

Application:

The pressure independent control valve “Cocon QTZ” with automatic flow control is a valve combination consisting of a flow regulator and a regulating valve. The nominal value of the flow regulator can be set with the help of an easily accessible handwheel. The pressure independent valve can be equipped with an actuator, a temperature controller or a manual head (connection thread M 30 x 1.5).

The pressure independent control valve “Cocon QTZ” is designed to be installed in heating and cooling systems (e.g. central or under-floor heating systems, fan coil units, chilled ceilings, fan convectors etc.) for automatic flow control (hydraulic balancing). It can also be used for the control of another variable (e.g. room temperature) by modifying the flow rate with the help of actuators, thermostats or temperature controllers.

Technical data:

Performance data

Max. operating temperature:	+120°C
Min. operating temperature:	-10°C
Max. operating pressure:	16 bar (1600 kPa)
Fluid:	Water or mixtures of water and ethylene/propylene-glycol (max. 50%), ph-value 6.5-10
Max. closing pressure:	16 bar (1600 kPa) in the direction of flow

Control range:

DN	Control range [l/h] (min.-max.)	Differential pressure p_1-p_3 (min.-max.)
10	30- 210	0.2 bar-4 bar (20 kPa-400 kPa)
10	90- 450	
15	30- 210	
15	90- 450	
15	150-1050	
20	150-1050	0.15 bar-4 bar (15 kPa-400 kPa)
20	180-1300	
25	300-2000	
32	600-3600	

Data for actuator connection:

Connection thread:	M 30 x 1.5
Piston stroke:	2.8 mm (DN 10/15/20: 30-1050 l/h) 3.5 mm (DN 20: 180-1300 l/h) 4 mm (DN 25 und DN 32)
Closing dimension:	11.8 mm
Closing pressure (actuator):	90 - 150 N

Materials:

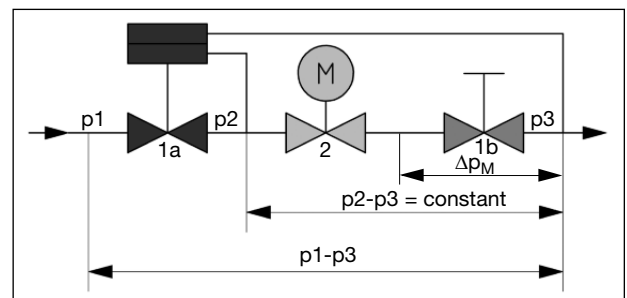
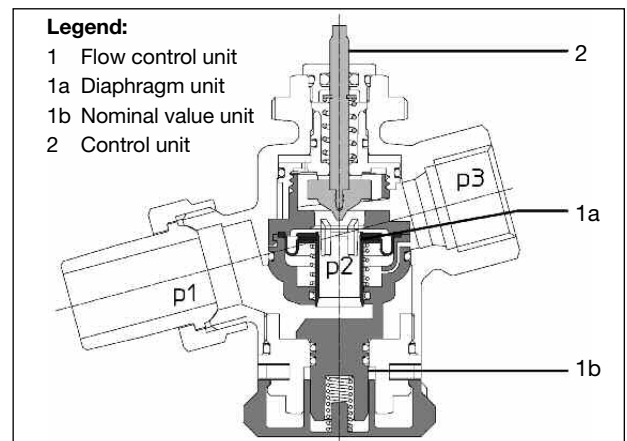
Body made of dezincification resistant brass, seals made of EPDM or PTFE, valve stem made of stainless steel.

Function:

The required flow rate is set at the handwheel (see page 3 at the bottom). The nominal setting can be secured by engaging the handwheel and by inserting the locking ring which is lead sealable. During low demand periods, regulation can be carried out with the help of an actuator or a temperature controller which can be screwed onto the valve.



“Cocon QTZ”



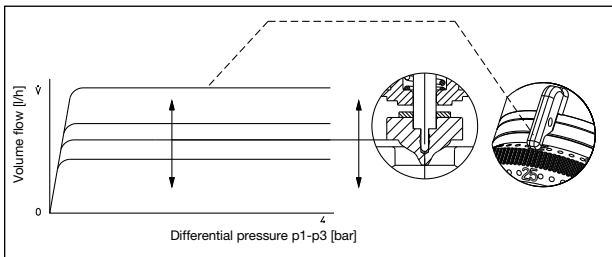
The illustrated section of the pressure independent control valve “Cocon QTZ” shows three pressure ranges:

“p1” is the inlet pressure and “p3” the outlet pressure of the valve. “p2” is the pressure actuating the integrated diaphragm unit (pos. 1 a) which maintains the differential pressure “p2” – “p3” at a constant level via the regulating unit (pos. 2) which is activated through the actuator and via the nominal value unit (pos. 1 b) which can be set to a maximum flow rate.

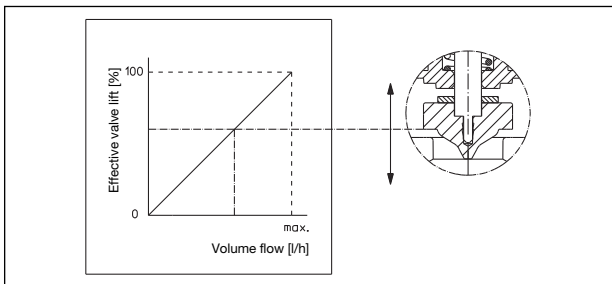
Even where high differential pressure variations “p1” – “p3” occur, e.g. if sections of the system are activated or inactivated, the differential pressure “p2” – “p3” is kept at a constant level. This way the valve authorities of 100% are maintained ($a = 1$). Even during low demand periods with steady control (e.g. in combination with 0-10 V actuators), the valve authority of the “Cocon QTZ” valve within the effective valve lift amounts to 100% ($a = 1$).

Advantages:

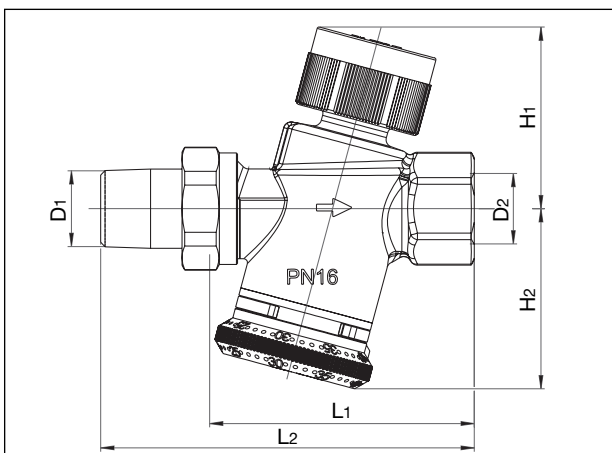
- constant, high valve authority
- small dimensions
- presetting of the nominal values even with mounted actuator
- optical display of the set nominal value even with mounted actuator
- excellent optical display of the presetting in any installation position
- nominal values can be read off in l/h without conversion
- presetting is secured by engaging the handwheel
- presetting can be locked and lead sealed with the help of the locking ring
- installation can be optimised by measuring the regulating pressure
- almost linear characteristic line if actuator driven
- high valve lift, even with small presetting values
- soft sealing valve disc



The maximum flow volume (\dot{V}) within the control range is set with the help of the handwheel. During low demand periods, room temperature control may for instance be carried out with the help of actuators and room thermostats.

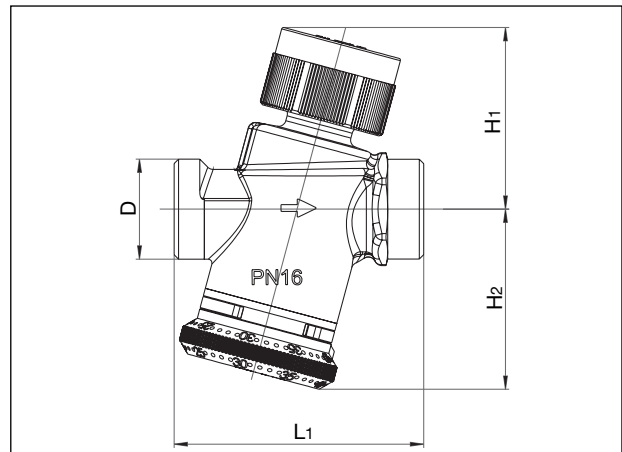


The pressure independent control valve “Cocon QTZ” has an almost linear characteristic line within the effective valve lift. This is advantageous when using actuators (electrothermal or electromotive) which also have a linear stroke behaviour across the control voltage. In general, the valve can also be combined with a temperature controller.



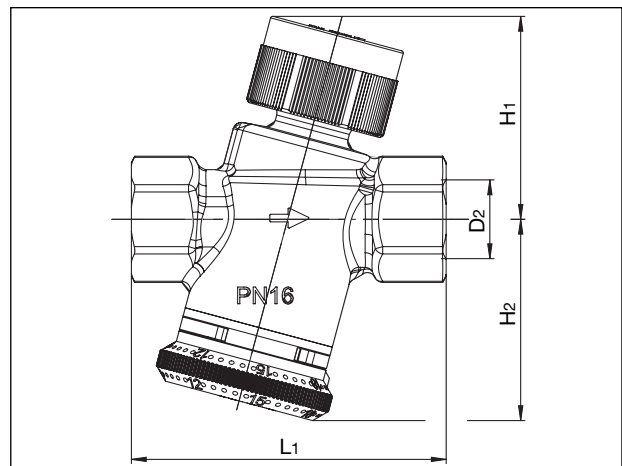
DN	L1	L2	H1	H2	D1	D2
15	70	98.5	52	48	R ½	Rp ½
20 (150-1050 l/h)	74	106	52	48	R ¾	Rp ¾
20 (180-1300 l/h)	85.5	117.5	58	54.5	R ¾	Rp ¾
25	118	154	66	79	R 1	Rp 1
32	124	165	66	79	R 1¼	Rp 1¼

Dimensions



DN	L1	H1	H2	D
10	60	54	46	G ½
15	66	52	48	G ¾
20 (150-1050 l/h)	74	52	48	G 1
20 (180-1300 l/h)	84	58	54.5	G 1
25	118	66	79	G 1¼
32	124	66	79	G 1¾

Dimensions



DN	L1	H1	H2	D
15	74.5	52	48	Rp ½
20 (150-1050 l/h)	78	52	48	Rp ¾
20 (180-1300 l/h)	89	58	54.5	Rp ¾
25	122	66	79	Rp 1
32	130	66	79	Rp 1¼

Dimensions

Actuators:

The pressure independent control valves “Cocon QTZ” can be used with the following Oventrop actuators (M 30 x 1.5):

Actuator	Voltage	Regulation behaviour		
		2 point	3 point	Proportional
Electro-thermal	24V	101 28 16/26*		101 29 51 (0-10V)*
		101 29 16/26		
Electro-motive	230V	101 28 15/25/17*		
		101 29 15/25		
	24V		101 27 08	101 27 00/05 (0-10V)
	230V	101 27 10		
Electro-motive	EIB			115 60 65/66*
	LON			115 70 65*

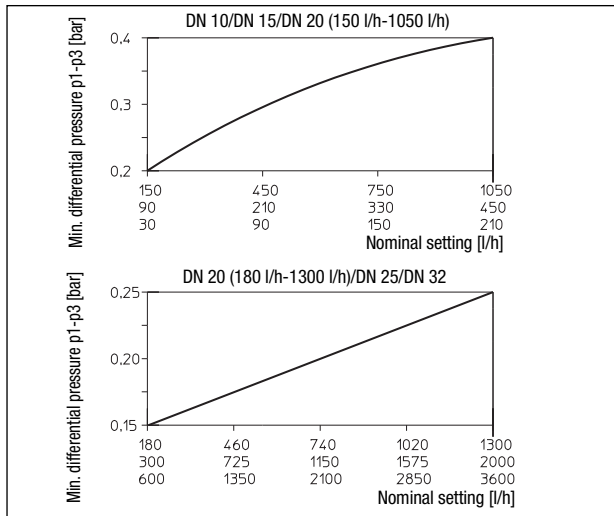
* Actuators with piston strokes smaller than 4 mm. Due to the smaller piston strokes, the maximum possible flow rates will not be reached when combining these actuators with valves sized DN 25 and DN 32.

Item no. 101 27 03: After modification of the presetting, the actuator has to be disconnected from the power for a short time. The “Cocon QTZ” valves can also be used with Oventrop thermostats and Oventrop temperature controllers.

Minimum differential pressure $p_1 - p_3$ for the valve design:

The minimum required differential pressure $p_1 - p_3$ across the valve can be obtained for the chart below:
Explanation of chart:

As for the valves with integrated flow control, the required minimum differential pressure changes depending on the nominal setting. The mathematical interrelationship is considered in the chart.

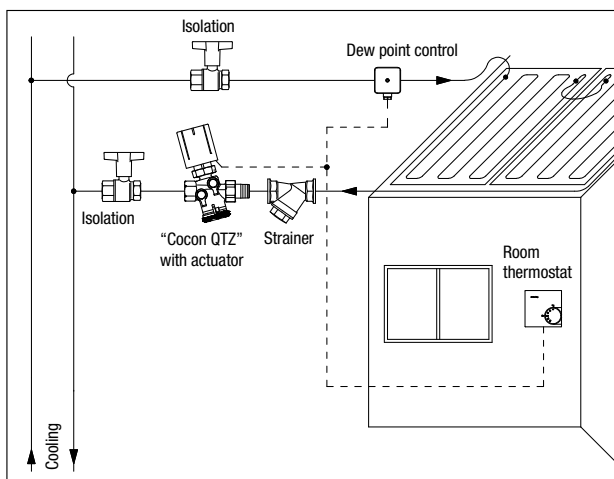


Installation:

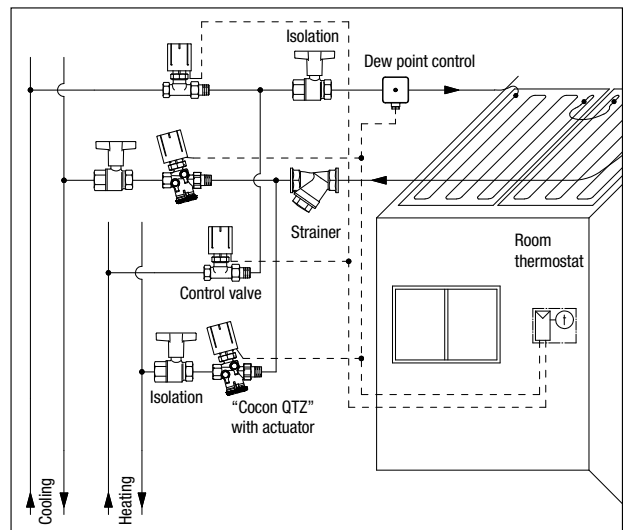
- The direction of flow must conform to the arrow on the valve body.
- The valve may be installed in any position (electric actuators, except for the actuators 101 29 15, 101 29 25, 101 29 16 and 101 29 26, may not be installed vertically downwards).
- Do not use any lubricant or oil when installing the valve as these may destroy the valve seals. All dirt particles and lubricant or oil residues must be removed from the pipework by flushing the latter.
- Any tension applied on the valve by the pipework must be avoided.
- When choosing the operating fluid, the latest technical development must be considered (e.g. VDI 2035).
- Isolating valves for maintenance are to be installed in front of and behind the valve.
- A strainer has to be installed in the supply pipe if the operating fluid is contaminated (see VDI 2035).
- The correction factors of the manufacturers of the antifreeze liquids have to be considered when setting the flow rate.
- Once installation is completed, check all installation points for leaks.

Pipe connection:

- Use suitable compression fittings “Ofix”, tailpipe connection sets or inserts (when using flat sealing tailpipes) of the Oventrop product range.



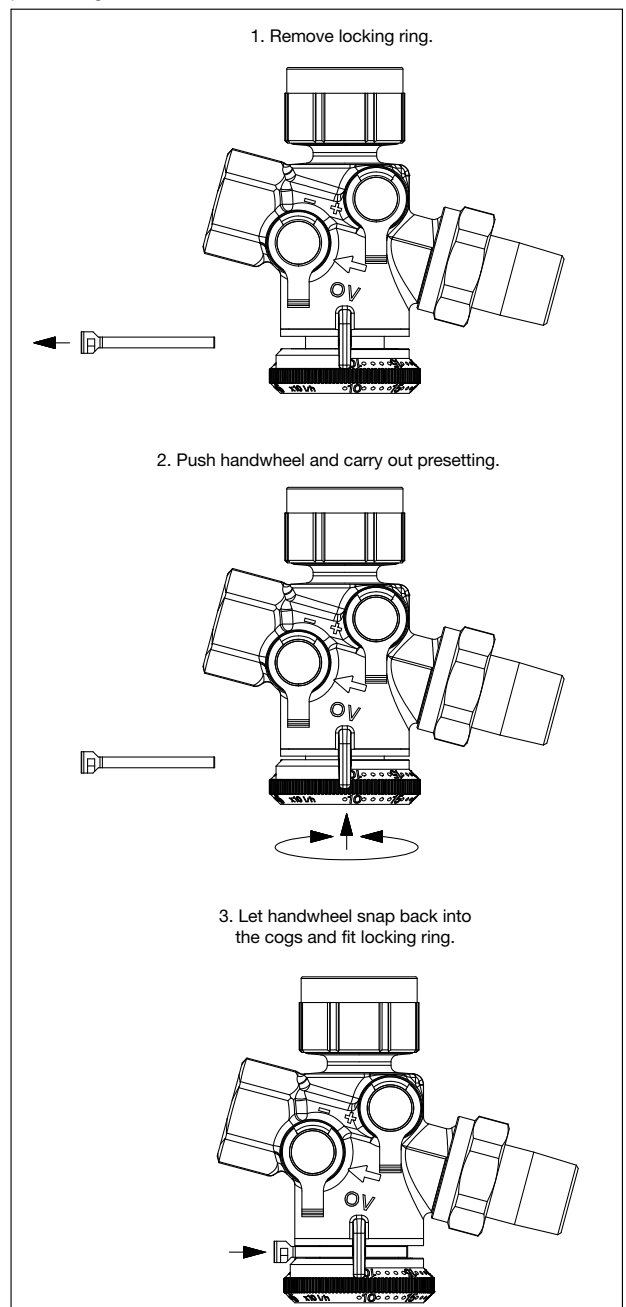
System illustration: Two pipe system



System illustration: Four pipe system

Setting of the flow rate:

The maximum flow rate can be set with the help of the protected presetting at the handwheel.



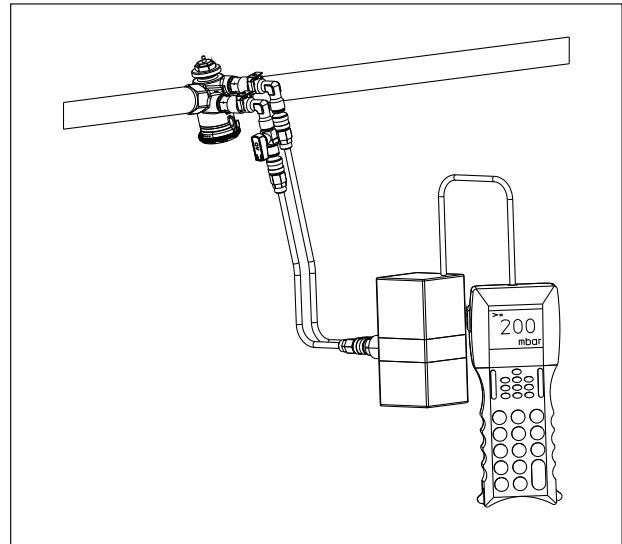
Pressure test points:

The flow meter “OV-DMC 2” can be connected to the pressure test points (model “Cocon QTZ” with pressure test points). This will confirm if the valve is working within the control range. The pump setting can be optimised by measuring the differential pressure.

For this purpose, the pump head is reduced until the hydraulically underprivileged valves are just working within the control range.

As the measured differential pressure is not equal to the minimum differential pressure ($p_1 - p_3$) for the valve design, the following charts must be used.

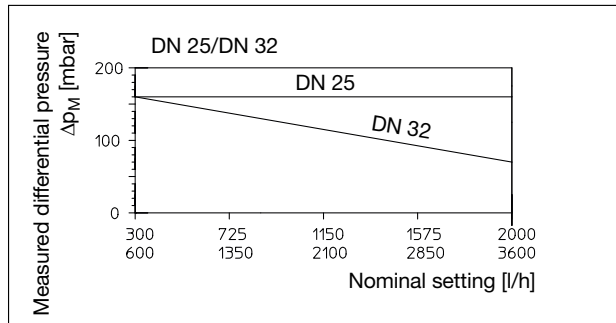
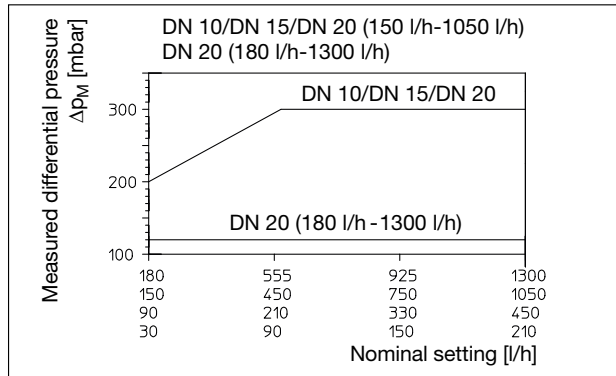
With a flow meter connected (e.g. “OV-DMC 2”), the differential pressure is measured across the flow unit. To do so, the pressure independent control valve must be fully opened (unscrew protection cap or set actuator to open position). As soon as the measured differential pressure is equal or higher than the differential pressure Δp_M indicated in the chart, the valve works within the control range.



Pressure test points

Maintenance:

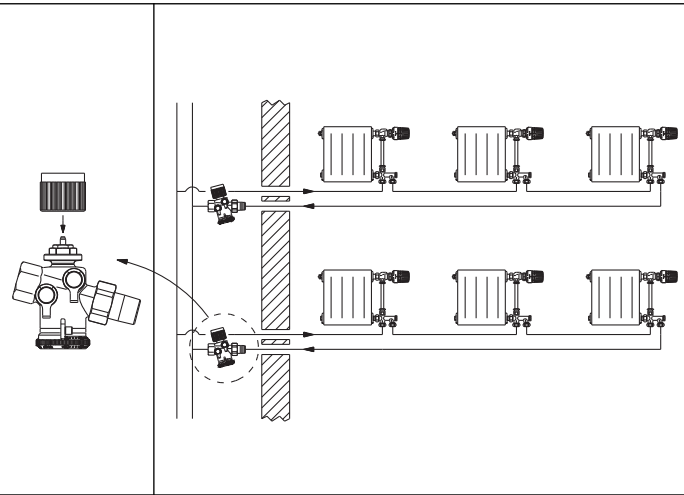
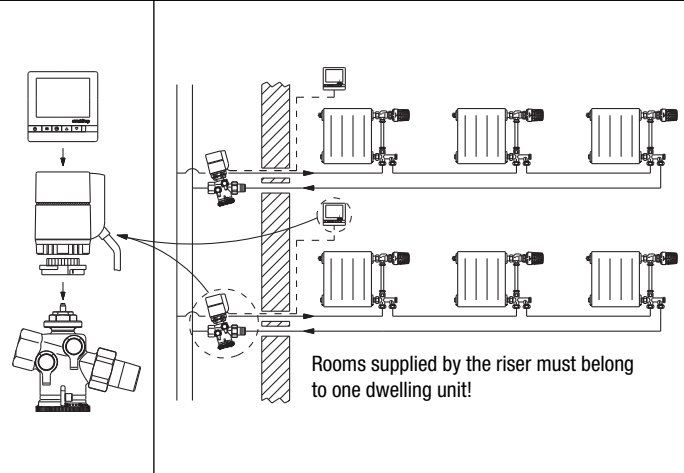
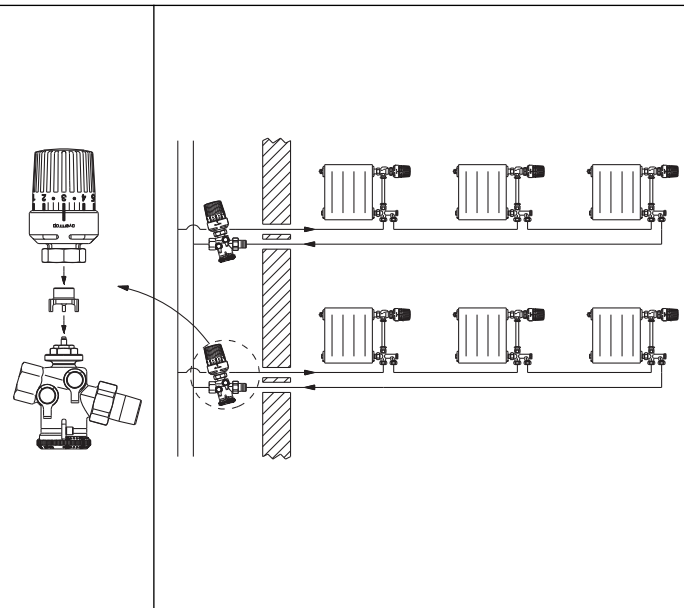
The valve has to be serviced if malfunctions occur.
The gland is replaceable under working conditions.



DN	Control range [l/h]	kvs-value	Item no.				
			without pressure test points			with pressure test points measuring technique “classic”	
			male/male	female/coupling	female/female	male/male	female/coupling
10	30-210	0.5	114 55 63	-	-	114 60 63	-
10	90-450	1.1	114 56 63	-	-	114 61 63	-
15	30-210	0.5	115 55 64	114 55 04	114 75 04	114 60 64	114 60 04
15	90-450	1.1	114 56 64	114 56 04	114 76 04	114 61 64	114 61 04
15	150-1050	1.8	114 57 64	114 57 04	114 77 04	114 62 64	114 62 04
20	150-1050	1.8	114 55 66	114 55 06	114 75 06	114 60 66	114 60 06
20	180-1300	2.5	114 56 66	114 56 06	114 76 06	114 61 66	114 61 06
25	300-2000	4	114 56 68	114 56 08	114 76 08	114 61 68	114 61 08
32	600-3600	7.2	114 56 70	114 56 10	114 76 10	114 61 70	114 61 10

Models

One pipe heating system:

Configuration level of the one pipe heating system		Advantages
1. Constant volume flows for each riser	<p>1a Hydronic balancing of the one pipe heating system</p> <p>Cap 114 60 91</p> <p>+</p> <p>“Cocon QTZ” DN 10-DN 32</p> 	<ul style="list-style-type: none"> - Hydronic balancing by constant volume flows in the one pipe heating risers - The risers do not influence each other - No undersupply
	<p>1b Hydronic balancing + temperature setback of the dwelling unit</p> <p>Digital room thermostat 115 25 61/ 115 25 62</p> <p>+</p> <p>Actuator 101 29 15/ 101 29 16</p> <p>+</p> <p>“Cocon QTZ” DN 10-DN 32</p>  <p style="text-align: center;">Rooms supplied by the riser must belong to one dwelling unit!</p>	<ul style="list-style-type: none"> - Hydronic balancing by constant volume flows in the one pipe heating risers - The risers do not influence each other - No undersupply <p style="text-align: center;">+</p> <ul style="list-style-type: none"> - Additional energy savings by reduction of the volume flow and reduction of the heat loss during low demand periods, e.g. night setback - Daily and weekly setback periods programmable via a digital room thermostat
2. Variable volume flows for each riser by limitation of return temperature	<p>2 Hydronic balancing + limitation of return temperature + minimum flow rate</p> <p>“Uni RTLH” 114 90 68</p> <p>+</p> <p>Distance piece 114 90 90</p> <p>+</p> <p>“Cocon QTZ” DN 10-DN 32</p> 	<ul style="list-style-type: none"> - Hydronic balancing by constant volume flows in the one pipe heating risers - The risers do not influence each other - No undersupply <p style="text-align: center;">+</p> <ul style="list-style-type: none"> - Energy savings by limitation of the return temperature - Room temperature control is improved by the reduction of the volume flow during low demand periods as overheating is avoided - Quick reactivation after reduction to a minimum volume flow which is guaranteed by the distance piece - Low return temperatures (important for gross calorific appliances and district heating systems)

To be observed: The “Cocon QTZ” valves should not be installed in rooms which are sensitive to noise.

Insulation shells DN 15 – DN 32

Tender specification:

The insulation shells have a CFC-free inner core made of polyurethane rigid foam with a 1.5 mm plastic coat. They consist of two double shells which are tightened by two metal straps.

For heating and cooling systems.

Building material class B2 according to DIN 4102.

Operating temperature t_s : -20°C up to +130°C

Sizes:

DN 15 – DN 20

DN 20, model 180 – 1300 l/h

DN 25 – DN 32

Item no.:

114 91 04

114 91 06

114 91 08

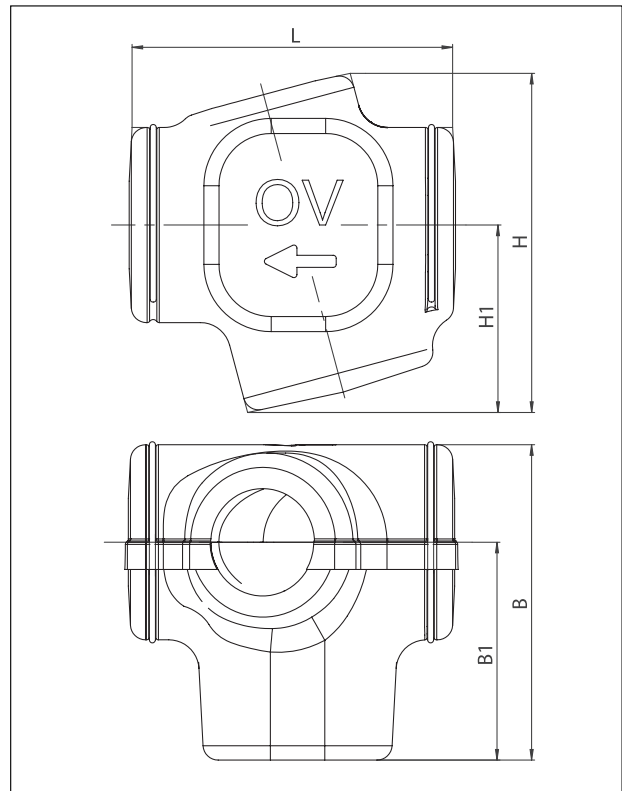
Accessories:

Adapter with stem for “Cocon QTZ”

114 91 90

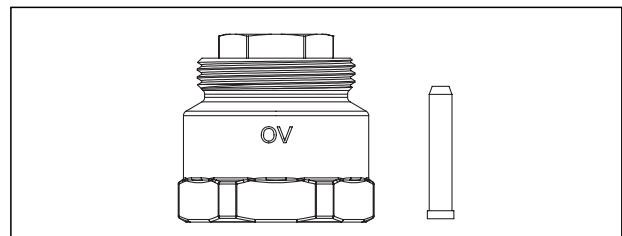
Extension = 25 mm

Is required if the “Cocon QTZ” valves shall be equipped with insulation shells and actuators.



DN	L	H	H1	B	B1	Item no.:
15/20	106	112	62	105	72	114 91 04
20*	116	125	69	120	82	114 91 06
25/32	166	169	101	154	97	119 91 08

Dimensions – *Model: 180 – 1300 l/h



Adapter with stem