



MICROTRANS^{II} DIFFERENTIAL PRESSURE AND AIRFLOW SIGNAL PROCESSOR

DESCRIPTION

The **MicroTrans^{II}** signal processor utilizes current state-of-the-art digital microprocessor technology capable of producing overall $\pm 0.1\%$ accuracy with unequaled 24-bit (16,777,216 steps) A/D and 12 bit (4,096 steps) D/A signal conversion resolution. Having twelve-point linearization, the **MicroTrans^{II}** can accurately determine true airflow rates even when the primary airflow measurement stations do not meet their minimum installation requirements.

The ultra-low 0.03" w.c. differential pressure (693 fpm) full scale operating range and the auto zeroing function of the **MicroTrans^{II}** provides accurate airflow measurement down to 100 fpm.

The **MicroTrans^{II}** accepts a temperature input signal for air temperature indication, temperature signal transmission for remote readout, and air density compensation for standard or actual airflow calculations.

Field configuration of engineering units, process noise filtering, operating range, alarm set points, etc., are performed via user friendly menus and a six button touch pad. A password protected Tech Configuration menu provides quick and simple field configuration by authorized personnel. Device monitoring and configuration can also be performed by a building management system through LonWorks®, BACnet®-MS/TP Master, or Modbus® RTU Slave communication network.

The **MicroTrans^{II}** offers an optional controller that utilizes a proprietary algorithm which results in true three mode control incorporating proportional band, integral (reset) and inverse derivative (P, I, 1/D) controller functionality and tuning. The controller will provide responsive modulation of a control damper or variable speed drive guaranteeing that a constant airflow or pressure is maintained.

Features

- $\pm 0.25\%$ full scale accuracy (standard)
 $\pm 0.10\%$ full scale accuracy (optional)
- Full scale ranges as low as 0.03" w.c. (7.47 Pa) differential pressure or 693 fpm (3.52 m/s) velocity
- Excellent resolution:
24 bit (16,777,216 steps) A/D
12 bit (4,096 steps) D/A
- LonWorks®, BACnet® Master and Modbus® RTU Slave communications
- Twelve point linearization
- Four point flow correction
- Large back lit LCD for configuration and local indication of the measured process
- Simple field configuration menus
- Controlled access to Tech configuration menus
- Capable of receiving external temperature input for standard and actual air calculations
- Outputs and displays measured value in differential pressure, velocity, or flow
- Field configurable for either English or SI engineering units
- Integral power switch
- Three-mode (P, I, 1/D) controller (optional)
- Display and output hold for high pressure purge applications (optional)
- Economizer Override (optional)
- Auto zeroing function (optional)
- High and low airflow alarms with remote relays (optional)
- NEMA 4X rated enclosure (standard)

MicroTrans^{II} Technical Specifications

Signal Processor

1. Transducer Natural Spans

0 to 0.10"w.c. (24.91 Pa)
 0 to 0.25"w.c. (62.27 Pa)
 0 to 0.50"w.c. (124.54 Pa)
 0 to 1.00"w.c. (249.09 Pa)
 0 to 2.00"w.c. (498.18 Pa)
 0 to 3.00"w.c. (747.27 Pa)
 0 to 5.00"w.c. (1.245 KPa)
 0 to 10.0"w.c. (2.49 KPa)

2. Accuracy

0.25% of full scale (standard)
 0.10% of full scale (optional),
 including linearity, hysteresis,
 deadband and repeatability

3. Operating Range

The operating range is calculated using 30% to 100% of the value entered as full scale range at factory calibration. The operating value entered will represent full scale process output of 5 VDC, 10 VDC, or 20 mA

4. Temperature Effect

Zero: 0.03% of transducer full span per °F (with auto zero option there is no zero effect with temperature)
 Span: 0.03% of transducer full span per °F

5. Temperature Limits

Operating: 32 to 158°F (0 to 70°C)
 Storage: -20 to 158°F (-29 to 70°C)

6. Overpressure Limits

Proof Pressure: 15 psid
 Burst Pressure: 25 psid

7. Humidity Limits

0 to 95% RH, non-condensing

8. Mounting Position Effect

Below 0.5"w.c. (124.5 Pa): ≤ 0.25% full scale
 Above 0.5"w.c. (124.5 Pa): ≤ 0.10% full scale

9. Span and Zero Adjustments

Performed by internally mounted push buttons

10. Auto Zero Option

Frequency is menu selectable between 1 and 24 hours on 1 hour intervals

11. Display Low Pass Filter

Response time to reach 98% of a step change is menu adjustable from 0 to 200 seconds.

12. Output Low Pass Filter

Response time to reach 98% of a step change is menu adjustable from 0 to 200 seconds.

13. Programmable Constants

Constants such as temperature, barometric pressure (altitude), area factor etc. can be easily entered via display menus.

Indication

14. Display

A backlit, graphical LCD providing 8 lines of data display. Also used for programming

Communication

15. Network

LonWorks®
 BACnet MS/TP® Master
 Modbus® RTU Slave

Inputs/Outputs

16. Analog Inputs

Temperature Input: 0 to 10 VDC or 4 to 20 mA 2-wire internally or externally loop powered temperature signal.
 Controller Setpoint: 0-10VDC or 4-20mA.
 Economizer Override: 0-10VDC or 4-20mA.

17. Analog Outputs

Process output signal, optional temperature and controller output signal are jumper selectable 0 to 5 VDC, 0 to 10 VDC, or 4-20 mA.

18. Digital Inputs

Display and process output hold during a high pressure purge cycle or other external events.
 Controller System Start input.

19. Digital Outputs

Optional Hi/Lo Alarm: two single (1 form C) dry contacts rated for 5 amps at 30 VAC/VDC and 10 amps at 120 VAC resistive load

Power

20. Power Supply

20 to 28 VAC/DC

21. Power Consumption

Standard Unit: 4.6 VA at 24 VAC, 2.7 VA at 24 VDC
 Full Options: 10 VA at 24 VAC, 5.5 VA at 24 VDC

22. Circuit Protection

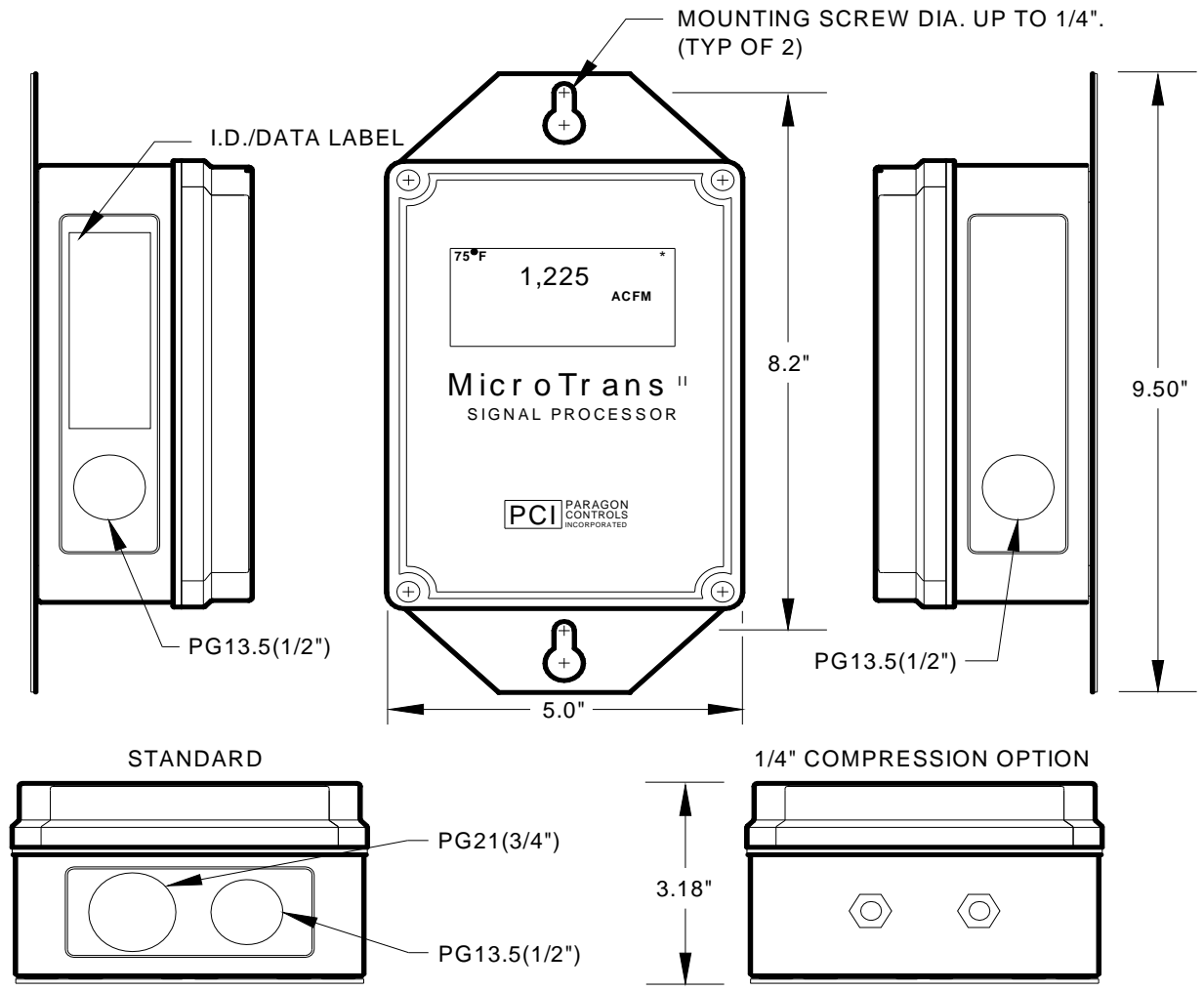
Power input is isolated, reverse polarity protected and supplied with a resettable fuse

Enclosure

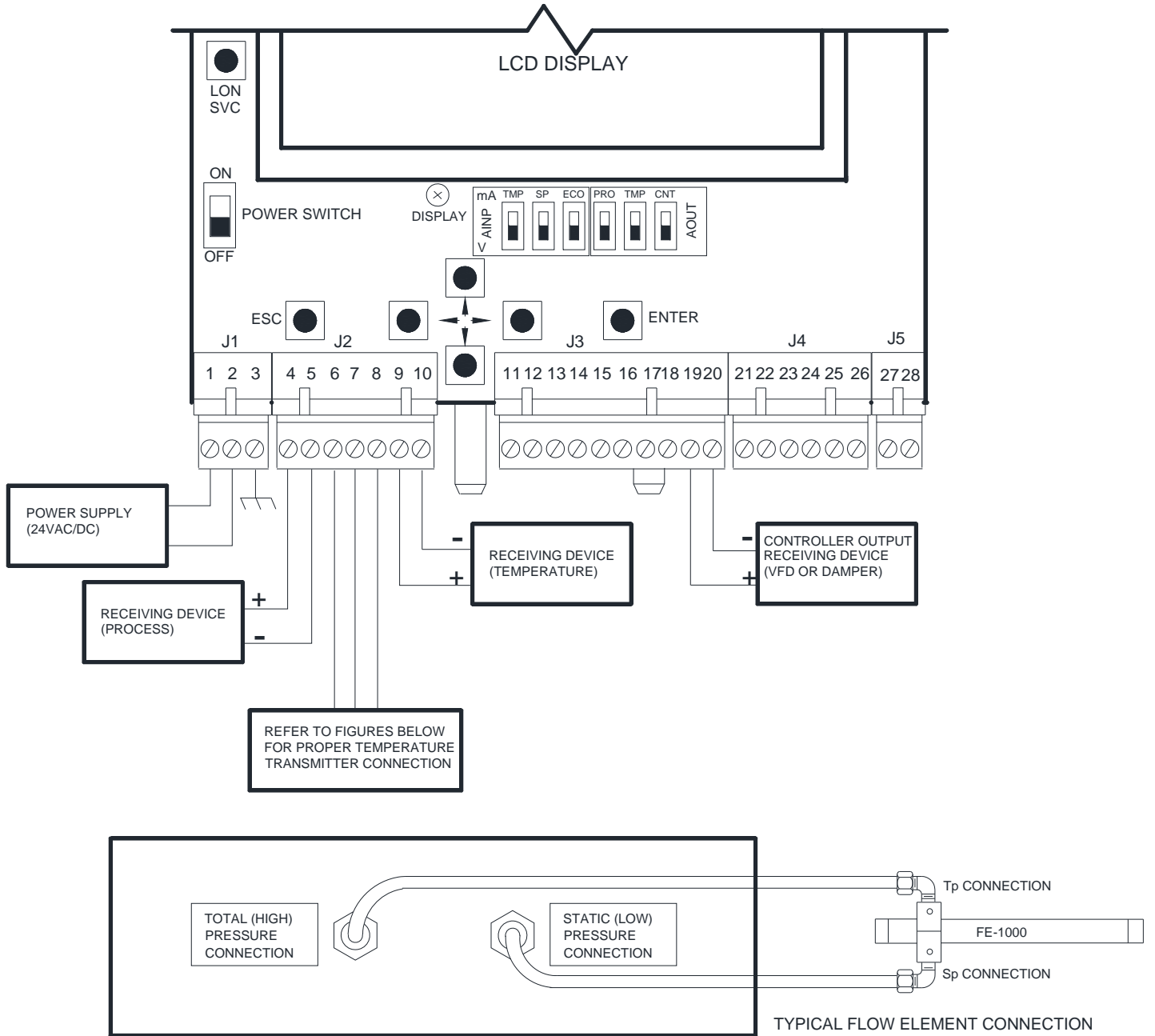
23. UL & CSA Rating

NEMA 4X (standard)
 Material: impact and corrosive resistant
 Dimensions: 9.50"H x 5.0"W x 3.18"D

MicroTrans^{II} Dimensions



MicroTrans^{II} Field Connections



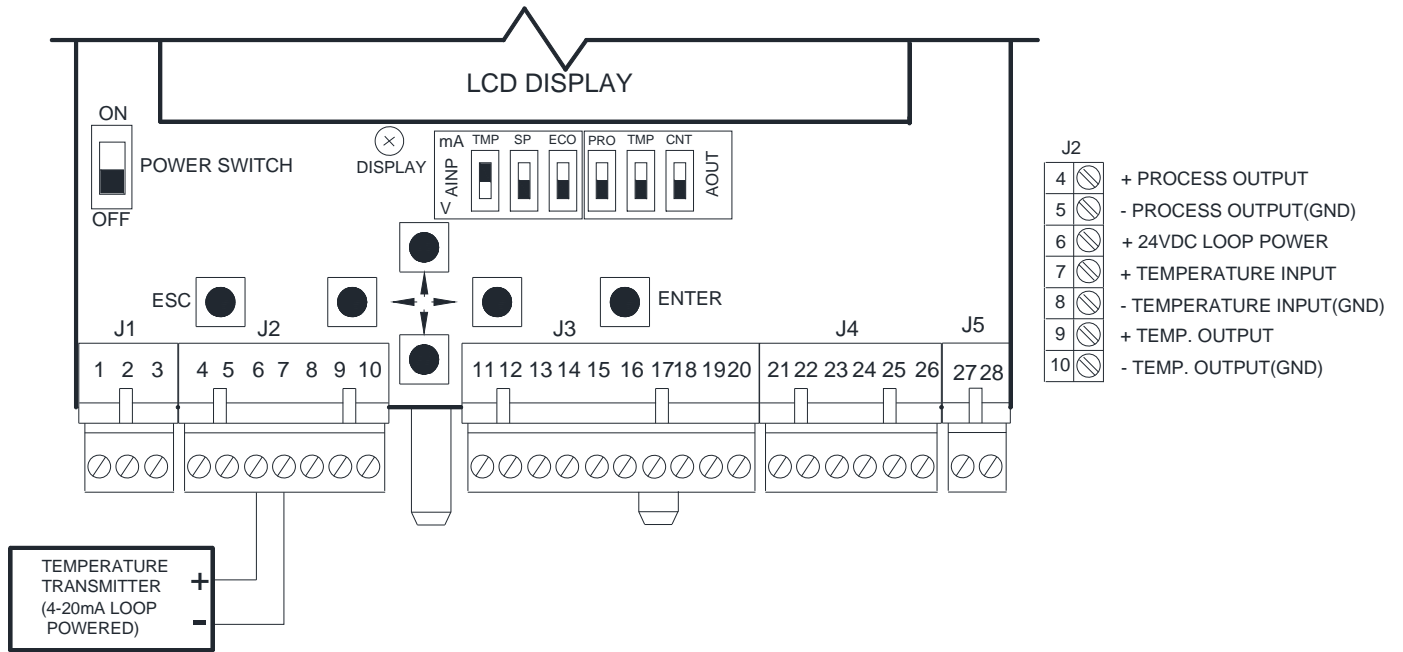
J1	
1	24VAC / DC
2	
3	
EARTH GROUND	
J2	
4	+ PROCESS OUTPUT
5	- PROCESS OUTPUT(GND)
6	+ 24VDC LOOP POWER
7	+ TEMPERATURE INPUT
8	- TEMPERATURE INPUT(GND)
9	+ TEMP. OUTPUT
10	- TEMP. OUTPUT(GND)

J3	
11	+ PURGE HOLD
12	- PURGE HOLD
13	+ SYSTEM START
14	- SYSTEM START
15	+ CONT. SP
16	- CONT. SP
17	+ ECON. OVERRIDE
18	- ECON. OVERRIDE
19	+ CONT. OUTPUT
20	- CONT. OUTPUT

J4	
21	COM
22	NO HIGH ALARM
23	NC
24	COM
25	NO LOW ALARM
26	NC

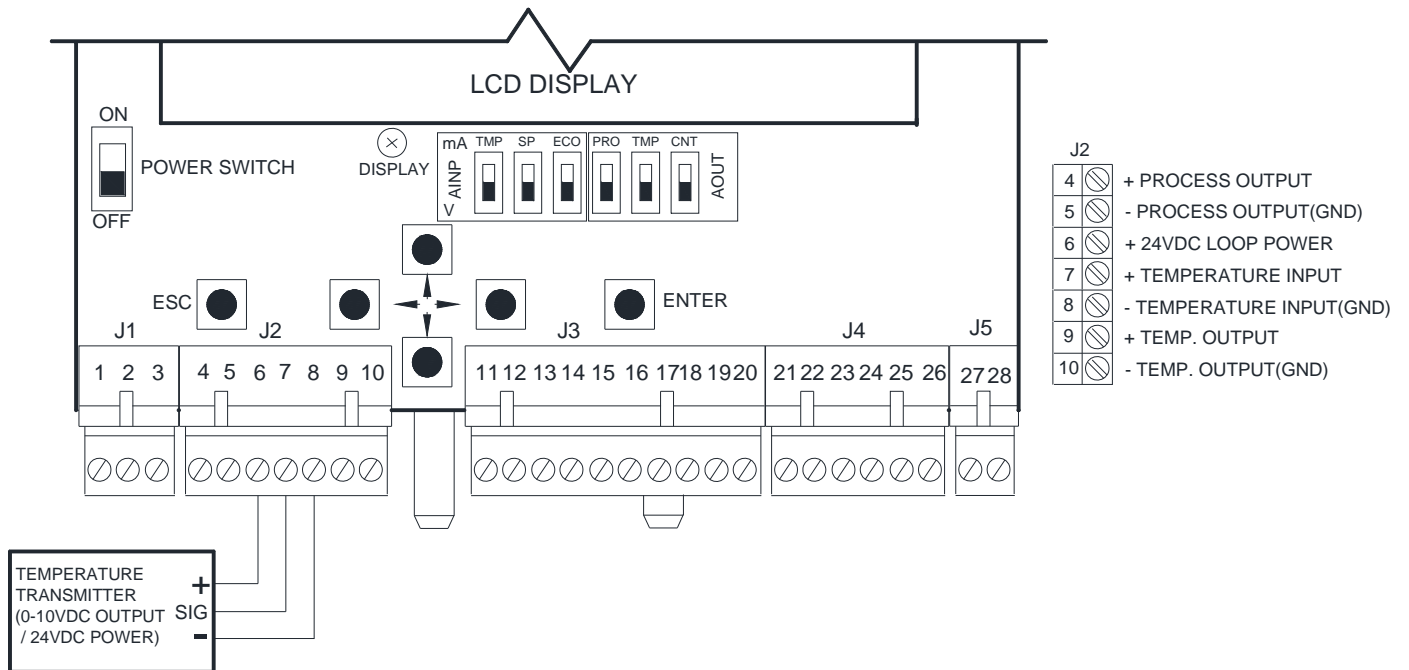
J5	
27	+ NETWORK COMMUNICATIONS
28	- NETWORK COMMUNICATIONS

4-20mA Loop Powered Temperature Transmitter Field Connection



Note: Verify S1 switch (Tmp) is in the mA position.

0-10vdc 3-wire Temperature Transmitter Field Connection



Note: Verify S1 switch (Tmp) is in the V position.

MicroTrans^{II} Specification Guide

Digital Airflow Signal Processors

1. Basis-of-Design Product: Subject to compliance with requirements, provide Paragon Controls Inc.; MicroTrans^{II} or equal as approved by the Engineer.
2. Span: Factory calibrated to match the application.
3. Accuracy: Plus or minus **[0.25] [0.1]** percent of full scale including non-linearity, hysteresis, deadband and non-repeatability.
4. Signal Conversion Resolution: 24-bit A/D and 12 bit D/A.
5. Temperature Effects: Less than 0.03 percent full scale per deg F (Less than 0.054 percent full scale per deg C).
6. Over-pressure: 15 psid proof, 25 psid burst (103 kPa proof, 172 kPa burst).
7. Noise Filtration: Response time to reach 98 percent of a step change adjustable from 0 to 200 seconds in 1 second increments.
8. Output: **[4-20 mA] [0-5 Vdc] [0-10 Vdc]**.
9. Standard twelve-point linearization and four-point flow correction.
10. Large backlit LCD for configuration and local indication of measured process.
11. Field configuration of engineering units, process noise filtering, operating range, and alarm set points utilizing six button touch pad.
12. Password protected Tech configuration menus for authorized personal.

Retain optional features in first six subparagraphs below if required.

13. Automatic Zeroing Circuit: For operating velocities below 1,266 fpm include an automatic zeroing circuit that is field configurable for frequency of activation between one and twenty four hours on 1-hour intervals. Signal processor output shall be locked and maintained at last given output value during automatic zeroing period so as not to interrupt automatic control process. Transmitter shall be auto calibrated to accuracy of plus or minus 1 count.
14. Temperature Compensation: Capable of accepting temperature input signal for air temperature indication, temperature signal transmission for remote readout, and air density compensation for standard or actual airflow calculations.
15. High/Lo Alarm: Contacts indicating low and/or high airflow conditions. Dry contacts shall be rated for 5 amps at 30VAC/VDC and 10 amps at 120 VAC resistive load.
16. Economizer Override: Capable of accepting an Economizer Override input signal to override the controller output signal.
17. Airflow signal processor shall be capable of controlling either a modulating control damper or fan variable speed drive to maintain required air volume or duct pressure. Airflow signal processor shall have menu selectable control mode values and be capable of "In Operation" controller tuning of proportional band, reset (integral), and inverse derivative (P, I, I/D) to match system dynamics. Controller shall also be provided with the following:
 - a. Auto/Manual control output selection.
 - b. Local or remote adjustment of required setpoint value.
 - c. Control accuracy of plus or minus 0.5 percent of full scale.
18. Monitoring and configuration shall be performed through **[LonWorks®] [BACnet®-MS/TP] [Modbus®]** communication networks.

