Portable Hand Held Service Manometer
For pressure, temperature, and flow
Type 909.40.500 - Standard
Type 909.40.600 - EX Intrinsically Safe

Tronic

- Microprocessor controlled
- Peak, valley, and hold memory function
- Pressure ranges from 10 INWC to 60,000 PSI
- Temperature from -392 ^{O}F to +1100 ^{O}F

The portable manometer is a microprocessor-based, hand-held system for measuring pressure, temperature, and flow. DC voltage, current and pulse frequencies can be measured. The display unit features a dust and waterproof foil-type keyboard. Either of the two ports can be individually set to any available engineering unit. For example, port 1 can indicate pressure in PSI and port 2 in BAR, and the pressure differential across both ports can be displayed in mmHg. Units (pressure or temperature) and the range of the connected transducers are set automatically. The microprocessor also sets the decimal point to achieve the best possible resolution for the selected range.

Features
The manometer accepts pressure transducers type 891.13.591 (ranges up to 25 INWC) , 891.13.590 (ranges to 250 PSI) and 891.23.590 (ranges to 60,000 PSI). The serial interface in the transducer automatically transmits the range and pressure unit to the manometer. The transducer wetted parts are 316 stainless steel. The standard process connection is 1/2" NPT with adapters available. Other pressure ranges and connections (flush diaphragm or sanitary seal) are available.

Complete Systems
The basic service kit consists of an aluminum carry case, the hand held display, two connecting cables for transducers, battery charger, and instruction manual. A wide range of accessories are available for specific applications. Pressure measurements require 891.13.591, 891.13.590, or 891.23.590 pressure transducers. Temperature applications require the TR-590 resistance thermometer. Other options include a plug-in adapter for flow measurement, pressure fittings, mini-mess snap-fit couplings, extension cables, and RS-232 serial interface.

Measurement of Flow and RPM
A plug-in adapter contains an EEPROM that is programmed at the factory or by personal computer to accept the signal of turbine type flow meters and rotary encoders from other manufacturers. Up to twelve paired values reflecting the frequency/flow ratio may be entered. The microprocessor interpolates the value measured to be indicated in gallons per minute or liters per minute. Ratio values may be spread or condensed as needed to compensate for non-linearity of the coder. For measurement of RPM, the EEPROM can be programmed to convert an optional number of pulses into indication of one RPM (1/s).

Specifications - Display unit

Digital liquid crystal display, 0.5" (12.7mm) high with a display range of +/- 10000. Selectable to indicate MBAR, BAR, mmH_2O, mmHg, kg/cm^2, kPa, PSI, PSI x10, inH_2O, inHg, ^{O}C, ^{O}F, K, V, mA, L/min, gal/min, 1/s. The display automatically changes to "-" when negative values are measured. Decimal point sets automatically depending on the selected range. Zero adjustment is self monitoring when on.

Accuracy
+/- 0.06 +/- 1 digit % of span

Error Prompts
-01- for A/D converter, -02- incorrect unit entered, -03- range overflow, LoBat (for low battery)

Pick Up Rate
1000 per second, LCD display refreshes twice per second

Memory
Hold: Digital memory, no data loss as long as power is on. Individual memory for each channel. **Minimum and Maximum** : Digital memory, no data loss as long as power on. Each channel holds individual memory for minimum and maximum. Pick up rate is <1 millisecond. Individual reset keys.

Analog Output (mV)
0.1 digit (1000 max) minimum output impedance 50KW, polarity changes with negative values. Also minimum, maximum and differential values available.

Differential Pressure
Measurement of pressure or temperature differential, using transducers of the same or different range. The resolution is established by the higher range.

Temperature Measurement
Resistance thermometers Pt 100, quadrupole, digital linearity per DIN. Range -200^{O} C to +600 ^{O} C , resolution 0.1^{O} C

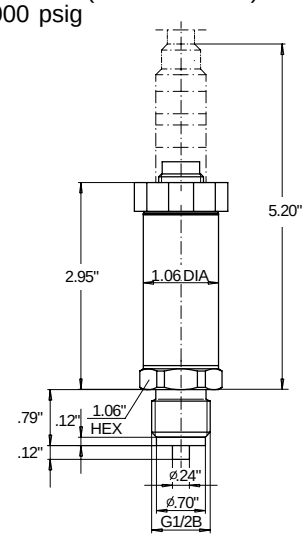
Flow (gal/min) and Frequency (Pulse) Measurement (1/s)
0-10000 with plug in adapter

Voltage (DC V) Current Measurement (DC mA)
50 max. Resolution to 10mV or 0.01mA

Power Supply (DC V)
6, uses 5 1.2V rechargeable batteries (WIKA part # 1147315) for 12 hour operation. Battery compartment in bottom of case.

Specifications - Transducer

Ranges (specify exact range required)
891.13.590: 0 to 25 INWC (for inert, gaseous media only)
891.13.590: 0-50 INWC to 250 PSIG (PSIA available)
891.23.590: 300 psig to 60,000 psig
{custom ranges available}



Process connections
1/2 " NPT {others available}

Wetted parts material
316 stainless steel

Body material
304 stainless steel

Power supply
5 VDC, from manometer

Signal output
0-500mV nominal

Response time (10..90%)
<1 millisecond

Accuracy (% of span)

Linearity (B.F.S.L.)	≤0.25% FS
Hysteresis	≤0.1% FS
Repeatability	≤0.05% FS
1-Year Stability	≤0.2% (at reference conditions)

Temperature

Maximum medium	-22°F to +212°F (-30°C to 100°C)
Ambient	+14°F to +176°F (-10°C to 80°C)
Storage	-40°F to +212°F (-40°C to 100°C)
Compensated range	+32°F to +176°F (0°C to 80°C)

Temperature error (reference temperature 70°F)

Effect of temperature

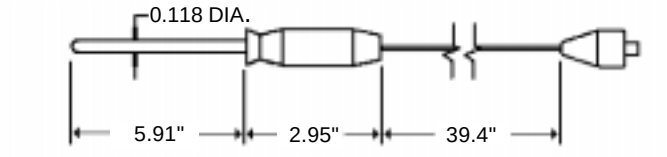
on zero	<0.2% of span per 18° F (10°C)
on span	<0.2% of span per 18° F (10°C)

Wiring	8-pin DIN plug
Weather protection	IP 65
Dimensions	See drawings
Weight	0.15 Kg (0.33 lbs)

Resistance Thermometer Model TR 590

Features
The manometer accepts PT 100 resistance thermometers. The WIKA hand-held temperature sensor TR 590 with an 8-pin DIN plug is designed to match the instrument.

Specifications and dimensions (in.)

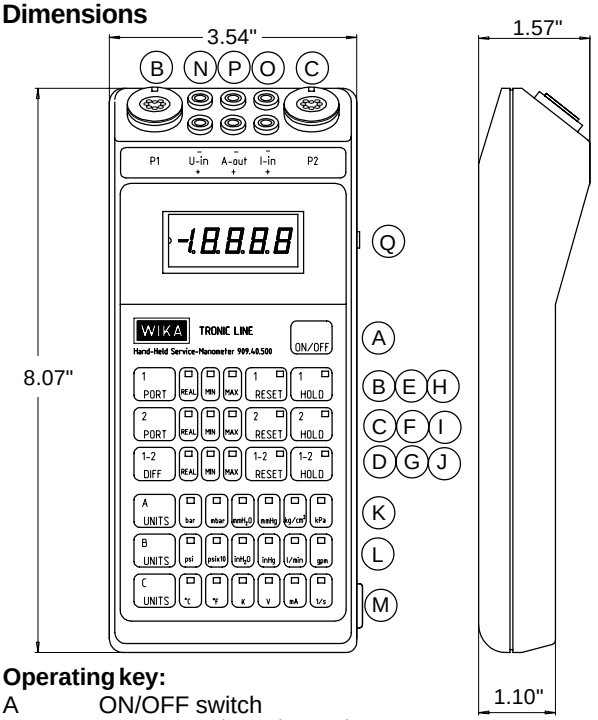


Model TR 590-T1 -200°C to 600°C, 5.9 in. long
Dip sensor suitable for liquids and gases. Response time is approximately 10 seconds. The stem is made of stainless steel. Plastic handle and 1 meter cable with 8-pin plug.

Model TR 590-E1, -200°C to 600°C, 5.9 in. long
Needle sensor suitable for media of plastic consistency. Response time is approximately 10 seconds.

Model TR 590-O1, -50°C to 400°C, 5.9 in. long
Surface sensor suitable to measure surface temperature of solids. Response time is approximately 55 seconds. It includes a rigid stem with pivoting Pt 100 ceramic sensor.

Dimensions



Operating key:

A	ON/OFF switch
B	Port 1 -- select channel 1
C	Port 2 -- select channel 2
D	Diff 1-2 -- differential across 1-2
E	Reset 1 -- Erase memory 1
F	Reset 2 -- Erase memory 2
G	Reset 1-2 -- Erase differential memory
H	Hold 1 -- Hold value channel 1
I	Hold 2 -- Hold value channel 2
J	Hold 1-2 -- Hold differential value
K	Units A -- Select Bar, mbar, mmH_2O, kg/cm^2, kPa
L	Units B -- Select PSI, PSI x 10, inH_2O, l/min, gpm
M	Units C -- Select °C, °F, K, V, mA, 1/s
N	U-in -- Voltage input
O	I-in -- mA input
P	A-out -- Analog output
Q	DC-in -- Receptacle for line adapter

REAL mode displays true value measured, MIN and MAX recalls memory, RESET erases memory.

HOLD and RESET keys correspond to the memory that was selected with PORT keys.

MIN and MAX will be memorized if HOLD of a non-selected channel is depressed. MIN and MAX will be erased if RESET of a non-selected channel is depressed.

Ordering Information:
State computer part number (if available) / type number / size / range / connection size and location / options required.

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