

Neles™ control valves angle steam conditioning, combination type

Series AS

with desuperheater for globe type,

Series GS

Installation, maintenance and
operating instructions

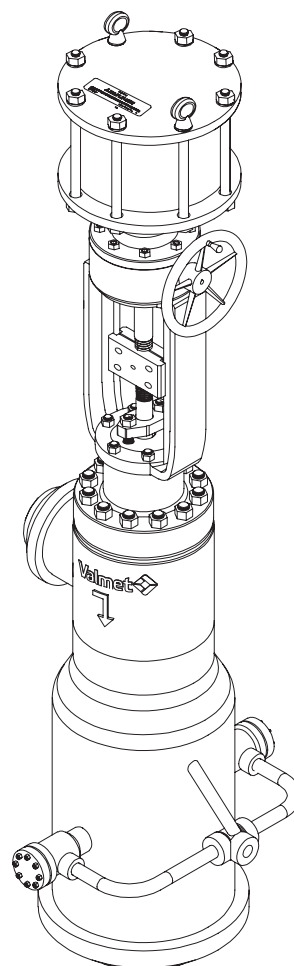


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All trademarks are property of their respective owners.

READ THESE INSTRUCTIONS FIRST!

These instructions provide information about safe handling and operation of the valve.

If you require additional assistance, please contact the manufacturer or manufacturer's representative.

SAVE THESE INSTRUCTIONS!

Addresses and phone numbers are printed on the back cover.

1. GENERAL

1.1 Scope of the manual

This manual provides essential information on series AS: Angle Steam Conditioning, Combination type valve installed sliding stem valves. Also, this manual explaining the GS: Desuperheater for Globe type.

Actuators and positioners are only discussed briefly. Refer to the individual manuals for further information on their installation, operation and maintenance.

NOTE:

Selection and use of the valve in a specific application requires close consideration of detailed aspects. Due to the nature of the product, this manual cannot cover all the individual situations that may occur when the valve is used.

If you are uncertain about use of the valve or its suitability for your intended purpose, please contact Valmet.

1.2 Valve construction

Series AS, Angle Steam Conditioning, Combination type valves are flanged (weld end available) single seated sliding stem control valves.

The valve seat ring and cage and plug with stem is a module accessible through the bonnet opening (top entry) of the body.

Our standard design provides a cage guide with a piston type plug with a quick change seat ring. The two split cages and inserted plug seal ring makes strong support to ensure valve alignment.

This series is available with series of reduced Cv trims and the standard seat tightness is class III-IV, optional trims can meet to class V, ANSI/FCI 70-2.

The detailed structure is revealed by the type code shown on the valve identification plate. The type code is explained in Section 12.

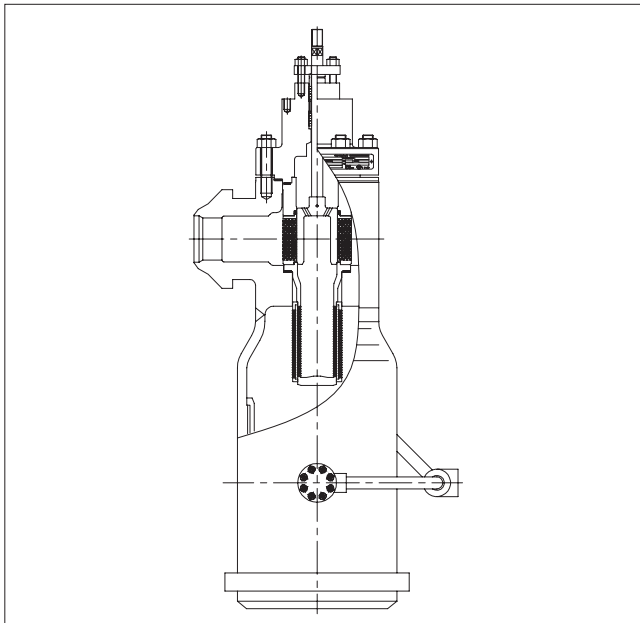


Fig. 1 Construction of the Neles Angle Steam Conditioning Valve, Series AS

1.3 Valve markings

The body markings are: manufacturer's trademark, nominal size, pressure rating and material of the body. The identification plate is attached on an actuator yoke side.

Markings on the identification plate:

1. Type designation (Valve code)
2. Size, Rating
3. Cv
4. Body material
5. Plug, Stem material
6. Seat material
7. Temp. min./max.
8. Maximum (shut-off) pressure
9. Valve manufacturing date
10. Tag No.
11. CO No.

Depending on manufacturing location, information on the identification plate may differ.

1.4 Technical specifications

Face-to-face length:	customized dimensions depending on the customer spec.
Body rating:	Class 150 to Class 900
Max. pressure differential:	acc. to pressure class
Temperature range:	amb. to +593 °C (depending on the body materials and bonnet type)
Flow direction:	indicated by an arrow on the body (normally flow to close)
Actuator mounting:	threaded bonnet with yoke nut or bolted yoke
Stem connection:	clamp with bolts/nuts
Dimensions:	see Section 10
Weights:	see Section 10

Note that the max. shut-off pressure is based on the mechanical maximum differential pressure at ambient temperature. You must always observe the fluid temperature when deciding on applicable pressure values. When selecting a valve you must also check the noise level, cavitation intensity, flow velocity, actuator load factor, etc. using Nelprof.

1.5 Valve seat leakage classification

The valve follows the seat leakage classifications of ANSI/FCI 70-2 requirement.

1.6 Recycling and disposal

Most valve parts can be recycled if sorted according to material. Most parts have a material marking. A material list is supplied with the valve. In addition, separate recycling and disposal instructions are available from the manufacturer. A valve can also be returned to the manufacturer for recycling and disposal for a fee.

1.7 Safety precautions

CAUTION:

Do not exceed the valve performance limitations!

Exceeding the limitations marked on the valve may cause damage and lead to uncontrolled pressure release. Damage or personal injury may result

CAUTION:

Do not dismantle the valve or remove it from the pipeline while the valve is pressurised!

Dismantling or removing a pressurised valve will result in uncontrolled pressure release. Always isolate the relevant part of the pipeline, release the pressure from the valve and remove the medium before dismantling the valve.

Be aware of the type of medium involved. Protect yourself and the environment from any harmful or poisonous substances. Make sure that no medium can enter the pipeline during valve maintenance.

Failure to do this may result in damage or personal injury.

CAUTION:

Be aware of plug motion!

To avoid personal inquiries resulting from movement of a plug, keep any part of your body, especially fingers out of the flow port. Any tools or any other foreign stuff also must be kept out of this flow ports. During valve maintenance, make sure that air pressure supply line is disconnected to the actuator.

Failure of this may cause personal inquiry and product damage.

CAUTION:

Protect yourself from noise!

The valve may produce noise in the pipeline. The noise level depends on the application. It can be measured or calculated using the Neles Nelprof software. Observe the relevant working environment regulations in terms of noise emission.

CAUTION:

Beware of a very cold or hot valve!

The valve body may be very cold or very hot during use. Protect yourself against cold injuries or burns.

CAUTION:

When handling the valve or the control valve assembly, take its weight into account!

Never lift the valve or control valve assembly by the positioner, the limit switch or their piping.

Place the lifting ropes securely around the valve body (see Fig. 2). Damage or personal injury may result from falling parts.

CAUTION:

Hexavalent chromium(VI) or Cr(VI), is known to cause cancer. Be sure to use all appropriate personal protective equipment (PPE) when welding metals containing chromium.

CAUTION:

Ensure that any weld splatter does not fall onto the valve trim. This may prevent proper trim movement or damage critical seating surfaces causing leaks.

CAUTION:

Make sure the valve is not pressurized when removing the actuator.

CAUTION:

Potential electrostatic charging hazard. Ensure the protection in the process.

CAUTION:

Improper stud and nuts or any other parts are not to be used. Use of unapproved stud and nuts or any other parts may cause an accident which results in personal inquiries and property damage.

2. TRANSPORTATION, RECEPTION AND STORAGE

Check the valve and the accompanying devices for any damage that may have occurred during transport.

Store the valve carefully before installation, preferably indoors in a dry place.

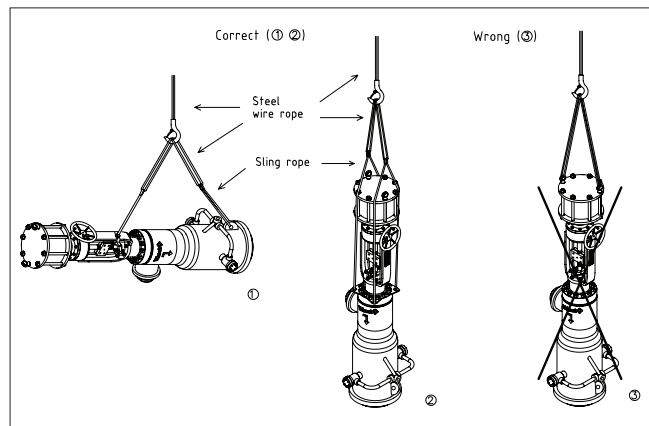


Fig. 2 Lifting the valve

NOTE:

*. Only acceptable case-3, when lift and move the valves;

1) up to outlet 6"- 300# body with VD (Diaphragm type) actuators

2) up to outlet 10"- 300# body with VC (Cylinder type) actuators

In the above two cases the lifting is limited to max. height of 1.0 m and max. moving distance of 70 m.

Do not remove the flow port protectors until immediately before installation of the valve into the pipeline.

The valve is delivered in the closed position. A valve equipped with a spring-return actuator is delivered in the position determined by the spring.

3. VALVE INSTALLATION

3.1 General

Remove the flow port protectors and check that the valve is clean inside.

CAUTION:

When handling the valve or the control valve assembly, take its weight into account!

3.2 Installation into the pipeline

Pipeline cleaning

Make sure no foreign particles, such as sand or pieces of welding electrode, are in the pipeline, they may damage the sealing surfaces.

Installation valve

The valve has an arrow indicating the flow direction. Install the valve in the pipeline so that the flow direction of the valve corresponds to the flow direction marked on the pipe. The mounting orientation of the valve should be vertical position as it shown on Fig. 3.

Choose flange gaskets according to the operating conditions.

CAUTION:

Hexavalent chromium(VI) or Cr(VI), is known to cause cancer. Be sure to use all appropriate personal protective equipment (PPE) when welding metals containing chromium.

CAUTION:

Ensure that any weld splatter does not fall onto the valve trim. This may prevent proper trim movement or damage critical seating surfaces causing leaks.

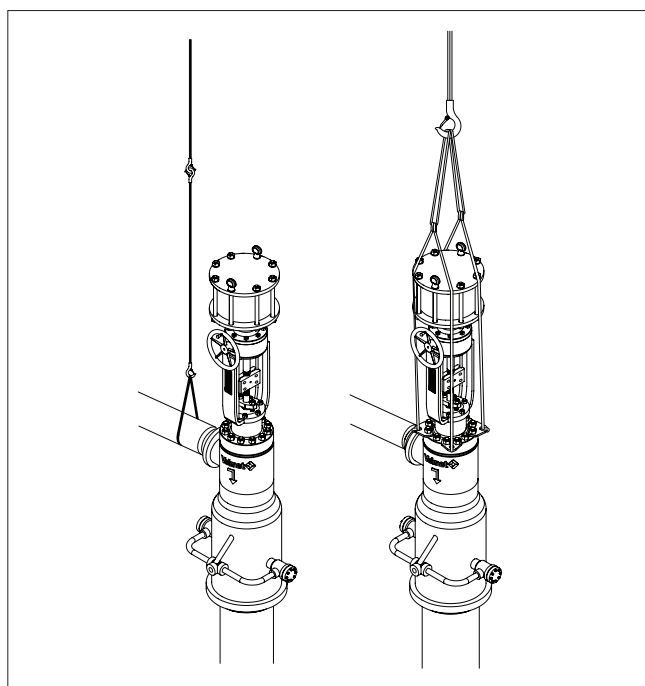


Fig. 3 Installing the control valve into pipeline using supports

Do not attempt to correct a pipeline misalignment by means of flange bolting.

Loads on the valve body from pipeline vibrations can be reduced by supporting the pipeline properly. Reduced vibration also increases the lifetime of the positioner.

Where necessary, you can support the valve by the body, using regular pipe clamps and supports. Do not fasten supports to the valve or flange bolting or to the actuator, see Fig. 3.

3.3 Hydrostatic testing and line flushing

When performing the hydrostatic test and flushing on the line, the control valve should not be used as an isolating valve. Ensure that the control valve is always in the open position before starting this process; otherwise, it may lead to valve and trim damage or failure of the seals. Flushing and hydrostatic test kits can be purchased from Valmet.

CAUTION:

Flushing trim kit should be installed in the valve (especially 'Tendril & Omega trim' application) to protect the original trim and the flow passages while the valve installation and line flushing. Unless this caution could result in clogging trim, low flow rates, unstable control, valve leakage and excessive noise and other trouble.

3.4 Control valve assembly

Check all joints, piping and cables.

Check that the actuator stop screws, positioner and limit switches are calibrated. Refer to their installation, maintenance and operating manuals.

3.5 Valve insulation

If necessary, the valve may be insulated. Insulation must not continue above the upper level of the valve body, see Fig. 4.

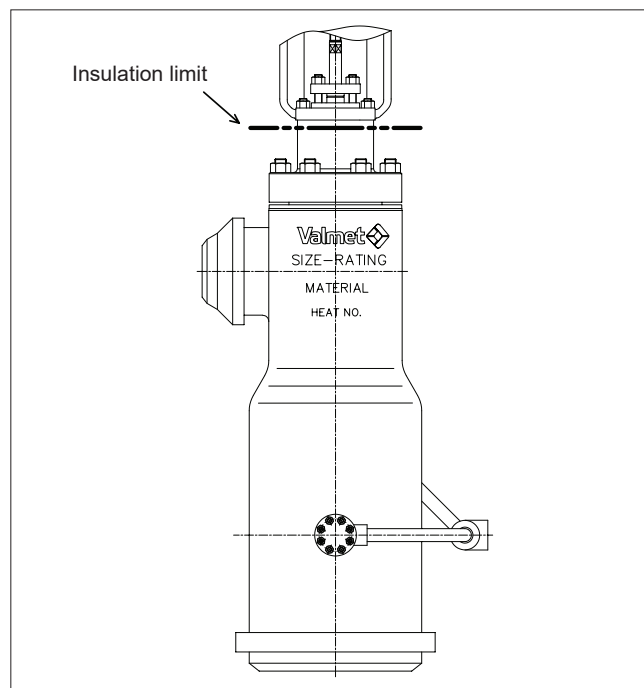


Fig. 4 Insulation of the valve

4. MAINTENANCE

CAUTION:

Observe the safety precautions listed in Section 1.7 before starting work!

CAUTION:

When handling the valve or the control valve assembly, take its weight into account!

4.1 General

The Neles series AS, Angle Steam Conditioning valve require regular maintenance. Check the gland packing for leakage. This section outlines the maintenance that can be carried out by the user. The numbers in parentheses refer to the parts lists and the exploded views of the valve in Section 9.

NOTE:

If you send the valve to the manufacturer for repair, do not dismantle it. Clean the valve carefully, including the inside. For safety reasons, inform the manufacturer of the nature of the medium when you send the valve.

NOTE:

Always use original spare parts to make sure the valve functions as intended.

4.2 Gland packing adjustment

In the event of a packing leakage tighten the gland nuts (18) in ¼ turn steps each until the leakage is stopped. Do not tighten more than necessary.

4.3 Replacing the gland packing

CAUTION:

Do not dismantle the valve or remove it from the pipeline while the valve is pressurised!

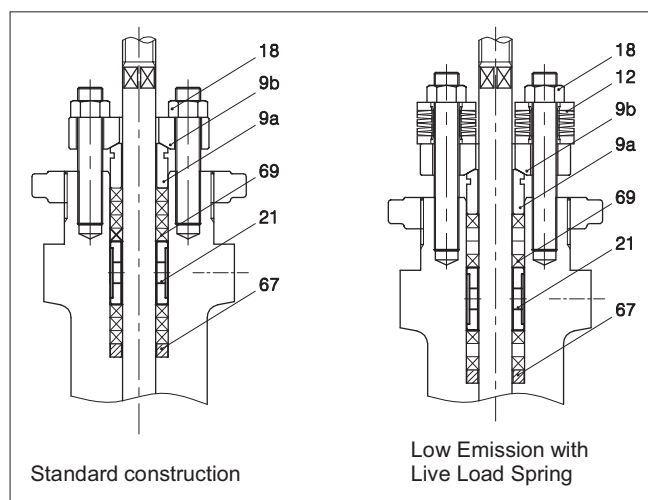


Fig. 5 Gland packing

- Make sure the valve is not pressurised.
- Remove the actuator from the valve stem according to the instructions given in the actuator manual.
- Loosen and remove the hexagon nuts (18).
- Remove the gland flange (9b), and gland (9a) up to the valve stem.
- Remove the old packing rings (69) using a pointed tool, avoid damaging the seal surfaces and valve stem.
- Clean the packing ring counterbore.
- Mount the new packing rings one by one into the packing gland box using the gland as a tool and mount the gland with hand-tightened nuts.
- Fasten the gland by tightening the hexagon nuts(18). Refer to the torque table to avoid over-tightening which may cause high friction and wearing.
- Check leakage when the valve is pressurised.

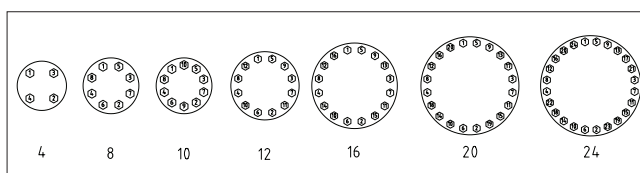


Fig. 6 Tightening sequence of the bonnet nuts

4.4 Replacing the trim and body reassembly

NOTE:

The trim set consists of the seat ring, valve plug and stem, retainer and gaskets(for seat ring and bonnet).

- Make sure the valve is not pressurised.
- Remove the actuator from the valve stem according to the instructions given in the actuator manual and next Section 6.
- Remove the hexagon nuts (18) slightly.
- Remove the hexagon nuts (17).
- Remove the bonnet (8)

Table 1 Required torques for bonnet nuts

Valve Size		Rating (ANSI)	Bonnet Stud Bolts		Required Torques (±5% allowable)	
mm	in		Size	Q'ty	Nm	lbf ft
50	2	150-300	1/2"-13UNC	8	45	33
		600	9/16"-12UNC	8	65	48
		900	7/8"-9UNC	8	250	184
		1500	7/8"-9UNC	8	250	184
		2500	1-1/8"-8UN	8	560	413
75	3	150-300	5/8"-11UNC	8	90	66
		600	5/8"-11UNC	10	90	66
		900	1-1/8"-8UN	8	560	413
		1500	1-1/8"-8UN	8	560	413
		2500	1-3/8"-8UN	8	1100	811
100	4	150-300	3/4"-10UNC	8	160	118
		600	3/4"-10UNC	10	160	118
		900	1-3/8"-8UN	8	1100	811
		1500	1-3/8"-8UN	8	1100	811
		2500	1-1/2"-8UN	8	1400	1033
150	6	150-300	3/4"-10UNC	8	160	118
		600	7/8"-9UNC	12	250	184
		900	1-1/8"-8UN	12	560	413
		1500	1-3/8"-8UN	12	1100	811
		2500	1-1/2"-8UN	12	1400	1033
200	8	150-300	7/8"-9UNC	12	250	184
		600	1"-8UNC	12	380	280
		900	1-5/8"-8UN	12	1810	1335
		1500	1-5/8"-8UN	12	1810	1335
250	10	150-300	1"-8UNC	16	380	280
		600	1-1/4"-8UN	16	790	583
		900	1-3/8"-8UN	12	1100	811
		1500	1-5/8"-8UN	16	1810	1335
300	12	150-300	1-1/8"-8UN	16	560	413
		600	1-1/4"-8UN	16	790	583
		900	1-3/8"-8UN	20	1100	811
		1500	2-1/4"-8UN	12	4970	3666
		2500	2-3/4"-8UN	12	9225	6804
350	14	150-300	1-1/4"-8UN	16	790	583
		600	1-3/8"-8UN	16	1100	811
		900	1-1/2"-8UN	20	1400	1033
		1500	2-1/2"-8UN	12	6880	5074
400	16	150-300	1-1/4"-8UN	20	790	583
		600	1-3/8"-8UN	20	1100	811
		900	1-5/8"-8UN	20	1810	1335
		1500	2-1/2"-8UN	12	6880	5074
450	18	150	1-1/4"-8UN	20	790	583
		300	1-1/4"-8UN	20	790	583
		600	1-5/8"-8UN	20	1810	1335
500	20	150	1-3/4"-8UN	20	2280	1682
		300	1-3/4"-8UN	20	2280	1682
		600	1-3/4"-8UN	24	2280	1682
600	24	150	1-3/4"-8UN	24	2280	1682
		300	1-3/4"-8UN	24	2280	1682
		600	2"-8UN	24	3455	2548

- Remove the cage guide (16), cage (15) and the seal ring (64). Avoid from damaging the seal ring between the cage and cage guide.
- Remove the body gasket (65 & 65a), one piece of seat ring (7) and diffuser (81), seat gasket (63).

NOTE:

The standard is 'quick change seat type', other design has a 'weld seat type' according to weld seat ring on the body side.

NOTE:

The standard is one piece with seat ring (7) and the diffuser (81) by welded, other design has a separated type according to weld diffuser on the body side.

- Remove the hexagon nuts (18), gland flange (9b) and gland (9a).
- Remove the old packing rings (69).

NOTE:

If the valve have excess leakage, the plug and seating surface need lapping and cleaning.

NOTE:**'Omega' Disk Stack Cage Cleaning**

The welded 'Omega' disk stack cage is not available disassembling, make sure the ultrasonic cleaning in the frequency range of 250 ~ 400 kHz and Min. duration 60 min.

- Clean the body gasket surface.
- Insert a new seat gasket (63) and the seat ring (7) & diffuser (81) kit into the body.

CAUTION:

Do not reuse the spiral wound gaskets (63 & 65 & 65a), this is need to be replace each time the valve is disassembled.

- Install the cage (15), seal ring (64), cage guide (16) and plug stem assembly (3, 5, 6) very carefully.
- Insert the body gasket (65 & 65a).
- Mount the bonnet on the body carefully maintaining alignment with the plug and the stem and with the retainer (or cage) in the closed position, so that the bonnet position in relation to the body is the same as the original position.
- Insert the hexagon nuts (17) into stud (13) and slightly fasten the nuts.

CAUTION:

Do not strongly tighten stud nuts at this time

- Insert the packing rings (69) according to above 4.3

CAUTION:

The all related parts (seat ring, retainer, cage, plug & stem, bonnet) must be properly aligned in the body.

- Tighten hexagon nuts (17) until plug and seat contact is obtained with proper bolt torque.

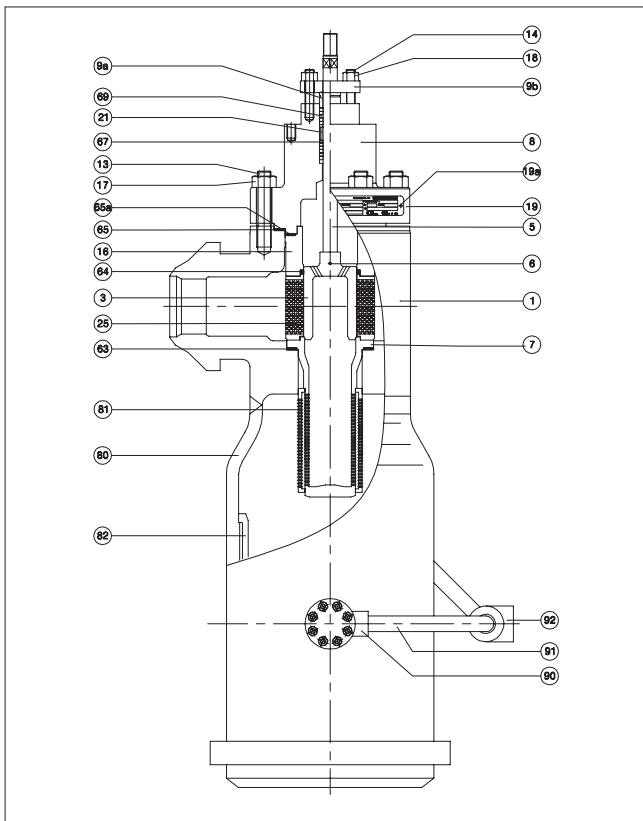


Fig. 7 Omega quick change, Standard balanced trim

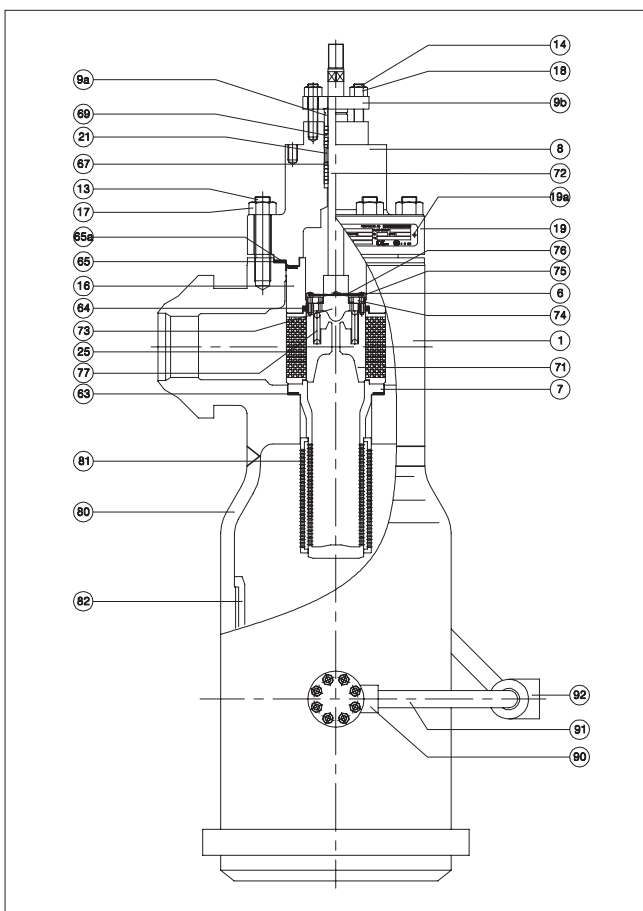


Fig. 8 Pilot Omega-balanced trim

4.5 Pilot Plug

Disassembly & Assembly

- Mount the plug and stem assembly on the chuck to setting.
- Remove the pilot wire (76).
- Remove the pilot bolts (75).

CAUTION:

Make sure to balance when loose the pilot bolts, and be careful the spring tension to bounced off the pilot plug and stem.

- Remove the pilot cover (74).
- Remove the pilot plug (73) and pilot stem (72) from pilot main plug (71).
- Remove the pilot spring (77) carefully.
- Remove the pilot plug (73) and the pilot seat as well as the surface inside of the pilot main plug (71). If there is damage, scratches or grooves, it should be replaced or repaired.
- Insert the cleaned pilot spring (77) into the upper side of main plug.
- Install the pilot plug (73) & pilot stem (72) on the spring (77).
- Install the pilot cover (74) and fasten the pilot bolts (75) keep in balance.
- Install wire (76) for connecting the all pilot bolts due to prevent loose on operation.

4.6 Spray Nozzle

Disassembly & Assembly

- Remove the (Spray to Spray) hexagon nuts (87a).
- Remove the spray cover (84).
- Remove the spray gasket (86).
- Remove the old packing rings (85) using a pointed tool, avoid damaging the seal surfaces and spray retainer.
- Remove the spray retainer (88) sub-assembly using by the one of stud (87) carefully.
- Grind welded point between the spray nozzle sub-assembly (detail 'a', 89a~d) and the spray retainer (88).
- Remove the spray nozzle sub-assembly (detail 'a', 89a~d) from the spray retainer (88) and replace them by new one.

CAUTION:

Do not reuse the spray nozzle sub-assembly (detail 'a', 89a~d), this is need to be replace each time the valve is disassembled.

- Re-weld one point the spray nozzle sub-assembly (detail 'a', 89a~d) and the spray retainer (88).
- Clean the body gasket surface.
- Install the new or repaired spray retainer (88) sub-assembly using by the one of stud (87) carefully.
- Mount the new packing rings (85) one by one into the packing gland box using the gland as a tool.
- Insert a new spray gasket (86) into the spray retainer (88).

CAUTION:

Do not reuse the spiral wound gasket (86), this is need to be replace each time the valve is disassembled.

- Install the spray cover (84).
- Tighten hexagon nuts (87a).

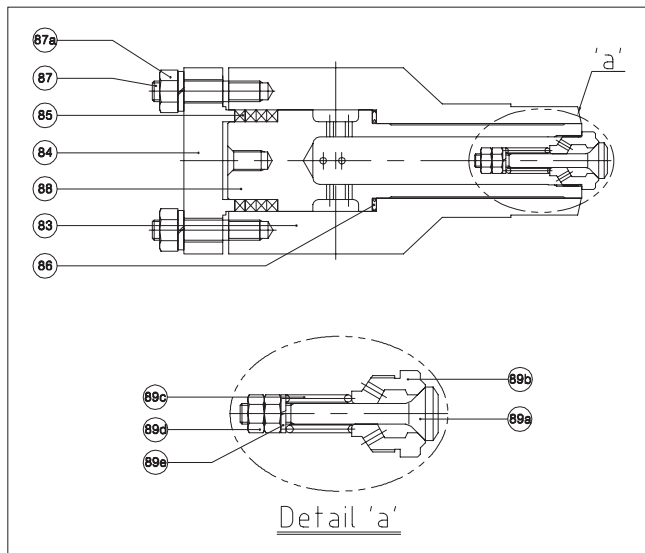


Fig. 9 Integral Spring loaded injection type spray nozzle

4.7 'GS' Desuperheater

Disassembly & Assembly

- Remove the (housing) hexagon nuts (96a).
- Remove the housing bonnet (95) sub-assembly carefully.
- Remove the flange gasket (97).
- Grind welded point between the spray nozzle sub-assembly (detail 'a', 89a~d) and the spray nozzle (89).
- Remove the spray nozzle sub-assembly (detail 'a', 89a~d) from the spray nozzle (89) and replace them by new one.

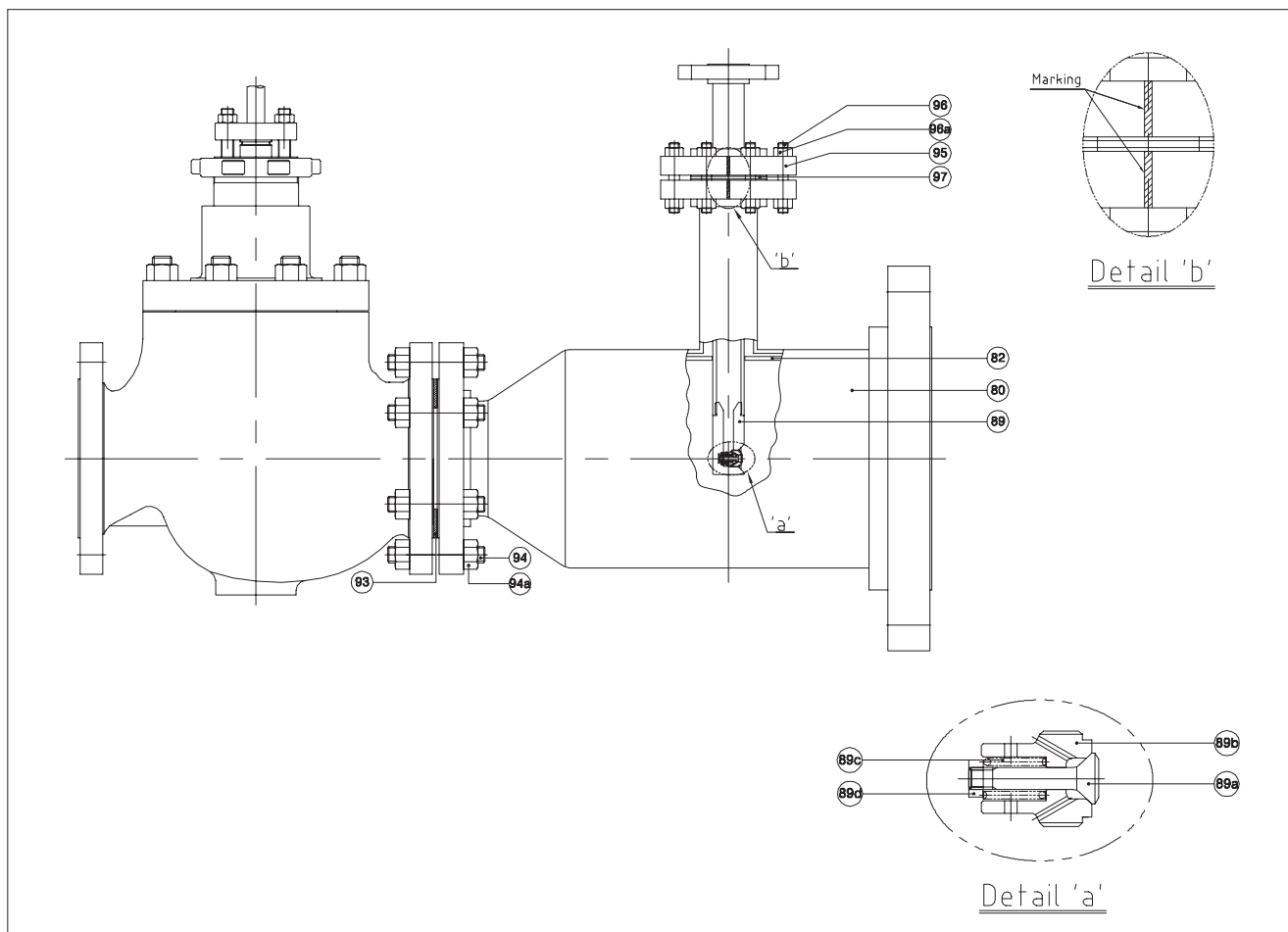
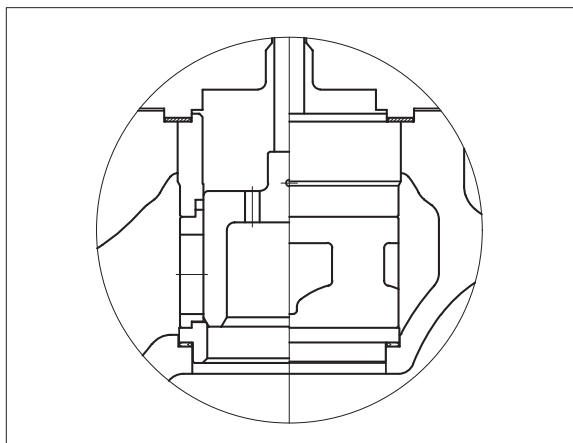
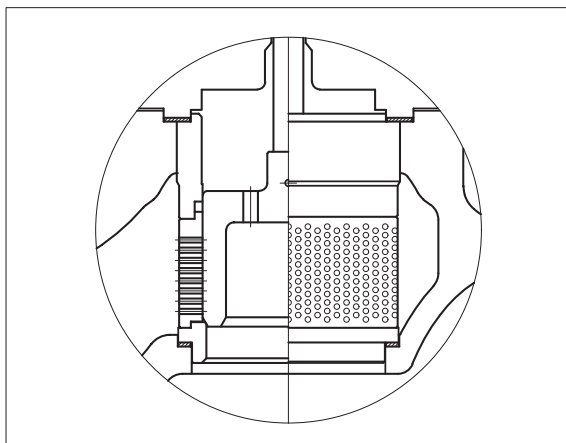


Fig. 10 Globe PCV + Desuperheater type

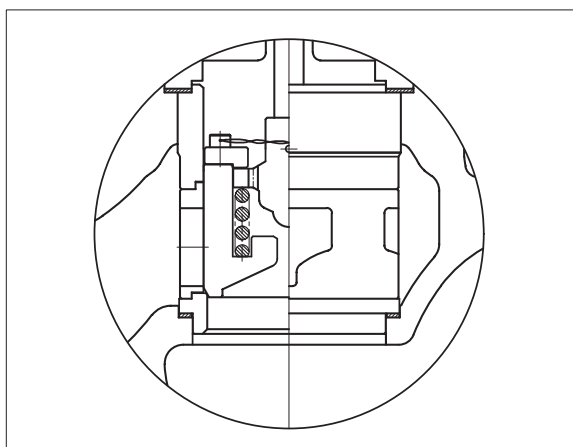
Trim Design application



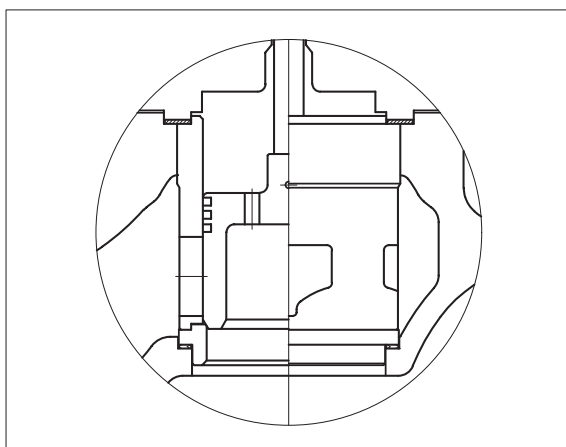
Quick change, standard cage trim



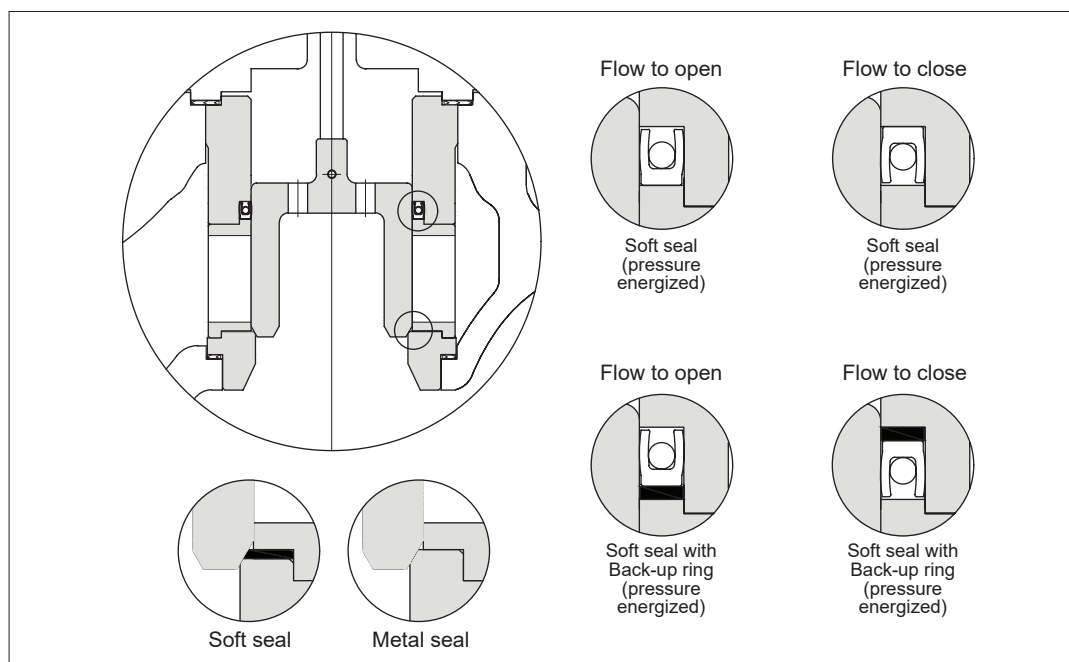
Tendril Multi-hole trim



Pilot balanced trim



High temperature trim



Seal-ring & seat solutions for GB valve trims

Fig. 11 Different trim designs

CAUTION:

Do not reuse the spray nozzle sub-assembly (detail 'a', 89a~d), this is need to be replace each time the valve is disassembled.

- Re-weld one point the spray nozzle sub-assembly (detail 'a', 89a~d) and the spray nozzle (89).
- Clean the flange gasket surface.
- Insert the spray gasket (86).

CAUTION:

Do not reuse the spiral wound gasket (86), this is need to be replace each time the valve is disassembled.

- Install the new or repaired spray nozzle (89) sub-assembly carefully.

CAUTION:

Make sure same direction to be cooperate the lines with the flange of desuperheater housing (80) and housing bonnet (95) for avoid miss arrangement of spray nozzle direction (see Detail 'b' of Fig. 10).

- Tighten hexagon nuts (96a).

5. TESTING THE VALVE

CAUTION:

Pressure testing should be carried out using equipment conforming to the correct pressure class!

We recommend that the valve body is pressure-tested after the valve has been assembled.

The pressure test should be carried out in accordance with an applicable standard for the pressure rating. The valve must be in the open position during the test.

6. REMOVAL & MOUNTING THE ACTUATOR

Actuator is to be mounted on the valve assembly and is to be reconnected to the valve plug stem according to this manual. There are several types of actuators such as VDR/VDD diaphragm actuator, VBR/VBD spring return cylinder actuator and VBC/VCC spring-less double acting cylinder actuator which requires different clamping. In this manual, VD actuator mounting and removal will be handled. For other types of actuator, please refer to separate IMOs.

CAUTION:

Make sure the valve is not pressurized when removing the actuator.

CAUTION:

Beware of the plug movement!

Do not use air pressure higher than what specified on the identification plate.

A. Actuator removal for VD Reverse<air to open, stem retract> actuator (Fig. 12)

- To prevent personal injury during dismantling, use compressed air to raise the valve plug approximately 100% from the seat ring. Failure to do so may cause clamps to spring out. This is because the actuator stem and valve stem are clamped together under pressure. Therefore, it is necessary to relieve the pressure by lifting the plug before disassembling the clamps.
- Loosen the stem lock nut (5**) and socket head screws (1a**) and hexagon nuts (1b**).
- Remove the clamp (1**).
- Shut off and disconnect air supply line.
- Support actuator with the suitable lifting device.
- Use compressed air to lift the valve stem, and then proceed to remove the yoke nut.
- Remove the actuator from the valve body assembly.

B. Actuator replacement (mounting) for VD Reverse<air to open, stem retract> actuator (Fig. 12)

- Mount the new or repaired actuator on top of the bonnet, using a suitable lifting device.
- Insert the yoke nut and tightly fasten the yoke by turning the yoke nut clockwise using tightening tools.
- Connect air line and accessories.
- Lift the top stem (18), using by specified air pressure.
- Adjustment stem length after clamping the clamp (1**) according to rated travel(stroke) as 'open' and 'close' position as per pressurizing and depressurizing the lower diaphragm chamber.
- Tighten stem socket head screws (1a**) and hexagon nuts (1b**) with stem lock nut (5**).

C. Actuator removal for VD Direct<air to close, stem extend> actuator (Fig. 12)

- Shut off and disconnect the air supply lines and accessories.
- Loosen stem lock nut (5**) and stem socket head screws (1a**) and hexagon nuts (1b**).
- Remove the clamp (1**).
- Support actuator with the suitable lifting device.
- Remove the yoke nut (3**).
- Remove the actuator from the valve body assembly.

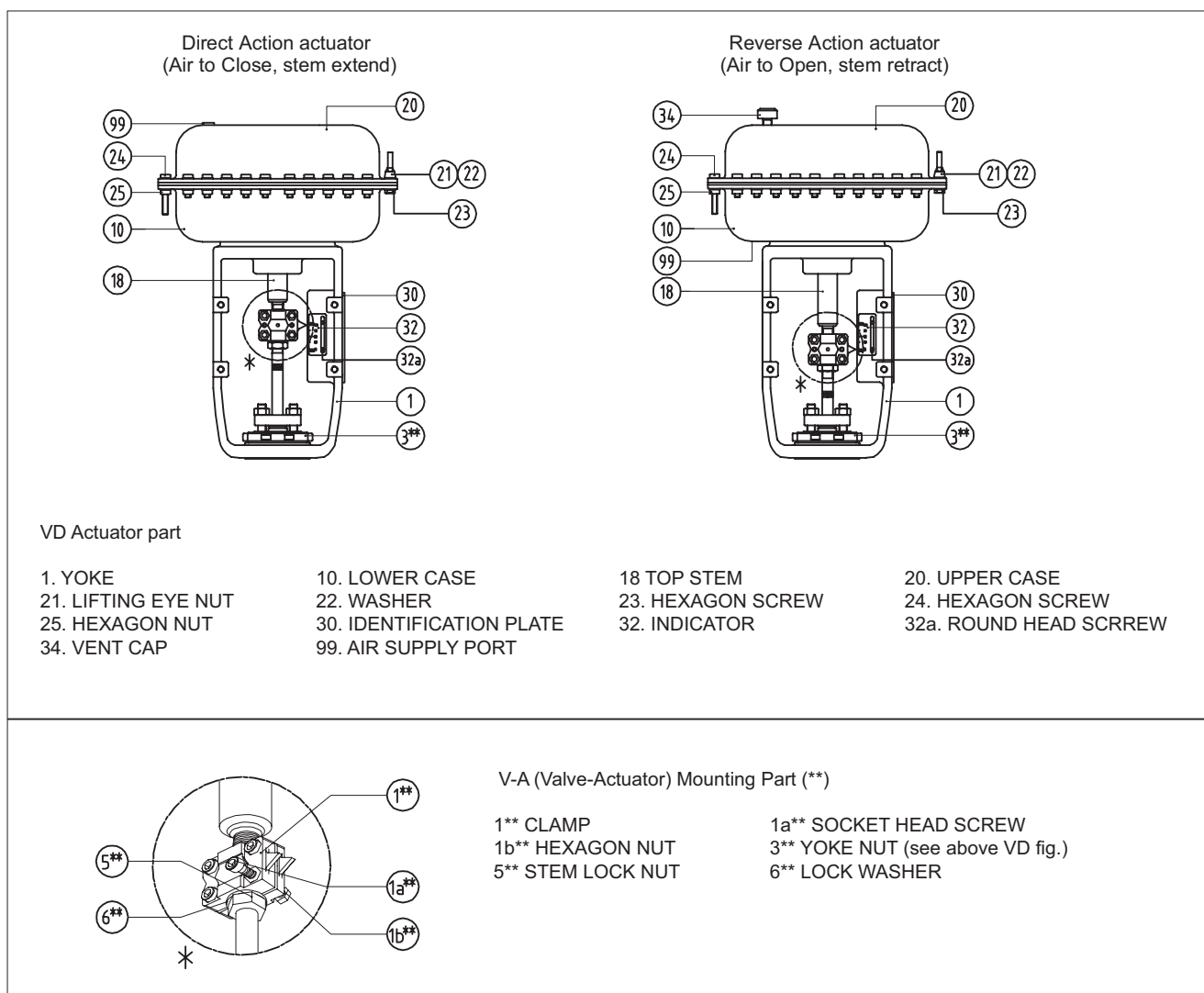


Fig. 12 VD Actuator

D. Actuator replacement (mounting) for VD Direct<air to close, stem extend> actuator (Fig. 12)

- Mount the new or repaired actuator on top of the bonnet, using a suitable lifting device to setting.
- Insert the yoke nut and tightly fasten the yoke by turning the yoke nut clockwise using tightening tools.
- Connect air line and accessories.
- Down the top stem (18), using by specified air pressure.
- Adjust stem length after clamping the clamp (1**) according to rated travel (stroke) as 'open' and 'close' position as per pressurizing and depressurizing the upper diaphragm chamber.
- Tighten stem socket head screws (1a**) and hexagon nuts (1b**) with stem lock nut (5**).

E. Actuator removal for VC actuator (Fig. 13)

- Shut off and disconnect the air supply lines and accessories.
- Loosen the plug stem locknut and the 4 socket head screws (26a) on the clamp (26).
- Remove the clamp (26).
- Support the actuator with the suitable lifting device.

- Remove the hexagon screws from the valve bonnet.
- Remove the actuator from the valve body assembly.

F. Actuator replacement (mounting) for VC actuator (Fig. 13)

- Mount the new or repaired actuator on top of the valve bonnet, using a suitable lifting device.
- Insert the hexagon screws and tightly fasten the yoke by turning the hexagon screws clockwise using tightening tools.
- Connect air line with actuator.
- Down the top stem (18), by using specified air pressure.
- Adjust stem length after clamping the clamp (26) according to rated travel (stroke) as 'open' and 'close' position as per pressurizing and depressurizing the both side of cylinder chambers.
- Tighten the 4 socket head screws (26a) on the clamp (26) and the lower stem locknut.

CAUTION:

Avoid to turn the valve plug and stem when plug is on seat ring to prevent the seating line from being damaged.

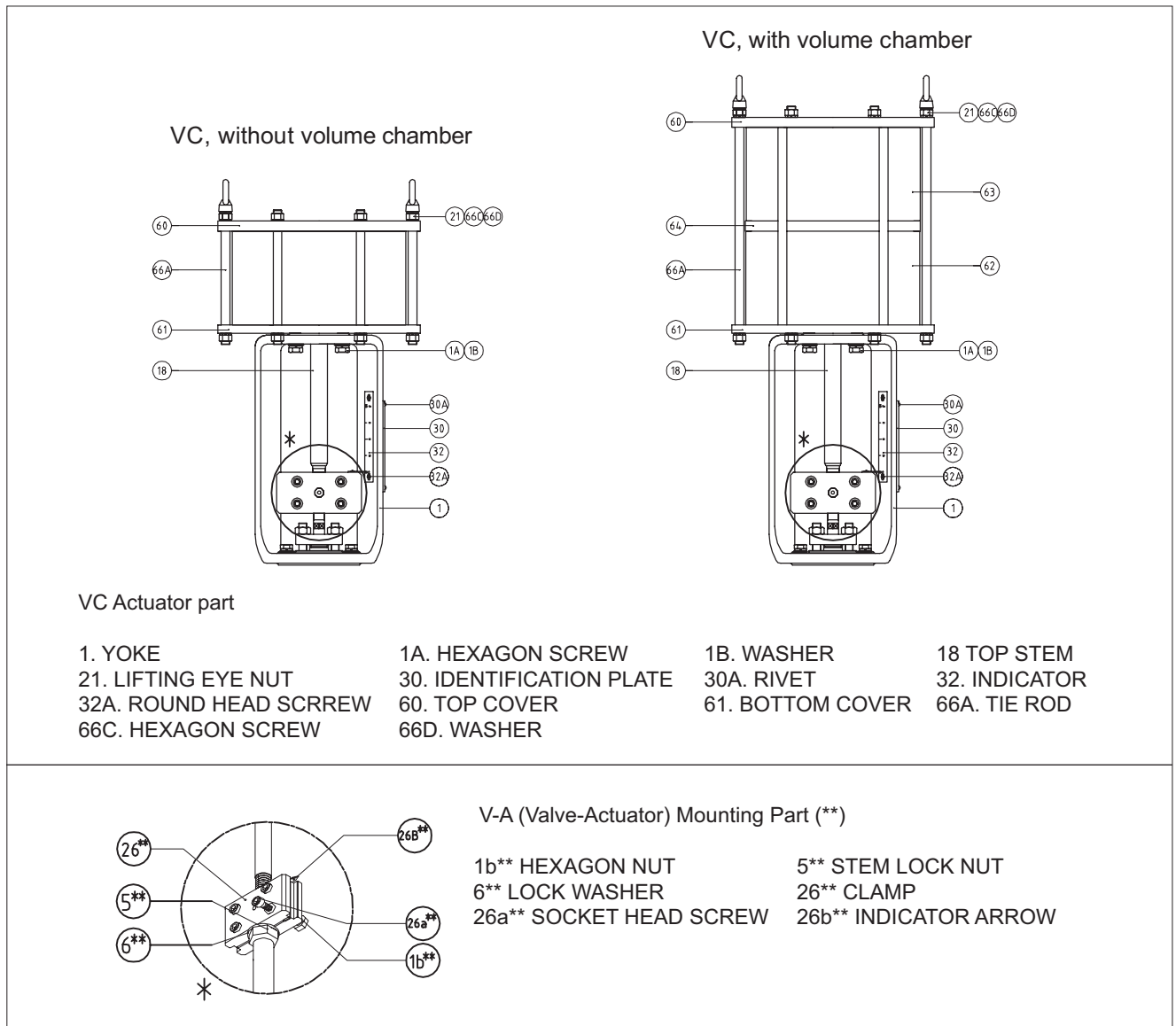


Fig. 13 VC Actuator

7. TOOLS

Removal of the actuator

- L- wrench set(mm)
- hex socket wrench set
- chisel and hammer(10 pound)
- +,- drivers
- Special tool for packing insertion
- Special tool for packing removal

8. ORDERING SPARE PARTS

NOTE:

Always use original spare parts to make sure that the valve functions as intended.

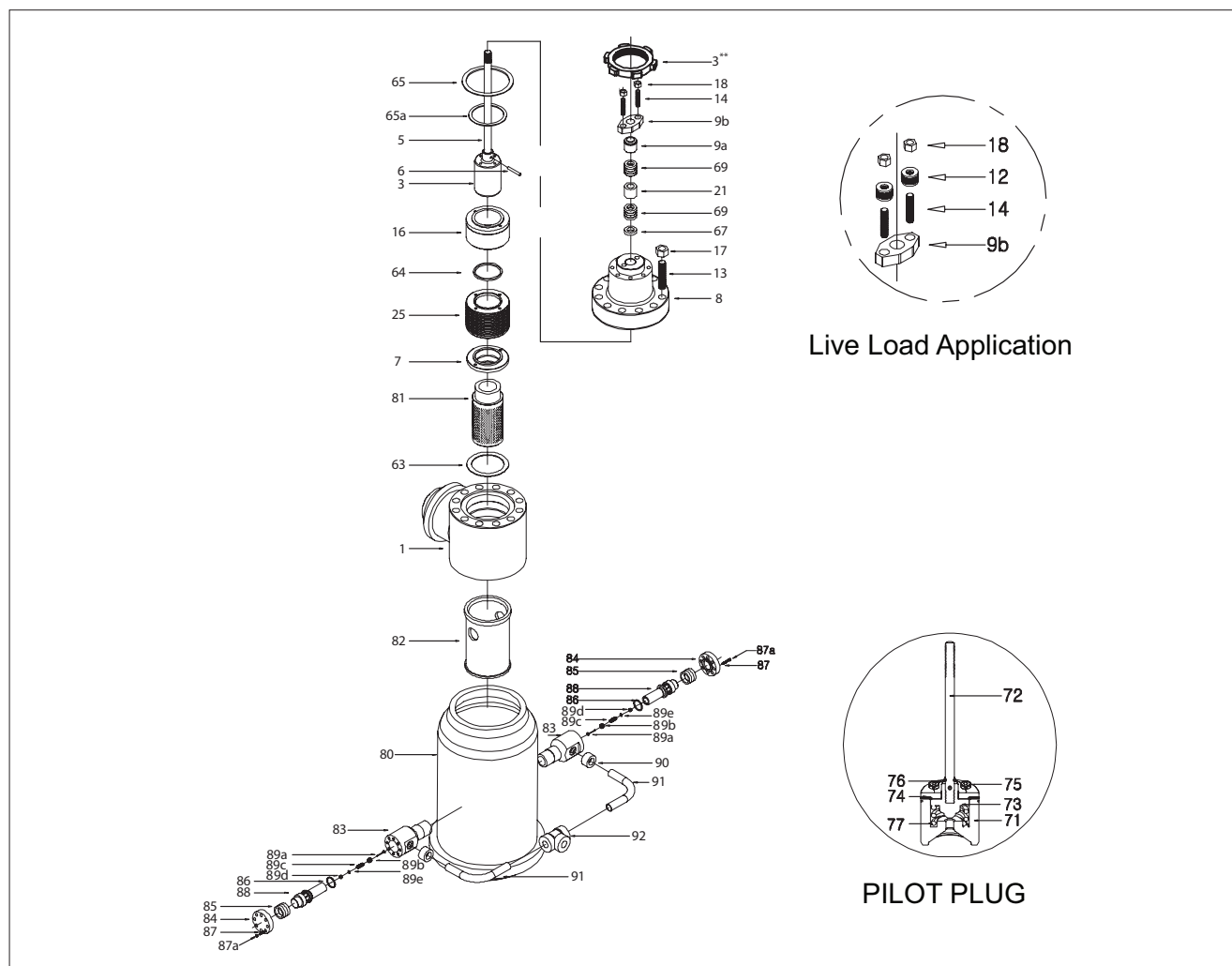
When ordering spare parts, always include the following information:

- type code, sales order number, serial number
- number of the parts list, part number, name of the part and quantity required

This information can be found from the identification plate or documents.

9. EXPLODED VIEW AND PARTS LIST

Series AS



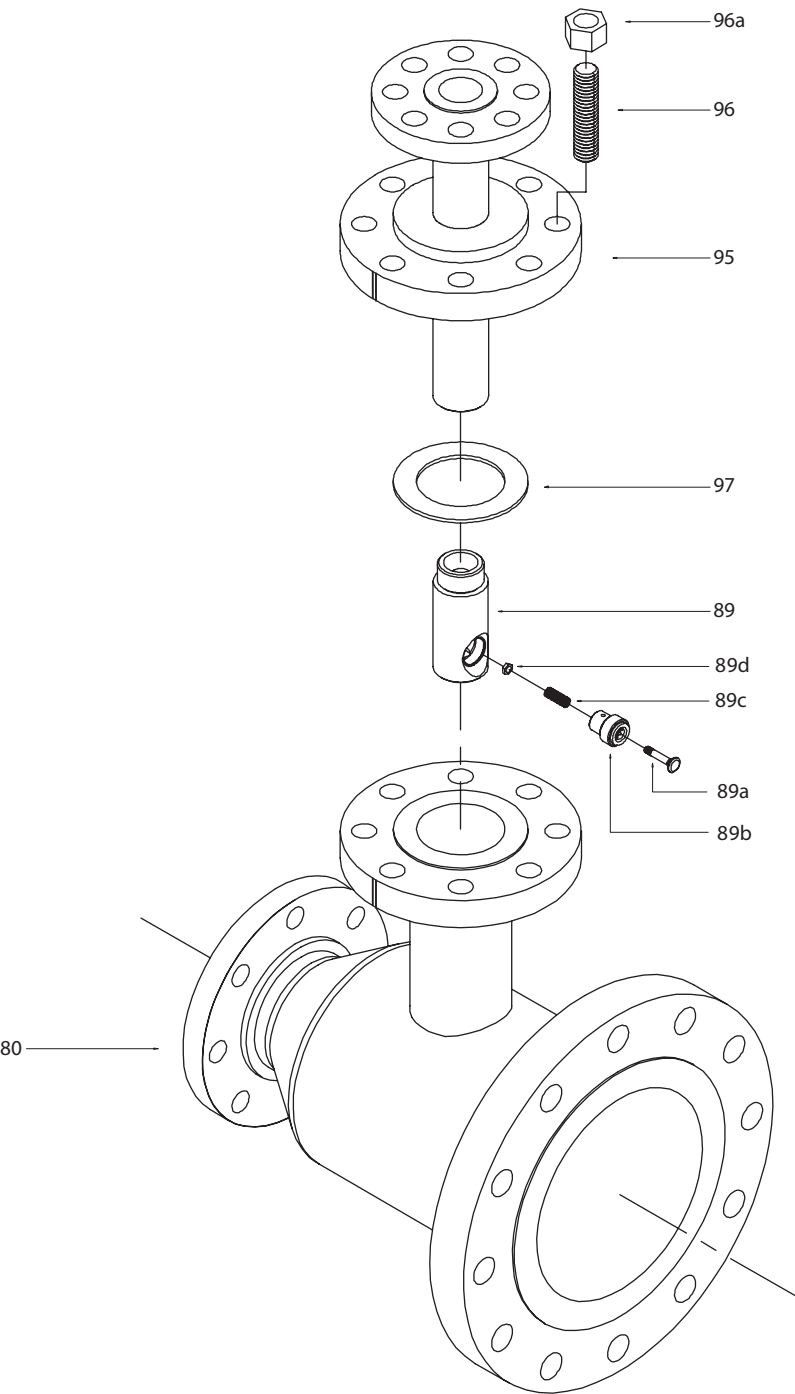
Item	Description	Recommended spare part
1	BODY	
2*	PLUG SET	
	3* PLUG	
	5* STEM	
	6* PLUG PIN	
3**	YOKE NUT	
7	SEAT RING	
8	BONNET	
9a	GLAND	
9b	GLAND FLANGE	
12	DISK SPRING ASSY	
13	STUD	
14	STUD	
16	CAGE GUIDE	
17	HEXAGON NUT	
18	HEXAGON NUT	
19	IDENTIFICATION PLATE	
19a	RIVET	
21	LANTERN RING	
25	DISK STACK	
63	SEAT GASKET	X
64	SEAL RING	X
65	BODY GASKET	X
65a	BODY GASKET	X
67	PACKING SPACER	
69	PACKING RING	X
71	PILOT MAIN PLUG	

Item	Description	Recommended spare part
72	PILOT STEM	
73	PILOT PLUG	
74	PILOT COVER	
75	PILOT BOLT	
76	PILOT WIRE	
77	PILOT SRPING	
80	DESUPERHEATER HOUSING	
81	DIFFUSER	
82	LINER	
83	SPRAY BODY	
84	SPRAY COVER	
85	PACKING RING	X
86	SPRAY GASKET	X
87	STUD	
87a	HEXAGON NUT	
88	SPRAY RETAINER	
89a	NOZZLE PLUG	
89b	NOZZLE SEAT	
89c	NOZZLE SPRING	
89d	LOCK NUT	
89e	SPRING SEAT	
90	PIPE SOCKET	
91	SPRAY PIPE	
92	SPRAY TEE	

*) Delivered as a set

**) V-A Mounting Parts

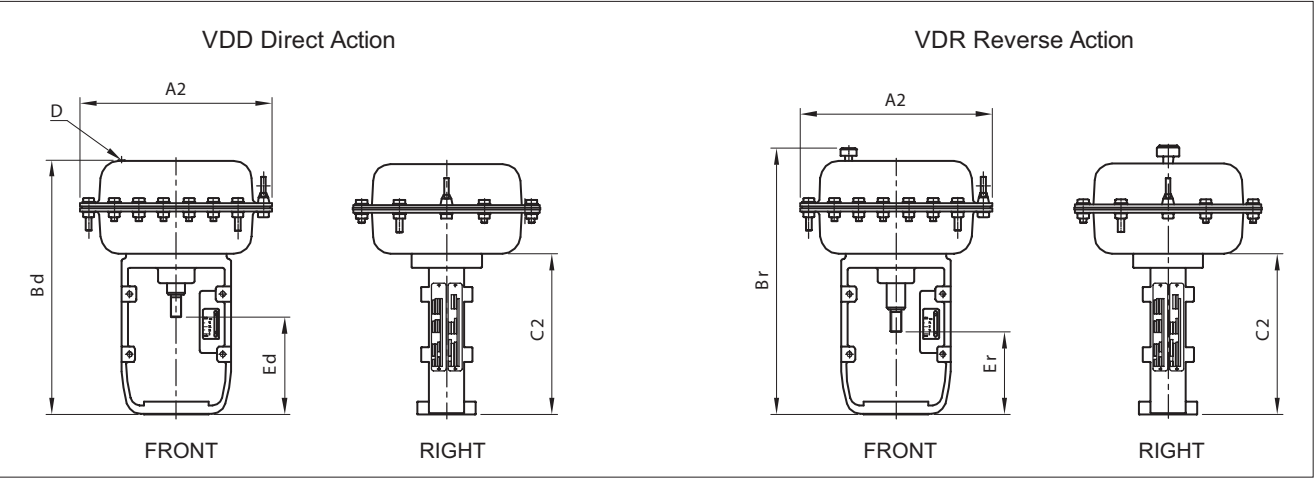
Series GS



Item	Description	Recommended spare part
80	DESUPERHEATER HOUSING	
89	SPRAY NOZZLE	
89a	NOZZLE PLUG	
89b	NOZZLE SEAT	
89c	NOZZLE SPRING	
89d	LOCK NUT	
95	HOUSING BONNET	
96	STUD	
96a	HEXAGON NUT	
97	FLANGE GASKET	X

10. DIMENSIONS AND WEIGHTS

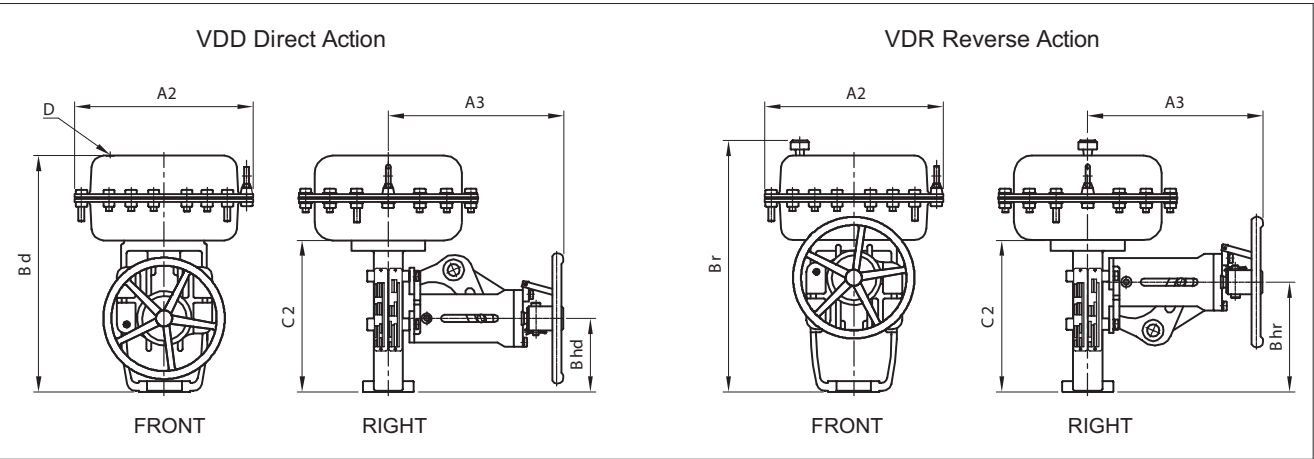
10.1 Actuators VD, VC



(UNIT: mm)

Without handwheel								
Size	A2	Bd	Br	D	Ed	Er	C2	Weight (kg)
#25	255	348	373	NPT 1/4	149	124	225	12
#29	295	391	416	NPT 1/4	174	129	251	18
#37	375	464	489	NPT 1/4	184	128	284	28
#48	486	652	677	NPT 1/4	250	165	381	86
#55	566	695	720	NPT 1/4	260	156	381	112

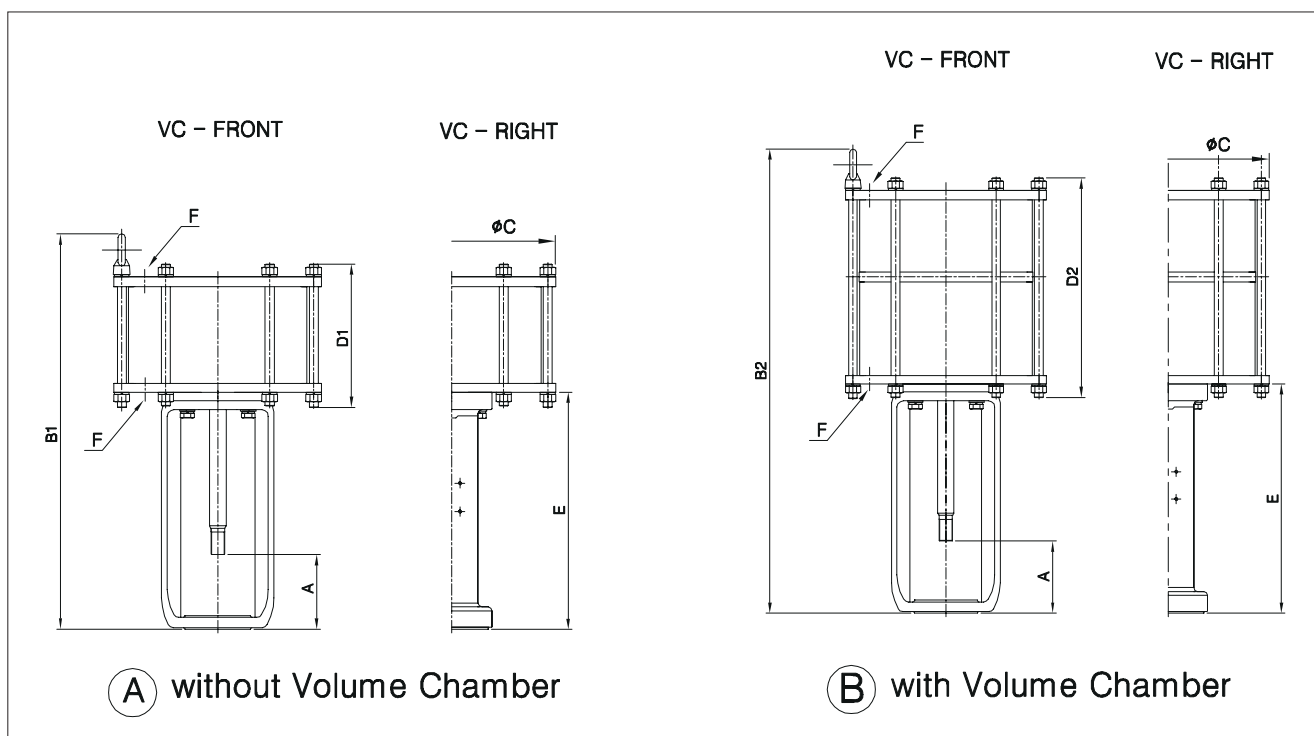
- NOTE
- 1. "Br" refers to reverse acting actuator, VDR
 - 2. "Bd" refers to direct acting actuator, VDD



(UNIT: mm)

With handwheel									
Size	A2	Bd	Br	D	A3	B hd	B hr	C2	Weight (kg)
#25	255	348	373	NPT 1/4	312	110	170	225	22
#29	295	391	416	NPT 1/4	312	122	182	251	28
#37	375	464	489	NPT 1/4	342	141	201	284	43
#48	486	652	677	NPT 1/4	464	144	244	381	119
#55	566	695	720	NPT 1/4	464	144	244	381	145

- NOTE
- 1. "Br" refers to reverse acting actuator, VDR
 - 2. "Bd" refers to direct acting actuator, VDD



Size # 30

(UNIT: mm)

Stroke	A	B1	ØC	D1	E	F	Weight (kg)	
		B2		D2			A	B
40	145	640 760	Ø370	185 305	420	PT 1/2	92	115
50	145	650 790	Ø370	195 335	420	PT 1/2	94	118
60	145	660 820	Ø370	205 365	420	PT 1/2	97	121
70	145	670 850	Ø370	215 395	420	PT 1/2	100	124
80	145	680 880	Ø370	225 425	420	PT 1/2	103	127
90	145	690 910	Ø370	235 455	420	PT 1/2	106	130
100	145	700 940	Ø370	245 485	420	PT 1/2	108	133
120	145	720 1000	Ø370	265 545	420	PT 1/2	114	139

Size # 40

(UNIT: mm)

Stroke	A	B1	ØC	D1	E	F	Weight (kg)	
		B2		D2			A	B
40	145	810 935	Ø460	205 330	560	PT 1/2	120	148
50	145	820 965	Ø460	215 360	560	PT 1/2	123	152
60	145	830 995	Ø460	225 390	560	PT 1/2	126	155
70	145	840 1025	Ø460	235 420	560	PT 1/2	128	159
80	145	850 1055	Ø460	245 450	560	PT 1/2	131	162
90	145	860 1085	Ø460	255 480	560	PT 1/2	134	166
100	145	870 1115	Ø460	265 510	560	PT 1/2	137	170
120	145	890 1175	Ø460	285 570	560	PT 1/2	142	177
140	145	910 1235	Ø460	305 630	560	PT 1/2	148	184
180	145	950 1355	Ø460	345 750	560	PT 1/2	159	198

Size # 50

(UNIT: mm)

Stroke	A	B1	ØC	D1	E	F	Weight (kg)	
		B2		D2			A	B
40	145	810 935	Ø560	205 330	560	PT 1/2	186	234
50	145	820 965	Ø560	215 360	560	PT 1/2	189	237
60	145	830 995	Ø560	225 390	560	PT 1/2	192	242
70	145	840 1025	Ø560	235 420	560	PT 1/2	195	246
80	145	850 1055	Ø560	245 450	560	PT 1/2	198	251
90	145	860 1085	Ø560	255 480	560	PT 1/2	201	256
100	145	870 1115	Ø560	265 510	560	PT 1/2	203	261
120	145	890 1175	Ø560	285 570	560	PT 1/2	209	270
140	145	910 1235	Ø560	305 630	560	PT 1/2	215	279
180	145	950 1355	Ø560	345 750	560	PT 1/2	227	298

Size # 60

(UNIT: mm)

Stroke	A	B1	ØC	D1	E	F	Weight (kg)	
		B2		D2			A	B
100	145	954 1199	Ø660	264 509	640	PT 1/2	255	344
120	145	974 1259	Ø660	284 569	640	PT 1/2	262	355
140	145	994 1319	Ø660	304 629	640	PT 1/2	269	365
180	145	1034 1349	Ø660	344 749	640	PT 1/2	283	386
240	145	1094 1619	Ø660	404 929	640	PT 1/2	303	417

Size # 70

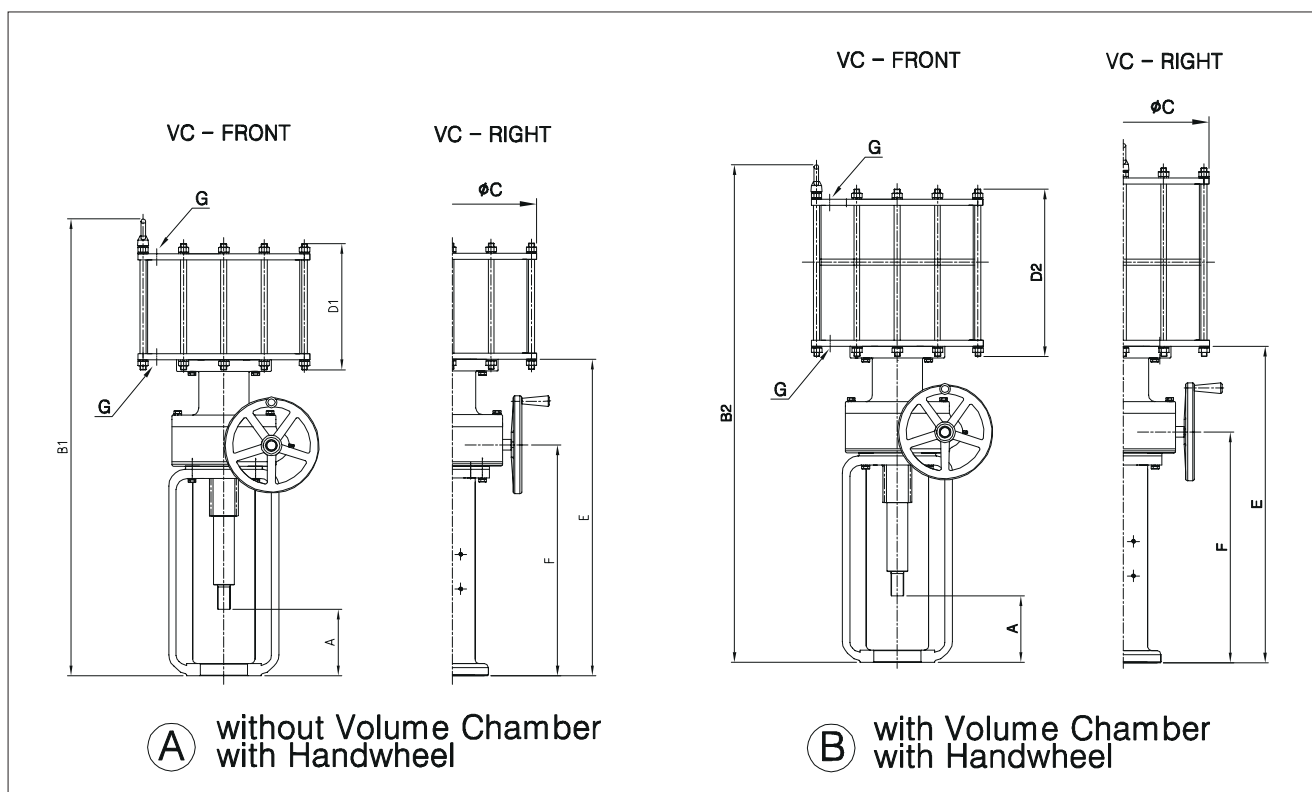
(UNIT: mm)

Stroke	A	B1	ØC	D1	E	F	Weight (kg)	
		B2		D2			A	B
100	145	955 1203	Ø710	265 510	640	PT 3/4	322	438
120	145	975 1263	Ø710	285 570	640	PT 3/4	330	450
140	145	995 1323	Ø710	305 630	640	PT 3/4	338	461
180	145	1035 1443	Ø710	345 750	640	PT 3/4	354	484
240	145	1095 1623	Ø710	405 930	640	PT 3/4	377	518

Size # 80

(UNIT: mm)

Stroke	A	B1	ØC	D1	E	F	Weight (kg)	
		B2		D2			A	B
100	145	954 1207	Ø820	264 509	640	PT 3/4	378	519
120	145	974 1267	Ø820	284 569	640	PT 3/4	386	531
140	145	997 1327	Ø820	304 629	640	PT 3/4	394	543
180	145	1034 1447	Ø820	344 749	640	PT 3/4	410	567
240	145	1094 1627	Ø820	404 929	640	PT 3/4	435	604
280	145	1134 1747	Ø820	444 1049	640	PT 3/4	451	628



Size # 30

(UNIT: mm)

Stroke	A	B1	ØC	D1	E	F	G	Weight (kg)	
		B2		D2				A	B
40	145	930 1055	Ø370	185 305	410	470	PT 1/2	134	157
50	145	940 1085	Ø370	195 335	410	470	PT 1/2	137	160
60	145	950 1115	Ø370	205 365	410	470	PT 1/2	139	163
70	145	960 1145	Ø370	215 395	410	470	PT 1/2	142	167
80	145	970 1175	Ø370	225 425	410	470	PT 1/2	144	170
90	145	980 1205	Ø370	235 455	410	470	PT 1/2	147	173
100	145	990 1235	Ø370	245 485	410	470	PT 1/2	150	176
120	145	1010 1295	Ø370	265 545	410	470	PT 1/2	155	183

Size # 40

(UNIT: mm)

Stroke	A	B1	ØC	D1	E	F	G	Weight (kg)	
		B2		D2				A	B
40	145	1095 1220	Ø460	205 330	845	616	PT 1/2	180	208
50	145	1105 1250	Ø460	215 360	845	616	PT 1/2	183	212
60	145	1115 1280	Ø460	225 390	845	616	PT 1/2	186	215
70	145	1125 1310	Ø460	235 420	845	616	PT 1/2	188	219
80	145	1135 1340	Ø460	245 450	845	616	PT 1/2	191	222
90	145	1145 1370	Ø460	255 480	845	616	PT 1/2	194	226
100	145	1155 1400	Ø460	265 510	845	616	PT 1/2	197	230
120	145	1175 1460	Ø460	285 570	845	616	PT 1/2	202	237
140	145	1195 1520	Ø460	305 630	845	616	PT 1/2	208	244
180	145	1235 1640	Ø460	345 750	845	616	PT 1/2	219	258

Size # 50

(UNIT: mm)

Stroke	A	B1	ØC	D1	E	F	G	Weight (kg)	
		B2		D2				A	B
40	145	1095 1220	Ø560	205 330	845	616	PT 1/2	246	294
50	145	1105 1250	Ø560	215 360	845	616	PT 1/2	249	299
60	145	1115 1280	Ø560	225 390	845	616	PT 1/2	252	303
70	145	1125 1310	Ø560	235 420	845	616	PT 1/2	255	308
80	145	1135 1340	Ø560	245 450	845	616	PT 1/2	258	313
90	145	1145 1370	Ø560	255 480	845	616	PT 1/2	261	318
100	145	1155 1400	Ø560	265 510	845	616	PT 1/2	263	322
120	145	1175 1460	Ø560	285 570	845	616	PT 1/2	269	332
140	145	1195 1520	Ø560	305 630	845	616	PT 1/2	275	341
180	145	1235 1640	Ø560	345 750	845	616	PT 1/2	287	360

Size # 60

(UNIT: mm)

Stroke	A	B1	ØC	D1	E	F	G	Weight (kg)	
		B2		D2				A	B
100	145	1239 1484	Ø660	264 509	925	696	PT 1/2	315	404
120	145	1259 1544	Ø660	284 569	925	696	PT 1/2	322	415
140	145	1279 1604	Ø660	304 629	925	696	PT 1/2	329	425
180	145	1319 1724	Ø660	344 749	925	696	PT 1/2	343	446
240	145	1379 1904	Ø660	404 929	925	696	PT 1/2	363	477

Size # 70

(UNIT: mm)

Stroke	A	B1	ØC	D1	E	F	G	Weight (kg)	
		B2		D2				A	B
100	145	1240 1488	Ø710	265 510	925	696	PT 3/4	368	502
120	145	1260 1548	Ø710	285 570	925	696	PT 3/4	376	514
140	145	1280 1608	Ø710	305 630	925	696	PT 3/4	384	525
180	145	1320 1728	Ø710	345 750	925	696	PT 3/4	400	548
240	145	1380 1908	Ø710	405 930	925	696	PT 3/4	423	582

Size # 80

(UNIT: mm)

Stroke	A	B1	ØC	D1	E	F	G	Weight (kg)	
		B2		D2				A	B
100	145	1289 1542	Ø820	264 509	975	696	PT 3/4	438	579
120	145	1309 1602	Ø820	284 569	975	696	PT 3/4	446	591
140	145	1329 1662	Ø820	304 629	975	696	PT 3/4	454	603
180	145	1369 1782	Ø820	344 749	975	696	PT 3/4	470	627
240	145	1429 1962	Ø820	404 929	975	696	PT 3/4	495	664
280	145	1469 2082	Ø820	444 1049	975	696	PT 3/4	511	688

11. INSTALLATION GUIDELINES

11.1 Pipeline cleaning

Make sure no foreign particles, such as sand or pieces of welding electrode, are in the pipeline, they may damage the sealing surfaces.

11.2 Installation and orientation of the valve

The valve has an arrow indicating the flow direction. Install the valve in the pipeline so that the flow direction of the valve corresponds to the flow direction marked on the pipe.

The mounting orientation of the valve should be vertical as it shown on Fig. 3.

Choose flange gaskets according to the operating conditions. Do not attempt to correct a pipeline misalignment by means of flange bolting. Loads on the valve body from pipeline vibrations can be reduced by supporting the pipeline properly. Reduced vibration also increases the lifetime of the positioner. Where necessary, you can support the valve by the body, using regular pipe clamps and supports. Do not fasten supports to the valve or flange bolting or to the actuator, see Fig. 3.

11.3 Hydrostatic testing and Line flushing

When the line is hydrostatic test and flushing, the control valve should not used as an isolating valve. Make sure the control valve always be opened position before start this process. Otherwise valve and trim damage or failure of the seals could result. Flushing and hydrostatic test kit can be purchased from Valmet.

CAUTION:

Flushing trim kit should be installed in the valve (especially 'Tendril & Omega trim' application) to protect the original trim and the flow passages while the valve installation and line flushing. Unless this caution could result in clogging trim, low flow rates, unstable control, valve leakage and excessive noise and other trouble.

11.4 Piping upstream

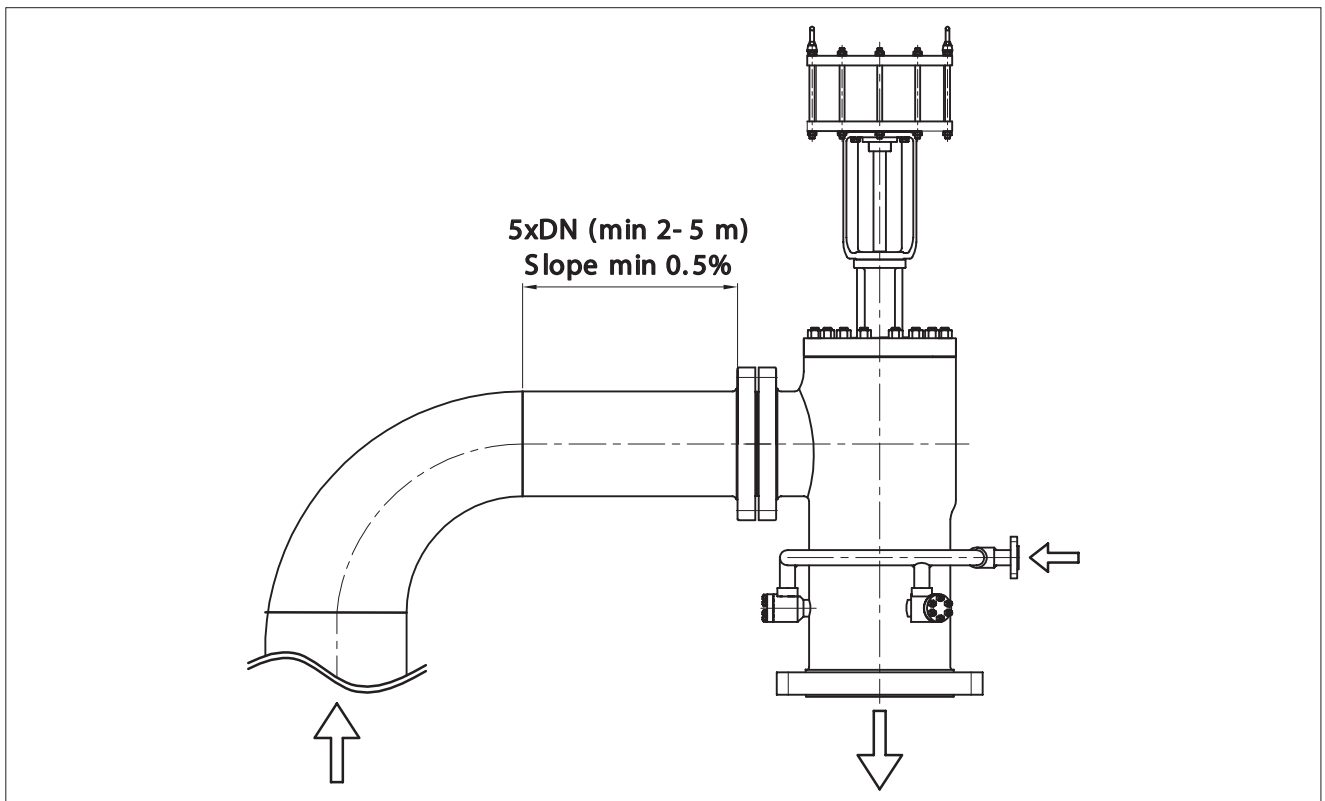
Upstream piping just before the AS valve must be straight and have no other components. T-piece junctions must also be avoided.

Neles™ guideline for the straight length of upstream piping is minimum 5 times to the nominal diameter of piping or a minimum of 2 meters.

If multiple components are located upstream the AS valve the distance must be increased to achieve uniform flow profile before the AS valve.

It is necessary to keep water out of the system (see drains) in order to avoid vibration, mechanical damages and ensure reliable temperature measurement.

Neles™ guide value for a slope against the flow is 1:200 as minimum. The drain must be provided at the lowest point of piping.



11.5 Downstream piping

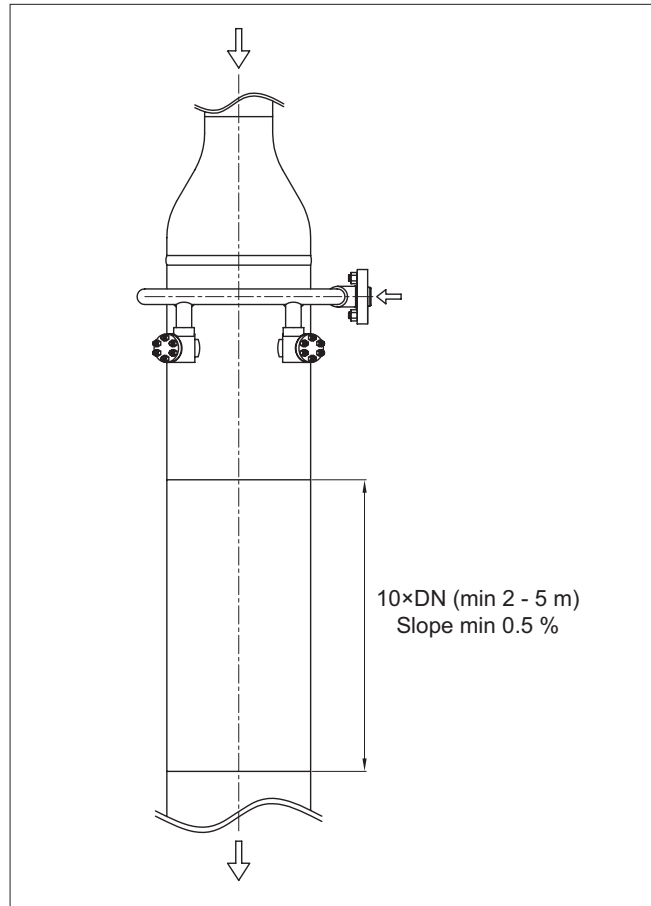
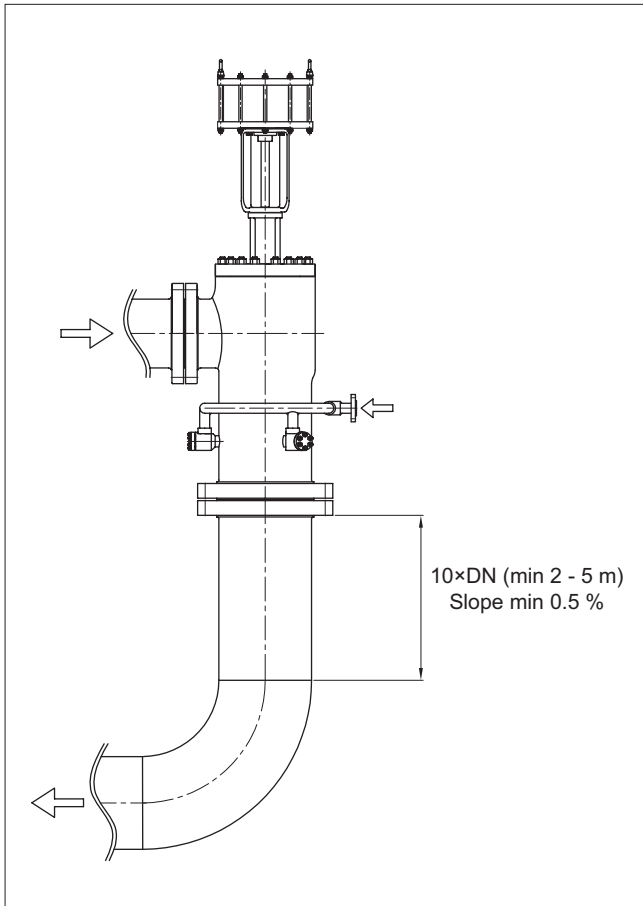
It is necessary to have straight piping downstream of the valve because sprayed water needs some distance to evaporate and for example bends will separate water from steam and hence prevent optimum evaporation.

Neles's guideline for straight downstream piping is about 10 times the nominal diameter and a minimum of 2-5 m.

In downstream piping it is also necessary to keep water away from piping (see drains).

Neles™ guide value for a slope with the flow is minimum 1:200.

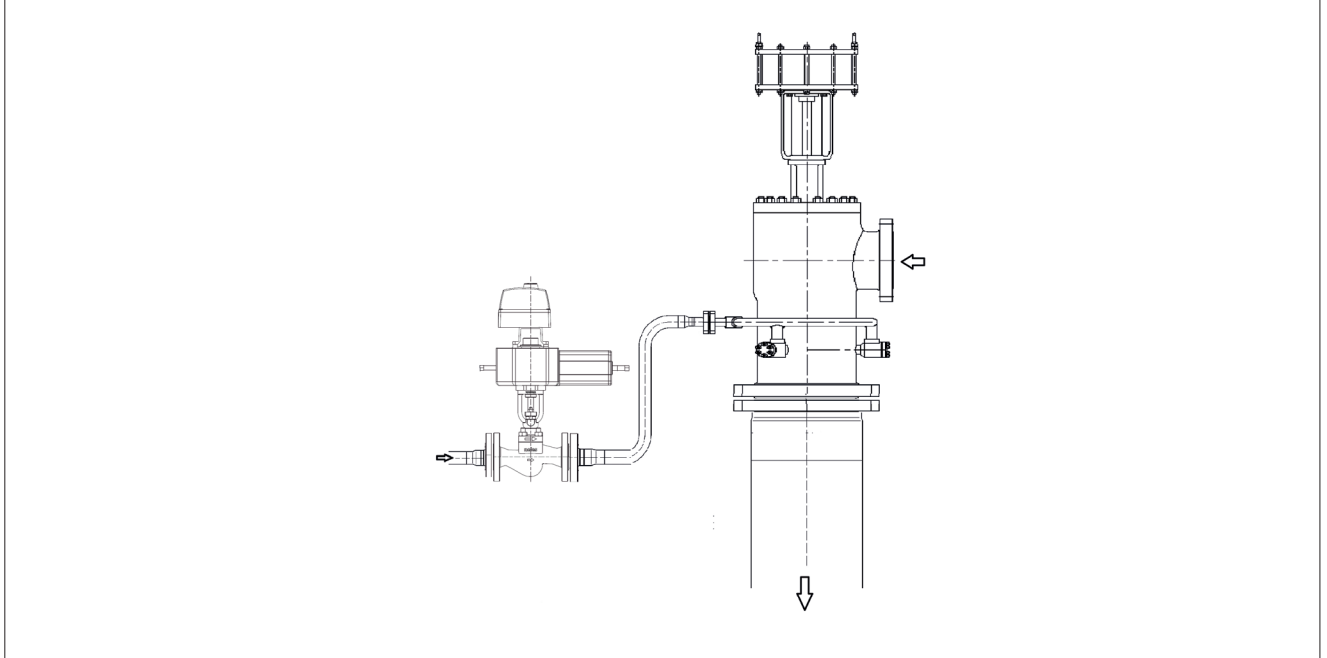
A drain should be provided at the lowest point.



11.6 Spray water pipe

Reliable operation of steam condition requires a proper installation between the AS valve and the spray water control valve. Spray water piping must ensure continuous and immediate supply of water and it should not get empty.

- The piping coming from the spray water control valve to the AS valve shall be arranged below the level of the spray pipe.
- The distance between the spray water control valve and the spray pipe should be minimized to less than 5 meters.

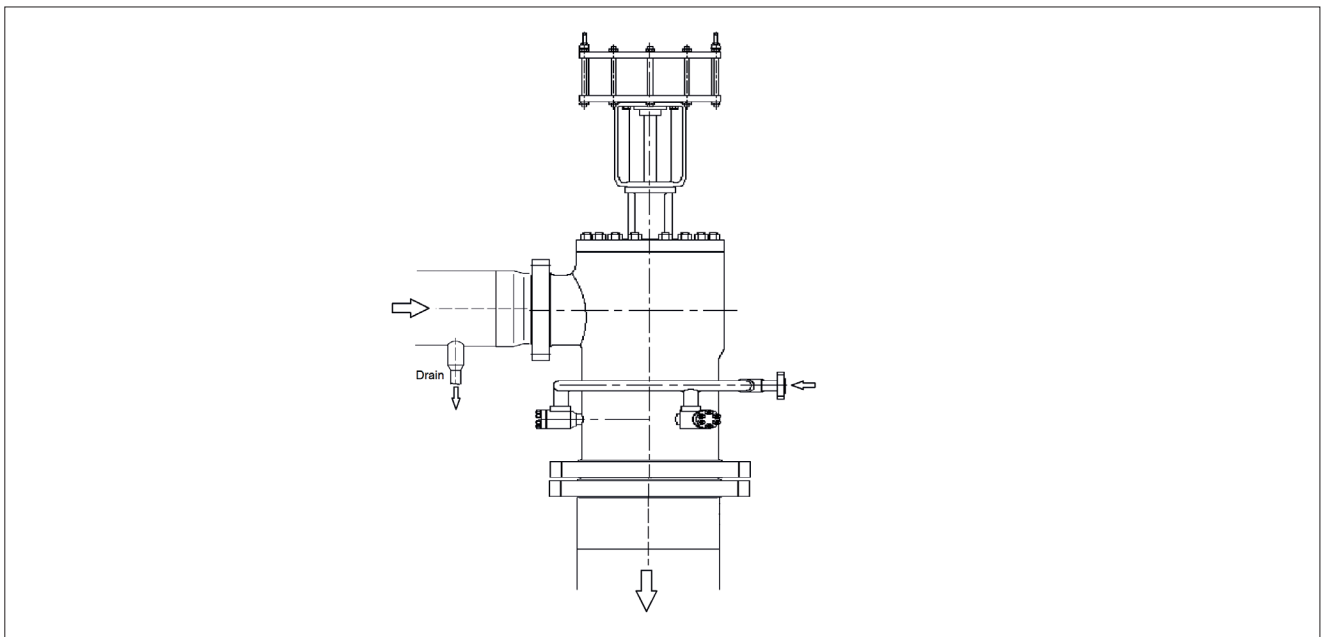


11.7 Drains

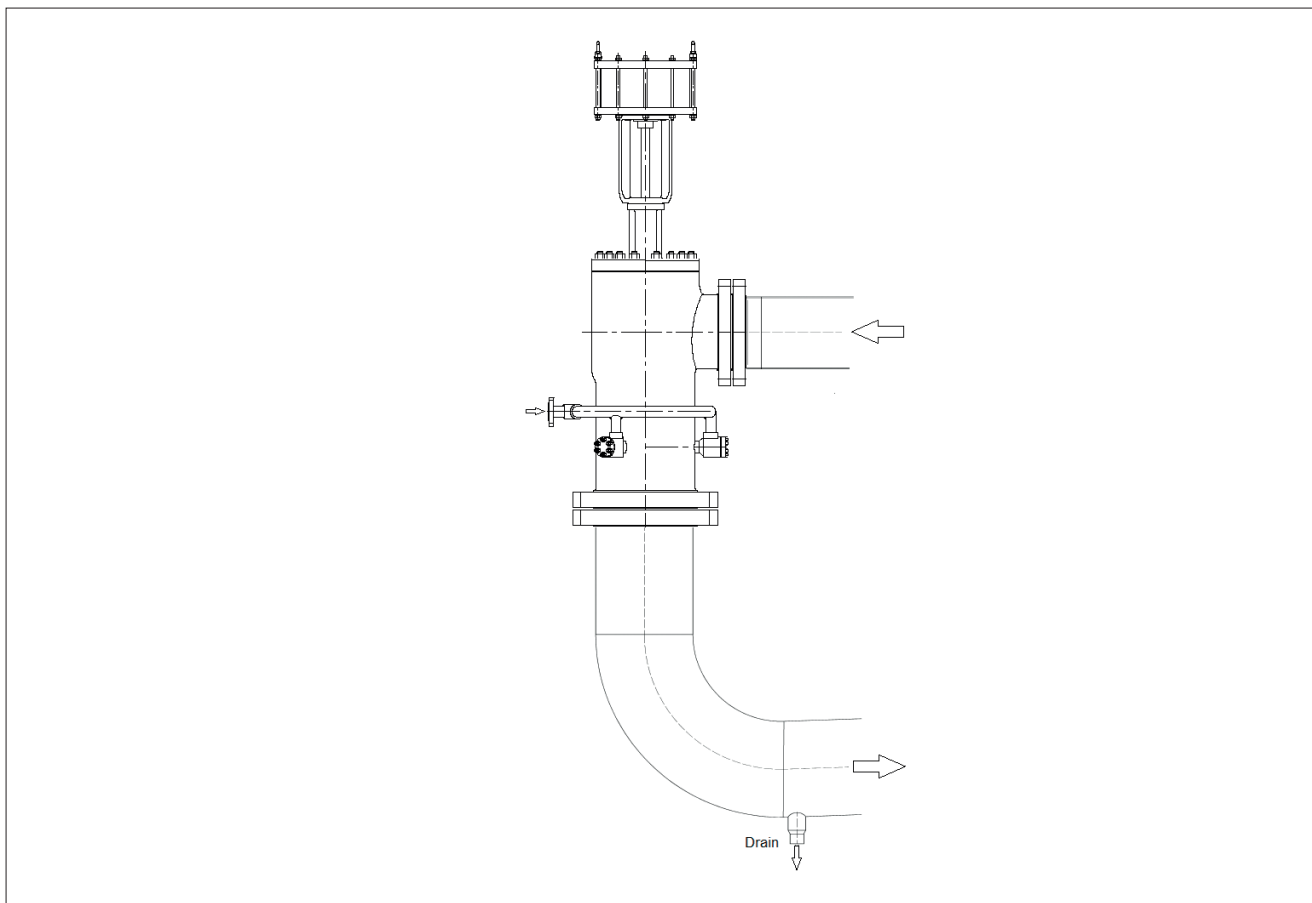
Condensate or non evaporated spray water in the valve or steam piping is very risky, it can cause erosion in piping and the valve, it causes vibration and water hammer and it can disturb temperature measurement causing problems in control.

Upstream drains are necessary to protect the AS valve. The drain connections shall be at the lowest point and nearest to the AS valve. Slopes shall be always arranged so that water flows towards the drain.

Neles™ guideline value for a standard drain connection upstream is a G ½" pipe thread.



It is necessary to protect the downstream piping system. The connection has to be at lowest point after the valve.



Neles™ guideline value for a standard drain connection in downstream piping is to size it for ~10% of the maximum spray water amount. The location of the drain shall be 2/3 of the distance to the temperature sensors. The drain between AS valve and the temperature sensor is mandatory.

11.8 Pre-Heating

Pre-Heating lines prevent the formation of condensate and reduce the risk of thermal stress. Especially in cases where the AS valve is closed in normal conditions (e.g. Bypass Valves) preheating has to be arranged.

11.9 Temperature sensor

The temperature sensors are fitted downstream in the straight piping at least 10xDN after the valve (min. 5m) and in case of horizontal piping ~30° rotated of the vertical piping.

12. TYPE CODE

Angle Steam Conditioning, Combination Type, Series AS																					
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.
AS	JL	H	Q	E	DK	G	P2	X	VH	S1	D1	X	S	F	F	H	H	X	A	L	FG

1.	VALVE SERIES
AS	Angle Steam conditioning, Combination type

2.	BODY SIZE (INLET X OULET)		
2a	INLET SIZE	2b	OUTLET SIZE
E	2"/DN 50	E	2"/DN 50
G	3"/DN 80	G	3"/DN 80
H	4"/DN 100	H	4"/DN 100
J	6"/DN 150	J	6"/DN 150
K	8"/DN 200	K	8"/DN 200
L	10"/DN 250	L	10"/DN 250
M	12"/DN 300	M	12"/DN 300
N	14"/DN 350	N	14"/DN 350
P	16"/DN 400	P	16"/DN 400
Q	18"/DN 450	Q	18"/DN 450
R	20"/DN 500	R	20"/DN 500
S	24"/DN 600	S	24"/DN 600
T	28"/DN 700	T	28"/DN 700
U	32"/DN 800	U	32"/DN 800
V	36"/DN 900	V	36"/DN 900
Y	Special	Y	Special

3.	PRESSURE RATING		
C	ASME Class 150	D	ASME Class 300
F	ASME Class 600	G	ASME Class 900
H	ASME Class 1500	I	ASME Class 2500
A	ASME Class 4500	Y	Special

4.	END CONNECTION
W	Flanged RF, ASME B16.5
Q	Butt welding, ASME B16.25
Z	Ring joint flange, ASME B16.5
Y	Special

5.	BONNET CONSTRUCTION
E	Extension
Y	Special

6.	BODY & BONNET MATERIAL		
BX	A182 gr. F11	CH	A182 gr. F22
DK	A182 gr. F91	YY	Special

7.	SPRAY NOZZLE CONSTRUCTION		
F	2-Spray nozzle Cv 2	G	2-Spray nozzle Cv 3
H	2-Spray nozzle Cv 6	J	2-Spray nozzle Cv 10
K	2-Spray nozzle Cv 16	Y	Special

8.	PLUG MATERIAL
DK	A182 gr. F91
P2	SUS 420J2
YY	Special

9.	PLUG APPLICATION
X	Not applicable
A	Cobalt based alloy
Y	Special

10.	STEM MATERIAL
VH	Inconel 718
YY	Special

11.	SEAT TYPE
S1	Single metal seat
YY	Special

12.	SEAT / CAGE / DISK STACK MATERIAL		
	Seat	Cage	Disk Stack
D1	A182 gr. F91	-	Inconel 718
P2	SUS 420J2	SUS 420J2	SUS 420J2
YY	Special	Special	Special

13.	SEAT APPLICATION
X	Not applicable
A	Cobalt based alloy
Y	Special

14.	PACKING TYPE
S	Standard packing
Y	Special

15.	PACKING MATERIAL
F	Graphite (with mold and braided)
H	Hi-Graphite (with mold and braided)
Y	Special

16.	SEALS MATERIAL
F	Graphite
C	Metal C-seal ring
M	Metal (Ductile)
Y	Special

17.	GASKET MATERIAL
H	S/W gasket type, 316 SS + Graphite for high temp.
M	S/W gasket type, 316 SS + Graphite for extreme temp.
Y	Special

18.	STUD / NUT MATERIAL
H	A193 gr. B16 / A194 gr. 4
Y	Special

19.	OPTIONS
X	Not applicable
Y	Special

20. Sign	TRIM TYPE	21. Sign	TRIM CHARACTERISTIC	22. Sign	RATED Cv														
					Description	Body Size													
						2" Srk.	3" Srk.	4" Srk.	6" Srk.	8" Srk.	10" Srk.	12" Srk.	14" Srk.	16" Srk.					
B	Balanced plug type	L	Linear	FT	Tendril 1 stage / Full capacity	32 (40)	78 (50)	156 (50)	310 (60)	540 (80)	700 (90)	1150 (120)	1450 (140)	1900 (160)					
P	Pilot balanced plug type	Q	Quick opening	1T	Tendril 1 stage / 1-Step reduction	14 (40)	34 (50)	84 (50)	170 (60)	340 (80)	500 (90)	850 (120)	1100 (140)	1500 (160)					
				FM	Tendril 2 stage / Full capacity	28 (40)	64 (50)	128 (50)	196 (60)	320 (80)	436 (90)	760 (120)	980 (140)	1200 (160)					
				1M	Tendril 2 stage / 1-Step reduction	24 (40)	42 (50)	56 (50)	88 (60)	144 (80)	196 (90)	342 (120)	440 (140)	540 (160)					
				FG	OMEGA / Full capacity	26 (40)	54 (50)	84 (50)	146 (60)	252 (80)	384 (90)	560 (120)	770 (140)	1020 (160)					
				1G	OMEGA / 1-Step reduction	12 (40)	28 (50)	52 (50)	90 (60)	156 (80)	234 (90)	340 (120)	470 (140)	624 (160)					
				2G	OMEGA / 2-Step reduction	6 (40)	14 (50)	26 (50)	45 (60)	78 (80)	116 (90)	170 (120)	234 (140)	310 (160)					
				3G	OMEGA / 3-Step reduction	3 (40)	7 (50)	14 (50)	22 (60)	40 (80)	58 (90)	84 (120)	116 (140)	154 (160)					
		E	Equal %	FT	Tendril 1 stage / Full capacity	28 (40)	70 (50)	146 (50)	280 (60)	490 (80)	600 (90)	950 (120)	1200 (140)	1500 (160)					
1T	Tendril 1 stage / 1-Step reduction			12 (40)	30 (50)	76 (50)	160 (60)	310 (80)	450 (90)	800 (120)	1000 (140)	1250 (160)							
FM	Tendril 2 stage / Full capacity			20 (40)	48 (50)	98 (50)	142 (60)	236 (80)	360 (90)	500 (120)	650 (140)	850 (160)							
1M	Tendril 2 stage / 1-Step reduction			18 (40)	32 (50)	44 (50)	64 (60)	106 (80)	162 (90)	254 (120)	306 (140)	410 (160)							
FG	OMEGA / Full capacity			18 (40)	38 (50)	60 (50)	104 (60)	176 (80)	268 (90)	390 (120)	540 (140)	710 (160)							
1G	OMEGA / 1-Step reduction			11 (40)	24 (50)	36 (50)	64 (60)	108 (80)	164 (90)	236 (120)	328 (140)	430 (160)							
2G	OMEGA / 2-Step reduction			5 (40)	12 (50)	18 (50)	32 (60)	54 (80)	82 (90)	118 (120)	164 (140)	214 (160)							
				3G	OMEGA / 3-Step reduction	2 (40)	6 (50)	9 (50)	16 (60)	27 (80)	40 (90)	60 (120)	82 (140)	106 (160)					
Y	Special	Y	Special	YY	Special	Contact Valmet for Cv details													

* Rated Cv is applied differently depending on the trim type & trim characteristic.

* Srk. & number in bracket means the valve stroke.

Desuperheater for Globe type, Series GS							
1.	2.	3.	4.	5.	6.	7.	8.
GS	JL	D	W	S	GM	N	N

PRODUCT

1.	VALVE SERIES
GS	Desuperheater for Globe type

HOUSING CONSTRUCTION

2.	BODY SIZE		
2a	INLET SIZE	2b	OUTLET SIZE
C	1" / DN 25	C	1" / DN 25
D	1-1/2" / DN 40	D	1-1/2" / DN 40
E	2" / DN 50	E	2" / DN 50
G	3" / DN 80	G	3" / DN 80
H	4" / DN 100	H	4" / DN 100
J	6" / DN 150	J	6" / DN 150
K	8" / DN 200	K	8" / DN 200
L	10" / DN 250	L	10" / DN 250
M	12" / DN 300	M	12" / DN 300
N	14" / DN 350	N	14" / DN 350
P	16" / DN 400	P	16" / DN 400
Y	Special	Y	Special

3.	PRESSURE RATING		
C	ASME Class 150	D	ASME Class 300
F	ASME Class 600	G	ASME Class 900
H	ASME Class 1500	I	ASME Class 2500
A	ASME Class 4500	Y	Special

4.	END CONNECTION
W	Flanged RF, ASME B16.5
V	Socket welding, ASME B16.11
Q	Butt welding, ASME B16.25
Z	Ring joint flange, ASME B16.5
Y	Special

OTHERS

5.	HOUSING CONSTRUCTION
S	Desuperheater with Straight housing
N	Desuperheater with Angle housing
D	Desuperheater only
Y	Special

6.	HOUSING MATERIAL		
BX	A335 gr. P11	CM	A335 gr. P21
DK	A335 gr. P91	XX	Not applicable
YY	Special		

7.	SPRAY NOZZLE CONSTRUCTION		
A	1-Spray nozzle Cv 1	L	3-Spray nozzle Cv 3
B	1-Spray nozzle Cv 1.5	M	3-Spray nozzle Cv 4.5
C	1-Spray nozzle Cv 3	N	3-Spray nozzle Cv 9
D	1-Spray nozzle Cv 5	P	3-Spray nozzle Cv 15
E	1-Spray nozzle Cv 8	Q	3-Spray nozzle Cv 24
F	2-Spray nozzle Cv 2	R	4-Spray nozzle Cv 4
G	2-Spray nozzle Cv 3	S	4-Spray nozzle Cv 6
H	2-Spray nozzle Cv 6	T	4-Spray nozzle Cv 24
J	2-Spray nozzle Cv 10	U	4-Spray nozzle Cv 40
K	2-Spray nozzle Cv 16	V	4-Spray nozzle Cv 64
Y	Special		

8.	OPTION
X	Not applicable
N	Liner for Desuperheater
Y	Special

* The materials are subject to change as equivalent depending on detail design.

13. GENERAL SAFETY WARNINGS AND DISCLAIMERS

General safety warnings

Lifting

1. Always use a lifting plan created by a qualified person to lift this equipment. Lifting guidance is provided in this IMO (Installation, Maintenance and Operation manual) to assist in lifting plan development. Think about the point center of gravity (CG) of the equipment being lifted. Make sure the CG is always under the central lifting point.
2. Valves may be equipped with lifting threads on the body or on the flanges. These are which are intended for use with the lifting plan.
3. Use only correct and approved lifting devices. Ensure that lifting devices and straps are securely attached to the equipment prior to lifting.
4. Check, that lifting devices are not damaged and in good condition with a valid check stamp prior to use.
5. Workers must be trained for lifting and handling valves.
6. Never lift an assembly by the instrumentation (solenoid, positioner, limit switch, etc.) or by the instrumentation piping. Straps and lifting devices should be fitted to prevent damage to instrumentation and instrumentation piping. Failure to follow the lifting guidance provided may result in damage and personal injury from falling objects.

Work activities on the valve

1. Wear your personal safety equipment. Personal safety equipment includes but is not limited to protective shoes, protective clothing, safety glasses, helmet, hearing protection and working gloves.
2. Always follow the local safety instructions in addition to the Valmet instructions. If Valmet instructions conflict with local safety instructions, stop work and contact Valmet for more information.
3. Before beginning service on the equipment, make sure that the actuator is disconnected from any kind of power source (pneumatic, hydraulic, and/or electric), and no stored energy is applied on the actuator (compressed spring, compressed air volumes, etc.). Do not attempt to remove a spring return actuator unless the stop screw is carrying the spring force.
4. Make sure that there is a LOTOTO (Lock Out / Tag Out / Try Out) procedure in place for the system in which the valve is installed and strictly follow it.
5. Always make sure that the pipeline is depressurized and in ambient temperature condition before maintenance work is started.
6. Keep hands and other body parts out of the flow port when the valve is being serviced and the actuator is connected to the valve. There is a high risk of serious injury to hands and/or fingers due to malfunction if the valve suddenly starts to operate.

General disclaimers

Receive, handle and unpacking

1. Respect the safety warnings above!
2. Valves are critical components for pipelines to control high pressure fluids and must therefore be handled with care.
3. Store valves and equipment in a dry and protected area until the equipment is installed.
4. Keep the original packaging on the valve as long as possible to avoid environmental contamination by dust, water, dirt, etc.

5. Remove the valve endcaps just before mounting into the pipeline.
6. FOR YOUR SAFETY IT IS IMPORTANT THE FOLLOWING PRECAUTIONS BE TAKEN PRIOR TO REMOVAL OF THE VALVE FROM THE PIPELINE OR BEFORE ANY DISASSEMBLY:
 - Be sure you know what fluid is in the pipeline. If there is any doubt, confirm with the proper supervisor.
 - Wear any personal protective equipment (PPE) required for working with the fluid involved in addition to any other PPE normally required.
 - Depressurize the pipeline, bring to ambient temperature, and drain the pipeline fluid.
 - Cycle the valve to relieve any residual pressure in the body cavity.
 - After removal but before disassembly, cycle the valve again until no evidence of trapped pressure remains.
7. The identification plate (nameplate, or engraved markings) on the valve gives the information of max. process conditions to the valve.
8. Temperatures and pressures must never exceed values marked on the valve. Exceeding these values may cause uncontrolled release of pressure and process fluid. Damage or personal injury may result.
9. Valmet valves typically are designed to be used in atmospheric conditions. Do not use valves under external pressurized conditions unless specifically designed and explicitly marked for this service.
10. Avoid Pressure shocks or water hammer. Systems with high pressure valves should be equipped with a bypass to reduce the differential pressure before opening the valve to avoid pressure shock.
11. Avoid thermal shock. High temperature, Low temperature and cryogenic valves should be operated in a way that limits the rate of increase or decrease in temperature. The valve should be thermally stabilized before being pressurized.
12. Materials of the valve are carefully selected for the process conditions. Changes to the process media can have a major impact on function and safety of the valve. Always confirm the materials are suitable for the service prior to installation.
13. As the use of the valve is application specific, a number of factors should be taken into account when selecting a valve for a given application. Therefore, some situations in which the valves are used are outside the scope of this manual.
14. It is the end user's responsibility to confirm compatibility of the valve materials with the intended service, however if you have questions concerning the use, application, or compatibility of the valve for the intended service, contact Valmet for more information.
15. Never use a valve with enriched or pure oxygen if the valve is not explicitly designed and cleaned for oxygen. Selected materials and design have a major impact on the safety to operate the valve with oxygen.
16. Valves intended for use in or with explosive atmospheres must be equipped with a grounding device and marked according ATEX (or equivalent international standards).

Maintenance

17. Respect the safety warnings above!
18. Plan service and maintenance actions, that spare parts, lifting devices and service personnel is available.

19. Maintain the valve within the recommended minimum maintenance intervals or within the recommended maximum operating cycles.
20. Always make sure that the valve and the pipeline is depressurized before starting any kind of maintenance work at a valve.
21. Always check the position of the valve before starting maintenance work. Follow the Lock out /tag out (LOTO) rules at the site before starting any maintenance activity.
 - See IMO for the correct stem position.
 - Consider that the positioner may give the wrong signals.
22. Sealing materials (soft sealing parts) should be changed when the valve is maintained. Always use original equipment manufacturers (OEM) spare parts to ensure proper performance of the repaired valve.
23. All pressure containing parts must be inspected visually for damage or corrosion. Damaged parts must be replaced.
24. Valve pressure bearing parts and all internals must be inspected for corrosion or erosion which may result in reduced wall thickness on pressure bearing parts. Damaged pressure bearing parts must be replaced with original equipment manufacturer's (OEM) replacement parts or repaired to factory specifications by an authorized Valmet service partner in order to maintain the warrantee.
25. Do not use sharp tools, grinding machines, or files to work on functional surfaces such as sealing, seating or bearing surfaces as this can damage these surfaces.
26. Do not weld on pressure bearing parts without an ASME and PED qualified procedure and personnel.
27. Pressure bearing parts of valves in high temperature applications must be carefully examined for the effects of material creep and fatigue.
28. Make sure that the valve is positioned in the correct flow direction into the pipeline.
29. If the valves are marked to be suitable for explosive atmospheres, the correct function of the discharging device must be tested before returning to service.
30. Always work in a clean environment. Avoid getting particles inside the valve due to machining, grinding, or welding nearby.
31. Never store a maintained valve without flow port protection.
32. When pressure testing valve seats, never exceed the maximum operating pressure of the system or the maximum shut-off pressure marked on the valve identification plate.
33. Actuator mounting and unmounting:
 - Before installing the actuator on to the valve, be sure the actuator is properly indicating the valve position. Failure to assemble these to indicate correct valve position may result in damage or personal injury.
 - When installing or removing a linkage kit, best practice is to remove the entire linkage assembly, including couplings which may fall off the valve during lifting or when position changes.
 - Mounting sets have been designed to support the weight of the Valmet actuator and recommended accessories. Use of the linkage to support additional equipment or additional weight such as people, ladders, etc. may result in equipment damage or personal injury.
34. The valve should be installed between flanges using appropriate gaskets and fasteners that are compatible with the application, and in compliance with applicable piping codes and standards. Center the gaskets carefully when fitting the valve between the flanges. Do not attempt to correct pipeline misalignment by means of the flange bolting.
35. Repairs on valves for special service like Oxygen, Chlorine, and Peroxide, have special requirements.
 - Parts must be cleaned appropriate to the service and protected from contamination prior to assembly.
 - Assembly areas and tools must be clean and dry to prevent contamination of the parts during assembly.
 - Test equipment must be clean and dry to prevent contamination during testing. This includes the test equipment internals that may allow particles or other contamination into the test fluid during the test.
 - Lubrication shall be used only if specifically required in the instructions. Where lubrication is required, the lubricant must be approved for the service by the end user.

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