SIGMATEK

HZS 532-2

Internal Controller Expansion

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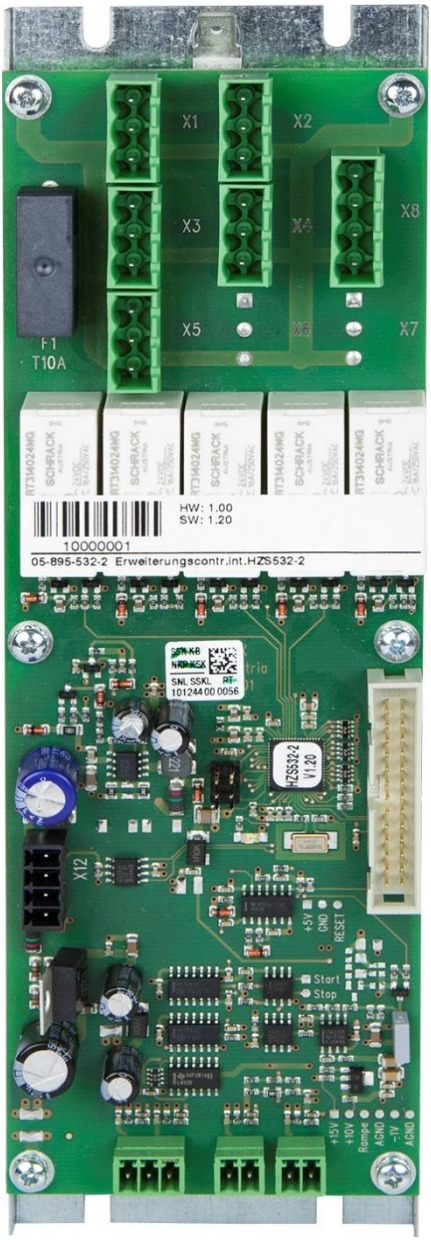
Publisher: SIGMATEK GmbH & Co KG
A-5112 Lamprechtshausen
Tel.: +43/6274/4321
Fax: +43/6274/4321-18
Email: office@sigmatek.at
WWW.SIGMATEK-AUTOMATION.COM

Translation from German

Internal Controller Expansion HZS 532-2



Contents

1 Configuration

- HZS 532-2 internal expansion card for the heating control

  - Themal resistor (PT1000 or KTY81-110 or KTY81-122/-25 ... +100 °C/ 0,2 °C/±0,5 °C/2-pin)
  - Themal resistor (PT1000 or KTY81-110 or KTY81-122/-25 ... +100 °C/ 0,2 °C/±0,5 °C/2-pin)
  - Room unit (actual value: 660-1200 Ω/0.6 Ω/±2 Ω) (set value: 1000-1100 Ω/0.6 Ω/±2 Ω) } 3-pin

  - Heat circulation pump (relay output/230 V AC/2 A/3-pin)
  - Mixer open (relay output/230 V AC/1 A/3-pin) } 4-pin
  - Mixer close (relay output/230 V AC/1 A/3-pin)
  - Boiler loading pump (relay output/230 V AC/2 A/3-pin)
  - Discharging motor (relay output/230 V AC/2 A/3 pins)

  } Common fuse 10 A

  - AT90CAN32 controller with 1x CAN bus
  - Up to 5 internal expansion modules can be connected
  - The +24V supply is provided by the CPU (HZS 511)
  - CPU (HZS 511) connected over internal CAN bus } 4-pin
  - The connection to the internal expansion modules is made over a 26-pin ribbon cable
  - 230 V AC supply in and out (2x 3-pin)
  - The conductors designed for a continuous current of approximately 6.5 A so that they don't burn if a discharge motor is blocked!

⇨ **The HZS 532-2 internal expansion controller is connected to the CPU (HZS 511) with a 4-pin Phoenix connector plug, over which the +24 supply for the internal expansion modules and the CAN bus communication with the CPU is established!**

⇨ **The internal expansion modules must be placed close to one another! Placing the internal expansion modules in such as way that the ribbon cable must be extended between the individual modules is not permitted!**

2 Technical Data

2.1 Controller Performance Data

Controller	AT90CAN32
Command execution time	circa 0.7 µs
Interfaces	1x CAN
Internal program memory	32-kbytes (Flash)
Internal data and/or program buffering (internal EEPROM)	1 kByte (Flash) no battery buffering required

2.2 Electrical Requirements

Relay power supply	230 V AC
Fuse	10 A for relay outputs
Internal electronics power supply	+24 V (from HZS 511), must be connected to the expansion controller
+24 V current consumption	HZS 532-2: maximum 60 mA (without relays) maximum 120 mA (with relays) HZS 532-2 with 5 expansion modules, maximum 350 mA

2.3 Digital Outputs Specifications: 230 V AC Relay Output

Output voltage	230 V AC
Maximum output current	maximum 6.5 A (single relay output) maximum 8.5 A (all relay outputs)
Number on the expansion controller	5
Number on the heating circuit module	3
Relay types	normally open
Relays	RT 314024 WG
Switching range	16.8-30 V DC
Switching current	typically9 mA at +24 V
Switching time	< 10 ms
Switching power	see data sheet: Tyco Schrack RT1 series
Fuse	10 AT
Connector	3x 3-pin Phoenix RM 5.08 1x 4-pin Phoenix RM 5.08

2.4 Technical Data RT314024 WG Relay

TE connectivity RELAY PRODUCTS

General Purpose Relays
PCB Relays

SCHRACK

Power PCB Relay RT1

- 1 pole 12A/16A, 1 form C (CO) or 1 form A (NO) contact
- DC or AC coil
- 5kV/10mm coil-contact, reinforced insulation
- Ambient temperature 85°C (DC coil)
- WG version: product in accordance to IEC 60335-1
- Reflow version: for THR (Through-Hole Reflow) soldering process

Typical applications
Boiler control, timers, garage door control, POS automation, interface modules

Approvals
VDE Cert. No. 40007571, cULus E214025, cCSAus 1142018;
CQC in preparation
Technical data of approved types on request

Contact Data

	12A	16A
Contact arrangement	1 form C (CO) or 1 form A (NO)	
Rated voltage	250VAC	
Max. switching voltage	400VAC	
Rated current	12A	16A
Limiting continuous current	12A	16A, UL: 20A
Limiting making current max. 4s, duty factor 10%	25A	30A
Breaking capacity max.	3000VA	4000VA
Contact material	AgNi 90/10, AgNi 90/10 gold plated	
Frequency of operation, with/without load		
DC coil	360/72000h^{-1}	
AC coil	360/36000h^{-1}	
Operate/release time max., DC coil	8/6ms	
Bounce time max., DC coil, form A/form B	4/6ms	
Electrical endurance	see electrical endurance graph [1]	

Contact ratings

Type	Contact	Load	Cycles
IEC 61810			
RT314 DC-coil	A (NO)	16A, 250VAC, cosp=1, 85°C	30x10^3
RT314 DC-coil	C (CO)	16A, 250VAC, cosp=1, 85°C	10x10^3
RT314 DC-coil	A (NO)	10A, 400VAC, cosp=1, 85°C	150x10^3
RT114 DC-coil	A (NO)	12A, 250VAC, cosp=1, 85°C	50x10^3
RT114 AC-coil	A (NO)	12A, 250VAC, cosp=1, 70°C	100x10^3
UL 508			
RT314	A/B (NO/NC)	20A, 250VAC, general purpose, 85°C	6x10^3
RT334	A (NO)	16A, 250VAC, gen. purpose, 85°C	50x10^3
RT314	A (NO)	1hp, 240VAC, 40°C	1x10^3
RT314	A (NO)	FLA/LRA, 4.5/13.1A, 480VAC, 70°C	100x10^3
EN60947-5-1			
RT314 DC-coil	A/B (NO/NC)	2A, 24VDC, DC13	6.050
EN60730-1			
RT314 DC-coil	A (NO)	12(2)A, 250VAC, 85°C	100x10^3

1) For reflow solderable versions: actual contact performance may be influenced by the reflow soldering process.

Contact Data (continued)

Mechanical endurance	
DC coil	>30x10^6 operations
AC coil	>10x10^6 operations
AC coil, reflow version	>5x10^6 operations

Coil Data

Coil voltage range, DC coil/ AC coil	5 to 110VDC / 24 to 230VAC
Operative range, IEC 61810	2
Coil insulation system according UL	class F

Coil versions, DC coil

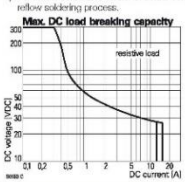
Coil code	Rated voltage VDC	Operate voltage VDC	Release voltage VDC	Coil resistance Ω±10% [2]	Rated coil power mW
005	5	3.5	0.5	62	403
006	6	4.2	0.6	90	400
009	9	6.3	0.9	200	400
012	12	8.4	1.2	360	400
020	20	14.0	2.0	952	420
024	24	16.8	2.4	1440	400
048	48	33.6	4.8	5520	417
060	60	42.0	6.0	8570 [3]	420
110	110	77.0	11.0	28800 [3]	420

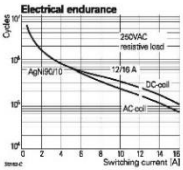
2) Coil resistance ±12%.
All figures are given for coil without pre-energization, at ambient temperature +23°C.
Other coil voltages on request.

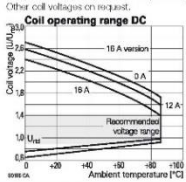
Coil versions, AC coil 50/60 Hz

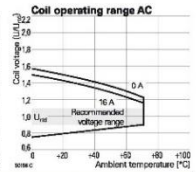
Coil code	Rated voltage VAC	Operate voltage VAC	Release voltage VAC	Coil resistance Ω±15% [2]	Rated coil power VA
024	24	18.0	3.6	350 [3]	0.76
115	115	86.3	17.3	8100	0.76
120	120	90.0	18.0	8800	0.75
200	200	150.0	30.0	24350	0.76
230	230	172.5	34.5	32500	0.74

3) Coil resistance ±10%.
All figures are given for coil without pre-energization, at ambient temperature +23°C, 50 Hz.
Other coil voltages on request.









2.5 Analog Input Specifications for the KTY81-110 and/or KTY81-122 (or PT1000)

Number of channels	2		
Sensor Type	KTY81-110 or KTY81-122 (resp. ERRVAL(1095))		
Measurement range	-25 ... +100 °C for KTY sensor -50 ... +200 °C for the PT1000 sensor		
Sensor range	KTY81-110 654-1696 Ω	KTY81-122 660-1713 Ω	PT1000 803-1758 Ω)
Resolution	0.2 °C		
Measurement precision	±0.5 °C		
Measurement value	14-bit		
Typical current measurement	1.1 mA		
Input resistance	8,2 KΩ		
Input filter	100 ms		
Connection technology	2-pin Phoenix RM 3.5 per Analog input		

2.6 FBR1 Room Unit Specifications

Number of inputs	1 per heating circuit module and 1 on the controller
Applicable sensor Type	FBR1
Actual sensor range value (actual temperature)	660-1200 Ω
Sensor range value setting (room correction)	1000-1100
Actual resolution value	0.6 Ω
Resolution setting	0.6 Ω
Input resistance	4.7 K
Input filter	100 ms
Measurement value	14-bit
Measurement precision of the actual value	±2 Ω
Measurement precision of the set value	±2 Ω

2.7 Terminal Requirements

Connection technology	**connector terminals are not included in delivery!** The following spring terminals are required: 5x 3-pin FKC 2.5/ 3-ST-5.08 Phoenix Contact spring terminal connector 1x 4-pin FKC 2.5/ 4-ST-5.08 Phoenix Contact spring terminal connector 2x 2-pin FKC 2.5/ 2-ST-5.08 Phoenix Contact spring terminal connector 1x 3-pin FK-MCP 1.5/ 3-ST-3.5 Phoenix Contact spring terminal connector 1x 4-pin FK-MCP 1.5/ 4-ST-3.5 Phoenix Contact spring terminal connector

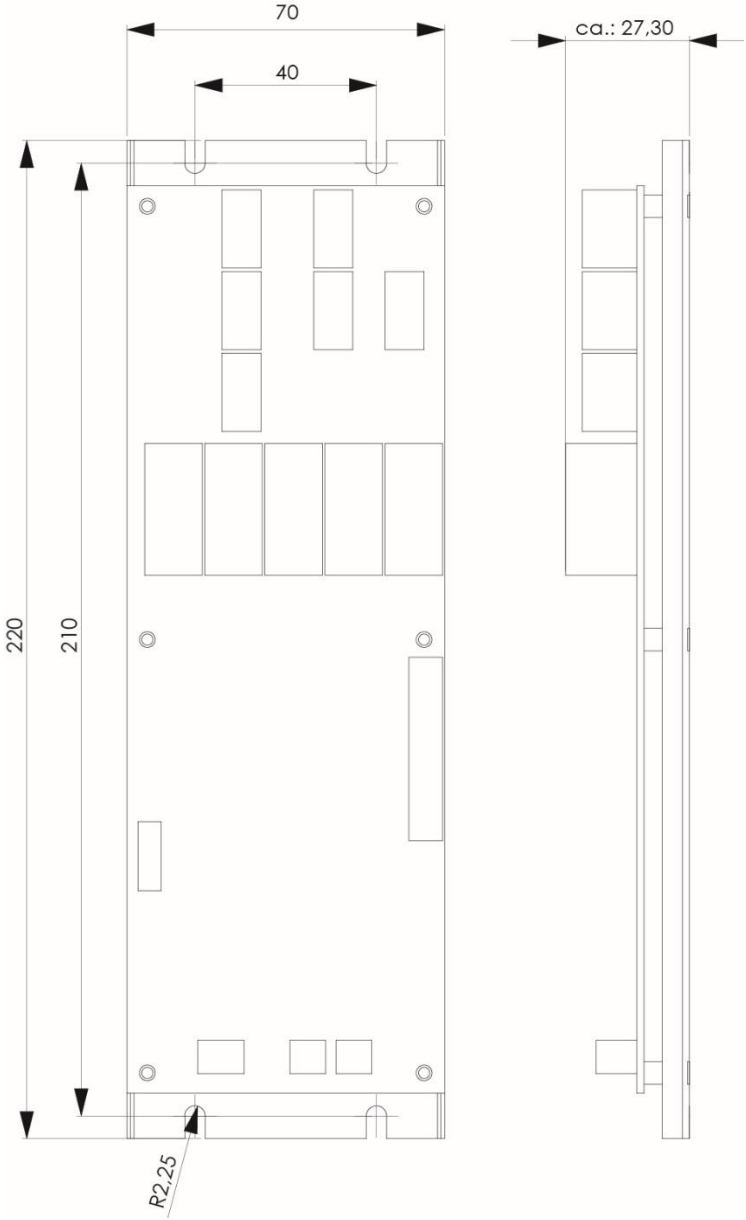
2.8 Miscellaneous

Article number	05-895-532-2
HW Version	1.x
HW classes	hzs53x => can be used for all

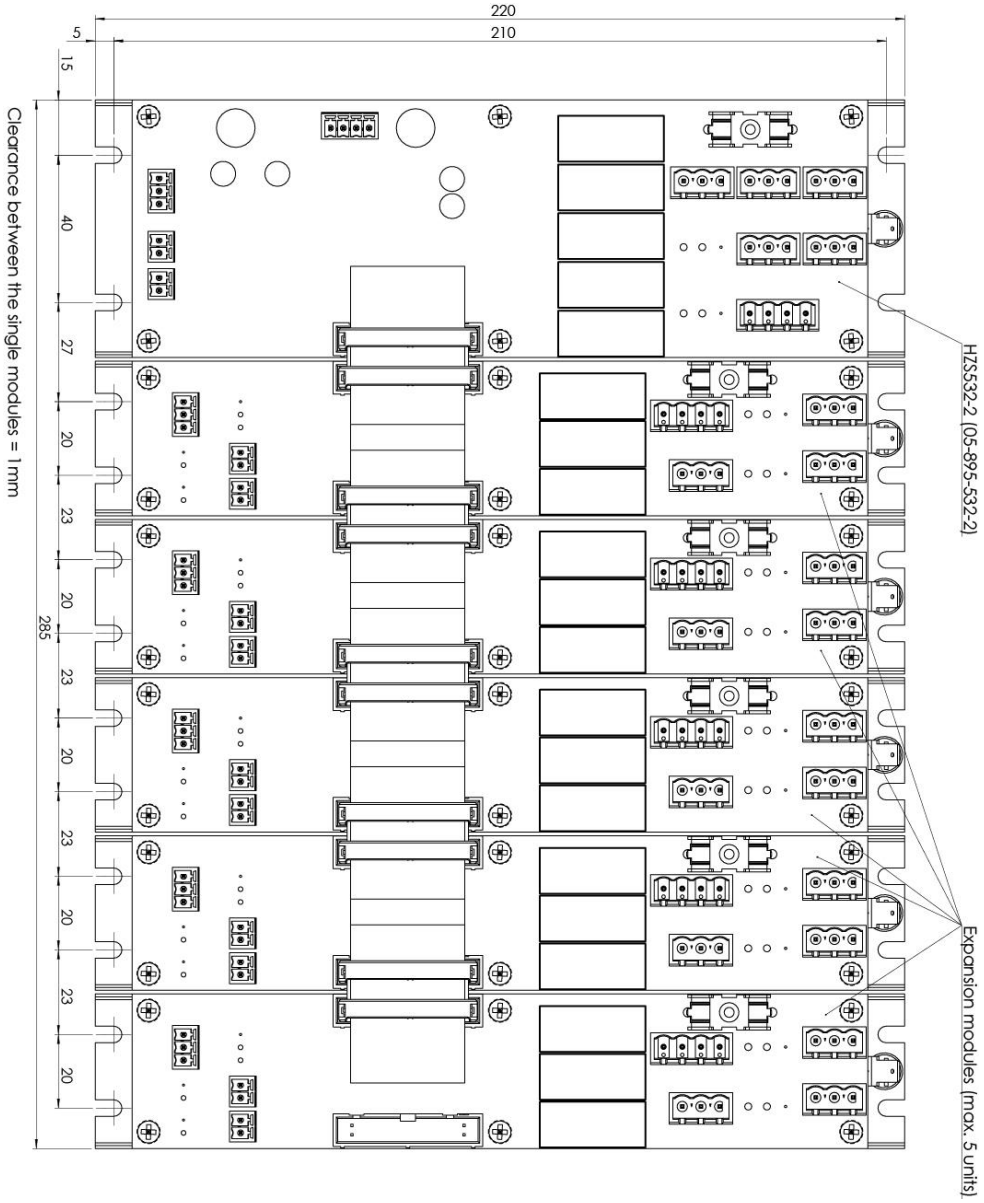
2.9 Environmental Conditions

Storage temperature	-20 ... +70 °C	
Operating temperature	0 ... +60 °C	
Humidity	0-95 %, non-condensing	
EMC stability	according to EN 61000-6-2:2001	
Shock resistance	EN 60068-2-27	150 m/s²

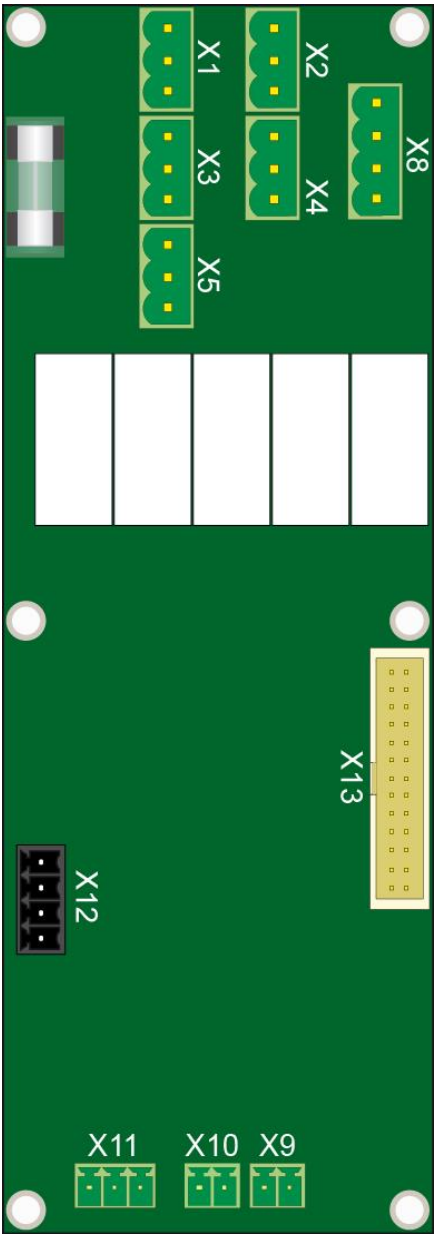
3 Mechanical Dimensions



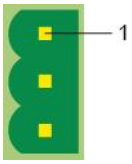
3.1 Mounting Instructions



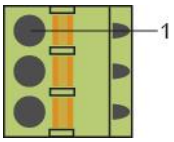
4 Connector Layout



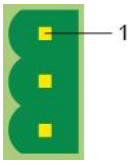
X1: 230 V AC Power Line (3-pin spring terminal connector Phoenix RM 5.08)



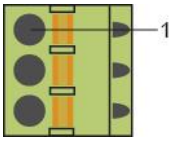
Pin	Signal	Function
1	L	Phase
2	N	Null circuit
3	PE	Ground wire



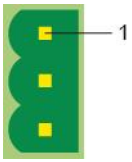
X2: 230 V AC Power Dissipation (3-pin spring terminal connector Phoenix RM 5.08)



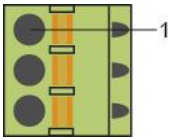
Pin	Signal	Function
1	L	Phase
2	N	Null circuit
3	PE	Ground wire



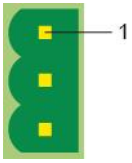
X3: 230 V AC Relay Output: Heat Pump (3-pin spring terminal connector Phoenix RM 5.08 (RO01))



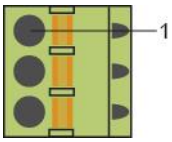
Pin	Signal	Function
1	$L_{heating\ circuit}$	Relay output for the heat circulation pump
2	N	Null circuit
3	PE	Ground wire



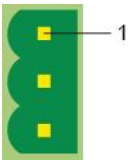
X4: 230 V AC Relay Output: Boiler Loading Pump (3-pin spring terminal connector Phoenix RM 5.08 (RO02))



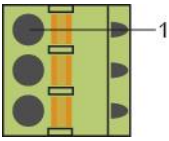
Pin	Signal	Function
1	L_{boiler}	Relay output for the Boiler load pump
2	N	Null circuit
3	PE	Ground wire



X5: 230 V AC Relay Output: Extraction Motor
(3-pin spring terminal connector Phoenix RM 5.08 (RO03))

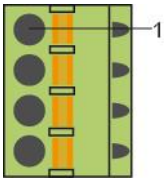


Pin	Signal	Function
1	L_{Auger}	Relay output Extraction Motor
2	N	Null circuit
3	PE	Ground wire

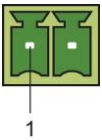


X8 230 V AC Relay Output: Mixer Open and Close
(4-pin spring terminal connector Phoenix RM 5.08 (RO04 and RO05))

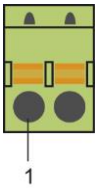
Pin	Signal	Function
1	$L_{mixer\ open}$	Relay output to open mixer
2	$L_{mixer\ closed}$	Relay output to close mixer
3	N	Null circuit
4	PE	Ground wire



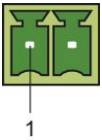
X9: Temperature Input 1 (3-pin spring terminal connector Phoenix RM 3.5 (AI1))



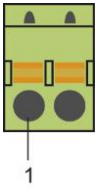
Pin	Signal	Function
1	AI1	Analog input AI1 KTY81-110 or -122 -25 ... +100 °C
2	AGND	AGND



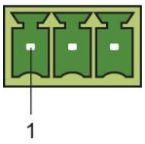
X10: Temperature Input 2 (3-pin spring terminal connector Phoenix RM 3.5 (AI2))



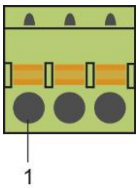
Pin	Signal	Function
1	AI2	Analog input AI2 KTY81-110 or -122 -25 ... +100 °C
2	AGND	AGND



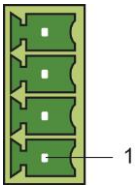
X11: Analog Inputs Room Unit
(3-pin spring terminal connector Phoenix RM 3.5 (AI3 and AI4))



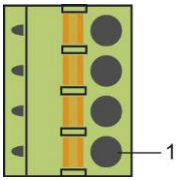
Pin	Signal	Function
1	AI3	Actual value (660-1200 Ω) AI3
2	AI4	Set value (1000-1100 Ω) AI4
3	AGND	AGND



X12: Connection to CPU (HZS 511) (4-pin spring terminal connector Phoenix RM3.5)



Pin	Signal	Function
1	+24 V	+24 V electronics power supply
2	CAN A	CAN bus low
3	CAN B	CAN bus high
4	GND	Ground



The CAN bus is terminated through the internal electronics!

X13: Ribbon cable connection to internal expansion modules (26-pin blade terminal)

Over the ribbon cable, the controller communicates with the various internal expansion modules. The required supply voltages to the internal expansions are also provided over this connection!

5 Status LED

LED Status	Definition
LED on	Controller running, CAN bus communication with CPU not active.
LED blinks (1 Hz)	Controller running, CAN bus communication with CPU active.
LED off	Controller not running, no power.

6 Wiring Guidelines

The signals recorded by the analog inputs are very small in comparison to the digital signals. To ensure error-free operation, a careful wiring method must be followed:

- The lines connected to the source of the analog signals must be as short as possible and parallel wiring to digital signal lines must be avoided.
- The signal lines must be shielded.
- 230 V AC lines (power circuit and relay outputs etc.) must not be wired in parallel with analog and digital input lines.

6.1 Wiring Guidelines for Digital Inputs

The input filters used to suppress noise signals allow operation in harsh environmental conditions. A careful wiring method is also recommended to ensure error-free function.

The following guidelines should be observed:

- Avoid parallel connections between input lines and load bearing or AC circuits.
- Correct wiring to mass

6.2 General Information on Relay Outputs

All relay coils are powered by the internal +24 V DC supply. The cross sectional area of the relay outputs is designed for the maximum continuous current at 230 V AC for each connected load as stated in the relay output specifications. It is important to note that at high currents, thermal loads affect the wiring and with continuous over loading, can lead to a break down! High voltages can cause current leakage or arcing between different potentials!

To ensure error-free operation, a careful wiring method must be followed.

- Avoid parallel wiring between input lines and load-bearing circuits.

7 CAN Bus Communication

A detailed description of the CAN bus communication can be found in the respective class description.

Documentation Changes

Change date	Affected page(s)	Chapter	Note
12.10.2021	13-14	4 Connector Layout, 5 Status LED	X9-X12 and Status LED corrected