

Series 23k Rotary Plug Valve in stainless steel

Application:

Stainless steel rotary plug valve with high flow capacity for process engineering plants, especially with viscous media and media containing solid parts:

- Nominal size DN 25,
- Nominal pressure PN 160,
- Temperature -10°C to 200°C.

The control valve consists of a stainless steel rotary plug valve and either a pneumatic quarter-turn actuator or manual gear actuator.

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

- Valve body designed with no cavities, and features a high flow capacity and a tight shut-off. It is suitable for use with dirty or viscous media as well as media containing solid particles.
- One-piece valve body made of stainless steel.
- Plug stem sealed by two carbon/graphite packings live-loaded by Belleville washers.
- The electrostatic discharging of rotary plug is ensured.
- Mounting acc. to DIN ISO 5211.

Versions:

The Series 23k Rotary Plug Valve is available optionally in the following versions:

- Rotary plug valve with hand gear box,
- Rotary plug valve with pneumatic quarter-turn actuator, (for details see respective data sheet).

Special design:

- Valve body and rotary plug made of special materials. (e.g. Hastelloy and nickel).
- Versions for larger nominal sizes and temperatures between -200°C und 450°C.
- Full bore.
- Heating jacket for valve body.

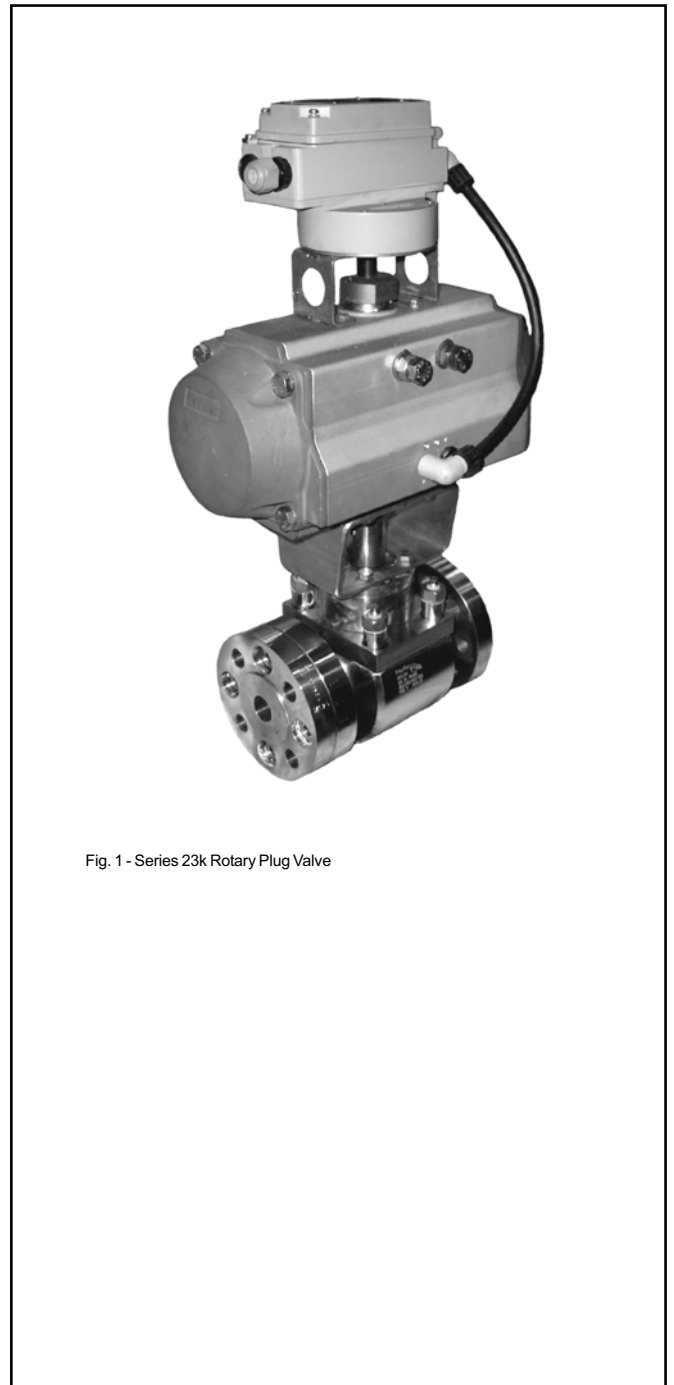


Fig. 1 - Series 23k Rotary Plug Valve

Rotary Plug Valve Series 23k

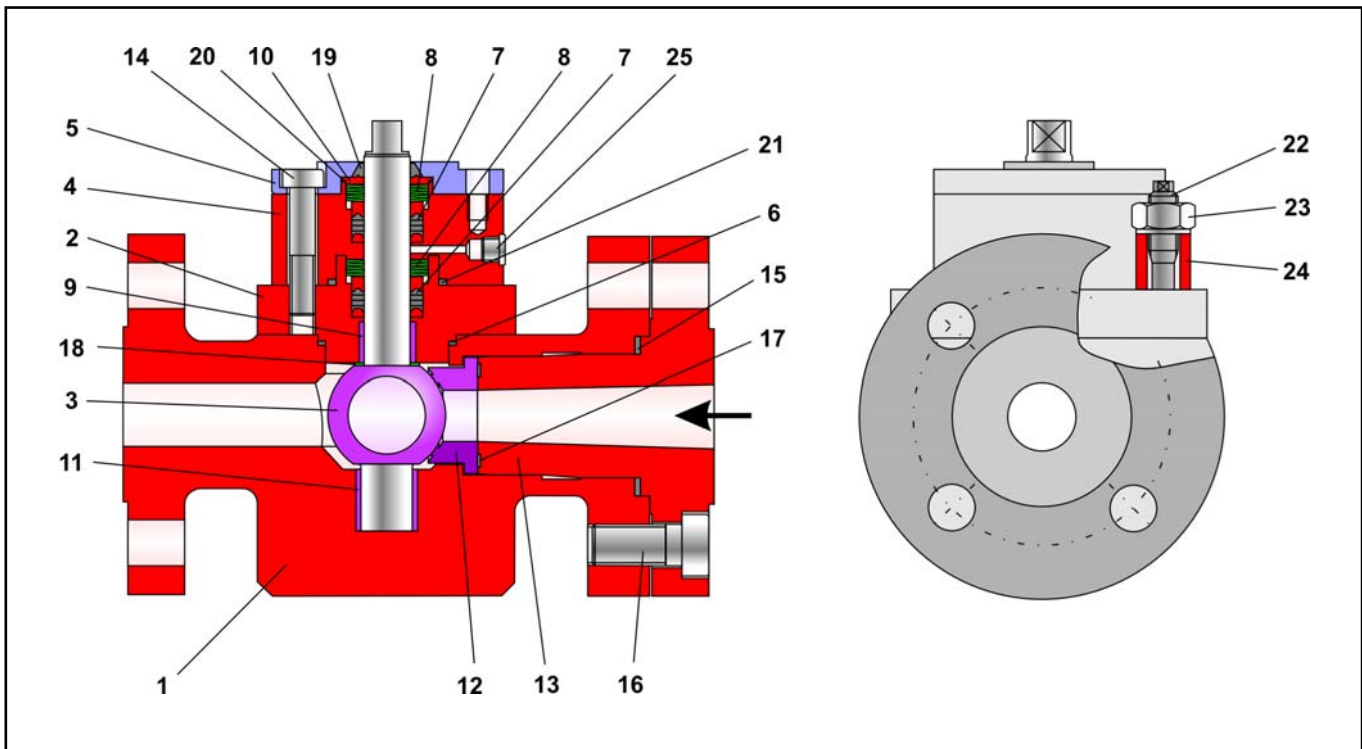


Fig. 2 - Sectional diagram of Series 23k Rotary Plug Valve

Item	Description	Item	Description
1	Valve body	14	Screw
2	Bonnet flange	15	Flat gasket
3	Rotary plug with stem	16	Screw
4	Stuffing box flange	17	Flat gasket
5	Stuffing box flange	18	Washer
6	Bonnet seal	19	Carbon-graphite ring
7	Carbon-graphite packing	20	Carbon-graphite ring
8	Set of Belleville washers	21	Carbon-graphite ring
9	Bearing bushing	22	Bolt
10	Bushing	23	Nut
11	Bearing bushing	24	Bushing
12	Seat ring	25	Locking screw
13	Seat retainer		

Table 1 - List of parts

Additional equipment and mounting parts:

The following accessories are optionally available for the valve separately or in combinations:

- Extension to stem (100 mm)
- Pneumatic and electric quarter-turn actuator
- Positioner
- Limit switches
- Solenoid valves
- Supply air pressure regulator/filter

Other accessories possible acc. to specifications on request.

Principle of operation:

The process media flows through the valve in the direction indicated by the arrow.

The position of the rotary plug (3) determines the flow rate through the area released between the rotary plug and the seat ring (12). The seat ring seals the rotary plug.

The seat design guarantees excellent tight shut-off at the seat and the high flow capacity.

The seat ring is easy to replace.

The rotary plug stem is sealed by a maintenance-free, carbon-graphite packing (7) loaded by Belleville washers (8) located above the packing.

The part-turn actuator is mounted to the valve at the connecting flange. The connecting dimensions conform to DIN ISO 5211.



Fail-safe position: Depending on how the pneumatic actuator is mounted to the valve, the valve has two fail-safe positions which become effective when the air pressure in the actuator is relieved or when the supply air fails:

Control valve with actuator "Spring closes":

Upon air failure, the valve is closed. The valve opens when the signal pressure increases, acting against the force of the springs.

Control valve with actuator "Spring opens":

Upon air failure, the valve is opened. The valve closes when the signal pressure increases, acting against the force of the springs.



Note: Before using the valve in hazardous areas, check whether this is possible according to ATEX 94/9/EC, by referring to the Operating Instructions <BA 23a>.

Technical data:

Nominal size	DN 25
Nominal pressure	PN 160
Temperature range	-10°C to 200°C
Basic characteristic	See characteristic curve
Rotary plug seal	Metal sealing
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
Flanges	acc. to DIN EN 1092 (DIN 2633 / 2635)
Stuffing box packing	Live-loaded Carbon-graphite packing

Table 2 – Technical data

Materials:

Valve body	1.4571
Rotary plug with stem	1.4980 / HSB 1
Seat ring	1.4571 / HSB 1
Packing	Carbon-graphite packing loaded by Belleville washers (1.8159)
Bearing bushing	1.4571 / HSB 1
Bonnet seal	Carbon-graphite
body gaskets	Carbon-graphite

Table 3 - Materials

Terms for control valve sizing:

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

opening angle	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

Correction terms:

with liquids, gases and vapors

$$\Delta LG = 0 \quad \Delta LF = 0$$

Terms for noise level calculation:

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

DN	25
z	0.15

Table 5 - Acoustical valve coefficient z acc. to VDMA 24422

Functional diagram with opening angles and characteristic curve :

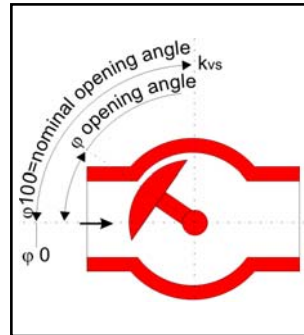


Fig. 3 – Functional diagram with opening angles

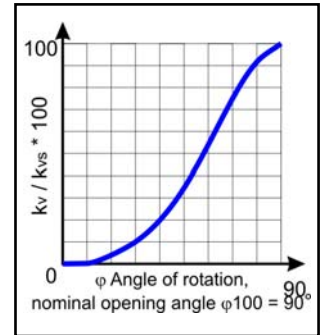


Fig. 4 – Characteristic curve

kvs values:

DN	kv/ Cv	phi 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

Table 6 - kvs values

Torque and breakaway torques:

DN	perm. torque M _{dmax} in Nm	required torque Md in Nm	required breakaway torque Md _i in Nm
25	360	10	10

Table 7 - Max. permissible torque, required torque and breakaway torque

The specified breakaway torques 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 considerable. The maximum permissible torques listed apply to the standard materials specified in Table 3.

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.

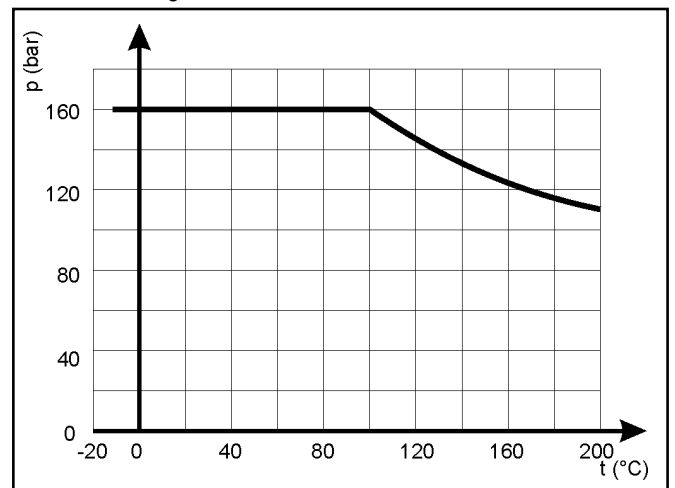


Fig. 5 - Pressure-temperature diagram

Dimensions and weights:

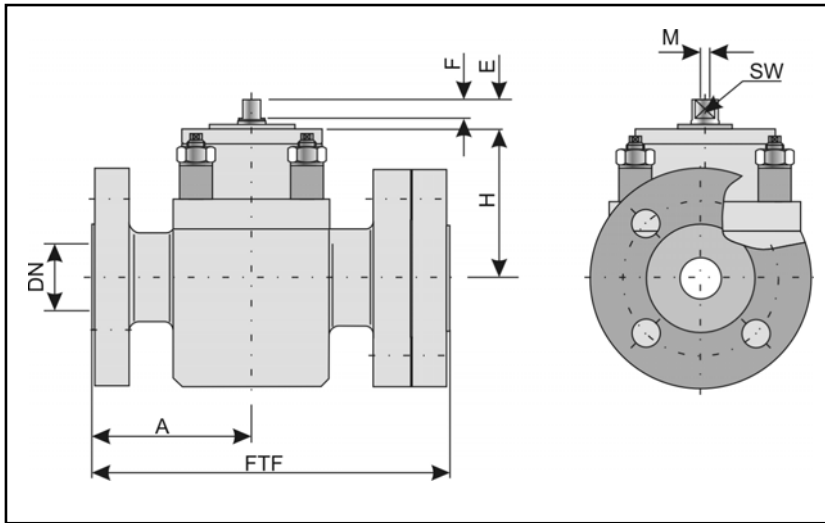


Fig. 5 – Dimensional drawing

DN	25
PN	160
FTF	230
A	102,5
H	95,5
E	19
F	12
M	-
SW	12
DIN ISO Anschluss	F07
Gewicht in kg	12

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 6.
3. Select the nominal pressure acc. to the pressure-temperature diagram.
4. Select a suitable actuator from Table 7.

Ordering text:

Rotary Plug Valve Series 23k,
 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:



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.

Please contact our technical sales team for your special requirements

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Specifications subject to change without notice.