



INSTRUCTIONS FOR

MECHANICAL ATOMIZING

DESUPERHEATERS

MA-III & MAIIIU

(FORM GN-10)

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INSTALLATION OF MA-III DESUPERHEATERS - GUIDANCE NOTES -

1. INTRODUCTION

The Mechanical Atomizing III Universal (MA-IIIU) Desuperheater is a device used to inject cooling liquids into hot steam or gas to reduce the temperature of the fluid. The liquid passes through the main tube of the desuperheater to the spray nozzles. The differential pressure between the inside and outside of the tube will open and close the nozzles allow the coolant to be dispersed into the flow stream. The MA-IIIU can be equipped with 2 to five nozzles.

The normal configuration of the MA-IIIU is shown in figure 1, it is flanged and can be bolted to the customer's header connection using the universal header mounting.

The universal header mount will also accommodate the MA-IU, MA-IIU, MNSD-U and the SAMN-U.

2. PRIOR TO DELIVERY

Shortly after your order is entered, Copes-Vulcan will issue a certified copy of the data Specification Sheet, detailing the operating conditions for which the equipment is being designed, along with drawings illustrating the critical installation dimensions of the equipment we propose to supply. This information should be reviewed carefully to confirm that our interpretation of the service requirements are correct.

These guidance and the drawings illustrating the equipment should be forwarded to the person(s) responsible for locating the desuperheater and designing the associated piping. These recommendations must be followed in order to achieve a satisfactory installation.

3. PIPING CONSIDERATIONS

Of particular importance in placement of the desuperheater in the piping system are the locations of the temperature sensing element and the capacity, pressure, and temperature of the cooling water supply, which are critical to proper desuperheating performance.

In those cases where an upstream pressure reducing valve is being used, the desuperheater inlet steam temperature should be verified to determine if the temperature change associated with the pressure drop was used for sizing the desuperheater.

Cooling Water Supply

The cooling water used for the desuperheater should be deaerated, as any dissolved oxygen in the water will be released when the cooling water evaporates. Oxygen corrosion on carbon steel can be very severe and has, in some cases led to the failure of the pressure boundary.

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Of additional concern is the level of dissolved or suspended solids in the cooling water. As the cooling water vaporizes, these solids are deposited in the pipeline and the desuperheater. Therefore only deaerated and demineralized water containing no more than 9 to 10 parts per million of dissolved solids is recommended for use with this desuperheater.

Pipe Size/Configuration

The MA-III is designed for installation in a branch connection attached to a straight run of pipe. The pipe should be sized so that the steam velocity is limited to 1800 – 30,000 ft/min. If the minimum steam velocity is less than 1800 ft/min a venturi liner or reduced pipe size will be needed.

It is recommended, but not necessary for the MA-III to be installed in a horizontal run of pipe. The MA-III can be installed in any clock position reference vertical and the only consideration is that the nozzles must face downstream.

The upstream piping should not have any control valve, block valve or elbow closer than at least three pipe diameters or three feet (whatever is greater) from the desuperheater.

No bends or elbows should be present at least 21 feet downstream of the desuperheater. The presence of a bend or elbow too close to the desuperheater will adversely affect the absorption of the coolant, lead to poor temperature control and may cause erosion in the pipe wall.

Location of the Temperature Sensing Element

The temperature sensing element may be located upstream of an elbow, but should be a minimum of at least one pipe diameter before the inlet of the elbow. The element should not be installed in an elbow, but can be installed downstream of an elbow a minimum of three pipe diameters.

The Data Specification Sheet will indicate Copes-Vulcan's recommended distance that the temperature sensing element should be from the desuperheater. The location of the element farther downstream than this may affect the units response time.

Condensate Removal

Provisions must always be made to remove excess water from the steam line.

Access to Desuperheater

The MA-IIIU requires little to no maintenance, but access for installation and removal should be provided.

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4. THERMAL LINER

Thermal liners are always recommended for application where the difference in cooling water temperature and steam temperature exceeds 450 degrees F. The liner should extend approximately 15 feet downstream of the desuperheater and approximately 10% of the steam should pass between the liner and the pressure boundary.

5. EQUIPMENT RECEIPT

On receipt the desuperheater should be inspected to ensure that no damage was sustained in transit. A packing list containing a complete description of all of the equipment is included with the shipment. Check the list against all items and check serial number against those supplied on the Data Specification Sheet.

6. PROVISIONS FOR PROPER STORAGE

If the desuperheater is not being installed immediately upon receipt, it should be stored indoors in a ventilated area. If indoor storage is not possible, the equipment should not be stored in contact with the ground. Unpainted metal surfaces may be protected from rust by applying a rust preventative compound that is easily removed by the process fluid and not harmful to the process. The gasket sealing surface and the weld prep surfaces are of primary importance.

7. INSTALLATION/SET-UP

Verify that the header mounting size, configuration and height are in accordance with the certified Copes-Vulcan outline drawing. The Through bore diameter of the header stand off must be at least 2.90 inches for installation clearance.

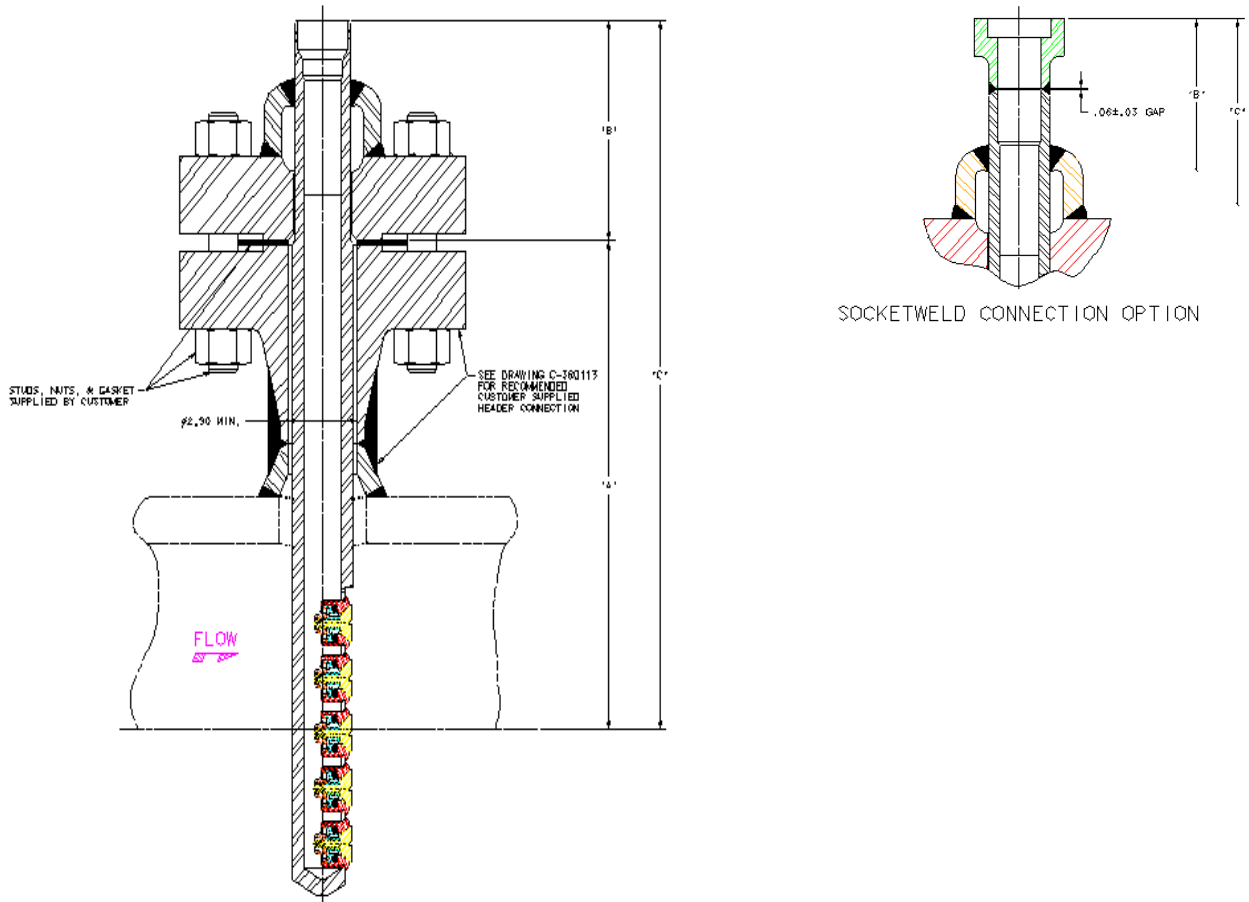
The nozzles must be oriented to discharge downstream

Detailed installation instructions are provided in the Copes-Vulcan Instruction Manual provided with the equipment or by contacting the Copes-Vulcan Service Department.

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Figure 1



| HEADER SIZE | DIMENSIONS (BUTTWELD CONNECTIONS) | | | | | | |
|-------------|-----------------------------------|----------------|-------|------|-------|------|-------|
| | 'A' | PRESSURE CLASS | | | | | |
| | | 900 | | 1500 | | 2500 | |
| | 'B' | 'C' | 'B' | 'C' | 'B' | 'C' | |
| 16" | 16.75 | | 24.31 | | 24.31 | | 24.31 |
| 18" | 17.75 | | 25.31 | | 25.31 | | 25.31 |
| 20" | 18.75 | 7.56 | 26.31 | 7.56 | 26.31 | 7.56 | 26.31 |
| 22" | 19.75 | | 27.31 | | 27.31 | | 27.31 |
| 24" | 20.75 | | 28.31 | | 28.31 | | 28.31 |
| 30" | 23.75 | | 31.31 | | 31.31 | | 31.31 |

| HEADER SIZE | DIMENSIONS (SOCKETWELD CONNECTION) | | | | | | | |
|-------------|------------------------------------|----------------|-------|------|-------|------|-------|--|
| | 'A' | PRESSURE CLASS | | | | | | |
| | | 900 | | 1500 | | 2500 | | |
| | | 'B' | 'C' | 'B' | 'C' | 'B' | 'C' | |
| 16" | 16.75 | | 25.81 | | 25.81 | | 25.81 | |
| 18" | 17.75 | | 26.81 | | 26.81 | | 26.81 | |
| 20" | 18.75 | 9.06 | 27.81 | 9.06 | 27.81 | 9.06 | 27.81 | |
| 22" | 19.75 | | 28.81 | | 28.81 | | 28.81 | |
| 24" | 20.75 | | 29.81 | | 29.81 | | 29.81 | |
| 30" | 23.75 | | 32.81 | | 32.81 | | 32.81 | |