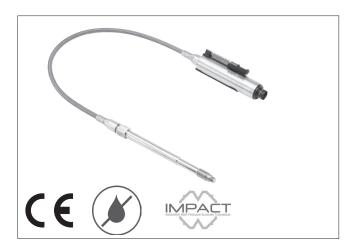
# **GEFRAN**

## IMPACT MELT PRESSURE TRANSMITTERS

# **I3 SERIES**

# mV/V Output



"IMPACT" is Gefran's exclusive series of high-temperature pressure sensors that use the piezoresistive principle.

The main characteristic of "IMPACT" sensors is that they do not contain any transmission fluid.

The sensitive element, directly positioned behind the contact membrane, is realised in silicon through microprocessing techniques.

The micro structure includes the measurement membrane and piezoresistors.

The minimum deflection required by the sensitive element makes it possible to use very robust mechanics.

The process contact membrane can be up to 15 times thicker than the membrane used in traditional Melt sensors.

#### **ADVANTAGES**

- Total compatibility with the European RoHS Directive
- High strength
- Long life
- Working temperature: up to 350°C
- Excellent read stability over time
- Fast response time

#### **MAIN FEATURES**

- · Pressure ranges:
  - 0-100 to 0-1000 bar / 0-1500 to 0-15000 psi
- Accuracy: < ±0.25% FSO (H); < ±0.5% FSO (M)
- Standard threading 1/2-20UNF, M18x1.5; other versions on request
- · Other types of diaphragms are available on request
- · Autozero function on board / external option
- 15-5 PH stainless steel diaphragm GTP coated

#### **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 or by means of external autozero.

The procedure is permitted only with pressure at zero". The Autozero function should be activated ONLY when the sensor is completely installed on the system.

The "IMPACT" series of Gefran, are pressure transmitters, without transmission fluid, for using in High temperature environment (350°C).

Medium pressure is transferred directly to the sensitive silicon element via a thick diaphragm.

Strain is transduced by a micro-worked silicon structure (MFMS).

The operating principle is piezoresistive.

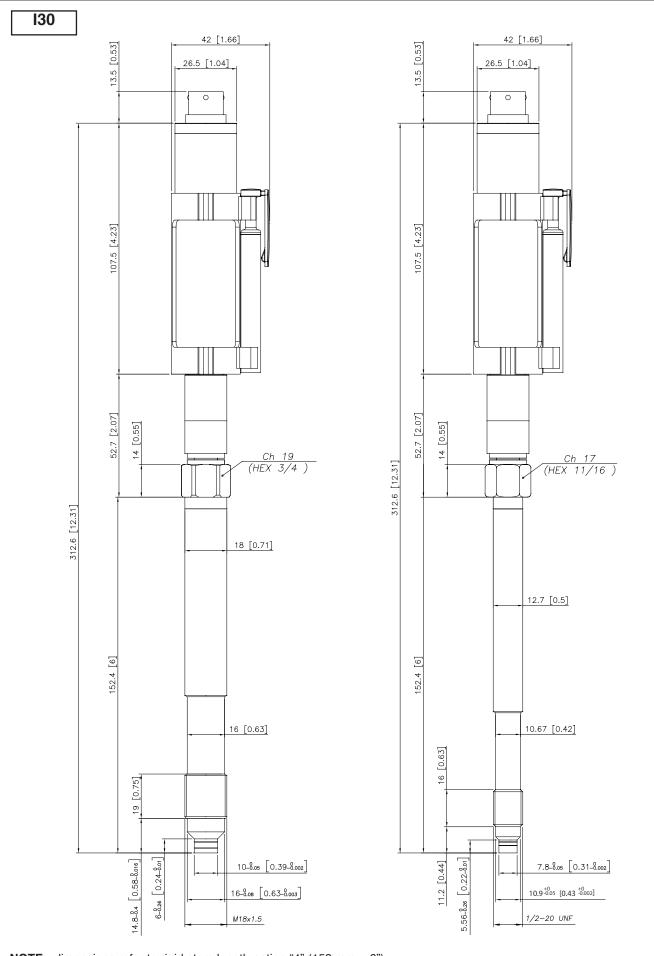
#### **TECHNICAL SPECIFICATIONS**

Resolution    M <±0.5%FSO	Accuracy (1)	<b>H</b> <±0.25%FSO <b>M</b> <±0.5%FSO	
Measurement range  01500 to 01000bar 01500 to 015000psi  Maximum overpressure  (without degrading performances)  Measurement principle Power supply Imput impedance Insulation resistance (at 50Vdc) Output signal Full Scale FSO  2,5mV/V (option 2) 3,33mV/V (option 3)  Zero signals adjustment (tollerance ± 0.5% FSO) Output impedance Response time (1090% FSO) Output signal Foll 1090% FSO) Output short circuit and supply reverse polarity protection Supply from output protection Compensed temperature range housing Aximum diaphragm temperature Deprature variation due to process temperature variation in range (20-350°C) Std contact diaphragm with process Thermocouple (with 6-pole female connector) Electrical connection  Conn. 6-pin VPT07RA10-6PT			
Maximum overpressure  (without degrading performances)  Measurement principle  Power supply  Imput impedance  Insulation resistance (at 50Vdc)  Output signal Full Scale FSO  Output impedance  Response time (1090% FSO)  Output soignals adjustment (tollerance ± 0.5% FSO)  Output noise (RMS 10-400Hz)  Calibration signal  Output short circuit and supply reverse polarity protection  Supply from output protection  Storage temperature range housing  Maximum diaphragm temperature  Zero signal variation due to process temperature variation in range (20-350°C)  Std contact diaphragm with process  Thermocouple (Model 132)  Protection degree (with 6-pole female connector)  Maximum variation very protection  Conn. 6-pin VPT07RA10-6PT	Resolution	16 bit	
Maximum overpressure  (without degrading performances)  Measurement principle  Power supply  Imput impedance Insulation resistance (at 50Vdc)  Output signal Full Scale FSO  Output impedance  Response time (1090% FSO)  Output short circuit and supply reverse polarity protection  Supply from output protection  Supply from output protection  Supply from output range housing Operating temperature range housing Maximum diaphragm temperature Zero signal variation due to process temperature variation in range (20-350°C)  Std contact diaphragm with process Thermocouple (Model I32)  Protection degree (with 6-pole female connection)  Imput impedance  1.5 x FS (maximum pressure 1200bar/17400psi) Piezoressitivo  812Vdc (10Vdc typical)  1200bar/17400psi) Piezoressitivo 1200bar/17400psi) Piezoressitivo 812Vdc (10Vdc typical)  9350 Ohm ± 10%  812Vdc (10Vdc typical)  9350 Ohm ± 10%  812Vdc (10Vdc typical)  9350 Ohm ± 10%  9402Verson  9404125°C  950°C	Measurement range	0100 to 01000bar	
(without degrading performances)  Measurement principle Power supply Imput impedance Insulation resistance (at 50Vdc) Output signal Full Scale FSO Output signal Full Scale FSO Output impedance Response time (1090% FSO) Output short circuit and supply reverse polarity protection Supply from output protection Supply from output protection Storage temperature range housing Maximum diaphragm temperature Zero signal variation due to process temperature variation in range (20-350°C) Std contact diaphragm with process Thermocouple (Model I32) Protection degree (with 6-pole female connection)  Insulation resistance I 1200bar/17400psi) Piezoresistivo Piezoresistivo Responsitivo Responseitivo Resund Mohm Autozero* function Supsimum J 2,5mW/V (option 2) 3,33mW/V (option 2) 3,33mW/V (option 3) "Autozero* function  "Autozero*		01500 to 015000psi	
(without degrading performances)       1200bar/17400psi)         Measurement principle       Piezoresistivo         Power supply       812Vdc (10Vdc typical)         Imput impedance       350 Ohm ± 10%         Insulation resistance (at 50Vdc)       >1000 MOhm         Output signal Full Scale FSO       2,5mV/V (option 2)         3,33mV/V (option 3)       33,33mV/V (option 3)         Zero signals adjustment (tollerance ± 0.5% FSO)       "Autozero" function         Output impedance       350 Ohm ± 10%         Response time (1090% FSO)       8ms         Output noise (RMS 10-400Hz)       < 0.025% FSO	Maximum overpressure	1.5 x FS	
Measurement principle       Piezoresistivo         Power supply       812Vdc (10Vdc typical)         Imput impedance       350 Ohm ± 10%         Insulation resistance (at 50Vdc)       >1000 MOhm         Output signal Full Scale FSO       2,5mV/V (option 2)         Zero signals adjustment       "Autozero" function         (tollerance ± 0.5% FSO)       "Autozero" function         Output impedance       350 Ohm ± 10%         Response time (1090% FSO)       8ms         Output noise (RMS 10-400Hz)       < 0.025% FSO		(maximum pressure	
Power supply   Imput impedance   350 Ohm ± 10%   1000 MOhm   2,5mV/V (option 2)   3,33mV/V (option 3)   2 zero signals adjustment   (tollerance ± 0.5% FSO)   0 utput impedance   350 Ohm ± 10%   8ms   0 utput noise (RMS 10-400Hz)   2 0.025% FSO   2 ms	(without degrading performances)	1200bar/17400psi)	
Imput impedance Insulation resistance (at 50Vdc)  Output signal Full Scale FSO  Zero signals adjustment (tollerance ± 0.5% FSO)  Output impedance  Response time (1090% FSO)  Output short circuit and supply reverse polarity protection  Supply from output protection  Compensed temperature range housing  Operating temperature range housing  Storage temperature range housing  Maximum diaphragm temperature  Zero signal variation due to process temperature variation in range (20-350°C)  Std contact diaphragm with process Thermocouple (Model I32)  Protection legree (with 6-pole female connection)  Zero signal Variation due to process (at 1000 MOhm  2,5mV/V (option 2) 3,33mV/V (option 2) 4,000 MOhm  2,5mV/V (option 2) 3,33mV/V (option 2) 4,000 MOhm  2,5mV/V (option 2) 3,33mV/V (option 2) 3,33mV/V (option 2) 3,33mV/V (option 2) 4,000 manufactor  YES  Output impedance  350 Ohm ± 10%  8ms  40+85°C  VES  4±1,2%FSO  4±1,2%FSO  Std contact diaphragm with process  15-5 PH GTP  STD: Type "J" (isolated junction)  Type "K" (on request)  IP65	Measurement principle	Piezoresistivo	
Insulation resistance (at 50Vdc) Output signal Full Scale FSO  Zero signals adjustment (tollerance ± 0.5% FSO) Output impedance Response time (1090% FSO) Output noise (RMS 10-400Hz) Calibration signal Output short circuit and supply reverse polarity protection Supply from output protection Compensed temperature range housing Operating temperature range housing Storage temperature range housing Aximum diaphragm temperature Zero signal variation due to process temperature variation in range (20-350°C) Std contact diaphragm with process Thermocouple (Model I32) Protection Conn. 6-pin VPT07RA10-6PT  Figure 12,5mV/ (option 2) 3,33mV/V (option 2) 4 Autozero* function  YES  0.0.025% FSO  YES  0+85°C  40+125°C  40+125°C  41.2%FSO  Span signal variation due to process temperature variation in range (20-350°C)  Span signal variation due to process temperature variation in range (20-350°C)  Std contact diaphragm with process  Thermocouple (Model I32)  Fig. Type "J" (isolated junction) Type "K" (on request)  IP65	Power supply	812Vdc (10Vdc typical)	
Output signal Full Scale FSO  Zero signals adjustment (tollerance ± 0.5% FSO)  Output impedance  Response time (1090% FSO)  Output noise (RMS 10-400Hz)  Calibration signal  Output short circuit and supply reverse polarity protection  Supply from output protection  Compensed temperature range housing Operating temperature range housing Storage temperature range housing  Maximum diaphragm temperature  Zero signal variation due to process temperature variation in range (20-350°C)  Std contact diaphragm with process Thermocouple (Model I32)  Protection degree (with 6-pole female connector)  Zero signal variation due to process  Teneroscouple (with 6-pole female connector)  Zero signal connection  Conn. 6-pin VPT07RA10-6PT	Imput impedance	350 Ohm ± 10%	
Zero signals adjustment (tollerance ± 0.5% FSO)  Output impedance Response time (1090% FSO)  Output noise (RMS 10-400Hz)  Calibration signal  Output short circuit and supply reverse polarity protection Supply from output protection  Compensed temperature range housing Operating temperature range housing Storage temperature range housing  Maximum diaphragm temperature Zero signal variation due to process temperature variation in range (20-350°C)  Std contact diaphragm with process Thermocouple (Model I32) Protection degree (with 6-pole female connection)  350 Ohm ± 10% Ratiozero" function  350 Ohm ± 10% Ratiozero" function  350 Ohm ± 10% Response time (1090% FSO)  8ms  40.0.25% FSO  YES  0+85°C  YES  0+85°C  0+85°C  440+125°C  440+125°C  450°C  451,2%FSO  STD: Type "J" (isolated junction) Type "K" (on request)  IP65  Conn. 6-pin VPT07RA10-6PT	Insulation resistance (at 50Vdc)	>1000 MOhm	
Zero signals adjustment (tollerance ± 0.5% FSO)     Output impedance   350 Ohm ± 10%     Response time (1090% FSO)   8ms     Output noise (RMS 10-400Hz)   < 0.025% FSO     Calibration signal   80% FSO     Output short circuit and supply reverse polarity protection   YES     Compensed temperature range housing   0+85°C     Operating temperature range housing   -30+85°C     Storage temperature range housing   -40+125°C     Maximum diaphragm temperature   350°C     Zero signal variation due to process   temperature variation in range (20-350°C)     Span signal variation due to process   temperature variation in range (20-350°C)     Std contact diaphragm with process   15-5 PH GTP     Thermocouple (Model I32)   Type "J" (isolated junction)     Type "K" (on request)     Electrical connection   Conn. 6-pin VPT07RA10-6PT	Output signal Full Scale FSO	2,5mV/V (option 2)	
(tollerance ± 0.5% FSO)       Output impedance       350 Ohm ± 10%         Response time (1090% FSO)       8ms         Output noise (RMS 10-400Hz)       < 0.025% FSO		3,33mV/V (option 3)	
Output impedance       350 Ohm ± 10%         Response time (1090% FSO)       8ms         Output noise (RMS 10-400Hz)       < 0.025% FSO	Zero signals adjustment	"Autozero" function	
Response time (1090% FSO) Output noise (RMS 10-400Hz) Calibration signal Output short circuit and supply reverse polarity protection Supply from output protection Compensed temperature range housing Operating temperature range housing Storage temperature range housing Tero signal variation due to process temperature variation in range (20-350°C) Span signal variation due to process temperature variation in range (20-350°C) Std contact diaphragm with process Thermocouple (Model I32) Protection degree (with 6-pole female connector)  R8ms  < 0.025% FSO  8ms < 0.025% FSO  90% FSO  YES  0+85°C  0+85°C  -30+85°C  -40+125°C  -350°C  < ± 1,2%FSO	(tollerance ± 0.5% FSO)		
Output noise (RMS 10-400Hz)  Calibration signal  Output short circuit and supply reverse polarity protection  Supply from output protection  Compensed temperature range housing Operating temperature range housing Storage temperature range housing  Maximum diaphragm temperature Zero signal variation due to process temperature variation in range (20-350°C) Span signal variation due to process temperature variation in range (20-350°C) Std contact diaphragm with process Thermocouple (Model I32) Protection degree (with 6-pole female connector)  Some Some Some Some Some Some Some Some	Output impedance	350 Ohm ± 10%	
Calibration signal  Output short circuit and supply reverse polarity protection  Supply from output protection  Compensed temperature range housing Operating temperature range housing Storage temperature range housing  Maximum diaphragm temperature Zero signal variation due to process temperature variation in range (20-350°C) Span signal variation due to process temperature variation in range (20-350°C) Std contact diaphragm with process Thermocouple (Model I32) Protection degree (with 6-pole female connector)  80% FSO YES YES  YES  YES  YES  Co+85°C  -40+125°C  350°C  < ± 1,2%FSO  < ± 1,2%FSO   * ± 1,2%FSO  * * ± 1%FSO  * * * * * * * * * * * * * * * * * * *	Response time (1090% FSO)	8ms	
Output short circuit and supply reverse polarity protection  Supply from output protection  Compensed temperature range housing Operating temperature range housing Storage temperature range housing Maximum diaphragm temperature Zero signal variation due to process temperature variation in range (20-350°C) Span signal variation due to process temperature variation in range (20-350°C) Std contact diaphragm with process Thermocouple (Model I32) Protection degree (with 6-pole female connector)  YES  YES  YES  YES  YES  YES  SEB (10-185°C)  STD: 40-185°C  (20-350°C)  STD: 7ype "J" (isolated junction) Type "K" (on request)  IP65  Conn. 6-pin VPT07RA10-6PT	Output noise (RMS 10-400Hz)	< 0.025% FSO	
polarity protection  Supply from output protection  Compensed temperature range housing Operating temperature range housing Storage temperature range housing  Maximum diaphragm temperature Zero signal variation due to process temperature variation in range (20-350°C) Span signal variation due to process temperature variation in range (20-350°C) Std contact diaphragm with process Thermocouple (Model I32) Protection degree (with 6-pole female connector)  Sypham of the Maximum of the protection o	Calibration signal	80% FSO	
Supply from output protection  Compensed temperature range housing Operating temperature range housing Storage temperature range housing  Maximum diaphragm temperature Zero signal variation due to process temperature variation in range (20-350°C) Span signal variation due to process temperature variation in range (20-350°C) Std contact diaphragm with process Thermocouple (Model I32) Protection degree (with 6-pole female connector)  Supply from output protection  YES  0+85°C  -30+85°C  -40+125°C  -41.2%FSO  < ± 1,2%FSO   - ± 1,2%FSO  - 5 PH GTP  STD: Type "J" (isolated junction)  Type "K" (on request)  IP65  Conn. 6-pin VPT07RA10-6PT	Output short circuit and supply reverse	YES	
Compensed temperature range housing Operating temperature range housing Storage temperature range housing  Maximum diaphragm temperature Zero signal variation due to process temperature variation in range (20-350°C) Span signal variation due to process temperature variation in range (20-350°C) Std contact diaphragm with process Thermocouple (Model I32) Protection degree (with 6-pole female connector)  Conn. 6-pin VPT07RA10-6PT	polarity protection		
Operating temperature range housing  Storage temperature range housing  Maximum diaphragm temperature  Zero signal variation due to process temperature variation in range (20-350°C)  Span signal variation due to process temperature variation in range (20-350°C)  Std contact diaphragm with process Thermocouple (Model I32)  Protection degree (with 6-pole female connector)  Storage temperature variation  350°C  < ± 1,2%FSO  < ± 1%FSO  < 5 PH GTP  STD: Type "J" (isolated junction)  Type "K" (on request)  IP65  Conn. 6-pin VPT07RA10-6PT	Supply from output protection	YES	
Storage temperature range housing  Maximum diaphragm temperature  Zero signal variation due to process temperature variation in range (20-350°C)  Span signal variation due to process temperature variation in range (20-350°C)  Std contact diaphragm with process Thermocouple (Model I32)  Protection degree (with 6-pole female connector)  Electrical connection  -40+125°C 350°C  St0°C  <= ± 1,2%FSO  <= ± 1%FSO  <= ± 1 %FSO	Compensed temperature range housing	0+85°C	
Maximum diaphragm temperature  Zero signal variation due to process temperature variation in range (20-350°C)  Span signal variation due to process temperature variation in range (20-350°C)  Std contact diaphragm with process Thermocouple ( Model I32)  Protection degree (with 6-pole female connector)  Electrical connection  350°C  < ± 1,2%FSO  < ± 1%FSO  < 5 PH GTP  STD: Type "J" (isolated junction)  Type "K" (on request)  IP65  Conn. 6-pin VPT07RA10-6PT	Operating temperature range housing	-30+85°C	
Zero signal variation due to process  temperature variation in range (20-350°C)  Span signal variation due to process temperature variation in range (20-350°C)  Std contact diaphragm with process  Thermocouple ( Model I32)  Protection degree (with 6-pole female connector)  Electrical connection	Storage temperature range housing	40+125°C	
temperature variation in range (20-350°C)  Span signal variation due to process temperature variation in range (20-350°C)  Std contact diaphragm with process  Thermocouple (Model I32)  Protection degree (with 6-pole female connector)  Electrical connection  Span signal variation in range (20-350°C)   (± 1%FSO Stb: Type "J" (isolated junction) Type "K" (on request)  IP65  Conn. 6-pin VPT07RA10-6PT	Maximum diaphragm temperature	350°C	
Span signal variation due to process  temperature variation in range (20-350°C)  Std contact diaphragm with process  Thermocouple (Model I32)  Protection degree (with 6-pole female connector)  Electrical connection  Span signal variation due to process  15-5 PH GTP  STD: Type "J" (isolated junction)  Type "K" (on request)  IP65	Zero signal variation due to process	< ± 1,2%FSO	
temperature variation in range (20-350°C) Std contact diaphragm with process Thermocouple (Model I32) Protection degree (with 6-pole female connector)  Electrical connection	temperature variation in range (20-350°C)		
C20-350°C)   Std contact diaphragm with process   15-5 PH GTP	Span signal variation due to process		
Std contact diaphragm with process Thermocouple ( Model I32) Protection degree (with 6-pole female connector)  Std contact diaphragm with process  15-5 PH GTP STD: Type "J" (isolated junction) Type "K" (on request)  IP65  Conn. 6-pin VPT07RA10-6PT	temperature variation in range	< ± 1%FSO	
Thermocouple ( Model I32) STD: Type "J" (isolated junction) Type "K" (on request) Protection degree (with 6-pole female connector)  Electrical connection Conn. 6-pin VPT07RA10-6PT	(20-350°C)		
( Model I32) Type "K" (on request)  Protection degree IP65 (with 6-pole female connector)  Electrical connection Conn. 6-pin VPT07RA10-6PT	Std contact diaphragm with process	15-5 PH GTP	
Protection degree IP65 (with 6-pole female connector)  Electrical connection Conn. 6-pin VPT07RA10-6PT	Thermocouple	STD: Type "J" (isolated junction)	
(with 6-pole female connector)  Electrical connection  Conn. 6-pin VPT07RA10-6PT	( Model I32)	Type "K" (on request)	
Electrical connection Conn. 6-pin VPT07RA10-6PT	Protection degree	IP65	
· ·	(with 6-pole female connector)		
	Electrical connection	•	

FSO = Full scale output

(1) BFSL method (Best Fit Straight Line): includes combined effects of Non-Linearity, Hysteresis and Repeatability.

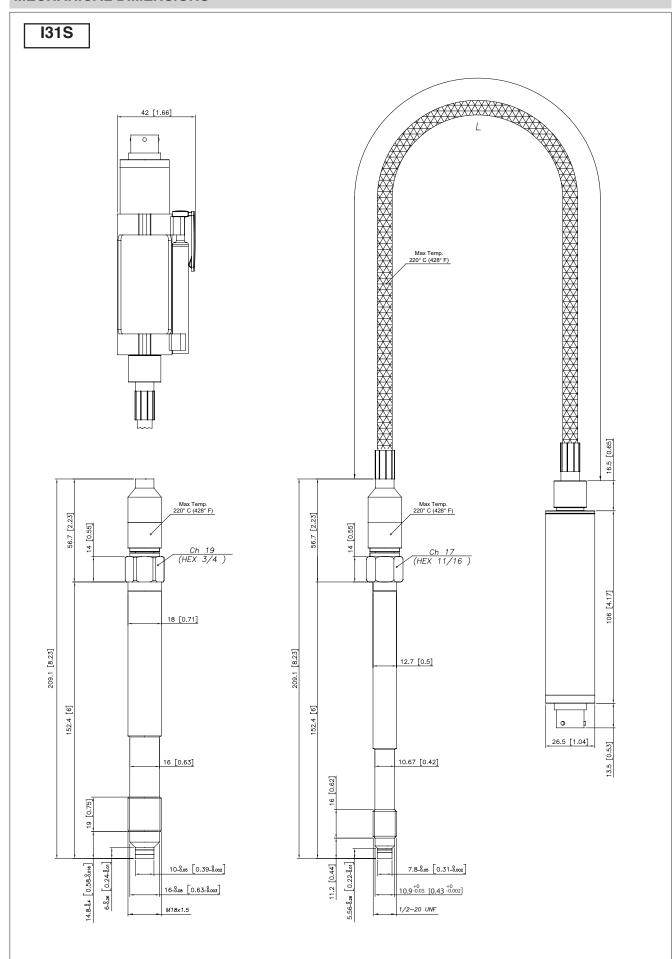
### **MECHANICAL DIMENSIONS**



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

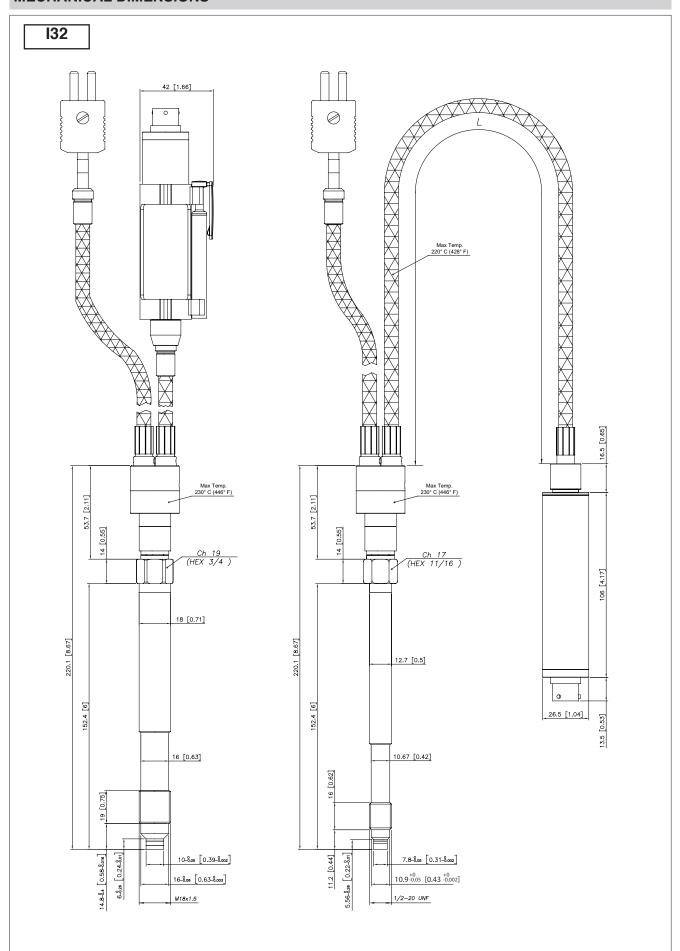
**I31M** 42 [1.66] Max Temp. 220° C (428° F) 43.9 [1.73] 14 [0.55] 26.5 [1.04] 18 [0.71] 12.7 [0.5] 16 [0.63] 10.67 [0.42] 6-820 [0.24-801] 14.8-84 [0.58-8016] 5.56-828 [0.22-8ar] 10-8.05 [0.39-8.002] 1/2-20 UNF M18x1.5

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



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

### **MECHANICAL DIMENSIONS**



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

### **ELECTRICAL CONNECTIONS**

#### 6 pin connector mV/V Output VPT07RA10-6PT2 (PT02A-10-6P) MAGNETIC AUTOZERO EXTERNAL AUTOZERO 6-pin 6-pin С С POWER SUPPLY POWER SUPPLY ADC D D μC Α Α OUTPUT OUTPUT DAC В В Ε Ε

F

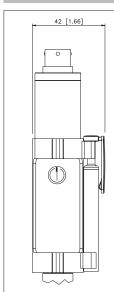
Shield drain wire is tied to connector via cable clamp

F

AUTOZERO

### **AUTOZERO FUNCTION**

CALIBRATION



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

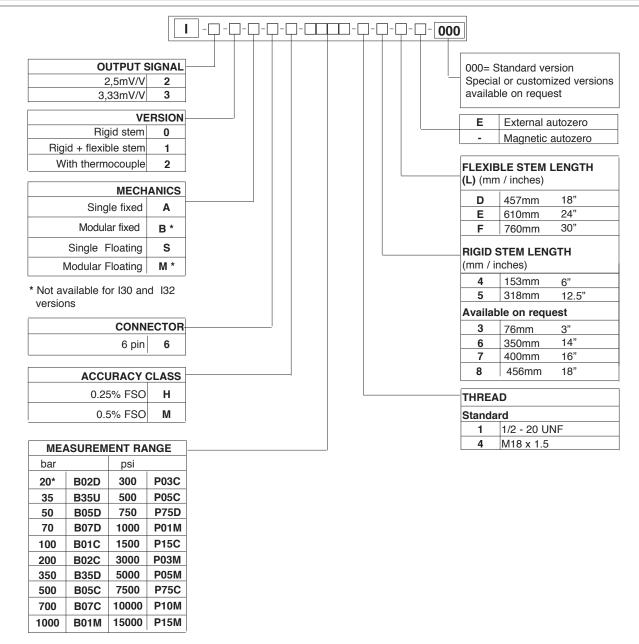
For the external Autozero version short-circuit the correct pin.

See the manual for a complete Autozero function explanation.

### **ACCESSORIES**

Connectors		Cable c	Cable color code	
6-pin female connector (IP65 protection degree)	ale connector (IP65 protection degree) CON300	Conn.	Wire	
		Α	Red	
Extension cables		В	Black	
6-pin connector with 8m (25ft) cable	C08WLS	С	White	
6-pin connector with 15m (50ft) cable	C15WLS	D	Green	
6-pin connector with 25m (75ft) cable	C25WLS	E	Blue	
6-pin connector with 30m (100ft) cable	C30WLS	F	Orange	
Other lengths  Accessories	on request			
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	PKIT309			
Autozero pen	PKIT312			

#### **ORDER CODE**



<sup>\* 10</sup> bar (B01D) or 150psi (P15D) for M18x1,5 version

### Example

#### 131S-6-M-B07C-1-4-D-000

Melt pressure transmitter without filling, 3,33mV/V output, 6-pin connector, 1/2-20 UNF threading, 700 bar pressure range, 0.5% precision level, 153 mm (6") rigid stem, 457 mm (18") flexible stem.

Sensors are manufactured in compliance with:

- EMC 2004/108/CE compatibility directive
- RoHS 2002/95/CE directive

Electrical installation requirements and Conformity certificate are available on our web site: www.gefran.com

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



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