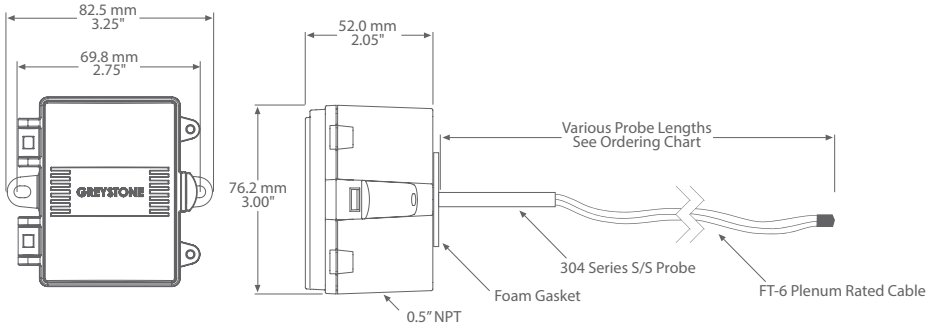
GREYSTONE
ENERGY SYSTEMS INC

FLEX-DUCT AVERAGE NETWORK TEMPERATURE SENSOR



TNDF SERIES

PRODUCT DESCRIPTION

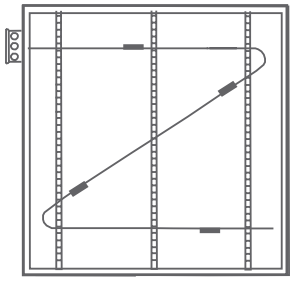
The flexible, multi point duct average network temperature sensor incorporates numerous precision sensors at equal distances across the FT-6 plenum rated cable and is available in various lengths. All probes provide excellent heat transfer, fast response and resist moisture penetration. The transmitter provides a BACnet® or Modbus signal for network connection. A compact ABS enclosure with a hinged and gasketed cover is provided for ease of installation.

TYPICAL INSTALLATION

For complete installation and wiring details, please refer to the product installation instructions.

The flex-duct average probes are installed through a hole in the side of the duct to monitor an average temperature within the duct. Select a probe length that allows for criss-crossing the duct multiple times. Install the probes in a straight section of duct at a suitable distance downstream from any heating, cooling, or humidification devices. **The cable probe needs to be fastened onto hangers using tube clamps or wire ties and should be secured every 100 cm or 3' maximum to prevent movement of the wire and prevent wear. If sensor is to be used in high velocity or vibration environment use of rigid style duct probe is recommended.**

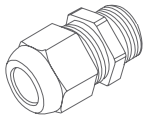
The enclosure provides mounting tabs for ease of installation.



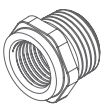
SPECIFICATIONS

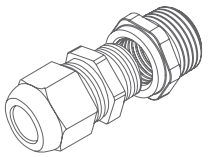
POWER SUPPLY	**BACnet®:** 24 Vac/dc ±10% (non-isolated half-wave rectified) **Modbus:** 24 Vac/dc ±20% (non-isolated half-wave rectified)
CONSUMPTION	**BACnet®:** 25 mA max @ 24 Vdc **Modbus:** 10 mA max @ 24 Vdc
OUTPUT SIGNAL	MS/TP 2-wire RS-485 (BACnet® or Modbus)
OPERATING ENVIRONMENT	-40 to 50°C (-40 to 122°F), 5 to 95 %RH non-condensing
STANDARD LENGTHS	1800mm, 3600mm, 6100mm, 7300mm (6', 12', 20', 24')
PROBE SENSING RANGE	-20 to 60°C (-4 to 140°F)
WIRE MATERIAL	FT-6 plenum rated cable, 22 AWG
WIRING CONNECTIONS	Screw terminal block (14 to 22 AWG)
ENCLOSURE	**A:** ABS, UL94-V0, IP65 (NEMA 4X) **E:** Same as A, with thread adapter (1/2" NPT to M16) and cable gland fitting
COUNTRY OF ORIGIN	Canada
TEMPERATURE	**Sensing Element:** NTC thermistor **Accuracy:** ±0.2°C (±0.36°F) @ 0 to 70°C (32 to 158°F) **Resolution:** 0.1°C/°F
BACnet® COMMUNICATIONS INTERFACE	**Hardware:** 2 wire RS-485 **Software:** Native BACnet® MS/TP protocol **Baud Rate:** 9600, 19200, 38400, 57600, 76800, or 115200 (auto-detect) **Network Address Range:** Locally set to 0-127 **Serial Configuration:** 8N1
MODBUS COMMUNICATIONS INTERFACE	**Hardware:** 2 wire RS-485 **Software:** Native Modbus MS/TP protocol (RTU) **Baud Rate:** 9600, 19200, 38400, 57600, 76800, or 115200 (auto-detect) **Network Address Range:** Locally set to 1-255 (switch selectable) **Parity:** None **Stop Bits:** 1 **Error Checking:** A001 (CRC-16 reverse)
INPUT VOLTAGE EFFECT	Negligible over specified operating range
PROTECTION CIRCUITRY	Reverse voltage protected and transient protected.

ACCESSORIES - INCLUDED WITH E ENCLOSURE OPTION



CABLE GLAND FITTING





THREAD ADAPTER 1/2" NPT TO M16

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BACnet® COMMUNICATION

BACnet® is a data communication protocol for building automation and control networks. The sensor communicates on a standard 2-wire RS-485 MS/TP network designed to run at speeds from 9600 to 115200 baud over twisted pair wiring.

BACnet® is a registered trademark of ASHRAE. ASHRAE does not endorse, approve or test products for compliance with ASHRAE standards. Compliance of BACnet® listed products to the requirements of ASHRAE Standard 135 is the responsibility of BACnet® International (BI). BTL is a registered trademark of BI.

MODBUS COMMUNICATION

Modbus is a network protocol for industrial manufacturing environments. The sensor communicates on a standard Modbus network using the RTU (Remote Terminal Unit) transmission mode. The hardware interface is RS-485.

ORDERING			PART NUMBER
PRODUCT	**TNDF**	Flexible Cable Duct Average Temperature Sensor	**TNDF**
ENCLOSURE	**A** **E**	ABS, with hinged and gasketed cover Same as A, with thread adapter and cable gland fitting	
SENSOR	**20**	NTC Thermistor, ±0.2°C	
PROBE LENGTH	**I** **J** **K** **L**	1800mm (6') 3600mm (12') 6100mm (20') 7300mm (24')	(4 sensors) (4 sensors) (4 sensors) (9 sensors)
COMMUNICATION OUTPUT	**B** **M**	BACnet® Modbus	

NOTE: Greystone Energy Systems, Inc. reserves the right to make design modifications without prior notice.

RoHS COMPLIANT

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