Doric 473/475 Series Portable Digital Calibrators

DORIC INSTRUMENTS
VASEngineering

Doric 473/475

Doric Model 473 and 475 Digital Temperature Calibrators use custom VLSI integrated circuits in a patented circuit design to deliver exceptional accuracy, high reliability, and long battery life in a truly portable, handheld instrument. Large, touch-type switches and precision adjustment control let you access multiple functions quickly, and because you can both simulate thermocouples or RTDs and measure corresponding transmitter output with one instrument, calibration is faster.

Other features that increase your productivity include direct readings in both °C and °F, without additional modules or conversion tables. Independent, simultaneous zero and span adjustment functions eliminate repetitive readjustments of instruments being calibrated. Rugged package design and complete fuse protection insure reliable use, year in and year out.

Key Features

- Measures and Simulates RTDs, Thermocouples, Ohms, Milliamps, and Millivolts
- Calibrates Temperature Controllers, Indicators, Recorders, Transmitters
- Long Battery Life
- Lightweight, Handheld Versatility (carrying case included)
- Hi/Lo Memory
- Accuracy ±0.1%

General Specifications

	473 Series	475 Series
Inputs:	Thermocouple: K, J, T, mV DC, mA DC, Ω	RTD: Pt. .00385, Pt. .00392, Cu 10Ω, Ω, mV DC, mA DC
Calibration Output:	Thermocouple: K, J, T, mV DC, mA DC, Ω	RTD: Pt. .00385, Pt. .00392, Cu 10Ω, Ω, mV DC, mA DC
Input/Output Impedance:	Input Impedance: T/C and mV: 13MΩ mA 11Ω or 50KΩ (selectable) Output Impedance: Less than 10Ω up to 150nA	Calibration Mode: Output impedance during set-up for calibration: 100MΩ between RTD terminals 1, 2, 3, and 4. Output impedance: during loop operation with an external instrument or transmitter, ohmic value between terminals 1 and 2 and between terminals 3 and 4 is equal to the pre-set ohmic value of the HI or LO potentiometer, from 1Ω to 2KΩ. Terminals 1 and 4 and terminals 2 and 3 are connected in common. Input Impedance: 10–20 Ω with mA input; 180KΩ with mV input. Indication Mode: Source Impedance: 21.5KΩ, with a nominal excitation current flowing from terminal 4 to terminal 3 of 172µA for temperature ranges (55µA for 0.1ohm range, 5.5µA for 1.0 ohm range). Input Impedance: 15MΩ between terminals 1 and 2.
Temperature Stability:	Zero: ± 2 µV/°C, Span: ±0.2% rdg/°C Ref. Junction: ±1°C/°C	Zero: ± 2 µV/°C, Span: ±0.2% rdg/°C
Stability with Time:	90 days add ±0.05% rdg. 1 year add ±0.1% rdg.	90 days add ±0.05% rdg. 1 year add ±0.1% rdg.
Noise Rejection:	CMV: 1000VAC or VDC, 1500V peak CMR: 140dB @ 50/60Hz, 0.1° range; 120dB @ 50/60Hz, 1.0° range; 100ohms unbalance NMR: 50dB @ 50/60Hz ±1Hz, 0.1° range; 35dB @ 50/60 Hz±1Hz, 1.0° range	CMV: 150VAC RMS; 200VDC CMR: 140dB @ 50/60Hz ±1Hz, 0.1° range; 120dB @ 50/60Hz ±1Hz, 1.0° range, 100ohms unbalance
Isolation:	Can be used with isolated or non-isolated instruments	Can be used with isolated or non-isolated instruments. The RTD input/output terminals are fully isolated from the mA/mV input terminals.
Weight:	1 lb. (454g)	1 lb. (454g)
Size (H x W x L)	2.75" x 3.75" x 8.3" (6.9 cm x 9.5 cm x 21.1 cm)	2.75" x 3.75" x 8.3" (6.9 cm x 9.5 cm x 21.1 cm)

Model 473 Ranges and Accuracy

Function	Resolution	Range	Accuracy*
K	1.0°F	-308° to +2501°F	0.1% rdg, ±1.8°F
J	1.0°F	-318° to +1858°F	0.1% rdg, ±1.8°F
T	1.0°F	-360° to +758°F	0.1% rdg, ±1.8°F
K	1.0°C	-189° to +1372°C	0.1% rdg, ±1.0°C
J	1.0°C	-194° to +1014°C	0.1% rdg, ±1.0°C
T	1.0°C	-217° to +403°C	0.1% rdg, ±1.0°C
K	0.1°F	-219.7° to +398.7°F	0.1% rdg, ±0.45°F
J	0.1°F	-179.4° to +398.3°F	0.1% rdg, ±0.45°F
T	0.1°F	-234.8° to +399.0°F	0.1% rdg, ±0.45°F
K	0.1°C	-139.8 to +203.7°C	0.1% rdg, ±0.25°C
J	0.1°C	-117.4° to + 203.5°C	0.1% rdg, ±0.25°C
T	0.1°C	-148.2° to +203.9°C	0.1% rdg, ±0.25°C
mV	100µV	-37.3 to +111.9mV	0.1% rdg, ±1 ct.
mV	10µV	-9.32 to +27.98mV	0.1% rdg, ±2 cts.
mA	10µA	0.00 to +27.98mA	0.1% rdg, ±2 cts.

*Includes all errors due to linearization, A/D conversion, internal instrument noise at 22°C ±3°C ambient temperature without zero or span adjustment for 24 hours.
All contributing errors are added together to produce worst case instrument accuracy.

Model 475 Ranges and Accuracy

Function	Resolution		Range		Accuracy*
PT .385 (100Ω Ro)	IPTS-68/ DIN 43760	0.1 deg 1 deg	-153.2 to +398.3°F -388 to +1660°F	-102.9 to +203.5°C -233 to +904°C	±0.1% rdg, ±0.45°F/±0.25°C ±0.1% rdg, ±1.8°F/±1.0°C
PT.392 (100Ω Ro)	NBS 1948	0.1 deg 1 deg	-153.2 to +398.3°F -388 to +1660°F	-102.9 to +203.5°C -233 to +904°C	±0.1% rdg, ±0.45°F/±0.25°C ±0.1% rdg, ±1.8°F/±1.0°C
Cu(Ro 10Ω @ 25°C)	Minco 16-9	1 deg	-58 to +482°F	-50 to +250°C	±0.1% rdg, ±1.8°F/±1.0°C
Ohms		0.1 ohm 1 ohm	2.0 to 399.2 ohm 2 to 1000 ohm		0.1% rdg, ±0.1ohm 0.1% rdg, ±1.0 ohm
mA (A)**		0.01mA	0.00 to 39.92 mA		0.1% rdg, ±0.02mA
mV (B)**		0.01mA	0.00 to 399.20mV		0.1% rdg, ±0.2mA

*Includes all errors due to linearization, A/D conversion, internal instrument noise at 22°C ±3°C ambient temperature without zero or span adjustment for 24 hours.
3-wire RTD indication: add 2.5°C/Ω lead resistance.
**Selected by internal A/B slide switch. Both positions display as mA.

Temperature Instruments, Probes, and Accessories

473 Series	475 Series
TP254	TP110P
TP255	TP112P
MH101K	TP120P
TP110K	TP130P
TP112K	
TP120K	
TP130K	
TP126K	
TP114K	
TP128K	

Ordering Guide

Model	Description
473	Thermocouple type: K, J, T, mV, and mA
475	RTD type: platinum (2), copper, ohms, and mA