ENG

MELT PRESSURE SENSORS

GEFRAN

BEYOND TECHNOLOGY

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Over fifty years of experience, an organisation with a strong focus on the customer's needs and constant technological innovation have made Gefran a benchmark in the design and production of sensors, systems and components for industrial process automation and control. Expertise, flexibility and process quality are the factors that distinguish Gefran in the production of integrated tools and systems for specific applications in various industrial fields, with consolidated know-how in the plastics, mobile hydraulics, heating and lift sectors.

Technology, innovation and versatility represent the catalogue's added value, in addition to the ability to create specific application solutions in association with the world's leading machine manufacturers.

MELT PRESSURE
TRANSDUCERS AND TRANSMITTERS

The high temperature melt pressure transducer is an electronic device that transforms a physical variable (pressure) into an electrical signal (current or voltage or in Can Open, IO-LINK, HART), acquired by the various control, measurement and regulation devices.

GEFRAN melt sensors are pressure/temperature transducers and transmitters designed for use in environments that reach very high temperatures, capable of detecting average pressure up to 538 °C.

Based on two main construction technologies (with extensometric filling fluid technology or totally fluid free with silicon piezoresistive technology), Gefran high temperature pressure sensors are available in 4 different designs: rigid stem, flexible sheath, flexible with thermocouple and exposed capillary.

Their high immunity to electromagnetic interference allows these sensors to be installed in any operating environment.

The devices guarantee vast coverage of detectable pressures, from the minimum range with a scale of 0-17 bar up to a range of 0-3000 bar.

The available output signals are mV/V, 4-20mA, 0-10V, Gauge type, CANOpen, and IO-LINK. Atex and PLd and SIL 2 versions complete the range for the various architectures and applications present on the plastics converting machinery market.

The Melt sensor is ideal for applications in the polymer production and processing industry.

MELT PRESSURE IMPACT TRANSDUCERS

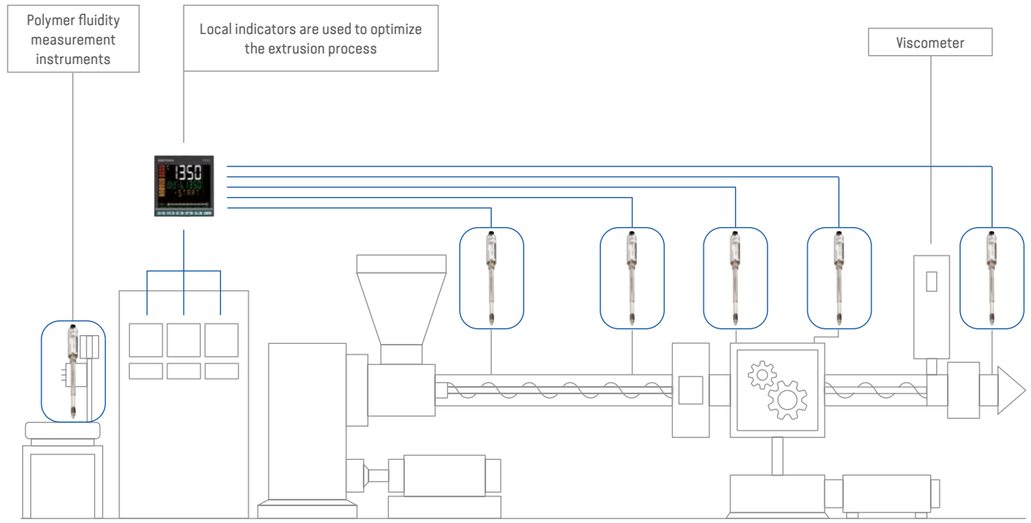
KEY ADVANTAGES OF USE
OF MELT PROBES

Use of melt probes is indispensable in extrusion processes as they contribute:

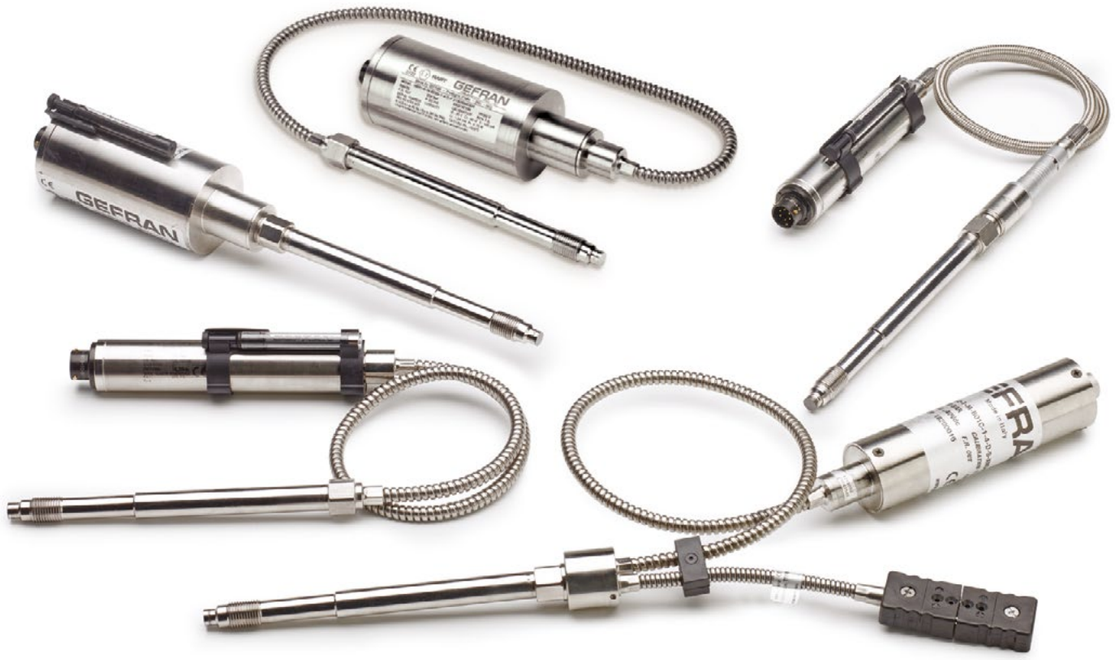
- To the safety of the system when used to prevent an uncontrolled rise in machine pressure.
- To improving the performance of production with their ability to keep flow-rate stable and optimal.

Melt sensors are normally used in pressure reading

- along the cylinder to check its performance during the development and design of the screw
- in the filter changer to check its cleanliness
- before and after the gear pump to keep the flow rate constant
- in the head for closed-loop pressure control.



Extrusion plant with the main locations of pressure measurement with melt probes



Gefran melt pressure probes in different mechanical versions with rigid or flexible stems and exposed capillaries permit suitable installation at the exact point where it is necessary to detect the pressure and temperature of the molten medium, both in traditional extrusion plants and in potentially explosive areas.

APPLICATION SECTORS

- POLYMER PRODUCTION
- EXTRUSION
- INJECTION
- INJECTION-BLOW MOULDING
- HOT MELT (GLUE DOSING)
- THERMODYNAMIC CONCENTRATED SOLAR POWER CSP INSTALLATIONS

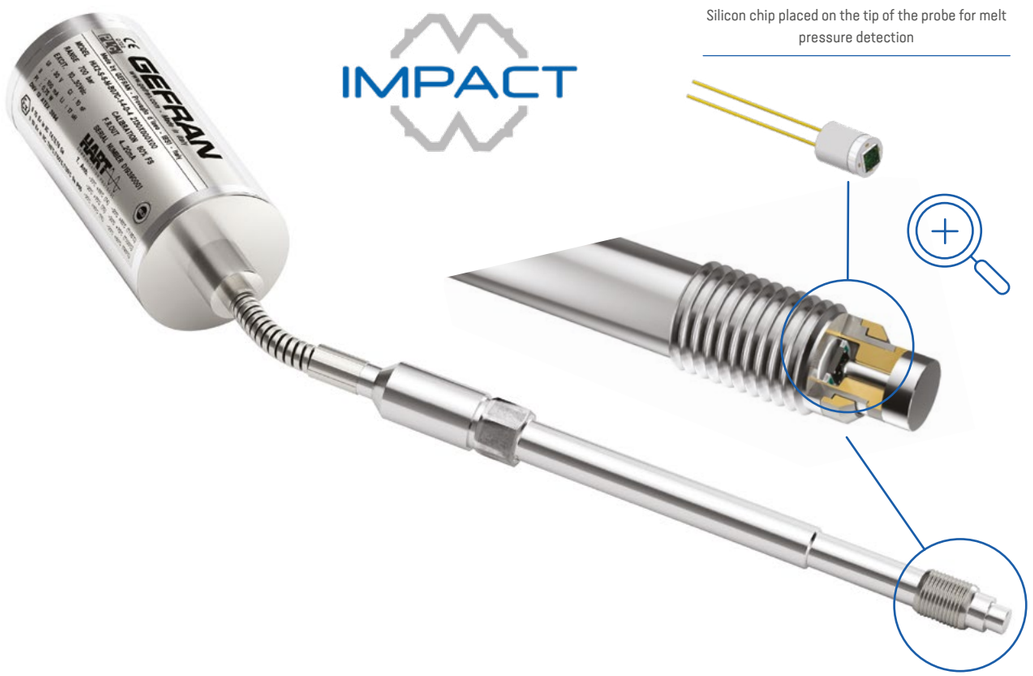
TECHNOLOGY

Gefran uses one of the most widespread and proven existing measurement principles, the so-called “Wheatstone Bridge”. There are a number of different technologies for making the sensitive element on the basis of this principle.

FULLY FLUID-FREE PIEZORESISTIVE TECHNOLOGY

The innovative IMPACT sensors (series I) are pressure transmitters, without transmission fluid, in which the medium pressure is transferred directly to the silicon sensing element through a thick membrane. The transduction of the physical stress is entrusted to a Wheatstone bridge made by means of 4 piezoresistors.
The IMPACT series, Gefran’s proprietary technology, is characterized by:

- Remarkable robustness (up to 15 times that of a conventional sensor)
- Notable response speed
- Extreme ease of installation thanks to the modularity of the sensor
- High safety standards (compliance with Machine Directives and RoHS)



THICK FILM ON STEEL WITH FILLING FLUID TECHNOLOGY

The operating principle is based on the hydraulic transmission of pressure by means of filling liquids with a low compressibility coefficient: sodium-potassium NaK mixture (K series), FDA approved diathermic oil (W series) and mercury (M series, available only in cases permitted by European Directive 2011/65/EU - RoHS II). The entire structure is therefore designed to transfer the pressure exerted by the medium on the contact diaphragm to the transduction part, i.e. the measuring diaphragm on which the strain gauge is located, taking care to keep it away from the heat source. The strain gauge then translates the pressure into an electrical signal.

Using the “screen printing process” technique, the insulating layers (dielectric), the conductive layer (cermet) and the resistive layer are deposited on the steel membrane to create the “Wheatstone bridge”.
The thickness of the membrane determines the measurement range, and the step-by-step transition from 200°C to 900°C makes the sensor extremely robust and reliable.

MERCURY-FREE SOLUTIONS

Sensitive to environmental issues, in full compliance with the RoHS directive, GEFRAN offers a wide range of mercury-free melt pressure sensors, both with filling fluid - oil (FDA approved) or NaK (GRAS substance) - and fluid-free (IMPACT).

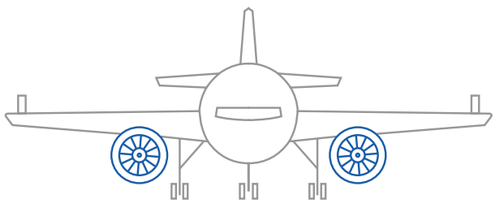
ATEX: INTRINSIC SAFETY

Gefran’s range of pressure sensors includes pressure transmitters in ATEX versions ideal for applications in potentially explosive atmospheres. ATEX Directive 2014/34/EU refers to electrical and mechanical equipment and protective systems that can be used in potentially explosive atmospheres (flammable gases, vapours and dusts), even under extreme conditions. The Melt series is certified II1G Ex ia IIC T4, T5 and T6.

MEMBRANE COATING IN CONTACT WITH GTP+

The innovative GTP+ coating, the result of Gefran's research, guarantees a longer life for Gefran melt pressure sensors thanks to:

- Great hardness
- Remarkable resistance to high temperatures
- Low friction coefficient



The GTP+ coating is used in turbines of jet engines, as this material is ideal to withstand high levels of temperature and pressure.

SIL2 & PERFORMANCE LEVEL 'd'

The entire range of melt pressure transmitters is available in an SIL2 & Performance Level 'd' version.

The advantages are concrete and immediately perceptible: higher safety levels for machines (compliance with the Machinery Directive and the extruder safety standard) and lower risks for operators.

The IMPACT series is also available in the SIL2 & PL'd' version, conforming to the safety requirements of the recent Machinery Directive and EN1114 specific to extruders.

IMPACT SIL2 & PL'd' is characterized by intelligent electronics with Auto Diagnostics properties capable of detecting possible faults. A relay integrated in the electronics changes status in the event of overpressures or exceeding the set threshold. The security level implemented is completed with full compliance with Namur recommendations NE21 and NE43.

PFD (Probability of failure following a request)	PFH (Probability of failure per hour)	SIL EN 61508 EN 62061	PL EN 13849-1	RISK REDUCTION FACTOR
10-2 < PFD < 10-1	10-6 < PFH < 10-5	1	B,C	10 TO 100
10-3 < PFD < 10-2	10-7 < PFH < 10-6	2	D	100 TO 1,000
10-4 < PFD < 10-3	10-8 < PFH < 10-7	3	AND	1000 TO 10,000

The concepts Safety Integrity Level (SIL) and Performance Level (PL) describe the ability of the control and command system to reduce the risk factor, in terms of safety.

SELF-COMPENSATION

Through the SP option, internal self-compensation, K/W/M series transmitters cancel the effect of pressure signal variation caused by melt temperature variation.

In this way, the reading error caused by heating of the filling fluid (typical in filled sensors) is reduced to a minimum.

In melt pressure probes with IMPACTtechnology, digital electronics can automatically compensate drift due to the thermal effect.

AUTOZERO & SPAN FUNCTION

All Gefran's amplified Melt Gefran pressure sensors (in the I/K/W/M series) are equipped with the Autozero function that eliminates signal variations linked to the thermal effect before putting the system under pressure.

The Autozero & Span function permits simple, effective adjustment of the pressure transducer zero and full scale using a magnetic pen.

Simply place the pen on the contact point identified by the symbol for a few seconds and the operationIS complete, with no need to open or disassemble the transducer.

GEFRAN
BEYOND TECHNOLOGY

WIDE RANGE OF PRODUCTS
ONE FOR EACH APPLICATION

	I IMPACT	K NAK	W OIL	M MERCURY
GTP+	•	•	•	•
AUTOZERO	•	•	•	•
SELF COMPENSATION	•	•	•	•
ATEX	•		•	•
IECEx	•		•	•
PAC	•		•	•
KOSHA	•		•	•
NEPSI	•		•	•
PESO	•		•	•
FM			•	•
MERCURY FREE	•	•	•	
FLUID FREE	•			
PERFORMANCE LEVEL 'C'	•	•	•	•
PL'd' SIL2	•	•	•	•
CANopen		•	•	•
IO-Link	•	•	•	•
HART	•	•	•	•

RIGID STEM

FLEXIBLE SHEATH

FLEXIBLE WITH THERMOCOUPLE

EXPOSED CAPILLARY

H	HART protocol	I	IMPACT	2	unamplified output 2.5 mV/V	0	rigid stem
IL	IO-Link digital output	K	NaK	3	unamplified output 3.33 mV/V	1	flexible sheath
		W	FDA oil	E	Current output 4...-20mA	2	flexible stem plus thermocouple
		M	mercurio*	N	voltage output 0-10V	3	exposed capillary
				D	digital output CAN-BUS DP404		
				5	output: GAUGE type analogue reading		
				6	output: GAUGE type digital reading		
				X	Atex for Built-in Safety		

* The M series (mercury filling) is available only in the cases permitted by European Directive 2011/65/EU - RoHS II

PRODUCTION OF POLYMERS

MELT PROBES WITH ADAPTERS AND FLANGES

Gefran also manufactures melt pressure probes with dedicated flanges, made to measure for plastic polymer production plants.

Gefran was the first company to create a probe for this sector complete with Atex and SIL2 or PLd certifications featuring the HART digital communication protocol, dedicated mechanical flanges and IMPACT fluid free technology.

HIX SERIES
ALL IN ONE!

DIGITAL COMMUNICATION IN IO-LINK

Digital solutions for the transmission of values measured in plastics production are becoming increasingly important. IO-Link is the worldwide standard for connecting sensors and actuators.

Thanks to this technology, melt probes with IO-Link output are able to measure not only the pressure but also the temperature of the extruded material, for example by storing the maximum pressure and temperature peaks and hours of operation under pressure. This allows the user to recognize in real time when the system is operating improperly or when the temperature of the point where the melt probe is installed has reached the permitted limit for production. The Gefran probe with IO-Link digital output version 1.1.3 completes this unique range, available in SIL2 or PLd certified versions with relay output, or, alternatively with analogue output scalable up to 1/3 of the full scale value.

SAFETY NORMS

IO-Link

4.0 READY

FLEXIBILITY | PRODUCTIVITY | CONNECTIVITY | EFFICIENCY | SAFETY

HOURS OF OPERATION

PRESSURE SETPOINT @ WORKING TEMPERATURE

SCALABLE PRESSURE RANGE

to 1/3 of nominal pressure range

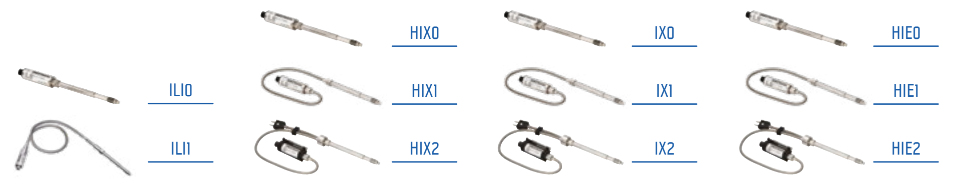
STORAGE OF MAXIMUM PRESSURE

STORAGE OF MAXIMUM TEMPERATURE

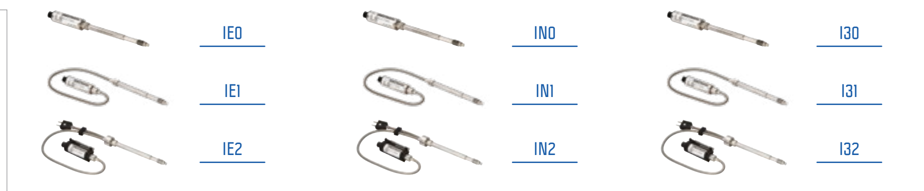
PRESSURES FROM 0...10 bar TO 0...2000 bar
PRESSURES FROM 0...150psi TO 30,000psi

FLUID-FREE IMPACT PRESSURE TRANSDUCERS

PRINCIPAL TECHNICAL PROPERTIES



IO-LINK OUTPUT HART+ATEX VERSION ATEX VERSION HART VERSION								
MODEL	IL PLd & SIL2		HIX HART + ATEX		IX ATEX		HIE HART	
FILLING FLUID	None		None		None		None	
MEASUREMENT RANGE (BAR) (PSI)	0...10bar a 0..1000bar 0...150psi a 0..15000psi		0...10bar a 0..1000bar 0...150psi a 0..15000psi		0...10bar a 0..1000bar 0...150psi a 0..15000psi		0...10bar a 0..1000bar 0...150psi a 0..15000psi	
PRECISION CLASS (%FSO)	(H) 0,25% (100...1000bar)	(M) 0,50%	(H) 0,25% (100...1000 bar)	(M) 0,50%	(H) 0,25% (100...1000 bar)	(M) 0,50%	(H) 0,25% (100...1000 bar)	(M) 0,50%
OVERPRESSURE WITHOU DEGRADATION (BAR) (PSI)	1.5 x FS (max. 1200 bar/17400 psi)		1.5 x FS (max. 1200 bar/17400 psi)		1.5 X FS (MAX. 1200 bar/17400 psi)		1.5 X FS (MAX. 1200 bar/17400 psi)	
MEASURING FLUID TEMPERATURE RANGE (°C)(°F)	-		-		-		-	
COMPENSATED AMBIENT TEMPERATURE RANGE (°C) (°F)	0… +85 °C 32… 185 °F		0… +85 °C 32… 185 °F"		0… +85 °C 32… 185 °F		0… +85 °C 32… 185 °F	
PERMISSIBLE AMBIENT TEMPERATURE RANGE (°C)(°F)	-30… +85°C -22… 185 °F		-20...+85°C -4...185°F		-30...+85°C -22...185°F		-30...+85°C -22...185°F	
THERMAL DRIFT IN THE ZERO COMPENSATED FIELD/CALIBRATION/SENSITIVITY	< ± 1%FS		< ± 1%FS		< ± 1%FS		< ± 1%FS	
STEM DRIFT (ZERO)	< ± 1,2%FS		< ± 1,2%FS		< ± 1,2%FS		< ± 1,2%FS	
SAMPLING TIME	2.7m sec: versions without integrated thermocouple 3.5m sec: version with integrated thermocouple		<= 8m sec		<= 8m sec		<= 8m sec	
MEASURING PRINCIPLE PROPERTIES	Thick film of sensitive element deposited on steel membrane		Thick film of sensitive element deposited on steel membrane		Thick film of sensitive element deposited on steel membrane		Thick film of sensitive element deposited on steel membrane	
TRANSDUCER BODY CONSTRUCTION MATERIALE	Electronic Case: AISI 304 STAINLESS STEEL / Stem: 17-4 PH		Electronic Case: AISI 304 STAINLESS STEEL / Stem: 17-4 PH		Electronic Case: AISI 304 STAINLESS STEEL / Stem: 17-4 PH		Electronic Case: AISI 304 STAINLESS STEEL / Stem: 17-4 PH	
STANDARD MATERIAL IN CONTACT WITH THE PROCESS	Membrane: 15-5 PH Coated in GTP+		Membrane: 15-5 PH Coated in GTP+		Membrane: 15-5 PH Coated in GTP+		Membrane: 15-5 PH Coated in GTP+	
PROCESS CONNECTIONS	1/2 - 20 UNF (1) M18 X 1.5 (4)		1/2 - 20 UNF (1) M18 X 1.5 (4)		1/2 - 20 UNF (1) M18 X 1.5 (4)		1/2 - 20 UNF (1) M18 X 1.5 (4)	
PROTECTION CLASS (IEC 529) (WITH FEMALE CONNECTOR MOUNTED)	IP65		IP65		IP65		IP65	
OUTPUT SIGNAL	IO-Link		Analogue/Digital		Analogue		Analogue	
TYPE OF OUTPUT SIGNAL	IO-Link Version 1.1 COM2 (38,4 kBaud)		4…20MA / HART		4…20mA		4…20mA	
POWER SUPPLY VOLTAGE (VDC)	18…30Vdc		13...30Vdc		10...30Vdc		10...30Vdc	
ELECTRICAL CONNECTIONS	5-pole connector M12 (5)		6-pin connector VPT07RA10-6PT (PT02A-10-6P) (6) 8-pin connector (PC02E-12-8P) (8)		6-pin connector VPT07RA10-6PT (PT02A-10-6P) (6) 8-pin connector (PC02E-12-8P) (8)		6-pin connector VPT07RA10-6PT (PT02A-10-6P) (6) 8-pin connector (PC02E-12-8P) (8)	
TEMPERATURE SENSOR	Version ILI0/ILI1 (type 'J' insulated joint thermocouple)		HIX2 HART + ATEX version (type 'J' insulated joint thermocouple)		IX2 ATEX version (type 'J' insulated joint thermocouple)		HIE2 HART version (type 'J' insulated joint thermocouple)	
MEASUREMENT RANGES	bar	psi	bar	psi	bar	psi	bar	psi
	10 B01D* 20 B02D 35 B35U 50 B05D 70 B07D 100 B01C 200 B02C 350 B35D 500 B05C 700 B07C 1000 B01M	150 P15D* 300 P03C 500 P05C 750 P75D 1000 P01M 1500 P15C 3000 P03M 5000 P05M 7500 P75C 10000 P10M 15000 P15M	10 B01D* 20 B02D* 35 B35U 50 B05D 70 B07D 100 B01C 200 B02C 350 B35D 500 B05C 700 B07C 1000 B01M	150 P15D* 300 P03C 500 P05C 750 P75D 1000 P01M 1500 P15C 3000 P03M 5000 P05M 7500 P75C 10000 P10M 15000 P15M	20 B02D* 35 B35U 50 B05D 70 B07D 100 B01C 200 B02C 350 B35D 500 B05C 700 B07C 1000 B01M	300 P03C 500 P05C 750 P75D 1000 P01M 1500 P15C 3000 P03M 5000 P05M 7500 P75C 10000 P10M 15000 P15M	20 B02D* 35 B35U 50 B05D 70 B07D 100 B01C 200 B02C 350 B35D 500 B05C 700 B07C 1000 B01M	300 P03C 500 P05C 750 P75D 1000 P01M 1500 P15C 3000 P03M 5000 P05M 7500 P75C 10000 P10M 15000 P15M
	* available for version M18x1.5 only		* available for version M18x1.5 only		* available for version M18x1.5 only		* available for version M18x1.5 only	
MAIN APPLICATIONS								

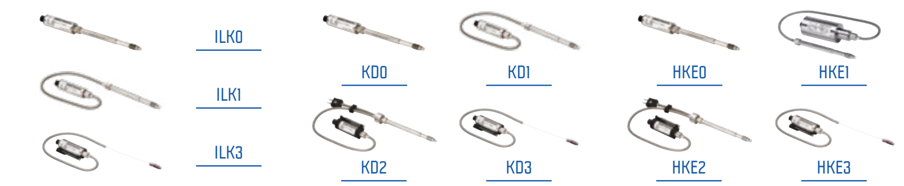


OUTPUT IN CURRENT OUTPUT IN VOLTAGE OUTPUT MV/V						
MODEL	IE PLc		IN / IN7 PLc		I3	
FILLING FLUID	None		None		None	
MEASUREMENT RANGE (BAR) (PSI)	0...10bar a 0..1000bar 0...150psi a 0..15000psi		0...10bar a 0..1000bar 0...150psi a 0..15000psi		0...10bar a 0..1000bar 0...150psi a 0..15000psi	
PRECISION CLASS (%FSO)	(H) 0,25% (100...1000bar)	(M) 0,50%	(H) 0,25% (100...1000bar)	(M) 0,50%	(H) 0,25% (100...1000 bar)	(M) 0,50%
OVERPRESSURE WITHOUT DEGRADATION (BAR) (PSI)	1.5 x FS (max. 1200 bar/17400 psi)		1.5 x FS (max. 1200 bar/17400 psi)		1.5 X FS (MAX. 1200 bar/17400 psi)	
MEASURING FLUID TEMPERATURE RANGE (°C)(°F)	-		-		-	
COMPENSATED AMBIENT TEMPERATURE RANGE (°C)(°F)	0… +85°C 32… 185°F		0… +85°C 32… 185°F		0… +85°C 32… 185°F	
PERMISSIBLE AMBIENT TEMPERATURE RANGE (°C)(°F)	-30...+85°C -22...185°F		-30...+85°C -22...185°F		-30...+85°C -22...185°F	
THERMAL DRIFT IN THE ZERO COMPENSATED FIELD/CALIBRATION/SENSITIVITY	< ± 1%FS		< ± 1%FS		< ± 1%FS	
STEM DRIFT (ZERO)	-20...+85°C -4...185°F		< ± 1,2%FS		< ± 1,2%FS	
SAMPLING TIME	<= 8msec		<= 8msec		<= 8msec	
MEASURING PRINCIPLE PROPERTIES	Thick film of sensitive element deposited on steel membrane		Thick film of sensitive element deposited on steel membrane		Thick film of sensitive element deposited on steel membrane	
TRANSDUCER BODY CONSTRUCTION MATERIAL	Electronic Case: • AISI 304 stainless steel Stem: • 17-4 PH"		Electronic Case: • AISI 304 stainless steel Stem: • 17-4 PH		Electronic Case: • AISI 304 stainless steel Stem: • 17-4 PH	
STANDARD MATERIAL IN CONTACT WITH THE PROCESS	Membrane: 15-5 PH - Coated in GTP+		Membrane: 15-5 PH - Coated in GTP+		Membrane: 15-5 PH - Coated in GTP+	
PROCESS CONNECTIONS	1/2 - 20 UNF (1) - M18 X 1.5 (4)		1/2 - 20 UNF (1) - M18 X 1.5 (4)		1/2 - 20 UNF (1) - M18 X 1.5 (4)	
PROTECTION CLASS (IEC 529) (WITH FEMALE CONNECTOR MOUNTED)	IP65		IP65		IP65	
OUTPUT SIGNAL	Analogue		Analogue		Analogue	
TYPE OF OUTPUT SIGNAL	4…20mA		0 .. 5VDC (M) 0 .. 10VDC (N) 0.1 .. 5.1VDC (B) 0.1 .. 10.1VDC (C) 0,5...10,5V (K7)		2.5 MV/V (2) 3.33MV/V (3)	
POWER SUPPLY VOLTAGE (VDC)	13...30Vdc		13...30Vdc		8...12Vdc	
ELECTRICAL CONNECTIONS	6-pin connector VPT07RA10-6PT (PT02A-10-6P) (6) 8-pin connector (PC02E-12-8P) (8)		6-pin connector VPT07RA10-6PT (PT02A-10-6P) (6) 8-pin connector (PC02E-12-8P) (8)		6-pin connector VPT07RA10-6PT (PT02A-10-6P) (6) 8-pin connector (PC02E-12-8P) (8)	
TEMPERATURE SENSOR	IE PLc Configuration 2		IN / IN7 Plc Configuration 2		Version I32 (type 'J' insulated joint thermocouple)	
MEASUREMENT RANGES	bar	psi	bar	psi	bar	psi
	10 B01D* 20 B02D 35 B35U 50 B05D 70 B07D 100 B01C 200 B02C 350 B35D 500 B05C 700 B07C 1000 B01M	150 P15D* 300 P03C 500 P05C 750 P75D 1000 P01M 1500 P15C 3000 P03M 5000 P05M 7500 P75C 10000 P10M 15000 P15M	10 B01D* 20 B02D 35 B35U 50 B05D 70 B07D 100 B01C 200 B02C 350 B35D 500 B05C 700 B07C 1000 B01M	150 P15D* 300 P03C 500 P05C 750 P75D 1000 P01M 1500 P15C 3000 P03M 5000 P05M 7500 P75C 10000 P10M 15000 P15M	10 B01D* 20 B02D 35 B35U 50 B05D 70 B07D 100 B01C 200 B02C 350 B35D 500 B05C 700 B07C 1000 B01M	150 P15D* 300 P03C 500 P05C 750 P75D 1000 P01M 1500 P15C 3000 P03M 5000 P05M 7500 P75C 10000 P10M 15000 P15M
	* available for version M18x1.5 only		* available for version M18x1.5 only		* available for version M18x1.5 only	
MAIN APPLICATIONS	Plastics extrusion Fibre extrusion		Plastics extrusion Mercury-free applications		Plastics extrusion - Mercury-free and/or HT polymer processing applications	

MELT PRESSURE TRANSDUCERS

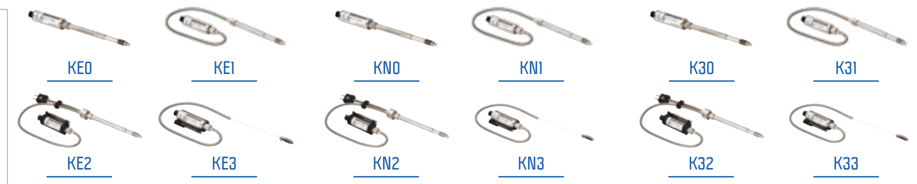
PRINCIPAL TECHNICAL PROPERTIES

FILLING WITH NAK (SODIUM POTASSIUM)



MODEL	ILK PLd & SIL2	KD	HKE HART Pld & SIL2
FILLING FLUID	NAK sodium-potassium	NAK sodium-potassium	NAK sodium-potassium
MEASUREMENT RANGE (BAR) (PSI)	0...17bar a 0..1000bar 0...250psi a 0..15000psi	0...35bar a 0..1000bar 0...250psi a 0..15000psi	0...17bar a 0..1000bar 0...250psi a 0..15000psi
PRECISION CLASS (%FS)	(H) 0,25% (100...1000 bar) (M) 0,50%	(H) 0,25% (100...1000 bar) (M) 0,50%	(H) 0,25% (100...1000 bar) (M) 0,50%
OVERPRESSURE WITHOUT DEGRADATION (BAR) (PSI)	2 x FS 1.5 x FS over 700 bar / 10000 psi	2 x FS 1.5 x FS over 700 bar / 10000 psi	2 x FS 1.5 x FS over 700 bar / 10000 psi
MEASURING FLUID TEMPERATURE RANGE (°C)(°F)	538°C 1000°F	538°C 1000°F	538°C 1000°F
COMPENSATED AMBIENT TEMPERATURE RANGE (°C)(°F)	0... +85°C 32... +185°F	0... +85°C 32... +185°F	0... +85°C 32... +185°F
PERMISSIBLE AMBIENT TEMPERATURE RANGE (°C)(°F)	-30... +85°C -22... 185 °F	-30...105°C -22....221°F	-30...85°C -22....185°F
THERMAL DRIFT IN THE ZERO COMPENSATED FIELD/CALIBRATION/SENSITIVITY	< 0,02 %FS/°C	< 0,02 %FS/°C	< 0,02% FS/°C
STEM DRIFT (ZERO)	< 3,5 bar/100 °C - < 28 psi/100 °F	< 3,5 bar/100 °C - < 28 psi/100 °F	< 3,5 bar/100 °C - < 28 psi/100 °F
RESPONSE TIME	2.7msec: versions without integrated thermocouple 3.5msec: version with integrated thermocouple	≤ 1msec	≤ 1msec
MEASURING PRINCIPLE PROPERTIES	Thick film of sensitive element deposited on steel membrane	Thick film of sensitive element deposited on steel membrane	Thick film of sensitive element deposited on steel membrane
TRANSDUCER BODY CONSTRUCTION MATERIAL	Electronic Case: • AISI 304 stainless steel Stem: • 17-4 PH	Electronic Case: • AISI 304 stainless steel Stem: • 17-4 PH	Electronic Case: • AISI 304 stainless steel Stem: • 17-4 PH
STANDARD MATERIAL IN CONTACT WITH THE PROCESS	Membrane: • 15-5PH with GTP+ coating • 17-7PH corrugated with GTP+ coating for range<100bar(1500psi)	Membrane: • 15-5PH with GTP+ coating • 17-7PH corrugated with GTP+ coating for range<100bar(1500psi)	Membrane: • 15-5PH with GTP+ coating • 17-7PH corrugated with GTP+ coating for range<100bar(1500psi)
PROCESS CONNECTIONS	1/2 - 20 UNF (1) - M18 X 1.5 (4)	1/2 - 20 UNF (1) - M18 X 1.5 (4)	1/2 - 20 UNF (1) - M18 X 1.5 (4)
PROTECTION CLASS (IEC 529) (WITH FEMALE CONNECTOR MOUNTED)	IP65	IP65	IP65
OUTPUT SIGNAL	IO - Link	CAN Open	Analogue / Digital
TYPE OF OUTPUT SIGNAL	IO-Link Version 1.1 COM2 (38.4 kBaud)	Device Profile DP404, with selectable baud rate from 10K to 1M baud (default 500K baud)	4...20MA / HART
POWER SUPPLY VOLTAGE (VDC)	18...30Vdc	12...40Vdc	13... 30 Vdc
ELECTRICAL CONNECTIONS	5-pole connector M12 (5)	5-pole connector M12 (5)	6-pin connector VPT07RA10-6PT2 (PT02A-10-6P) 8-pin connector (PC02E-12-8P) Bendix
TEMPERATURE SENSOR	ILK0/ILK1 version (type 'J' insulated joint thermocouple) ILK3 version with unavailable exposed capillary thermocouple	Version KD2 (type 'J' insulated joint thermocouple)	Version HKE2 HART+Plc (type 'J' insulated joint thermocouple)
MEASUREMENT RANGES	bar: 17 B17U 35 B35U 50 B05D 70 B07D 100 B01C 200 B02C 350 B35D 500 B05C 700 B07C 1000 B01M psi: 250 P25D 500 P05C 750 P75D 1000 P01M 1500 P15C 3000 P03M 5000 P05M 7500 P75C 10000 P10M 15000 P15M	bar: 35 B35U 50 B05D 70 B07D 100 B01C 200 B02C 350 B35D 500 B05C 700 B07C 1000 B01M psi: 500 P05C 750 P75D 1000 P01M 1500 P15C 3000 P03M 5000 P05M 7500 P75C 10000 P10M 15000 P15M	bar: 17 B17U 35 B35U 50 B05D 70 B07D 100 B01C 200 B02C 350 B35D 500 B05C 700 B07C 1000 B01M psi: 250 P25D 500 P05C 750 P75D 1000 P01M 1500 P15C 3000 P03M 5000 P05M 7500 P75C 10000 P10M 15000 P15M
MAIN APPLICATIONS	Plastics extrusion - Mercury-free and/or HT polymer processing applications	Plastics extrusion - Mercury-free and/or HT polymer processing applications	Plastics extrusion - Mercury-free and/or HT polymer processing applications Solar thermodynamic energy CSP applications
	IO-Link, SIL2, PL'd'	CANopen	ANALOGUE, SIL2, HART, PL'd'

FILLING WITH NAK (SODIUM POTASSIUM)

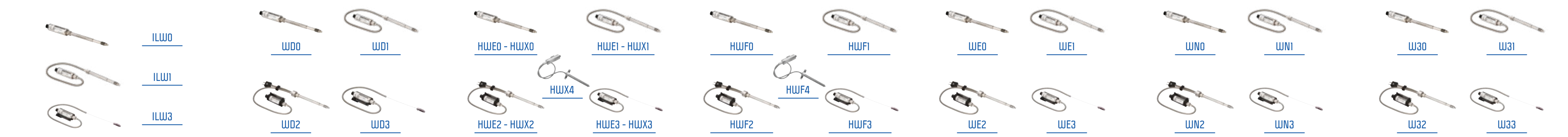


MODEL	KE / KE Plc & SIL2	KN / K7 PLc & SIL2	K3
FILLING FLUID	NAK sodium-potassium	NAK sodium-potassium	NAK sodium-potassium
MEASUREMENT RANGE (BAR) (PSI)	0...17bar a 0..1000bar 0...250psi a 0..15000psi	0...17bar a 0..1000bar 0...250psi a 0..15000psi	0...17bar a 0..1000bar 0...250psi a 0..15000psi
PRECISION CLASS (%FS)	(H) 0,25% (100...1000 bar)" (M) 0,50%	(H) 0,25% (100...1000 bar) (M) 0,50%	(H) 0,25% (100...1000 bar) (M) 0,50%
OVERPRESSURE WITHOUT DEGRADATION (BAR) (PSI)	2 x FS 1.5 x FS over700 bar / 10000 psi	2 x FS 1.5 x FS over 700 bar / 10000 psi	2 x FS 1.5 x FS over 700 bar / 10000 psi
MEASURING FLUID TEMPERATURE RANGE (°C)(°F)	538°C 1000°F	538°C 1000°F	538°C 1000°F
COMPENSATED AMBIENT TEMPERATURE RANGE (°C)(°F)	0... +85°C 32... +185°F	0... +85°C 32... +185°F	0...+100°C 32...212°F
PERMISSIBLE AMBIENT TEMPERATURE RANGE (°C)(°F)	-30... +105°C -22... 221 °F	-30... +105°C -22... 221 °F	30...+120°C -22...250°F
THERMAL DRIFT IN THE ZERO COMPENSATED FIELD/CALIBRATION/SENSITIVITY	< 0,02% FS/°C	< 0,02% FS/°C	< 0.02% FS/°C < 0.01% FS/°F
STEM DRIFT (ZERO)	< 3,5 bar/100 °C < 28 psi/100 °F	< 3,5 bar/100 °C < 28 psi/100 °F	< 3,5 bar/100°C < 28 psi/100°F
RESPONSE TIME	<= 1msec	<= 1msec	<= 1msec
MEASURING PRINCIPLE PROPERTIES	Thick film of sensitive element deposited on steel membrane	Thick film of sensitive element deposited on steel membrane	Thick film of sensitive element deposited on steel membrane
TRANSDUCER BODY CONSTRUCTION MATERIAL	Electronic Case: • AISI 304 stainless steel Stem: • 17-4 PH	Electronic Case: • AISI 304 stainless steel Stem: • 17-4 PH	Electronic Case: • AISI 304 stainless steel Stem: • 17-4 PH
STANDARD MATERIAL IN CONTACT WITH THE PROCESS	Membrane: • 15-5PH with GTP+ coating • 17-7PH corrugated with GTP+ coating for range<100bar(1500psi)	Membrane: • 15-5PH with GTP+ coating • 17-7PH corrugated with GTP+ coating for range<100bar(1500psi)	Membrane: • 15-5PH with GTP+ coating • 17-7PH corrugated with GTP+ coating for range<100bar(1500psi)
PROCESS CONNECTIONS	1/2 - 20 UNF (1) - M18 X 1.5 (4)	1/2 - 20 UNF (1) - M18 X 1.5 (4)	1/2 - 20 UNF (1) - M18 X 1.5 (4)
PROTECTION CLASS (IEC 529) (WITH FEMALE CONNECTOR MOUNTED)	IP65	IP65	IP65
OUTPUT SIGNAL	Analogue	Analogue	Analogue
TYPE OF OUTPUT SIGNAL	4...20mA	0 ... 5Vdc (M) - 0 .. 10Vdc (N) 0.1 .. 5.1Vdc (B) - 0.1 .. 10.1Vdc (C) 0 .. 5Vdc (power supply -15...+15Vdc) (H) 0 .. 10Vdc (power supply -15...+15Vdc) (L) 0.5...10.5V (K7)	2.5 mV/V (2) 3.33mV/V (3)
POWER SUPPLY VOLTAGE (VDC)	10... 30 Vdc	15...30Vdc (N), (C) 10...30Vdc (B), (M) -15....+15Vdc (H), (L)	6...12Vdc (typically 10Vdc)
ELECTRICAL CONNECTIONS	6 pin connector VPT07RA10-6PT2 (PT02A-10-6P) 8 pin connector (PC02E-12-8P) Bendix	6-pin connector VPT07RA10-6PT (PT02A-10-6P) (6) 8-pin connector PC02E-12-8P (8)	6-pin connector VPT07RA10-6PT (PT02A-10-6P) (6) 8-pin connector PC02E-12-8P (8)
TEMPERATURE SENSOR	Version HKE2 Plc (type 'J' insulated joint thermocouple)	Version KN2 / K72 Plc (type 'J' insulated joint thermocouple)	Version K32 (type 'J' insulated joint thermocouple)
MEASUREMENT RANGES	bar: 17 B17U 35 B35U 50 B05D 70 B07D 100 B01C 200 B02C 350 B35D 500 B05C 700 B07C 1000 B01M psi: 250 P25D 500 P05C 750 P75D 1000 P01M 1500 P15C 3000 P03M 5000 P05M 7500 P75C 10000 P10M 15000 P15M	bar: 17 B17U 35 B35U 50 B05D 70 B07D 100 B01C 200 B02C 350 B35D 500 B05C 700 B07C 1000 B01M psi: 250 P25D 500 P05C 750 P75D 1000 P01M 1500 P15C 3000 P03M 5000 P05M 7500 P75C 10000 P10M 15000 P15M	bar: 17 B17U 35 B35U 50 B05D 70 B07D 100 B01C 200 B02C 350 B35D 500 B05C 700 B07C 1000 B01M psi: 250 P25D 500 P05C 750 P75D 1000 P01M 1500 P15C 3000 P03M 5000 P05M 7500 P75C 10000 P10M 15000 P15M
MAIN APPLICATIONS	Plastics extrusion - Mercury-free and/or HT polymer processing applications	Plastics extrusion - Mercury-free and/or HT polymer processing applications	Plastics extrusion - Mercury-free and/or HT polymer processing applications
	ANALOGUE, SIL2, PL'c'	ANALOGUE, SIL2, PL'c'	

MELT PRESSURE TRANSDUCERS

PRINCIPAL TECHNICAL PROPERTIES

FILLING WITH DIATHERMIC OIL



MODEL	ILW PLd & SIL2	WD	HWE HART+ Pld & SIL2 HWX HART + ATEX + Pld & SIL2	HWF HART	WE / WE Plc & SIL2	WN / W7 Plc & SIL2	W3
FILLING FLUID	Diathermic oil (FDA approved) FDACFR 178.3620 and CFR 172.878	Diathermic oil (FDA approved) FDACFR 178.3620 and CFR 172.878	Diathermic oil (FDA approved FDA) CFR 178.3620 and CFR 172.878	Diathermic oil (FDA approved FDA) CFR 178.3620 e CFR 172.878	Diathermic oil (FDA approved) FDACFR 178.3620 and CFR 172.878	Diathermic oil (FDA approved) FDACFR 178.3620 and CFR 172.878	Diathermic oil (FDA approved) FDACFR 178.3620 and CFR 172.878
MEASUREMENT RANGE (BAR) (PSI)	0...17bar a 0..1000bar 0...250psi a 0..15000psi	0...35bar a 0..1000bar 0...250psi a 0..15000psi	0...17bar a 0..1000bar 0...250psi a 0..15000psi	0...17bar a 0..1000bar 0...250psi a 0..15000psi	0...17bar a 0..1000bar 0...250psi a 0..15000psi	0...17bar a 0..1000bar 0...250psi a 0..15000psi	0...17bar a 0..1000bar 0...250psi a 0..15000psi
PRECISION CLASS (%FSO)	(H) 0,25% (100...1000 bar) | (M) 0,50%	(H) 0,25% (100...1000 bar) | (M) 0,50%	(H) 0,25% (100...1000 bar) | (M) 0,50%	(H) 0,25% (100...1000 bar) | (M) 0,50%	(H) 0,25% (100...1000 bar) | (M) 0,50%	(H) 0,25% (100...1000 bar) | (M) 0,50%	(H) 0,25% (350...1000bar) | (M) 0,50%
OVERPRESSURE WITHOUT DEGRADATION (BAR) (PSI)	2 x FS 1.5 x FS over 700 bar / 10000 psi	2 x FS	2 x FS 1.5 x FS over 500 bar / 7500 psi	2 x FS 1.5 x FS over 500 bar / 7500 psi	2 x FS 1.5 x FS over 500 bar / 7500 psi	2 x FS 1.5 x FS over 500 bar / 7500 psi	2 x FS 1.5 x FS over 500bar/7500psi
MEASURING FLUID TEMPERATURE RANGE (°C)(°F)	315°C 600°F	315°C 600°F	315°C 600°F	315°C 600°F	315°C 600°F	315°C 600°F	315°C 600°F
COMPENSATED AMBIENT TEMPERATURE RANGE (°C)(°F)	0... +85 °C 32... 185 °F	0... +85 °C 32... 185 °F	0... +85 °C 32... 185 °F	0... +85 °C 32... 185 °F	0... +85 °C 32... 185 °F	0... +85 °C 32... 185 °F	0... +85 °C 32... 185 °F
PERMISSIBLE AMBIENT TEMPERATURE RANGE (°C)(°F)	-30... +85°C -22... 185 °F	-30... +125°C -22... 255 °F	-30... +105°C -22... 221 °F	-30... +105°C -22... 221 °F	-30... +105°C -22... 221 °F	-30... +105°C -22... 221 °F	30...+120°C -22...250°F
THERMAL DRIFT IN THE ZERO COMPENSATED FIELD/CALIBRATION/SENSITIVITY	< 0,02 %FS/°C < 0,01 %FS/°F	< 0,02 %FS/°C < 0,01 %FS/°F	< 0,02 %FS/°C < 0,01 %FS/°F	< 0,02 %FS/°C < 0,01 %FS/°F	< 0,02 %FS/°C < 0,01 %FS/°F	< 0,02 %FS/°C < 0,01 %FS/°F	4 bar/100 °C 30 psi/100 °F
STEM DRIFT (ZERO)	< 4 bar/100 °C < 32 psi/100 °F	< 4 bar/100 °C < 32 psi/100 °F	< 4 bar/100 °C < 32 psi/100°F	< 4 bar/100 °C < 32 psi/100 °F	< 4 bar/100 °C < 32 psi/100 °F	< 4 bar/100 °C < 32 psi/100 °F	< 4 bar/100 °C < 32 psi/100 °F
RESPONSE TIME	2.7msec: versions without integrated thermocouple 3.5msec: version with integrated thermocouple	≤ 1msec	≤ 1msec	<= 1msec	<= 1msec	<= 1msec	<= 1msec
MEASURING PRINCIPLE PROPERTIES	Thick film of sensitive element deposited on steel membrane	Thick film of sensitive element deposited on steel membrane	Thick film of sensitive element deposited on steel membrane	Thick film of sensitive element deposited on steel membrane	Thick film of sensitive element deposited on steel membrane	Thick film of sensitive element deposited on steel membrane	Thick film of sensitive element deposited on steel membrane
TRANSDUCER BODY CONSTRUCTION MATERIAL	Electronic Case: · AISI 304 STAINLESS STEEL Stem:· 17-4 PH	Electronic Case: · AISI 304 stainless steel Stem: · 17-4 PH	Electronic Case: · AISI 304 stainless steel Stem: · 17-4 PH	Electronic Case: · AISI 304 stainless steel Stem: · 17-4 PH	Electronic Case: · AISI 304 stainless steel Stem: · 17-4 PH	Electronic Case: · AISI 304 stainless steel Stem: · 17-4 PH	Electronic Case: · AISI 304 stainless steel Stem: · 17-4 PH
STANDARD MATERIAL IN CONTACT WITH THE PROCESS	Membrane: · 17-7 PH corrugated with GTP+ coating	Membrane: · 17-7 PH corrugated with GTP+ coating	Membrane: · 17-7 PH corrugated with GTP+ coating	Membrane: · 17-7 PH corrugated with GTP+ coating	Membrane: · 17-7 PH corrugated with GTP+ coating	Membrane: · 17-7 PH corrugated with GTP+ coating	Membrane: · 17-7 PH corrugated with GTP+ coating
PROCESS CONNECTIONS	1/2 - 20 UNF (1) - M18 x 1.5 (4)	1/2 - 20 UNF (1) - M18 x 1.5 (4)	1/2 - 20 UNF (1) - M18 x 1.5 (4)	1/2 - 20 UNF (1) - M18 x 1.5 (4)	1/2 - 20 UNF (1) - M18 x 1.5 (4)	1/2 - 20 UNF (1) - M18 x 1.5 (4)	1/2 - 20 UNF (1) - M18 x 1.5 (4)
PROTECTION CLASS (IEC 529) (WITH FEMALE CONNECTOR MOUNTED)	IP65	IP65	IP65	IP65	IP65	IP65	IP65
OUTPUT SIGNAL	IO - Link	CAN Open	Analogue/Digital	Analogue	Analogue	Analogue	Analogue
TYPE OF OUTPUT SIGNAL	IO-Link Version 1.1 COM2 (38.4 kBaud)	Device Profile DP404, with selectable baud rate from 10K to 1M baud (default 500K baud)	4...20mA / Hart	4...20mA	4...20mA	0 .. 5Vdc (M) - 0 .. 10Vdc (N) 0.1 .. 5.1Vdc (B) - 0.1 .. 10.1Vdc (C) 0 .. 5Vdc (alimentaz. -15...+15Vdc) (H) 0 .. 10Vdc (alimentaz. -15...+15Vdc) (L) 0,5...10,5V (K7)	2.5 mV/V (2) 3.33mV/V (3)
POWER SUPPLY VOLTAGE (VDC)	18...30Vdc	12...40Vdc	13... 30 Vdc	13....30Vdc	10... 30 Vdc	15...30Vdc (N), (C) - 10...30Vdc (B), (M) -15....+15Vdc (H), (L)	6...12Vdc(10Vdc tipico)
ELECTRICAL CONNECTIONS	5-pole connector M12 (5)	5-pole connector M12 (5)	6 Pin Connector - VPT07RA10-6PT2 (PT02A-10-6P) 8 Pin Connector (PC02E-12-8P) Bendix	Cable NPT	6 Pin Connector - VPT07RA10-6PT2 (PT02A-10-6P) / 8 Pin Connector (PC02E-12-8P) Bendix	6-pin connector VPT07RA10-6PT (PT02A-10-6P) (6) 8-pin connector PC02E-12-8P (8)	6-pin connector VPT07RA10-6PT (PT02A-10-6P) (6) 8-pin connector PC02E-12-8P (8)
TEMPERATURE SENSOR	Version ILW0/ILW1 (type 'J' insulated joint thermocouple) ILW3 version with unavailable exposed capillary thermocouple	Version WD2 (type 'J' insulated joint thermocouple)	HWE2 HART+PLd & SIL2 versions HWX2 HART+ATEX+PLd & SIL2 (type 'J' insulated joint thermocouple)	-	WE2 / WE2 PLc versions (type 'J' insulated joint thermocouple)	WN2 / W72 PLc versions (type 'J' insulated joint thermocouple)	Version W32 (type 'J' insulated joint thermocouple)

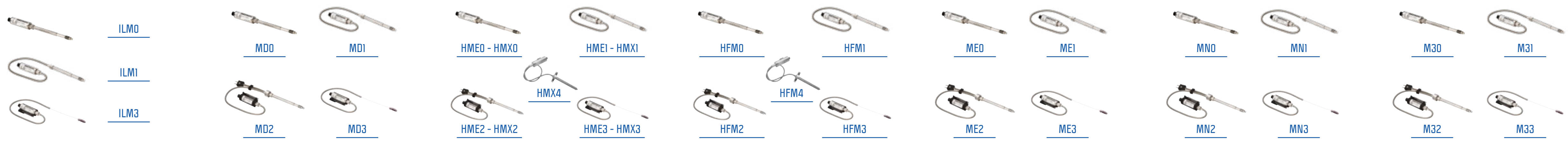
MEASUREMENT RANGES	ILW bar	ILW psi	WD bar	WD psi	HWE/HWX bar	HWE/HWX psi	HWF bar	HWF psi	WE bar	WE psi	WN bar	WN psi	W3 bar	W3 psi
	17 B17U 35 B35U 50 B05D 70 B07D 100 B01C 200 B02C 350 B35D 500 B05C 700 B07C 1000 B01M	250 P25D 500 P05C 750 P75D 1000 P01M 1500 P15C 3000 P03M 5000 P05M 7500 P75C 10000 P10M 15000 P15M	35 B35U 50 B05D 70 B07D 100 B01C 200 B02C 350 B35D 500 B05C 700 B07C 1000 B01M	500 P05C 750 P75D 1000 P01M 1500 P15C 3000 P03M 5000 P05M 7500 P75C 10000 P10M 15000 P15M	17 B17U 35 B35U 50 B05D 70 B07D 100 B01C 200 B02C 350 B35D 500 B05C 700 B07C 1000 B01M	250 P25D 500 P05C 750 P75D 1000 P01M 1500 P15C 3000 P03M 5000 P05M 7500 P75C 10000 P10M 15000 P15M	17 B17U 35 B35U 50 B05D 70 B07D 100 B01C 200 B02C 350 B35D 500 B05C 700 B07C 1000 B01M	250 P25D 500 P05C 750 P75D 1000 P01M 1500 P15C 3000 P03M 5000 P05M 7500 P75C 10000 P10M 15000 P15M	17 B17U 35 B35U 50 B05D 70 B07D 100 B01C 200 B02C 350 B35D 500 B05C 700 B07C 1000 B01M	250 P25D 500 P05C 750 P75D 1000 P01M 1500 P15C 3000 P03M 5000 P05M 7500 P75C 10000 P10M 15000 P15M	17 B17U 35 B35U 50 B05D 70 B07D 100 B01C 200 B02C 350 B35D 500 B05C 700 B07C 1000 B01M	250 P25D 500 P05C 750 P75D 1000 P01M 1500 P15C 3000 P03M 5000 P05M 7500 P75C 10000 P10M 15000 P15M	17 B17U 35 B35U 50 B05D 70 B07D 100 B01C 200 B02C 350 B35D 500 B05C 700 B07C 1000 B01M	250 P25D 500 P05C 750 P75D 1000 P01M 1500 P15C 3000 P03M 5000 P05M 7500 P75C 10000 P10M 15000 P15M

MAIN APPLICATIONS	ILW	WD	HWE / HWX	HWF	WE	WN / W7	W3
	Plastics extrusion Mercury-free applications in the food sector	Plastics extrusion - Mercury-free applications in the food sector - Hot Melt applications	Plastics extrusion Mercury-free applications in the food sector	Plastics extrusion Mercury-free applications in the food sector	Plastics extrusion Mercury-free applications in the food sector	Plastics extrusion Mercury-free applications in the food sector	Plastics extrusion Mercury-free applications in the food sector

MELT PRESSURE TRANSDUCERS

PRINCIPAL TECHNICAL PROPERTIES

RIEMPIMENTO CON MERCURIO



MODEL	ILM PLd & SIL2	MD	HME HART PLd & SIL2 HMX HART ATEX PLd & SIL2	HMF HART
FILLING FLUID	Mercury	Mercury	Mercury	Mercury
MEASUREMENT RANGE (BAR) (PSI)	0…17bar a 0..2000bar 0…250psi a 0..30000psi	0…35bar a 0..2000bar 0…250psi a 0..30000psi	0…17bar a 0…2000bar 0…250psi a 0…30000psi	0…17bar a 0…1000bar 0…250psi a 0…15000psi
PRECISION CLASS (%FS)	(H) 0,25% (100…2000 bar) / (M) 0,50%	(H) 0,25% (100…2000 bar) / (M) 0,50%	(H) 0,25% (100…2000 bar) / (M) 0,50%	(H) 0,25% (100…1000 bar) / (M) 0,50%
OVERPRESSURE WITHOUT DEGRADATION (BAR) (PSI)	2 x FS 1.5 x FS over 700 bar / 10000 psi	2 x FS 1.5 x FS over 1000 bar / 15000 psi	2 x FS 1.5 x FS over 1000 bar / 15000 psi	2 x FS
MEASURING FLUID TEMPERATURE RANGE (°C)(°F)	400°C 750°F	400°C 750°F	400°C 750°F	400°C 750°F
COMPENSATED AMBIENT TEMPERATURE RANGE (°C)(°F)	0… +85 °C 32… 185 °F	0… +85 °C 32… 185 °F	0… +85 °C 32… 185 °F	0… +85 °C 32… 185 °F
PERMISSIBLE AMBIENT TEMPERATURE RANGE (°C)(°F)	-30… +85°C -22… 185 °F	-30…105 °C -22….221 °F	-30…85 °C -22…185 °F	-30…85 °C -22….185 °F
THERMAL DRIFT IN THE ZERO COMPENSATED FIELD/CALIBRATION/SENSITIVITY	< 0,02 %FS/°C < 0,01 %FS/°F	< 0,02 %FS/°C < 0,01 %FS/°F	< 0,02 %FS/°C < 0,01 %FS/°F	< 0,02 %FS/°C < 0,01 %FS/°F
STEM DRIFT (ZERO)	< 2 bar/100 °C < 16 psi/100 °F	< 2 bar/100 °C < 16 psi/100 °F	< 2 bar/100 °C < 16 psi/100 °F	< 2 bar/100 °C < 16 psi/100 °F
RESPONSE TIME	2.7msec: versions without integrated thermocouple 3.5msec: version with integrated thermocouple	≤ 1msec	≤ 1msec	<= 1msec
MEASURING PRINCIPLE PROPERTIES	Thick film of sensitive element deposited on steel membrane	Thick film of sensitive element deposited on steel membrane	Thick film of sensitive element deposited on steel membrane	Thick film of sensitive element deposited on steel membrane
TRANSDUCER BODY CONSTRUCTION MATERIAL	Electronic Case: • AISI 304 stainless steel Stem: • 17-4 PH	Electronic Case: • AISI 304 stainless steel Stem: • 17-4 PH	Electronic Case: • AISI 304 stainless steel Stem: • 17-4 PH	Electronic Case: • AISI 304 stainless steel Stem: • 17-4 PH
STANDARD MATERIAL IN CONTACT WITH THE PROCESS	Membrane: • 15-5PH with GTP+ coating • 17-7PH corrugated with GTP+ coating for range<100bar(1500psi)	Membrane: • 15-5PH with GTP+ coating • 17-7PH corrugated with GTP+ coating for range<100bar(1500psi)	Membrane: • 15-5PH with GTP+ coating • 17-7PH corrugated with GTP+ coating for range<100bar(1500psi)	Membrane: • 15-5PH with GTP+ coating • 17-7PH corrugated with GTP+ coating for range<100bar(1500psi)
PROCESS CONNECTIONS	1/2 - 20 UNF (1) - M18 x 1.5 (4)	1/2 - 20 UNF (1) - M18 x 1.5 (4)	1/2 - 20 UNF (1) - M18 x 1.5 (4)	1/2 - 20 UNF (1) - M18 x 1.5 (4)
PROTECTION CLASS (IEC 529) (WITH FEMALE CONNECTOR MOUNTED)	IP65	IP65	IP65	IP65
OUTPUT SIGNAL	IO - Link	CAN Open	Analogue / Digital	Analogue / Digital
TYPE OF OUTPUT SIGNAL	IO-Link Version 1.1 COM2 (38.4 kBaud)	Device Profile DP404, with selectable baud rate from 10K to 1M baud (default 500K baud)	4…20mA / Hart	4…20mA / Hart
POWER SUPPLY VOLTAGE (VDC)	18…30Vdc	12…40Vdc	13… 30 Vdc	13… 30 Vdc
ELECTRICAL CONNECTIONS	5-pole connector M12 (5)	5-pole connector M12 (5)	6 Pin Connector - VPT07RA10-6PT2 (PT02A-10-6P) 8 Pin Connector (PC02E-12-8P) Bendix	Cable NPT
TEMPERATURE SENSOR	Version ILM0/ILM1 (type 'J' insulated joint thermocouple) Version ILM3 with unavailable exposed capillary thermocouple	Version MD2 ('J' type insulated joint thermocouple)	HME2 HART PLd & SIL2 versions HMX2 HART PLd & SIL2 (type 'J' insulated joint thermocouple)	-
MEASUREMENT RANGES	bar: 17 B17U, 35 B35U, 50 B05D, 70 B07D, 100 B01C, 200 B02C, 350 B35D, 500 B05C, 700 B07C, 1000 B01M, 1400 B14C, 2000 B02M psi: 250 P25D, 500 P05C, 750 P75D, 1000 P01M, 1500 P15C, 3000 P03M, 5000 P05M, 7500 P75C, 10000 P10M, 15000 P15M, 20000 P20M, 30000 P30M	bar: 35 B35U, 50 B05D, 70 B07D, 100 B01C, 200 B02C, 350 B35D, 500 B05C, 700 B07C, 1000 B01M, 1400 B14C, 2000 B02M psi: 500 P05C, 750 P75D, 1000 P01M, 1500 P15C, 3000 P03M, 5000 P05M, 7500 P75C, 10000 P10M, 15000 P15M, 20000 P20M, 30000 P30M	bar: 17 B17U, 35 B35U, 50 B05D, 70 B07D, 100 B01C, 200 B02C, 350 B35D, 500 B05C, 700 B07C, 1000 B01M, 1400 B14C, 2000 B02M psi: 250 P25D, 500 P05C, 750 P75D, 1000 P01M, 1500 P15C, 3000 P03M, 5000 P05M, 7500 P75C, 10000 P10M, 15000 P15M, 20000 P20M, 30000 P30M	bar: 17 B17U, 35 B35U, 50 B05D, 70 B07D, 100 B01C, 200 B02C, 350 B35D, 500 B05C, 700 B07C, 1000 B01M psi: 250 P25D, 500 P05C, 750 P75D, 1000 P01M, 1500 P15C, 3000 P03M, 5000 P05M, 7500 P75C, 10000 P10M, 15000 P15M
MAIN APPLICATIONS	Plastics extrusion - Fibre extrusion	Plastics extrusion - Fibre extrusion	Plastics extrusion - Fibre extrusion	Plastics extrusion - Fibre extrusion
	IO-Link PL'd' SIL2	CANopen	ANALOGUE Ex SIL2 HART PL'd' IECEx EAC Ex	ANALOGUE FM APPROVED HART

MODEL	ME / ME PLc & SIL2	MN / M7 PLc & SIL2	M3
FILLING FLUID	Mercury	Mercury	Mercury
MEASUREMENT RANGE (BAR) (PSI)	0…17bar a 0..2000bar 0…250psi a 0..30000psi	0…17bar a 0..2000bar 0…250psi a 0..30000psi	0…17bar a 0..2000bar 0…250psi a 0..30000psi
PRECISION CLASS (%FS)	(H) 0,25% (100…2000 bar) / (M) 0,50%	(H) 0,25% (100…2000 bar) / (M) 0,50%	(H) 0,25% (100…2000 bar) / (M) 0,50%
OVERPRESSURE WITHOUT DEGRADATION (BAR) (PSI)	2 x FS 1.5 x FS over 1000 bar / 15000 psi	2 x FS 1.5 x FS over 1000 bar / 15000 psi	2 x FS 1.5 x FS over 1000 bar / 15000 psi
MEASURING FLUID TEMPERATURE RANGE (°C)(°F)	400°C 750°F	400°C 750°F	400°C 750°F
COMPENSATED AMBIENT TEMPERATURE RANGE (°C)(°F)	0… +85 °C 32… 185 °F	0… +85 °C 32… 185 °F	0…+100°C 32…212°F
PERMISSIBLE AMBIENT TEMPERATURE RANGE (°C)(°F)	-30… +105°C -22… 221 °F	-30… +105°C -22… 221 °F	30…+120°C -22…250°F
THERMAL DRIFT IN THE ZERO COMPENSATED FIELD/CALIBRATION/SENSITIVITY	< 0,02% FS/°C	< 0,02% FS/°C	2 bar/100 °C 15 psi/100 °F
STEM DRIFT (ZERO)	< 2 bar/100 °C < 16 psi/100 °F	< 2 bar/100 °C < 16 psi/100 °F	< 2 bar/100 °C < 16 psi/100 °F
RESPONSE TIME	<= 1msec	<= 1msec	<= 1msec
MEASURING PRINCIPLE PROPERTIES	Thick film of sensitive element deposited on steel membrane	Thick film of sensitive element deposited on steel membrane	Thick film of sensitive element deposited on steel membrane
TRANSDUCER BODY CONSTRUCTION MATERIAL	Electronic Case: • AISI 304 stainless steel Stem: • 17-4 PH	Electronic Case: • AISI 304 stainless steel Stem: • 17-4 PH	Electronic Case: • AISI 304 stainless steel Stem: • 17-4 PH
STANDARD MATERIAL IN CONTACT WITH THE PROCESS	Membrane: • 15-5PH with GTP+ coating • 17-7PH corrugated with GTP+ coating for range<100bar(1500psi)	Membrane: • 15-5PH with GTP+ coating • 17-7PH corrugated with GTP+ coating for range<100bar(1500psi)	Membrane: • 15-5PH with GTP+ coating • 17-7PH corrugated with GTP+ coating for range<100bar(1500psi)
PROCESS CONNECTIONS	1/2 - 20 UNF (1) - M18 x 1.5 (4)	1/2 - 20 UNF (1) - M18 x 1.5 (4)	1/2 - 20 UNF (1) - M18 x 1.5 (4)
PROTECTION CLASS (IEC 529) (WITH FEMALE CONNECTOR MOUNTED)	IP65	IP65	IP65
OUTPUT SIGNAL	Analogue	Analogue	Analogue
TYPE OF OUTPUT SIGNAL	4…20mA	0 .. 5Vdc (M) - 0 .. 10Vdc (N) 0.1 .. 5.1Vdc (B) - 0.1 .. 10.1Vdc (C) 0 .. 5Vdc (alimentaz. -15…+15Vdc) (H) 0 .. 10Vdc (alimentaz. -15…+15Vdc) (L) 0,5…10,5V (K7)	2.5 mV/V (2) 3.33mV/V (3)
POWER SUPPLY VOLTAGE (VDC)	10… 30 Vdc	15…30Vdc (N), (C) 10…30Vdc (B), (M) -15….+15Vdc (H), (L)	6…12Vdc(10Vdc tipico)
ELECTRICAL CONNECTIONS	6 pin connector VPT07RA10-6PT2 (PT02A-10-6P) / 8 pin connector (PC02E-12-8P) Bendix	6-pin connector VPT07RA10-6PT (PT02A-10-6P) (6) 8-pin connector PC02E-12-8P (8)	6-pin connector VPT07RA10-6PT (PT02A-10-6P) (6) 8-pin connector PC02E-12-8P (8)
TEMPERATURE SENSOR	ME2 / ME2 PLc versions (type 'J' insulated joint thermocouple)	MN2 / M72 PLc versions (type 'J' insulated joint thermocouple)	Version M32 (type 'J' insulated joint thermocouple)
MEASUREMENT RANGES	bar: 17 B17U, 35 B35U, 50 B05D, 70 B07D, 100 B01C, 200 B02C, 350 B35D, 500 B05C, 700 B07C, 1000 B01M, 1400 B14C, 2000 B02M psi: 250 P25D, 500 P05C, 750 P75D, 1000 P01M, 1500 P15C, 3000 P03M, 5000 P05M, 7500 P75C, 10000 P10M, 15000 P15M, 20000 P20M, 30000 P30M	bar: 17 B17U, 35 B35U, 50 B05D, 70 B07D, 100 B01C, 200 B02C, 350 B35D, 500 B05C, 700 B07C, 1000 B01M, 1400 B14C, 2000 B02M psi: 250 P25D, 500 P05C, 750 P75D, 1000 P01M, 1500 P15C, 3000 P03M, 5000 P05M, 7500 P75C, 10000 P10M, 15000 P15M, 20000 P20M, 30000 P30M	bar: 17 B17U, 35 B35U, 50 B05D, 70 B07D, 100 B01C, 200 B02C, 350 B35D, 500 B05C, 700 B07C, 1000 B01M, 1400 B14C, 2000 B02M psi: 250 P25D, 500 P05C, 750 P75D, 1000 P01M, 1500 P15C, 3000 P03M, 5000 P05M, 7500 P75C, 10000 P10M, 15000 P15M, 20000 P20M, 30000 P30M
MAIN APPLICATIONS	Plastics extrusion - Fibre extrusion	Plastics extrusion - Fibre extrusion	Plastics extrusion - Fibre extrusion
	ANALOGUE PL'c' SIL2	ANALOGUE PL'c' SIL2	

MELT PRESSURE TRANSDUCERS

PRINCIPAL TECHNICAL PROPERTIES

MELT PRESSURE MANOMETERS	 W60 W61 W62	 M60 / K60 M61 / K61 M62 / K62	 M50 / K50 M51 / K51 M52 / K52
MODEL	W6	M6 / K6	M5 / K5
FILLING FLUID	Diathermic oil (FDA approved) FDACFR 178.3620 and CFR 172.878	**M** Mercury / **K** NAK	**M** Mercury / **K** NAK
MEASUREMENT RANGE (BAR) (PSI)	0..35 to 0...1000bar 0..500 to 0..15000psi	0...35 to 0...1000bar 0...500 to 0...15000psi	0...350 to 0...700bar 0...5000 to 0...10000psi
PRECISION CLASS (%FS)	*(M) 0.50% (35...1000 bar)*	*(M) 0.50% (35...1000 bar)*	*(L) 1.00% (35...1000 bar)*
MEASURING FLUID TEMPERATURE RANGE (°C)(°F)	315°C 600°F	M6 400°C / K6 538°C M6 750°F / K6 1000°F	M6 400°C / K6 538°C M6 750°F / K6 1000°F
COMPENSATED AMBIENT TEMPERATURE RANGE (°C)(°F)	55°C 130°F	55°C 130°F	
PERMISSIBLE AMBIENT TEMPERATURE RANGE (°C)(°F)	0... +85 °C 32... 185 °F	0... +85 °C 32... 185 °F	0... +85 °C 32... 185 °F
THERMAL DRIFT IN THE ZERO COMPENSATED FIELD/CALIBRATION/SENSITIVITY	4.0%/100°C 2.0%/100°F	4.0%/100°C 2.0%/100°F	4.0%/100°C 2.0%/100°F
STEM DRIFT (ZERO)	2 bar/100°C 16 psi/100°F	2 bar/100°C 16 psi/100°F	2 bar/100°C 16 psi/100°F
MEASURING PRINCIPLE PROPERTIES	Strain gage Wheatstone bridge	Strain gage Wheatstone bridge	Bourdon tube
STANDARD MATERIAL IN CONTACT WITH THE PROCESS	15-5 PH corrugated SS (coated with Titanium Nitride)	15-5 PH SS (Coated in GTP+) 17-7 PH Corrugated SS (Coated in Titanium Nitride)	15-5 PH SS (Coated in GTP+)
PROCESS CONNECTIONS	1/2 - 20 UNF (1) - M18 x 1.5 (4)	1/2 - 20 UNF (1) - M18 x 1.5 (4)	1/2 - 20 UNF (1) - M18 x 1.5 (4)
OUTPUT SIGNAL	Analogue	Analogue	
TYPE OF OUTPUT SIGNAL	4-20 mA (650 Ω max. load)	4-20 mA (650 Ω max. load)	
POWER SUPPLY VOLTAGE (VDC)	115 VAC or 230 VAC	115 VAC or 230 VAC	115 VAC or 230 VAC
ELECTRICAL CONNECTIONS	screw terminal block	screw terminal block	screw terminal block
TEMPERATURE SENSOR	Version W62 (type 'J' insulated joint thermocouple)	Version M62 (type 'J' insulated joint thermocouple)	Version M52 (type 'J' insulated joint thermocouple)
MEASUREMENT RANGES	bar: 35 B35U, 50 B05D, 70 B07D, 100 B01C, 200 B02C, 350 B35D, 500 B05C, 700 B07C, 1000 B01M psi: 500 P05C, 750 P75D, 1000 P01M, 1500 P15C, 3000 P03M, 5000 P05M, 7500 P75C, 10000 P10M, 15000 P15M	bar: 35 B35U, 50 B05D, 70 B07D, 100 B01C, 200 B02C, 350 B35D, 500 B05C, 700 B07C, 1000 B01M psi: 500 P05C, 750 P75D, 1000 P01M, 1500 P15C, 3000 P03M, 5000 P05M, 7500 P75C, 10000 P10M, 15000 P15M	bar: 350 B35D, 700 B07C psi: 5000 P05M, 10000 P10M
MAIN APPLICATIONS	Plastics extrusion Fibre extrusion	Plastics extrusion Fibre extrusion	Plastics extrusion Fibre extrusion
		*(K6)	*(K5)

SELECTION GUIDE OF THE MEMBRANE IN CONTACT WITH THE EXTRUDED POLYMER

FIELD OF APPLICATION	MATERIAL PROCESSED	PROCESS PRESSURE TEMPERATURE	NB:	SPECIAL VERSION
Thermally insulated panels / Plexiglass; injection-moulded plastics	PMMA (high speed), plexiglass	190-230°C	Standard Membrane	000
Pipes for hydraulic use (drains, sewers, etc.)	PVC-U, UPVC, RPVC (high speed)	180-200°C	Standard Membrane	026-109
Hydraulic pipes for heating, high pressure pipes, pipes for chemical industry	PP (polypropylene)	200-230°C	Standard Membrane	000
Upholstery and carpets	PP (polypropylene)	200-230°C	Standard Membrane	000
Plastic bags, films and coating tapes, low-cost laminates	PE-LD (low density) (or LO-PE)	170-190°C	Standard Membrane	000
Potato chip and stay-fresh bags (W/K/I series)	PP (polypropylene)	200-230°C	Use series W	000
Plastic bottles and other food applications (Series W/K/I)	PET		Use series W	000
Nylon films and tapes for packaging; covering materials with good mechanical strength and resistance to high temperatures (profiles, corners, etc.)	PA6 (Nylon 6)	210-260°C P <500bar	Special membrane with excellent resistance in contact with adhesive materials	123
Films, monofilaments and various profiles	PA66 (Nylon 66, Polyamide 66) / PVDF	210-290°C P >500bar	Special membrane with excellent resistance in contact with adhesive materials	110
Food grade films (roast in bag) (Series W/K/I)	PA66 (Nylon 66, Polyamide 66)	265-290°C	Use series W	123
Food grade films (Series W/K/I)	PE-HD-High Density (or HD-PE)	180-210°C	Use series W with Standard membrane	000
Construction; compounds and tyres	Highly abrasive plastics; high speed extrusion; glass fibres, ceramics, mineral resins, rubber	Up to 400°C	Special membrane with characteristics of high strength and abrasion resistance; deterioration of stem drift, precision and sensitivity	264 - B31
Insulating sheath and sock for electric cables	PVC / Corrosive plastics	200°C	Special membrane, resistant to adhesive materials	109
Finishing coatings (caravans, furniture, household appliances, freezers, formica, etc.)	ABS (Acrylonitrile Butadiene Styrene)	205-240°C 100-250 bar	Special membrane, resistant to adhesive materials	109
For packaging; construction	Teflon, PC Polycarbonate-Makrolon, dyestuffs; additive resins		Special membrane, resistant to adhesive materials	B31
Pharmaceutical use (W/K/I Series)	Teflon, PC Polycarbonate-Makrolon, dyestuffs; additive resins		K series with special B31 or series W with standard GTP coating	B31
Abrasive applications with temperatures not too high	Processes containing glassy materials or abrasive resins		Special diaphragm with abrasion resistance; deterioration of stem, precision and sensitivity	B31
Abrasive applications	Processes containing glassy materials or abrasive resins		Special diaphragm with abrasion resistance; deterioration of stem, precision and sensitivity	B31
Plastics recycling	Loaded materials + solid impurities		Special diaphragm with abrasion resistance; deterioration of stem, precision and sensitivity	B31
Plastic material transformation. FDA approval			W/K/I Series with FDA approved coating	B39

ACCESSORIES

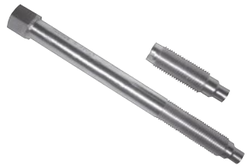
SAFETY DEVICES

GRD BURSTING DISCS

The bursting disc, also known as the bursting cap, is an entirely mechanical device designed to yield at a given pressure.

Mounted on the extruder, it prevents dangerous and sudden increases in pressure inside the machine by breaking to allow the pressure to be released.

An accuracy of ± 0.5% and a vast pressure range make the GRD a valid complement to traditional control devices, especially in emergency conditions where very rapid intervention is required.



Process connection:	1/2 20 UNF
Tip size:	8mm
Main features:	Maximum working temperature 400°C
Pressure:	2500 to 15000psi

DRILLING AND CLEANING KIT

DRILLING KIT FOR 1/2 - 20 UN F	KF12
DRILLING KIT FOR M - 1.5	KF18
DRILLING KIT FOR M10X1 (FOR MJ ONLY)	KF10

CLEANING KIT FOR 1/2 - 20 UN F	CT12
CLEANING KIT FOR M - 1.5	CT18
CLEANING KIT FOR M10X1 (FOR MJ ONLY)	CT10

BRACKETS AND PROTECTIVE CAPS

FIXING BRACKETS	SF18

PROTECTIVE CAP FOR 1/2 - 20 UN F	SC12
PROTECTIVE CAP FOR M - 1.5	SC18
PROTECTIVE CAP FOR M10X1 (FOR MJ ONLY)	SC10

MATCHING PRODUCTS

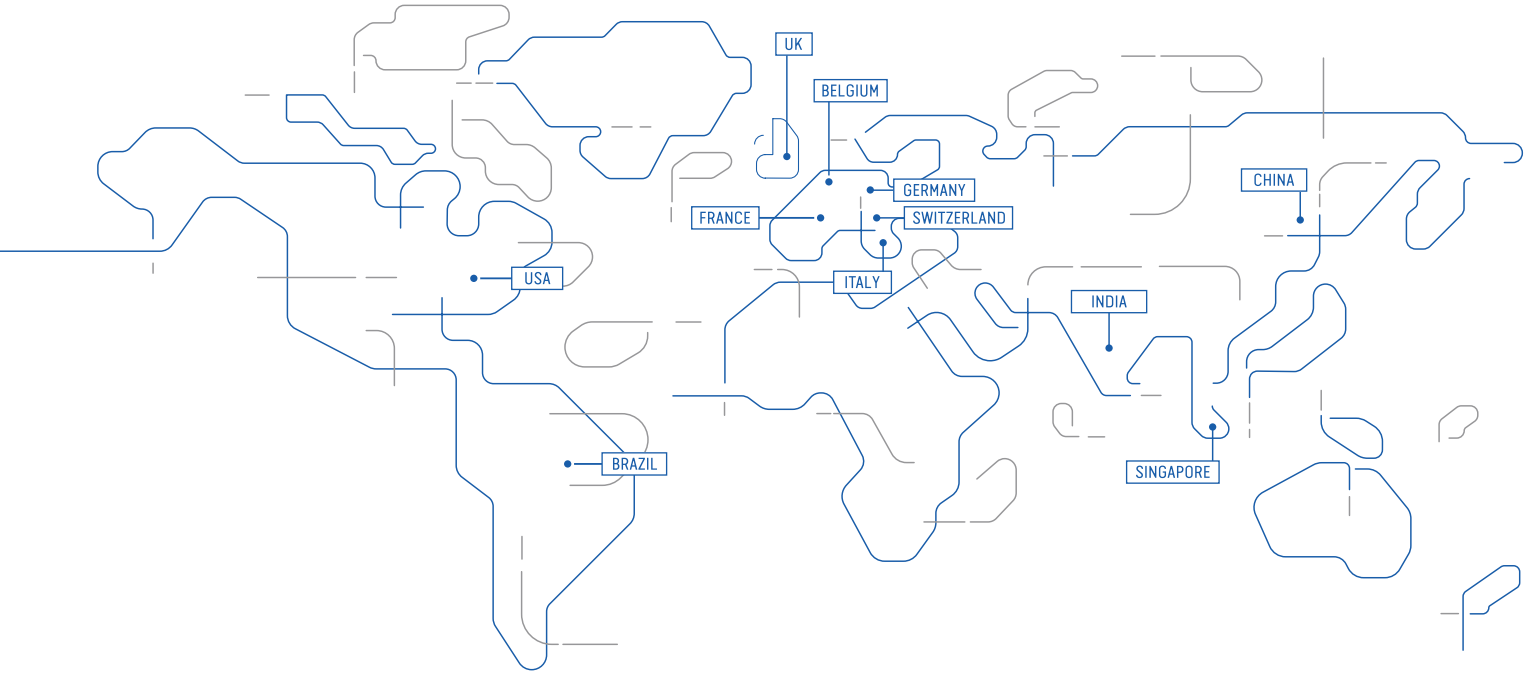
CONTROLLER

- universal inputs for amplified and non-probes
- very high acquisition speed
- high accuracy
- mathematical calculations, pressure delta
- 4 configurable outputs
- modbus and Profibus communication

PRESSURE GAUGES

- universal inputs for amplified probes
- very high acquisition speed
- high accuracy
- mathematical calculations, pressure delta
- 4 configurable outputs
- modbus and Profibus communication
- input from non-amplified pressure probes
- 4 configurable outputs
- modbus communication
- input from amplified pressure probes
- 4 configurable outputs
- modbus communication

COD. 81201N



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