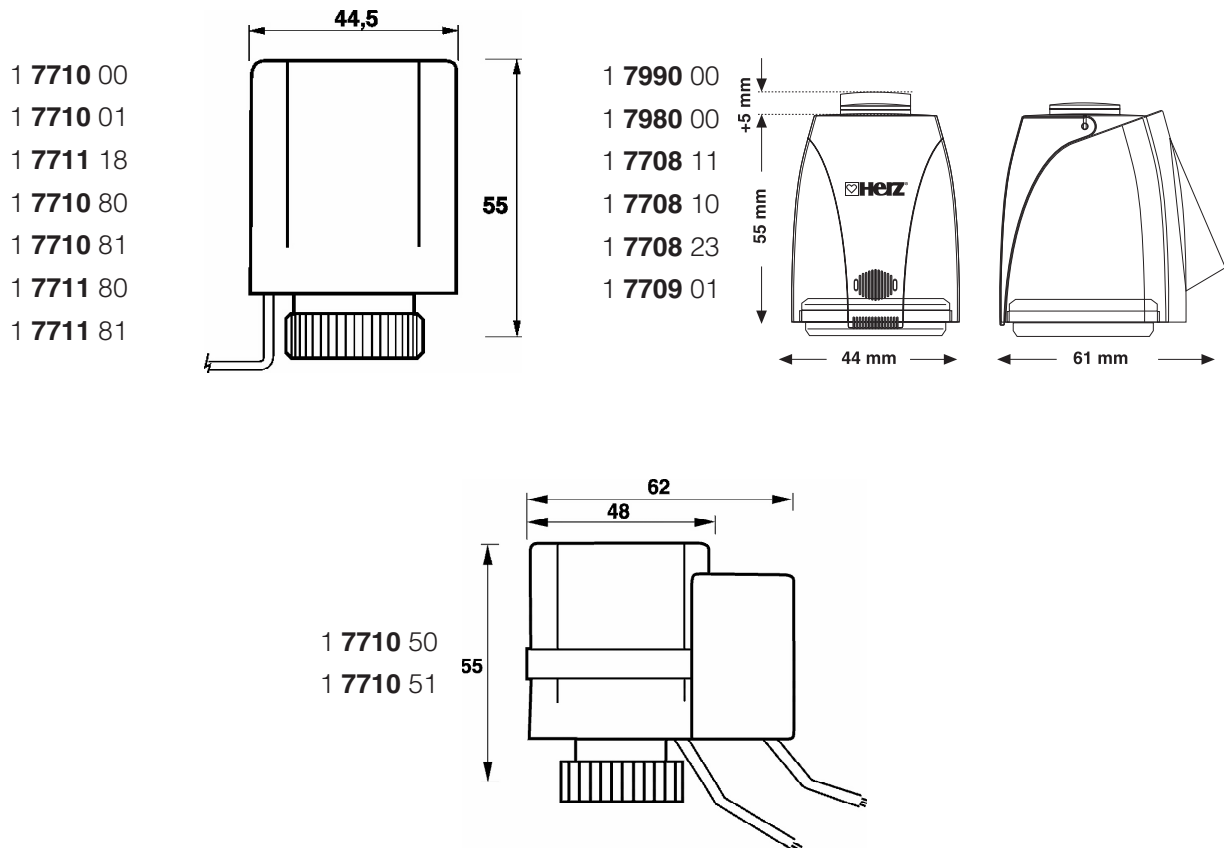


# HERZ-Thermal Actuators

Data Sheet **7708 - 7990**, Issue 1011

## ☑ Dimensions in mm



## ☑ Thermal Actuator Models

- 1 7710 00 **HERZ- Thermal Actuator M 28 x 1,5, 230 V, 50 Hz**  
with normally closed contact (NC), can be switched to normally open contact (NO), M 28 x 1.5.
- 1 7710 01 **HERZ- Thermal Actuator M 28 x 1,5, 24 V DC**  
with normally closed contact (NC), can be switched to normally open contact (NO), M 28 x 1.5.
- 1 7711 18 **HERZ- Actuating drives for continuous control, M 30 x 1,5, 24 V DC**  
Thermo-electronic continuous drive, 3-conductor connection cable, operating voltage 24 V, driving voltage 0-10 V DC.
- 1 7710 80 **HERZ- Thermal Actuator M 30 x 1,5, 230 V, 50 Hz**  
with normally closed contact (NC), can be switched to normally open contact (NO), M 30 x 1,5
- 1 7710 81 **HERZ- Thermal Actuator M 30 x 1,5, 24 V DC**  
with normally closed contact (NC), can be switched to normally open contact (NO), M 30 x 1,5
- 1 7711 80 **HERZ- Thermal Actuator M 30 x 1,5, 230 V, 50 Hz**  
For HERZ-thermostatic valves 1 7760, 1 7762 and 1 7763; with normally closed contact (NC), can be switched to normally open contact (NO). M 30 x 1,5
- 1 7711 81 **HERZ- Thermal Actuator M 30 x 1,5, 24 V DC**  
For HERZ-thermostatic valves 1 7760, 1 7762 and 1 7763; with normally closed contact (NC), can be switched to normally open contact (NO). M 30 x 1,5
- 1 7990 00 **HERZ- DDC- actuating drive M 28 x 1,5, 24 V AC**  
Thermo-electronic continuous drive, 3-conductor connection cable. Operating voltage 24 V, driving voltage 0-10 V DC, 100kΩ M 28 x 1,5

- 1 7710 50 **HERZ- Thermal Actuator M 28 x 1,5, 230 V, 50 Hz**  
with normally closed contact (NC), can be switched to normally open contact (NO), M 28 x 1.5, Installed with auxiliary contact (1 changeover contact).
- 1 7710 51 **HERZ- Thermal Actuator M 28 x 1,5, 24 V DC**  
with normally closed contact (NC), can be switched to normally open contact (NO), M 28 x 1.5, Installed with auxiliary contact (1 changeover contact).
- 1 7708 11 **HERZ- Thermal Actuator M 28 x 1,5, 230 V, 50 Hz**  
with normally closed contact (NC), M 28 x 1.5.
- 1 7708 10 **HERZ- Thermal Actuator M 28 x 1,5, 24 V DC**  
with normally closed contact (NC), M 28 x 1.5.
- 1 7710 55 **Auxiliary contact**  
For actuating drives 1 7710 ..., for retro fitting.
- 1 7708 23 **HERZ- Thermal Actuator M 28 x 1,5, 230 V, 50 Hz**  
with normally closed contact (NC), M 28 x 1.5.
- 1 7709 01 **HERZ- Thermal Actuator M 28 x 1,5, 230 V, 50 Hz**  
with normally open contact (NO), M 28 x 1.5.

#### **Application 7710/7711/7708/7709**

HERZ thermal actuators are electrothermal actuating drives for 2-point control in heating and cooling systems to be installed with a thermostat. They are particularly suitable for zone control and for floor heating systems. HERZ thermal actuators can be used with all HERZ valves with M 28 x 1.5 (7710) or M 30 x 1.5 (7711) equipped for thermostatic operation. Rating of auxiliary switch when used with direct current: 4...30 V, 1...100 mA


#### 1 7711 18

HERZ thermal actuators are electrothermal actuating drives for continuous drive control in heating and cooling systems to be installed with a thermostat. They are particularly suitable for zone control and for floor heating systems. HERZ thermal actuators can be used with HERZ valves with M 30 x 1.5 equipped for thermostatic operation.


#### 7990

HERZ thermal actuators are electrothermal actuating drives for continuous drive control in heating and cooling systems to be installed with an Electronic Control System for Modulating Control. The output signal is then allocated linearly to the effective stroke. HERZ thermal actuators can be used with HERZ valves with M 28 x 1.5 equipped for thermostatic operation.

#### **Function 7710/7711**

-  The thermal drive is actuated by an external contact, e.g. from a room thermostat, and starts to open or close the valve. The actuating movement is achieved by means of an electrically heated expansion element. When the heating current is switched off, the actuator shuts or opens the valve. The HERZ actuating drive is maintenance free and works silently.

#### 1 7711 18/7990


-  The actuator has an electrically heated, overload-proof expansion element which transfers its stroke direct to the valve. It works silently and requires no maintenance. When the heating element is switched on from cold, the valve (after a warming-up period of about 80 seconds) starts to open, reaching the maximum stroke of 4,5 mm after about 85 seconds. When the drive is regulating, a movement of 1 mm is carried out in about 30 seconds; the stroke is monitored by a Hall sensor. The closing operation is similar (with regard to time) to the opening operation: the expansion element cools down and the valve is closed by spring pressure.

#### **Changing the Operating Mode**


##### **7710/7711**

The HERZ thermal actuator is factory set to “closed without current”. By pulling out a plug-in component, the operating mode can be changed to “open without current”. In this operating mode, the thermostatic valve is closed when the expansion element is heated, and opened when it cools down. How to change the operating mode is described and shown in a graph in the instruction sheet supplied with the device.

#### **Emergency Operation**

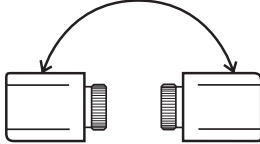
-  When the thermal actuator is in the factory-set operating mode “closed without current”, the valve can be opened by removing the actuating drive in case of power failure.

#### **Special Design Features**

-  The actuating drive is mounted onto a plastic base and equipped with a plastic cover. There is no metallic connection between the actuating drive and the valve. The drive is mounted onto the valve by means of a knurled nut.

\*Germany only

### ☑ Installation



Before working on the device shut off the power.

- The connection may be made only by an authorized person.
  - The connection must be made according to the attached wiring diagram.
  - The device is intended for connection to fixed cables in closed and dry rooms.
  - When installing, make sure that voltage-carrying lines, power supply and relay connection lines, do not come into contact with low-voltage cables, such as sensor wires (minimum distance of 4 mm at base insulated conductors).
  - Provide sufficient protection against independent release of all connecting conductors according to EN60730, part 1 requirements.
- Note the VDE 0100, EN 60730, Part 1, and the rules of the local power company.
  - If the device does not work, first check the correct connection and the power supply.
  - Incorrect connection may damage the regulator! Damage caused by incorrect connection and / or improper handling will not be covered by the warranty!

#### Installation of the Thermostatic Valve

The flow direction must be in accordance with the arrow on the valve body. Avoid installing the actuating drive below the valve spindle axis. Drops of water might penetrate the actuating drive and impair its functioning.

#### Installation of the Thermal Actuator 7710/7711

Remove the screw cap or handwheel from the valve. The valve is completely open. Place the thermal actuator in the desired position at the centre of the valve body and press it onto the front side. Subsequently, turn the knurled nut clockwise and fasten by hand.

#### Installation of the Thermal Actuator 7980/7990/7708/7709

After screwing the adapter ring on the valve, the actuator is mounted and locked (click). After pressing the button, the actuator can be removed. The valve adapter should be mounted on the valve when the valve is fully open.

The actuator is mounted and wired, but not under tension. This state corresponds to the function „normally open“ and allows pipe flushing, sample heating. When power is applied to the actuator for the first time the operating status will be „closed“ as per factory settings.

At the head of the actuator a function display is provided. The valve is in the „open“ position when the blue field is visible.

### ☑ Technical Data

Order Number	1 7710 00	1 7710 01
Nominal Voltage	230 V	24 V
Power supply AC/DC	230 V w 15%, 50-60 Hz.	24 V w 20%
Max. Input Current	250 mA	250 mA
Operating Power	2,5 W	3 W
Input	58 VA	6 VA
Operating Mode	normally closed contact (NC), can be switched to normally open contact (NO)	
Closing and Opening Times	app. 3 min.	
Installation Position	not up-side down, only horizontal	
Ambient Temperature	-5 to 50 °C	
Ambient Humidity	< 95 % rF	
Max. operating temperature	max. 100 °C at valve	
Connecting Cable	min. 0,8 m with tolerance up to 1,2 m, fix installed, white	
Housing	Self-extinguishing plastic, white RAL 9010	
Degree	IP 42 (EN60259), vertical IP 44	
max. Differential Pressure	1,2 bar	
Weight	0,2 kg	
Connection Thread	M 28 x 1,5	

<b>Order Number</b>	<b>1 7710 80</b>
Nominal Voltage	230 V
Power supply AC/DC	230 V w 15%, 50-60 Hz.
Max. Input Current	250 mA
Operating Power	2,5 W
Input	58 VA
Operating Mode	normally closed contact (NC), can be switched to normally open contact (NO)
Closing and Opening Times	app. 3 min.
Installation Position	not up-side down, only horizontal
Ambient Temperature	-5 to 50 °C
Ambient Humidity	< 95% rF
Max. operating temperature	max. 100 °C at valve
Connecting Cable	min. 0,8 m with tolerance up to 1,2 m, fix installed, white
Housing	Self-extinguishing plastic, white RAL 9010
Degree	IP 42 (EN60259), vertical IP 44
max. Differential Pressure	1,2 bar
Weight	0,2 kg
Connection Thread	M 30 x 1,5

<b>Order Number</b>	<b>1 7710 50</b> (with auxiliary contact)	<b>1 7710 51</b> (with auxiliary contact)
Nominal Voltage	230 V	24 V
Power supply AC/DC	230 V w 15%, 50-60 Hz.	24 V w 20%
Max. Input Current	250 mA	250 mA
Operating Power	2,5 W	3 W
Input	58 VA	6 VA
Operating Mode	normally closed contact (NC), can be switched to normally open contact (NO)	
Closing and Opening Times	app. 3 min.	
Installation Position	not up-side down, only horizontal	
Ambient Temperature	-5 to 50°C	
Ambient Humidity	< 95% rF	
Max. operating temperature	max. 100 °C at valve	
Connecting Cable	min. 0,8 m with tolerance up to 1,2 m, fix installed, white	
Housing	Self-extinguishing plastic, white RAL 9010	
Degree	IP 42 (EN60259), vertical IP 44	
max. Differential Pressure	1,2 bar	
Weight	0,2 kg	
Connection Thread	M 28 x 1,5	

The auxiliary contact can be connected to e.g. a circulating pump, with the contact switch between 35% and 50 % stroke. the output of the contact is 3 A for resistive load and 2 A for inductive load. The contacts close when the stroke reaches 35% or 50%.

<b>Order Number</b>	<b>1 7711 80</b>	<b>1 7711 81</b>
Nominal Voltage	230 V	24 V
Power supply AC/DC	230 V w 15%, 50-60 Hz.	24 V w 20%
Max. Input Current	250 mA	250 mA
Operating Power	2,5 W	3 W
Input	58 VA	6 VA
Operating Mode	normally closed contact (NC), can be switched to normally open contact (NO)	
Closing and Opening Times	app. 3 min.	
Installation Position	not up-side down, only horizontal	
Ambient Temperature	-5 to 50 °C	
Ambient Humidity	< 95% rF	
Max. operating temperature	max. 100 °C at valve	
Connecting Cable	min. 0,8 m with tolerance up to 1,2 m, fix installed, white	
Housing	Self-extinguishing plastic, white RAL 9010	
Degree	IP 42 (EN60259), vertical IP 44	
max. Differential Pressure	1,2 bar	
Weight	0,2 kg	
Connection Thread	M 30 x 1,5	

<b>Order Number</b>	<b>1 7990 00</b>
Nominal Voltage	24 V
Power supply AC/DC	24 V AC -10% +20%
Max. Input Current	0-10 V DC
Operating Power	1,5 W
Input	100 k $\Omega$
Operating Mode	normally closed contact (NC)
Closing and Opening Times	30 s/mm
Installation Position	not up-side down, only horizontal
Ambient Temperature	-5 bis 50 °C
Ambient Humidity	< 95% rF
Max. operating temperature	max. 100 °C at valve
Connecting Cable	min. 0,8 m with tolerance up to 1,2 m, fix installed, white
Housing	Self-extinguishing plastic, white RAL 9010
Degree	IP 40 (EN60259)
max. Differential Pressure	1,2 bar
Weight	97 g
Connection Thread	M 28 x 1,5

<b>Order Number</b>	<b>1 7708 11</b>	<b>1 7708 10</b>
Nominal Voltage	230 V	24 V
Power supply AC/DC	230 V, +10%...-10%, 0-60 Hz	24 V, +20%...-10%, 0-60 Hz
Operating Power	2 W	2 W
Operating Mode	normally closed contact (NC)	
Closing and Opening Times	3 min	
Installation Position	not up-side down, only horizontal	
Ambient Temperature	0-50 °C	
Ambient Humidity	max. 80%	
Max. operating temperature	0-100 °C	
Connecting Cable	min. 0,8 m with tolerance up to 1,2 m, fix installed, white	
Housing	Plastic, white RAL 9010	
Degree	IP 40/ II (EN60259)	
max. Differential Pressure	1,2 bar	
Weight	73 g	
Connection Thread	M 28 x 1,5	

<b>Order Number</b>	<b>1 7708 23</b>	<b>1 7709 01</b>
Nominal Voltage	230 V	
Power supply AC/DC	230 V AC $\pm$ 10% 50-60 Hz	
Max. Input Current	300 mA	
Operating Power	1,8 W	
Operating Mode	normally closed contact (NC)	normally open contact (NO)
Closing and Opening Times	ca. 3 min	
Installation Position	any position	
Ambient Temperature	0 to 60 °C	
Ambient Humidity	max. 100%	
Max. operating temperature	min. 0,8 m with tolerance up to 1,2 m, fix installed, white	
Housing	Plastic, white RAL 9010	
Degree	IP 54 / II	
max. Differential Pressure	1,2 bar	
Weight	97 g	
Connection Thread	M 28 x 1,5	

### ☑ Room Thermostat 7710/7711/7708/7709

Any conventional room thermostat with thermal offsetting can be used to control the HERZ thermal actuator. If required, several drives can be connected in parallel, depending on the electric rating of the switching contact.

#### 7990

In connection with the HERZ RTC Room Temperature Computer 1 7940 62 or any other controller with continuous output 0-10 V. The actuator must not be opened. Be installed for long connecting cables must have a connection box.

### ☑ Sizing and Installation

When selecting the switching contacts and sizing the mains fuses, the input current of the heating element must be taken into account. The voltage drop through the electric cable must not exceed 10% in order to maintain the specified operating time.

The table below shows the maximum cable lengths for a thermal actuator for the specified conductor cross sections (in a cable according to specifications, the voltage drop is approx. 5%, at 230 V the voltage drop is 10 V, at 24 V the voltage drop is 1 V).

When using several thermal actuators, the specified cable length must be divided by the number of thermal actuators connected.

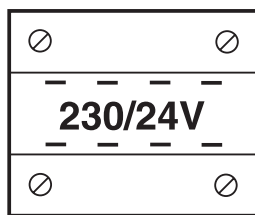
Cable cross-section (mm <sup>2</sup> )	230 V, max. Length (m)	24 V, max. Length (m)
2 x 0,75	1500	168
2 x 1,0	2000	224
2 x 1,5	3000	340
2 x 2,5	5000	560

### ☑ Resistance Values

The resistance values for HERZ-valves when operating with HERZ actuators can be found in the HERZ standard diagrams of the respective data sheets.

### ☑ Accessories 1 7796 02 HERZ-transformer 230/24 V

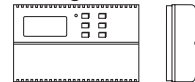
The overload-proof security HERZ transformer 230/24 V is provided for connecting a HERZ-thermostats and HERZ engines and is designed for the operation of up to 8 HERZ actuators.



Execution	According to VDE 0551
Protection Class	II
Degree	IP 20
ISO Kl.	T40/E
Input Voltage	230 V
Input circuit fuse	50-60 Hz, 315 mA
Output Voltage	24 V
Power rating	50 VA
Quick mounting on Equipment rail	wg DIN 42227/3
Dimensions	106 x 90 x 74 mm (W x H x D)

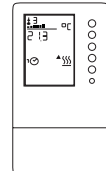
### 1 7940 62 HERZ-RTC-Room Temperature Computer

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.



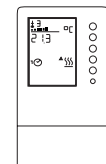
### 1 7791 23 HERZ- Electronic Room Temperature Controller for 2-Point or Pulse Control with digital timer

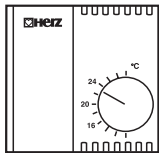
For individual time and temperature programmable adjustment. Digital timer with program on a weekly and yearly basis, automatic switching between summer and winter time. Set value range 8-38 °C. Switching difference as 2-point controller 0.4-8 K. Metering precision 0.3 K at a temperature of 20 °C.



### 1 7791 02 HERZ- Electronic Room Temperature Controller for 2-Point or Pulse Control with digital timer

Design as 1 7791 23, but operation by 2 alkalimanganese penlight type round cells (AA) 1.5 V, not included in package.

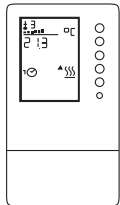




**1 7790 15 HERZ- Room Temperature Controller for 2-Point Control 230 V, 50 Hz**  
 1 change-over contact  
 Set value range 10-30 °C.  
 Switching difference  $\pm 0.2$  K fixed

**1 7790 25 HERZ- Room Temperature Controller for 2-Point Control 24 V DC**

1 change-over contact  
 Set value range 10-30 °C.  
 Switching difference  $\pm 0.2$  K fixed



**1 7794 23 HERZ- Electronic Room Temperature Controller with PI control**

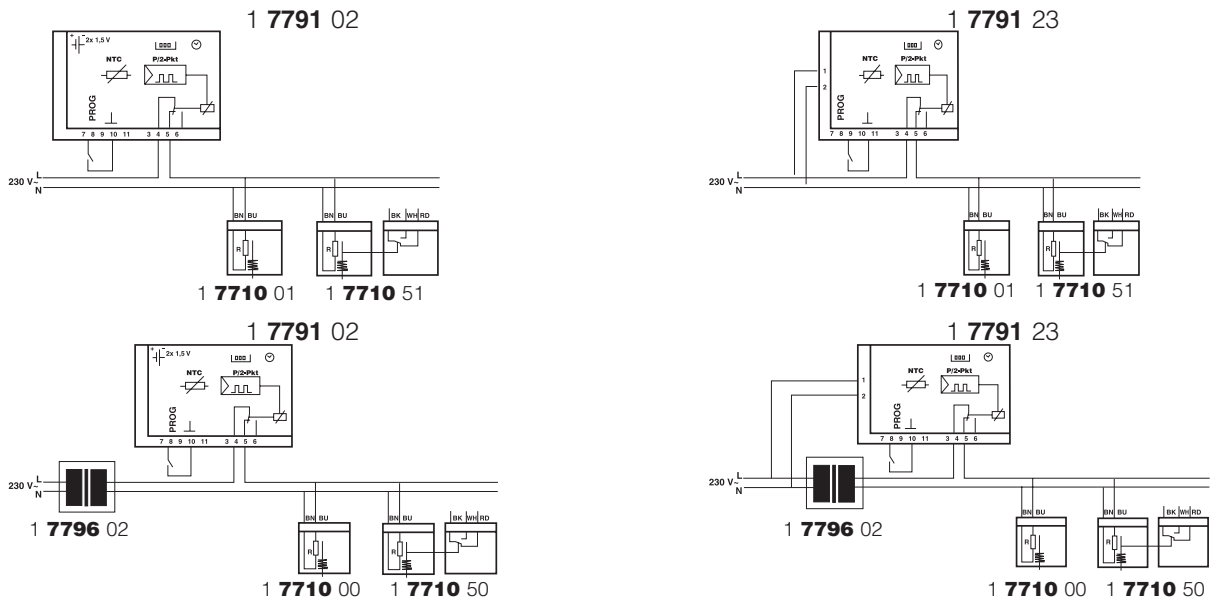
For heating and cooling operation, with programmable time and temperature settings. Outlets for motor (3-point) and thermal drive and pump or fan (on/off signal). Fix basic programme (preset condition) for first start-up. Easy adjustment to system by selecting 8-basis control model by service parameter. Electronics located in the attachable body, white (RAL 9010), front with digital display in viewing window. Digital timer with weekly and yearly programme, relay with elapsed time indicator. For installation on a wall or flush-mounting socket.

**3 F798 00 HERZ- Electric Distribution Panel for Actuating Signals**



For distribution of electric signals and for power supply of control devices and actuating drives. The switch impulse of the room temperature controller is individually passed to the actuating drivers. Plastic body, white RAL 9010, with integrated fuse 4 A, over voltage protection for actuating drives, pump connection with earthed conductor and temperature limiter, pump logistics as needed (24 V or 230 V) with volt-free contacts available as accessories. Electrical connections with screw clamps max. 1.5 mm<sup>2</sup>.

**Wiring Diagram**



**Number of actuators that can be connected to one controller**

		HERZ Controller							
		1 7790 15 230 V	1 7790 25 24 V	1 7790 00 230 V	1 7791 23 230 V	1 7791 02 3 V	1 7794 23 230 V	1 7794 24 24 V	1 7940 62 24 V
<b>HERZ Actuator</b>	1 7710 00	8	-	10	8	8	-	-	-
	1 7710 01	-	8	-	-	8	-	-	-
	1 7710 80	8	-	10	8	8	-	-	-
	1 7710 81	-	8	-	-	8	-	-	-
	1 7710 50	8	-	10	8	8	-	-	-
	1 7710 51	-	8	-	-	8	-	-	-
	1 7990 00	-	-	-	-	-	-	-	6
	1 7711 18	-	-	-	-	-	-	-	24
	1 7711 80	8	-	10	8	8	6	-	-
	1 7711 81	-	8	-	-	8	-	3	-
	1 7708 11	> 20	-	> 20	> 20	> 20	-	-	-
	1 7708 10	-	> 20	-	-	> 20	-	-	-
	1 7708 23	8	-	10	8	8	-	-	-
	1 7709 01	8	-	10	8	8	-	-	-

 **Accessories:**

Adapter blue	1 7708 85	M 28 x 1,5	for 4002, 4006, 7217 TS-V
Adapter grey	1 7708 80	M 28 x 1,5	for 7217 TS-E
Adapter grey	1 7708 98	M 30 x 1,5	for 7760, 7762, 7763, TS-90-H, TS-98-VH