

# HRM REFRACTORY MANDREL

TSHRM

USED TO CREATE A CAST REFRACTORY ENTRANCE HOLE FOR THE HTP THERMOCOUPLE

## FEATURES

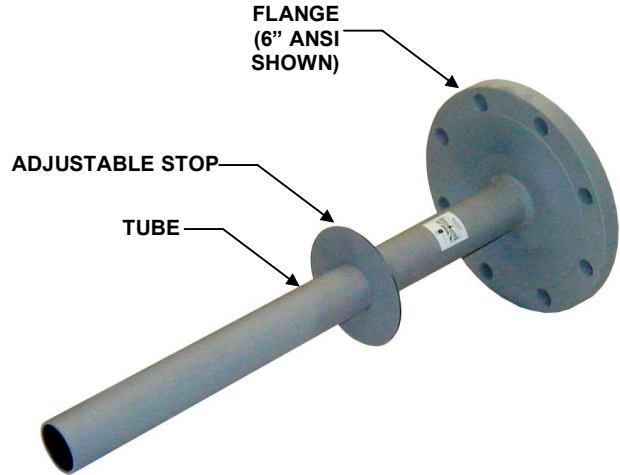
- Results in a straight, on the nozzle centerline, accurate hole through the refractory.
- Keeps excess refractory and mortar out of the flanged entrance nozzle during lining.
- A 6" 150# R.F. size entrance nozzle is recommended for best results.

## APPLICATION

The HTP and its refractory protective well must be installed on the centerline of, and concentric with, the flanged mounting nozzle. The refractory liner will move in relation to the vessel shell. The refractory changes dimensions at rates different from the shell as the temperature varies. It will also shift and deform as it ages. A small hole, drilled through the refractory on the centerline of the nozzle, will move relative to the flanged nozzle. Thus, a thermocouple inserted through a small drilled refractory hole and bolted to the flanged nozzle/shell will be broken off.

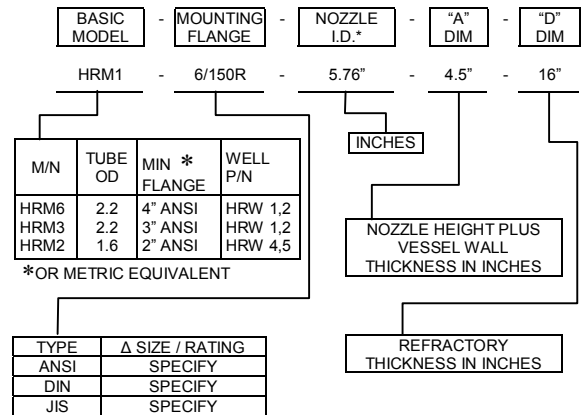
The HTP requires a relatively large hole on the centerline of the mounting nozzle. This allows the insertion of a heavy duty refractory well with a large internal hole. The thermocouple, which is attached to the shell, is free to move around inside the refractory well hole. It is not pushed against the refractory as the two shift and move relative to each other. This large hole must be straight, true, and on the centerline of the nozzle. Being located off the centerline or at an angle can allow the thermocouple element well to encounter the refractory well and be broken off.

This refractory protective well is supported by the top face of the refractory. Excess refractory or mortar can easily enter the nozzle during the lining process, and prevent the refractory protective well from seating properly and being in the correct vertical location. This can cause the thermocouple element well tip to encounter the refractory well bottom and be broken off during installation. The stop disc blocks the nozzle at the correct location and prevents refractory from entering the nozzle.



HRM REFRACTORY MANDREL ASSEMBLY PRODUCES A CAST-IN-PLACE HOLE USED WITH THE HTP THERMOCOUPLE

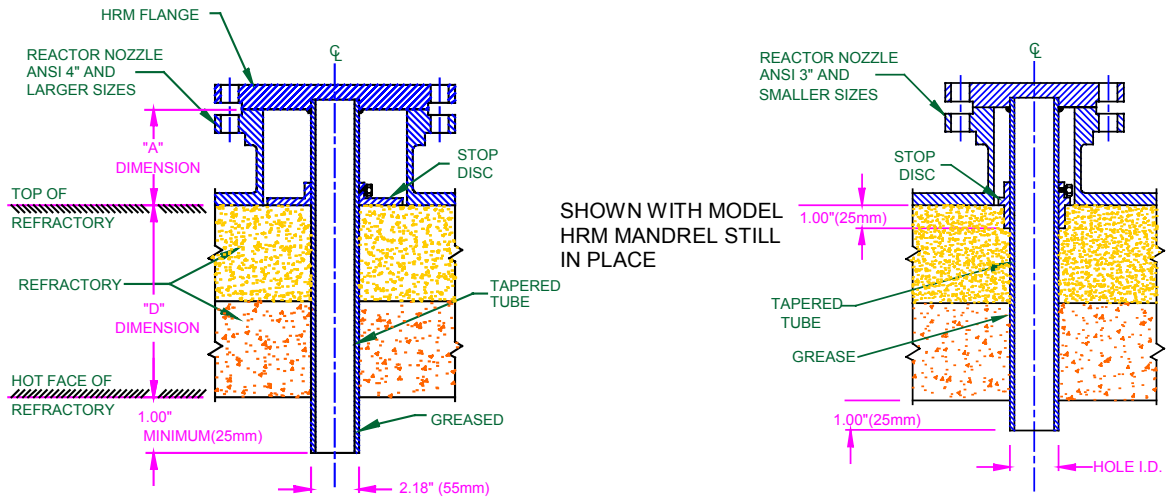
## MODEL NUMBERING SYSTEM



NOTE: SMALLER FLANGE SIZES DOWN TO ANSI 2", 50mm PIPE AND THOSE WITH A LARGER I.D. CAN BE ACCOMODATED. FLANGE SIZES OF ANSI 6", 150mm; ARE RECOMMENDED FOR BEST RESULTS

## CREATING A REFRACTORY MANDREL BY CASTING

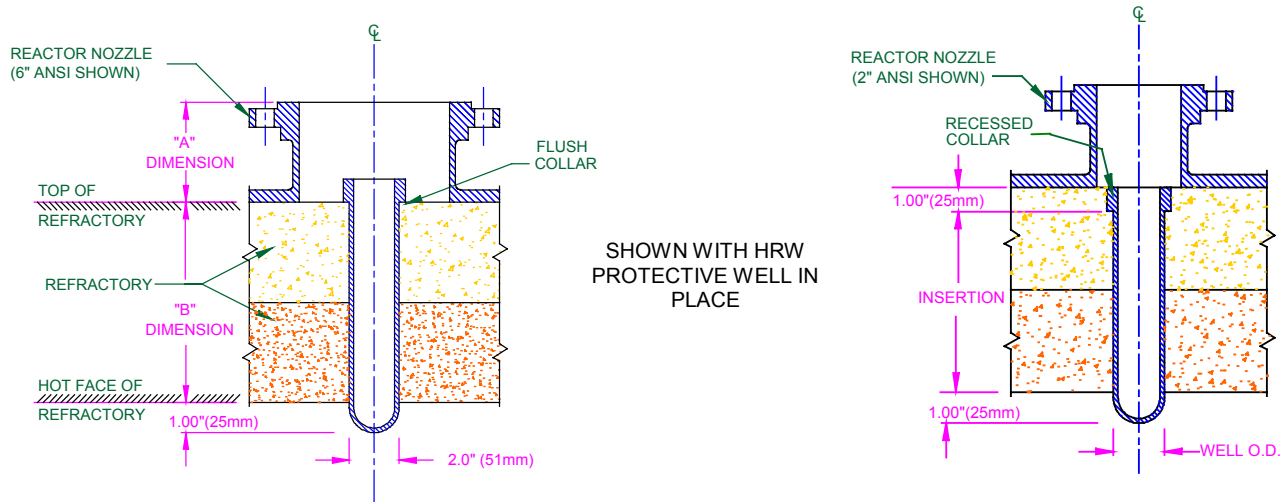
The HRM Mandrel is mounted in the nozzle and the refractory is installed around it. This is usually the simplest, easiest, and most reliable method.



- The well collar must be recessed below the reactor shell when the nozzle is 3.40" (86mm) or smaller. Recessing allows room for the nozzle/refractory to move without shearing off the HTP element protective well.
- The tube is tapered and greased. This prevents the refractory from adhering to the tube, making the HRM easy to remove. The resulting hole will not interfere with installation or operation of the HRW refractory well.

### FINAL RESULT

The result produced must be a hole on the centerline of the mounting nozzle and concentric with it. The figures below show both "Basic" and "Small" size "HRW" wells installed.



NOTE: The support collar must be recessed below the inside surface of the reactor shell when installed in a small size nozzle.

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