



The HWF series of Gefran are pressure transmitters with HART communication protocol for using in high temperature environment with explosive atmosphere presence.

The main characteristic of this series is the capability to read pressure of the media up to 315°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 strain-gauge technology.

The SIL2 and PL d approvals make the product suitable for use in the Functional Safety applications, particularly in the process plants for the production of polymers, where it is an essential requirement.

MAIN FEATURES

- Pressure ranges from: 0-35 to 0-1000 bar / 0-500 to 0-15000 psi
- Accuracy: < ±0.25% FS (H); < ±0.5% FS (M)
- FM approval for potentially explosive atmospheres
- SIL2 and PL d approvals for Functional Safety
- 1/2-20UNF, M18x1.5 standard threads, mounting flange ø 66.3mm (2.61")
- Autozero function on board / external option
- 17-7 PH corrugated diaphragm with GTP+ coating

HWF0 The rigid rod configuration provides fast and easy installation

HWF1 The flexible rod configuration is suitable for applications demanding greater thermal isolation and where installation would otherwise be difficult.

HWF2 This configuration lets you measure process pressure and temperature at the same point with a single installation (no FM approval available).

HWF3 The configuration with exposed tip is ideal for applications in limited space.

HWF4 Configuration with flange for specific applications.

The transmitters have been designed and manufactured according to FM standards with the following types of protection and features:

- Explosion-proof (XP) for Class I, Division 1, Groups A, B, C and D
- Dust-Ignitionproof (DIP) for Classes II, III, Division 1, Groups E, F and G
- Indoor and outdoor areas classified as hazardous: Type 4X, IP67
- Rated ambient temperature of T5 Ta = -20°C to +85°C, T6 Ta = -20°C to +60°C

List of applicable standards:

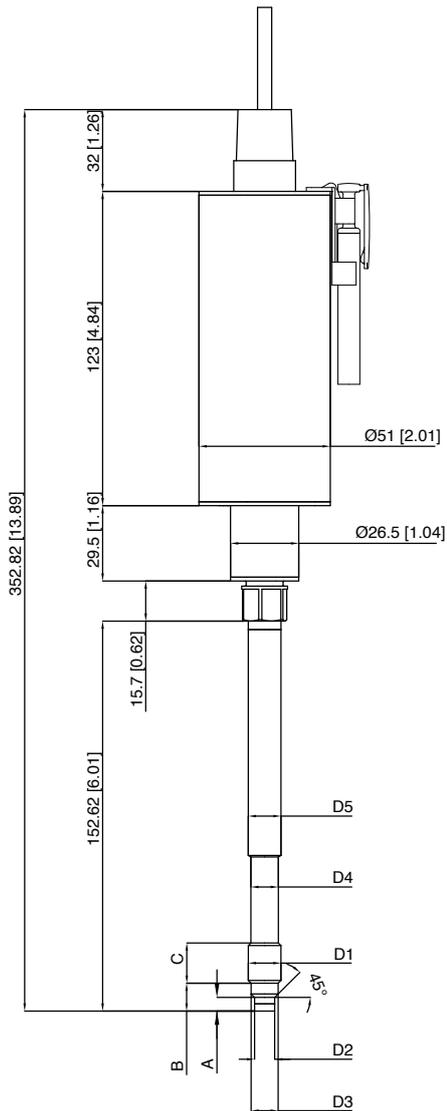
- FM3600
- FM3615
- FM3616
- FM3810
- ANSI/NEMA 250
- ANSI/IEC 60529

TECHNICAL SPECIFICATIONS

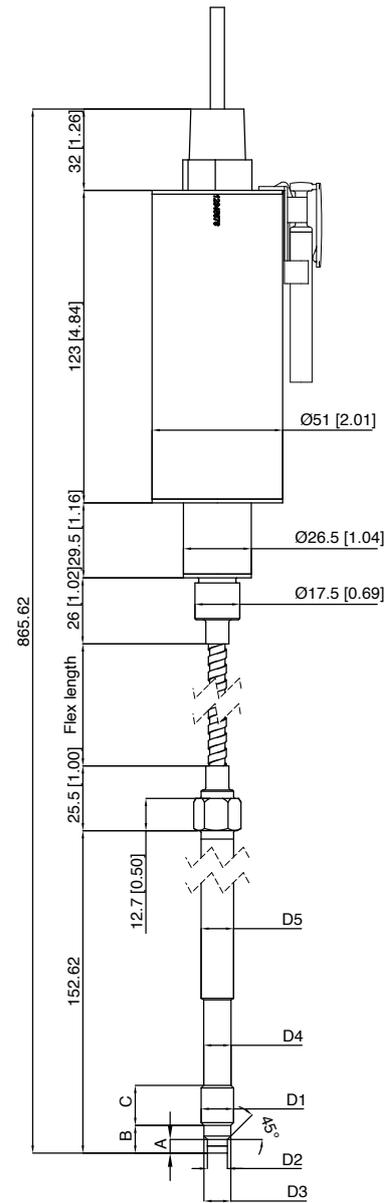
Accuracy (1)	H <±0.25%FS (range ≥100bar/1500psi) M <±0.5%FS
Resolution	16 Bit
Measurement range	0..35 to 0..1000bar 0..500 to 0..15000psi
Rangeability	3:1
Maximum overpressure (without degrading performances)	2 x FS 1.5 x FS above 500bar/7500psi
Measurement principle	Extensimetric strain gauge
Power supply	13...30Vdc
Maximum current absorption	23mA
Output signal Full Scale (FS)	20mA
Zero balance (tolerance ± 0.25% FS)	4mA
Calibration signal	80% FS
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	< 0.02% FS/°C
Diaphragm maximum temperature	315°C / 600°F
Zero drift due to change in process temperature (zero)	< 0.04 bar/°C
Standard material in contact with process medium	Diaphragm: • 17-7 PH corrugated diaphragm with GTP+ coating Stem: • 17-4 PH
Thermocouple (model HWF2)	STD: type "J" (isolated junction)
Protection degree	IP67, NEMA 4X
SIL2 certification PL 'd' certification	IEC/EN 62061 / IEC 61508 EN ISO 13849
FS = Full scale output (1) BFSL method (Best Fit Straight Line): includes combined effects of Non-Linearity, Hysteresis and Repeatability (according to IEC 62828-2)	

MECHANICAL DIMENSIONS

HWF0



HWF1

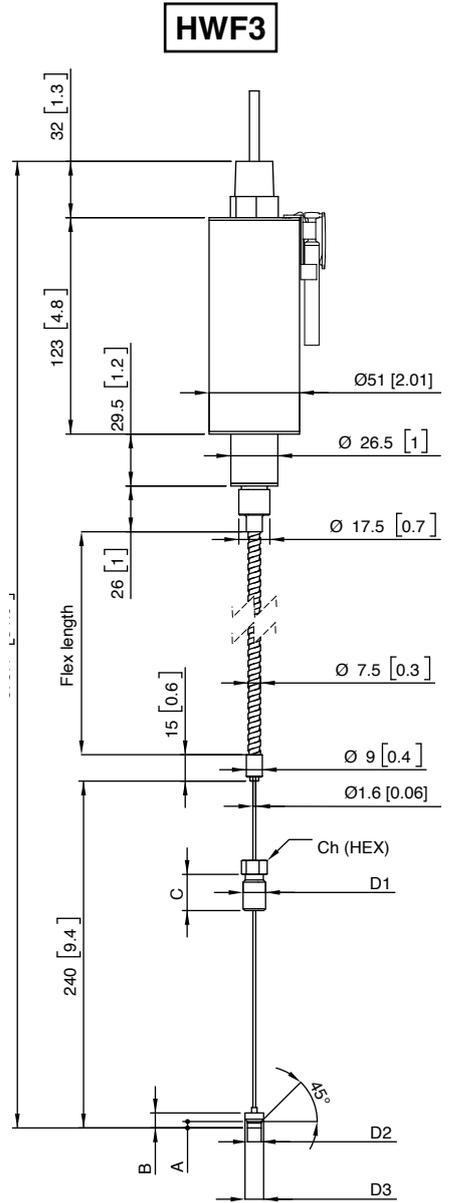
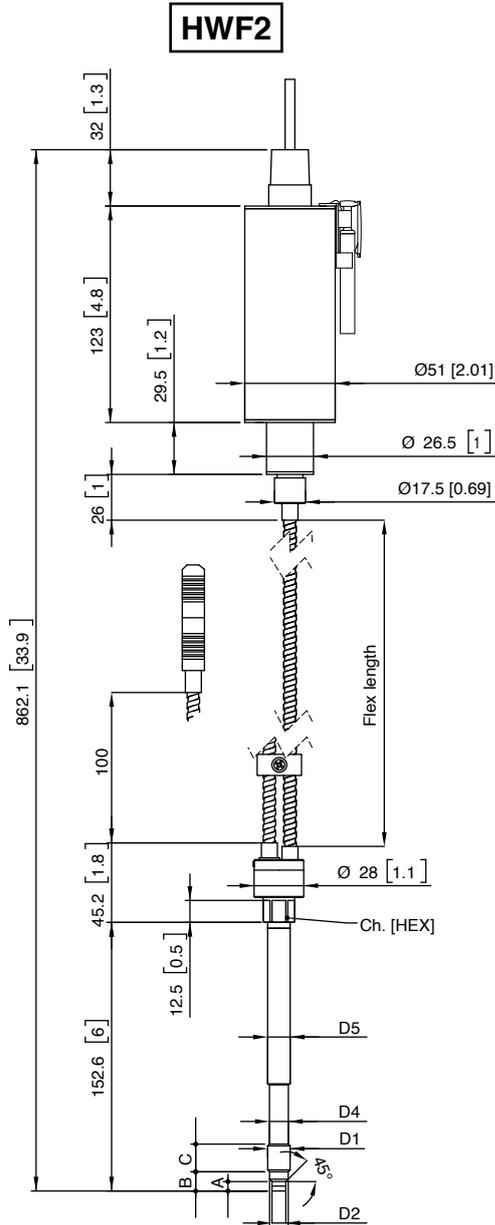


D1	1/2 - 20UNF	D1	M18x1.5
D2	$\phi 7.8 -0.05$ [$\phi 0.31'' -0.002$]	D2	$\phi 10 -0.05$ [$\phi 0.394'' -0.002$]
D3	$\phi 10.5 -0.025$ [$\phi 0.41'' -0.001$]	D3	$\phi 16 -0.08$ [$\phi 0.63'' -0.003$]
D4	$\phi 10.67$ [$\phi 0.42''$]	D4	$\phi 16 -0.4$ [$\phi 0.63'' -0.016$]
D5	$\phi 12.7$ [$\phi 0.5''$]	D5	$\phi 18$ [$\phi 0.71''$]
A	5.56 -0.26 [0.22'' -0.01]	A	6 -0.26 [0.24'' -0.01]
B	11.2 [0.44'']	B	14.8 -0.4 [0.58'' -0.016]
C	15.74 [0.62'']	C	19 [0.75'']
Ch [Hex]	16 [5/8'']	Ch [Hex]	19 [3/4'']

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)

MECHANICAL DIMENSIONS



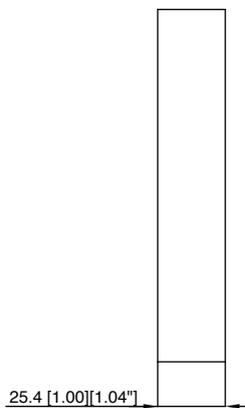
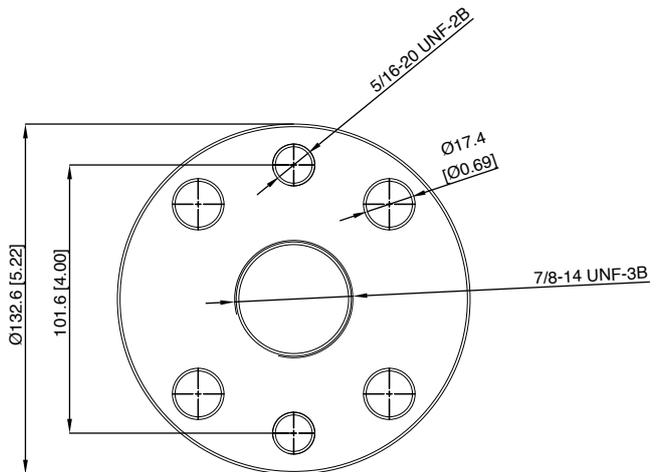
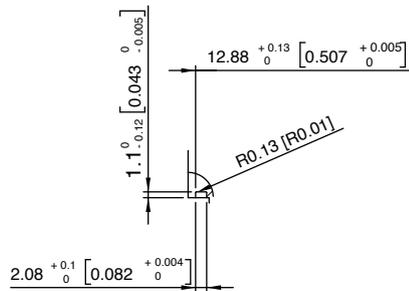
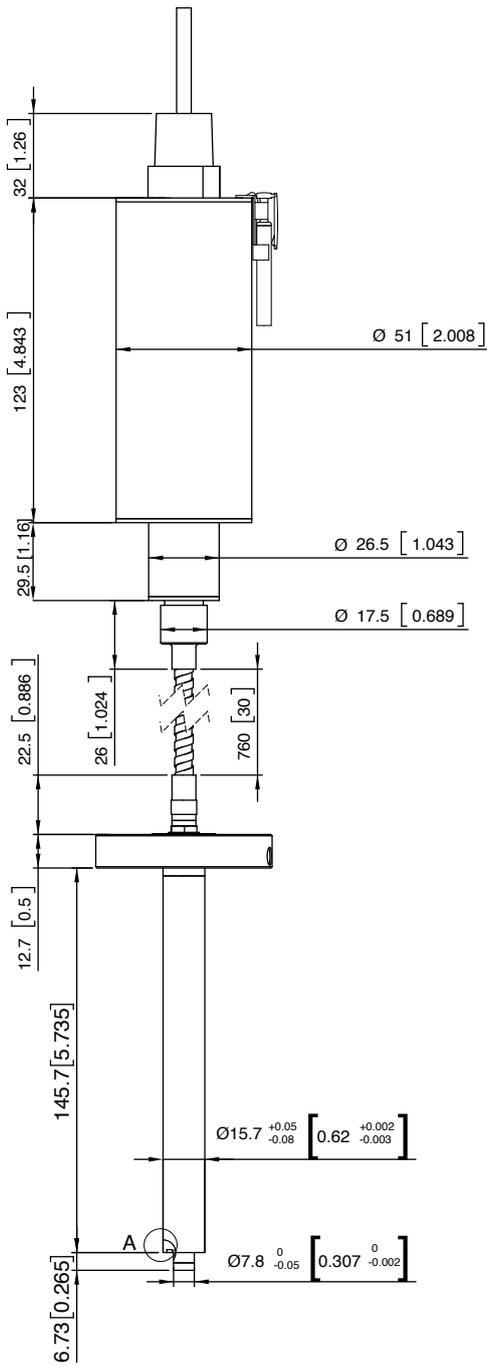
D1	1/2 - 20UNF	D1	M18x1.5
D2	$\phi 7.8 -0.05$ [$\phi 0.31$ " -0.002]	D2	$\phi 10 -0.05$ [$\phi 0.394$ " -0.002]
D3	$\phi 10.5 -0.025$ [$\phi 0.41$ " -0.001]	D3	$\phi 16 -0.08$ [$\phi 0.63$ " -0.003]
D4	$\phi 10.67$ [$\phi 0.42$ "]	D4	$\phi 16 -0.4$ [$\phi 0.63$ " -0.016]
D5	$\phi 12.7$ [$\phi 0.5$ "]	D5	$\phi 18$ [$\phi 0.71$ "]
A	$5.56 -0.26$ [0.22 " -0.01]	A	$6 -0.26$ [0.24 " -0.01]
B	11.2 [0.44 "]	B	$14.8 -0.4$ [0.58 " -0.016]
C	15.74 [0.62 "]	C	19 [0.75 "]
Ch [Hex]	16 [$5/8$ "]	Ch [Hex]	19 [$3/4$ "]

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)

MECHANICAL DIMENSIONS

HWF4



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

SELF DIAGNOSTICS (ONLY FOR SIL2 / PL d VERSIONS)

Below the conditions detected by the sensor self-diagnostics:

- Cut cable / device non connected / broken power supply, output $\leq 3.6\text{mA}$
- Pin detachment output $\leq 3.6\text{mA}$
- Broken primary element $\geq 21\text{mA}$
- Pressure above 200% of the span, output $\geq 21\text{mA}$
- Voltage monitor in case of overvoltage/undervoltage/voltage variation in the electronics, output $\leq 3.6\text{mA}$ (*)
- Program sequence error, output $\leq 3.6\text{mA}$ (*)
- Overtemperature on the electronics, output $\leq 3.6\text{mA}$ (*)
- Error on the primary element output or on the first amplification stage, output $\geq 21\text{mA}$

(*) In such conditions the Alarm Type can be programmed via HART at $\geq 21\text{mA}$.

NAMUR COMPLIANCE (ONLY FOR SIL2 / PL d VERSIONS)

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 $\leq 3.6\text{mA}$
- Device not connected: breakdown information as the signal is $\leq 3.6\text{mA}$
- Broken power-supply: breakdown information as the signal is $\leq 3.6\text{mA}$
- or in case of performance problems:
- Broken primary element $\geq 21\text{mA}$
- Pressure above 200% of the span, output $\geq 21\text{mA}$
- Others $\leq 3.6\text{mA}$ (*)

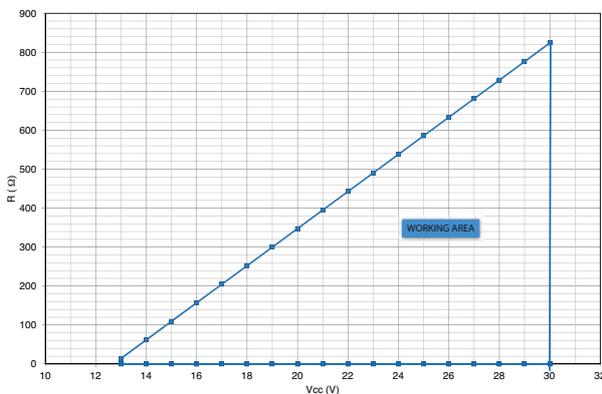
(*) In such a condition the Alarm Type can be programmed via HART at $\geq 21\text{mA}$.

Note: in all the remaining situations, the output signal is always included between 3.8 and 20.5mA.



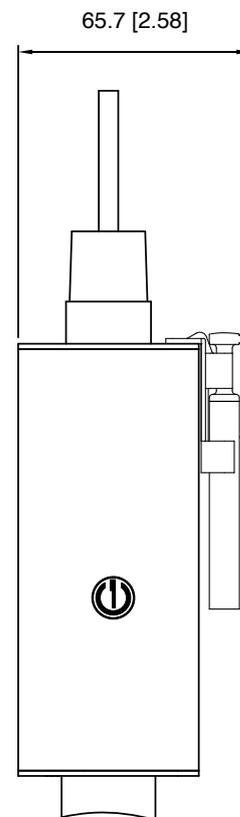
Recommendation: the error level set by the customer (e.g. maximum pressure value) has to be inside the nominal range.

LOAD DIAGRAM



The diagram shows the optimum ratio between load and power supply for transmitters with 4...20mA output. For correct function, use a combination of load resistance and voltage that falls within the two lines in the graph above.

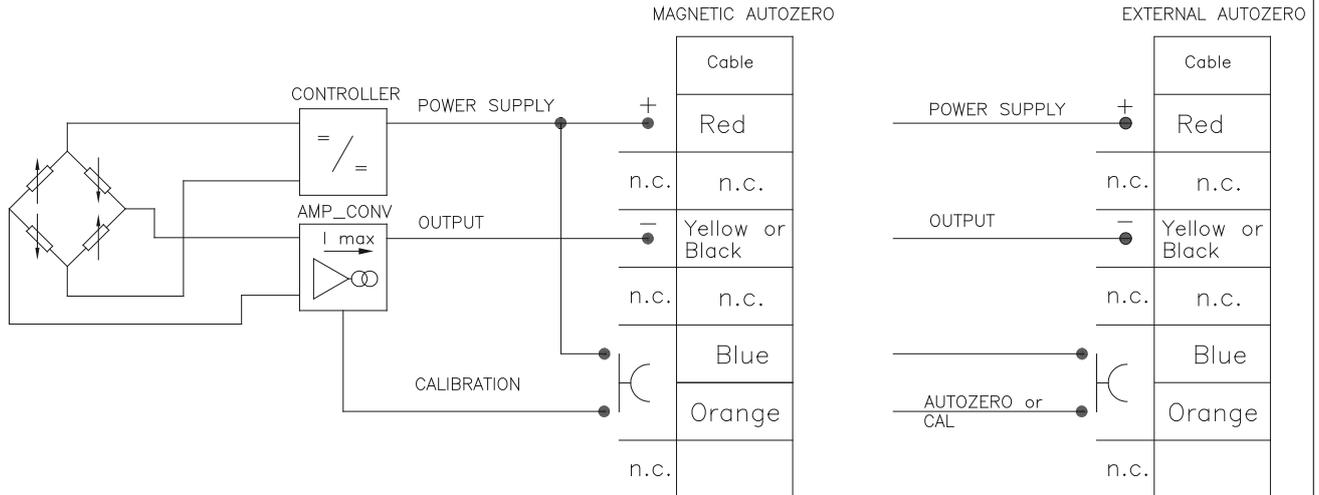
AUTOZERO FUNCTION



The Autozero function is activated through a magnetic contact (external magnet supplied with the sensor). The Autozero function can be activated through HART command as well. See the manual for a complete Autozero function explanation.

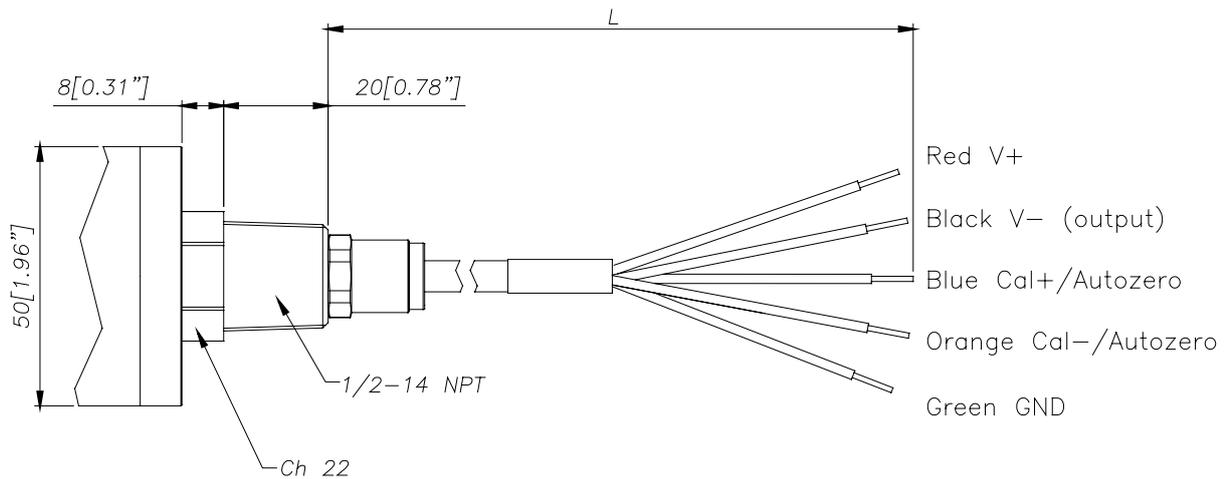
ELECTRICAL CONNECTIONS

CURRENT OUTPUT



The cable shield is tied to both sides, i.e. to the sensor connector and to the controller

Cable outlet (1/2 14-NPT) Current output L = 1 m



ACCESSORIES

Accessories

- Mounting bracket
- Dummy plug for 1/2-20UNF
- Dummy plug for M18x1.5
- Drill kit for 1/2-20UNF
- Drill kit for M18x1.5
- Cleaning kit for 1/2-20UNF
- Cleaning kit for M18x1.5
- Fixing pen clip
- Autozero pen

- SF18
- SC12
- SC18
- KF12
- KF18
- CT12
- CT18
- PKIT1032
- PKIT378

Thermocouples for model HWF2

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

- 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

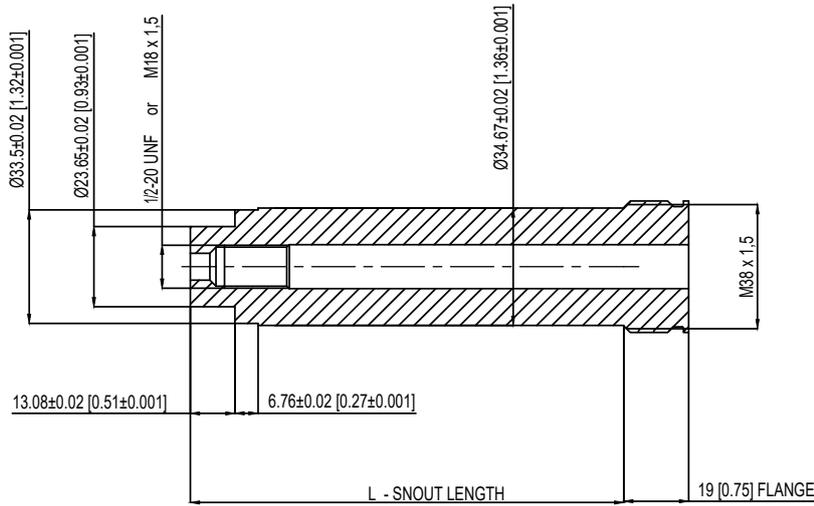
PROCESS FLANGE ADAPTER

The process flange adapter is a sensor accessory that allows for the installation of 1/2-20 UNF or M18x1.5 melt pressure sensor in a button seal style process mounting port. The adapter is made with an adapter body with different snout lengths plus an adapter flange available in different sizes (see tables and drawing below). Each combination of snout and flange is available according to the ordering information with a specific ordering code.

SPECIFICATIONS

- Pressure range: according to the selected sensor (up to 1000 bar/15000 psi max)
- Temperature range: according to the selected sensor
- Material of construction: 17-4PH Stainless steel

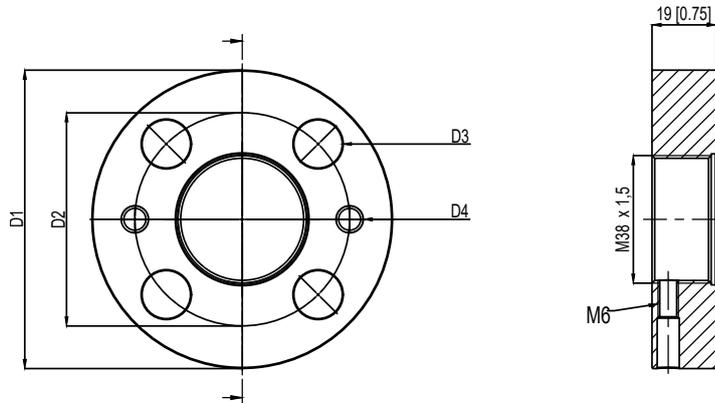
ADAPTER BODY



1/2-20 UNF	L - SNOOT LENGTH
STE1020	127 [5]
STE1021	51,6 [2,031]

M18 X 1,5	L - SNOOT LENGTH
STE1022	127 [5]
STE1023	51,6 [2,031]

ADAPTER FLANGE



	FLA960	FLA961
D1	82,6 [3,25]	88,9 [3,50]
D2	54 [2,14]	63,5 [2,50]
D3	13,2 [0,52]	14,3 [0,56]
D4	5/16-18 UNC	5/16-18 UNC

ORDER CODE

KIT - 5 - 0 - 1

Snout length	
5 inch [127 mm]	5
2,031 inch [51,6 mm]	2

Flange type (see technical drawing)	
FLA960	0
FLA961	1

Thread dimensions	
1/2-20 UNF	1
M18 x 1,5	4

ADAPTER GASKETS			
Material	Dimensions	Max Pressure	Ord. Code
Aluminium	30.2 mm [1.19"] OD 24.1 mm [.950"] ID	200 bar/3000 psi	RON360
AISI 303 SS	30.2 mm [1.19"] OD 24.1 mm [.950"] ID	700 bar/10000 psi	RON361

Example:

KIT501

Process adapter with 5" snout length, 82.6 mm size flange, suitable for 1/2-20 UNF melt sensor

