

Product Description**M250 and M250A90 Actuator**

with Two-way/Three-way Valves of the RK/RF/RD/RWD/RGD/RWG Series

M250 and M250A90 Actuator

with Two-way/Three-way Valves of the RK/RF/RD/RWD/RGD/RWG Series

Connection

M250 for 3-point control 230 V AC with straight-way and 3-way valves.

M250A90 for 3-point control 24 V AC with straight-way and 3-way valves.



Änderungen vorbehalten - Contents subject to change - Sous réserve de modifications - Reservado el derecho a modificación - Wijzigingen voorbehouden - Con riserva di modifiche - Innehåll som skall ändras - Změny vyhrazeny - Zmiany zastrzeżone - Возможны изменения - A változtatások jogát fenntartjuk - 保留未经通知而改动的权力

M250 and M250A90 Actuator

with Two-way/Three-way Valves of the RK/RF/RD/RWD/RGD/RWG Series

Product Description

Content	Page
Important Information Regarding Product Safety.....	3
M250 and M250A90 actuator.....	4
Application.....	4
Item	4
Technical Data	4
Accessories (not included in delivery).....	4
Dimensions	5
Connection	1
Manual/Automatic Mode	6
Installation	7
RK65..100(-BF)M250(A90) Three-Way/Two-Way Valve with Actuator	9
Types	9
Technical Data: RK..(-BF) Valves	9
RF65..100(-BF)M250(A90) Three-Way/Two-Way Valve with Actuator.....	11
Types	11
Technical Data: RF..(-BF) Valves	11
RD65..100M250(A90) Two-Way Valve with Actuator	13
Types	13
Technical Data: RD.. Valves	13
RWD65..100M250(A90) Three-Way Valve with Actuator	15
Types	15
Technical Data: RWD.. Valves.....	15
RGD50..100M250(A90) Two-Way Valve with Actuator	17
Types	17
Technical Data: RGD.. Valves	17
RWG50..100M250(A90) Three-Way Valve with Actuator	19
Types	19
Technical Data: RWG.. Valves.....	19
Valve Installation	21
Valve Cross-Sections with Flow Directions.....	22
Installation of the M250 and M250A90 actuator.....	23
Commissioning.....	24
General Information	24

Product Description**M250 and M250A90 Actuator**
with Two-way/Three-way Valves of the RK/RF/RD/RWD/RGD/RWG Series**Important Information Regarding Product Safety****Safety Instructions**

This data sheet contains information on installing and commissioning the product "M250, M250A90". Each person who carries out work on this product must have read and understood this data sheet. If you have any questions that are not resolved by this data sheet, you can obtain further information from the supplier or manufacturer.

If the product is not used in accordance with this data sheet, the protection provided will be impaired.

Applicable regulations must be observed when installing and using the device. Within the EU, these include regulations regarding occupational safety and accident prevention as well as those from the VDE (Association for Electrical, Electronic & Information Technologies). If the device is used in other countries, it is the responsibility of the system installer 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 due to technical training, knowledge and experience as well as knowledge of the appropriate regulations.

Legend**WARNING**

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

**CAUTION**

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

**NOTICE**

Indicates a hazard of medium risk which can result in material damage or malfunctions if it is not avoided.

**NOTE**

Indicates additional information that can simplify the work with the product for you.

Notes on Disposal

For disposal, the product is considered waste from electrical and electronic equipment (electronic waste) and must not be disposed of as household waste. Special treatment for specific components may be legally binding or ecologically sensible. The local and currently applicable legislation must be observed.

M250 and M250A90 Actuator

with Two-way/Three-way Valves of the RK/RF/RD/RWD/RGD/RWG Series

Product Description**M250 and M250A90 actuator****Application**

The M250 and M250A90 compact actuator, with a positioning force of 1,600 N, is used for fine stroke adjustment of two-way and three-way valves of types RK65..100(-BF), RF65..100(-BK), RD65..100(-BF), RWD65..100, RGD50..100 and RWG50..100.

The actuators are controlled with a 3-point signal (Open/Stop/Closed).

**Item**

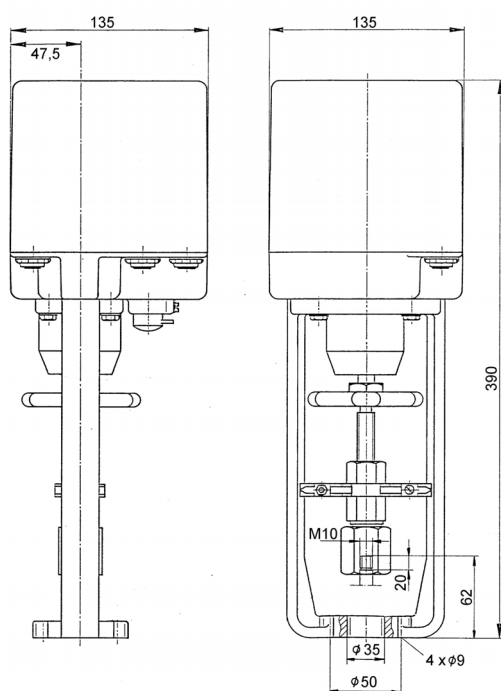
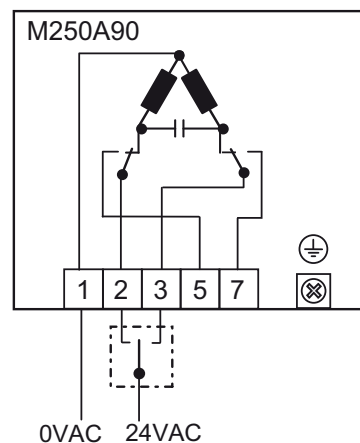
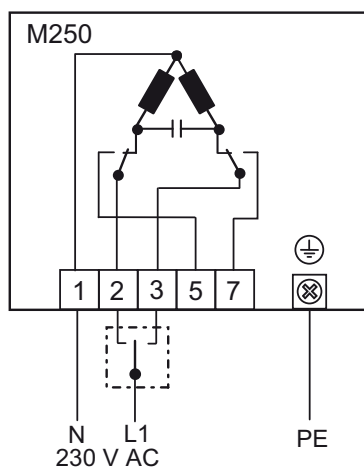
M250	AC 230 V actuator with 3-point control
M250A90	AC 24 V actuator with 3-point control

Technical Data

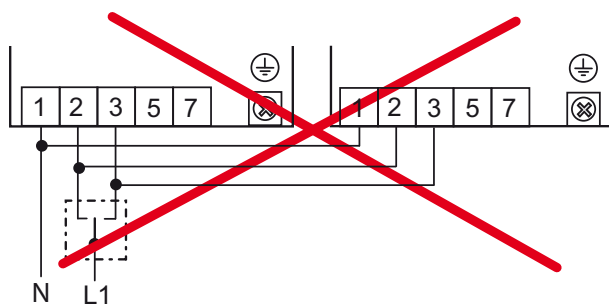
Nominal voltage	M250	AC 230 V \pm 10%, 7.5 VA
	M250A90	AC 24 V \pm 10%, 7.9 VA
Actuator	Reversible synchronous motor	
Limit stop	Force-dependent motor switch-off via micro-switches at the valve end positions	
Control	3-point signal (Open/Stop/Closed)	
Hub	Max. 30 mm, automatic limit stop via micro-switches	
Position indicator	Bridge within the position marks on the actuator	
Travel time	6.6 s/mm nominal stroke, approx. 200 s for 30 mm nominal stroke	
Positioning force	1,600 N	
Ambient temp.	0 to 50 °C	
Degree of protection	IP54	
Protection class	I in accordance with EN 60730 M250 III in accordance with EN 60730 M250A90	
Installation position	Anywhere from vertical above the valve to a horizontal position	
Manual mode	By means of lifting button and handwheel on actuator	
Maintenance	The working drive is maintenance-free. Depending on the operating conditions, the threaded spindle should be greased as needed.	
Weight	3.5 kg	

Accessories (not included in delivery)

E/M200-M300	Switch module with two additional end switches, voltage-free, max. AC 250 V, 3 A; feedback about both valve end positions (open/closed).
R1/M200/100	Potentiometer module with potentiometer 100 Ω for position feedback
R1/M200/1000	Potentiometer module with potentiometer 1000 Ω for position feedback

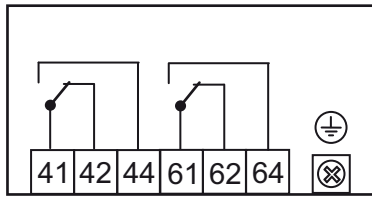
Product Description**M250 and M250A90 Actuator**
with Two-way/Three-way Valves of the RK/RF/RD/RWD/RGD/RWG Series**Dimensions****Connection****NOTICE**

Connecting additional actuators in parallel is not allowed because they will affect each other.

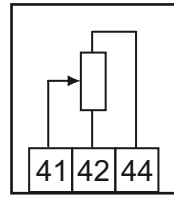


M250 and M250A90 Actuator

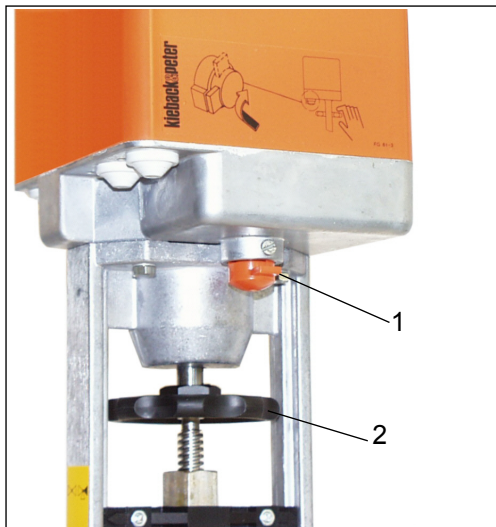
with Two-way/Three-way Valves of the RK/RF/RD/RWD/RGD/RWG Series

Product Description**Connecting Accessories**

Additional end switch E/M200-M300,
Max. AC 250 V, 3 A



Feedback resistor R1/M200/1000, R1/M200/1000

Manual/Automatic Mode

(1) Lifting button
(2) Handwheel

- ▶ Press the red lifting button (1) and engage (quarter turn) for manual mode.
- ▶ Adjust manually by turning the handwheel (2).
- ▶ To return to automatic mode, the lifting button (1) must be disengaged again.

Product Description**M250 and M250A90 Actuator**
with Two-way/Three-way Valves of the RK/RF/RD/RWD/RGD/RWG Series**Installation****WARNING****Warning: Mains voltage AC 230 V.**

Electrical installation and unit connection may only be carried out by qualified technicians.

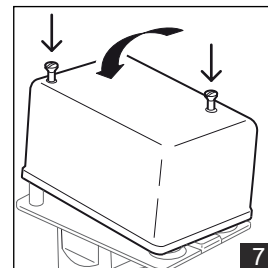
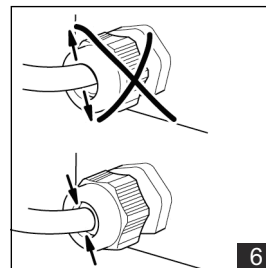
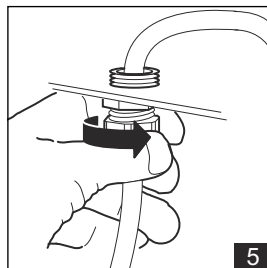
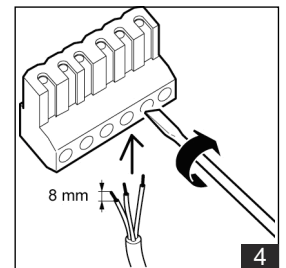
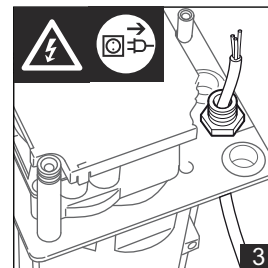
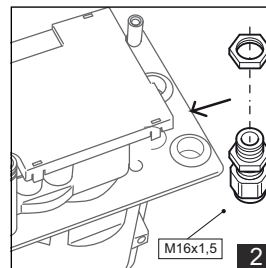
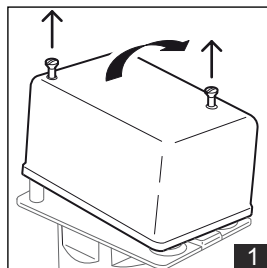
The mains supply may only be connected after the electrical installation.

Be sure to comply with VDE guidelines and local wiring regulations.

The device is connected according to the obligatory wiring diagram.

**CAUTION****The actuator must be electrically connected as a fixed installation.**

An M16 x 1.5 screw fitting (included in the scope of delivery of the actuator) is to be used as a strain relief device. The electrical connection is to be made using plug-in screw terminals (connection diameter 0.3 mm to 2.3 mm). Cables between the low voltage lines (AC 230 V) and the other lines (e.g. positioning feedback connection) must be routed separately.



M250 and M250A90 Actuator

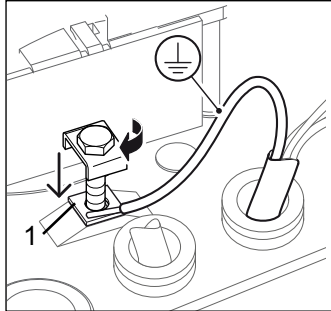
with Two-way/Three-way Valves of the RK/RF/RD/RWD/RGD/RWG Series

Product Description**WARNING**

If low voltage (AC 230 V is applied, the device must be installed to meet the requirements of protection class I.

The contacts on the end switches must only be used with voltages of the same installation category.

The wiring of the PE terminal must be connected between the terminal clip and the square washer (Cupal washer), with the copper-coated side of the washer facing the terminal clip.



Copper-coated side (1) of the square washer (Cupal washer)

Product Description**M250 and M250A90 Actuator**

with Two-way/Three-way Valves of the RK/RF/RD/RWD/RGD/RWG Series

RK65..100(-BF)M250(A90) Three-Way/Two-Way Valve with Actuator**Application**

The gray cast iron three-way valves and two-way valves with actuator M250(A90) are used for mixing liquids precisely.

The valves are used as two-way valves with the BF blank cover on gate B.

The actuator is controlled with a 3-point signal (Open/Stop/Closed).

Types

RK.. grey cast iron three-way valve with M250(A90) actuator for water up to 120 °C, 6 bar

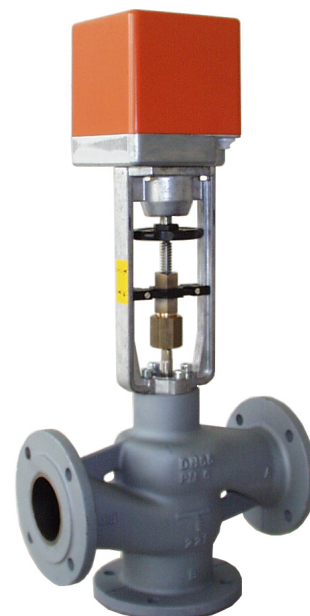
	DN	PN	kvs	Δp (bar)	Positioning time (s)	Weight (kg)
RK65/50M250	65	6	50	3,9	132	16,3
RK65M250	65	6	63	3,9	132	16,3
RK80/80M250	80	6	80	2,5	200	18,4
RK80M250	80	6	100	2,5	200	18,4
RK100/125M250	100	6	125	1,5	200	32,3
RK100M250	100	6	160	1,5	200	32,3

RK..-BF grey cast iron two-way valve with M250(A90) actuator for water up to 120 °C, 6 bar

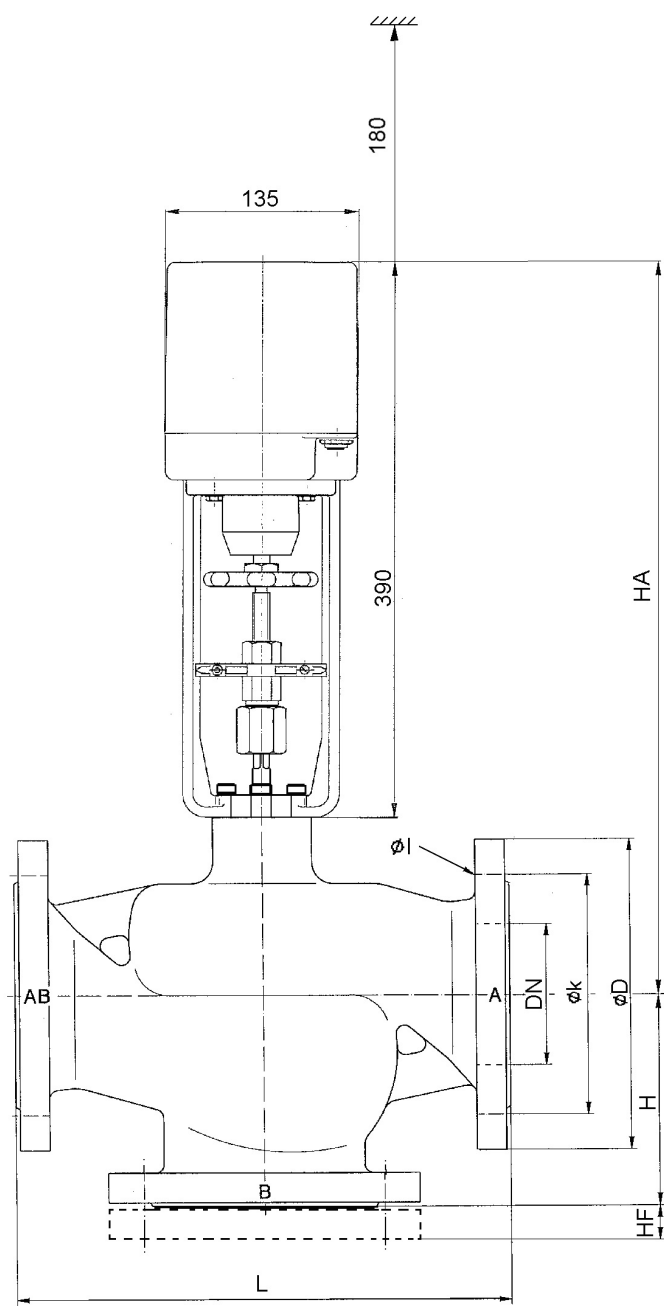
	DN	PN	kvs	Δp (bar)	Positioning time (s)	Weight (kg)
RK65/50-BFM250	65	6	50	3,9	200	16,3
RK65-BFM250	65	6	63	3,9	200	16,3
RK80/80-BFM250	80	6	80	2,5	200	22,3
RK80-BFM250	80	6	100	2,5	200	22,3
RK100/125-BFM250	100	6	125	1,5	200	32,3
RK100-BFM250	100	6	160	1,5	200	32,3

Technical Data: RK..(-BF) Valves

Nominal diameter	DN65 to 100
Pressure rating	PN 6
Connection	Flange in accordance with EN 1092-2 Type 21
Characteristic curve	RK.. Gates A → AB = same percentage Gates B → AB = linear
	RK..-BF Gates A → AB = same percentage
Nominal stroke	RK65(-BF): 20 mm RK80..100(-BF): 30 mm
Leak rate	In accordance with EN 1349, leakage class VI
Medium temperature	0 °C to 130 °C (max. 120 °C at 6 bar)
Housing	Gray cast-iron EN-JL1040
Cone	Brass CW614N
Valve spindle	CrMo steel 1.4122
Spindle seal	EPDM O-rings, maintenance-free



Dimensions



DN	L	H	HA	HF (RK..-BF)	Ø D	Ø k	Ø I
65	290	120	497	approx. 16	160	130	4x Ø 14
80	310	130	509	approx. 18	190	150	8x Ø 18
100	350	150	516	approx. 18	210	170	8x Ø 18
Dimensions L to I in mm							

Product Description**M250 and M250A90 Actuator**

with Two-way/Three-way Valves of the RK/RF/RD/RWD/RGD/RWG Series

RF65..100(-BF)M250(A90) Three-Way/Two-Way Valve with Actuator**Application**

The gray cast iron three-way valves and two-way valves with actuator M250(A90) are used for mixing liquids precisely.

The valves are used as two-way valves with the BF blank cover on gate B.

The actuator is controlled with a 3-point signal (Open/Stop/Closed).

Types

RF.. grey cast iron three-way valve with M250(A90) actuator for water up to 120 °C, 16 bar

	DN	PN	kvs	Δp (bar)	Positioning time (s)	Weight (kg)
RF65/50M250	65	16	50	3,8	132	23,3
RF65M250	65	16	63	3,8	132	23,3
RF80/80M250	80	16	80	2,4	200	28,2
RF80M250	80	16	100	2,4	200	28,2
RF100/125M250	100	16	125	1,5	200	36,5
RF100M250	100	16	160	1,5	200	36,5

RF....-BF grey cast iron two-way valve with M250(A90) actuator for water up to 120 °C, 16 bar

	DN	PN	kvs	Δp (bar)	Positioning time (s)	Weight (kg)
RF65/50-BFM250	65	16	50	3,8	132	23,3
RF65-BFM250	65	16	63	3,8	132	23,3
RF80/80-BFM250	80	16	80	2,4	200	28,2
RF80-BFM250	80	16	100	2,4	200	28,2
RF100/125-BFM250	100	16	125	1,5	200	36,5
RF100-BFM250	100	16	160	1,5	200	36,5

**Technical Data: RF..(-BF) Valves**

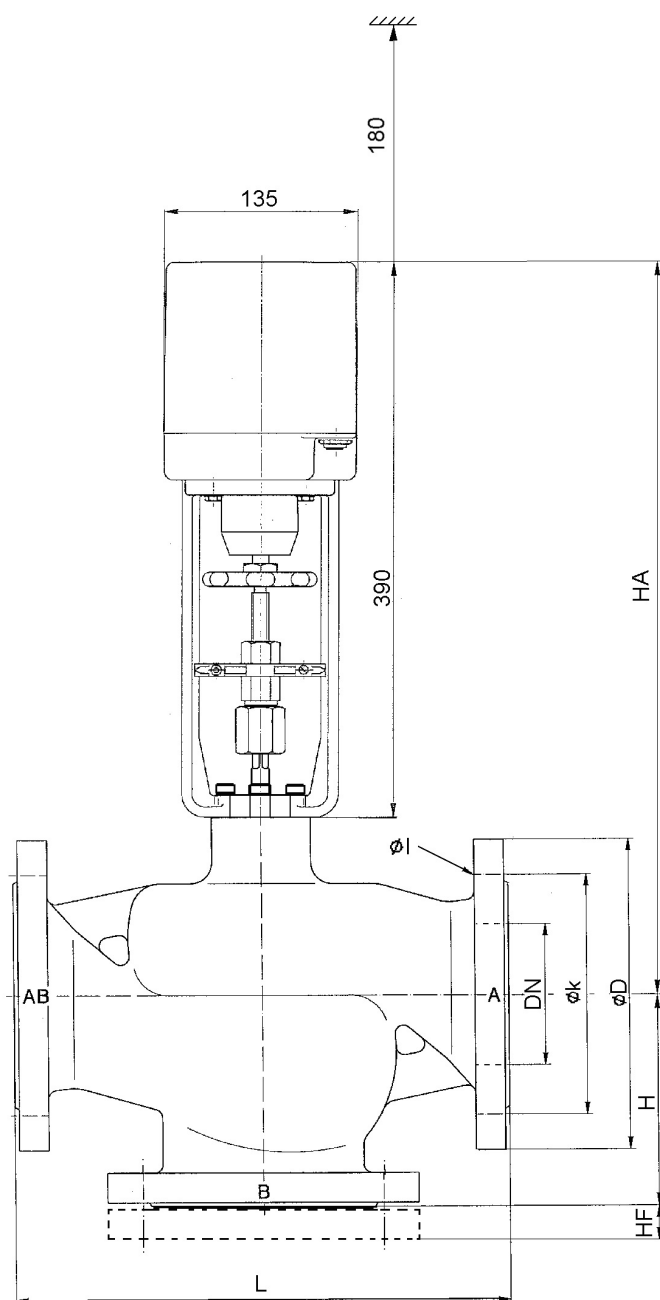
Nominal diameter	DN65 to 100
Pressure rating	PN 16
CE marking	CE marking, notified body: 0045
Connection	Flange in accordance with EN 1092-2 Type 21
Characteristic curve	RF.. Gates A → AB = same percentage Gates B → AB = linear RF..-BF Gates A → AB = same percentage
Nominal stroke	RF65(-BF): 20 mm RF80..100(-BF): 30 mm
Leak rate	In accordance with EN 1349, leakage class VI G1 (leak proof)
Medium temperature	0 °C to 130 °C (max. 120 °C at 16 bar)
Housing	Gray cast-iron GG25/ EN-JL1040
Cone	Brass CW614N
Valve spindle	CrMo steel 1.4122
Spindle seal	EPDM O-rings, maintenance-free

M250 and M250A90 Actuator

with Two-way/Three-way Valves of the RK/RF/RD/RWD/RGD/RWG Series

Product Description

Dimensions



DN	L	H	HA	HF (RK..-BF)	Ø D	Ø k	Ø I
65	290	120	497	approx. 20	185	145	4x Ø 18
80	310	130	509	approx. 22	200	160	8x Ø 18
100	350	150	516	approx. 22	220	180	8x Ø 18
Dimensions L to I in mm							

Product Description**M250 and M250A90 Actuator**

with Two-way/Three-way Valves of the RK/RF/RD/RWD/RGD/RWG Series

RD65..100M250(A90) Two-Way Valve with Actuator**Application**

The nodular iron two-way valves with M250(A90) actuator are used for mixing liquids, gases and vapors precisely.

The actuator is controlled with a 3-point signal (Open/Stop/Closed).

Types

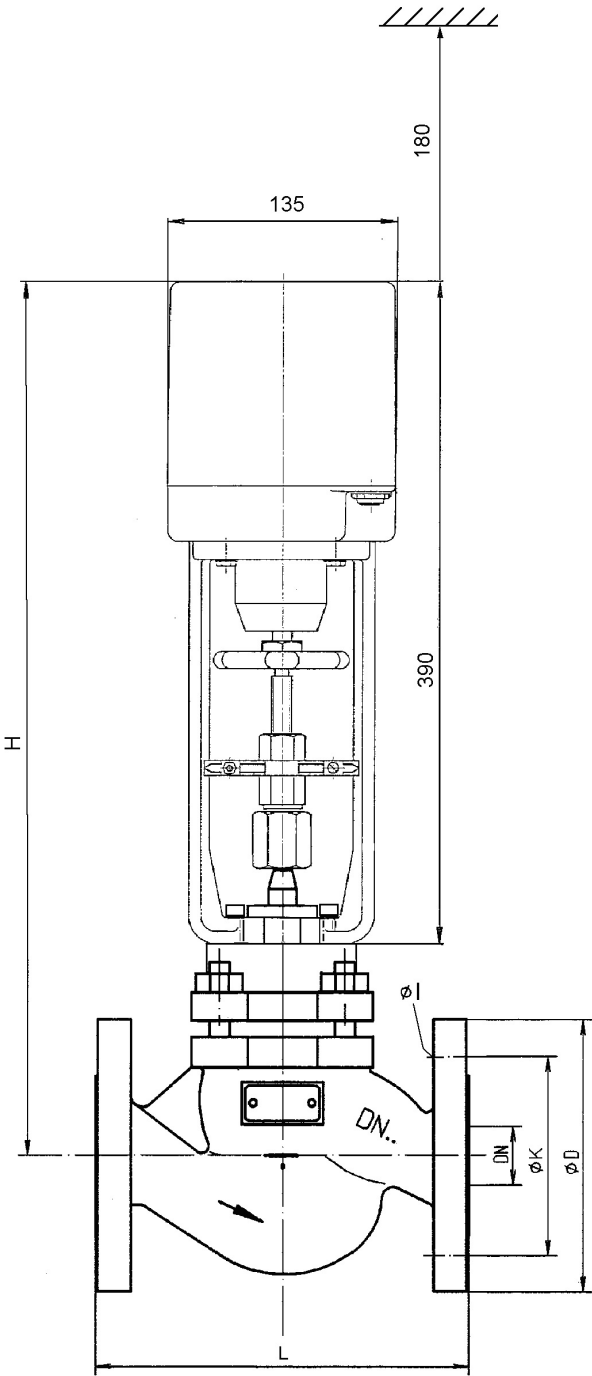
RD.. nodular iron two-way valves with M250(A90) actuator for water up to 120 °C, 16 bar, as well as for hot water and steam up to 200 °C, 13 bar

	DN	PN	kvs	Δp (bar)	Positioning time (s)	Weight (kg)
RD65M250	65	16	63	3	200	22,5
RD100M250	100	16	160	1	200	44,5

**Technical Data: RD.. Valves**

Nominal diameter	DN65 to 100
Pressure rating	PN16
CE marking	CE marking, notified body: 0045
Connection	Flange according to DIN, PN16
Characteristic curve	Equal percentage
Nominal stroke	30 mm
Leak rate	In acc. with EN 1349, leakage class IV
Medium temperature	0 °C to 200 °C
Housing	Nodular ironGGG-40.3
Seat ring	Stainless steel 1.4021
Cone	Stainless steel 1.4021
Valve spindle	Stainless steel 1.4021
Spindle seal	Univerdit gaskets with PTFE sleeve

Dimensions



DN	L	H	Ø D	Ø K	Ø I
65	290	512.5	185	145	4x Ø 18
100	350	547	220	180	8x Ø 18
Dimensions L to I in mm					

Product Description**M250 and M250A90 Actuator**

with Two-way/Three-way Valves of the RK/RF/RD/RWD/RGD/RWG Series

RWD65..100M250(A90) Three-Way Valve with Actuator**Application**

The nodular iron three-way valves with M250(A90) actuator are used for mixing liquids precisely.

The actuator is controlled with a 3-point signal (Open/Stop/Closed).

Types

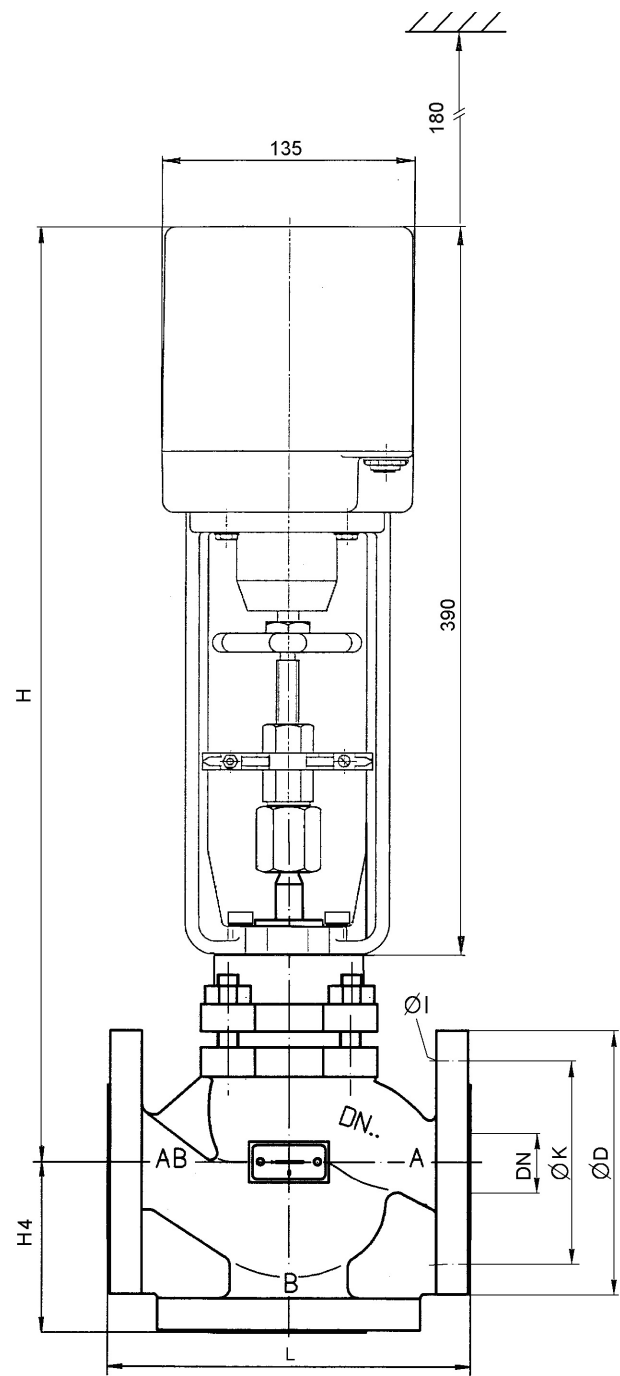
RWD.. nodular iron 3-way valve with M250(A90) actuator for water up to 120 °C, 16 bar, as well as for hot water and steam up to 200 °C, 13 bar

	DN	PN	kvs	Δp (bar)	Positioning time (s)	Weight (kg)
RWD65M250	65	16	63	3	200	32.5
RWD100M250	100	16	160	1	200	51.5

**Technical Data: RWD.. Valves**

Nominal diameter	DN65 to 100
Pressure rating	PN 16
CE marking	CE marking, notified body: 0045
Connection	Flange according to DIN, PN16
Characteristic curve	Gates A → AB = same percentage Gates B → AB = linear
Nominal stroke	30 mm
Leak rate	In accordance with EN 1349, leakage class VI
Medium temperature	0 °C to 200 °C
Housing	Nodular iron GG-40.3
Seat ring	Stainless steel 1.4021
Cone	Stainless steel 1.4021
Valve spindle	Stainless steel 1.45711
Spindle seal	Gaskets Univerdit with PTFE sleeve

Dimensions



DN	L	H	H4	Ø D	Ø K	Ø I
65	290	556	120	185	145	4x Ø 18
100	350	590.5	150	220	180	8x Ø 18
Dimensions L to I in mm						

Product Description**M250 and M250A90 Actuator**

with Two-way/Three-way Valves of the RK/RF/RD/RWD/RGD/RWG Series

RGD50..100M250(A90) Two-Way Valve with Actuator**Application**

The graphite cast-iron three-way valves with actuator M250(A90) are used for precisely regulating liquid and vapor flowrates.

The actuator is controlled with a 3-point signal (Open/Stop/Closed).

Types

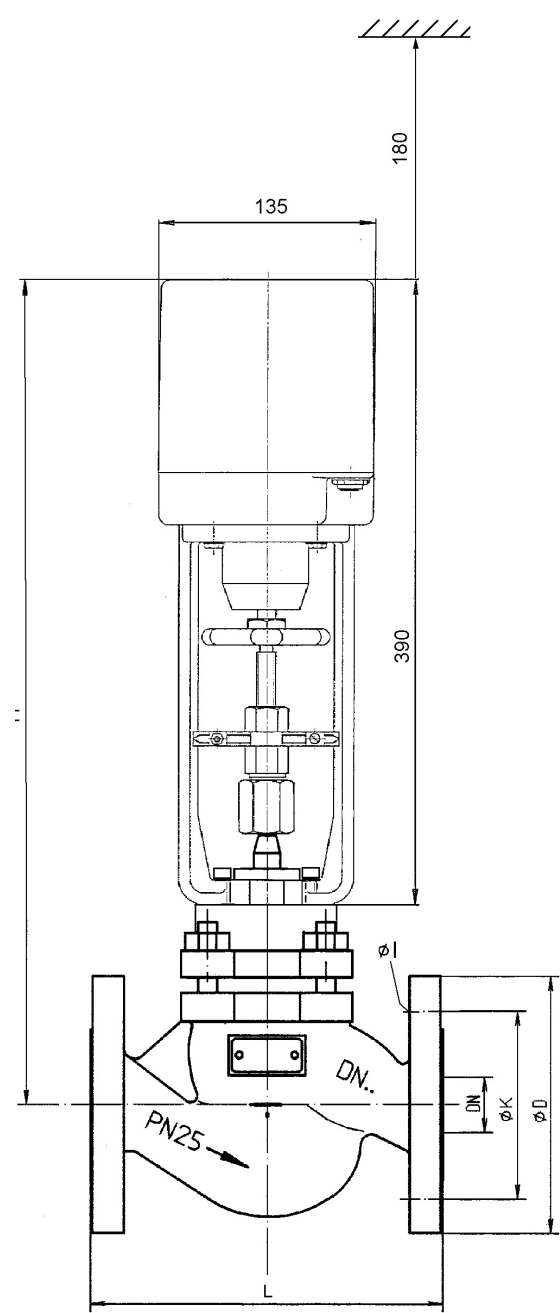
RGD.. nodular iron two-way valve with M250(A90) actuator for water up to 120°C, 25 bar and heating water and steam up to 200 °C, 20 bar.

	DN	PN	kvs	Δp (bar)	Positioning time (s)	Weight (kg)
RGD50M250	50	25	40	5,5	200	14,7
RGD65M250	65	25	63	3	200	22,5
RGD80M250	80	25	100	1,8	200	24,8
RGD100M250	100	25	160	1	200	36,1

**Technical Data: RGD.. Valves**

Nominal diameter	DN65 to 100
Pressure rating	PN 25
CE marking	CE marking starting from DN32, notified body: 0525
Connection	Flange according to DIN, PN25
Characteristic curve	Equal percentage
Nominal stroke	30 mm
Leak rate	In accordance with EN 1349, leakage class VI
Medium temperature	0 °C to 200 °C
Housing	Nodular ironGGG-40.3
Seat ring	Stainless steel 1.4021
Cone	Stainless steel 1.4571
Valve spindle	Stainless steel 1.4571
Spindle seal	Univerdit gaskets with PTFE sleeve

Dimensions



DN	L	H	Ø D	Ø K	Ø I
50	230	247	165	125	4xØ18
65	290	512.5	185	145	8xØ18
80	310	528.5	200	160	8xØ18
100	350	547	235	190	8xØ22
Dimensions L to I in mm					

Product Description

M250 and M250A90 Actuator
with Two-way/Three-way Valves of the RK/RF/RD/RWD/RGD/RWG Series

RWG50..100M250(A90) Three-Way Valve with Actuator**Application**

The graphite cast-iron three-way valves with actuator M250(A90) are used for precisely regulating liquids.

The actuator is controlled with a 3-point signal (Open/Stop/Closed).

Types

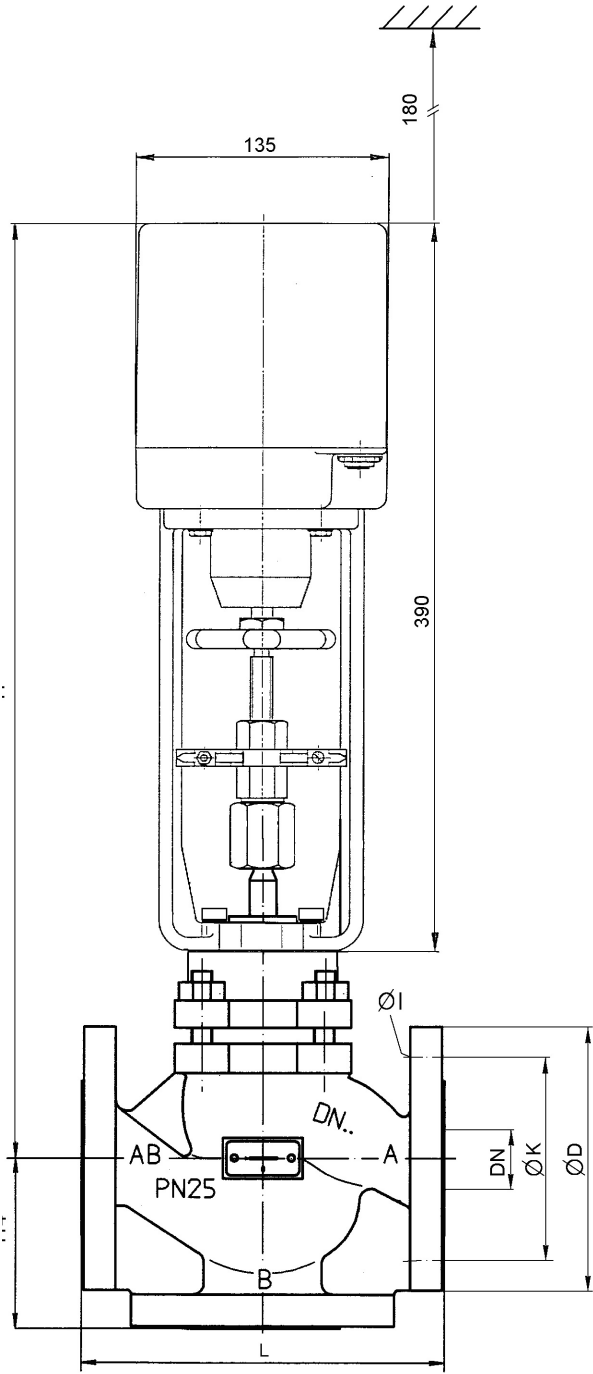
RWG.. nodular iron three-way valve with M250(A90) actuator for water up to 120°C, 25 bar and heating water and steam up to 200 °C, 20 bar

	DN	PN	kvs	Δp (bar)	Positioning time (s)	Weight (kg)
RWG50M250	50	25	40	5,5	200	18,1
RWG65M250	65	25	63	3	200	27,0
RWG80M250	80	25	100	1,8	200	33,5
RWG100M250	100	25	160	1	200	50,0

**Technical Data: RWG.. Valves**

Nominal diameter	DN50 to 100
Pressure rating	PN 25
CE marking	CE marking, notified body: 0045
Connection	Flange according to DIN, PN25
Characteristic curve	Gates A → AB = same percentage Gates B → AB = linear
Nominal stroke	30 mm
Leak rate	In accordance with EN 1349, leakage class VI
Medium temperature	0 °C to 200 °C
Housing	Nodular iron GGG-40.3
Seat ring	Stainless steel 1.4021
Cone	CrNi steel 1.4021
Valve spindle	Stainless steel 1.4571
Spindle seal	Univerdit gaskets with PTFE sleeve (maintenance-free)

Dimensions



DN	L	H	H4	Ø D	Ø K	Ø I
50	230	517.5	100	165	125	4 x Ø18
65	290	556	120	185	145	8 x Ø18
80	310	572	130	200	160	8 x Ø18
100	350	590.5	150	235	190	8 x Ø22
Dimensions L to I in mm						

Product Description**M250 and M250A90 Actuator**
with Two-way/Three-way Valves of the RK/RF/RD/RWD/RGD/RWG Series**Valve Installation****NOTICE**

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 ports come with protective caps to protect against contamination. They are to be removed before installing the valves.
- The pipeline system and the interior of the fitting must be free of foreign objects. In the event of contaminated media, dirt collectors are to be inserted upstream of the valves.
- There must be no tension between the valve and the pipeline connection.
- Use only perfectly fitting flange seals, inserted centrally in the valve flanges.
- 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.
- When mounting, the permissible max. pressure difference Δp and the specified direction of flow must be taken into account (see table in “Types” section, as well as the “Valve Principle”).
- The three-way valves are to be used as mixing valves. Pay attention to the direction of flow (see fig. “Valve Principle”).
- The actuator can be installed vertically above the fixture, or in any position as far as a horizontal position. When installed horizontally, the drive pillars must be one upon the other. Where applicable, turn the cross member after loosening the retaining nut.
- To remove the actuator hood, approx. 180 mm of free space is required above the drive.
- The actuator is delivered with a protective box. Up until commissioning, this cover protects the drive during the installation phase and pipeline work.
- Observe the direction of flow arrow on the valve body. Inverting the direction of flow impairs control behavior.

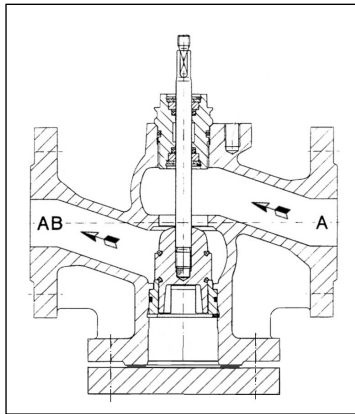
M250 and M250A90 Actuator

with Two-way/Three-way Valves of the RK/RF/RD/RWD/RGD/RWG Series

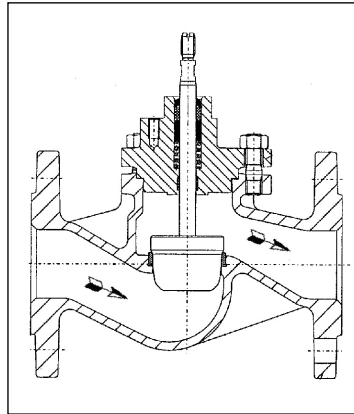
Product Description

Valve Cross-Sections with Flow Directions

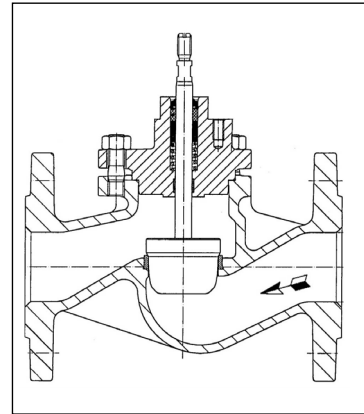
Two-way valves



RK/RF..-BF

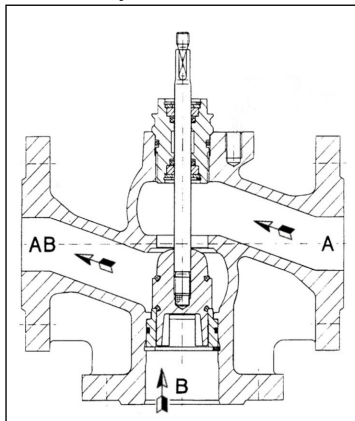


RD..

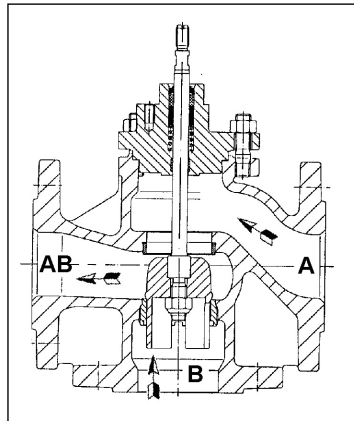


RGD..

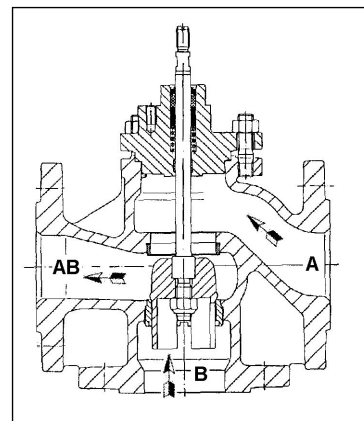
Three-way valves



RK/RF..



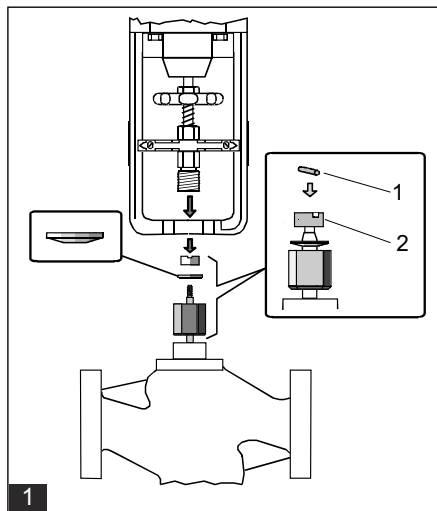
RWD..



RWG..

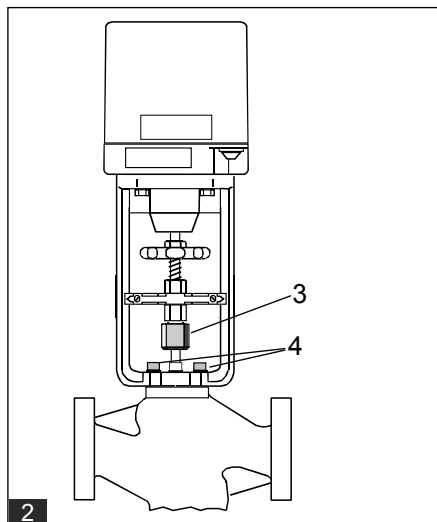
Product Description

M250 and M250A90 Actuator
with Two-way/Three-way Valves of the RK/RF/RD/RWD/RGD/RWG Series

Installation of the M250 and M250A90 actuator

- (1) Pin
(2) Threaded ring

- ▶ Screw upper surface of threaded ring (2) flush to upper surface of the valve stem. When doing this, align the slot of the threaded ring (2) with the slot of the valve stem so that the pin (1) can be inserted.
- ▶ Secure the threaded ring (2) with the pin (1).



- (3) Union nut
(4) Screws (2 or 3 screws depending on type of valve)

- ▶ Fasten the actuator in the valve flange with the screws (4) depending on the number of bores.
- ▶ Tighten the union nut (3) with the SW30 open-end wrench

Installation instructions

- If the valve is installed in the plant, ensure that no differential pressure builds up in the valve body before beginning work. If necessary, close the gate valve and switch off pumps.
- After the pipeline has cooled off, the actuator can be installed.
- The actuator is dismantled in reverse order.

Commissioning

General Information

The commissioning process may change if accessories are installed. In such cases, commissioning is described in the data sheet of the accessory that is being used.



WARNING

Caution: AC 230 V mains voltage may be present at the connection terminals of the switch module when the E/M200-M300 switch module is used.

Actuating direction

The actuating direction of the valve is to be checked, and changed if necessary, according to the plant function.



WARNING

Warning: Mains voltage AC 230 V.

The connection lines must be free of voltage before the actuating direction is reversed.

Actuating direction			
Voltage at Terminals 1 - 2			
Terminals 1 - 3			
= open = closed = flanged off			