

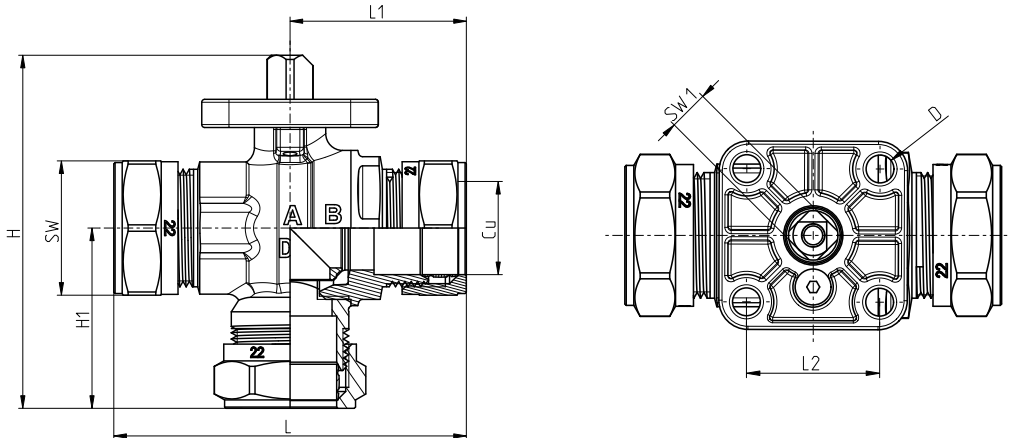
HERZ Zone valve

3-way diverting valve

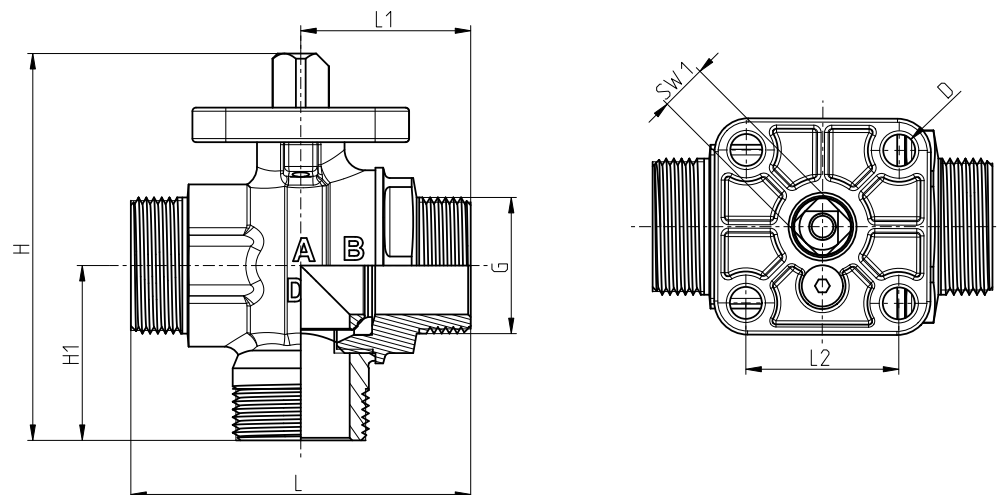
Datasheet for 2412, Issue 0624

☑ Dimensions

HERZ ZONE VALVE with Compression ends (1 2412 0X)



HERZ ZONE VALVE with external threads, flat sealing (1 2412 1x)



Order Nr.*	DN	Sw [mm]	Sw1 [mm]	Cu [mm]	G** [in]	L [mm]	L1 [mm]	L2 [mm]	H [mm]	H1 [mm]	D [mm]
1 2412 02	20	32	9	22	-	84	42	30	84	43	6
1 2412 03	25	41	9	28	-	99	49,5	30	94	46,5	6
1 2412 04	32	46	9	35	-	114	57	30	100	57	6
1 2412 12	20	-	9	-	¾	66	33	30	75	34	6
1 2412 13	25	-	9	-	1	79	39,5	30	84	36,5	6
1 2412 14	32	-	9	-	1-¼	94	47	30	100	47	6

* valve without motor actuator

** external thread acc. to ISO 228-1

☑ Material and construction

Body:	forged brass acc. to EN 12165
Ball:	forged brass acc. to EN 12165, chrome plated
Spindle:	machined brass acc. to EN 12164
Ball seals:	PTFE
Gaskets:	EPDM
Flange type:	F04 acc. to EN ISO 5211
Stem position:	diagonally orientated acc. to EN ISO 5211, 9 x 9 mm acc.
External G threads:	to ISO 228-1

☑ Operating data

Nominal pressure:	PN10
Max. operating temperature:	110°C (no steam)* *when Zone valve is used in combination with HERZ motor Actuator, ambient temperature must not exceed 50°C
Min. operating temperature:	0°C (water 0,5°C)
Working stroke angle (turn):	90°
Opening torque (at PN10):	≤ 5 Nm
Leakage rate:	0%

Medium:

Heating water purity in accordance to ÖNORM H 5195 and VDI- Standard 2035. The use of ethylene, or propylene glycol in a mixing ratio of 25- 50% is allowed. EPDM gaskets will be affected by mineral oils lubricants and thus lead to failure of the EPDM seals. Please refer to the manufacturer's documentation when using ethylene glycol products for frost and corrosion protection.

☑ Brass

HERZ Zone valve is made from brass due to its good strength and excellent corrosion resistance.

Under Article 33 of the REACH Regulation (EC No. 1907/2006), we are obliged to point out that the material lead is listed on the SVHC list and that all brass components manufactured in our products exceed 0.1 % (w / w) lead (CAS: 7439-92-1 / EINECS: 231-100-4). Since lead is a component part of an alloy, actual exposure is not possible and therefore no additional information on safe use is necessary.

☑ Field of application

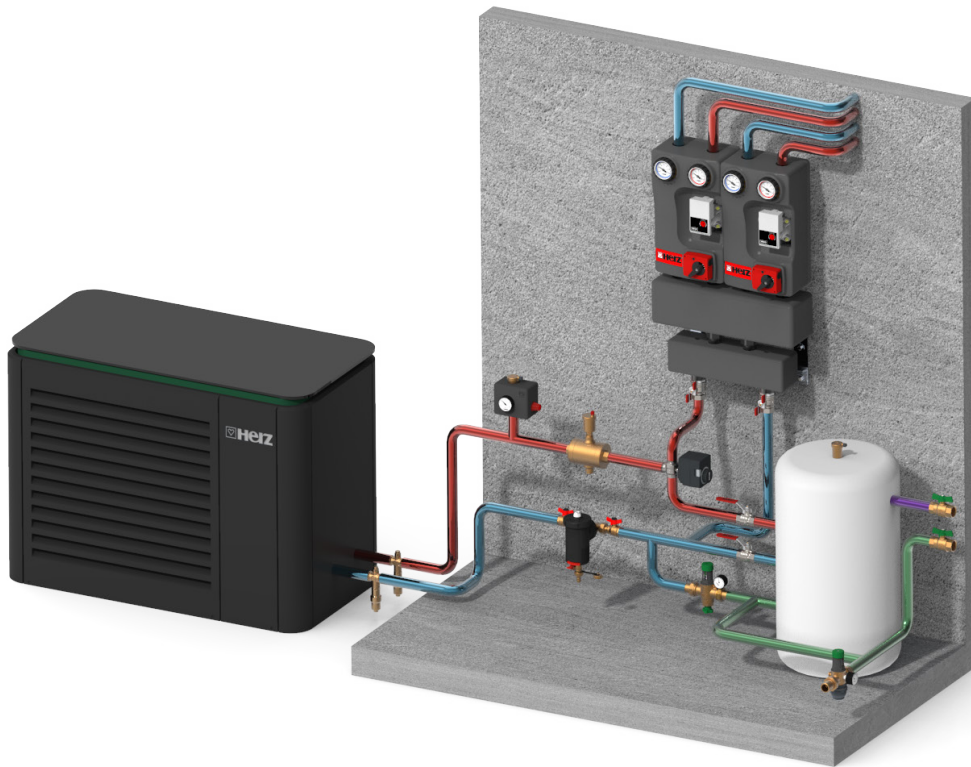
HERZ Zone Valves are used in heating and cooling systems such as heat pump systems, floor heating and HVAC applications as a zone management element. The main advantage of the ball valve is automatic control of the valve, which is manipulated through the motor actuator. This allows the automatic quick switch-over function (from one circuit to another) of the valve that is managed by a system controller.

Efficient motor actuation for responsive control HERZ Zone Valve has an integrated motor actuator that switches 90° position in 12 seconds. Quick switch-over of the motor actuator means a rapid response to system needs and energy-efficient function of the entire system. Motor actuators are available in 230 V AC and 24 V AC/DC versions, with or without an adjustable auxiliary switch. The motor actuator is installed onto the valve with a special fast mounting module which allows simple assembly and disassembly.

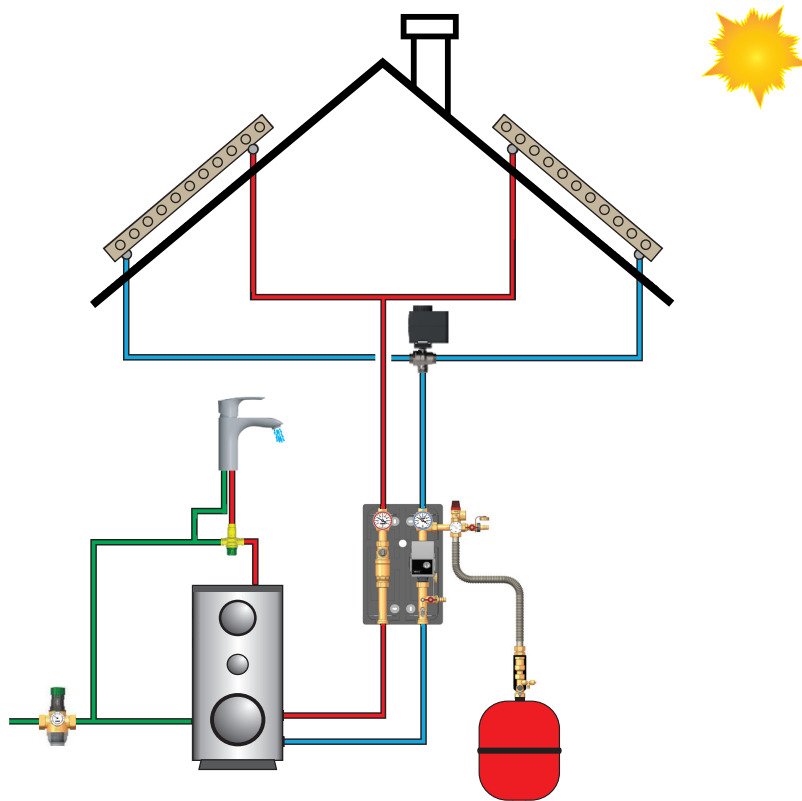
HERZ ball valve is made from high-quality brass and has identical kvs value through AB-A and AB-B. Valves are available from dimension DN20 up to DN32.

☑ Application hydraulic scheme

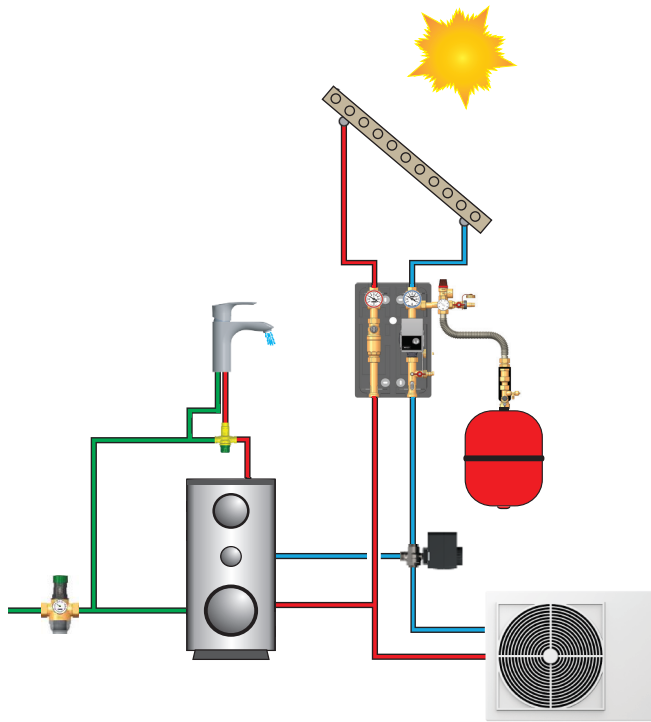
- Usage in heat pump systems: diverting the flow from the preparation of domestic hot water and heating circuit,



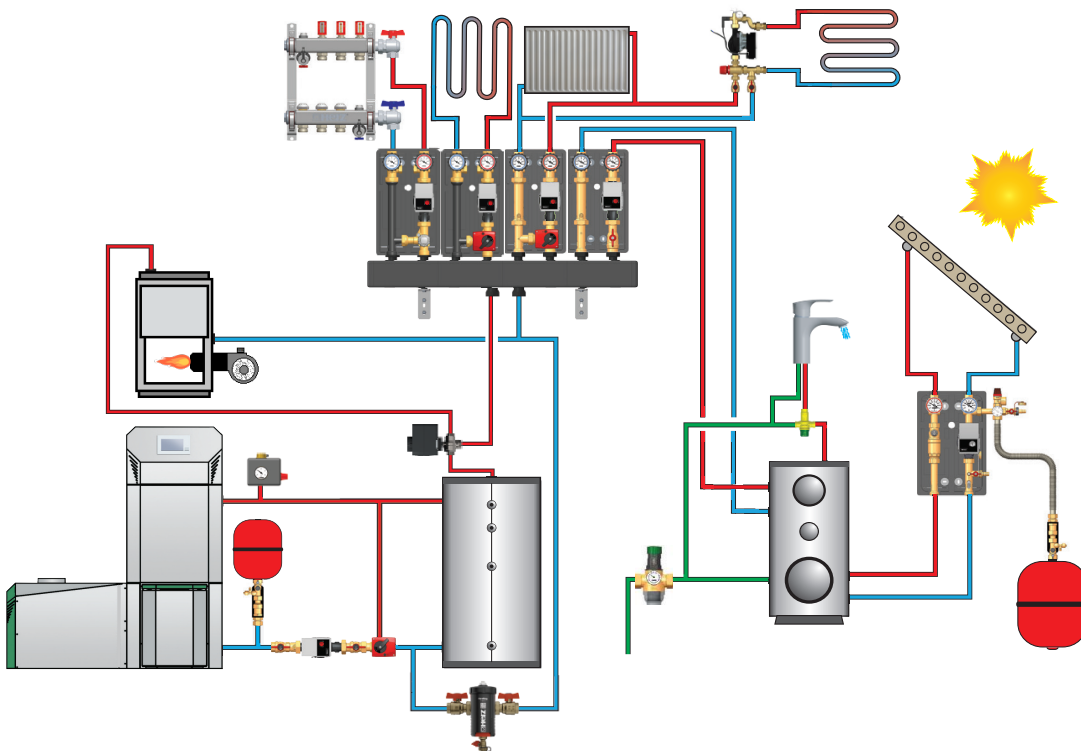
- Solar collectors system: diverting the flow from the west and east side of the roof,



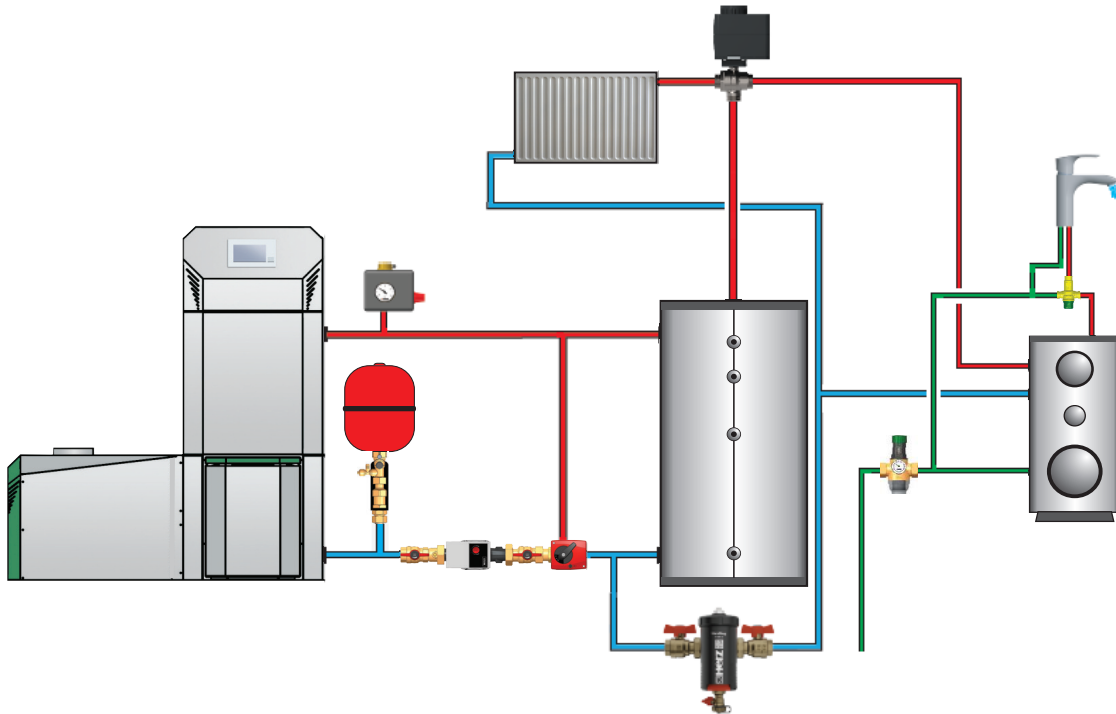
- Preparation of sanitary hot water: diverting the flow from the solar system and heat pump,



- Switch over from a solid fuel boiler to an oil boiler,



- Usage in solid fuel boiler systems: diverting the flow from the preparation of domestic hot water and heating circuit (radiators)

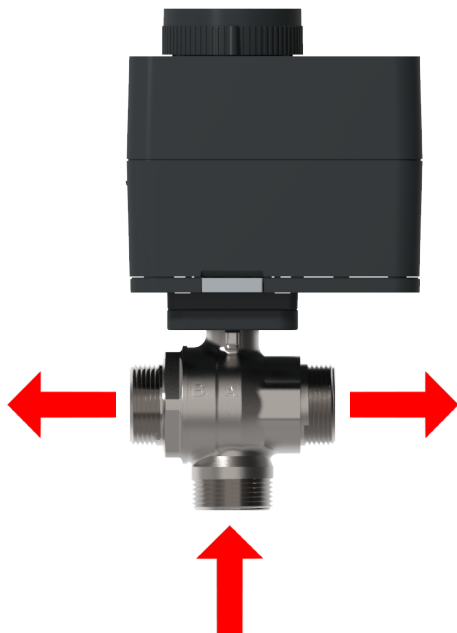


Note: All drawings in paragraph Application hydraulic scheme are only shown as application examples. They are by no means installation schemes! Important components may be missing!

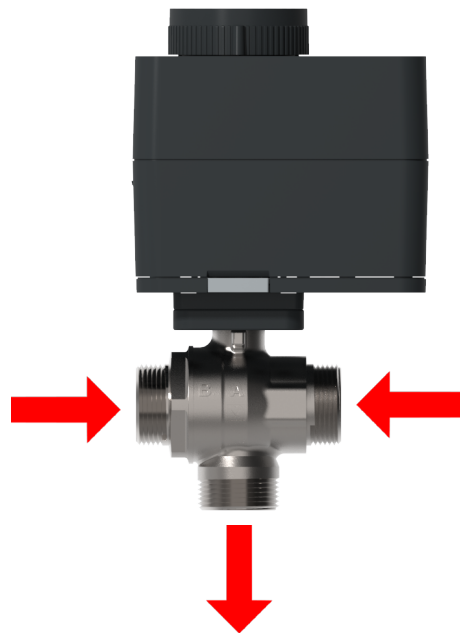
Flow direction

Flow direction is possible in both ways:

AB-A or AB-B



A-AB or B-AB

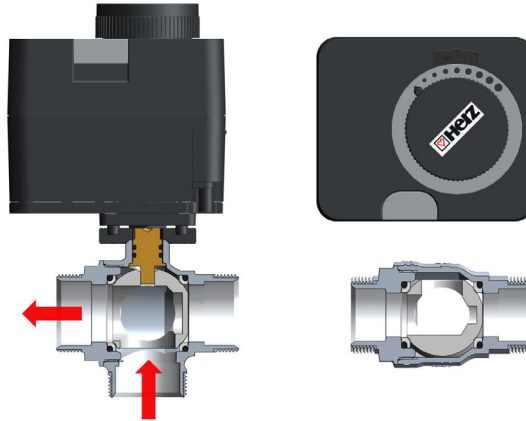


☑ **Function principle AB-A / AB-B.**

Diverting function: factory setting of the valve is position AB-A. When the valve is operated, the motor actuator will turn the ball for 90° in 12s. After the ball was rotated, it is now facing into the zone B, so the medium is now flowing from AB to zone B.

Kvs value is identical in both situations: AB-A or in AB-B.

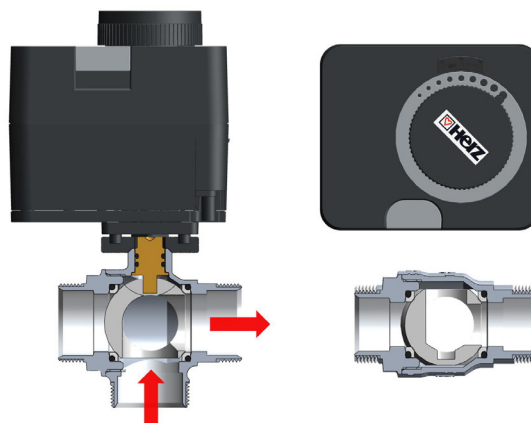
1. AB - B



2. Switch-over



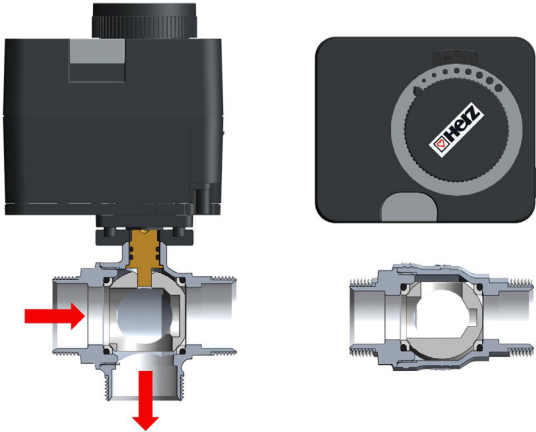
3. AB - A



Function principle A-AB / B-AB

Kvs value is identical in both situations: A-AB or in B-AB.

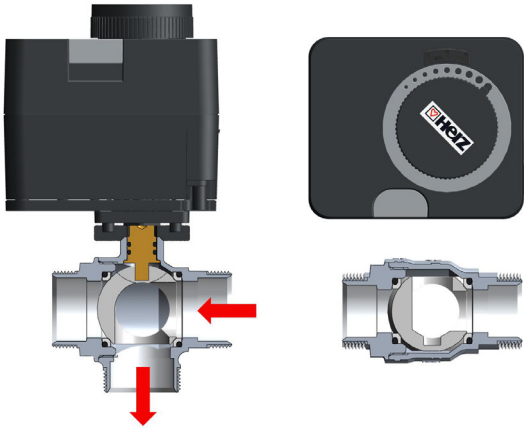
1. B - AB



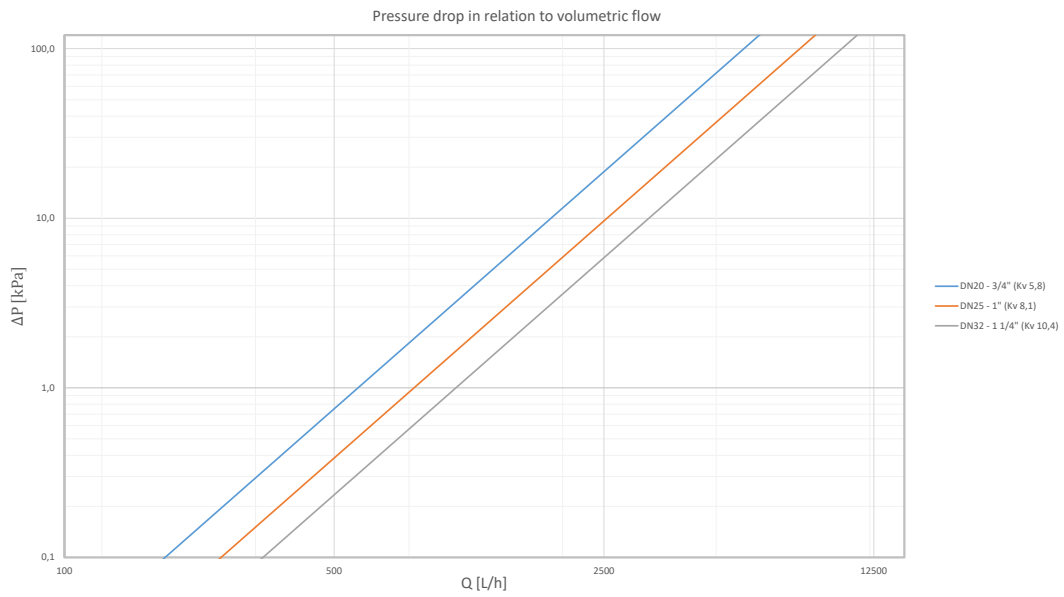
2. Switch-over



3. A - AB



Valve hydraulic characteristic



Installation HEATING

HERZ Zone valve itself can be mounted in any position. However, when the motor actuator is attached to the HERZ Zone valve, the assembly in a hanging position is not recommended due to the possibility of water breaking into a motor drive. Valve is installed in pipe systems with the help of connectors depending on the application.



COOLING

If the HERZ Zone valve is used in systems with chilled water and there is some risk of condensation, we strongly recommend installation with motor actuator facing up. This way the condensation will not drip onto the actuator and cause malfunctions.



A system where the HERZ Zone valve is installed must be flushed to remove any dirt or debris that may have accumulated during installation. Failure to remove dirt or debris may affect performance and the manufacturer's warranty. The installation of filters of appropriate capacity at the inlet of the water from the main supply is always advisable. In areas that are subject to highly aggressive water, arrangements must be made to treat the water before it enters the valve.

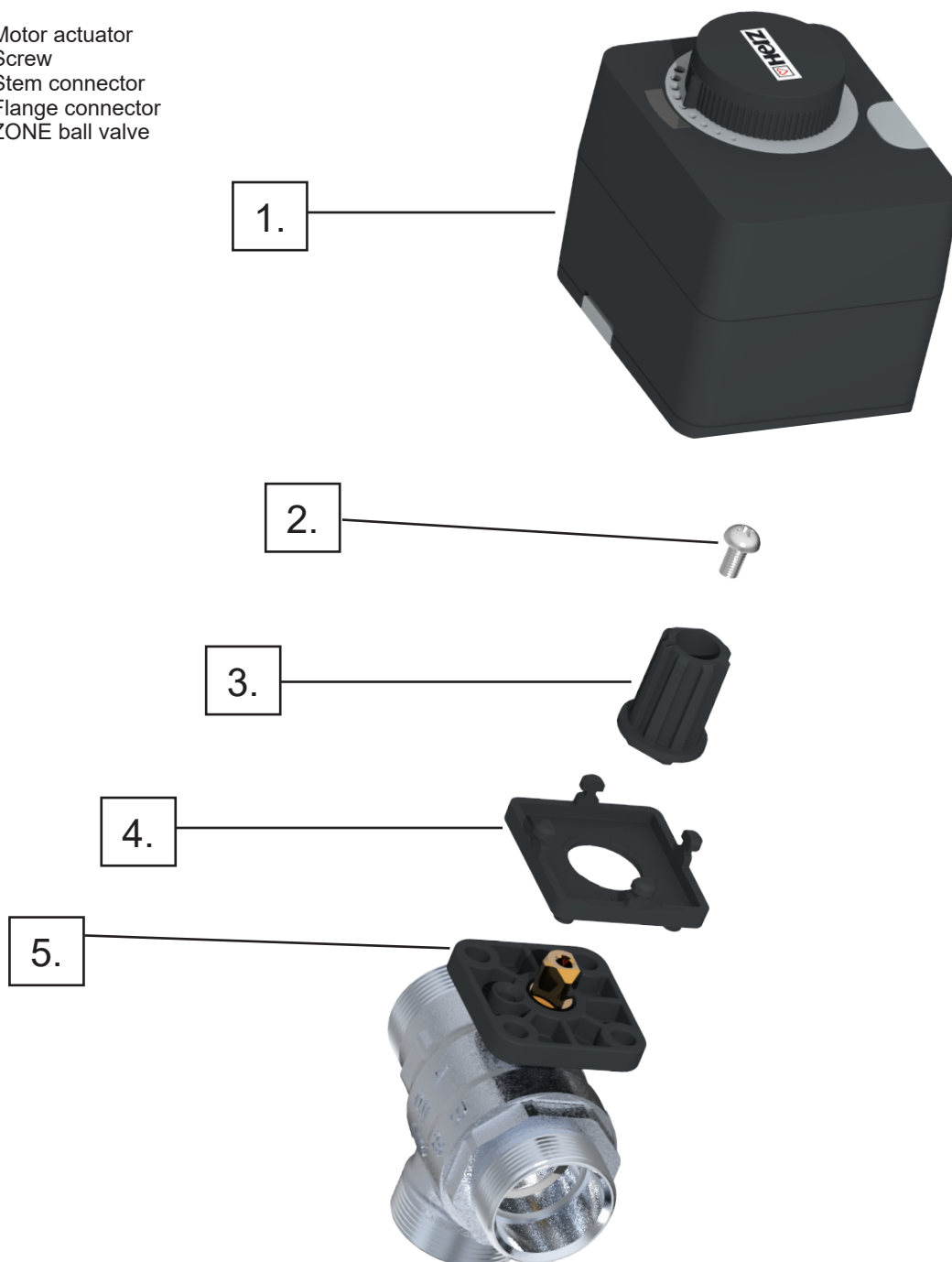
Access to the HERZ Zone valve must be unobstructed for any maintenance that may be required to the Zone valve or valve connections. The pipework from/to the HERZ Zone valve must not be used to support the weight of the Zone valve itself.

When connecting the HERZ Zone valve to the system components use suitable sealing material (spinning material, Teflon ribbon, sealing paste) to coat the pipes. There should not be an excess of sealing material on the pipe because it can damage the thread. All the connecting pipes have to be correctly aligned, so the zone valve is not loaded with a bending moment. When using copper or plastic pipes take into account the pressure and temperature limits of used material.

When assembling, use a suitable assembly tool that adapts to zone valve end connections. Following assembly, the connections of the zone valve must be checked for water-tightness by the installer. All engineering standards and recognized regulations must be adhered to by these specialist staff.

Components of HERZ ZONE valve

1. Motor actuator
2. Screw
3. Stem connector
4. Flange connector
5. ZONE ball valve



Important warnings



WARNING

HOT WATER / LIQUID

Pay attention while installing / commissioning / servicing the Zone valve because the temperature of medium can exceed 100°C. Exposure to this high temperature medium can cause death, serious injury or damage of the other components in the system. Make sure that when works are being carried out on the HERZ Zone valve the system is cooled down and it is unpressurised. Before any disassembly make sure that the system is drained.



DANGER

ELECTRIC SHOCK

Usage all of electrical standards and recognized regulations must be adhered to by specialist electricians who are installing Herz Zone valve. Usage of correct safety equipment against electric shock is obligatory. Live parts can cause electric shock that will result in serious injury or death.

When working on the actuator, disconnect the mains voltage supply and ensure that it cannot be switched on.

See detailed instructions for the actuator for the correct connection to the main electrical supply.

Installation and electrical connection should only be carried out by a person with suitable qualification. When installing, it is necessary to follow the rules of the profession, valid legislation and regulations. When installing, make sure that the actuator is mounted away from open sources of fire or water. If there is a possibility of flooding, the actuator must be installed above the possible level of the flood water level.

Any interference with the actuator not described in the manual is forbidden. Before installing the actuator, make sure that the parts in contact with the actuator and the installer are not under voltage.

The operator or the system user is responsible for the selection of a qualified person that will perform the installation of the actuator.

The user is also responsible for the proper operation and maintenance of the system.

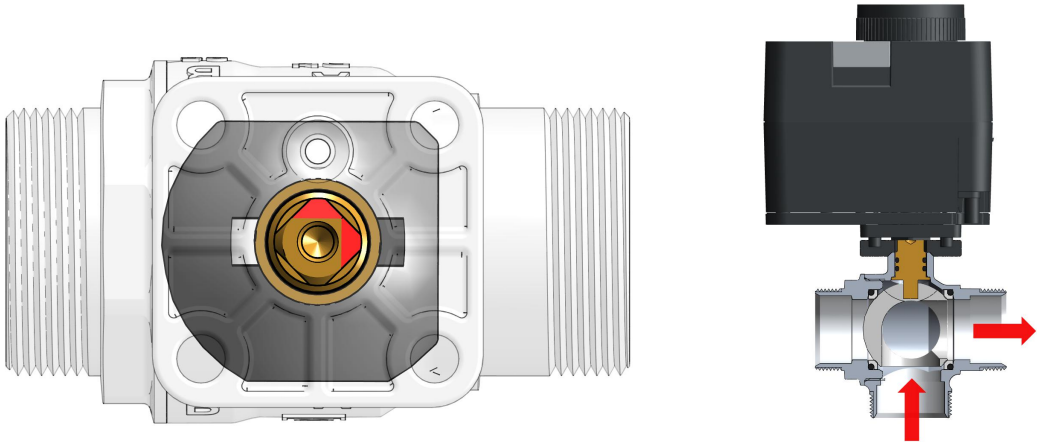
Failure to follow the instructions and unprofessional work may result in the following:

- actuator malfunction
- endangering the safe operation of the system
- damage to the system
- risk of electric or mechanical shock for persons in contact with the system

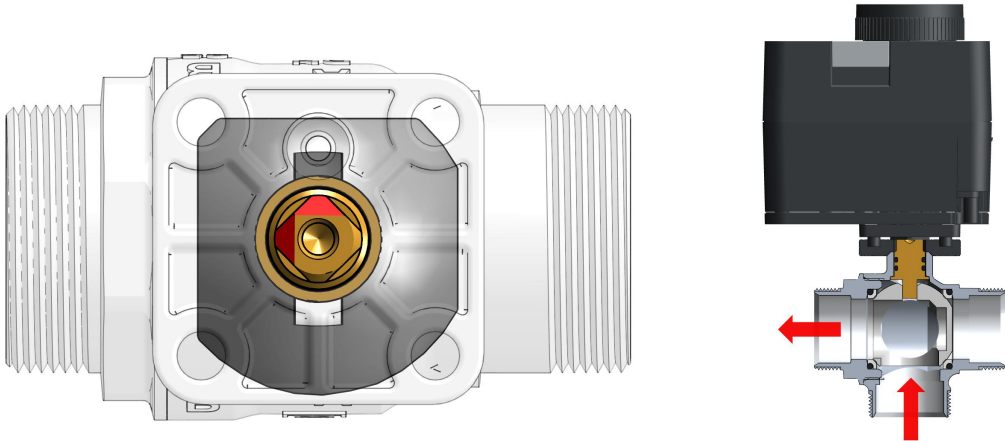
Installation of motor actuator

Observe the flow direction indicator on the stem while installing the HERZ motor actuator onto the 3-way ball valve. Special marking is present on top of stem. Position of this marking indicates the direction of flow; whether is from AB to A or from AB to B.

AB - A



AB - B



NOTE: The red markings on the stem are purely for enhancing visualization of its position. In reality, the stem is brass-colored.

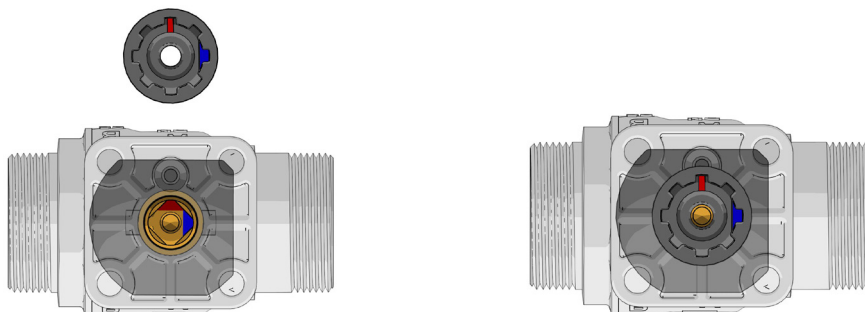
After identifying position of the stem and the ball position, focus on the assembly of the actuator itself. First assemble the flange connector, after this install stem connector and fix it with a supplied screw. After assembling the parts on the stem, install the motor actuator on the valve.



Step 1:

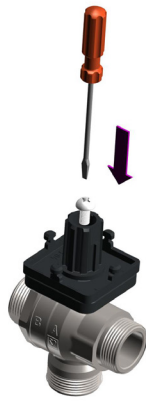


Step 2:



NOTE: The red / blue markings on the stem are purely for enhancing visualization of its position. In reality, the stem is brass-colored.

Step 3:



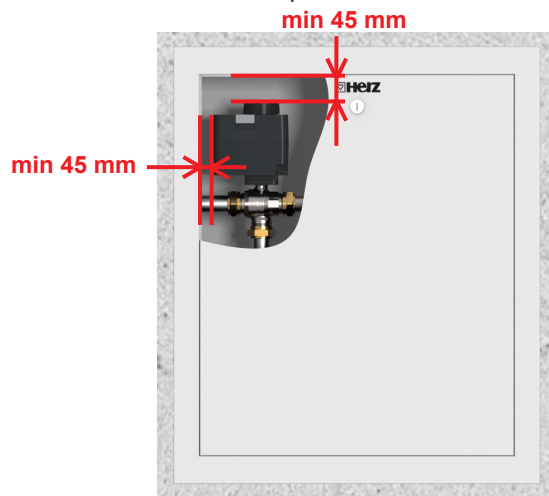
Step 4:



It is possible to install the motor actuator on the valve in either shown positions:



If the valve is installed in a cabinet, make sure that there is at least 45mm space around the motor actuator and the cabinet frame. This allows maintenance and replacement.

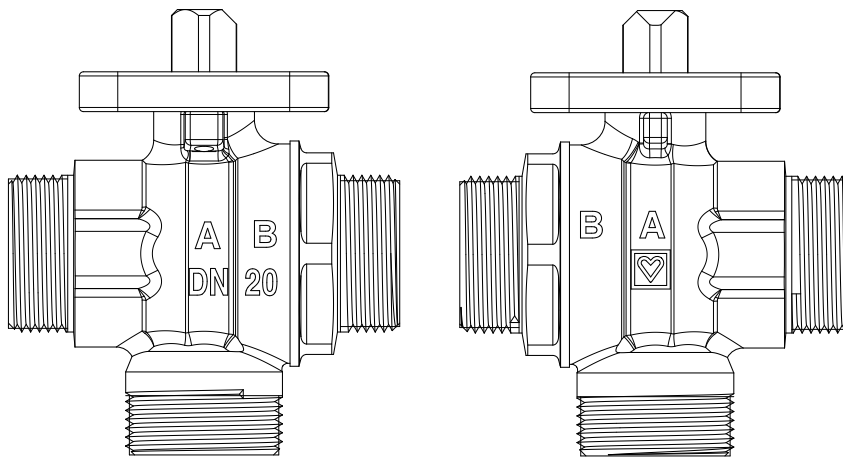


NOTE: The red / blue markings on the stem are purely for enhancing visualization of its position. In reality, the stem is brass-colored.

Enough constant ventilation needs to be provided if the valve is installed in a cabinet. Motor actuator can heat-up and reach high-temperatures if there is not sufficient ventilation ensured.



☑ Labelling of HERZ ZONE valve



A Zone A

B Zone B

DN Dimension of the valve



Manufacturers logo

Connecting the valve into the system

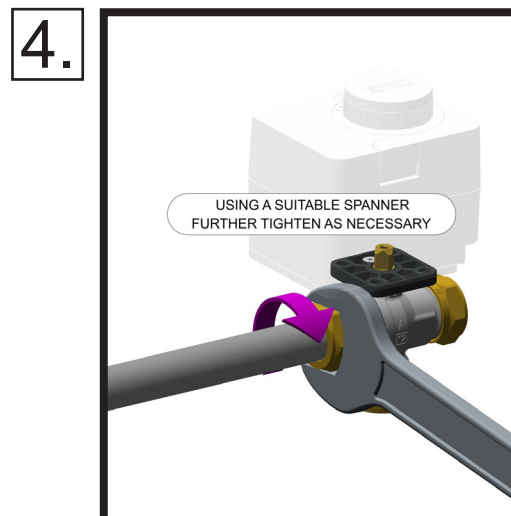
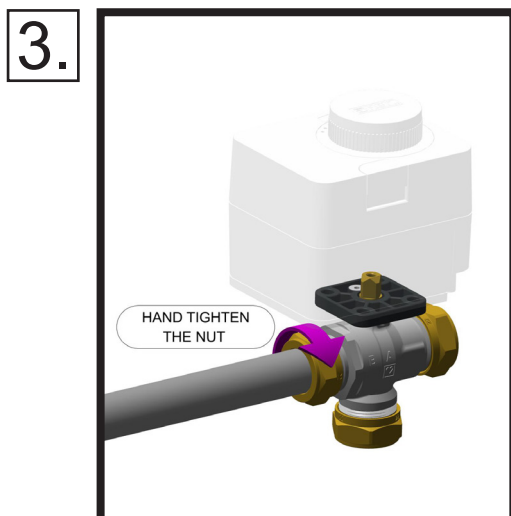
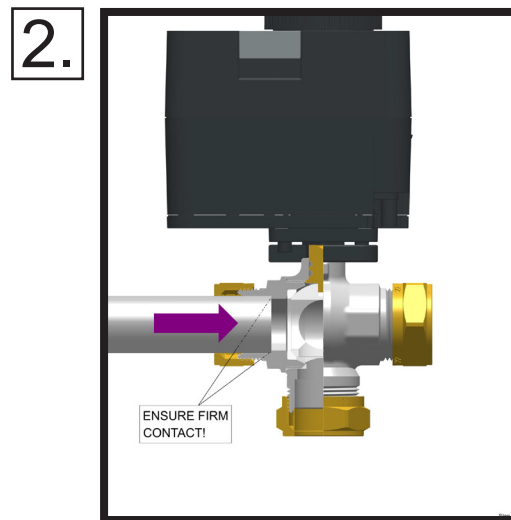
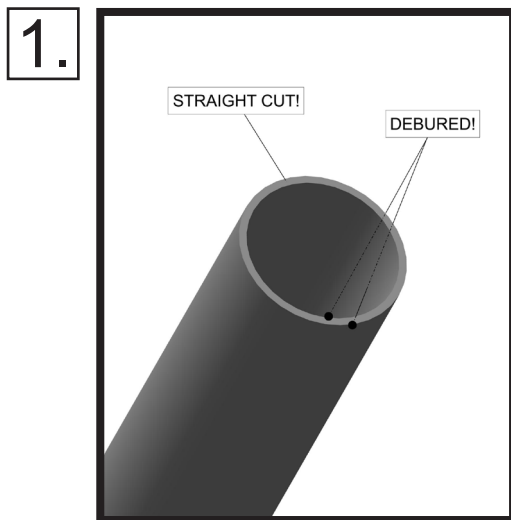
1. HERZ ZONE VALVE with Compression ends (1 2412 0X)

HERZ – ball valve with compression ends is designed for easy and fast installation of the valve in the pipe network. It is suitable for heating and chilled water systems where the pipes are made from copper, carbon steel and stainless steel.

Tightening pipe connection system is made from components that allow quick installation without special tools and sealing materials. It enables effective seal and easy adjustment of the position of the ball valve in the pipe network.

1. Ensure that the tube has been cut straight and deburred properly leaving no sharp edges,
2. Insert the pipe firmly into the compression fitting, ensuring that the compression ring seats centrally and that the pipe makes firm contact in the bottom of the valve housing,
3. Hand tighten the nut,
4. Using a suitable spanner, tighten the nut until the system is sealing. Ensure that the valve body is secured with a suitable tool. Take care to not overtighten.
5. Repeat the process on all connections.

A light oil can be used on the threads to assist tightening. If sealant paste is required, use a suitable PTFE based compound.



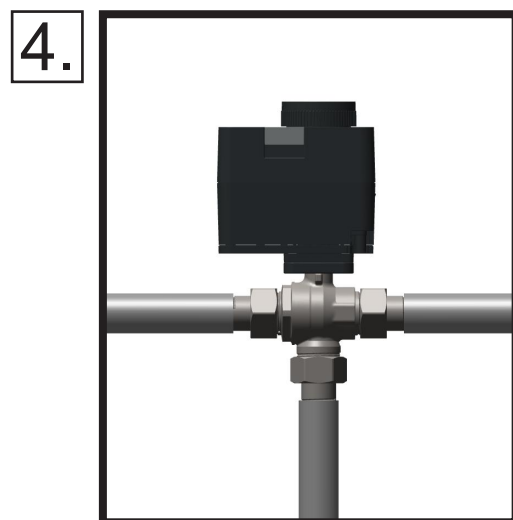
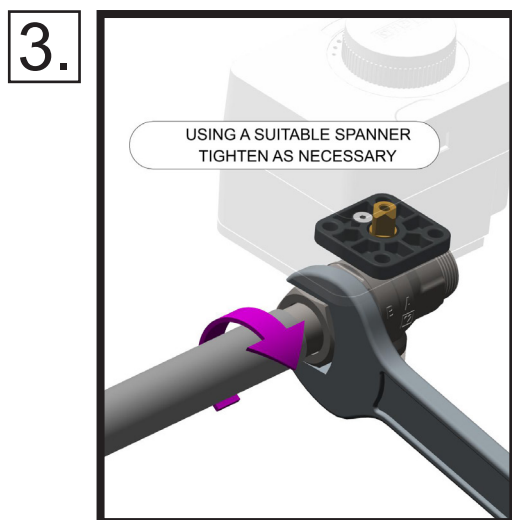
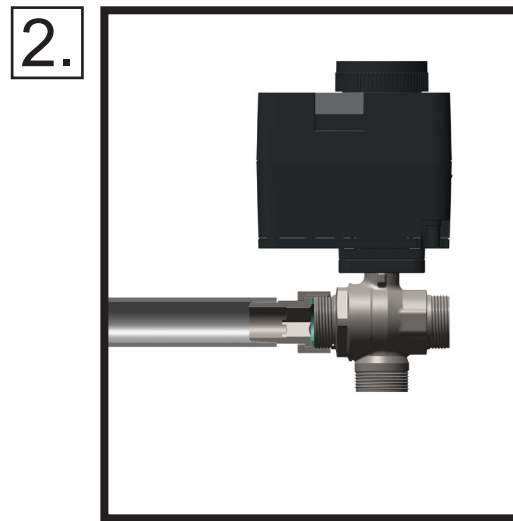
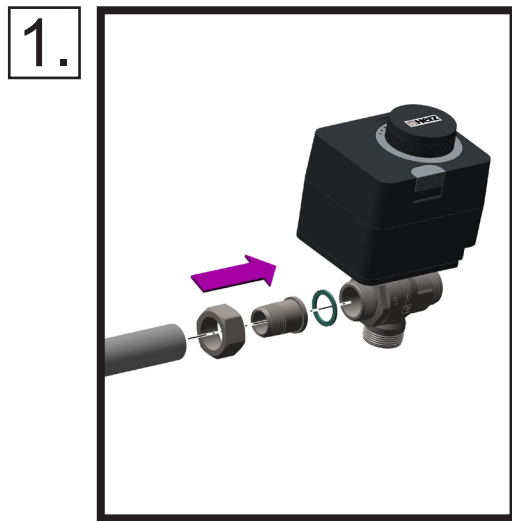
2. HERZ ZONE VALVE with external thread connection (1 2412 1X)

2.1. HERZ – ball valve with compression ends is designed to be connected to the system with a free-turning nut with female thread. This allows easy service and the possibility of disconnecting the valve during the maintenance process.

The opposing connection piece has to have the correct thread which has to be made according to standard ISO 228/1. In case a free-turning nut connector is used to install HERZ Zone valve into the system, assemble according to instructions shown below:

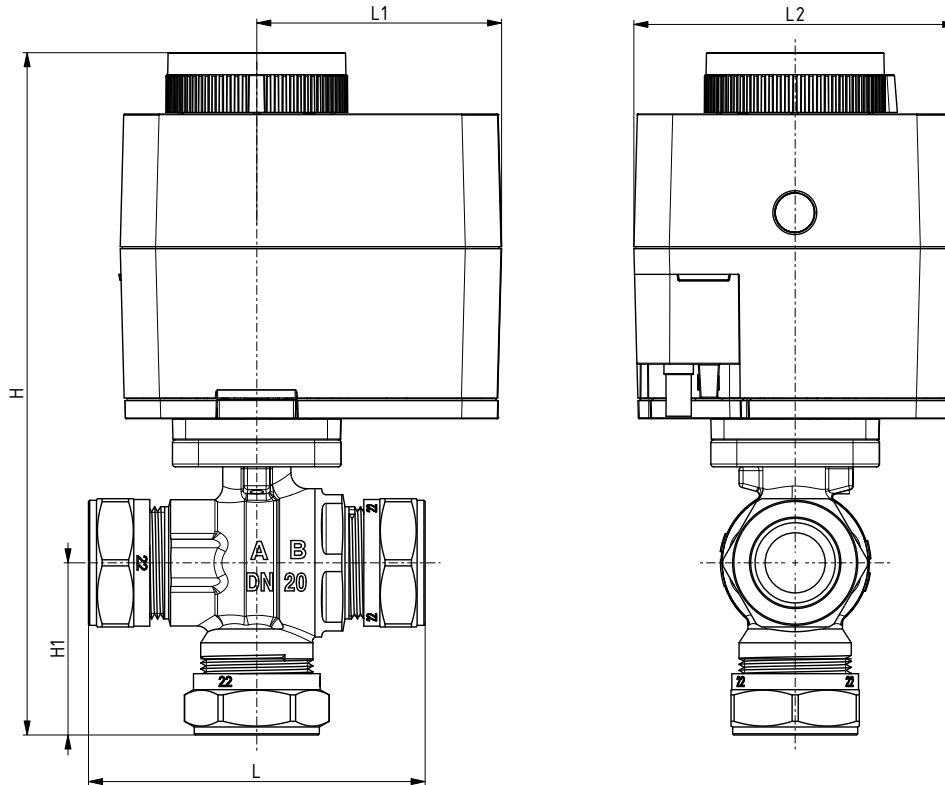
1. Assemble the free-nut connection (nut + connector + flat sealing)
2. Screw the connector into the thread of a fitting, ensuring it is securely connected to the pipe.
3. Using a suitable spanner, tighten the nut until the system is sealing. Ensure that the valve body is secured with a suitable tool. Take care to not overtighten.
4. Repeat the process on all connections.

Use suitable force when screwing the free-turning nut.



Versions

HERZ ZONE VALVE with compression ends (1 2412 0X) and motor actuator

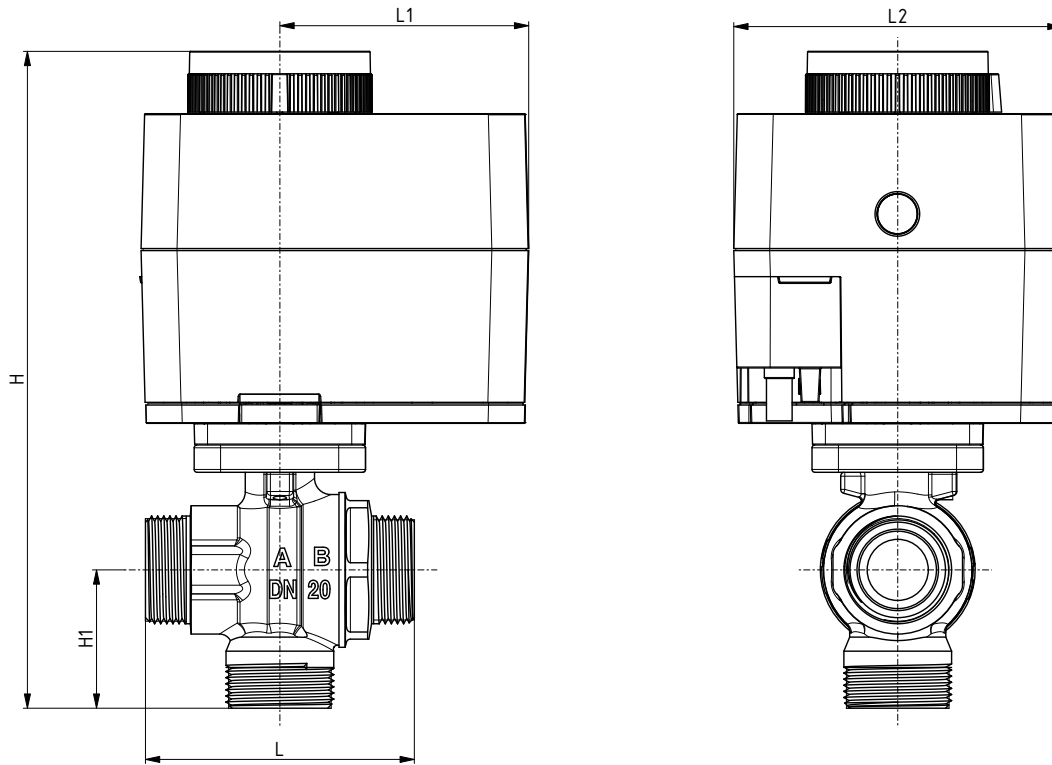


Set order number*	DN	Cu [mm]	Ball valve order nr.	Motor Actuator order nr.	Motor Actuator description	H [mm]	H1 [mm]	L [mm]	L1 [mm]	L2 [mm]
1 2412 22	20	22	1 2412 02	1 7711 60	HZ1, 230R, 5 Nm, 12S, 230V, 2P**	170	43	84	61	80,5
1 2412 23	25	28	1 2412 03			180	46,5	99	61	80,5
1 2412 24	32	35	1 2412 04			196	57	114	61	80,5
1 2412 32	20	22	1 2412 02	1 7711 61	HZ1, 230RS, 5 Nm, 12S, 230V, 2P+S***	170	43	84	61	80,5
1 2412 33	25	28	1 2412 03			180	46,5	99	61	80,5
1 2412 34	32	35	1 2412 04			196	57	114	61	80,5
1 2412 42	20	22	1 2412 02	1 7711 62	HZ1, 24R, 5 Nm, 12S, 24V, 2P**	170	43	84	61	80,5
1 2412 43	25	28	1 2412 03			180	46,5	99	61	80,5
1 2412 44	32	35	1 2412 04			196	57	114	61	80,5
1 2412 52	20	22	1 2412 02	1 7711 63	HZ1, 24RS, 5 Nm, 12S, 24V, 2P+S***	170	43	84	61	80,5
1 2412 53	25	28	1 2412 03			180	46,5	99	61	80,5
1 2412 54	32	35	1 2412 04			196	57	114	61	80,5

*order number in the shown table includes SET of ball valve + motor actuator.
For example: 1 2412 22 = 1 2412 02 + 1 7711 60

**2P = 2-point

***2P+S = 2-point + auxiliary switch

HERZ ZONE VALVE with external thread (1 2412 1X) and motor actuator


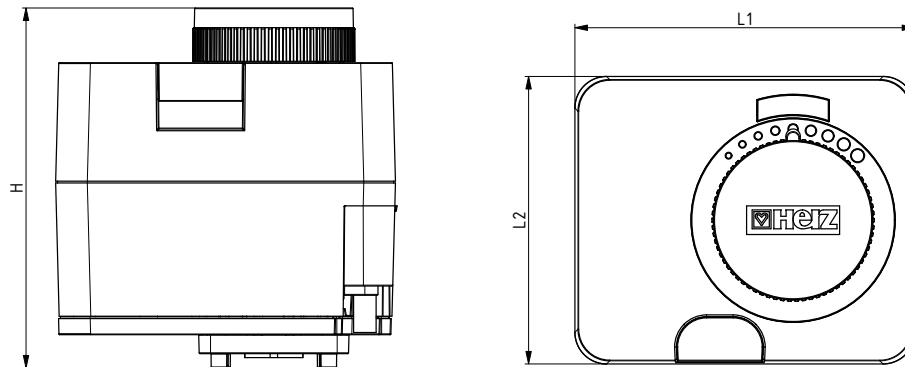
Set order number*	DN	G [in]	Ball valve order nr.	Motor Actuator order nr.	Motor Actuator description	H [mm]	H1 [mm]	L [mm]	L1 [mm]	L2 [mm]
1 2412 62	20	¾"	1 2412 12	1 7711 60	HZ1, 230R, 5 Nm, 12S, 230V, 2P**	161	34	66	61	80,5
1 2412 63	25	1"	1 2412 13			170	36,5	79	61	80,5
1 2412 64	32	1-¼"	1 2412 14			186	47	94	61	80,5
1 2412 72	20	¾"	1 2412 12	1 7711 61	HZ1, 230RS, 5 Nm, 12S, 230V, 2P+S***	161	34	66	61	80,5
1 2412 73	25	1"	1 2412 13			170	36,5	79	61	80,5
1 2412 74	32	1-¼"	1 2412 14			186	47	94	61	80,5
1 2412 82	20	¾"	1 2412 12	1 7711 62	HZ1, 24R, 5 Nm, 12S, 24V, 2P**	161	34	66	61	80,5
1 2412 83	25	1"	1 2412 13			170	36,5	79	61	80,5
1 2412 84	32	1-¼"	1 2412 14			186	47	94	61	80,5
1 2412 92	20	¾"	1 2412 12	1 7711 63	HZ1, 24RS, 5 Nm, 12S, 24V, 2P+S***	161	34	66	61	80,5
1 2412 93	25	1"	1 2412 13			170	36,5	79	61	80,5
1 2412 94	32	1-¼"	1 2412 14			186	47	94	61	80,5

*order number in the shown table includes SET of ball valve + motor actuator.
For example: 1 2412 62 = 1 2412 12 + 1 7711 60

**2P = 2-point

***2P+S = 2-point + auxiliary switch

☑ Dimensions



Order number*	Type	Voltage [V]	Auxiliary switch	L1 [mm]	L2 [mm]	H [mm]
1 7711 60	HZ1 230 R	230	-	95,5	80	100,5
1 7711 61	HZ1 230 RS	230	Adjustable, 250 V~, 3 A	95,6	80	100,5
1 7711 62	HZ1 24 R	24 AC/DC	-	95,6	80	100,5
1 7711 63	HZ1 24 RS	24 AC/DC	Adjustable, 250 V~, 3 A	95,5	80	100,5

☑ Operating data

Operation mode	Two-point
Nominal voltage (power supply)	See table above
Nominal voltage frequency	50/60 Hz
Nominal voltage range	for 24 V: AC 19.2...28.8 V / DC 19.2...28.8 V for 230 V: AC 184...276 V
Power consumption in operation	2,5-5 W
Power consumption for wire sizing	2.5 VA
Connection supply / control	Terminals 4 mm ² (cable Ø6...8 mm, 4-wire)
Parallel operation	Yes (note the performance data)

☑ Functional data

Torque motor	5 Nm
Positional accuracy	±5%
Direction of motion motor	CW and CCW rotation
Manual override	temporary and permanent gear disengagement with light gray button on the housing
Angle of rotation	90°
Running time motor	12 s / 90°
Duty cycle value	60% (= active time 12 s / operating time 19,2s)
Sound power level, motor	< 40 db
Position indication	Reversible scale plate
Cable length	1 m

☑ Safety data

Protection class

II for versions 230 V,

III for versions 24 V

Degree of protection

IP 42

EMC

CE according to 2014/30/EU

Mode of operation

Type 1

Rated impulse voltage supply / control

0,8 kV

Pollution degree

3

Ambient temperature

0...50°C

Storage temperature

-20...70°C

Ambient humidity

Max. 95% RH, non-condensing

Servicing

maintenance-free

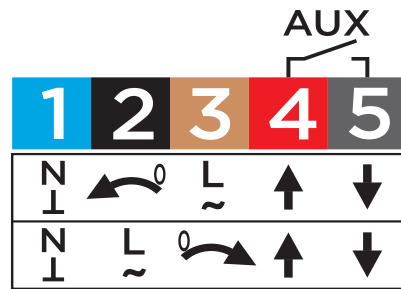
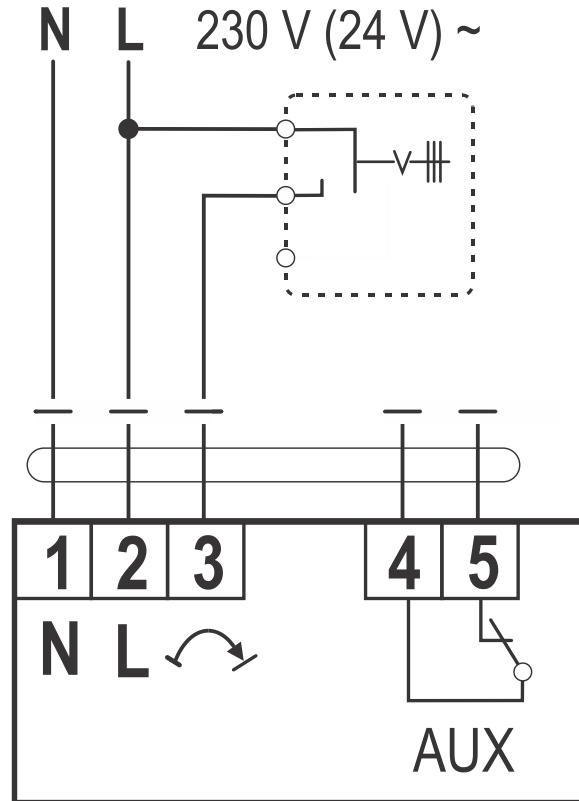
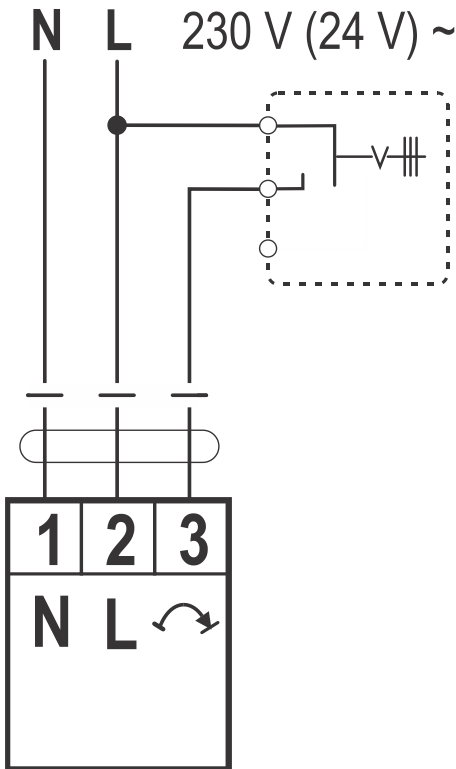
Housing cover

PC material (gray)

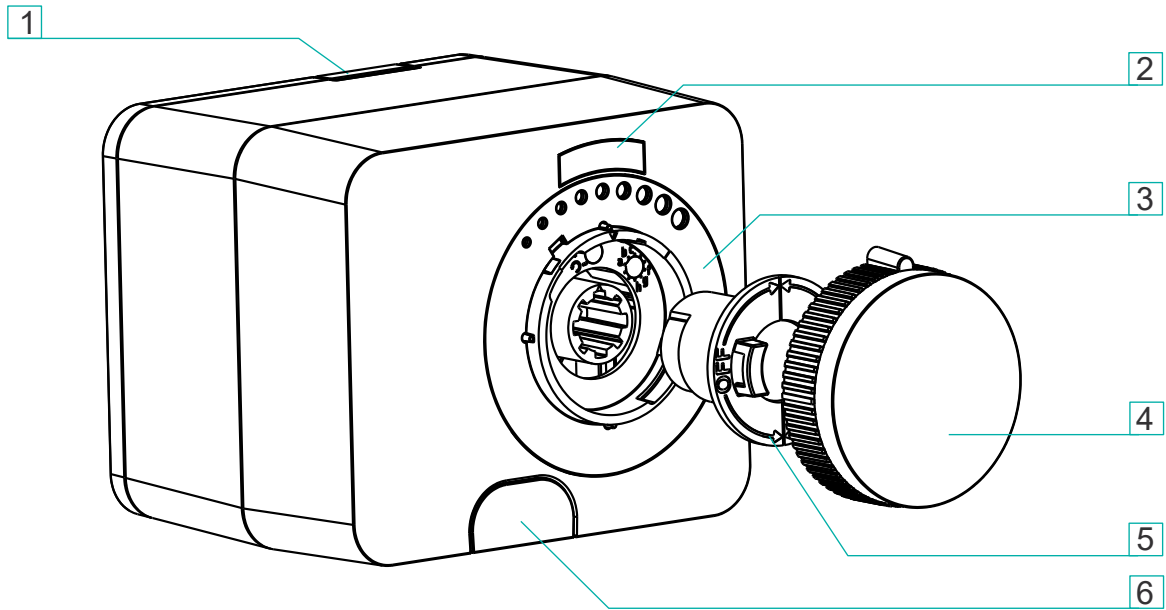
☑ Electrical connection





2-point

2-point + AUX Switch



☑ Components of HERZ ZONE motor actuator





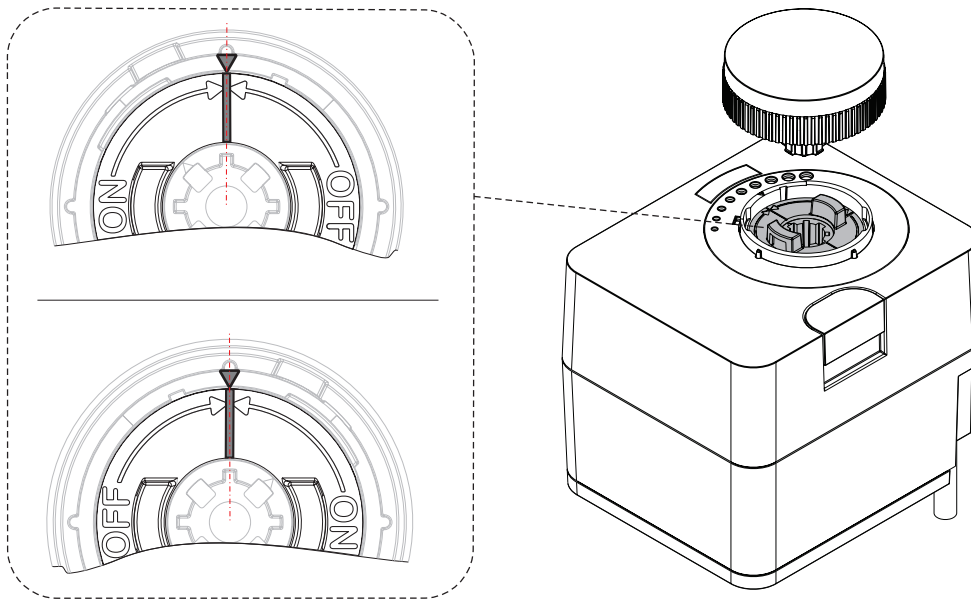
Nr.	Marking on the actuator	Description
1		Button for mounting and dismounting the actuator on the valve.
2		Actuator operation indicator
		Rotating the actuator counterclockwise. The light illuminates at half brightness when the motor actuator is in end position.
		Rotating the actuator clockwise. The light illuminates at halfbrightness when the motor actuator is in end position.
		Status of auxiliary switch.
		The red light is on. The additional switch is activated.
3		Scale to set the valve position display.
4		Valve manual positioning button.
5		Ring for auxiliary switch.
6		Button (clutch) for manual operation mode.

☑ Additional switch

HERZ Zone motor actuators 1 7711 61 and 1 7711 63 have additional feature: switch, that can be used for function: Auxiliary pump OFF switch. Position of the auxiliary

Adjusting the position of the additional switch

To turn on the auxiliary switch, press the button  and turn the manual positioning button to the position where the additional switch is to be activated. Press the button  again and remove the manual positioning button. By rotating the ring for the auxiliary switch, set the activating point of the additional switch. Align one of the two indicators separating the ON and OFF fields on the ring with the triangular mark on the motor actuator cover. In the ON field, the auxiliary switch is activated, in the OFF field, the auxiliary switch is deactivated. After the setting, return the manual positioning button back to the actuator.



☑ Maintenance instructions

If the product is used properly, no special maintenance is required in normal operation. The ingress of condensate, dripping water etc. into the drive should be prevented. Repairs on the device must be carried out by authorized persons only.

According to EN 806-5 (point 6. Operation), valves must always be in their fully opened or closed position and actuated at regular intervals to ensure they remain operational. Therefore HERZ Ball valves must be closed and opened periodically at least twice a year. This prevents the ball valve from blocking, reduces sediment deposition, and reduces the possibility of corrosion inside the valve.

It is recommended that the valve is also actuated in the "OFF" season (in case of heat pump season this means summer, when there is no need to heat the system and valve is only supplying hot water from heat pump to boiler for sanitary water). See what are the options of the control unit that is controlling the heating system. Choose option of automatic valve motion in case of non-operation (if possible in the control unit).

Regular maintenance of heating systems keeps them running smoothly, optimizing their energy consumption and reducing utility bills. Well-maintained components ensure the heating system doesn't have to work harder than necessary to achieve the desired temperature.

Make sure, that regular maintenance is done periodically at least twice a year, according to the procedures written below:

1. Check and clean the system filters.
2. Check that the non-return valves are operating normally, without problems caused by impurities.
3. Limescale can be removed from internal components by immersion in a suitable de-scaling liquid.
4. When the components which can be maintained have been checked, commissioning should be carried out again.

In-service tests should be carried out regularly to monitor the diverting valve performance, as deterioration of performance could indicate that the valve and/or the system require maintenance. If, during these tests, the performance of the valve has changed significantly in comparison to the previous tests, the details given in the installation sections should be checked and maintenance carried out.

The following aspects should be checked regularly to ensure that the optimum performance levels of the valve are maintained, periodically at least twice a year.

- Motor actuator:

In case the motor actuator is broken, then only the specialist electricians can exchange or service it.

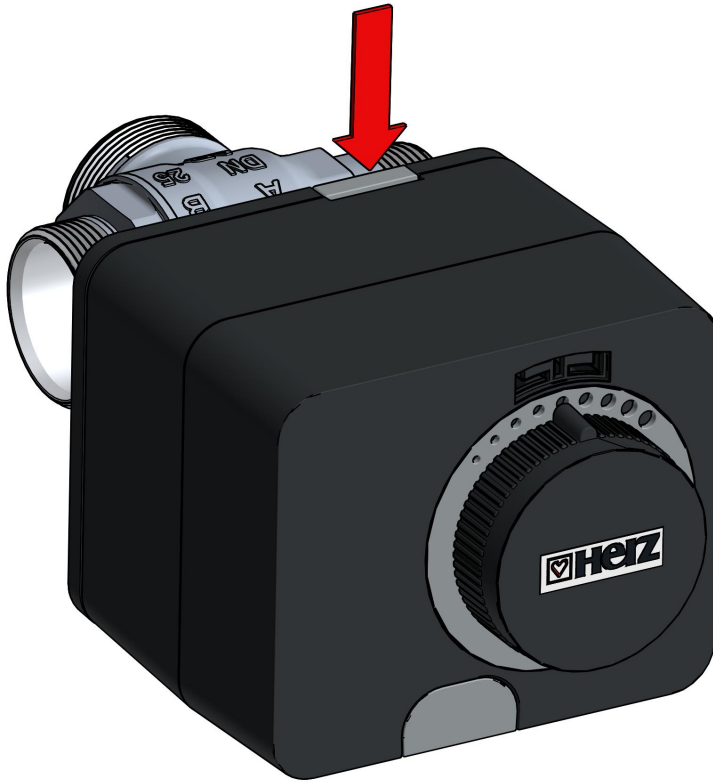


These specialist electricians need to respect all of electrical standards and recognized regulations. Usage of correct safety equipment against electric shock is obligatory. Live parts can cause electric shock that will result in serious injury or death.

Replacing the motor actuator

If the actuator needs to be replaced, this does not require draining the system because it can be replaced easily without re-installing the entire HERZ ZONE ball valve. When working on the actuator, disconnect the mains voltage supply and ensure that it cannot be switched on. See detailed instructions for the actuator for the correct connection to the main electrical supply.

The actuator is latched to the HERZ Zone valve via a special flange. Disconnect the actuator simply by pressing the gray button on the bottom of the actuator and pulling the actuator off the valve:



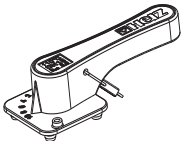

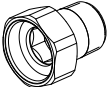
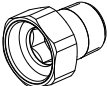
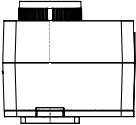
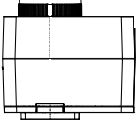
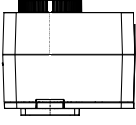
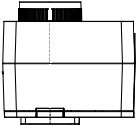


Disposal instructions

The disposal of HERZ Zone valve accessories must not endanger the health or the environment. National legal regulations for the proper disposal of the HERZ Zone valve accessories have to be followed.

Spare parts

Sketch	Description	Article number	Pcs.
	Compression end, consisting of union nut M28 and olive Cu22	1 2413 07	1
	Compression end, consisting of union nut 3/4" and olive Cu28	1 2413 08	1
	Compression end, consisting of union nut 5/4" and olive Cu35	1 2413 09	1

Sketch	Description	Article Nr.	Pc.
	Valve flange	1 2143 05	1
	Connection set	1 2143 06	1
	Handle for manual control of ZONE valve	1 2001 90	1
	Free-turning nut connector G3/4"-R1/2"	1 6221 31	1
	Free-turning nut connector G1"-R3/4"	1 6221 32	1
	Free-turning nut connector G1-1/4"-R1"	1 6221 33	1
	Motor actuator 230V	1 7711 60	1
	Motor actuator 230V With auxiliary switch	1 7711 61	1
	Motor actuator 24V	1 7711 62	1
	Motor actuator 24V With auxiliary switch	1 7711 63	1

☑ Troubleshooting

Problem	Description	Solution
Motor actuator is over-heating	Duty cycle value of the valve is 60% ED (= active time 12 s / operating time 19,2s)	Reduce actuator running time / extend stop periods
	Blocked ball with dirty water	There might be blockage in the ball that is blocking the actuator and cannot reach end position. Clean the system.
	Not enough ventilation if valve is installed inside of cabinet (50°C)	Ensure proper ambient temperature / reduce duty cycle < 60% ED
	System medium temperature is too hot, causing motor overheating	Check the medium temperature (if its installed into SOLAR system). Temperature can be transmitted trough stem into the motor actuator, causing it to overheat.
The motor actuator is not working	No voltage supply at the actuator	Rectify the power interruption
	The motor actuator is defective	Replace the motor actuator
	Both direction LED's are shining, actuator not turning	Both signals for OPEN/CLOSE are present at same time.
	Actuator is turning, no change on the valve	Remove actuator and check both linkage parts ie. flange and adapter part for damage
	Actuator is not turning, direction Led is not shining	Check the controller for correct output / Check the actuator wiring
	24V was installed into 240V supply	Actuator is damaged. Ensure correct power supply, then replace the actuator
	240V was installed into 24V supply	Ensure correct power supply
	Wiring system is malfunctioning	<ul style="list-style-type: none"> Inspect wiring system
	AUX switch doesn't activate/ activates in incorrect position	Check the adjustment of AUX switch / adjust the switch accordingly. <ul style="list-style-type: none"> Check if the wet contact is present at wire #4
Actuator is moving forth and back / oscillating	Blocked valve or damaged actuator. Check valve for torque / Check actuator proper turning when off the valve.	
Actuator is moving forth and back / oscillating	Blocked valve or damaged actuator. Check valve for torque / Check actuator proper turning when off the valve.	
Both zones are heated	Check if the motor actuator is in end position	There might be blockage in the ball that is blocking the actuator and cannot reach end position. Clean the system.
	Malfunction of the valve sealing	Check system filters
Condensation build-up on actuator	Outside walls of actuator are condensing	Ensure proper ventilation of environment. Use insulation for the valve and/or actuator.

System example

