Model TX-FM/FN Sensor Head

Instruction Manual

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Welcome to PureAire Monitoring Systems

I'd like to thank you for investing in our continuous life safety and process control toxic gas monitoring systems.

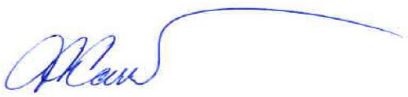
PureAire offers an unbeatable combination of experience and innovation in solving the safety and environmental needs of our customers. We're capable of providing small systems of a few points to a total multi-point turnkey computerized package.

PureAire's proprietary sensor cell technology and state-of-the-art electronics are designed to interface with the latest distributive or PLC based control systems. We believe that our experience, innovative products and commitment to service will satisfy your specific monitoring needs now and in the future.

Our growth is a result of our total commitment to supporting our customers. We're available 24 hours a day, 7 days a week to help you when you need us. Our 24 hour Emergency phone number is 1-224-443-5445. We can provide field service, preventative maintenance programs and training to your technicians in the operation of our equipment. Our goal is to provide the best after sale service and support in the industry. That's just one way PureAire takes that extra step to ensure your complete satisfaction.

Thank you again for investing in PureAire Monitoring Systems for your monitoring needs and I'm proud to welcome you to our family of valued and satisfied customers.

Sincerely,



Albert A. Carrino
President

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1: Introduction

TX-FM/FN series sensor heads are self-contained gas detection systems suitable for a wide range hazardous gases, including ammonia, chlorine, HCl, and hydrogen. Each system consists of an amperometric, electrochemical sensor cell and two-wire transmitter. TX-FM/FN series sensor heads may be used as stand-alone gas detectors or linked to an optional controller (RX-1G) or your own centralized control and surveillance system.

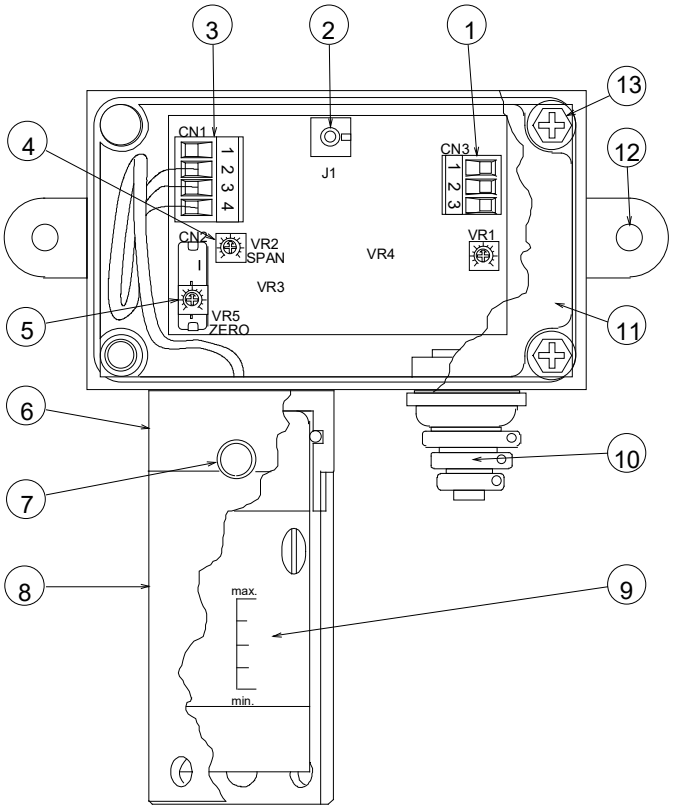
The transmitter is available either with a local display (FM series) or without a local display (FN series).

1.1 Component Identification

1.1.1 Overall System Composition

The TX-FM/FN may be integrated into the overall hazardous gas monitoring system as shown in the following drawing. It may also be used as a stand-alone detection system.

1.1.2 Front View



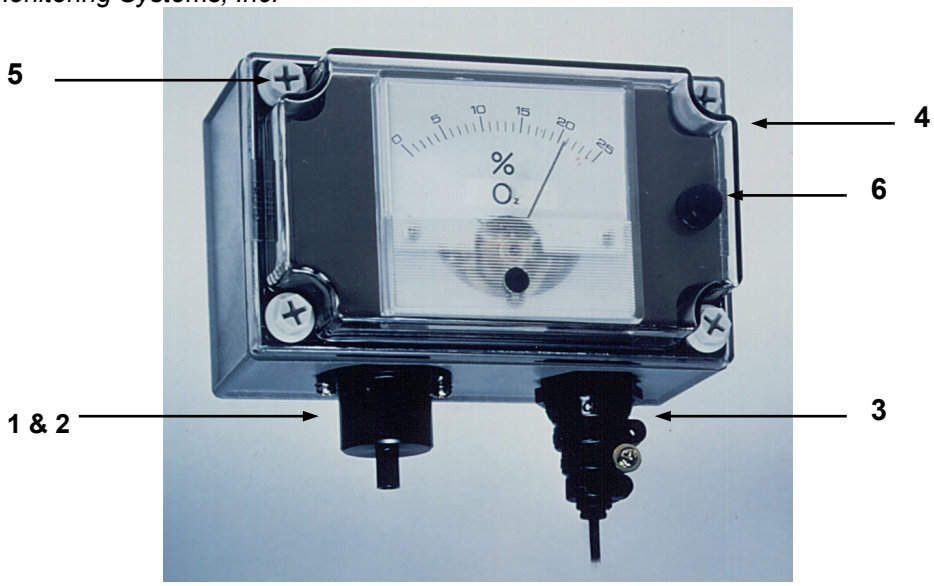
1. **4-20 mA Signal Output Terminal** — This connection serves as both the 4-20 mA output connection and 24 VDC power input connection. See section 3: Installation for more information.
2. **Calibration Jack** — This port is used when calibrating non-display units.

3. **Sensor Cable Terminal Block** — This terminal is used to connect the sensor cable.
4. **Span Potentiometer** — This potentiometer is used to adjust the sensitivity of the sensor cell. It should only be adjusted when calibrating the instrument.
5. **Zero Potentiometer** — This potentiometer is used to adjust the instrument's 4 mA analog output signal to ensure that it is transmitting a 4 mA signal when the instrument is reading a zero concentration. On FM units, this pot is located on the front panel; on FN units, it is located on the left hand connector.
6. **Sensor Holder** — Serves as a mounting bracket for the sensor.
7. **Sensor Fastening Screw** — Holds sensor to the sensor holder.
8. **Sensor Cover** — This cover protects the gas sensor. It threads onto the sensor holder.
9. **Gas Sensor** — An amperometric, electrochemical sensor which detects and measures the target gas. Different gas sensors are required to detect different gases. When exposed to the target gas, the sensor outputs an electrical signal proportional to the gas concentration.
10. **Cable Port** — This is the opening in the transmitter housing for connecting the 4-20 mA output and 24 VDC power cable.
11. **Transmitter Cover** — A removable, waterproof cover that protects the interior of the transmitter.
12. **Mounting Holes** — Mounting brackets/holes are provided on both sides of the transmitter housing as well as within the housing itself to permit convenient wall mounting.
13. **Transmitter Cover Fasteners** — These captive screws secure the transmitter cover in place.

1.2 Component Identification TX-1100FK O_2

1.2.1 Overall System Composition

The TX-1100FK may be integrated into the overall hazardous gas monitoring system as shown in the following drawing. It may also be used as a stand-alone detection system.



1.2.2 Front View

1. **Sensor Cover** — This cover protects the gas sensor. It fastens directly to the transmitter Nema 4X enclosure.
2. **Gas Sensor** — An amperometric, electrochemical sensor which detects and measures the target gas. Different gas sensors are required to detect different gases. When exposed to the target gas, the sensor outputs an electrical signal proportional to the gas concentration.
3. **Cable Port** — This is the opening in the transmitter housing for connecting the 4-20 mA output and 24 VDC power cable.
4. **Transmitter Cover** — A removable, waterproof cover that protects the interior of the transmitter.
5. **Transmitter Cover Fasteners** — These captive screws secure the transmitter cover in place.
6. **Panel Knob** — Pull to unlock and open the front panel. This provides access to the power terminal Phoenix connector.

2: Specifications

➡ **NOTE:** *Due to our commitment to continual product improvement, all specifications are subject to change without notice.*

2.1 Performance Specifications

Models:	**TX-FM** — Single point, with local analog display. **TX-FMD** — Single point, with local digital display. **TX-FHD** — Single point, with local digital display and remote sensor cell **TX-FN** — Single point, without local analog display. **TX-1100FK** — Single point, with local analog display
Sensor Type:	Diffusion type electrochemical cell (2 or 3 wire); plug-in sensors and sensors configured for remote installation also available. TX-1100FK – zirconium oxide sensor cell
Response Time:	Within 30 seconds to T90.
Repeatability:	±10% of full scale.
Fault Indicators:	Loss of VDC power (4 mA signal drops to 0).
Operating Temperature:	14° to 113°F (-10° to +45°C); consult PureAire for lower operating temperatures.
Humidity:	Sensor dependent; typically 20 to 95% RH; consult PureAire for sensors which can operate in 100% condensing RH environments.

2.2 Gas Detection System

Type:	Proprietary electrochemical gas sensor; renewable. Disposable sensors also available.
Sensor Life:	4 to 5 years under normal conditions; 1-2 years for disposable sensors.
Detectable Gases:	Consult PureAire.

2.3 Signal Outputs

Local Display:	**TX-FM** — Analog meter calibrated for the specific target gas. **TX-FMD** — Digital display calibrated for the specific target gas. **TX-FHD** — Digital display calibrated for the specific target gas. **TX-FN** — No local readout. **TX-1100FK** — Analog meter calibrated for oxygen
Analog Output:	DC 4-20 mA (2-wire system). TX-1100-FK DC 4-20mA (3-wire system)

2.4 Electrical Requirements

Power:	24 VDC external power.
Consumption:	Approximately 1.0 watt TX-1100FK - 500mA current ➡**NOTE:** The TX-1100FK O2 monitor requires a 5-minute warm-up.

2.5 Physical Characteristics

Dimensions:	4.9 (W) x 6 (H) x 2.54 (D) inches; 125 x 177 x 75 mm
Weight:	1.1 pounds (0.5 kg)
Enclosure Type:	General purpose IP 65 NEMA 4X; not intended for explosive atmospheres. Optional intrinsic safety barrier available for installation in Class I, Division 1, Group B,C, and D hazardous areas.
Installation Options:	Low temperature sensor enclosure. Bulkhead fittings for remote sensor installation.

3: Installation

3.1 Site Requirements

The TX-FM/FN/FK Sensor Head should be mounted in an area free of vibration and electrical noise or interference. If possible, avoid areas with high temperatures or relative humidity.

The unit should be installed in a location where gas leaks are likely to occur or where released gases may accumulate. Air flow within the monitored area, the characteristics of the target gas (lighter or heavier than air), and the position of work stations and personnel should all be considered in determining the most suitable installation location.

Allow sufficient space around the instrument to permit access for maintenance and calibration.

➡ **WARNING:** *The TX-FM/FN is not designed for installation in hazardous areas. Consult PureAire for information on enclosures for use in hazardous environments.*

3.2 Mounting

➡ **IMPORTANT:** *The TX-FM/FM must be mounted with the sensor pointed directly down. Do not install with the sensor at greater than a 45° angle from vertical. Do not install the sensor cell horizontal.*

The TX-FM/FN is designed primarily for wall mounting and should be installed no closer than 8.85 inches (260 mm) above floor level.

See Section 6 for mounting schematics.

3.3 Sensor Installation

➡ **NOTE***: The following applies to type "D" diffusion sensors only. Consult PureAire for installation information on plug-in type sensors.*

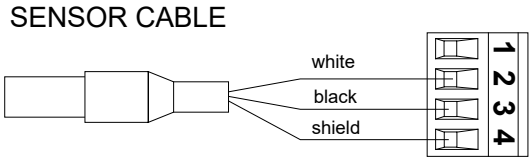
➡ **IMPORTANT:** *Be careful not to turn the sensor or touch the membrane on the bottom of the sensor during installation.*

1. Remove the transmitter cover. It is held in place by captive screws mounted in each of its four corners.
2. Remove the sensor cover by rotating it counterclockwise (right to left).
3. Insert the sensor cable through the sensor holder and into the transmitter housing.
4. Carefully push the top of the sensor into the sensor holder and fasten it in place by gently turning the fastening screw. Do not overtighten!
5. Replace the sensor cover.
6. Connect the sensor cable to the sensor cable terminal block. Depending on the gas being monitored, the sensor cable will have either three or four wires.

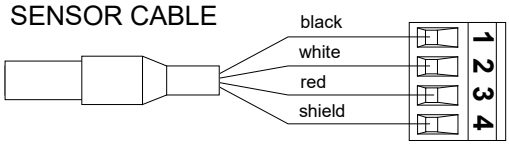
➡ **IMPORTANT:** *Remove the shorting wire or current generator from the black and white sensor cell wires before connecting the sensor cell to the transmitter.*

➡ **NOTE:** *The terminal block may be removed from the printed circuit board to make these connections. Be sure to replace the terminal block securely once all connections have been made.*

Sensor Cable Type	Wire Color	Location
3-Wire Sensor Cable	White Black Shield	Terminal 2 Terminal 3 Terminal 4
4-Wire Sensor Cable	Black White Red Shield	Terminal 1 Terminal 2 Terminal 3 Terminal 4



2-Electrode Sensor Wiring



3-Electrode Sensor Wiring

NOTE: *The TX-1100FK oxygen zirconium sensor cell is supplied permanently connected to the transmitter board.*

3.4 Wiring

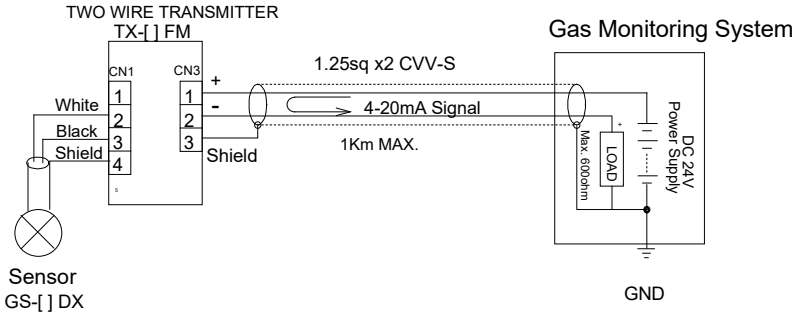
The TX-FM/FN and TX-1100FK uses a three conductor, 18 AWG stranded shielded cable. PureAire recommends the use of a General Cable #E2203S.30.86 or equivalent for analog output and 24 VDC power input. The maximum permissible cable length is 0.62 miles (1 km).

The analog out and VDC power in connections are made on the 4-20 mA signal output terminal inside the transmitter housing. These connections are made as follows:

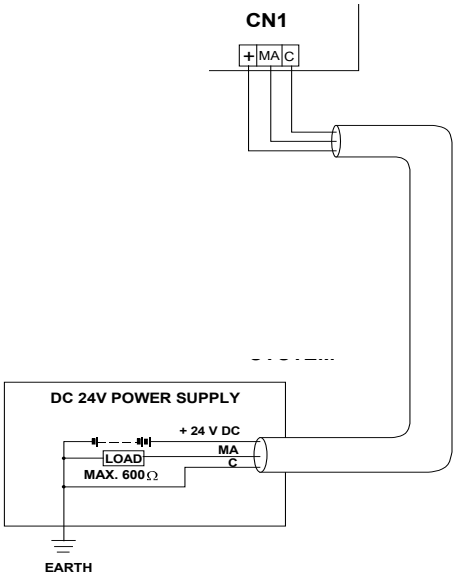
Two wire Transmitter TX-[ ]FM TX-1100FK Oxygen

Terminal Number	Connection	Terminal Number	Connection
Terminal 1	+	Terminal 1	+
Terminal 2	--	Terminal 2	mA
Terminal 3	Shield	Terminal 3	Common

3.4.1 Non-Hazardous Areas



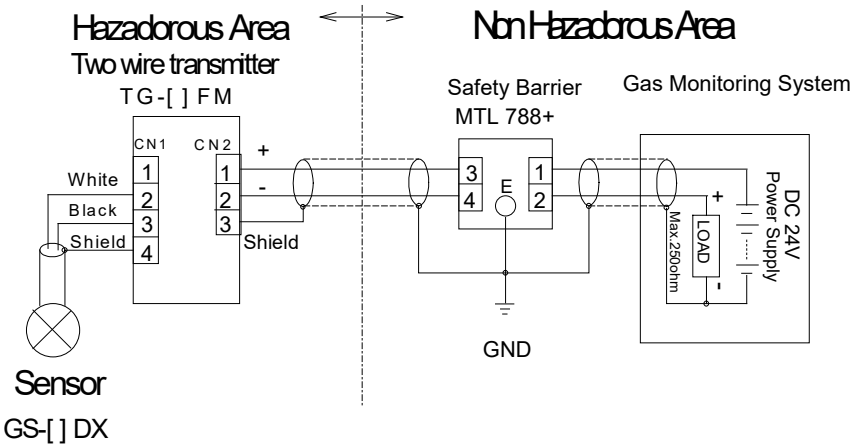
TX-1100FK Oxygen Monitoring System



3.4.2 Hazardous Areas

If the TX-FM/FN transmitter is installed in a Class I, Division 1, Group B, C, or D hazardous area, the optional safety barrier must be installed between the transmitter and control panel.

CAUTION: ***The TX-1100FK O_2 system cannot operate in Class 1 environments.***



3.5 Initial Startup

Once installation of the gas detector has been completed, it is ready for startup. The following procedures should be performed before putting the instrument into operation:

1. Check the integrity of all wiring.
2. Apply 24 VDC power.

The instrument should now be operating properly.

➡**NOTE:** *The TX-1100FK O2 monitor requires up to a 5-minute warm-up. The indicator needle will remain at zero until initial warm-up*

4: Normal Operation

The Model TX-FM/FN Sensor Head is a single point monitor designed for the continuous detection and measurement of hazardous gas leaks.

4.1 Concentration Display and Indicator Lights

➡ **NOTE:** *The following applies to Model TX-FM and Model TX-FMD instruments only. The TX-FN is a non-display unit.*

4.1.1 Concentration Meter

This is a real time display of the measured concentration of the target gas. The target gas and units of measure (PPM, PPB, etc.) are indicated on the front of the instrument.

➡**NOTE:** *Upon initial power up, the TX-1100FK O2 indicator will remain at zero until initial warm-up. Time for warm-up is approximately 3-5 minutes.*

4.1.1 Power LED

This LED is lit when the instrument is operating properly. It will get brighter as the measured gas concentration increases. (Not available on TX-1100FK)

4.1.2 Test Button

This button is used to test the 4-20 mA output signal. When pressed, it outputs a 22 mA signal. (Not available on TX-1100FK)

➡ **CAUTION:** *Disable any connected alarms before testing. Failure to do so will activate any connected alarm contacts.*

4.2 Routine Maintenance Schedule

Continuous gas detection systems depended upon to measure and detect hazardous gas leaks in the workplace require periodic maintenance to ensure proper operation. The frequency with which this routine maintenance is required depends on the environment, since temperature, humidity, gas concentrations, and dust all affect system operation.

The following table is intended to serve as a general guideline for routine maintenance. The conditions in your particular application, as well as your organization's maintenance policies, will ultimately determine the best routine maintenance schedule for your equipment.

4.2.1 Routine Visual Checks

	TX-FM (DISPLAY UNIT)	TX-FN (NO DISPLAY)
Items to check	Check for power and proper operation	Check for power and proper operation
Condition / status when operating properly	Should read "0" when no gas is present	Unit should be outputting a 4 mA signal when no gas is present
Corrective actions	If meter reads higher than "0" in a zero gas condition, adjust as required to the environment	If analog signal is higher than 4 mA in a zero gas condition, adjust as required to the environment
TX-1100FK O2	Meter must indicate ambient O_2 levels of 20.9%. The mA output for normal ambient O_2 level is 17.37mA.	

4.2.2 Recommended Routine Maintenance Schedule

Routine Visual Checks	Monthly
Electrolyte Replacement	Every 6 months *
Sensor O-ring and Membrane Replacement	Every 6 months *
Sensor Calibration	Every 6 months *
TX-1100FK O_2	Test with N_2 every 6 months**

➡ ***NOTE:** Scrubber monitoring systems will require more preventative maintenance due to the harsh scrubber environment. Precipitate build-up and dirt will inhibit the gas transfer to the cell and result in a lower sensor cell signal output.

➡ ****NOTE:** The O_2 monitoring system will always read 20.9% in a normal ambient environment. To test the O_2 monitoring system, subject it to nitrogen and the reading will fall to zero.

4.3 Loss of Power Indicator

In the event the TX-FM/FN Sensor Head loses VDC power, the 4-20 mA analog output signal drops to 0.

5: Maintenance & Calibration

Maintenance and calibration should be performed only by qualified personnel.

5.1 Sensor Cell Removal and Installation

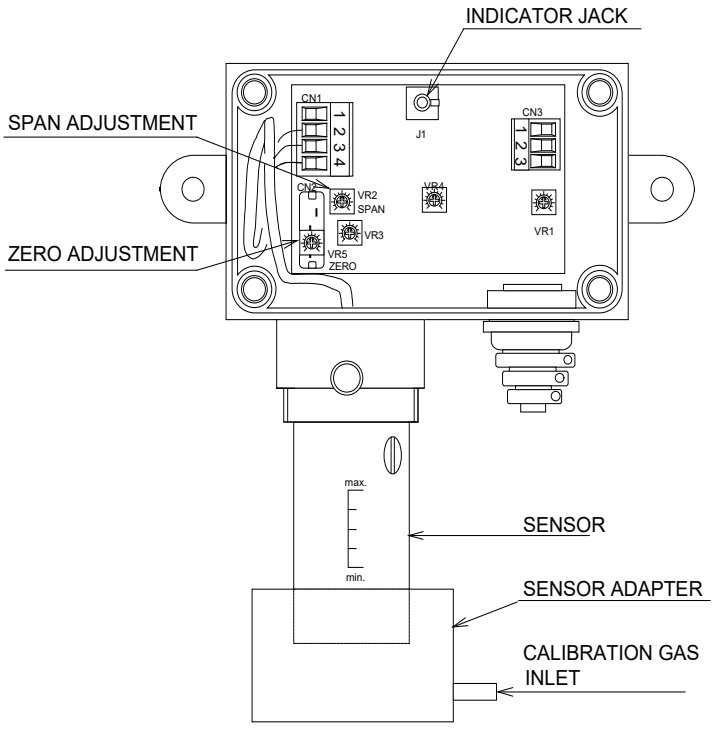
5.1.1 Sensor Removal

1. Remove the cover from the transmitter housing.
2. Unplug the sensor connection terminal block from the printed circuit board.
3. Remove the sensor cover by rotating counter-clockwise (right to left).
4. Loosen the sensor fastening screw.
5. Pull the sensor out of the sensor holder.

➡ **CAUTION:** *Do not twist the sensor; this may loosen the cap covering the working electrode.*

➡ **CAUTION:** *Avoid spilling electrolyte out of the small opening on the side of the sensor.*

➡ **IMPORTANT:** *Do not touch the membrane at the bottom of the sensor. Oil from your hands or fingers will adversely affect performance.*



➡ **NOTE:** *Zero adjustment pot is located directly on the printed circuit board for the TX-FN. On the TX-FM and FMD, the zero pot is located on the face plate of the instrument.*

5.1.2 Sensor Installation

➡ **NOTE:** *If sensor is supplied with a shorting wire, it must be removed before installation.*

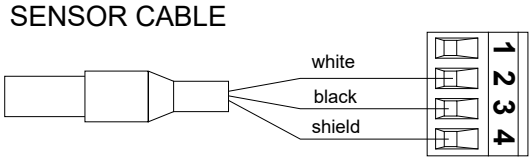
➡ **IMPORTANT:** *Be careful not to turn the sensor or touch the membrane on the bottom of the sensor during installation.*

1. Remove the transmitter cover. It is held in place by screws mounted in each of its four corners.
2. Remove the sensor cover by rotating it counterclockwise (right to left).
3. Insert the sensor cable through the sensor holder and into the transmitter housing.
4. Carefully push the top of the sensor into the sensor holder and fasten it in place by gently turning the fastening screw. Do not overtighten!
5. Replace the sensor cover.
6. Connect the sensor cable to the sensor cable terminal block. Depending on the gas being monitored, the sensor cable will have either three or four wires.

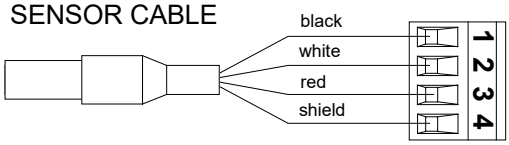
➡ **NOTE:** *The terminal block may be removed from the printed circuit board to make these connections. Be sure to replace the terminal block securely once all connections have been made.*

Sensor Cable Type	Wire Color	Location
3-Wire Sensor Cable	White Black Shield	Terminal 2 Terminal 3 Terminal 4
4-Wire Sensor Cable	Black White Red Shield	Terminal 1 Terminal 2 Terminal 3 Terminal 4

➡ **CAUTION:** *Do not twist the sensor. This may loosen the cap covering the working electrode.*



2-Electrode Sensor Wiring



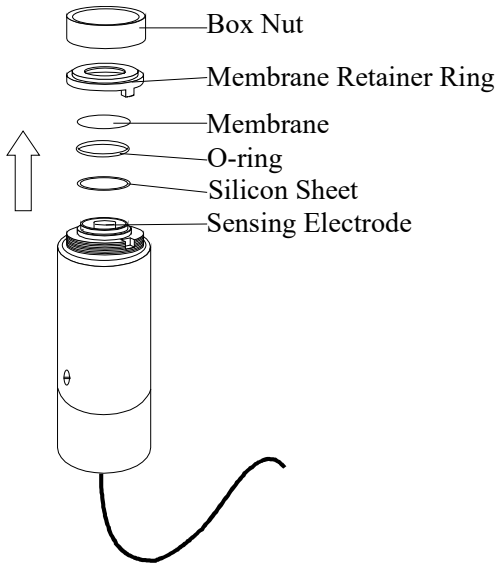
3-Electrode Sensor Wiring

NOTE: *The TX-1100FK oxygen zirconium sensor cell is supplied permanently connected to the transmitter board.*

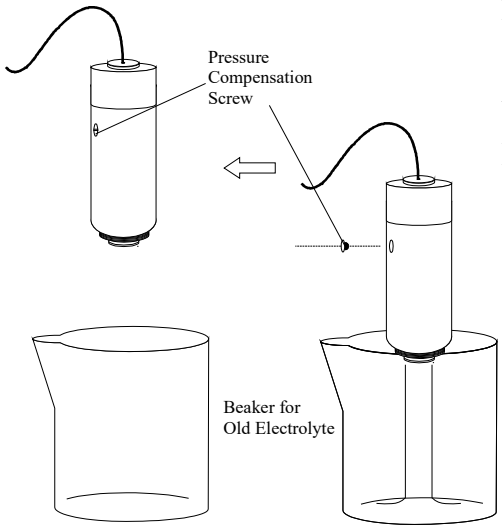
5.2 Electrolyte Replacement (for renewable type sensor cells only)

➡ **CAUTION:** *PureAire recommends wearing protective gloves and safety glasses when replacing sensor electrolyte. Be sure to adhere to your facility's chemical handling guidelines and procedures.*

1. Remove the sensor as outlined in section 5.1.1.
2. Place your finger over the pressure compensation port and turn the sensor upside down. Remove the box nut, membrane retainer ring, membrane, O-ring, and silicon sheet (depending on sensor model).



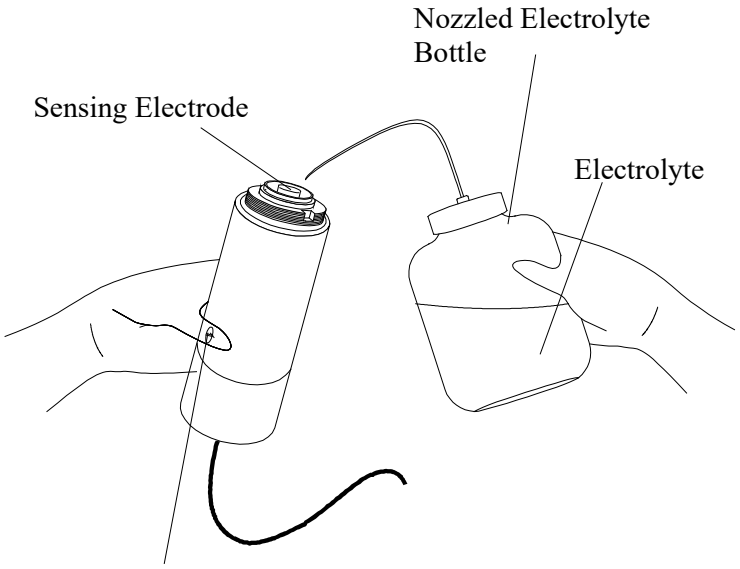
3. Place the sensor over the beaker as shown and pour the old electrolyte into the beaker. Some will remain in the sensor until the pressure compensation plug is removed. Remove the milli seal covering the plug and then the plug to release the electrolyte into the beaker.



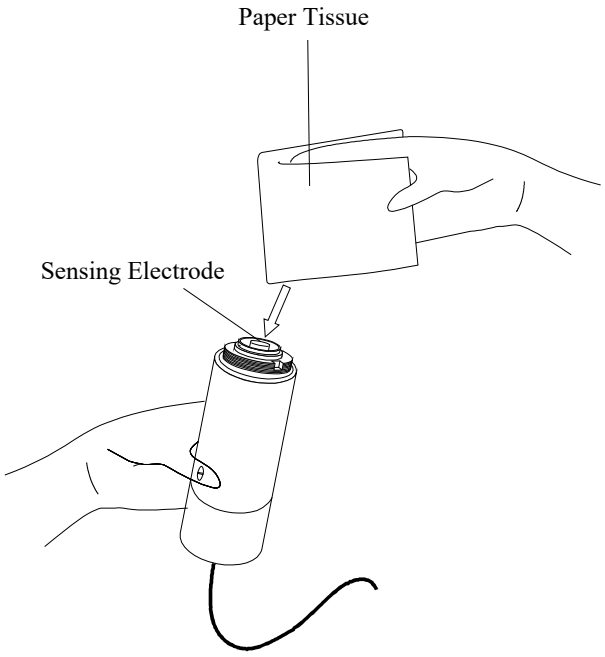
NOTE: The Pressure Compensation Screw has a Teflon membrane fixed to the inside of the screw.

Never remove this membrane.

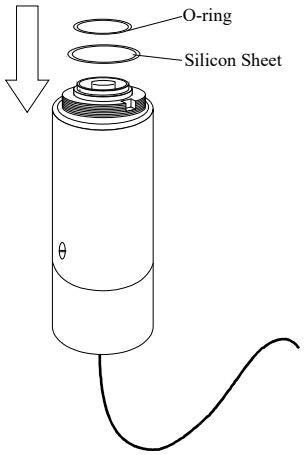
4. Hold the sensor in your hand with the sensing electrode up. Hold a piece of paper tissue over the pressure compensation port with your thumb. Pour 10 cc's of fresh electrolyte into the sensor and rinse. Discard into the beaker.



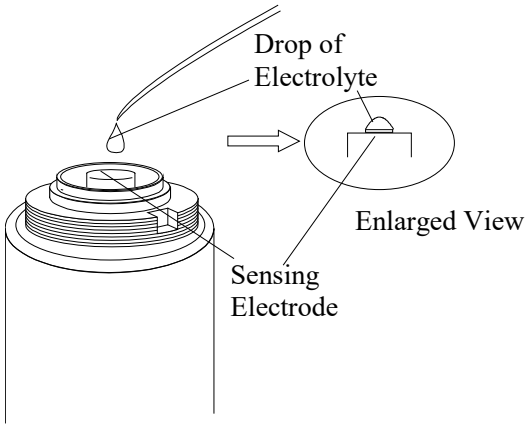
5. Wipe the sensing electrode and the surrounding area with a dry paper tissue.



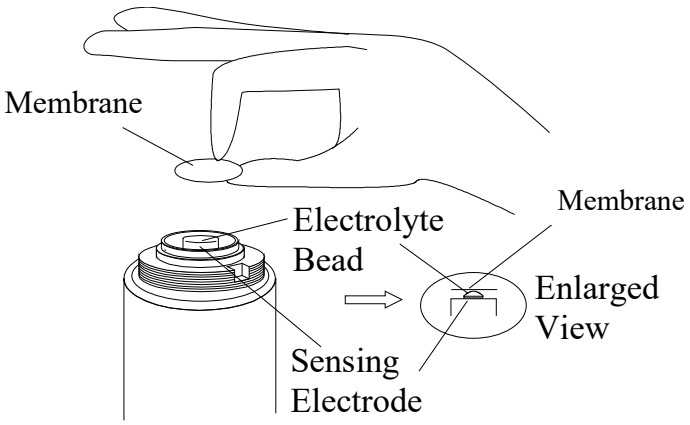
6. Place a new silicone sheet (if used) and O-ring on the sensor. Make sure that the area is dry of electrolyte.



7. Apply a drop of electrolyte on the sensing electrode.



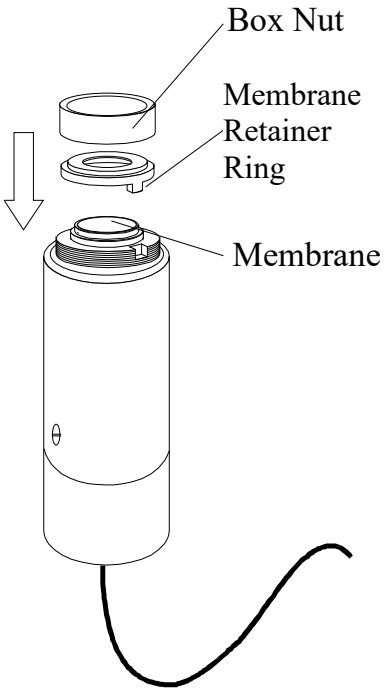
8. Place a new membrane on the sensor, with the bead of electrolyte between the electrode and the membrane.



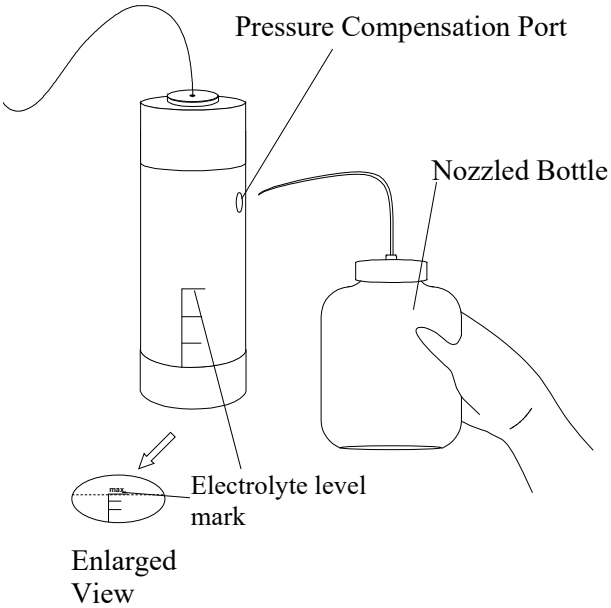
➡ **NOTE**: *Do not touch center of membrane with bare fingers. Oil from your fingers may adversely affect performance.*

9. Place the retainer ring over the membrane and then place the box nut over the retainer ring. Turn box nut clockwise until it is hand tight; continue tightening until the box nut can no longer be moved by hand.

CAUTION: **Sensor cell response will be affected if box nut is too loose.**

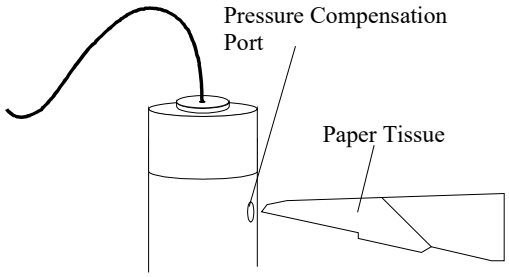


10. Hold the sensor in your hand with the electrode down. Pour fresh electrolyte in until it reaches the MAX. mark.

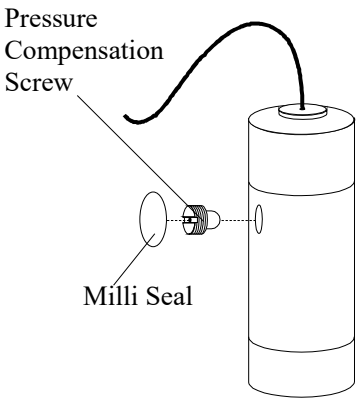


➡ **NOTE:** *MAX. level differs from sensor to sensor.*

11. Wipe the pressure compensation port and its surrounding area with a dry paper tissue.



12. Insert the pressure compensation screw into the port and cover with a new milli seal.



13. Reinstall the sensor as outlined in section 5.1.2.

➔**NOTE:** *When storing the sensor cell never store the sensor cell horizontal with the Pressure Compensation Screw positioned down or store the sensor cell upside down. This can cause the electrolyte to leak from the sensor cell pressure compensation screw.*

5.3 Sensor Calibration

The TX-FM/FN requires periodic calibration with the appropriate standard gas. Calibration should be performed whenever:

- The membrane or electrolyte is replaced;
- The entire sensor is replaced;
- Six months has passed without membrane, electrolyte, or sensor replacement.

NOTE: for higher accuracy more frequent dynamic gas calibration is recommended

The PureAire Calibration Kit (optional) is recommended for calibration.

5.3.1 Gas Generation and Calibrating Kits

For generating a calibrating gas, the following PureAire Gas Generation Kits are recommended. They are available by separate order.

Calibration Kit Model	K-I PH_3	K-II Cl_2	K-III HCN	K-IV SO_3	K-V H_2S	K-VI NH_3	K-VII HCl	K-VIII HF
Gas generation tubes	1 box		1 box	1 box	1 box			
Gas generation solution (10 ml)	2 bottles		2 bottles	2 bottles	2 bottles			
Soft paper towels	1 pack		1 pack	1 pack	1 pack	1 pack		
Gas detection tube	1 box	1 box	1 box	1 box	1 box	1 box	1 box	1 box
Gas sampling bags (5 liter, 1 valve)	2	2	2	2	2	2	2	2
Gas sampling pump SCAP1	1	1	1	1	1	1	1	1
Double bellows	1	1	1	1	1	1	1	1
Teflon® tube ($\phi 6 \times \phi 4$)	1 m	1 m	1 m	1 m	1 m	1 m	1 m	1 m
Calibration Cap (optional)		1	1	1	1	1	1	1
Mini-pump PUMP2N (optional)		1	1	1	1	1	1	1
Instruction manual	1	1	1	1	1	1	1	1
Case	1	1	1	1	1	1	1	1
Silicon tube ($\phi 8 \times \phi 4$)	1 m	1 m	1 m	1 m	1 m	1 m	1 m	1 m
Reagent 1		1 bottle				1 bottle	1 bottle	1 bottle
Reagent 2		1 bottle				1 bottle	1 bottle	1 bottle
Dispenser bottle (100 ml)		1 bottle				1 bottle	1 bottle	1 bottle

5.3.2 Optional Calibration Equipment

The following equipment is available from PureAire Monitoring Systems to facilitate gas calibration:

Part Number	Description	Quantity
PUMP2N	High Flow Sampling Pump	1
690100	Calibration Cap for "D" Type Sensor Cells	1
690200	Calibration Cap for "FPN" Type Sensor Cells	1
690400	Calibration Cap for "K" Type Sensor Cells	1

5.3.3 Initial Preparation

1. If the instrument is connected to a controller, set the controller to Standby mode to avoid accidental alarms.
2. Remove the transmitter cover.

5.3.4 Zero Calibration

➡ **IMPORTANT:** *This procedure should be performed under normal monitoring conditions, without any of the target gas present..*

➡ **NOTE:** *PureAire's Meter Adapter (p/n 690600) is required for Model TX-FN (non-display) sensor heads. This allows you to use a VOM digital multimeter to read the gas concentration display.*

1. Check the instrument's gas concentration reading on either the local display or the digital multimeter.
2. If the display/multimeter does not read a steady "0," adjust the zero potentiometer as required. A clockwise rotation increases the display value, a counter-clockwise rotation decreases the display value.

➡ **NOTE:** *On the Model TX-FN (non-display) sensor head, the zero adjust potentiometer is located on the printed circuit board connector. On Model TX-FM (display) units, the zero potentiometer is located on the instrument faceplate.*

5.3.5 Span Calibration

➡ **CAUTION:** *Be sure to observe all safety guidelines when generating and using calibration gases.*

➡ **NOTE:** *Gas generation kits are available through PureAire. These kits include instructions and materials for generating calibration gases and precise methods for accurately measuring the concentration of these gases.*

➡ **NOTE:** *The gas concentration should be close to, but never exceed, full scale.*

1. Connect the appropriate calibration cap to the inlet of the high flow sampling pump and connect the Tedlar "waste gas" bag to the outlet of the pump.
2. Open the valve on the waste gas bag.
3. Connect the flowmeter to the inlet of the calibration cap and turn the high flow sampling pump "on."

4. Adjust the pump's flowrate potentiometer until a flowrate of 0.5 liters/minute is achieved. A clockwise rotation increases flow; a counter-clockwise rotation decreases flow.
5. Recheck the instrument's zero reading; adjust as required.
6. Generate the calibration gas within a Tedlar bag.

➡ **IMPORTANT:** *Be sure to perform the calibration before the concentration of the gas changes. Also, PureAire recommends that you verify that the concentration of the calibration gas is the same after calibration as it was before.*

7. Disconnect the flowmeter and connect the Tedlar calibration gas bag to the inlet side of the calibration cap.
8. Open the valve on the calibration gas bag.
9. Expose the sensor cell to the span gas for 1 to 2 minutes until the gas reading stabilizes.
10. Adjust the instrument's span potentiometer until the displayed gas reading matches the concentration value of the calibration gas. A clockwise rotation increases the display value; a counter-clockwise rotation decreases the display value.

➡ **NOTE:** *The span potentiometer is located directly on the instrument's printed circuit board.*

11. Close the valve on the calibration gas bag and permit the instrument to return to a zero reading.
12. Open the valve on the calibration gas bag and verify that the display reading matches the concentration of the calibration gas. Readjust the span potentiometer as required.
13. Close the valve on the calibration gas bag and disconnect it from the calibration cap.
14. Allow the instrument to return to a zero reading. If the instrument has not returned to zero after 5 minutes, readjust the zero potentiometer as required.
15. Close the valve on the waste gas bag and disconnect from the sampling pump.
16. Turn the sampling pump "off."
17. Remove calibration cap from the sensor cell by gently rocking the cap as you pull downward.

➡ **IMPORTANT:** *Do not twist the calibration cap.*

18. Replace the transmitter housing cover.
19. If the TX-FM/FN sensor head is connected to a controller, return the controller to the monitoring mode.

➡ **WARNING:** *Be sure to dispose of the remaining calibration gas and waste gas properly.*

5.3.6 TX-1100FK Calibration

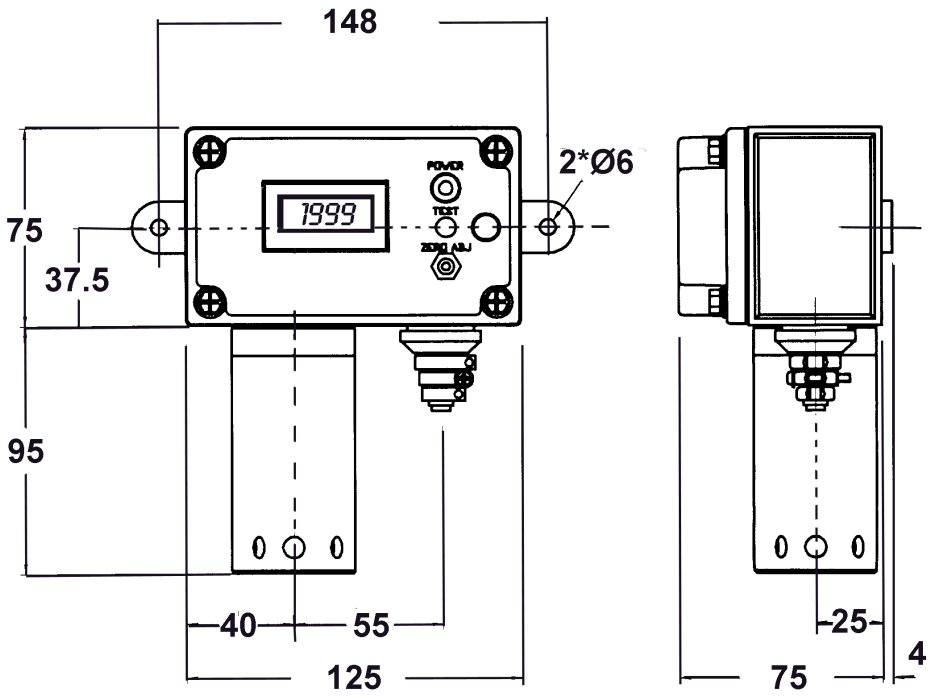
TX-1100FK O_2 system is always indicating ambient oxygen levels of 20.9% and does not require calibration. There are no zero or span pots supplied for adjustment.

If required the O_2 system operation may be checked by challenging it with nitrogen. The sensor protector has a ¼" male tube fitting designed for connecting sample tubing from a Nitrogen cylinder. Expose the O_2 cell to N_2at a flow rate of 500 cc/min. The reading will drop off to zero in a few minutes when the O_2 sensor is exposed to pure N_2. The system will recover to 20.9% when the N_2 is removed.

6: Diagrams and Schematics

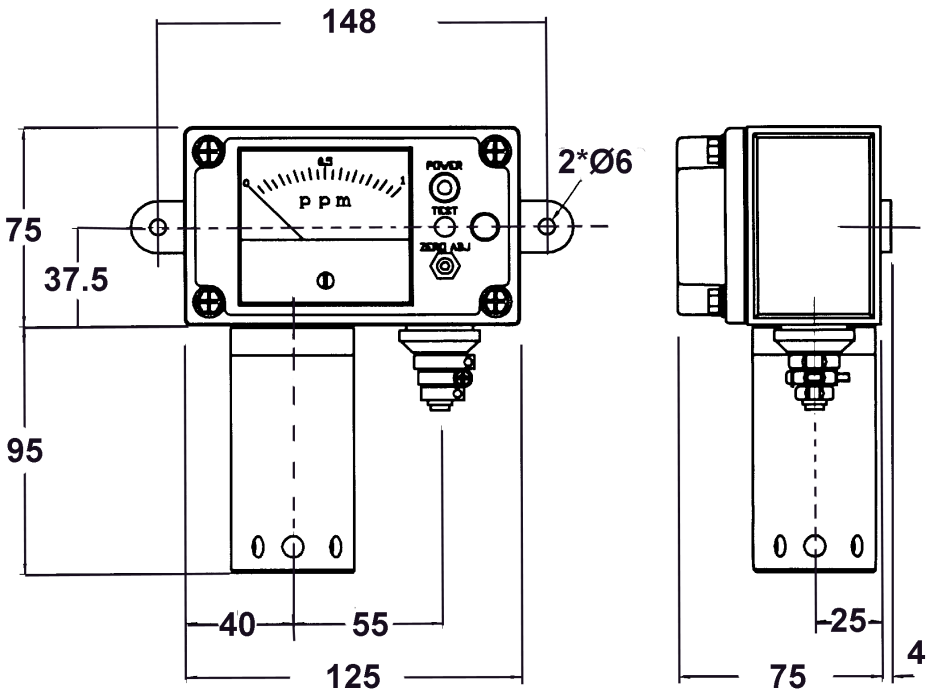
➡ **NOTE:** *Transmitters shown with standard power cable connector. Power cable connection also available as ¾ inch NPT fitting.*

6.1 TX-FMD Dimensional Drawing



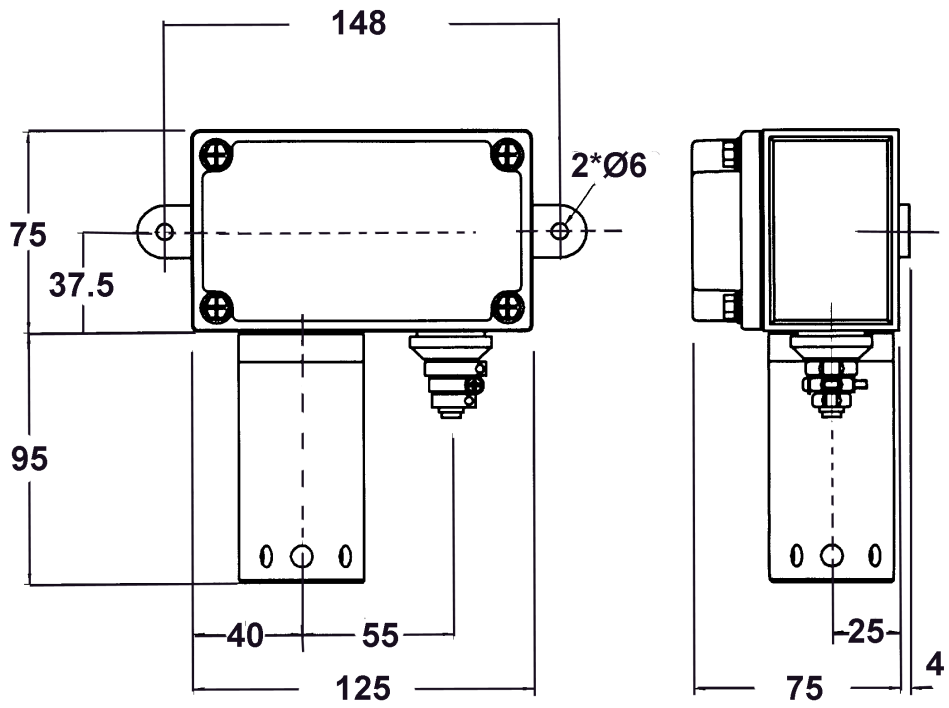
Dimensional information given in millimeters (mm).

6.2 TX-FM Dimensional Drawing



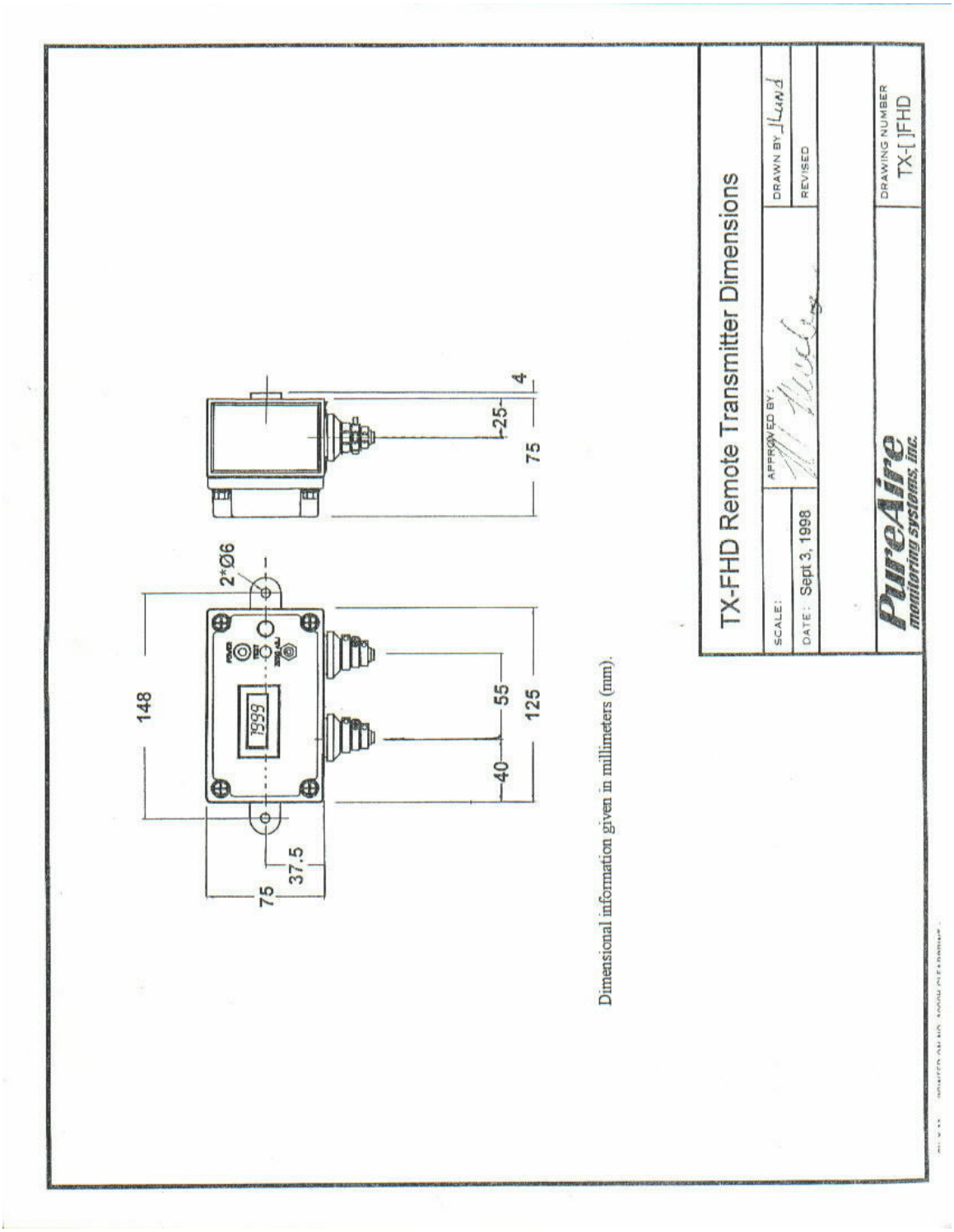
Dimensional information given in millimeters (mm).

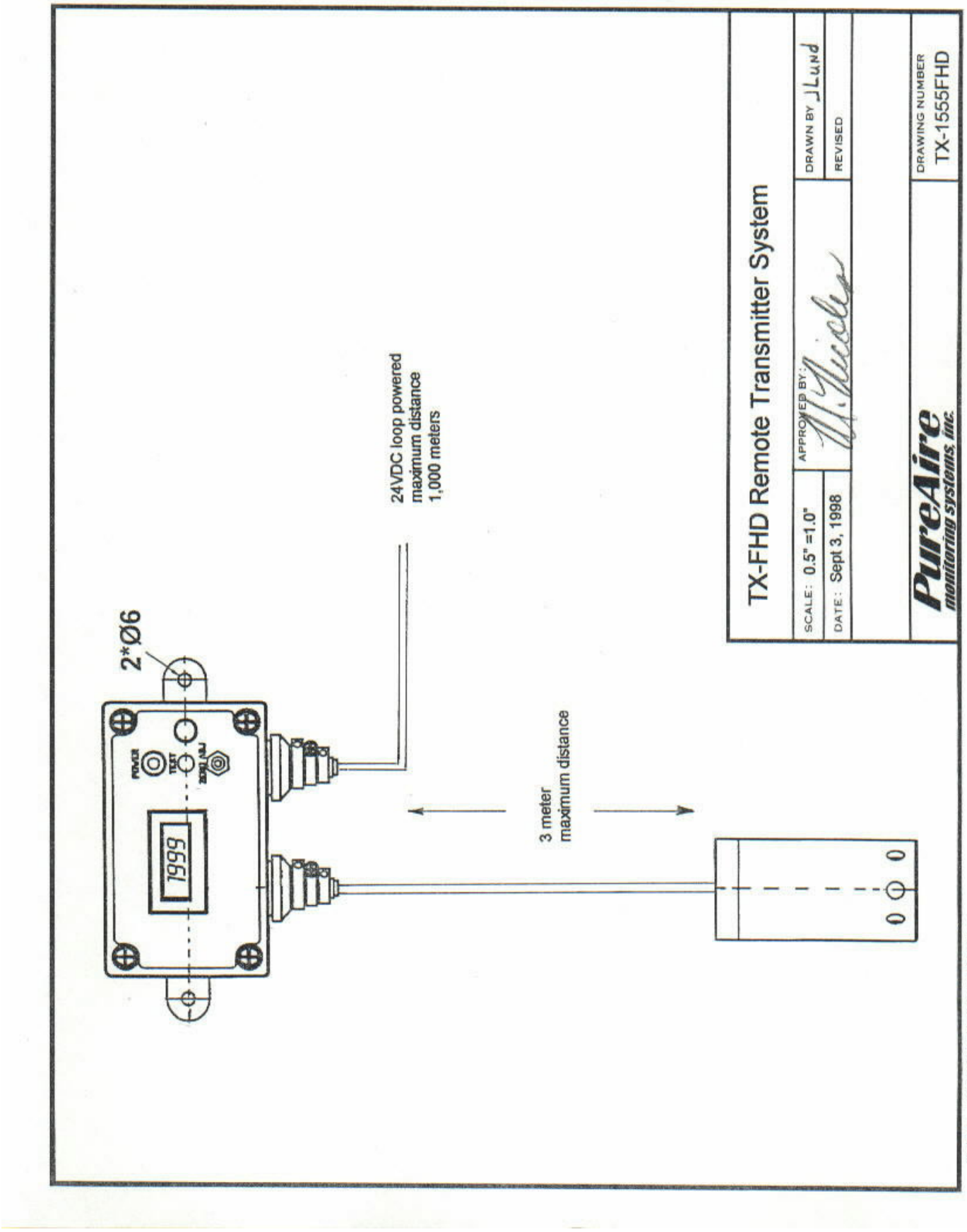
6.3 TX-FN Dimensional Drawing

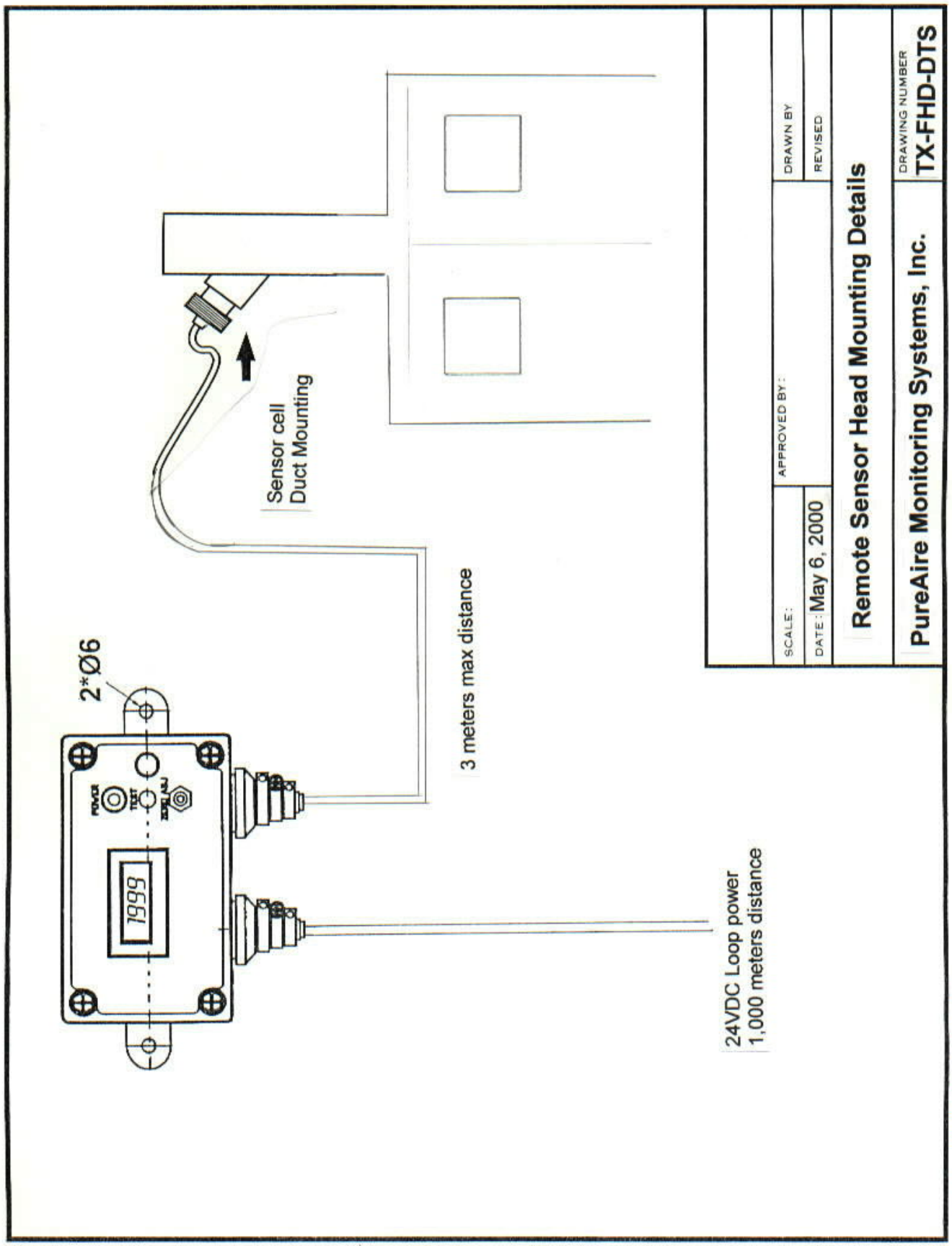


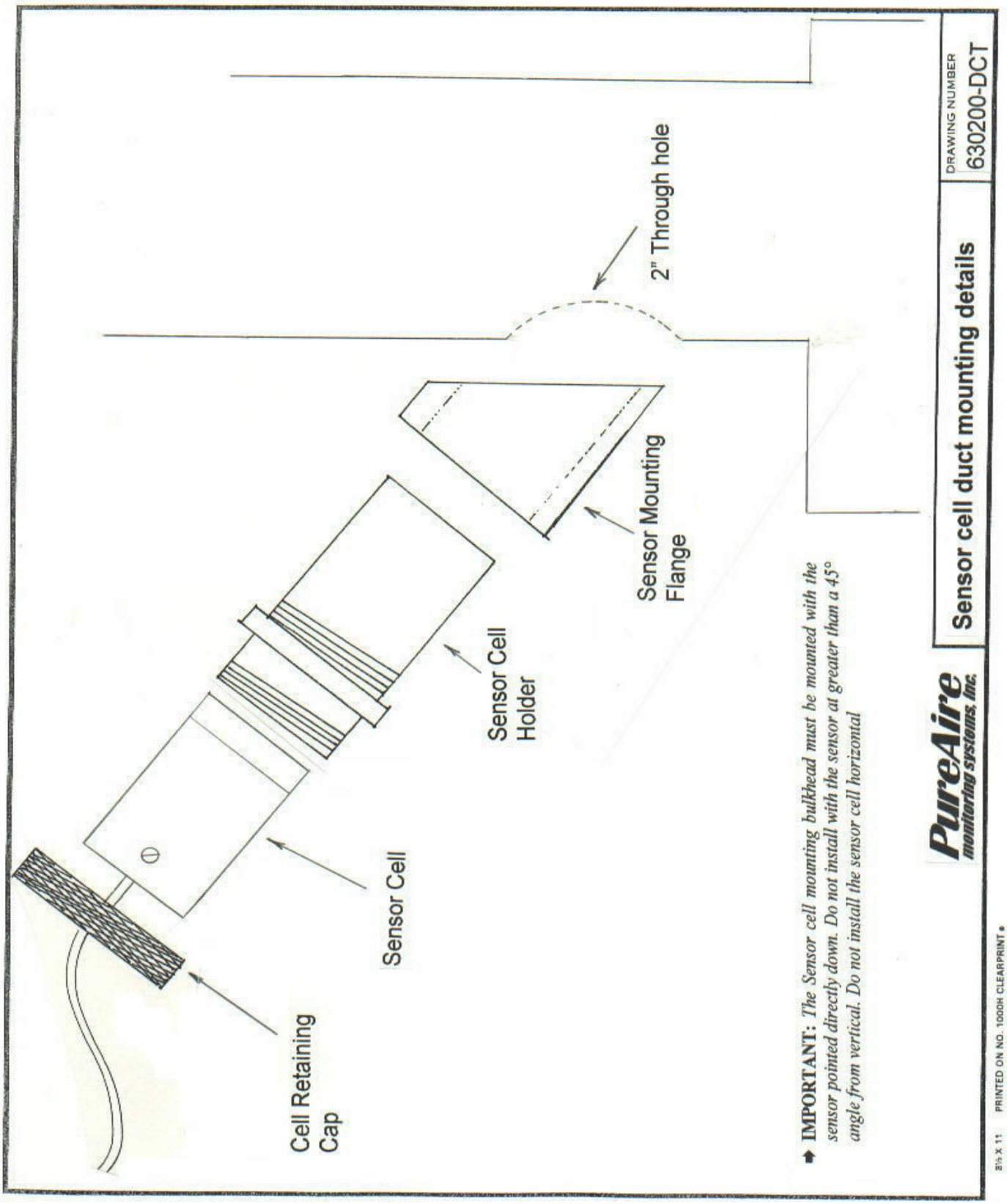
Dimensional information given in millimeters (mm).

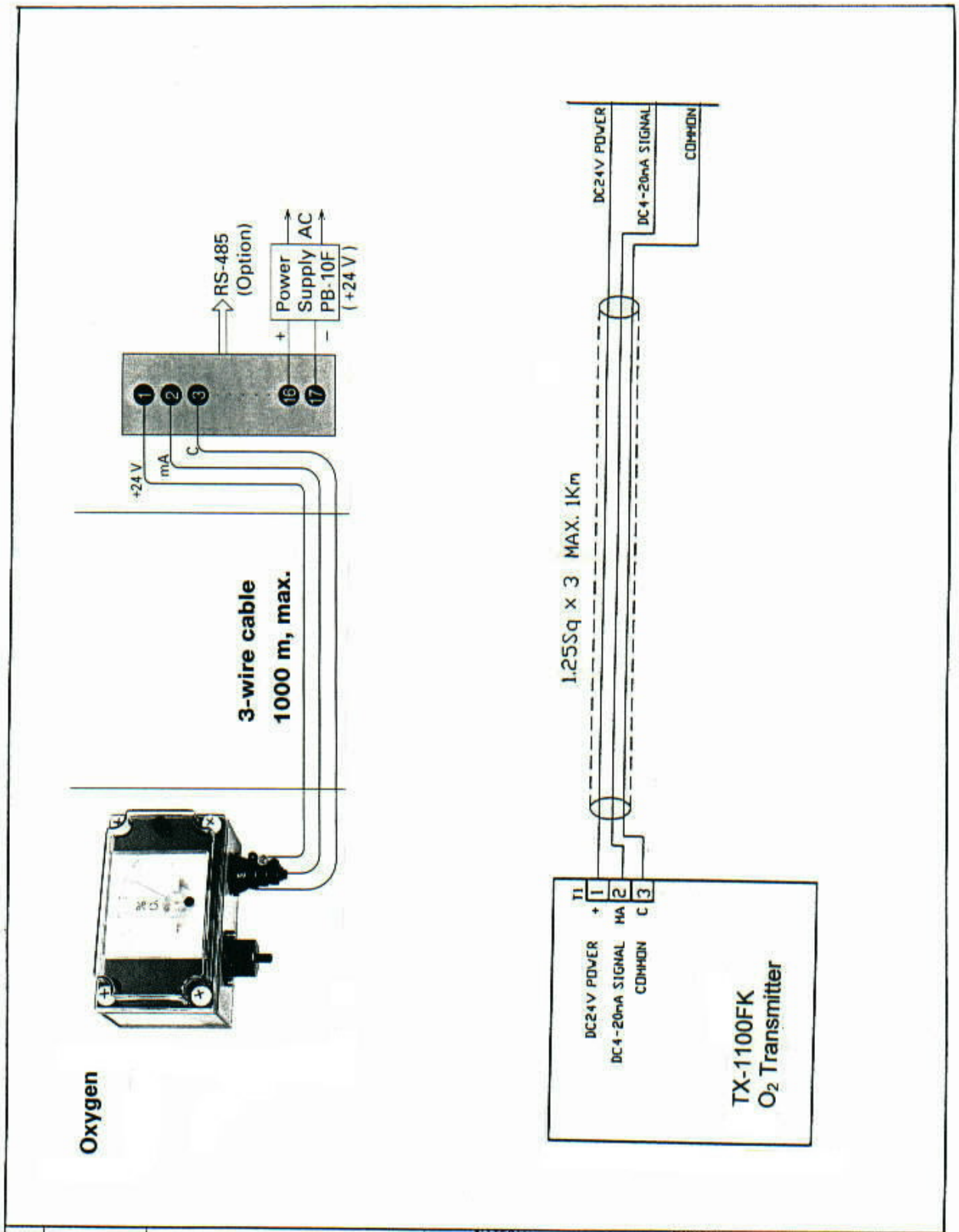
7: Appendix


TX-FHD Remote Transmitter Dimensions
SCALE:
DATE: Sept 3, 1998
APPROVED BY:
DRAWN BY:
REVISED
DRAWING NUMBER
TX-[ ]FHD
PureAire
monitoring systems, inc.
Dimensional information given in millimeters (mm).
2*Ø6
148
75
37.5
55
125
40
25
4
75
1999


TX-FHD Remote Transmitter System
SCALE: 0.5" =1.0"
DATE: Sept 3, 1998
APPROVED BY:
DRAWN BY JLund
REVISED
PureAire monitoring systems, inc.
DRAWING NUMBER
TX-1555FHD
24VDC loop powered
maximum distance
1,000 meters
3 meter
maximum distance
2*Ø6
POWER
TEST
FAULT
1999
8½ X 11 PRINTED ON NO. 1000H CLEARPRINT ®


Sensor cell
Duct Mounting
3 meters max distance
2*Ø6
24VDC Loop power
1,000 meters distance
SCALE:
DATE: May 6, 2000
APPROVED BY:
DRAWN BY
REVISED
Remote Sensor Head Mounting Details
PureAire Monitoring Systems, Inc.
DRAWING NUMBER
TX-FHD-DTS
8½ X 11 PRINTED ON NO. 1000H CLEARPRINT


2" Through hole
Sensor Mounting Flange
Sensor Cell Holder
Sensor Cell
Cell Retaining Cap
IMPORTANT: The Sensor cell mounting bulkhead must be mounted with the sensor pointed directly down. Do not install with the sensor at greater than a 45° angle from vertical. Do not install the sensor cell horizontal
PureAire monitoring systems, Inc.
Sensor cell duct mounting details
DRAWING NUMBER
630200-DCT
8½ X 11 PRINTED ON NO. 1000H CLEARPRINT ®



⚠	. .			MATERIAL	FINISH	QTY
⚠	. .			MODEL		
⚠	. .			TITLE	WIRING DIAGRAM TX-1100FK	
	DATE	REVISION	SIGN			
DESIGN	DRAW	INSPECT	APPROVE	DATE	SCALE	DRAW No.
				JUN. 27 '97		

PureAire Monitoring Systems, Inc.