

The M7 Performance Level 'c' series of Gefran are pressure transmitters for using in high temperature environment.

The main characteristic of this series is the capability to read temperature of the media up to 400°C.

The constructive principle is based on the hydraulic transmission of the pressure.

The fluid-filled system assures the temperature stability. The physical measure is transformed in a electrical measure by means of the strain-gauge technology.

### MAIN FEATURES

- Pressure ranges from:  
0-17 to 0-2000 bar / 0-250 to 0-30000 psi
- Accuracy: <math>\pm 0.25\%</math> FSO (H); <math>\pm 0.5\%</math> FSO (M)
- Fluid-filled system for temperature stability
- Mercury filling volume: M70 (30mm<sup>3</sup>); M71, M72, M73 (40mm<sup>3</sup>)
- 1/2-20UNF, M18x1.5 standard threads; other types available on request
- Other diaphragms available on request
- Autozero function on board / external option
- Standard diaphragm is 15-5 PH stainless steel with GTP+ coating
- 17-7 PH corrugated diaphragm with GTP+ coating for ranges below 100 bar-1500 psi

*GTP+ (advanced protection)  
Coating with high resistance against corrosion, abrasion and high temperature*

### AUTOZERO FUNCTION

All signal variations in the absence of pressure can be eliminated by using the Autozero function. This function is activated by closing a magnetic contact located on the transmitter housing. The procedure is permitted only with pressure at zero.

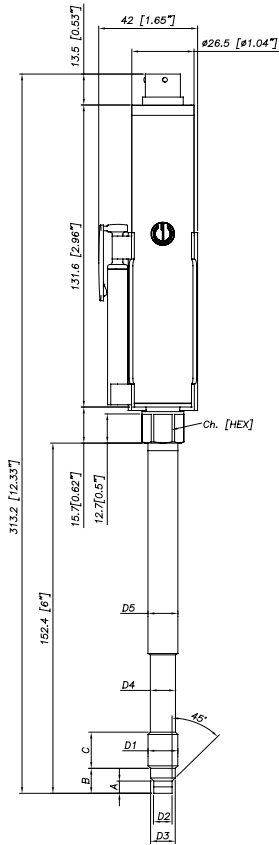
### TECHNICAL SPECIFICATIONS

Accuracy (1)	<b>H</b> <math>\pm 0.25\%</math> FSO (100...2000 bar) <b>M</b> <math>\pm 0.5\%</math> FSO (35...2000 bar)
Resolution	16 bit
Measurement range	0..17 to 0..2000bar 0..250 to 0..30000psi
Maximum overpressure (without degrading performances)	2 x FS 1.5 x FS above 1000bar/15000psi
Measurement principle	Extensimetric
Power supply	18...30Vdc
Maximum current absorption	15mA (30mA with relay optional)
Output signal Full Scale (FSO)	10,5Vdc
Zero balance (tolerance $\pm 0.25\%$ FSO)	0,5Vdc
Response time (10...90% FSO)	8ms
Output noise (RMS 10-400Hz)	<math>< 0.025\%</math> FSO
Calibration signal	80% FSO
Power supply polarity reverse protection	YES
Compensated temperature range housing	0...+85°C
Operating temperature range housing	-30...+85°C
Storage temperature range housing	-40...+125°C
Thermal drift in compensated range: Zero / Calibration / Sensibility	<math>< 0.02\%</math> FSO/°C
Diaphragm maximum temperature	400°C / 750°F
Zero drift due to change in process temperature (zero)	<math>< 0.02</math> bar/°C
Standard material in contact with process medium	Diaphragm: • 15-5PH with GTP+ coating • 17-7 PH corrugated diaphragm with GTP+ coating for ranges <math>< 100\text{bar}</math> (1500psi) Stem: • 17-4 PH
Thermocouple (model M72)	STD : type "J" (isolated junction)
Protection degree (6-pole female connect)	IP65

FSO = Full scale output; (1) BFSL method (Best Fit Straight Line): includes combined effects of Non-Linearity, Hysteresis and Repeatability.

# MECHANICAL DIMENSIONS

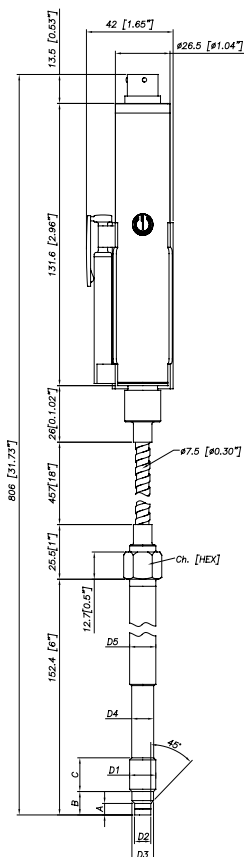
## M70



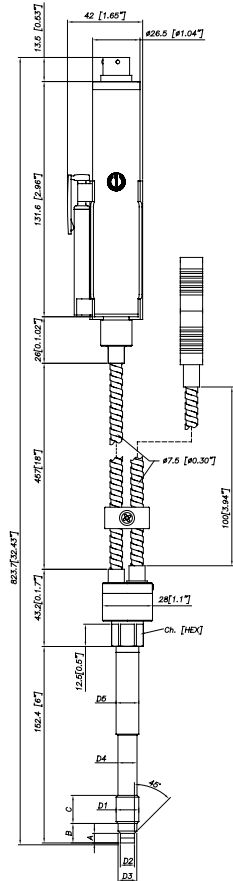
D1	<b>1/2 - 20UNF</b>
D2	$\varnothing 7.8 - 0.05$ [ $\varnothing 0.31$ " - 0.002 ]
D3	$\varnothing 10.5 - 0.025$ [ $\varnothing 0.41$ " - 0.001 ]
D4	$\varnothing 10.67$ [ $\varnothing 0.42$ " ]
D5	$\varnothing 12.7$ [ $\varnothing 0.5$ " ]
A	5.56 - 0.26 [ 0.22" - 0.01 ]
B	11.2 [ 0.44" ]
C	15.74 [ 0.62" ]
Ch [Hex]	16 [ 5/8" ]

D1	<b>M18x1.5</b>
D2	$\varnothing 10 - 0.05$ [ $\varnothing 0.394$ " - 0.002 ]
D3	$\varnothing 16 - 0.08$ [ $\varnothing 0.63$ " - 0.003 ]
D4	$\varnothing 16 - 0.4$ [ $\varnothing 0.63$ " - 0.016 ]
D5	$\varnothing 18$ [ $\varnothing 0.71$ " ]
A	6 - 0.26 [ 0.24" - 0.01 ]
B	14.8 - 0.4 [ 0.58" - 0.016 ]
C	19 [ 0.75" ]
Ch [Hex]	19 [ 3/4" ]

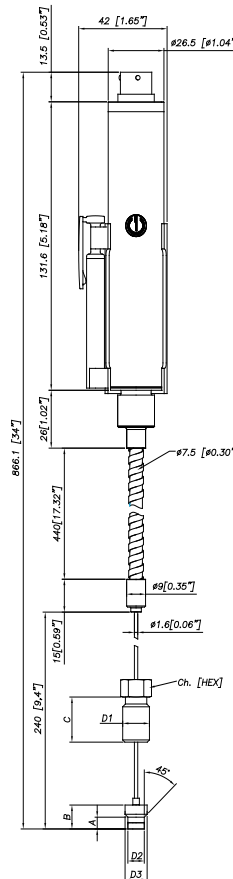
## M71



## M72



## M73



**NOTE :** dimensions refer to rigid stem length option "4" (153 mm – 6")

**WARNING :** For installation use a maximum tightening torque of 56 Nm(500 in-lb)

## SELF DIAGNOSTICS

Below the conditions detected by the sensor self-diagnostics:

- Cut cable / device non connected / broken power supply, output <0.25V
- Pin detachment, output >11.125V
- Pressure above 200% of the span, output <11.125V
- Voltage monitor in case of overvoltage/undervoltage/ voltage variation in the electronics, output <0,25V
- Program sequence error, output <0.25V
- Overtemperature on the electronics, output <0.25V
- Error on the primary element output or on the first amplification stage, output <0.25V

## OPTIONAL RELAY OUTPUT FOR EXCESS PRESSURE PROTECTION

Safety relay characteristics:

- Activation threshold to be defined in the order code
- Rated carry current: 1A
- Rated voltage: 24Vdc  $\pm$  20%
- Switch accuracy: 2 x sensor accuracy
- Hysteresis: 2% FSO

SUPPLY	OUTPUT	RELAY STATUS
OFF	-	OPEN
ON	< X%fs	CLOSED
ON	> X%fs	OPEN
ON	output < 0.25V	OPEN
ON	output > 11.125V	OPEN

## NAMUR COMPLIANCE

The sensors are tested according to Namur NE21 recommendations.

The same compatibility is valid for the NE43 Namur recommendation with the following sensor behaviour in case of breakdown:

- Cut cable: breakdown information as the signal is <0.25V
- Device not connected: breakdown information as the signal is <0.25V
- Broken power-supply: breakdown information as the signal is <0.25V

or in case of performance problems:

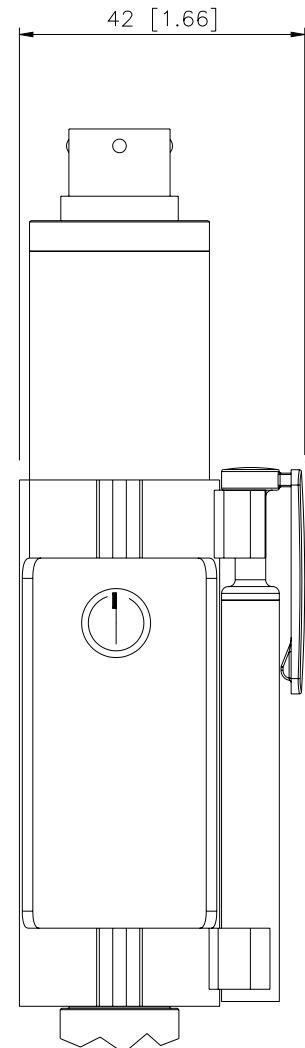
- most common failures on primary sensors: the signal goes to >11.125V

Note: in all the remaining situations, the output signal is always included between 0.25V and 11.125V.



**Recommendation:** the error level set by the customer (e.g. maximum pressure value) has to be inside the nominal range

## AUTOZERO FUNCTION

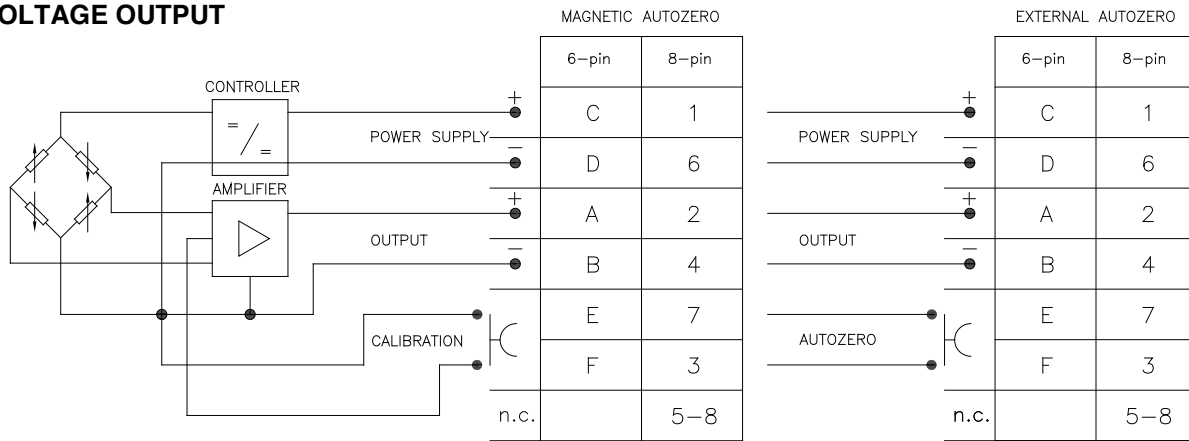


The Autozero function is activated through a magnetic contact (external magnet supplied with the sensor).

See the manual for a complete Autozero function explanation.

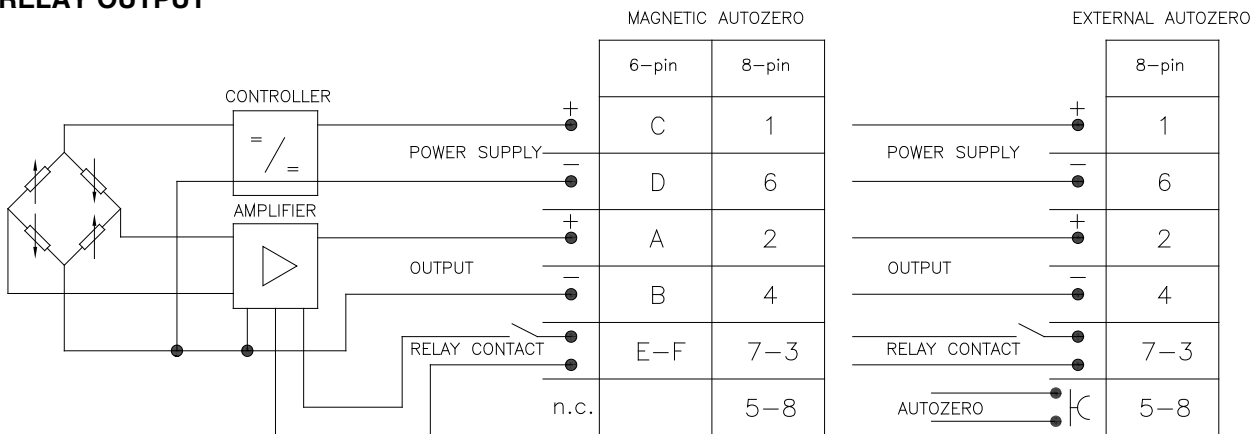
# ELECTRICAL CONNECTIONS

## VOLTAGE OUTPUT



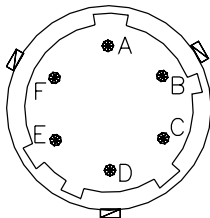
The cable shield is tied to connector via cable clamp

## RELAY OUTPUT

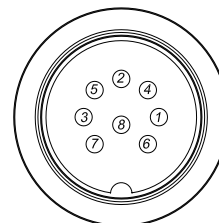


The cable shield is tied to connector via cable clamp

### 6 pin connector VPT07RA10-6PT2 (PT02A-10-6P)



### 8 pin connector (Binder) M16 DIN/EN45326 (09-0173-00-08)



## ACCESSORIES

### Connectors

6-pin female connector (IP65 protection degree)

**CON300**

8-pin female connector (IP65 protection degree)

**CON027**

### Extension cables

6-pin connector with 8m (25ft) cable

**C08WLS**

6-pin connector with 15m (50ft) cable

**C15WLS**

6-pin connector with 25m (75ft) cable

**C25WLS**

6-pin connector with 30m (100ft) cable

**C30WLS**

8-pin connector with 8m (25ft) cable

**C08WLS8**

8-pin connector with 15m (50ft) cable

**C15WLS8**

8-pin connector with 25m (75ft) cable

**C25WLS8**

8-pin connector with 30m (100ft) cable

**C30WLS8**

### Accessories

Mounting bracket

**SF18**

Dummy plug for 1/2-20UNF

**SC12**

Dummy plug for M18x1.5

**SC18**

Drill kit for 1/2-20UNF

**KF12**

Drill kit for M18x1.5

**KF18**

Cleaning kit for 1/2-20UNF

**CT12**

Cleaning kit for M18x1.5

**CT18**

Fixing pen clip

**PKIT 379**

Autozero pen

**PKIT 378**

### Thermocouple for M72 model

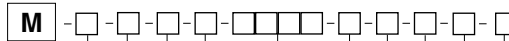
Type "J" (153mm - 6" rigid rod)

**TTER 601**

### Cable color code

Conn.	Wire
A-2	Red
B-4	Black
C-1	White
D-6	Green
E-7	Blue
F-3	Orange
5	Grey
8	Pink

# ORDER CODE



OUTPUT SIGNAL	
0,5...10,5V	7

VERSION	
Rigid rod	0
Rigid + flexible rod	1
With thermocouple	2
Exposed capillar	3

CONNECTOR	
6 pin	6
8 pin	8

ACCURACY CLASS	
0.25% FSO (ranges ≥ 100 bar/1500 psi)	H
0.5% FSO	M

MEASUREMENT RANGE			
bar		psi	
17	<b>B17U</b>	250	<b>P25D</b>
35	<b>B35U</b>	500	<b>P05C</b>
50	<b>B05D</b>	750	<b>P75D</b>
70	<b>B07D</b>	1000	<b>P01M</b>
100	<b>B01C</b>	1500	<b>P15C</b>
200	<b>B02C</b>	3000	<b>P03M</b>
350	<b>B35D</b>	5000	<b>P05M</b>
500	<b>B05C</b>	7500	<b>P75C</b>
700	<b>B07C</b>	10000	<b>P10M</b>
1000	<b>B01M</b>	15000	<b>P15M</b>
1400	<b>B14C</b>	20000	<b>P20M</b>
2000	<b>B02M</b>	30000	<b>P30M</b>

THREADING	
Standard	
1/2 - 20 UNF	1
M18 x 1.5	4

0000 X 000 X 00

Output Relay Version  
(activation threshold):  
X=no relay    B=80%fs  
A=70%fs    C=90%fs

000= Special executions

<b>E</b>	External Autozero (*)
-	Magnetic Autozero
(*) as an alternative to the CAL function	

<b>P</b>	Performance Level='c'
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FLEXIBLE ROD LENGTH (mm/inches)		
Standard (M70)		
0	none	
Standard (M71,M72)		
<b>D</b>	457mm	18"
<b>E</b>	610mm	24"
<b>F</b>	760mm	30"
Standard (M73)		
<b>L</b>	711mm	28"
Available on request		
<b>A</b>	76mm	3"
<b>B</b>	152mm	6"
<b>C</b>	300mm	12"
<b>G</b>	914mm	36"
<b>H</b>	1067mm	42"
<b>I</b>	1220mm	48"
<b>J</b>	1372mm	54"
<b>K</b>	1520mm	60"

RIGID ROD LENGTH (mm/inches)		
Standard (M70, M71, M72)		
<b>4</b>	153mm	6"
<b>5</b>	318mm	12.5"
Standard (M73)		
<b>0</b>	nessuno	
Available on request		
<b>1</b>	38mm	1.5"
<b>2</b>	50mm	2"
<b>3</b>	76mm	3"
<b>6</b>	350mm	14"
<b>7</b>	400mm	16"
<b>8</b>	456mm	18"

Example

## M71-6-M-B07C-1-4-D-P

Melt pressure transducer 0,5...10,5Vdc output, 6-pin connector, 1/2-20 UNF threading, 700 bar pressure range, 0.5% accuracy, 153 mm (6") rigid rod, 457 mm (18") flexible rod; Performance Level='c'.

Sensors are manufactured in compliance with:

- EMC directive
- machinery directive

Product designed and available in compliance with Directive 2011/65/EU (RoHS II) only for large-scale stationary installation or industrial tools, or for B-to-B laboratory equipments for R&D purposes.

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