



#### Main Features

- Ranges: from 0...0.05 bar to 0...60 bar (0...1 to 0...1000 psi)
- Complete range of voltage/current outputs
- Protection rating: IP65/IP67
- Wetted parts: AISI316L
- Operating temperature range -20...+85°C
- Accuracy:  $\pm 0.15\%$  FSO typical
- Fill Fluid: silicone oil
- Available absolute ranges
- Available "Barometric" range (0.8-1.2 bar abs)
- Available low ranges (50mbar and 100mbar)

Series TSA transmitters are based on silicon piezoresistive sensing element in wheatstone bridge configuration.

Thanks to highly stable electronic components, these transmitters can be used in applications requiring long-distance signal transmission or in smart control systems.

TSA pressure transmitters were developed mainly for pressure measurement in industrial refrigeration and air conditioning, compressor and pumps. They are also used for monitoring and control on automatic machines and general purpose industrial applications.

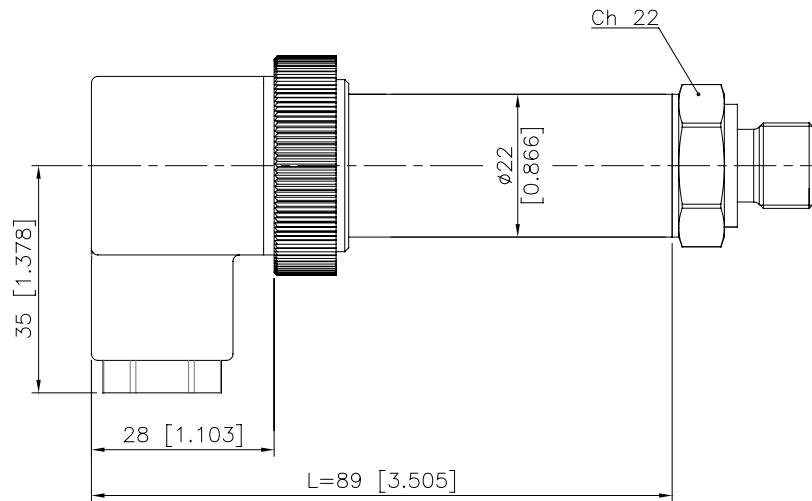
#### TECHNICAL DATA

	Output signal	VOLTAGE	CURRENT
Accuracy (1)		$\pm 0.15\%$ FSO typical; $\pm 0.25\%$ FSO max ( $\pm 0.5\%$ FSO for absolute ranges)	
Resolution		Infinite	
Overpressure (without degrading performance) (2)		see table	
Pressure containment (Burst test) (3)		see table	
Pressure media		Fluid compatible with AISI 316L Stainless steel	
Body materials		AISI 304 Stainless steel	
Power supply		15...30Vdc	10...30Vdc
Supply sensitivity		< 0,0015% FSO/V	
Insulation resistance		> 1000 M $\Omega$ @ 50Vdc	
Zero output signal		C, M, N	4mA (E)
Full scale output signal		C, M, N	20mA (E)
Max current absorption		< 13mA	<32mA
Max allowed load		1mA	See diagram
Long term stability		< 0.1% FSO/per year (ranges $\geq$ 250mbar)	
Compensated temperature range		-20...+85°C (-4...+185°F)	
Campo temperatura compensato		-10...+85°C (+14...+185°F)	
Storage temperature range		-20...+85°C (-4...+185°F)	
Temperature effects over compensated range (zero-span)		$\pm 0.01\%$ FSO/°C typical ( $\pm 0.02\%$ FSO/°C max.) ranges >1 bar $\pm 0.04\%$ FSO/°C typical ranges $\leq$ 1 bar	
Response time (10...90%FSO)		< 4 msec.	
Start-up time		< 500 msec.	
Mounting position effects		Negligible (ranges $\geq$ 1bar)	
Humidity		Up to 100%RH non condensing	
Weight		200 gr. nominal	
Mechanical shock		100 g / 1 msec. according to IEC 60068-2-27	
Vibrations		20 g max a 15-2000Hz according to IEC60068-2-6	
Ingress protection		IP65/IP67	
Output short circuit and reverse polarity protection		YES	
EC conformity		According to Directive 2014/30/EU	
FSO = Full Scale Output    1 BFUL method (Best Fit Straight Line): includes combined effects of Non-Linearity, Hysteresis and Repeatability 2 tested for more than 1000 strokes with single duration <2msec. 3 tested for more than 100 strokes with single duration <2msec			

MEASUREMENT RANGE (Bar)	0.05	0.1	0.25	0.5	1	0.8-1.2	2	2.5	4	5	6	7	10	16	20	25	30	40	50	60
Overpressure	0.2	0.2	0.7	1.4	2	2	5	5	8	12	12	20	20	32	50	50	80	80	100	120
Burst test	0.3	0.3	1	2	3	3	7.5	7.5	12	18	18	30	30	48	75	75	120	120	150	180

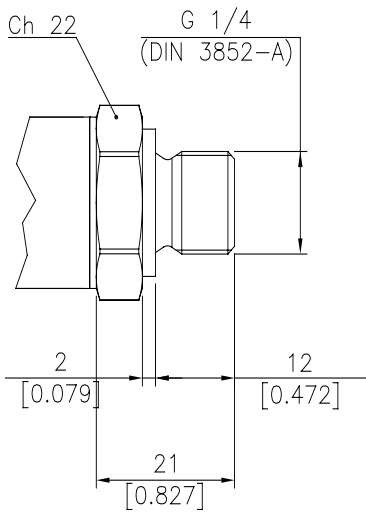
## INSTALLATION DRAWINGS

Dimensions: mm [inches]

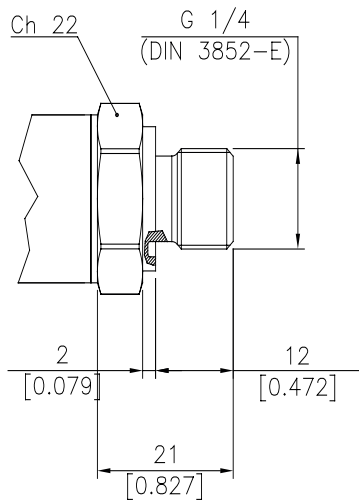


## PRESSURE CONNECTION

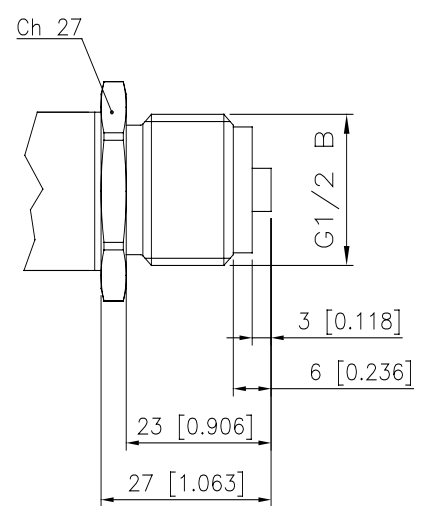
**(1) G 1/4 MALE  
(DIN 3852-A)**



**(E) G 1/4 E  
(DIN 3852-E)**

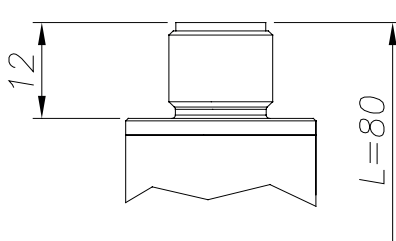


**(3) G 1/2 B  
(DIN 16288)**

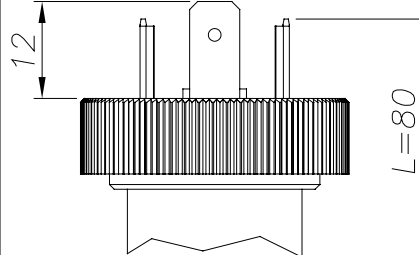


## ELECTRICAL CONNECTION

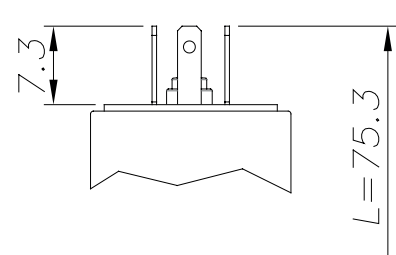
**Z - 4 pole connector M12x1**



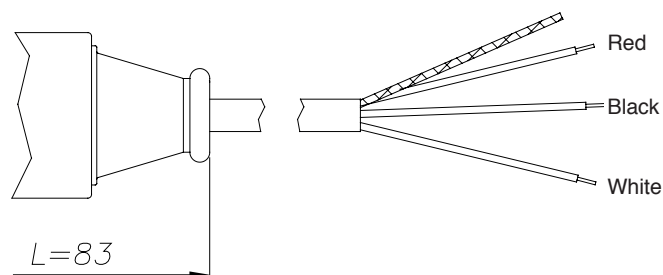
**E - EN 175301-801 type A**



**M - EN 175301-801 type C**

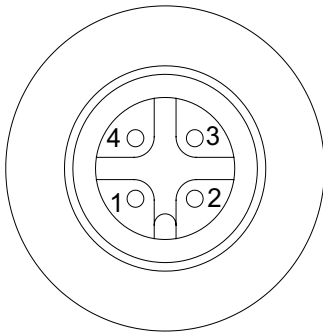


**F - 2/3 pole cable**



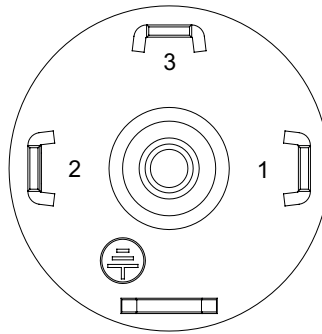
## ELECTRICAL CONNECTION - Connectors

**Z - M12 x 1 (4 pin)**



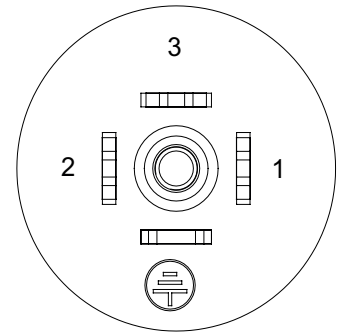
Protection IP67

**E - EN 175301-803A**



Protection IP65

**M - EN 175301-803C**

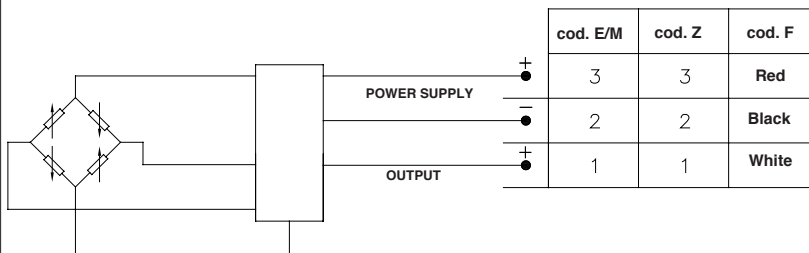


Protection IP65

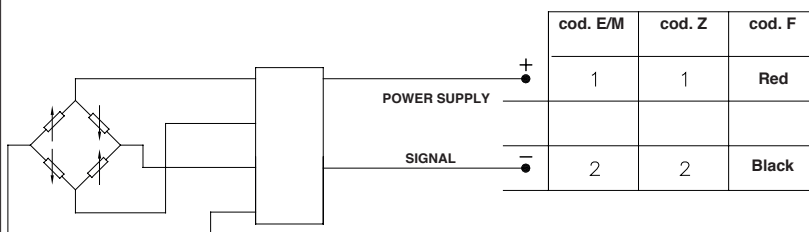
1. The IP rating specified in this document normally applies with the suitable female connector plugged-in and properly wired.
2. The transducers with relative pressure measuring ranges require vented cable and/or mating connector, to allow the compensation of the atmospheric pressure reference.

## ELECTRICAL CONNECTION - connection diagrams

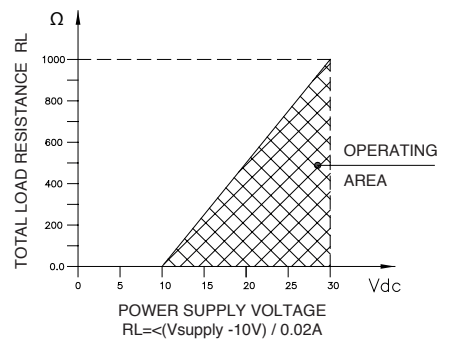
VOLTAGE AMPLIFIED OUTPUT - mod. C/M/N



CURRENT AMPLIFIED OUTPUT - mod. E



LOAD DIAGRAM



## ACCESSORIES ON REQUEST

### Connectors Plugs

#### Connection E

EN 175301-803 4 pin DIN Type A – Prot. IP65

**CON 006**

#### Connection Z

4 poles connector M12x1 – Prot. IP67

**CON 293**

#### Connection M

EN 175301-803 4 pin DIN Type C – Prot. IP65

**CON 008**

## EXTENSION CABLES

IP67 female connector M12 x 1 + 2 m of cable

**CAV220**

IP67 female connector M12 x 1 + 3 m of cable

**CAV221**

IP67 female connector M12 x 1 + 5 m of cable

**CAV222**

IP67 female connector M12 x 1 + 10 m of cable

**CAV223**

### Cable color code

Pin	Wire
1	Brown
2	White
3	Blue
4	Black

## ORDERING INFORMATION

Pressure transmitter

TSA



OUTPUT SIGNAL	
4 .. 20 mA	<b>E</b>
0 .. 10 Vdc	<b>N</b>
0,1 .. 10,1 Vdc	<b>C</b>
0 .. 5 Vdc	<b>M</b>
Different outputs available on request	

PRESSURE CONNECTION	
G ¼ male (DIN 3852-A)	<b>1</b>
G ¼ male (DIN 3852-E)	<b>E</b>
G ½ A male (DIN 16288)	<b>3</b>
Different pressure connections available on request	

ELECTRICAL CONNECTION	
EN 175301-803 type A	<b>E</b>
4 pole M12x1 connector	<b>Z</b>
EN 175301-803 type C	<b>M</b>
Shielded cable (1 m)*	<b>F</b>
Different connectors available on request	
* Different lengths of cable available on request	

Mechanical and/or electrical characteristics differing from standard may be arranged on request.

RESPONSE TIME	
<b>V</b>	Fast (< 4 msec)

ACCURACY	
<b>T</b>	±0,25%FSO

<b>G</b>	Relative
<b>A</b>	Absolute

**CALIBRATION STANDARDS**  
Instruments manufactured by Gefran are calibrated against precision pressure calibration equipment which is traceable to International Standards.

MEASUREMENT RANGE					
bar			psi		
<b>BV05</b>	0...0.05		<b>P01U</b>	0...1	
<b>BV10</b>	0...0.1		<b>P2V5</b>	0...2.5	
<b>BV25</b>	0...0.25		<b>P05U</b>	0...5	
<b>BV50</b>	0...0.5		<b>P15U</b>	0...15	
<b>B01U</b>	0...1		<b>P18U</b>	11...18	
<b>B1V2</b>	0.8...1.2		<b>P03D</b>	0...30	
<b>B02U</b>	0...2		<b>P05D</b>	0...50	
<b>B2V5</b>	0...2.5		<b>P75U</b>	0...75	
<b>B04U</b>	0...4		<b>P01C</b>	0...100	
<b>B05U</b>	0...5		<b>P15D</b>	0...150	
<b>B06U</b>	0...6		<b>P25D</b>	0...250	
<b>B07U</b>	0...7		<b>P03C</b>	0...300	
<b>B01D</b>	0...10		<b>P05C</b>	0...500	
<b>B16U</b>	0...16		<b>P75D</b>	0...750	
<b>B02D</b>	0...20		<b>P01M</b>	0...1000	
<b>B25U</b>	0...25				
<b>B03D</b>	0...30				
<b>B04D</b>	0...40				
<b>B05D</b>	0...50				
<b>B06D</b>	0...60				

☐ = Range available also "Absolute"

**B1V2** = Range available only "Absolute" (Barometric)

**P18U** = Range available only "Absolute" (Barometric)

**Note:** The measurement range B1V2 is for absolute pressure from 0.8 to 1.2 bar and is defined as "Barometric". The signal output is scaled from 800mbar (i.e. 4mA) to 1200mbar (i.e. 20mA).

Sensors are manufactured in compliance with: - EMC 2014/30/EU compatibility directive

- RoHS 2011/65/EU directive

Electrical installation requirements and Conformity certificate are available on our web site [www.gefran.com](http://www.gefran.com)

Ex.: **TSA - N - 1 - Z - B03D - G - T - V**

Pressure transmitter TSA with 0...10Vdc output signal, G 1/4 male pressure connection, M12x1 connector, pressure range 0...30 bar gauge, ±0.25% FSO accuracy, 4 msec response time.

**GEFRAN spa** reserves the right to make any kind of design or functional modification at any moment without prior notice

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