



12 Series

Explosion-Proof, Pressure, Vacuum, and Differential Pressure Switches

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 PRODUCT MAY CAUSE EXPLOSION AND PERSONAL INJURY. THESE INSTRUCTIONS MUST BE THOROUGHLY READ AND UNDERSTOOD BEFORE UNIT IS INSTALLED.

Cert number	E40857-19971015
Applicable Area	North America
Markings	Class I, Groups A, B, C and D; Class II, Groups E, F and G; Class III
Applicable Standards	UL 1203, UL 508; CAN/CSA C22.2 No. 14, CAN/CSA C22.2 No. 25, CAN/CSA C22.2 No. 30

Cert number	DEMKO C8 ATEX 0717128X
Applicable Area	Europe (EU)
Markings	II 2 G Ex db IIC T6 Gb; II 2 D Ex tb IIIC T85 °C Db
Applicable Standards	EN IEC 60079-0; EN 60079-1; EN 60079-31

Cert number	IECEx UL 14.0072X
Applicable Area	International
Markings	Ex db IIC T6 Gb Ex tb IIIC T85 °C Db IP66 -50 °C to +80 °C
Applicable Standards	IEC 60079-0; IEC 60079-1; IEC 60079-31

Cert number	DEMKO 11 ATEX 1105261X
Applicable Area	Europe (EU)
Markings	II 1 G Ex ia IIC T6 Ga; -50 °C to +60 °C
Applicable Standards	EN IEC 60079-0; EN 60079-11

Cert number	IECEx UL 14.0075X
Applicable Area	International
Markings	Ex ia IIC T6 Ga -50 °C ≤ Tamb ≤ +60 °C
Applicable Standards	IEC 60079-0; IEC 60079-11

! 12 SERIES FOR USE IN CLASS I, DIV. 1, GROUPS A, B, C & D; CLASS II, DIV. 1, GROUPS E, F & G; CLASS III HAZARDOUS LOCATIONS. ENCLOSURE TYPE 4X, IP66. AMBIENT TEMPERATURE RANGE -50°C (-58°F) TO 95°C (203°F).

! ATEX AND IEC SPECIFIC CONDITIONS OF USE: THE WIRING TO THE PRESSURE SWITCH MUST ONLY BE CONNECTED IN A SAFE AREA OR BY AN APPROVED TERMINAL BOX CERTIFIED TO EN 60079-0/IEC 60079-0, EN 60079-1/IEC 60079-1, AND EN 60079-31/IEC 60079-31 FOR HAZARDOUS LOCATIONS. THE EPOXY RESIN SHALL NOT BE SUBJECTED TO A TEMPERATURE GREATER THAN 125°C (257°F). THE WIRES SHALL BE PROTECTED AGAINST MECHANICAL DAMAGE, E.G., BY USE OF CONDUIT. OPTION M515 WITH DIN CONNECTOR IS NOT COVERED BY THIS CERTIFICATE. OPTION M460, EXTERNAL EARTH GROUND SCREW, IS TO BE USED IF METAL CONDUIT IS NOT USED. ELECTRICAL CONDUIT FITTING THREADED CONNECTION SHALL BE M20 X 1.5 WITH 7 THREADS MINIMUM ENGAGEMENT.

UE declarations and third-party issued Agency certifications are available for download at www.ueonline.com.

i PRIOR TO INSTALLATION, CHECK THE WETTED PARTS MATERIAL FOR COMPATIBILITY TO THE PROCESS MEDIA.

! THE DUAL SEAL DEVICE METHOD OF PRIMARY SEAL FAILURE ANNUNCIATION IS VISIBLE LEAKAGE FROM THE ENCLOSURE. DEPENDING UPON MEDIA SENSED, ADDITIONAL METHODS OF LEAK DETECTION SHALL BE REQUIRED.

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

i PROOF PRESSURE * LIMITS STATED IN THE LITERATURE AND ON NAMEPLATES MUST NEVER BE EXCEEDED, EVEN BY SURGES IN THE SYSTEM. OCCASIONAL OPERATION OF UNIT UP TO PROOF PRESSURE IS ACCEPTABLE (E.G., START-UP, TESTING). CONTINUOUS OPERATION SHOULD NOT EXCEED THE DESIGNATED OVER RANGE ** OR WORKING PRESSURE RANGE***.

* Proof Pressure - the maximum pressure to which a pressure sensor maybe occasionally subjected, which causes no permanent damage (e.g., start-up, testing). The unit may require re-gapping.

** Over Range Pressure - the maximum pressure to which a pressure sensor may be continuously subjected without causing damage and maintaining set point repeatability.

*** Working Pressure Range - the pressure range in which two opposing sensors can be safely operated and still maintain set point provided the difference in pressure between the low and high sides does not exceed the designated adjustable range.

The 12 Series switch utilizes a diaphragm or a piston sensor to detect a pressure change. The response, at a predetermined set point, actuates a SPDT or DPDT snap-acting switch, converting a pressure signal into an electrical signal. Control set point may be varied by turning the internal slotted adjustment screw according to procedures outlined in Part II-Adjustments. Please refer to product datasheet at www.ueonline.com for product specifications. Date code format on nameplate is "YYWW" for year and week.

DEVICE MUST NOT BE ALTERED OR MODIFIED AFTER SHIPMENT. CONSULT UE IF MODIFICATION IS NECESSARY.

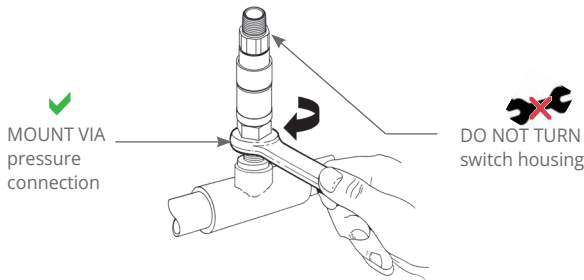


Figure 1

Part I - Installation

Mounting

- 1 1/16" Open end wrench

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

NOTE: Due to product sensitivity on sensor Type W, it is recommended that these models be mounted vertically with pressure connection facing down. Other types of mounting may cause slight set-point shifts, which may require readjustment.

CONSIDER THE USE OF A PRESSURE SNUBBER IF SEVERE PRESSURE SURGES ARE EXPECTED.

FOR PRESSURE MODELS, MOUNT VIA PRESSURE CONNECTION. ALWAYS USE A WRENCH ON PRESSURE CONNECTION HEX (SEE FIGURE 1). DO NOT TIGHTEN BY TURNING THE ENCLOSURE AS THIS WILL DAMAGE THE SENSOR AND WEAKEN WELDED JOINTS.

FOR DIFFERENTIAL PRESSURE MODELS, MOUNT USING THE ATTACHED MOUNTING BRACKET AGAINST A RIGID SUPPORT, AND THEN CONNECT LOW AND HIGH PRESSURE PORTS.

IF USING WITH A JUNCTION BOX, IT IS RECOMMENDED THAT THE PRODUCT BE MOUNTED VERTICALLY WITH THE PRESSURE CONNECTION FACING DOWN.

If product is to be set after mounting, verify that adjustment opening is accessible, "Front" marking on nameplate facing operator.

Panel Mounting via 1/2" NPTM or M20 Electrical Connection

When panel mounting, mount through 7/8" clearance hole in panel. Use 1/2" or M20 conduit nut to secure in place. Always support the product by holding a wrench on the hex.

Surface Mounting Bracket Kit (P/N 62169-13) (see Fig. 6)

- 1 Open the adjustment cover and orient the unit so that adjustment opening will be accessible when the switch is mounted.
- 2 Close the adjustment cover ensuring that the bracket does not interfere with the cover as this serves as the Dual Seal device method of primary seal failure annunciation and venting.

Failure to install the unit correctly with the mounting bracket may result in improper venting of the adjustment cover.

Wiring

DISCONNECT ALL SUPPLY CIRCUITS BEFORE WIRING UNIT. WIRE UNITS ACCORDING TO NATIONAL AND LOCAL ELECTRICAL CODES. THE WIRES SHOULD BE PROTECTED AGAINST MECHANICAL DAMAGE BY USE OF A CONDUIT OR OTHER SUITABLE MEANS.

DO NOT EXCEED ELECTRICAL RATINGS LISTED ON NAMEPLATE. OVERLOAD ON A SWITCH CAN CAUSE FAILURE, EVEN ON THE FIRST CYCLE.

DIN CONNECTOR (OPTION M515, FIGURE 4) IS NOT APPROVED FOR CLASS I, DIV. 1 HAZARDOUS LOCATIONS/ FLAMEPROOF ATMOSPHERES.

1/2" NPT (male) or M20 (male) conduit connection is provided on top of the product with 72" long, 18 AWG leadwires. The product is available with SPDT or DPDT operation. External grounding screw and clamp is provided with option M460 for ATEX installation with non-metallic conduit systems (See Figure 2). To attach conduit connection hold electrical connection steady with wrench on hex, then thread on conduit.

Factory Sealed Leadwires are color coded:

TERMINALS	SPDT	DPDT	
		Circuit 1	Circuit 2
Common	Brown	Brown	Yellow
Normally Closed	Red	Red	Black
Normally Open	Blue	Blue	Violet
Ground	Green	Green	

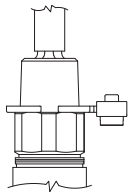


Figure 2

DIN Connector with 4 Male Terminals (see Figure 4)

Connector conforms to DIN 43650. Use a female mating DIN connector (not UE supplied).

Coding: TERMINALS	
Terminal #1	Common
Terminal #2	Normally Closed
Terminal #3	Normally Open
⊕	Ground

Part II - Adjustments



- Flathead screwdriver with 3/16" or 1/4" wide blade

- Connect control to pressure source.
- With power disconnected, slide cover toward electrical terminations while twisting it to overcome friction.
- Connect power to terminals or leads.
- Insert screwdriver into adjustment slot and turn clockwise to increase setting or counter clockwise to decrease setting (See Figure 3).

Part III - Dimensions

Dimensional drawings for all models may be found at: www.ueonline.com

Standard Configuration

PRESSURE SWITCH / CONNECTION CHART							
Type	Description	Dimension A		Dimension B		Dimension C	
		In	mm	In	mm	In	mm
2	1/2" NPT (female)	4.4	111.1	0.7	16.5	1 1/16	27.0
3, 5	1/2" NPT (female)	4.4	111.1	0.6	15.2	1 1/16	27.0
4, 6, 8	1/4" NPT (female)	4.4	111.1	0.6	15.2	1 1/16	27.0
7, 9	1/2" NPT (female)	4.0	100.3	1.6	40.6	1 1/8	28.6
P0-P9	1/4" NPT (female)	4.4	111.1	1.0	25.4	1 1/16	27.0
W1-W2	1/2" NPT (female)	4.0	100.3	2.2	55.9	1 1/16	27.0
W3-W4	1/2" NPT (female)	4.0	100.3	1.7	42.9	1 1/16	27.0
K1-K3	1/8" NPT (female)	4.4	111.1	1.7	42.9	N/A	N/A
K4-K6	1/8" NPT (female)	4.4	111.1	1.8	44.5	N/A	N/A
Option	Description	Dimension "A"		Dimension "B"		Dimension "C"	
M511	1/4" NPT (male)			1.1	27.9	1 1/16	27.0
XP112	1/2" NPT (female)			0.6	15.2	1 1/16	27.0
XP113	1/2" NPT (female)			0.6	15.2	1 1/16	27.0

For setting on rise, apply desired pressure and turn adjustment clockwise until switch actuates (circuit across N.O. and COM terminals closes).

For setting on fall, apply pressure equal to normal system operating pressure. Reduce source pressure to setpoint value. Turn adjustment counter clockwise until switch actuates (circuit across N.C. and COM terminals closes).



AFTER COMPLETING SETTING ADJUSTMENT, BE SURE TO SLIDE ADJUSTMENT COVER BACK INTO PLACE.

Recommended Practices

- A redundant device is necessary for applications where damage to the primary device could endanger life, limb or property. A high or low limit switch is necessary for applications where a dangerous runaway condition could result.
- Monitor operation to observe warning signs of possible damage to device, such as drift in set point. Check device immediately.
- Preventative maintenance and periodic testing is necessary for critical applications where damage could endanger property or personnel.

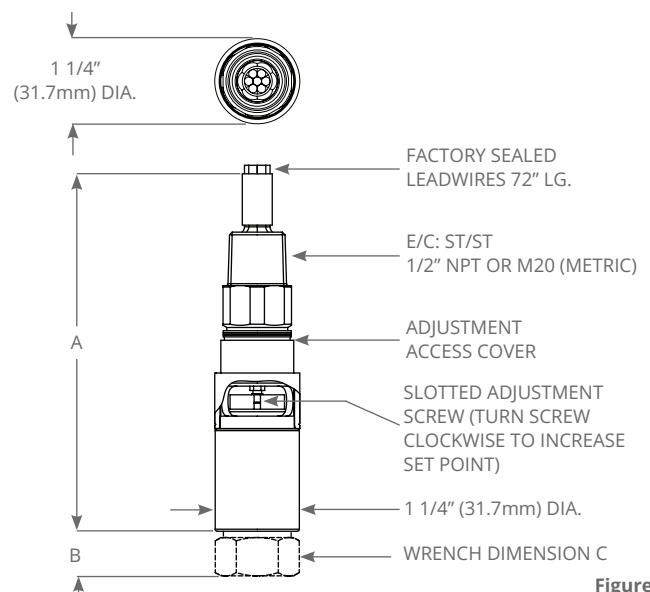
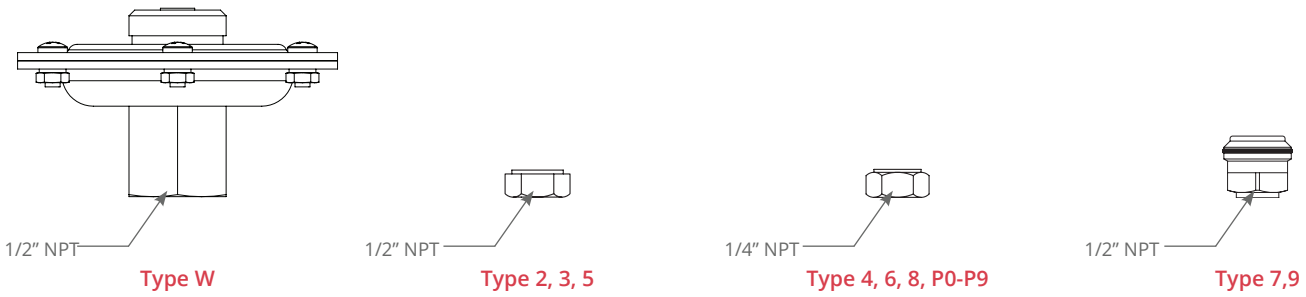


Figure 3

Pressure Connections

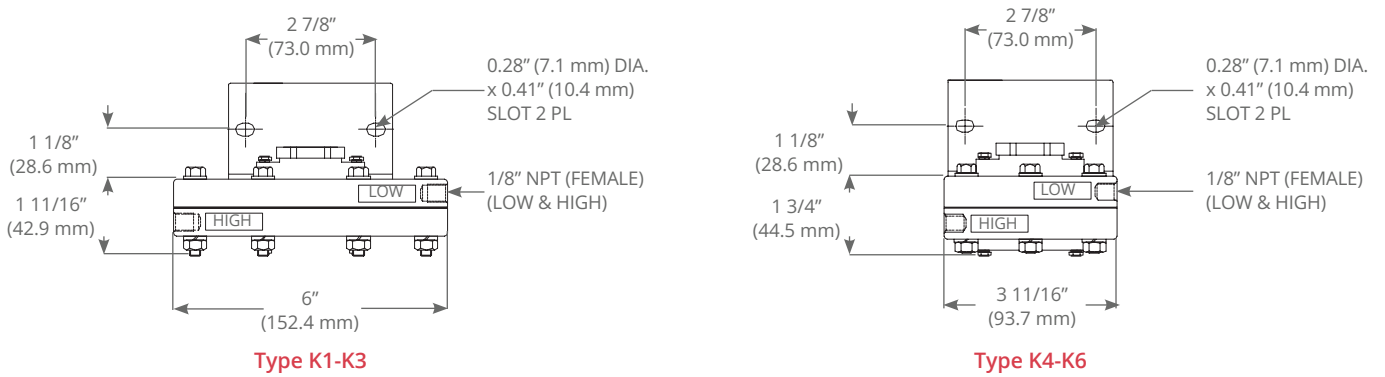


Option M511



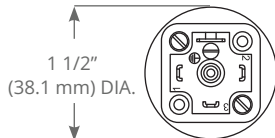
Options XP112, XP113

Differential Pressure Connections

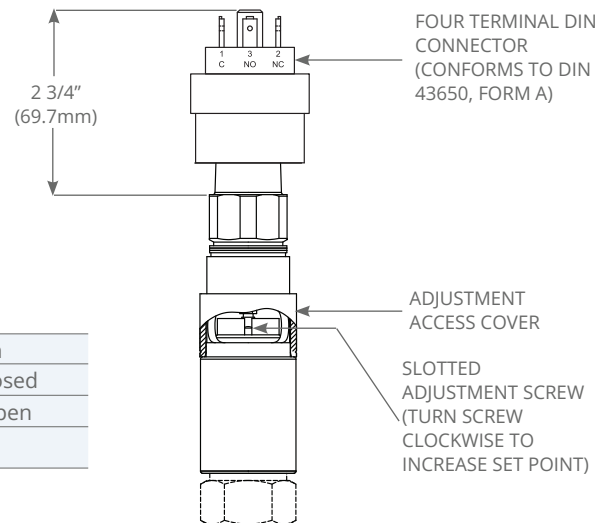


Types K1-K3 and K4-K6 shown with mounting bracket attached

Option M515 DIN Connection



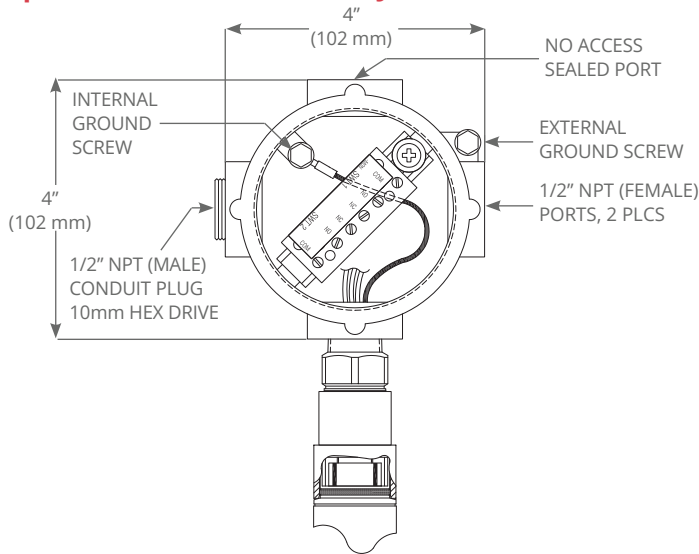
Terminal #1	Common
Terminal #2	Normally Closed
Terminal #3	Normally Open
⊕	Ground



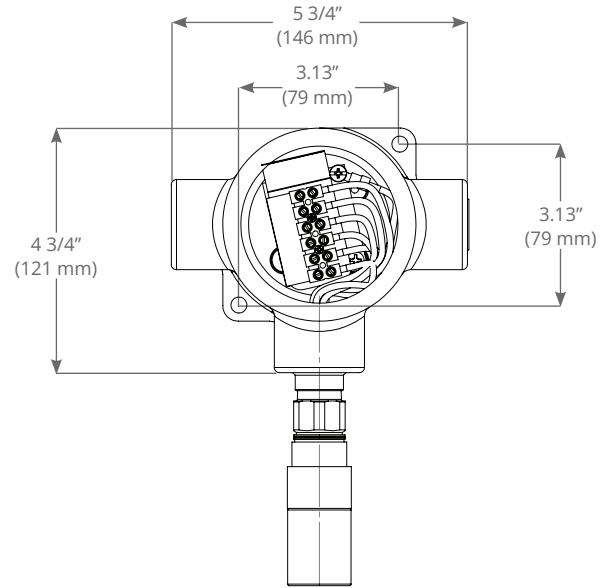
NOTE: Does not meet Div. 1 or 2, or ATEX requirements.

Figure 4

Option M421, M423 & M513 Junction Boxes



M421 - EAC only; M423 - ATEX or IEC
Not cULus approved. Cover not shown.



M513
cULus only. Does not meet Enclosure Type 4X. Cover not shown.

Option M430 Adjustment Cover Lock

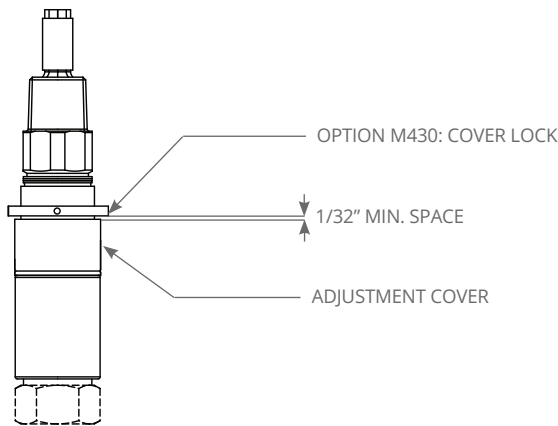


Figure 5

NOTE: A 1/32" min. space must be maintained between the bottom of the cover lock and the top of the adjustment cover to ensure proper dual seal annunciation and venting.

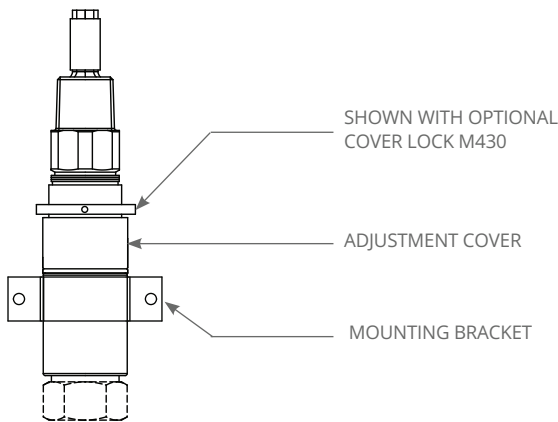
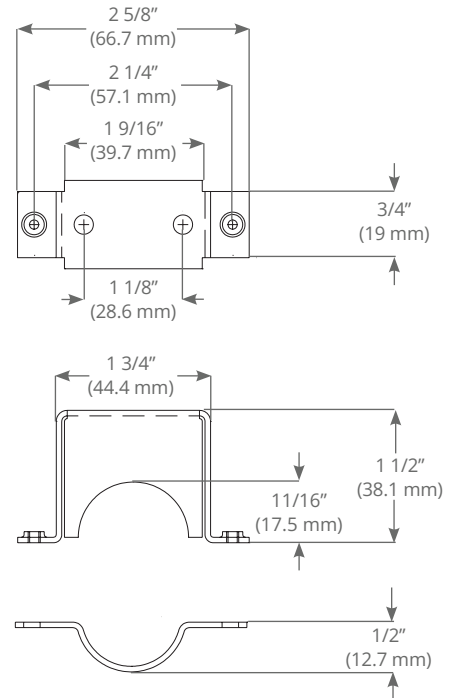


Figure 6



FRENCH WARNING TRANSLATIONS		
Pg	Warning Text	Texte d'Avertissement
1	MISUSE OF THIS PRODUCT MAY CAUSE EXPLOSION AND PERSONAL INJURY. THESE INSTRUCTIONS MUST BE THOROUGHLY READ AND UNDERSTOOD BEFORE UNIT IS INSTALLED.	Une mauvaise utilisation de cet appareil peut provoquer une explosion et/ou des blessures. Ces consignes doivent être lues attentivement et bien comprises avant l'installation de l'appareil.
1	12 SERIES PRESSURE-OPERATED SWITCH FOR USE IN CLASS I, GROUPS A, B, C AND D; CLASS II, GROUPS E, F AND G; CLASS III HAZARDOUS LOCATIONS. ENCLOSURE TYPE 4X, IP66. AMBIENT TEMPERATURE RANGE: -50°C (-58°F) TO 71°C (160°F).	Le pressostat 12 Series est adapté à une utilisation dans les lieux de Classe I, Division 1, de Groupes A, B, C et D ; Classe II, Division 1, Groupes E, F et G ; Classe III; ou non-dangereux. Boîtier de type 4X, IP66. Plage de température ambiante -50°C (-58°F) à 95°C (203°F).
1	ATEX AND IEC SPECIFIC CONDITIONS OF USE: THE WIRING TO THE PRESSURE SWITCH MUST ONLY BE CONNECTED IN A SAFE AREA OR BY AN APPROVED TERMINAL BOX CERTIFIED TO EN 60079-0/IEC 60079-0, EN 60079-1/IEC 60079-1, AND EN 60079-31/IEC 60079-31 FOR HAZARDOUS LOCATIONS. THE EPOXY RESIN SHALL NOT BE SUBJECT TO A TEMPERATURE GREATER THAN 125°C (257°F). THE WIRES SHALL BE PROTECTED AGAINST MECHANICAL DAMAGE, E.G. BY USE OF CONDUIT. OPTION M515 WITH DIN CONNECTOR IS NOT COVERED BY THIS CERTIFICATE. OPTION M460, EXTERNAL EARTH GROUND SCREW, IS TO BE USED IF METAL CONDUIT IS NOT USED. ELECTRICAL CONDUIT FITTING THREADED CONNECTION SHALL BE M20 X 1.5 WITH 7 THREADS MINIMUM ENGAGEMENT.	Conditions spécifiques d'utilisation ATEX et IEC: le câblage de l'appareil ne doit être connecté que dans une zone non dangereuse ou à une boîte de jonction et d'entrées de câble certifiées EN 60079-0/IEC 60079-0, EN 60079-1/IEC 60079-1, et EN 60079-31/IEC 60079-31 pour zone dangereuse. La résine Epoxy ne doit pas être soumise à une température supérieure à 125°C (257°F). Les fils doivent être protégés contre les dommages mécaniques par un conduit. L'option M515 avec un connecteur DIN n'est pas couverte par ce certificat. L'option M460, vis de mise à terre externe, doit être utilisée si on n'utilise pas de conduit métallique. Le raccord fileté du conduit électrique doit être de type M20 X 1,5 avec un engagement minimum de 7 filets.
1	THE DUAL SEAL DEVICE METHOD OF PRIMARY SEAL FAILURE ANNUNCIATION IS VISIBLE LEAKAGE FROM THE ENCLOSURE. DEPENDING UPON MEDIA SENSED, ADDITIONAL METHODS OF LEAK DETECTION MAY BE REQUIRED (PRESSURE MODELS ONLY)	La défaillance du joint primaire du dispositif à double étanchéité est indiquée par une fuite visible. En fonction du type de médium mesuré, d'autres méthodes de détection des fuites peuvent être nécessaires (pressostats seulement).
1	THIS PRODUCT DOES NOT HAVE ANY FIELD REPLACEABLE PARTS. ANY SUBSTITUTION OF COMPONENTS SHALL INVALIDATE AGENCY CERTIFICATION(S), AND IMPAIR SUITABILITY FOR CLASS I, DIV. 1 LOCATION.	Aucun composant de cet appareil ne peut être remplacé sur le terrain. Toute substitution de composant invalidera les approbations et certifications données par un tiers et compromettra l'utilisation dans un lieu de Classe I, Division 1.
2	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 minimales. Ne pas installer l'appareil dans un lieu où les températures ambiantes dépassent les limites indiquées sur la plaque signalétique de l'appareil.
2	DISCONNECT ALL SUPPLY CIRCUITS BEFORE WIRING DEVICE. WIRE DEVICE IN ACCORDANCE WITH LOCAL AND NATIONAL ELECTRICAL CODES. WIRES SHOULD BE PROTECTED AGAINST MECHANICAL DAMAGE BY USE OF A CONDUIT OR OTHER SUITABLE MEANS.	Avant le branchement de l'appareil, déconnecter l'installation sur laquelle l'appareil doit être monté. Réaliser le branchement électrique selon les codes électriques nationaux et locaux. Les fils doivent être protégés contre les dommages mécaniques par un conduit ou moyen approprié.
2	DO NOT EXCEED ELECTRICAL RATINGS LISTED ON NAMEPLATE. OVERLOAD ON A SWITCH CAN CAUSE FAILURE, EVEN ON THE FIRST CYCLE.	Les seuils électriques indiqués sur la plaque signalétique ne doivent jamais être dépassés. La surtension peut causer une panne de l'appareil dès les premier cycle.
2	DIN CONNECTOR (OPTION M515) IS NOT APPROVED FOR CLASS I, DIV. 1 HAZARDOUS LOCATION/FLAMEPROOF ATMOSPHERE.	Le connecteur DIN (Option M515) n'est pas approuvé pour la classe I, DIV. 1 zone dangereuse/ atmosphère inflammable.

LIMITED WARRANTY

Seller warrants that the device hereby purchased is, upon delivery, free from defects in material and workmanship and that any such device which is found to be defective in such workmanship or material will be repaired or replaced by Seller (Ex-works, Factory, Watertown, Massachusetts. INCOTERMS); provided, however, that this warranty applies only to device found to be so defective within a period of 24 months from the date of manufacture by the Seller. Seller shall not be obligated under this warranty for alleged defects which examination discloses are due to tampering, misuse, neglect, improper storage, and in any case where devices are disassembled by anyone other than authorized Seller's representatives. EXCEPT FOR THE LIMITED WARRANTY OF REPAIR AND REPLACEMENT STATED ABOVE, SELLER DISCLAIMS ALL WARRANTIES WHATSOEVER WITH RESPECT TO THE DEVICE, INCLUDING ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.

LIMITATION OF SELLER'S LIABILITY

Seller's liability to Buyer for any loss or claim, including liability incurred in connection with (i) breach of any warranty whatsoever, expressed or implied, (ii) a breach of contract, (iii) a negligent act or acts (or negligent failure to act) committed by Seller, or (iv) an act for which strict liability will be imputed to seller, is limited to the "limited warranty" of repair and/or replacement as so stated in our warranty of device. In no event shall the Seller be liable for any special, indirect, consequential or other damages of a like general nature, including, without limitation, loss of profits or production, or loss or expenses of any nature incurred by the buyer or any third party.

UE specifications subject to change without notice.



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