

MELT PRESSURE SENSORS



GEFRAN



EXTENSIMETRIC TECHNOLOGY with filling fluid

The operating principle is based on hydraulic transmission of pressure by means of **filling fluids** with low coefficient of compressibility: **mercury** (M series available only where permitted by the European Directive 2011/65/UE – RoHS II), **FDA-approved diathermic oil** (W series), and **sodium-potassium NaK mix** (K series).

Therefore, the entire structure is built to **transfer the pressure exerted by the medium** on the contact diaphragm to the transduction part, i.e., **measurement diaphragm** with the strain gauge, keeping it away from the heat source. The **strain gauge** then transduces the physical pressure quantity into an electrical signal.

PIEZORESISTIVE TECHNOLOGY entirely fluid free

Innovative **IMPACT sensors** (I series) are pressure transmitters **without transmission fluid**: medium pressure is transferred directly to the silicon sensitive element by means of a thick diaphragm.

Physical stress is transduced by a Wheatstone bridge with 4 piezoresistors.

Gefran's **IMPACT series**, with proprietary technology, provides:

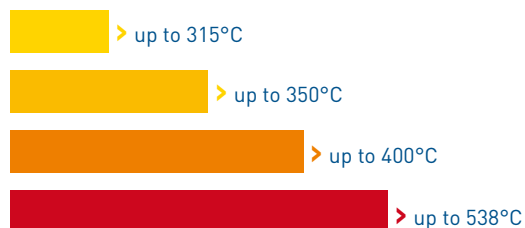
- High **strength** (up to 35 times stronger than traditional sensors)
- High response **speed**
- Extremely **easy installation** thanks to a modular sensor
- High **safety standards** (conformity to Machinery Directives and RoHS)



PRESSURE MEASUREMENT AT HIGH TEMPERATURES

GEFRAN Melt sensors are pressure/temperature transducers and transmitters that **measure Melt medium pressure in high temperature environments (up to 538°C)**.

Melt pressure can be measured in four main process temperature ranges:





PLASTICS – EXTRUSION



PLASTICS – INJECTION



PLASTIC RECYCLING



ENERGY



FOOD



CHEMICAL AND PHARMACEUTICAL

4 DIFFERENT DESIGNS

Gefran Melt pressure sensors are generally available in four versions: **rigid stem**, **flexible sheath**, **flexible with thermocouple**, and **exposed tip** (except for the IMPACT series).



RIGID STEM



FLEXIBLE SHEATH



FLEXIBLE WITH THERMOCOUPLE



EXPOSED TIP

H	K	E	2
H HART protocol	I IMPACT	2 2.5 mV/V non-amplified output	0 rigid stem
	K NaK	3 3.33 mV/V non-amplified output	1 flexible sheath
	W FDA oil	E 4-20mA current output	2 flexible sheath with thermocouple
	M mercury*	N 0-10V voltage output	3 exposed tip
		D CAN-BUS DP404 digital output	
		5 output: GAUGE Analogue indication	
		6 output: GAUGE Digital indication	
		X Atex with Intrinsic Safety	

* M series (mercury filled) is available only where permitted by the European Directive 2011/65/UE – RoHS II)

WHY GEFRAN

MERCURY FREE SOLUTIONS

Sensitive to environmental issues, and in **full harmony with the RoHS Directive**, GEFTRAN offers a 'wide range of sensors Melt pressure mercury-free, both by filling fluid - oil (FDA approved) or NaK (GRAS substance) - that *fluid free* (IMPACT).

GTP+

The new **GTP+ coating**, the result of Gefran research, guarantees longer Melt sensor life thanks to:

- **Greater hardness**
- **Resistance to high temperatures**
- **Low coefficient of friction**

AUTOZERO FUNCTION

All Gefran amplified Melt pressure sensors (M/W/K/I series) have the Autozero functions, which **eliminates signal variations linked to a thermal effect**, before putting the system under pressure.

AUTOCOMPENSATION

With the SP option (internal autocompensation), **M/W/K series transmitters** cancel the effect of variation of pressure signal caused by variation of Melt temperature.

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

In **IMPACT**, technology, digital electronics **automatically compensate** for drift due to thermal effect.



CERTIFICATIONS

ATEX

MX/HMX, WX/HWX and IX (Atex) GEFTRAN transmitters are certified based on their respective protection and safety requisites, and can work in potentially explosive atmospheres.

PERFORMANCE LEVEL 'C' (PL'c' EN13849-1)

IMPACT is available in the IMPACT PL'c' version, IMPACT PL'c',

to the safety requisites of the recent Machinery Directive and EN1114 specific for extruders.

IMPACT PL'c' features **intelligent electronics** with Auto Diagnostics to detect possible faults. An integrated relay in the electronics changes state in case of overpressure or if the setpoint is exceeded. Increased safety on the IMPACT PL'c' is completed by full conformity to Namur NE21 and NE43 recommendations.

Even the **full range** of MELT pressure transmitters with filling fluids (e.g. sodium-potassium) is available in **Performance Level 'c'** version.

The benefits are tangible and immediate: **higher safety levels** for machineries (i.e. conformity with the Machinery Directive and with the standard for extruders' safety) and **less risk** for operators above all.



NaK PL'c'

IMPACT PL'c'
Innovative Melt Pressure Accurate Transducer

	 GTP+	 Autozero	 Autocompensation	 ATEX	 Mercury Free	 Fluid Free	 Performance Level 'c'	 CANopen	 HART COMMUNICATION PROTOCOL
I IMPACT	•	•	•	•	•	•	•		
K NaK	•	•	•		•		•	•	•
W Oil	•	•	•	•	•		•	•	•
M Mercury*	•	•	•	•			•	•	•

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T _{MAX}	FILLING FLUID	ENVIRONMENT	OUTPUT	GEFRAN SERIES
315°C	Diathermic oil	Safe area	mV/V	W3
			Current	WE, WE PL'c'
			Voltage	WN, W7 PL'c'
			CANopen	WD
			HART (current)	HWE, HWE PL'c'
			Local display	W6
		Atex area (EU)	Current	WX
				WX4
			HART (current)	HWX, HWX PL'c'
				HWX4, HWX4 PL'c'
	Mercury*	Safe area	mV/V	M3
			Current	ME, ME PL'c'
			Voltage	MN, M7 PL'c'
			CANopen	MD
			HART (current)	HME, HME PL'c'
			Local display	M5
				M6
		Atex area (EU)	Current	MX
				MX4
			HART (current)	HMX, HMX PL'c'
				HMX4, HMX4 PL'c'
350°C	Sodium-Potassium	Safe area	mV/V	K3
			Current	KE, KE PL'c'
			Voltage	KN, K7 PL'c'
			CANopen	KD
			HART (current)	HKE, HKE PL'c'
			Local display	
		Atex area (EU)	Current	IX
				IX4
			HART (current)	HMX, HMX PL'c'
				HMX4, HMX4 PL'c'
	Fluid free	Safe area	mV/V	I3
			Current	IE, IE PL'c'
			Voltage	IN
				I7 PL'c'
			Local display	
		Atex area (EU)	Current	IX
				IX4
			HART (current)	HMX, HMX PL'c'
				HMX4, HMX4 PL'c'
400°C	Sodium-Potassium	Safe area	mV/V	K3
			Current	KE, KE PL'c'
			Voltage	KN, K7 PL'c'
			CANopen	KD
			HART (current)	HKE, HKE PL'c'
			Local display	
		Atex area (EU)	Current	IX
				IX4
			HART (current)	HMX, HMX PL'c'
				HMX4, HMX4 PL'c'
	Fluid free	Safe area	mV/V	I3
			Current	IE, IE PL'c'
			Voltage	IN
				I7 PL'c'
			Local display	
		Atex area (EU)	Current	IX
				IX4
			HART (current)	HMX, HMX PL'c'
				HMX4, HMX4 PL'c'
538°C	Sodium-Potassium	Safe area	mV/V	K3
			Current	KE, KE PL'c'
			Voltage	KN, KN PL'c'
			CANopen	KD
			HART (current)	HKE, HKE PL'c'
			Local display	
		Atex area (EU)	Current	IX
				IX4
			HART (current)	HMX, HMX PL'c'
				HMX4, HMX4 PL'c'
538°C	Sodium-Potassium	Safe area	mV/V	K3
			Current	KE, KE PL'c'
			Voltage	KN, KN PL'c'
			CANopen	KD
			HART (current)	HKE, HKE PL'c'
			Local display	
		Atex area (EU)	Current	IX
				IX4
			HART (current)	HMX, HMX PL'c'
				HMX4, HMX4 PL'c'

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ACCESSORIES

RUPTURE-GRD DISCS

The rupture disc (also known as a bursting disc), is a **mechanical device** that fails at a predetermined pressure.

Installed on the extruder, it **prevents dangerous and sudden pressure increases** in the machine and releases pressure by rupturing. $\pm 0.5\%$ accuracy and a wide pressure range make the GRD a valid **addition to traditional control devices**, especially in emergency conditions where immediate intervention is required.



TRANSDUCER SIMULATOR

The **TS3** simulates the output of a Gefran mV/V melt pressure transducer (M3, W3, K3 series) at various pressure levels.

It also simulates any strain-gauge transducer, and is available in a 6 pin (TS36) or 8 pin (TS38) version.



EXTENSION CABLES

6 and 8-pin **extension cables** with length up to 30 metres, for non-amplified and digital output.



GENERAL ACCESSORIES

Drill kit



Cleaning kit



Brackets



Rupture discs



6-pin female connector



5-pin female connector



8-pin female connector



RELATED PRODUCTS

CONTROLLERS

2500

- universal inputs for amplified and non-amplified sensors
- very high acquisition speed
- high accuracy
- math calculations, pressure delta
- 4 configurable outputs
- Modbus and Profibus communication



PRESSURE INDICATORS

2400

- universal inputs for amplified sensors
- very high acquisition speed
- high accuracy
- math calculations, pressure delta
- 4 configurable outputs
- Modbus and Profibus communications

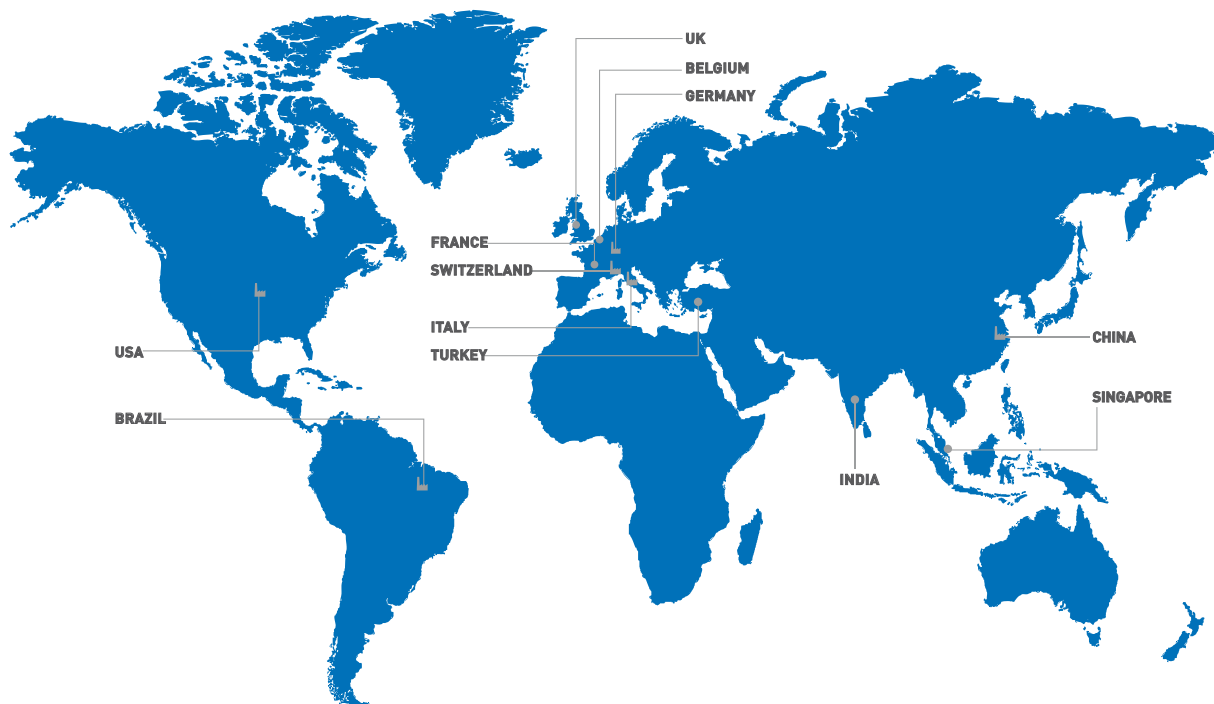
40B

- input for non-amplified pressure sensors
- 4 configurable outputs
- Modbus communications

40T

- input for amplified pressure sensors
- 4 configurable outputs
- Modbus communication





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