Installation and Setting-Up Instructions

Contents :

DOCUMENTS
Technical Specifications : G345
Installation and Setting-Up Instructions : G345AV

The sensor-specific spare part list will be delivered with the order.

We reserve the right for technical modifications without prior notice.

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1. TECHNICAL DATA

PASVE® pH is a mounting/service valve for pH sensors. It can be used with practically all pH sensors in this size category.

PASVE® pH allows the cleaning and calibration of pH sensors without stopping the process. When required, this can be done automatically. To protect the sensor in abrasive processes, it can be turned to the measuring position only for the duration of the actual measurement.

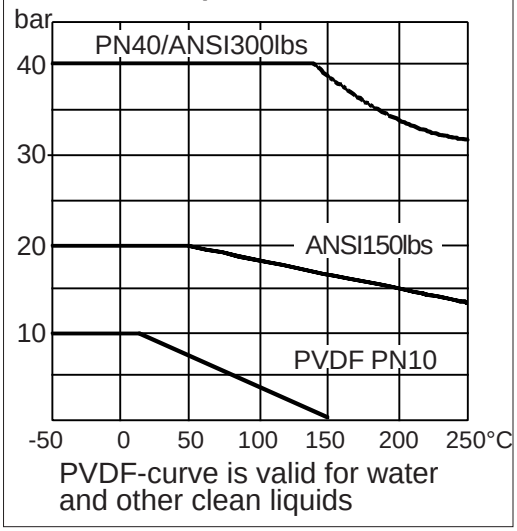
PASVE® pH is available in a manually operated type or equipped with a pneumatic or electric actuator.

TECHNICAL SPECIFICATIONS

Applicable pH sensors
See the technical specification SATRON PASVE pH Mounting and Service Valve G345

Max. operating pressure/temperature
40 bar, 250 °C, (see the appended table).
Min. operating temp. -50°C.
Sensor-specific limitations should also be taken into account in applications.

Pressure / Temperature curve



PVDF-curve is valid for water and other clean liquids

Surface temperature

Ambient temperature °C	Temperature class
70	T6
85	T5
120	T4

Materials
Wetted parts: AISI316L, Titanium, Hastelloy® C276, Duplex and also PVDF for type F.
Seals: PTFE, or PTFE with carbon and graphite filling or PTFE 50%+AISI316 50% alloy.

Weight
PASVE pHC 4.7 kg, PASVE pHP 4.8 kg,
PASVE pHF 8.9 kg,
Actuator 5.5 kg

European Directive Information

ATEX directive (94/9/EC)
Satron Instruments Inc. complies with the ATEX directive.

European Pressure Equipment Directive (PED) (97/23/EC)
- Sound Engineering Practice

European Certification :

Ex II 3 GD

SATRON instruments

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DECLARATION OF CONFORMITY

Module A
ATEX Directive, 94/9/EC
EN13463-1:2001 + AC:2002

Manufacturer: Satron Instruments Inc.

Address: Patamäenkatu 5
P.O.Box 22
FIN-33901 Tampere, Finland

Products: Mounting and service valves:
PASVE®
PASVE® pH

Above mentioned is hereby guaranteed

Tampere, 30.05.2006

Satron Instruments Inc.

Timo Blom
Managing Director

Pasve is the registered trademark of Satron Instruments Inc.

2. CONSTRUCTION AND OPERATION

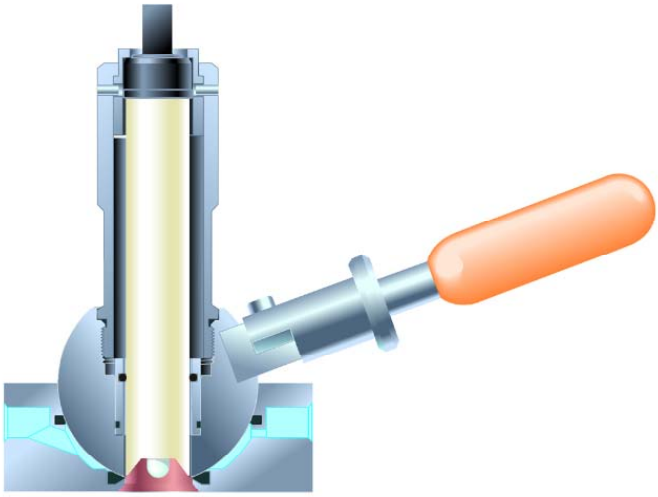


Figure 2-1 Measurement position

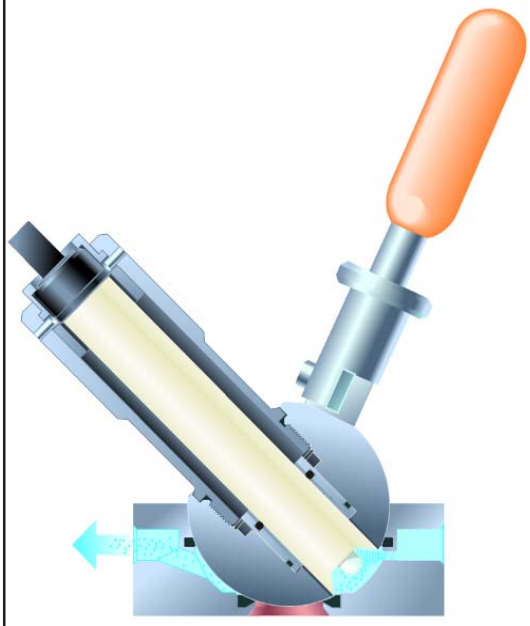


Figure 2-2 Service and Cleaning position

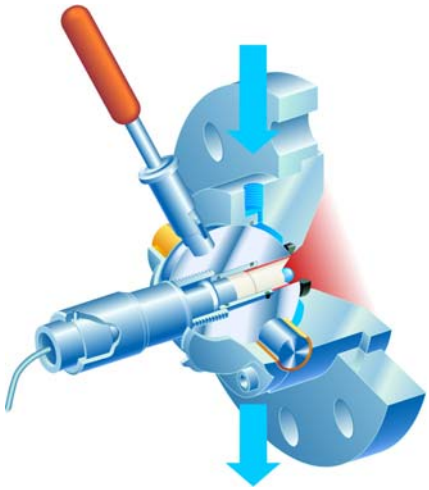
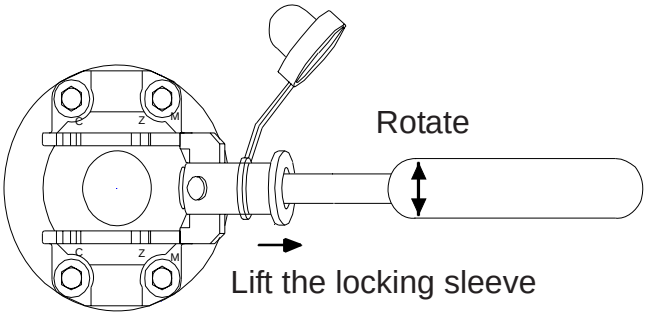
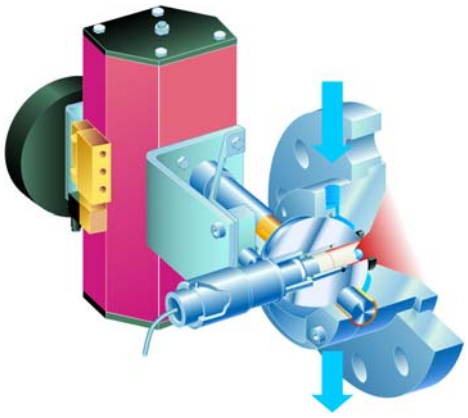


Figure 2-3 Pasve pH manual operation



Rotate the handle (right-hand thread) to release the locking.
Lift the locking sleeve to change to operation position.

Figure 2- 4 Manual valve operation



Spring return, double action, and electric actuator are available. Automatic operation provides many added benefits.

Figure 2- 5 Automatic operation with actuator

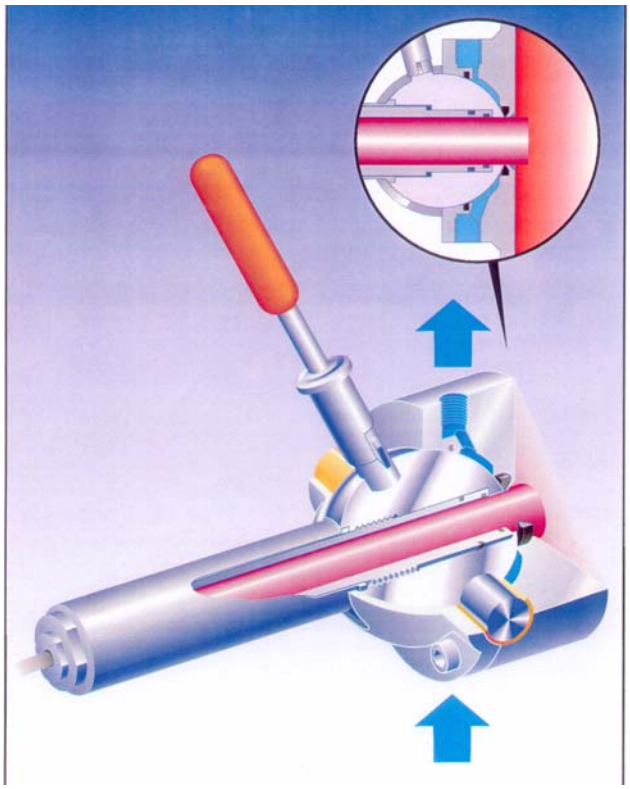


Figure 2- 6 **IN-LINE pH-measurement**

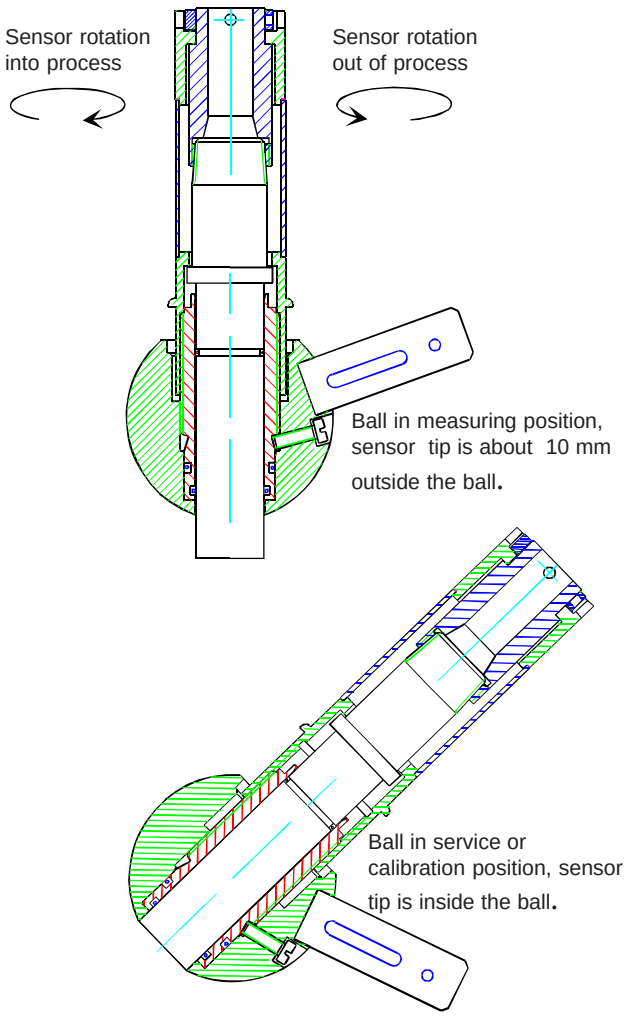


Figure 2- 7 **IN-LINE operation**

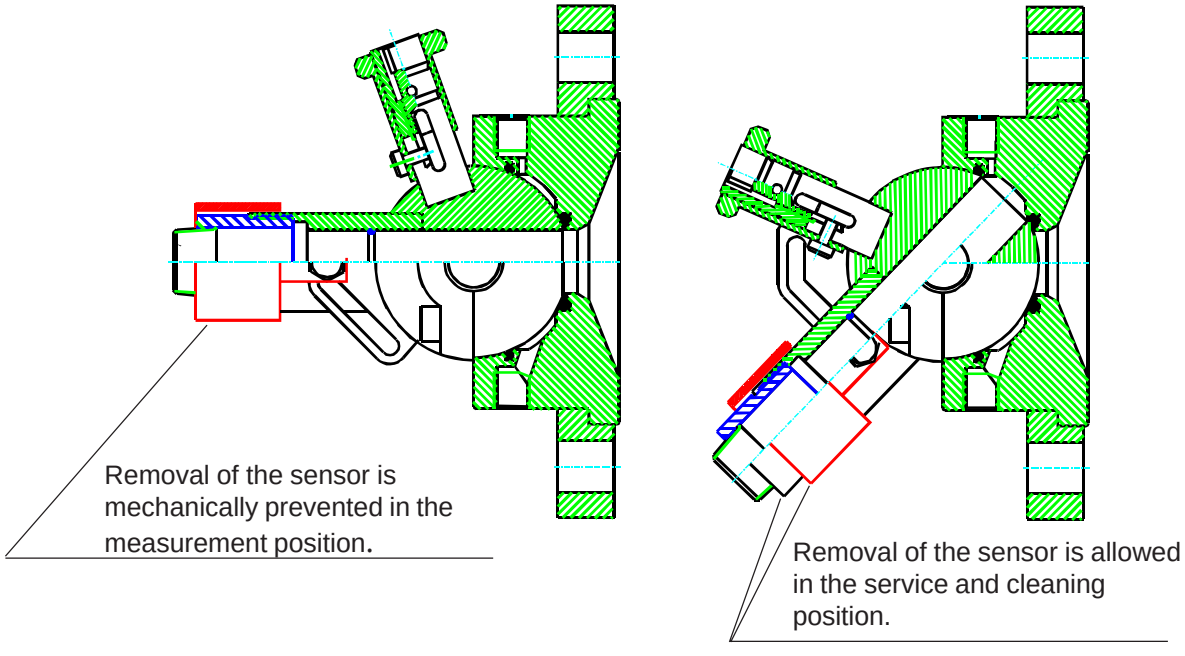


Figure 2- 8 **Manually operated valve with security operation for Ø12 / 120 mm pH-glass sensor**

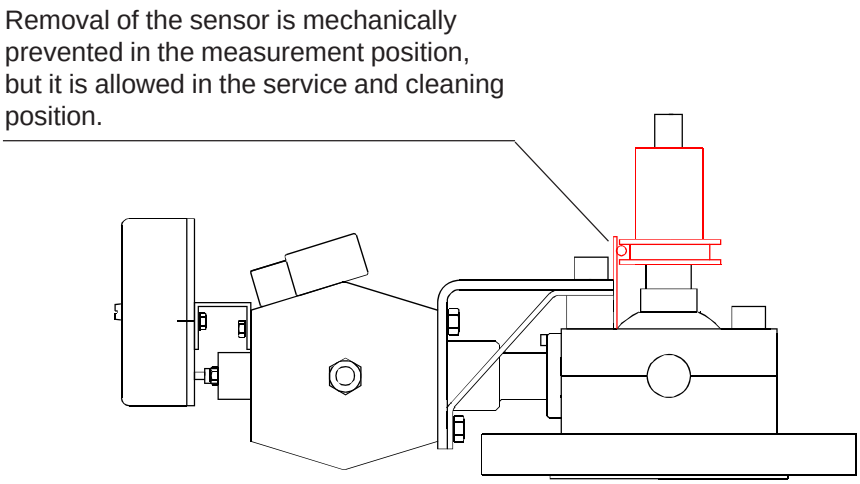


Figure 2- 9 **Automatic operated valve with safety operation for Ø12 / 120 mm pH-glass sensor**

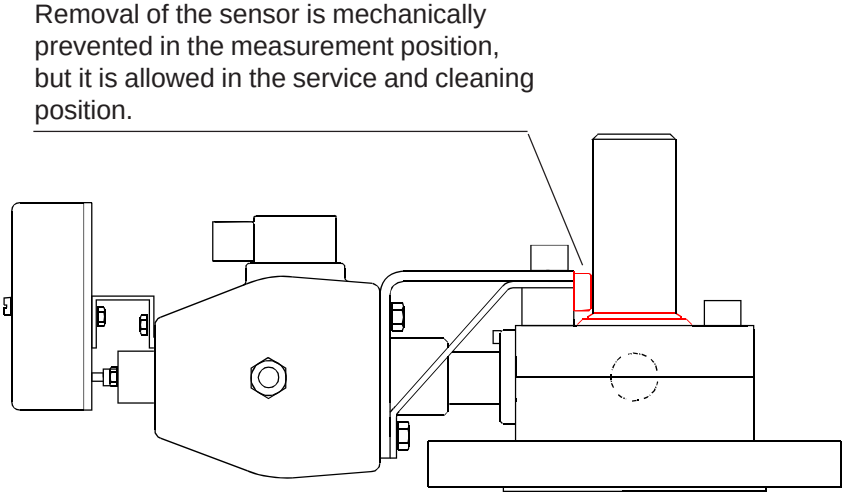


Figure 2- 10 **Automatic operated valve with safety operation for pH-sensor**

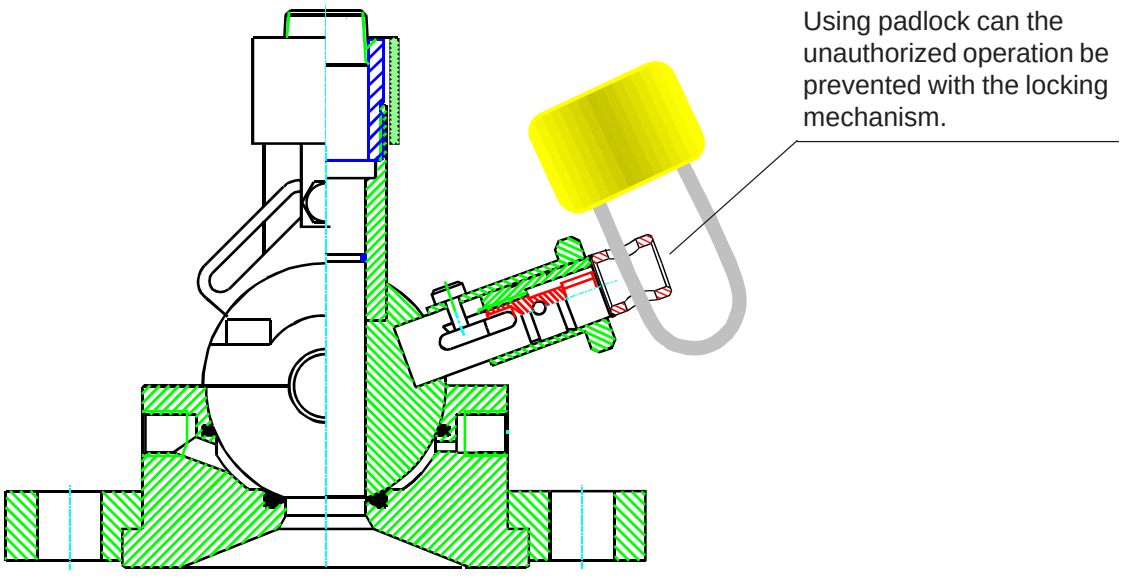
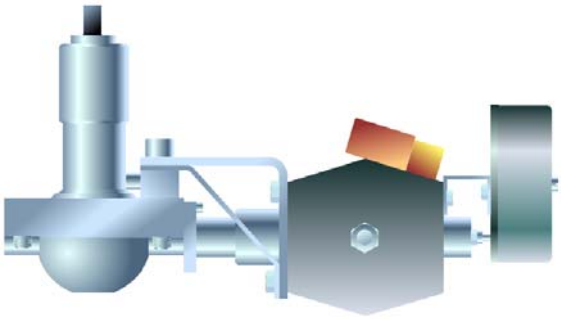
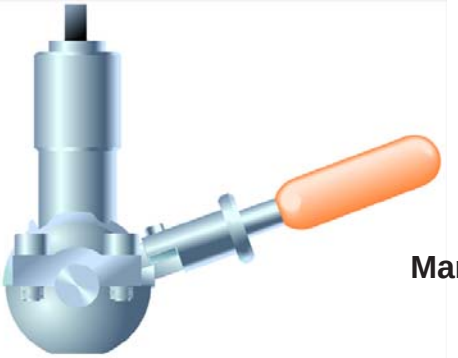


Figure 2- 11 **Manually operated valve with security operation**

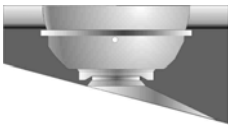


Automatic operated valve with actuator



Manually operated valve

C-body

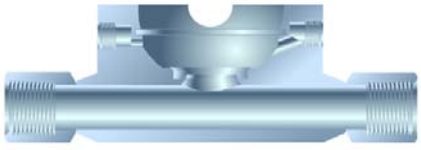


B-body

P-body

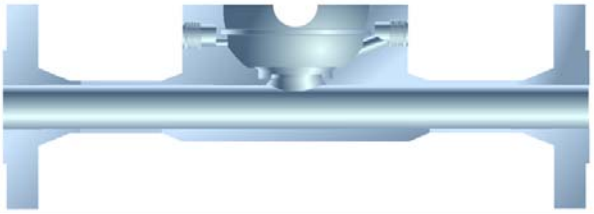
F-body

Flange standards :
- DIN
- ANSI
- JIS



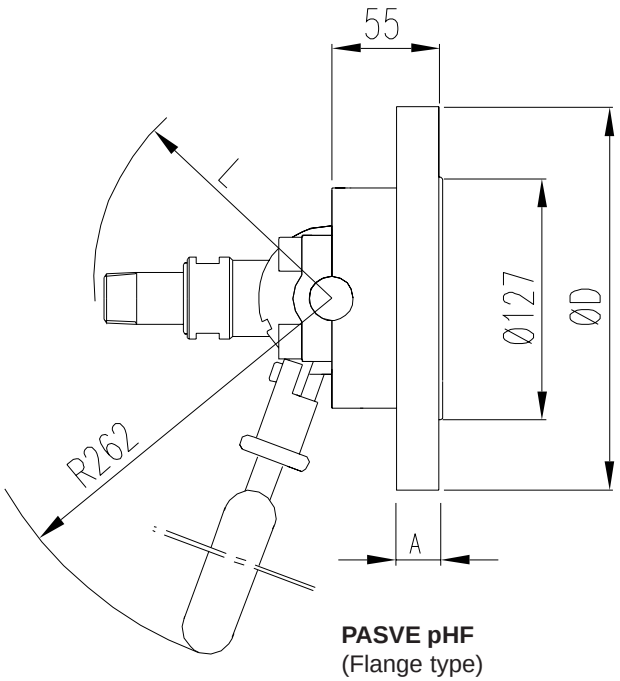
T-body

T-body threads :
- 1” - NPT
- 1½” - NPT
- 2” -

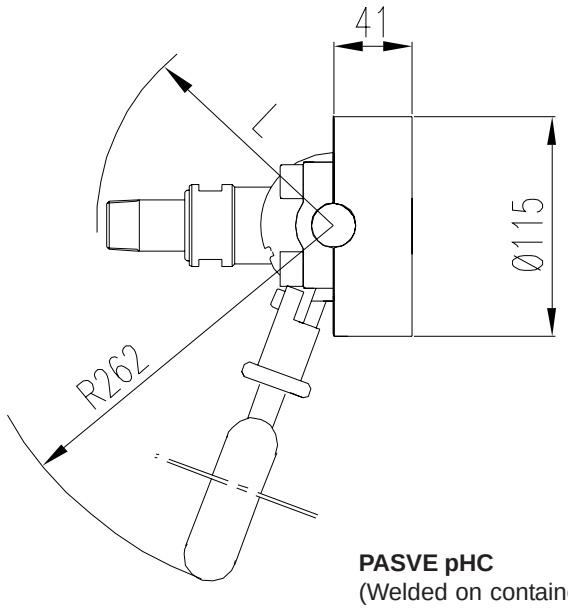


D-body

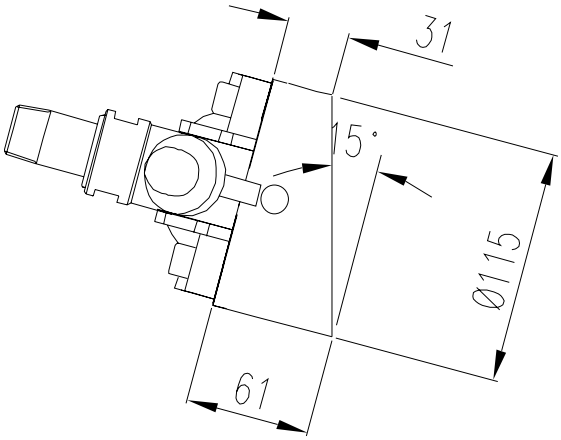
Figure 2- 12 **Process connection types for Pasve pH**



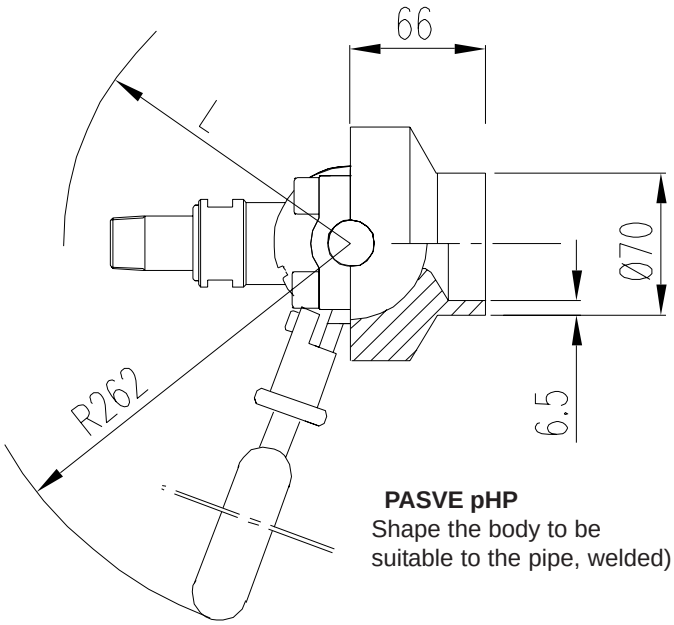
PASVE pHF
(Flange type)



PASVE pHC
(Welded on container or horizontal pipe)



PASVE pHB
(Welded on container or vertical pipe, body 15º)



PASVE pHP
Shape the body to be suitable to the pipe, welded)

PASVE pHF

Flange Code	Type	ØD	Ød	A
A	ANSI 3" 150 lb	191	152.4	22
B	ANSI 3" 300 lb	210	168.3	27
C	DN100 PN40	220	180	26
D	DN80 PN40	200	160	22
E	JIS 10K 80	185	150	20
F	JIS 40K 80	210	170	30

L depends on the sensor type.

Figure 2- 13 **Dimensions (in mm)**

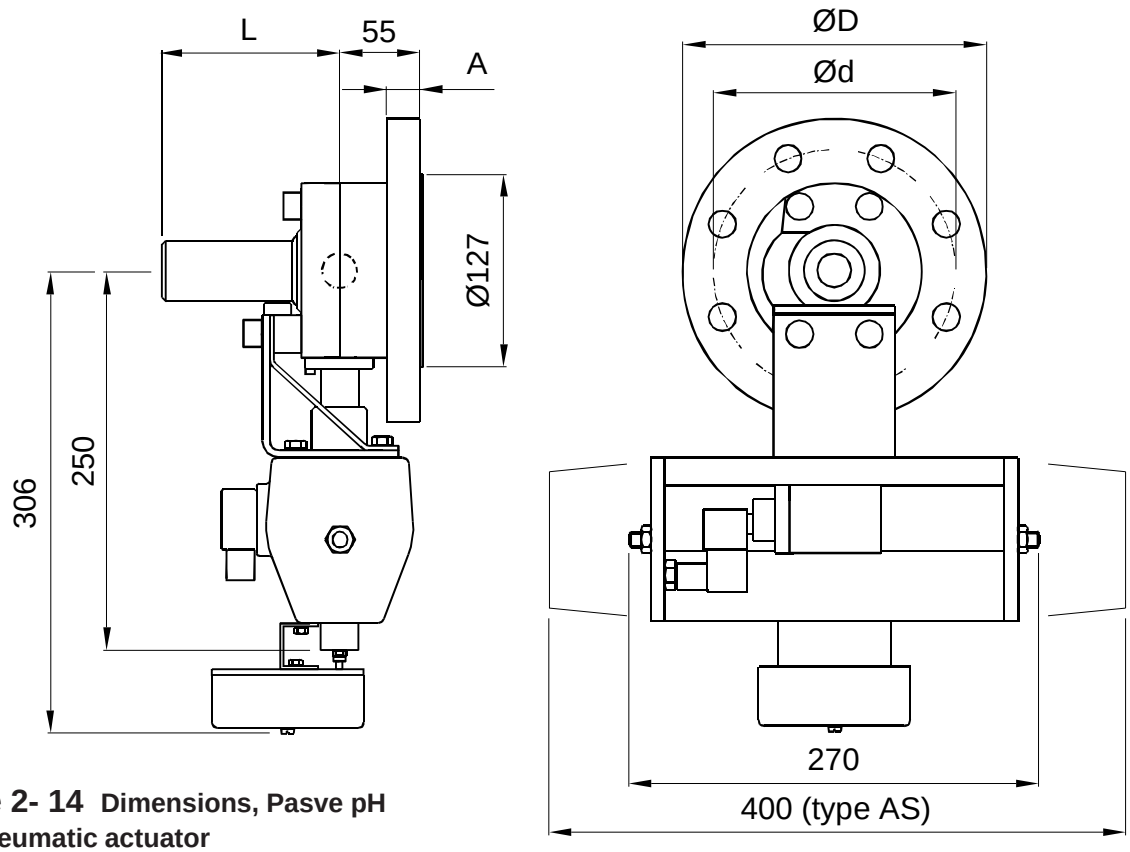


Figure 2- 14 **Dimensions, Pasve pH with pneumatic actuator**

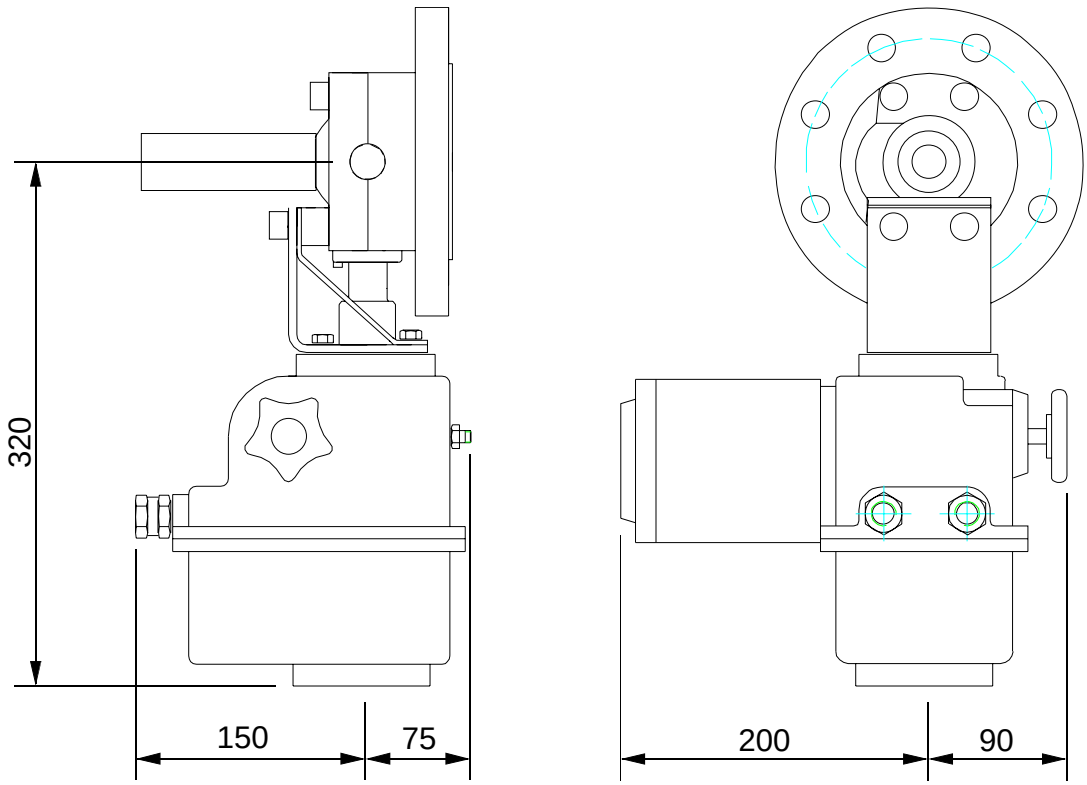
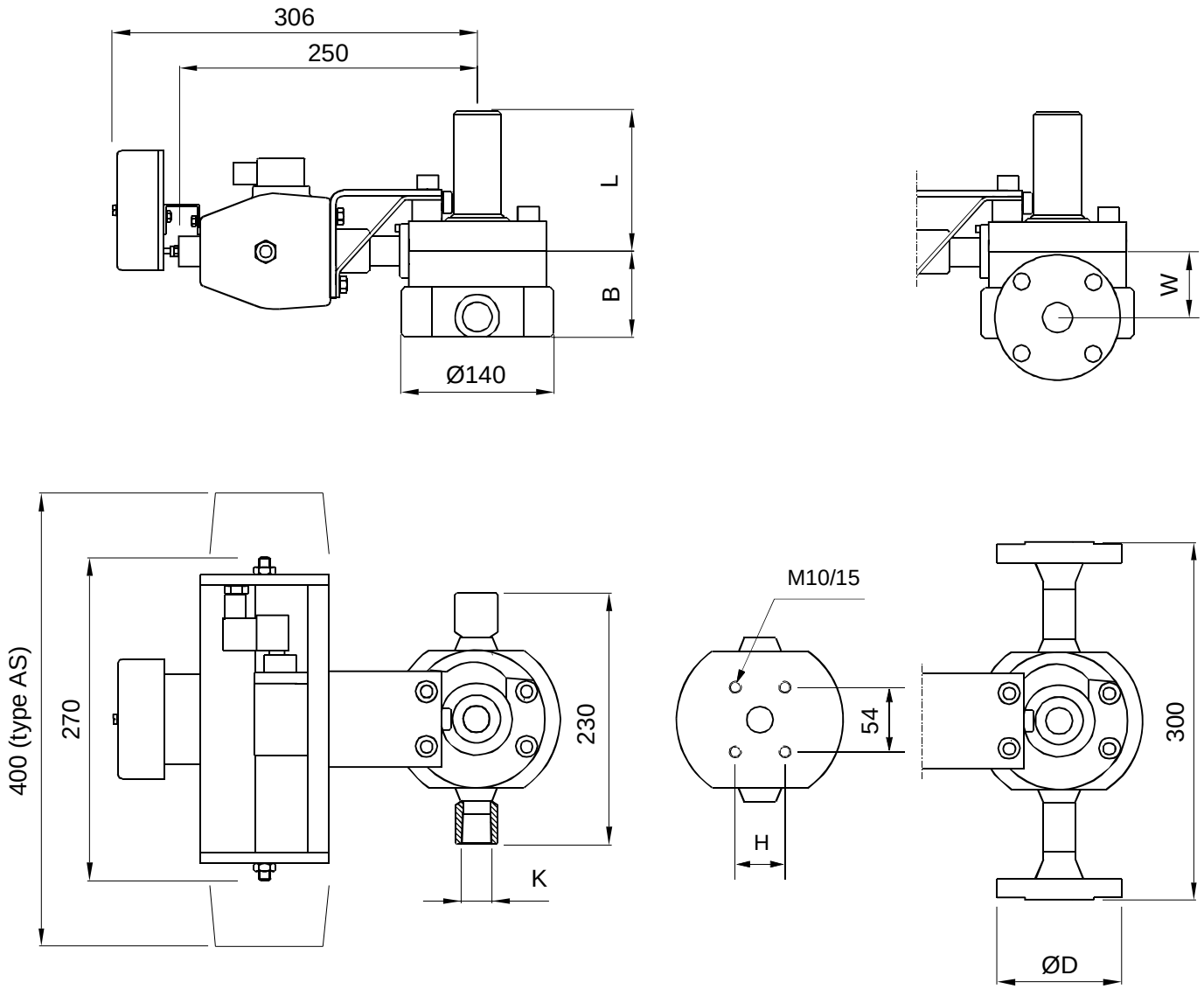


Figure 2- 15 **Dimensions, Pasve pH with electric actuator**



PASVE pHT
(Threaded connection,
body **T**)

PASVE pHD
(Flange connection,
body **D**)

PASVE pHT

Code	Thread (dimension K)	B	H
2	1" - NPT	77	48
4	1,5" - NPT	92	64
5	2" - NPT	104	76

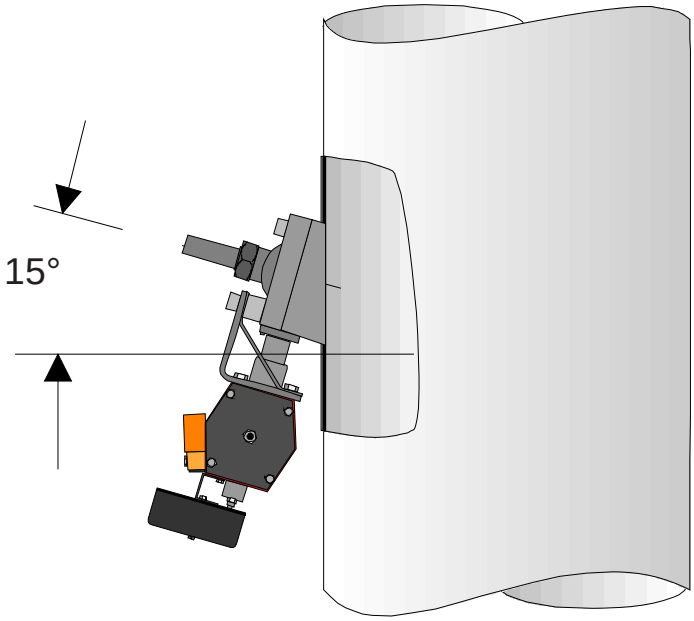
PASVE pHD

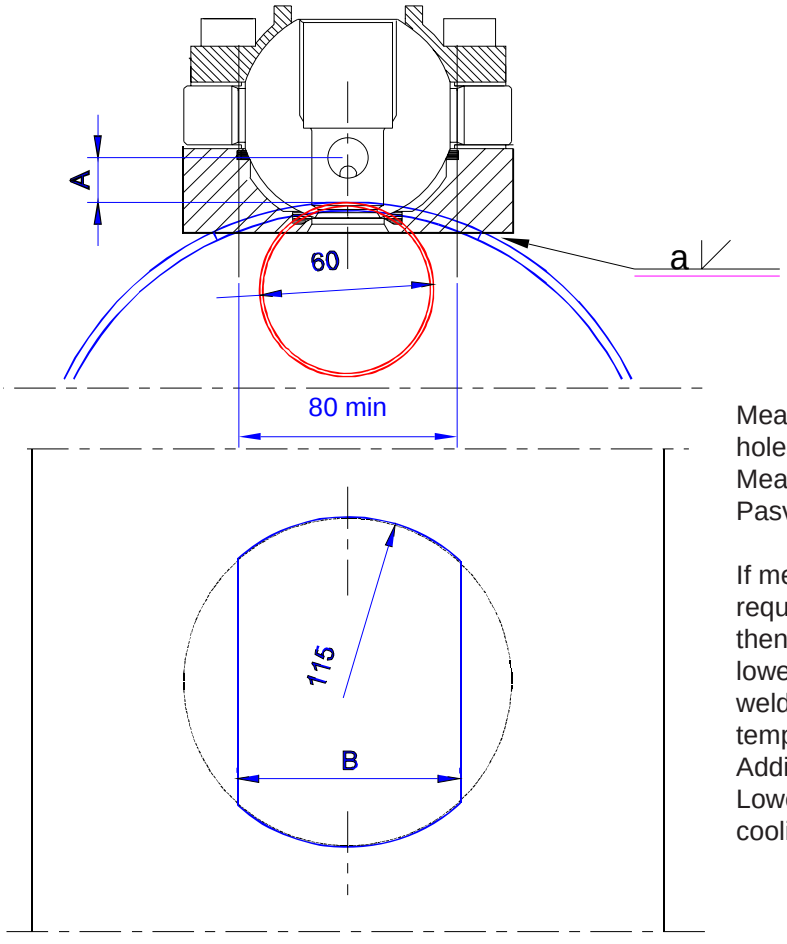
Code	Flange Type	W	ØD	H
H	ANSI 1" 150 lbs	55	108	48
J	ANSI 1" 300 lbs	55	124	48
U	ANSI 2" 150 lbs	68	153	76
V	ANSI 2" 300 lbs	68	165	76
G	DN25 PN40	55	115	48
T	DN50 PN40	68	165	76

Figure 2- 16 **Dimensions, mounting types T and D (flow-through)**

3. Installation
3.1 Mechanical installation

Note! In vertical mounting the air bubble in pH-sensor does not stay into the tip of sensor. It is recommended to use PASVE mounting type B; the mounting angle is 15°.

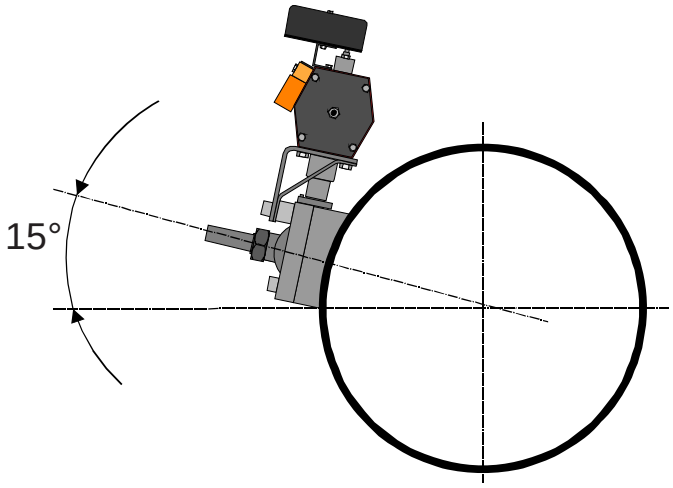


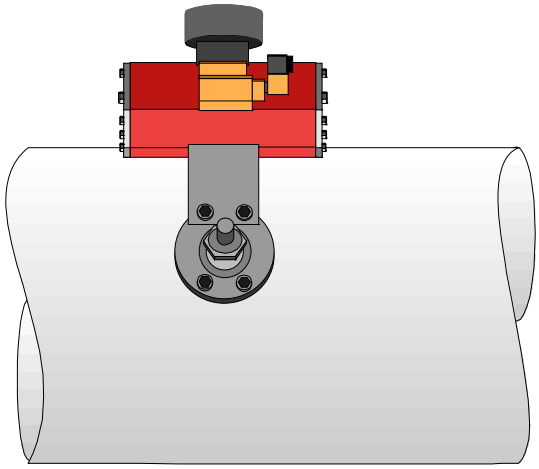


Measure A so that connectors for flushing holes can be connected
Measure B so that minimum 80mm of the Pasve body is inside inner surface of the pipe

If measure B cannot fulfill 80mm minimum requirement (incase of below 200mm pipes), then PASVE must be disassembled and lowest gasket removed before welding. The welding must be carried so that the body temperature remains as small as possible. Additional cooling is recommended. Lowest pipe size with disassemby and cooling is 60mm.

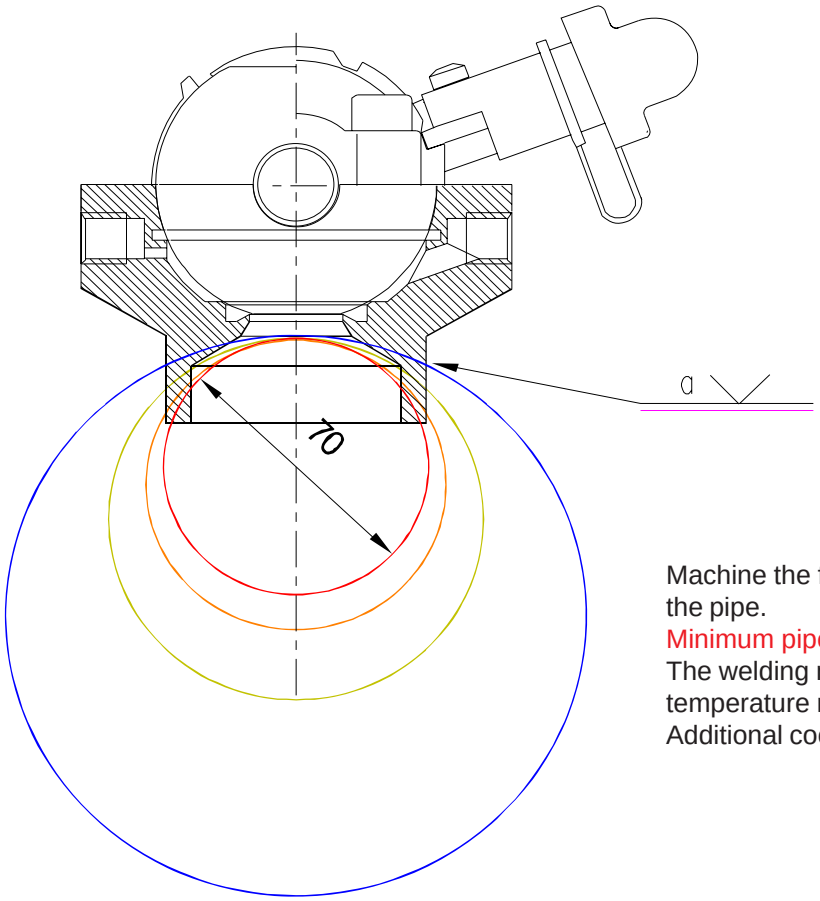
Figure 3-1 Installation in container or vertical pipe





Note! In horizontal mounting the air bubble in pH-sensor does not stay into the tip of sensor. It is recommended to use the mounting angle 15°.

Figure 3-2 **Installation in horizontal pipe**



Machine the fbody of Pasve to the same diameter as the pipe.
Minimum pipe size is 70 mm.
The welding must be carried so that the body temperature remains as small as possible.
Additional cooling is recommended.

Figure 3-3 **Install body P in the pipe**

Figure 3-4 **Installation of Pasve pH body C in horizontal pipe**

Figure 3-5 **Welding of Pasve pH body C in horizontal pipe**

3.2 FLUSHING INSTALLATION

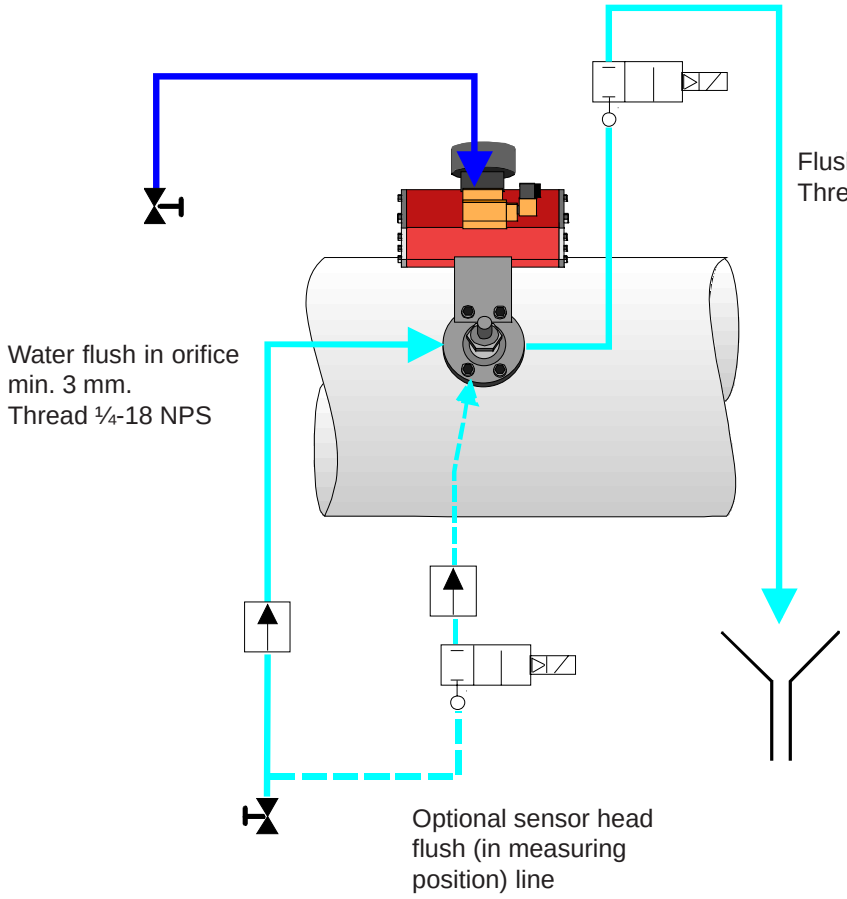
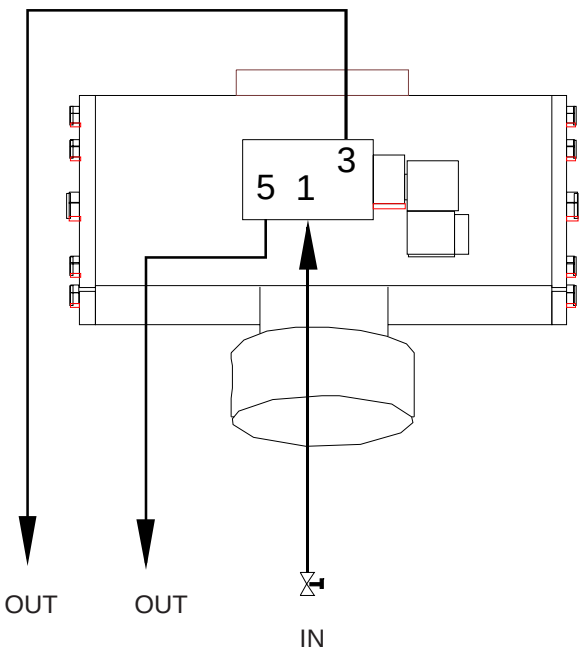


Figure 3-6 Flushing connection

3.3 COMPRESSED AIR INSTALLATION



Port number	Port thread
1	G1/4
3	G1/8
5	G1/8

Figure 3-7 Pressure connection

3.4 ELETRICAL CONNECTION

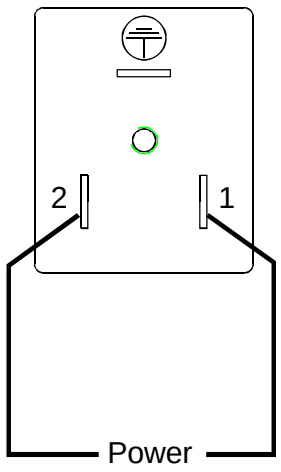


Figure 3-8 Solenoid valve connection

1004354093

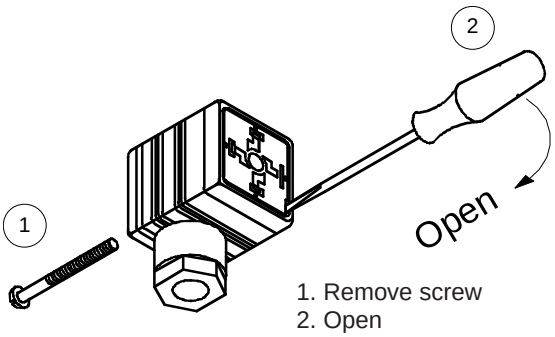
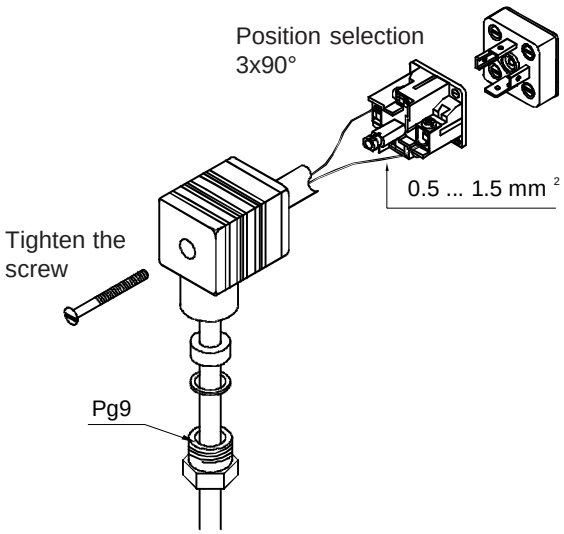


Figure 3-9 Removing the PLUG junction box

1004354092



Kuva 3-10 Adjusting the junction box position

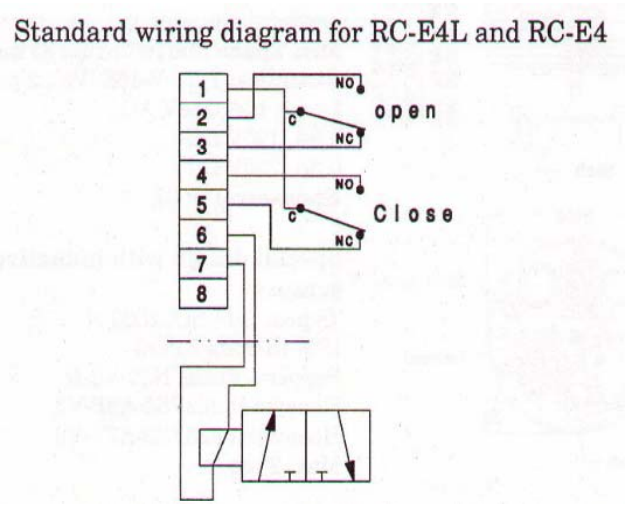


Figure 3-11 Standard position switches

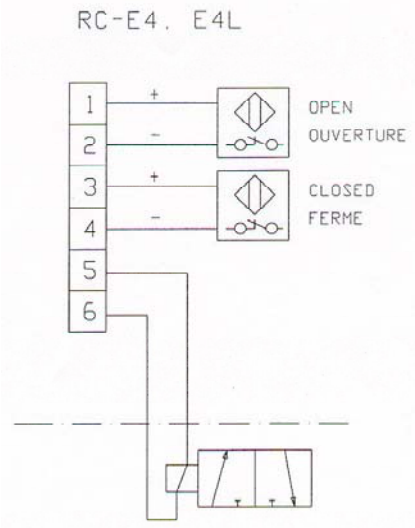


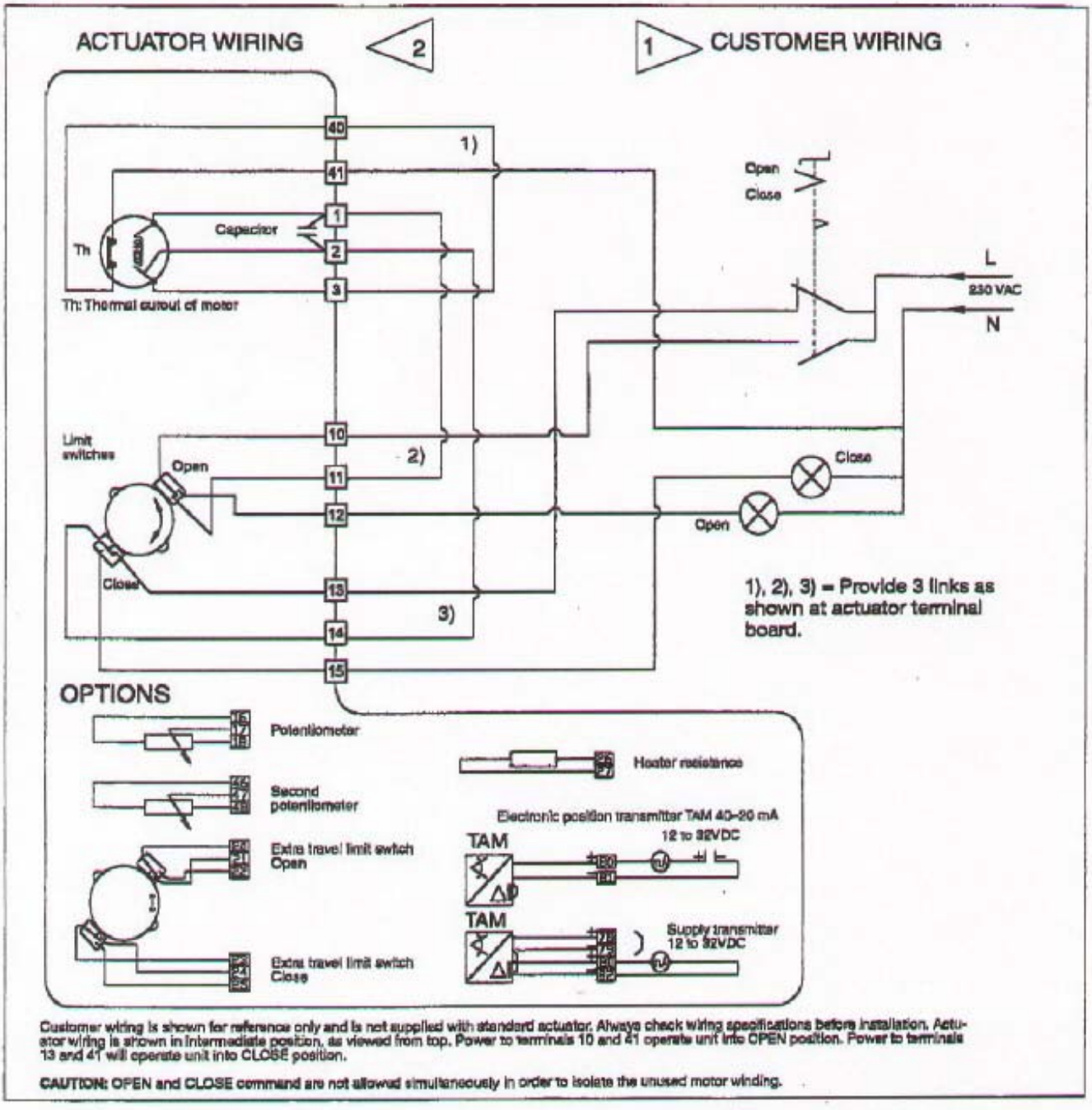
Figure 3-12 Inductive position switches, NS5002, NJ2-V3-N

BERNARD

www.bernard-actuators.com

Type	Torque Nm	Closing time secs/ 90°	Motor single phase	P kW	In A	Is A
OA6	60	6	230 V 50 Hz	0,03	0,6	0,9
OA8	80	6	230 V 50 Hz	0,10	1,2	1,7
OAP6	80	30 or 60	230 V 50 Hz	0,03	0,6	0,9
OA15	150	15 or 25	230 V 50 Hz	0,03	0,6	0,9

WIRING S2242-A



Customer wiring is shown for reference only and is not supplied with standard actuator. Always check wiring specifications before installation. Actuator wiring is shown in intermediate position, as viewed from top. Power to terminals 10 and 41 operate unit into OPEN position. Power to terminals 13 and 41 will operate unit into CLOSE position.

CAUTION: OPEN and CLOSE command are not allowed simultaneously in order to isolate the unused motor winding.

Figure 3-13 Electric actuator connection

4 SETTING-UP

1. Shut-off valve **A** must be closed.
2. Install the sensor to Pasve.
3. Open the shut-off valve **A**.

Note! The pressure **P1 > P2**, and the valve **B** in the discharge pipe must be closed. The temperature of flushing liquid should be as near as possible the temperature of process liquid.

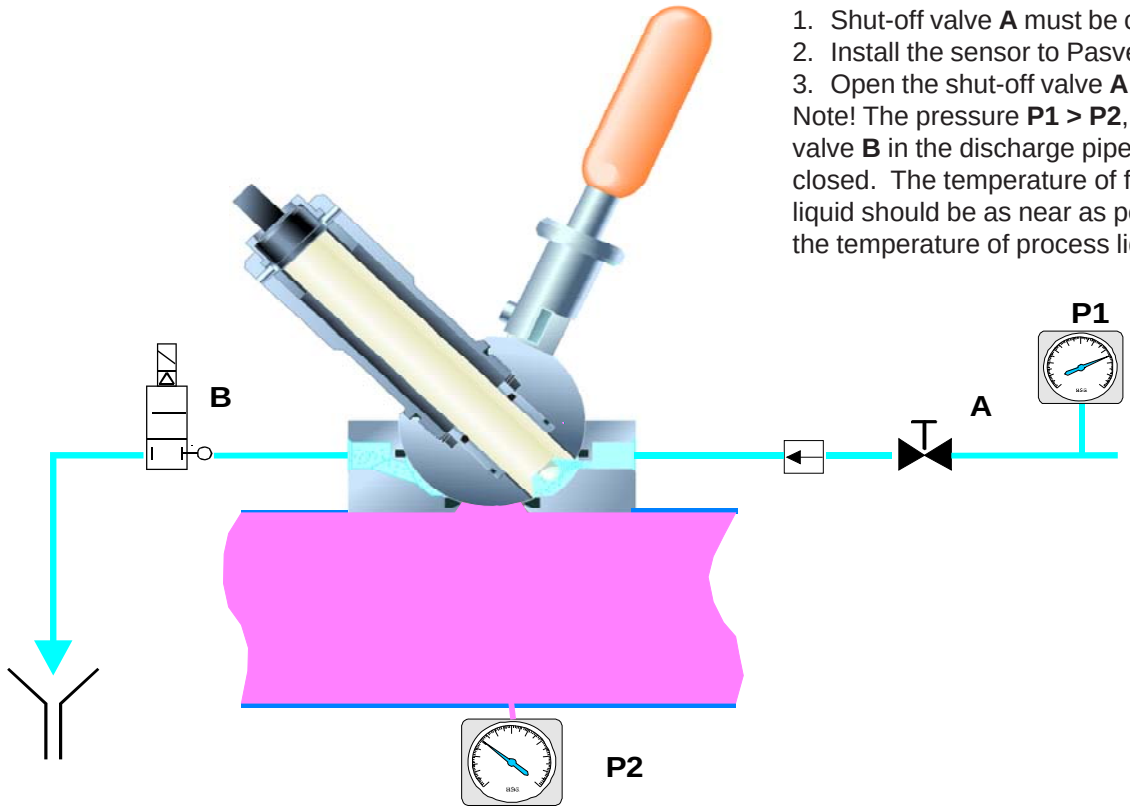


Figure 4-1 pH sensor installation to Pasve pH mounting valve

Shut-off valve **B** in the discharge pipe must be closed and the valve **A** in the inlet pipe is open. The pressure **P1> P2**

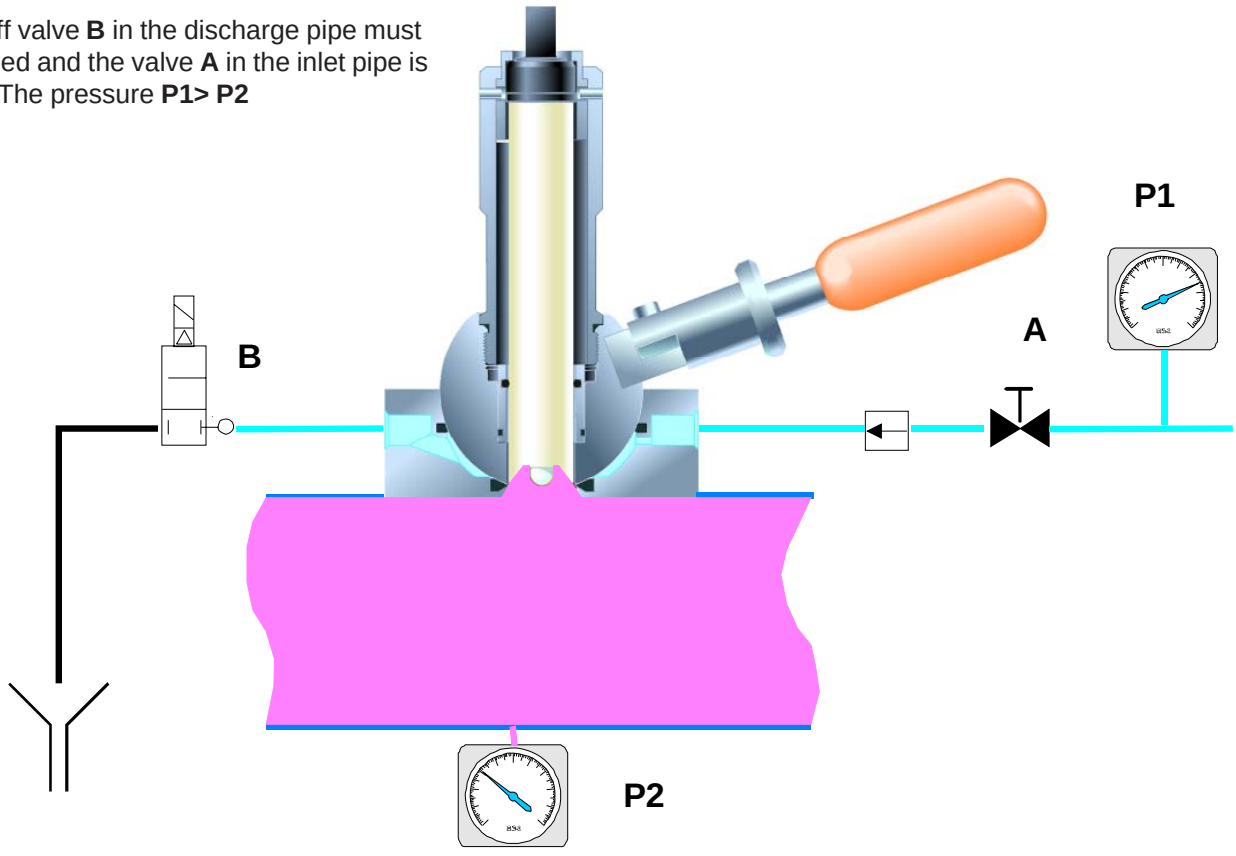
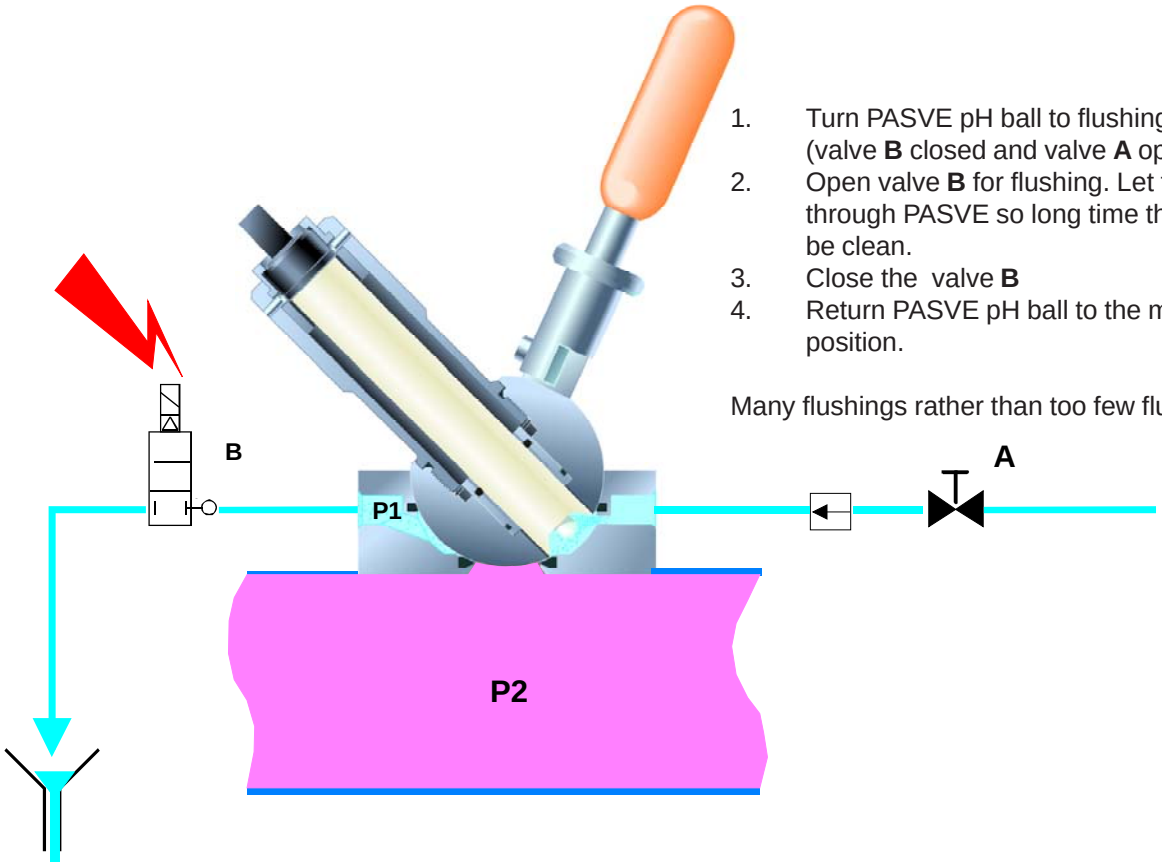


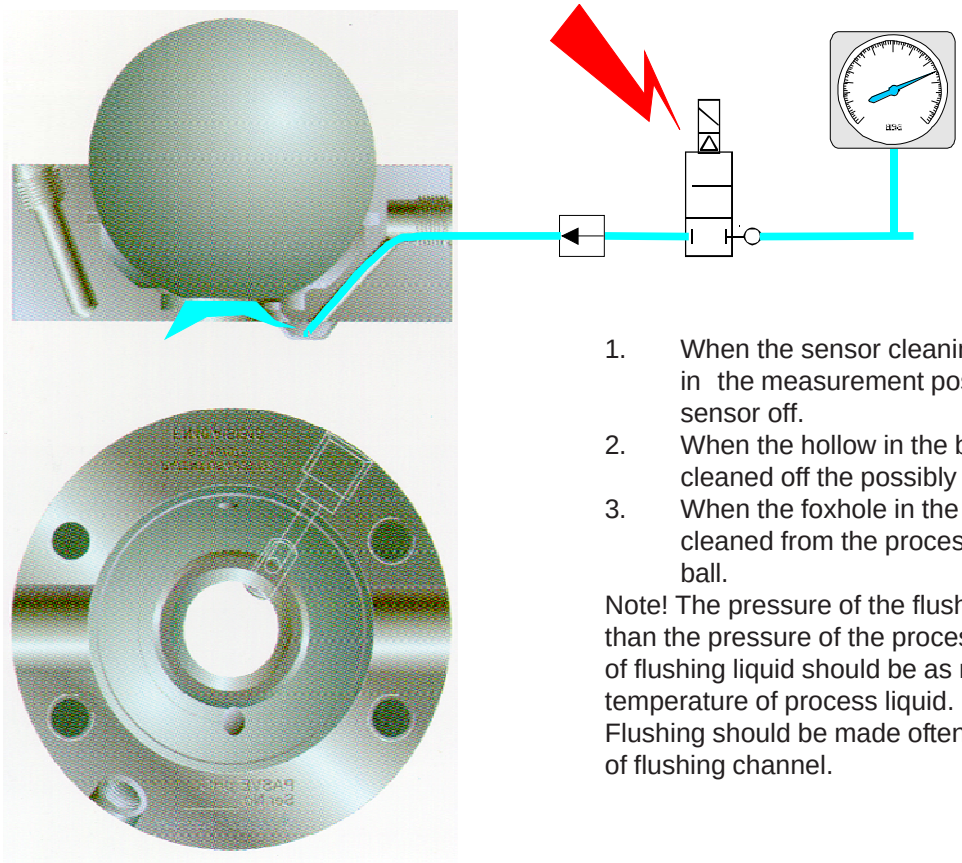
Figure 4-2 pH sensor turning to measuring position



1. Turn PASVE pH ball to flushing position. (valve **B** closed and valve **A** open, P1 > P2)
2. Open valve **B** for flushing. Let flushing water run through PASVE so long time that the sensor will be clean.
3. Close the valve **B**
4. Return PASVE pH ball to the measuring position.

Many flushings rather than too few flushings!

Figure 4-3 pH sensor flushing



1. When the sensor cleaning and flushing is needed in the measurement position without turning the sensor off.
2. When the hollow in the body is needed to be cleaned off the possibly sedimented stuff
3. When the foxhole in the body is needed to be cleaned from the process liquid before turning the ball.

Note! The pressure of the flushing liquid must be bigger than the pressure of the process liquid. The temperature of flushing liquid should be as near as possible to the temperature of process liquid.
Flushing should be made often for avoiding the blocking of flushing channel.

Figure 4-4 When the process side flushing is needed?

5 MAINTENANCE

Replacing the seals

Required tools

- M12 Allen key
- piece of wood to press seal in groove
- sharp, thin screwdriver to remove old seal
- cleaning paper or cloth to clean the grooves

Procedure

1. If PASVE is connected to process, make sure that the container/pipe is empty and unpressurized and, when necessary, flushed.
2. Remove the sensor and valve ball (four M12 Allen screws). Make sure that the bearing parts do not drop off the shaft. When Pasve is equipped with an actuator then it is very important that the other screws will not be opened, because the actuator settings can otherwise be changed, see figure 5-1 part 18 or 24.
3. Remove old sealing with screwdriver. Be careful not to scratch the metal surfaces. Once removed, the old seals will be damaged and useless.
4. Clean the surface and sealing grooves carefully.
5. Place the bottom (smallest) seal in its groove. Correct alignment: the seal's shorter chamfer against the ball, see figure 5-2.
6. Press the seal with a finger as deep as possible in the groove. Then press the seal carefully home with a piece of wood. Since the final pressing requires the use of force, be sure to exert a uniform pressure on the piece of wood to avoid damaging the seal.
7. Check the seals visually: they should be evenly in their grooves without any visible damage.
8. Press new bearing strips and sleeves to the bottom of the shafts. Re-install the valve ball. Note mounting alignment, see the picture Mounting on the back. Grease the Allen screws and tighten them by turns (60 Nm).
9. Check the ball's movement and tightness. At first the ball will move quite stiffly, and moving the ball will require an additional lever arm and solid mounting (the valve must be firmly mounted either in the process or e.g. on a vice bench).

Other considerations:

The type equipped with actuator has two groove seals,
one of which is installed on the bearing ring to balance the bearing. Cut from the seal away a piece which is as big as the hole in the bearing ring, see figure 5-1 part 26.

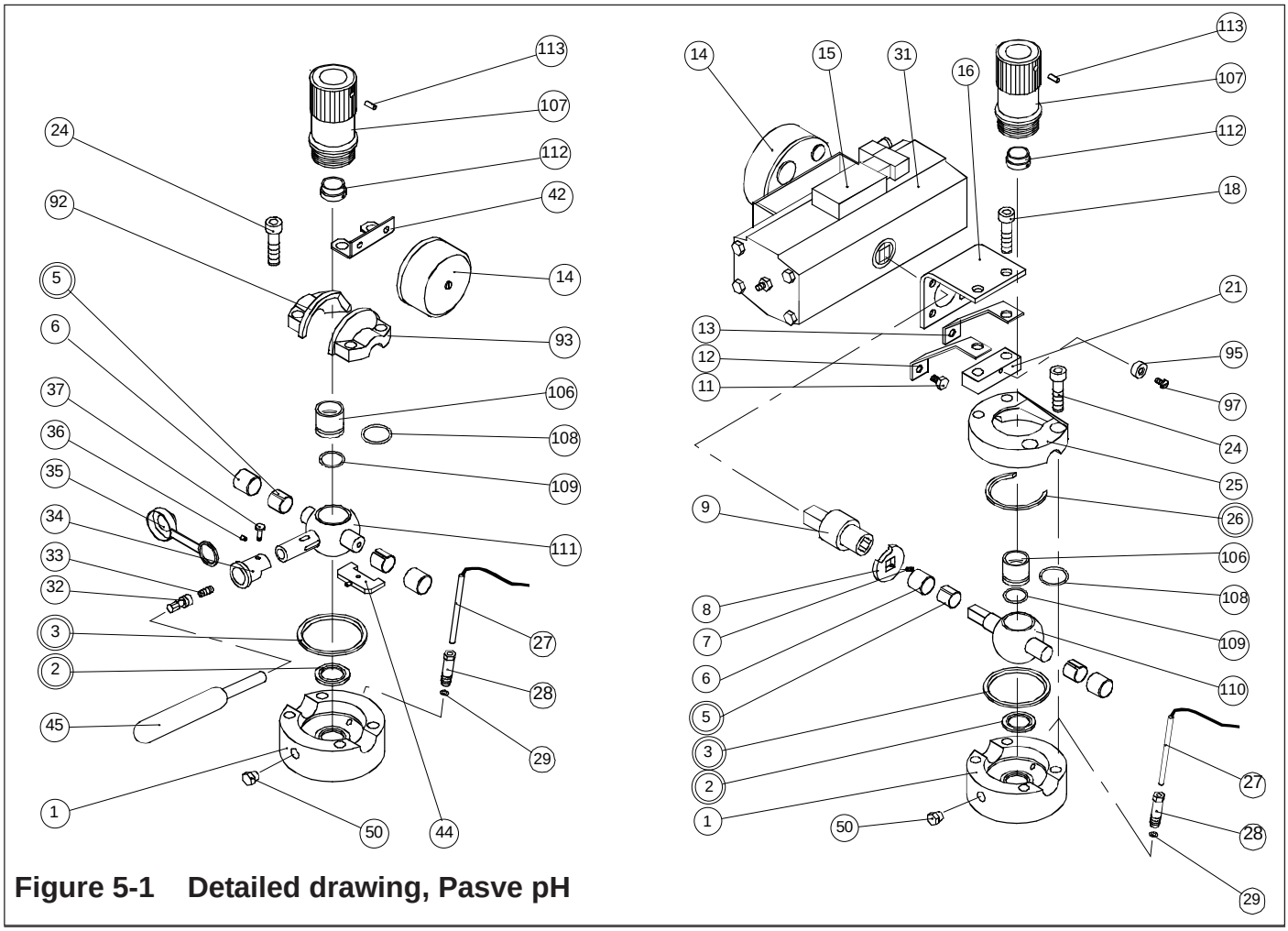
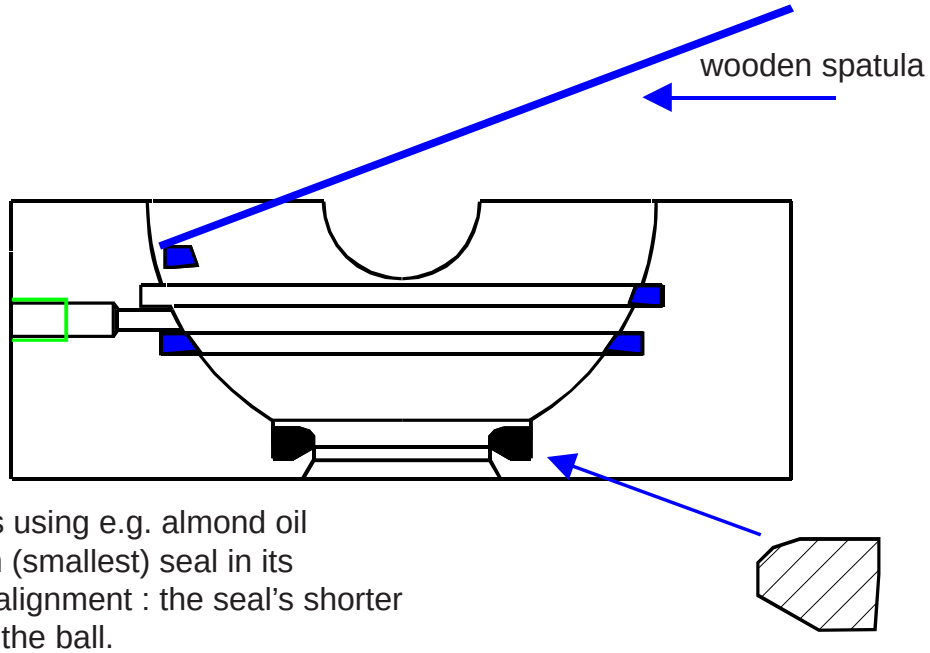
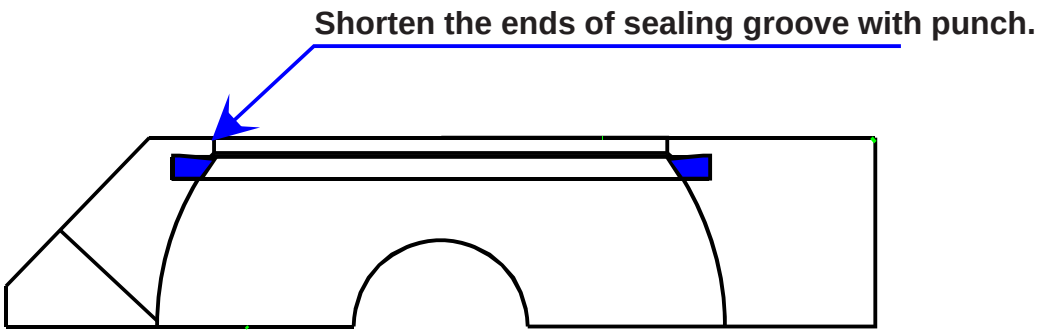


Figure 5-1 Detailed drawing, Pasve pH



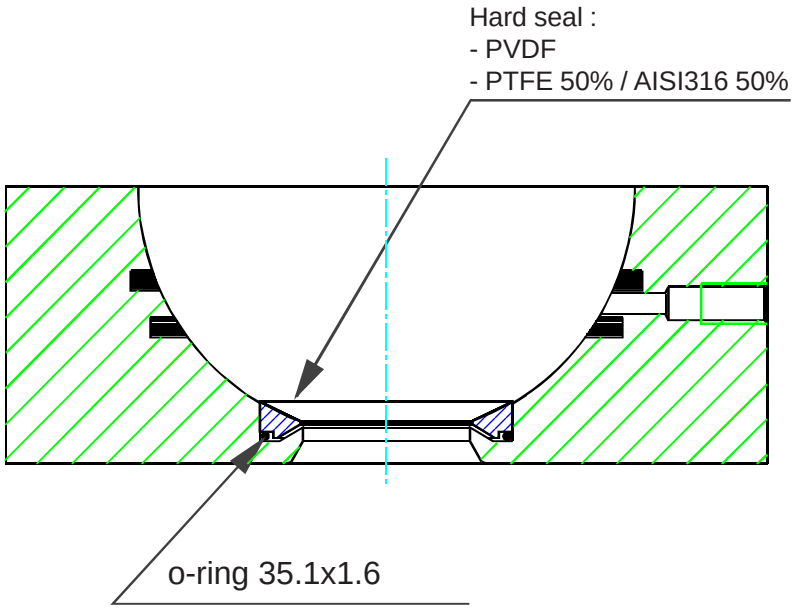
1. Grease the seals using e.g. almond oil
2. Place the bottom (smallest) seal in its groove. Correct alignment : the seal's shorter chamfer against the ball.
3. Press the seal with a finger as deep as possible in to the groove. Then press the seal carefully home with a piece of wood. Since the final pressing requires the use of force, be sure to exert a uniform pressure on the piece of wood to avoid damaging the seals.

Figure 5-2 Seals installation



1. Cut from the seal away a piece which is as big as the hole in the bearing ring and set the seal.
2. Shorten the ends of sealing groove with the punch so the seal do not slide from the groove.

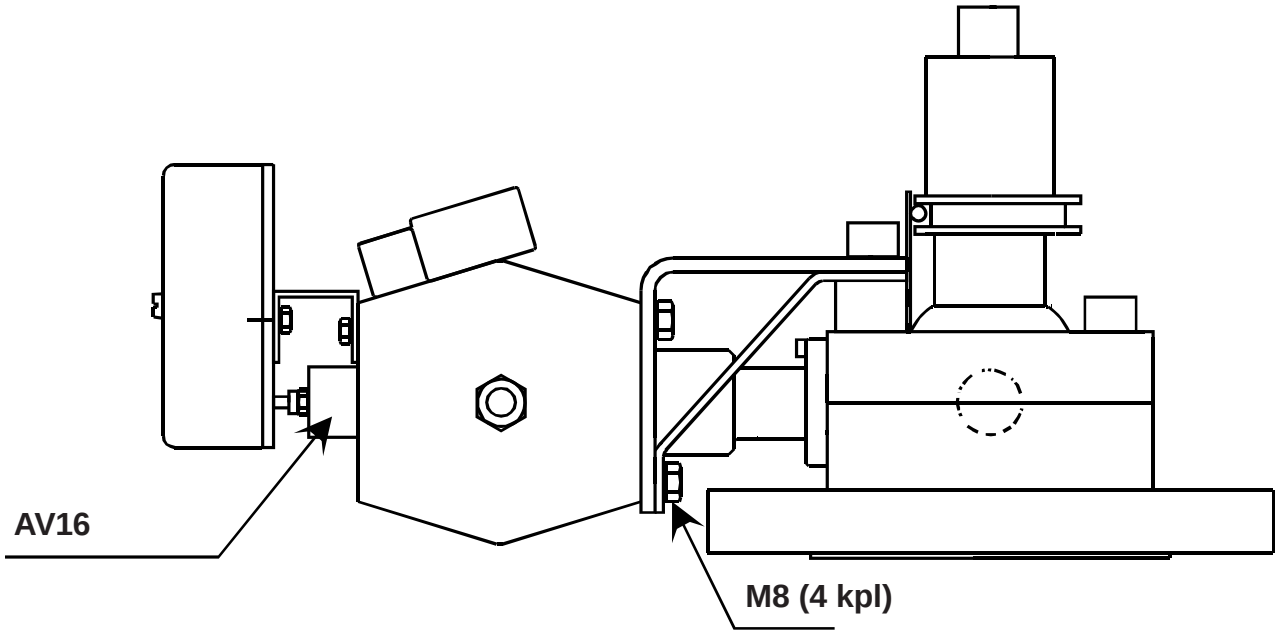
Figure 5-3 Back-up seal installation



1. Set o-ring Ø35.1x1.6 to the groove in the body bottom.
2. Set hard seal on the 0-ring in the body bottom. Be sure that 0-ring is placed properly into the space of the seal collar and body groove.
3. Install the ball.

Hard seal will be used e.g. with the cutting ball or together with diamond-/ ceramic-coated ball.
Order code for PVDF-seal set : **KIT553262**
Order code for PTFE 50% / AISI316 50% -seal set : **KIT551350**

Figure 5-4 Hard seal installation



1. Remove old actuator by opening screws M8 (4 pcs)
2. Fasten new actuator by screws M8.
3. Turn the valve to the measuring position.
4. Loosen screws M8 (4 pcs)
5. Turn the valve to the flushing position.
6. Tighten the screws M8 (4 pcs), torque 60Nm.

Figure 5-5 Changing the actuator

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