

Section 1

INSTALLATION

General

The overall accuracy of temperature and other measurements depends on several variables. Although the transmitter has an outstanding performance, proper installation is essential, in order to maximize its performance.

Among all factors, which may affect transmitter accuracy, environmental conditions are the most difficult to control. There are, however, ways of reducing the effects of temperature, humidity and vibration.

Mounting

Temperature fluctuation effects can be minimized by locating the transmitter in areas protected from extreme environmental changes.

In warm environments, the transmitter should be installed to avoid, as much as possible, direct exposure to the sun. Installation close to lines and vessels subjected to high temperatures should also be avoided. For temperature measurements, sensors with cooling-neck can be used or the sensor can be mounted separated from the transmitter housing.

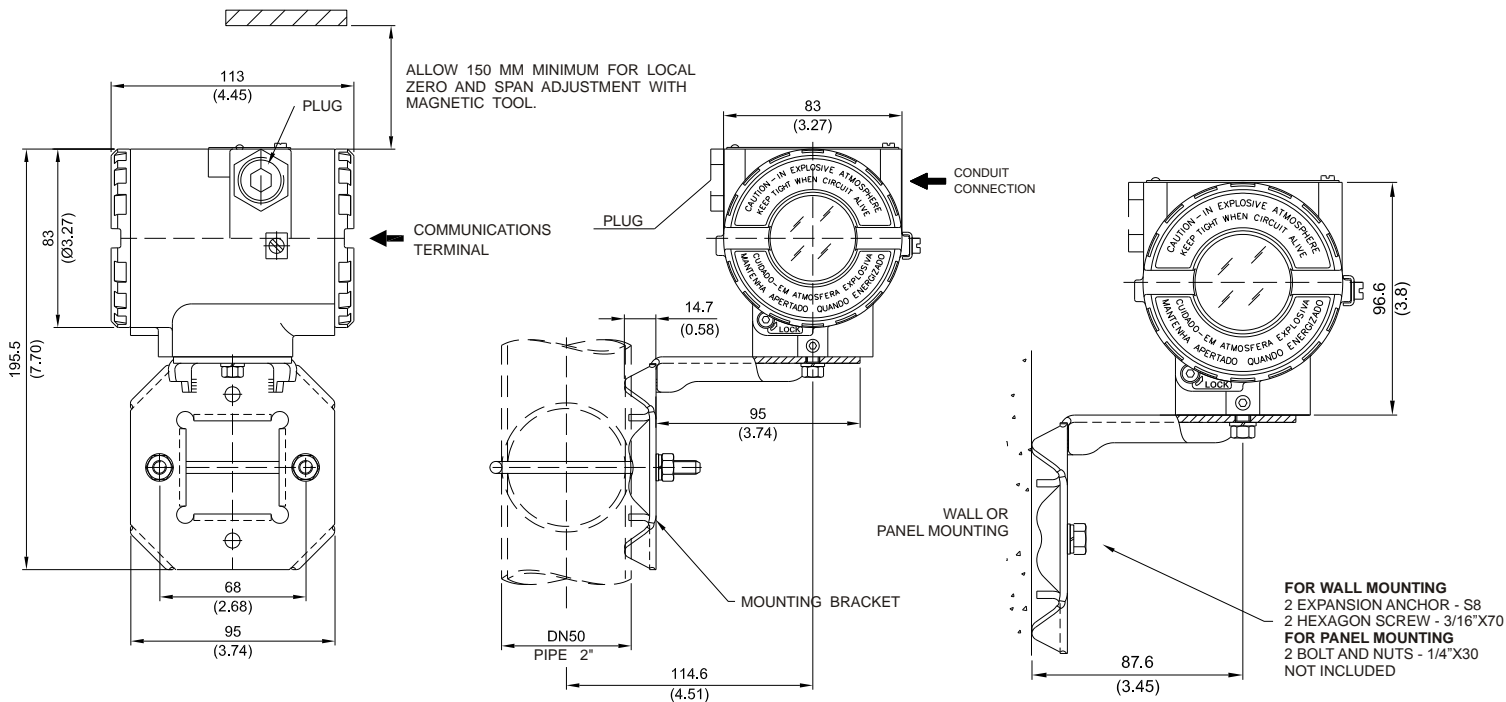
Use of sunshades or heat shields to protect the transmitter from external heat sources should be considered, if necessary.

The transmitter may be mounted in two basic ways, as follows:

- Separated from the sensor, using optional mounting brackets;
- Mounted on the sensor assembly.

Using the brackets, the mounting may be done in several positions, as shown on Figure 1.1.

Measurement error can be decreased by using proper wires (see Section II, Operation).



WARNING

Do not remove the graphite grease from the covers, or they may jam.

Electronic Housing

Humidity is fatal to electronic circuits. In areas subjected to high relative humidity, the O-rings for the electronics cover must be correctly placed. Removal of the electronics cover in the field should be reduced to the minimum necessary, since each time it is removed; the circuits are exposed to the humidity.

The electronic circuit is protected by a humidity proof coating, but frequent exposures to humidity may affect the protection provided. It is also important to keep the covers tightened in place. Every time they are removed, the threads are exposed to corrosion, since painting cannot protect these parts. Sealing methods should be employed on conduit entering the transmitter.

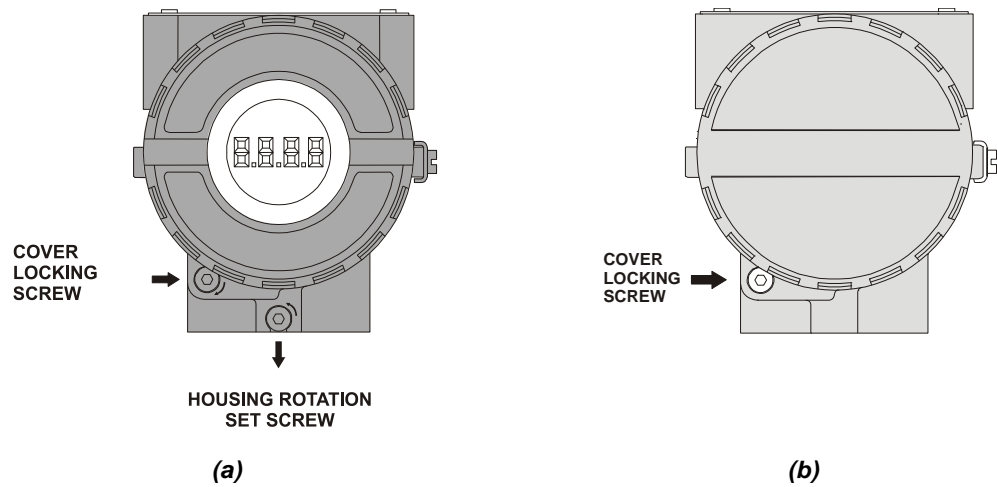
One of the conduit inlets for electrical connection is used to mount the sensor integral to the temperature transmitter (see Fig. 1.1).

WARNING

The unused cable entries should be plugged and sealed accordingly to avoid humidity entering, which can cause the loss of the product's warranty.

For better visibility, the digital indicator may be rotated in steps of 90° (see Section 5, Maintenance).

Reach the display and main board by removing the Cover with window. This cover should be locked closed by the cover locking screw. To release the cover, rotate the locking screw clockwise. See figure 1.2.



**Figure 1.2- Cover Locking and Housing Rotating Set Screw (a) Electronic Board Side
(b) Terminal Connection Side**

Wiring

Access the wiring block by removing the Electrical Connection Cover. This cover can be locked closed by the cover locking screw (Figure 1.2- b). To release the cover, rotate the locking screw clockwise.

The terminals in the superior part marked with (+) and (-) are to receive the powering from 12 to 45 Vdc. The inferior terminals marked with the numbers from 1 to 4 they are for the connections of the different types of sensor.

Test and Communication terminals allow, respectively, to measure the current in the 4 - 20 mA loop, without opening it, and to communicate with the transmitter. To measure it, connect a multimeter in the mA scale in the "- " and "+ " TEST terminals. To communicate with it, use a HART configurator between "+ " and "- " COMM terminals. The wiring block has screws on which terminals type fork or ring can be fastened, see Figure. 1.3.

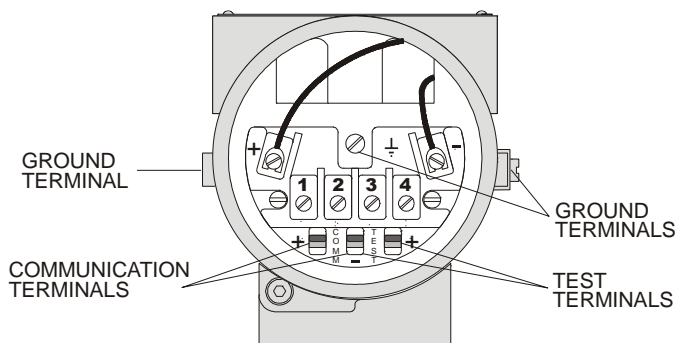


Figure 1.3 - Ground Terminal

The **TT301** is protected against reversed polarity.

For convenience there are three ground terminals: one inside the cover and two external, located close to the conduit entries.

Use of twisted pair (22 AWG) cables is recommended.

Avoid routing signal wiring close to power cables or switching equipment.

The Figure 1.3 shows the correct installation of the conduit, in order to avoid penetration of water, or other substance, which may cause malfunctioning of the equipment.

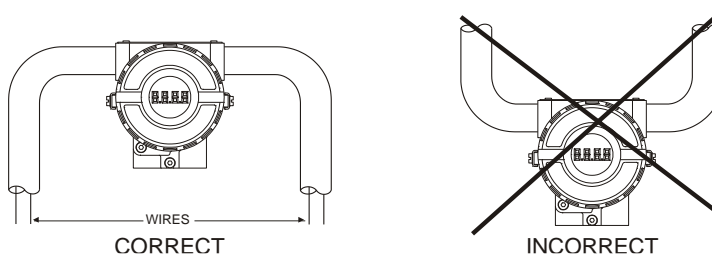


Figure 1.4 - Conduit Installation Diagram.

Loop Connections

WARNING

Do **not** connect the Power Supply to the sensor terminals (Terminals 1, 2, 3 and 4).

Connection of the **TT301** working as transmitter should be performed as in Figure 1.6.

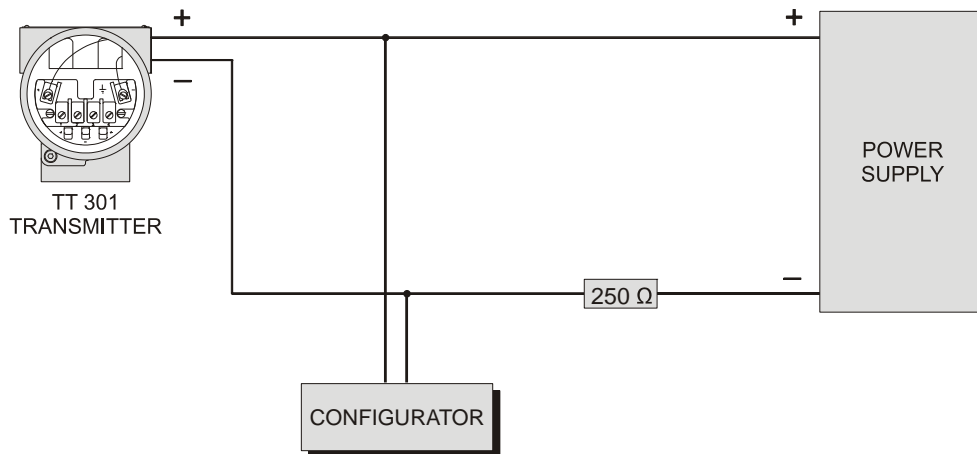


Figure 1.5 – Wiring Diagram for the TT301 Working as Transmitter

Connection of the **TT301** working as a controller (Optional) should be as indicated in Figure 1.5.

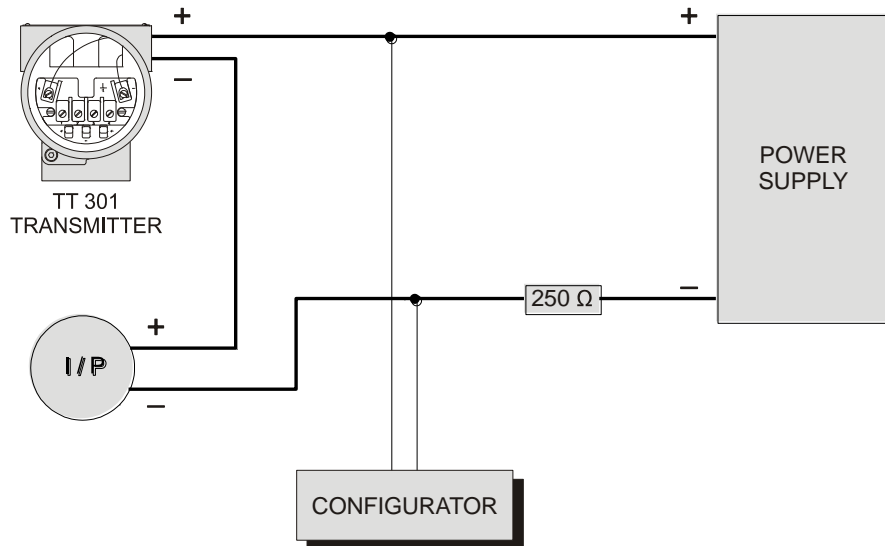


Figure 1.6 – Wiring Diagram for the TT301 Working as Controller

Connection of the **TT301** in multidrop configuration should be done as in Figure 1.6. Note that a maximum of 15 transmitters can be connected on the same line and that they should be connected in parallel. When many transmitters are connected to the same line, calculate the voltage drop through the 250 Ohm resistor and verify that the voltage of the power supply is enough (Figure 1.7).

Wiring diagram for the **TT301** in multidrop.

WARNING

For proper operation, the configurator requires a minimum load of 250 Ohm between it and the power supply.

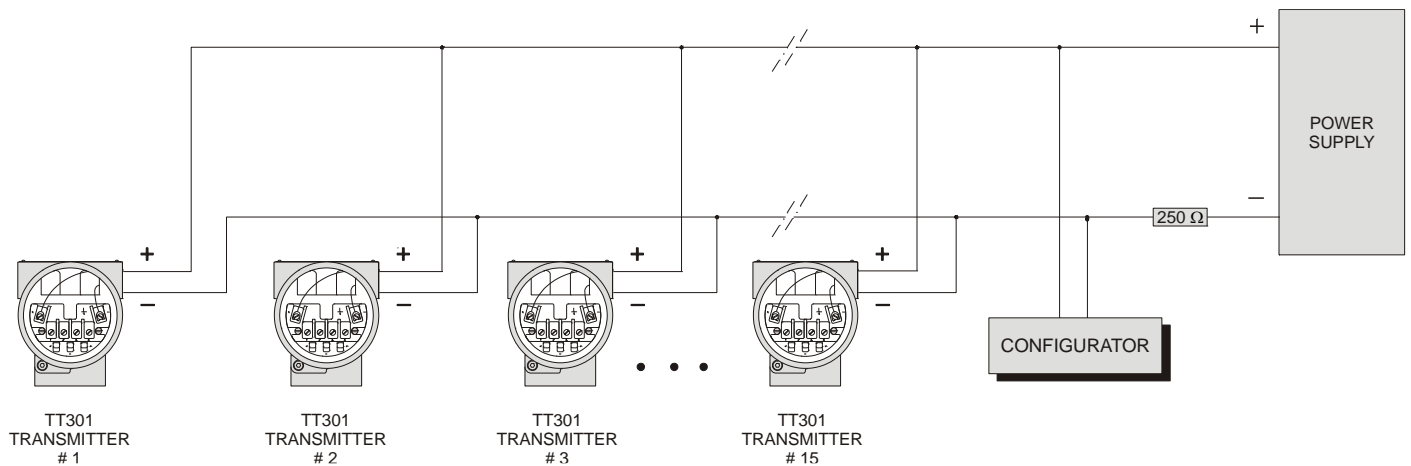


Figure 1.7 - Wiring Diagram for the TT301 in Multidrop Configuration

The Configurator can be connected to the communication terminals of the transmitter or at any point of the signal line by using the interface with alligator clips.

It is also recommended to ground the shield of shielded cables at only one end. The not grounded end must be carefully isolated.

NOTE

Make sure that the transmitter is operating within the operating area as shown on the load diagram (Figure 1.9). Communication requires a minimum load of 250 Ohm.

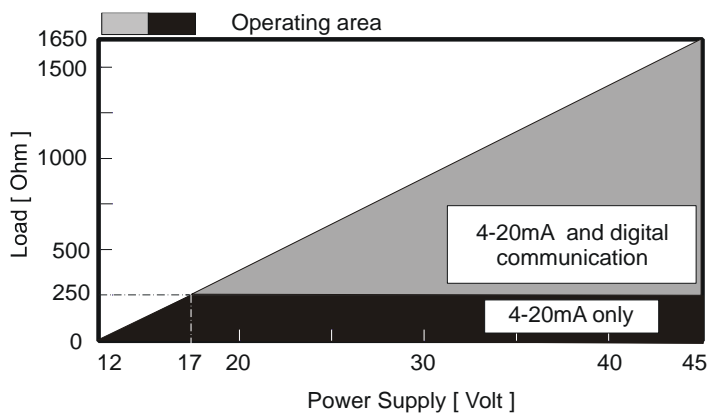


Figure 1.8 – Load Curve

The sensor should be connected as per Figure 1.8.

WARNING

When operating with two sensors, the sensors can not be both grounded. At least one has to be not grounded for proper operation of **TT301**.

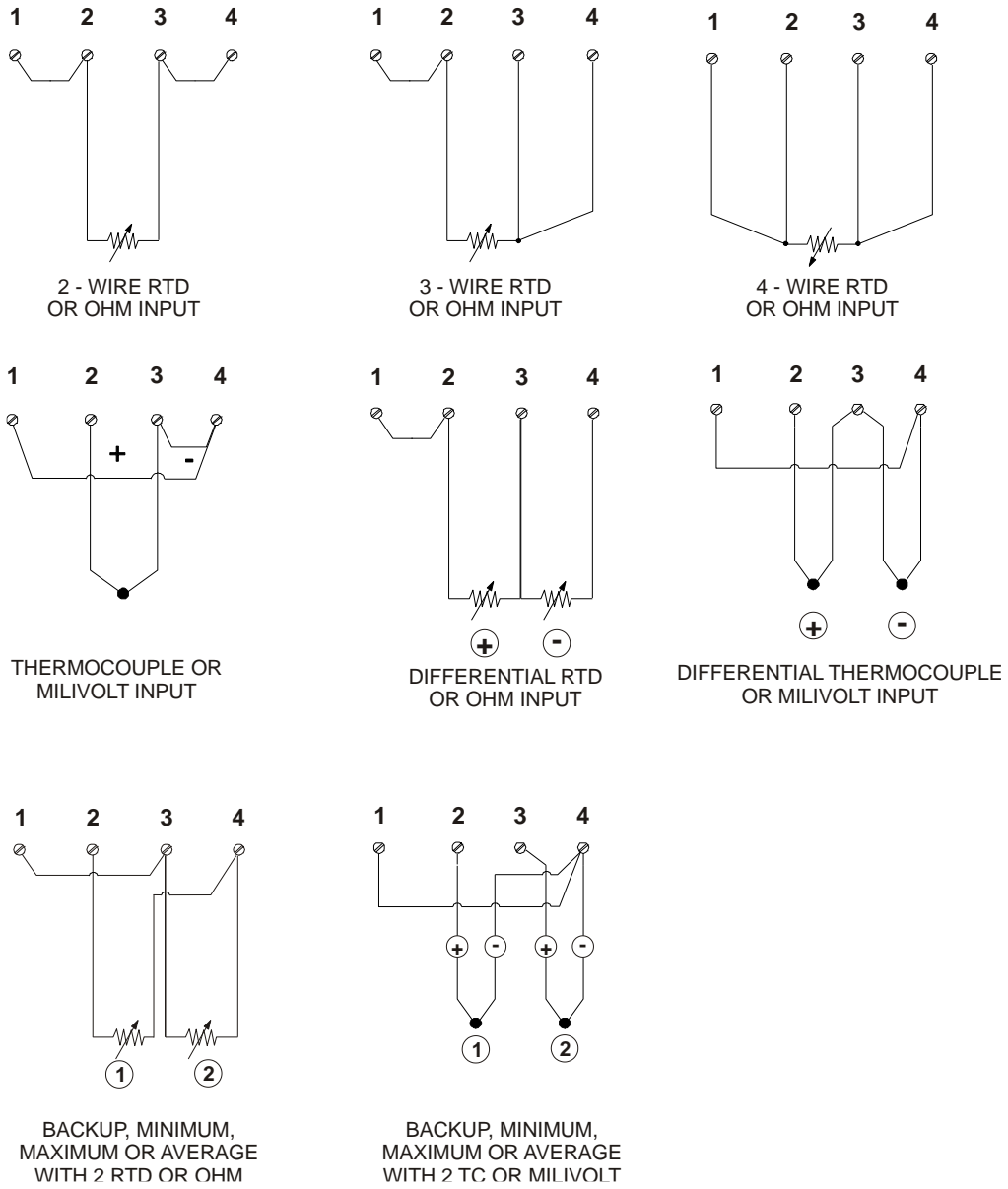


Figure 1.9 – Sensor Wiring

Installation in Hazardous Areas

Consult the Appendix A for Hazardous Location Approvals.