

Service Instructions for Yarway™ AT-13/23 and AT-33/43 QueTemp™ Standard and Heavy Duty

This instruction manual was prepared by Emerson.

Do not install, operate or maintain this product without being fully trained and qualified in valve, actuator and accessory installation, operation and maintenance.

To avoid personal injury or property damage it is important to carefully read, understand, and follow all of the contents of this manual, including all safety cautions and warnings.

If you have any questions about these instructions, contact your [Emerson sales office](#) before proceeding.

Installation

⚠ WARNING

Always wear protective gloves, clothing, and eyewear when performing any installation operations. Check with your process or safety engineer for any other hazards that may be present from exposure to process media.

Personal injury or equipment damage caused by sudden release of pressure may result if the desuperheater is installed where service conditions could exceed the limits given on the product nameplate. To avoid such injury or damage, provide a relief valve for over-pressure protection as required by government or accepted industry codes and good engineering practices.

CAUTION

When ordered, the desuperheater configuration and construction materials were specified to meet particular pressure, temperature, pressure drop, and fluid conditions. Do not apply any other conditions to the desuperheater without first contacting your local Emerson sales office.

Maintenance

⚠ WARNING

Avoid personal injury or property damage from sudden release of process pressure or bursting of parts. Before performing any maintenance operations:

- Always wear protective gloves, clothing, and eyewear when performing any maintenance operations.
- Use bypass valves or completely shut off the process to isolate the valve from process pressure. Relieve process pressure from both sides of the valve. Drain the process media from both sides of the valve.
- Use lock-out procedures to be sure the above measures stay in effect with you work on the equipment.
- Check with your process or safety engineer for any other hazards that may be present from exposure to process media.

CAUTION

When adjusting the travel stop for the closed position of the valve ball or disk, refer to the appropriate valve instruction manual for detailed procedures. Undertravel or overtravel at the closed position may result in poor valve performance and/or damage to the equipment.

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YARWAY QUE - TEMP DESUPERHEATER STANDARD-/HEAVY DUTY INSTALLATION AND MAINTENANCE INSTRUCTIONS

Before installation these instructions must be fully read and understood



INSTALLATION OF THE QUE - TEMP DESUPERHEATER

Before installation, check the Que - Temp Desuperheater for any visible damage. Check that the information on the documentation, identification plate and tag number complies with the order specification. Remove the Que - Temp Desuperheater carefully from its packaging, lifting by means of straps around the body. Leave the flange covers in place during transportation, until ready to install in the pipework.

When installing the Que - Temp Desuperheater use gaskets and bolting material in accordance with the relevant piping code, for example ASME B31.1 or EN. Place the gasket onto the mounting flange and carefully insert the nozzle into the branch pipe. Ensure that the spray cylinder is pointed in the direction of the steam flow before tightening the mounting bolts (see Figure 3).

UNPACKING

The Yarway Que - Temp Desuperheater is packed with the greatest of care in wooden boxes or cartons for protection during handling and transit to site. After hydrostatic testing, the Que - Temp Desuperheater is flushed through with a high grade of preservative to protect machined and internal surfaces from corrosion. If it is found, however, that damage has occurred during shipment, then this should be reported immediately to your forwarder or Yarway representative.

Particular care should be exercised when removing the Que - Temp Desuperheater from its packing and your special attention is required to check carefully that no damage has occurred to flange faces, threadings, etc. (see Figures 1 and 2).

Note: the Que - Temp Desuperheaters should be free of 'forces, moments and torques'.

The Que - Temp Desuperheater is provided with a standard lower body length, as specified in the contract drawing and the mounting branch for the steam pipework must be manufactured to suit. The length of this branch should be such, that the centerline of the spray cylinder is located on the centerline of the steam pipe (± 5 mm).

The mounting branch should be for Model 33 / 13, 3" (DN 80) and for Model 43 / 23, 4" (DN 100) nominal bore, maximum pipe schedule 160 for clearance purposes (check the applicable power piping code).

RECOMMENDATIONS

(acid cleaning of steam boilers)

Remove Que - Temp Desuperheaters from the piping prior to acid cleaning!

YARWAY QUE - TEMP DESUPERHEATER STANDARD-/HEAVY DUTY

INSTALLATION AND MAINTENANCE INSTRUCTIONS

The minimum pipe run, required downstream of the Que - Temp Desuperheater, varies with each individual application and would be specified by Yarway at the enquiry stage. The distance from injection point to the first pipe bend is also a function of steam pressure, temperature and nozzle size. Experience has shown that in systems up to 25 bar, 4 to 6 meters, is an acceptable distance.

The distance from the Que - Temp Desuperheater to the temperature sensor is nominally 12 to 15 meters, although the distance specific to the application would be advised by Yarway at the enquiry stage. Longer distances will ensure that full evaporation of the water will take place at lower steam velocities.

The temperature sensor should be located in the upper half of the pipe, avoid branching of the steam pipework between the Que - Temp Desuperheater and the sensor (see Figure 4).

FIGURE 1 - MODEL 33 / 43

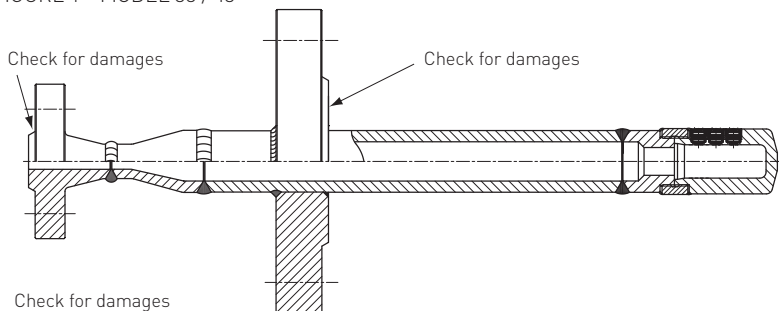


FIGURE 2 - MODEL 13 / 23

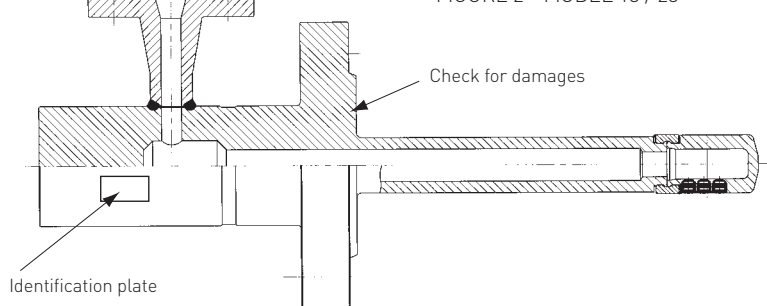


FIGURE 3

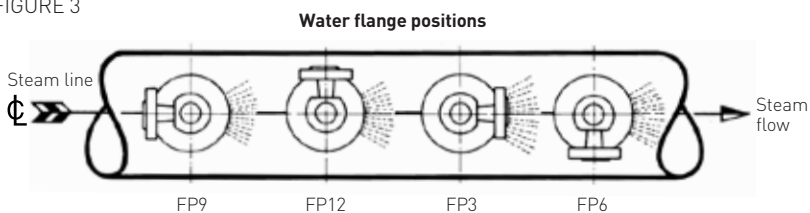
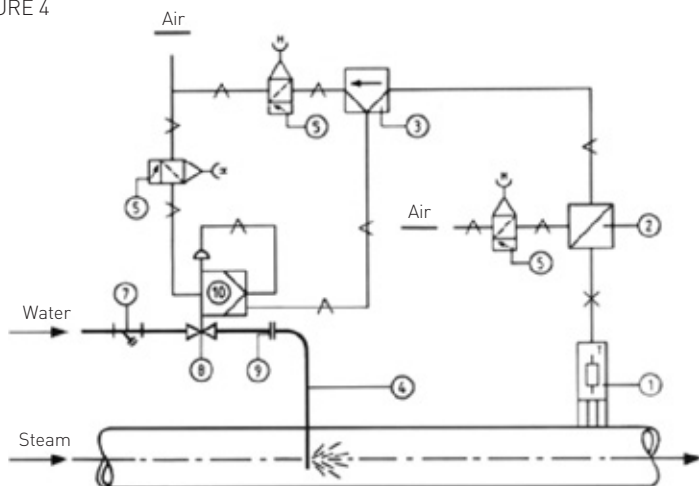


FIGURE 4



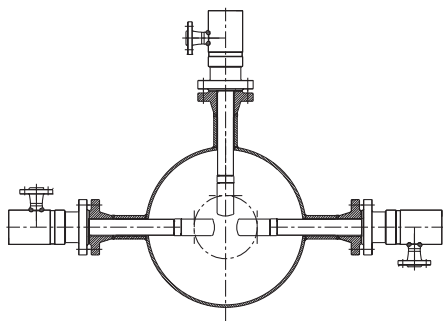
PARTS LIST

Item	Description
1	Temperature sensor
2	Temperature transmitter
3	Temperature controller
4	Que - Temp Desuperheater
5	Air filter regulator
7	Strainer
8	Control - or On/Off valve
9	Flange
10	Pneumatic - or E/P-positioner

YARWAY QUE - TEMP DESUPERHEATER STANDARD-/HEAVY DUTY

INSTALLATION AND MAINTENANCE INSTRUCTIONS

FIGURE 5



Pipe bends should always be of the long radius type to assist in keeping the water droplets in suspension, until complete evaporation has taken place. Installation may be in vertical or horizontal piping, but the direction of water injection should always be with the steam flow. The Que - Temp Desuperheater may be mounted at 90° to the steam pipe, for all steam flow orientations, but avoid installation in the vertically downwards position, wherever possible (see Figure 5).

Yarway supplies the Que - Temp Desuperheater as follows:

Identification number:

xx. 33. xxxxx - Fabricated type

xx. 43. xxxxx - Fabricated type, oversized

xx. 13. xxxxx - Forged type

xx. 23. xxxxx - Forged type, oversized

Both with the spray cylinder tack welded for class 150 (PN 25/40) and class 300 (PN 64) and circular welded for class 600 (PN 100) up to and including class 2500 (PN 400) to the body extension pipe.

The water supply should be of a good quality; clean and filtered for example boiler feed water and should have a constant pressure as specified in the order documents. Each water supply line should be protected with its own individual strainer with a maximum element perforation size of 0.1 mm (0.4 mm acceptable for nozzles 'E' size and up).

START-UP

Ensure that all components are installed correctly. Connection of electrical supplies and instrument air piping should be in accordance with the manufacturer's instruction manual. Verify and adjust, if necessary, set points for filter regulators and valve positioners, following the manufacturer's recommendations.

MAINTENANCE

Note: maintenance of the Que - Temp Desuperheater 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 is 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 Que - Temp Desuperheater from the system, ensure that both the steam -and water- pipework are pressureless and vented. Loosen steam flange and water flange bolting, but vent connections before complete removal.

The Que - Temp Desuperheater may now be removed from the system. It is recommended that the Que - Temp Desuperheater is transported to a convenient workshop which has a workbench and vice. Lift the unit by means of straps around the body.

Disassembly

The Que - Temp Desuperheater can be disassembled, most easily when, in the horizontal position with the body extension section clamped firmly in the vice. Grind off the four nozzle tack welds for class 150 (PN 25/40) and class 300 (PN 64) (see Figure 6) and circular welded for class 600 (PN 100) up to and including class 2500 (PN 400) (see Figure 7), using any standard type of angle grinder. Make sure that the weld is removed sufficiently to allow rotation of the fastener ring, without fouling.

Unscrew the fastener ring by rotating anti clockwise. Note that the threading on the body extension is right handed. Tapping the fastener ring with a hammer may facilitate removal. Note that the threading on the spray cylinder is left handed. If difficulties are encountered with the removal of the fastener ring, then this item may be removed by grinding through at two diametrically opposite points. Exercise great care not to damage the body and spray cylinder threadings.

Spray cylinder

Once removed, inspect the condition of the cylinder internally, using a flashlight. Scratches and blemishes may be removed by either polishing or honing.

The cylinder bore should not exceed 32 mm with a maximum eccentricity of 0.25 mm. Debris can be removed from the nozzles by blowing through with compressed air. Inspect the nozzle atomizer outlet holes. These should not show any undue elliptical wear, roughness or damage or this will have a detrimental affect on the Que - Temp Desuperheater performance. Carefully clean the cylinder threading, dressing where necessary, with a small file.

YARWAY QUE - TEMP DESUPERHEATER STANDARD-/HEAVY DUTY

INSTALLATION AND MAINTENANCE INSTRUCTIONS

Body extension: only for class 150 (PN 25/40) and class 300 (PN 64) (see Figure 6)

Examine the threading on the body extension, dressing where necessary, with a small file. If care is exercised, during routine maintenance, the valve body extension should never require any repair work. If this threading does become accidentally damaged, however, then weld repair may be possible. It should be noted that this job is for a specialist welder and filler materials must be compatible with both the base material and the service conditions. In the event that such work is necessary, please consult Yarway for further advice.

Reassembly

Before reassembling 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.

Reassemble the spray cylinder onto the body extension. Use a fine grade polishing paste to lap the seating area of cylinder and body extension. The seal is metal to metal so a concentric seat area is vital. Always use a new fastener ring. Set the spray cylinder into the correct orientation (the water spray should always be in the same direction as the steam flow) and tighten the fastener ring.

Tack welding

After reassembly, the spray cylinder should be tack welded or circular welded for added security. It is essential that this welding is carried out by a competent welder. A Welding Procedure Specification is available from Yarway, upon request. Both TIG and ARC welding methods are acceptable and the recommended electrode material is ER NiCrMo3. A minimum of two 8 mm long tacks are required, diametrically opposite, with one weld securing the fastener ring to the body extension, the other securing the spray cylinder to the fastener ring. After welding, use a suitable dye penetrant method to check the weld.

No cracks are permitted. If necessary, grind-off, re-check until a satisfactory weld is obtained (see Figure 8).

FIGURE 6
Version 'tack welded' for class 150 (PN 25/40) and class 300 (PN 64)

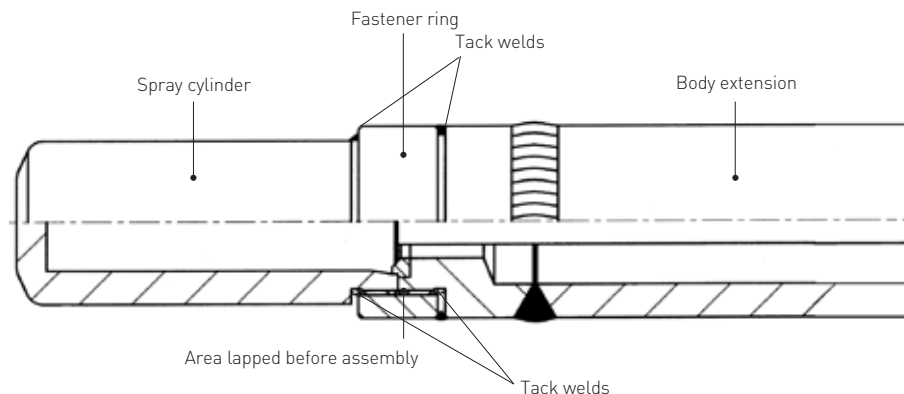


FIGURE 7
Version 'circular welded' for class 600 (PN 100) up to and including class 2500 (PN 400).
See 'Inspection Procedure' further on.

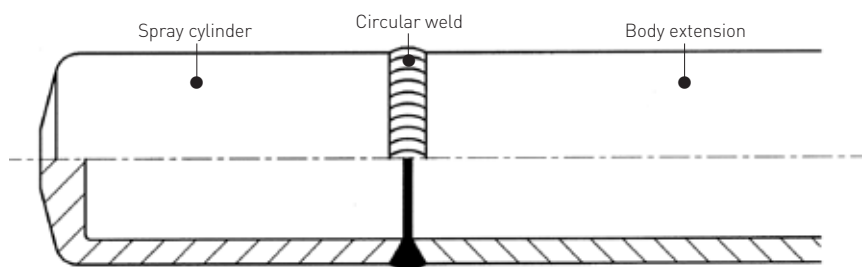
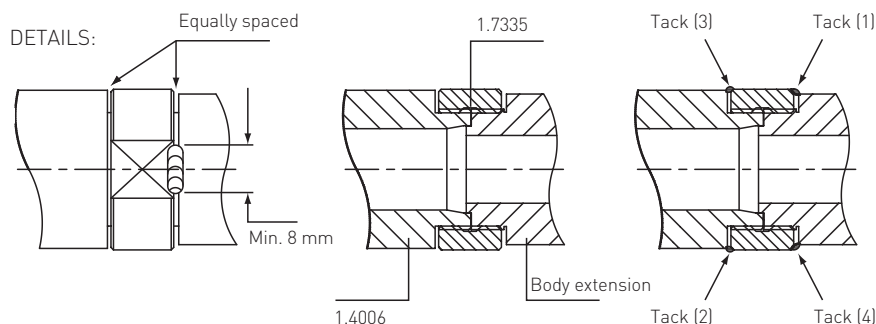


FIGURE 8



Before re-installing the Que - Temp Desuperheater, make sure that the connecting flange faces are cleaned thoroughly and any gasketing material removed. Insert the Que - Temp Desuperheater into the steam pipework and check that the nozzle is orientated correctly with the spray in the direction of the steam flow. Apply a high temperature lubricating compound to the bolts and nuts and tighten evenly, in accordance with the manufacturer's recommendations. Before connecting the water line, flush through and check for any contamination or restriction in the supply.

Follow the procedure for 'start-up', as detailed earlier in the installation instructions. Check the flange tightness.

YARWAY QUE - TEMP DESUPERHEATER STANDARD-/HEAVY DUTY

INSTALLATION AND MAINTENANCE INSTRUCTIONS

SPARE PARTS

Make sure that the identification number (indicated on the nameplate) is verified and specified when ordering spare parts. For cross-sectional drawings and parts lists, see the next pages.

INSPECTION PROCEDURE

Spray nozzle assemblies (1) and (2) and fastener rings (5) shall be considered wear parts. The materials selected are such that they do cope with the conditions as found on applications in steam/water environments. Thermal cycling does occur and users should realize that the temperature differentials at Desuperheaters are usually the highest found in the Plant. It is advised to check the spray nozzle assembly, with the integrally vacuum brazed injection nozzles, fastener ring and tack-welds after the first year of service. At the inspection, by use of dye check or fluor penetrant investigation, these parts shall be checked for cracks. Parts with hair crack indications shall not be re-used. 'Defect-free' heads in such installations shall be inspected once per 2 year of operation. It is advised to replace the above mentioned components at least once per 5 years of service. Taking these precautions has historically proven to give reliable service. **Note:** spray nozzle assemblies may have been made specifically for the specification. Delivery time of such components will be 8 weeks.

STORAGE PROCEDURE

Upon receipt, check both the Que - Temp Desuperheater and the packing case for any transit damage. Any damage to the Que - Temp Desuperheater should be reported immediately to 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.

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. Ensure that the Que - Temp Desuperheater is dry and free from moisture. Apply a cosmoline type grease to machined faces. Retain Que - Temp Desuperheater in its original packing and inspect at 3 monthly intervals to ensure that no deterioration has occurred.

Note: materials and data of units supplied, may deviated from this Instruction Manual. Please consult order documents in case of doubt.

Que - Temp Desuperheater is classified under European Directive 97/23/EC under category I with CE-marking.

YARWAY QUE - TEMP DESUPERHEATER STANDARD-/HEAVY DUTY

INSTALLATION AND MAINTENANCE INSTRUCTIONS

FIGURE 9

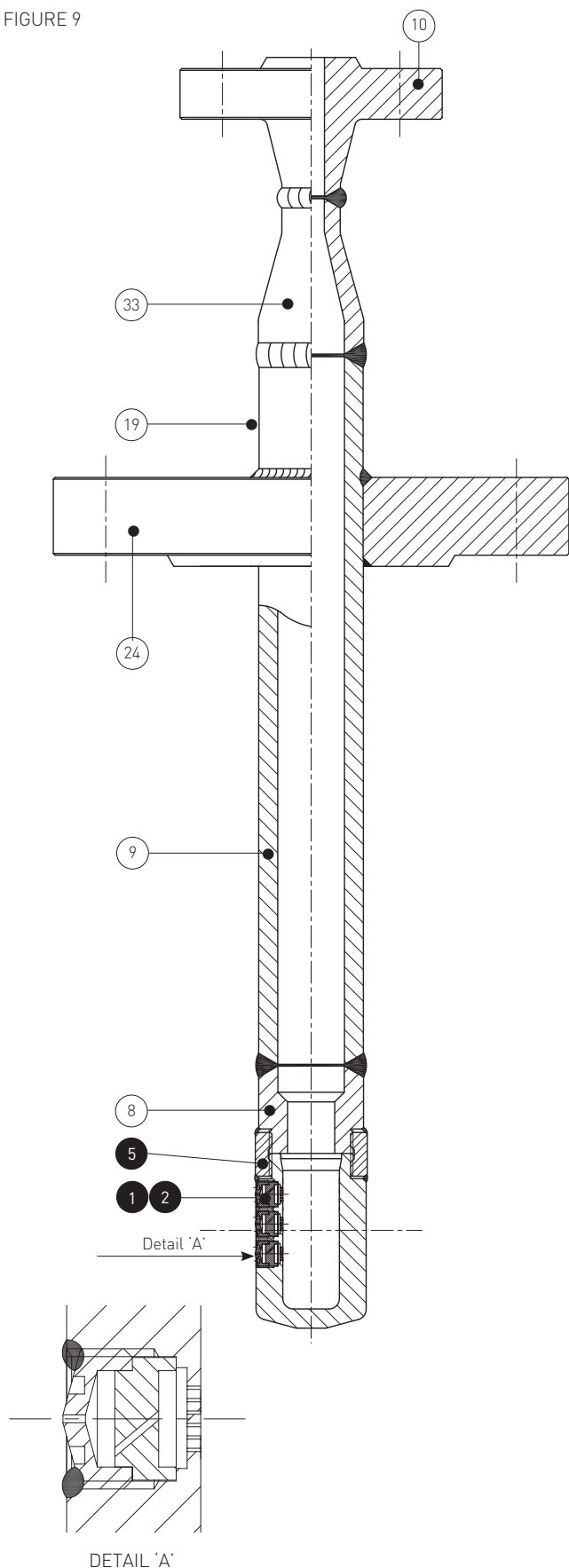


TABLE 1 - STANDARD MATERIALS

Item	Name	Material	Equivalent
1 + 2	Spray nozzle assembly	AISI 410	1.4006
5	Fastener ring	SA182 F11	1.7335
8	Mounting part	SA105	P250GH
		SA182 F11	1.7335
9	Body pipe	SA106 Gr.B	P235GH TC2
		SA335 P11	1.7335
10	Water flange	SA105	P250GH
		SA182 F11	1.7335
19	Name plate	AISI 304	1.4301
24	Steam flange	SA105	P250GH
		SA182 F11	1.7335
33	Reducer	A234 Gr. WP B	P235GH TC2
		Gr. WP11	1.7335

NOTES

- Recommended spares (in case of welded spray head, no spares available)
Other materials are available upon request.

Certification

Que - Temp Desuperheater is approved by authorized authorities to comply with the requirements of ASME B16.34 and EN 12516.
All data subject to changes.

Materials and data of units supplied, may deviate from this brochure.
Please consult order documents in case of doubt.

YARWAY QUE - TEMP DESUPERHEATER STANDARD-/HEAVY DUTY

INSTALLATION AND MAINTENANCE INSTRUCTIONS

FIGURE 10

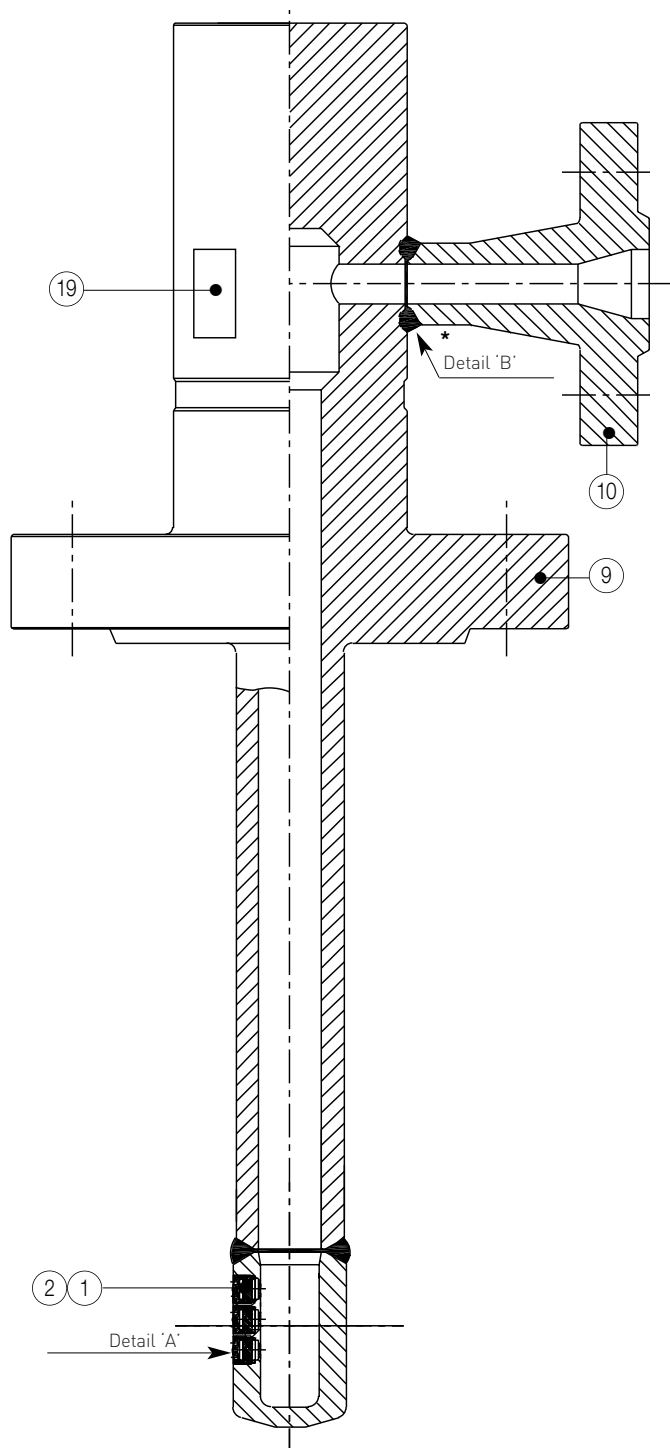


TABLE 2 - MODEL 13 / 23 - STANDARD MATERIALS

Item	Name	Material	Equivalent
1 + 2	Spray nozzle assembly	AISI 410**	1.4006**
9	Body	SA182 F22	1.7383
		SA182 F347H	1.4550
		SA182 F91*	1.4903*
10	Water flange	SA182 F22	1.7383
		SA182 F347H	1.4550
		SA182 F91*	1.4903*
14	Nut	A194 4H*	1.4923*
16	Stud	A193 B16*	1.4923*
19	Name plate	AISI 304	1.4301
23	Securing washer	Steel*	Steel*
25	Spiral wound gasket	St. steel/graphite*	St. steel/graphite*

NOTES

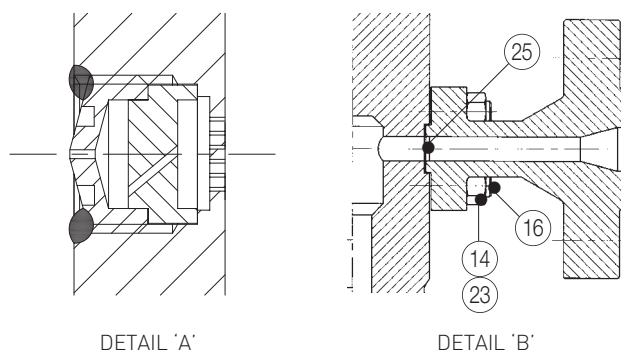
* High temperature model with bolted water flange available upon request. See detail 'B'.

** Welded sprayhead material is similar to body material. Nozzles in inconel 718. Other materials are available upon request.

Certification

Standard Duty Que - Temp Desuperheater is approved by authorized authorities to comply with the requirements of ASME B16.34 and EN 12516.

All data subject to changes.



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