



RBQ15..32, RBQ40..50 (Cocon QTR DN40..50) and RBQ65..200 (Cocon QFC DN65..200) combo valve

Application

The 2-way combo valves are valve combinations with automatic differential pressure-independent flow rate control (hydraulic balancing).

The combo valve is used for precise volume flow control in air conditioning, cooling and heating systems, e.g. central heating systems, floor heating systems, fan coil systems, cooling ceilings and fan convectors.



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Important Information on Product Safety

Safety instructions

This document contains information on installing and commissioning the product “RBQ15..200”. Each person who carries out work on this product must have read and understood this document. If you have any questions that are not resolved by this document, you can obtain further information from the supplier or manufacturer.

If the product is not used in accordance with this document, the protection provided could be impaired.

The applicable regulations must be observed when installing and using the devices. Within the EU, these include regulations regarding occupational safety and accident prevention as well as those from the VDE (German Association for Electrical, Electronic & Information Technologies). If the device is used outside of the EU, it is the responsibility of the plant engineer or operator to comply with local regulations.

Mounting, installation and commissioning work on the devices may only be carried out by qualified technicians. Qualified technicians are persons who are familiar with the described product and who can assess given tasks and recognize possible dangers based on their technical training, knowledge and experience, as well as their knowledge of the applicable regulations.

Symbol meanings



WARNING

Indicates a hazard of medium risk which can result in death or serious bodily injury if not avoided.



CAUTION

Indicates a hazard of low risk which can result in minor or medium bodily injury if not avoided.



CAUTION

Indicates a hazard which can result in material damage or malfunctions if not avoided.



NOTE

Indicates additional information that can simplify working with the product.



NOTES ON DISPOSAL

In accordance with the applicable laws and directives of the European Union countries, the product should not be disposed of with household waste. This ensures environmental protection and sustainable recycling or raw materials.

Private users should contact their local retailer or their local authority for information regarding environmentally safe recycling of old appliances. The local and currently valid legislation must be observed.

Commercial users should contact their supplier and observe the conditions of the purchase agreement. This device may not be disposed of together with other commercial waste.

Types

Type	DN	PN	Volume flow range [l/h] min*..max	Kvs	Control range [kPa]	Connection	Weight [kg]
RBQ15/0,5	15	16	30..210	0.5	20..400	G 3/4; Rp 1/2	0.5
RBQ15/1,1	15	16	90..450	1.1	20..400	G 3/4; Rp 1/2	0.5
RBQ15/1,8	15	16	150..1050	1.8	20..400	G 3/4; Rp 1/2	0.5
RBQ20/1,8	20	16	150..1050	1.8	20..400	G 1; Rp 3/4	0.6
RBQ20/2,5	20	16	180..1300	2.5	15..400	G 1; Rp 3/4	0.6
RBQ25/4,0	25	16	300..2000	4.0	15..400	G 1 1/4; Rp 1	1.3
RBQ32/6,0	32	16	600..3600	6.0	15..400	G 1 3/4; Rp 1/4	2.4
RBQ40 (QTR DN40 1146172)	40	16	1500..7500	11.5	20..400	G 1 3/4	10.0
RBQ50 (QTR DN50 1146174)	50	16	2500..10000	15.0	20..400	G 2 3/8	13.0
RBQ65 (QFC DN65 1146151)	65	16	5000..20000	36.0	20..400	Flansch DN65	27.0
RBQ80 (QFC DN80 1146152)	80	16	7500..30000	56.0	20..400	Flansch DN80	32.0
RBQ100 (QFC DN100 1146153)	100	16	12500..50000	80.0	20..400	Flansch DN100	45.0
RBQ125 (QFC DN125 1146154)	125	16	27000..108000	150.0	20..400	Flansch DN125	72.0
RBQ150 (QFC DN150 1146155)	150	16	36000..150000	220.0	20..400	Flansch DN150	85.0
RBQ200 (QFC DN200 1146156)	200	16	55000..190000	270.0	20..400	Flansch DN200	150.0

* Recommended minimum setting value; using a suitable actuator, the flow rate can be reduced from the setting value down to zero.

Technical Data

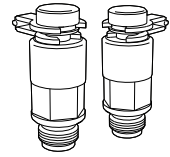
Operating temperature	RBQ15..32: -10..+120 °C RBQ40..50 (QTR40..50): -10..+120 °C RBQ65..200 (QFC65..200): -10..+120 °C
Max. operating pressure	16 bar (1600 kPa)
Max. differential pressure	4 bar (400 kPa)
Leak rate	0.01% of kvs
Positioning stroke	DN15, DN20 (150..1050 l/h): 2.8 mm DN20 (180..1300 l/h): 3.5 mm DN25, DN32: 4 mm DN40, DN50: 10 mm DN65..DN100: 20 mm DN125: 36 mm DN150, DN200: 40 mm
Medium	Water or water-propylene glycol mixtures and water-ethylene glycol mixtures (max. 50%, pH value 6.5 to 10)
Housing	DN15..DN32: dezincification-resistant brass DN40, DN50: gunmetal, female thread on both sides DN65..DN200: gray cast iron
Seals	Made of EPDM or PTFE



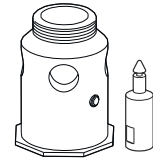
Product Description RBQ15..200

Accessories (not included in delivery)

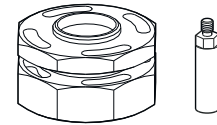
- Z221** Measuring
from DN40..200 included in delivery
Further information in the installation note, data sheet 3.10-20.010-99.



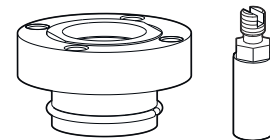
- Z223** Adapter for RBQ40 (QTR DN40) and RBQ50 (QTR DN50) with actuator MD50-BUS, MD50(-E)(-R), MD50/230 or MF50-R.
Further information can be found in the mounting instructions for Z223 and in the product descriptions of the actuators.



- Z224-2** Adapter for RBQ65..100 (QFC DN65..100) with actuator MD100(-E), MD100-RE(-E), MD100/230(-E), MF100, MD100-BUS-xx and MF100-BUS-xx.
Further information can be found in the mounting instructions for Z224-2 and in the product descriptions of the actuators.

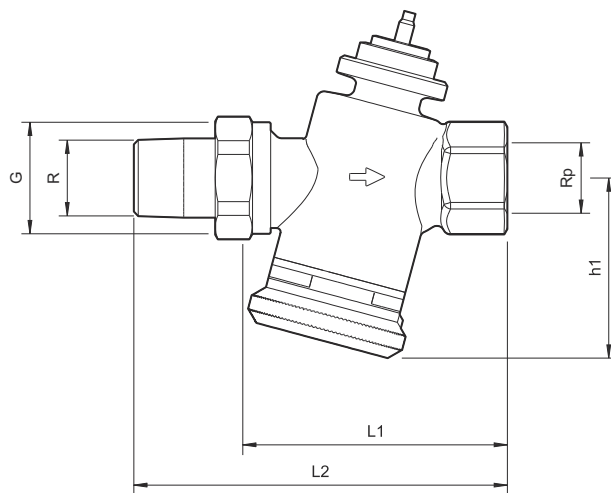


- Z226** Adapter for RBQ125..200 (QFC DN125..200) with actuator MD250(-E), MD250/230(-E), MF250, MD250-BUS-xx and MF250-BUS-xx
Further information can be found in the mounting instructions for Z226 and in the product descriptions of the actuators.



Dimensions

- RBQ15..32 threaded connection M30x15



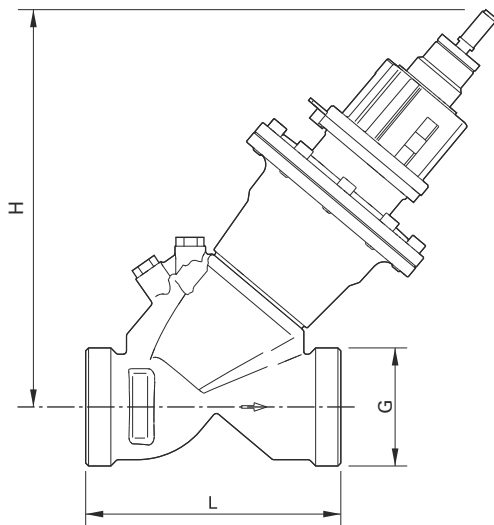


DN	L1 [mm]	L2 [mm]	h1 [mm]	G	R [Inch]	Rp [Inch]	Δp [bar]
15	70	98.5	48	G 3/4	R 1/2	Rp 1/2	0.2 to 4
20 (150 to 1050 l/h)	74	106	48	G 1	R 3/4	Rp 3/4	0.2 to 4
20 (180 to 1300 l/h)	85.5	117.5	54.5	G 1	R 3/4	Rp 3/4	0.15 to 4
25	118	154	79	G 1 1/4	R 1	Rp 1	0.15 to 4
32	124	165	79	G 1 3/4	R 1 1/4	Rp 1 1/4	0.15 to 4



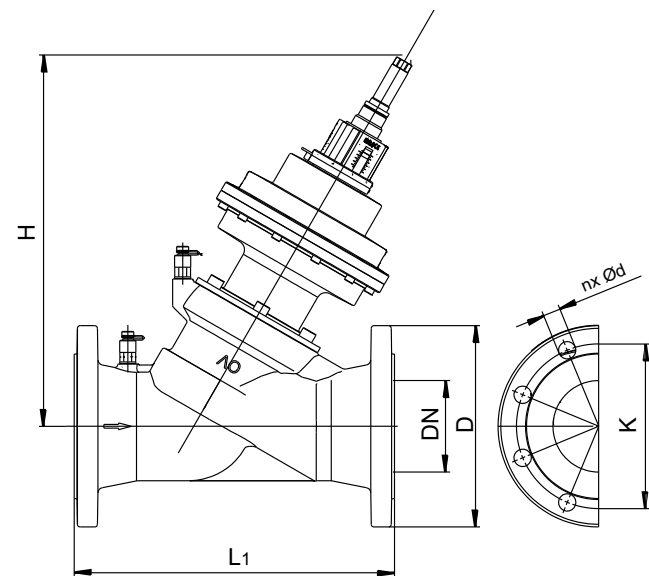
Product Description
RBQ15..200

- RBQ40..50 (QTR DN40..50)



DN	L [mm]	H [mm]	G [Inch]	Δp [bar]
40	120	245	G 1 3/4	0,2..4
50	120	255	G 2 3/8	0,2..4

- RBQ65..200 (QFC DN65..200)

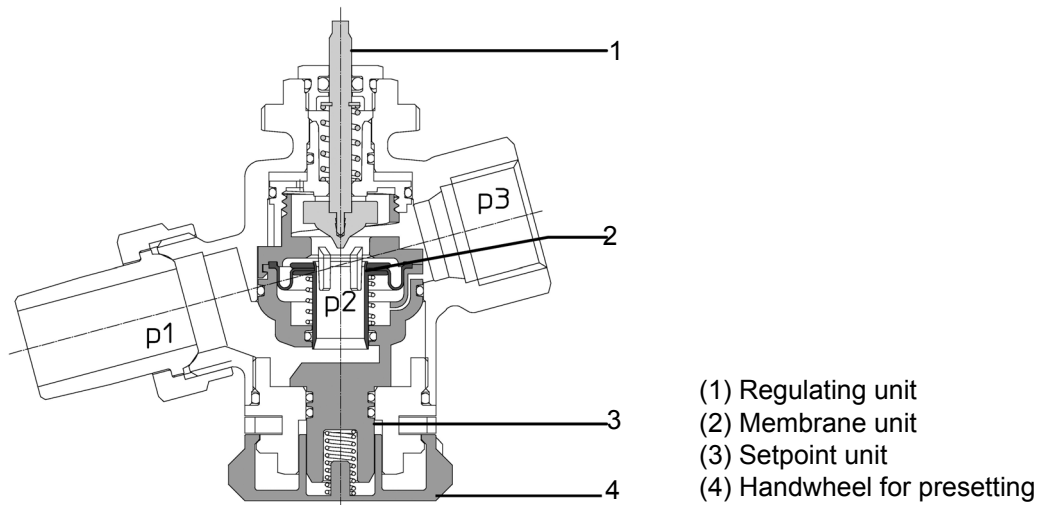


DN	L1 [mm]	H [mm]	D [mm]	K [mm]	n x Ød
65	290	370	185	145	4 x 19
80	310	385	200	160	8 x 19
100	350	405	220	180	8 x 19
125	400	520	250	210	8 x 19
150	480	520	285	240	8 x 23
200	600	565	340	295	12 x 23

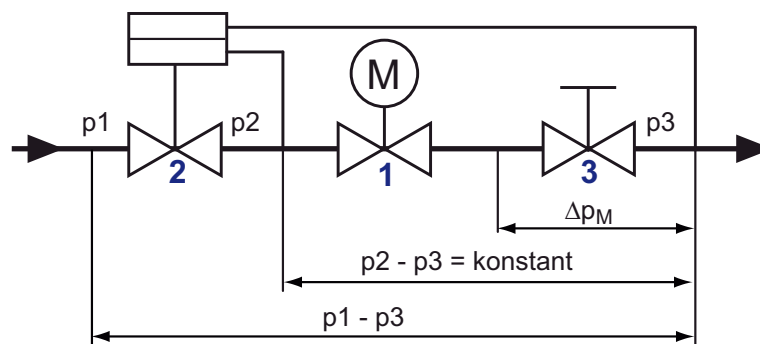


Function of two-way combo valves RBQ15..32

Valve cross-section RBQ15.32



Hydraulic diagram for the combo valve



The cross-section of the RBQ15..32 2-way combo valve shows three pressure ranges p1 to p3. The input pressure p1, the working pressure p2 in the membrane unit and the output pressure p3 on the fixture.

The differential pressure p2 - p3 is kept constant by the membrane unit (2) integrated in the RBQ combo valve, by the actuator-controlled regulating unit (1) and the setpoint unit (3) that can be set to a maximum flow value rate.

The maximum flow rate value is preset using the handwheel (4).

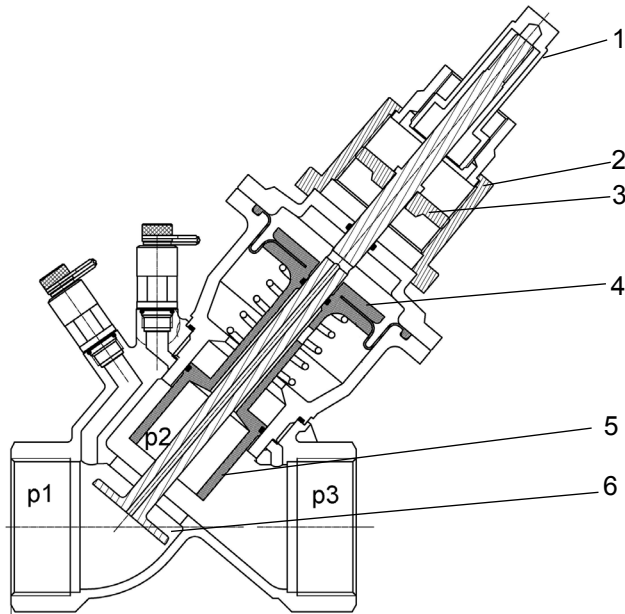
The combo valve keeps the differential pressure at a constant level even in the event of intense pressure fluctuations in the system.

Even in the partial load range, the valve authority is 100% within the effective valve stroke.



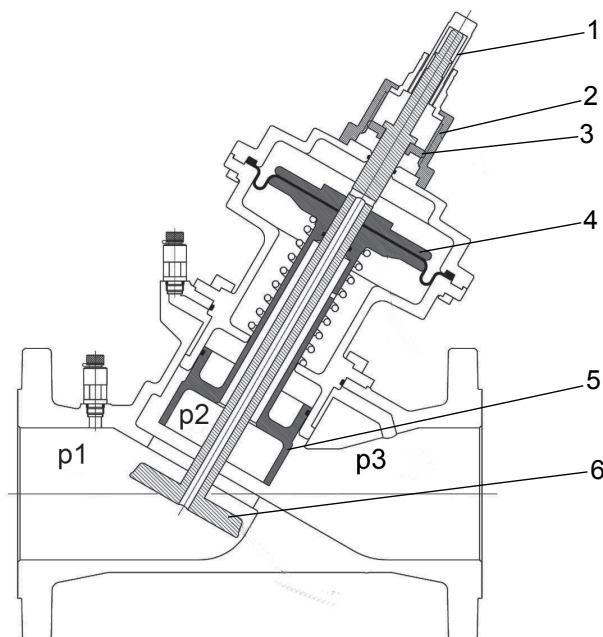
Function of two-way combo valves RBQ40..50 (QTR DN40..50) and RBQ65..200 (QFC DN65..200)

Valve cross-section RBQ40..50 (QTR DN40..50)



- (1) Adjustment sleeve
- (2) Handwheel for presetting
- (3) Setpoint unit
- (4) Membrane unit
- (5) Control sleeve
- (6) Regulating unit

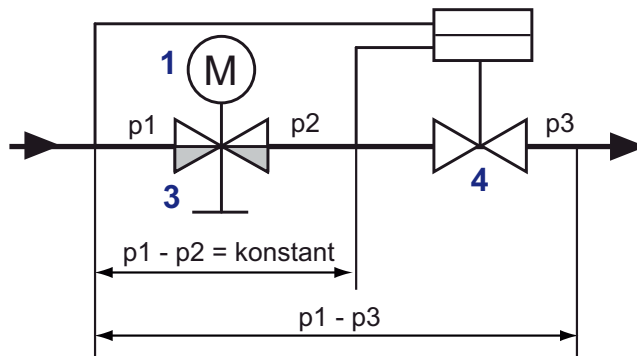
Valve cross-section RBQ65..200 (QFC DN65..200)



- (1) Adjustment sleeve
- (2) Handwheel for presetting
- (3) Setpoint unit
- (4) Membrane unit
- (5) Control sleeve
- (6) Regulating unit



Hydraulic diagram for the combo valve



The cross-section of the RBQ40..50 (QTR DN40..50) and RBQ65..200(QFC DN65..200) 2-way combo valve shows three pressure ranges p_1 to p_3 .

The input pressure p_1 , the working pressure p_2 in the membrane unit and the output pressure p_3 on the fixture.

The combo valve keeps the differential pressure $p_1 - p_2$ at a constant value using the integrated membrane unit (4), the actuator-controlled regulating unit (1) and the setpoint unit (3).

The maximum flow rate value is set on the setpoint unit (3) using the setting wheel (2).

The combo valve keeps the differential pressure at a constant level even in the event of intense pressure fluctuations in the system.

Even in the partial load range, the valve authority is 100% within the effective valve stroke.



Differential pressure p1 - p3 for the valve design

Minimum required differential pressure p1 - p3 for valve configuration:

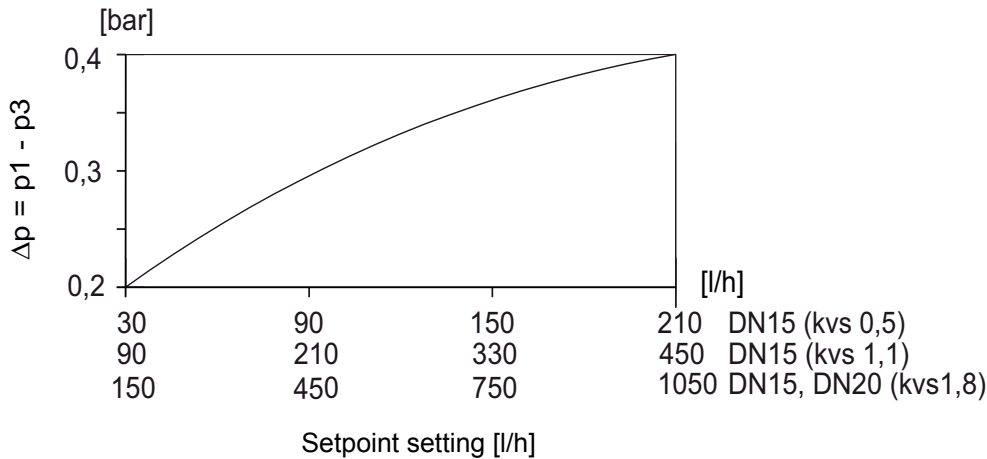
Refer to the following diagrams for the minimum required differential pressure p1 - p3 above the valve.

Explanation of the diagrams:

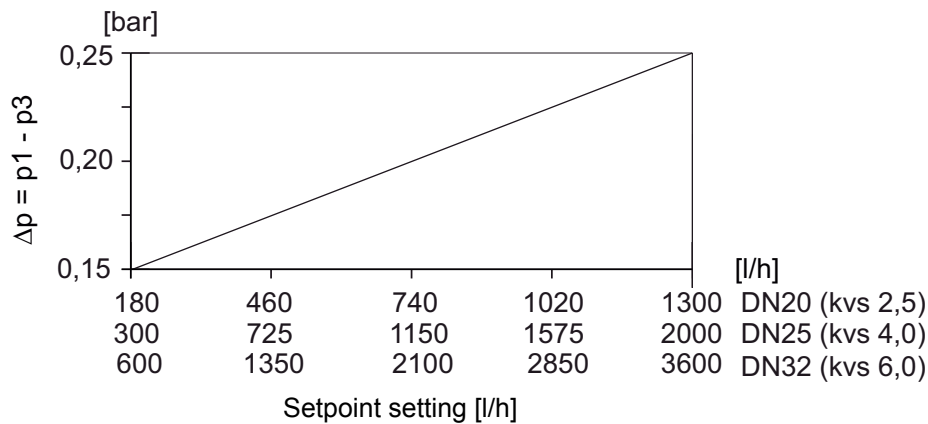
For valves with integrated flow rate control, the minimum differential changes depending on the setpoint setting. The applicable mathematical relationship has been taken into consideration in the diagrams.

The desired flow rate can be set using the handwheel and with the aid of the adjustment sleeve.

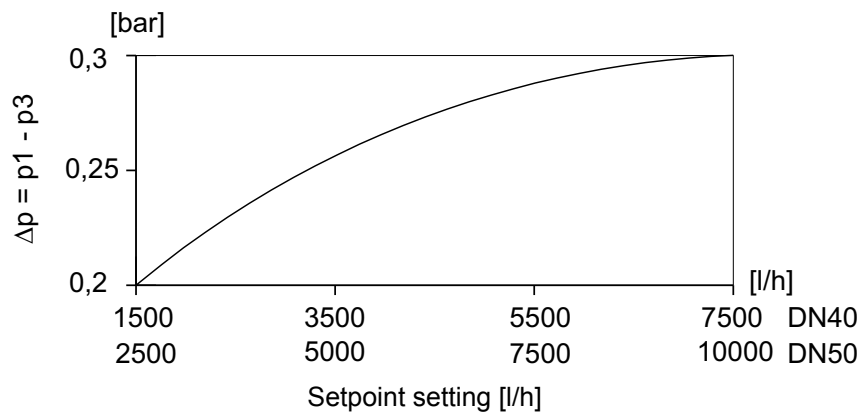
-RBQ15/0.5..20/1.8



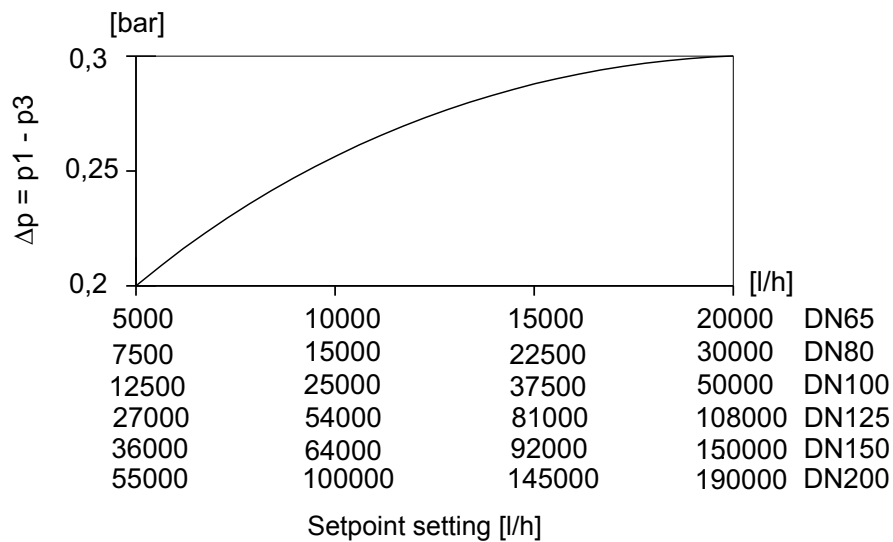
- RBQ20/2.5..32/6.0



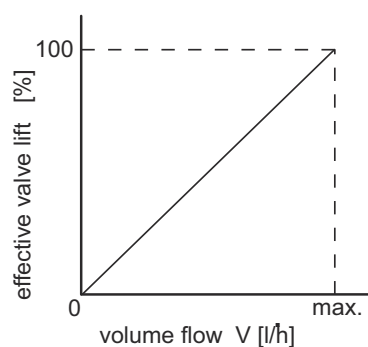
- RBQ40..50 (QTR40..50)



- RBQ65..200 (QFC DN65..200)



Characteristic curve

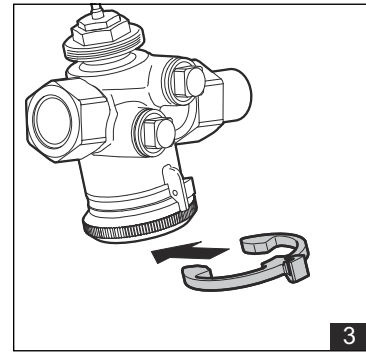
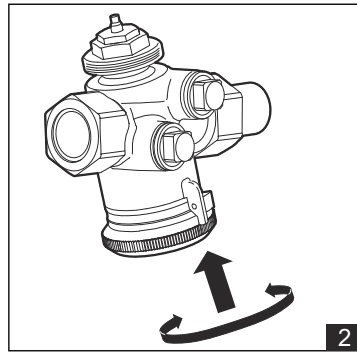
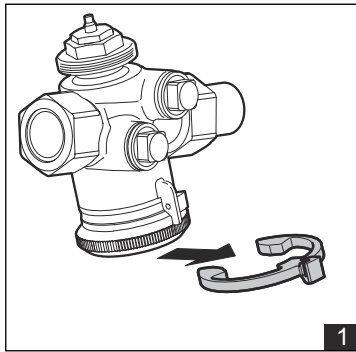


The combo valves have an approximately linear characteristic curve within the effective valve stroke.



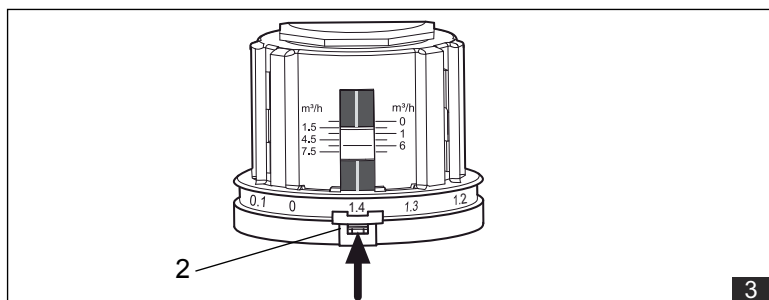
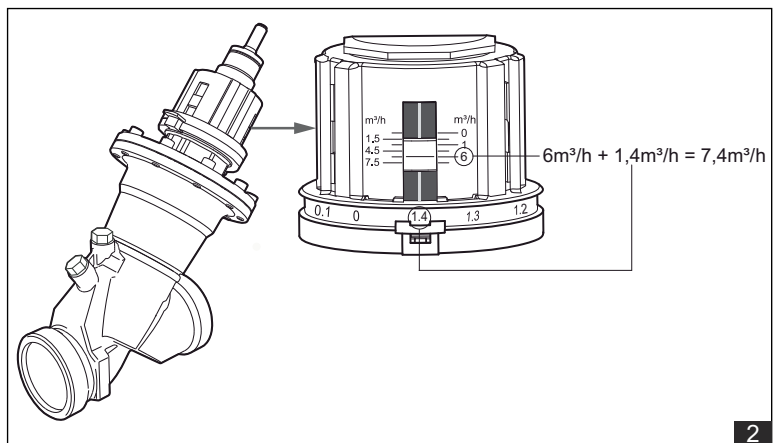
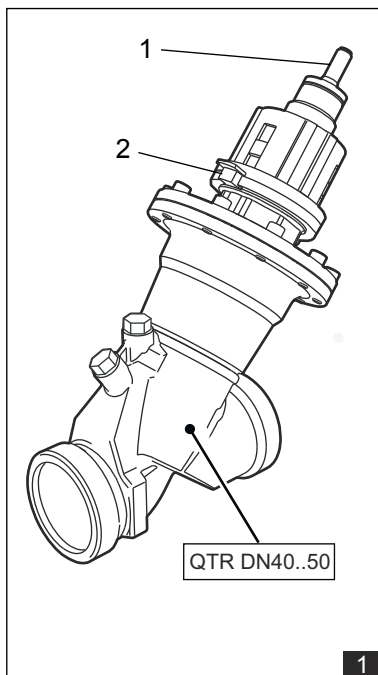
Setting the maximum volume flow rate

- RBQ15..32



- ▶ Remove the blocking ring.
- ▶ Set the setpoint of the maximum volume flow to the desired value by turning the handwheel.
- ▶ Reinsert the blocking ring.

- RBQ40..50 (QTR DN40..50) and RBQ65..200 (QFC DN65..200)



- ▶ Before the setting value can be changed, the adjustment sleeve (1) must be removed.
- ▶ Push the locking clip (2) down.
- ▶ Adjust the setpoint of the maximum volume flow rate to the desired value by turning the handwheel.
- ▶ Return the locking clip (2) to the locking position (push upward) and secure the adjustment sleeve (1) if the valve is used without an actuator.

Otherwise, follow the installation steps in the mounting instructions for Z224-2 doc. no. 3.10-20.025-99 or Z226 doc. no. 3.10-20.030-99 (included with accessories Z224-2 or Z226).



Mounting



CAUTION

Installation and commissioning work may only be carried out by qualified technicians.

If the valve is installed in the system, make sure that no differential pressure builds up in the valve body before beginning work. If necessary, close the gate valve and turn off pumps. After the pipeline has cooled off, the actuator can be installed.

Be sure to comply with VDE guidelines and local wiring regulations. The device is connected according to the legally binding system circuit diagram.



CAUTION

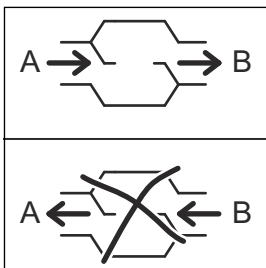
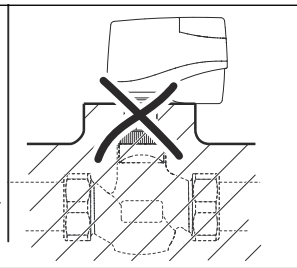
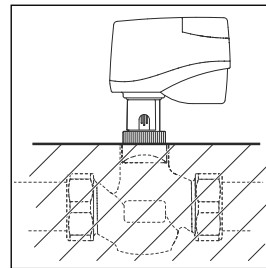
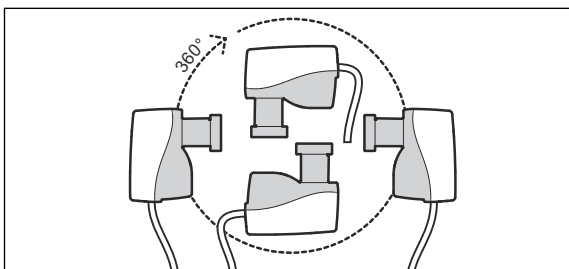
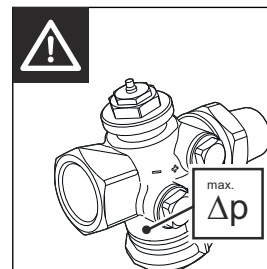
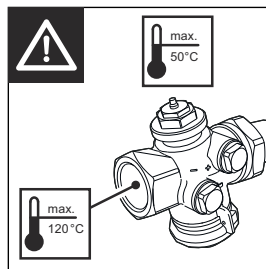
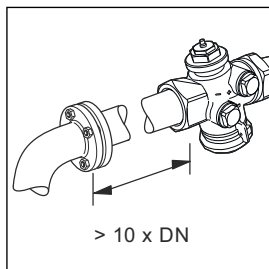
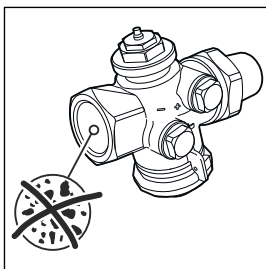
The valve may only be installed by qualified technicians. In addition to the generally valid installation guidelines, the following points are to be observed:

- Any protective caps on the valve gates should be removed before assembling the valves.
- No grease or oil may be used during assembly because these could destroy the valve seals.
- The pipeline system and the interior of the fitting must be free of foreign objects, particles of dirt, and grease and oil residues. Rinse them out if necessary.
- There must be no tension between the fixture and the pipeline connection.
- To avoid eddy formations in the valve body, the valve should be installed in a straight section of the pipe. A distance of 10 times the nominal diameter is recommended between the valve flange and manifold or other similar parts.
- The installation location is to be selected so that the ambient temperature at the actuator is kept between 0 °C and +50 °C.
- If the operating medium is contaminated, a strainer must be installed in the supply pipe. For maintenance purposes, we recommend to install shut-off valves both upstream and downstream of the valve or plant section.
- When mounting, observe the maximum permitted pressure difference Δp and the specified flow direction.
- When mounting the actuator or removing the connection cover, ensure that there is sufficient clearance above the actuator.
- Observe the direction of flow arrow on the valve body. Inverting the flow direction impairs control behavior.

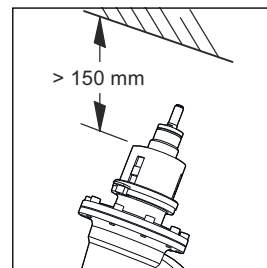
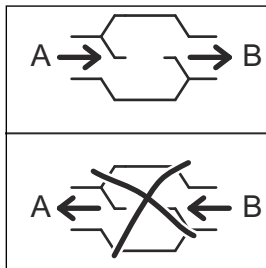
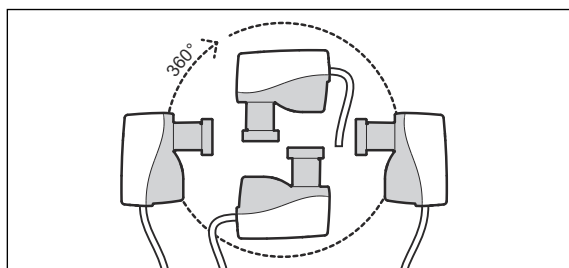
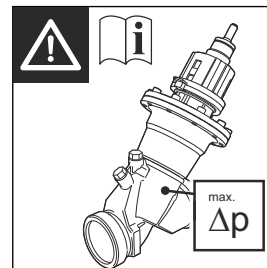
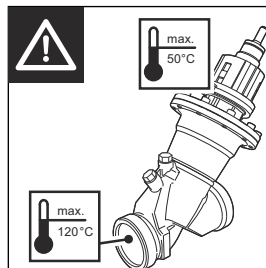
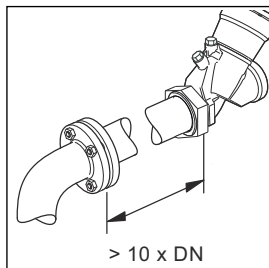
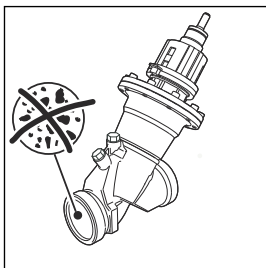


Product Description RBQ15..200

RBQ15..32

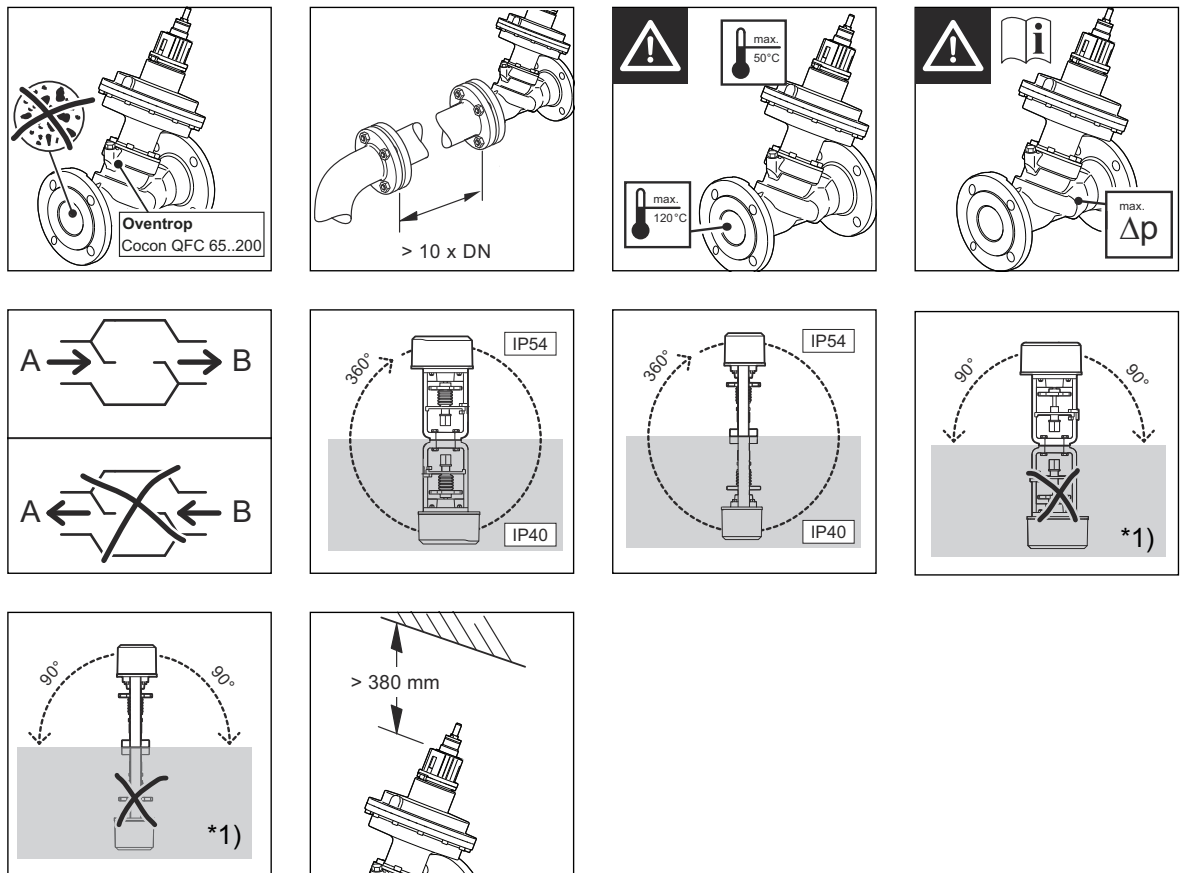


RBQ40..50 (QTR DN40..50)





RBQ65..200 (QFC DN65..200)



*1) only for actuators with 230 V AC nominal voltage or auxiliary switch module

Overview of valve actuator to be used

	MD15-Q MF15-R-Q MD15-BUS-Q MD15-BUS-N-Q	MD50-BUS MF50-R	MD50(-E)(-R) MD50/230	MD100xx MD100-BUS-xx MF100-BUS-xx MF100	MD250xx MD250-BUS-xx MF250-BUS-xx MF250
RBQ15..32	X	-	-	-	-
RBQ40 (QTR DN40) RBQ50 (QTR DN50)	-	X	X	-	-
RBQ65 (QFC DN65) RBQ80 (QFC DN80) RBQ100 (QFC DN100)	-	-	-	X	-
RBQ125 (QFC DN125) RBQ150 (QFC DN150) RBQ200 (QFC DN200)	-	-	-	-	X



NOTE

For more information when using the valves with actuators, see the product data sheet or operating instructions for the actuator MD15-Q, MF15-R-Q, MD15-BUS, MD15-BUS-N-Q, MD50xx, MF50-R, MD50-BUS, MD100xx, MD100-BUS-xx, MF100-BUS-xx, MD250xx, MD250-BUS-xx, MF250-BUS-xx, MF100 or MF250.

