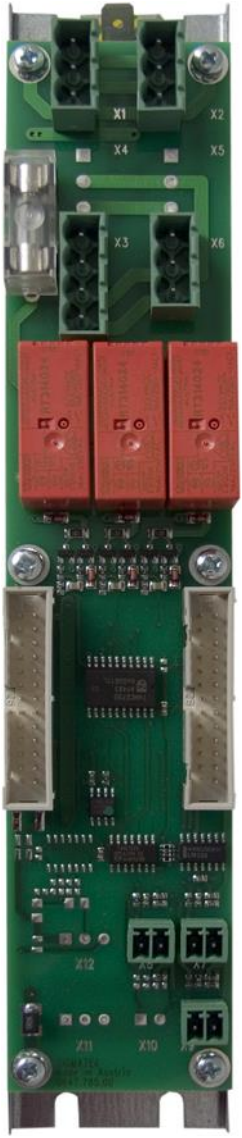
Internal Buffer/Boiler Module HZS 534



Configuration

- **HZS 534 internal buffer/boiler module for the heating controller**
  - Upper buffer temperature (PT1000/-10 … +120 °C/0.2 °C/±0.5 °C/2-pin)
  - Lower buffer temperature (PT1000/-10 … +120 °C/0.2 °C/±0.5 °C/2-pin)
  - Middle buffer (PT1000/-10 … +120 °C/0.2 °C/±0.5 °C/2-pin)

  - Fast heating module(1) (relay output/230 V AC/1 A)
  - Fast heating module(2) (relay output/230 V AC/1 A)
  - Buffer load pump (relay output/230 V AC/3 A/3-pin)

  - 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 as way that the ribbon cable must be extended between the individual modules is not permitted!**

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 534 maximum 15 mA (without relays) maximum 40 mA (with relays)

Digital input specifications (counter input)

Input signal	open collector
Input frequency	maximum 200 Hz
Signal evaluation	1X
Counter resolution	8-bit
Input delay	typically 0,2 ms
Number of …	1 on solar module
Connection technology	3-pin Phoenix RM 3.5 mm

Specifications for the digital outputs: Relay output - 230 V AC 1 A/or 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	HF115FK/24-Z33(335) / alternative: RT 314024	
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	5 AT	
Connection technology	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	

Technical Data Relay HF115FK/24-Z33(335)

HF115FK MINIATURE HIGH POWER RELAY

c UL us
File No.:E134517

VDE
File No.:116934

CQC
File No.:CQC17002176308

Features

- Low height: 15.7 mm
- 16A switching capability
- 5kV dielectric strength (between coil and contacts)
- Creepage distance: 10mm
- Meeting reinforce insulation
- Flux proofed type
- Product in accordance to IEC 60335-1 available
- UL insulation system: Class F

CONTACT DATA

Contact arrangement	1A, 1C	2A, 2C
Contact resistance [1]	100mΩ max.(at 1A 6VDC)	
Contact material	$AgSnO_2$	
Contact rating (Res. load)	12A/16A 250VAC	8A 250VAC
Max. switching voltage	400VAC	
Max. switching current	12A / 16A	10A
Max. switching power	3000VA / 4000VA	2000VA
Mechanical endurance	1×10^7 OPS	
Electrical endurance	H3(P)T type: 1×10^5 OPS (NO: 16A 277VAC, Resistive Load at 40°C, 1s on 9s off) Z3(P)T type: 5×10^4 OPS (NO: 16A 250VAC, Resistive Load at 85°C, 1s on 9s off) 2Z4(P)T type: 5×10^4 OPS (NO: 8A 250VAC, Resistive Load at 85°C, 1s on 9s off) Z33 type: 1×10^5 OPS (NO: 16A 277VAC, Resistive Load at 40°C, 1s on 9s off) 2Z43 type: 5×10^4 OPS (NO: 8A 277VAC, Resistive Load at 40°C, 1s on 9s off)	

Notes: 1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric strength	Between coil & contacts	5000VAC 1min
	Between open contacts	1000VAC 1min
	Between contact sets	2500VAC 1min
Surge voltage (between coil & contacts)		10kV (1.2 x 50μs)
Operate time (at rated. volt.)		10ms max.
Release time (at rated. volt.)		5ms max.
Shock resistance *	Functional	$98m/s^2$
	Destructive	$980m/s^2$
Vibration resistance *		10Hz to 150Hz 10g/5g
Humidity		5% to 85% RH
Ambient temperature		-40°C to 85°C
Termination		PCB
Unit weight		Approx. 13g
Construction		Flux proofed

Notes: 1) The data shown above are initial values.
2) * Index is not in relay length direction.

COIL

Coil power	Approx. 400mW(Standard type)
	Approx. 530mW(high power consumption type)

COIL DATA at 23°C

Standard type

Nominal Voltage VDC	Pick-up Voltage VDC max. [1]	Drop-out Voltage VDC min. [1]	Max. Voltage VDC [2]	Coil Resistance Ω
5	3.50	0.5	7.5	62 x (1±10%)
6	4.20	0.6	9.0	90 x (1±10%)
9	6.30	0.9	13.5	202 x (1±10%)
12	8.40	1.2	18	360 x (1±10%)
18	12.60	1.8	27	810 x (1±10%)
24	16.80	2.4	36	1440 x (1±10%)
48	33.60	4.8	72	5760 x (1±15%)

COIL DATA at 23°C

high power consumption type

Nominal Voltage VDC	Pick-up Voltage VDC max. [1]	Drop-out Voltage VDC min. [1]	Max. Voltage VDC [2]	Coil Resistance Ω
5	≤3.50	≥0.5	7.5	47 x (1±10%)
6	≤4.20	≥0.6	9.0	68 x (1±10%)
9	≤6.30	≥0.9	13.5	153 x (1±10%)
12	≤8.40	≥1.2	18	271 x (1±10%)
18	≤12.60	≥1.8	27	611 x (1±10%)
24	≤16.80	≥2.4	36	1086 x (1±10%)
48	≤33.60	≥4.8	72	4347 x (1±15%)

Notes: 1) The data shown above are initial values.
2)*Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

HONGFA RELAY
ISO9001, ISO/TS16949 , ISO14001, OHSAS18001, IECQ QC 080000 CERTIFIED 2018 Rev. 1.00

Technical Data Relay RT314024

Tyco Electronics General Purpose Relays SCHRACK

Power PCB Relay RT1

1 pole 12/16 A, 1 CO or 1 NO contact
DC- or AC-coil
Sensitive coil 400 mW
5 kV/10 mm coil-contact, reinforced insulation
Ambient temperature 85°C (DC-coil)
WG version: Product in accordance to IEC60335-1
RoHS compliant (Directive 2002/95/EC) as per product date code 0413

F0144-B

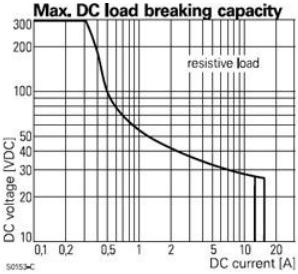
Applications
Boiler control, timers, garage door control, POS automation, interface modules

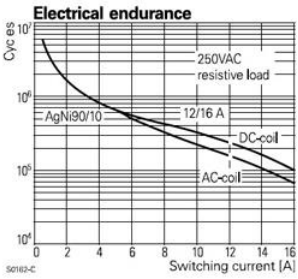
Approvals

VDE REG.-Nr. 6106, c UL us E214025, SP 14385, SEMKO C0786, KEMA KEUR 98.4118.01,
Technical data of approved types on request

Contact data

Contact configuration	1 CO or 1 NO contact	
Contact set	single contact	
Type of interruption	micro disconnection	
Rated current	12 A	16 A
Rated voltage / max.switching voltage AC	250/400 VAC	
Limiting continuous current		UL: 20 A
Maximum breaking capacity AC	3000 VA	4000 VA
Limiting making capacity, max 4 s, df 10%	25 A	30 A
Contact material	AgNi 90/10, AgNi 90/10 gold plated	
Mechanical endurance DC coil	> 30 x 10^6 cycles	
AC coil	> 10 x 10^6 cycles	
Rated frequency of operation with / without load	6 / 1200 min^{-1}	





Contact ratings

Type	Load	Cycles
RT314	16 A, 250 VAC, NO contact, 85°C, DF 10%, UL508	50x10^3
RT314	16 A, 250 VAC, NC contact, 70°C, 30min^{-1}	53x10^3
RT314	20 A, 250 VAC, NO contact, 85°C, UL508	6x10^3
RT314	1000 W incandescent lamp, 250 VAC	1.2x10^3
RT314	10 A, 250 VAC, cosφ=0.6, CO contact, 70°C	200x10^3
RT314	5 A / 2 A, 250 VAC, cosφ=1, motor, NO contact, 10min^{-1}, 70°C	1.1x10^6
RT314	0.26 A / 0.01 A, 230 VAC, cosφ=0.38, valve, NO contact, 25min^{-1}	7.6x10^6
RT314	Pilot duty A300 (NO contact), B300 (CO/NC contact), UL508	
RT314	1hp @ 240 VAC, 1/2hp @ 120 VAC, NO contact, UL508	
RT314	AC15, 6 A, 250 VAC, NO and NC contact, 85°C, EN60947-5-1	
RT314	DC13, 2 A / 24 VDC, 0.2 A / 250 VDC, NO and NC contact, 85°C, EN60947-5-1	

Coil data

Rated coil voltage range DC coil	5...110 VDC
AC coil	24...230 VAC
Coil power DC coil	typ 400 mW
AC coil	typ 0.75 VA
Operative range	2
Coil insulation system according UL1446	class F

Specifications for the 230 V AC/1.5 A TRIAC output

Output voltage	230 V AC
Max. Output current	1.5 A output current
Number of …	1 (solid state relay)
Connection technology	1 x 3-pin. Phoenix RM 5.08 mm

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	±0.5 °C
Measurement value	14-bit		
Typical current measuring	0.9 mA		
Input resistance	10 KΩ		
Input filter	100 ms		
Connection technology	2-pin Phoenix RM 3.5 per PT1000 input		

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 3x 2-pin FK-MCP 1,5/2-ST-3,5 Phoenix Contact spring terminal connector

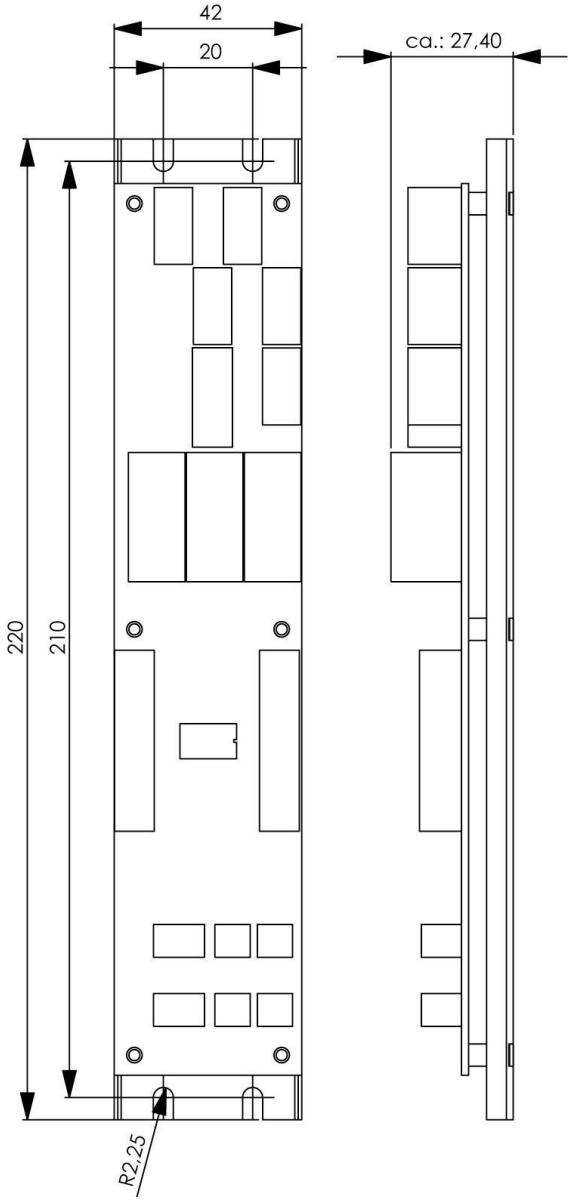
Miscellaneous

Article number	05-895-534
HW Version	1.x
HW classes	hzs534 hzs53x => can be used for all

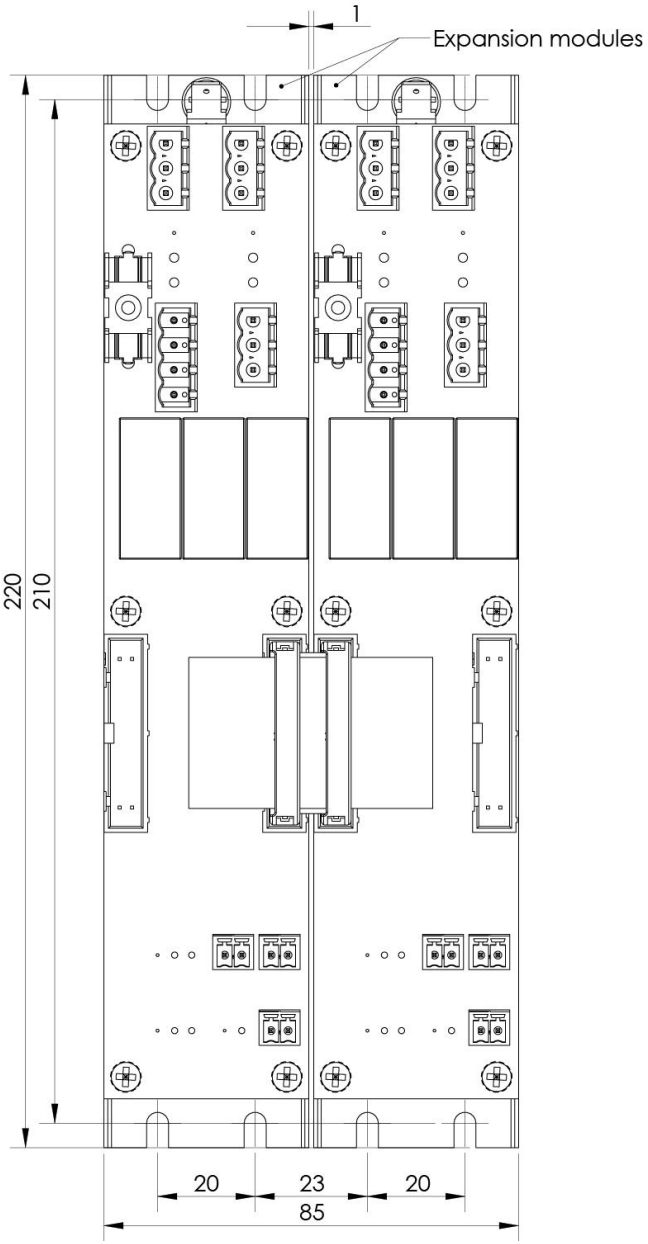
Environmental conditions

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

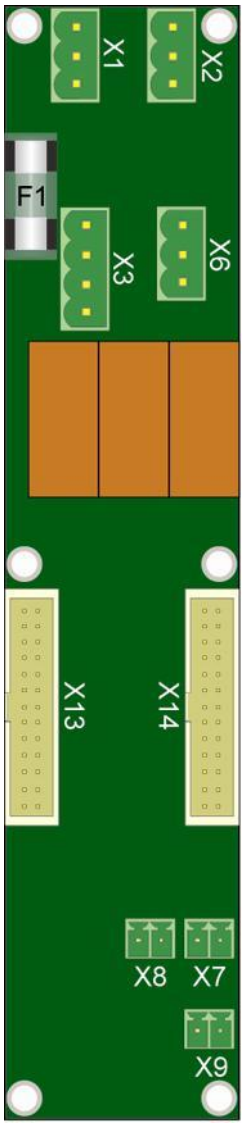
HZS 534 Mechanical Dimensions



Assembly instructions



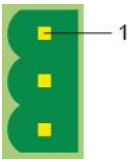
HZS 534 Internal Buffer/Boiler Module Connector Layout



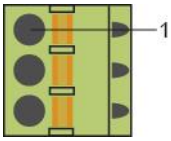
Internal Buffer/Boiler Module Connector Pin Assignment

X1 – 230 V AC – mains – Phoenix RM 5.08

3-pin spring connector terminal

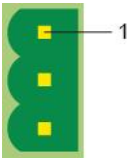


Pin	Signal	Function
1	L	Phase
2	N	Neutral
3	PE	Earth wire

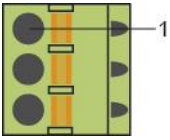


X2 – 230 V AC power line – Phoenix RM 5.08

3-pin spring connector terminal



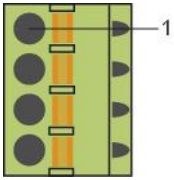
Pin	Signal	Function
1	L	Phase
2	N	Neutral
3	PE	Earth wire



X3 – 230 V AC relay output: Fast heating module – Phoenix RM 5.08 (DO01 and DO02)

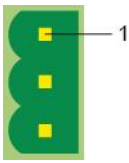
4-pin spring connector terminal

Pin	Signal	Function
1	$L_{Schnellh1}$	Relay output, fast heating module (1)
2	$L_{Schnellh2}$	Relay output, fast heating module (2)
3	N	Neutral
4	PE	Earth wire

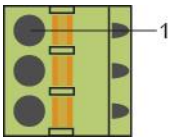


X6 – 230 V AC relay output: buffer load pump – Phoenix RM 5.08 (DO03)

3-pin spring connector terminal

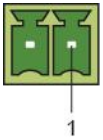


Pin	Signal	Function
1	LPump	Relay output for the buffer load pump
2	N	Neutral
3	PE	Earth wire

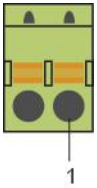


X7 – Upper buffer temperature input 3.5 – Phoenix RM 3.5 (AI1)

2-pin spring connector terminal

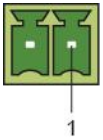


Pin	Signal	Function
1	AI1	Analog input AI1 PT1000 (-10 ... +120 °C)
2	AGND	AGND

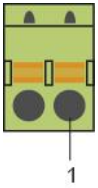


X8 – Lower buffer temperature input 3.5 – Phoenix RM 3.5 (AI2)

2-pin spring connector terminal

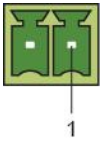


Pin	Signal	Function
1	AI2	Analog input AI2 PT1000 (-10 ... +120 °C)
2	AGND	AGND

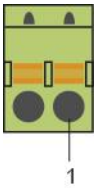


X9 – Middle buffer temperature input 3.5 – Phoenix RM 3.5 (AI3)

2-pin spring connector terminal



Pin	Signal	Function
1	AI3	Analog input AI3 PT1000 (-10 ... +120 °C)
2	AGND	AGND



X13 and x14 - ribbon cable connection to internal expansion modules - 26-pin blade terminal

The internal buffer/boiler module communicates with the controller (X13) over this ribbon cable connection.

All signals are encoded and/or sent to the next internal expansion (X14).

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.

Wiring guidelines for digital inputs

The input filters used, which suppress noise signals, allow operation in harsh environmental conditions. In addition, a careful wiring method is 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

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 must be large enough for the maximum continuous current at 230 V AC for each connected load as stated in the specifications for the relay outputs. 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! Hi voltages can 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.

CAN Bus Communication

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