



Max Machinery, Inc.  
an ISO 9001:2008 certified company

## Installation Instructions – Hazardous Locations

Applies only to Max Model EX295 and EX296 Transmitters with explosion proof certification.

These transmitters provide protection via a flame proof housing and through current limiting to the circuit board: Must wire with a class 2 power supply (See table for loads page 3).

Meets US and Canadian Haz-Loc classifications, Class I, Div 1, Groups C and D, Tx

As well as ATEX/IECEX II 2 G Ex d IIB Tx Gb

Certification numbers Demko 11 ATEX 1013058X and IECEX UL 10.0048X

### Mechanical Installation

The outer housing freely rotates to align the conduit hole with your electrical connection point. If the transmitter is already attached to the meter skip to step 5:

1. To attach the transmitter to the flow meter, apply a small amount of low strength thread adhesive, such as Loctite™, on the threads and screw the transmitter onto the exterior threads on top of the flow meter.
2. Locate the locking set screw below the conduit hole and using a 3/32" hex wrench remove it. Rotate the outer housing clockwise until the screw hole lines up with a hole in the inner housing. (Inserting an Allen key into the threaded hole while rotating the housing can help in finding the point of alignment.) Now re-insert the set screw and hand-tighten it to lock the inner and outer housing together.
3. Finish tightening the transmitter onto the meter by applying a torque of 2 to 5 ft.-lb. (2.7 to 6.78 N-m).
4. Now back out the locking set screw until it is flush with the surface of the transmitter.
5. The housing can now be rotated to align the conduit port in the desired direction.
6. To remove the lid for wiring, remove the safety screw at the edge of the lid and then remove the cap using a 3/8" socket drive.
7. Install conduit. Within 18" of the housing install a conduit stop and fully seal with potting compound.
8. Connect wires to terminal block as shown below, using 2 mm screw driver.
9. A case ground terminal is provided internally, but if grounded metallic conduit is not used, then one of the external grounds below the conduit fitting must be used. For metric- use either a 6 or 8 mm long stainless steel M5 x 8.0 bolt. For inch measurement - use either a 1/4" or 5/16" long stainless steel #10-32 bolt.
10. Reattach cap and tighten to 40 in-lbs to seal enclosure. Install safety lock screw at the edge of the lid and hand tighten.

## Removal from Flow Meter

**Note:** the transmitter does not need to be removed from the flow meter for any field servicing or adjustments. Normally, the flow meter and transmitter are shipped back to the factory for calibration as a unit.

1. Remove the locking screw at the edge of the lid and then remove the cap using a 3/8" socket drive.
2. Disconnect wires at the terminal block and remove wiring conduit from transmitter.
3. Locate the locking set screw below the conduit hole and remove it. Rotate the outer housing clockwise until the screw hole lines up with a hole in the inner housing. (Inserting an Allen key into the threaded hole while rotating the housing can help in finding the point of alignment.) Now re-insert the set screw and hand-tighten it. This will lock the inner and outer housing together.
4. Unscrew the transmitter, using a strap wrench if necessary.

## Moisture Protection

The housing is a liquid and vapor-tight enclosure certified to IP66. There is an O-ring seal at the lid of the housing – the seal needs to be fully seated to provide moisture protection and achieve flameproof specifications.

## About Explosion proof installations

For the Model 295 and 296 to fully adhere to the HazLoc certifications, the wiring must meet the appropriate codes. (Use of a wire conduit does not make the installation explosion proof - read below.) The transmitters which are certified for use in hazardous locations require the use of a 1/2" NPT hazardous location rated conduit fitting. The wiring conduit must be sealed with a conduit stop within 18" of the device. If you choose to use exposed cables, cable seals must be used with sealing fittings and the wiring must be an approved armored cable.

## Electrical Installation

Use wiring that is between 20 and 28 gauge and rated to at least 5°C above the maximum ambient temperature, and rated to at least 80% of the maximum fluid temperature.

Pulse Output Wiring	Pulse PCB Label	Analog Output Wiring	Analog PCB Label	Wiring Adaptor Pin #	Two Part Transmitter Wiring	
					Ex-Proof Sender (Ex.: 29x-051-000)	Remote Receiver (Ex.: 296-x8x-xxx)
Power *	V+	Power	V+	1	Case	Case
Common	Com	Common	Com	2	5V	5V
Signal Output	PhA	Signal Output (+)	Sig	3	Ra	Ra
(Quad only)	PhB	Signal Output (-)	Ret	4	Rb	Rb
Case Ground	Case	Case Ground	Case	5	Com	Com

\* Consult Table

## Electrical Requirements

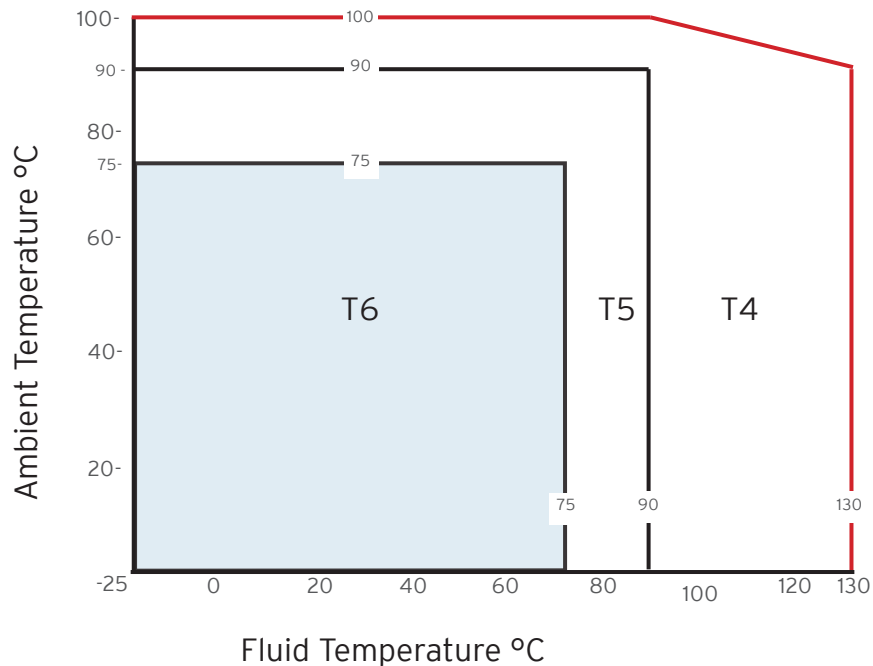
The device must be powered with a Class 2 power supply. Electrical loads are specific to model number's:

Part #'s	Transmitter Type	Electrical Input Requirements	Output Electrical Requirements
29x-0xx-	Pulse Output Transmitter	5-28Vdc 40mA	Single Line 0-5V 10mA (500 ohm pulldown or greater)
29x-1xx-0xx	Quadrature Output Transmitter	5-28Vdc 50mA	2 Lines 0-5V 10mA each (500 ohm pulldown or greater)
29x-2xx-	mA Output Transmitter	24-28Vdc 50mA	Isolated current loop, max 500 ohms in line, 12Vdc max
29x-2xx-1xx	mA Output Transmitter (12Vdc)	12-15Vdc 100mA	Isolated current loop, max 500 ohms in line, 12Vdc max
29x-3xx-	V Output Transmitter (24Vdc)	24-28Vdc 50mA	Isolated voltage loop, min 1000 ohms across line, 12Vdc
29x-3xx-1xx	V Output Transmitter (12Vdc)	12-15Vdc 100mA	Isolated voltage loop, min 1000 ohms across line, 12Vdc
29x-6xx-0xx	Level Shifter Pulse Output Transmitter	5-28Vdc 30mA	Single line, current sinking, max 28Vdc, max 25mA

## Temperature Classification

Temperature class is a function of fluid temperature used in the meter and ambient temperature. For hot fluids, meter must be insulated and transmitter must be left exposed. All transmitters are rated to operate within the BLUE region, but only the remote sender unit variants (295-x5x-xxx) can operate up to the maximum temperatures shown in the chart. Consult factory for installation details when operating near temperature limits.

### Temperature class chart for all explosion proof variants:



**Note:** Consult factory to determine the functional temperature limit of your transmitter variant. Temperature class ratings do not correspond with the continuous duty area for the electronics within the transmitter. A complete description of your transmitter may be found on the Max Machinery web site ([www.maxmachinery.com](http://www.maxmachinery.com)). Individual specification sheets and product family manuals are also available for viewing or downloading.

## EC Declaration of Conformity

We, Max Machinery Inc. declare as manufacturer under our sole responsibility that the product series 295/296 Explosion Proof Flow Transmitter is in conformity with the provisions of the European Community Directives as shown below.

Applicable Series: Part numbers of the format EX295-xx1-x00 and EX296-xx1-x00 where 'x' does not affect conformity to the standards.

Low Voltage Directive 2006/95/EC

EMC Directive 2004/108/EC

EN 61000-6-2:2005 Electromagnetic Immunity

EN 61000-6-4:2007 Electromagnetic Emission

ATEX Directive 94/9/EC designed and manufactured in accordance with Annex II of the ATEX Directive

EN 60079-0:2009 Explosive atmospheres general requirements

(Note: no routine verification and tests are required by clause 27)

EN 60079-1:2007 Protection by flameproof enclosures type d"

Designation:  0539  II 2 G Ex d IIB Tx Gb

EC Type examination certificate DEMKO 11 ATEX 1013058X provided by

UL International DEMKO A/S NB Number: 0539

P.O. Box 514, Lyskaer 8, DK-2730 Herlev, Denmark

Product quality assurance notification #11 ATEX Q1116140 provided by UL Demko

Production control done to ISO 9001:2008, certificate #C2010-01864



Bryan Snyder  
Engineering Manager

May 24, 2011  
Max Machinery Inc.  
33A Healdsburg Ave.  
Healdsburg, CA USA  
(707) 433-2662