

EXPLOSION - PROOF PRESSURE TRANSMITTER



FEATURES

- Fixed range or field-adjustable
- 4-20 mA, 1-5 or 0-10 VDC output
- 0.25% accuracy
- Compact, 316 stainless steel, hermetically sealed enclosure
- cULus & ATEX certified for Class I, Div. 1, Zone 1
- Pressure ranges:
0 to 15 psi to 0 to 25,000 psi
(0 to 1 bar to 0 to 1723,7 bar)



OVERVIEW

United Electric's TX200™ is a compact, rugged pressure transmitter designed for process control industries worldwide, and ideally suited for petrochemical and upstream oil and gas applications. All welded, 316 stainless steel hermetic construction provides airtight and watertight protection within the harshest environments. A bonded foil strain gauge sensor or piezo-resistive strain gauge sensor provide reliability and durability.

FEATURES

- Enclosure type 4X/IP66
- Welded stainless steel wetted material
- Submersible to 100 feet
- Wide variety of pressure connections
- Non-interactive zero and span adjustment
- 5:1 pressure range turndown
- Adjustable version may be calibrated in-place
- Certificate of calibration accompanies every unit



Model TX200A is field adjustable for zero and span using external stainless steel control buttons. Each control button is 316 stainless steel, and magnetically coupled through the hermetically sealed enclosure. For ease of calibration, the transmitter does not require a calibrated pressure source and can be calibrated in-place. Model TX200A span control allows a 5:1 pressure range turndown.

Protective Shield. Affixed to the TX200 is a 316 stainless steel, rotatable protective cover, which helps protect product markings and adjustment buttons (TX200A) from the elements and tampering.

Model TX200B is a fixed range transmitter for applications where the process is consistent and field adjustability is not required or desired. The TX200B provides a cost-effective alternative to conventional process transmitters.

APPLICATIONS

cULus and ATEX approvals assure most worldwide hazardous location requirements are met. TX200 pressure transmitters are used to monitor pressure in a variety of upstream, midstream, and downstream applications.



Instrument Panels



- Offshore rigs and pumping platforms
- RTU's & SCADA systems
- Sub-sea valve monitoring
- Flow line manifold monitoring
- Oil/gas separator systems



- Gas flow monitoring
- Pipeline compressor stations for maintaining flow and pressure levels along gas pipelines
- Pipeline monitoring of both surface and subterranean pipeline's physical and mechanical integrity
- Pump monitoring



- Onshore drilling rigs
- Wellhead monitoring
- Monitoring tubing & casing pressures
- CO2 injection skids
- Blowout preventor (BOP) accumulator
- Emergency shutdown and safety monitoring

TECHNOLOGY

Pressure transmitters convert applied pressure to an electronic signal through various technologies. The TX200 pressure transmitter utilizes two of these - a piezo-resistive pressure sensor for low-pressure applications and a bonded foil strain gage pressure sensor for high-pressure applications, both using ASIC technology to provide optimum sensor signal conditioning and temperature compensation of the sensor output.



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SPECIFICATIONS

PERFORMANCE

Full Scale Pressure Range (FSPR):	0 to 15 (0 to 1,0 bar) through 0 to 25,000 psi (0 to 1723,7 bar)
Non-linearity (L):	0 to 15 (0 to 1,0 bar) typical 0.3%, 0 to 30 psi through 0 to 250 psi (0 to 17,2 bar) typical @ 0.2% FSO 0 to 500 (0 to 34,5 bar) through 0 to 25,000 psi (0 to 1723,7 bar) typical @ 0.1% FSO
Hysteresis (H) and Repeatability (R):	±0.1% FSO
Accuracy (L, H, R):	0.25% (0.5% for 15 psi range)
Full Scale Output (FSO):	16 mA (4 - 20 mA), 4 VDC (1-5 VDC), 10 VDC (0-10 VDC)
Resolution:	Infinite
Zero Balance:	± 0.5% (FSO)
Response Time:	10 mSec (typical 90% final value)
Temperature Effect on Zero:	±0.5% per 100°F (55°C)
Temperature Effect on Span:	±0.5% per 100°F (55°C)
Compensated Temperature Range:	0°F to + 176°F (-18°C to 80°C)
Media Temperature:	-40°F to 257°F (-40°C to 125°C)
Operating Temperature:	-40°F to 185°F (-40°C to 85°C) per UL, cUL -40°F to 176°F (-40°C to 80°C) per ATEX
Storage Temperature Range:	-67°F to + 221°F (-55°C to 105°C)

ELECTRICAL

Supply Voltage:	10 to 36 VDC for 4-20 mA output 10 to 30 VDC for 1-5 VDC output 14 to 30 VDC for 0-10 VDC output
Output Signal:	4-20 mA or 1-5 VDC or 0-10 VDC <i>Range adjustment/calibration for TX200A only</i> Span adjustment: rangeable down 5:1 FSPR Range calibration signal: nominal 20% of FSPR, externally switched Calibration signal accuracy: ±1.0% FSO (a certificate of calibration with the exact signal to pressure correlation is provided with each unit).
Load Impedance:	4-20 mA output: 1300 ohms max. at 36 VDC or 700 ohms max. at 24 VDC 1-5 VDC or 0-10 VDC output: 2000 ohms min.
Circuit Protection:	The TX200 input is protected against transient surges using both varistor and TVS transient voltage suppressor technology, and is reverse polarity protected.
Electrical Connection:	1/2" NPT (male), 72" 18 AWG, color coded leadwires
Wiring:	Red: +VDC Black: -VDC Green: Earth Ground Blue: 1-5 V or 0-10 V output (only)

MECHANICAL

Wetted Materials:	316, 15-5 stainless steel; Hastelloy C and Monel available, please consult UE
Pressure Connections:	1/4" NPT, 1/2" NPT, 7/16-20 SAE, G-1/4, G-1/2, and medium pressure and high pressure autoclave (see pressure connection chart page 10), 316 stainless steel
Sensors	Model 03-08, 15929: 316 stainless steel welded diaphragm, micro-machined piezo-resistive strain gauge silicon element, 0.25 ml silicon oil fill Model 09-20: 15-5 stainless steel welded diaphragm, bonded foil strain gauge element
Proof Pressure:	≤10,000 psi (689,5 bar) 3 times FSPR; ≥15,000 psi (1034,2 bar) 2 times FSPR
Burst Pressure:	15 to 2000 psi (6,9 to 137,9 bar) 10 times FSPR; 2500 to 6000 psi (172,4 to 413,7 bar) 8 times FSPR or 30,000 psi, whichever is less; 7500 to 25,000 psi (517,1 to 1723,7 bar) 4 times FSPR or 90,000, whichever is less
Shock:	200 G's, one millisecond duration
Vibration:	Tested to MIL-STD-810F, modified to 2000 Hz at 15 G's peak
Enclosure:	316 stainless steel
Enclosure Classification:	Welded, hermetically sealed, enclosure type 4X. Certified to IP66 requirements
Weight:	TX200A: approx. 1.5 lbs (.68 kg) , TX200B: approx. 1.3 lbs (.59 kg)



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APPROVALS



UNITED STATES AND CANADA

Class I, Division 1 & 2, Groups A, B, C & D

Class II, Division 1 & 2, Groups E, F & G

Class III

Class I, Zone 1, Group IIC

Enclosure Type 4X

UL Listed, **cUL** Certified

UL 698, 1203, 61010-1;

CSA No. 25, 30, 61010-1 - File # E226592



EUROPEAN UNION

ATEX Directive 94/9/ EC

II 2 G Ex d IIC T5

II 2 D Ex tD A21 IP66 T+90C

Tamb = -40C to +80C

EN 60079-0, 60079-1, 61241-0, 61241-1

UL International DEMKO A/S (N.B.# 0539)

Certificate # DEMKO 08 ATEX 0810742X



Pressure Equipment Directive (PED)

(97/23/EC)

Sound Engineering Practice (SEP)

Electromagnetic Compatibility Directive (EMC)

(89/336/EEC, 92/31/EEC & 93/68/EEC)

UL International EMC Services

Certificate File # NC4525

EN 55011, 61000-6-4, 61000-6-2, 61326

PRESSURE MODEL CHART

Model	Pressure Range		Proof Pressure*		Burst Pressure**	
	psi	bar	psi	bar	psi	bar
Welded 316 stainless steel diaphragm and pressure connection (see page 9 for available connections)						
03	0 to 15	0 to 1	45	3,1	150	10,3
04	0 to 30	0 to 2,1	90	6,2	300	20,7
05	0 to 50	0 to 3,4	150	10,3	500	34,5
06	0 to 100	0 to 6,9	300	20,7	1000	68,9
07	0 to 250	0 to 17,2	750	51,7	2500	172,4
08	0 to 500	0 to 34,5	1500	103,4	5000	344,7
Welded 15-5 stainless steel diaphragm with 316 stainless steel pressure connection (see page 9 for available connections)						
09	0 to 1000	0 to 68,9	3000	206,8	10,000	689,5
17	0 to 1500	0 to 103,4	4500	310,3	15,000	1034,2
18	0 to 2000	0 to 137,9	6000	413,7	20,000	1379,0
10	0 to 2500	0 to 172,4	7500	517,1	20,000	1379,0
19	0 to 3000	0 to 206,8	9000	620,5	25,000	1723,7
11	0 to 5000	0 to 344,7	15,000	1034,2	25,000	1723,7
20	0 to 6000	0 to 413,7	18,000	1241,1	30,000	2068,4
12	0 to 7500	0 to 517,1	22,500	1551,3	30,000	2068,4
13	0 to 10,000	0 to 689,5	30,000	2068,4	40,000	2757,9
14	0 to 15,000	0 to 1034,2	30,000	2068,4	60,000	4136,9
15	0 to 20,000	0 to 1379,0	40,000	2757,9	80,000	5515,8
16	0 to 25,000	0 to 1723,7	50,000	3447,4	90,000	6205,3
316 stainless steel 1/4" NPT (female) pressure connection and welded diaphragm with 4-20 mA output (fixed range only)						
15929	0 to 300	0 to 20,7	750	51,7	2500	172,4

* **Proof Pressure:** The maximum pressure to which a pressure sensor may be occasionally subjected (e.g., start-up, testing), which causes no permanent damage. The unit may require re-calibration if subjected to pressure above proof.

** **Burst Pressure:** Pressure which may cause failure of the pressure element, resulting in permanent damage.



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HOW TO ORDER

Select letter or number codes to construct part number.

PART #	TX200	A	9	S	1	T	M446
	Type	Enclosure	Models, Range	Pressure Reference	Pressure Connection	Output Signal	Options
CODE	DESCRIPTION						
ENCLOSURE DESIGNATION							
A	Field-adjustable transmitter						
B	Fixed range transmitter						
15929 [†]	Fixed range transmitter						
MODELS, PRESSURE RANGE							
03	0 to 15						
04	0 to 30						
05	0 to 50						
06	0 to 100						
07	0 to 250						
08	0 to 500						
09	0 to 1000						
17	0 to 1500						
18	0 to 2000						
10	0 to 2500						
19	0 to 3000						
11	0 to 5000						
20	0 to 6000						
12	0 to 7500						
13	0 to 10,000						
14	0 to 15,000						
15	0 to 20,000						
16	0 to 25,000						
PRESSURE REFERENCE							
S	psi (sealed gage)						

Continued
on page 9

[†] Model incorporates enclosure, pressure range & connection, and output (see pressure model chart on page 7)

HOW TO ORDER (CONTINUED)

PART #	TX200	A	9	S	1	T	M446
	Type	Enclosure	Models, Range	Pressure Reference	Pressure Connection	Output Signal	Options

PRESSURE CONNECTION

1	1/4" NPT (female); NOT AVAILABLE MODELS 15-16
2	1/2" NPT (female); NOT AVAILABLE MODELS 14-16
3	1/2" NPT (male); NOT AVAILABLE MODELS 14-16
4	HF4 high pressure autoclave 1/4" (female); NOT AVAILABLE MODELS 03-05
5	HF6 high pressure autoclave 3/8" (female); NOT AVAILABLE MODELS 03-05
6	LF4 medium pressure autoclave 1/4" (female); NOT AVAILABLE MODELS 03-05
7	LF6 medium pressure autoclave 3/8" (female); NOT AVAILABLE MODELS 03-05
8	1/4" NPT (male); NOT AVAILABLE MODELS 15-16
9	7/16-20 SAE (female); NOT AVAILABLE MODELS 14-16
A	G-1/4 (female); NOT AVAILABLE MODELS 14-16
B	G-1/2 (female); NOT AVAILABLE MODELS 14-16
C	7/16-20 SAE (male); NOT AVAILABLE MODELS 14-16
D	HM4 high pressure autoclave 1/4" (male); NOT AVAILABLE MODELS 03-05
E	HM6 high pressure autoclave 3/8" (male); NOT AVAILABLE MODELS 03-05
F	LM4 medium pressure autoclave 1/4" (male); NOT AVAILABLE MODELS 03-05
G	LM6 medium pressure autoclave 3/8" (male); NOT AVAILABLE MODELS 03-05
H	G-1/4 (male); NOT AVAILABLE MODELS 14-16
J	G-1/2 (male); NOT AVAILABLE MODELS 14-16

OUTPUT

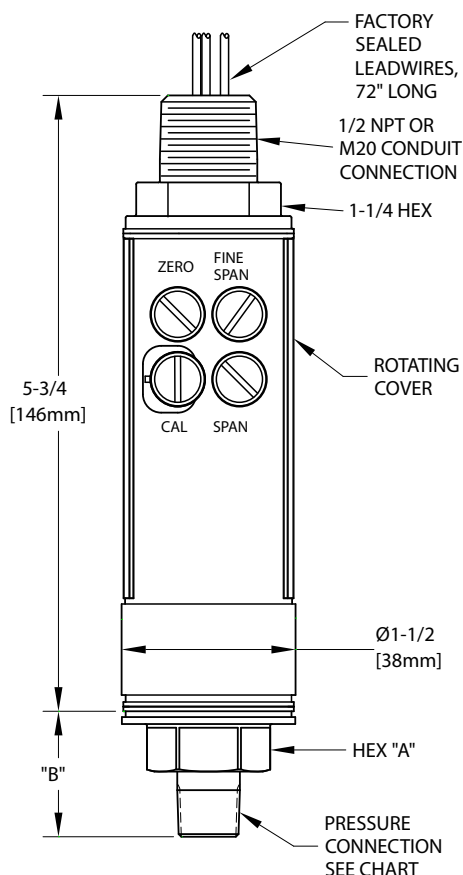
T	4-20 mA
D	1-5 VDC
P	0-10 VDC; NOT AVAILABLE MODELS 03-06

OPTIONS

M276	Pressure range markings in bar
M277	Pressure range markings in kPa
M278	Pressure range markings in Kg/cm ²
M423	ATEX flameproof compliant metallic junction box, pre-wired (not UL approved). NOT AVAILABLE ON M20 METRIC THREAD ELECTRICAL CONDUIT VERSION
M441	M20 metric thread (male) electrical connection
M444	Paper ID tag
M446	Stainless steel ID tag and wire
M460	External ground screw; required by ATEX for non-metallic conduit systems
M513	UL approved junction box, pre-wired, meets enclosure type 4. NOT ATEX COMPLIANT
M550	Oxygen service cleaning; alcohol cleaning to remove residue from the process connection

DIMENSIONAL DRAWING

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



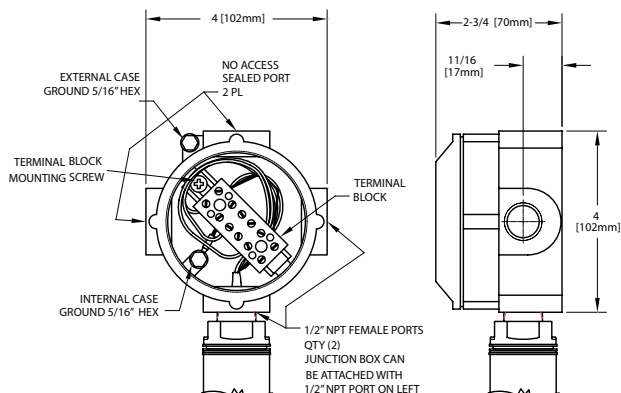
Pressure Connection Chart

Code	Description	Hex "A" in	Length "B" in [mm]
1	1/4" NPT (female)	15/16	0.54 [13.7]
2	1/2" NPT (female)	1-3/8	1.01 [25.7]
3	1/2" NPT (male)	15/16	1.26 [32.0]
4	HF4 autoclave (female)	15/16	0.54 [13.7]
5	FH6 autoclave (female)	1-3/8	0.90 [22.9]
6	LF4 autoclave (female)	15/16	0.54 [13.7]
7	LF6 autoclave (female)	15/16	0.65 [16.5]
8	1/4" NPT (male)	15/16	0.97 [24.6]
9	7/16-20 SAE (female)	15/16	0.54 [13.7]
A	G-1/4 (female)	15/16	0.54 [13.7]
B	G-1/2 (female)	1-3/8	1.01 [25.7]
C	7/16-20 SAE (male)	15/16	0.77 [19.6]
D	HM4 autoclave (male)	15/16	1.10 [27.9]
E	HM6 autoclave (male)	15/16	1.29 [32.8]
F	LM4 autoclave (male)	15/16	1.18 [30.0]
G	LM6 autoclave (male)	15/16	1.32 [33.5]
H	G-1/4 (male)	15/16	1.03 [26.2]
J	G-1/2 (male)	1-3/8	1.78 [45.2]

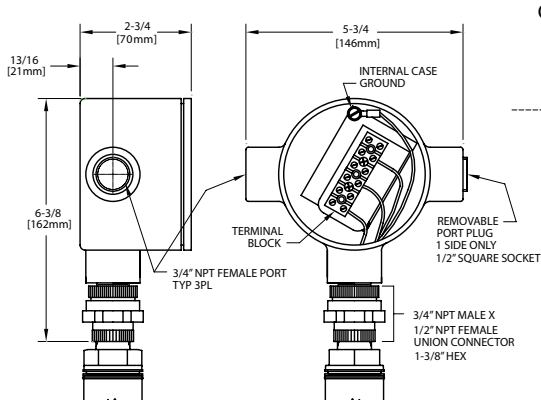
Wire Color Coding

	4-20 mA output	1-5 or 0-10 VDC output
RED	+ VDC	+ VDC
BLACK	- VDC	- VDC
GREEN	Earth Ground	Earth Ground
BLUE	N/A	Voltage Output

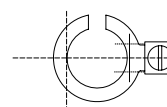
OPTION M423 ATEX JUNCTION BOX



OPTION M513 UL JUNCTION BOX



OPTION M460 EXTERNAL GROUNDING SCREW



ALTERNATIVE PRODUCTS FROM UE

Stainless Steel 12 Series

- Compact, cylindrical 316 stainless steel design
- Hermetically sealed micro-switch
- Explosion Proof
- Snap-acting belleville spring mechanism for maximum vibration resistance and set point stability
- Pressure ranges 1 to 12,500 psi;
DP working pressure ranges 0 to 2500 psid;
temperature ranges -130 to 650°F
- Dual seal compliance to ANSI/ISA 12.27.01



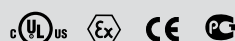
120 Series

- Explosion-proof line of pressure, differential pressure, and temperature models with wide selection of ranges, sensors and pressure connections
- UL, cUL, ATEX certified for hazardous locations
- Single or dual switch outputs
- Welded stainless steel diaphragm pressure sensor
- Internal or external set point adjustment



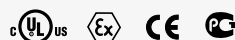
One Series for Division 1 (Zone 1)

- Electronic pressure and temperature switches with no moving parts
- Fully adjustable deadband and smart self diagnostics
- 4-20 mA output and digital process display
- Explosion-proof enclosure for Division 1 (Zone 1) hazardous areas
- 2-wire, 4-wire and loop powered models available
- Digital display and tamper-proof keypad adjustment of setpoint and deadband



One Series for Division 2 (Zone 2)

- Electronic solid-state reliability
- Two-wire operation
- Digital display with keypad set-up
- 100% of range adjustable on-off deadband
- 4-20 mA output models
- Continuous diagnostic health check



Temperature Sensors

Rugged RTDs and thermocouples for process and energy applications, available with Nema 4X and explosion-proof heads to match heat-trace, turbine, combustion, and stack-emission applications



RECOMMENDED PRACTICES AND WARNINGS

United Electric Controls Company recommends careful consideration of the following factors when specifying and installing UE pressure transmitters. Before installing a unit, the Installation and Maintenance instructions provided with unit must be read and understood.

- To avoid damaging unit, proof pressure and maximum temperature limits stated in literature and on nameplates must never be exceeded, even by surges in the system. Operation of the unit up to maximum pressure or temperature is acceptable on a limited basis (i.e., start-up, testing) but continuous operation must be restricted to the designated adjustable range. Excessive cycling at maximum pressure or temperature limits could reduce sensor life.
- A back-up unit is necessary for applications where damage to a primary unit could endanger life, limb or property. A high or low limit switch is necessary for applications where a dangerous runaway condition could result.
- Install unit where shock, vibration and ambient temperature fluctuations will not damage unit or affect operation. When applicable, orient unit so that moisture does not enter the enclosure via the electrical connection. When appropriate, this entry point should be sealed to prevent moisture entry.
- Unit must not be altered or modified after shipment. Consult UE if modification is necessary.
- Monitor operation to observe warning signs of possible damage to unit, such as drift. Check unit immediately.
- Preventative maintenance and periodic testing is necessary for critical applications where damage could endanger property or personnel.
- Supply voltage stated in literature and on nameplate must not be exceeded. Overload on a transmitter can cause damage, even on the first cycle. Wire unit according to local and national electrical codes, using wire size recommended in installation sheet.
- Do not mount unit in ambient temp. exceeding published limits.

LIMITED WARRANTY

Seller warrants that the product hereby purchased is, upon delivery, free from defects in material and workmanship and that any such product 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 equipment found to be so defective within a period of 36 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 products 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 PRODUCT, 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 INPUTTED TO SELLER, IS LIMITED TO THE "LIMITED WARRANTY" OF REPAIR AND/OR REPLACEMENT AS SO STATED IN OUR WARRANTY OF PRODUCT. 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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