PARAGON CONTROLS INCORPORATED

Technical Data Sheet

MTSE Multi-Trans Smart Ecosystem

- Measure, Sum, and Report up to 3 Systems (i.e. SA, RA, and OA) using 1 MTSE with up to 10 Sensors
- Measure up to 4 Differential Pressure Points such as Filter Loading (i.e. Pre and Final Filter)
- Variable Sensor Configurations (i.e. 2 SF / 2 RF / 1 OA / 2 Filters, or 3 SF / 2 RF / 2 Filters, or 1 OA / 2 Filters etc.)
- Connects to Piezometer Rings Eliminating Fan Inlet Obstructions
- User Friendly Color Touchscreen and Menus
- Field Configuration Available with Intuitive Setup Wizard
- Single Point Comm Connection to BMS or Local Controller via Field Selectable BACnet or Modbus Protocols

MTSE MULTI-TRANS SMART ECOSYSTEM

The **M**ulti-**T**rans **S**mart **E**cosystem (MTSE) is a flow and pressure transmitter that has been engineered to provide a cost effective solution for accurate (±0.50% F.S.) airflow measurement of up to three systems; perfect for air handling or rooftop units requiring supply and return fan/fan array and outside air intake monitoring. The MTSE can connect to each fan's existing piezometer-ring airflow sensors or to field installed airflow stations. The MTSE can simultaneously measure up to four additional differential pressure sensing points such as pressure drop across filters or coils, duct static pressure, and plenum pressure. The MTSE is available with up to ten sensing points used for flow and/or pressure.

The total (summed) airflow rate for up to three individual flow systems and up to four differential pressure points is indicated on a 3.5-inch, Human-Machine-Interface (HMI) touch screen; individual flow and pressure sensing values are also accessible via touchscreen menus. The total airflow rate of each system is available to the Building Management System (BMS) or local controller via dedicated field selectable 0 to 10 VDC or 4 to 20 mA analog outputs and via field selectable BACnet®-MS/TP Master or Modbus® RTU Slave network communications. Independent flow and pressure values for each of the ten sensing points is also available to the BMS or local controller via network communication.

Additional Features

- Local display of each fan's airflow rate as well as the total airflow rate for each array
- Measurement of min and max OA flow rate for economizing
- Field Selectable Modbus RTU Slave & BACnet®-MS/TP Master Communication, Standard
- Standard impact resistant, flame retardant Polycarbonate NEMA 4X and IP66 rated enclosure
- ±0.50% F.S. Accuracy
- Super-K Factor to eliminate need for individual manufacturer's fan coefficients or area factors
- Calibrated using NIST Traceable Reference Standards
- Easy and intuitive 3.5-inch touchscreen display
- Software updates via MicroSD
- True AutoZero (optional)
- User defined high and low airflow alarm visual and BMS/BAS indication

SPECIFICATIONS

Performance Specifications

Flow Summation	Up to 3 Unique Systems (i.e. SA/RA/OA)
Sensing Points	Up to 10 Unique Transducers
Pressure Sensing Points	Up to 4 Transducers (i.e. Filter Loading)
Accuracy	+/- 0.50% F.S.[1]
Long Term Stability	0.15% F.S. Annually
Standard Response Time	1 second
Warmup Temperature Shifts	+/- 0.2% F.S. Span[2] +/- 0.2% F.S. Offset[2]
Proof Pressure	100 in. H20
Burst Pressure	300 in. H20
Pressure Media	Non-corrosive, non-ionic dry gases and air
Alarm	User defined high and low
Display	3.5" Capacitive Touchscreen

Note[1]: Accuracy includes typical linearity, hysteresis & repeatability.
Note[2]: Temperature shift relative to 77°F

Electrical Specifications

Power Requirements	20 - 28VAC/VDC
Circuit Protection	Polarity Protected Self-Resetting Fuse
Power Consumption	8.5 Watts, 15.3 VA Max
Digital Outputs	(2) Open Collector Digital Outputs
Digital Inputs	(2) Dry Contact Digital Inputs
Analog Outputs	(3) 12-bit Analog Outputs Field Selectable 0-10V & 4-20mA Overvoltage and Overcurrent Protected
Analog Inputs	(3) 12-bit Analog Inputs Field Selectable 0-5V, 0-10V & 4-20mA
Terminal Blocks	Pluggable Screw Type
Wiring	16 to 24 AWG

Environmental Specifications

Operating Temperature	-4°F to 158°F (-20°C to 70°C)
Temperature Compensated Range	-4°F to 158°F (-20°C to 70°C)
Storage Temperature	-40°F to 176F (-40°C to 80°C)
Operating Humidity	0 to 95% RH (non-condensing)

Physical Specifications

Pressure Connections	1/4" OD Barbed Brass Fittings
Dimensions	9.50" L x 5.69" W x 3.56" H
Enclosure	IP-66, NEMA 4X Rated Fire Retardant Impact Resistant Polycarbonate
Mounting	Built in top and bottom mounting tabs 1/4" Through hole
Outer Connections	Molded opening for 1/2" conduit fitting
Weight	2lbs

Compliance

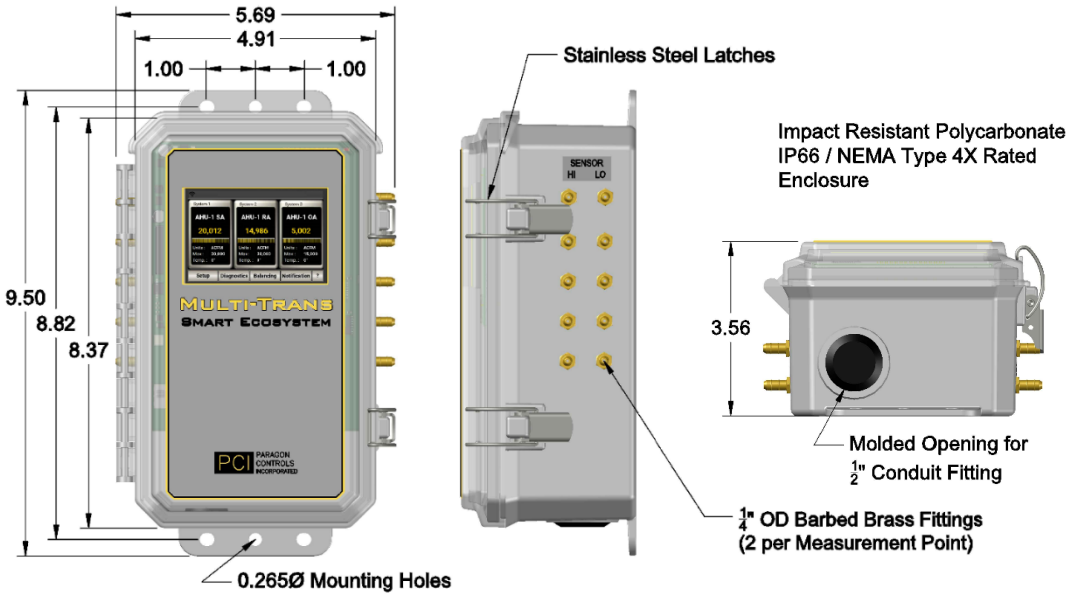
UL	Conforms to UL 94 V-0 Conforms to UL 50E
CE	RoHS directive 2011/65/EU REACH 1907/2006/EC Low Voltage Directive 2014/35/EU EMC Directive 2014/30/EU
Conflict Minerals	DRC Conflict Free
FCC	FCC Part 15, Subpart B
BACnet	Application Specific Controller B-ASC

Communications

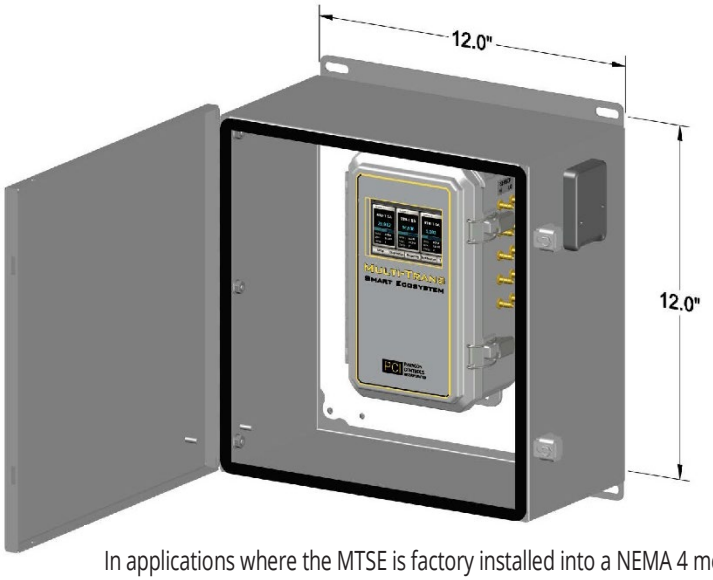
Hardware	EIA-485
Supported Protocols	Modbus RTU Slave, BACnet MS/TP
Modbus RTU data bits	8
Modbus RTU parity	None
Modbus stop bits	1
Max communication length	4000 ft. (EIA-485)

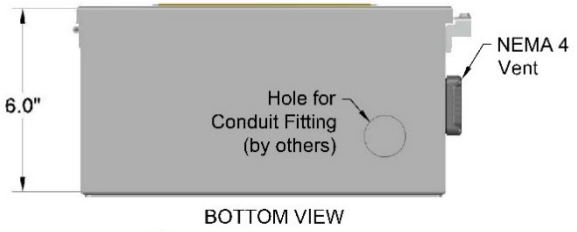
ENCLOSURE OPTIONS

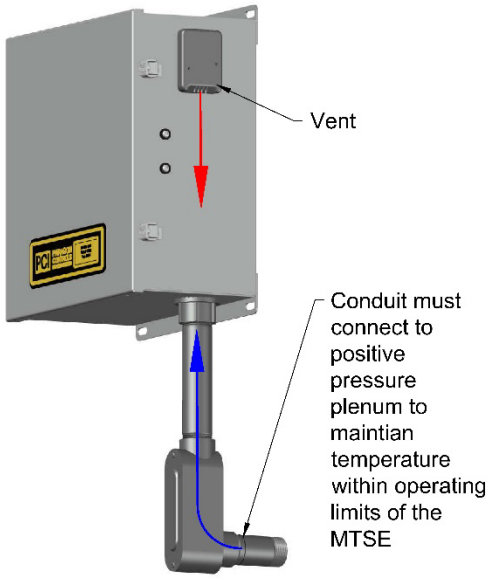
Indoor Installation (Standard) - NEMA 4X enclosures are offered as standard construction for installations located Indoors or within a conditioned space. The MTSE can be mounted near the supply/return/exhaust fans reducing the pneumatic tubing runs. Since the MTSE comes standard in a polycarbonate NEMA 4X enclosure it can also be mounted in the OA intake where it may be exposed to rain/snow or near cooling coils, providing flexibility in the mounting location. All wiring or conduit connections will be made in the field as required.



Outdoor Installation (Optional) - For installations located outdoors exposed to direct sunlight or in areas exposed to temperature fluctuations outside the recommended Operating Temperature Limits, the MTSE will be located within a NEMA 4 rated metal enclosure protecting it and the pneumatic tubing connections from UV light and a NEMA 4 rated panel vent will be provided for ventilation. Careful consideration must be given for sizing the conduit(s) to accommodate the multiple pairs of pneumatic tubing.



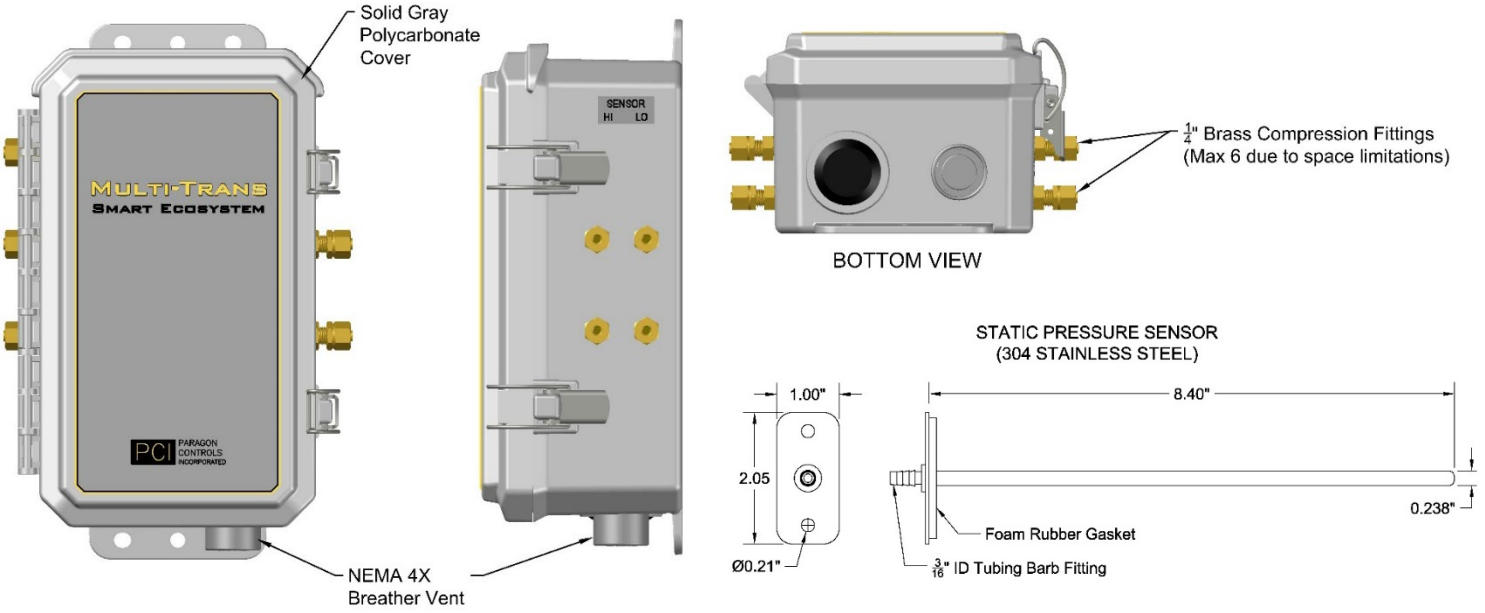




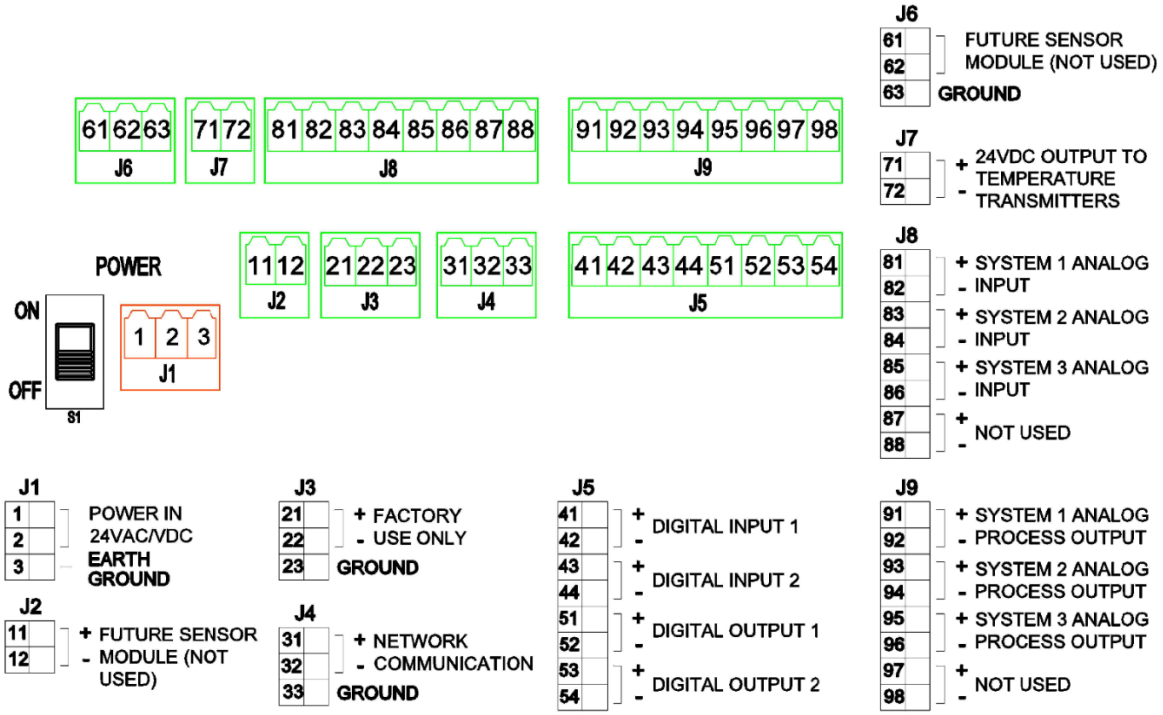
In applications where the MTSE is factory installed into a NEMA 4 metal enclosure, it is required to field install a NEMA 4 rated conduit connection between the MTSE panel and a positively pressurized section of the AHU (typically the supply air plenum). This process allows for conditioned air to travel through the conduit connection into the MTSE enclosure and purge out the factory supplied vent.

ACCESSORIES

The MTSE has the following accessories as shown below: solid label and blank cover made of solid gray polycarbonate, NEMA 4X breather vent, ¼" brass compression fittings, and stainless steel static pressure sensor for Dp measurement. Accessories may be ordered individually.



ELECTRICAL CONNECTIONS



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SPECIFICATION GUIDE

1.1 Airflow and Pressure Measurement Systems

A. Airflow Sensors:

i. Fan/Fan Array: Fan manufacturer shall provide airflow measurement pressure taps for each individual fan. If pressure taps are not available for the fans being supplied, the use of Pitot-type fan inlet airflow sensors is acceptable. Basis-of-Design Product: Subject to compliance with requirements, provide Paragon Controls Inc.; FE-1050 or equal as approved by the Engineer.

ii. Outside Air Intake/Duct Systems: Airflow stations shall consist of multiple Pitot-type airflow sensors, factory mounted and pre-piped in a casing designed for flanged connection to ductwork, control dampers, louvers, etc. Sensor density shall comply with ANSI/ASHRAE Standard 111 for equal area traversing. Airflow stations with low sensor densities such as thermal dispersion and single or dual point differential pressure sensors are not acceptable. Subject to compliance with requirements, provide Paragon Controls Inc.; FE-1500 or equal as approved by the Engineer.

B. Airflow/Pressure Transmitters:

Each transmitter shall be designed to measure, sum, and report the flow rate of up to three systems (such as supply air, return air, and outside air) with up to ten flow sensing points (such as fans/fan arrays, outside air intakes, and duct systems) and measure up to four additional independent differential pressure sensing points (such as pressure drop across filters or coils, duct static pressure, and plenum pressure) with an accuracy of ±0.50% of full scale. The transmitter shall be housed in a hinged compact NEMA4X enclosure to provide flexibility in mounting location. Transmitter shall include a color touchscreen with on-screen keypad and setup wizard allowing for simple field configuration when required. Connection to the airflow sensor shall be by plenum tubing; flow sensors requiring transmitter connection using proprietary electrical cabling are prohibited. The total (summed) airflow rate for each system shall be available to the Building Management System (BMS) or local controller via dedicated field selectable 0 to 10 VDC or 4 to 20 mA analog outputs and via field selectable BACnet®-MS/TP Master or Modbus® RTU Slave network communications. Independent flow and pressure values for each of the ten sensing points shall also be available to the BMS or local controller via network communication. Transmitter software shall be upgradeable using MicroSD card. Basis-of-Design Product: Subject to compliance with requirements, provide Paragon Controls Inc.; MTSE or equal as approved by the Engineer.