SCI Series S7166NV 6000psi CWP

Stainless Steel Threaded End Needle Valve

Installation, Operation and Maintenance Instructions

Figure 1 – SCI Series S7166NV Threaded-End Needle Valve

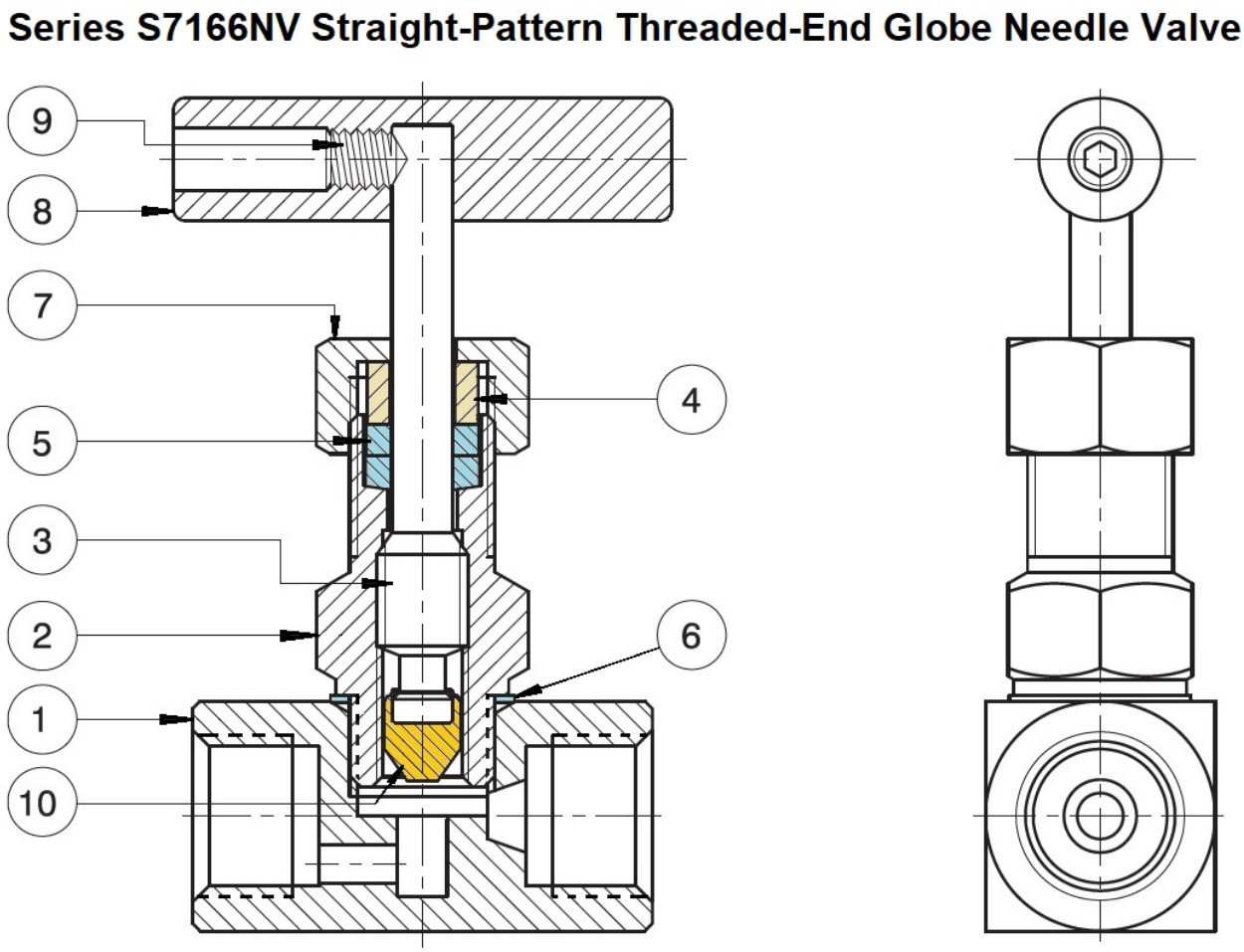

Table 1 – SCI Series S7166NV Needle Valve List of Materials (See Figure 1 for items illustrated)

Item No.	Part Description	Material
1	Body	ASTM A182 F 316 Stainless Steel
2	Bonnet	ASTM A182 F 316 Stainless Steel
3	Stem	ASME SA479 Type 316 Stainless Steel
4	Gland	316 Stainless Steel
5	Packing	PTFE
6	Body Seal	PTFE
7	Gland Nut	316 Stainless Steel
8	Handle	410 Stainless Steel
9	Set Screw	Alloy Steel
10	Disc (Needle Tip)	316 Stainless Steel

Valve Installation [See Figure 1 and Table 1 for part numbers listed in parentheses ( )]

These valves may be installed in the pipeline in any orientation or position using good piping practice. For threaded-end valves, use a suitable joint compound or PTFE tape on pipe threads of the body (1) for ease of fit-up and to seal the threads. However, it is recommended to install the valve with the handle (8) above the flow axis (in horizontal pipe) for optimum access and operation of the valve by the user.

Valve Operation [See Figure 1 and Table 1 for part numbers listed in parentheses ( )]

These valves are a multi-turn globe-style needle valve with a rotating & rising stem (3) which is equipped with a metal tee handle (8) for manual operation. The needle-shaped disc (10) allows for precise control of the fluid through the adjacent seat portion of the body (1) by allowing the handle (8) and stem (3) to be turned slightly counterclockwise off the fully seated position.

To open the valve, turn the tee handle (8) counterclockwise to the desired open position. The gland nut (7) can be torqued to fix or secure the stem (3) and hold the position of the disc (10).

To close the valve, loosen the gland nut (7) [counterclockwise] then turn the handle (8) clockwise to the desired position – or turn it fully until the disc (10) is fully seated in the body (1) to fully close it. Again, the gland nut (7) can be torqued to secure the stem (3) and disc (10) in any position including fully shut.

Valve Maintenance [See Figure 1 and Table 1 for part numbers listed in parentheses ( )]

Safety Precautions Prior to Performing Maintenance:

⚠ **DANGER** – Do not attempt to perform maintenance on valves in pressurized lines. Doing so may result in severe injury or death if there is an uncontrolled release of system pressure.

Before removing a valve from the pipeline, determine which media may be flowing through the valve. The media may be corrosive, toxic, flammable or contaminated. When there is evidence of hazardous fluids having flowed through the valve, additional precautions should be taken to avoid contact with these fluids and additional precautions should be taken when handling the valves during removal. Review the Safety Data Sheet (SDS) for any hazardous flowing fluids for any additional precautions. As a minimum, the following additional precautions should be taken.

1. Always wear OSHA-approved Safety Eyewear or face shields.
2. Always wear protective gloves and overalls or a chemical-resistant apron.
3. Wear protective footwear (e.g., safety shoes).
4. Wear protective headgear as required for the work area (e.g., hard hat – if required).
5. Ensure that running water is easily accessible (e.g., to rinse fluids from hands or valve / parts).
6. Have a suitable fire extinguisher ready if working with flammable media.

Check pipeline gauges to ensure that no pressure exists on either the upstream or downstream sides of the valve before performing any maintenance.

Ensure that any trapped media is released from the valve and piping by operating the valve slowly to the half-open position. Then leave the valve in the fully open position during maintenance.

Valve Maintenance:

Stem Packing (5) Adjustment:

If leakage is evident from the stem packing (5) area and the gland nut (7), tighten the gland nut (7) beneath the handle (8) about 1/8 of a turn. If the leakage persists, repeat the tightening sequence again. If the leakage cannot be corrected by tightening the gland nut (7), replacement of the stem packing (5) may be necessary.

Stem Packing (5) Removal:

Note: ASC recommends that all soft elastomer parts – including packing (5) and the body / bonnet seal (6) be replaced with new parts if available in a kit (contact sales). If kits are not available, a new replacement valve assembly will be required.

To perform replacement of any internal valve components, the valve must be removed from the pipeline (e.g., unscrewed from piping if a threaded valve) and moved to a suitable and clean work location.

Turn the valve to the open position and remove the set screw (9) and the handle (8). Loosen and remove the gland nut (7) from the valve bonnet (2) and remove the gland (4) which compresses the packing (5).

Remove the stem packing (5) or rings using a packing hook or sharp object to catch and pull the packing. **Use caution** not to scratch or nick the inside of the packing bore / cavity inside the bonnet (2) which may cause additional leakage. If only the packing needs to be replaced, skip to the section on *Stem Packing (5) Replacement*, otherwise continue with the steps below.

Bonnet (2) Removal and Body Seal (6) replacement:

If the body seal (6) shows signs of leakage or to gain internal access to the body seat and disc (10), remove the bonnet (2) by unscrewing it counterclockwise – remove the body seal (6).

Valve body (1) seat and disc (10) refurbishment:

Remove the stem (3) and needle/disc (10) assembly by unscrewing it from the bonnet (2). Inspect the surfaces of the disc (10) and the body (1) seat for damage, wear or scratches that would keep these parts from providing a tight seal when closed.

If necessary, use a small amount of very fine polishing compound on the disc and seat to polish the two together. Note: use a rotary reciprocating motion of the stem (3) and disc (10) into the body (1) seat with light pressure to polish the contact surfaces. Caution: remember to remove all traces of polishing compound prior to reassembly of the stem (3) and disc (10) into the valve.

Valve Reassembly:

Make sure all the valve components are clean and undamaged before assembly. A light application of thread lubricant (e.g., Never-Seez or equivalent) on the body (1) to bonnet (2) threads, and stem (3) to bonnet (2) threads is recommended when assembling these parts.

First, assemble the stem (3) and disc (10) assembly into the bonnet (2) by threading it back into the bonnet until the stem shoulder makes contact and cannot turn.

Place a new body seal (6) in the recess in the top of the body (1) and thread the bonnet/stem/disc (2/3/10) assembly into the body and tighten to hand-tight plus ¼ turn.

Stem Packing (5) Replacement:

Place a new set of packing (5) over the stem (3) and down into the packing bore. Place the packing gland (4) over the end of the stem (3) until it sits atop the packing (5). Place the gland nut (7) over the stem (3) end and thread onto the bonnet (2) until hand tight.

Place the handle (8) back onto the stem (3) and secure with the set screw (9) and test the handle assembly by turning the handle fully closed and open again. Tighten the packing nut (4) another ¼ turn to ensure the stem (3) is tight.

The following tests are recommended before reinstalling the valve into the pipeline and to ensure tightness of the valve body (1) to bonnet (2) connection and disc (10) to body (1) seat.

- *If the body (1) and bonnet (2) have been disassembled* - a pressurized shell test at 150% of the valve pressure rating (e.g., 9000psi for a 6000psi WOG rated valve) with water for 15 seconds – with no leakage allowable. [per API-598 & ASME B16.34].
- *If the stem (3) and disc (10) are removed or refurbished* - a seat test of the valve with the stem (3) and disc (10) in the CLOSED position at 80 ± 20psig (5.5 ± 1.5barg) with air or nitrogen for 60 seconds – with leakage in accordance with Table 2 below. [in accordance with MSS SP-61].

Table 2 – SCI Series S7166NV Needle Valve Allowable Seat Leakage Rate (80psig Gas)

Size (NPS) inch	Size (DN) mm	Allowable Leakage in scfh	Allowable Leakage in cc/minute	Allowable Leakage in bubbles/min
1/4”	DN8	0.025	11.8	295
3/8”	DN10	0.038	17.7	443
½”	DN15	0.050	23.6	590
¾”	DN20	0.075	35.4	885
1”	DN25	0.100	47.2	1180

Notes: per MSS SP-61 allowable gas leakage (in alternate units):

- 0.00166 scfm/ per NPS,
- 47.2 cc/min/per NPS,
- 1180 bubbles/min/per NPS

See the section on Valve Installation for re-installation of the valve back into the pipeline.