Multipoint Thermocouple Assemblies

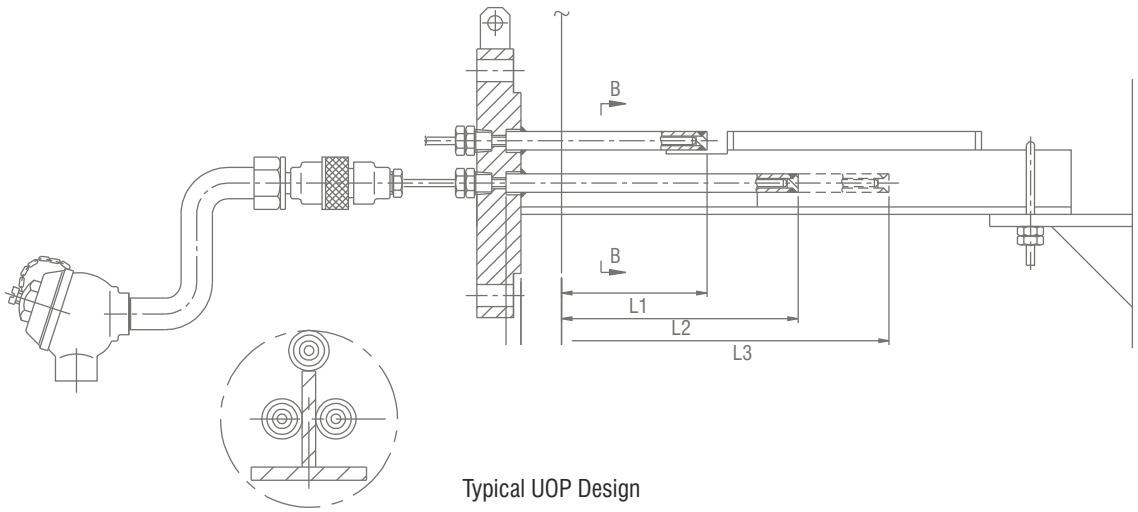
Features

- Ideal for measuring temperature at various elevations
- Fully tailormade
- Proven track record in cross section of industries
- Can be offered with practically any length
- Cost effective & overcomes space limitation
- Different thermocouples with varied MOC possible.
- Construction enables user to remove thermocouple for maintenance

Where space limitations and cost consideration are of prime importance, multi-point thermocouple assemblies come into picture which are used for measuring and controlling temperature in a reactor having different temperature zones. Any thermocouple assembly with measuring junctions located at more than a one-immersion depth is commonly referred to as a multi-point. As the number of variations possible in multi-point assemblies is virtually limitless they are generally designed and manufactured to meet the requirements of individual applications. As different multi-point designs vary tremendously, careful consideration should be given to such variables as the positive location of measuring junctions and the ease/cost of replacement.

General with its vast experience has designed and developed several types of multipoint assemblies, which are performing satisfactorily at hundreds of installations in several parts of world. Some designs allow for replacement of individual elements while others require replacement of the entire assembly. In either case, complete shut down of the process line may not be required depending upon important design considerations. Testing of multipoint is another specialised area. Our manufacturing set-up is equipped with all latest testing equipments to perform all stringent tests.

Major user industries: Refineries & Petrochemical, Oil & Gas, Chemical & Fertiliser.



Typical UOP Design

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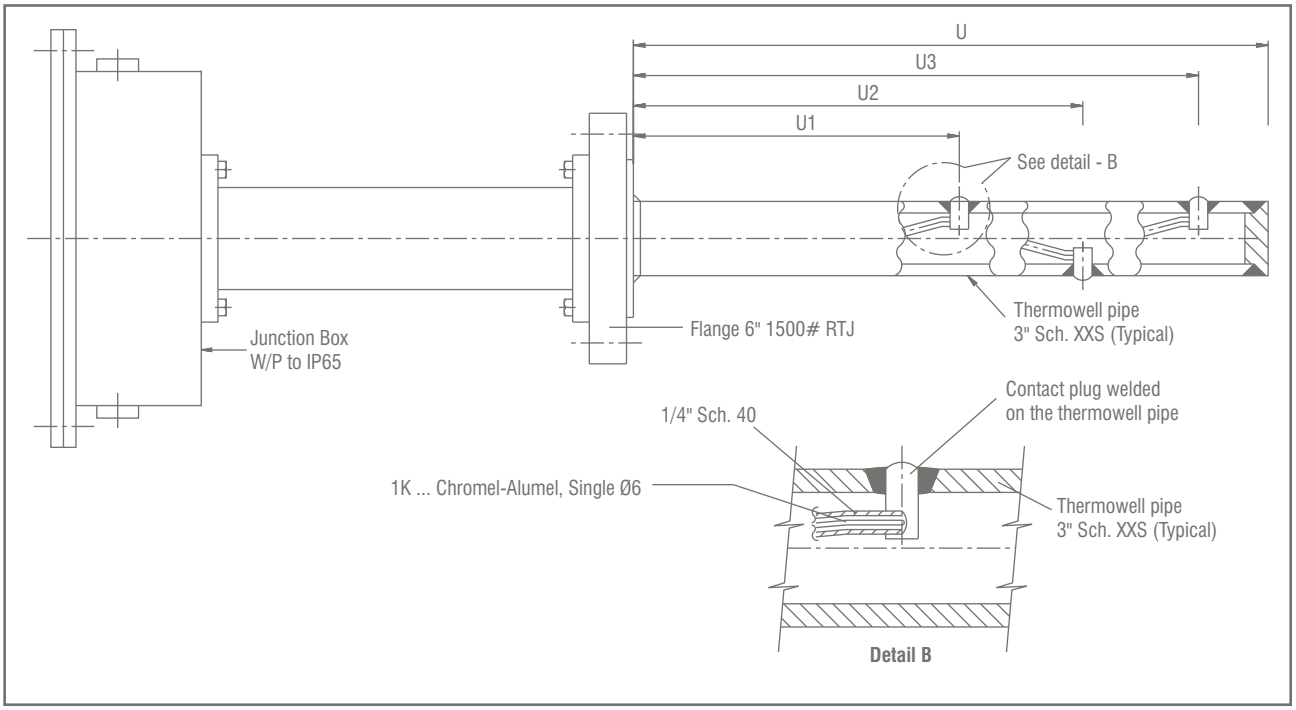
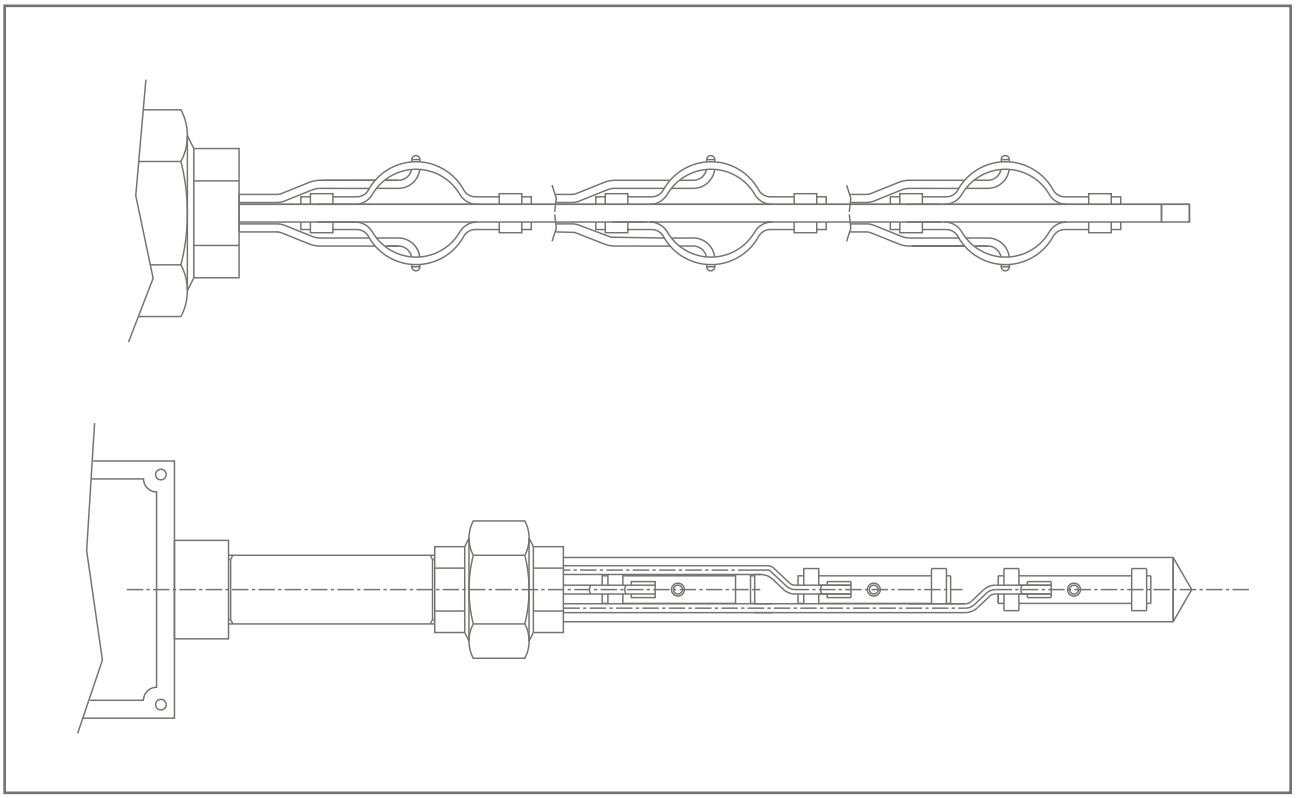
Typical Constructions



Thermocouples at various levels inserted in individual guiding tubes which in turn are welded to outer protecting tube as shown.



Spring loaded (with the help of 'S' spring or leaf spring) thermocouples located at various points mounted on a plate enclosed in a protecting tube as shown above. The springs ensure proper contact with the protecting tube. As many as 33 points assembly was supplied as import substitution for a reputed fertiliser plant.

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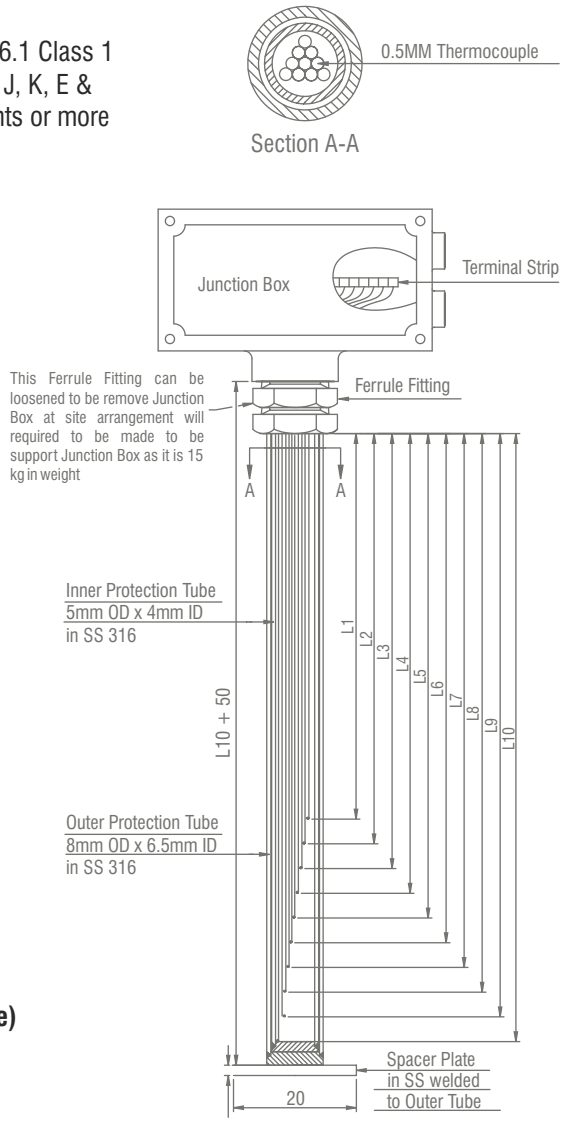
In-House tests carried out for thermocouple assemblies

1. **Calibration**
   Thermocouple calibration in accordance with IEC 584 / ANSI MC 96.1 Class 1 & 2. Typical test is conducted at two points viz. 100^{0}C & 600^{0}C for J, K, E & at 100^{0}C & 900^{0}C or 1100^{0}C for R, S & B type. Optionally for 3 points or more on request.
2. **Insulation Resistance Test at ambient at 500 VDC (MI type)**
   Should be more than 100 M ohms for sheath OD greater than 3 mm
   Should be more than 100 M ohms at 75 V DC in case of sheath OD 1 to 3 mm
3. **Insulation Resistance Test at 540^{0}C at 500 VDC**
   IR should be more than 2 M ohms as standard.
   IR > 20 M ohms can also be offered on request.
4. **N_2 Leakage Test**
   For thermocouple tip sensor after cap welding the same test is conducted & no leakage should be observed at 40 kg/cm^2 as per IEC 1515.
5. **Response Time Test/Thermal Cycling/Thermal Inertia**
   As per IS7358 - ASTM E-839 (63.2% step change from ambient to 80^0 C)
6. **Flame Test**
   This test is applicable for multipoint thermocouple assembly to find out exact location of thermocouple in protecting tube and to ensure touching of thermocouple tip to tube.
7. **Continuity Test: By using continuity tester/multimeter**
   To confirm the element is proper and no open junction is observed.
8. **Grounding & Ungrounding Junction**
   By using continuity tester/multimeter.
9. **Ductility - (Bending Test) - (For MI thermocouple & MI RTD cable)**
   Minimum bending radius should be 5 times sheath OD.
10. **Sheath Integrity Test - Water Immersion test**
    To check sheath integrity of mineral insulated (MI) thermocouple/RTD cable.
11. **Dye Penetration Test**
    For skin type Dye Penetration test for weld joints of weld pad and tip of sensor.
12. **Helium Leak Test** on request.



Miniature Multipoint Thermocouple Assembly with 0.5 mm OD Thermocouple