One Series

UNITED ELECTRIC CONTROLS

Electronic Pressure, Differential Pressure and Temperature Switches
Discrete Input, Intrinsically Safe, Flameproof and Non-Incendive
Models: 1XSWLL, 1XSWHL, and 1XSWHH

Installation and Operation Instructions

Please read all instructional literature carefully and thoroughly before starting.
Refer to the final page for the Warranty.

GENERAL

MISUSE OF THIS DEVICE MAY CAUSE EXPLOSION AND PERSONAL INJURY. THESE INSTRUCTIONS MUST BE THOROUGHLY READ AND UNDERSTOOD BEFORE DEVICE IS INSTALLED. SEE THE DEVICE NAMEPLATE FOR AGENCY CERTIFICATIONS APPLICABLE.

BEFORE INSTALLING, CHECK THE SENSOR MODEL SELECTED FOR COMPATIBILITY BETWEEN THE PROCESS MEDIA AND THE SENSOR WETTED PARTS.

CABLE GLANDS USED MUST BE RATED FOR A MINIMUM OF IP66 IN ORDER TO MAINTAIN THE SAME IP RATING.

FOR ZONE HAZARDOUS LOCATIONS, ALL CABLE ENTRY DEVICES SHALL BE CERTIFIED IN TYPE OF EXPLOSION PROTECTION FLAMEPROOF ENCLOSURE "d" WITH AN IP66 RATING, SUITABLE FOR THE CONDITIONS OF USE AND CORRECTLY INSTALLED. IF CABLES AND CABLE GLANDS ARE NOT USED, A SEAL MUST BE INSTALLED WITHIN 2" OF THE ENCLOSURE. FLAMEPROOF JOINT AND GAP DETAILS ARE PROVIDED ON PAGE 3.

THIS DEVICE DOES NOT HAVE ANY REPLACEABLE PARTS. ANY SUBSTITUTION OF COMPONENTS SHALL INVALIDATE AGENCY CERTIFICATION(S), AND IMPAIR SUITABILITY FOR CLASS I, DIV. 1 LOCATION.

This equipment is certified in accordance with the requirements of the following applicable standards (see table below) and is suitable for use in non-hazardous and the following hazardous locations.

Region and Agency	Classification	
	Models 1XSWLL	Models 1XSWHL, 1XSWHH
North America UL/CSA	**Certification:** E226592-20150623 Class I, Groups A, B, C, and D; Class II, Groups E, F, and G; Class III [i] Class I, Groups B, C, and D; Class II, Groups E, F, and G; Class III [ii] Class I, Div. 2, Groups A, B, C, and D; Class II, Div. 2, Groups F and G; Class III [iii] Class I, Zone 0, AEx ia IIC T4 Ga [i] — Ex ia IIC T4 Ga Class I, Zone 1, AEx db IIC T3/T5 Gb [iv] — Ex db IIC T3/T5 Gb [iv] Class I, Zone 2, AEx nA IIC T4 Gc — Ex nA IIC T4 Gc **Applicable Standards:** UL 60079-0, CSA C22.2 No. 60079-0, UL 60079-1, CSA C22.2 No. 60079-1; UL 60079-11, CSA C22.2 No. 60079-11, UL 60079-15, CSA C22.2 No. 60079-15; UL 61010-1, CSA C22.2 No. 61010-1; UL 913; UL 1203; UL 50; UL 50E; UL 121201; CSA C22.2 No. 25; CSA C22.2 No. 30; CSA C22.2 No. 157; CSA C22.2 No. 213; CSA C22.2 No. 94.1; CSA C22.2 No. 94.2; ISA 12.27.01	**Certification:** E226592-20151030 Class I, Groups A, B, C, and D; Class II, Groups E, F, and G; Class III Class I, Groups B, C, and D; Class II, Groups E, F, and G; Class III [ii] Class I, Div. 2, Groups A, B, C, and D; Class II, Div. 2, Groups F and G; Class III [iii] Class I, Zone 1, AEx db IIC T3/T5 Gb [iv] — Ex db IIC T3/T5 Gb [iv] Class I, Zone 2, AEx nA IIC T4 Gc — Ex nA IIC T4 Gc **Applicable Standards:** UL 60079-0, CSA C22.2 No. 60079-0; UL 60079-1, CSA C22.2 No. 60079-1; UL 60079-15, CSA-C22.2 No. 60079-15; UL 61010-1, CSA C22.2 No. 61010-1; UL 1203; UL 50; UL 50E; UL 121201; CSA C22.2 No. 25; CSA C22.2 No. 30; CSA C22.2 No. 157; CSA C22.2 No. 213; ISA 12.27.01
Europe ATEX	**Certification:** DEMKO 09 ATEX 0813748X, DEMKO IS ATEX 1483	
	II 1 G Ex ia IIC T4 Ga II 1 D Ex ia IIIC T135 °C Da II 2 G Ex db IIC T3/T5 Gb [iv] II 2 D Ex tb IIIC T90 °C Db II 3 G Ex nA IIC T4 Gc -40 °C ≤ Ta ≤ +85 °C	II 2 G Ex db IIC T3/T5 Gb [iv] II 2 D Ex tb IIIC T90 °C Db II 3 G Ex nA IIC T4 Gc -40 °C ≤ Ta ≤ +80 °C
	Applicable Standards: EN IEC 60079-0, EN 60079-1, EN 60079-11, EN 60079-15, EN 60079-31	

[i] Explosion Proof or Intrinsic Safety. Intrinsically safe when installed in accordance with Control Drawing No. 62174-64.
[ii] Explosion Proof for models with M041 Dual Seal option.
[iii] Non-incendive.
[iv] T3 for pressure sensor models P06-P16 only

Region and Agency	Classification	
	Models 1XSWLL	Models 1XSWHL, 1XSWHH
International IECEx	**Certification: IECEx UL 08.0017X**	
	Ex ia IIC T4 Ga Ex ia IIIC T135 °C Da Ex db IIC T3/T5 Gb [i] Ex tb IIIC T90 °C Db, IP66 Ex nA IIC T4 Gc -40 °C ≤ Ta ≤ +85 °C	Ex db IIC T3/T5 Gb [i] Ex tb IIIC T90 °C Db, IP66 Ex nA IIC T4 Gc -40 °C ≤ Ta ≤ +85 °C
	Standards: IEC 60079-0, IEC 60079-1, IEC 60079-11, IEC 60079-15, IEC 60079-31	
China CCC	**Certification:** 2020322304003033	
	Ex ia IIC T4 Ga Ex ia IIIC T200 135 °C Da Ex db IIC T3/T5 Gb [i] Ex tb IIIC T90C Db Ex ec IIC T4 Gc -40 °C ≤ Ta ≤ +85 °C	Ex db IIC T3/T5 Gb [i] Ex tb IIIC T90 °C Db, IP66 Ex ec IIC T4 Gc -40 °C ≤ Ta ≤ +85 °C
	Standards: GB/T 3836.1, GB/T 3836.2, GB/T 3836.3, GB/T 3836.4, GB/T 3836.31	
Brazil INMETRO	**Certification:** UL-BR 15.1049X	
	Ex ia IIC T4 Ga Ex ia IIIC T135°C Da Ex db IIC T3/T5 Gb [i] Ex tb IIIC T90 °C Db Ex nA IIC T4 Gc -40 °C ≤ Ta ≤ +85 °C	Ex db IIC T3/T5 Gb [i] Ex tb IIIC T90 °C Db Ex nA IIC T4 Gc -40 °C ≤ Ta ≤ +85 °C
	Standards: ABNT NBR IEC 60079-0, ABNT NBR IEC 60079-1, ABNT NBR IEC 60079-11, ABNT NBR IEC 60079-15, ABNT NBR IEC 60079-31	
Korea KCS	**Certification:** 19-KA4BO-0624X, 16-GA4BO-0041X, 16-KA480-0539X	
	Markings: Ex ia IIC T4 Ga Ex db IIC T3/T5 [i] -40 °C ≤ Ta ≤ +85 °C	Ex db IIC T3/T5 Gb [i] -40 °C ≤ Ta ≤ +85 °C
	Standards: based on IEC UL 08.0017X	
India PESO	**Certification:** P417586/2, P417586/3	
	II 1 G Ex ia IIC T4 Ga II 1 D Ex ia IIIC T135 °C Da II 2 G Ex db IIC T3/T5 Gb [i] II 2 D Ex tb IIIC T90 °C Db -40 °C ≤ Ta ≤ +85 °C	II 2 G Ex db IIC T3/T5 Gb [i] II 2 D Ex tb IIIC T90 °C Db -40 °C ≤ Ta ≤ +85 °C
	Standards: See DEMKO 09ATEX 0813748X	
UKCA	**Certification:** UL21UKEX2236X	
	II 1 G Ex ia IIC T4 Ga II 1 D Ex ia IIIC T135 °C Da II 2 G Ex db IIC T3/T5 Gb [i] II 2 D Ex tb IIIC T90 °C Db II 3G Ex nA IIC T4 Gc -40 °C ≤ Ta ≤ +85 °C	II 2 G Ex db IIC T3/T5 Gb [i] II 2 D Ex tb IIIC T90 °C Db II 3G Ex nA IIC T4 Gc -40 °C ≤ Ta ≤ +85 °C
	Standards: EN IEC 60079-0, EN 60079-1, EN 60079-11,EN 60079-15, EN 60079-31	
EAC (Russia, Armenia, Belarus, Kazakhstan, Kyrgyzstn)	**Certification:** RU C-US.AA87.B.00608/20	**Certification:** RU C-US.AA87.B.00606/20
	0Ex ia IIC T4 Ga X Ex ia IIIC T135 °C Da X 1 Ex db IIC T5 Gb X Ex tb IIIC T90 °C Db X 2Ex nA IIC T4 Gc X -40 °C ≤ Ta ≤ +85 °C	1Ex db IIC T3/T5 Gb X [i] Ex tb IIIC T90 °C D X 2Ex nA IIC T4 G X -40 °C ≤ Ta ≤ +85 °C
	Standards: ГОСТ 31610.0, ГОСТ IEC 60079-1, ГОСТ 31610.11, ГОСТ 31610.15, ГОСТ IEC 60079-31	**Standards:** ГОСТ 31610.0, ГОСТ IEC 60079-1, ГОСТ 31610.15, ГОСТ IEC 60079-31

[i] T3 for pressure sensor models P06-P16 only

ATEX AND IEC SPECIFIC CONDITIONS OF USE FOR FLAMEPROOF AND DUST-IGNITION PROOF ("db" AND "tb"):

FLAMEPROOF JOINT AND GAP DETAILS:

- Enclosure to cover threaded joint: 4" - 16 UN-2, 7 threads engaged minimum
- Glass to cover cemented joint: 0.753" (19,1 mm) rabbet/spigot minimum length
- Breather element threaded joint: M8-1.25 (6g/6H medium fit class), 11 threads engaged minimum
- Electrical conduit threaded joint: 3/4"-14 NPT, 5 threads engaged minimum
- Enclosure to sensor threaded joint:
  - Pressure models: 1"-20 UNEF-2, 10 threads engaged minimum
  - Temperature models: 1/2"-14 NPT, 5 threads engaged minimum
  - Remote and local spring loaded temperature sensor gap joints: 0.0045" (0.114 mm) maximum annular gap by 1.25" (31,8 mm) minimum length
- User installed temperature sensors must be certified to flameproof "db" and dust "tb" requirements for the same group and ambient temperature range, made from a corrosion resistant material, and engage 5 threads min with grease required on threads. This certificate applies to the device described herein only and does not cover the user installed temperature sensor.

DUAL SEAL ADAPTOR (OPTION M041) JOINT AND GAP DETAILS:

- Threaded Dual Seal Adaptor Option Enclosure to One Series Enclosure : 1"-20 UNEF-2, 10 threads engaged minimum
- Breather element threaded joint: 1/4"-20 UNC-2, 10 threads engaged minimum
- Secondary Seal Housing to union housing joint: 0.580" (14,73 mm) rabbet/spigot minimum length, maximum annular gap 0.003 in. (0,08 mm)
- Sensor to union housing joint: 0.580" (14,73 mm) rabbet/spigot minimum length, maximum gap 0.003 in. (0,08 mm)
- Threaded Dual Seal Adaptor option to Sensor 1"-20 UNEF-2, 10 threads engaged minimum or 1/2"-14 NPT, 5 threads engaged minimum.

ATEX AND IEC SPECIFIC CONDITIONS OF USE FOR INTRISIC SAFETY ("ia"):

- Enclosure and cover are made from Aluminum Alloy, do not strike with heavy object.
- Separation distances were assessed to Annex F of IEC 60079-11.
- Device must be powered by a galvanically isolated intrinsic safety barrier.

ATEX AND IEC SPECIFIC CONDITIONS OF USE: THE DEVICE MUST BE CLEANED WITH A DAMP CLOTH TO AVOID STATIC DISCHARGE.

PROOF PRESSURE * LIMITS LISTED ON NAMEPLATE MUST NEVER BE EXCEEDED, EVEN BY SURGES IN THE SYSTEM. OCCASIONAL OPERATION OF UNIT UP TO PROOF PRESSURE IS ACCEPTABLE, E.G. START-UP AND TESTING. EXCESSIVE CYCLING AT MAXIMUM PRESSURE LIMIT COULD REDUCE SENSOR LIFE. CONTINUOUS OPERATION SHOULD NOT EXCEED THE DESIGNATED OVER RANGE ** OR MAXIMUM WORKING PRESSURE * RANGE.**

* Proof Pressure - the maximum pressure that may be occasionally applied without causing damage. May cause changes to the sensor output requiring Offset and Span adjustments.
** Over Range Pressure - the maximum pressure that may be applied continuously without causing changes to the calibration. Exceeding the Over Range Pressure will cause a fault to occur.
*** Working Pressure Range - the maximum pressure that may be applied simultaneously to the high and low ports. Note: In addition to the Working Pressure limit, the Adjustable Set point Range must be maintained. .

MAX. TEMPERATURE* LIMITS LISTED ON NAMEPLATE MUST NEVER BE EXCEEDED, EVEN BY SURGES IN THE SYSTEM. OCCASIONAL OPERATION OF UNIT UP TO MAX. TEMPERATURE IS ACCEPTABLE, E.G., START-UP AND TESTING. EXCESSIVE CYCLING AT MAXIMUM TEMPERATURE LIMIT COULD REDUCE SENSOR LIFE. CONTINUOUS OPERATION SHOULD NOT EXCEED THE DESIGNATED ADJUSTABLE TEMPERATURE RANGE.

* Maximum Temperature - the maximum temperature that may be consistently applied without causing damage.

One Series models 1XSWLL and 1XSWHL are designed to operate on residual current from a PLC. Models 1XSWLL and 1XSWHL are designed to work with most Programmable Logic Controller (PLC) or Distributed Control System (DCS) discrete inputs and some interposing relays. When open, the switch draws 750 µA (max); when closed, the switch sinks or sources 0.1 A maximum.

The One Series also utilizes UE's patented IAW™ self-diagnostic software. On a continuous basis, the IAW™ algorithm checks for proper device operation, and locally reports the status using messages or revolving arrows on the display. For remote reporting, a discrete IAW™ Output signal can be monitored by the control system and used to detect normal, tripped, and fault conditions. IAW™ self-monitors, searching for possible faults, both within the device and in the overall system (see Fault Codes, page 14). In the event of a detected fault, the One Series will attempt to display the fault details and provide remote electrical indication by opening (turning off) the IAW™ Output and the main switch contact will move to the designated failsafe state. In the case of certain micro-controller faults, the revolving arrow may freeze or go out; indicating locally that a failure exists.

The One Series features a large, easy to read LCD display (see Figure 1) to show process indication, programming menu and switch status/ troubleshooting.

Figure 1

In the Process Display mode, the display may be indicating the following:

• **Current process value and units of measure**

• **I Am Working (IAW™) status**, a circular 4-segment arrow revolving around the letters "IAW".

• **Offset/Span Adjustment:** The word "offset" will appear above the process value, indicating that the factory offset and/or span calibration has been modified by the user.

In addition, the user can easily access information such as the set point, deadband and minimum/maximum process readings:

By pushing the right ⇨ button once, the display will scroll as follows: SP1 XX.XX DB1 XX.XX

By pushing the left ⇳ button once, the display will scroll the min/max process values recorded in memory: MAX XX.XX MIN XX.XX TRIPS SW1XX

The display will automatically revert back to the Process Display mode after scrolling.

ALARM CONDITION

When the process goes beyond the set point, the display will begin to flash, alternating between the process value and "SW1". The display will continue to flash until the process has returned to a value beyond the deadband, at which point the display will revert to normal operation and process value display. If the unit was programmed to have a latching output, a small "Latch" icon will light in the display when the set point is reached, indicating that the output is latched and needs to be manually reset.

FAULT CONDITIONS

In the case of a fault condition, the display may indicate the following:

- **An error message:** the IAW™ software detects a fault outside of the micro-controller but can still operate. IAW arrow is no longer displayed.
- **The display goes blank:** there is a failure of the power supply or the wiring.

(See Fault Codes, page 14 for a complete description of fault diagnostics.)

Please refer to the One Series datasheet for product specifications at www.ueonline.com.

UE declarations and third party issued certifications are available for download at www.ueonline.com/support/certifications/. Date code format on nameplate is "YYWW" for year and week.

Part I - Installation

Mounting

- 1 1/16" wrench for sensors fitting
- Screwdriver for mounting bolts
- 4 mounting bolts (1/4" Max.)

INSTALL DEVICE WHERE SHOCK, VIBRATION AND TEMPERATURE FLUCTUATIONS ARE MINIMAL. DO NOT INSTALL DEVICE IN AMBIENT TEMPERATURES THAT EXCEED PUBLISHED LIMITS ON THE NAMEPLATE.

DEVICE IS PROVIDED WITH TWO 3/4" NPT ELECTRICAL CONDUIT OPENINGS, EITHER OF WHICH OR BOTH CAN BE USED DURING INSTALLATION.

Mount the device using the four (4) 1/4" clearance holes in the enclosure base.

VERTICAL MOUNTING IS RECOMMENDED TO PREVENT MOISTURE FROM ENTERING THE ENCLOSURE.

The device may be mounted in any position except with the process connection facing up. Ensure the process connection is sealed to the process port to prevent leakage. The One Series should be protected from direct sunlight and rain in outdoor installations using a user supplied shroud.

FOR PRESSURE AND LOCAL TEMPERATURE MODELS ALWAYS HOLD A WRENCH ON THE SENSOR HEX WHEN MOUNTING THE DEVICE. DO NOT TIGHTEN BY TURNING ENCLOSURE, THIS WILL DAMAGE THE CONNECTION BETWEEN THE SENSOR AND HOUSING.

FOR DIFFERENTIAL PRESSURE MODELS (ESPECIALLY LOW RANGE MODELS), MOUNT THE SENSOR LEVEL TO MINIMIZE ANY PRESSURE READING OFFSETS. THE OFFSET COMMAND MAY BE USED TO ZERO THE DISPLAY (SEE PAGE 11 FOR ADDITIONAL INFORMATION).

NEVER INSERT ANY OBJECT INTO THE PRESSURE SENSOR OPENING. DAMAGE TO THE SENSOR WILL RESULT, AFFECTING ACCURACY.

Pressure and Differential Pressure Models

To pipe mount:

1. Thread the pressure connection onto the pressure port, thread sealant recommended, making sure that the mating threads are clean and free of debris.
2. Use a wrench on the pressure connection hex to tighten.
3. Test for leaks.

ON DIFFERENTIAL PRESSURE MODELS, THE LOW (L) SIDE PRESSURE MUST NOT EXCEED THE HIGH (H) SIDE PRESSURE. DAMAGE TO THE SENSOR MAY RESULT.

Local and Remote Temperature Models

For Ambient Sensing (models TL1-TL3):

Mount the device to ensure that the sensor housing will not be damaged and where the measured temperature is representative of the surrounding environment.

For Local Spring-Loaded (model TTC):

A SUITABLE THERMOWELL MADE FROM CORROSION-RESISTANT MATERIAL AND ENGAGING 5 THREADS MINIMUM (WITH THREAD SEALANT) IS REQUIRED FOR THE LOCAL SPRING LOADED TEMPERATURE SENSOR TO MAINTAIN IP66.

For Process Sensing:

1. Route the extension wire to avoid contact with live components or close proximity to electrical noise sources.
2. Avoid kinks, or excessive flexing.
3. Tighten the ferrule fitting, if applicable.

For Surface Sensing: Secure the sensor housing to the pipe or vessel using an adhesive or strapping method suitable for the application.

For Immersion Sensing (models C, H, R & L): Use of a thermowell is highly recommended to aid in maintenance, testing and preservation of the system integrity.

1. Insert the sensor housing (0.25" diameter) into the well ensuring that the sensor's sheath bottoms out and the well is completely immersed in the media (2.5" min.)
2. Screw the sensor's nipple into the thermowell, with thread sealant, by placing a wrench on the union nut.
3. Tighten the union connector.

For best temperature measurements, the sensor housing must be in full contact with the surface or media being measured. A heat transfer compound may be used to aid in fully transferring the media temperature to the sensor housing. Locate where the temperature is most representative of the system. Minimum insertion depth is 2-1/2". Sensor dimensional drawings are shown on page 17.

Part II: Wiring

FIELD WIRING MUST BE RATED 105°C MINIMUM. FOR AMBIENT TEMPERATURES BELOW -10°C, USE SUITABLE FIELD WIRING. USE COPPER WIRES ONLY - ALUMINUM WIRE NOT ALLOWED! INSTALL ALL CLASS 2 WIRING WITHIN FLEXIBLE TUBING TO MAINTAIN SEGREGATION BETWEEN CIRCUITS.

Removing the One Series Enclosure Cover and Display Module

TO PREVENT ELECTROSTATIC DISCHARGE WIPE DOWN COVER AND ENCLOSURE OF ANY DUST BUILD-UP BEFORE REMOVING COVER.

DISCONNECT ALL SUPPLY CIRCUITS BEFORE WIRING DEVICE. WIRE DEVICE IN ACCORDANCE WITH LOCAL AND NATIONAL ELECTRICAL CODES. MAXIMUM RECOMMENDED WIRE SIZE AND TIGHTENING TORQUE FOR FIELD WIRING TERMINAL BLOCKS ARE SHOWN WITHIN TABLE 3 (PAGE 7).

TO PREVENT SEIZURE OF ENCLOSURE COVER, DO NOT REMOVE LUBRICANT. THREADS SHOULD ALSO BE FREE OF DIRT AND OTHER CONTAMINANTS.

1. Remove the enclosure cover by turning it counter-clockwise for 7 revolutions (Figure 2).
2. Carefully remove the display module by grasping the outer edge and pulling it away from the base enclosure (Figure 3), being careful not to strain any of the wired connections.
3. Allow the display module to hang from the wired connections to access the base enclosure and terminal blocks for wiring. Do not remove the display module wire assemblies.
4. Insert the field wiring through the conduit opening(s) of the base enclosure.
5. Make the connections as shown within the wiring diagrams beginning (Figures 4-8, pages 6-7). The primary chassis and equipment grounding terminal is provided inside the base enclosure.

Cleaning the display and keypad surface should be performed with a damp cloth only. Do not attempt to wash down the One Series with the cover removed.

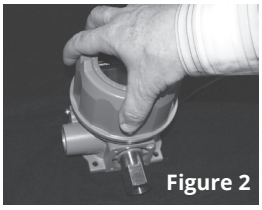


Figure 2

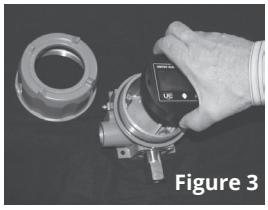


Figure 3

Wiring for Flameproof & Non-Incendive Installations

- Small flat-head screwdriver
- Wire strippers

TO PREVENT IGNITION, DISCONNECT POWER BEFORE REMOVING ENCLOSURE COVER. KEEP COVER TIGHT WHILE IN OPERATION. DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NON-HAZARDOUS.

THE DEVICES SHALL BE PROPERLY GROUNDED IN THE END USE APPLICATION USING THE GROUND SCREWS PROVIDED WITH THE ENCLOSURE.

MODELS 1XSWLL AND 1XSWHL DERIVE THEIR POWER DIRECTLY FROM A PLC/DCS DISCRETE INPUT OR OTHER LOW-CURRENT DC LOADS (FIGURES 4-5, PAGE 6). THE SWITCHED OUTPUT MAXIMUM LOAD RATING IS 0.1A. THE DEVICE MUST NOT BE CONNECTED DIRECTLY TO A POWER SUPPLY WITHOUT AN APPROPRIATE CURRENT LIMITING LOAD SUCH AS THAT PROVIDED BY A PLC/DCS DISCRETE INPUT. OVERLOADING THE SWITCH MAY CAUSE FAILURE (SEE TABLE 2, PAGE 6).

Maximum Switch Ratings – Flameproof and Non-Incendive			
Model	Signal Name	Voltage Rating	Current Rating
1XSWLL	SW	7.8 – 50.0 VDC	0.1 amperes [1]
	IAW	7.8 – 50.0 VDC	0.1 amperes [1]
1XSWHL	SW	70 – 240 VAC/VDC	0.1 amperes [1]
	IAW	7.8 – 50.0 VDC	0.1 amperes [1]
1XSWHH	SW	70 – 240 VAC	0.150 – 10 amperes [2]
	IAW	7.8 – 50.0 VDC	0.1 amperes [1]

[1] Derate at 0.001 amperes per ˚C above 25 ˚C
[2] Derate at 1 ampere per 5.5 ˚C above 38 ˚C ambient

Table 2

Wiring Diagrams - Models 1XSWLL and 1XSWHL

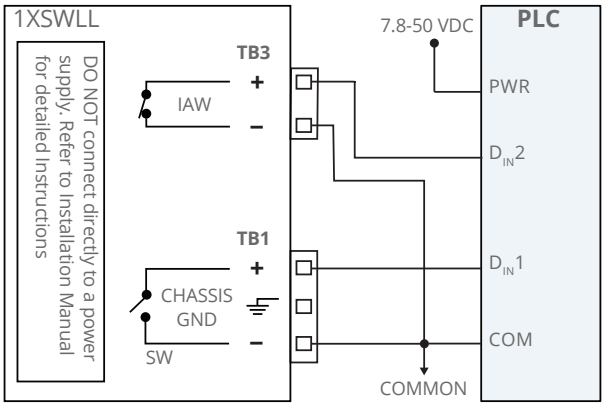


Figure 4
SW and IAW PLC Inputs Circuit

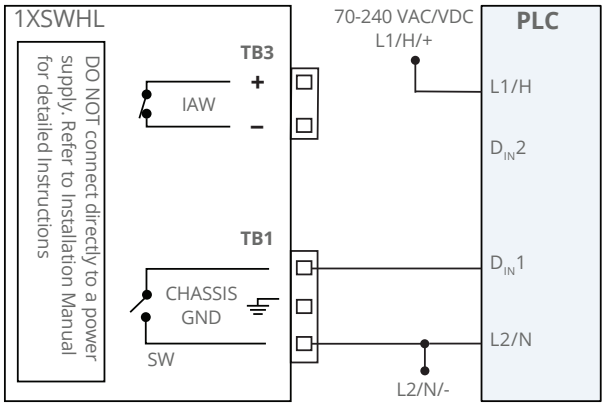


Figure 5

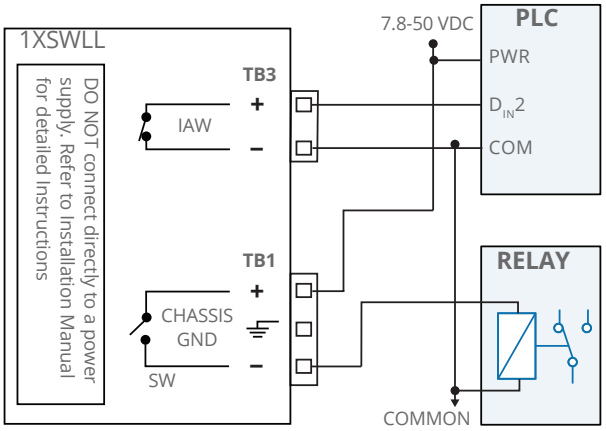


Figure 6
Interposing Relay with IAW Circuit

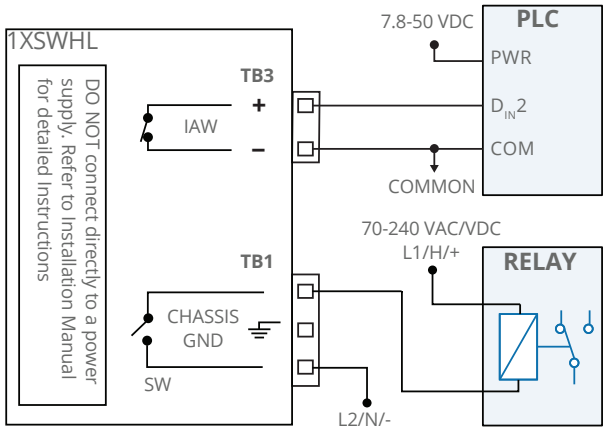


Figure 7

Models 1XSWLL and 1XSWHL can also be wired in series with the coil of certain interposing relays, as shown in figures 6-7. The relay coil specifications must not exceed the maximum switch ratings. (See Table 2, page 6).

NOTE: One Series switch contacts may be wired in either a sinking or sourcing format.

NOTE: For bench testing model 1XSWLL, a circuit is required as shown in Figure 8. These components are not included and must be provided by the user. Do not connect model 1XSWLL directly to a power supply without a suitable load in series with the switch. Do not exceed the maximum switch ratings or permanent damage may result (See Table 2, page 6).

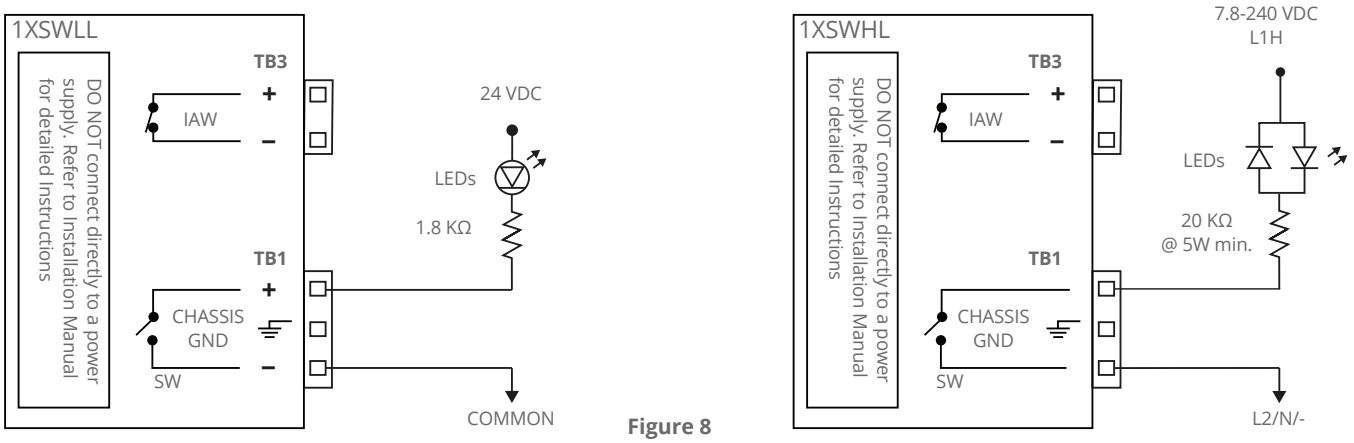


Figure 8
Recommended Bench Test Circuit

Wiring Diagrams - Models 1XSWHH

Model 1XSWHH requires 70 – 240 VAC @ 6 mA external power supply for each device. Power for all One Series functions are provided by this power supply connection at TB2, terminals C (L1/H) and D (L2/N). Connections for the programmable solid state relay switch are made at TB2 terminals A and B (refer to Table 2, page 6 and Table 3, page 7).

The wiring diagram below (Figure 9) provides a view inside the One Series base enclosure with the display module removed. TB2 is located there. All models include a separate IAW™ switched output located at TB3 on the back of the display module.

This signal provides the health status of the One Series and is normally closed. When open, this signal provides an indication that IAW™ has detected a fault condition. Monitor this signal by connecting it to the discrete input of a PLC or DCS. The IAW™ wiring connection is not required if remote health status of the One Series is not used.

NOTE: The solid state relay switch in model 1XSWHH has a minimum load requirement of 0.150 A making it incompatible with control system inputs. Do not exceed the maximum switch ratings (see Table 2, page 6) or permanent damage to the One Series may result.

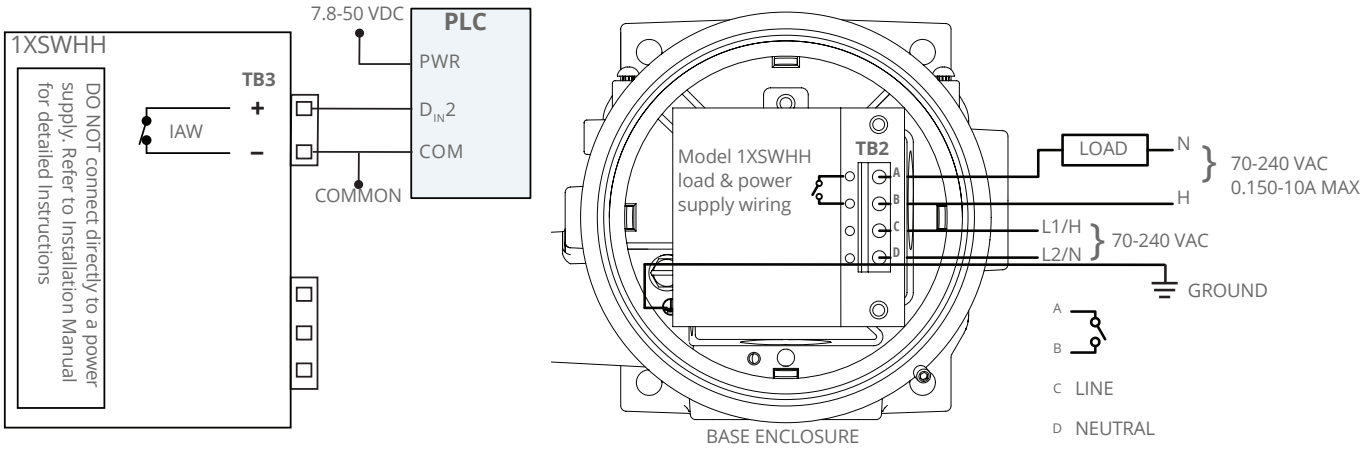


Figure 9

Terminal Block and Torque Details for Flameproof, Non-Incendive and Intrinsic Safety Installations				
Terminal	Description	Max. Wire Gauge	Min. Wire Gauge	Recommended Tightening Torque
TB1	3-Position	14 AWG	22 AWG	7 in-lbs.
TB2	4-Position	10 AWG	20 AWG	4.4 in-lbs.
TB3	2-Position	14 AWG	22 AWG	7 in-lbs.

Table 3

Intrinsic Safety Wiring Diagrams - MODEL 1XSWLL

WHEN USED FOR EXPLOSION PROOF, NON-INCENDIVE, "d", "nA", MODEL 1XSWLL WILL NEED TO USE A CLASS 2 OR SELV POWER SUPPLY,

Model 1XSWLL is intended for direct connection to a PLC or DCS discrete input, or other suitable load (see graph 1, page 13). Power is obtained and the discrete switch signal is provided by the same two-wire connection. Polarity must be observed. (refer to Table 2, page 6) for switch ratings.

DO NOT CONNECT MODEL 1XSWLL DIRECTLY TO A POWER SUPPLY WITHOUT A SUITABLE LOAD IN SERIES WITH THE SWITCH.

FOR 1XSWLL MODELS, ONLY ONE CONDUIT OPENING IS REQUIRED. THE UNUSED CONDUIT OPENING MUST INCLUDE AN EXPLOSION-PROOF/ FLAMEPROOF PLUG, MADE FROM A CORROSION-RESISTANT MATERIAL, SUITABLE FOR ALL GAS AND DUST GROUPS AS LISTED ON THE NAMEPLATE. BLANKING ELEMENTS FROM FACTORY HAVE BEEN TESTED WITH THE ENCLOSURE AS AN ASSEMBLY AND CARRY NO MARKINGS.

Selecting an Intrinsic Safety Barrier (Model 1XSWLL)

For Intrinsically-Safe (I.S.) installations, please reference the Control Drawing UE 62174–64 for Intrinsic Safety entity parameters and wiring information (https://www.ueonline.com/product-documentation/). Model 1XSWLL must be wired to an approved I.S. galvanically isolated barrier for Zone 0 EPL Ga and Class I, Division 1 classifications. The information provided is for reference only and is intended to act as a guide in the selection of a suitable I.S. Barrier.

SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.

Installation of Intrinsically-Safe circuits must be performed in accordance with the requirements of the government and/or other local authority having jurisdiction. System components and installation methods must be approved by the appropriate recognized approval authority. There are two general types of I.S. Barriers, shunt diode (passive) safety barriers and transformer isolated barriers. Shunt diode safety barriers are not recommended for use with model 1XSWLL.

Transformer Isolated Barriers:
Due to the unique method by which the model 1XSWLL operates, a specifically designed isolated barrier must be used. Any safety barrier that adheres to NAMUR standard EN 60947-5-6 for proximity and dry contact switches may be used to achieve intrinsic safety with the One Series model 1XSWLL.

Recommended NAMUR standard transformer isolated intrinsic safety barriers:

Pepperl+Fuchs
models KCD2-SR-Ex1.LB and KFD2-SR2-Ex1.W.LB

Figure 4 (page 6) shows a typical wiring scheme depicting model 1XSWLL connected to a programmable logic controller (PLC), distributed control system (DCS) or other logic solver discrete input.

Part III: Programming

- Programming Flowchart (page 15)

Programming of the One Series is accomplished using the two buttons on the faceplate (labeled ⇳ and ⇨ - See Figure 10). Stepping down through the main menu using the left ⇳ button, you can access the various commands of the One Series software menu. The right button is then used to move into the command submenu for setting up or modifying the parameters.

Figure 10

NOTE: The flowchart on page 15 shows the entire programming commands menu structure. Before removing the enclosure cover, please read the instructions on page 5. The One Series programming menu is a single direction loop, with submenus embedded within, so there is no way to back up in the program. If you need to make a correction to a prior Main Menu step, you will need to continue forward, exit and then re-enter the program and step through to the appropriate feature. If you are in a Submenu, you will need to continue to the beginning of the menu item and re-enter the Submenu to make the correction.

Entering the Programming Mode

The switch output failsafe state will be based on the programmed operating mode of the switch. For example, the failsafe state for “Open on” modes is open. The control system will interpret these signals as a detected fault and a process upset (set point reached) simultaneously.

IT IS ESSENTIAL TO ALERT THE CONTROL SYSTEM OPERATORS BEFORE ENTERING THE PROGRAMMING MODE.

Use the Flowchart on page 15 as a guide through the various commands in the Programming Mode.

1. Press and release both buttons ⇳⇨ simultaneously and then press the right button ⇨ to enter the password.

2. Enter the 4-digit password. The factory default password is "0000".
   - The left ⇳ button increments the blinking digit.
   - The right ⇨ button sets the digit and moves to the next.
   - Once a valid password is entered, "OK" will appear on the display.

3. Press and release the right ⇨ button.
   - CLR MAX/MIN (or MAN RSET if Latch is set) will appear on the display.

This is the first command prompt in the Programming Mode.

NOTE: The One Series will automatically exit the Programming Mode if two minutes elapse without a button being pressed. The One Series recalls all previously saved parameters from memory and any program changes that were made will be discarded. This two-minute timeout feature prevents the One Series from being left in programming mode accidentally.

Exiting the Programming Mode

When any of the program commands are displayed, it is possible to escape and exit the Programming Mode by pressing the left ⇳ and right ⇨ button simultaneously. Doing this redirects the programmer to the Save Changes menu location, which is only possible at menu actions indicated by an asterisk (*) on the Programming Flowchart, found on page 15.

NOTE: It is also possible to exit the Programming Mode by repeatedly pressing the left ⇳ button from any program command until the Save Changes menu location is reached.

Saving Programming Changes

When changes have been made to the program settings, a choice is provided to Save or Discard the changes. At any prompt marked by an asterisk (*):

Press both left ⇳ and right ⇨ buttons to display SAVE CHNG menu.

To **Save** changes, press the right ⇨ button. NO (the default) will be displayed.

• Press the left ⇳ button to toggle and display YES.

• Then press both left ⇳ and right ⇨ buttons to confirm, save the changes and return to the Process Display mode.
The One Series will resume process monitoring using the new program parameters.

To **Discard** changes, press the right ⇨ button. NO will be displayed.

• Press both left ⇳ and right ⇨ buttons to confirm, discard changes and return to the Process Display mode.
The One Series will resume monitoring the process recalling all previously saved parameters from memory.

Basic Features

SETTING THE UNITS OF MEASURE

The One Series allows the units of measure to be set in the field. The default units are pounds per square inch (PSI) for pressure models and degrees Fahrenheit (˚F) for temperature models.

1. To change the units of measure, enter the programming mode. Press the left ⇳ button. The display will scroll SET UNITS.

2. Press the right ⇨ button and the display will read the default units psi or ˚F.

3. Repeatedly press and release the left ⇳ button to select from the available choices. Stop at the desired choice.

4. Press the right ⇨ button to make the selection. The display will return to "Set Units."

5. Press the left ⇳ button to continue on in the menu or press both left ⇳ and right ⇨ buttons to exit the Programming Mode and save changes.

NOTE: MAX/MIN memory is reset (changed to zero) whenever the units of measure have been changed. Set Point, Deadband, Offset, Span and Plug Port values are recalculated for the newly selected units of measure.

SETTING THE SWITCH MODE, SET POINT AND DEADBAND

Please refer to the Programming Flowchart, page 15.

1. Enter the programming mode (see page 8-9).

2. Press and release the left ⇳ button until SW1 appears on the display.

3. Press the right ⇨ button. The previously selected mode will appear. OPEN RISE is the factory default.

The One Series has six available modes of operation:

OPEN RISE	Switch opens on rising process values that exceed the set point.
OPEN FALL	Switch opens on falling process values that drop below the set point
OPEN WINDOW	Switch opens when process values go outside programmed limits specified by set point high and set point low.
CLOSE RISE	Switch closes on rising process values that exceed the set point.
CLOSE FALL	Switch closes on falling process values that drop below the set point.
CLOSE WINDOW	Switch closes when process values go outside programmed limits specified by set point high and set point low.

NOTE: "OPEN" Modes are recommended in safety applications where a DTT (De-energize to Trip) output is required. This ensures that the switch output will go to the fail safe state in the event of a power loss or line break. The IAW™ output always operates in DTT mode.

Please use the Switch Decision Logic (Figure 11, page 10) for help with setting the appropriate switch mode.

1. Press and release the left ⇳ button until the desired mode appears.
2. Press the right ⇨ button to select the mode and move on to the set point. SP will appear.

NOTE: The set point is the process value at which the One Series opens or closes the switch. The Set Point is fully programmable throughout the operating range of the sensor as noted on the device nameplate.

1. Press the right ⇨ button to select a positive or negative set point. POS is the default. Use the left ⇳ button to change to NEG.
2. Press the right ⇨ button to view and change the set point. Press the left ⇳ button to increment the blinking digit. Press the right ⇨ button to enter and move to the next digit.
3. Press the right ⇨ button to enter a new Deadband. DB will show on the display.

NOTE: The Deadband is the amount above or below the set point at which the One Series resets the switch, returning it to the normally closed or open state. Deadband is represented as a value which is added or subtracted from set point, depending on the control mode.

EXAMPLE 1: If the Control Mode is OPEN RISE and the set point is 100 and the deadband is 10, the Switch will open as pressure rises to 100 and close (reset) as the pressure falls to 90.

EXAMPLE 2: If the Control Mode is CLOSE RISE and the set point is 100 and the deadband is 10, the Switch will close as pressure rises to 100 and open (reset) as the pressure falls to 90.

EXAMPLE 3: If the Control Mode is OPEN FALL and the set point is 100 psi and the deadband is 10, the Switch will open as pressure falls to 100 psi and close (reset) as pressure rises to 110 psi.

EXAMPLE 4: If the Control Mode is CLOSE FALL and the set point is 100 psi and the deadband is 10, the Switch will close as pressure falls to 100 psi and open (reset) as pressure rises to 110 psi.

NOTE: Deadband should be set wide enough so that frequent or rapid switch cycling (chatter) does not occur but narrow enough to satisfy the process conditions. A Deadband value of zero is undefined and, therefore, not permitted.

1. Press the right ⇨ button to view and change deadband. Press the left ⇳ button to increment the blinking digit. Press the right ⇨ button to enter and move to the next digit.
2. Press the right ⇨ button to enter a new Deadband. SW1 will show on the display.

SWITCH DECISION LOGIC

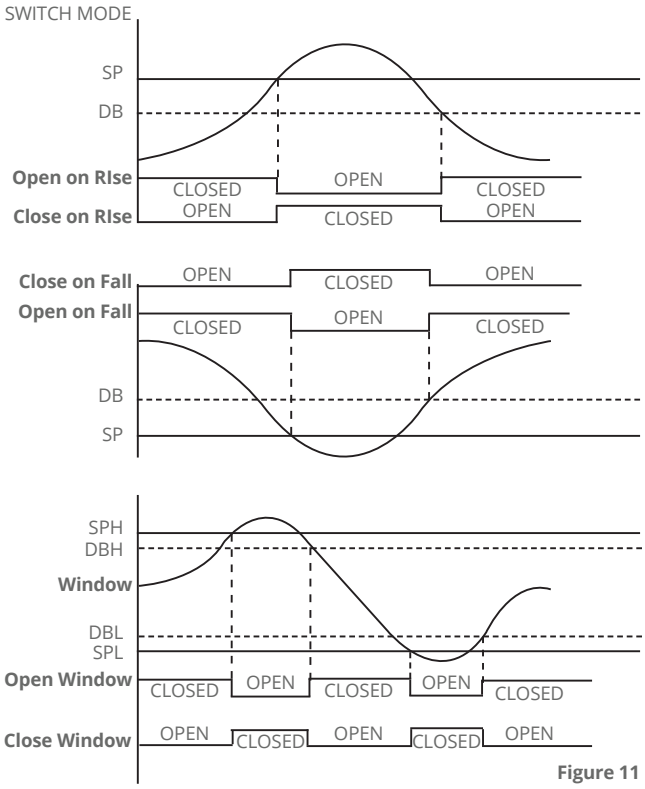


Figure 11

NOTE: The Set Point and Deadband settings are subject to the accuracy of the instrument. Actual switch points may vary up to +0.5% of the sensor's maximum range at room temperature.

EXAMPLE: The P15 sensor has a range of 0 to 300 psi. When setting a Set Point of 150, the actual switch point may occur between 148.5 and 151.5 due to the accuracy error of +1.5 (300 x 0.5%).

RESETTING THE MAXIMUM & MINIMUM VALUES

The One Series continuously captures the readings from the sensor and stores one minimum and maximum value since the last time they were reset. The values can be viewed at any time by removing the enclosure cover and pushing the left ⇳ button. The display will scroll the values and then return to the Process Display mode.

To reset the values, enter the Programming Mode (see pages 8-9). CLR MAX/MIN command is the first menu item. Press the right ⇨ button two times. After exiting the Programming Mode and saving the changes (see page 9), the values will be reset to the current reading and begin recording again.

Advanced Features

NOTE: No initial programming of these features is required. The default for these advanced commands is zero or off.

ADJUSTING DISPLAY OFFSET

The One Series is factory calibrated to 0.25% of the sensor's maximum range at room temperature. In some installations, it may be necessary to adjust the display's offset due to the range and position of the sensor. Chemical seals with long capillaries combined with low maximum range sensors are a common cause of offset error. The OFFSET command allows the user to enter a positive ("POS") or negative ("NEG") offset to the display readings. An offset adjustment of up to +10% of the sensor's maximum range is allowed.

EXAMPLE: When the sensor has a zero pressure applied, but the display reads a value other than zero, entering the additive inverse (reversing the sign) of the displayed value for OFFSET will force the display to read zero.

NOTE: Any numerical value entered other than 0.00 will cause the display to indicate "Offset" just above the process reading in the process display.

USE OF THIS OPTION MAY CREATE A CONDITION WHERE THE DISPLAY MAY INDICATE "0.00" WHEN SIGNIFICANT PRESSURE OR TEMPERATURE (UP TO 10% OF MAXIMUM RANGE) EXISTS IN THE SYSTEM. INDEPENDENT VERIFICATION OF THE PROCESS VARIABLE SHOULD BE DONE PRIOR TO MAINTENANCE ON THE SYSTEM WHEN "OFFSET" APPEARS ON THE DISPLAY.

Refer to the Programming Flowchart on page 15.

1. Enter the Programming Mode and use the left ⇳ button to move to the OFST command.
2. Press the right ⇨ button to select a positive or negative offset. POS is default. Use the left ⇳ button to change to NEG.
3. Press the right ⇨ button to view and change the offset. Zero is the factory setting. Press the left ⇳ button to increment the blinking digit. Press the right ⇨ button to enter and move to the next digit.
4. Press the right ⇨ button to enter the new offset and return to the main menu.

ADJUSTING SPAN

SPAN provides an adjustment to shift the slope of the sensor's response curve to accommodate an offset value other than zero. To adjust SPAN, calculate and enter a new SPAN value. To calculate the SPAN value, apply a reference source below maximum scale to the sensor. Record the value that shows on the One Series display and the reference source value. Divide the reference source value by the display value and then multiply the result by the sensor's upper range.

FORMULA: SPAN = reference source / display value x upper range value

PRESSURE EXAMPLE: For a sensor range of 0 - 100 psi, choose a reference source (90) below the upper range limit (100) to prevent an over range condition. Divide the reference source value from the resulting display value (88). Multiply the result by the upper range limit. Span = 90 / 88 x 100 = 102 (rounded)

TEMPERATURE EXAMPLE: For a sensor range of -40 to 450 °F, choose a reference source (400) below the upper range limit (450) to prevent an over range condition. Divide the reference source value from the resulting display value (404). Multiply the result by the upper range limit. Span = 400 / 404 x 450 = 446 (rounded)

Refer to the Programming Flowchart on page 15.

1. Enter the Programming Mode and use the left ⇳ button to move to the SPAN command.
2. Press the right ⇨ button to select a positive or negative span. POS is default. Use the left ⇳ button to change to NEG.
3. Press the right ⇨ button to view and change the span. Zero is the factory setting. Press the left ⇳ button to increment the blinking digit. Press the right ⇨ button to enter and move to the next digit.
4. Press the right ⇨ button to enter the new offset and return to the main menu.

NOTE: To return to factory calibration settings, enter all zeros for both SPAN and OFST.

SETTING THE LATCH MODE (MANUAL RESET)

The switch can be configured to latch when the set point is reached. Refer to the Programming Flowchart on page 15.

1. LCH1: In the Programming Mode, press the right ⇨ button.
2. If OFF is displayed, press the left ⇳ button to set LCH1 to ON.
3. Press the right ⇨ button to set the latch. When latch mode is on (set), the Switch changes state when the set point is crossed and remains latched until the Switch is manually reset by the user or the One Series is power cycled.

When latched, an icon on the display will read Latched To Reset the Latch

1. Enter the Programming Mode. If the Latch is set, the display will read MAN RSET. To return to the Process Display without resetting the latch, press the right ⇨ button.
2. To continue programming without resetting the latch, press the left ⇳ button.
3. Press both ⇳ ⇨ buttons to reset the latch. The display now reads RSET DONE.
4. Press the right ⇨ button to return to the Process Display.
5. Press the left ⇳ button to continue programming.

NOTE: Interrupting power to the One Series will also reset the latch.

SETTING THE PLUGGED PORT FEATURE

The One Series IAW™ self-diagnostics have the ability to detect that the process port may be plugged. It does this by monitoring the sensor for changes over time. The amount of change and the time period are programmable. If the process variable does not change by the amount and selected time period, the display will indicate PLUG, the IAW™ Output will open, indicating a fault, and the switch will move to the fail state (see Programming Flowchart on page 15).

1. Enter the Programming Mode and press the left ⇳ button until PLUG PORT is scrolling on display. Press the right ⇨ button.
2. There are four possible selections -

OFF	This disables the plugged port function and is the default setting. This should be done where sensor plugging is not a concern or where the system pressures may not change over time (example: a storage tank).
1 minute **1 hour** **24 hours**	Maximum time with no process variation before fault indication

3. Using the left ⇳ button, select a time.
4. If OFF is selected, press the right ⇨ button to return to the PLUG PORT command and leave Plug Port deactivated.
5. Press the right ⇨ button to enter a process value < 10% of the sensor's maximum range. This number represents the minimum variation expected in the process value over the time period entered above under normal operating conditions. Each time the process value reaches this value, the Plug Port timer is reset.

NOTE: This value can be accurately determined by subtracting the minimum from the maximum process value as recorded by the MAX/MIN feature. See RESETTING MAXIMUM AND MINIMUM VALUES on page 10 for additional information.

RESETTING TRIP COUNTER

Trip Count provides information that may be useful for troubleshooting a process. Each time the set point is reached, the trip count is incremented by 1, up to 9999, where it will automatically return to 1. Trip Count is always on and can be manually reset to zero at any time by following these steps (See Programming Flowchart on page 15).

1. Enter the Programming Mode (see page 8-9).
2. Press and release the left ⇳ button until RESET TRIP CNT appears on the display
3. Press the right ⇨ button. The recorded value of times the set point was reached (the trip count) will appear on the display.
   • Press the right ⇨ button to clear (reset) the trip count to zero.
   • Press the left ⇳ button to retain the trip count value without resetting.

SETTING THE FILTER

In some applications, it is desirable to "dampen" the switch response and prevent intermittent false trips due to pressure spikes or other transient/isolated events. The Filter feature provides a software-based digital filter with a programmable time constant for suppressing certain transient short-duration events.

Refer to the Programming Flowchart on page 15.

1. Enter the Programming Mode (see page 8-9) and move through the program until FILTER is scrolling on the display. Press the right ⇨ button.
2. There are four possible selections -

Pressure Models	OFF (Default) 1/4 second 1/2 second 1 second 2 seconds
Temperature Models	1/2 second 1 second 2 seconds

3. Using the left ⇳ button, select a time constant.
4. Press the right ⇨ button to enter the time constant and return to main menu.

NOTE: The One Series typically responds to a process value change in less that 100 milliseconds when the Filter is set to off. Using this feature can lengthen the overall response time of the One Series for certain types of process value changes (pressure spikes).

- A shorter delay setting provides a faster response but is less stable.
- A longer delay setting provides a slower response and is more stable.

SETTING THE TRIP DELAY

The Trip Delay provides a programmable delay for the switch with a range of 0 – 999.9 seconds. Zero seconds is the factory default. When the set point is reached, the switch trip will be delayed by the number of seconds entered into the Trip Delay command using the following steps (See Programming Flowchart on page 15).

1. Enter the Programming Mode (see page 8-9).
2. Press and release the left ⇳ button until TRIP DELAY appears on the display
3. Press the right ⇨ button. OFF will appear on the display. Press the left ⇳ button to select ON. The Trip Delay value in seconds (default = 000.0) will appear on the display with the left digit blinking.
   • Press the left ⇳ button to increment the blinking digit. '
   • Press the right ⇨ button to move to the next digit.
4. Press the right ⇨ button to enter the new Trip Delay value.

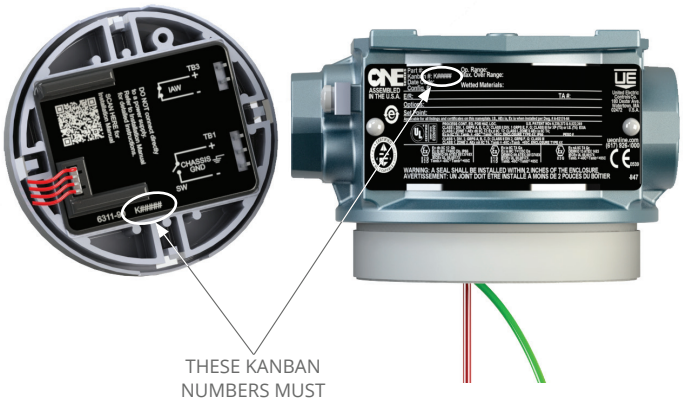


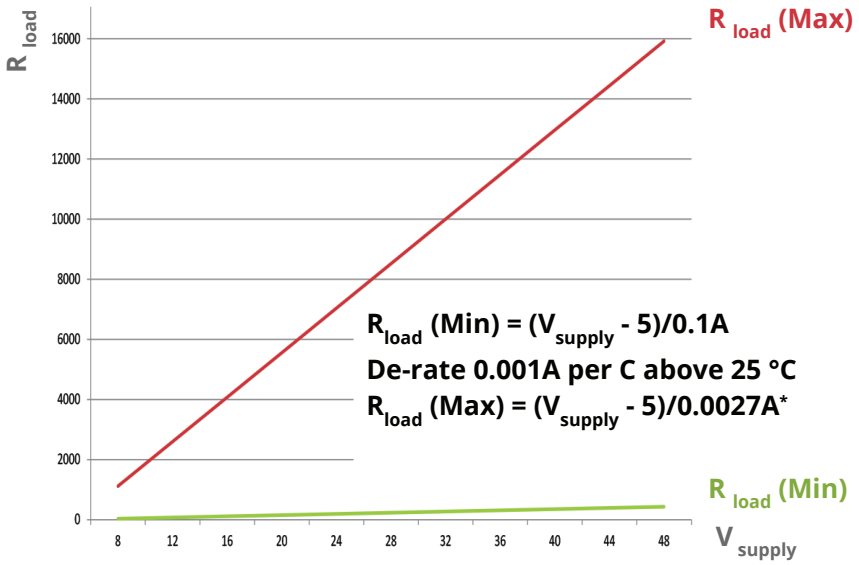
Figure 12

ACCEPTABLE SUPPLY VOLTAGES AND LOADS FOR 1XSWLL AND 1XSWHL

The graphs below provide a range of acceptable power supply voltages (in Volts) and series loads (in Ohms). This is useful when the One Series is connected to non-standard PLC and DCS inputs or is connected in series with a relay or solenoid coil.

NOTE: If you need assistance with determining the compatibility of the One Series with your PLC, DCS, or relay, we can help. Please have the manufacturer's model number ready when you call us. In rare cases, when the series resistor value is too large and falls out of the Acceptable Range, placing another resistor across the input will allow it to work. Please call +1 (617) 923-6977 (Inside Sales) for assistance.

1XSWLL Allowable Voltage / Load Characteristics



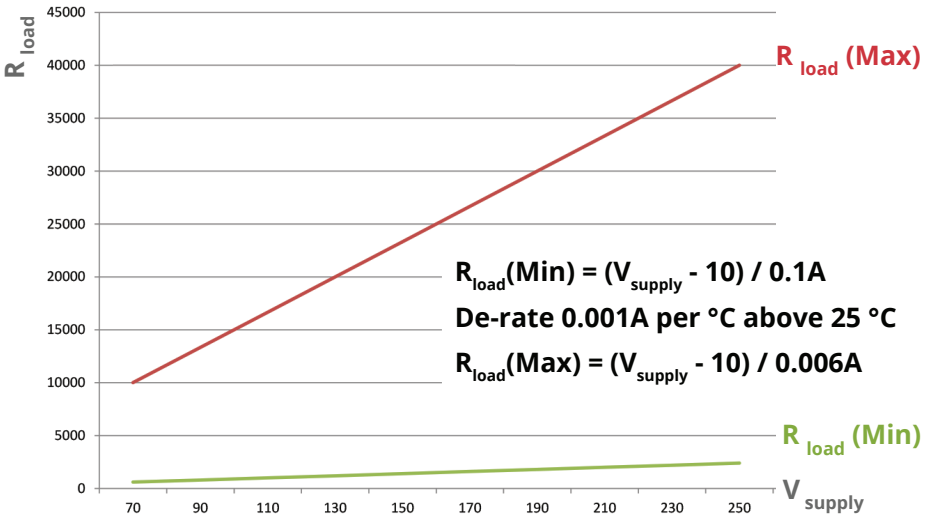
V_{supply}	R_{load} (Max)	R_{load} (Min)
8	1111	30
12	2593	70
16	4074	110
20	5556	150
24	7037	190
28	8519	230
32	10000	270
36	11481	310
40	12963	350
44	14444	390
48	15926	430

* At -40 °F/ °C start up current could be up to 3 mA

Graph 1

NOTE: At temperatures below -4 °F/ -20 °C, start up time can be expected to be longer.

1XSWHL Allowable Voltage / Load Characteristics



V_{supply}	R_{load} (Max)	R_{load} (Min)
70	10000	600
90	13333	800
110	16667	1000
130	20000	1200
150	23333	1400
170	26667	1600
190	30000	1800
210	33333	2000
230	36667	2200
250	40000	2400

Graph 2

One Series Fault Codes

The One Series IAW™ diagnostics are capable of detecting many possible fault conditions. Some fault conditions will clear automatically when the parameter returns to normal; others require the device to be powered down and restarted; and some may require repair or replacement. A list of fault conditions is shown below:
If a fault message appears on the One Series display, please provide this code when calling UE Inside Sales for assistance.

Possible Corrective Actions				
Code		Probable Causes	Reason	Other Options
E-	04	Loop Current Fault	The current measured in the 4-20mA loop, by the fault monitoring circuitry, is incorrect.	Verify that the power supply voltage and load resistance on the 4-20mA loop are within allowable limits.
E-	15	Diagnostic Fault Sensor OPEN	An open circuit has been detected on the sensor drive pins 2 & 3.	Diagnostic Fault Sensor open, check all sensor connections.
E-	88	Error -- Process Variable Extreme Overrange	Extreme overrange, a pressure input has exceeded 150% of the operating range or a temperature input has exceeded 110% of range.	Warning: This fault may indicate damage to the sensor. Check that the process is within the operating limits of the device. Verify all sensor connections.
E-	100	External Watchdog Timer Fault	Likely indicates presence of high electrical noise in the vicinity of the One Series.	Make sure external ground screw on the enclosure is wired to a ground. Use twisted-pair or shielded wiring. Check power supply to make sure it is steady. Cycle power to the One Series to try to clear the error.
E-	101	Incorrect voltage or current applied to the switch	Either an incorrect voltage or current is being applied to the switch.	The user must check their voltage to make sure it is correct, then make sure they have the proper amount of resistance in series with the switch.

Table 4

NOTE: Power cycling the One Series will reset some faults. If the fault remains after power cycling, please contact UE Inside Sales at Insidesales@ueonline.com or call +1 (617)-923-6977. Some fault codes not noted above indicate microprocessor faults.

Lost Passwords

Contact UE Inside Sales at +1-617-923-6977 or go online at www.UEonline.com/UUC to obtain a unique unlock code. The Kanban number from the product nameplate is required (see Figure 13).

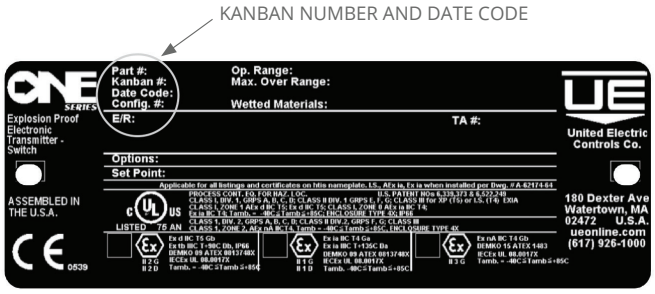


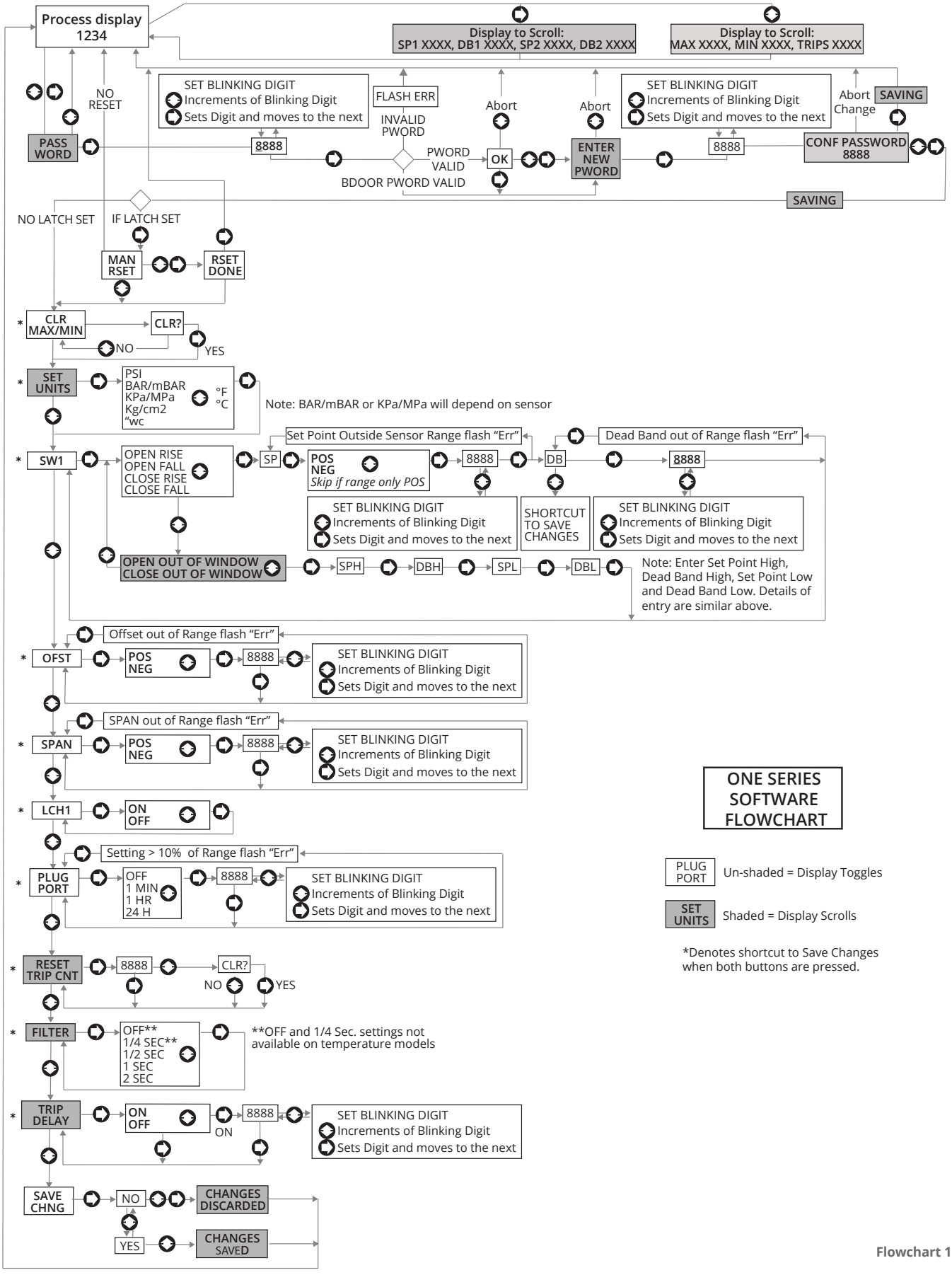
Figure 13

Troubleshooting

The switches contained in the One Series are electronic. The on/off switch signal is produced by a transistor or a solid-state relay, depending on the One Series model. Electronic switches cannot be properly tested with an ohmmeter. Instead, measure the voltage drop across the switch connected to the intended load to determine if it is open or closed. A properly functioning One Series electronic switch will exhibit the following voltage levels (see Table 5):

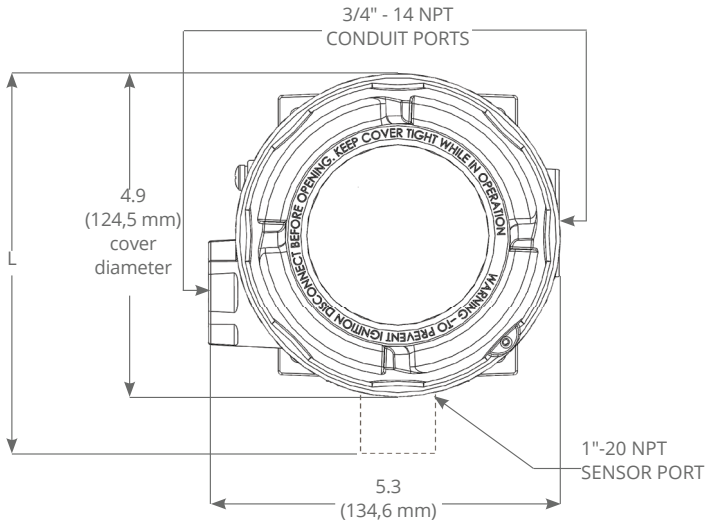
Signal	Location	Voltage Open	Voltage Closed
Setpoint switch 1XSWLL	TB1	Supply voltage (up to 50 VDC)	4.7 VDC (nominal)
Setpoint switch 1XSWHL	TB1	Supply voltage (70-240 VAC, VDC)	13.5 VAC, VDC (nominal)
Setpoint switch 1XSWHH	TB2 A, B	Supply voltage (24-280 VAC, VDC)	0 VAC, VDC (nominal)
IAW output switch All models	TB3 +, -	Supply voltage (up to 50 VDC)	4.7 VDC (nominal)

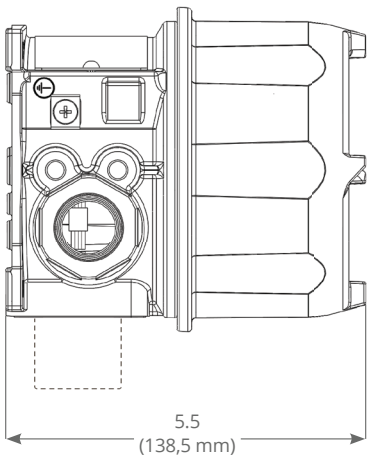
Table 5


Process display
1234
Display to Scroll:
SP1 XXXX, DB1 XXXX, SP2 XXXX, DB2 XXXX
Display to Scroll:
MAX XXXX, MIN XXXX, TRIPS XXXX
NO
RESET
SET BLINKING DIGIT
Increments of Blinking Digit
Sets Digit and moves to the next
FLASH ERR
INVALID
PWORD
Abort
Abort
SET BLINKING DIGIT
Increments of Blinking Digit
Sets Digit and moves to the next
Abort
Change
SAVING
PASS
WORD
8888
PWORD
VALID
BDOOR PWORD VALID
OK
ENTER
NEW
PWORD
8888
CONF PASSWORD
8888
SAVING
NO LATCH SET
IF LATCH SET
MAN
RSET
RSET
DONE
*
CLR
MAX/MIN
CLR?
NO
YES
*
SET
UNITS
PSI
BAR/mBAR
KPa/MPa
Kg/cm2
"wc
°F
°C
Note: BAR/mBAR or KPa/MPa will depend on sensor
Set Point Outside Sensor Range flash "Err"
Dead Band out of Range flash "Err"
*
SW1
OPEN RISE
OPEN FALL
CLOSE RISE
CLOSE FALL
SP
POS
NEG
Skip if range only POS
8888
DB
8888
SET BLINKING DIGIT
Increments of Blinking Digit
Sets Digit and moves to the next
SHORTCUT
TO SAVE
CHANGES
SET BLINKING DIGIT
Increments of Blinking Digit
Sets Digit and moves to the next
OPEN OUT OF WINDOW
CLOSE OUT OF WINDOW
SPH
DBH
SPL
DBL
Note: Enter Set Point High, Dead Band High, Set Point Low and Dead Band Low. Details of entry are similar above.
Offset out of Range flash "Err"
*
OFST
POS
NEG
8888
SET BLINKING DIGIT
Increments of Blinking Digit
Sets Digit and moves to the next
SPAN out of Range flash "Err"
*
SPAN
POS
NEG
8888
SET BLINKING DIGIT
Increments of Blinking Digit
Sets Digit and moves to the next
*
LCH1
ON
OFF
Setting > 10% of Range flash "Err"
*
PLUG
PORT
OFF
1 MIN
1 HR
24 H
8888
SET BLINKING DIGIT
Increments of Blinking Digit
Sets Digit and moves to the next
*
RESET
TRIP CNT
8888
CLR?
NO
YES
*
FILTER
OFF**
1/4 SEC**
1/2 SEC
1 SEC
2 SEC
**OFF and 1/4 Sec. settings not available on temperature models
*
TRIP
DELAY
ON
OFF
ON
8888
SET BLINKING DIGIT
Increments of Blinking Digit
Sets Digit and moves to the next
SAVE
CHNG
NO
CHANGES
DISCARDED
YES
CHANGES
SAVED
ONE SERIES
SOFTWARE
FLOWCHART
PLUG
PORT
Un-shaded = Display Toggles
SET
UNITS
Shaded = Display Scrolls
*Denotes shortcut to Save Changes when both buttons are pressed.

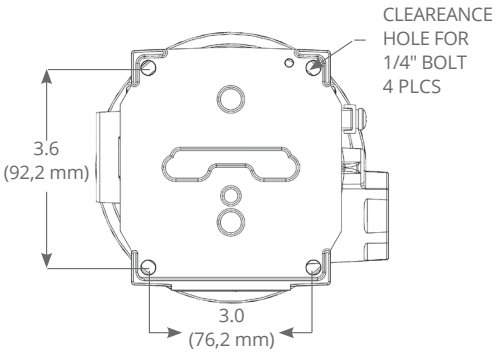
Flowchart 1

Part III - Dimensional Drawings

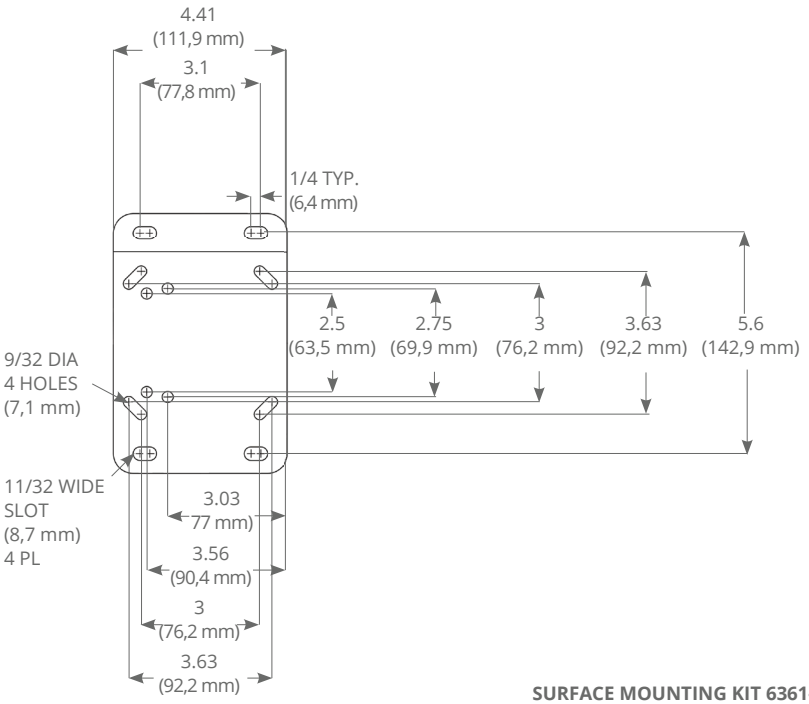


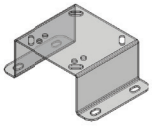


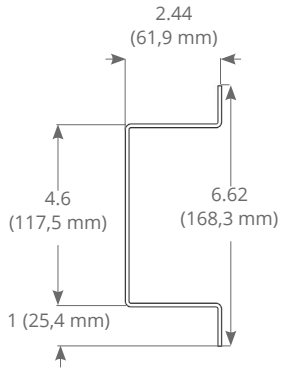
Dimension L			
Models	Inches	mm	NPT
Pressure			
P06-P20	5.7	144,8	1/4
Differential Pressure			
K10-K13	7	155	1/4
Temperature			
Remote: TR1, TC1, TH1	78" when uncoiled	1981,2	Bulb & Capillary
Remote: THC, TRC, TCC	Customer supplied dimension		Bulb & Capillary
Local Welded: TL1-TL3	9.2, 11.2, 15.2	233,7; 284.5; 386,1	Immersion Stem
Local Spring Loaded: TTC	Customer supplied dimension		Immersion Stem



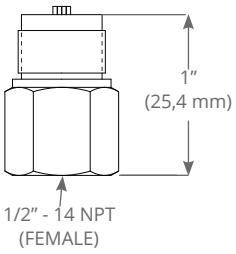
MOUNTING BOLT PATTERN
All models



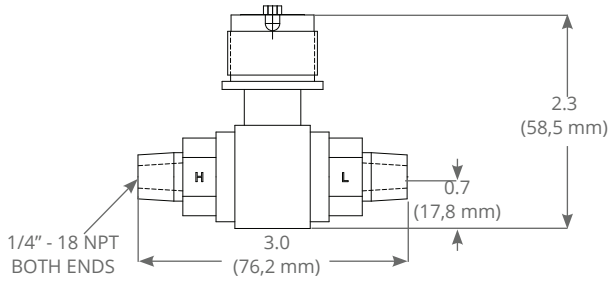




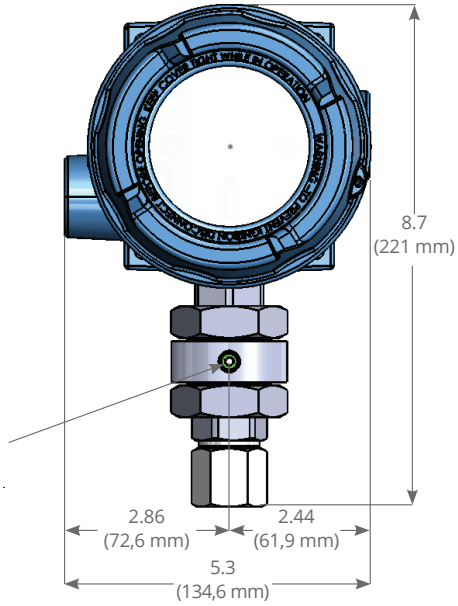
SURFACE MOUNTING KIT 6361-704



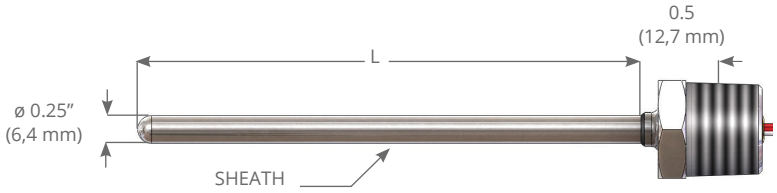
Gage Pressure Sensors



Differential Pressure Sensors

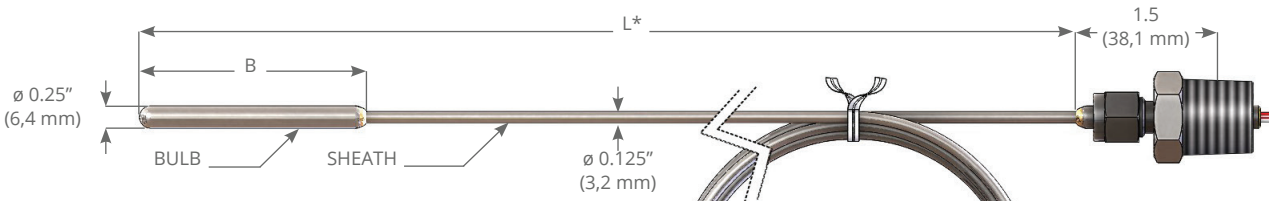


Dual Seal with Gage Pressure Sensor (Option M041)



TL1 to TL3

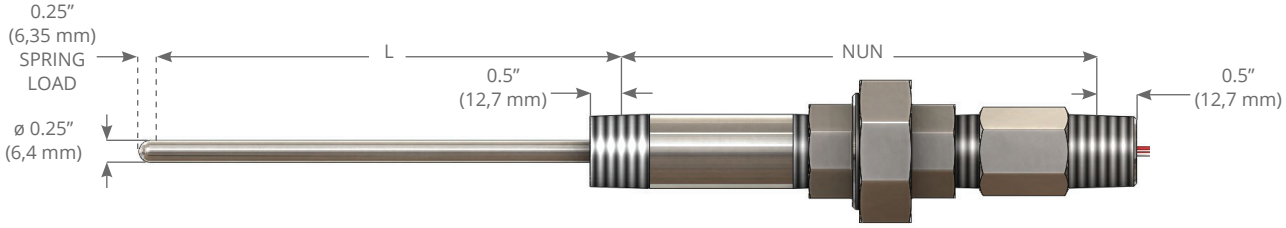
Model	L (Inches)	L (mm)
TL1	4"	101,6
TL2	6"	152,4
TL3	10"	254



Model	L* (ft)	L* (m)	B (in)	B (mm)
TR1	6	1,8	6	152,4
TRC	1 to 60 max	0,3 to 18,3 max	6	152,4
TH1	6	1,8	2.5	63,5
THC	1 to 60 max	0,3 to 18,3 max	2.5	63,5
TC1	6	1,8	2.5	63,5
TCC	1 to 60 max	0,3 to 18,3 max	2.5	63,5

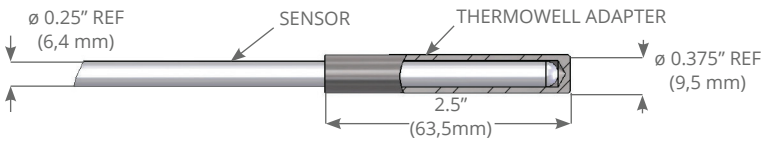
* Length includes loop uncoiled

Remote Sensors



TTC Sensors

L = 36" max., NUN = 4 to 10" (101,6 to 254 mm) in 1" (25,4 mm) increments



Thermowell Adapter
(Option W081)

French Warnings Translations

Pg	Warning Text	Texte d'Avertissement
1	MISUSE OF THIS DEVICE MAY CAUSE EXPLOSION AND PERSONAL INJURY. THESE INSTRUCTIONS MUST BE THOROUGHLY READ AND UNDERSTOOD BEFORE DEVICE IS INSTALLED. SEE THE DEVICE NAMEPLATE FOR AGENCY CERTIFICATIONS APPLICABLE.	Une mauvaise utilisation de cet appareil peut provoquer explosion et/ou blessures corporelles. Ces consignes doivent être lues attentivement et bien comprises avant l'installation de l'appareil. Les certifications d'agence sont indiquées sur la plaque signalétique de l'appareil.
1	CABLE GLANDS USED MUST BE RATED FOR A MINIMUM OF IP66 IN ORDER TO MAINTAIN THE SAME IP RATING.	Les presse-étoupes utilisés doivent être classés au minimum IP66 afin de conserver le même classement IP.
1	FOR ZONE HAZARDOUS LOCATIONS, ALL CABLE ENTRY DEVICES SHALL BE CERTIFIED IN TYPE OF EXPLOSION PROTECTION FLAMEPROOF ENCLOSURE "d" WITH AN IP66 RATING, SUITABLE FOR THE CONDITIONS OF USE AND CORRECTLY INSTALLED. IF CABLES AND CABLE GLANDS ARE NOT USED, A STOPPING BOX SHALL BE PROVIDED WITHIN 2" OF THE ENCLOSURE. FLAMEPROOF JOINT AND GAP DETAILS ARE PROVIDED ON PAGE 3.	Lors de l'installation dans une zone dangereuse, tous les dispositifs d'entrée de cables (bouchons, presse-étoupes ou adaptateurs) doivent être homologués antidéflagrants type "d" avec un indice de protection IP66 et être correctement installés. Si des bouchons et presse-étoupe ne sont pas utilisés, une boîte d'arrêt ou des raccords d'étanchéité doivent etre installés à moins de 2 inches du boîtier. Les détails sur les joints et raccords antidéflagrants sont fournis page 3.
1	THIS DEVICE DOES NOT HAVE ANY REPLACEABLE PARTS. ANY SUBSTITUTION OF COMPONENTS SHALL INVALIDATE AGENCY CERTIFICATION(S), AND IMPAIR SUITABILITY FOR CLASS I, DIV. 1 LOCATION.	Aucun composant ne peut être remplacé sur le terrain. Tout remplacement de composant invalidera toutes les approbations, homologations et certifications données par un tiers. L'appareil peut alors ne plus être adapté à une utilisation dans un lieu de Classe I, Division 1.
3	ATEX AND IEC SPECIFIC CONDITIONS OF USE FOR FLAMEPROOF AND DUST-IGNITION PROOF ("DB" AND "TB"): FLAMEPROOF JOINT AND GAP DETAILS: • Enclosure to cover threaded joint: 4" - 16 UN-2, 7 threads engaged minimum • Glass to cover cemented joint: 0.753" (19,1 mm) rabbet/spigot minimum length • Breather element threaded joint: M8-1.25 (6g/6H medium fit class), 11 threads engaged minimum • Electrical conduit threaded joint: 3/4"-14 NPT, 5 threads engaged minimum • Enclosure to sensor threaded joint: - Pressure models: 1"-20 UNEF-2, 10 threads engaged minimum - Temperature models: 1/2"-14 NPT, 5 threads engaged minimum - Remote and local spring loaded temperature sensor gap joints: 0.0045" (0.114 mm) maximum annular gap by 1.25" (31,8 mm) minimum length • User installed temperature sensors must be certified to flameproof "db" and dust "tb" requirements for the same group and ambient temperature range, made from a corrosion resistant material, and engage 5 threads min with grease required on threads. This certificate applies to the device described herein only and does not cover the user installed temperature sensor. DUAL SEAL ADAPTOR (OPTION M041) JOINT AND GAP DETAILS: • Threaded Dual Seal Adaptor Option Enclosure to One Series Enclosure : 1"-20 UNEF-2, 10 threads engaged minimum • Breather element threaded joint: 1/4"-20 UNC-2, 10 threads engaged minimum • Secondary Seal Housing to union housing joint: 0 .580" (14,73 mm) rabbet/spigot minimum length, maximum annular gap 0.003 in. (0,08 mm) • Sensor to union housing joint: 0 .580" (14,73 mm) rabbet/spigot minimum length, maximum gap 0.003 in. (0,08 mm) • Threaded Dual Seal Adaptor option to Sensor 1"-20 UNEF-2, 10 threads engaged minimum or 1/2"-14 NPT 5 threads engaged minimum.	Conditions d'utilisation spécifiques ATEX et IEC pour utilisation en zone antidéflagrante et à risque d'inflammation/explosion due à la poussière («db» et « tb ») : DÉTAILS DES JOINTS ET DES ECARTS RÉSISTANTS À LA FLAMME : • Joint fileté entre le boîtier et le couvercle : 4" - 16 UN-2, 7 filets engagés au minimum. • Joint collé entre le verre et le couvercle : longueur minimale de 19,1 mm (0,753"). • Joint fileté de l'aérateur (reniflard) : M8-1.25 (6g/6H classe d'ajustement moyen), 11 filets engagés au minimum • Raccord fileté du conduit électrique : 3/4"-14 NPT, 5 filets engagés au minimum • Raccord fileté entre le boîtier et le capteur : - Modèles à pression : 1"-20 UNEF-2, 10 filets engagés au minimum - Modèles de température : 1/2"-14 NPT, 5 filets engagés au minimum - Joints d'espacement des télécapteurs et capteurs locaux de température à ressort : 0,0045" (0,114 mm) maximum d'espace annulaire par 1,25" (31,8 mm) minimum. Les capteurs de température installés par l'utilisateur doivent être certifiés conformes aux exigences d'étanchéité à la flamme « db » et à la poussière « tb » pour le même groupe et la même plage de températures ambiantes, être fabriqués dans un matériau résistant à la corrosion et comporter au moins 5 filetages, la graisse étant requise sur les filetages. Ce certificat s'applique uniquement au dispositif décrit dans le présent document et ne couvre pas le capteur de température installé par l'utilisateur. ADAPTATEUR A DOUBLE ETANCHEITE (OPTION M041) DETAILS DU JOINT ET DE L'ECART : • Adaptateur fileté à double étanchéité option boîtier vers boîtier One Série : 1"-20 UNEF-2, 10 filets engagés au minimum • Joint fileté de l'aérateur (reniflard) : 1/4"-20 UNC-2, 10 filets engagés au minimum • Joint d'étanchéité secondaire entre le boîtier et le boîtier union : longueur minimale de la feuillure de 0,580"(14,73 mm), écart annulaire maximal de 0,08 mm (0.003"). • Joint entre le capteur et le boîtier union : 0,580" (14,73 mm) longueur minimale de la feuillure, écart maximal de 0,08 mm (0.003") • Adaptateur fileté à double étanchéité optionnel pour le capteur 1"-20 UNEF-2, 10 filets engagés minimum ou 1/2"-14 NPT 5 filets engagés minimum.

French Warnings Translations (continued)

Pg	Warning Text	Texte d'Avertissement
3	ATEX AND IEC SPECIFIC CONDITIONS OF USE FOR INTRISIC SAFETY ("IA"): • Enclosure and cover are made from Aluminum Alloy, do not strike with heavy object. • Separation distances were assessed to Annex F of IEC 60079-11. • Device must be powered by a galvanically isolated intrinsic safety barrier.	Conditions d'utilisation spécifiques ATEX et IEC pour la sécurité intrisèque (« ia ») : • Le boîtier et le couvercle contiennent de l'aluminium, ne pas frapper avec un objet lourd. • Les distances de séparation ont été évaluées conformément à l'annexe F de la norme IEC 60079-11. • L'appareil doit être alimenté par une barrière de sécurité intrinsèque isolée galvaniquement.
3	ATEX AND IEC SPECIFIC CONDITIONS OF USE: THE DEVICE MUST BE CLEANED WITH A DAMP CLOTH TO AVOID STATIC DISCHARGE.	Conditions d'utilisation spécifiques ATEX et IEC : l'appareil doit être nettoyé avec un chiffon humide pour éviter les décharges d'électricité statique.
4	INSTALL DEVICE WHERE SHOCK, VIBRATION AND TEMPERATURE FLUCTUATIONS ARE MINIMAL. DO NOT INSTALL DEVICE IN AMBIENT TEMPERATURES THAT EXCEED PUBLISHED LIMITS ON THE NAMEPLATE.	Installer l'appareil dans un endroit où les chocs, les vibrations et les variations de température sont minimes. Ne pas installer l'appareil dans un lieu où les températures ambiantes dépassent les limites indiquées sur la plaque signalétique de l'appareil.
4	DEVICE IS PROVIDED WITH TWO 3/4" NPT ELECTRICAL CONDUIT OPENINGS, EITHER OF WHICH OR BOTH CAN BE USED DURING INSTALLATION.	L'appareil est pourvu de deux ouvertures pour conduits électriques 3/4 NPT. L'une, l'autre ou les deux peuvent être utilisées pendant l'installation.
5	A SUITABLE THERMOWELL MADE FROM CORROSION-RESISTANT MATERIAL AND ENGAGING 5 THREADS MINIMUM (WITH THREAD SEALANT) IS REQUIRED FOR THE LOCAL SPRING LOADED TEMPERATURE SENSOR TO MAINTAIN IP66.	Un puits thermométrique fabriqués dans un matériau résistant à la corrosion et comportant au moins 5 filets (avec un joint d'étanchéité), est nécessaire pour que le capteur de température local à ressort conserve son IP66.
5	FIELD WIRING MUST BE RATED 105 °C MINIMUM. FOR AMBIENT TEMPERATURES BELOW -10 °C, USE SUITABLE FIELD WIRING. USE COPPER WIRES ONLY - ALUMINUM WIRE NOT ALLOWED! INSTALL ALL CLASS 2 WIRING WITHIN FLEXIBLE TUBING TO MAINTAIN SEGREGATION BETWEEN CIRCUITS.	Le câblage de terrain doit être classé 105 °C minimum. Utiliser un câblage de terrain approprié pour les températures ambientes inférieures à -10 °C. Utiliser exclusivment des fils de cuivre. Les fils d'aluminium ne sont pas autorisés. Installer tous les câbles de classe 2 dans des tubes flexibles pour maintenir la séparation entre les circuits.
5	DISCONNECT ALL SUPPLY CIRCUITS BEFORE WIRING DEVICE. WIRE DEVICE IN ACCORDANCE WITH LOCAL AND NATIONAL ELECTRICAL CODES. MAXIMUM RECOMMENDED WIRE SIZE AND TIGHTENING TORQUE FOR FIELD WIRING TERMINAL BLOCKS ARE SHOWN WITHIN TABLE 3 (PAGE 7**).**	Assurezvous que l'alimentation est intégralement coupée avant/pendant l'installation et l'entretien. L'installation électrique doit être conforme aux codes électriques locaux et nationaux. La taille maximale des fils et le couple de serrage sont indiqués dans le tableau 3 (page 7).
5	TO PREVENT IGNITION, DISCONNECT POWER BEFORE REMOVING ENCLOSURE COVER. KEEP COVER TIGHT WHILE IN OPERATION. DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NON-HAZARDOUS.	Ne pas retirer les couvercles du transmetteur lorsque l'appareil est sous tension. Avant de raccorder une interface de communication dans une atmosphère explosive, s'assurer que les instruments dans la boucle sont installés conformément aux consignes de câblage de sécurité intrinsèque ou non incendiaire.
8	WHEN USED FOR EXPLOSION PROOF, NON-INCENDIVE, "d", "nA", MODEL 1XSWLL WILL NEED TO USE A CLASS 2 OR SELV POWER SUPPLYIS TO BE USED	En cas d'utilisation pour des applications antidéflagrantes, non incendiaires, « d », « nA », le modèle 1XSWLL devra utiliser une alimentation de classe 2 ou selv.
8	FOR 1XSWLL MODELS, ONLY ONE CONDUIT OPENING IS REQUIRED. THE UNUSED CONDUIT OPENING MUST INCLUDE AN EXPLOSION-PROOF/ FLAMEPROOF PLUG, MADE FROM A CORROSION-RESISTANT MATERIAL, SUITABLE FOR ALL GAS AND DUST GROUPS AS LISTED ON THE NAMEPLATE. BLANKING ELEMENTS FROM FACTORY HAVE BEEN TESTED WITH THE ENCLOSURE AS AN ASSEMBLY AND CARRY NO MARKINGS.	Le modele 1XSWLL n'utilise qu'une ouverture de conduit électrique. L'ouverture non utilisée du conduit doit comporter un presse-étoupe antidéflagrant/anti-flamme, résistant à la corrosion, adapté à tous les groupes de gaz et de poussières indiqués sur la plaque signalétique. Les éléments d'obturation provenant de l'usine ont été testés avec le boîtier en tant qu'ensemble et ne portent aucun marquage.
8	SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.	Substituer des composants peut affecter la securité intrinsèque.

TERMS AND CONDITIONS OF SALE

UE specifications subject to change without notice.

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