotary field error.

**Fault signal output**

Connection for	Screw terminal X3	Detail
Relay or optocoupler is on Slave2 at load current of 20 A and on Master at 32...250 A	13 N/O contact or collector	
	14 N/C contact	
	15 pole or emitter	

**Interfaces (option)**

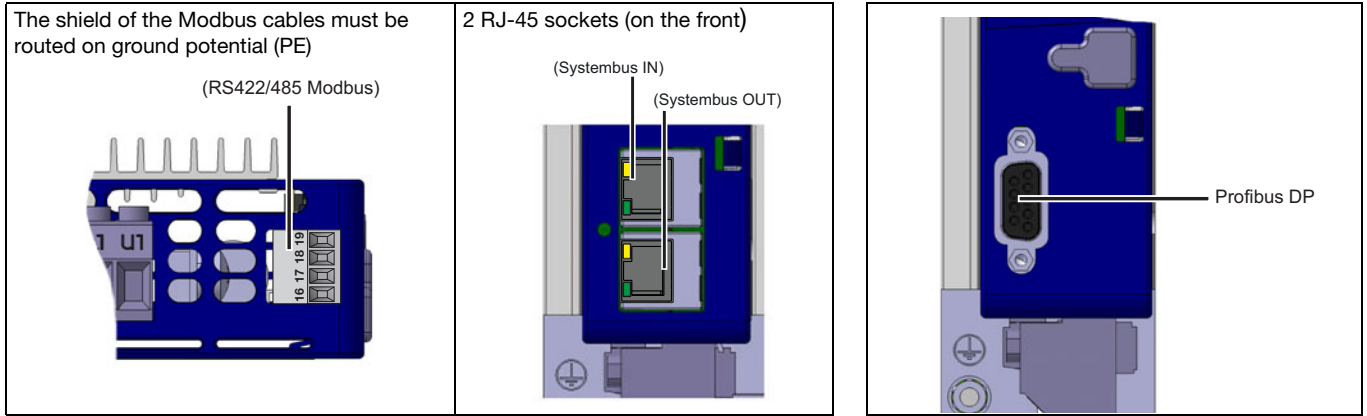
Modbus connection	RS422	RS485	JUMO mTRON T system bus EtherCAT conf. tested or PROFINET
 Pluggable screw terminals on the underside of the housing	TxD (-)	RxD/TxD B(-)	1 TX+
	TxD (+)	RxD/TxD A(+)	2 TX-
	RxD (-)	-	3 RX+
	RxD (+)	-	6 RX

Connection	PROFIBUS-DP
SUB-D socket 9-pin (on the front)	3 A(+)
	8 B(-)
	6 VCC
	5 GND
	Shielding

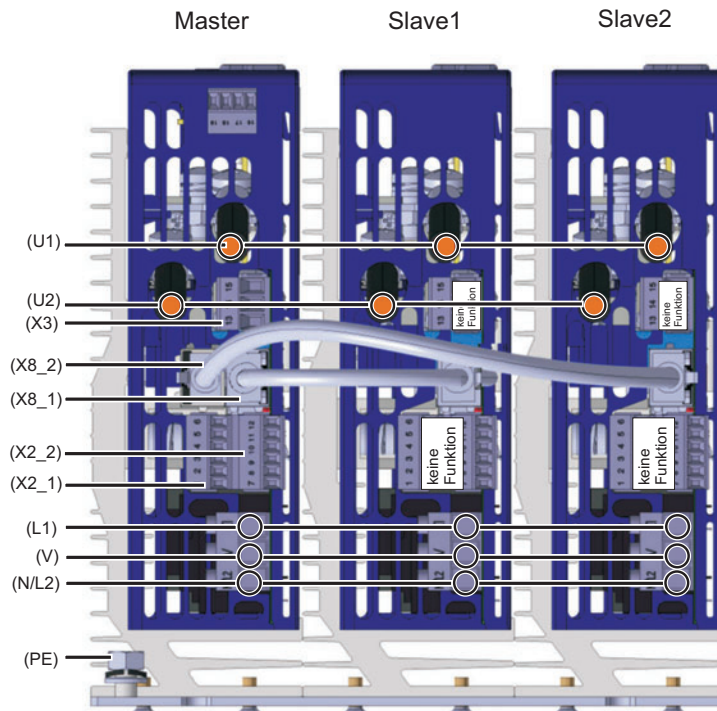
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Type 709063/X-0X-032-XXX-XXX-XX-25X



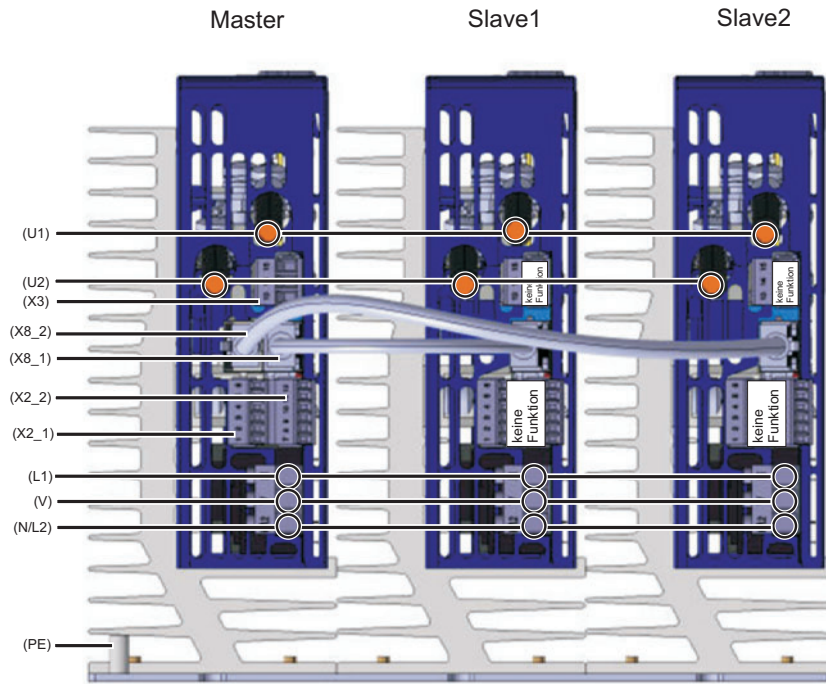
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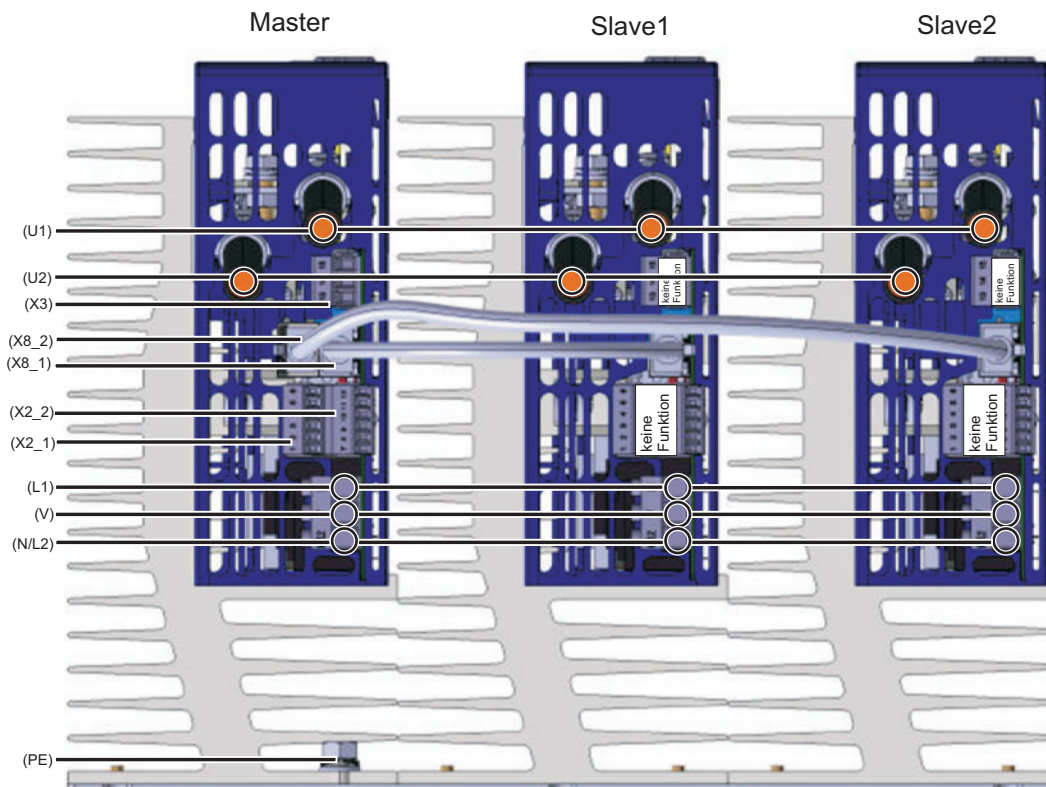
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**Type 709063/X-0X-050-XXX-XXX-XX-25X**



**Type 709063/X-0X-100-XXX-XXX-XX-25X**



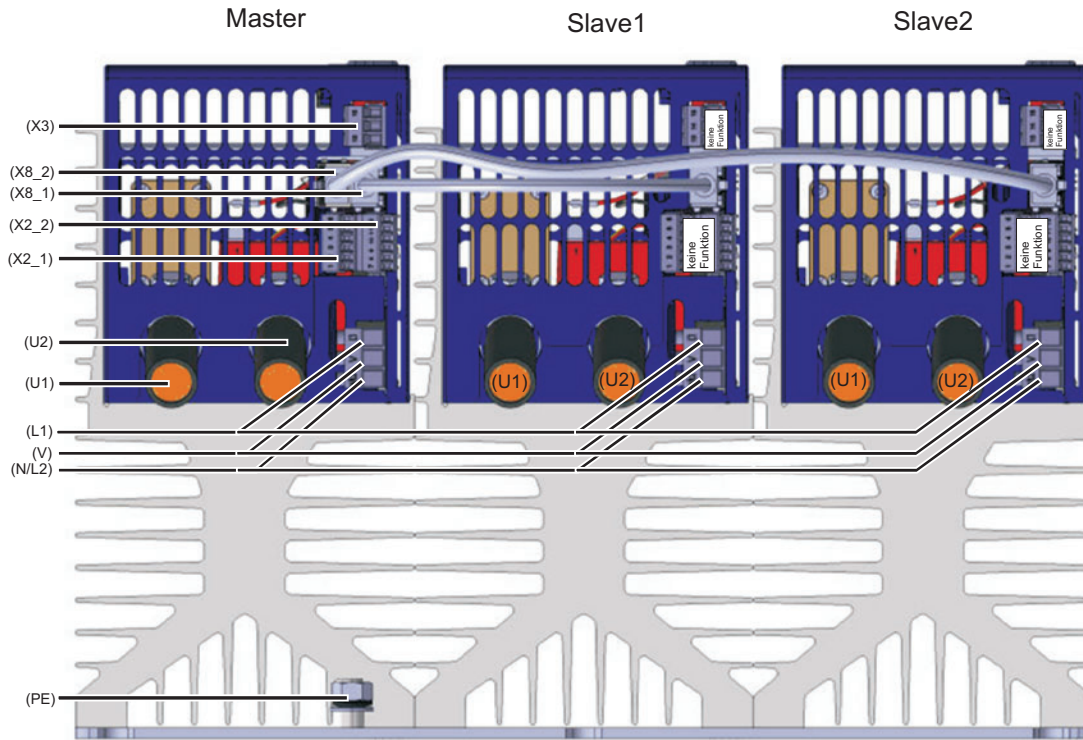
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**Type 709063/X-0X-150-XXX-XXX-XX-25X,  
 Type 709063/X-0X-200-XXX-XXX-XX-25X**



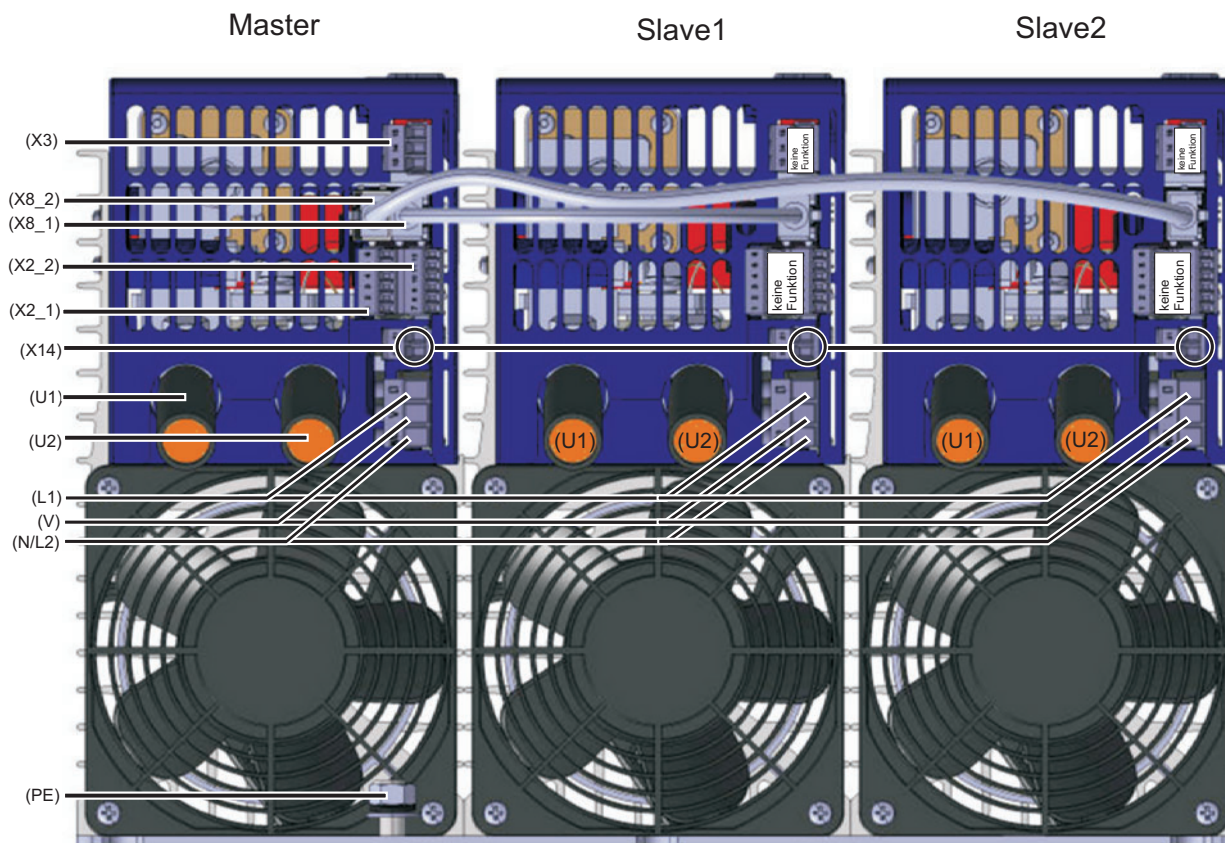
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**Type 709063/X-0X-250-XXX-XXX-XX-25X**



**Example:**

**Fan voltage supply with type 709063/X-0X-250-XXX-400-XX-25X**

Depending on the mains voltage of the power controller, all three X14 fan terminals must be supplied with the voltage specified below.

The lead protection must be between **2 A** and a **maximum of 5 A**.

The fan is temperature-controlled, switches on automatically when the device temperature reaches 85°C, and remains in operation until the device temperature falls below 70°C.

Mains voltage of the power controller	Tolerances	Fan specifications
Mains voltage AC 24 V	-20 to +15%, 48 to 63 Hz	AC 24 V / 3×30 VA
Mains voltage AC 42 V		
Mains voltage AC 115 V	-15 to +10%, 48 to 63 Hz	AC 115 V / 3×30 VA
Mains voltage AC 230 V		
Mains voltage AC 265 V	-15 to +10%, 48 to 63 Hz	AC 230 V / 3×30 VA
Mains voltage AC 400 V		
Mains voltage AC 460 V		
Mains voltage AC 500 V		



## Wiring

### Delta connection (three-wire circuit)

For 3-wire connection the terminals V of master, slave1 and slave2 must be connected, but **not connected to N!**

### Star connection without neutral wire (three-wire circuit)

For 3-wire connection the terminals V of master, slave1 and slave2 must be connected, but **not connected to N!**

### Star connection with neutral wire (four-wire circuit)

For 4-wire connection the terminals V of master, slave1 and slave2 must be connected and **connected to N!**

The star point of the load **must also be connected to N!**

This circuit example can only be applied in TN-Systems. In TT-Systems additionally the neutral conductor has to be switched with S1 and S2.

#### Attention:

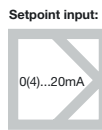
Make sure that the rotating electrical field of L1, L2 and L3 is right-handed!

Note the correct sequence! ↻		
Master (L1)	Slave1 (L2)	Slave2 (L3)

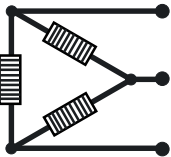
$$U_{Thy} = U_L$$

$$I_{Thy} = \frac{P_{tot}}{3 \cdot U_N} = \frac{P_{tot}}{\sqrt{3} \cdot U_L}$$

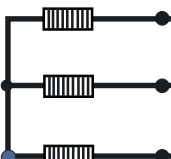
$$I_{Thy} = I_L$$



Ohmic load in a delta connection



Ohmic load in a star connection



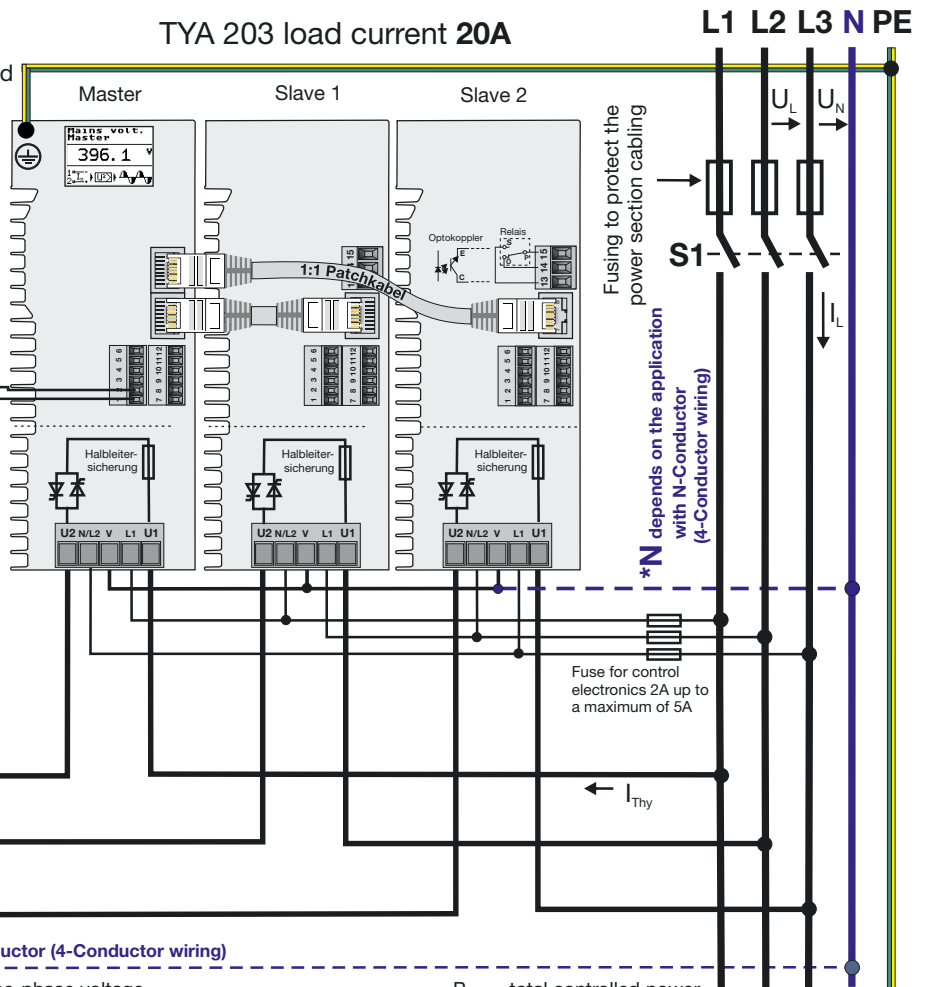
S2\*

\*N depends on the application with N-Conductor (4-Conductor wiring)

$U_L$  = phase-phase voltage  
 $U_N$  = phase-neutral voltage  
 $U_{Thy}$  = voltage on thyristor power unit

\* see switch on sequence if bus-systems are used

$P_{tot}$  = total controlled power  
 $I_L$  = current in phase conductor  
 $I_{Thy}$  = current in thyristor power unit



**Important information:** In the case of power controllers with a load current of 250 A, both X14 fan terminals of the Master, Slave1, and Slave2 must also be supplied with the stated voltage, see "Example: Fan voltage supply with type 709063/X-0X-250-XXX-400-XX-25X".  
 page 16

**Delta connection (three-wire circuit)**

For 3-wire connection the terminals V of master, slave1 and slave2 must be connected, but **not connected to N!**

**Star connection without neutral wire (three-wire circuit)**

For 3-wire connection the terminals V of master, slave1 and slave2 must be connected, but **not connected to N!**

**Star connection with neutral wire (four-wire circuit)**

For 4-wire connection the terminals V of master, slave1 and slave2 must be connected and **connected to N!**

The star point of the load **must also be connected to N!**

This circuit example can only be applied in TN-Systems. In TT-Systems additionally the neutral conductor has to be switched with S1 and S2.

**Attention:**

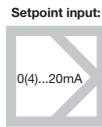
Make sure that the rotating electrical field of L1, L2 and L3 is right-handed!

Note the correct sequence! ↻  
 Master (L1) Slave1 (L2) Slave2 (L3)

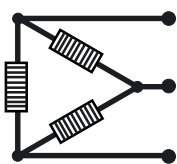
$$U_{Thy} = U_L$$

$$I_{Thy} = \frac{P_{tot}}{3 \cdot U_N} = \frac{P_{tot}}{\sqrt{3} \cdot U_L}$$

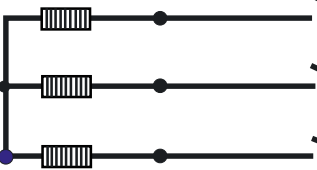
$$I_{Thy} = I_L$$



Ohmic load in a delta connection



Ohmic load in a star connection



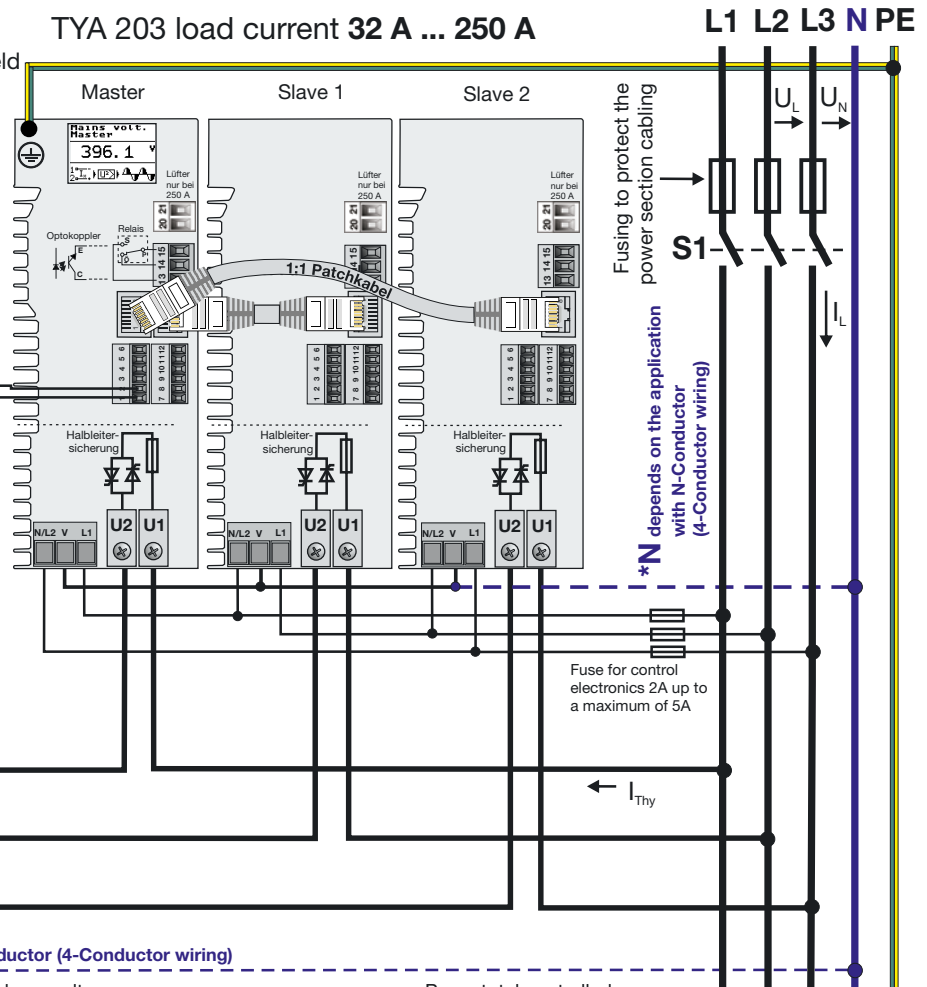
\*N depends on the application with N-Conductor (4-Conductor wiring)

$U_L$  = phase-phase voltage  
 $U_N$  = phase-neutral voltage  
 $U_{Thy}$  = voltage on thyristor power unit

★ see switch on sequence if bus-systems are used

$P_{tot}$  = total controlled power  
 $I_L$  = current in phase conductor  
 $I_{Thy}$  = current in thyristor power unit

TYA 203 load current 32 A ... 250 A



**Important information:**

In the case of power controllers with a load current of 250 A, both **X14 fan terminals of the Master, Slave1, and Slave2** must also be supplied with the stated voltage, see "Example: Fan voltage supply with type 709063/X-0X-250-XXX-400-XX-25X". page 16

**Open delta connection (six-wire connection)**

**Attention:**

Make sure that the rotating electrical field of **L1, L2 and L3** is right-handed!

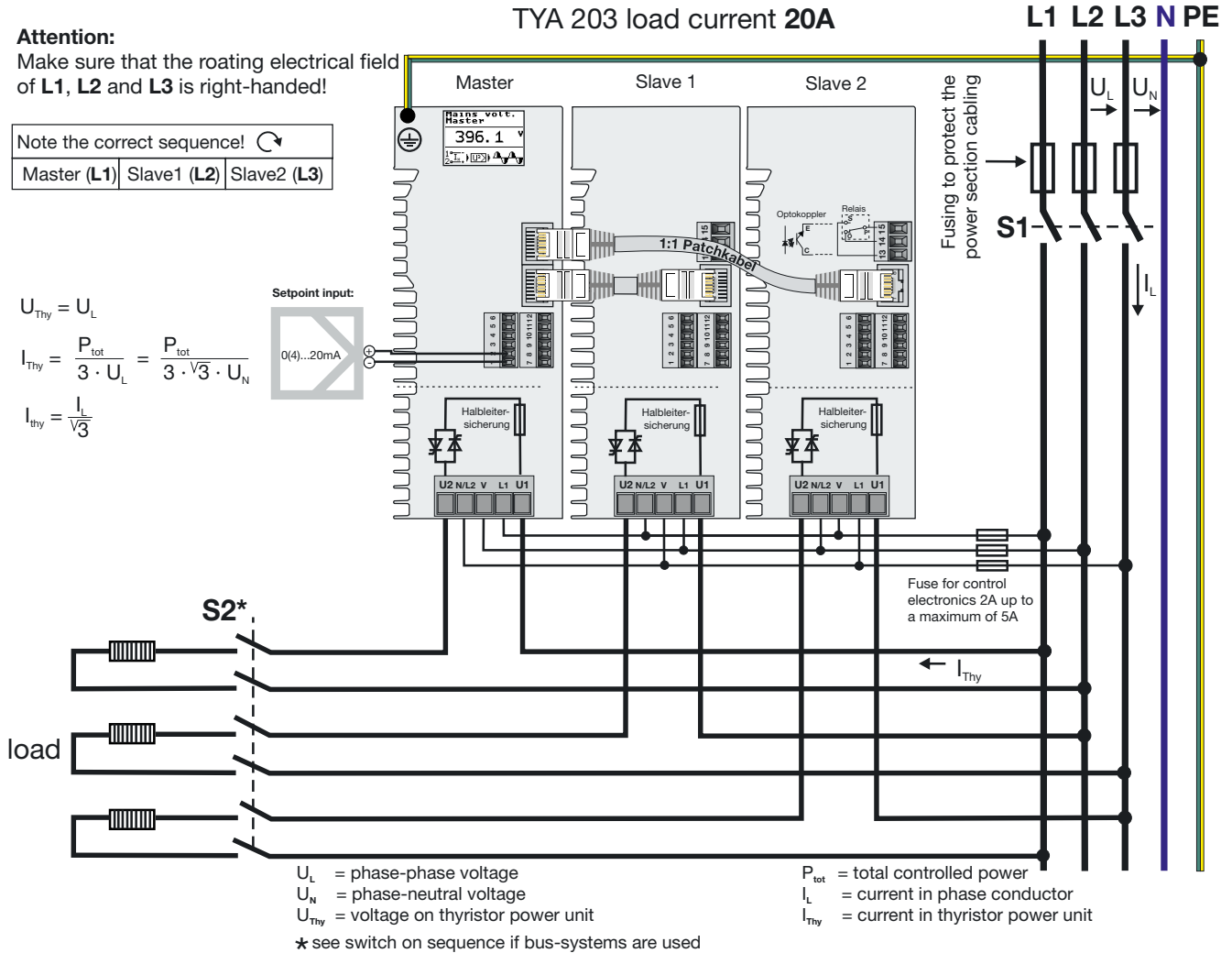
Note the correct sequence! ↻

Master (L1)	Slave1 (L2)	Slave2 (L3)
-------------	-------------	-------------

$$U_{Thy} = U_L$$

$$I_{Thy} = \frac{P_{tot}}{3 \cdot U_L} = \frac{P_{tot}}{3 \cdot \sqrt{3} \cdot U_N}$$

$$I_{thy} = \frac{I_L}{\sqrt{3}}$$



**Important information:** In the case of power controllers with a load current of 250 A, both **X14 fan terminals of the Master, Slave1, and Slave2** must also be supplied with the stated voltage, see "Example: Fan voltage supply with type 709063/X-0X-250-XXX-400-XX-25X".  
 page 16

### Open delta connection (six-wire connection)

**Attention:**

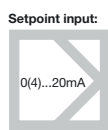
Make sure that the rotating electrical field of L1, L2 and L3 is right-handed!

Note the correct sequence! ↻		
Master (L1)	Slave1 (L2)	Slave2 (L3)

$$U_{Thy} = U_L$$

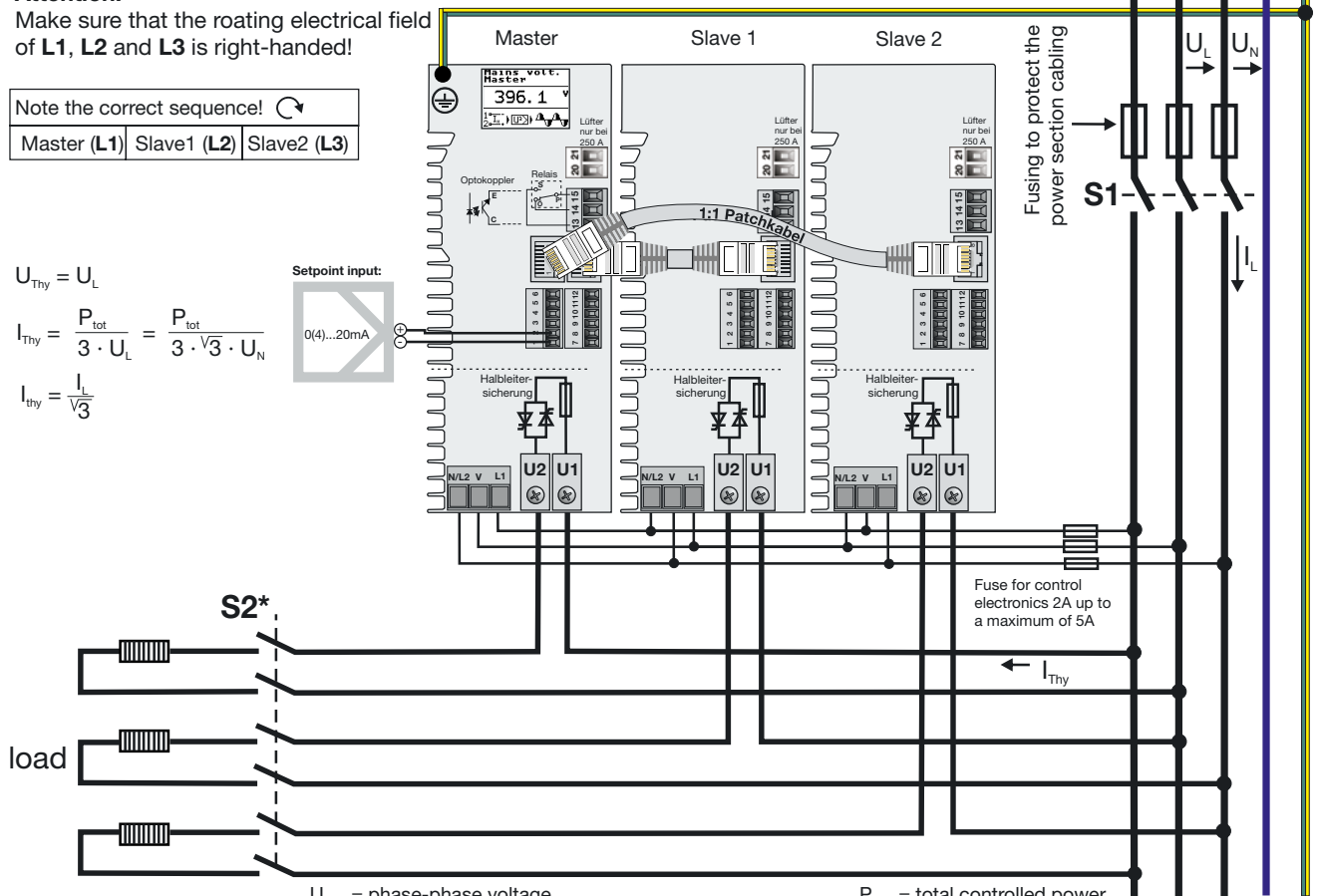
$$I_{Thy} = \frac{P_{tot}}{3 \cdot U_L} = \frac{P_{tot}}{3 \cdot \sqrt{3} \cdot U_N}$$

$$I_{thy} = \frac{I_L}{\sqrt{3}}$$



TYA 203 load current 32 A ... 250 A

L1 L2 L3 N PE



U<sub>L</sub> = phase-phase voltage  
 U<sub>N</sub> = phase-neutral voltage  
 U<sub>Thy</sub> = voltage on thyristor power unit  
 P<sub>tot</sub> = total controlled power  
 I<sub>L</sub> = current in phase conductor  
 I<sub>Thy</sub> = current in thyristor power unit  
 ★ see switch on sequence if bus-systems are used

**Observe the general switch-on sequence** The S2 switch is not required if no bus system is used. The control section and power section are switched on simultaneously via switch S1. This is particularly important for the operation of transformer loads and resistance loads with a high temperature coefficient (TC >> 1). This makes sure the necessary load start functions (soft start, current limiting, etc.) are activated accordingly.

**Switch-on sequence when using bus systems** When using a bus system, the control section and power section are switched on via S1 and S2. The TYA's control section must remain connected to the mains voltage (S1 permanently closed) to maintain the field bus communication. S2 is used to activate the load. In the event of transformer loads or loads with a large temperature coefficient (TC >> 1), the controller output must be blocked using the inhibit function prior to opening S2. After closing S2, the controller output must be reactivated via the inhibit function.

**Note:** In the case of power controllers with a load current of 250 A, the fan terminal X14 must also be supplied with the specified voltage! "Example: Fan voltage supply with type 709063/X-0X-250-XXX-400-XX-25X". page 16

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## Order details

### (1) Basic type

709063	TYA 203 three-phase Thyristor power controller
--------	--

### (2) Version

8	Standard with default settings
9	Customer-specific programming according to specifications

### (3) National language of display texts

01	German (default setting)
02	English
03	French
14	Spanish

### (4) Load current

020	AC 20 A
032	AC 32 A
050	AC 50 A
100	AC 100 A
150	AC 150 A
200	AC 200 A
250	AC 250 A

### (5) Subordinate control loop (see important Information below)

010	I, I <sup>2</sup> (can be set to U, U <sup>2</sup> )
001	P (can be set to I, I <sup>2</sup> or U, U <sup>2</sup> )

### (6) Mains voltage<sup>a</sup>

024	AC 24 V	-20 to +15%, 48 to 63 Hz
042	AC 42 V	-20 to +15%, 48 to 63 Hz
115	AC 115 V	-20 to +15%, 48 to 63 Hz
230	AC 230 V	-20 to +15%, 48 to 63 Hz
265	AC 265 V	-20 to +15%, 48 to 63 Hz
400	AC 400 V	-20 to +15%, 48 to 63 Hz
460	AC 460 V	-20 to +15%, 48 to 63 Hz
500	AC 500 V	-20 to +15%, 48 to 63 Hz

### (7) Interface

00	None
54	RS485/422
63	PROFINET
64	PROFIBUS-DP
84	EtherCAT/JUMO mTRON T system interface

### (8) Extra codes

252	Relay (changeover contact) 3 A
257	Optocoupler <sup>b</sup>

(1) / (2) - (3) - (4) - (5) - (6) - (7) / (8)  
 709063 / 8 - 01 - 100 - 100 - 400 - 00 / 252  
**Order code**  
**Order example**

<sup>a</sup> Mains voltage = voltage supply for control electronics (always use the **line conductor voltage** L1-L2 of the three-phase supply)

<sup>b</sup> Enables energy counter

**Important information:** **Subordinate control loop I<sup>2</sup>, code 010:** enables voltage control, current control, partial load failure detection, dual energy management, current limiting and energy counter

**Subordinate control loop P, code 001:** enables voltage control, current control, power control, partial load failure detection, dual energy management, current limiting, r-control and and energy counter

**Note fan voltage at 250 A load current!**

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## Scope of delivery

1 Operating manual
1 Thyristor power controller in the version ordered
1:1 patch cable, 2 pieces

## Accessories

Item	Part no.
Setup program 709061 (TYA 201), 709062 (TYA 202), and 709063 (TYA 203)	00544869
USB cable A-connector B-connector 3 m	00506252
<b>Installation kits</b>	
Installation kit for DIN-rail 20 A TYA 203	00648636

## General accessories

Item	Load current $I_{Rated} = I_N$	Part no.
709710/02 semiconductor fuse 40 A / AC 690 V	$I_N = 20 \text{ A}$	00513108
709710/02 semiconductor fuse 80 A / AC 690 V	$I_N = 32 \text{ A}$	00068011
709710/02 semiconductor fuse 80 A / AC 690 V	$I_N = 50 \text{ A}$	00068011
709710/02 semiconductor fuse 160 A / AC 690 V	$I_N = 100 \text{ A}$	00081801
709710/02 semiconductor fuse 350 A / AC 690 V	$I_N = 150 \text{ A}$	00083318
709710/02 semiconductor fuse 550 A / AC 690 V	$I_N = 200 \text{ A}$	00371964
709710/02 semiconductor fuse 550 A / AC 690 V	$I_N = 250 \text{ A}$	00371964