



Unpacking

The Narvik Turbo - Cascade High Pressure Let - Down Valve is packed with the greatest of care in wooden boxes or cartons for protection during handling and transit to site. After hydrostatic testing, the T.C. - Valve is flushed through with a high grade of preservative to protect machined and internal surfaces from corrosion. If it's found, however, that damage has occurred during shipment, then this should be reported immediately to your Forwarder or NARVIK - YARWAY representative.

Particular care should be exercised when removing the T.C. - Valve from its packing and your special attention is required to check carefully that no damage has occurred to butt weld ends, threadings, actuators, connecting pipes etc. etc. (see Fig. 1)

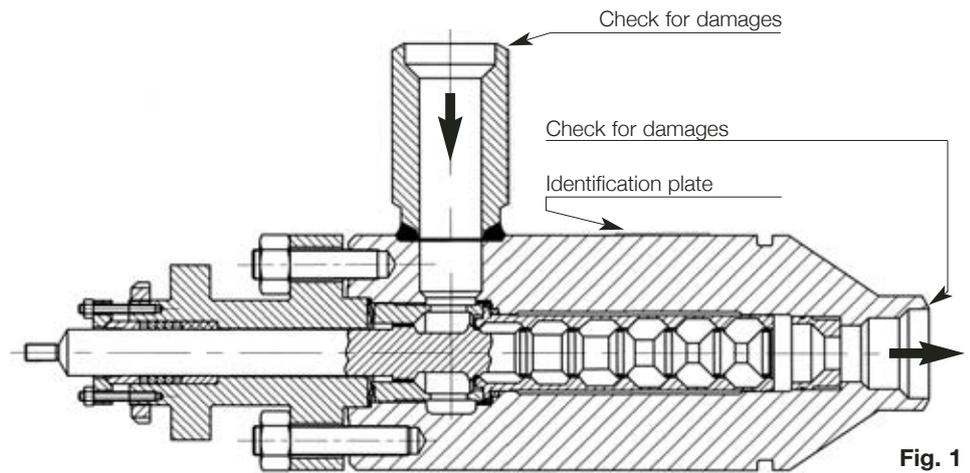


Fig. 1

Installation of the Turbo - Cascade Valve

Before installation, check the T.C. - Valve, actuator and accessories for any visible damage. Any damage to the unit should be reported immediately to your Forwarder or Narvik - Yarway representative. Check that the information on the Documentation, Identification plate and Tag no complies with the Order specification. Remove the T.C. - Valve carefully from its packaging, lifting by means of straps around the body, or use the hoisting lug if provided. Do not use the inlet nozzle, yoke, actuator or any of its accessories for lifting. Leave the covers in place during transportation, until ready to install in the pipework.

When installing the T.C. - Valve use gaskets and bolting material in accordance with the relevant piping code, for example ASME / ANSI B31. 1 or DIN/TRD. Immediately prior to installation, check the piping leading to the T.C. - Valve for foreign objects and clean lines. T.C. - Valves are manufactured with butt weld, socket weld or flanged ends. When welding the T.C. - Valve into the line, select welding rod compatible with the body material. All welding should be done in accordance with approved welding procedures as required by applicable specifications.

Note: The arrow on the valve body indicating flow direction. Keep the valve in full open position when flushing the piping at start up. Do not close before system has been thoroughly cleaned.

Piping

High pressure pump recirculation flow is one the most common application for the T.C. - Valve. A typical installation diagram is shown in Figure 2. Recommended straight length equal to the valve connection for the valve inlet is 0, 2 meter and at least 0, 5 meter for the valve outlet. Use pipe reducers (if required) following the straight pipe section at the outlet or ahead of the inlet length. Follow the recommendations for installation of control valves as specified in the Handbook of Control Valves as a guide for operation and maintenance. Due to its multi - stage design, the T.C. - Valve will handle large pressure drops at low sound pressure levels, but flow turbulence reaching the valve or turbulence in the line near the valve may create unwanted noise.

It is good engineering practice to design inlet and outlet piping near the valve as streamlined as possible. The number of elbows upstream should be minimized, is recommended. Use full - ported gate valves instead of globes as isolating valves. These and other methods of 'quiet design' will increase turbulence and resultant pipeline noise. Mount the valve in the line with the actuator vertically up or in the horizontal direction. Installation with the actuator vertically down is not recommended because of the difficulty in servicing the valve. Observe the flow direction of the valve body. Mount the valve in line, remembering that the inlet is on the side.

Note: The T.C. - Valves should be free of 'Forces, Moments and Torques'.

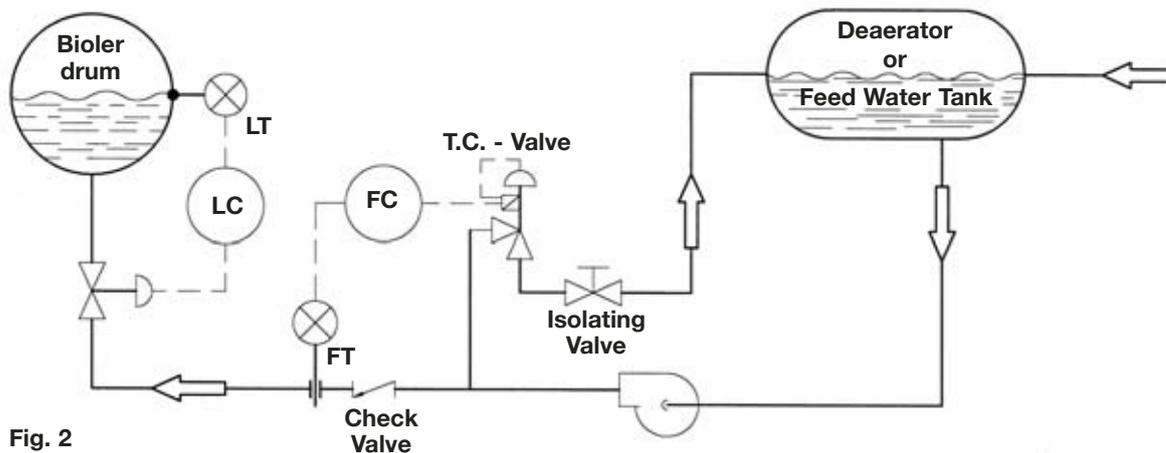


Fig. 2

Clearance for maintenance

Flanged valves may be removed from the line for service, but valves welded into lines can also be serviced adequately with proper planning.

Leave adequate removal clearance from the top of the valve actuator. For overall dimensions, refer to the engineering outline drawing supplied for the valve. In limited areas, a minimum of 0,3 meter must be allowed to remove a pneumatic actuator from the valve. For disassembly of the cascade piston (7) and de cascade bushing (4), it is recommended that the actuator and bonnet (13) has been disassembled. Additional clearance is required to accomplish this, the amount depending upon the valve size, number of cascade stages and pressure class. An allowance of 0,5 meter will accommodate all valve sizes through 3" (DN80).

When the valve is installed with the actuator in a horizontal position, support of the actuator is not absolutely necessary, but it is considered good engineering practice to do so.

Air supply

While the air supply requirement to the actuator or positioner depends upon the specific application, normally 70 psig (480 kPa) minimum for piston actuators and 35 psig (240 kPa) minimum for diaphragm actuators are used. An air filter regulator set on the supply line is required. Connect the air supply and /or air signal lines in accordance with the actuator manufacturer's instructions.

Operation

All T.C. - Valves, together with the mounted actuator and accessories, are stroke tested in the factory. A final field stroking check is recommended, however, prior to putting the valve in service. The identification plate on the valve contains important information about its operating characteristics. When the indicated instrument pressure range (3 - 15 or 6 - 30 Psi / 20 - 100 or 40 - 200 kPa on modulating valves) is applied, the valve should stroke the entire indicated valve travel. The supply pressure for which the actuator was sized is stamped on the identification - plate.

Follow the actuator manufacturer's instructions to connect the valve to the control station. Check for correct action (air to open or air to close) to match the controlling instrument. For satisfactory operation, valve and actuator stems should move freely in response to the loading pressure change to the piston or diaphragm of the actuator. All T.C. - Valves are adjusted for maximum stroke and corresponding maximum Cv (Kv).

Should a lower Cv (Kv) limit be required, the stroke of the actuator can be adjusted accordingly.

See Figure 3 for percent stroke vs. percent maximum flow.

Should the valve or the actuator not work satisfactorily over the entire operating range, consult the actuator manufacturer's literature or contact Narvik - Yarway.

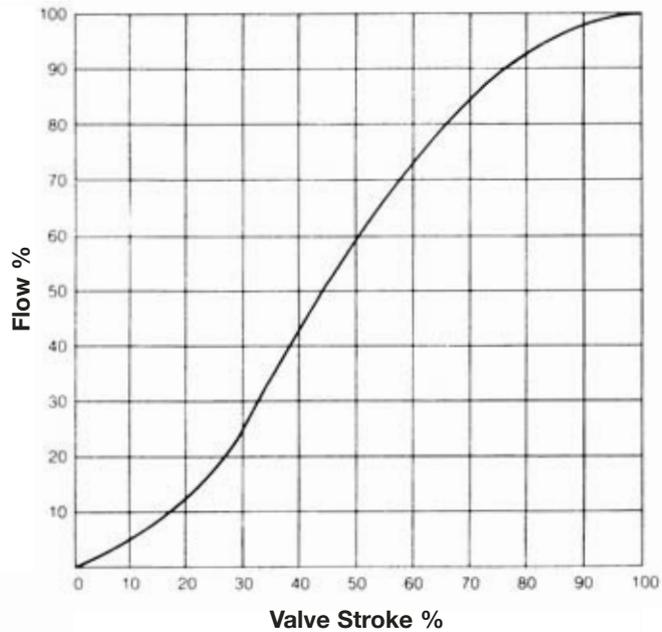


Fig. 3

Maintenance

Note

Maintenance of the T.C. - Valve is straight forward and does not require any special tools or training. Care should be taken during any maintenance operation, particularly when working with grinders, compressed air and rotating machinery.

It's imperative that safety glasses and protective workwear are used in accordance with Standard Safety Procedures.

In case of doubt, consult your Supervisor or Safety Officer before commencing any work on the equipment.

Removal

Before removing the T.C. - Valve from the system, ensure that both the pipework is pressureless and vented. Isolate any electrical supplies to the actuator and / or ancillaries, prior to disconnection. Vent and remove instrument air supply piping. Loosen flange bolting and / or grind off the buttwelds and the vent connections before complete removal.

The T.C. - Valve may now be removed from the system. It's recommended that the T.C. - Valve is transported to a convenient workshop which has a workbench and vice. Lift the unit by means of straps around the body. Do not attempt to lift the T.C. - Valve by the yoke, actuator or any of its accessories.

Depending upon the type of actuator fitted various stem couplings are used. Measure accurately, and record the dimensions A and B (see Fig. 6) for re - assembly purposes. Also record positions of any levers or special fixings, sketching if necessary, prior to removal. If any work is required on the actuator, then please refer to the actuator manufacturer 's manual.

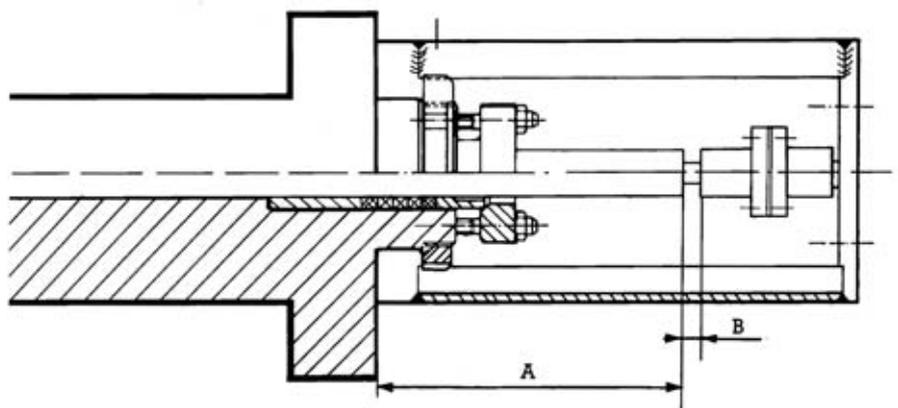


Fig. 4

Disassembly

The T.C. - Valve can be disassembled, most easily when, in the vertical position with the body secured firmly.

Stuffing box

Remove all rings lantern ring and packing material from the valve body. Clean the stuffing box carefully, using a rotating wire brush and / or honing device. Cleanness of the packing area is vital for proper valve sealing.

Only ever use genuine Narvik components, as there are supplied as matched sets (see Fig. 5).

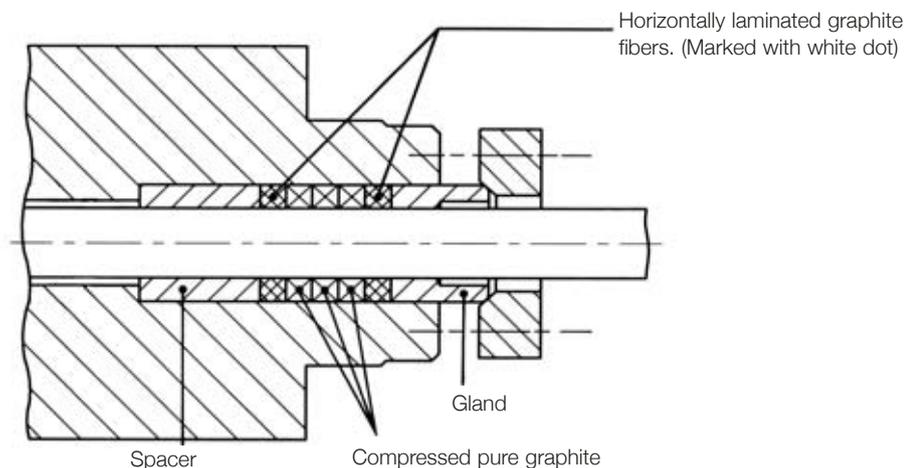


Fig. 5

Re - assembly

Before re - assembling the valve, lubricate all threads with a suitable high temperature nickel compound.

Do not use grease or other oil based lubricants as these may lead to dismantling problems later.

Refit the actuator onto the T.C. - Valve, referring to the notes taken during disassembly, for resetting the stem position. If the actuator is electric, check that the limits switches are functioning correctly by manual operation of the unit. Set at mid - stroke before applying power and verify that opening and closing directions are correct and correspond with system logics.

Follow the procedure for 'Operation', as detailed earlier in the installation instructions. Check the stuffing box tightness. Do not overtighten the stuffing box packing gland as this may prevent proper T.C. - Valve operation.

In the event of persistent leakage through the stem packing, then the unit should be removed to the workshop, for further examination. Experience shows that providing the stuffing box, packing and stem are clean and score - free, leak tightness can be achieved.

Spare parts

Make sure that the identification number (indicated on the nameplate) is verified and specified when ordering spare parts. For cross - sectional drawing and part list, see page 5.

Storage procedure

Upon receipt, check both the T.C. - Valve and the packing case for any transit damage. Any damage to the T.C. - Valve should be reported immediately to NARVIK - YARWAY or their local agent. Any damage to the packing container should be rectified to prevent the ingress of dust or water, prior to placing the equipment into storage.

Check the information contained on the identification plate - tag plate and documentation and return the unit to its packing with protective covers in place (see Fig. 1).

For short term storage, up to 6 months duration, no additional preservation measures are necessary. Retain the unit in its original packing in a clean, dry indoor location. If outdoor storage is unavoidable, then the packing case should be enclosed in a waterproof covering.

For long term storage use only a dry indoor location. Remove the stem packing and ensure that the T.C. - Valve is dry and free from moisture. Apply a cosmoline type grease to machined faces, valve stem and stuffing box. Retain T.C. - Valve Desuperheater in its original packing and inspect at 3 monthly intervals to ensure that no deterioration has occurred.

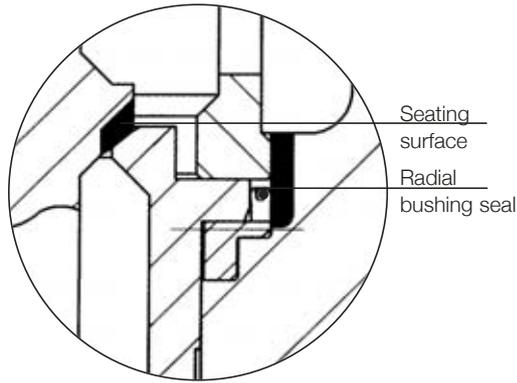
Before placing the T.C. - Valve into service, replace stem packing and inspect other components, such as actuator seals etc., to ensure correct functioning. Follow the procedure for installation as detailed in the operating and maintenance instruction manual.

Note

Materials and data of units supplied, may deviated from this Instruction Manual. Please consult Order documents in case of doubt.

Turbo - Cascade H.P. (Model : 39) Let - Down Valve

Installation and maintenance instructions



Detail "A"

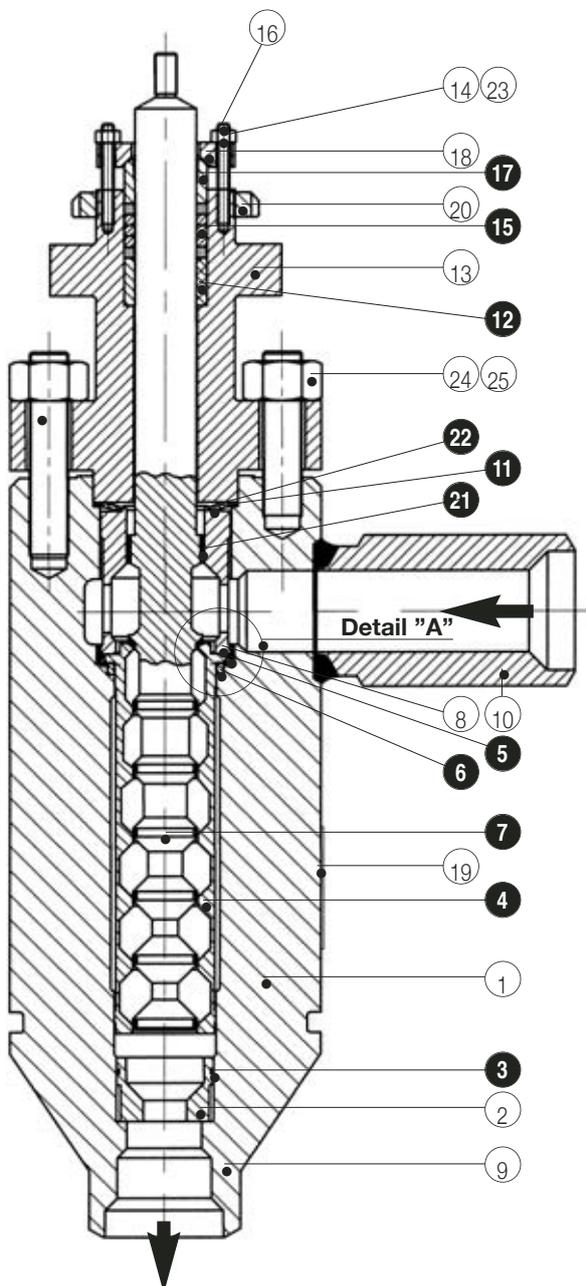


Table 1 - Standard materials

Item	Name	Material	Equivalent
1	Valve body	A105	C22 N
2	Orifice	A182 F 316	1. 4404
3	" O " - ring	Viton	Viton
4	Cascade bushing	17 - 4 PH	1. 4542
5	Radial Seal	Turcite 51	
6	Venting ring	A564 Gr. 630	
7**	Cascade piston	AISI 410	1. 4006
8	Spacer sleeve	AISI 410	1. 4006
9	Outlet nozzle	A105	C22 N
10	Inlet nozzle	A105	C22 N
11	Belville washer	PH 15 - 7 Mo	
12	Spacer	AISI 431 *	1. 4057 *
13	Bonnet	A105	C22 N
14	Nut	A194 2H	1. 4923
15	Packing set	Graphite	Graphite
16	Stud	A193 B7	1. 4923
17	Gland	AISI 431 *	1. 4057 *
18	Gland plate	AISI 304	1. 4301
19	Nameplate	AISI 304	1. 4301
20	Nut (FAG)	C. Steel	C. Steel
21	Piston ring (Snubber)	AISI 420	1. 4021
22	Gasket	St.St./Graphite	St.St./Graphite
23	Securing washer	Steel	Steel
24	Nuts	A194 2H	1. 4923
25	Studs	A193 B7	1. 4923

* Nitrided

** Stellite lands upon request

Note

Other materials are available upon request.

Certification

Turbo - Cascade Valves are approved by authorized Authorities to comply with the requirements of ANSI B16. 34 and TRD 110.

All data subject to changes.

● Recommended spares