

# Multi-Point Thermocouples

## TCP's Multi-Points Provide the Solution to Space Limitations for Multiple Thermocouples

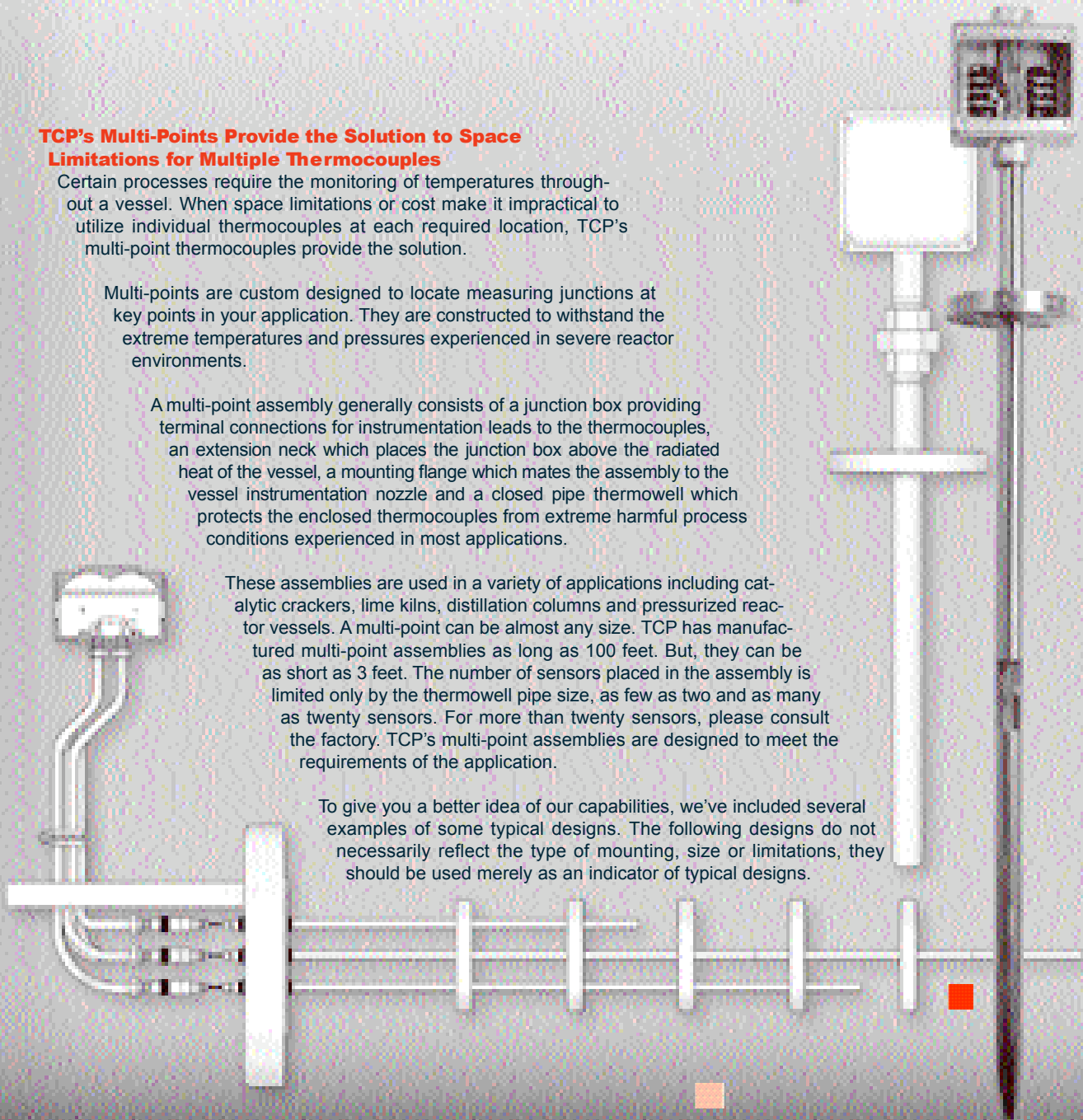
Certain processes require the monitoring of temperatures throughout a vessel. When space limitations or cost make it impractical to utilize individual thermocouples at each required location, TCP's multi-point thermocouples provide the solution.

Multi-points are custom designed to locate measuring junctions at key points in your application. They are constructed to withstand the extreme temperatures and pressures experienced in severe reactor environments.

A multi-point assembly generally consists of a junction box providing terminal connections for instrumentation leads to the thermocouples, an extension neck which places the junction box above the radiated heat of the vessel, a mounting flange which mates the assembly to the vessel instrumentation nozzle and a closed pipe thermowell which protects the enclosed thermocouples from extreme harmful process conditions experienced in most applications.

These assemblies are used in a variety of applications including catalytic crackers, lime kilns, distillation columns and pressurized reactor vessels. A multi-point can be almost any size. TCP has manufactured multi-point assemblies as long as 100 feet. But, they can be as short as 3 feet. The number of sensors placed in the assembly is limited only by the thermowell pipe size, as few as two and as many as twenty sensors. For more than twenty sensors, please consult the factory. TCP's multi-point assemblies are designed to meet the requirements of the application.

To give you a better idea of our capabilities, we've included several examples of some typical designs. The following designs do not necessarily reflect the type of mounting, size or limitations, they should be used merely as an indicator of typical designs.





Thermo-Couple Products Co.

# TYPICAL MULTI-POINT DESIGNS

- Ideal for Sensing Temperature at various elevations in a vessel through a single inlet
- Custom Designed to fit your application
- Constructed to withstand extreme temperatures and pressures
- Assemblies can be of any length
- Extensive design experience with major refinery and petrochemical firms
- Number of sensors limited only by pipe size
- Cost effective and saves space
- Providing multi-points to the industry for over 30 years.

### Ordering Information:

Due to the complexity of these thermocouples, they are all custom designed for specific applications. In general, the following information is needed to design a multi-point:

### Type

- Free Hanging
- Multi-Guide Tube
- Spring Loaded
- Others

### Elements

- Calibration Required
- Construction: Simplex or Duplex
- Sheath Material
- Desired Diameter of Sheath
- Junction type: Grounded or Ungrounded
- Number of thermocouples Required
- Length of Each Element Below Mounting

### Junction Box

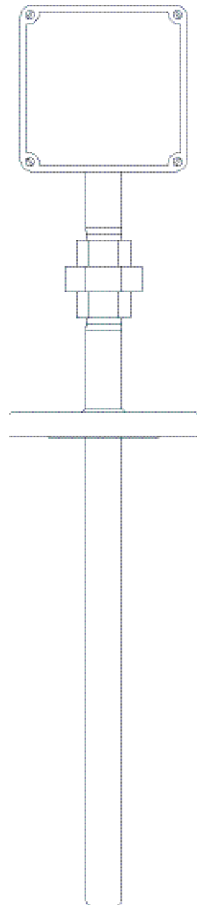
- Classification NEMA 4, Explosion-Proof, etc.
- Junction Box Material
- Desired Size
- Conduit Connection

### Extension

- Length
- Construction

### Thermowell

- Pipe Size
- Material
- Length Below Mounting
- Mounting Connection:
  - Pipe Size
  - Flange Size/Type/Rating
  - Material



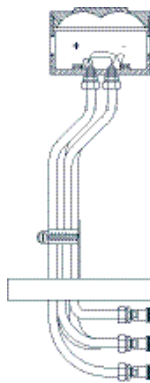
### Free Hanging

Thermocouple elements are mounted to the desired length then bundled together. This type of assembly is often small in diameter allowing the thermocouples to fill up the inner area of the thermowell which reduces thermal lag. Thermocouple sensors can be replaced, but the unit must be returned to the factory. The free hanging design is generally the most economical of all multi-point designs.



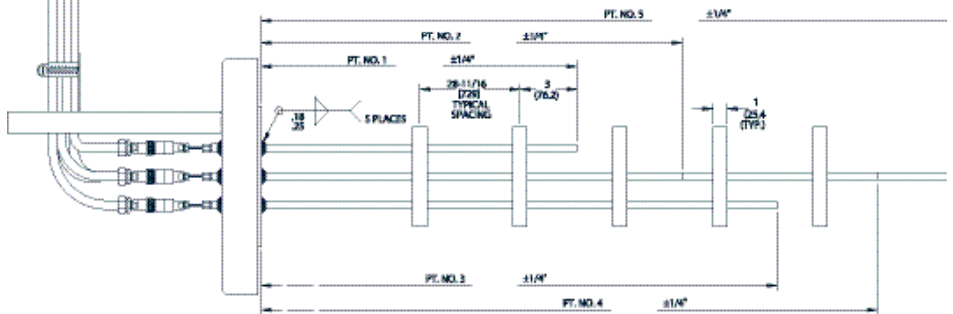
### Multi-Guide Tube

This is the most common and reliable multi-point design. It offers long life with little maintenance. Each guide tube is welded to a plug which is then welded into and becomes an integral part of the wall of the thermowell. If a single sensor should need to be replaced, it can be accomplished easily and quickly on site without interrupting the process.



### Special Applications

TCP has worked closely with major petrochemical and refinery design companies in the development of multi-point thermocouple assemblies for specialized applications. These designs are currently in service world-wide throughout the petrochemical and refinery industry.



Send us a sketch or specification containing as much of the above information as possible. Our engineers are ready to assist you with your sensing requirements.