ENG

SENSORS

MELT PRESSURE SENSORS

GEFRAN

COD. 81201D

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), **FDA-approved diathermic oil** (W series), and **sodium-potassium NaK mix** (K series), defined as a substance Generally Recognized As Safe (GRAS).

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*

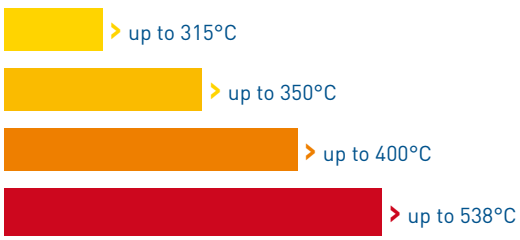
Innovative **IMPACT sensors** (I series) are pressure transmitters **without transmission fluid**: medium pressure is transferred directly to the silicon sensitive element by means of a thick diaphragm.

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 that 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 hightemperature 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	
H	HART protocol

M	
M	mercury
W	FDA oil
K	NaK
I	IMPACT

E	
2	2.5 mV/V non-amplified output
3	3.33 mV/V non-amplified output
E	4-20mA current output
N	0-10V voltage output
D	CAN-BUS DP404 digital output
5	output: GAUGE Analogue indication
6	output: GAUGE Digital indication
X	Atex with Intrinsic Safety
F	Factory Mutual Explosion proof

2	
0	rigid stem
1	flexible sheath
2	flexible sheath with thermocouple
3	exposed tip

WHY GEFRAN

MERCURY FREE SOLUTIONS

Sensitive to environmental issues, and in **full harmony with the RoHS Directive (2011/65/EU)**, GEFRAN 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 AND FACTORY MUTUAL

MX/HMX, WX/HWX or IX (Atex) and MF or WF (Factory Mutual) GEFRAN 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 2006/42/CE 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 Innovative Melt Pressure Accurate Transducer PL'c'

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

T_{MAX}	FILLING FLUID	ENVIRONMENT	OUTPUT	GEFRAN SERIES
315°C	Diathermic oil	Safe area	mV/V	W3
			Current	WE
			Voltage	WN
			CANopen	WD
			HART (current)	HWE
			Local display	W6
		Atex area (EU)	Current	WX
			HART (current)	HWX
		Hazardous area (USA)	Corrente	WF
	Mercury	Safe area	mV/V	M3
			Current	ME
			Voltage	MN
			CANopen	MD
			HART (current)	HME
			Local display	M5
				M6
		Atex area (EU)	Current	MX
				MX4
			HART (current)	HMX
				HMX4
		Hazardous area (USA)	Current	MF
	Sodium-Potassium	Safe area	mV/V	K3
			Current	KE
			Voltage	KN
			CANopen	KD
			HART (current)	HKE
	Fluid free	Safe area	mV/V	I3
			Current	IE
			Voltage	IN
				I7
		Atex area (EU)	Current	IX
350°C	Mercury	Safe area	mV/V	M3
			Current	ME
			Voltage	MN
			CANopen	MD
			HART (current)	HME
			Local display	M5
				M6
		Atex area (EU)	Current	MX
				MX4
			HART (current)	HMX
				HMX4
		Hazardous area (USA)	Current	MF
	Sodium-Potassium	Safe area	mV/V	K3
			Current	KE
			Voltage	KN
			CANopen	KD
			HART (current)	HKE
	Fluid free	Safe area	mV/V	I3
			Current	IE
			Voltage	IN
				I7
		Atex area (EU)	Current	IX
400°C	Mercury	Safe area	mV/V	M3
			Current	ME
			Voltage	MN
			CANopen	MD
			HART (current)	HME
			Local display	M5
				M6
		Atex area (EU)	Current	MX
				MX4
			HART (current)	HMX
				HMX4
		Hazardous area (USA)	Current	MF
	Sodium-Potassium	Safe area	mV/V	K3
			Current	KE
			Voltage	KN
			CANopen	KD
			HART (current)	HKE
538°C	Sodium-Potassium	Safe area	mV/V	K3
			Current	KE
			Voltage	KN
			CANopen	KD
			HART (current)	HKE

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. ±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

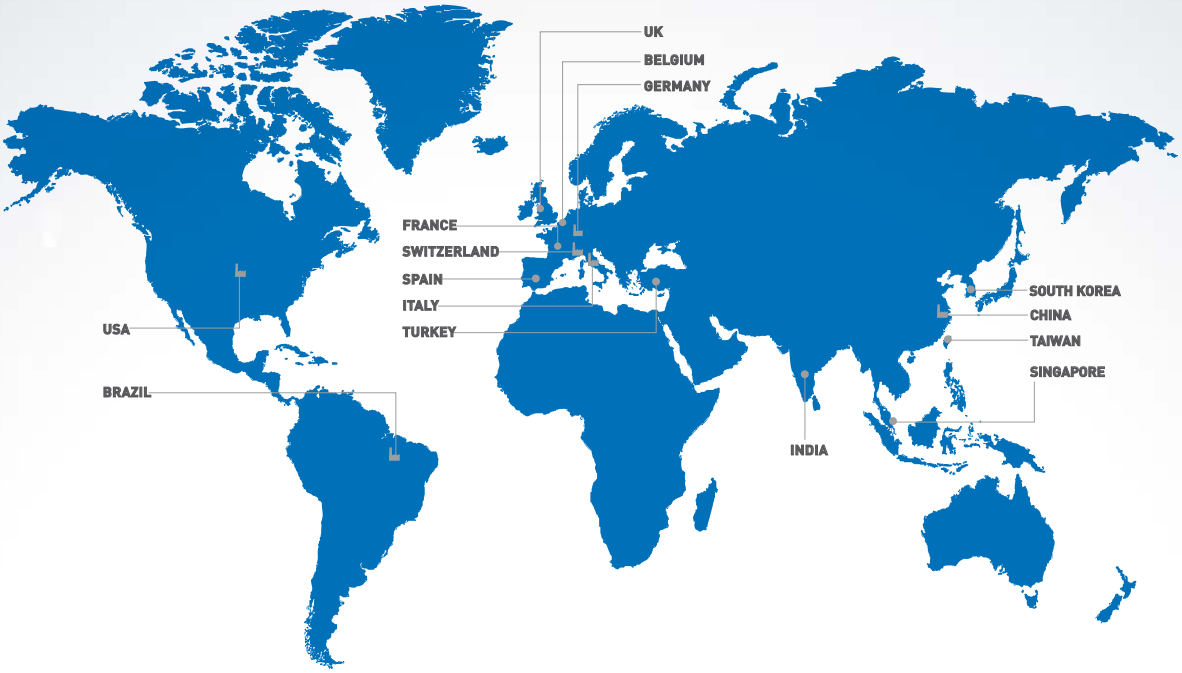
- universal inputs for amplified sensors
- very high acquisition speed
- high accuracy
- math calculations, pressure delta
- 4 configurable outputs
- Modbus and Profibus communications

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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