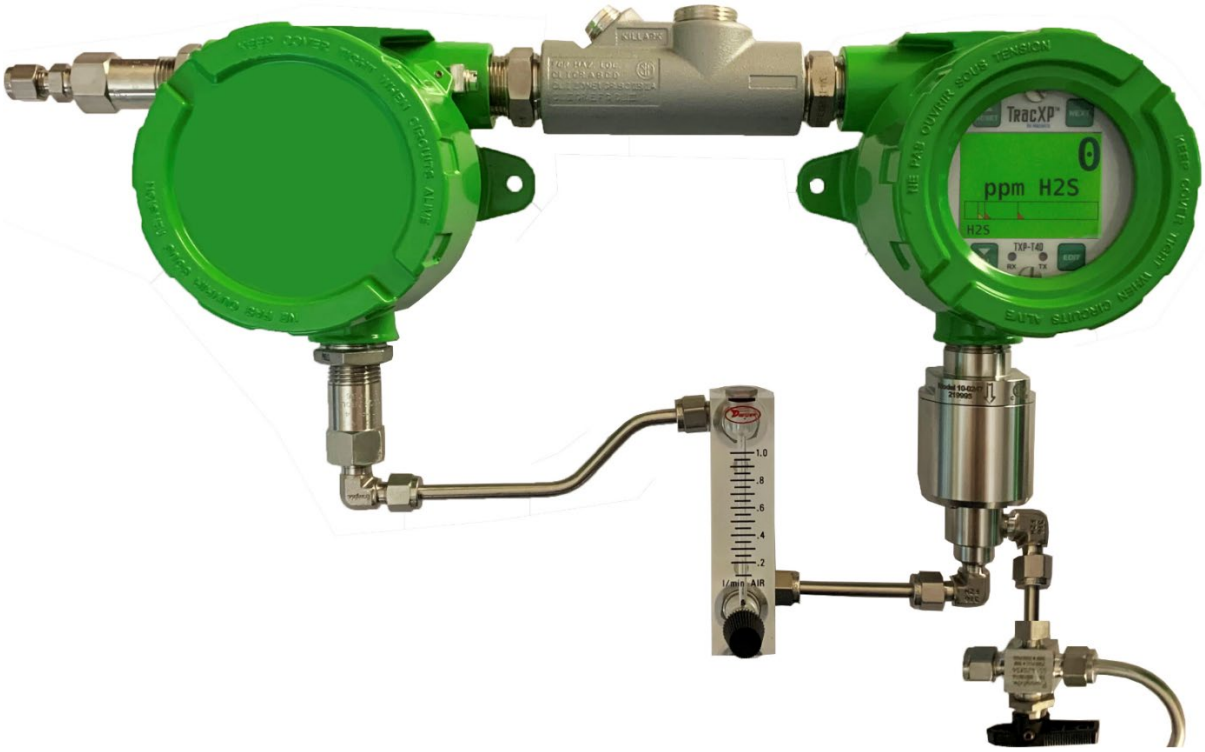
TracXP™
Industrial Gas Solutions
by Macurco

Northside Sales, Co.
Safety & Industrial Products
800-467-9005

TracXP™ TXP-SDA

Sample Draw

User Instructions



IMPORTANT: Read and understand contents of this manual prior to operation. Keep these user instructions for reference.

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1 Safety Information

1.1 Read Before Installation and Operation

IMPORTANT

AVERTISSEMENT: Lire attentivement les instructions avant de metre en marche.

CAUTION

CAUTION: FOR SAFETY REASONS THIS EQUIPMENT MUST BE OPERATED AND SERVICED BY QUALIFIED PERSONNEL ONLY. READ AND UNDERSTAND INSTRUCTION MANUAL COMPLETELY BEFORE OPERATING OR SERVICING.

ATTENTION: POUR DES RAISONS DE SÉCURITÉ, CET ÉQUIPEMENT DOIT ÊTRE UTILISÉ, ENTRETENU ET RÉPARÉ UNIQUEMENT PAR UN PERSONNEL QUALIFIÉ. ÉTUDIER LE MANUE D'INSTRUCTIONS EN ENTIER AVANT D'UTILISER, D'ENTRETENIR OU DE RÉPARER L'ÉQUIPEMENT.

CAUTION: KEEP EXPLOSION PROOF COVER TIGHT WHILE CIRCUITS ARE ALIVE.

ATTENTION: GARDEZ LE COUVERCLE ANTI-EXPLOSION SERRÉ PENDANT QUE LES CIRCUITS SONT VIVANTS.

CAUTION: USE SUPPLY WIRES SUITABLE FOR 40°C ABOVE SURROUNDING AMBIENT.

ATTENTION: UTILISER DES FILS D'ALIMENTATION QUI CONVIENNENT A UNE TEMPERATURE DE 40°C AU-DESSUS DE LA TEMPERATURE AMBIANTE.

WARNING - EXPLOSION HAZARD
SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2.

AVERTISSEMENT - RISQUE D'EXPLOSION
LA SUBSTITUTION DES COMPOSANTS PEUT PROVOQUER UNE ADAPTATION À LA CLASSE I, DIVISION 2.

WARNING- EXPLOSION HAZARD
DO NOT CONNECT OR DISCONNECT WHEN ENERGIZED UNLESS THE AREA IS KNOWN TO BE NON-HAZARDOUS.

AVERTISSEMENT - RISQUE D'EXPLOSION
NE PAS BRANCHER OU DÉBRANCHER LORSQU'IL EST SOUS TENSION, SAUF SI LA ZONE EST CONNUE POUR ÊTRE NON HASARDEUX.

CAUTION: A CONDUIT SEAL MUST BE INSTALLED WITHIN 18 INCHES OF THE ENCLOSURE.

ATTENTION: LE CONDUIT DOIT ÊTRE INSTALLÉ À MOINS DE 18 POUCES DU BOÎTIER.

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1.2 WARNINGS

- Shock Hazard - Disconnect or turn off power before servicing this instrument.
- WARNING- EXPLOSION HAZARD- DO NOT REPLACE FUSE UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NON-HAZARDOUS.
- WARNING- EXPLOSION HAZARD- DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NON-HAZARDOUS.
- Use a properly rated CERTIFIED AC power (mains) cable installed as per local or national codes.
- A certified AC power (mains) disconnect, or circuit breaker should be mounted near the controller and installed following applicable local and national codes. If a switch is used instead of a circuit breaker, a properly rate CERTIFIED fuse or current limiter is required to be installed as per local or national codes. Markings for positions of the switch or breaker should state (I) for on and (O) for off.
- Clean only with a damp cloth without solvents.
- Equipment not used as prescribed within this manual may impair overall safety.

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2 Use Instructions and Limitations

⚠WARNING
Each person using this equipment must read and understand the information in this user manual before use. Use of this equipment by untrained or unqualified persons or use that is not in accordance with this user manual, may adversely affect product performance.

The TRACXP TXP-SDA is a sample draw system that is designed to provide reliable gas detection in locations where the environment is not suitable for the installation of traditional ambient sensors. The TRACXP TXP-SDA combines a sample pump, low flow detection switch, visual flow meter and TRACXP TXP-T40 gas detector into a single unit that provides 4-20mA analog output, Ethernet, programmable relays including system FAULT, and a MODBUS slave interface. The integrated Run/Cal flow control valve and TRACXP TXP-T40 user-prompted calibration procedure make normal maintenance quick and easy.

Sample gas enters the unit through the Sample/Calibration valve where it is drawn into the explosion proof enclosure towards the sensor in the sensor housing then through the flowmeter before passing the first of the two flame arrestors. It then enters the pump enclosure in the second explosion proof housing and through the pump's flow switch before passing through the pump and then finally pushing out through the second and final flame arrestor and exiting the exhaust port. Electronics in the TRACXP TXP-SDA monitor the flow switch, sensor and internal circuitry and activate the FAULT relay if the sensor fails. If sample flow falls below a preset value or if the internal microprocessor becomes inactive, the unit will activate the FAULT relay.

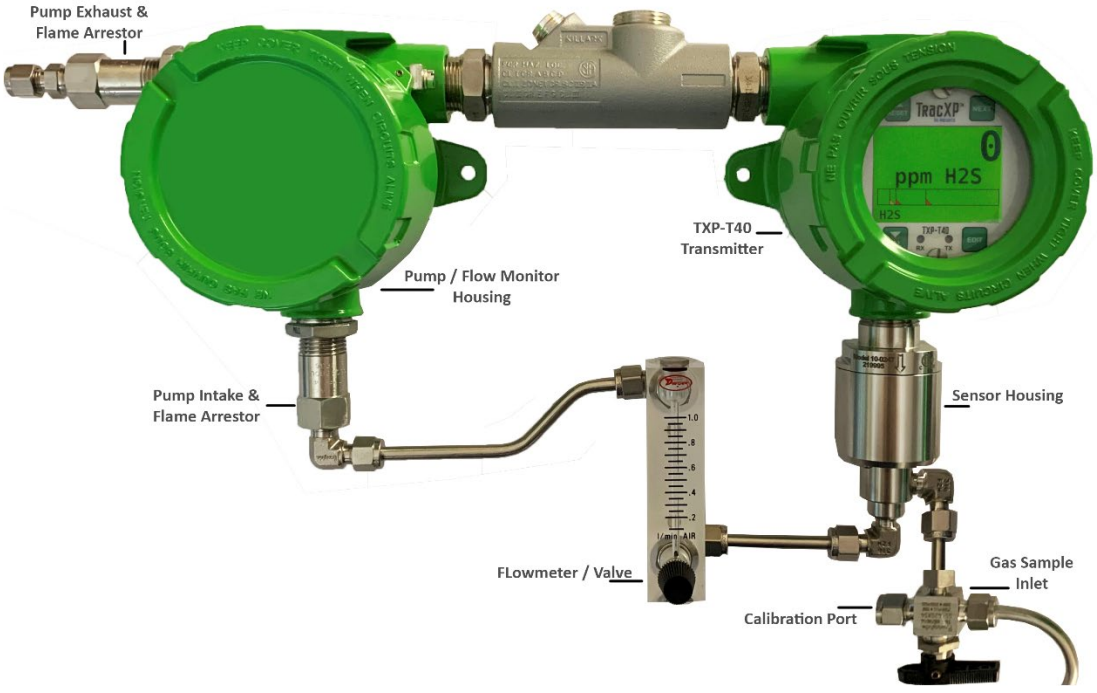

Figure 1-1 Parts Diagram

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Mount the TRACXP TXP-SDA as close as possible to the extraction point. Try to keep the unit above the sampling point so that any moisture that condenses inside the tubing flows back to the source. We recommend the end-of-line dust filter at the pickup point if the area contains significant amounts of dust or particulates.

3 Installation

3.1 Selecting a Mounting Location

As compared to a fixed-point gas detector, the TRACXP TXP-SDA sample draw system provides good flexibility when choosing a mounting location. Consider the following when considering where to install the TRACXP TXP-SDA:

- Locate the TRACXP TXP-SDA where it will be easy to service and calibrate. The high visibility LCD color screen may provide a sufficient visual warning of hazardous conditions without the need to install a dedicated strobe.
- Minimize the length of sample tubing. Lengths up to 50 feet will incur no more than 30 seconds of sample delay.
- Mount the TRACXP TXP-SDA at or above the sample point if possible and add a drip leg to minimize condensation if possible.
- Keep the sample pickup point from becoming submerged in liquid. The sample pump is capable of drawing water to a height of 15 feet. If liquid enters the flame arrestor or sample pump, damage will occur.
- If it is necessary to tie the sample outlet back to the sample source, make sure there are no obstructions or restrictions. Any increase in pressure inside the sensor flow cell will result in reading errors.

3.2 Mounting the TXP-SDS

The TRACXP TXP-SDA standard enclosure is a dual aluminum explosion-proof enclosure and is available standalone. The TRACXP TXP-SDA must be mounted vertically for the flow switch and flow meter to operate properly.

3.3 Inlet Tubing

Specifications for the inlet tubing depend on the target gas. Long runs of sample tubing will cause a significant delay between the appearance of gas and the resulting warning. Small diameter stainless steel (1/4” OD) is ideal for most gases. Flexible tubing or tubing manufactured from Teflon or PTFE may also be used. Smaller diameter tubing results in faster response because of the smaller total volume of gas that must be drawn from the sample point. It takes approximately 1 minutes for a sample to be drawn through 120 feet of 1/4” OD flexible tubing; this gives a delay rate of roughly 0.5 seconds per foot of tubing. Larger diameter tubing with higher internal volume will result in a longer delay, while smaller tubing may be subject to blockage from condensed water droplets or dirt particles.

NOTE: THE SAMPLE PUMP IS CAPABLE OF PULLING UP TO 7.0 PSI VACUUM, ENOUGH TO LIFT WATER OVER 15 FEET. CARE SHOULD BE TAKEN NOT TO SUBMERGE THE SAMPLE EXTRACTION POINT IN LIQUID AS THE PUMP WILL QUICKLY FILL THE FLAME ARRESTORS, FLOW SWITCH, FLOW METER AND SAMPLE FLOW CELL WITH LIQUID. FOR THIS REASON, USE OF A HYDROPHOBIC FILTER AT OR NEAR THE SAMPLE LINE INLET IS RECOMMENDED

3.4 Sample Exhaust

Changes in ambient pressure will affect the output from most sensors and allowing the sample to exhaust directly to the atmosphere will minimize these affects. Long runs of tubing connected to the sample outlet may increase the backpressure inside the sensor flow cell and cause higher than normal readings. Returning a sample to a process stream may be desirable and will work if the process stream is only slightly above ambient (< 5” of water column) and has a relatively constant pressure.

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IMPORTANT: DO NOT RESTRICT THE SAMPLE EXHAUST OUTLET. A BUILDUP OF PRESSURE IN THE SAMPLE FLOW CELL MAY DAMAGE THE SENSOR AND WILL RESULT IN INCORRECT READINGS.

3.5 DC Power & Signal Connections

To access the TRACXP TXP-SDA signal and power connections, remove the right-hand-side cover on the TRACXP TXP-SDA explosion-proof enclosure, loosen the 2 thumbscrews holding the display assembly and remove it. The display will remain connected to the IO/Power Supply PCB mounted in the back of the enclosure by a short ribbon cable. Route the power and signal wires through the right-hand-side conduit entry and connect to terminal block “TB1”

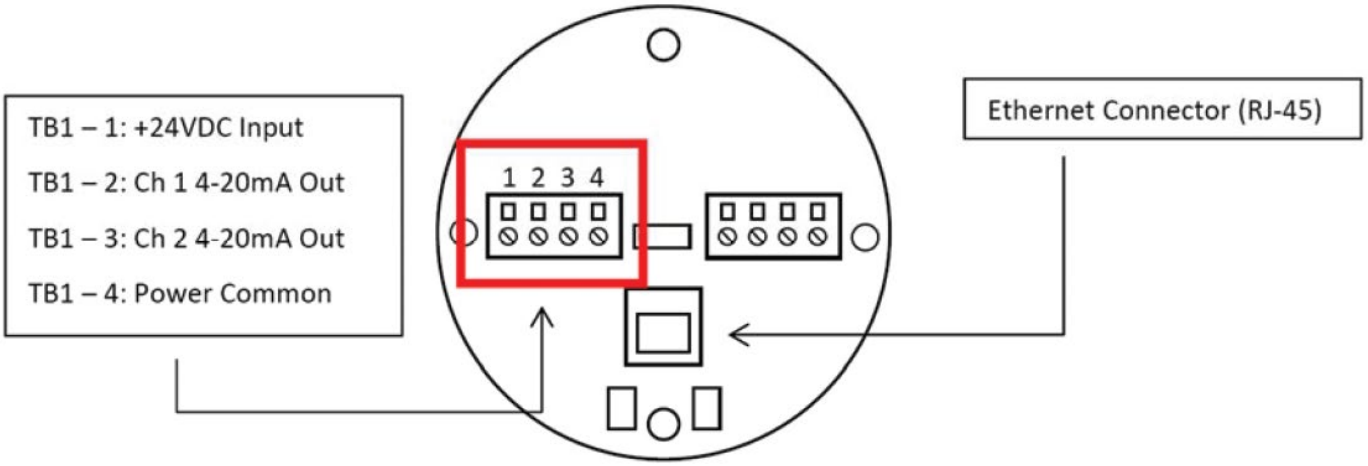

Figure 3-1 Main PCB inside TXP-T40

NOTE: WE ALWAYS RECOMMEND USING SHIELDED WIRE FOR SIGNAL AND POWER CABLE.

3.6 Ethernet Connection

The TRACXP TXP-SDA provides an industry-standard 10/100 Mbit RJ-45 Ethernet connection on the main I/O board (see Fig 4-1). Standard Ethernet connection links can be up to 100 m / 300 ft in length. The TRACXP TXP-T40 Ethernet interface provides both MODBUS/TCP access to the internal MODBUS database as well as a built-in web server that allows remote monitoring on any Ethernet device that supports a standard web browser.

3.7 Relay & Modbus Connections

The TRACXP TXP-T40Relay / dual MODBUS RTU slave interface is connected “piggyback” to the back of the TRACXP TXP-T40Display Assembly and supplies three level alarm relays, a FAULT relay and dual RS-485 Modbus RTU serial ports.

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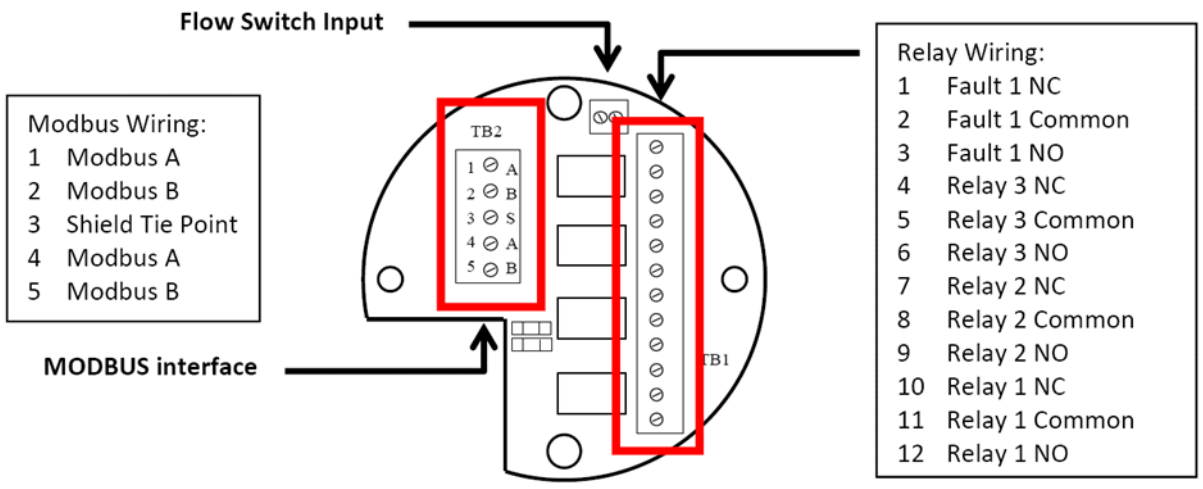

Figure 3-2 Relay Board inside TXP-T40

Relays K1, K2 and K3 can be programmed to respond to Alarm 1, Alarm 2, or Alarm 3 as well as fault and other channel or system-level operations. Alarms can be programmed to trigger above or below a certain value, work as normal or 'failsafe' and can be made to latch if desired. Relay K4 indicates a FAULT condition in the sensor, microprocessor, or flow system.

WARNING: RELAY CONTACTS ARE RATED FOR RESISTIVE LOADS ONLY! INDUCTIVE LOADS MAY CAUSE ARCING WHICH SHORTENS LIFE AND MAY INTERFERE WITH SENSOR DATA.

4 Optional Modbus Wiring Junction Box

The TRACXP TXP-SDAMODBUS RTU interface allows remote controllers or PLCs to monitor most aspects of operation, including real-time data, range, and alarm setpoints and alarm and fault status bits. The TRACXP TXP-SDA interface supports RS-485 differential signaling only.

Access to each MODBUS RS-485 interface is via TB2 on the optional Relay / MODBUS board mounted on the back of the TRACXP TXP-T40 display module. Separate input and output terminals for MODBUS "A" and "B" signals are available. A center terminal to tie incoming and outgoing shield connections is also provided. MODBUS system architecture requires that the devices in any MODBUS loop be connected in a daisy chain layout. This minimizes signal reflections and improves signal noise margin. A MODBUS Termination Jumper installs a load resistor across the MODBUS signal lines and should only be set to "A" (ON) at the last device in the string. Cable selection for MODBUS systems is important for both signal integrity and power distribution. MODBUS / RS-485 transmissions use low-voltage differential signaling to achieve reasonable data rates over very long distances, up to 4000 feet without a repeater. For MODBUS data signals, we recommend 20GA to 24GA twisted shielded cable. Daisy-chain power distribution may require larger gauge wire since it is critical that the supply voltage for the TRACXP TXP-SDA at the far end of the string not fall below 22VDC during power-up.

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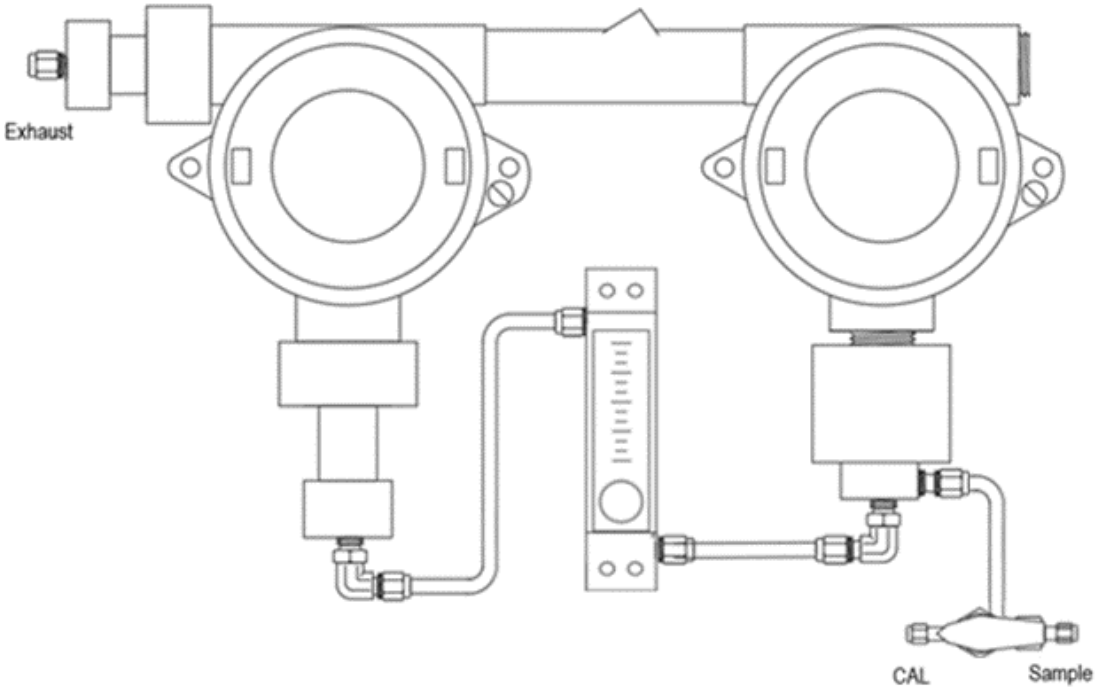

Figure 4-1 2D View of SDA

Note that while the TRACXP TXP-SDA has two sets of wiring terminals for MODBUS “A” and “B” signals, daisy chain power wiring requires that two wires be installed in the “+24” and “GND” terminals on the TRACXP TXP-SDA I/O Power Supply board. This can be difficult if wire sizes are larger than #18GA. For these reasons, if MODBUS is required, we recommend the addition of the MODBUS Wiring Junction Box. This option minimizes the need to access wiring inside the TRACXP TXP-SDA, provides individual wire landing points for incoming and outgoing MODBUS and power wiring and shields, and makes it easy to temporarily disconnect the TRACXP TXP-SDA power or MODBUS connections without affecting any other MODBUS device.

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5 Startup

After installation, turn on the power supply, adjust the flow between 0.5LPM to 1Lpm. See Figure 5-1.

Adjust the flow by turning the knob while the pump is running. If the flow is lower than .5LPM the Flow Switch may shut off power to the pump.

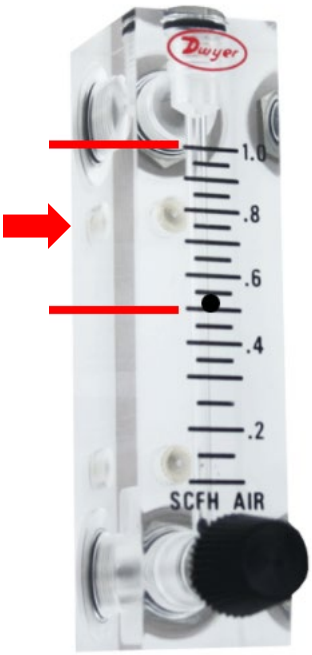

Figure 5-1 Flowmeter / Valve

Then follow the instructions of TracXP TXP-T40 to set up the gas detector.

For the details of the gas detector, please refer to the manual:

https://www.macurco.com/product/txp-t40/

6 Troubleshooting

If the pump fails to run continuously, check that the flow rate is set between 0.5 and 1.0 LPM. Check the air filter for debris and inspect the airline tubing for leaks. Check that the wiring is intact and connected correctly. If the unit continues to perform poorly, the pump may need to be cleaned or replaced. Contact technical support for assistance. To determine if the pump is operating properly, momentarily close off the outlet or inlet of the system to allow the Flow Switch to shut off the pump when airflow is stopped. If the pump fails to stop, the switch may be faulty.

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7 Maintenance

Regularly scheduled maintenance of the SDA system will ensure it functions properly and delivers consistent and reliable results. Items to inspect include checking the tubing for cracking, loose fittings, checking the filter for debris, and verifying the wiring connections are tight and sealed.

Regular calibration of the T-40 sensor is necessary to ensure the SDA system works at peak efficiency throughout its lifespan. Please see the TXP-T40 manual for details on replacing and calibrating the sensor element.

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8 Appendix A – Table of Figures

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9 Macurco Gas Detection Product limited warranty

Macurco warrants the TXP-SDA gas detector will be free from defective materials and workmanship for a period of two (2) years from the date of manufacture (indicated on inside cover of the TXP-SDA), provided it is maintained and used in accordance with Macurco instructions and/or recommendations. If any component becomes defective during the warranty period, it will be replaced or repaired free of charge, if the unit is returned in accordance with the instructions below. This warranty does not apply to units that have been altered or had repair attempted, or that have been subjected to abuse, accidental or otherwise. The above warranty is in lieu of all other express warranties, obligations, or liabilities. THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PARTICULAR PURPOSE ARE LIMITED TO A PERIOD OF TWO (2) YEARS FROM THE PURCHASE DATE. Macurco shall not be liable for any incidental or consequential damages for breach of this or any other warranty, express or implied, arising out of or related to the use of said gas detector. The manufacturer or its agent's liability shall be limited to replacement or repair as set forth above. Buyer's sole and exclusive remedies are the return of the goods and repayment of the price, or repair and replacement of non-conforming goods or parts.

Macurco Gas Detection

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