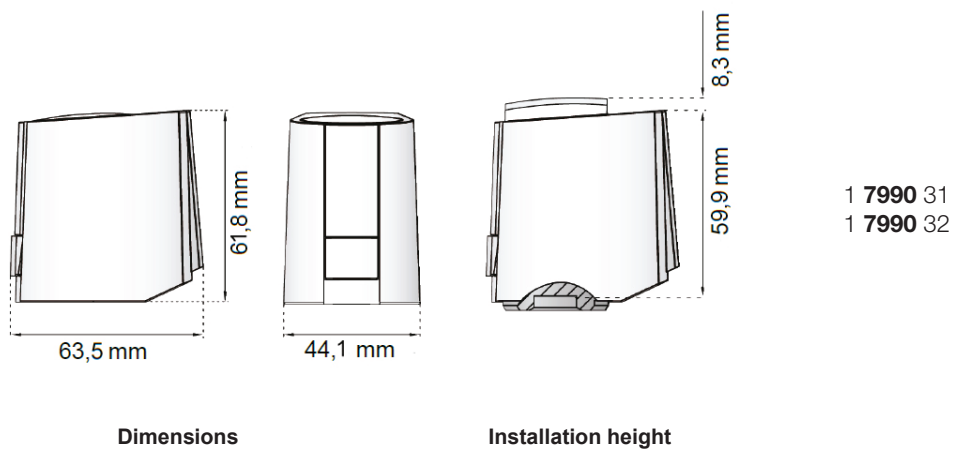
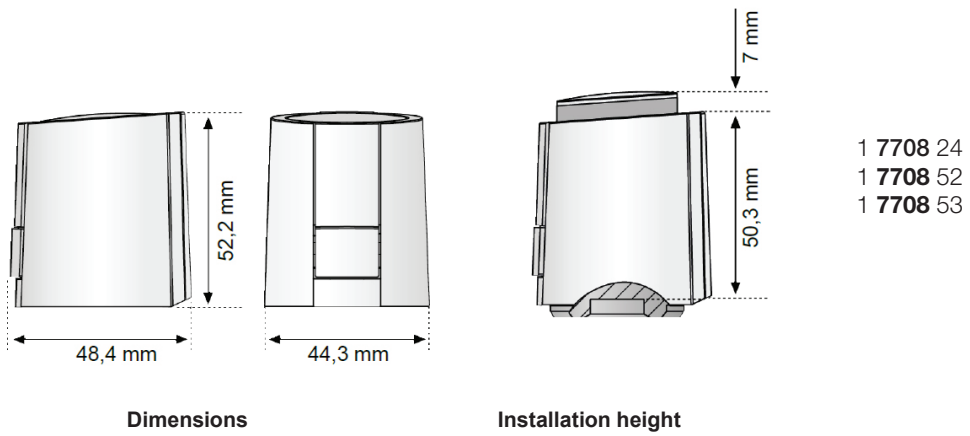
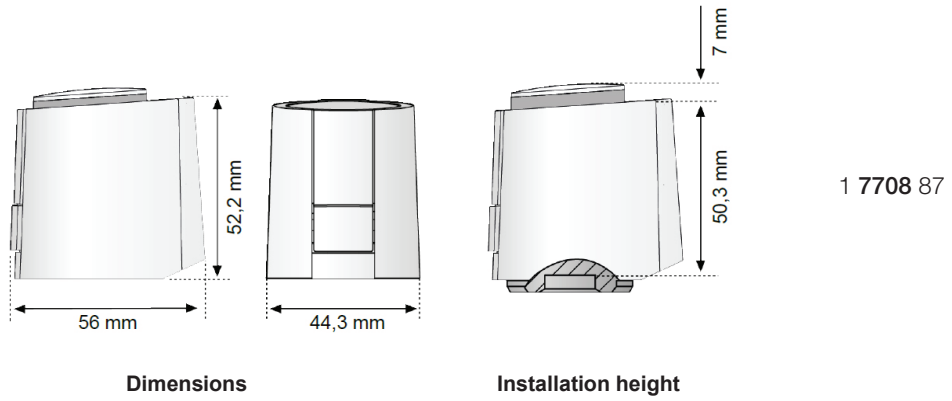


HERZ Actuator 7708, 7990

Data sheet for **7708, 7990** Issue **1116**

Dimensions



☑ Models

- 1 **7708 24** **HERZ Actuator 2-point, M28 x 1.5, 230 V, 50 Hz**
normally open, closing force 100 N, operating voltage 230 V ~, threaded connection M28 x 1.5, red adapter
1 **7708 90** is included, max. stroke 5 mm
- 1 **7708 87** **HERZ Actuator 2-point with end switch, M28 x 1.5, 230 V, 50 Hz**
normally closed, closing force 100 N, operating voltage 230 V ~, threaded connection M28 x 1.5, red adapter
1 **7708 90** is included, max. stroke 5 mm
- 1 **7708 52** **HERZ Actuator 2-point, M28 x 1.5, 24 V, 50 Hz**
normally closed, closing force 100 N, operating voltage 24 V ~, threaded connection M28 x 1.5, red adapter
1 **7708 90** is included, max. stroke 5 mm
- 1 **7708 53** **HERZ Actuator 2-point, M28 x 1.5, 230 V, 50 Hz**
normally closed, closing force 100 N, operating voltage 230 V ~, threaded connection M28 x 1.5, red adapter
1 **7708 90** is included, max. stroke 5 mm
- 1 **7990 31** **HERZ Actuator modulating 0..10 V, M28 x 1.5, 24 V, 50 Hz**
normally closed, closing force 100 N, operating voltage 24 V ~, threaded connection M28 x 1.5, blue adapter
1 **7708 85** is included, max. stroke 5 mm
- 1 **7990 32** **HERZ Actuator modulating 0..10 V, M28 x 1.5, 24 V, 50 Hz**
normally closed, closing force 125 N, operating voltage 24 V ~, threaded connection M28 x 1.5, blue adapter
1 **7708 85** is included, with valve path recognition, max. stroke 6,5 mm

☑ Application 1 7708 87

The HERZ-Actuator 230 V with end switch is a thermoelectric valve drive for opening and closing valves and small valves used in the scope of HVAC technology. The integrated micro switch with floating contact allows direct operation of a pump or fan control unit. The HERZ Actuator 230 V with end switch is controlled by a 230 V room thermostat with two-point output or pulse-width modulation.

☑ Application 1 7708 24, 1 7708 52, 1 7708 53

The HERZ-Actuator 230 V / 24 V is a thermoelectric valve drive for opening and closing valves on heating circuit distributors of concealed floor heating and cooling systems. The main field of application is the energy-efficient individual room temperature control in the range of building management systems and home automation. The HERZ-Actuator 230 V / 24 V is controlled by a 230 V / 24 V room thermostat with two point output or pulse-width modulation.

☑ Application 1 7990 31, 1 7990 32

The HERZ-Actuator 2-point, Proportional 5/6,5 mm is a thermoelectric actuator for the control of heating and cooling systems in direct proportion to the applied control voltage. The control of the actuators is performed by a 0-10 V DC signal via a central DDC system or by a room thermostat. The principal area of application is the building management system range.

Furthermore, the variant 1 **7990 32** with valve path recognition automatically registers the valve path for an optimum use of the active control voltage range. This guarantees an even more precise control of all valves.

☑ Operation

The actuating drive is switched on via an electrical contact, e.g. from a room thermostat, and starts opening or closing the thermostatic valve. The actuating movement is accomplished by an electrically-heated expansion element. When the heating current is switched off, the valve closes or opens respectively. The HERZ actuating drive is maintenance-free and offers silent operation.

☑ "First-Open"-Function

HERZ-actuators are delivered in a normally open state. By means of this feature it is possible to have the heating or cooling system operating even before an electrical wiring stage is completed. On first use an operating voltage must be applied for longer than six minutes to the actuator, then it will be unlocked and ready-for-use. Once the "First-Open"-function has been activated a bigger force is required to mount the actuator.

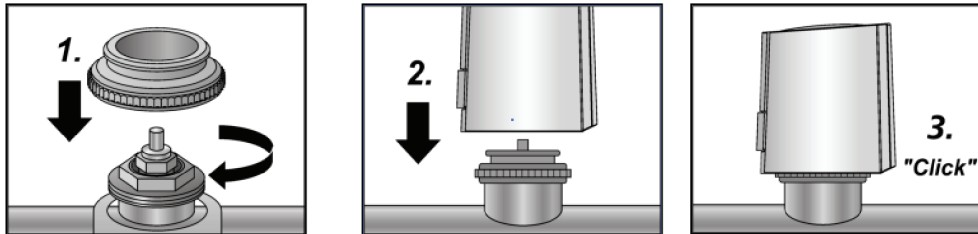
☑ Emergency function

With factory setting "normally closed" the valve can be opened by removing the drive in case of a power failure.

☑ Installation 1 7708 24, 1 7708 87, 1 7708 52, 1 7708 53

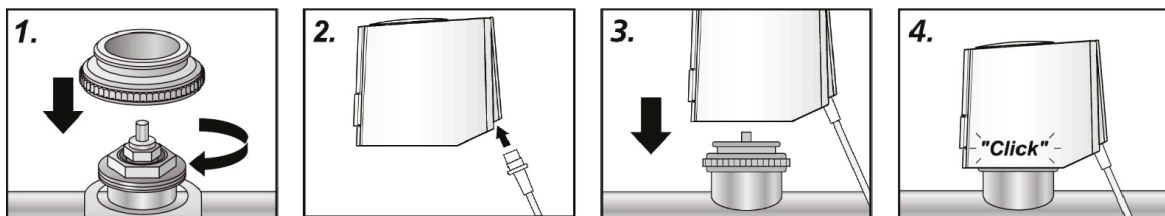
The wide selection of valve adapters guarantees a perfect match of the HERZ-Actuator to almost any valve insert or manifold available on the market. Simply snap-on the HERZ-Actuator to the manually pre-installed valve adapter.

- First the valve adapter is screwed on the valve manually.
- The HERZ-Actuator is placed vertically on the valve adapter.
- The HERZ-Actuator snaps onto the valve adapter with a “click” when pressed down vertically by hand.



☑ Installation 1 7990 31, 1 7990 32

The valve adapter assortment guarantees a perfect match of the actuator to almost all valve inserts and heating circuit distributors available on the market. The HERZ ActuatorProportional is simply plugged on to the valve adapter previously installed manually.



Screw the adapter manually onto the valve.

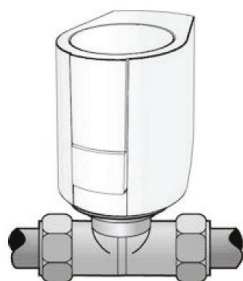
Connect the line to the actuator.

Position the HERZ Actuator manually in vertical position to the valve adapter.

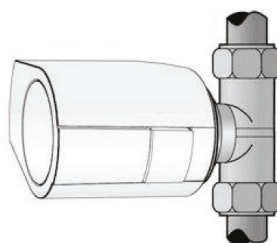
Latch the HERZ Actuator to the valve adapter by manually applied vertical pressure; this can be done noiselessly and without any problems.

☑ Installation position

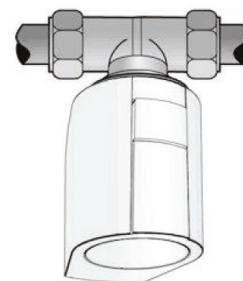
The HERZ-Actuator must be installed preferably in vertical or horizontal installation position. For “upside down” installation special circumstances (e. g. drainwater) can reduce the lifetime of the actuator.



Vertical



Horizontal



Upside down

☑ Technical data 1 7708 24, 1 7708 53

Operating voltage	230 V AC, +10%...-10%, 50/60 Hz
Max. start up current	< 550 mA during 100 ms max.
Operating power	1 W ¹⁾
Stroke (actuator travel)	5.0 mm
Actuating force	100 N ±5%
Fluid temperature	0 to +100°C ²⁾
Storage temperature	-25°C to +60°C
Ambient temperature	0 to +60°C
Type of protection	IP 54 ³⁾ / II
CE conformity according to	EN 60730
Housing material/housing colour	Polyamide / light grey (RAL 7035)
Connecting cable/colour	2 x 0.75 mm ² PVC / light grey (RAL 7035)
Cable length	1 m
Weight with connecting cable (1 meter)	100 g
Surge protection according to EN 60730-1	min. 2.5 kV

1) measured with precision reference instrument LMG95 - 2) in dependence of the adapter even higher - 3) in all installation positions

☑ Technical data 1 7708 52

Operating voltage	24 V AC/DC, +20%...-10%
Max. start up current	< 300 mA during 2 min. max.
Operating power	1 W ¹⁾
Stroke (actuator travel)	5.0 mm
Actuating force	100 N ±5%
Fluid temperature	0 to +100°C ²⁾
Storage temperature	-25°C to +60°C
Ambient temperature	0 to +60°C
Type of protection	IP 54 ³⁾ / III
CE conformity according to	EN 60730
Housing material/housing colour	Polyamide / light grey (RAL 7035)
Connecting cable/colour	2 x 0.75 mm ² PVC / light grey (RAL 7035)
Cable length	1 m
Weight with connecting cable (1 meter)	100 g
Surge protection according to EN 60730-1	min. 2.5 kV

1) measured with precision reference instrument LMG95 - 2) in dependence of the adapter even higher - 3) in all installation positions

☑ Technical data 1 7708 87

Operating voltage	230 V AC, -10%...+10%, 50/60 Hz
Max. start up current	< 550 mA during max. 100 ms
Operating power	1 W ¹⁾
Stroke (actuator travel)	5.0 mm
Actuating force	100 N ±5%
Switching current for micro switch	230 V AC: 5 A resistive load, 1 A inductive load
Switching point of micro switch NC	approx. 2 mm
Fluid temperature	0 - +100°C ²⁾
Storage temperature	-25 °C to +60°C
Ambient temperature	0 to +60°C
Degree / class of protection	IP 54 ³⁾ / II
CE conformity according to	EN 60730
Casing material / colour	Polyamide / light grey (RAL 7035)
Connection line / colour	4 x 0.75 mm ² PVC / light gray (RAL 7035)
Cable length	1 m
Weight with connecting cable (1 m)	approx. 150 g
Surge protection according to EN 60730-1	min. 2.5 kV

1) measured with precision reference instrument LMG95 - 2) in dependence of the adapter even higher - 3) in all installation positions

☑ Technical data 1 7990 31, 1 7990 32

Voltage	24 V AC, -20 %... +20 %
Control voltage range	0 V... 10 V DC
Max. start up current	< 300 mA for max. 2 Min.
Operating power	1. W ¹⁾ (1 7990 31) / 1,2 W ¹⁾ (1 7990 32)
Resistance of control voltage input	100 kΩ
Stroke	5 mm (1 7990 31) / 6.5 mm (1 7990 32)
Actuating force	100 N ±5% (1 7990 31) / 125 N ±5% (1 7990 32)
Fluid temperature	0 to +100°C ²⁾
Storage temperature	-25°C to +65°C
Ambient temperature	0 to +60°C
Degree / class of protection	IP 54 ³⁾ / III
CE conformity according to	EN 60730
Casing material / colour	Polyamid / white
Connection line / colour	3 x 0.22 mm ² PVC / white

1) measured with precision reference instrument LMG95 - 2) in dependence of the adapter even higher - 3) in all installation positions

☑ Room thermostat

Standard room thermostats equipped with a thermal feedback loop can be used for piloting the HERZ actuating drive. If required, several drives can be connected in parallel taking the maximum admissible electrical load of the switch contact into account.

Design and planning notes

When selecting the switch contacts and mains fuses, the start up current of the heating element must be taken into account. The voltage loss in the electric lines must not exceed 10 %, ensuring that the indicated runtime is guaranteed.

Max. cable length for an actuating drive with given cable cross-sections (information with voltage drop approx. 5 %; at 230 V voltage drop is 10 V, at 24 V voltage drop is 1 V).

When using several actuating drives, the indicated cable length must be divided by the number of actuating drives connected.

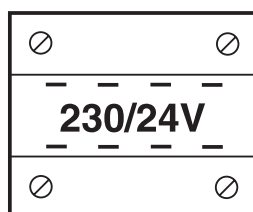
Cable cross-section (mm ²)	230 V, max. length (m)	24 V, max. length (m)
2 x 0.75	1500	168
2 x 1.0	2000	224
2 x 1.5	3000	340
2 x 2.5	5000	560

Resistance values

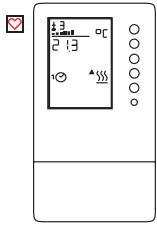
Please refer to the HERZ standard diagrams contained in the relevant standard sheets with regard to resistance values when operating HERZ valves with HERZ actuating drives. The curves "Valve fully open" or "max." apply.

☑ Accessory
☑ 1 7796 04 HERZ Transformer 230/24 V

The overload-proof HERZ safety transformer 230/24 V is designed for the connection of HERZ room thermostats and HERZ actuating drives and suitable for operation of 8 HERZ actuating drives max.



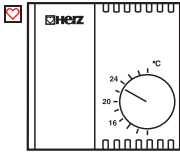
Version	as per VDE 0551
Protection class	II
Protection class	IP 20
ISO Cl.	T40/E
Input voltage	230 V
Fuse in input circuit	50-60 Hz, 315 mA
Output voltage	24 V
Power	50 VA
Quick installation on device rail	ref. DIN 42227/3
Dimensions	106 x 90 x 74 mm (B x H x T)



1 **7791 23 HERZ Electronic room temperature controller for 2-point or pulse control with timer**

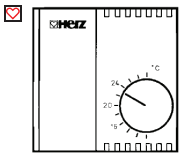
For individual control with programmable times and temperatures. Timer with weekly and annual programs, automatic switchover from summer to winter time.

Setpoint range 8 – 38 °C
 Switching differential as 2-point controller 0.4 – 8 K
 Measurement accuracy 0.3 K at 20 °C
 Operating voltage 230 V



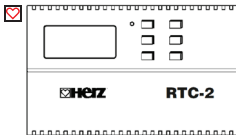
1 **7790 15 HERZ Electronic room temperature controller for 2-point control**

1 switchover contact
 Setpoint range 10 – 30 °C
 Switching differential +/-0.2 K fixed
 Operating voltage 230 V



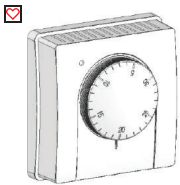
1 **7790 25 HERZ Electronic room temperature controller for 2-point control**

1 switchover contact
 Setpoint range 10 – 30 °C
 Switching differential +/-0.2 K fixed
 Operating voltage 24 V



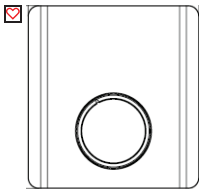
1 **7940 62 HERZ-RTC-2 Room Temperature Computer**

With 3 weekly programmes, 4 temperature steps, vacation programme for heating and cooling, switching difference adjusting. Set value range 5–40 °C, operating voltage 24 V, output voltage 0–10 V.

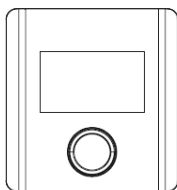


Electromechanical Room Temperature Controller

1 change-over contact, set value range 5-30°C. Adjustment of set value by means of mechanical limitation of set value range



- | | | |
|---------------|------------------|--|
| Analog | 3 F799 11 | Heating, temperature set-back, frost protection, 230 V~ |
| | 3 F799 12 | Heating, temperature set-back, frost protection, 24 V~ |
| | 3 F799 13 | Heating/ cooling, temperature set-back, frost protection and valve protection function, cooling lock, 230 V~ |
| | 3 F799 14 | Heating/ cooling, temperature set-back, frost protection and valve protection function, cooling lock, 24 V~ |



- | | | |
|----------------|------------------|--|
| Digital | 3 F799 15 | Heating, temperature set-back, frost protection, 230 V~ |
| | 3 F799 16 | Heating, temperature set-back, frost protection, 24 V~ |
| | 3 F799 17 | Heating/ cooling, temperature set-back, frost protection and valve protection function, cooling lock, 230 V~ |
| | 3 F799 18 | Heating/ cooling, temperature set-back, frost protection and valve protection function, cooling lock , 24 V~ |

Adapter for Motor Valve Drives

- 1 **7708 90** Colour red, adapter M28 x 1,5 for the use with HERZ- heating circuit distributor and HERZ valves (incl. 4002, 4006 and 7217-GV) in combination with 2-point-actuators.
- 1 **7708 85** Colour blue, adapter M28 x 1,5 for HERZ 4002, 4006 and 7217 GV in combination continuous actuators 1 7990 3x and 1 7990 4x
- 1 **7708 86** Colour light gray, adapter for the use with: Oventrop thermostatic valves and distributors made of stainless steel, Oventrop Cocon, Cocon4, Viega distributors made of stainless steel , T&A, TBV-CM, TBV-CMP
- 1 **7708 80** Adapter M 28 x 1,5 for HERZ-actuating drive, colour grey for the use with 7217-98-V, 7217-99-V
- 1 **7708 98** Adapter M 30 x 1,5 for the use with HERZ Ventilen with M 30 x 1,5 connection thread and regulating valves 7760, 7762 and 7763

Adapter-Valve-Diagram

Valve types												
	TS-90-DE LUXE	TS-98-V DE LUXE	DE LUXE TS-3000	DE LUXE VUA	TS-98-V (M28 x 1,5)	TS-90-V (M28 x 1,5)	TS-99-FV (M28 x 1,5)	TS-90-KV (M28 x 1,5)	TS-90 (M28 x 1,5)	TS-90-E (M28 x 1,5)	TS-E (M28 x 1,5)	
Adapters and actuators	2-Point-Regulation 1 7708 24	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	1 7708 52	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	1 7708 53	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	1 7708 87	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Adapters and actuators	continuous Regulation 1 7990 31	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	1 7990 32	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	*	Adapter 1 7708 90 has to be ordered separately										
	**	Adapter 1 7708 80 has to be ordered separately										
	***	Adapter 1 7708 98 has to be ordered separately										

Adapter-Valve-Diagram

Valve types												
	TS-90 DIN (M28 x 1,5)	TS-90-V DIN (M28 x 1,5)	TS-98-V DIN (M28 x 1,5)	TS-99-FV DIN (M28 x 1,5)	TS-98-VH (M30 x 1,5)	TS-90-H (M30 x 1,5)	TS-98-VH (M30 x 1,5)	TS-3000 (M28 x 1,5)	TS-3000 (M30 x 1,5)	TS-90 (M28 x 1,5)	Callis-TS (M28 x 1,5)	
Adapters and actuators	2-Point-Regulation 1 7708 24	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	1 7708 52	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	1 7708 53	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	1 7708 87	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Adapters and actuators	continuous Regulation 1 7990 31	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	1 7990 32	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
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	**	Adapter 1 7708 80 has to be ordered separately										
	***	Adapter 1 7708 98 has to be ordered separately										

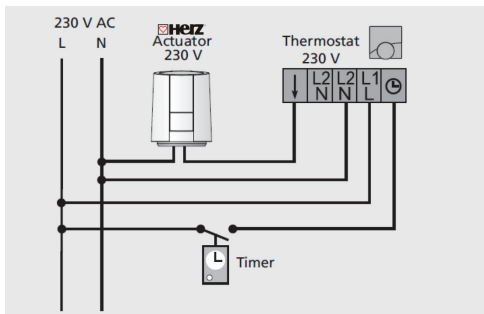
Adapter-Valve-Diagram

		Valve types										
		Callis-TS-E (M28 x 1,5)	VTA-40 (M28 x 1,5)	VTA-50 (M30 x 1,5)	VUA-AHA (M28 x 1,5)	VUA-40 (M28 x 1,5)	VUA-50 (M30 x 1,5)	4002 (M28 x 1,5)	4006 (M28 x 1,5)	7217 V (M28 x 1,5)	7217 GV (M28 x 1,5)	7217-98-V (M28 x 1,5)
red	2-Point-Regulation 1 7708 24	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	1 7708 52	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
blue	1 7708 53	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	1 7708 87	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	continuous Regulation 1 7990 31	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	1 7990 32	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	*	Adapter 1 7708 90 has to be ordered separately										
	**	Adapter 1 7708 80 has to be ordered separately										
	***	Adapter 1 7708 98 has to be ordered separately										
Adapters and actuators												

Adapter-Valve-Diagram

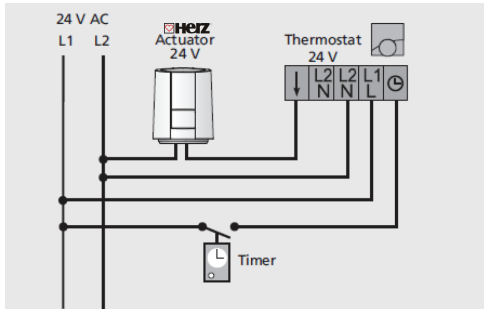
		Valve types									
		7217-99-FV (M28 x 1,5)	7723 Zonenventil (M28 x 1,5)	7760 RD (M28 x 1,5)	7761 RD (M28 x 1,5)	7760 (M30 x 1,5)	7762	7763			
red	2-Point-Regulation 1 7708 24	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
	1 7708 52	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
blue	1 7708 53	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
	1 7708 87	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
	continuous Regulation 1 7990 31	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
	1 7990 32	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
	*	Adapter 1 7708 90 has to be ordered separately									
	**	Adapter 1 7708 80 has to be ordered separately									
	***	Adapter 1 7708 98 has to be ordered separately									
Adapters and actuators											

Electric connections 1 7708 53



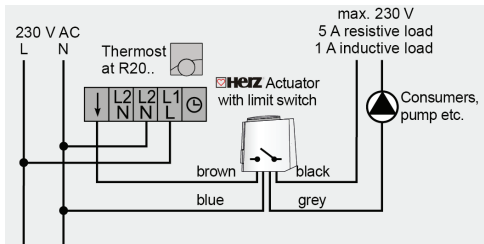
We recommend usage of the following lines for installing a 230 V system:
 Light plastic-sheathed cable NYM 1.5 mm² or flat webbed building wire NYIF 1.5 mm²

Electric connections 1 7708 52



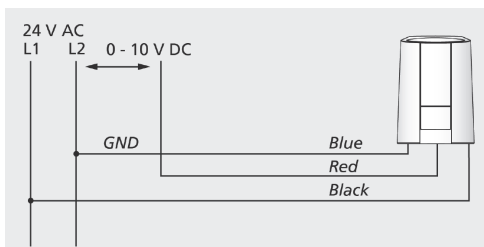
We recommend usage of the following lines for installing a 24 V system:
 Light plastic-sheathed cable NYM 1.5 mm² or flat webbed building wire NYIF 1.5 mm²

Electric connections 1 7708 87



We recommend usage of the following lines for installing a 230 V system:
 Light plastic-sheathed cable NYM 1.5 mm² or flat webbed building wire NYIF 1.5 mm²

Electric connections 1 7990 31, 1 7990 32



Calculation of maximum cable length (copper cable) for 24 V rated voltage
 $L = C \times A / n$
 L Cable length in m; K Constant (269 m/mm²); A Conductor cross-section in mm²; n Number of Alpha-Actuators

We recommend the following cables for installing a 24 V system:
 Telephone line J-Y(ST)Y 0.8 mm²
 Light plastic-sheathed cable: NYM 1.5 mm²
 Flat webbed building wire: NYIF 1.5 mm²

Transformer: A safety isolating transformer according to EN 61558-2-6 must always be used. Transformer dimensioning results from the making capacity of the HERZ-Actuators.
 Rule-of-thumb formula: $P_{transformer} = 7.2 \text{ W} \times n$
 n = Number of OEM Actuators

Note: All diagrams are for illustrating purposes only and do not claim to be complete. All information contained in this brochure corresponds to the state of knowledge at the time of going to print and is intended for informational purposes only. We therefore reserve the right to make any changes subject to advancing technology. The images are symbolic representations only and can therefore visually deviate from the actual appearance of products. Any deviations in color are due to typography. Subject to country-specific product variants. We reserve the right to change specifications and functions without notice. Please contact your nearest HERZ subsidiary if you have any questions.