SECTION 28 42 00.10

INDUSTRIAL GAS DETECTION AND ALARM

Display hidden notes to specifier. (Don't know how? [Click Here](https://www.arcat.com/sd/display_hidden_notes.shtml))

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\*\* NOTE TO SPECIFIER \*\* Macurco Inc.; gas detection devices.
This section is based on the products of Macurco Inc., which is located at:1504 W. 51st St.Sioux Falls, SD 57105Toll Free Tel: 877-367-7891Fax: 605-951-9616Email: [request info (info@macurco.com)](https://arcat.com/rfi?action=email&company=Macurco%252BInc.&message=RE%253A%2520Spec%2520Question%2520(13852mac)%253A%2520&coid=50560&spec=13852mac&rep=&fax=605-951-9616)
Web: <https://macurco.com/applications>
 [ [Click Here](https://arcat.com/company/macurco-inc-50560) ] for additional information.
Macurco Gas Detection provides a broad, proven range of gas detection solutions that help organizations and users deliver around-the-clock monitoring that aid in the mitigation and notification of toxic, combustible, or oxygen depleting gas events.
Macurco Gas Detection continues to drive product innovation to meet the demands of new applications, new codes, and the needs of its customers. Macurco designs and develops its own products and manufactures both their fixed and wireless products in the USA.
Macurco Gas Detection has been a leader in gas detection for more than years. Macurco monitors are used in all sorts of applications ranging from: parking garages, car dealership, maintenance shops, distribution centers, warehouses, grow and extraction applications, landfills, ambulance/firehouse bays, loading docks, commercial kitchens, industrial settings, water/wastewater, oil & gas, cold storage, beverage plants and beverage dispensing, schools, convention centers, homes, and many others throughout all 50 states and across the global.

1. GENERAL
	1. SECTION INCLUDES

\*\* NOTE TO SPECIFIER \*\* Delete items below not required for project.

* + 1. Fixed gas detection.
			1. TXP-T40 Transmitter.
			2. TXP-C20 Control Panel.
			3. TXP-C40 Control Panel.
			4. TXP-C64 Control Panel.
		2. Wireless gas detection.
			1. TXP-WTA Transmitter.
			2. TXP-WCR Control Panel.
	1. RELATED SECTIONS

\*\* NOTE TO SPECIFIER \*\* Delete any sections below not relevant to this project; add others as required.

* + 1. Division 16 - Electrical.
	1. REFERENCES

\*\* NOTE TO SPECIFIER \*\* Delete references from the list below that are not actually required by the text of the edited section.

* + 1. CSA Group (CSA):
			1. CSA C22.2 No. 213 - Nonincendive Electrical Equipment for Use in Class I And II, Division 2 And Class III, Divisions 1 And 2 Hazardous (Classified) Locations (Binational Standard with UL 121201).
			2. CSA C22.2 No. 152 - Combustible Gas Detection Instruments.
			3. CSA C22.2 No. 1010.1 - Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use. Part 1: General Requirements.
		2. EMC Standards:
			1. EN61000 - Electromagnetic compatibility.
		3. European Committee for Electrotechnical Standardization (CENELEC):
			1. EN55011 - Industrial, scientific, and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement.
		4. Federal Communications Commission (FCC):
			1. FCC 15.247 - Operation within the bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz.
		5. International Society of Automation (ISA):
			1. ISA S82.02 - Safety Standard for Electrical and Electronic Test, Measuring, Controlling and Related Equipment Electrical and Electronic Test and Measuring Equipment.
		6. Underwriters Laboratories (UL):
			1. UL 1604 - UL Standard for Safety Electrical Equipment for Use in Class I and II, Division 2, and Class III Hazardous (Classified) Locations.
			2. UL 121201 - UL Standard for Safety Non-incendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations.
	1. SUBMITTALS
		1. Submit under provisions of Section 01 30 00 - Administrative Requirements.
		2. Product Data:
			1. Manufacturer's data sheets on each product to be used.
			2. Preparation instructions and recommendations.
			3. Storage and handling requirements and recommendations.
			4. Typical installation methods.

\*\* NOTE TO SPECIFIER \*\* Delete if not applicable to product type.

* + 1. Verification Samples: Two representative units of each type, size, pattern, and color.
		2. Shop Drawings: Include details of materials, construction, and finish. Include relationship with adjacent construction.
	1. QUALITY ASSURANCE
		1. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with a minimum five years documented experience.
		2. Installer Qualifications: Company specializing in performing Work of this section with minimum two years documented experience with projects of similar scope and complexity.
		3. Source Limitations: Provide each type of product from a single manufacturing source to ensure uniformity.

\*\* NOTE TO SPECIFIER \*\* Include mock-up if the project size or quality warrant the expense. The following is one example of how a mock-up on might be specified. When deciding on the extent of the mock-up, consider all the major different types of work on the project.

* + 1. Mock-Up: Construct a mock-up with actual materials in sufficient time for Architect's review and to not delay construction progress. Locate mock-up as acceptable to Architect and provide temporary foundations and support.
			1. Intent of mock-up is to demonstrate quality of workmanship and visual appearance.
			2. If mock-up is not acceptable, rebuild mock-up until satisfactory results are achieved.
			3. Retain mock-up during construction as a standard for comparison with completed work.
			4. Do not alter or remove mock-up until work is completed or removal is authorized.
	1. PRE-INSTALLATION CONFERENCE
		1. Convene a conference approximately two weeks before scheduled commencement of the Work. Attendees shall include Architect, Contractor and trades involved. Agenda shall include schedule, responsibilities, critical path items and approvals.
	2. DELIVERY, STORAGE, AND HANDLING
		1. Store and handle in strict compliance with manufacturer's written instructions and recommendations.
		2. Protect from damage due to weather, excessive temperature, and construction operations.
	3. PROJECT CONDITIONS
		1. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.
	4. WARRANTY
		1. Manufacturer's standard limited warranty unless indicated otherwise.
1. PRODUCTS
	1. MANUFACTURERS
		1. Acceptable Manufacturer: Macurco Inc., which is located at:1504 W. 51st St.Sioux Falls, SD 57105Toll Free Tel: 877-367-7891Fax: 605-951-9616Email: [request info (info@macurco.com)](https://arcat.com/rfi?action=email&company=Macurco%252BInc.&message=RE%253A%2520Spec%2520Question%2520(13852mac)%253A%2520&coid=50560&spec=13852mac&rep=&fax=605-951-9616);Web: <https://macurco.com/applications>

\*\* NOTE TO SPECIFIER \*\* Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions.

* + 1. Substitutions: Not permitted.
		2. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

\*\* NOTE TO SPECIFIER \*\* TracXP is the industrial products division of Macurco Gas Detection, who has been providing gas detection solutions for over years. The TracXP line addresses special hazard applications including harsh industrial environments and hazardous locations with a comprehensive line of wired and wireless gas detection solutions. Applications: Oil and gas, refining and chemical production, water and wastewater treatment plants, food and beverage facilities, metal manufacturing, pulp and paper, and power generation. Delete article if not required.

* 1. FIXED GAS DETECTION

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + 1. Basis of Design: Model TXP-T40. Fixed Single or Dual Sensor Gas Transmitter
			1. Highly configurable fixed gas detector for single or dual sensor applications in Class 1 Division 1 or Class 1 Division 2 environments.
			2. Local and remote sensor capable.
			3. Intelligent sensors transfer sensor information to transmitter including sensor type, measurement range, calibration span values, last calibration date, serial number, sensor life and manufacture date.
			4. Status indicating color display and LEDs provide visual verification of safe or unsafe conditions.
			5. Setup and Programming: Intuitive non-intrusive magnetic interface and embedded webpage.

\*\* NOTE TO SPECIFIER \*\* Delete sensor housing options not required.

* + - 1. Sensor Housing: Cast Aluminum (LxWxH): 5 x 5.4 x 8 inch (127 x 137 x 203 mm).
				1. Explosion-Proof: Cl.1 Div.1 Gr ABCD.
				2. Non-Incendive: Cl.1 Div.2 Gr ABCD.
				3. IP Rating: Cast Aluminum Enclosure: IP65 w/88-C200-0002-00 or 88-C200-0003-00.
			2. Sensor Housing: Black Poly Enclosure (LxWxH): 4 x 5 x 7 inch (102 x 127 x 178 mm).

\*\* NOTE TO SPECIFIER \*\* Excludes catalytic bead sensors.

* + - * 1. Non-Incendive: Cl.1 Div.2 Gr ABCD.
				2. IP Rating: Black Poly Enclosure: Suitable for IP54.
			1. Sensor Housing: Stainless steel (LxWxH): 5 x 5.4 x 8 inch (127 x 137 x 203 mm).
			2. Power Supply: 10 to 30 VDC at less than 10 watts with relay board; all relays energized.
			3. Input: Channel 1 and 2: Electrochemical, Catalytic Bead, Infrared or Photoionization (PID) sensor.
			4. Output:
				1. Dual 3-wire 4 to 20 mA current source; Max loop Resistance 600 ohms at 24 VDC, Ethernet RJ-45 with built-in web Server, Modbus TCP.

\*\* NOTE TO SPECIFIER \*\* The output below is optional.

* + - * 1. Delete if not required.
				2. Three programmable relays plus dedicated FAULT relay. Dual programmable master / slave Modbus RS-485 serial interfaces.
			1. Display: QVGA backlit color TFT 320 x 240.
				1. Displays gas values, units of measurement, trend graphs and alarm levels.
			2. Temperature Range: Minus 40 to 140 degrees F (Minus 40 to 60 degrees C).
			3. Humidity Range for IR Sensor: 95 percent RH Non-condensing.
			4. Humidity Range for Electrochemical Sensor: 85 percent RH Non-condensing.
			5. Standard ethernet port with web server.

\*\* NOTE TO SPECIFIER \*\* Delete options not required.

* + - 1. Options:
				1. Relays: 4 configurable 5A relays.
				2. Output: Modbus RS-485.

\*\* NOTE TO SPECIFIER \*\* Delete gas options not required.

* + - 1. Gas Options:
				1. Ammonia (NH3).

86-3112-1900-00 - T40/WTA SENSOR, AMMONIA (NH3) 0-100 PPM, EC.

86-3112-2000-00 - T40/WTA SENSOR, AMMONIA (NH3) 0-200 PPM, EC.

86-3144-3300-00 - T40/WTA SENSOR, AMMONIA (NH3) 0-200 PPM, EC, EXTENDED LIFE.

86-3112-3700-00 - T40/WTA SENSOR, AMMONIA (NH3) 0-300 PPM, EC.

86-3112-2200-00 - T40/WTA SENSOR, AMMONIA (NH3) 0-500 PPM, EC.

* + - * 1. Carbon Dioxide (CO2).

86-2314-0014-00 - T40 SENSOR, CARBON DIOXIDE (CO2) 0-5% VOL, IR.

86-2314-0021-00 - T40 SENSOR, CARBON DIOXIDE (CO2) 0-100% VOL, IR.

* + - * 1. Carbon Monoxide (CO).

86-3115-1800-00 - T40/WTA SENSOR, CARBON MONOXIDE (CO) 0-50 PPM, EC.

86-3115-2000-00 - T40/WTA SENSOR, CARBON MONOXIDE (CO) 0-200 PPM, EC.

86-3115-2300-00 - T40/WTA SENSOR, CARBON MONOXIDE (CO) 0-1,000 PPM, EC.

86-3115-2400-00 - T40/WTA SENSOR, CARBON MONOXIDE (CO) 0-2,000 PPM, EC.

* + - * 1. Chlorine (Cl2).

86-3116-1400-00 - T40/WTA SENSOR, CHLORINE (CL2) 0-10 PPM, EC (HIGHLY REACTIVE).

86-3116-1800-00 - T40/WTA SENSOR, CHLORINE (CL2) 0-50 PPM, EC (HIGHLY REACTIVE).

* + - * 1. Chlorine Dioxide (ClO2).

86-3117-1100-00 - T40/WTA SENSOR, CHLORINE DIOXIDE (CLO2) 0-1 PPM, EC (HIGHLY REACTIVE).

* + - * 1. Combustibles (IR).

86-2351-0021-00 - T40 SENSOR, METHANE (CH4) 0-100% VOL, IR.

86-2351-0022-00 - T40 SENSOR, METHANE (CH4) 0-100% LEL, IR.

86-9551-0022-00 - TXP-IRE SENSOR, METHANE (CH4) 100% LEL, EXTREME DUTY, 4-20MA OUTPUT.

86-2352-0022-00 - T40 SENSOR, PROPANE (C3H8) 0-100% LEL, IR

* + - * 1. Combustibles (Cat Bead).

86-2251-0022-00 - T40 SENSOR, COMBUSTIBLE GAS, 0-100% LEL, CATALYTIC BEAD, CSA 152.

86-2261-0022-00 - T40 SENSOR, ACETYLENE (C2H2) 0-100% LEL, CATALYTIC BEAD

* + - * 1. Hydrogen (H2).

86-3124-2300-00 - T40/WTA SENSOR, HYDROGEN (H2) 0-1,000 PPM, EC

86-3124-2600-00 - T40/WTA SENSOR, HYDROGEN (H2) 0-10,000 PPM, EC

* + - * 1. Hydrogen Chloride (HCl).

86-3126-1900-00 - T40/WTA SENSOR, HYDROGEN CHLORIDE (HCL) 0-100 PPM, EC (HIGHLY REACTIVE)

* + - * 1. Hydrogen Fluoride (HF).

86-3128-3700-00 - T40/WTA SENSOR, HYDROGEN FLUORIDE (HF) 0-40 PPM, EC

* + - * 1. Hydrogen Sulfide (H2S).

86-3130-1600-00 - T40/WTA SENSOR, HYDROGEN SULFIDE (H2S) 0-25 PPM, EC.

86-3130-1800-00 - T40/WTA SENSOR, HYDROGEN SULFIDE (H2S) 0-50 PPM, EC.

86-3130-1900-00 - T40/WTA SENSOR, HYDROGEN SULFIDE (H2S) 0-100 PPM, EC.

86-3130-2000-00 - T40/WTA SENSOR, HYDROGEN SULFIDE (H2S) 0-200 PPM, EC.

86-3130-2500-00 - T40/WTA SENSOR, HYDROGEN SULFIDE (H2S) 0-5,000 PPM, EC.

* + - * 1. Mercaptan (CH3SH).

86-3132-1400-00 - T40/WTA SENSOR, MERCAPTAN (CH3SH) 0-10 PPM, EC.

* + - * 1. Nitric Oxide (NO).

86-3133-1900-00 - TXP/WTA SENSOR, NITRIC OXIDE (NO) 0-100PPM, EC.

* + - * 1. Nitrogen Dioxide (NO2).

86-3134-1500-00 - T40/WTA SENSOR, NITROGEN DIOXIDE (NO2) 0-20 PPM, EC.

* + - * 1. Oxygen (O2).

86-3111-0017-00 - T40/WTA SENSOR, OXYGEN (O2) 0-25% VOL, EC.

* + - * 1. Ozone (O3).

86-3136-1100-00 - T40/WTA SENSOR, OZONE (O3) 0-1 PPM, EC (POLY ONLY).

86-3136-1500-00 - T40/WTA SENSOR, OZONE (O3) 0-20 PPM, EC (POLY ONLY).

86-3136-1900-00 - T40/WTA SENSOR, OZONE (O3) 0-100 PPM, EC (POLY ONLY).

* + - * 1. Phosphine (PH3).

86-3138-1300-00 - T40/WTA SENSOR, PHOSPHINE (PH3) 0-5 PPM, EC (HIGHLY REACTIVE).

* + - * 1. Sulfur Dioxide (SO2).

86-3140-1500-00 - T40/WTA SENSOR, SULFUR DIOXIDE (SO2) 0-20 PPM, EC.

* + - * 1. Volatile Organic Compounds (VOC).

86-6631-2600-00 - T40 SENSOR, PHOTOIONIZATION (PID) 0-4,000 PPM, 10.6 EV.

\*\* NOTE TO SPECIFIER \*\* Delete accessories not required.

* + - 1. Accessories:
				1. Remote Sensor Assemblies.

Part Number: 88-1109-0000-10. Remote Sensor Assembly, Aluminum, Stainless Steel Sensor Head C1D1; Non-reactive Sensor.

Part Number: 88-1109-0000-20. Remote Sensor Assembly, Aluminum, Stainless Steel Sensor Head C1D2; Reactive Sensor.

Part Number: 88-1309-0000-30. Remote Sensor Assembly, Poly C1D2 Non-Incendive.

* + - * 1. Part Number: 88-1000-0040-00. Relay Option Board, Four, 5A / Dual Modbus; Master and Slave.
				2. Part Number: 88-C20S-0000-00. Sensor Head Flow Cell Adapter. Compatible with Stainless Steel Sensor Housing.
				3. Part Number: 88-C50G-0000-00. Splash Guard W/Calibration Port. Compatible with Stainless Steel Sensor Housing.
				4. Part Number: 88-C50P-0000-00. Sensor Head Flow Cell, Cover Only. Compatible with Poly Sensor Housing.
				5. Part Number: 88-C200-0000-0D. Universal Duct Mount Kit.
				6. Part Number: 88-C50P-0000-00. Sensor Head Cal-Adapter. Compatible with Stainless Steel Sensor Housing.
				7. Part Number: 88-C000-0000-02. Large Magnetic Wand, AL/SS Transmitters.
				8. Part Number: 88-C000-0000-01. Small Magnetic Wand, Poly Transmitters.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + 1. Alarm Control Panels:

\*\* NOTE TO SPECIFIER \*\* Delete basis of design option not required.

* + - 1. Basis of Design: Model TXP-C20. 2 Channel Alarm Control Panels. Designed to display, and control alarm event switching for two sensor points.
				1. Inputs: TXP-C20:

Dual bridge; Catalytic Bead/IR.

Dual toxic; Electrochemical.

One bridge and one toxic.

Dual 4-20 mA input.

* + - * 1. Serial Port Option: Modbus RTU Slave RS-485 Port Tx / RX LED's.
			1. Basis of Design: Model TXP-C40. 4 Channel Alarm Control Panels. Designed to display, and control alarm event switching for four sensor points.
				1. Inputs: TXP-C40:

Quad bridge; Catalytic Bead/IR.

Quad toxic; Electrochemical.

Dual bridge and dual toxic.

Dual bridge and dual 4-20 mA.

Quad 4-20 mA.

* + - * 1. Serial Port Option TXP-C40:

Modbus RTU Master/Slave RS-485 Port Tx / RX LED's.

Serial to dual Ethernet Modbus TCP bridge, for C1D2 locations.

* + - 1. Standards Compliance:
				1. CSA C22.2 No. 1010.1 and C22.2 NO 152 for combustible gases.
				2. ISAS82.02: UL1604 / C22.2 No 213l; NEMA 4X Enclosures: Div. 2, Groups A, B, C and D.
				3. EN55011 and EN 61000.
			2. Poly Enclosure Size (LxWxH): 14.1 x 12.14 x 7.75 inch (358 x 308 x 197 mm). NEMA 4X.

\*\* NOTE TO SPECIFIER \*\* Delete power supply option not required.

* + - 1. Primary Power Supply: 120 to 240 VAC.
			2. Primary Power Supply: 10 to 30 VDC, 50 watt primary power supply.
			3. Relays:
				1. Two programmable 5A 30 VDC or 250 VAC resistive Form C Relays for warning, high alarm, horn, and fault conditions.

\*\* NOTE TO SPECIFIER \*\* Relays below are optional. Delete if not required.

* + - * 1. Six programmable 5A 30 VDC or 250 VAC resistive Form C Relays.
			1. Display:
				1. LCD Screen: 128 x 64 pixel backlit indicates engineering units, 30 minute trends or bar-graphs.
				2. LEDs: Quantity of Six, provide alarm and fault status, cal mode and keypad activity.

Cal Mode: Offers pushbutton zero and span calibration for direct sensor input applications.

* + - 1. Temperature Range: Minus 13 to 140 degrees F (Minus 25 to 60 degrees C).
			2. Humidity Range: 0 to 90 percent R. H. non-condensing.
			3. Altitude: Recommended up to 6562 ft (2000 m).

\*\* NOTE TO SPECIFIER \*\* Delete parts and accessories paragraph not required then delete parts and accessories not required.

* + - 1. Parts and Accessories for TXP-C20:
				1. Part Number: 88-C020-0000-20.

Power Supply: 100 to 240 VAC.

Power Supply: 10 to 30 VDC with 50 W, C1, D2.

* + - * 1. Part Number: 90-8000-0000-07. LCD / micro controller PCB and ribbon cable.
				2. Part Number: 88-4000-0070-00. Dual 4 to 20 mA output board.
				3. Part Number: 88-5000-0080-00. RS-232 / RS-485 RTU addressable interface.
				4. Part Number: 88-4000-0300-00. Dual channel 4 to 20 mA input board.
				5. Part Number: 88-4000-0400-00. Bridge sensor, 1 EC sensor input combo board.

\*\* NOTE TO SPECIFIER \*\* Alarm relay board is optional. Delete if not required.

* + - * 1. Part Number: 88-4000-0020-00. Alarm Relay Board; Six, 5A Form C Relays.
			1. Parts and Accessories for TXP-C40:
				1. Part Number: 88-C020-0000-20. Power Supply, 100 to 240 VAC / 10 to 30 VDC with 50 W, C1, D2.
				2. Part Number: 90-8000-0000-09. Quad LCD / micro controller PCB and ribbon cable.
				3. Part Number: 88-4000-0020-00. Alarm relay board; Six, 5A form C relays.
				4. Part Number: 88-5000-0060-00. Single RS-485 serial Modbus TCP bridge, non-hazardous locations.
				5. Part Number: 88-5000-0070-00. Quad channel 4 to 20 mA output board.
				6. Part Number: 88-5000-0070-20. Serial to dual Ethernet Modbus TCP bridge, for C1D2 locations.
				7. Part Number: 88-5000-0080-00. RS-232 / RS-485 RTU addressable interface.
				8. Part Number: 90-8000-5000-00. Quad channel 4 to 20 mA input board.
				9. Part Number: 90-8000-6000-00. Two Bridge Sensors and two, 4-20 mA or four Bridge sensors input boards.
		1. Multi-Channel Controllers:
			1. Basis of Design: Model TXP-C64. 64 Channel Alarm Controller. Provides signal conditioning, simultaneous real-time display, and alarm events for 64 input channels. Display settings offer readings in numerical engineering units, bar graphs and trends. Data is logged and retrieved via an SD card.
			2. Standards Compliance:
				1. CSA C22.2 No. 1010.1 and C22.2 No. 152 for combustible and ISA S82.02.
				2. UL 1604 / C22.2 No. 213; NEMA 4X: Class 1 Div. 2 Groups A, B, C, D.
				3. EN55011 and EN61000.
			3. Housing Dimensions, Fiberglass (LxWxH): 27.6 x 24.11 x 9.51 (701 x 612 x 242 mm).
				1. Shipping Weight: 72 lbs (32.66 kg).
			4. Housing Dimensions, Compact Fiberglass (LxWxH): 16 x 13.16 x 8.5 (406 x 334 x 216 mm).
				1. Shipping Weight: 32 lbs (14.51 kg).
			5. Primary Power Supply: 120-240 VAC.
			6. Primary Power Supply: 10-30 VDC, 600 watt.
			7. Modbus Inputs: Dual Modbus Master and Slave RS-485 ports.
			8. Ethernet Port: Modbus TCP interface port with web server.

\*\* NOTE TO SPECIFIER \*\* Analog inputs and outputs are optional. Delete if not required.

* + - 1. Analog Inputs: 4-20 mA inputs; 16, 32, 48 or 64.
			2. Analog Outputs: 4-20 mA outputs; 16, 32, 48 or 64.
			3. Relays: Five, 5A 30 VDC or 250 VAC resistive Form C.
				1. Two, standard SPDT 5A alarm relays for horn and fault.
				2. Three, programmable alarm relays.

\*\* NOTE TO SPECIFIER \*\* The following two items are optional. Delete if not required.

* + - * 1. Discrete Relay Option Board; 16, 5A 30 VDC or 250 VAC resistive Form C.
				2. Programmable Alarm Relay Board; 16, 5A Form C Relays.
			1. Display: Color QVGA 320 x 240 pixel graphic LCD with backlight displays bar graphs, trends, and engineering units.
				1. Five discrete LEDs indicate alarm status for five alarm relays.
			2. Temperature Range: Minus 13 to 140 degrees F (Minus 25 to 60 degrees C).
			3. Magnetic Key-Pad: For non-intrusive operation.
			4. Cal Mode: Zero/span calibration for direct sensor input applications.
			5. Security Functions: Lock out unauthorized users.
			6. Expandable for changing needs.

\*\* NOTE TO SPECIFIER \*\* Delete options not required.

* + - 1. Options:
				1. Part Number: 88-7000-0030-00. Programmable Alarm Relay Board; 16, 5A Form C Relays.
				2. Part Number: 88-7000-0020-00. Discrete Alarm Relay Board; 16, 5A Form C Relays.
				3. Part Number: 88-7000-0010-00. Auxiliary Standard Alarm Relay Board; 2 standard relays for horn and fault, 3 programmable relays.
				4. Part Number: 88-7000-0070-00. Analog 4-20 mA Output Board; 16 Outputs.
				5. Part Number: 88-7000-0300-00. Analog 4-20 mA Input Board; 16 Inputs.
				6. Part Number: 88-700R-0000-00. NEMA 4X Expansion Kit; Adds Up To 5 Option Positions.
				7. Part Number: 88-730U-0000-00. NEMA 4X Expansion Enclosure; Adds Up To 10 Option Positions.
				8. Part Number: 88-7040-0000-00. 100 - 240 VAC Universal Input 600 Watt 24 VDC Power Supply; Replacement.

\*\* NOTE TO SPECIFIER \*\* Delete article if not required.

* 1. WIRELESS GAS DETECTION

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + 1. Basis of Design: Model TXP-WTA. 900 MHz Wireless Transmitter. Available using a robust 900 MHz radio frequency to meet demanding communication requirements. Smart Sensors: Single or dual configurations allow redundant readings for critical operations or monitoring combination gases. Allows changing sensor types. Utilizes same sensors as wired transmitters. Supports integral and remote sensors. Intuitive non-intrusive magnetic interface.
			1. Standards Compliance: FCC 15.247 and Industry Canada (IC), CSA Certified for Class 1, Division 2 Hazardous locations.

\*\* NOTE TO SPECIFIER \*\* Delete housing option not required.

* + - 1. Aluminum Housing (LxWxH): 5 x 5.4 x 8 inches (127 x 137 x 203 mm).
				1. Shipping Weight: 6.5 lbs. (2.94 kg).
			2. Poly Housing (LxWxH): 4 x 5 x 7 inches (102 x 127 x 178 mm).
				1. Shipping Weight: 3 lbs. (1.36 kg).

\*\* NOTE TO SPECIFIER \*\* Delete power supply option not required. The battery option is standard.

* + - 1. Power Supply: Disposable, internal 3.6 V, D-cell lithium battery.
			2. Power Supply: Power board, 12-24 VDC.

\*\* NOTE TO SPECIFIER \*\* Delete input option not required.

* + - 1. Input: Single or dual electrochemical or infrared sensors input capable.
			2. Input: 4-20 mA.
			3. Standard Output: Frequency-hopping spread spectrum (FHSS) Wireless modem with data encryption 900MHz power adjustable from 10 mW to 1.0 watt / 0-30 dBm.
			4. Display: 64 x 128 Pixel LCD w/ 30-minute trend Bar graph and engineering units.
			5. Temperature Range: Minus 40 to 131 degrees F (Minus 40 to 55 degrees C).
			6. Humidity: 0 to 95 percent RH non-condensing.
			7. Five LED Indications: Three alarms, and two communication status.
			8. Password provides menu security.
			9. Performance:
				1. 900 MHz indoor/urban range: Up to 3000 ft (9124.4 m).
				2. 900 MHz frequency range: 902 to 928 MHz with 50 hops with 2dBi dipole antenna.
				3. 900 MHz outdoor RF LOS range: Up to 2 to 3 miles (3.22 to 4.83 km) with high-gain antenna.
			10. Options:
				1. Dual sensor capable with integral and remote sensor options.
				2. Magnetic mount option.

\*\* NOTE TO SPECIFIER \*\* Delete gas options not required.

* + - 1. Gas Options:
				1. Ammonia (NH3).

86-3112-1900-00 - T40/WTA SENSOR, AMMONIA (NH3) 0-100 PPM, EC.

86-3112-2000-00 - T40/WTA SENSOR, AMMONIA (NH3) 0-200 PPM, EC.

86-3144-3300-00 - T40/WTA SENSOR, AMMONIA (NH3) 0-200 PPM, EC, EXTENDED LIFE.

86-3112-3700-00 - T40/WTA SENSOR, AMMONIA (NH3) 0-300 PPM, EC.

86-3112-2200-00 - T40/WTA SENSOR, AMMONIA (NH3) 0-500 PPM, EC.

* + - * 1. Carbon Dioxide (CO2).

86-2314-0014-00 - T40 SENSOR, CARBON DIOXIDE (CO2) 0-5% VOL, IR.

86-2314-0021-00 - T40 SENSOR, CARBON DIOXIDE (CO2) 0-100% VOL, IR.

* + - * 1. Carbon Monoxide (CO).

86-3115-1800-00 - T40/WTA SENSOR, CARBON MONOXIDE (CO) 0-50 PPM, EC.

86-3115-2000-00 - T40/WTA SENSOR, CARBON MONOXIDE (CO) 0-200 PPM, EC.

86-3115-2300-00 - T40/WTA SENSOR, CARBON MONOXIDE (CO) 0-1,000 PPM, EC.

86-3115-2400-00 - T40/WTA SENSOR, CARBON MONOXIDE (CO) 0-2,000 PPM, EC.

* + - * 1. Chlorine (Cl2).

86-3116-1400-00 - T40/WTA SENSOR, CHLORINE (CL2) 0-10 PPM, EC (HIGHLY REACTIVE).

86-3116-1800-00 - T40/WTA SENSOR, CHLORINE (CL2) 0-50 PPM, EC (HIGHLY REACTIVE).

* + - * 1. Chlorine Dioxide (ClO2).

86-3117-1100-00 - T40/WTA SENSOR, CHLORINE DIOXIDE (CLO2) 0-1 PPM, EC (HIGHLY REACTIVE).

* + - * 1. Combustibles (IR).

86-2351-0021-00 - T40 SENSOR, METHANE (CH4) 0-100% VOL, IR.

86-2351-0022-00 - T40 SENSOR, METHANE (CH4) 0-100% LEL, IR.

86-2352-0022-00 - T40 SENSOR, PROPANE (C3H8) 0-100% LEL, IR.

86-4451-0022-00 - T40/WTA SENSOR, COMBUSTIBLE GAS, 0-100% LEL, IR (LOW POWER).

* + - * 1. Hydrogen (H2).

86-3124-2300-00 - T40/WTA SENSOR, HYDROGEN (H2) 0-1,000 PPM, EC.

86-3124-2600-00 - T40/WTA SENSOR, HYDROGEN (H2) 0-10,000 PPM, EC.

* + - * 1. Hydrogen Chloride (HCl).

86-3126-1900-00 - T40/WTA SENSOR, HYDROGEN CHLORIDE (HCL) 0-100 PPM, EC (HIGHLY REACTIVE).

* + - * 1. Hydrogen Fluoride (HF).

86-3128-3700-00 - T40/WTA SENSOR, HYDROGEN FLUORIDE (HF) 0-40 PPM, EC

* + - * 1. Hydrogen Sulfide (H2S).

86-3130-1600-00 - T40/WTA SENSOR, HYDROGEN SULFIDE (H2S) 0-25 PPM, EC.

86-3130-1800-00 - T40/WTA SENSOR, HYDROGEN SULFIDE (H2S) 0-50 PPM, EC.

86-3130-1900-00 - T40/WTA SENSOR, HYDROGEN SULFIDE (H2S) 0-100 PPM, EC.

86-3130-2000-00 - T40/WTA SENSOR, HYDROGEN SULFIDE (H2S) 0-200 PPM, EC.

86-3130-2500-00 - T40/WTA SENSOR, HYDROGEN SULFIDE (H2S) 0-5,000 PPM, EC.

* + - * 1. Mercaptan (CH3SH).

86-3132-1400-00 - T40/WTA SENSOR, MERCAPTAN (CH3SH) 0-10 PPM, EC.

* + - * 1. Nitric Oxide (NO).

86-3133-1900-00 - TXP/WTA SENSOR, NITRIC OXIDE (NO) 0-100PPM, EC.

* + - * 1. Nitrogen Dioxide (NO2).

86-3134-1500-00 - T40/WTA SENSOR, NITROGEN DIOXIDE (NO2) 0-20 PPM, EC.

* + - * 1. Oxygen (O2).

86-3111-0017-00 - T40/WTA SENSOR, OXYGEN (O2) 0-25% VOL, EC

* + - * 1. Ozone (O3).

86-3136-1100-00 - T40/WTA SENSOR, OZONE (O3) 0-1 PPM, EC (POLY ONLY).

86-3136-1500-00 - T40/WTA SENSOR, OZONE (O3) 0-20 PPM, EC (POLY ONLY).

86-3136-1900-00 - T40/WTA SENSOR, OZONE (O3) 0-100 PPM, EC (POLY ONLY).

* + - * 1. Phosphine (PH3).

86-3138-1300-00 - T40/WTA SENSOR, PHOSPHINE (PH3) 0-5 PPM, EC (HIGHLY REACTIVE).

* + - * 1. Sulfur Dioxide (SO2).

86-3140-1500-00 - T40/WTA SENSOR, SULFUR DIOXIDE (SO2) 0-20 PPM, EC.

\*\* NOTE TO SPECIFIER \*\* Delete For other gases and ranges, please contact Macurco Gas Detection (1-877-367-7891; info@macurco.com )

* + 1. Basis of Design: Model TXP-WCR. 900 MHz 32 Channel Wireless Controller/Receiver.

\*\* NOTE TO SPECIFIER \*\* Delete controller receiver options not required.

* + - 1. TXP-WCR/PY: NEMA 4X non-metallic polyester wall mount.
				1. DIV 2 Groups A, B, C, D.
				2. Category II and pollution degree 3.
				3. NEMA 4X; IP66.
			2. TXP-WCR/SS: NEMA 4X stainless steel wall mount.
				1. DIV 2 Groups A, B, C, D.
				2. Category II and pollution degree 3.
				3. NEMA 4X; IP66.

\*\* NOTE TO SPECIFIER \*\* Delete housing options not required.

* + - 1. Poly Housing (LxWxH): 7.3 x 12.1 x 14.1 inch (185 x 307 x 358 mm). NEMA 4X, C1, D2.
				1. Shipping Weight: 18.2 lbs (8.25 kg).
			2. Stainless Steel Housing (LxWxH): 6.0 x 9.75 x 13.75 inch (152 x 248 x 349 mm). NEMA 4X, C1, D2.
				1. Shipping Weight: 17.0 lbs (7.71 kg).
			3. Power Supply:
				1. AC Power 100-240 VAC 50/60 Hz at .80 amp Max.
				2. 40 watts Max Steady-State 10-30 VDC.
				3. 3 watts max; basic WCR with all relays energized.
			4. Input: Wireless Communication from TXP-WTA.
			5. Output: 900 MHz Power Adjustable From 10 mW to 1 watt.
			6. Display: 128 x 64 Pixel Graphic LCD.
			7. Temperature Range: 35 to 140 degrees F (Minus 25 to 60 degrees C).
			8. Humidity: 0 to 90 percent RH Non-Condensing.
			9. Wi-Fi: Remote HMI functionality.
			10. Non-volatile memory.
			11. Up to 26 frequency-hopping spread spectrum hopping patterns.
			12. Programmable Relays: Eight.
			13. Real time clock and calendar.

\*\* NOTE TO SPECIFIER \*\* Delete antenna options not required.

* + - 1. Antenna: 900 MHz Dipole rubber, Div. 2.
			2. Antenna: 900 MHz Dipole, X.P. D1.
			3. Antenna: 900 MHz Yagi.
			4. Non-intrusive magnetic interface.
			5. Time and date stamped event logging.

\*\* NOTE TO SPECIFIER \*\* Delete accessories not required.

* + - 1. I / O Communications Accessories:
				1. Wi-Fi Radio Kit.
				2. Datalogging with wired Modbus Slave.
				3. Datalogging with wireless Modbus Slave Port with 900 Mhz Radio kit.
				4. Datalogging with wired Modbus Slave Port with Wi-Fi and embedded web page.
				5. Datalogging with wireless Modbus Slave Port with 900 MHz radio kit with Wi-Fi and embedded web page.
				6. Datalogging with wired Modbus Slave Port and Ethernet.
				7. Datalogging with wireless Modbus Slave Port with 900 MHz radio kit and Ethernet.
1. EXECUTION
	1. EXAMINATION
		1. Do not begin installation until substrates have been properly constructed and prepared.
		2. If substrate preparation is the responsibility of another installer, notify Architect in writing of unsatisfactory preparation before proceeding.
	2. PREPARATION
		1. Clean surfaces thoroughly prior to installation.
		2. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
	3. INSTALLATION
		1. Install in accordance with manufacturer's instructions, approved submittals, and in proper relationship with adjacent construction.
	4. FIELD QUALITY CONTROL
		1. Field Inspection: Coordinate field inspection in accordance with appropriate sections in Division 01.

\*\* NOTE TO SPECIFIER \*\* Include if manufacturer provides field quality control with onsite personnel for instruction or supervision of product installation, application, erection, or construction. Delete if not required.

* + 1. Manufacturer's Services: Coordinate manufacturer's services in accordance with appropriate sections in Division 01.
	1. CLEANING AND PROTECTION
		1. Clean products in accordance with the manufacturers recommendations.
		2. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION