

TDP05K

Advanced Thermal Dispersion Airflow And Temperature Measuring Probe



APPLICATION

Ruskin model TDP05K is a highly accurate thermal dispersion airflow and temperature measuring probe. Multiple velocity and temperature points on one or more duct-mounted probes are averaged to arrive at air measurements. The TDP05K is capable of measuring a velocity range from 0 to 5,000 FPM and displaying the flow and temperature at each sensing point. Within each low pressure drop, airfoil-shaped probe are up to 8 moisture resistant flex sensors. Both velocity and temperature are measured by each flex sensor thermistor pair. The flex sensor pair is protected from the elements with a thin conformal coating. Trouble free performance is assured by laser etched, micro welded and hermetically sealed flex sensor connection points. The highest accuracy over the entire range of airflows results from probe sensing elements that are factory tested and calibrated at 20 points.

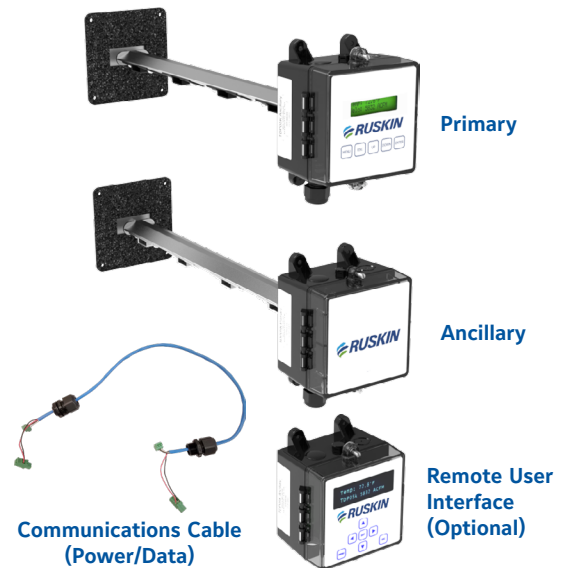
Contact Ruskin for assistance selecting the options and features for the TDP05K to fit your applications!

STANDARD CONSTRUCTION

Probe Material	Low profile 2" x 3/4" (51 x 19) 6063T6 high yield extruded aluminum with acid etch clear anodized finish.
Sensor Accuracy	Airflow : ±2% of reading and ±0.25% repeatability. Temperature : ±0.10° F (0.06° C).
Installed Accuracy	+/- 3% when Ruskin's placement guidelines are met or exceeded
Product Performance Range	Airflow : 0-5000 FPM (0-25 m/s). Transmitter Temperature : -20°F to 120°F (-29°C to 49°C). Sensor Temperature : -20°F to 120°F (-29°C to 49°C). Humidity : 0-99% RH, non-condensing.
Power Requirements	24 VAC or VDC (+/- 15%); 15 VA.
Sensor Distribution	Max 128 sensing points.
Calibrated Metered Orifice	U.L. 94 flame rated, high impact ABS.
Sensor Circuit	Conformal coated, water resistant flexible polyimide circuit, with heated and ambient thermistors.
Master Control Circuit	Field configurable, solid state, circuit board robotically assembled. Production includes high pressure deionizing wash, solder reflow, wave solder, secondary deionizing wash final assembly, four step inspection, conformal coating, retest and calibration. Two individually configurable outputs for Velocity or Temperature. Velocity Output : 4-20mA or 2-10 VDC with 500 ohm resistor. Temperature Output : 4-20mA or 2-10 VDC with 500 ohm resistor.
Communication Cable	Factory Supplied Combination Cables (24/1 pr Comm + 18/2 Power), Shielded, Blue Jacket. Cables include cord grips and phoenix connectors attached for terminating in monitor boxes (Primary, Ancillary, Remote Display) in a Daisy Chain configuration. Quantity and length of cables supplied are based on number of probes per station (duct dimension). See page 4 for details.
Duct/Plenum Size	Width: 8" to 120" (203 to 3050). Height: 8" to 120" (203 to 3050).

NOTES:

- Values shown in () indicate metric units.
- Refer to Installation Instructions for additional details : <https://www.ruskin.com/doc/Id/6766>
- Installed accuracy values are derived from testing in accordance with AMCA Standard 610, Figure 1. The TDP05K will provide the installed accuracy noted above when Ruskin's placement guidelines are met or exceeded.



One primary to be combined with the required quantity of ancillary probes & cables based on duct size.



STANDARD FEATURES

- ▶ Self-diagnostics utilizing artificial intelligence
- ▶ BACnet MS/TP, Modbus RTU, and analog output standard
- ▶ Lowest power consumption thermal dispersion device available
- ▶ Tool-free one touch setup through surface membrane label
- ▶ Stainless Steel hardware for INSERTION mount installations
- ▶ Factory supplied standard combination cabling; Proprietary cabling not required.
- ▶ UL Type 1 rated Monitor Box Enclosures.
- ▶ Airfoil shaped acid-etch clear anodized sensing probes which produce lower pressure drop and less noise
- ▶ Highest density thermal dispersion sensing array up to 128 sensing points!

LISTINGS AND COMPLIANCES

- ▶ UL Listed: UL 60730-1; UL 60730-2-9; UL 60730-2-15
- ▶ UL Compliant: UL 60335-1 and CAN/CSA-C22.2 No. 60335-1; UL
- ▶ 60335-2-40 and CSA C22.2 No. 60335-2-40
- ▶ FCC: Meets part 15 Subpart B, Class A device requirements.
- ▶ CE: European shipments only
- ▶ BACnet (BTL): Certified to BACnet standard ISO 16484-5 rev. 1.14

VARIATIONS

Ruskin model TDP05K is available with the following Optional Variations.

- ▶ Remote User Interface Hard-Wired to Primary Probe
- ▶ Wireless Remote User Interface. Wireless connectivity between the Remote Interface and the Primary Probe
- ▶ Wired Primary Controller, mounted remotely
- ▶ UL Type 4 rated Monitor Box Enclosures
- ▶ Custom density probe/sensor array
- ▶ Equal Area Distribution, Log-Tchebycheff arrangement, or Round EK Log
- ▶ Internal Mount Configuration; for rectangular duct sizes of 14" to 120" width
- ▶ Stand-Off Mount Configuration; for rectangular installations, available with optional aluminum hardware

INSTALLATION DETAILS

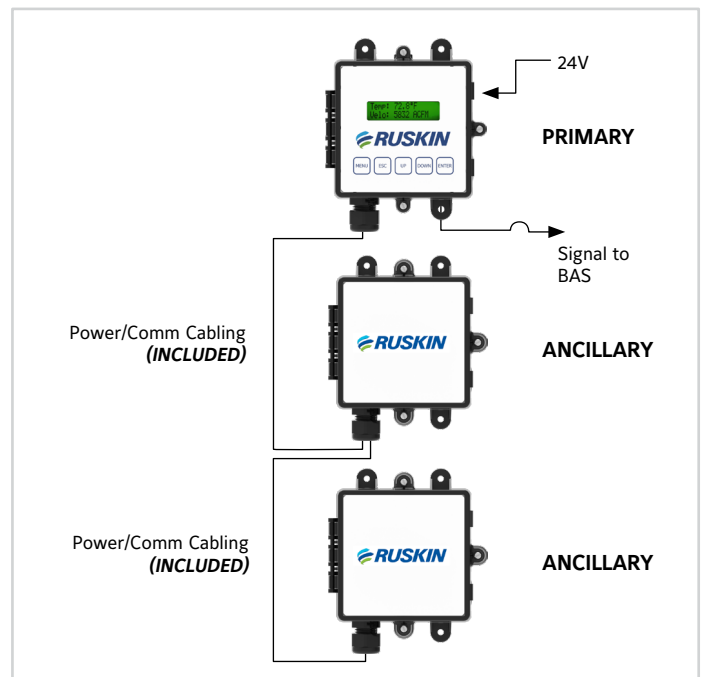
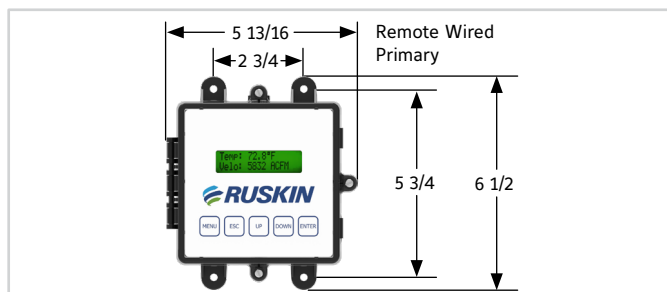
Probe kit comes with Primary Control Probe and utilizes thermal dispersion technology to calculate the airflow and average the temperature. Two thermistors at multiple sensing points measure ambient temperature and velocity. Temperature and velocity thermistors at each sensing point are housed in a high impact, ABS, calibrated metered orifice that is mechanically fastened to the airfoil probe. The probe and sensor circuit

default density are based on the duct or plenum size and corresponding density chart. Number of probes and number of sensor per probe are based on the OD dimensions where "A" is the duct or plenum width* and "B" is the duct or plenum height. The sensor readings are digitally communicated to the primary probe.

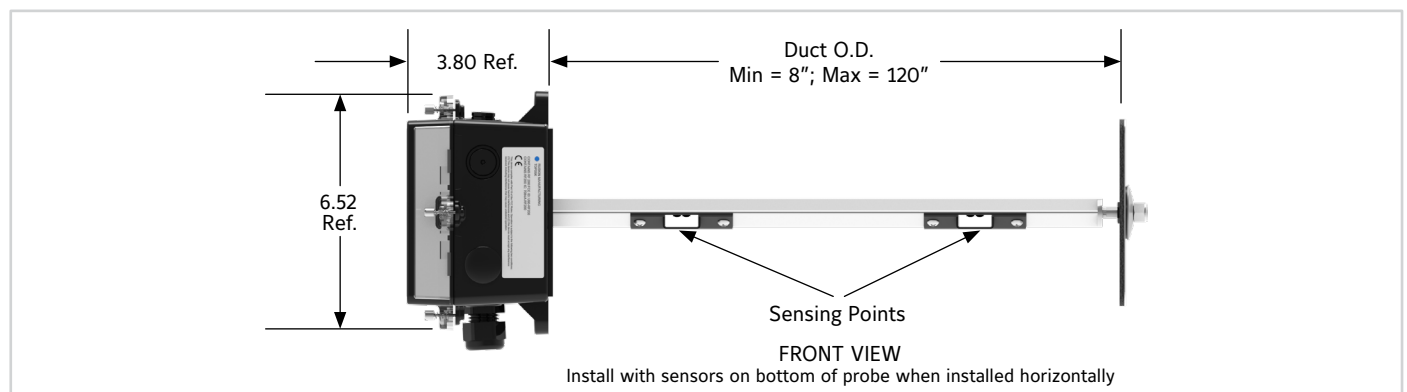
* (Stand-Off mounts are sized based on I.D. dimension)

TYPICAL WIRING DETAIL

- ▶ For stocking or replacement purposes, Connect-Air part number W24182P-2306BL is recommended. Alternatively, use a twisted shielded pair 24AWG low capacitance wire communication cable and an 18AWG power cable in separate conduits.
- ▶ Factory supplied cable lengths as required per duct/plenum dimensions.
- ▶ Connections are 2 part pluggable Phoenix terminals
- ▶ Primary/Ancillary probe design facilitates quick daisy chain wiring (probe to probe)
- ▶ Hinged enclosure with dust tight or weather resistant construction comes pre-drilled with four connection access points (with dust caps or optional Type 4 plugs)
- ▶ For use with outdoor rated cable, Type 4 Cord Grips can be ordered to facilitate a sealed cable connection

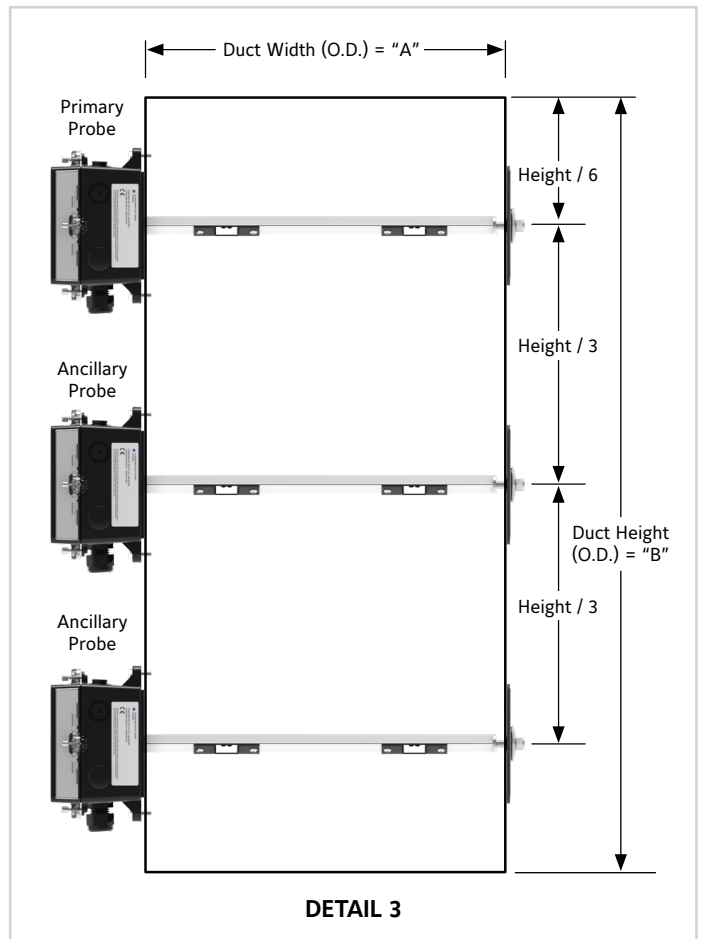
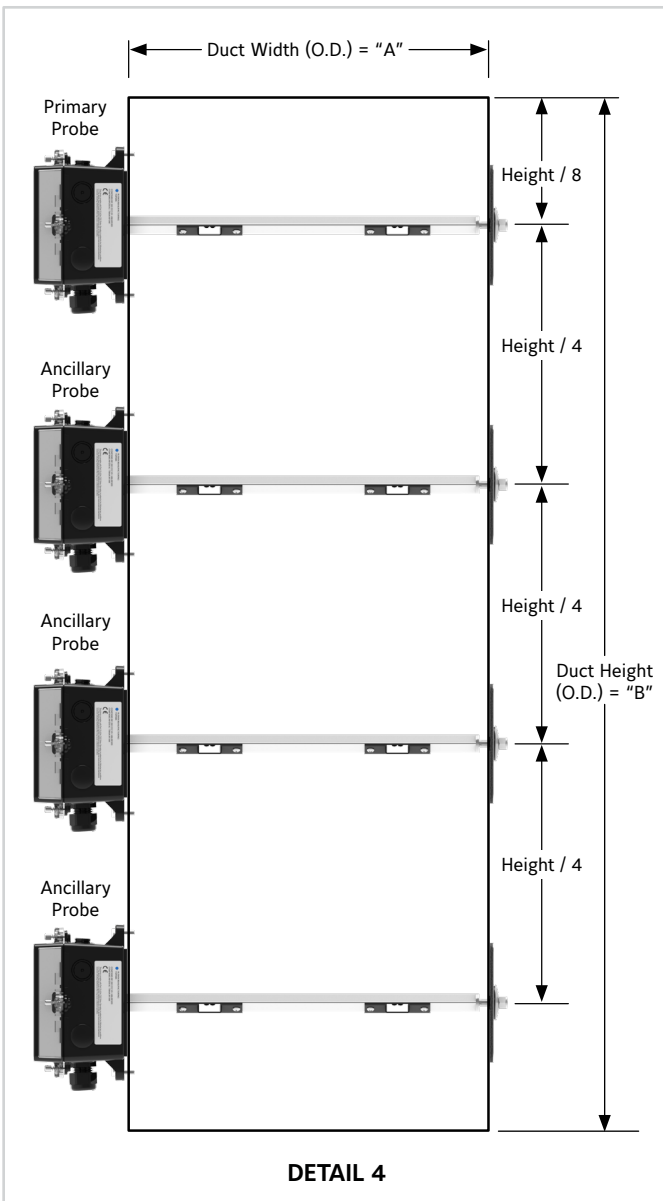
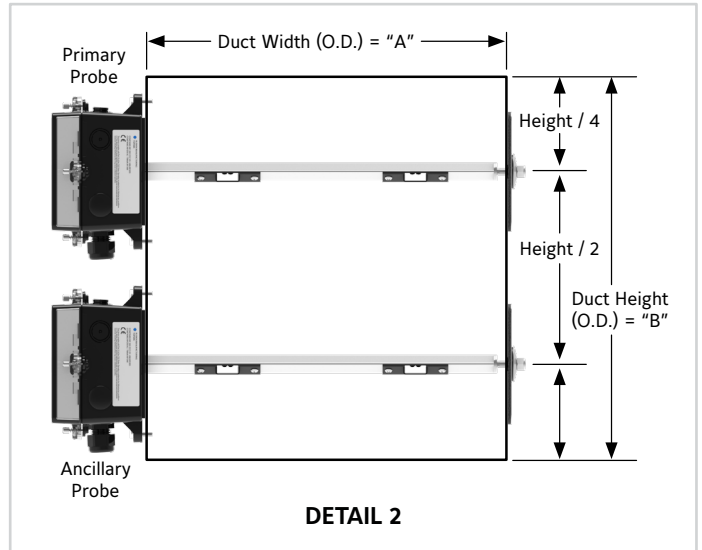
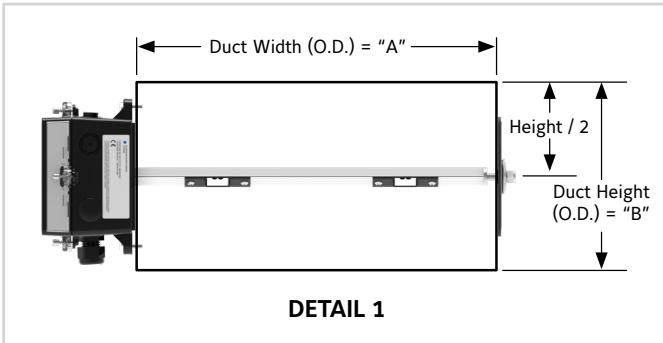


The optional Remote Wired Primary can be purchased with any TDP05K system. All probes become Ancillary, and the separate Remote Wired Primary monitor box can be mounted up to 500 feet from the TDP05K ancillary probes.



HIGHEST SENSOR DENSITY PER SQUARE FOOT IN THE INDUSTRY

The model TDP05K probe assembly may be installed in square, round, or oval ducts and plenums. Hardware required for the insertion style mounting configuration (as depicted in the DETAILS shown below) is provided as standard with the TDP05K. Stand-off mounting hardware is available as an option for applications that require probes mounted onto the upstream side of a Ruskin control damper (damper sold separately). For specific installation and operation details, and for round or oval applications, refer to the Installation and Maintenance Instructions. The information on this data sheet is for general reference and is subject to correction or modification.



SENSOR DENSITY TABLE

Square/Rectangle Installations (# Probes / # Sensors per Probe)

		PROBE LENGTH - Square/Rectangle Duct Width (O.D.) "A"																				
		8" (203)	12" (305)	14" (356)	16" (406)	18" (457)	20" (508)	22" (559)	24" (610)	30" (762)	36" (914)	42" (1067)	48" (1219)	54" (1372)	60" (1524)	66" (1676)	72" (1829)	84" (2134)	96" (2438)	108" (2743)	120" (3048)	
Square/Rectangle Duct Height (O.D.) = "B"	8" (203)	1/2	1/2	1/3	1/3	1/4	1/4	1/4	1/4	1/6	1/6	1/6	1/6	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	
	12" (305)	1/2	1/2	1/3	1/3	1/4	1/4	1/4	1/4	1/6	1/6	1/6	1/6	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	
	14" (356)	1/2	1/3	1/3	1/3	1/4	1/4	1/6	1/6	1/6	1/6	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	
	16" (406)	2/2	2/2	2/2	2/2	2/2	2/3	2/3	2/3	1/6	1/6	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	
	18" (457)	2/2	2/2	2/2	2/2	2/3	2/3	2/3	2/3	1/6	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	
	20" (508)	2/2	2/2	2/2	2/3	2/3	2/3	2/3	2/3	2/4	1/8	1/8	1/8	1/8	2/6	2/6	2/6	2/6	2/6	2/7	2/8	2/8
	22" (559)	2/2	2/2	2/3	2/3	2/3	2/3	2/3	2/3	2/4	1/8	1/8	1/8	2/6	2/6	2/6	2/6	2/7	2/8	2/8	2/8	
	24" (610)	2/2	2/2	2/3	2/3	2/3	2/3	2/3	2/3	2/4	2/4	1/8	1/8	2/6	2/6	2/6	2/6	2/7	2/8	2/8	2/8	
	30" (762)	3/2	3/2	3/2	3/2	3/2	2/4	2/4	2/4	2/4	2/4	2/6	2/6	2/6	2/7	2/7	2/8	2/8	2/8	2/8	2/8	
	36" (914)	3/2	3/2	3/2	3/2	3/3	3/3	3/3	2/4	2/4	2/6	2/6	2/6	2/7	2/8	2/8	2/8	2/8	2/8	2/8	2/8	
	42" (1067)	3/2	3/2	3/3	3/3	3/3	3/3	3/3	3/3	2/6	2/6	2/7	2/7	2/8	2/8	2/8	2/8	2/8	2/8	2/8	2/8	
	48" (1219)	3/2	3/2	4/2	4/2	4/2	4/2	4/2	4/2	3/4	2/6	2/7	2/8	2/8	2/8	2/8	2/8	2/8	2/8	2/8	2/8	
	54" (1372)	4/2	4/2	4/2	4/2	4/2	4/2	3/4	3/4	3/4	2/7	2/8	2/8	2/8	2/8	2/8	4/4	2/8	2/8	2/8	2/8	
	60" (1524)	4/2	4/2	4/2	4/2	4/2	3/4	3/4	3/4	4/4	4/4	2/8	2/8	2/8	4/4	4/4	4/4	4/4	2/8	2/8	2/8	
	66" (1676)	4/2	4/2	4/2	4/2	4/3	3/4	3/4	3/4	4/4	4/4	4/4	2/8	2/8	4/4	4/4	4/4	4/4	4/4	2/8	2/8	
	72" (1829)	4/2	4/2	4/2	4/2	4/3	3/4	3/4	3/4	4/4	4/4	4/4	2/8	4/4	4/4	4/4	4/4	4/4	4/4	4/4	2/8	
84" (2134)	4/2	4/2	4/2	4/2	4/3	3/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4		
96" (2438)	4/2	4/2	4/2	4/2	4/3	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4		
108" (2743)	4/2	4/2	4/2	4/2	4/3	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4		
120" (3048)	4/2	4/2	4/2	4/2	4/3	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4		

Refer to Installation Instructions for Round and Oval Duct Installations: <http://www.ruskin.com/doc/ld/6766>

REMOTE GRAPHIC USER INTERFACE

The Remote User Interface is an available option for the TDP05K. The remote user interface duplicates the controls of the primary probe.

We recommend the REMOTE USER INTERFACE for outside installations such that the user interface can be mounted in a remote location for enhanced ease of setup.

The primary probe is always the interface point with the building automation system.

The remote user interface is connected as another ancillary device to the primary probe.

Wireless option between the remote user interface and primary probe allows the user interface to be powered with 24VAC from a separate source and will duplicate all the features available on the primary display without any wires between the air measurement station and the remote user interface. Distances for wired units up to 500 Feet away are possible and for wireless units up to 200 Feet away are possible depending on the environment where installed.



REMOTE MOUNTING OPTIONS - Examples with 3 probes

Standard Installation	1 Primary Probe and 2 Ancillary Probes. Building Automation connection at Primary Probe.
Remote Wired Primary	1 Remote Primary and 3 Ancillary Probes. Building Automation connection at Remote Primary.
Wired Remote User Interface, with Primary Probe including Display	1 Wired Remote Display, 1 Primary Probe with display and 2 Ancillary Probes. Building Automation connection at Primary Probe.
Wired Remote User Interface, with Primary Probe without Display	1 Wired Remote Display, 1 Primary Probe without display and 2 Ancillary Probes. Building Automation connection at Primary Probe.
Wireless Remote User Interface, with Primary Probe including Display	1 Wireless Remote Display, 1 Primary Probe with display and 2 Ancillary Probes. Building Automation connection at Primary Probe.
Wireless Remote User Interface, with Primary Probe without Display	1 Wireless Remote Display, 1 Primary Probe without display and 2 Ancillary Probes. Building Automation connection at Primary Probe.

SUGGESTED SPECIFICATION

CSI-3 Part Guide Specification is available at <https://www.ruskin.com/model/tdp05k> under Additional Resources.

Furnish and install, at locations shown on plans or as in accordance with schedules, an electronic thermal dispersion type airflow and temperature measuring station. The AFTMS shall be capable of monitoring and reporting the airflow and temperature at each measuring location with up to 16 measuring probes containing 1 to 8 sensor points per probe. AFTMS shall include a primary probe that interfaces with the building automation system (BAS) using BACnet MS/TP, Modbus RTU, or 4-20mA analog outputs reporting velocity and temperature measurements. Probe(s) shall be constructed of an airfoil shaped acid-etch clear anodized 6063T6 aluminum extrusion containing the sensor circuit(s) for low pressure drop and low noise in installed applications. Each moisture resistant flexible polyimide sensor circuit shall consist of thermistors for velocity and temperature. Primary probe user interface shall feature tool-free touch setup through surface membrane label on a hinged enclosure with dust tight or weather resistant construction. Factory calibration of thermal dispersion sensors shall be at 20 points between 0 and 5,000 FPM.

Production of all circuits shall include primary and secondary deionizing wash and include conformal coating.

Complete assembly shall be constructed and calibrated in an ISO 9001 certified facility following strict ISO calibration test procedures. Proprietary cables are not acceptable. For ease of installation, a composite 4 wire cable similar to Connect Air W24182P-2306BL with communications and power in one cable is recommended. Alternatively, communications cable shall be a TSP (Twisted Shielded Pair) 24AWG low capacitance wire and power shall be an 18AWG Pair. Primary Control Probe shall be capable of processing up to 128 (16 probes, 8 sensors/probe each) independent sensing points per AFTMS and shall operate on a Class 2 24VAC/VDC low-voltage supply. Primary Control Probe shall feature a 16 character x 2 line alphanumeric backlit LCD display, digital offset/gain adjustment, continuous performing sensor/transmitter diagnostics and a visual alarm to detect malfunctions. Display shall be field adjustable to display either I.P. or S.I. units. Primary Control Probe output shall include an RS485 interface for BACnet MS/TP or Modbus RTU protocol and also a field adjustable 4-20mA or 2-10 VDC signal across a 500 ohm resistor. All electronic components of the assembly shall be leadfree RoHS compliant. Accuracy shall be based on tests and procedures performed in accordance with AMCA publications 610 and 611. AFTMS shall be in all respects equivalent to Ruskin model TDP05K, advanced thermal dispersion airflow and temperature measuring probe.

i LINKS TO IMPORTANT DOCUMENTS

Document Title
Advanced Thermal Dispersion Airflow
Limited Warranty Document



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