



## MX1H2 PRESSURE TRANSDUCER

- EC79 Hydrogen Certified
- Microfused Technology
- One-piece stainless steel pressure port
- Low profile package
- Enhanced EMC/RFI rejection
- Reverse polarity protected
- Rugged connector

### Features

- 20, 448, 900 Bar
- -40 to 125°C Operating Temperature
- $\pm 0.25\%$  Accuracy (FSO)
- $\pm 1\%$  Total Error Band
- High Burst Pressure
- ISO11452 compliant EMC performance

### Applications

- Transportation Fuel Cell Systems
- Hydrogen Storage (350 and 700 Bar)
- Mid Pressure Distribution Circuits (20 Bar)

TE Connectivity's MX1H2 Series is designed for on road hydrogen storage and distribution. The transducer utilizes TE's proven MSG strain gage sensing technology and a single piece machined metal port and sense element. To enable hydrogen compatibility the sensor uses 316L stainless steel where contact with Hydrogen is expected. The result is a stable and durable interface to the hydrogen system.

The MX1H2 series is validated for hydrogen systems through EC-79 environmental and durability testing and holds the EC-79 certification for on road vehicles. The transducer exceeds the maximum pressure ratings required for certification.

## MX1H2 PRESSURE TRANSDUCER

### Electrical Specifications

(Unless otherwise specified, all parameters are measured at 25°C @ 5.0V applied)

Parameter	Symbol	Min	Typ	Max	Units	Notes/Conditions
Supply voltage (Vsupply)	Vdd	4.75		5.25	V	
Operating current	Idd	4.0		10.0	mA	
Output rise time	Tr		1.0		ms	10% to 90%
Output load resistance (M71H2)	Ro	10,000			Ω	
Insulation resistance(1)		10			MΩ	@500VDC

(1)Between sensor body and any pin in the connector

### Operating Specifications

(Unless otherwise specified, all parameters are measured at 25°C @ 5.0V applied)

Parameter	Symbol	Min	Typ	Max	Units	Notes/Conditions
Full scale span(1)		0.5		4.5	V	Ratiometric to Vdd
Accuracy(2)		-0.25		0.25	%Span	BFSL
Total error band(3) 448B & 900B	TEB			±1.0 ±2.0	%Span	-20°C to 85°C -40°C to -20°C
Total error band(3) 20B	TEB			±1.5 ±3.0	%Span	-20°C to 85°C -40°C to -20°C
Long term stability		-0.25		+0.25	%Span	per year

(1)Span is ratiometric to power supply voltage. Output saturation is 4.7V (high) and 0.3V (low)

(2)Combined linearity, hysteresis, repeatability

(3)Total error band (TEB) includes accuracy, thermal, span, and zero errors over compensated temperature range

### Pressure Ratings

Pressure Range Option Code	Nominal Working Pressure (NWP)	Maximum Allowed Working Pressure (MAWP)	Pressure Overload	Pressure Burst	Units	Notes/Conditions
020B	20	27	100	1600	Bar	
448B	448	613	896	1800*	Bar	*Burst limit due to O-Ring
900B	900	1233	1800	1800*	Bar	*Burst limit due to O-Ring

## MX1H2 PRESSURE TRANSDUCER

### Environmental Specifications

(Unless otherwise specified, all parameters are measured at 25°C @ 5.0V applied)

Parameter	Symbol	Min	Typ	Max	Units	Notes/Conditions
Operating temperature range	To	-40		125	°C	EC79 applications certified to 120C
Storage temperature	Ts	-50		140	°C	
Ambient humidity		0		95	%RH	Non-condensing

Parameter	Symbol	Model	Rating	Notes/Conditions
Ingress protection	IP	M71H2	IP67	ISO 20653

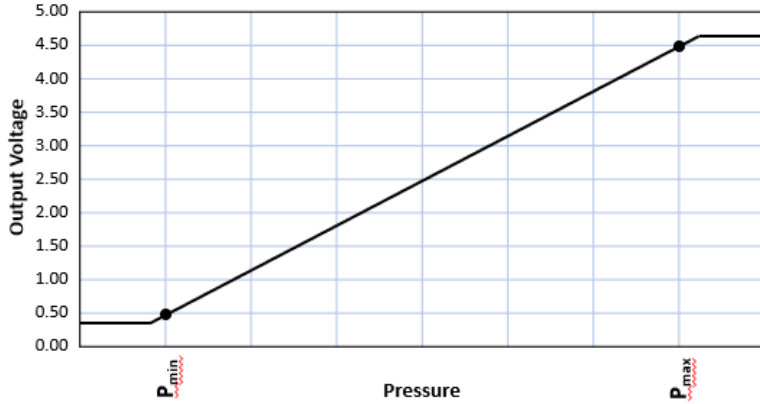
Parameter	Material	Part	Notes/Conditions
Media compatibility	316L Stainless Steel	Wetted surface	EC79 Certified
	304 Stainless Steel	Hex	
	Polyetherimide (PEI)	Connector Housing	

### Agency Certifications and Approvals

Evaluation Parameter	Reference Standard
RoHS	RoHS 2 Compliant (Directive 2011/65/EU)
Radiated susceptibility	ISO 11452-2 200 – 3000MHz, Level IV, 100V/m
BCI	ISO 11452-4 90kHz – 400MHz, Level IV, 60mA
EC79	EC 79/2009

### Pressure Transfer Function

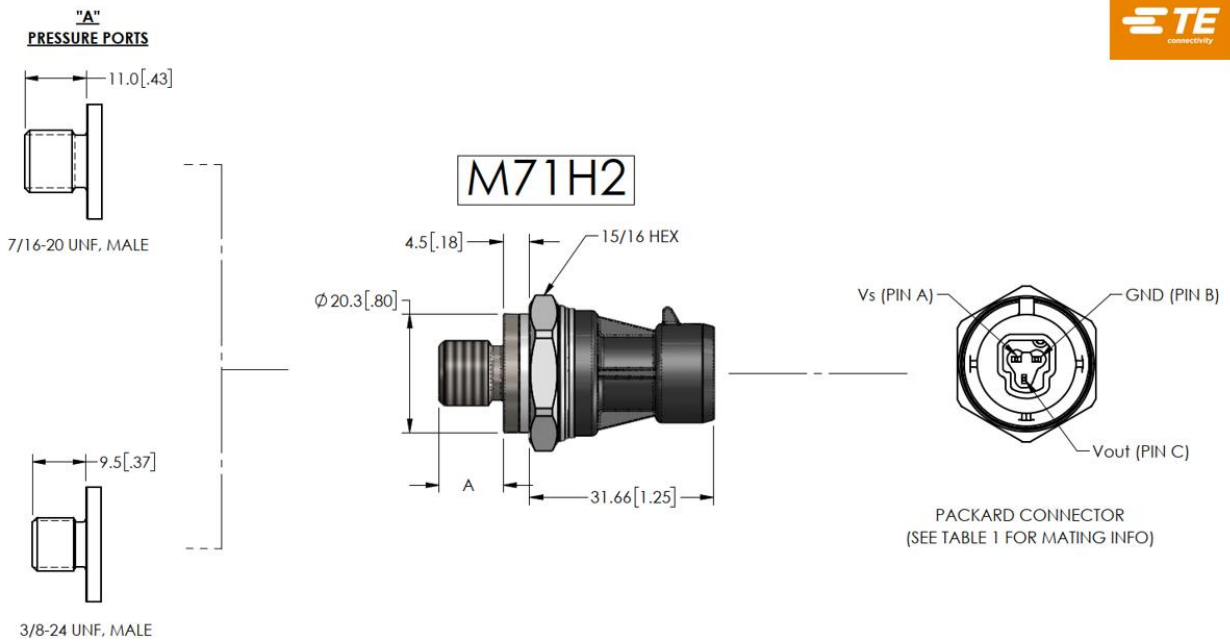
# MX1H2 PRESSURE TRANSDUCER



V<sub>out</sub> - Output Voltage  
 P<sub>max</sub> - Maximum Rated Pressure  
 P<sub>min</sub> - Minimum Rated Pressure  
 P<sub>app</sub> - Applied Pressure  
 V<sub>dd</sub> - Power Supply Voltage

$$V_{out} = \left[ \frac{0.8}{(P_{max} - P_{min})} \times (P_{app} - P_{min}) + 0.1 \right] \times V_{dd}$$

## Outline Drawing and Connections



## Connector Details

Model	Sensor Connector	Mating Connector
M71H2	Metri-Pack 150	12065287

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## Pressure Port & O-Ring<sup>(1)(2)</sup> Details

Pressure Range (Bar)	7/16-20 UNF Male (SAE -4) 45n-m Tightening Torque	3/8-24 UNF Male (SAE -3) 35n-m Tightening Torque
20	BUNA N90: 3-904 N552-90	BUNA N90: 3-903 N552-90
448	BUNA N90: 3-904 N552-90 or PPDI 93: 3-904 P4300	BUNA N90: 3-903 N552-90
900	BUNA N90: 3-904 N552-90 or PPDI 93: 3-904 P4300	Pressure w/ Port Combination Not Available

<sup>(1)</sup>O-Ring Manufacturer: Parker.

<sup>(2)</sup>Supplier and materials specified have been validated to EC79. O-ring is not included with sensor order. Customer is responsible for sourcing and proper installation of O-ring.

## Ordering Information

**M91 STANDARD PART MATRIX ORDERING INFO**

MX1H2x x - xxxx x - x x 0000

SENSOR	
CODE	TYPE
7	M71H2

OUTPUT TYPE SEE TABLE 2 AND CHART A	
CODE	OUTPUT VOLTAGE
3	0.5 - 4.5 V

CONNECTORS	
CODE	TYPE
9*	PACKARD (M71H2 ONLY)

\*CONNECTOR AND MATING SEE TABLE 1

PRESSURE RANGE NORMAL WORKING PRESSURE	
BAR	
020B	
448B	
900B*	

\*ONLY AVAILABLE IN 7/16-20. SEE PRESSURE PORT CODE

PRESSURE TYPE	
CODE	TYPE
G	GAGE

PORT MATERIAL	
CODE	TYPE
1	316L SS

**NOTES:**  
1. 20 BAR SENSOR IS PART OF MX1H2 SERIES BUT WILL NOT BEAR EC79 MARKING GIVEN IT IS < 3 MPA

PRESSURE PORT			
CODE	PORT	DIM "A"	TIGHTENING TORQUE (N.m) SEE NOTES 9,10, & 11
D	7/16-20 UNF, SAE J1926-2, MALE	11.0 [.43]	45
Y	3/8 - 24 UNF, SAE J1926-2, MALE	9.5 [.37]	35

\* T.F.F.T: TURNS FROM FINGER TIGHT

**NOTES (CONTINUED): INSTALLATION**  
11. TRANSDUCERS CAN BE INSTALLED BY EITHER SPANNER OR DEEP SOCKET. TORQUE VALUES PROVIDED ARE FOR REFERENCE; ACTUAL TORQUE DEPENDS UPON MATING PORT MATERIAL, SURFACE FINISH, LUBRICATION AND SEALING MECHANISM. TRANSDUCER CALIBRATION AND/OR ZERO MAY SHIFT IF PART IS OVER-TORQUED DURING INSTALLATION. CHECK FOR A ZERO SHIFT AFTER INSTALLING.  
12. SAE J1926/2 ONLY APPROVED UP TO 63 MPa

Pressure range and pressure port can be configured for custom OEM requirements. Contact factory for details.

## MX1H2 PRESSURE TRANSDUCER

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### Parts Readily Available

Description	Catalog Model No.	Ordering TE Part No.
M71H2, 20 Bar G, 7/16-20, Packard Connector	M71H239-020BG-D10000	11112685-00
M71H2, 448 Bar G, 7/16-20, Packard Connector	M71H239-448BG-D10000	11112685-01
M71H2, 900 Bar G, 7/16-20, Packard Connector	M71H239-900BG-D10000	11112685-02

### Customer Notes