

PRODUCT MANUAL

APPLICATION

- In common measuring circuits of systems of industrial automation;
- For fast complete closing or opening of flow of the operation liquid, which can flow through the ball valve in both directions; the recommended direction is identified with an arrow on the body;
- As special design in purity grade for oxygen (O₂), this armature is delivered perfectly degreased and provided with a suspended blue tag (code P2S);
- As special design with purity of inner surfaces of grade I pursuant to TPE 10-40/1926/85 (code PC1).

The ball valves may not be used for regulating the flow; it concerns a closing full-flow armature.

DESCRIPTION

The basis of the ball valve consists of a body, in which the stop ball is located. With the use of a shaft, it is connected with handle to for manual control of the ball valve.

The positions of the ball valve "CLOSED" - "OPEN" (OFF-ON) are achieved by the movement of the handle to the stop.

Antistatic design of the ball valve ensures electric interconnection of all parts, which are in contact with the operation liquid and jacket (body) of the armature.

The ball valve design also ensures protection against possible pushing out of the control mechanism from the ball valve body. The ball valve in open position does not contain "dead areas", in which residue of operation liquids could remain or where their solid compounds could be deposited.

Flanges with weld-on optional inlet and outlet connecting terminals are screwed to the unit.

The stop element of the armature (ball) revolves around its axis that is vertical to the direction of flow and in the open position, the operation liquid flows through the ball valve.

The ball valve is closed (opened) by turning the handle to the right (left) by 90° up to the stop, which results in full closure or opening of the ball valve.

TECHNICAL DATA

Technical requirements for ball cocks are specified in ČSN 13 4103.

Operation position: Weight: Type of operation: Connection to piping: discretionary approx. 0.45 kg continuous optional input and output connecting terminals pursuant to Table 2

OPERATION CONDITIONS

Ball valve are designed for the environment defined by the group of parameters and their severity grades IE36 pursuant to standard EN 60721-3-3 and the following operation conditions. Nominal inner diameter: DN 10 Nominal pressure: PN 63 Maximum operation temperature: 150 °C - with sealing from material FPM 125 °C - with sealing from material NBR Operation liquid: technical water, other liquids and gaseous fuels



Position	Name of part	Material
1	body	1.4541 *
2	flanges and terminals	1.4541 *
3	shaft	1.4541 *
4	ball	AISI 316 *
5	handle	1.4541 *
6	shaft bush	1.4541 *
7	screws	stainless steel A2
8	nut	stainless steel A2
9	nut, washer	stainless steel A2
10	seat	PTFE
11	seal	FPM (NBR)+PTFE
12	distance ring	PVDF
13	flange sealing	FPM (NBR)
14	handle to roll-on	VINYL

*) The manufacturer has the relevant certificate 3.1 for these materials pursuant to EN 10204

CHEMICAL RESISTANCE OF SEALING MATERIALS

Chemical resistance of materials of sealing elements represents an important parameter, which determines reliability of the valve. The following table includes informative data of the most frequently used substances together with chemical resistance of sealing element materials. If other substances are used, chemical resistance tests shall be performed directly at the customer in the expected operation conditions (temperature, pressure, concentration ...)

Ball valve PN 63

Medium				NBR	PTFE	PVDF
Acet	one		-	-	*	+
Acet	vlene		+	+	+	+
Petr	ol		+	*	+	+
Ammonia		aqueous		-		
		solution	-	-	+	+
	nonia	liquid	-	*		+
		gaseous	*	*		+
Ethy	lene		+	+		+
Hydı	raulic fluids	not flammable	*	-		+
Hydi	roxides		*	*		+
	Boric		+	+	+	+
	Citric		+	+	*	+
	Nitric		-	+	-	+
		< 65%	*	+	-	+
	Hydrofluoric	> 65%	*		-	
		10%	+	+	+	+
	Phosphoric	concentrato	- -	, +	+	, +
	Thosphone	boiling conc	+	т	т	т
		10% 80°C	*			
	Hydrochloric	10%, 60 C	*	+	-	+
	Olympia in	36%, 20 C		+		+
	Chromic		+		-	
DS	Malic		+	+	+	+
Ū	Carbolic		-		-	
∢	Hydrocyanic		+		*	
	Butyric		*		*	
	Lactic		+	+	*	+
	Formic	10%	-	+	-	+
	Acetic	10%	-	+	-	+
		concentrate	-		-	
	Salicylic		+	+	+	+
	Sulphurio	25%	*	+	*	+
	Sulphune	80%	-	*	-	*
	Oxalic	10%	+	+	+	+
	Carbonic		+	+	+	+
	Tartaric		+	+	+	+
Oxy	gen		+	-	+	+
Oils			+	*	+	+
C 4-		< 200°C	*	-		+
Steam		> 200°C	-	-	-	-
Perc	hloroethvlene		+	*	+	+
Kerosene			+	*	+	+
Gaseous fuels			+	+	+	+
Radioactive radiation			*	*	-	-
Compressed air			+	+	+	+
Toluene.						
trichloroethylene			*	-	+	
Hydrocarbons			+	+	+	+
nyulocarbons		4 80°C			-	
Water			-	*		- 7
			+	-	+	+
Hydrogen		bot	-	*	+	+
		not	+		+	+

+ Great resistance

- Not resistant

* Good or conditional resistance

Vacant No information is available

RELIABILITY

Reliability indicators in the operating conditions and environmental conditions in this manual - Mean operating time between failures of 96,000 hours

-the estimated life span of

96,000 hours (inf.value) 10 years

PRODUCT MANUAL TYPE 972

DESIGNATION

(pursuant to ČSN 13 3005-1)

- Data on ball valve body
- Trade mark of the manufacturer
 Product ordering number
- Time code (serial number for design for O₂ and for design with code PC1)
- Nominal inner diameter
- Nominal pressure
 - Maximum operation temperature
- Body material
- Casting number of body material
- Mark of performed pressure test
- Code of shaft seal sealing
- Arrow indicating recommended direction of medium flow

Data on ball valve handle to

 Arrows and terms OFF – ON identifying direction of CLOSING – OPENING the ball valve

The armature in purity grade for O_2 is marked with a suspended blue tag.

DELIVERY

Unless agreed otherwise with the customer, each delivery includes

- Delivery note
- Products pursuant to the purchase order
- Accompanying technical documentation in Czech:
 - Product quality and completeness certificate, which also serves as the warranty certificate
 - o Test report and list of used materials
 - o Product manual
 - $\circ \qquad \text{Inspection report for design for O_2 (only in case of armature with code $P2S$)}$
 - Inspection report about purity of internal surfaces (only in case of armature with code PC1)

If it is established in the purchase contract or agreed otherwise, the following documentation can be also delivered with the product:

- Copy of inspection certificate 3.1 pursuant to EN 10204 for body material with casting number
- Declaration of Conformity with purchase order 2.1 pursuant to EN 10204
- Supplier's declaration of conformity in accordance with ISO/IEC 17050-1
- Test report about the seismic and the vibration qualification

PLACING AN ORDER

- The purchase order shall specify:
- Name
- Product ordering number
- Other (special) requirements
 Number of pieces

PURCHASE ORDER EXAMPLE Standard design:

- 1. Ball valve PN 63
- 972 11 15 15 W2 BM1 20 pcs
- 2. Ball valve PN 63
- 972 11 15 21 W1 BZ1 KKU5 20 pcs

Special requirement:

Ball valve PN 63 972 11 99 99 5 pcs

TABLE 1 - DESIGN OF BALL COCKS, TYPE 972

SPECIFICATIONS			ORDERING NUMBER									
			972	1	1	XX	XX	XX	XXX	XXX	ХХХ	ХХХ
DESIGN OF BALL VALVE pursuant to Fig. 1		direct		1	1							
CONNECTING TERMINALS pursuant to table 2		of inlet				xx						
		of outlet					хх					
	O-ring FPM (-20 to +150°C) +PTFE+PVDF							W1				
SHAFT SEAL	O-ring NBR (-30 to +125°C) +PTFE+PVDF							W2				
	green								BZ1			
	red								BR1			
ON	blue								BM1			
	yellow								BY1			
SPECIAL	purity grade for O ₂									P2S		
TREATMENT ¹)	cleanness of internal surfaces of equipment of grade I									PC1		
ACCESS	CODE	of inlet									XXX	
pursuant to t	able 3 ¹)	of outlet										XXX

¹) If the code is not specified, the fitting will be supplied without special modifications and without accessories

TABLE 2 - OVERVIEW OF CONNECTING TERMINALS

All specified connecting terminals (with the exception of terminals with codes 31, 35 and 37) are designed for full flow-through with nominal inner diameter DN 10.



TABLE 2 - OVERVIEW OF CONNECTING TERMINALS – continuation from the previous page

CODE	DRAWING	DESCRIPTION AND INSTALLATION PROCEDURE		
21	20 512007M	SCREW-JOINT FOR CONE 1. Put a cap nut on the cone 2. Weld the cone on the tube end 3. By means of a nut, screw the tube to the sleeve, hold the cock flange with side wrench 32 and tighten the nut with torque of 120 Nm.		
22	31 (1) (1) (2) (1) (2) (1) (2) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1	WELD-ON CONE WITH CAP NUT M20x1.5 By means of the nut, screw the armature to the screw joint for a cone, which forms a part of e.g. condensation tank, another valve, etc., hold the cock flange with a side wrench 32 and tighten the nut with torque of 120 Nm.		
23	31 51 222 0 224	WELD-ON CONE WITH CAP NUT M22x1.5 By means of the nut, screw the armature to the screw joint for a cone with the corresponding thread, which forms a part of e.g. piping, hold the cock flange with a side wrench 32 and tighten the nut with torque of 150 Nm.		
31	25 5120X1:5	MANOMETRIC SCREW-JOINT M20x1.5 1. Put a cap nut on the sleeve 2. Weld the sleeve on the tube end 3. Put a metal sealing on the screw joint 4. By means of a nut, screw the piping to the screw joint, hold the cock flange with side wrench 32 and tighten the nut with torque of 120 Nm.		
32	~42 51 20 26 0 24	WELD-ON SLEEVE WITH CAP NUT M20x1.5 By means of a nut, screw the armature to the manometric screw joint with the corresponding thread, hold the cock flange with side wrench 32 and tighten the nut with torque of 120 Nm.		
33	30 22 22 22 22 22 22 22 22 22 22 22 22 22	SCREW-JOINT WITH MANOMETRIC CONNECTION M20x1.5 LH / M20x1.5 The screw joint is used to connect a manometer or valve with this screw joint. 1. Put a metal sealing on the screw joint of the manometer. 2. Screw the manometer and the armature together with the use of a sleeve coupling (it is delivered with the armature), hold the cock flange with side wrench 32 and tighten the nut with torque of 120 Nm.		
34	31 22 51 002W	TEST SCREW-JOINT M20x1.5 The screw joint is used to connect control manometer. It is delivered including the plug with sealing. Recommended torque is 120 Nm.		
35	25	MANOMETRIC SCREW-JOINT G1/2 1. Put a cap nut on the sleeve 2. Weld the sleeve on the tube end 3. Put a metal sealing on the screw joint 4. By means of a nut, screw the piping to the screw joint, hold the cock flange with side wrench 32 and tighten the nut with torque of 120 Nm.		
36	~42 ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	WELD-ON SLEEVE WITH CAP NUT G1/2 By means of a nut, screw the armature to the manometric screw joint with a corresponding thread, hold the cock flange with side wrench 32 and tighten the nut with torque of 120 Nm.		
37		WELD-ON SLEEVE WITH CAP NUT M20x1.5 WITH SEALING PURSUANT TO STANDARD SHELL By means of a nut, screw the armature to the manometric screw joint, hold the cock flange with side wrench 32 and tighten the nut with torque of 120 Nm. Tightness is ensured with stainless sealing ring made of soft steel.		
39	30 22 22 12 12 12 12 12 12 12 12 12 12 12	SCREW-JOINT WITH MANOMETRIC CONNECTION M20x1.5 LH / G1/2 The screw joint is used to connect a manometer or valve with manometric screw joint G1/2. 1. Put a metal sealing on the screw joint of the manometer. 2. Screw the manometer and the armature together with the use of a manometric connection (it is delivered with the armature), which shall be tightened with torque of approx. 120 Nm.		

TABLE 2 - OVERVIEW OF CONNECTING TERMINALS - continuation from the previous page

40	24 24 61/2LH 027	SCREW-UNION WITH MANOMETRIC CONNECTION M20x1.5 LH / G1/2 The screw-union is used to connect a manometer or valve with manometric screw-union G1/2. 1. Put a metal sealing on the screw-union of the manometer. 2. Screw the manometer and the armature together with the use of a manometric connection (it is delivered with the armature), which shall be tightened with torque of approx. 120 Nm.
42	1/2-14 NPT	EXTERNAL THREAD 1/2 - 14 NPT 1. Wind up sealing tape of PTFE on the thread. 2. Screw the armature into the hole with corresponding internal thread, hold the cock flange with side wrench 32 and tighten the nut with torque of 120 Nm.
54	33 33 10N 11-2/1	INTERNAL THREAD 1/2 - 14 NPT The thread is cut in the weld-on terminal. 1. Wind up sealing tape of PTFE on a corresponding external thread 2. Screw the screw joint or tube into the hole in the armature, hold the cock flange with side wrench 32 and tighten the nut with torque of 120 Nm.
62		EXTERNAL THREAD G1/2 Wind up sealing tape of PTFE on the thread. Hold the cock flange with side wrench 32 and tighten the nut with torque of 120 Nm.
71		INTERNAL THREAD G1/4 The thread is cut in the weld-on flange. 1. Wind up sealing tape of PTFE on a corresponding external thread 2. Screw the screw joint or tube into the hole in the weld-on terminal 3. Hold the cock flange with side wrench 32 and tighten the nut with torque of 35 Nm.
72		INTERNAL THREAD G1/2 The thread is cut in the weld-on terminal. 1. Wind up sealing tape of PTFE on a corresponding external thread 2. Screw the screw joint or tube into the hole in the weld-on terminal 3. Hold the cock flange with side wrench 32 and tighten the nut with torque of 120 Nm.
73		INTERNAL THREAD G3/8 The thread is cut in the weld-on flange. 1. Wind up sealing tape of PTFE on a corresponding external thread 2. Screw the screw joint or tube into the hole in the weld-on terminal 3. Hold the cock flange with side wrench 32 and tighten the nut with torque of 80 Nm.
99	·	ANOTHER CONNECTING TERMINAL

ORDERING ACCESSORIES

The purchase order shall specify:

- Name
- Product ordering number
- Number of pieces

PURCHASE ORDER EXAMPLE Standard design:

- . Weld-on sleeve with cap nut and sealing 981 NA1
- 20 pcs
- 2. Sealing3
 - 972 11 15 21 W1 BZ1 KKU5 20 pcs

TABLE 3 OVERVIEW OF OPTIONAL ACCESSORIES

CODE	WELD-ON CONE WITH CAP NUT The cone is delivered by 1 piece, welded in a PE bag together with the relevant cap nut. After putting the cap nut on the cone and welding the cone on the piping, it is possible to connect an armature to the cone, which is provided with a corresponding screw-union for the cone according to the dimensional drawing of the screw-union						
	MATER	IAL	INNER DIAMETER	DRAWING			
KU1	Carbon steel	1.0569					
KU2	Stainless steel	1.4541	7				
KU3	Creep-resisting steel	15 128					
KKU4	Carbon steel	1.0569		38			
KKU5	Stainless steel	1.4541 10		4			
KKU6	Creep-resisting steel	15 128					
	CAP NUT FOR WELD-ON CONE						
	MATERIAL OF NUT	DRAWIN	IG OF NUT	DRAWING OF SCREW-UNION			
	Stainless steel 1.4541 (only for KU2, KU3, KKU5 and KKU6)			20 G TXOZW			
	Carbon steel 11 109.0 (only for KU1 and KKU4)		0 24				

WELD-ON SLEEVE WITH CAP NUT AND SEALING The sleeve is delivered by 1 piece, welded in a PE bag together with the relevant cap nut and aluminium sealing. After putting the cap nut on the sleeve and welding the sleeve on the piping, it is possible to connect an armature, which is provided with a corresponding screw-union for the sleeve according to the dimensional drawing of the screw-union, to CODE the piping SLEEVE MATERIAL OF SLEEVE THREAD OF NUT **INNER DIAMETER** DRAWING NA1 1.0569 Carbon steel Stainless steel 30 NA2 1.4541 M20 x 1.5 NA3 Creep-resisting steel 15 128 NAG1 Carbon steel 1.0569 NAG2 Stainless steel 1.4541 G 1/2 NAG3 15 128 Creep-resisting steel 6.5 NA4 Carbon steel 1.0569 NA5 Stainless steel 1.4541 30 M20 x 1.5 NA6 Creep-resisting steel 15 128 NAG4 Carbon steel 1.0569 NAG5 Stainless steel 1.4541 G 1/2 NAG6 Creep-resisting steel 15 128 CAP NUT FOR WELD-ON SLEEVE MATERIAL OF NUT DIMENSIONAL DRAWING OF NUT DRAWING OF SCREW-UNION 24 Stainless steel 1.4541 (only for NA2, NAG2, NA3, NAG3, NA5, NAG5, NA6 and NAG6) S 1/2) 20x1 Carbon steel 11 109.0 ○ 24 Q \geq (only for NA1, NAG1 NA4 and NAG4) SEALING RINGS FOR WELD-ON SLEEVE ORDERING Sealing rings made of other materials can also be ordered independently according to the following ordering numbers NUMBER DRAWING OF SEALING **MATERIAL OF SEALING** 382 041 AI EN AW-1050A 276 067 42 3005 Cu ø16 Ø6,2 DETAIL A 382 063 Stainless steel 1.4541 ഹ ~i 382 096 Stainless steel 1.4404 ø17.5

Optional accessories according to Table 3 can also be ordered separately as Type 981 (according to Accessory Catalog 981).

Figure 1 - Ball valve - direct, dimensional drawing



PACKING

Both products and accessories are delivered in a packing ensuring resistance to the impact of thermal effects and mechanical effects pursuant to controlled packing regulations.

TRANSPORT

The products may be transported on conditions corresponding to the set of combinations of classes IE 23 pursuant to EN 60721-3-2 but they may not be exposed to direct rain (i.e. by plains, trucks, trailers and semi-trailers, railway wagons with specially designed shock absorbers and ships, in premises that are without ventilation and protection against climatic effects).

STORAGE

The products may be stored on conditions corresponding to the set of combinations of classes IE 12 pursuant to EN 60721-3-1 but with ambient temperature from -30 to 45 °C (i.e. in places, where temperature and humidity are not regulated, with a threat of occurrence of condensation, dripping water and formation of ice, without a special threat of an attack with biological agents, with vibrations of small significance and not situated close to sources of dust and sand).

INSTALLATION AND CONNECTION

The ball valve installation may be realized by a worker of the installation or service organization.

The operation liquid may flow through the ball valve in both directions. The arrow in the upper part of the body indicating the recommended direction of flow only serves for identification of inlet and outlet terminals in case they are different.

Installation of the ball valve shall be realized directly on the piping by means of inlet and outlet connecting terminals.

The procedure of correct connection of the terminals with threaded rings is specified on the instruction label, which forms a part of the delivery of the ball valve.

COMMISSIONING

After the installation (connection of the piping) and inspection of the correct position of the control handle, the ball valve is prepared for operation.

OPERATION AND MAINTENANCE

The ball valve is closed (opened) by turning the handle to the right (left) by 90° to the stop, which results in full closure or opening of the ball valve. The positions of the ball valve "CLOSED" - "OPEN" (OFF-ON) are achieved by the movement

of the handle to the stop. Intermediate positions are not recommended on principle – danger of damaging seats and losing tightness.

The ball valve may only be cleaned by service workers of the manufacturer.

PROCEDURE IN CASE OF FINDING LEAKAGE OF THE CONNECTION WITH THREADED RINGS

Possible leakage of the connection can be caused by unauthorized installation, e.g. by failure to comply with required torque (i.e. excessive or insufficient tightening of the cap nut), failure to comply with the minimum direct part of the tube from its end or application of this connection in conditions with increased level of vibrations without any fixation of the armature and connecting tubes, especially of those of bigger lengths.

The cap nut may never be tightened (released) under pressure – it could cause lethal injury!!!

Uninstallation and repeated installation of the connection shall be realized pursuant to table 2 - INSTALLATION PROCEDURE FOR CONNECTING TERMINALS WITH THREADED RINGS.

SPARE PARTS

The ball valve design does not require any delivery of spare parts.

WARRANTY

The warranty period is 36 months from the receiving of the product by the customer, unless established otherwise in the contract. The manufacturer warrants for the parts, which are subjected to natural wear and are replaceable as a part of common maintenance of the product (seal sealing, sealing O-rings, etc.), for the period of 24 months.

Rejection of defects shall be enforced in writing at the manufacturer within the warranty period. The rejecting side shall identify the product name, ordering and manufacturing numbers, date of issue and number of the delivery note, clear description of the occurring defect and the subject of the claim. If the rejecting side is invited to send the device for repair, it shall do so in the original package of the manufacturer and/or in another package ensuring safe transport.

The warranty shall not apply to defects caused by unauthorized intervention into the device, its forced mechanical damage or failure to comply with operation conditions of the product and the product manual.

REPAIRS

The ball valves shall be repaired by the manufacturer. They shall be sent for repair in the original or equal package without accessories.

DISABLING AND LIQUIDATION

The product and its package do not include any parts that could impact the environment.

Products that are withdrawn from operation (including their packages) may be disposed of to sorted or unsorted waste pursuant to the type of waste.

The package of the product can by recycled completely. Metal parts of the product are recycled, non-recyclable plastic materials shall be disposed of in accordance with applicable legislation

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