

HZS 533-3

Internal Heating Circuit Module

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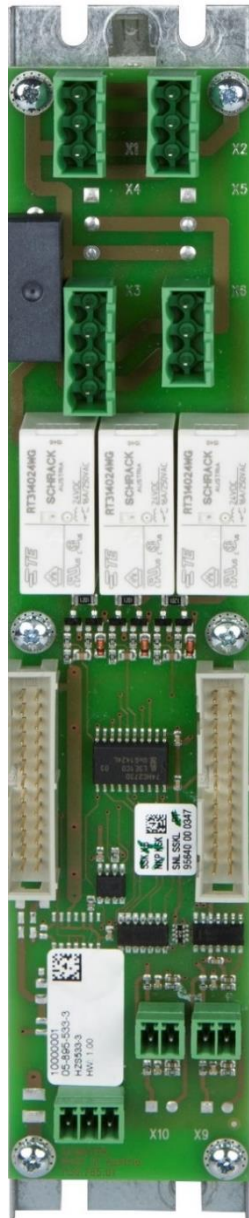
Translation from German

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1 Configuration

- **HZS 533-3 internal heating circuit module for the heating controller**

- Forward flow temperature (PT1000/-10 ... +120 °C/0.2 °C/±0.5 °C/2-pin)
- Return flow temperature (PT1000/-10 ... +120 °C/0.2 °C/±0.5 °C/2-pin)
- Room unit (see Room Unit Specifications/3-pin)

- Mixer open (Triac output/230 V AC/1.5 A)
 - Mixer close (Triac output/230 V AC/1.5 A)
 - Pump (relay output/230 V AC/2 A/3-pin)

} 4-pin

} Common fuse 5 A

- 230 V AC supply in and out (2x 3-pin)
- Ribbon cable connection to the controller and the next expansion module

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

2 Technical Data

2.1 Power Supply

Relay power supply	230 V AC
Fuse	5 A for relay outputs and/or 3 A for solar module
Internal electronics power supply	+24 V (from HZS 511), must be connected to the expansion controller
+24 V current consumption	HZS 533-3: maximum 15 mA (without relays) Maximum 50 mA (with relays)

2.2 Digital Input Specification (Counter Input)

Input signal	open collector
Input frequency	maximum 200 Hz
Signal analysis	1X
Counter resolution	8-bit
Input delay	typically 0.2 ms
Number	1 on solar module
Connector	3-pin Phoenix RM 3.5 mm

2.3 Digital Outputs Specifications:

Relay Output - 230 V AC/1 A resp. 3 A

Output voltage	230 V AC	
Max. Output current	1 A output current	3 A output current
Number on the heating circuit module	2	1
Number on the buffer module	2	1
Amount on solar module	0	2
Relay Types	normally open	
Relays	RT 314024WG	
Switching range	16.8-30 V DC	
Switching current	typically 9 mA at +24 V	
Switching time	< 10 ms	
Switching power	see data sheet: Tyco Schrack RT1 series	
Fuse	5 AT	
Connector	3-pin Phoenix RM 5,08 mm 3 A relay output 4-pin Phoenix RM 5.08 mm 1 A relay output (or 3 A on solar module)	

2.4 Technical Data RT314024 WG Relay



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%	
Breaking capacity max.	3000VA	4000VA
Contact material	AgNi 90/10, AgNi 90/10 gold plated	
Frequency of operation, with/without load	360/72000h ⁻¹	
DC coil	360/36000h ⁻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

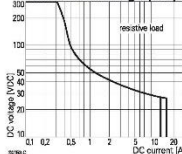
Type	Contact	Load	Cycles
IEC 61810			
RT314 DC-coil	A (NO)	16A, 250VAC, cosφ=1, 85°C	30x10 ³
RT314 DC-coil	C (CO)	16A, 250VAC, cosφ=1, 85°C	10x10 ³
RT314 DC-coil	A (NO)	10A, 400VAC, cosφ=1, 85°C	150x10 ³
RT114 DC-coil	A (NO)	12A, 250VAC, cosφ=1, 85°C	50x10 ³
RT114 AC-coil	A (NO)	12A, 250VAC, cosφ=1, 70°C	100x10 ³

EN60947-5-1

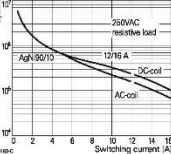
RT314 DC-coil A (NO)	2A, 24VDC, DC13	6.050
EN60730-1		
RT314 DC-coil A (NO)	12(2)A, 250VAC, 85°C	100x10 ³

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

Max. DC load breaking capacity



Electrical endurance



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	400
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 ²⁾	420
110	110	77.0	11.0	28800 ²⁾	420

2) Coil resistance ±12%.

All figures are given for coil without pre-energization, at ambient temperature +23°C.

Other coil voltages on request.

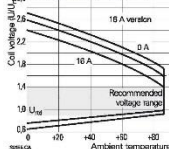
Coil versions, AC coil 50/60 Hz

Coil code	Rated voltage VAC	Operate voltage VAC	Release voltage VAC	Coil resistance Ω±15% ³⁾	Rated coil power VA
524	24	18.0	3.6	350 ³⁾	0.76
615	115	86.3	17.3	8100	0.76
620	120	90.0	18.0	8800	0.75
700	200	150.0	30.0	24350	0.76
730	230	172.5	34.5	32500	0.74

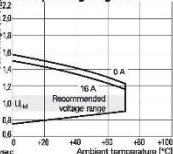
3) Coil resistance ±10%.

All figures are given for coil without pre-energization, at ambient temperature +23°C, 50 Hz. Other coil voltages on request.

Coil operating range DC



Coil operating range AC



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Datasheets and product specification according to IEC 61810-1 and to be used only together with the 'Definitions' section

Datasheets and product data is subject to the terms of the disclaimer and all chapters of the 'Definitions' section, available at <http://relays.te.com/definitions>

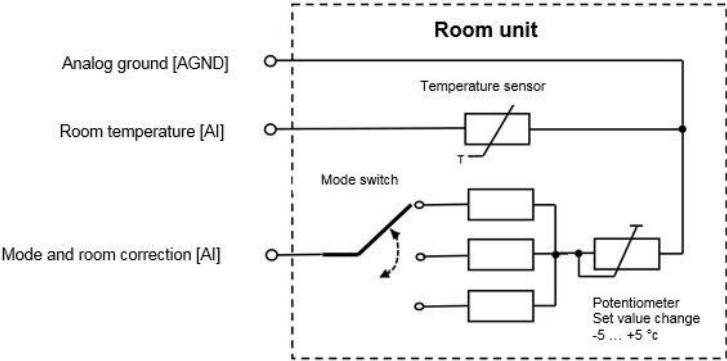
Datasheets, product data, 'Definitions' section, application notes and all specifications are subject to change.

2.5 PT1000 Analog Output Specifications

Number of channels	Heating circuit module: 2 Buffer module: 3 Solar module: 2	Heating circuit module: 0 Buffer module: 0 Solar module: 2	Expansion controller: 1
Sensor Type	PT1000 (Ohmic temperature sensor)		
Measurement range	-10 ... +120 °C	-50 ... +200 °C	-50 ... +70 °C
Sensor range	960.86-1460.68	803.06-1758.56	803.06-1270.75
Resolution	0.2 °C	1.0 °C	0.2 °C
Measurement precision	±0.5 °C	±1 °C	±1 °C
Measurement value	14-bit		
Typical current measurement	1.1 mA		
Input resistance	10 kΩ		
Input filter	100 ms		
Connection technology	2-pin Phoenix RM 3.5 per PT1000 input		

2.6 Room Unit Specifications

Number of room unit connections	1			
Temperature sensor type	PT1000/KTY81-110/KTY81-122/NI1000			
Temperature sensor range	-25° ... +100°C			
	PT1000	KTY81-110	KTY81-122	NI1000
Sensor temperature -25 °C	typ. 902 Ω	typ. 654 Ω	typ. 660 Ω	typ. 867 Ω
Sensor temperature 100 °C	typ. 1385 Ω	typ. 1696 Ω	typ. 1713 Ω	typ. 1618 Ω
Mode selector switch (MSS)	Night 		Automatic 	Day 
Set value change +5 °C	typ. 1335 Ω		typ. 1665 Ω	typ. 1004 Ω
Set value change 0 °C	typ. 1380 Ω		typ. 1710 Ω	typ. 1050 Ω
Set value change -5 °C	typ. 1423 Ω		typ. 1753 Ω	typ. 1092 Ω
Resolution temperature sensor	0,6 Ω			
Resolution MSS set value change	0,6 Ω			
Measure management tempera- ture sensor	±2 Ω			
Measurement precision MSS set value change	±2 Ω			
Input resistance	4.7 K			
Input filter	100 ms			



The room unit RTV (05-895-541-Z10) with the KTY81-122 sensor can be ordered from SIGMATEK.

Room units with PT1000, KTY81-110 or NI1000 can be directly ordered from Co. EAP.

2.7 Terminal Requirements

Connection technology	connector terminals are not included in delivery! The following spring terminals are required: 3x 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 FK-MCP 1.5/ 2-ST-3.5 Phoenix Contact spring terminal connector 1x 3-pin FK-MCP 1.5/ 3-ST-3.5 Phoenix Contact spring terminal connector
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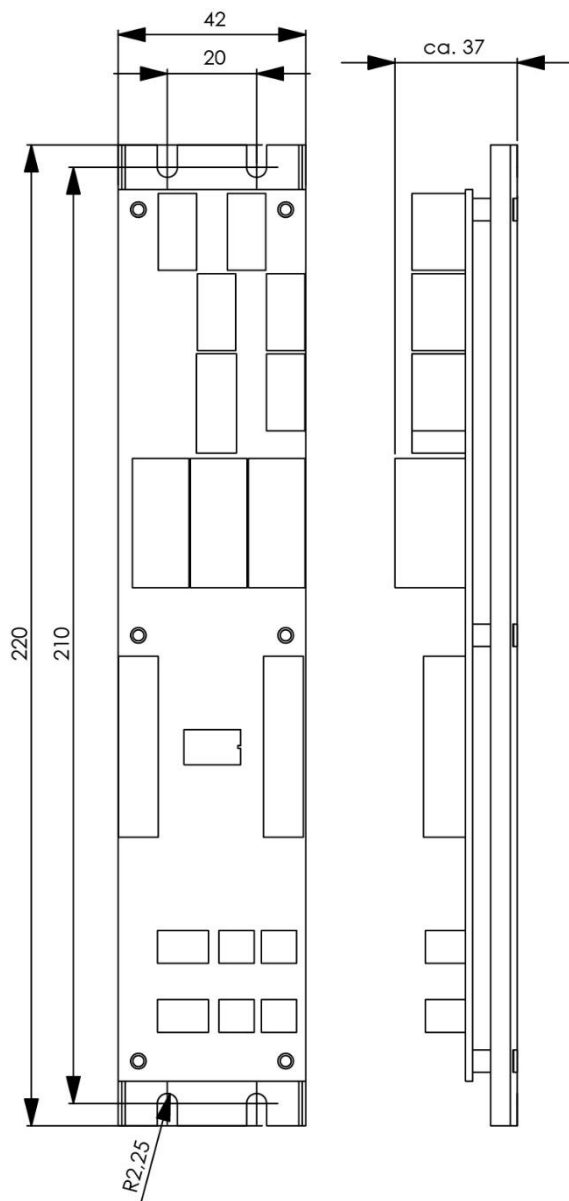
2.8 Miscellaneous

Article number	05-895-533-3
HW Version	1.x
HW classes	hzs53x => can be used for all

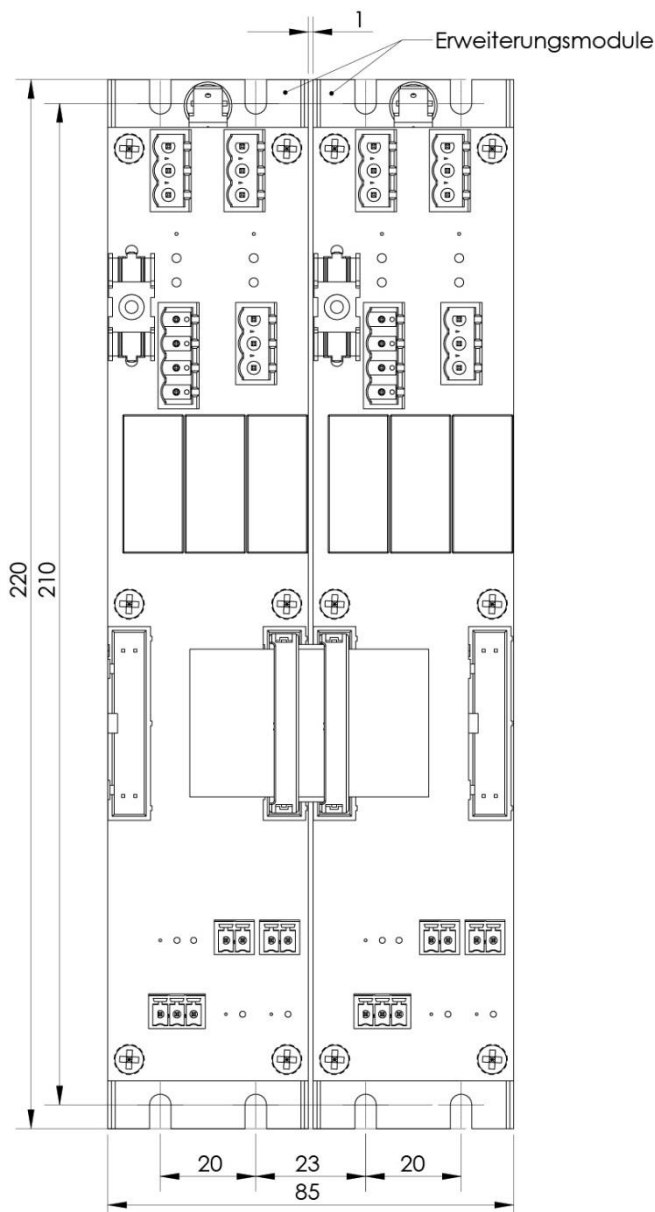
2.9 Environmental conditions

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/s ²

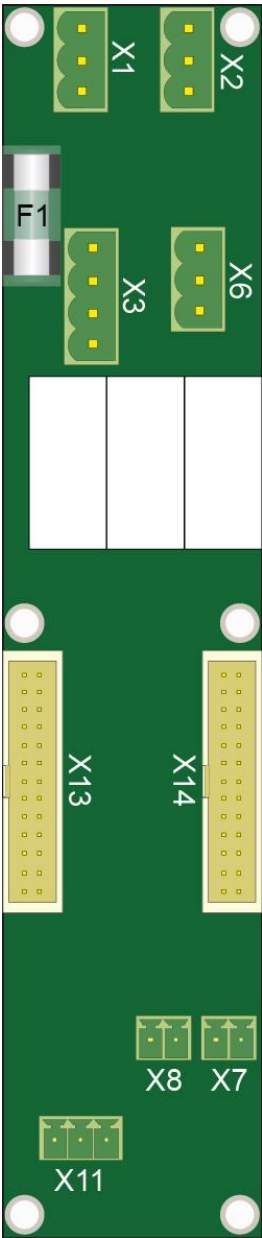
3 Mechanical Dimensions



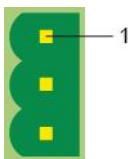
3.1 Mounting instructions



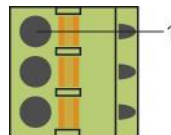
4 Connector Layout



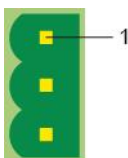
X1: 230 V AC Power Line (3-pin spring terminal connector Phoenix RM 5.08)



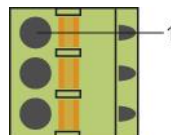
Pin	Signal	Function
1	L	Phase
2	N	Null circuit
3	PE	Ground wire



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



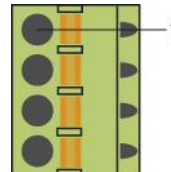
Pin	Signal	Function
1	L	Phase
2	N	Null circuit
3	PE	Ground wire



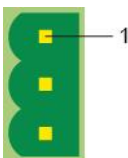
X3: 230 V AC Relay Output: Mixer Open and Close (4-pin spring terminal connector Phoenix RM 5.08 (RO01 and RO02))



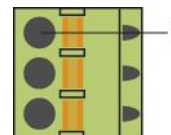
Pin	Signal	Function
1	L _{mixer open}	Relay output to open mixer
2	L _{mixer closed}	Relay output to close mixer
3	N	Null circuit
4	PE	Ground wire



X6: 230 V AC Relay Output: Heat Pump (3-pin spring terminal connector Phoenix RM 5.08 (RO03))



Pin	Signal	Function
1	L _{pump}	Pump relay output
2	N	Null circuit
3	PE	Ground wire

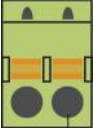


X7: Temperature Input: Forward Flow
(2-pin spring terminal connector Phoenix RM 3.5 (AI1))



1

Pin	Signal	Function
1	AI1	Analog input AI1 PT1000 (-10 ... +120 °C)
2	AGND	AGND



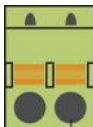
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X8 Temperature Input: Return Flow
(2-pin spring terminal connector Phoenix RM 3.5 (AI2))



1

Pin	Signal	Function
1	AI2	Analog input AI2 PT1000 (-10 ... +120 °C)
2	AGND	AGND



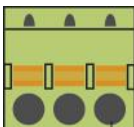
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X11: Analog Input: Room Unit
(3-pin spring terminal connector Phoenix RM 3.5 (AI3 and AI4))



1

Pin	Signal	Function
1	AI3	Room temperature
2	AI4	Mode and room correction
3	AGND	AGND



1

X13 and X14: Ribbon cable connection to internal expansion modules
(26-pin blade terminal)

The internal heating circuit module communicates with the controller (X13) over this connection.
All signals are encoded and/or sent to the next internal expansion (X14).

5 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 parallel to analog and digital input lines.

5.1 Wiring Guidelines for Digital Inputs

The input filters used, which 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

5.2 General Information on the 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.

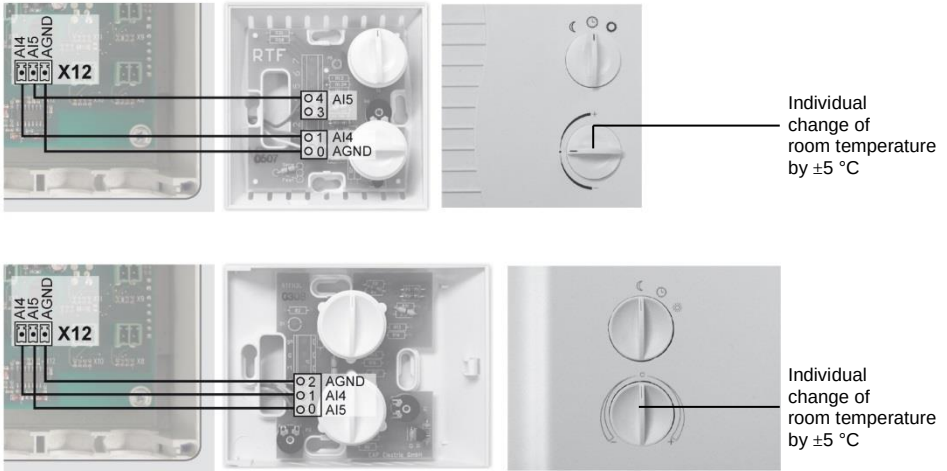
- Avoid parallel wiring between input lines and load-bearing circuits.

5.3 CAN Bus Communication

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

5.4 Room Unit (X11)

If a **room unit** is used to regulate floor heating, it must be connected with the module according to the following connector layout at **X11**:



To connect the **room unit**, use a 3-wire cable with a minimum cross section of **0.25 mm²** (maximum **1.5 mm²**)
(e.g. LiYY 3x0.25 or LiYY 3x1.5)!

Documentation Changes

Change date	Affected page(s)	Chapter	Note

