



BR 23b · Rotary plug valve

Stainless steel rotary plug valve in DIN - Version



Applications

Stainless steel rotary plug valve with high flow capacity for technical process plants, especially at media with solid parts:

- **Nominal diameters DN 25 to DN 150**
- **Nominal pressure PN 10 to PN 40**
- **Temperature -10°C to 200°C**

The control equipment consists of a stainless steel rotary plug valve and a pneumatic quarter-turn actuator or a hand-operated actuator.

The valve is designed according to the modular-assembly principle and has the following features:

- Pocket free design with high flow capacity at low leakage, applicable at media with solid particles, polluted flow and high viscosity
- Anticorrosive Stainless steel one-piece valve body
- Stem sealed by spring-loaded PTFE V-ring packing
- Shaft sealed by a self-adjusting PTFE V-ring packing, supported by disc springs, maintenance-free
- Electrical conductive plug confirmed
- Face-to-face dimension according to DIN EN 558, Series 1
- Mounting according to DIN ISO 5211

Versions

The BR 23b Rotary Plug Valve is available in the following versions:

- Rotary plug valve with hand-operated actuator
- Rotary plug valve with pneumatic quarter-turn actuator, (for details see respective data sheet)
- According to customer specifications

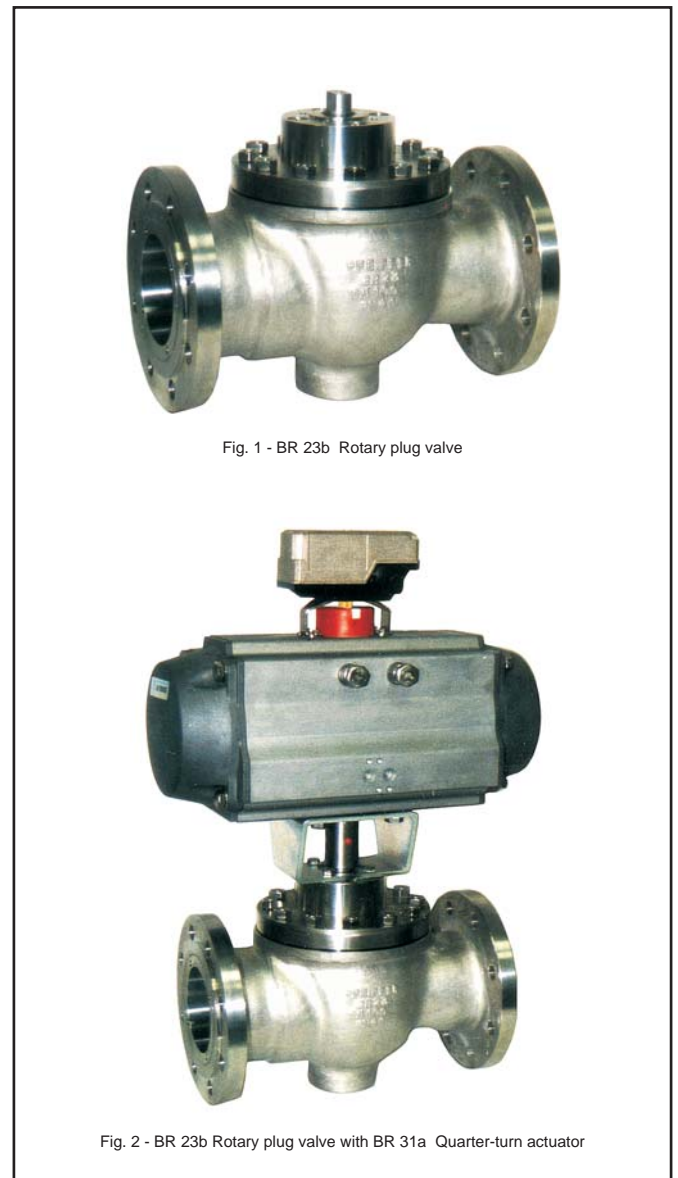


Fig. 1 - BR 23b Rotary plug valve

Fig. 2 - BR 23b Rotary plug valve with BR 31a Quarter-turn actuator

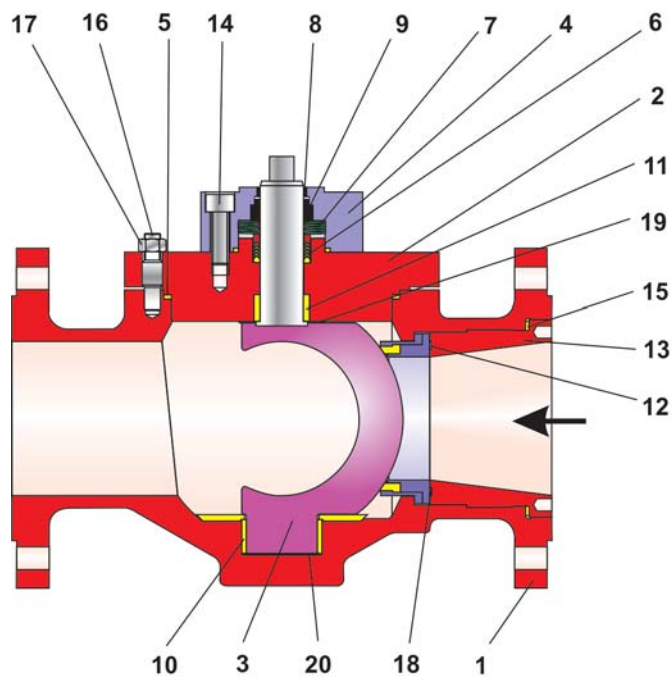


Fig. 3 - BR 23b Rotary plug valve

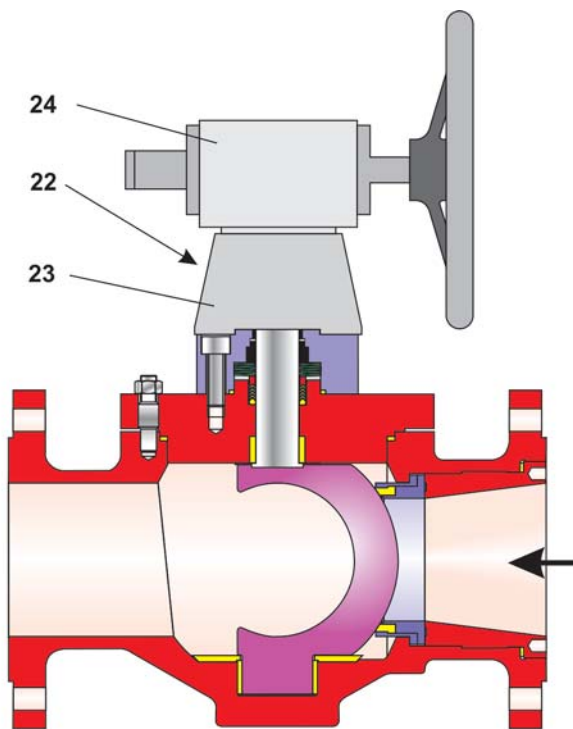


Fig. 4 - Rotary plug valve with hand-operated actuator

Item	Description
1	Valve body
2	Bonnet flange
3	Rotary plug with stem
4	Stuffing box flange
5	Bonnet seal
6	V-ring packing
7	Set of disc springs
8	Bearing bushing
9	Distance washer
10	Bearing bushing
11	Bearing bushing
12	Seat ring

Table 1 - List of parts

Item	Description
13	Spacer
14	Screw
15	Body sealing
16	Stud bolt
17	Nut
18	Seal
19	Distance washer
20	Washer
22	Adaptor
23	Yoke
24	Hand gear box

Special design

- Heating jackets
- Body and rotary plug segment are available in special materials (e.g. Hastelloy or nickel)
- Latent range regarding diameter and temperature, from -200°C up to 450°C
- Double stuffing box with leakage detecting connection
- Solenoid coupling
- High pressure up to PN 160.
- Full bore.
- ANSI - Design

Principle of operation:

The media flow is basically in arrow direction.

The ball segment (3) determines the flow through the free area between the ball and seat ring.

The seat ring (12) confirms the tightness of the valve.

This construction confirms a higher tightness, higher flow capacity and a more easier interchangeability of the seat rings.

The stem is sealed by a maintenance free PTFE - V-ring packing (6). The spring washers (7) affect a prestressing of this.



Note:

Please, pay attention to the usability acc. to the ATEX 2014/34/EU in correspondence to the maintenance sheet before using the ball valve in hazardous area!

Failure position

In dependance of mounting position of the actuator there are two failure positions, which take place by pressure relieving or on failure of air supply:

• Ball valve with actuator “on failure closing”

On failure of air supply the ball valve closes.
The opening of the ball valve accures on rising of air supply against the force of the springs.

• Ball valve with actuator “on failure opening”

On failure of air supply the ball valve opens.
The closing of the ball valve accures on rising of air supply against the force of the springs.

Optional material combinations

For best adaption to process conditions, it is possible to optimise BR 23b rotary plug valve by modification of materials (eg. body, shaft, ball and sealing).

Additional accessories

The following accessories are available (separately or in combination):

- Locking device
- Shaft extension (100 mm, standard)
- Pneumatic or electric quarter-turn actuators
- Positioner (with optional ball valve for control application)
- Limit switches
- Solenoid valves
- Filter regulator
- Heating jacket
- Ball valve for control application by characteristic seat ring

Further accessories are possible on customer request.

Advantages of the live-loaded sealing system

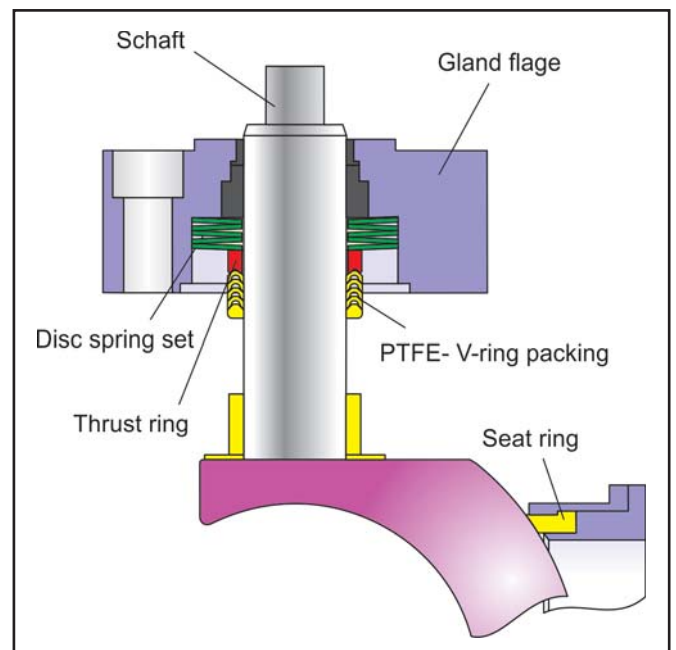


Fig. 5 – Live-loaded sealing system

- Maintenance-free and self-adjusting
- Highest tightness, even under extreme pressure and temperature conditions
- High durability
- **All in all:**
Extremely economic!

General technical data

Nominal size	DN 25 to DN 150
Nominal pressure	PN 10, PN 16, PN 25, PN 40
Temperature range	-10°C to 200°C
Control valve leakage rate	0,001% of the kvs value at $\varphi=90^\circ$
Shut-off valve leakage rate	Leakage rate A acc. to DIN EN 12266-1, P12 (Leakage rate 1 BO acc. to DIN 3230 Part 3)
Rangeability	50 : 1
End connections	all DIN versions

Table 2 - Technical data

Materials

Body	1.4408 / 1.4571
Rotary plug with stem	1.4408 / 1.4571
Seat ring	1.4571 or equivalent
Sealing ring	TFM (PTFE)
Packing	PTFE - V-ring packing loaded by Belleville washers (1.8159)
Bearing bushing	TFM
Bonnet seal	PTFE O-ring

Table 3 - Materials

Pressure-Temperature diagram

The area of application is determined by the pressure-temperature diagram. Process data and the process medium can affect the values in the diagram.

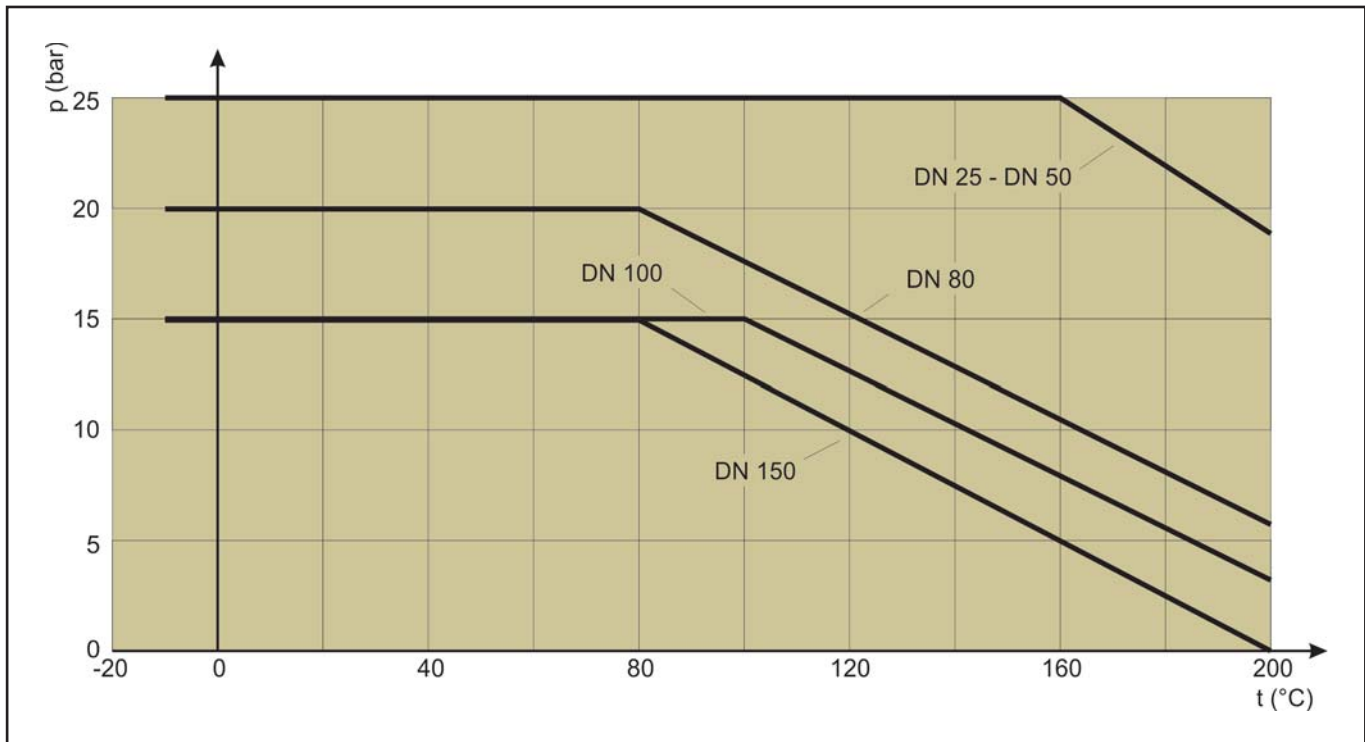


Fig. 6 - Pressure-Temperature Diagram

Functional diagram with opening angles

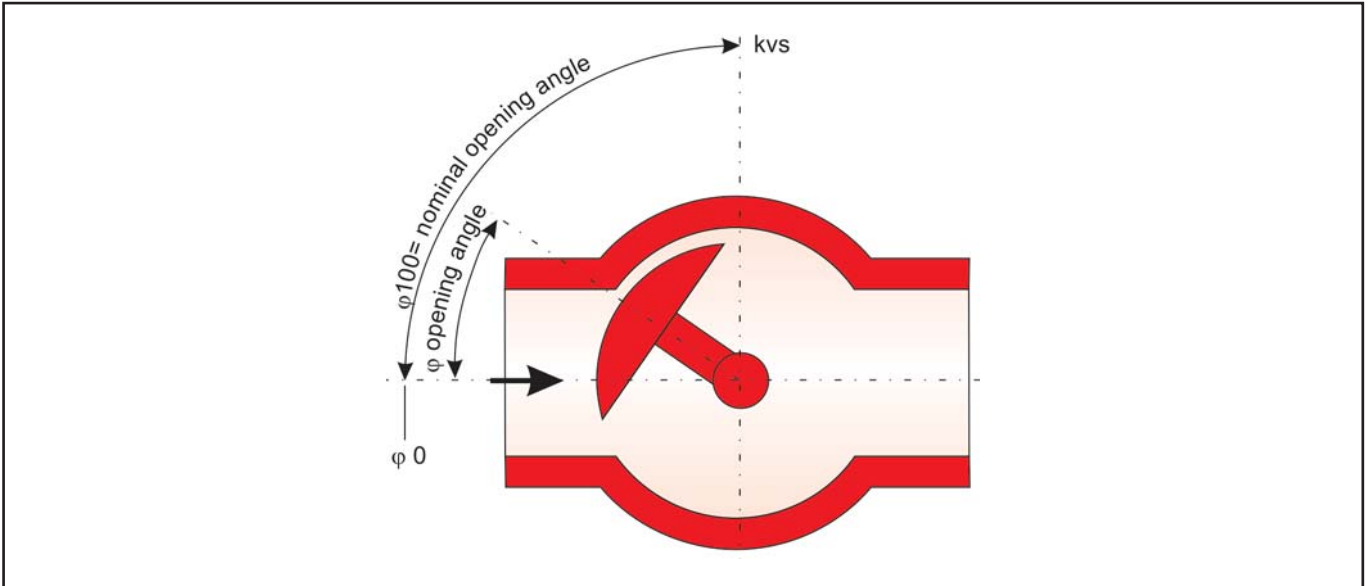


Fig. 7 - Functional diagram with opening angles

Characteristic curve

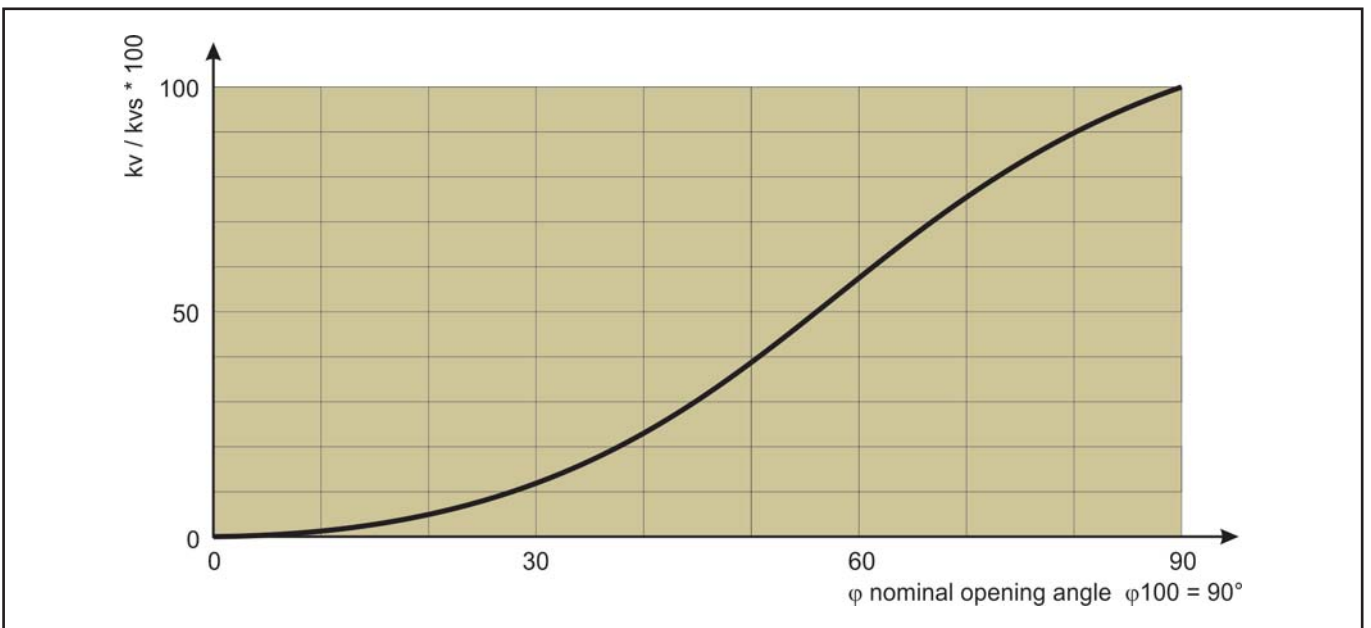


Fig. 8 - Characteristic curve

Terms for control valve sizing

For control valve sizing acc. to DIN EN 60534 opening angle.

Opening angle φ	30°	40°	50°	60°	70°	80°	90°
FL	0.75	0.73	0.72	0.70	0.59	0.55	0.55
xT	0.47	0.45	0.44	0.41	0.30	0.26	0.25

Table 4 – Terms for control valve sizing

Terms for noise level calculation

z-values for noise level calculation acc. to VDMA 24422

DN	25	60	80	100	150
z	0.15	0.15	0.1	0.1	0.1

Table 5 - noise-dependent control valve „z“ according to VDMA 24422

Correction terms

with liquids $\Delta LF = 0$,
with gases and vapour $\Delta LG = 0$

Torque and breakaway torques

DN	perm. torque M_{dmax} in Nm	required torque M_d in Nm	req. breakaway torque M_{dl} in Nm
25	168	10	10
50	226	25	25
80	437	60	60
100	749	90	90
150	1497	250	250

Table 6 - max. permissible torque M_{dmax} ., required torque M_d and breakaway torque M_{dl}

The breakaway torques specified are average values which were measured with air at 20°C with the corresponding differential pressures.

Operating temperature, process medium and long operating times may affect the permissible torques and breakaway torques considerably.

The listed max. permissible operating torques are valid for the standard materials in table 3.

kvs value:

DN	kv/ Cv	φ Opening angle								
		10°	20°	30°	40°	50°	60°	70°	80°	90°
25	kv	0.06	1.4	3	6	10.4	15.5	22.5	27.5	30
	Cv	0.07	1.6	3.5	7	12	18	26	32	35
50	kv	0.25	3.6	13	24	45	68	98	123	130
	Cv	0.29	4.8	15	28	53	80	115	144	152
80	kv	0.65	15	32	64	110	165	240	295	320
	Cv	0.76	18	37	75	129	193	281	345	374
100	kv	1.0	23	50	100	173	260	375	460	500
	Cv	1.2	27	59	117	202	304	439	538	585
150	kv	2.4	56	120	240	416	624	900	1105	1200
	Cv	2.8	66	140	281	487	730	1053	1293	1404

Table 7 - kvs value

Dimensions and weights

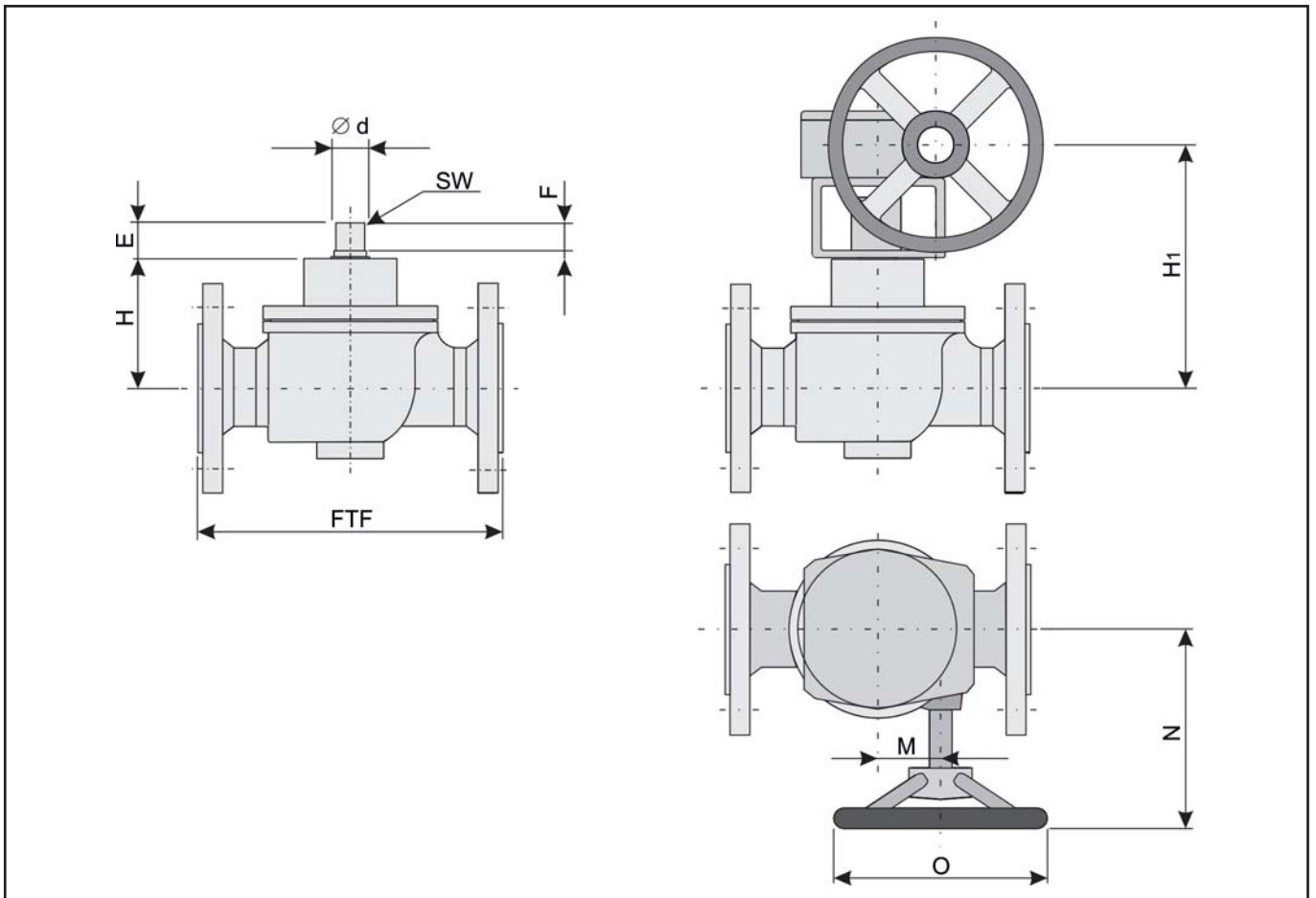


Fig. 9 - Rotary Plug Valve

DN	25	50	80	100	150
FTF	160	230	310	350	480
E	19	19	23	23	31
F	12	12	16	16	24
$\varnothing d$	16	20	24	28	36
H	81	99	127	134	205
SW	12	12	16	16	24
DIN ISO Connection	F05	F07	F07	F07	F10
Weight Rotary plug valve in kg	5	13	26	35	120

H1	170	200	220	230	315
M	45	45	45	45	45
N	150	150	150	150	150
O	200	200	200	200	200
Weight Hand gear in kg	3	3	3	3	3

Table 8 - Dimensions in mm and weights in kg

Selecting and sizing the rotary plug valve

1. Calculate the appropriate kv value
2. Select the nominal size and the kvs value from Table 7
3. Comparing the operation conditions in accordance to the pressure-temperature diagram
4. Select a suitable actuator from Table 6
5. Additional equipment



Note:

All relevant details regarding the version ordered, which deviate from the specified version in this technical description data, can be taken if required, from the corresponding order confirm.

Associated data sheets

- for Multi-turn actuators TB 30a
- for Quarter-turn actuators TB 31a

Ordering text

Rotary Plug Valve BR 23b

DN

PN

optional special version

Manual gear actuator or actuator (brand name):

Supply pressure: bar

fail-safe position:

Limit switch (brand name):

Solenoid valve (brand name):

Positioner:

Others: