



**TEL-TRU  
MANUFACTURING CO.**

*World-Class Thermometers*

Thermometers • Pressure Gauges • Transmitters

# **TEL-TRU SPECIFICATION GUIDE**

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**FOR SELECTION OF TEMPERATURE  
AND PRESSURE INSTRUMENTS**

**PREPARED FOR USE BY ENGINEERS  
AND SPECIFICATION WRITERS**

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**QUALITY PRODUCTS SINCE 1916**

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# SPECIFICATION GUIDE TEMPERATURE INSTRUMENTS

## FILLED GLASS TUBE INDUSTRIAL THERMOMETERS

### **Die Cast Aluminum Case Series**

Thermometers will be a filled glass tube adjustable angle type, 9" scale, with black enameled die cast aluminum case, heavy-duty protective glass window and brass thermowell. The fill material will be blue spirit heat transfer medium. Mercury fill shall not be used. Accuracy will be  $\pm 1$  scale division. Thermometers will be TEL-TRU Series 91203, 91206 or approved equal.

### **Molded Cyclocac Case Series**

Thermometers will be a filled glass tube adjustable angle type, 9" scale, with black molded Cyclocac case, heavy-duty protective glass window and brass thermowell. The fill material will be blue spirit heat transfer medium. Mercury fill shall not be used. Accuracy will be  $\pm 1$  scale division. Thermometers will be TEL-TRU Series 81203, 81206 or approved equal.

### **Economy Thermometer Series**

Thermometers will be a filled glass tube fixed straight or 90 degree back angle type, 6" scale, with V shaped gray Valox® case, heavy-duty protective glass window and brass thermowell. The fill material will be spirit. Mercury fill shall not be used. Accuracy will be  $\pm 1$  scale division. Thermometers will be TEL-TRU Economy Series 83401 (straight) or 84401 (angle), or approved equal.

Add to each specification:

The proper range will be selected so that the operating temperature of the material being measured will fall approximately in the middle of the scale.

Thermometers for measuring fluid temperatures will have stems with insertion lengths of roughly half of the pipe diameter; minimum thermowell insertion length will be 2½" except on Economy Thermometers where the minimum thermowell insertion length will be 1¼". Thermometers installed on tanks will have a minimum thermowell insertion length of 4½".

Where insulation thickness exceeds 2", a longer stem thermometer will be used with an extension neck brass thermowell. The extension neck will be at least 2" long.

Thermometers for measuring air temperatures will be the same as above with the exception of having a perforated guard stem and a mounting flange instead of a brass thermowell.

## **BIMETALLIC DIAL THERMOMETERS**

### **Model AA** (Adjustable Angle)

Thermometers will be bimetallic dial type, 3", 4" or 5" dial size with a 304 stainless steel case and ¼" diameter stem with an adjustable angle style ½" NPT connection. Case to have a glass lens and be hermetically sealed; dial to be true anti-parallax design with pointer and scale in the same plane; bimetallic helical coil and stem wire to be centered in stem by a bushing and be silicone dampened. Instrument to have external recalibration by use of an Allen screw. Accuracy will be ±1.0% full span, ASME B40.3 Grade A. Thermometers will be TEL-TRU Model AA or approved equal.

### **Model GT or BC** (Fixed back or bottom stem)

Thermometers will be bimetallic dial type, 3", 4" or 5" dial size with a 304 stainless steel case and ¼" diameter stem with a fixed back or bottom ½" NPT connection. Case to have a glass lens and be hermetically sealed; dial to be true anti-parallax design with pointer and scale in the same plane; bimetallic helical coil and stem wire to be centered in stem by a bushing and be silicone dampened. Instrument to have external recalibration by use of an Allen screw. Accuracy will be ±1.0% full span, ASME B40.3 Grade A. Thermometers will be TEL-TRU Model GT or BC or approved equal.

### **Model LN-250R** (Fixed back stem)

Thermometers will be bimetallic dial type, 2" dial size with a 304 stainless steel case and ¼" diameter stem with a fixed back ¼" NPT connection. Case to have a glass lens and be hermetically sealed; bimetallic helical coil and stem wire to be centered in stem by a bushing and be silicone dampened. Instrument to have external recalibration by use of an Allen screw. Accuracy will be ±1.0% full span, ASME B40.3 Grade A. Thermometers will be TEL-TRU Model LN-250R or approved equal.

Add to each specification:

The proper range will be selected so that the operating temperature of the material being measured will fall approximately in the middle of the scale.

Thermometers for pipe or tank mounting will have a brass or stainless steel thermowell.

Thermometers for measuring fluid temperatures will have stems with thermowell insertion lengths of roughly half of the pipe diameter; minimum thermowell insertion length will be 2½". Thermometers installed on tanks will have a minimum thermowell insertion length of 4½".

Where insulation thickness exceeds 2", a longer stem will be used with an extension neck thermowell. The extension neck will be at least 2" long.

Thermometers for measuring air temperatures will have a duct flange connection instead of a thermowell.

## **GAS OR VAPOR ACTUATED DIAL THERMOMETERS**

### **Model DM Gas Actuated** (Directly mounted 4½" or 6" dial size)

Thermometers will be of the inert gas actuated, adjustable angle, direct mounted type, 4½" or 6" dial size with a 304 stainless steel case, bayonet lock ring and a glass lens. Dial face to have a linear scale and be white with black figures; pointer to be slotted type for field adjustment. Thermometers to have a 316 stainless steel bulb and stem with a ½" NPT connector to fit into a union adapter bushing or thermowell. Thermometers will be TEL-TRU Model DM4525 or DM6025 or approved equal.

### **Model RT Gas Actuated** (Remotely mounted 2½", 3½", 4½" or 6" dial size)

Thermometers will be of the inert gas actuated, remote dial type, 2½", 3½", 4½" or 6" dial size with a 304 stainless steel case, bayonet lock ring and a glass lens. Dial face to have a linear scale and be white with black figures; pointer to be slotted type for field adjustment. Thermometer to have either a 316 stainless steel plain bulb or a bulb with an extension and a ½" NPT sliding connector to fit into a union adapter bushing or thermowell and have armored flexible capillary tubing. The case will be surface mounted or flush mounted so that the thermometer may be easily read at eye level. Thermometers will be TEL-TRU Model RT or approved equal.

### **Model V Vapor Actuated** (Remotely mounted 3½" or 4½" dial size)

Thermometers will be of the vapor dial type, 3½" or 4½" dial size with a 304 stainless steel case and a polycarbonate lens. Dial face to be white with black figures; pointer to be slotted type for field adjustment. Thermometer to have a copper bulb with copper braided flexible capillary tubing or a 316 stainless steel bulb with stainless steel armored capillary tubing. The bulb to be plain or have a jam nut and a union adapter bushing or thermowell. The case will be surface mounted, flush mounted or have an adjustable angle mounting bracket so that the thermometer may be easily read at eye level. Thermometers will be TEL-TRU Model V35 or V45 or approved equal.

Add to each specification:

The proper range will be selected so that the operating temperature of the material being measured will fall approximately in the middle of the scale, or in the case of vapor dial thermometers in the manufacturer's recommended working zone.

Thermometers for pipe or tank wall mounting will have a brass or stainless steel thermowell.

Gas or vapor actuated thermometers for measuring fluid temperatures will have their sensing bulb positioned in the pipe, duct or tank to obtain a meaningful temperature reading.

# **SPECIFICATION GUIDE PRESSURE INSTRUMENTS**

## **HIGH QUALITY - HIGH ACCURACY - PROCESS AND INDUSTRIAL APPLICATIONS**

### **Model 10 Solid Front Case Process Gauge**

Pressure gauges will be 4½" dial size with a fiberglass reinforced polypropylene case, solid front, blowout back, threaded ring and a laminated safety glass lens. The case will be hermetically sealed with a temperature/pressure compensating diaphragm and be liquid fillable in the field through a top port. Bourdon tube and socket will be 316 stainless steel. Movement will be 300 series stainless steel rotary-gear type with over-pressure and under-pressure stops. Dial face will be white with black figures; pointer will be micrometer adjustable type. Accuracy will be ±0.5% of scale range, ANSI B40.1 Grade 2A. Gauges in severe service may be liquid filled with glycerine or silicone. Pressure gauges will be TEL-TRU Model 10 or approved equal.

## **HIGH QUALITY - GOOD ACCURACY - PROCESS AND INDUSTRIAL APPLICATIONS**

### **Model 31 Solid Front Case Gauge**

Pressure gauges will be 4" dial size with a stainless steel case, solid front, blowout back, stainless steel bayonet lock ring and a laminated safety glass lens. Bourdon tube and socket will be 316 stainless steel. Movement will be stainless steel with over-pressure and under-pressure stops. Dial face will be white with black figures; pointer will be micrometer adjustable type. Accuracy will be ±1.0% of scale range, ANSI B40.1 Grade 1A. Gauges in severe service may be liquid filled with glycerine or silicone. Pressure gauges will be TEL-TRU Model 31 or approved equal.

### **Model 30 Industrial Gauge**

Pressure gauges will be 2½", 4" or 6" dial size with a stainless steel case, stainless steel bayonet lock ring and a laminated safety glass lens. Bourdon tube and socket will be 316 stainless steel. Movement will be stainless steel with over-pressure and under-pressure stops. Dial face will be white with black figures; pointer will be micrometer adjustable type. Accuracy will be ±1.0% of scale range, ANSI B40.1 Grade 1A. Gauges in severe service may be liquid filled with glycerine or silicone. Pressure gauges will be TEL-TRU Model 30 or approved equal.

### **Model 32S Industrial Gauge**

Pressure gauges will be 2½" dial size with a stainless steel case and crimped ring and an acrylic lens. Bourdon tube and socket will be 316 stainless steel. Movement will be stainless steel. Dial face will be white with black figures; pointer will be black painted aluminum. Accuracy will be ±1.5% of scale range, ANSI B40.1 Grade A. Gauges in severe service may be liquid filled with glycerine or silicone. Pressure gauges will be TEL-TRU Model 32 or approved equal.

### **Model 37 Industrial Low Pressure Gauge**

Pressure gauges will be 4" dial size with a stainless steel or painted steel case, stainless steel bayonet lock ring and a laminated safety glass lens. Capsule diaphragm and socket will be 316 stainless steel or bronze/brass. Movement will be brass. Dial face will be white with black figures; pointer will be black painted aluminum. Accuracy will be  $\pm 1.5\%$  of scale range, ANSI B40.1 Grade A. Pressure gauges will be TEL-TRU Model 37S or Model 37B or approved equal.

## **COMMERCIAL DESIGN QUALITY - GOOD ACCURACY - CONTRACTOR TYPE APPLICATIONS**

### **Model 52B Mechanical Contractor Gauge**

Pressure gauges will be 4½" dial size with a stainless steel case, stainless steel friction ring and an acrylic lens. Bourdon Tube and socket will be brass. Movement will be brass. Dial face will be white with black figures; pointer will have an adjustment screw. Accuracy will be  $\pm 1.0\%$  of scale range, ANSI B40.1 Grade 1A. Pressure gauges will be TEL-TRU Model 52B or approved equal.

## **COMMERCIAL DESIGN QUALITY - COMMERCIAL ACCURACY**

### **Model 33B Brass Internals Industrial Gauge**

Pressure gauges will be 1½", 2", 2½" or 4" dial size with a stainless steel case and ring and an acrylic lens. Bourdon tube and socket will be brass with a restrictor. Movement will be brass. Dial face will be white with black figures; pointer will be black painted aluminum. Accuracy will be  $\pm 3-2-3\%$  of scale range, ANSI B40.1 Grade B. Gauges in severe service may be liquid filled with glycerine or silicone. Pressure gauges will be TEL-TRU Model 33B or approved equal.

### **Model 33S Stainless Steel Internals Industrial Gauge**

Pressure gauges will be 1½", 2", 2½" or 4" dial size with a stainless steel case and ring and an acrylic lens. Bourdon tube and socket will be brass with a restrictor. Movement will be stainless steel. Dial face will be white with black figures; pointer will be black painted aluminum. Accuracy will be  $\pm 3-2-3\%$  of scale range (4" dial size will be 1.5%), ANSI B40.1 Grade B. Gauges in severe service may be liquid filled with glycerine or silicone. Pressure gauges will be TEL-TRU Model 33S or approved equal.

## **UTILITY DESIGN QUALITY - COMMERCIAL ACCURACY**

### **Model 50B Brass Internals, Steel Case Utility Gauge**

Pressure gauges will be 1½", 2", 2½" or 3½" dial size with a black painted steel case, a chrome plated friction ring and an acrylic lens. Bourdon tube and socket will be brass. Movement will be brass. Dial face will be white with black figures; pointer will be black

painted aluminum. Accuracy will be  $\pm 3-2-3\%$  of scale range, ANSI B40.1 Grade B. Pressure gauges will be TEL-TRU Model 50B or approved equal.

**Model 55B Brass Internals Low Pressure Gauge**

Pressure gauges will be 2½" dial size with a steel case and an acrylic lens. Capsule diaphragm will be phosphor bronze and socket will be brass. Movement will be brass. Dial face will be white with black figures; pointer will be black painted aluminum. Accuracy will be  $\pm 3-2-3\%$  of scale range, ANSI B40.1 Grade B. Pressure gauges will be TEL-TRU Model 55B or approved equal.

Add to each specification:

The proper range will be selected so that the average operating pressure falls approximately in the middle of the scale selected.

All pressure gauges will be furnished with TEL-TRU brass or stainless steel needle valves.

Gauges on steam service will be furnished with TEL-TRU Model 21AS steel coil siphons.

Gauges on any service where pressure surges or pulsations are possible will be furnished with Ray™ Model 722 or 723 pressure snubbers.

## **DIAPHRAGM PROTECTION SEALS - TO PROTECT PRESSURE OR VACUUM SENSING DEVICES**

### **Model W Welded Diaphragm Seals**

Diaphragm protection seals will be continuous operation types for safety. All seals will be a two-piece bolted design with the diaphragm welded to the upper housing to provide a high integrity seal. The upper housing may be removed to facilitate cleaning without loss of the fill fluid. When required by the service the lower housing will have a ¼" NPT flushing connection. The process flange and diaphragm material will be compatible with the process fluid. Diaphragm protection seals will be TEL-TRU Model W or approved equal.

### **Model M Mini Diaphragm Seals**

Diaphragm protection seals will be of welded construction with ¼" or ½" NPT upper and lower connections. When required by the service the lower housing will have a ¼" NPT flushing connection. The process housing and diaphragm material will be compatible with the process fluid. The Mini diaphragm seal will be used only for pressure instruments of a 3½" dial size or smaller and a pressure range of 0 to 100 psi or greater. Mini diaphragm protection seals will be TEL-TRU Model M or approved equal.

### **Model S Sanitary Diaphragm Seals**

Diaphragm protection seals will have the diaphragm welded to the seal housing to provide sanitary type construction and have a ¼" or ½" NPT upper connection. The seal will be manufactured to meet design, material and fabrication requirements of 3-A Sanitary Standard 74-01. The seal housing will be designed to be clamped onto a sanitary piping system and may be removed without loss of fill fluid. Sanitary diaphragm protection seals will be TEL-TRU Model S or approved equal.