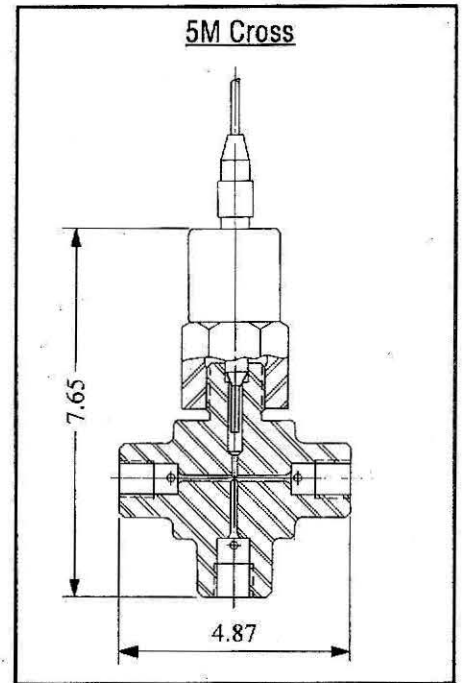
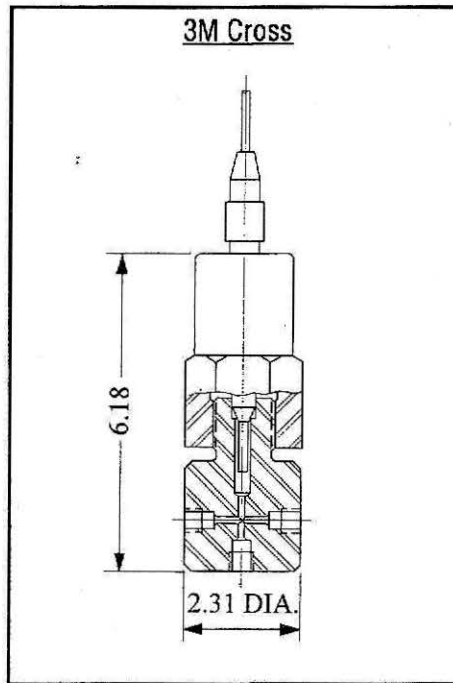
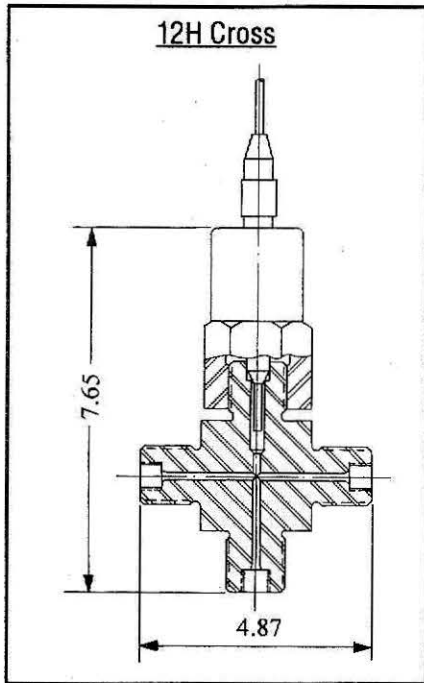


# MANGANIN PRESSURE SENSORS



**Open coil transducers for use with non-conductive fluids only:**

**Illustrations indicate mounting dimensions**

Range: **0-200,000 psi**; accuracy is  $\pm 100$  psi\*

Part No.                      Configuration

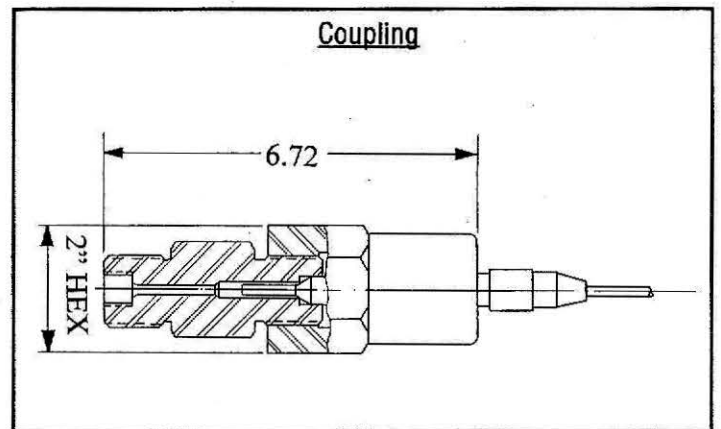
- C-7185            12H/4L x 12H/4L x Manganin Tee
- C-7186            12H/4L x Manganin x 12H/4L
- C-7187            12H/4L x 12H/4L x 12H/4L x Manganin Cross
- C-7181            3M x 3M x Manganin Tee
- C-7182            3M x 3M x 3M x Manganin Cross

Range: **0-150,000 psi**; accuracy is  $\pm 100$  psi\*

- C-7183            5M x 5M x Manganin Tee
- C-7184            5M x 5M x Manganin x 5M Cross

Range: **0-100,000 psi**; accuracy is  $\pm 100$  psi\*

- C-7180            12H/4L Manganin Coupling



**Jacketed transducers for use with conductive (water based) fluids:**

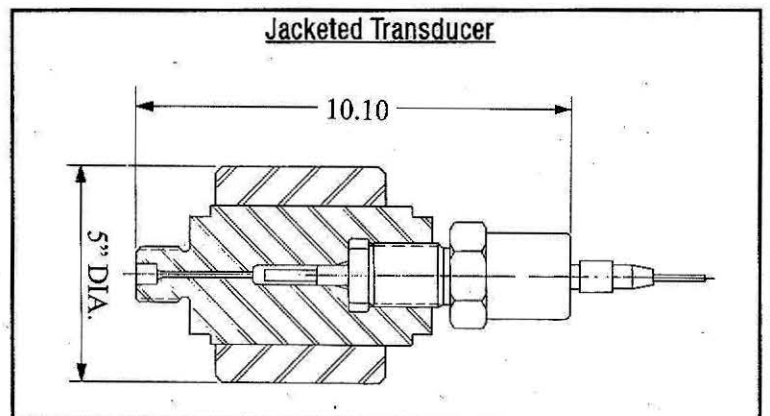
Range: **0-200,000 psi**; accuracy is  $\pm 100$  psi\*

Part No.                      Configuration

- D-4211-B            12H Connection

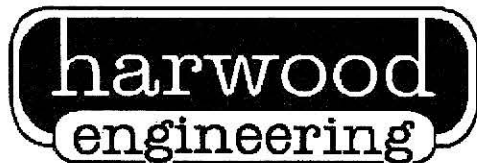
Range: **0-100,000 psi**; accuracy is  $\pm 100$  psi\*

- D-4211-B            12H Connection or optional 4L pocket and mounting bracket



\*Expected accuracy when calibrated with the instrumentation listed on the following page.

A ten-point NIST traceable calibration is included in the price of every system and a calibration certificate is provided.



**HARWOOD ENGINEERING COMPANY, INC.**  
455 SOUTH STREET, WALPOLE, MA 02081-2799

TEL. 508-668-3600 FAX: 508-660-2276

LABORATORY AND INDUSTRIAL  
HIGH PRESSURE EQUIPMENT

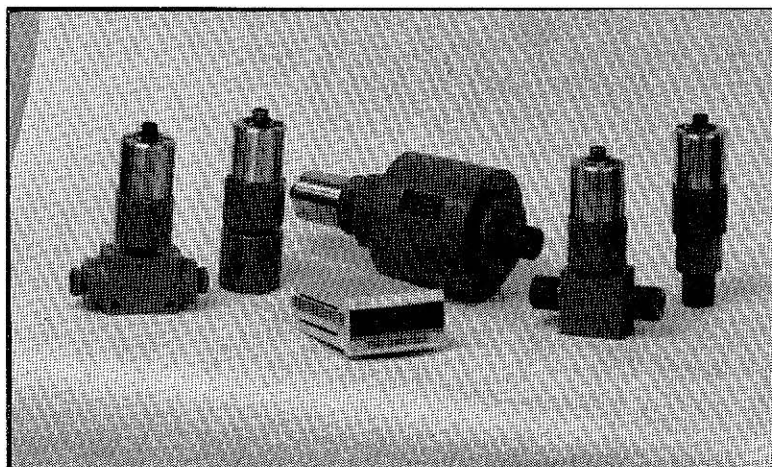
## *Pressure Measuring* **MANGANIN CELLS & INSTRUMENTATION**

- ◆ 200,000 PSI Service
- ◆ Metric units to 14000 BAR or 14000 Kg/cm<sup>2</sup>
- ◆ 10-point secondary standard calibration traceable to NIST
- ◆ 10-point primary standard calibration is available
- ◆ Cells are available for both polar and non-polar fluids
- ◆ Digital panel meters for pressure indication and/or control
- ◆ 4 or 5 digit resolution provides accuracies to  $\pm 0.05\%$  span (details inside)

The *Harwood* Manganin cells are manufactured with carefully temperature-seasoned Manganin wire and are pressure-seasoned to 300,000 psi. The cells have an active pressure-measuring coil with a resistance of  $120 \Omega \pm 0.1 \Omega$ . The remainder of the full bridge circuit is made up of precision wire wound  $\pm 0.01\%$  resistors. The pressure sensitivity of the wire is  $1.65 \times 10^{-7}$  ohms per ohm per psi. Each cell is tested and calibrated before shipment.

One unit is offered for use with high pressure fluids which may be polar (conducting). In this cell the active coil is isolated from the pressure fluid, being placed within a bronze bellows which is vacuum filled with a non-polar high pressure fluid.

The other unit is offered for use with non-polar, non-hygroscopic and dry (no water) gases and liquids. This cell is built into a Harwood 12H, 3M or 5M series Tee or Cross, and is directly exposed to the high pressure fluid.



**Harwood Manganin Cells**