



Kieback&Peter

OPERATING INSTRUCTIONS

MD100 AND MD100-E

**Actuator for valves from the
RK/RB/RF/RGD/RWG/RBQ series**

This document replaces all versions with an older release date. This version is not updated automatically. Subject to change.

The figures in this document were created with the utmost care. Nevertheless, we cannot guarantee that the delivered product will not differ from these figures.

The original operating instructions were composed in German.

Documentation in other languages has been translated from German.

Kieback&Peter is not liable for damages that result directly or indirectly from the improper use of this device.

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IMPORTANT

READ CAREFULLY BEFORE USE

RETAIN FOR LATER REFERENCE

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1 Notes on these operating instructions



NOTE

If you have any questions that cannot be clarified with these operating instructions, you can obtain further information from your Kieback&Peter contact person.

1.1 Validity of the operating instructions

This document is a part of the MD100 and MD100-E actuator for RXX valves and is valid only for these actuators and the described valves.

To make the document easier to read, the MD100 and MD100-E actuator is referred to in the text below as the “actuator.” The RXX valves are referred to in the text as the “valve.”

The scope of delivery is specific to each actuator and is in accordance with the customer requirements. The positions and figures of the components in the operating instructions may differ depending on the choice of the valve.

1.2 Display elements



NOTE

Notes provide you with important information.

You can find the following display elements in these instructions:

- List point
- ▶ Step or measure for avoiding danger

2 Safety

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2.1 Explanation of safety instructions and warnings

The basic safety information includes general instructions for the safe use of the actuator with valve or instructions to maintain its safe condition.

Action-related warnings of residual risks are indicated prior to performing dangerous actions.

Presentation and structure of warnings

The warnings are action-related and are structured as follows.



CAUTION

Type and source of danger!

Potential consequences when the danger occurs or the warning is not observed.

- ▶ Measures to avoid the danger.

Warnings are classified according to the severity of the hazard. The hazard levels and their corresponding signal words and warning symbols are described below:



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.

2.2 Basic safety instructions

Safety in the workplace depends on the attention, care and rationality of all the persons involved. To prevent damage and injury, read and follow the safety instructions below, the safety instructions in the documentation on using the components and the applicable local regulations.

Sharp edges and corners

There is a risk of skin abrasions and cutting injuries due to sharp edges and corners, such as those on cast iron bodies and the outer threads of the valves and individual parts of the actuators.

- ▶ Proceed with care.
- ▶ Wear protective gloves.

Toppling, falling and ejected parts

Severe injury and substantial damage to property due to:

- Toppling or falling valve or actuator parts
- Ejected parts in the event of impermissible pressure increases (bursting components)
- Impermissible drop in pressure (e.g. when using tensioning devices)
- ▶ Secure the protected area against access by unauthorized persons.
- ▶ Secure parts to prevent toppling and falling.
- ▶ Do not exceed the maximum valve operating pressure.

Pressurized liquids

There is a risk of severe burns and injuries caused by liquid jets due to incorrect connections.

- ▶ Do not exceed the maximum valve operating pressure.
- ▶ Check all connections before filling the system.
- ▶ Secure the protected area against access by unauthorized persons.

Hot or cold surfaces

Severe burns or hypothermia are possible if contact is made with hot or cold surfaces at valves and pipelines.

- ▶ Before starting the work, wait until the temperature of the pipelines and valves corresponds to around 5 to 35°C.

Musculoskeletal disorders

There is a risk of severe musculoskeletal disorders (e.g. back injuries) due to incorrect posture or excessive exertion (e.g. due to weight loads).

- ▶ Proceed with care.

2.3 Responsibilities of the Operator

The actuator and valve must be operated only when in a technically sound and safe condition. The operator must observe the following points:

- Ensure that the operating instructions are available to all persons who perform work on the actuator and valve.
- Ensure that all persons have read and understood the operating instructions before working on the actuator and valve.
- Ensure the required ambient conditions and clearances at the mounting location.
- Ensure that mounting, installation and commissioning are carried out only by a fitter or specialist electrician, according to the tasks. NOT DEFINED
- Inform your Kieback&Peter contact person in the event of damage to the actuator and/or valve.
- Ensure that personnel receive the personal protective equipment (PPE) stipulated in the specific country and use this equipment at all times.

2.4 Qualification of personnel

Fitter

The fitter is familiar with heating, ventilation and air conditioning systems. Based on his or her technical training and appropriate knowledge and experience, he or she is familiar with the described actuator and valve. The fitter knows the applicable regulations, can assess his or her assigned tasks and identify potential dangers.

Electrical specialist

The electrical specialist is a person who is familiar with the described actuator. Based on his or her professional training, knowledge and experience, he or she has a very good understanding of the fields of cable, wire and laying systems and a good knowledge of the areas of electrical engineering and electrical machines and actuators. The electrical specialist knows the applicable regulations, can assess work assigned to him or her and identify possible dangers.

Who is permitted to perform which tasks?

Task	Fitter	Electrical specialist
Mounting		
Assembling the valve	x	
Assembling the actuator	x	
Commissioning		
Electrical connection		x
Adapting actuator functions		x
Faults and remedial measures		
Searching for and correcting faults	x	x
Decommissioning, disassembly and disposal		
Taking the actuator out of operation		x
Disassembling the actuator	x	
Disassembling the valve	x	
Disposal	x	

2.5 Intended use

- The actuator with valve is designed to control the flow or precise mixture of liquids for heating, ventilation and air conditioning systems.
- Operate the actuator only with one of the specified valves and the original valve accessories.
- The actuator with valve is intended only for industrial and commercial use; never operate the actuator with valve in the private sphere or in households.
- Only operate the actuator with valve indoors.
- Maintain the specified ambient conditions during operation, transport and storage.
- Use a suitable operating medium.
- Only operate the actuator with valve in its original condition. Modifications to the actuator and/or valve may result in unforeseeable dangers and are thus prohibited.

3 Description

The actuators MD100 and MD100-E with a positioning force of 1000 N are used for fine stroke adjustment of two-way and three-way valves of the types:

- RK15..50/65K(-BF)
- RB15..50(-BK)
- RF15..50/65K(-BF)
- RGD15..40
- RWG15..40
- RBQ65..100

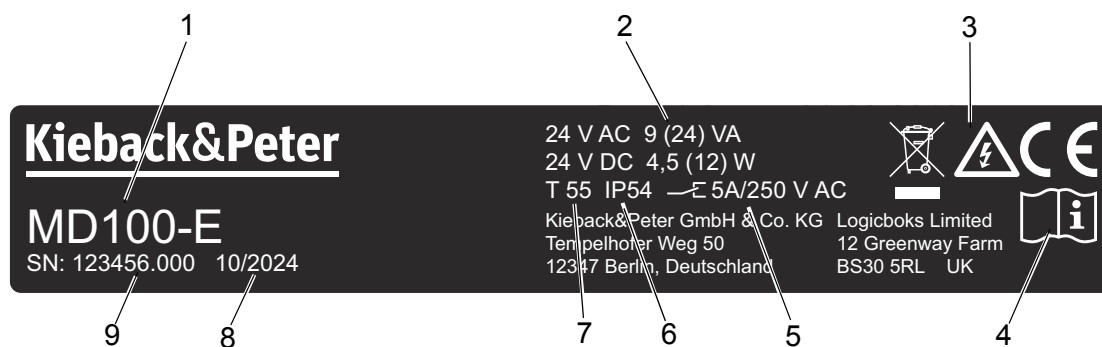
This is controlled with one of the following signals:

- Constant signal 0(2)..10 V DC or 0(4)..20 mA
- 3-point signal open/stop/closed or
- 2-point signal open/closed

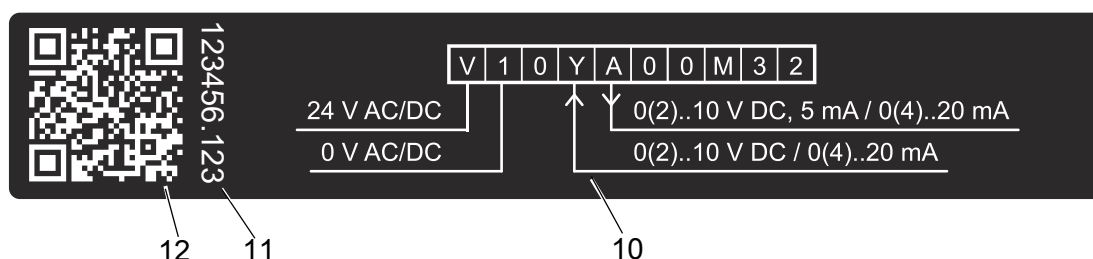
The actuator MD100-E additionally has an auxiliary switch module with two galvanically separated changers for the optional message of the valve positions open, closed, two valve positions (adjustable) or malfunction message.

3.1 Identification

The actuator labelling is on the beam.



3-1: Type plate of the actuator (example presentation)



3-2: Terminal image (example presentation)

- 1 Actuator type
- 2 Key electrical data for the actuator
- 3 Labelling: Disposal, protection class, CE
- 4 Reference to the operating instructions regarding further information
- 5 Switching capacity of the auxiliary switch, only for MD100-E
- 6 Degree of protection of the actuator
- 7 Temperature range
- 8 Month/year of construction
- 9 Serial number
- 10 Wiring diagram
- 11 Production number
- 12 Production-related QR code with integrated URL link to the documents



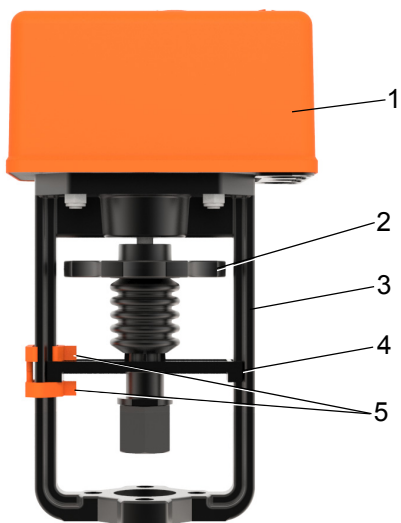
NOTE

The product number of the valve is only entered on the actuator's type plate if you have received a pre-mounted actuator-valve combination.

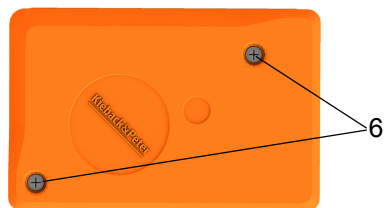
You can find important valve-specific information on the type plate of the valve. Depending on the valve type, the type plate is affixed to different positions on the valve body or flange.

3.2 Actuator

3.2.1 Structure



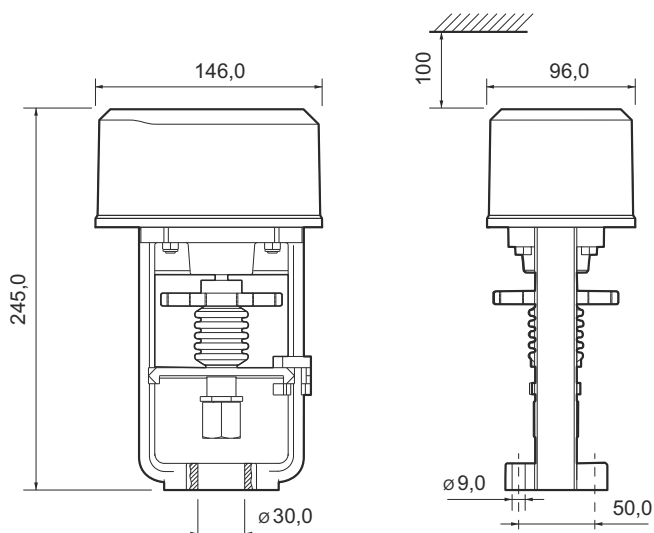
3-3: Actuator layout – view A



3-4: Actuator layout – view B

1	Cover	Actuator cover
2	Handwheel	Manual adjustment of the valve position
3	Beam	
4	Position indicator	Display of the current valve stroke
5	Position marks for the valve setting	Labelling of the maximum and minimum valve stroke
6	Cover screws (2x)	Cover fastening

3.2.2 Dimensions



3.2.3 Technical data

Nominal voltage	24 V AC/DC $\pm 10\%$; 50/60 Hz	
Dimensioning	18 VA (AC); 9 W (DC) With actuator heating: 24 VA (AC); 12 W (DC)	
Switch-on current	max. 7 A, < 1 ms, < 0.049 A ² s	
Power consumption	Sleep mode: 1.6 VA (AC); 0.6 W (DC) 1.9 s/mm and 2.6 s/mm: Nominal: 9 VA (AC); 4.5 W (DC) 5.5 s/mm and 9 s/mm: Nominal: 3 VA (AC); 1.5 W (DC)	
Auxiliary switch	Auxiliary switch module only for MD100-E 2 floating changeover contacts, contact load max. 5 A, 250 V AC	
Cable cross section	min. 0.75 mm ²	
Regulation	3-point signal (open/stop/closed); minimum switch-on and off time 0.6 s 2-point signal (open/closed) minimum switch-off time 2 s Continuous control; adjustable via DIP switch (see page 39) - Voltage signal 0(2)..10 V DC; Re=100 k Ω ; invertible - Power signal 0(4)..20 mA; invertible	
Position feedback	Adjustable via DIP switch (see 39) - voltage signal 0(2)..10 V DC; 5 mA; invertible; approx. 12.5 V signal during fault - current signal 0(4)..20 mA; Ri= 0.5 k Ω ; invertible; approx. 0 mA signal during fault	
Stroke	max. 20 mm, automatic stroke adaptation	
Actuating speed	Adjustable via DIP switch (see page 39) 1.9 s/mm 2.6 s/mm 5.5 s/mm (factory setting) 9 s/mm	
Positioning force	Nominal 1000 N	
Sound power	Approx. 38 dB(A) at 5.5 s/mm	
Maintenance	Maintenance-free	
Ambient temperature	0..55 °C	
Ambient humidity	0..95% r.h., non-condensing	
	MD100	MD100-E
Degree of protection (see page 31)	IP54 (upper semi-sphere), IP40 (lower semi-sphere)	IP54 (upper semi-sphere)
Protection class	III in accordance with EN 60730	I in accordance with EN 60730
Installation position	360°	180° (upper semi-sphere)
Weight	1.38 kg	1.48kg



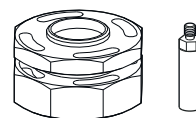
NOTE

Bistable relays are installed in the auxiliary switch. They have the property of remaining in their last switch state in the de-energized state.

3.2.4 Accessories (not included in the delivery)

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.



3.3 RK15..RK50/65K(-BF) three-way/two-way valve with actuator

Application

The gray cast iron three-way valves and two-way valves with an actuator are used for mixing liquids precisely.

The valves can be used as two-way valves using the BF blank flange on gate B.

3.3.1 Types

Gray cast iron three-way valve RK15..RK50/65K usable for actuator MD100 or MD100-E, for water up to 120°C, 6 bar

Type	DN	PN	kvs	Δp (bar)	Weight (kg)
RK15/0,63	15	6	0.63	6	2.2
RK15/1,0	15	6	1.0	6	2.2
RK15/1,25	15	6	1.25	6	2.2
RK15/1,6	15	6	1.6	6	2.2
RK15/2,5	15	6	2.5	6	2.2
RK15	15	6	4.0	6	2.2
RK20/5,0	20	6	5.0	6	3.0
RK20	20	6	6.3	6	3.0
RK25/8,0	25	6	8.0	6	3.7
RK25	25	6	10	6	3.7
RK32/12,5	32	6	12.5	6	5.6
RK32	32	6	16	6	5.6
RK40/20	40	6	20	5.5	7.0
RK40	40	6	25	5.5	7.0
RK50/31,5	50	6	31.5	3.5	8.4
RK50	50	6	40	3.5	8.4
RK65/50K	65	6	50	1.5	14.7
RK65K	65	6	63	1.5	14.7



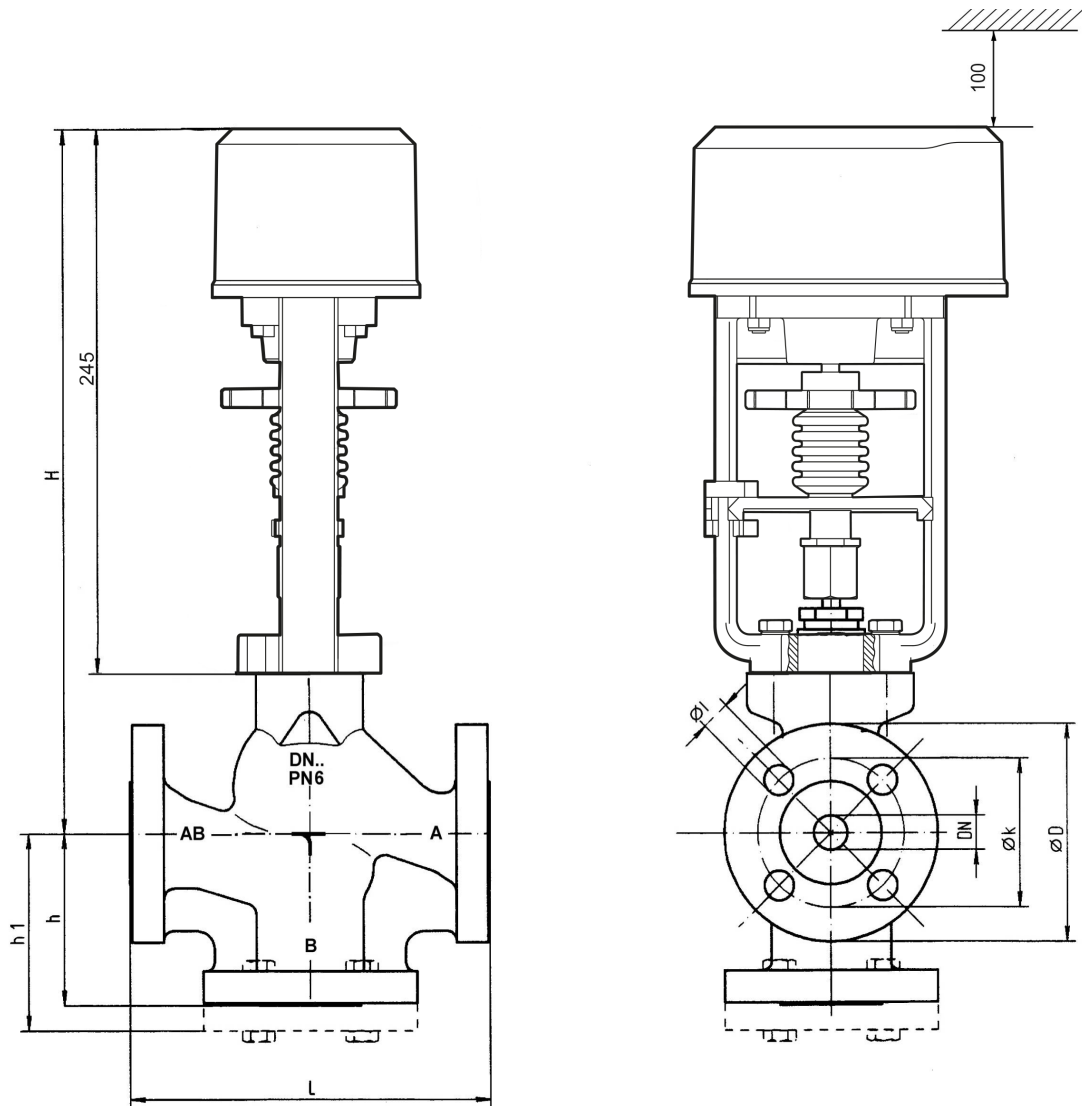
Gray cast iron two-way valve RK15-BF..RK50/65K-BF usable for actuator MD100 or MD100-E, for water up to 120°C, 6 bar

Type	DN	PN	kvs	Δp (bar)	Weight (kg)
RK15/0,63-BF	15	6	0.63	6	2.8
RK15/1,0-BF	15	6	1.0	6	2.8
RK15/1,25-BF	15	6	1.25	6	2.8
RK15/1,6-BF	15	6	1.6	6	2.8
RK15/2,5-BF	15	6	2.5	6	2.8
RK15-BF	15	6	4.0	6	2.8
RK20/5,0-BF	20	6	5.0	6	3.9
RK20-BF	20	6	6.3	6	3.9
RK25/8,0-BF	25	6	8.0	6	4.8
RK25-BF	25	6	10	6	4.8
RK32/12,5-BF	32	6	16	6	7.1
RK32-BF	32	6	16	6	7.1
RK40/20-BF	40	6	20	5.5	8.8
RK40-BF	40	6	25	5.5	8.8
RK50/31,5-BF	50	6	31.5	3.5	10.5
RK50-BF	50	6	40	3.5	10.5
RK65/50K-BF	65	6	50	1.5	17.9
RK65K-BF	65	6	63	1.5	17.9

3.3.2 Technical data: RK..(-BF) valves

Nominal width	DN15..65	
Pressure rating	PN 6	
Connection	Flanges to EN 1092-2 type 21	
Characteristic curve	RK..	Ports A → AB = equal percentage Gates B → AB = linear
	RK..-BF	Ports A → AB = equal percentage
Positioning stroke	RK15..50(-BF): 14 mm RK65K(-BF): 20 mm	
Leak rate	In accordance with EN 1349, leakage class VI	
Medium	Water or max. 50% glycol-water mixtures (pH 6.5..10)	
Medium temperature	0..130 °C (max. 120 °C at 6 bar) up to -10 °C only with spindle heating	
Housing	Gray cast iron EN-JL1040	
Valve seat	CrNi steel 1.4021	
Cone	Brass CW614N	
Valve spindle	CrMo steel 1.4122	
Stem seal	O-rings with guide bushes EPDM/PTFE, maintenance-free	

Dimensions



DN	L	Ø D	Ø k	Ø l	H	h	h1 (RK...-BF)
15	130	80	55	4x Ø 11	287	65	86
20	150	90	65	4x Ø 11	292	70	93
25	160	100	75	4x Ø 11	297	75	98
32	180	120	90	4x Ø 14	300	95	119
40	200	130	100	4x Ø 14	303	100	124
50	230	140	110	4x Ø 14	303	100	124
65	290	160	130	4x Ø 14	352	120	144
65 K	290	160	130	4x Ø 14	352	120	144
Measurement L to h1 in mm							

3.4 RB15..50(-BK) three-way/two-way valve with actuator

Application

The red cast iron three-way valves and two-way valves with an actuator are used for mixing liquids precisely.

The valves can be used as two-way valves using the BK blank cover on gate B.

3.4.1 Types

Gunmetal three-way valve RB15..50 usable for actuator MD100 or MD100-E, for water up to 120°C, 16 bar

Type	DN	PN	Kvs	Δp (bar)	Terminal (inches)	Weight (kg)
RB15/0,63	15	16	0.63	16	Rp 1/2	0.9
RB15/1,0	15	16	1.0	16	Rp 1/2	0.9
RB15/1,25	15	16	1.25	16	Rp 1/2	0.9
RB15/1,6	15	16	1.6	16	Rp 1/2	0.9
RB15/2,5	15	16	2.5	16	Rp 1/2	0.9
RB15	15	16	4.0	16	Rp 1/2	0.9
RB20/5,0	20	16	5.0	16	Rp 3/4	1.4
RB20	20	16	6.3	16	Rp 3/4	1.4
RB25/8,0	25	16	8.0	15	Rp 1	1.7
RB25	25	16	10	15	Rp 1	1.7
RB32/12,5	32	16	12.5	9	Rp 1 1/4	3.4
RB32	32	16	16	9	Rp 1 1/4	3.4
RB40/20	40	16	20	5.5	Rp 1 1/2	4.0
RB40	40	16	25	5.5	Rp 1 1/2	4.0
RB50/31,5	50	16	31.5	3.5	Rp 2	5.6
RB50	50	16	40	3.5	Rp 2	5.6



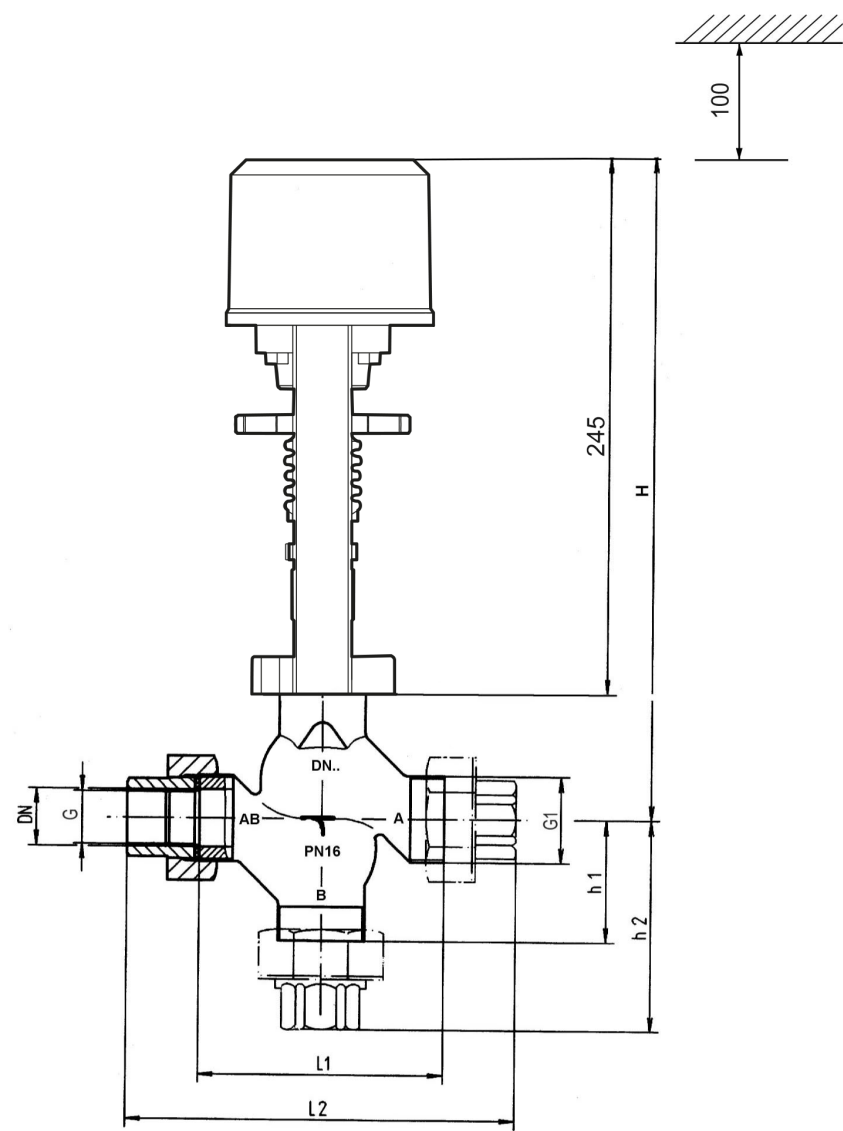
Gunmetal two-way valve RB15..50-BK usable for actuator MD100 or MD100-E, for water up to 120°C, 16 bar

Type	DN	PN	Kvs	Δp (bar)	Terminal (inches)	Weight (kg)
RB15/0,63-BK	15	16	0.63	16	Rp 1/2	0.9
RB15/1,0-BK	15	16	1.0	16	Rp 1/2	0.9
RB15/1,25-BK	15	16	1.25	16	Rp 1/2	0.9
RB15/1,6-BK	15	16	1.6	16	Rp 1/2	0.9
RB15/2,5-BK	15	16	2.5	16	Rp 1/2	0.9
RB15-BK	15	16	4.0	16	Rp 1/2	0.9
RB20/5,0-BK	20	16	5.0	16	Rp 3/4	1.4
RB20-BK	20	16	6.3	16	Rp 3/4	1.4
RB25/8,0-BK	25	16	8.0	15	Rp 1	1.7
RB25-BK	25	16	10	15	Rp 1	1.7
RB32/12,5-BK	32	16	12.5	9	Rp 1 1/4	3.4
RB32-BK	32	16	16	9	Rp 1 1/4	3.4
RB40/20-BK	40	16	20	5.5	Rp 1 1/2	4.0
RB40-BK	40	16	25	5.5	Rp 1 1/2	4.0
RB50/31,5-BK	50	16	31.5	3.5	Rp 2	5.6
RB50-BK	50	16	40	3.5	Rp 2	5.6

3.4.2 Technical Data: RB..(-BK) Valves

Nominal width	DN15..50	
Pressure rating	PN 16	
Connection	Male thread in accordance with ISO 228/1, with female thread fittings in accordance with ISO 7/1	
Characteristic curve	RB..	Ports A → AB = equal percentage Gates B → AB = linear
	RB..-BF	Ports A → AB = equal percentage
Positioning stroke	RB15..20(-BK): 12 mm RB25..50(-BK): 14 mm	
Leak rate	EN 1349 - Seat leak VI G 1 (sealing)	
Medium	Water or max. 50% glycol-water mixtures (pH value 6.5..10)	
Medium temperature	0..150 °C (max. 120 °C at 16 bar) Horizontal drive position only permissible from 130 °C and above up to -10 °C only with spindle heating	
Housing	Gunmetal, Rg-5 / CC491K	
Cone	Brass CW614N	
Valve spindle	CrMo steel 1.4122	
Stem seal	EPDM peroxide-cured O-rings, maintenance-free	
Pipe connections	Female thread fittings and Union nuts malleable cast iron GTW, blue chromated	
Blank cover for RB.-BK	Union nuts malleable cast iron GTW, blue chromated; Steel gasket	

Dimensions



Model RB...-BK (two-way valve) with blind cover on gate B

DN	L1	L2	h1	h2	H	G	G1
15	62	114	40	66	285	Rp 1/2	G 1 A
20	75	127	41	67	288	Rp 3/4	G 1 1/4 A
25	80	138	45	74	291	Rp 1	G 1 1/2 A
32	120	184	55	89	300	Rp 1 1/4	G 2 A
40	130	198	60	94	303	Rp 1 1/2	G 2 1/4 A
50	150	222	65	101	303	Rp 2	G 2 3/4 A
Dimensions L1 to H in mm, connection threads G1 in inches							

3.5 RF15..50/65K(-BF) three-way/two-way valve with actuator

Application

The gray cast iron three-way valves and two-way valves with an actuator are used for mixing liquids precisely.

The valves can be used as two-way valves using the BF blank flange on gate B.

3.5.1 Types

Gray cast iron three-way valve RF15..50/65K usable for actuator MD100 or MD100-E, for water up to 120°C, 16 bar

Type	DN	PN	Kvs	Δp (bar)	Weight (kg)
RF15/0,63	15	16	0.63	16	3.1
RF15/1,0	15	16	1.0	16	3.1
RF15/1,25	15	16	1.25	16	3.1
RF15/1,6	15	16	1.6	16	3.1
RF15/2,5	15	16	2.5	16	3.1
RF15	15	16	4.0	16	3.1
RF20/5,0	20	16	5.0	16	4.0
RF20	20	16	6.3	16	4.0
RF25/8,0	25	16	8.0	15	5.0
RF25	25	16	10	15	5.0
RF32/12,5	32	16	12.5	9	7.6
RF32	32	16	16	9	7.6
RF40/20	40	16	20	5.5	9.1
RF40	40	16	25	5.5	9.1
RF50/31,5	50	16	31.5	3.5	11.6
RF50	50	16	40	3.5	11.6
RF65/50K	65	16	50	1.5	19.1
RF65K	65	16	63	1.5	19.1



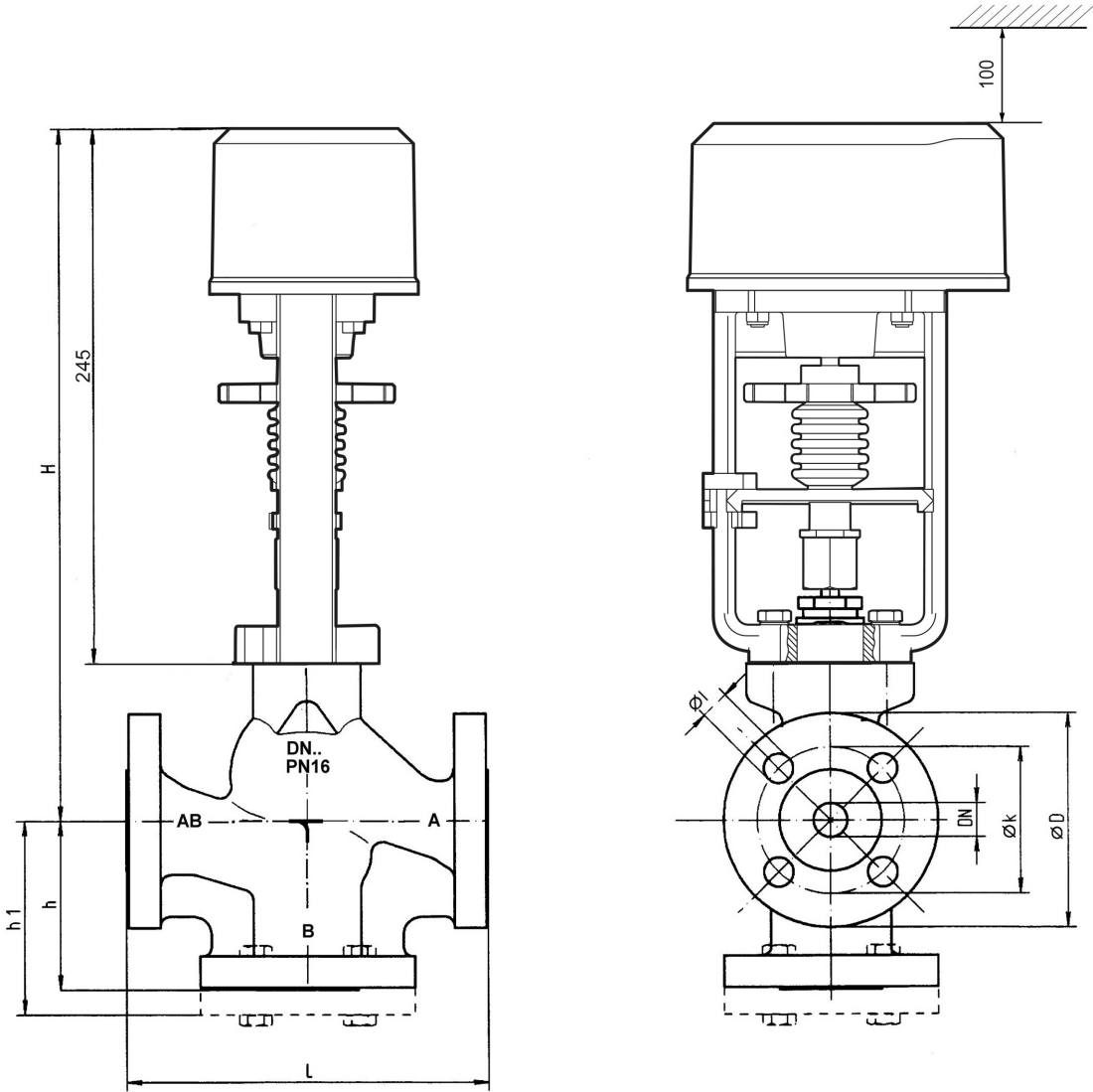
Gray cast iron two-way valve RF15..50-BF usable for actuator MD100 or MD100-E, for water up to 120°C, 16 bar

Type	DN	PN	Kvs	Δp (bar)	Weight (kg)
RF15/0,63-BF	15	16	0.63	16	4.1
RF15/1,0-BF	15	16	1.0	16	4.1
RF15/1,25-BF	15	16	1.25	16	4.1
RF15/1,6-BF	15	16	1.6	16	4.1
RF15/2,5-BF	15	16	2.5	16	4.1
RF15-BF	15	16	4.0	16	4.1
RF20/5,0-BF	20	16	5.0	16	5.3
RF20-BF	20	16	6.3	16	5.3
RF25/8,0-BF	25	16	8.0	15	6.6
RF25-BF	25	16	10	15	6.6
RF32/12,5-BF	32	16	12.5	9	10.0
RF32-BF	32	16	16	9	10.0
RF40/20-BF	40	16	20	5.5	11.8
RF40-BF	40	16	25	5.5	11.8
RF50/31,5-BF	50	16	31.5	3.5	13.3
RF50-BF	50	16	40	3.5	13.3
RF65/50K-BF	65	16	50	1.5	24.8
RF65K-BF	65	16	63	1.5	24.8

3.5.2 Technical data: RF..(-BF) valves

Nominal width	DN15..65
Pressure rating	PN 16
Connection	Flanges EN 1092-2 type 21
Characteristic curve	RF.. Ports A → AB = equal percentage Gates B → AB = linear
	RF..-BF Ports A → AB = equal percentage
Positioning stroke	RF15..50(-BF): 14 mm RF65K(-BF): 20 mm
Leak rate	In accordance with EN 1349, leakage class VI
Medium	Water or max. 50% glycol-water mixtures (pH 6.5..10)
Medium temperature	0..130 °C (max. 120 °C at 6 bar) up to -10 °C only with spindle heating
Housing	Gray cast iron EN-JL1040
Cone	Brass CW614N
Valve spindle	CrMo steel 1.4122
Stem seal	O-rings EPDM, maintenance-free

Dimensions



DN	L	Ø D	Ø k	Ø l	H	h	h1 (RF..-BF)
15	130	95	65	4x Ø 14	287	65	79
20	150	105	75	4x Ø 14	292	70	84
25	160	115	85	4x Ø 14	297	75	91
32	180	140	100	4x Ø 18	300	95	111
40	200	150	110	4x Ø 18	303	100	116
50	230	165	125	4x Ø 18	303	100	118
65	290	185	145	4x Ø 18	349	120	150
Measurement L to h1 in mm, flanges in accordance with DIN, PN16							

3.6 RGD15..40 two-way valve with actuator

Application

The nodular iron two-way valves with an actuator are used for precisely regulating liquid and vapor flow rates.

3.6.1 Types

RGD15..40 nodular iron two-way valve for actuator MD100 or MD100-E, for water up to 120°C, 25 bar and hot water and vapor up to 200°C, 20 bar.

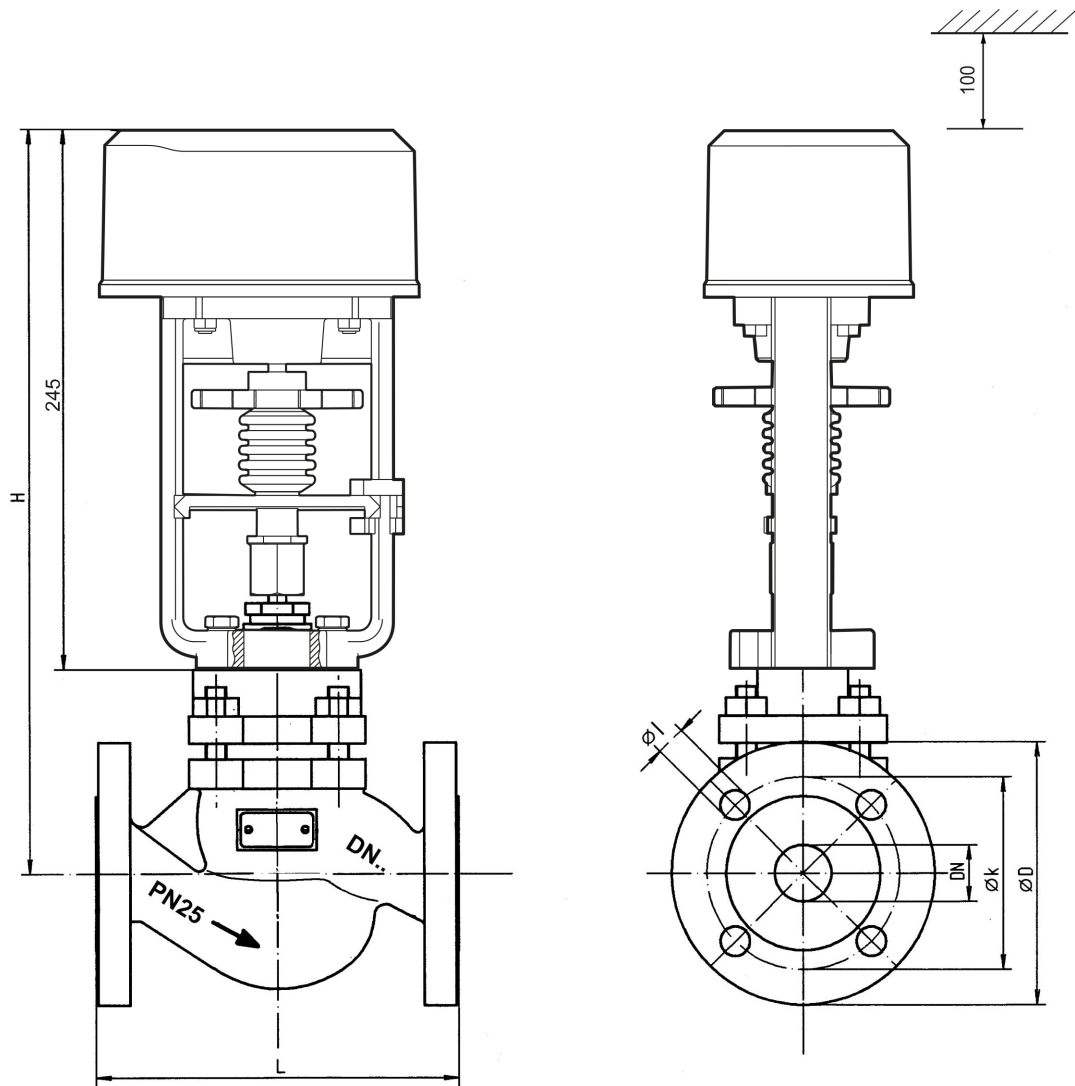
Type	DN	PN	Kvs	Δp (bar)	Weight (kg)
RGD15/0,4	15	25	0.4	25	3.2
RGD15/0,63	15	25	0.63	25	3.2
RGD15/1,0	15	25	1	20.5	3.2
RGD15/1,6	15	25	1.6	20.5	3.2
RGD15/2,5	15	25	2.5	20.5	3.2
RGD15	15	25	4	20.5	3.2
RGD25/6,3	25	25	6.3	11.8	4.8
RGD25	25	25	10	11.8	4.8
RGD32	32	25	16	8.6	6.3
RGD40	40	25	25	4.4	8.7



3.6.2 Technical data: RGD.. valves

Nominal width	DN15..40
Pressure rating	PN 25
CE designation	CE marking from DN 32, notified body: 0525
Connection	Flanges DIN 2501-1, PN25, sealing strip form C DIN 2526
Characteristic curve	equal percentage
Positioning stroke	15 mm
Leak rate	In accordance with EN 1349, leakage class VI
Medium	Water up to 120 °C; 25 bar max. 50% glycol/water mixtures (pH 6.5..10) up to 120 °C; 25 bar Hot water and steam up to 200 °C; 20 bar
Medium temperature	0..200 °C up to -10 °C only with spindle heating
Housing	Spheroidal cast iron GGG-40.3
Valve seat	Stainless steel 1.4021
Cone	DN15..32 Stainless steel 1.4571 DN40 Stainless steel 1.4021
Valve spindle	Stainless steel 1.4571
Stem seal	Chevron sleeves Univerdit with PTFE bushing, maintenance-free

Dimensions



DN	L	Ø D	Ø K	Ø I	H
15	130	95	65	4xØ14	330
25	160	115	85	4xØ14	338
32	180	140	100	4xØ18	338
40	200	150	110	4xØ18	349
Measurement L to H in mm					

3.7 RWG15..40 three-way valves with actuator

Application

The nodular iron three-way valves with actuator are used for precisely regulating liquid and vapor flow rates.

3.7.1 Types

RWG15..40 nodular iron three-way valve for actuator MD100 or MD100-E, for water up to 120°C, 25 bar, as well as for hot water up to 200°C, 20 bar

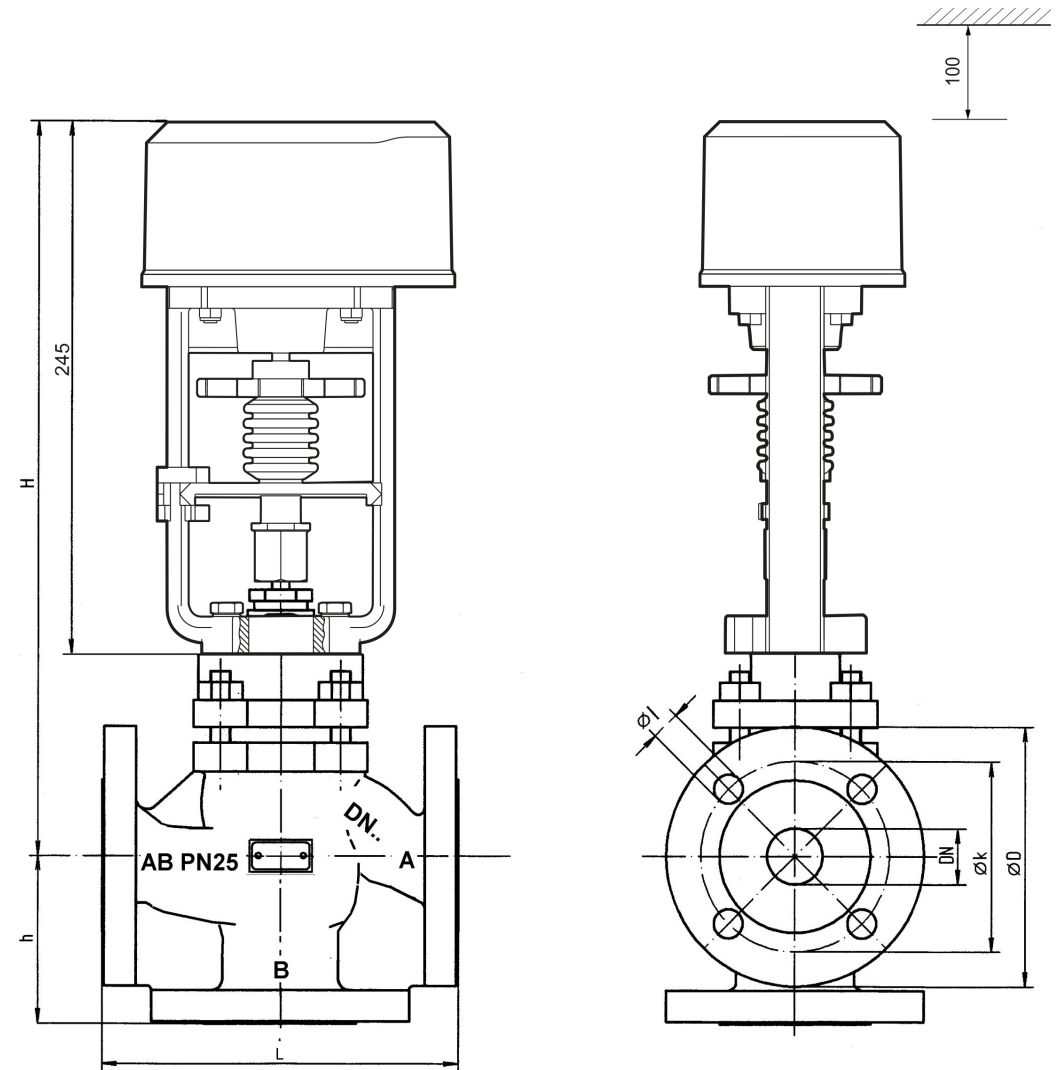
Type	DN	PN	Kvs	Δp (bar)	Weight (kg)
RWG15/1,0	15	25	1	20.5	5.1
RWG15/1,6	15	25	1.6	20.5	5.1
RWG15/2,5	15	25	2.5	20.5	5.1
RWG15	15	25	4	20.5	5.1
RWG25/6,3	25	25	6.3	11.8	7.1
RWG25	25	25	10	11.8	7.1
RWG32	32	25	16	8.6	9.7
RWG40	40	25	25	4.4	13.0



3.7.2 Technical data: RWG valves

Nominal width	DN15..40	
Pressure rating	PN 25	
CE marking	CE marking from DN32, notified body: 0525	
Connection	Flange in accordance with DIN, PN25	
Characteristic curve	RWG..	Ports A → AB = equal percentage
		Gates B → AB = linear
Positioning stroke	15 mm	
Leak rate	In accordance with EN 1349, leakage class VI	
Medium	Water up to 120 °C; 25 bar max. 50% glycol/water mixtures (pH 6.5..10) up to 120 °C; 25 bar Hot water and steam up to 200 °C; 20 bar	
Medium temperature	0..200 °C	
	As low as -10 °C only with spindle heating	
Housing	Spheroidal cast iron GGG-40.3	
Valve seat	Stainless steel 1.4021	
Cone	DN15..32	CrNi steel 1.4571
	DN40	CrNi steel 1.4021
Valve spindle	Stainless steel 1.4571	
Stem seal	Chevron sleeves Univerdit with PTFE bushing (maintenance-free)	

Dimensions



DN	L	Ø D	Ø k	Ø l	h	H
15	130	95	65	4 x Ø14	65	338
25	160	115	85	4 x Ø14	75	342
32	180	140	100	4 x Ø18	80	368
40	200	150	110	4 x Ø18	90	377.5
Measurement L to H in mm, flanges in accordance with DIN, PN25						

3.8 RBQ65..100 combo valves with actuator

Application

The two-way combo valves with actuator are used to set the volume flow rate and for automatic flow control independent of the differential pressure (hydraulic balancing).

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



3.8.1 Types

RBQ65..100 gray cast iron combo valves usable for MD100 or MD100-E actuator, for water up to 120 °C, 16 bar

Type	DN	PN	Volume flow rate range [l/h] min*..max	kvs	Control range [kPa]	Connection	Weight [kg]
RBQ65 (QFC DN65 1146151)	65	16	5000..20000	36.0	20..400	DN65 flange	27.0
RBQ80 (QFC DN80 1146152)	80	16	7500..30000	56.0	20..400	DN80 flange	32.0
RBQ100 (QFC DN100 1146153)	100	16	12500..50000	80.0	20..400	DN100 flange	45.0

* Recommended minimum setting value; using the actuator, the flow rate can be reduced from the setting value all the way down to full shut-off.



NOTE

Z224-2 mounting kit required (see accessories on page 12).



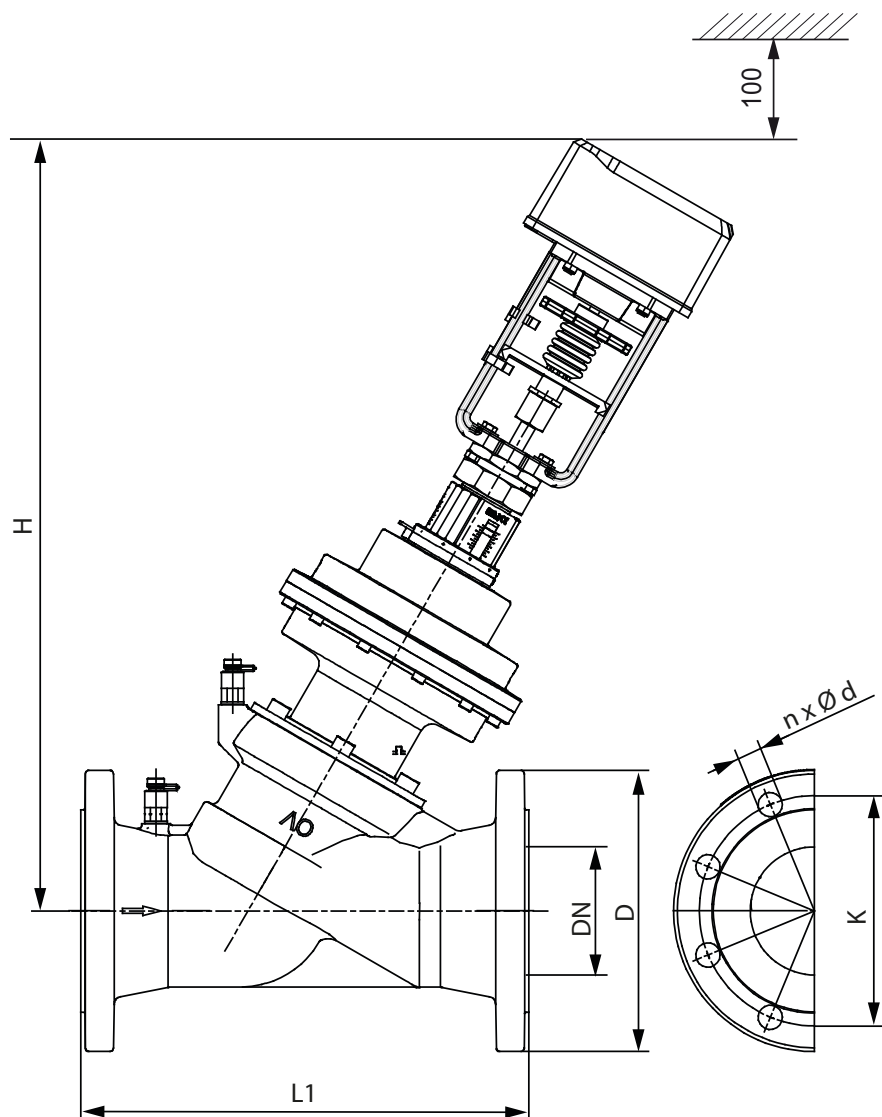
NOTE

Detailed descriptions regarding technical data, function, volume flow rate adjustment and dimensions for the RBQ combo valves can be found in the RBQ15..200 product description, document no. 3.10-20.000-01.

3.8.2 RBQ technical data

Operating temperature	RBQ65..100 (QFC65..100): -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	20 mm
Medium	Water or water-propylene glycol mixtures and water-ethylene glycol mixtures (max. 50 %, pH value 6.5 to 10)
Housing	Gray cast iron
Seals	Made of EPDM or PTFE

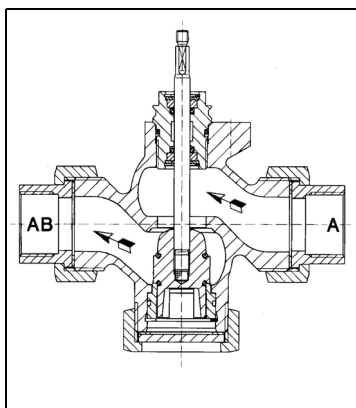
Dimensions



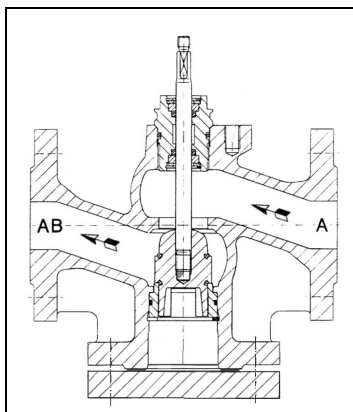
DN	L1 [mm]	H [mm]	D [mm]	K [mm]	n x Ød
65	290	558	185	145	4 x 19
80	310	573	200	160	8 x 19
100	350	593	220	180	8 x 19

3.9 Valve cross-sections with flow directions

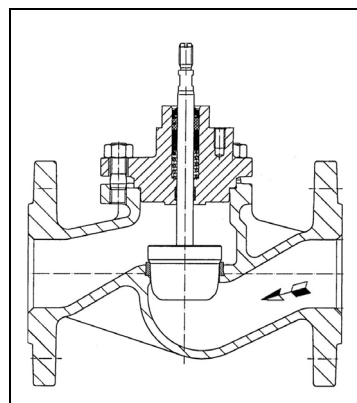
Two-way valves



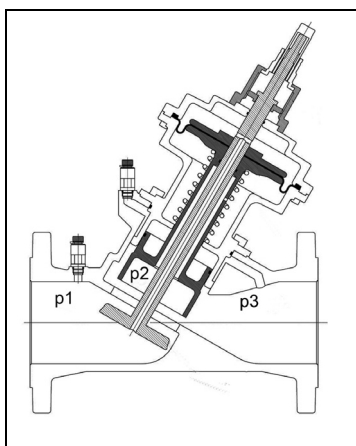
RBxx-BK



RK/RFxx-BF

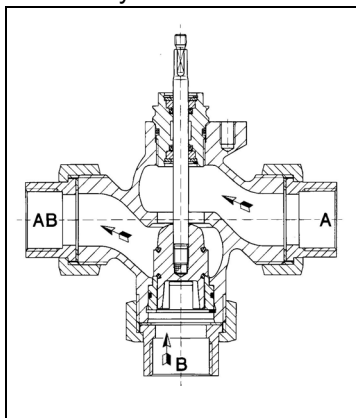


RGDxx

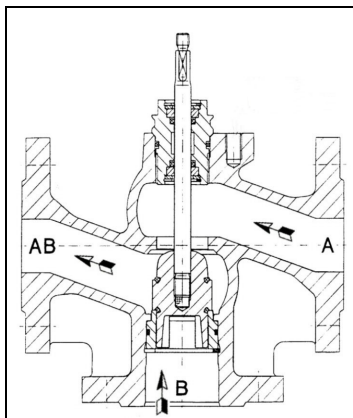


RBQ65..100

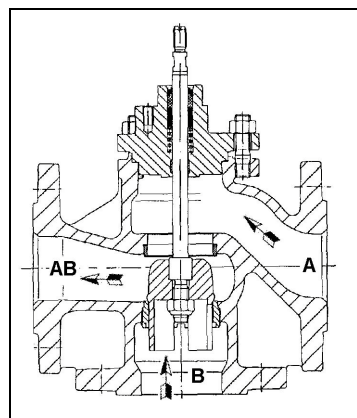
Three-way valves



RB..



RK/RF..



RWG..

4 Scope of delivery, transportation and storage



WARNING

Risk of injury due to weight load!

Persons who carry or hold a valve or an actuator/valve combination may be injured due to the heavy weight of the load. There is a risk of accidents with severe injuries and damage to property.

- ▶ Use suitable aids to lift and carry the valve or the actuator/valve combination.
-

Scope of delivery

The actuator can be supplied in different combinations with the valve or as a standalone product. The actuator and valve can also be ordered as a pre-assembled combination.

The maximum scope of delivery includes:

- Actuator MD100 or MD100-E incl.:
 - Two hexagon screws ISO4017-M8x25-8.8
 - Two washers S8
 - Screw connection M16x1.5
 - Screw connection M20x1.5 only for MD100-E
 - One union nut with washer and drive ring
- A two-way or three-way valve from the RK/RB/RF/RGD/RWG/RBQ series
- Operating instructions MD100 and MD100-E actuator for valves from the RK/RB/RF/RGD/RWG/RBQ series
- Mounting instructions MD100 or MD100-E

Unpacking

- ▶ Do not use damaged deliveries and get in touch with your contact at Kieback&Peter.
- ▶ Dispose of packaging material according to local regulations.

Repackaging

- ▶ Use suitable packaging material to facilitate the transportation and to protect the product from damage.

Transportation

- ▶ Maintain the specified ambient temperature of -20..+60 °C and ambient humidity of 0..85% r. F., non-condensing.
- ▶ Avoid slipping.

Storage

- ▶ Maintain the specified ambient temperature of -20..+50 °C and ambient humidity of 0..85% r. F., non-condensing.

5 Valve Mounting



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:

- The valve gates come with protective caps to protect against contamination. They are to be removed before the valve is mounted.
- The pipeline system and the interior of the fitting must be free of foreign objects. In the case of contaminated media, dirt traps are to be inserted before the valves.
- There must be no tensions between the fitting and the pipeline connection.
- Only use flange seals which fit precisely and insert the valve flanges centrally.
- To prevent vortex formation in the valve bodies, these should be inserted in a straight length of pipe. The guideline value 10 x the nominal width is used as the measurement between the valve flange and the manifold.
- The installation location is to be selected so that the ambient temperature at the actuator is kept between 0°C and +55°C.
- When carrying out mounting, the permissible max. pressure difference Δp and the specified flow direction must be taken into account (see table in “Types” section as well as “Valve Principle”).
- The three-way valves are to be used as mixing valves. Please observe the flow direction (see fig. “Valve Principle”).
- The actuator can be fitted vertically above and below the fitting up to the horizontal position. If installed horizontally, the actuator columns must be positioned one on top of the other vertically. If necessary, turn the beam after loosening the fastening nut.
- To remove the actuator cover, you need 100 mm of free space above the actuator.
- The delivery includes a protective box for the actuator. Before commissioning, this cover serves as actuator protection during the construction phase and piping work.
- Observe the direction of flow arrow on the valve body. A reverse flow direction will impair the control performance!

5.1 Mounting the actuator



NOTE

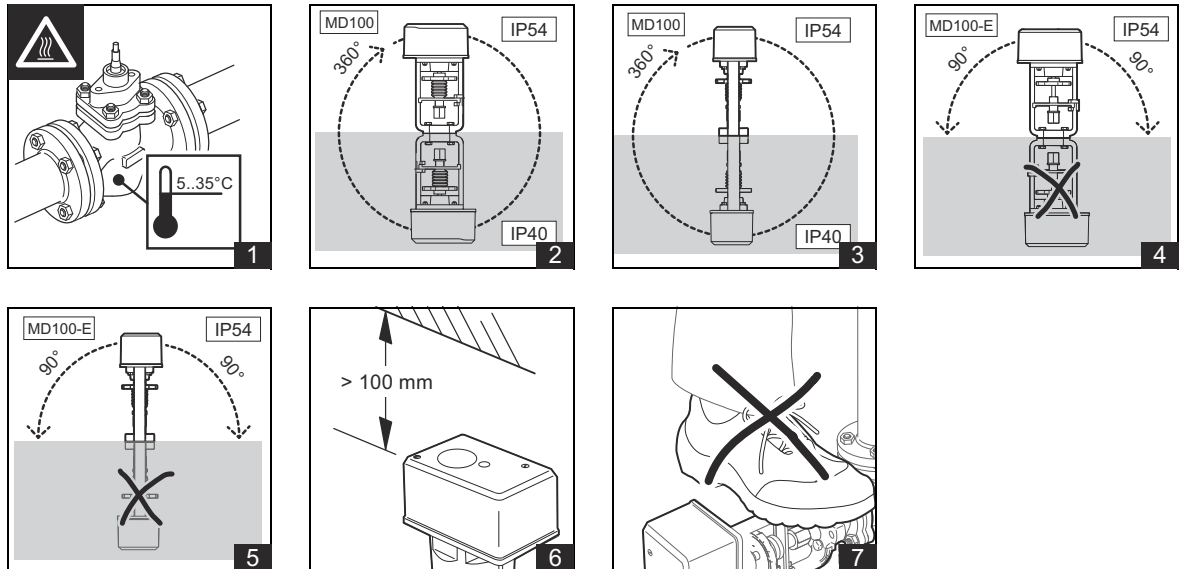
The actuator is delivered in a protective box.
Use this box to protect the actuator until commissioning.

Preparatory tasks

Perform the following preparatory tasks to mount the actuator on a valve in a plant that is in operation:

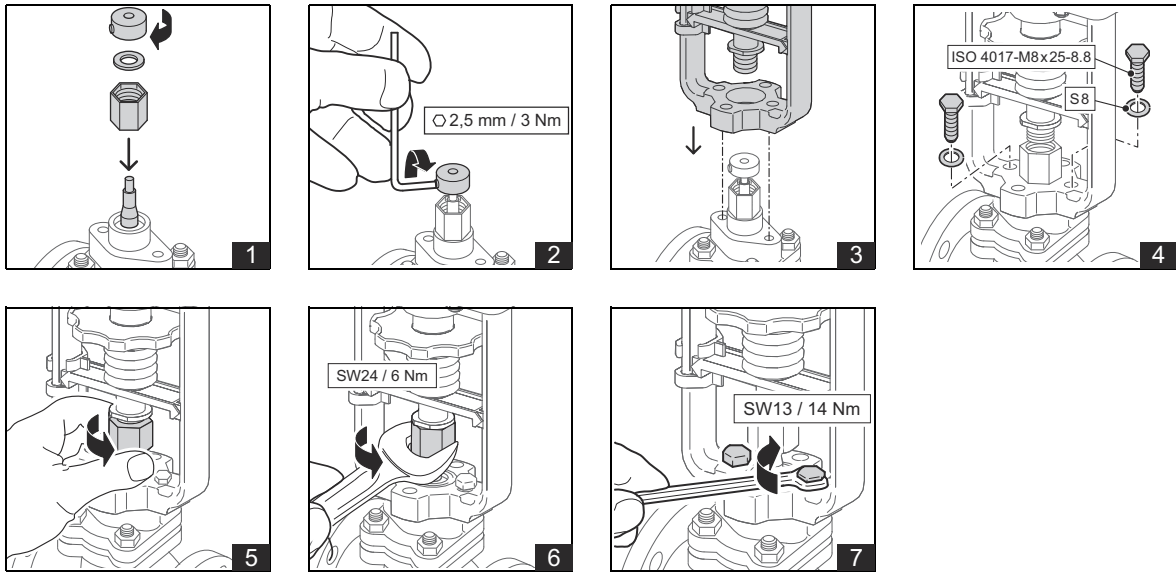
- ▶ Before starting the tasks, ensure that there is no buildup of differential pressure in the valve body.
 - ▶ Close the gate valve and turn off pumps.
- ▶ Allow the valve and pipelines to cool down.

Installation instructions



- ▶ **1** After the pipeline has cooled off, the actuator can be mounted.
- ▶ **2 to 5** These installation positions are permitted.
- ▶ **6** Mount the device so that there is a clearance of at least 100 mm above it.
- ▶ **7** Do not use the actuator as a step or shelf.

Mounting



- ▶ **1** Position the union nut above the valve spindle. Insert the circlip into the union nut. To ensure that the drive ring can sit flush on the section of the valve, unscrew the set screw in the drive ring using a 2.5 mm hexagon socket.
- ▶ **2** Position the drive ring on the valve spindle. Tighten the set screw with a tightening torque of 3.0 Nm using a 2.5 mm hexagon socket.
- ▶ **3** Position the actuator on the valve. Ensure that the actuator beam is resting on the valve beam without any tension.
- ▶ **4** Install washers S8 and screws ISO4017-M8x25-8.8 and tighten them by hand.
- ▶ **5 6** Secure the union nut and tighten this using an SW24 open-end wrench and a tightening torque of 6 Nm.
- ▶ **7** Tighten the ISO4017-M8x25-8.8 screws to a tightening torque of 14.0 Nm using an open-ended wrench.



NOTE

For RBQ65..100 valves, the Z224-2 adapter must be installed first. For further information, see the Z224-2 mounting instructions, document no. 3.10-20.025-99.

6 Connecting the actuator and putting it into operation

6.1 Connection diagrams

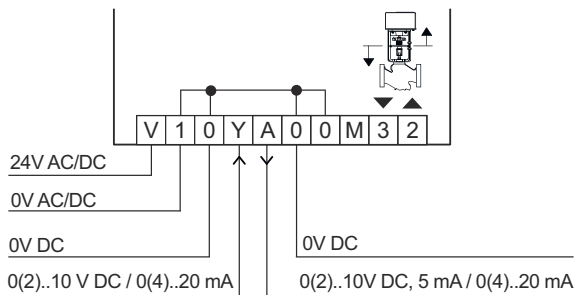


NOTE

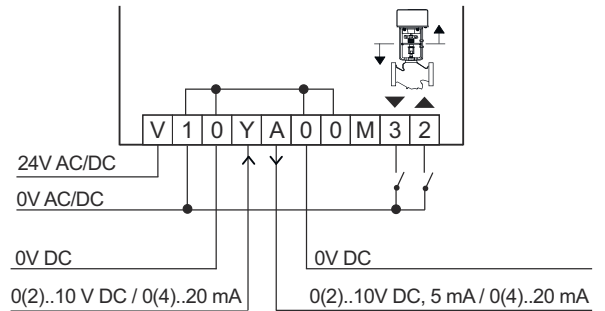
Y = DC 10 V or connection terminal 2 occupied = valve spindle pulled (factory setting B3 = OFF)

Y = DC 0 V or connection terminal 3 occupied = valve spindle pushed (factory setting B3 = OFF)

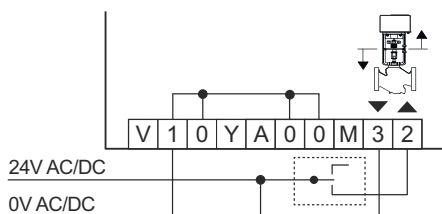
Constant operation mA/V (0..100%)



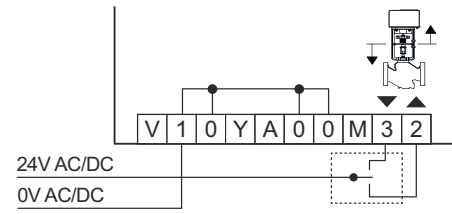
Priority switching (open/closed)



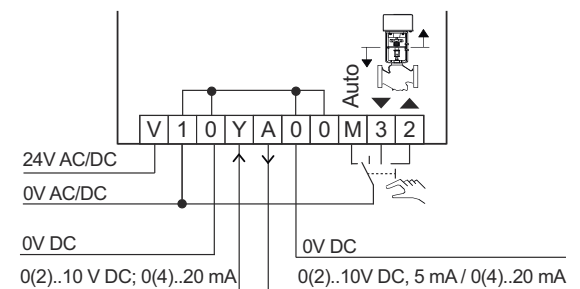
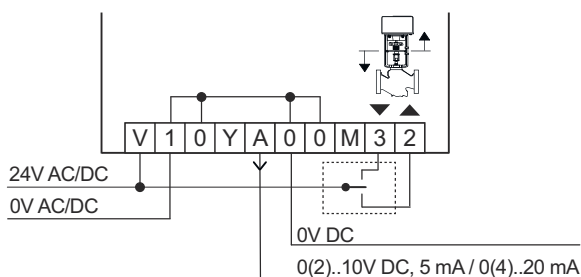
2-point operation (open/closed)



3-point operation (open/stop/closed)



3-point operation (open/stop/closed) with position Manual operation with operating mode switch feedback (from a delivery date of November 2024 (auto/stop/closed/open) onward)



NOTE

The display of the "pull" and "push" adjustment directions for the connection diagrams on terminals 2 and 3 refers to the factory setting B3 = OFF. At B3=ON, the actuating direction is inverted.



CAUTION

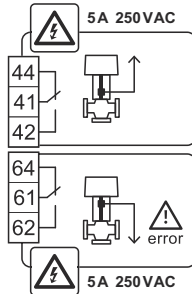
A reinitialization must be triggered in the event of rewiring.



NOTE

When using the measurement of the 0(4)..20 mA current as position feedback, the load resistance of the measuring input must be between 0.5 k Ω and 1 k Ω to avoid false measurements.

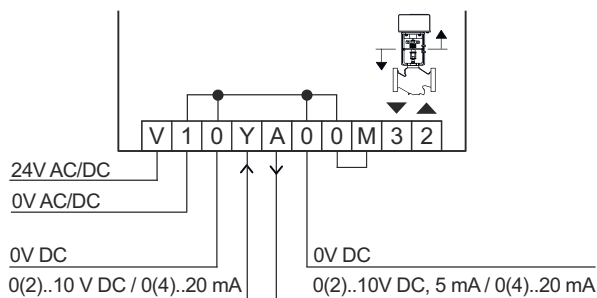
- Connection of auxiliary switch only for MD100-E



6.2 Replacing the actuator in existing plants

The MD100 and MD100-E connector is compatible with the MD200Y and MD210Y drive variants. Rewiring is required only if the function for inverting the actuating signal Yin B3 = ON and terminals 2 and 3 are being used.

See note in chapter 6.1.



If the bridge in the connector is set between 0 and M for the connection variants constant operation and priority switching, it must not be removed when connecting the MD100 or MD100-E drive. If the bridge is set, the actuator will continue in automatic mode.



CAUTION

Removing the bridge afterwards causes the actuator to go into manual operation on Stop. It no longer follows the actuating signal as a result. The actuator will return to automatic mode when an initialization is triggered or the bridge is reset.

6.3 Electrical connection



CAUTION

Electrical installation and device connection may only be carried out by qualified technicians, e.g. an electrician. Ensure that this process complies with guidelines from the VDE (Association for Electrical, Electronic & Information Technologies) and local wiring regulations.



NOTE

The cable cross-section has to be at least 0.75 mm^2 . You may need to consider adjusting the cable cross-section, depending on the length of the cables. Please observe the applicable installation specifications outlined in the applicable VDE guidelines for each respective use case.

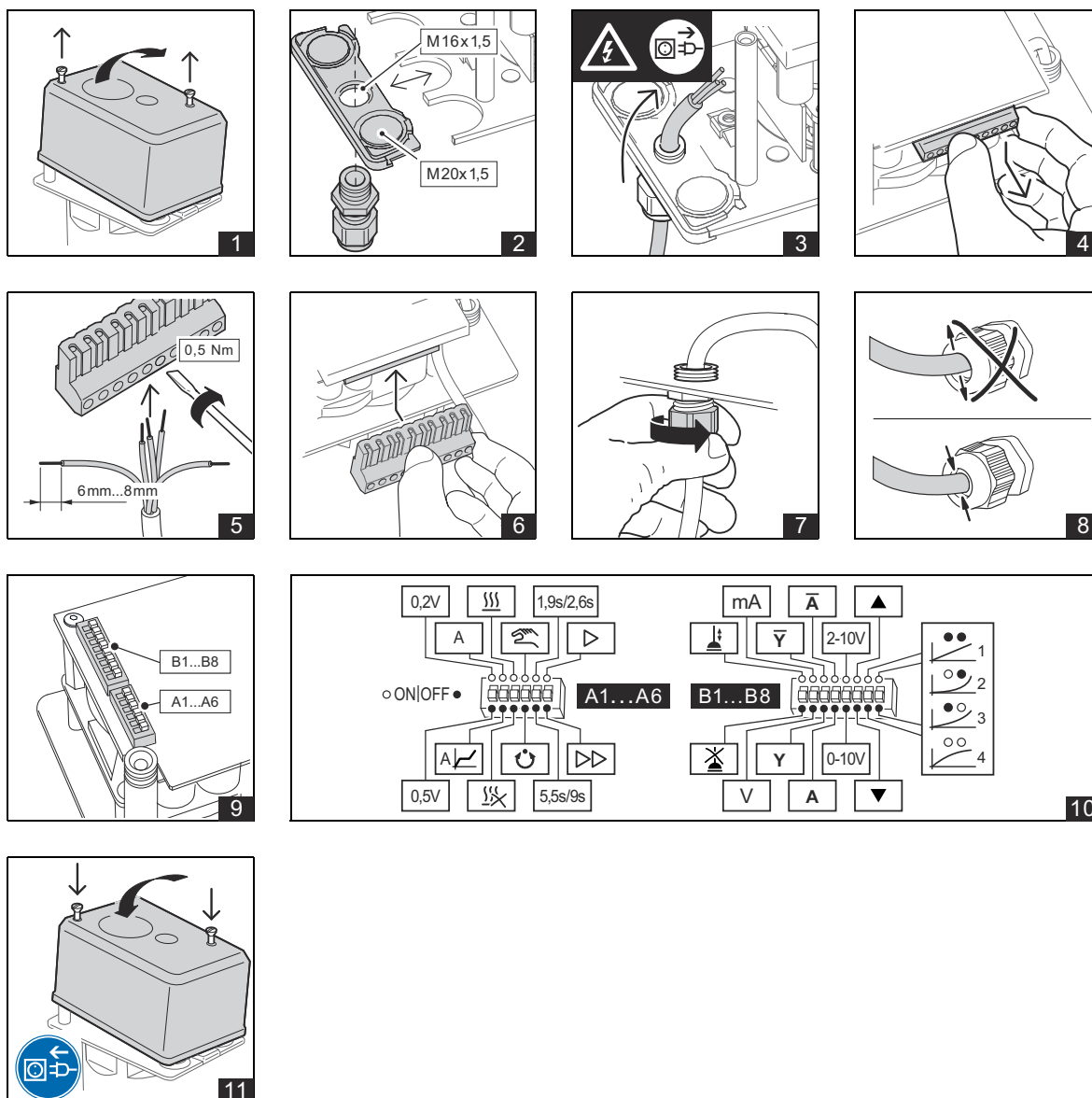


CAUTION

The electrical connection for the actuator must be a fixed installation and connected to a valve.

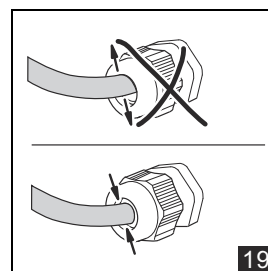
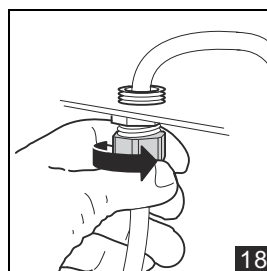
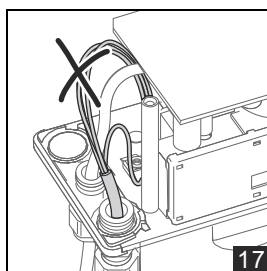
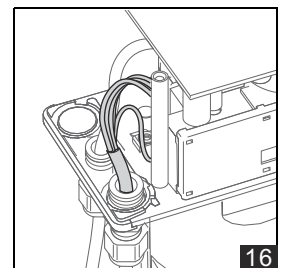
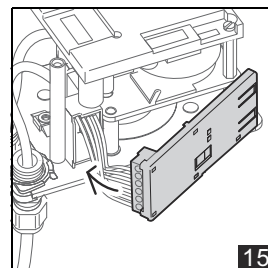
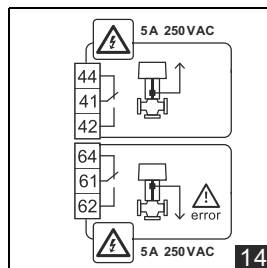
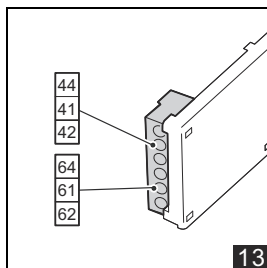
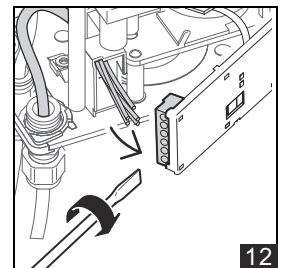
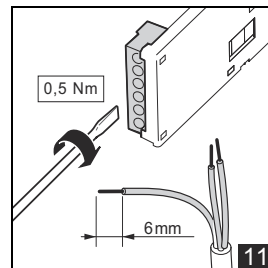
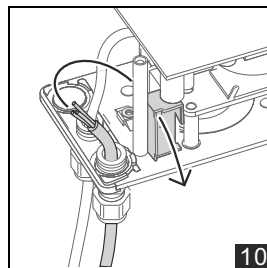
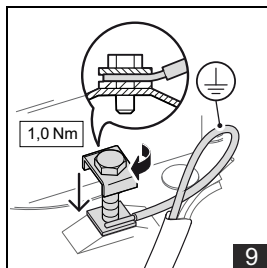
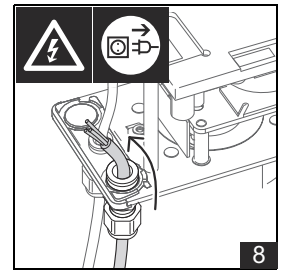
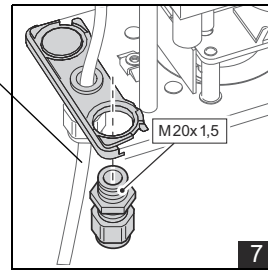
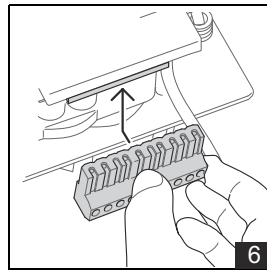
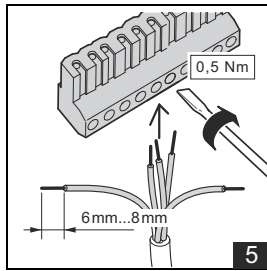
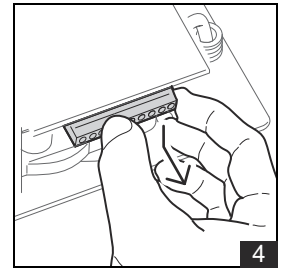
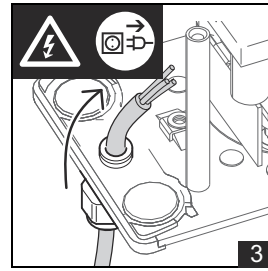
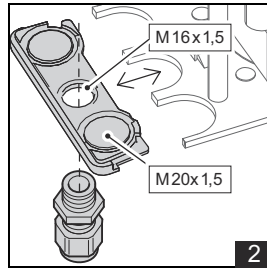
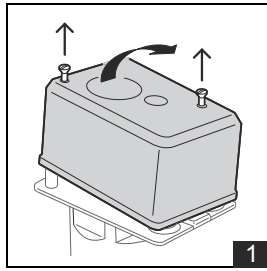
An M16x1.5 screw fitting is included with the delivery of the actuator as a strain relief device. For the actuator with auxiliary switches, the scope of delivery also includes an M20x1.5 screw connection. The electrical connection is established using screw terminals (connection diameter 0.3..2.3 mm).

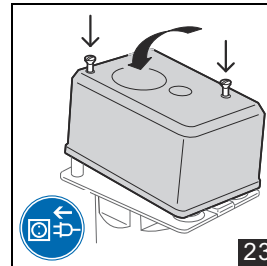
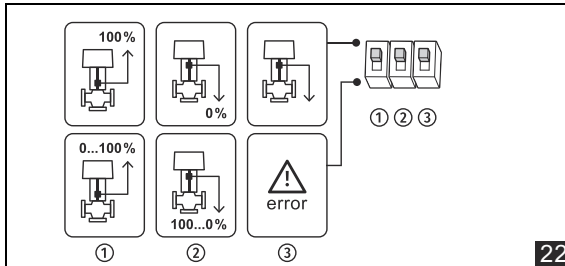
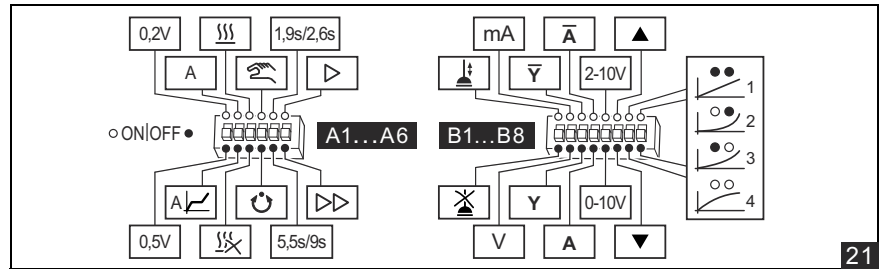
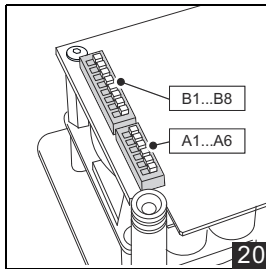
■ Electrical connection for MD100



- ▶ **1** Loosen both screws and remove the actuator cover.
- ▶ **2** Install the cable gland.
- ▶ **3** Insert the connection line through the cable gland.
- ▶ **4** Remove the connector from the actuator.
- ▶ **5** Carry out the electrical connection of the actuator as a fixed installation.
- ▶ **6** Insert the pre-assembled connection plug.
- ▶ **7 8** Tighten the cable gland by hand until it tightly closes the cable.
- ▶ **9 10** Adjust the actuator functions using the DIP switches (see page 36).
- ▶ **11** Return the actuator cover to its original position and fasten with two screws. Switch on the power supply.

■ Electrical connection for MD100-E





- ▶ **1** Loosen both screws and remove the actuator cover.
- ▶ **2** Install the first cable gland.
- ▶ **3** Insert the connection line (board) through the cable gland.
- ▶ **4** Remove the connector from the actuator.
- ▶ **5** Carry out the electrical connection of the actuator as a fixed installation.
- ▶ **6** Insert the pre-assembled connection plug.
- ▶ **7** Install the second cable gland.
- ▶ **8** Insert the connection line (of the auxiliary switches) through the cable gland.
- ▶ **9** Connect the PE cable of the PE terminal between the terminal clip and the square washer (Cupal washer), with the copper-coated side of the washer facing the terminal clip.
- ▶ **10** Route the connection line (of the auxiliary switches) through the auxiliary switch module bracket.
- ▶ **11 to 14** Carry out the electrical connection of the auxiliary switches as a fixed installation.
- ▶ **15** Attach the auxiliary switch module to the bracket.
- ▶ **16 17** Do not cross the connection lines.
- ▶ **18 19** Tighten the cable glands by hand until they tightly close the cable.
- ▶ **20 21** Adjust the actuator functions using the DIP switches (see page 36).
- ▶ **22** Adjust the auxiliary switch function using the DIP switches (see page 41)
- ▶ **23** Return the actuator cover to its original position and fasten with two screws. Switch on the power supply.

6.4 Commissioning

6.4.1 Commissioning steps

Adjustment of the actuator functions

The preset actuator functions can be adapted with DIP switches A and B.

The switches are located under the actuator cover on the side of the circuit board.



CAUTION

Risk of short circuit! The tool used to actuate the DIP switches must not contact any conductive areas of the printed circuit board.

Function switch position ON	Switch (A)	Function switch position OFF (factory setting)
Actuating speed *1)		Actuating speed *1)
Actuating speed *1), (triggers init.)		Actuating speed *1), (triggers init.)
Manual adjustment		Automatic mode
Actuator heating: On (switched on with temperatures below 8 °C)		Actuator heating: Off
Feedback: absolute position *2)		Feedback: relative position *3)
Hysteresis: 0.2 V (0.4 mA)		Hysteresis: 0.5 V (1 mA)

*1) Setting the actuating speed

DIP switch A5	DIP switch A6	Actuating speed
OFF	OFF	5.5 s/mm
ON	OFF	1.9 s/mm
OFF	ON	9 s/mm
ON	ON	2.6 s/mm

The value 9 s/mm is reached via interval travel (1.5 s travel at 5.5 s/mm / 1 s break).

*2) Absolute position:

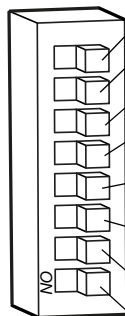
Regardless of the set valve characteristic curve, Y_{out} may deviate from Y_{in} when the setting position is reached. Example: equal percentage characteristic curve:

$Y_{in}=4\text{ V} \rightarrow Y_{out}=3.5\text{ V}$

*3) Relative position:

Regardless of the set valve characteristic curve $Y_{in} = Y_{out}$ when the setting position is reached.

Funktion Schalterstellung ON	Schalter (B)	Funktion Schalterstellung OFF (Werkseinstellung)
Kennlinie *4)	8	Kennlinie *4)
Kennlinie *4)	7	Kennlinie *4)
Sicherheitsendlage: ziehen	6	Sicherheitsendlage: drücken
Stellbereich (Yin + Yout): 2..10 V (4..20 mA) → 0..100 % *5)	5	Stellbereich (Yin + Yout): 0..10 V (0..20 mA) → 0..100 %
Invertierung (Yout): 0..100 % → 10..0 V (20..0 mA) 	4	Invertierung (Yout): 0..100 % → 0..10 V (0..20 mA) 
Invertierung (Yin und Klemme 2, 3): *6) 0..10 V (0..20 mA) → 100..0 % 	3	Invertierung (Yin und Klemme 2, 3): 0..10 V (0..20 mA) → 0..100 % 
Signal (Yin + Yout): mA	2	Signal (Yin + Yout): V
VBS: An	1	VBS: Aus



*4) Adjusting the characteristic curve

DIP switch B7	DIP switch B8	Characteristic curve
OFF	OFF	Characteristic curve 1
ON	OFF	Characteristic curve 2
OFF	ON	Characteristic curve 3
ON	ON	Characteristic curve 4



NOTE

The characteristic curve to be set always depends on the system hydraulics and must be adapted individually. In most use cases, the characteristic curve 1 (factory setting) is recommended, not inverted (DIP switch B3 = OFF).

*5) Setting range (Yin + Yout):

If the setting range of 2...10 V (4...20 mA) is switched on, the wire breakage detection is active. In this case, if the controller outputs 0 V (0 mA) instead of 2 V (4 mA) for 0%, the actuator does not move to the 0 position, but to the set safety limit position see page S. 44).

*6) Inversion of the actuating signal Yin and at terminals 2 and 3.



NOTE

Y = DC 10 V or connection terminal 2 occupied = valve spindle pulled (factory setting B3 = OFF)
Y = DC 0 V or connection terminal 3 occupied = valve spindle pushed (factory setting B3 = OFF)



CAUTION

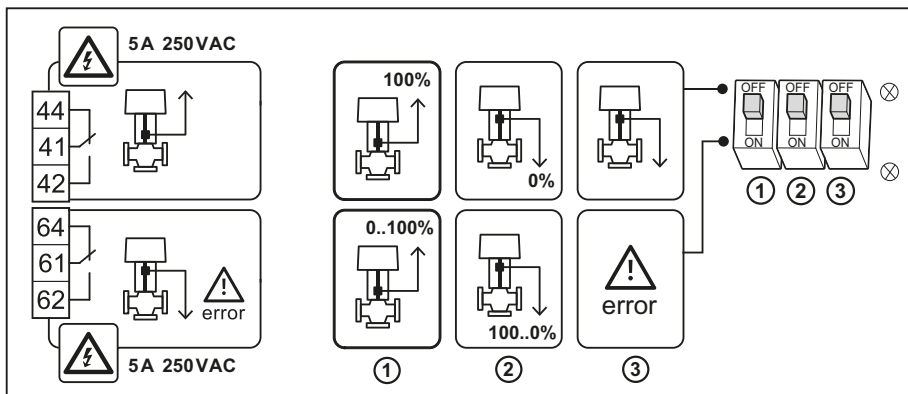
The actuator heating and valve blocking protection functions take effect only during two-point operation, three-point operation with position feedback and constant operation because the actuator must be permanently supplied with voltage to do so.

Adjustment of the auxiliary switch functions only for MD100-E

The auxiliary switch module has two galvanically isolated changeover contacts for optional signaling of the valve positions open, closed, two valve positions (adjustable) or fault signal.

The auxiliary switch functions can be adapted with DIP switches 1 to 3.

The DIP switches are located laterally under the actuator cover.



Changer 1 = terminal 42, 41 and 44

Changer 2 = terminal 62, 61 and 64

DIP switch	Position	Description
1	OFF	Changer 1 closes terminals 41 and 44 in the upper end position, the upper LED lights up.
1	ON	When the DIP switch is switched from the OFF to the ON position, the current valve position is saved. Changer 1 switches at this position on the way to the upper end position.
2	OFF	Changer 2 closes terminals 61 and 64 in the lower end position, the lower LED lights up.
2	ON	When the DIP switch is switched from the OFF to the ON position, the current valve position is saved. Changer 2 switches at this position on the way to the lower end position.
3	OFF	Changer 2 switches according to the settings of DIP switch 2.
3	ON	Changer 2 switches when an error is detected. The settings of DIP switch 2 are ineffective.

Factory setting: all DIP switches in the OFF position

Switching on the power supply

The LED (1) flashes green.

Initialization, adjustment to the valve stroke

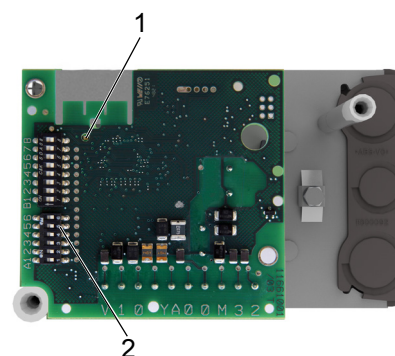
The one-off initialization run for adjusting to the valve stroke starts automatically during initial commissioning.

Initialization only occurs if the actuator is in automatic mode (see manual adjustment / automatic mode page 43).

During the initialization the valve is opened once fully and closed. The stroke is learned.

In this case, the feedback is passed via Yout with a signal of approx. 12.5 V or 0 mA

The LED (1) flashes green during the initialization. The completed initialization is indicated with a constant light.



- 1 LED
- 2 DIP switch A5



NOTE

When the unit is remounted (or after any settings for the maximum flow value on the valve have been changed), you must adapt the valves again by performing a reinitialization.

- ▶ To do this, switch DIP switch A5 (2) back and forth (change the switch position).



CAUTION

The power supply must not be interrupted or clocked during the automatic initialization run when the unit is put into operation or after a manual triggering of an init.

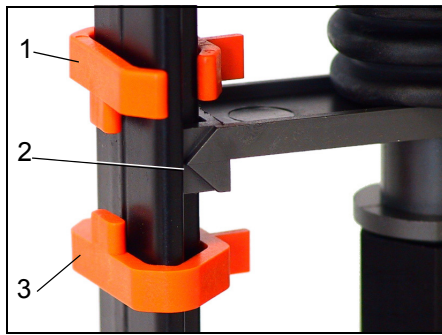
Due to voltage interruption or clocking during initialization, the initialization run is interrupted and the valve adaptation is not carried out completely

6.4.2 Status of the LED displays

LED under the actuator cover	Meaning
LED constant green	Normal operation / automatic mode
LED flashing green	VBS (valve blocking protection)
	Initialization (valve adaption)
	Safety limit position
LED rapidly flashing alternately green/orange	Wire breakage at DIP switch B5 = ON and $Y_{in} < 1\text{ V}$ or 2 mA
LED alternately flashing green/orange	Manual adjustment or manual operation (Stop) / Actuator not following actuating signal
LED constant red	Insoluble blockage
LED flashing red	Initialization failed / actuator following the actuating signal
LED quick flashing red	Operating voltage is too low

6.5 Actuator functions

Position display at the actuator



- (1) Position mark for upper valve position
- (2) Current stroke position
- (3) Position mark for lower valve position

Automatic removal algorithm for blocking with malfunction message

If a blocking by foreign bodies in the pipeline occurs within the valve lift, the actuator signals this fault at the connection terminal A by the following feedback signals:

- approx. 12.5 V DC, if the signal is set to V (B2=OFF)
- 0 mA if the signal is set to mA (B2=ON)

Using an automatic rectification algorithm, the actuator then attempts to remove the valve blockage itself several times by raising the poppet for a brief period of time.

Switchable limit position hysteresis

The limit position hysteresis is the point at which the actuator travels to the limit position.

For the hysteresis, the values 0.5 V (1 mA) or 0.2 V (0.4 mA) are set via DIP switch A1.

Example: At hysteresis 0.5 V, the limit position is approached at $Y_{in} < 0.5 \text{ V}$ and $> 9.5 \text{ V}$.

Feedback

The feedback is inverted separately from Y_{in} via DIP switch B4.

The feedback output can be switched between absolute and relative position via DIP switch A2. The signal is output in 2..10 V or 4..20 mA when DIP switch B5 is in the ON switch position.

Actuator heating

The actuator heating is for preventing the buildup of condensation at low temperatures.

This function is activated via DIP switch A3.

Manual mode

You can switch from automatic operation to manual operation using an external operating mode switch (see page 39). The actuator is then activated or set to stop via the electrical connections on terminal 2 or 3. The continuous Y input signal is overlaid. In manual mode, there are the states **auto-matic mode / stop / shut / open**.



NOTE

The limit position will resynchronize by moving to the safety limit position when changing from stop to automatic operation.

Priority switching

Priority switching at terminals 2 or 3 (page 33) is a direct control and overlays the constant Y input signal for a valve position Open or Closed (e.g. frost protection or limitation).

VBS (valve blocking protection)

If plant specifications permit, the valve blocking protection feature may be activated during commissioning.

Valve blocking protection prevents the poppet from jamming when the valve is not moved for a long period of inactivity, e.g. for heating systems during the summer.

If the valve blocking protection is activated, the valve poppet is raised one half stroke and back if no stroke movement has been performed within 21 days.

This functionality can be switched on via DIP switch B1.

Safety limit position / resynchronizing the limit position

Operating mode	Behavior
Continuous control / Automatic operation	After a voltage reset, after ending manual operation (stop) or after ending manual adjustment using the DIP switch, the limit position is resynchronized by way of movement to the safety limit position.
2- or 3-point control / automatic operation	After using the DIP switch to end manual adjustment, the limit position is resynchronized by way of movement to the current limit position.
Manual operation (open/closed) or priority switching (open/closed)	After ending manual adjustment via the DIP switch or after a voltage reset, the limit position is resynchronized by way of movement to the current limit position.

The direction of the safety limit position can be set via DIP switch B6.

In addition, the safety limit position is approached if a wire breakage is detected (see wire breakage detection).

In this case, the feedback is passed via Yout with a signal of approx. 12.5 V or 0 mA, depending on the position of DIP switch B2.

Dynamic Yin damping / compensation for external interferences

To prevent the actuator from linking external interferences on control line Y, the input hysteresis band is automatically enlarged.

If the fault no longer occurs, the hysteresis is reset to minimal values again.

This function largely prevents external interferences, and unnecessary temperature fluctuations and actuator and valve wear are avoided.

Wire breakage detection

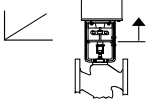
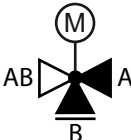
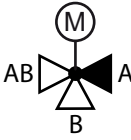
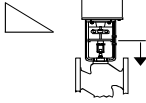
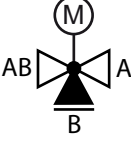
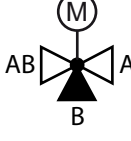
This function is active by setting the setting range to 2..10 V or 4..20 mA (DIP switch B5).

If no input signal is detected in continuous operation, the actuator moves into the safety limit position. This limit position can be selected with the switches B6 (factory settin: pull).

In this case, the feedback is passed via Yout with a signal of approx. 12.5 V or 0 mA.

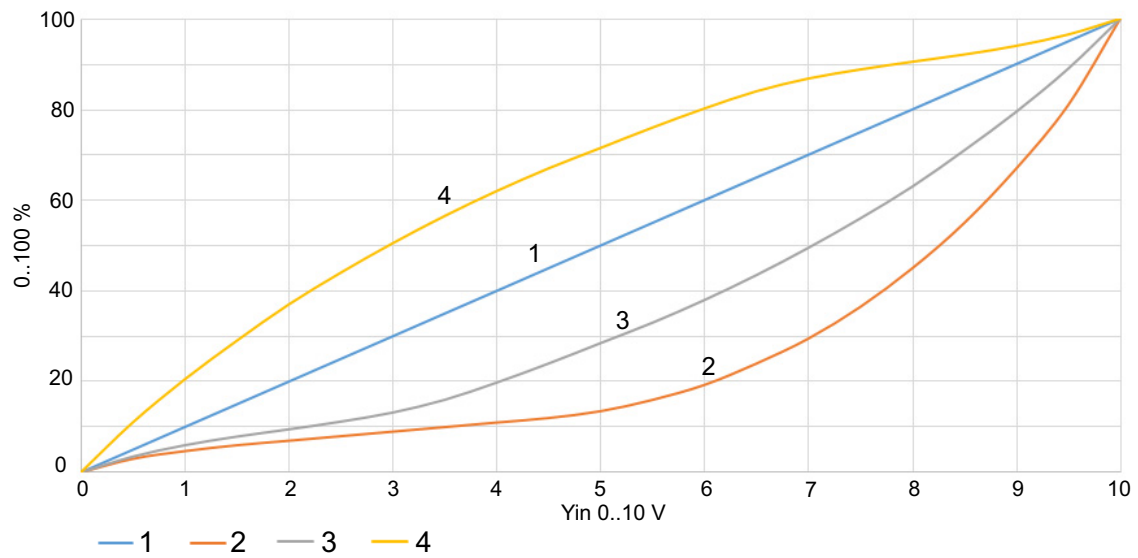
Inversion (OFF or ON) of the actuating direction

The following flow directions can be achieved by inverting the control signal $Y_{in} = 0..10\text{ V}$ ($0..20\text{ mA}$) or terminals 2 and 3 using DIP switch B3:

Actuating direction	Two-way valve			Three-way valve
	RGD..	RBQ..	RK-BF/RB-BK/RF-BF..	RK/RB/RF/RWG..
DIP switch B3 = OFF  Y = 10 V DC (20 mA), Voltage at terminal 2				
DIP switch B3 = ON  Y = 10 V DC (20 mA), voltage at terminal 2				
 = open  = closed  = sealed at the flange				

Characteristic curves 1 to 4

- DIP switch B3 = OFF

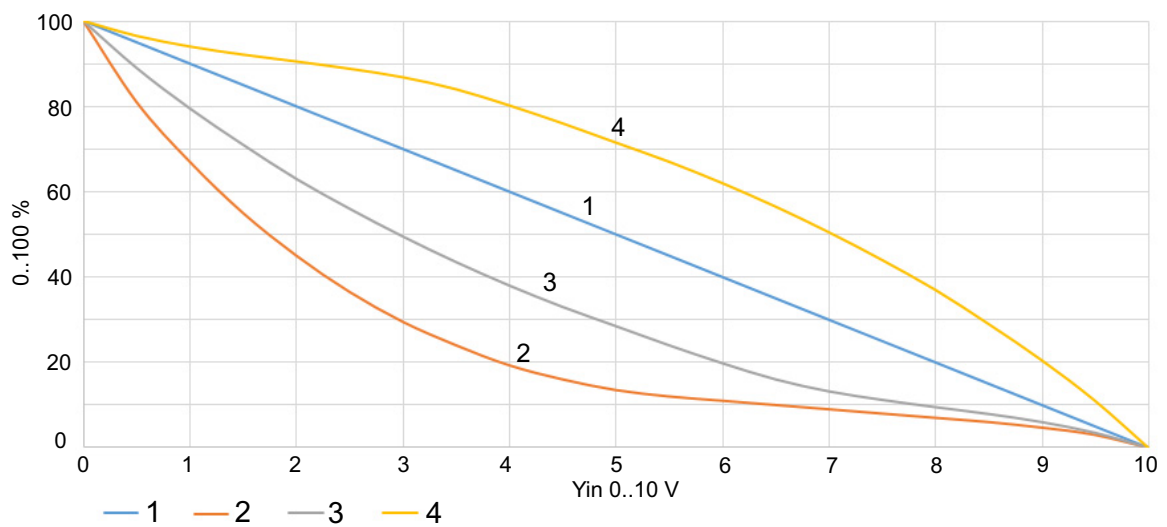


NOTE

Characteristic curves can be inverted at any time using DIP switch B3

Characteristic curves 1 to 4 inverted

- DIP switch B3 = ON



6.6 Priorities of operating mode feedback

Priority	Operating mode	Feedback signal
1	Manual adjustment	Malfunction message 12.5 V or 0 mA
2	Init. (Automatic or via DIP switch)	Malfunction message 12.5 V or 0 mA
3	Priority switching 2 = 0 V (pull valve spindle)	Position 0..100 %
4	Priority switching 3 = 0 V (press valve spindle)	Position 0..100 %
5	Manual operation (stop) M = open (only after M was 0 V (wire breakages))	Malfunction message 12.5 V or 0 mA
6	VBS	Position 0..100 %
7	2P/3P operation 2 = 24 V (pull valve spindle)	Position 0..100 %
8	2P/3P operation 3 = 24 V (press valve spindle)	Position 0..100 %
9	Constant control (Yin)	Position 0..100 %

7 Maintenance

Maintenance

The actuator does not require maintenance.

Cleaning

The actuator does not require cleaning.



NOTE

Regular inspection of the plant, including functional testing of the actuator, is recommended.

8 Faults and remedial measures



WARNING

Hot and cold surfaces!

If a hardware or software error occurs, there may be unexpected movements and the valve may open. There is a risk of severe burns or hypothermia from contact with hot or cold surfaces on the valves and pipelines.

- ▶ Wear protective gloves

Error	Cause	Rectification
Actuator not moving, LED off	Power outage	▶ Determine the cause and rectify it.
	Actuator is connected incorrectly	▶ Check the connection and correct.
	Main circuit board defective	▶ Contact your Kieback&Peter contact person.
Actuator not moving, LED alternately flashing green/orange	Due to the later removal of the wire jumper, the actuator is in manual mode (stop)	▶ Trigger initialization or set the bridge between 0 and M
Actuator not moving, LED alternately flashing green/orange	Actuator is not in automatic mode	▶ Set DIP switch position A4 to OFF
Actuator instable when running	Voltage drop due to the connection line being too long and/or the cross section being too small	▶ Measure the operating voltage. Recalculate the electrical connection lines and replace.
	Power supply fluctuations greater than the permitted tolerance	▶ Improve the electrical system conditions.
Actuator stops every so often	Supply line has a loose connection	▶ Check and tighten the connections to the terminal strip.
Actuator not moving or not moving correctly to the valve position dictated by the input signal, valve not closing or opening	Valve is jammed	▶ Ensure the valve can travel freely or replace the valve.
	Pressure difference too high	▶ Set the pressure difference correctly.
	Main circuit board defective	▶ Contact your Kieback&Peter contact person.

9 Repair

At the installation location, the valve/actuator combination can only be repaired by replacing the valve or actuator. Get in touch with your contact at Kieback&Peter.

10 Decommissioning, Removal and Disposal

10.1 Decommissioning and dismantling the actuator



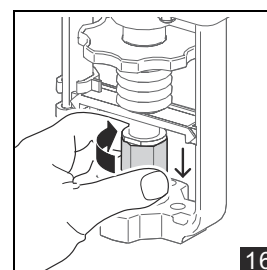
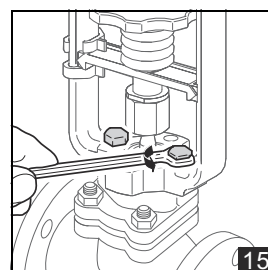
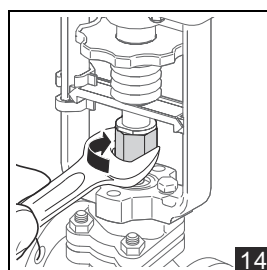
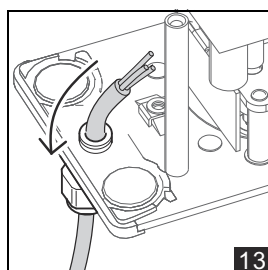
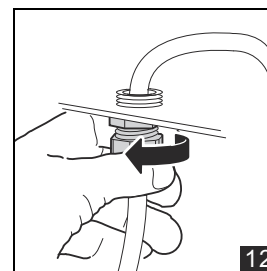
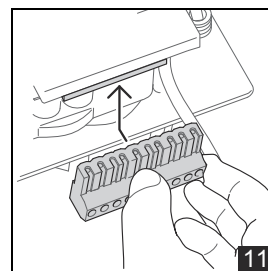
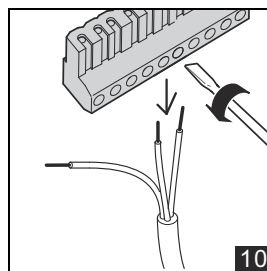
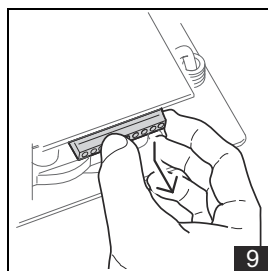
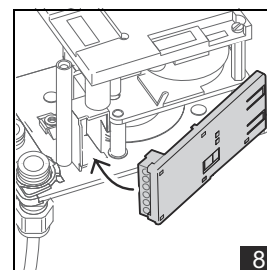
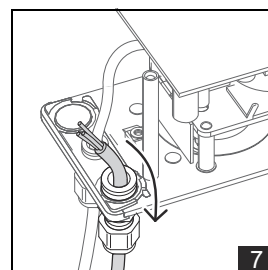
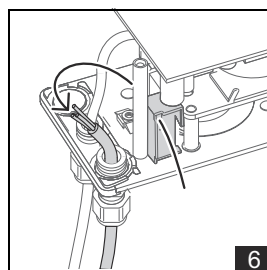
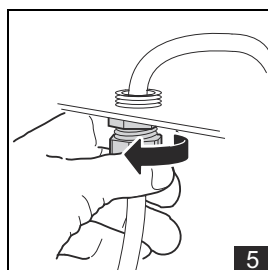
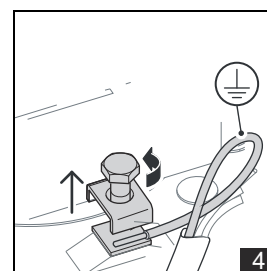
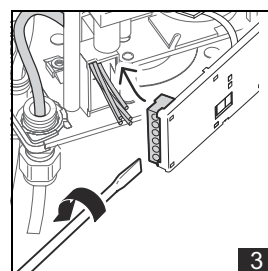
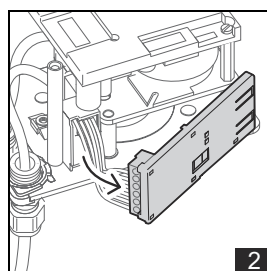
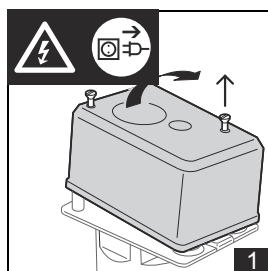
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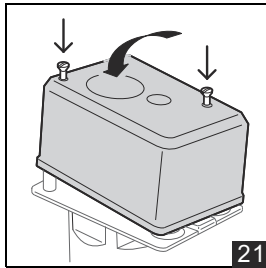
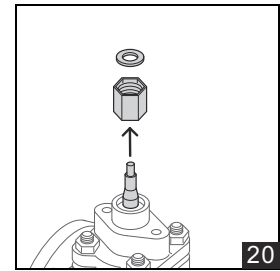
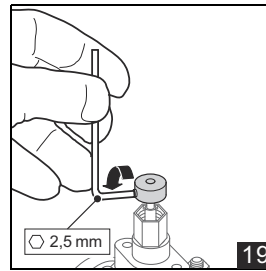
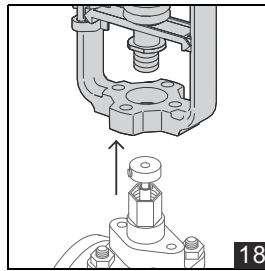
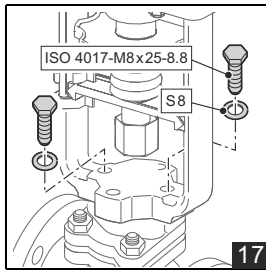
Hot and cold surfaces!

If a hardware or software error occurs, there may be unexpected movements and the valve may open. There is a risk of severe burns or hypothermia from contact with hot or cold surfaces on the valves and pipelines.

- ▶ Wear protective gloves

- Before beginning to dismantle the unit, 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, you can begin to dismantle the actuator.





NOTE

Disassembly steps 2 to 8 are only required for MD100-E.

- ▶ Using an actuating signal or manual adjustment (by turning with a 4 mm Allen key), move the actuator out of the end position to a position in the middle.
- ▶ **1** Disconnect the actuator from power.
Loosen both screws and remove the actuator cover.
- ▶ **2** Remove the auxiliary switch module from the bracket.
- ▶ **3** Detach the electrical lines from the auxiliary switch connector.
- ▶ **4** Disconnect the PE cable from the PE terminal.
- ▶ **5 6 7** Remove the cable gland and disconnect the connection cable from the actuator.
- ▶ **8** Reconnect the auxiliary switch module.
- ▶ **9** Remove the connector from the actuator.
- ▶ **10** Loosen the electrical connections from the connector.
- ▶ **11** Re-insert the connector.
- ▶ **12 13** Remove the cable gland and disconnect the connection cable from the actuator.
- ▶ **14** Loosen the console screws.
- ▶ **15** Remove both console screws with washers.
- ▶ **16 17** Loosen the union nut and remove the actuator from the valve.
- ▶ **18** Remove the actuator from the valve.
- ▶ **19** Loosen the threaded pin with drive ring using a 2.5 mm hexagon socket. The valve spindle is loosened. Remove the drive ring from the valve spindle.
- ▶ **20** Remove the circlip and the union nut from the valve spindle.
- ▶ **21** Return the actuator cover to its original position and fasten with two screws.



NOTE

For RBQ65..100 valves, the Z224-2 adapter also has to be removed. For further information, see the Z224-2 mounting instructions, document no. 3.10-20.025-99.

10.2 Removing the valve

- ▶ No differential pressure must occur on the valve body. Close the gate valve and turn off pumps.
- ▶ Loosen the screw fittings between the pipeline and the valve connections.
- ▶ Remove the valve from the pipeline.

10.3 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. 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.

11 Contact persons

Orders and questions

If you want to submit an order, have questions or require technical information, please contact your Kieback&Peter contact person.

Repair service

If your device has a defect, contact your Kieback&Peter contact person to clarify how to proceed.

12 Declaration of conformity

EN

Kieback&Peter



EU-DECLARATION OF CONFORMITY

Kieback&Peter GmbH & Co. KG
Tempelhofer Weg 50
12347 Berlin / Germany

Authorized Representative for Documentation:
Lydia Bruchno / Eva Franke

declares in sole responsibility that the designated product

actuator

MD100

in combination with the **valves** of the series

RK/ RB/ RF/ RGD/ RWG/ RBQ

to which this declaration refers, corresponds to the requirements which are stipulated in the following European directives:

- **2006/42/EG** Directive Machinery
- **2014/35/EU** Low Voltage Directive
- **2014/30/EU** electromagnetic compatibility
- **2011/65/EU** Restriction of certain Hazardous Substances

Harmonised standards applied:

DIN EN 60730-2-14:2019-10
DIN EN ISO 12100:2011-03

Signed for and on behalf of:

(ppa. Philipp Menzel)

Managing Director
Product & Solutionmanagement

(ppa. Rainer Mahling)

Managing Director
Solution & Support Center

Berlin,
10/02/26

QM-F-060 | Rev. 3.0 vom 15.01.2026
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Klassifizierung: Öffentlich



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