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Pressure-independent control valves

Perfect technology for energy-efficient heating and cooling

HERZ Pressure independent control valve - state-of-the-art technology

Over the last decade, planners, installers and users have learned to appreciate the advantages of pressure independent control valves (PICV): simplified design, high comfort and best energy efficiency.

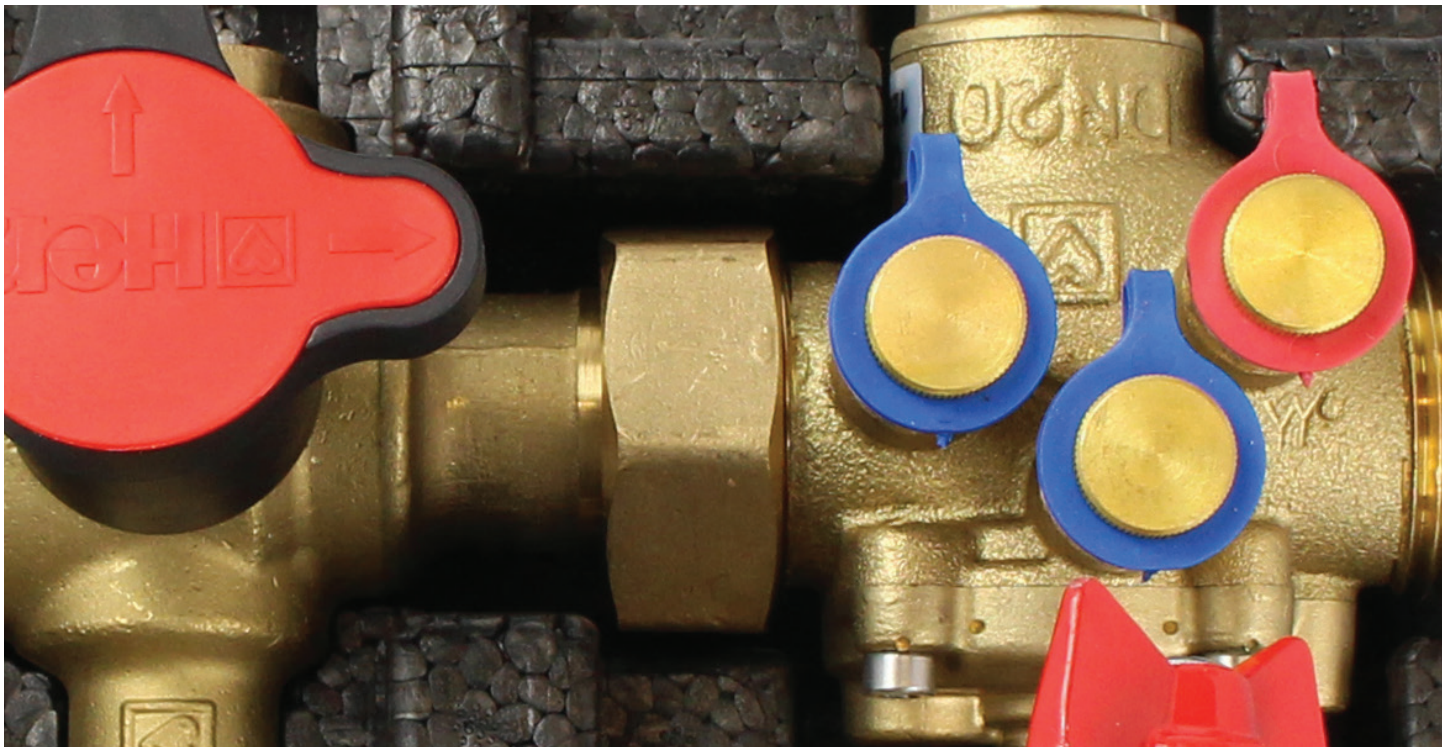
To deliver these benefits reliably and in the long term, perfect performance and high quality of the valves are required.

Drawing on its many years of design experience and in-house technological capabilities, HERZ has renewed its product range to create a new range of pressure independent control valves that sets the benchmark in the industry.

Robust design concept, optimised moulding of the housing, generous design of the control elements with complete pressure relief, precisely determined characteristic curves, accurate machining, strictest quality control and European manufacturing are features that distinguish HERZ pressure independent control valves.

The functionalities of several valves are combined in one compact housing of the HERZ Pressure independent control valve. Thus, control valve, regulating valve, differential pressure regulator, isolation valve and measuring orifice come together to save costs and space. Simple operation with setting of the desired flow rate as a percentage of the maximum flow rate saves commissioning time.

HERZ pressure independent control valves represent a complete product range covering the flow rate range from 20 l/h to 410,000 l/h. Available are versions with male thread or female thread in DN 15 to DN 50 as well as flanged versions in DN 50 to DN 250.



Benefits

- Development, design and production from HERZ
- High flow capacity
- Low and stable response pressure
- Simple operation
- Large variety of flow rates, nominal diameters and connections
- Use of small drives
  Available for all types up to DN 50
- On rules and regulations in the heating and cooling
- Made in Europe

5 JAHRE · 5 YEARS · 5 ANS · 5 JAAR · GARANTIE

Overview

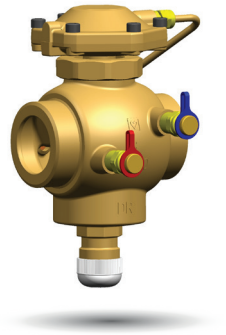
4006 / 4206 SMART

- DN 15 - DN 20, male and female thread, compact design, short overall lengths
- High flow capacity
- Simple presetting in % of the maximum flow rate
- Low and stable set pressure across the range
- Pressure relief for accurate control and low actuating forces
- Max. Differential pressure 4 bar (DN 15 LF, DN 15 MF),
  6 bar (DN 15 SF - DN 20 SF, DN 15 HF - DN 20 HF), PN 25

4600 HerzCON

- Direct connection for fan coils and other heating and cooling devices
- Models in DN 15 to DN 32 cover a flow range of 20 - 2500 l/h
- Compact design, all components easily accessible. Footprint of the insulation shell only 18x18cm for DN 15 - DN 20
- Third measuring point for direct flow measurement
- Backflushing of the strainer basket without having to remove it

4406



- DN 25 - DN 50, AG, short overall lengths
- Flow capacity up to 12500 l/h
- Simple presetting in % of the maximum flow rate
- Stable set pressure over the entire model range
- Pressure relief allows the use of small actuators up to DN 50
- Max. Differential pressure 6 bar, PN 25

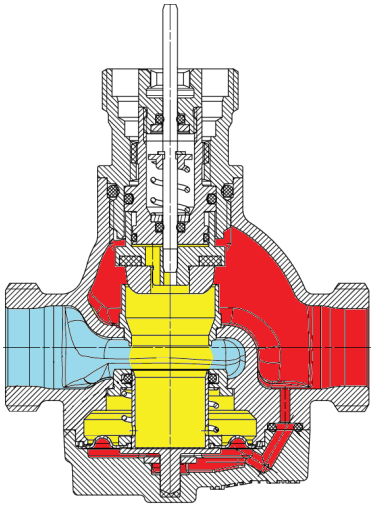
F4006

- Models in DN 50 to DN 250 cover a flow range from 3.75 to 410 m3/h
- Stable set pressure across the range
- Complete pressure relief
- Stepless presetting of the desired flow rate
- Three measuring points for direct measurement of the actual flow rate

HERZ 4006 / 4206 SMART, DN 15 - DN 20

HERZ 4006 / 4206 SMART pressure independent control valves are characterised by their outstanding technical design.

The geometry of the housing, cast from dezincification-resistant brass, has been optimised for both water flow and casting quality. As a result, only minor additional pressure losses occur in the housing at higher flow rates and the set pressure is kept at a low level. At the same time, favourable casting conditions are achieved, ensuring a high quality of the casing.



The housing as well as all other brass parts come from in-house production and are subject to strict quality control.

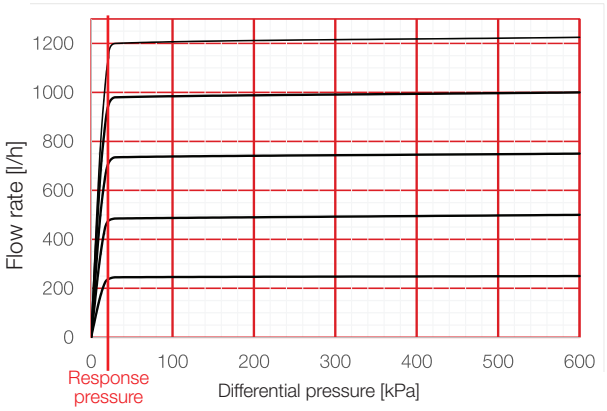
In the centre of the valve is a precisely machined brass ring.

This is generously dimensioned so that a high flow capacity can be achieved at a low response pressure.

Connected to the ring from one side is the brass regulating piston with a precisely designed and machined regulating surface, which ensures a linear characteristic curve of the valve. The regulating piston is pressure-balanced, which enables the use of small actuators with low positioning forces. It is also equipped with an EPDM seal to ensure reliable shut-off.

The regulating piston is positioned by a threaded bushing to limit the flow to the required maximum level. Within one turn, the maximum flow can be infinitely adjusted as a percentage of the maximum flow.

The other side of the ring serves as a seat for the pressure regulating cap. This pressure-relieved part is precisely guided at two points and accurately finished to form a regulating edge that is capable of relieving the excess differential pressure even at low flow rates.



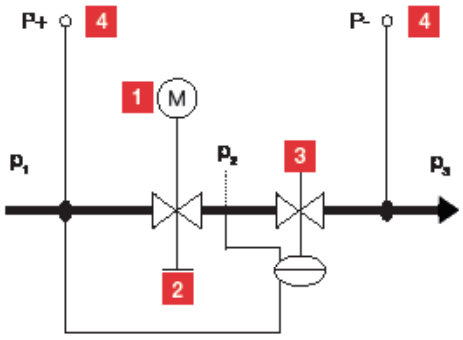
The pressure regulating bonnet is actuated by a diaphragm which senses the pressure upstream of the regulating piston on one side and the pressure downstream of the regulating piston on the other. A precisely designed and manufactured stainless steel spring ensures that this pressure difference is maintained at the set pressure level.

1 Actuator for control valve

2 Stepless presetting for maximum desired flow rate

3 Integrated differential pressure regulator

4 Pressure measurement points



Since the regulating piston defines the valve opening and the pressure regulator limits the differential pressure to the constant value, the flow rate remains constant as long as the set pressure is reached.

HERZ 4006 / 4206 SMART

	4006 SMART **AG** - External thread flat sealing			4206 SMART **IG** - Female thread		
						
DN	**Dim.**	**with measuring valves**	**without measuring valves**	**Dim.**	**with measuring valves**	**without measuring valves**
15 LF	G ¾"	1 **4006** 30	-	Rp ½"	1 **4206** 20	1 **4206** 60
15 MF	G ¾"	1 **4006** 39	-	Rp ½"	1 **4206** 29	1 **4206** 69
15 SF	G ¾"	1 **4006** 51	1 **4006** 91	Rp ½"	1 **4206** 01	1 **4206** 91
15 HF	G ¾"	1 **4006** 71	1 **4006** 81	Rp ½"	1 **4206** 71	1 **4206** 81
20 SF	G 1"	1 **4006** 52	1 **4006** 92	Rp ½"	1 **4206** 02	1 **4206** 92
20 HF	G 1"	1 **4006** 72	1 **4006** 82	Rp ½"	1 **4206** 72	1 **4206** 82

Technical data

		4006 / 4206 SMART					
		DN 15 LF	DN 15 MF	DN 15 SF	DN 15 HF	DN 20 SF	20 HF
Max. flow rate l/h		120 l/h	190 l/h	800 l/h	1200 l/h	1200 l/h	2000 l/h
Control range		20 - 100%					
Differential pressure at the housing	Δp_{min}	18 kPa	20 kPa	20 kPa	20 kPa	20 kPa	20-30 kPa
	Δp_{max}	400 kPa	400 kPa	600 kPa	600 kPa	600 kPa	600 kPa
Max. Operating pressure		25 bar					
Min. operating temperature		2 °C (pure water); - 20 °C (Antifreeze)					
Max. operating temperature		130 °C					
Valve lift		4 mm					
Closing dimension		9,35 mm					
Drive connection		M 28 x 1,5					
Housing length		75 mm					
Height with 1 **7990** 3X actuator		158 mm					
Water quality		According to ÖNORM H 5195 and VDI 2035. The use of ethylene-propylene glycol is permissible in a mixing ratio of 25 -50 % by volume.					

Hinweis: Passende Stellmotore - siehe Seite 9

HerzCON, DN 15 - DN 32

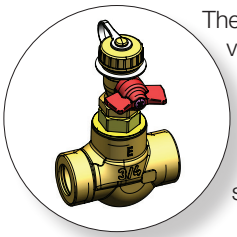
For people to feel comfortable in a room, it is important that the air coming out of the fan coil units has a stable temperature. The HERZ 4006 SMART valves ensure this by maintaining a constant flow of the cooling medium. To facilitate the installation and maintenance of fan coils, HERZ has created compact and clever valve packages that are equipped with a diffusion-tight insulating cover.

The 4600 HerzCON direct connection features a particularly compact design and easy access to all service functions. The footprint of the DN 15 and DN 20 versions is only 18x18 cm. The heating or cooling medium enters the unit through a strainer with drain valve. This is a DN 15 full-size drain and fill valve with wing handle, hose connection, cap and chain.

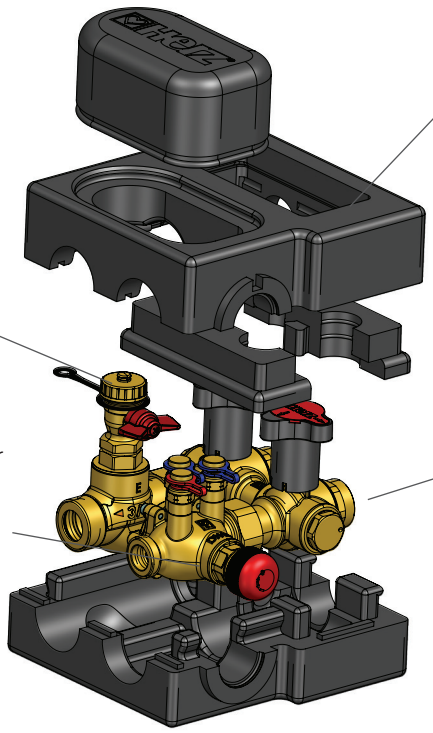
The union of the strainer and the drain valve provides useful functionality. The backflush process allows the strainer screen to be cleaned without having to remove it from the valve. A simple procedure that saves time. The movement of the medium through the HerzCON is directed by adjusting the T-bore ball valves.

The ball valves have specially shaped handles that indicate the flow path and are long enough to reach out of the insulating shell. The ball valves can be operated at any time without dismantling the insulation shell.

Product overview



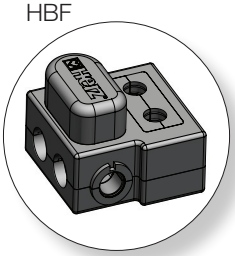
The integrated drain valve in the strainer allows the system to be flushed without removing the strainer screen.



Insulating shell impermeable to water vapor

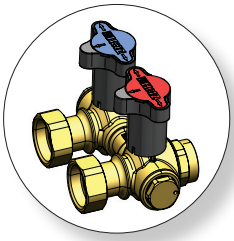
Methode	Class
DIN EN ISO 11925-2 [1]	E
DIN 4102-1	B2
FMVSS 302	Fulfilled
UL 94	HBF

[1] Insulating shell impermeable to water vapor EN 13501-1



Pressure-independent control valve (PICV)
One valve for four requirements: differential pressure controller, adjustment, control, shut off. No valve authority calculation and verification necessary.

HERZ multifunction ball valve block. with red and blue handle, ball with T-bore. T-bore of the ball with full passage allows draining or filling of complete system or a partial system in case of maintenance. The position of the ball valves is indicated by the ball valve handles.



SMART Pressure-independent control valve

The heart of HerzCON is the HERZ 4006 SMART combination valve volume flow controller. This outstanding piece of technology is equipped with three measuring valves in HerzCON. The first and last measuring points are used to check the pressure drop across the entire valve. The flow can be verified directly by measuring at the first and second measuring points without the additional pressure loss of an extra orifice plate.

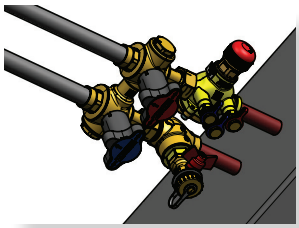
The insulating shell is a compact and solid part made of diffusion-proof EPS, with standard or high fire resistance. The shell is designed for easy installation and convenient maintenance access. Simply snap out one segment of the shell and you have good access to the drain valve and metering connections.

The adjustment disc and the drive connection of the pressure independent control valve are located right on the side, allowing the drive to be mounted outside the thermally insulated room.

With just a few turns of the handles, it is possible to shut off the fan coil unit and fill, drain or flush various parts of the system. The HERZ pressure independent control valve can be flushed clean in backflush mode while at the same time cleaning the strainer.

Normal operation

Bypass



Flushing

Back flushing

Product overview

				
l/h	**DN**	**Pipe center distance**	**HerzCON incl. insulating box**	**HerzCON without insulating box**
20 - 120	DN 15 LF	65 mm	1 **4600** 50	-
40 - 190	DN 15 MF	65 mm	1 **4600** 59	-
160 - 800	DN 15 SF	65 mm	1 **4600** 76	-
240 - 1200	DN 15 HF	65 mm	1 **4600** 56	-
240 - 1200	DN 20 SF	65 mm	1 **4600** 77	-
400 - 2000	DN 20 HF	65 mm	1 **4600** 57	-
100 - 1900	DN 25	90 mm	1 **4600** 58	-
200 - 2500	DN 32	110 mm	-	1 **4600** 54

Note: Suitable servomotors - see page 9

HERZ 4406, DN 25 - DN 50

For high-capacity heat exchangers, such as air handling units, robust and accurate control is more important than a small footprint. That is why HERZ engineers designed the DN 25 - DN 50 pressure independent control valve with a large, external diaphragm. At the same time, the housing lengths remained small.

The casting mould of the housings was also generously adapted to allow high flow rates to pass through without causing unnecessary pressure losses at the housing. As a result, the valves have a high flow capacity while the set pressure remains stable over the flow range and the entire family.

Thanks to full pressure relief, the valves up to and including DN 50 can be operated with with the same size actuators across all sizes of valve actuators.

Thanks to the robust design and precise machining, the valves easily provide a constant flow in the differential pressure range up to 6 bar.

	4406 **MT** - External thread		**4206** **FT** - Internal thread	
DN	**Dim.**	**with measuring valves**	**Dim.**	**with measuring valves**
DN 25	G 1 ¼"	1 **4406** 23	Rp 1"	1 **4206** 33
DN 32	G 1¾"	1 **4406** 24	Rp 1¼"	1 **4206** 34
DN 40	G 2"	1 **4406** 25	Rp ½"	1 **4206** 35
DN 50	G 2 ½"	1 **4406** 26	Rp 2"	1 **4206** 36

Technical data

		4406 / 4206			
		DN 25	DN 32	DN 40	DN 50
Max. Flow rate l/h	6,5 mm Drive*	3300 l/h	6000 l/h	7500 l/h	12500 l/h
	5 mm Drive*	2480 l/h	4000 l/h	5650 l/h	9400 l/h
Control range		20 - 100%			
Differential pressure across the valve	Δp_{min}	35 kPa	35 kPa	30 kPa	40 kPa
	Δp_{max}	600 kPa	600 kPa	600 kPa	600 kPa
Max. operating pressure		25 bar			
Min. operating temperature		2 °C (pure water); - 20 °C (Antifreeze)			
Max. operating temperature		130 °C		110 °C	
Valve lift		6 mm			
Closing dimension		9,35 mm			
Drive connection		M 28 x 1,5			
Housing length		75 mm	100 mm	110 mm	130 mm
Height with 1 **7990** 3X actuator		222 mm	246 mm	246 mm	251 mm
Water quality		According to ÖNORM H 5195 and VDI 2035. The use of ethylene-propylene glycol is permissible in a mixing ratio of 25 -50 % by volume.			

* The max. flow with 6.5 actuator is achieved with the 1 **7990** 32 and 1 **7708** 27/48 thermal motor or with the 1 **7708** 4X gear motors. When using the 1 **7990** 31 and 1 **7708** 52/53/87 actuators with 5 mm stroke, the max. flow is reduced. The **7711** actuators with 4.5 mm stroke are suitable for the DN 25 - DN 50 HERZ combination valve flow regulators.

Drives for 4006 / 4206 / 4406 PICVs and 4600 HerzCON

The choice of a drive depends on the application requirements. Modern control systems achieve the best comfort and high energy efficiency through continuous control. HERZ actuators integrate seamlessly into the building management system to provide the required continuous control of the flow. Actuators with valve travel detection enable even more precise control of the valve by adapting the control voltage range to the actual valve travel and preventing the actuator from running empty.

Compared to thermoelectric actuators, motorised actuators respond more quickly to the required setting and do not consume energy until a change in setting is made. For some applications, simple on/off control of the valve is sufficient. In this case, 2-point actuators are used. Drives with integrated limit switches can be used for direct switching of a pump or fan control. Depending on the controller used, 24 V or 230 V operating voltage is selected, as well as the de-energised open/closed state.

Recommended drives

Image	Order number	Regulation	Hub	Currentless state	Operating voltage	Control signal
	1 **7990** 32	Continuous, thermoelectric, with valve travel detection	6,5 mm	NC (normally closed)	24 V /AC	0…10 V / DC
	1 **7990** 31	Continuous, thermoelectric	5 mm	NC (normally closed)	24 V /AC	0…10 V / DC
	1 **7708** 42	Continuous, with stepper motor and valve travel detection	8,5 mm	-	24 V /AC DC	0…10 V / DC
	1 **7708** 46	Continuous, with stepper motor. With valve travel detection and return signal	8,5 mm	-	24 V /AC DC	0…10 V / DC
	1 **7708** 53	2-point, thermoelectric, also for pulse width modulation	5 mm	NC (normally closed)	230 V / AC	-
	1 **7708** 52	2-point, thermoelectric, also for pulse width modulation	5 mm	NC (normally closed)	24 V / AC DC	-
	1 **7708** 87	2-point, thermoelectric, also for pulse width modulation. With limit switch	5 mm	NC (normally closed)	230 V / AC	-
	1 **7708** 27	2-point, also suitable for pulse-pause operation	6,5 mm	NC (normally closed)	230 V/AC	-
	1 **7708** 48	2-point, also suitable for pulse-pause operation	6,5 mm	NC (normally closed)	24 V/AC/ DC	-

HERZ F 4006, DN 50 - DN 250 flanged

HERZ is one of the few leading manufacturers to develop and produce large pressure independent control valves with flanged connections and manufacture them. Sophisticated design with robust diaphragm (420 cm^2 diaphragm surface area for DN 125 - DN 250), generously dimensioned and precisely machined control parts and full pressure relief ensure accurate flow control and stable set pressures.

In each size there is an F **4006** 6X model with a stable set pressure of 40 kPa over the entire flow range. This makes it possible to keep pump performance low in installations with consumers that require different flow rates.

For higher flow rates, versions with a higher response pressure (70 kPa or 85 kPa) have been developed.

The complete series in DN 50 - DN 250 with housings made of grey cast iron EN-GJL-250 and with overall lengths and flanges according to EN 1092-2 covers a flow range from 4 to 410 m^3/h.

The F **4006** pressure independent control valves are characterised by a linear characteristic curve. The volume flow can be continuously adjusted on the valve in the range from 25% to 100% of the maximum flow. With an actuator, the volume flow can be readjusted independently of pressure. The F **4006** combination valve volume flow controllers are equipped with three measuring points. This enables the differential pressure available for each valve to be measured and thus also the pump delivery head to be optimized. With the third metering valve, the actual flow rate can be checked directly at the valve.

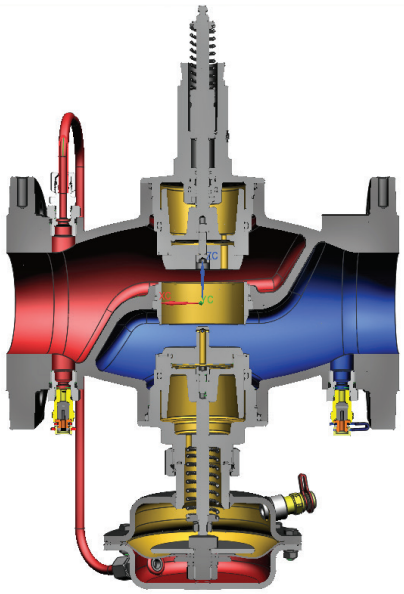
DN	m^3/h	min Δp	Hub	Order number
50	3,75-15	40 kPa	15 mm	F **4006** 62
65	5-20	40 kPa	15 mm	F **4006** 63
80	9-36	40 kPa	20 mm	F **4006** 64
100	10,75-43	40 kPa	20 mm	F **4006** 65
125	25-100	40 kPa	40 mm	F **4006** 66
125 HF	37,5-150	70 kPa	40 mm	F **4006** 56
150	36,25-145	40 kPa	40 mm	F **4006** 67
150 HF	50-200	70 kPa	40 mm	F **4006** 57
200 SF	52,5-210	40 kPa	40 mm	F **4006** 68
200 HF	75-300	70 kPa	40 mm	F **4006** 58
200 UHF	87,5-350	85 kPa	40 mm	F **4006** 48
250 SF	87,5-350	50 kPa	40 mm	F **4006** 69
250 HF	102,5-410	70 kPa	40 mm	F **4006** 59

Technical data

Control range	25 - 100%
Max. Differential pressure at the housing	4 bar
Max. operating pressure	16 bar
Min. operating temperature	2 °C (pure water) - 20 °C (antifreeze)
Max. operating temperature	110 °C
Housing length	EN 1092-2

Water properties according to ÖNORM H 5195 and VDI 2035.
The use of ethylene-propylene glycol is permissible in the mixing ratio of 25 -50 % by volume.

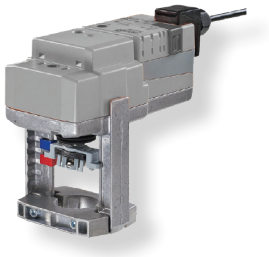
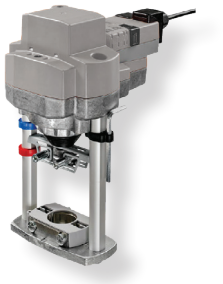
Note: See page 11 for suitable drives.



Drives for F 4006 flanged PICV

The F 4006 flanged pressure independent control valves feature a pressure-balanced control spool that adequately maintains the required actuator forces. However, for accurate control and high flow capacity, the valves have been designed with longer valve travels that require the use of certain actuators. For best control efficiency, it is recommended to use actuators with continuous control.

The HERZ **F7712** actuators with continuous control are characterised by independent adaptation to the valve stroke, low running noise, maintenance-free gearing, adjustable direction of action and intelligent control electronics.

Image	Order number	Hub	Currentless state	Operating voltage	Control signal
	1 **7712** 21	49 mm	Continuous, 2-point or 3-point	24 V / AC / DC or 230 V / AC with 1 **7712** 22	0...10 V or 4...20 mA
	F **7712** 90	15 mm	Continuous	24 V AC/DC	2-10 V
	F **7712** 95	15 mm	2-point or 3-point	24 V AC/DC	
	F **7712** 81	15 mm	2-point or 3-point	230 V AC	
	F **7712** 91	20 mm	Continuous	24 V AC/DC	2-10 V
	F **7712** 96	20 mm	2-point or 3-point	24 V AC/DC	
	F **7712** 82	20 mm	2-point or 3-point	230 V AC	
	F **7712** 92	40 mm	Continuous	24 V AC/DC	2-10 V
	F **7712** 98	40 mm	2-point or 3-point	24 V AC/DC	
	F **7712** 84	40 mm	2-point or 3-point	230 V AC	

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