

**PN 16**

**Small actuating drives M25Y, M25, M25/230 with straight-way/ three-way valves R15/RW15**

for continuous or 3-point control in zone aftertreatment devices for heating, aeration and air conditioning plants



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Contents subject to change

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**Notes on the device description**

The description contains instructions on the use and installation of the straight-way and three-way valves with small actuating drives M25Y, M25, M25/230.

In case of questions which cannot be clarified with this device description, please refer to the supplier or manufacturer for further information.

The indicated installation instructions/regulations are valid in the Federal Republic of Germany.

When utilizing the actuating drives in other countries, the builder or operator of the plant is responsible for the observation of the respective national regulations.

The operating staff shall be trained according to the descriptions of the technical data sheet.

**Safety Instructions**

The respective worker's protection rules, regulations for prevention of accidents and VDE rules shall be observed

Any work concerning the installation or initial operation of the actuating device or valve shall be exclusively carried out by qualified specialists, see paragraph "Qualified specialists".

Every person utilizing the devices shall have read and understood the descriptions in the technical data sheet.

Meaning of the symbols in the technical data sheet:



Danger

Warning of dangerous electrical voltage



Danger

Warning of a general danger



Warning

General warning, strictly observe this notice



Note

Further notice to observe

**Danger**

means mortal danger, severe bodily injuries or serious material damage in case of non-observance.

**Warning**

means danger of bodily injuries or material damage in case of non-observance.

**Note**

indicates information which is particularly stressed.

**Qualified specialists**

Qualified specialists for the purposes set out in this technical data sheet are persons who are familiar with the described devices and possess a qualification for their respective occupation.

These are for instance:

- Authorization to connect the devices according to the VDE rules and local Electricity Board regulations, as well as the authorization to switch the devices on and off taking the in-house regulations into account.
- Knowledge of the regulations for prevention of accidents.
- Knowledge of the utilization of the devices within the plant system.
- etc.

**Device Description**

**M25Y, M25, M25/230 Small Actuating Drives**  
with straight-way / three-way valves R15/RW15

**Continuous Control 0..10 V DC**

**Small Actuating Drive M25Y with straight-way / three-way valve**

**Application**

Gunmetal straight-way / three-way valves R15/RW15 with small actuating drives M25Y are used for continuous control in zone aftertreatment devices for heating, aeration and air conditioning plants with water temperatures of 0..110°C.

The small actuating drive M25Y for a mains voltage 24 V AC/DC is triggered by a continuous signal Y 0..10 V DC (reversible to 2..10 V DC).

**Types**

Gunmetal straight-way valves R15, PN16 for water 0..110°C with small actuating drive M25Y for mains 24 V AC/DC with continuous control 0..10 V DC.

	DN	PN	kvs	Δp	Floating time	Weight
R15/0,16M25Y	15	16	0.16	10 bar	128 s	approx. 1.1 kg
R15/0,25M25Y	15	16	0.25	10 bar	128 s	approx. 1.1 kg
R15/0,4M25Y	15	16	0.4	10 bar	128 s	approx. 1.1 kg
R15/0,63M25Y	15	16	0.63	6 bar	128 s	approx. 1.1 kg
R15/1,0M25Y	15	16	1.0	6 bar	128 s	approx. 1.1 kg
R15/1,6M25Y	15	16	1.6	6 bar	128 s	approx. 1.1 kg
R15/2,5M25Y	15	16	2.5	4 bar	128 s	approx. 1.1 kg
R15/4,0M25Y	15	16	4.0	4 bar	128 s	approx. 1.1 kg

Gunmetal three-way valves R15, PN16 for water 0..110°C with small actuating drive M25Y for mains 24 V AC/DC with continuous control 0..10 V DC.

	DN	PN	kvs	Δp	Floating time	Weight
RW15/0,63M25Y	15	16	0.63	2 bar	128 s	approx. 1.2 kg
RW15/1,0M25Y	15	16	1.0	2 bar	128 s	approx. 1.2 kg
RW15/1,6M25Y	15	16	1.6	2 bar	128 s	approx. 1.2 kg
RW15/2,5M25Y	15	16	2.5	1 bar	128 s	approx. 1.2 kg
RW15/4,0M25Y	15	16	4.0	1 bar	128 s	approx. 1.2 kg



Fig. RW15..M25Y

**Small Actuating Drive M25  
with straight-way / three-way valve**

**Continuous Control 0..10 V DC**

**Technical data**

Actuating Drive M25Y	Mains	24 V AC ± 10%, 50/60 Hz, 4,8 VA or 24 V DC ± 10%, 2,5 VA		
	Drive	Continuous signal Y 0..10 V DC, invertible (reversible to 2..10 V DC, see section Initial Operation M25Y)		
	Connection	with connecting line 3-wire, 1,5 m long		
	Motor stop	Drive spindle: extending = load-dependent, drawing-in = path-dependent		
	Actuating stroke	max. 9 mm		
	Position display	by position indicator in the drive housing		
	Floating time	approx. 16 s/mm actuating stroke with 50 Hz (adjustable to 11 s/mm actuating stroke)		
	Actuating power	≥ 250 N		
	LED display	for operation and failure message, integrated in the position display		
	Manual operation	switch over the slide switch in the housing to Manual and turn the hand wheel		
	Ambient temperature	0..50°C (non-condensing)		
	Degree of enclosure protection	IP 54 in Automatic Mode, IP 30 in Manual Mode		
	Weight	310 g		
	Valves R/RW15..	DN, PN, kvs, Δp	Nominal width, nominal pressure, kv value, pressure difference, see section Types	
		Actuating stroke	8 ± 0.5 mm	
Media		Cold and hot water 0..110°C with antifreezer and corrosion preventive (up to 50%), glycol, glycerin, ethylene glycol, propylene glycol, monoethylene, ethanol, methanol, Antifrogen N + L. Not suitable for media based on mineral oil.		
Connection		Outside thread G1 with inside thread connecting pieces G 1/2		
Characteristic curves		R15/..	equal percentage	
		RW15/..	Gates A → AB: equal percentage, Gates B → AB: linear	
Material		Housing	Rg5	2.1096
		Spindle	CrNi-steel	1.4305
		Cone	Ms	2.0401 with elastomer obturator
		Sealing	O-rings	EPDM
Leakage rate	acc. to EN 1349, leakage class VI			
Weight	R15/...: 720 g, RW15/...: 860 g			

**Continuous Control 0..10 V DC**

**Small Actuating Drive M25 with straight-way / three-way valve**

**Installation**



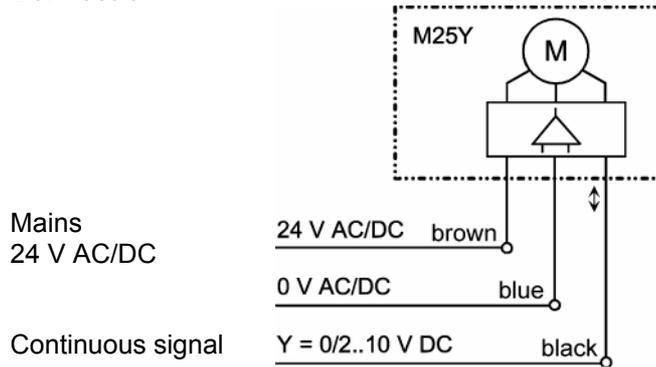
Danger

The electric installation and the device connection shall be exclusively carried out by qualified specialists, e.g. by an electrician!

This must be done in accordance with the VDE regulations and local specifications.

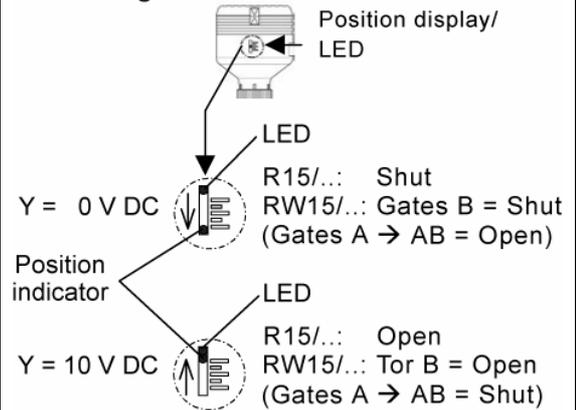
The device shall be connected acc. to the binding wiring diagram with the 1.5 m-long connector lines.

**Connection**



Observe the type sign!

**Positioning direction**

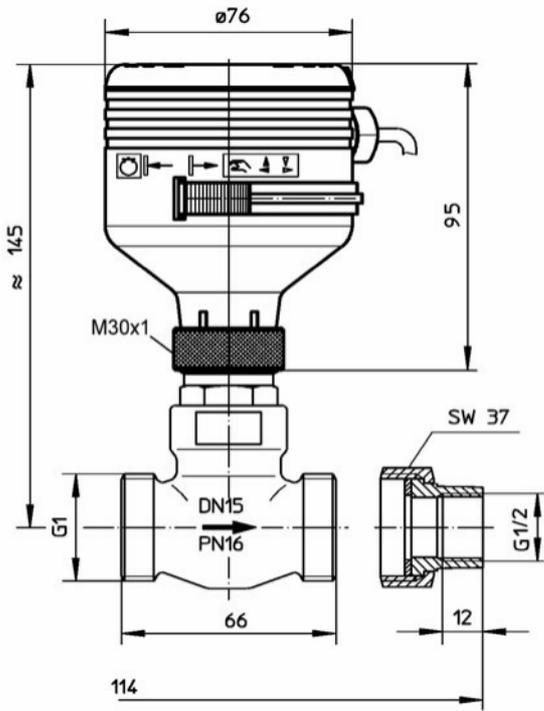


Inversion of the positioning direction, see adaptation of the valve function in section Initial Operation: Small Actuating Drive M25Y.

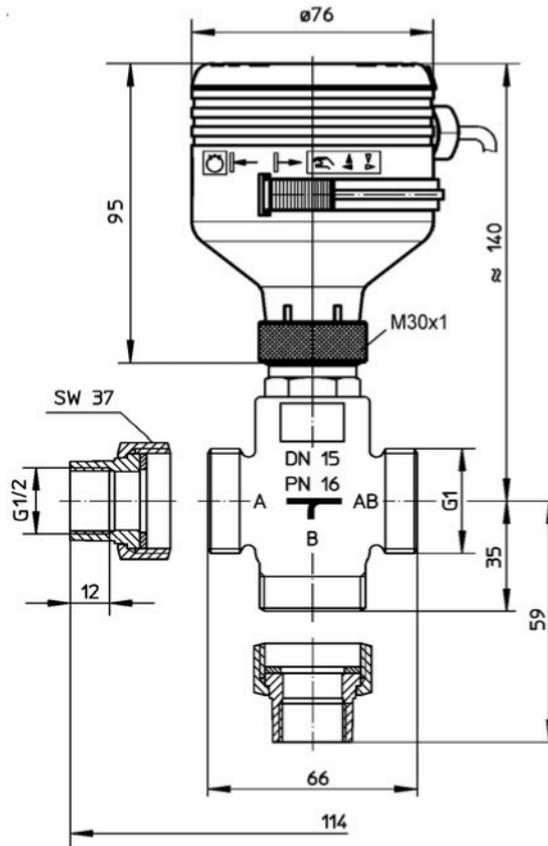
**Small Actuating Drive M25  
with straight-way / three-way valve**

**Continuous Control 0..10 V DC**

**Dimensions**



R15..M25Y



RW15..M25Y

## Device Description

**M25Y, M25, M25/230 Small Actuating Drives**  
with straight-way / three-way valves R15/RW15**3-point Control 24 V AC/DC****Small Actuating Drive M25  
with straight-way / three-way valve****Application**

Gunmetal straight-way / three-way valves R15/RW15 with small actuating drives M25 are used for 3-point control in zone aftertreatment devices for heating, aeration and air conditioning plants with water temperatures 0..110°C.

The small actuating drive M25 is triggered with a 3-point signal 24 V AC/DC.

**Types**

Gunmetal straight-way valves R15, PN16 for water 0..110°C with small actuating drive M25 for 3-point control 24 V AC/DC

	DN	PN	kvs	$\Delta p$	Floating time	Weight
R15/0,16M25	15	16	0.16	10 bar	128 s	approx. 1.1 kg
R15/0,25M25	15	16	0.25	10 bar	128 s	approx. 1.1 kg
R15/0,4M25	15	16	0.4	10 bar	128 s	approx. 1.1 kg
R15/0,63M25	15	16	0.63	6 bar	128 s	approx. 1.1 kg
R15/1,0M25	15	16	1.0	6 bar	128 s	approx. 1.1 kg
R15/1,6M25	15	16	1.6	6 bar	128 s	approx. 1.1 kg
R15/2,5M25	15	16	2.5	4 bar	128 s	approx. 1.1 kg
R15/4,0M25	15	16	4.0	4 bar	128 s	approx. 1.1 kg

Gunmetal three-way valves RW15, PN16 for water 0..110°C with small actuating drive M25 for 3-point control 24 V AC/DC

	DN	PN	kvs	$\Delta p$	Floating time	Weight
RW15/0,63M25	15	16	0.63	2 bar	128 s	approx. 1.2 kg
RW15/1,0M25	15	16	1.0	2 bar	128 s	approx. 1.2 kg
RW15/1,6M25	15	16	1.6	2 bar	128 s	approx. 1.2 kg
RW15/2,5M25	15	16	2.5	1 bar	128 s	approx. 1.2 kg
RW15/4,0M25	15	16	4.0	1 bar	128 s	approx. 1.2 kg



Fig. RW15/..M25

**Small Actuating Drive M25  
with straight-way / three-way valve**

**3-point Control 24 V AC/DC**

**Technical data**

Actuating Drive M25	Mains	24 V AC ± 10%, 50/60 Hz, 5.4 VA or 24 V DC ± 10%, 2.4 VA
	Drive	3-point signal Open/Stop/Shut
	Connection	with 3-core connecting line, 1.5 m long
	Motor stop	Load-dependent
	Actuating stroke	max. 9 mm
	Position display	by position indicator in the drive housing
	Floating time	approx. 16 s/mm actuating stroke with 50 Hz (adjustable to 11 s/mm actuating stroke)
	Actuating power	≥ 250 N
	Positioning direction	selection by connection
	Manual operation	switch over the slide switch in the housing to Manual and turn the hand wheel
	Ambient temperature	0..50°C (non-condensing)
	Degree of enclosure protection	IP 54 in Automatic Mode, IP 30 in Manual Mode
	Weight	310 g
Valves R/RW15..	DN, PN, kvs, Δp	Nominal width, nominal pressure, kvs value, pressure difference, see section Types
	Actuating stroke	8 ± 0.5 mm
	Media:	Cold and hot water 0..110°C with antifreezer and corrosion preventive (up to 50%), glycol, glycerin, ethylene glycol, propylene glycol, monoethylene, ethanol, methanol, Antifrogen N + L. Not suitable for media based on mineral oil.
	Connection	Outside thread G1 with inside thread connecting pieces G 1/2
	Characteristic curves	R15/.. equal percentage RW15/.. Gates A → AB: equal percentage, Gates B → AB: linear
	Material	Housing Rg5 2.1096 Spindle CrNi-steel 1.4305 Cone Ms 2.0401 with elastomer obturator Sealing O-rings EPDM
	Leakage rate	acc. to EN 1349, leakage class VI
	Weight	R15/..: 720 g, RW15/..: 860 g

**3-point Control 24 V AC/DC**

**Small Actuating Drive M25 with straight-way / three-way valve**

**Installation**



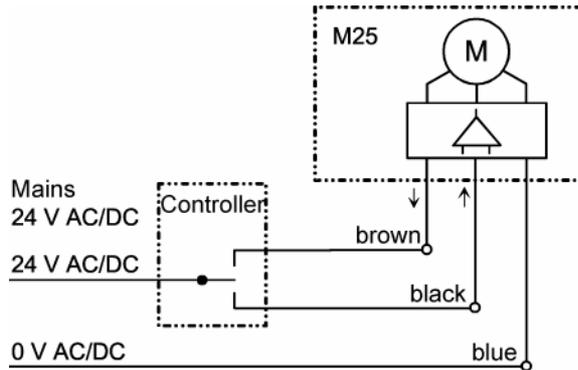
Danger

**The electric installation and the device connection shall be exclusively carried out by qualified specialists, e.g. by an electrician!**

This must be done in accordance with the VDE regulations and local specifications.

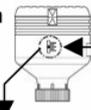
The device shall be connected acc. to the binding wiring diagram with the 1.5 m-long connector lines.

**Connection**



Observe the type sign!

**Positioning direction**



Position indicator

Connection at:

brown/blue  
24 V AC/DC



R15/... Shut  
RW15/... Gate B = Shut  
(Gates A → AB = Open)

black/blue  
24 V AC/DC



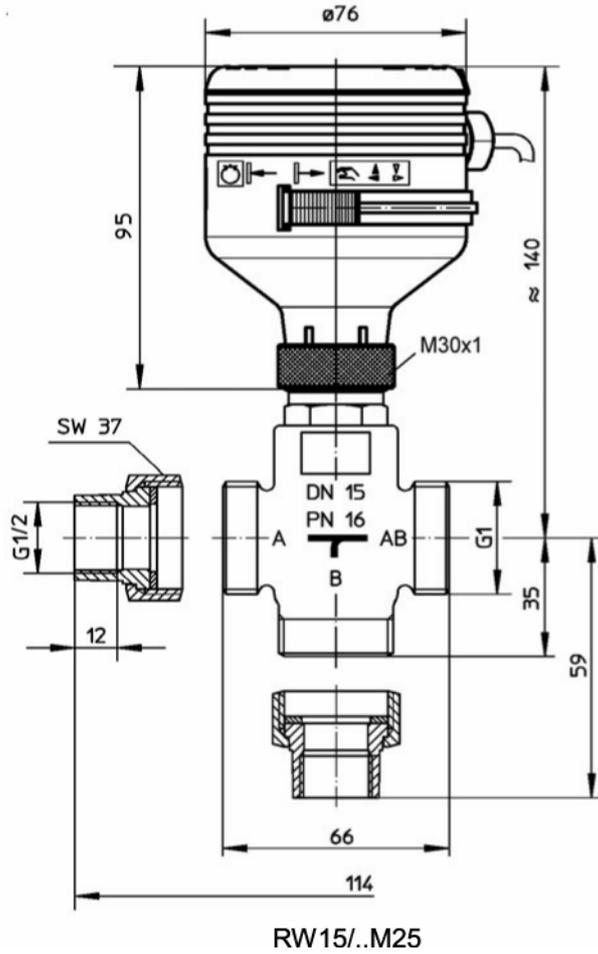
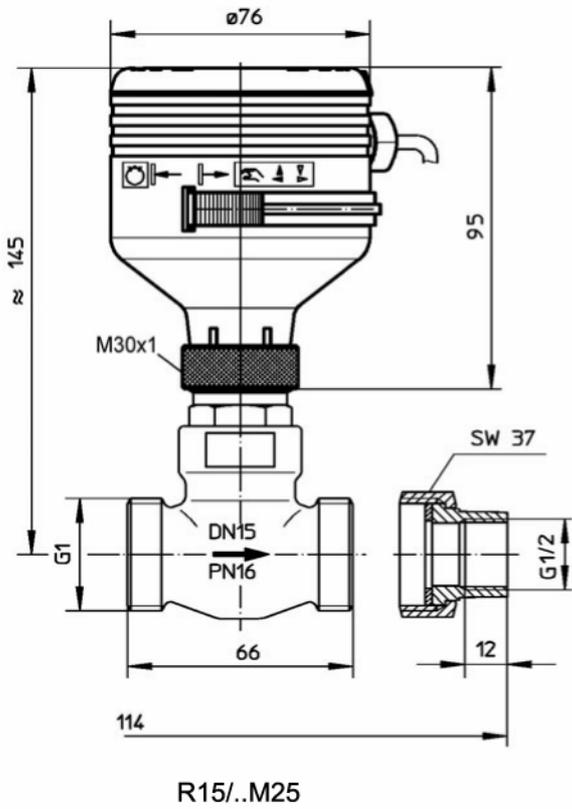
R15/... Open  
RW15/... Gate B = Open  
(Gates A → AB = Shut)

Change of the positioning direction:  
Switch off the actuating drive and interchange the brown and black connector lines.

**Small Actuating Drive M25  
with straight-way / three-way valve**

**3-point Control 24 V AC/DC**

**Dimensions**



**Device Description**

**M25Y, M25, M25/230 Small Actuating Drives**  
with straight-way / three-way valves R15/RW15

**3-point control 230 V AC**

**Small Actuating Drive M25/230 with straight-way / three-way valve**

**Application**

Gunmetal straight-way / three-way valves R15/RW15 with small actuating drives M25/230 are used for 3-point control in zone aftertreatment devices for heating, aeration and air conditioning plants with water temperatures 0..110°C.

The small actuating drive M25/230 is triggered with a 3-point signal 230 V AC.

**Types**

Gunmetal straight-way valves R15, PN16 for water 0..110°C with small actuating drive M25/230 for 3-point control 230 V AC.

	DN	PN	kvs	Δp	Floating time	Weight
R15/0,16M25/230	15	16	0.16	10 bar	128 s	approx. 1.2 kg
R15/0,25M25/230	15	16	0.25	10 bar	128 s	approx. 1.2 kg
R15/0,4M25/230	15	16	0.4	10 bar	128 s	approx. 1.2 kg
R15/0,63M25/230	15	16	0.63	6 bar	128 s	approx. 1.2 kg
R15/1,0M25/230	15	16	1.0	6 bar	128 s	approx. 1.2 kg
R15/1,6M25/230	15	16	1.6	6 bar	128 s	approx. 1.2 kg
R15/2,5M25/230	15	16	2.5	4 bar	128 s	approx. 1.2 kg
R15/4,0M25/230	15	16	4.0	4 bar	128 s	approx. 1.2 kg



Fig. RW15/..M25

Gunmetal three-way valves RW15, PN16 for water 0..110°C with small actuating drive M25 for 3-point control 24 V AC/DC

	DN	PN	kvs	Δp	Floating time	Weight
RW15/0,63M25/230	15	16	0.63	2 bar	128 s	approx. 1.3 kg
RW15/1,0M25/230	15	16	1.0	2 bar	128 s	approx. 1.3 kg
RW15/1,6M25/230	15	16	1.6	2 bar	128 s	approx. 1.3 kg
RW15/2,5M25/230	15	16	2.5	1 bar	128 s	approx. 1.3 kg
RW15/4,0M25/230	15	16	4.0	1 bar	128 s	approx. 1.3 kg

**Small Actuating Drive M25/230  
with straight-way / three-way valve****3-point control 230 V AC****Technical data**

Actuating Drive M25/230	Mains	230 V AC $\pm$ 10%; 50/60 Hz;
	Drive	3-point signal Open/Stop/Shut
	Connection	with 3-core connecting line, 1.5 m long
	Motor stop	Load-dependent
	Actuating stroke	max. 9 mm
	Position display	by position indicator in the drive housing
	Floating time	approx. 16 s/mm actuating stroke with 50 Hz (adjustable to 11 s/mm actuating stroke)
	Actuating power	$\geq$ 250 N
	Positioning direction	selection by connection
	Manual operation	switch over the slide switch in the housing to Manual and turn the hand wheel
	Ambient temperature	0..50°C (non-condensing)
	Degree of enclosure protection	IP 54 in Automatic Mode, IP 30 in Manual Mode
	Weight	430 g
	Valves R/RW15..	DN, PN, kvs, $\Delta p$
	Actuating stroke	8 $\pm$ 0.5 mm
	Media	Cold and hot water 0..110°C with antifreezer and corrosion preventive (up to 50%), glycol, glycerin, ethylene glycol, propylene glycol, monoethylene, ethanol, methanol, Antifrogen N + L. Not suitable for media based on mineral oil.
	Connection	Outside thread G1 with inside thread connecting pieces G 1/2
	Characteristic curves	R15/.. equal percentage RW15/.. Gates A $\rightarrow$ AB: equal percentage, gates B $\rightarrow$ AB: linear
	Material	Housing Rg5 2.1096 Spindle CrNi-steel 1.4305 Cone Ms 2.0401 with elastomer obturator Sealing O-rings EPDM
	Leakage rate	acc. to EN 1349, leakage class VI
	Weight	R15/..: 720 g, RW15/..: 860 g

**3-point control 230 V AC**

**Small Actuating Drive M25/230 with straight-way / three-way valve**

**Installation**



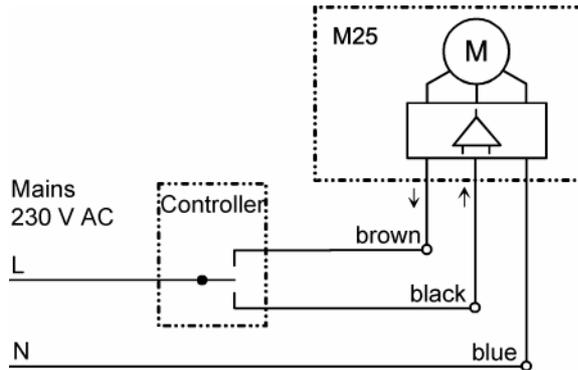
Danger

**The electric installation and the device connection shall be exclusively carried out by qualified specialists, e.g. by an electrician!**

This must be done in accordance with the VDE regulations and local specifications.

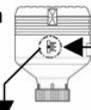
The device shall be connected acc. to the binding wiring diagram with the 1.5 m-long connector lines.

**Connection**



Observe the type sign!

**Positioning direction**



Position indicator

Connection at:

brown/blue  
230 V AC



R15/... Shut  
RW15/... Gate B = Shut  
(Gates A → AB = Open)

black/blue  
230 V AC



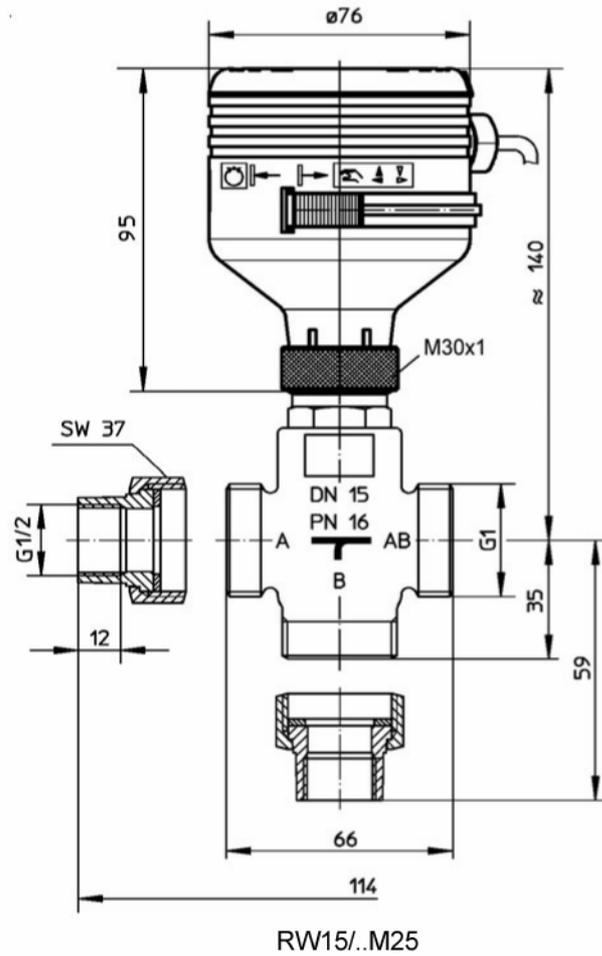
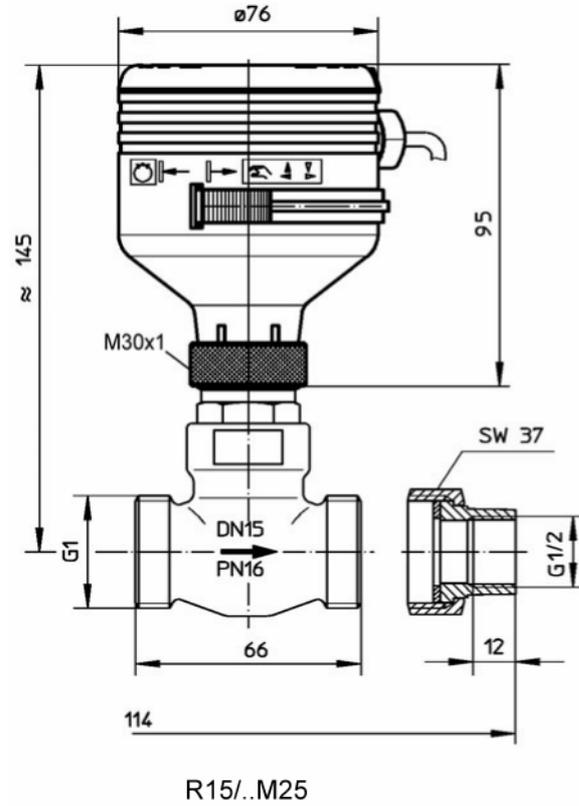
R15/... Open  
RW15/... Gate B = Open  
(Gates A → AB = Shut)

Inversion of the positioning direction:  
Switch off the actuating drive and interchange  
the brown and black connector lines.

**Small Actuating Drive M25/230  
with straight-way / three-way valve**

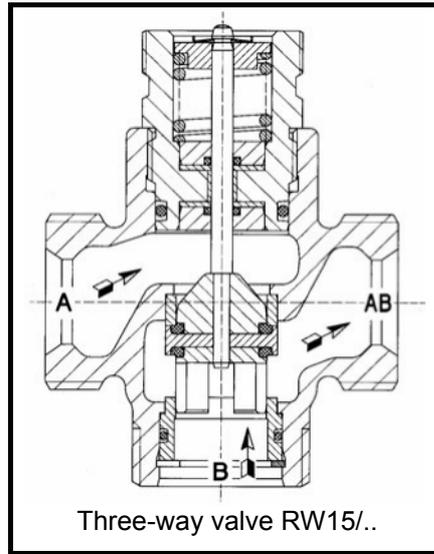
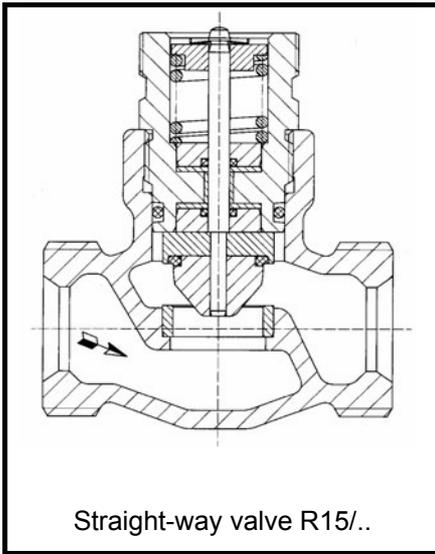
**3-point control 230 V AC**

**Dimensions**





**Sectional drawings of the valve**



## Installation

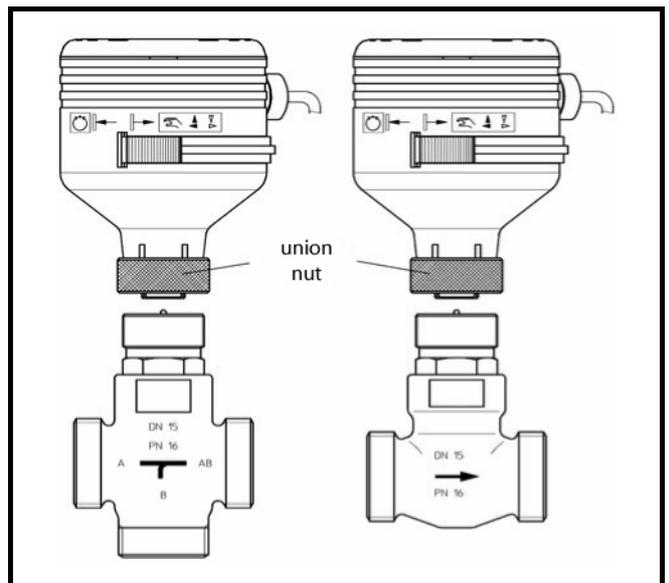
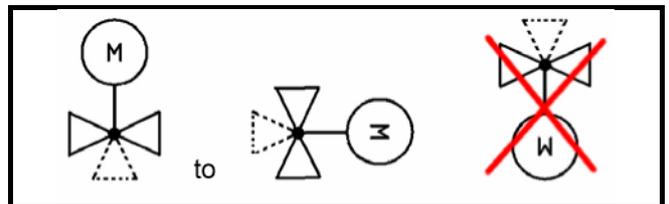


**Installation may be carried through by qualified expert personnel only!**

**Danger** Valve R15/RW15/.. and small actuating drive M25.. are delivered in separate packages.

Apart from the generally valid installation guidelines, the following points shall be observed:

- The valves are delivered with internal thread connecting pieces G1/2 with sealing washers for screwing into the pipe system.
- The pipe system and the valve body shall be free from foreign matter.  
In case of contaminated media, dirt catchers with fine strainers (mesh width 0.25 mm) shall be installed.
- There shall be no tension between valve and pipe connection.
- When installing the valves, the flow direction shall be observed.  
Furthermore, the admissible pressure difference  $\Delta p$  must not be exceeded.
- In order to avoid eddying in the valve body, the latter shall be positioned in a straight pipe section. The standard value for the distance between valve flange and elbow or similar is  $10 \times$  nominal width.
- The positioning place shall be selected with regard to maintaining the ambient temperature at the actuating drive  $0..50^{\circ}\text{C}$ .
- The three-way valves shall be installed mainly for mixing purposes.
- After the installation of the valves the smooth running of the cone in the valve face shall be checked by pushing in the valve spindle.
- In order to install the actuating drive and to remove the housing lid, a clear space above the actuating drive threaded connection of the valve of approx. 200 mm shall be provided.
- The valve can hence be installed in the pipe with the mounted small actuating drive pointing upwards up to the horizontal position.  
For safety reasons, the small actuating drives must not be suspended below the valve!
- After the installation of the valve, the small actuating drive M25.. shall be positioned on the actuating drive threaded connection and secured hand-tight with the union nut.



**Initial operation**

Danger

**Initial operation may be carried through by qualified expert personnel only!****Caution** with hot pipes!

If necessary, block the pipe or switch off the circulation pump and wait until the pipe has cooled off.



Warning

**Do not electrically operate the small actuating drive M25Y, M25, M25/230 without valve!**

Before connecting the mains, check the following:

- the correct installation of the valve in the pipe and the flow directions,
- the max. admissible pressure difference acc. to the kvs value,
- the admissible water temperature 0..110°C,
- the installation of the small actuating drive (perpendicular above the valve up to horizontal position),
- the ambient conditions of the small actuating drive acc. to the instructions in the technical data,
- the electric wiring acc. to VDE (Association of German Electrical Engineers) regulations and the local regulations,
- the mains voltage acc. to the type sign.

After the mains are switched on, the entire function of the drive valve shall be checked within the plant control circuit.

- M25Y: Inversion of actuating direction, change of actuating time, switch-over to actuating signal Y 2..10 V DC, see section Adaptation of the Valve Function, Small Actuating Drive M25Y.



Note

**Initialization**

After a mains cutoff 24 V AC/DC or after manual operation, the small actuating drive M25Y carries out an automatic adaptation in its valve end position Y = 0 V DC in order to adapt the valve stroke.

If the actuating signal Y = 0..10 V DC is interrupted, the small actuating drive M25Y travels to position 0 V DC.

If the actuating signal Y = 2..10 V DC is interrupted, the small actuating drive M25Y travels to the set end position, see section Adaptation of the Valve Function, M25Y – jumpers JP1 and JP2.

- M25, M25/230: Inversion of the actuating direction for M25 or M25/230, see section Installation. Change of actuating time, see section Adaptation of the Valve Function, Small Actuating Drive M25, M25/230.

- **Adaptation of the Valve Function**

In order to adapt the valve function within the control circuit, the small actuating drives M25Y, M25, M25/230 contain a pin bar which serves to adjust the functions using jumpers.

The pin bar is located beneath the housing lid of the small actuating drive.

Taking off the housing lid:

- Switch off the small actuating drive.
- Insert a screwdriver in an opening in the lid and remove the lid by turning the screwdriver (figure 1).

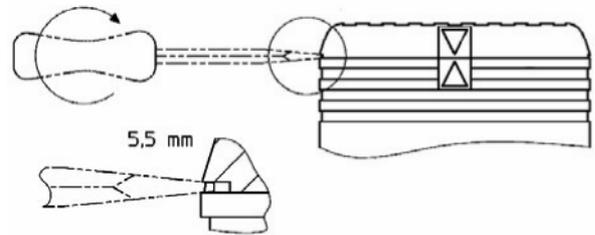


Figure 1

Closing the housing lid:

- After adapting and checking the valve function, the housing lid shall be pushed on top of the housing until it securely locks.
- Make sure that the arrow markers on the lid and on the housing are exactly opposite each other (figure 1, position **A**).
- After each dismounting / mounting the impeccable seating and tightness of the housing lid shall be checked.



Warning

**Operation without the housing lid is admissible only for a functional check during initial operation and shall be carried out exclusively by qualified staff!**

**Small Actuating Drive M25Y**

**LED display**

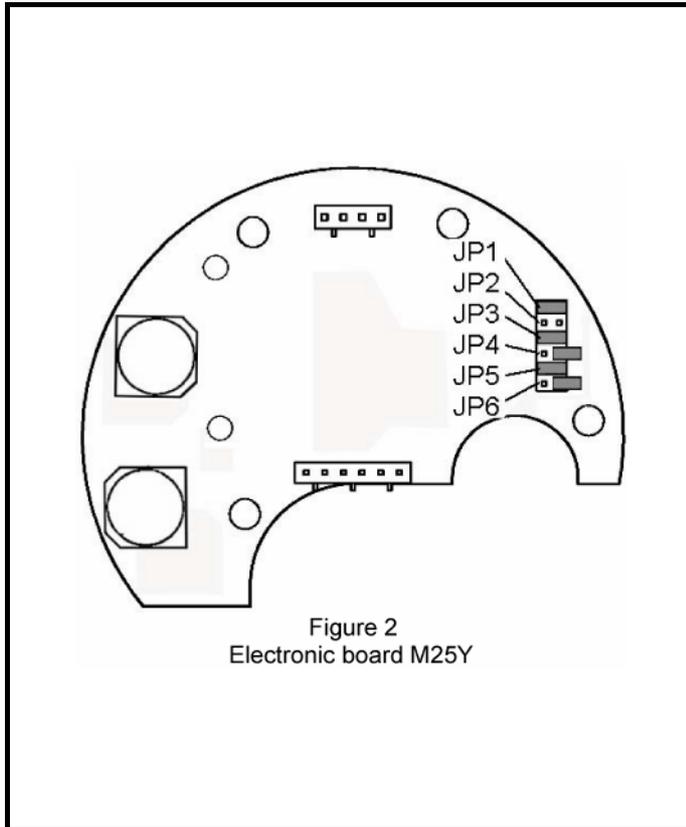
LED Status	Function	LED Status	Function
	Ready for operation		Malfunction message, blocking extended Drive cannot reach the current set position Wire break "actuating signal" (only if 2..10V active)
	Mains supply interrupted/ Manual mode		Initializing Run (see p.11, section "Initial operation")
 - off  = on,  = slow blinking,  = asymmetric fast blinking			

**Automatic Malfunction Messages**

- “Blocking – drive extended”**  
 In case of the valve stroke is blocked by a foreign body in the pipe, the drive indicates this by an asymmetric blinking of the LED.  
 Through an automatic correction algorithm, the actuating drive will then try several times to eliminate the valve blocking itself by shortly lifting the valve cone.  
 The message can be removed by eliminating the blocking or by a manual new initialization.
- Wire break detection**  
 Function is only active in mode actuating signal 2..10 V. With  $Y < 2V$ , the actuating drive travels to the end position selected by JP 2 and signals this by an asymmetric blinking of the LED.  
 The message can be removed by a manual new initialization.

**Small Actuating Drive M25Y**

The electronic board contains the pin bar with the jumpers JP1, JP3..JP6 (figure 2).



Function overview of the jumpers		
JP1 actuating signal Y	0..10 V DC	2..10 V DC
JP2 works only with 2..10V, valve end position in case the actuating signal Y is interrupted	↓	↑
JP3 actuating time/mm stroke	16 s	11 s
JP4 actuating direction	10 V DC = (	10 V DC = (
JP5 must always be plugged	operating function	---
JP6 valve actuating stroke	5.5 mm	8 mm

The standard adjustment of the jumpers JP1..JP6 is shown in the housing lid.

1) If the actuating signal Y 2..10 V DC is set, the free jumper JP1 can be used for position JP2 in order to adjust the valve end position ↑/↓ in case of an interruption of actuating signal Y. The function "automatic wire break detection" is exclusively active in this mode.

**Small Actuating Drive M25Y**

The electronic board contains the pin bar with the jumpers JP3 and JP5 (figure 3).

The standard adjustment of the small actuating drives M25, M25/230 is an actuating time of 16 s/mm stroke. A change of the actuating time to 11 s/mm stroke can be carried out with jumper JP3.

 **Mains voltage 230 V for small actuating drive M25/230. Before removing the housing lid, check whether the small actuating drive M25/230 is securely cut off from the mains!**

Danger

With the M25/230, the pin bar with the jumpers JP3 and JP5 is located under the transformer board which can be carefully lifted in order to change the actuating time.

The electronic board contains the pin bar with the jumpers JP1, JP3..JP6 (figure 2).

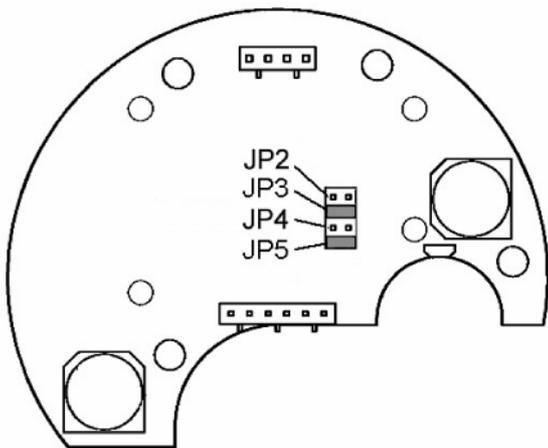


Figure 3  
Electronic board M25Y

Function overview of the jumpers		
JP 2 free	---	---
JP3 actuating time/mm stroke	16 s	11 s
JP 4 free	---	---
<b>JP5 must always be plugged</b>	operating function	---

The standard adjustment of the jumpers JP3/JP5 is shown in the housing lid.