

Gold Series Thermal Dispersion Airflow/Temperature Measurement Device (ATMD)



GTC116-PD OVERVIEW

The GTC116-PD is **EBTRON**'s top-of-the-line and most accurate Gold Series thermal dispersion airflow and temperature measurement device (ATMD). Equipped with our highest ('D') density probes, this ATMD is ideal for continuous commissioning and other applications where airflow accuracy of 3% of reading or better is required from 0 to 5,000 feet per minute and temperature accuracy of $\pm 0.15^\circ$ from -20° to 160°F in the most advantageous duct locations in the industry. A programmable Alarm feature permits setting Hi or Low limit, Setpoint with hysteresis for airflow or transmitter/probe fault alarms. The ATMD includes the GTC116 industrial grade integrated transmitter and combination analog and RS-485 network output option with field selectable BACnet[®] MS/TP Master, Modbus RTU or JCI N2-Bus[®] interface for communication with virtually all modern building automation systems (BAS).

APPLICATIONS

- OA measurement for dilution control and compliance with **ASHRAE[®] 62.1, 189.1** and **International Mechanical Code Chapter 4**.
- Contributes towards attainment of **LEED[®] Energy and Atmosphere** and **Indoor Environmental Quality** Credits.
- Building, floor or room pressurization.

SYSTEM FEATURES

- **EBTRON** Advanced Thermal Dispersion (TD) airflow measurement technology ensures accurate, repeatable measurement from zero flow (still air).
- Each sensor is factory calibrated at 16 points to **NIST-traceable standards**.
- **EBTRON** proprietary sensor design permits placement in locations typically not possible with other sensing technologies.
- Versatile duct/plenum mount options.
- True average, multi-point, independent sensors.
- Simple push-button user interface for field configuration and diagnostics.

GOLD SERIES
DATA SHEET

GTC116-PD SPECIFICATIONS

System

Installed Airflow Accuracy: .Better than $\pm 3\%$ of reading (typical)
Temperature: $\pm 0.15^\circ\text{F}$ ($\pm 0.08^\circ\text{C}$)
Calibrated Range:0 to 5,000 fpm [25.4 m/s]
Operating Temperature:Probe: -20 to 160°F
[-28.9 $^\circ\text{C}$ to 71.1 $^\circ\text{C}$]
Transmitter: -20 to 120°F
[-28.9 $^\circ\text{C}$ to 48.9 $^\circ\text{C}$]
Operating Humidity Range: .0 to 99% non-condensing;
Transmitter must be protected from exposure to precipitation
Power Requirements:24 VAC (22.8-26.4 VAC) at 12-20 VA (based on sensor quantity)

Maximum Quantity

Probes / Sensing Nodes:4 probes per transmitter; 8 sensing nodes per probe; 16 nodes total max.

Factory Calibrated Sensor

Accuracy:Airflow: $\pm 2\%$ of reading
Temperature: $\pm 0.15^\circ\text{F}$ [$\pm 0.08^\circ\text{C}$]
Probe/Transmitter Cable: . .10 ft. [3.05 m] plenum rated FEP cable, positive locking connector with gold plated pins (Optional cable length of up to 50 feet [15.24m])

Transmitter and Enclosure

Transmitter Construction: . .Heavy duty industrial grade IC's, rugged aluminum chassis and sliding cover
Transmitter Dimensions:9.251 x 6.688 x 2.5 in (HxWxD) [234.98 x 169.87 x 63.5 mm]
Transmitter Mounting:Mounting holes located 0.75 in from top/bottom, and 0.375 from left/right edges on integral mounting plate

Output Interfaces

Analog Output:Isolated analog 0-5/0-10 VDC or 4-20 mA, linear airflow/temperature
Analog Output Resolution: . . .0.025% of full scale
RS-485 Output:Field selectable BACnet[®] MS/TP Master, Modbus RTU or JCI N2-Bus[®]
RS-485 Baud Rate:9.6k, 19.2k, 38.4k, and 76.8k baud
Repeatability:0.25% of reading
Field Calibration Wizard: . . .Automated 1 or 2 point adjustment to factory calibration
Airflow Output Signal Filter: .Field Adjustable 0 to 99% (via push-button interface)
Airflow Low Limit Cutoff: . . .Forces output to zero below a user-specified value
Programmable Alarm:Alarm can be engaged for user defined Hi or Low Limit, Setpoint with hysteresis for airflow or transmitter/probe fault conditions.

Sensor Probes

Probe Construction:Type 6063 gold anodized aluminum or Type 316 stainless steel (SS) optional
Mounting Brackets:Type 304 SS
Probe Dimensions:Alum: 1.1 in [27.94 mm] diameter
SS: 1.125 in [28.575 mm] diameter
Standard Size Ranges:
Insertion/Standoff:8 to 120 in (203.2 to 3048 mm)
Internal Mount:12 to 120 in (304.8 to 3048 mm)

GOLD SERIES TECHNOLOGY OVERVIEW

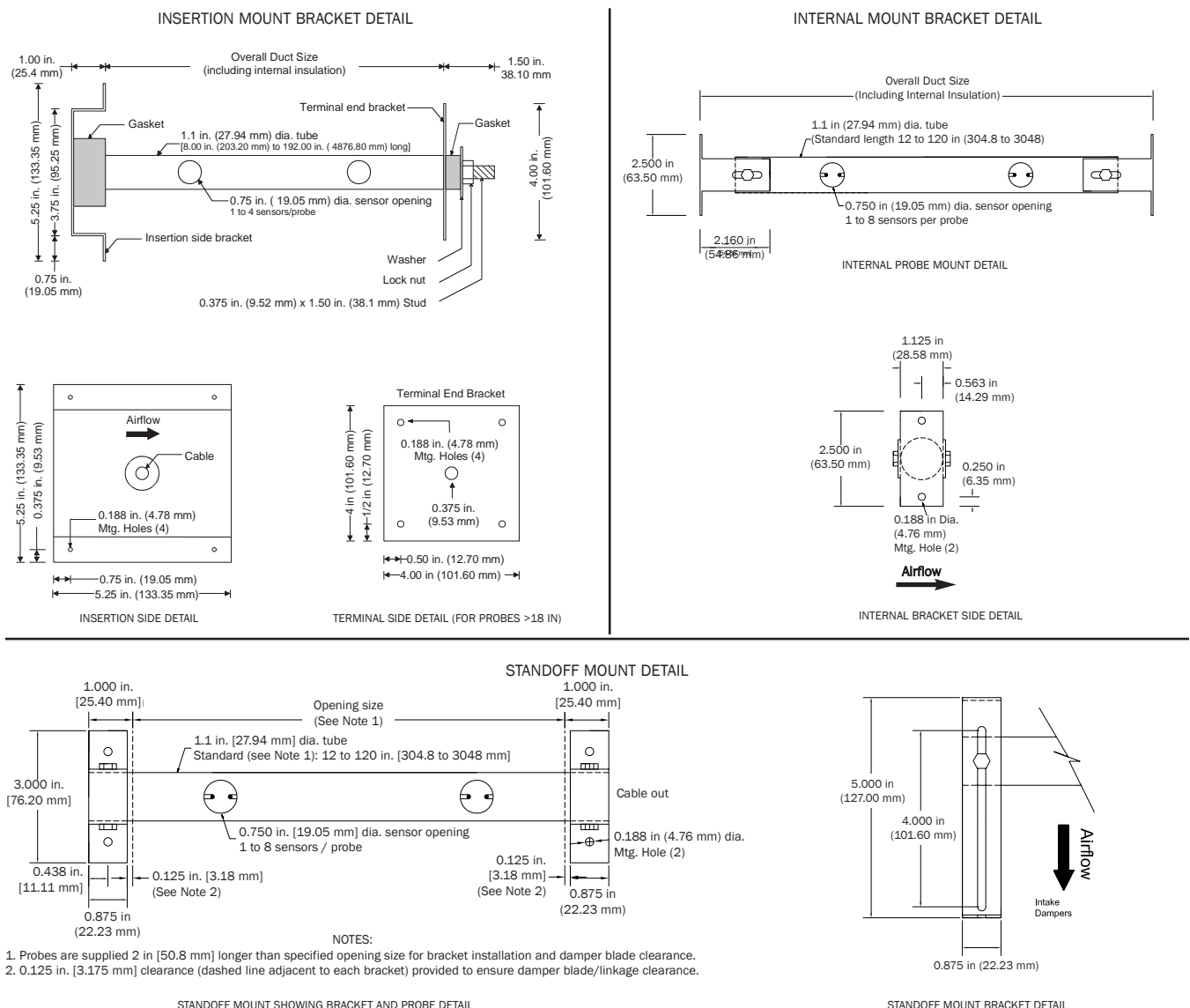
The GTx116 transmitter can process up to 16 individual sensing nodes and requires 24 VAC to provide airflow and temperature measurement outputs. Models are available for concurrent analog and RS-485 (GTC116), analog only (GTA116), RS-485 only (GTN116 with BACnet ARCNET), ethernet (GTE116) and LonWorks (GTL116) output for BAS networks. The transmitter is independent of the sensor probes thus eliminating field matching. The transmitter includes a 16 character LCD display that indicates airflow, temperature and system status, and is also useful during configuration and diagnostic modes. Field configuration and diagnostics are accomplished through a simple push-button interface on the main circuit board for selection of units of measure, display units, output scaling, dampening filter, diagnostics and instrument status. Individual sensor airflow and temperature measurements can be displayed and are beneficial as an HVAC system diagnostic tool.

A built in Field Calibration Wizard permits 1 or 2 point adjustment to factory calibration if required in less than optimum

placement applications. The airflow output signal can be filtered and a process low limit can be set to force the transmitter output to zero when airflow falls below a user defined value. Both features are important for outside air intake applications that can be affected by transient wind gusts at low airflow rates. In addition, an airflow offset and a gain adjustment feature can be engaged for installations where field calibration or adjustment is necessary.

A versatile programmable Alarm feature permits setting an airflow alarm output for Low Limit, High Limit, Setpoint with hysteresis, or can be set to activate in the event of a transmitter or sensor probe fault. **EBTRON's** GP1 sensor probes with proprietary flow loss compensation design are available in gold anodized aluminum (standard) or stainless steel (optional) finishes. Internal and Insertion duct mounting options are available, as well as an adjustable standoff mount for a wide range of damper applications.

PROBE MOUNTING STYLES AND BRACKET DIMENSIONS



TS_GTC116PD_R1A

'D' SENSOR DENSITY TABLES

EBTRON 'D' sensor density is ours highest sensor density, developed for applications that do not meet the minimum placement requirements of the 'C' sensor density, for test laboratories, continuous commissioning and other applications where over-sampling of sensing points is desired or required. The 'D' sensor density is generally not required for most HVAC control applications. To maximize installed performance and accuracy, always follow minimum placement guidelines. The following tables indicate the quantity of probes and number of sensing nodes per probe provided for common rectangular and round/round-oval applications with probes from 12 to 120 inches.

GP1 'D' Sensor Density Tables

Rectangular Probe Sensor Density (# Probes / # Sensors per Probe)

GTx116-PD

		PROBE LENGTH - RECTANGULAR DUCTS															
		12	18	24	30	36	42	48	54	60	66	72	84	96	108	120	
ADJACENT SIDE LENGTH	12	2/2	2/2	2/3	2/3	1/6	1/6	1/8	1/8	1/8	1/8	1/8	1/8	2/6	2/6	2/6	
	18	2/2	2/3	2/3	2/3	2/4	2/4	2/4	2/4	2/4	2/6	2/6	2/6	2/8	2/8	2/8	
	24	3/2	3/2	3/3	3/3	2/4	2/4	2/6	2/6	2/6	2/6	2/8	2/8	2/8	2/8	2/8	
	30	4/2	3/2	3/3	3/3	3/3	3/4	3/4	3/4	4/4	4/4	4/4	2/8	2/8	2/8	2/8	
	36	4/2	4/2	3/3	3/3	3/4	3/4	4/4	4/4	4/4	4/4	4/4	4/4	2/8	2/8	2/8	
	42	4/2	4/2	4/2	4/3	4/3	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	2/8	2/8	
	48	4/2	4/2	4/3	4/3	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	
	54	4/2	4/2	4/3	4/3	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	
	60	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	
	66	4/2	4/3	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	
	72	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	
	84	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	
	96	4/3	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	
	108	4/3	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	
	120	4/3	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	
	144	4/3	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	
168	4/3	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		
192	4/3	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		

Round-Oval Probe Sensor Density (# Probes / # Sensors per Probe)

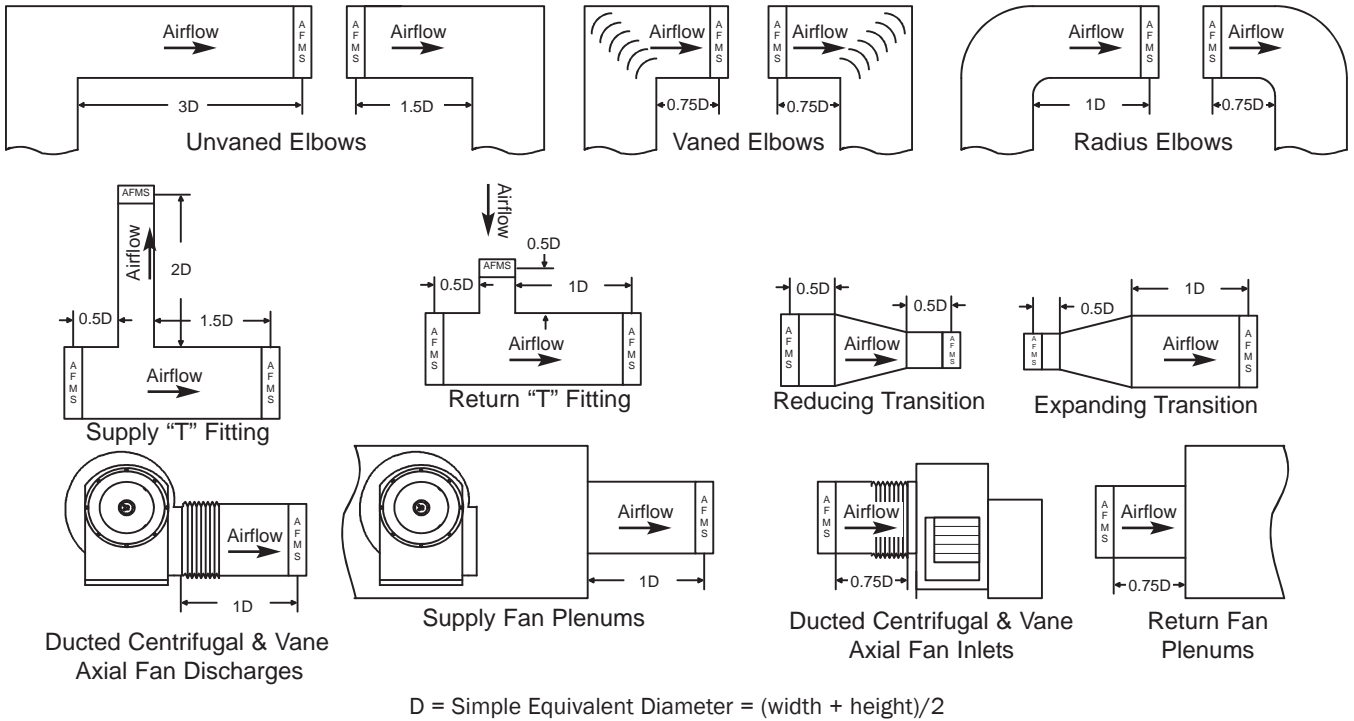
GTx116-PD

		PROBE LENGTH - ROUND-OVAL DUCTS															
		12	18	24	30	36	42	48	54	60	66	72	84	96	108	120	
ADJACENT SIDE LENGTH	12	2b/2	1a/4	1a/4	2b/2	2c/3	2c/3	2c/3	3c/3	3c/3	3c/3	3c/3	3c/3	3c/3	4c/3	4c/3	
	18		2b/2	2b/2	2b/2	2b/2	2b/2	2c/3	2c/3	2c/3	2c/3	3c/3	3c/3	4c/3	4c/3	4c/3	
	24			2b/4	2b/4	2b/4	2b/4	2b/4	2b/4	2b/4	2b/4	2b/4	2b/4	2b/4	2b/4	4c/4	
	30				2b/4	2b/4	2b/4	2b/4	2b/4	2b/4	2b/4	2b/4	2b/4	2b/4	2b/4	2b/4	
	36					3b/4	2b/6	2b/6	2b/6	2b/6	2b/6	2b/6	2b/6	2b/6	2b/6	2b/6	
	42						2b/6	2b/6	2b/8	2b/8	2b/8	2b/8	2b/8	2b/8	2b/8	2b/8	
	48							4b/4	2b/8	2b/8	2b/8	2b/8	2b/8	2b/8	2b/8	2b/8	
	54								4b/4	2b/8	2b/8	2b/8	2b/8	2b/8	2b/8	2b/8	
	60									4b/4	2b/8	2b/8	2b/8	2b/8	2b/8	2b/8	
	66										4b/4	2b/8	2b/8	2b/8	2b/8	2b/8	
	72											4b/4	2b/8	2b/8	2b/8	2b/8	
	84												4b/4	2b/8	2b/8	2b/8	
	96													4b/4	2b/8	2b/8	
	108														4b/4	2b/8	
	120															4b/4	

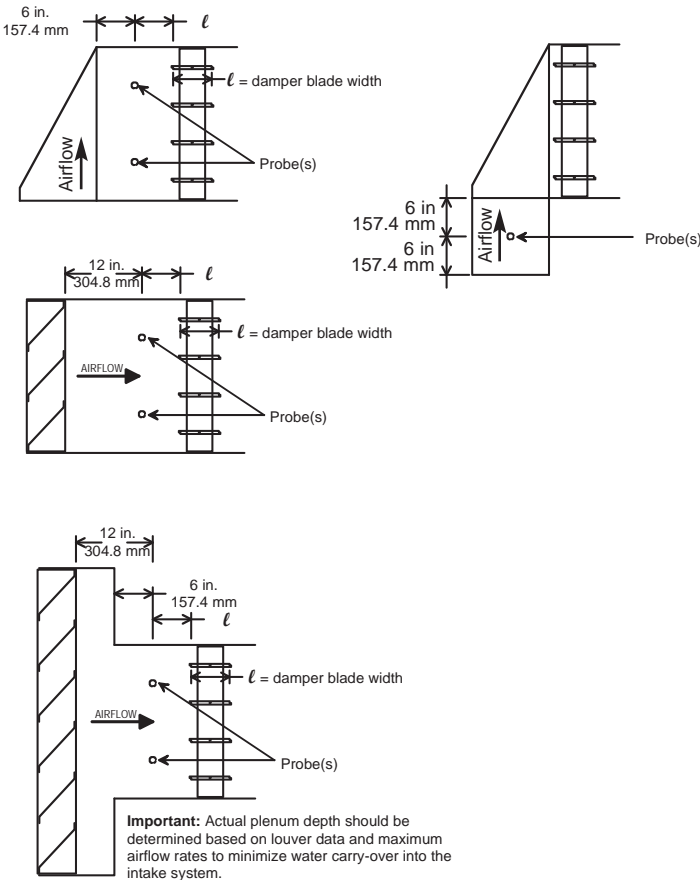
TS_GTC116PD_R1A

'D' SENSOR DENSITY PLACEMENT GUIDELINES

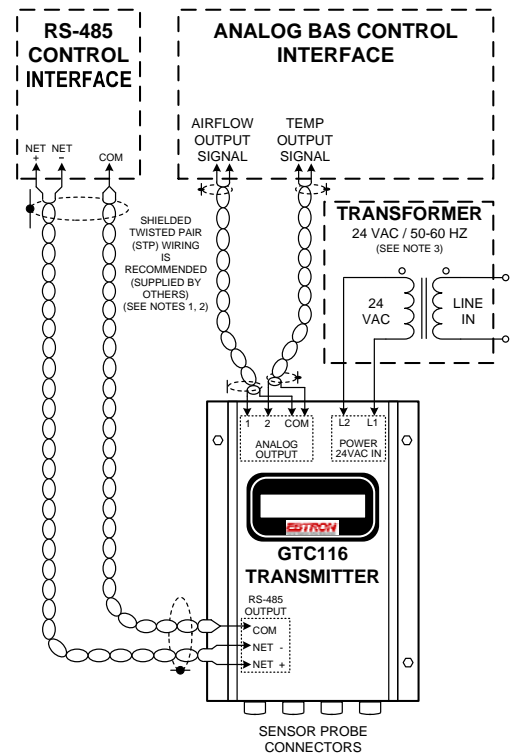
Duct and Plenum Probe Minimum Placement Guidelines ('D' Density Probes)



Outside Air Intake Damper/Plenum Application Guidelines



TYPICAL WIRING DIAGRAM



- NOTES:**
1. CONNECT OUTPUT SIGNAL CABLE DRAINS TO EARTH GROUND AT ONE END OF EACH CABLE ONLY.
 2. RS-485 COM CONNECTION MAY USE A SINGLE CONDUCTOR.
 3. ON MULTIPLE TRANSMITTER INSTALLATIONS WITH A COMMON 24VAC SOURCE, WIRE 24 VAC POWER IN-PHASE TO THE SAME TERMINALS ON ALL TRANSMITTERS (e.g.: L1 to L1, L2 to L2).

TS_GTC116PD_R1A