GEORGIN

Safety for Industrial Process

# Short form

www.georgin.com

## LES REGULATEURS GEORGIN
## A more than 70 years experience

Established in 1939, the company has constantly grown by widening the range of its activities around two areas of expertise: industrial instrumentation and intrinsic safety protection technology for hazardous areas.

GEORGIN, by showing proof of its high level of technical skill added to a high level of reactivity to the needs of industrial customers, has been able to develop innovations that make the difference.

- **1965**: The **measure and control** department was created for **instrumentation** of pressure and temperature.
- **1970**: Renowned and specialised in intrinsically safe interfaces, the **electronic** department was created.
- **1981**: A first **CENELEC** Certification was obtained.
- **1993**: The **energy-transport-Navy** department was set up to meet the demands and the specific needs of major accounts like the French state rail operator, the Navy, thermal and nuclear power stations.
- **1994**: Certification to the **ISO 9001** standard.
  A subsidiary was opened in **Belgium**.
- **2001**: A first **ATEX** Certification was obtained.
- **2003-04**: **Configurable digital electronics** and **fieldbus** were introduced.
- **2009**: **SIL** certification for our product range.

A commercial office was opened in **China**.

Today, GEORGIN continues to develop these activities with all the rigor of an **ISO 9001 Version 2008** certified quality management system.

## 70 years know-how

In collaboration with its customers, GEORGIN has guided its businesses in a demanding and constantly changing market by developing and enhancing its skills in the fields of pressure and temperature (logical and analogue sensors), intrinsic safety equipment (barriers, relays, converters, power supplies, indicators...) and fieldbuses (remote I/O).

GEORGIN's investments in R&D have enabled it to deliver reliable and durable equipment and to maintain the quality of its products.

## Recognized skills in

- **Measurement**
- **Control**
- **Safety**

The products offered are suitable for a multitude of industrial applications in which they are integrated into the main processes. They are used in very harsh environments such as extreme temperatures, corrosive atmospheres and explosive atmospheres.

## GEORGIN, Specialist for harsh environments.

## Functional safety and safety integrity

Georgin offers a wide range of products and assists its customers in making their industrial sites safe to meet the requirements of an instrumented safety function complying with the Machinery Directive 2006/42/EC.

To qualify our products, we have chosen to integrate the requirements of standard CEI61508 at the early stages of design.

For the current range of pressure and temperature switches, and pressure transmitters, Georgin has performed an operational feedback analysis, allowing us to quantify the reputation for reliability of our equipment.

All our SIL approved products allow without redundancy or external monitoring in accordance with the 1oo1 Markov architecture.

## GEORGIN, at your service

### The service

*Our team is at your side at every stage in your projects to provide you with :*

- ✔ All the information and advice you need about the selection of equipment,
- ✔ Commercial support, based on its technical skills,
- ✔ An answer to your needs with suitable delivery times,
- ✔ Technical assistance when installing our equipment and systems,
- ✔ And regular maintenance of your pool of Georgin instruments by a reactive After-Sales Service.

Georgin also supports you by giving training courses on its products in order to optimise their use.
Georgin is certified to provide professional training (certification N° 11920903792) in the following fields: pressure and temperature measurement, intrinsic safety loop calculation, installations conforming to intrinsic safety standards, Industrial Local Area Networks...

### Documentation

This is available in several languages and can be easily downloaded from

***www.georgin.com***

### A commercial presence near you

GEORGIN has a competent commercial network made up of a sales engineers team in France and Belgium backed up by regional commercial agents.

MEASUREMENT

CONTROL

SAFETY



*The head office, 5 kilometres from Paris*

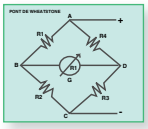
**More than half a century...** *supplying measurement and pressure or temperature control instruments has enabled the* GEORGIN *team of engineers to acquire know-how and experience which are expressed throughout this catalogue, beginning with the wide range of technologies used to provide solutions to each specific problem encountered by their customers.*

# 1 Instruments for measurement

## PRESSURE TRANSMITTERS

GEORGIN use the piezo-resistive effect sensor principle to make these products.

The distortion under pressure of a sensing element results in resistance fluctuations of a WHEATSTONE strain gauge bridge screen printed on a ceramic support. This type of sensing element is commonly called a thick film strain gauge.

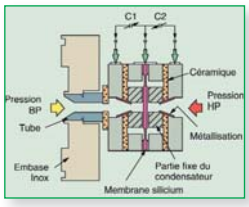


Under the effect of pressure a distortion is caused. This one leads to proportional variations in the resistance bridge to obtain a 4 to 20 mA electric signal.

This family of pressure transmitters generally use a cylindrical format, with fixed range, 0.5% accuracy class and are not configurable.

## PROCESS PRESSURE TRANSMITTERS

Using leading edge technology in silicon chip manufacturing, ProcessX transmitters incorporate a high performance micro capacitance silicon sensor.




The differential pressure is applied to the silicon sensor and changes the two capacitance values (C1 and C2) of the sensor as a function of the measured pressure.

The silicon chip is assembled floating in the measuring cell neck and improves the static pressure and temperature stability characteristics.

The SMART pressure transmitters of this family are rangeable and offer a high level of accuracy (<0.1% class).

## TEMPERATURE CONVERTER

The TiXo family range includes 3 models of programmable temperature converters using digital technology.

TiXo allows a large range of inputs as RTDs, TC, resistance or voltage (2-wire technology) :

- TiXo1 is fully dedicated to RTD100 input.

- TiXo2 and TiXo3 have a programmable universal input (RTDs, TC, resistance or voltage). They also include cold junction compensation and galvanic insulation.

This new generation of converter is fully and easily configurable through our ProgressXmanager freeware, an FDT tool or a HART® pocket.

TiXo3 uses the HART® communication protocol and accepts a signal from a Resistance Temperature Detector (RTD), a thermocouple, a resistance or a millivolt signal.

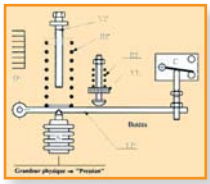
# 2 Instruments for control *and* safety

## PRESSURE AND TEMPERATURE SWITCHES

The pressure or temperature to be controlled is applied to a sensor (diaphragm, bellows, manometric tube). Whenever there is a change of pressure or temperature, the sensor is distorted and acts on a force balance connected to a microswitch.

Opposite this sensitive element, is an adjustable spring that enables the working point to be adjusted.

Adding a second adjustable spring permits greater or lesser increase of the hysteresis (dead-band) or to act on dislocation between the two contacts if the instrument is equipped.



## MEASURE ELEMENT

### Relative pressure

■ ***Bellows***

The most conventional sensing element used in our pressure and temperature switches is metallic bellows (bronze or stainless steel). Flexible by nature, it compresses or elongates axially under the effect of pressure and provides excellent transmission.

■ ***Diaphragm***

For low pressure, bellows which are too rigid, are replaced by an elastomer diaphragm which is hold in place by two metal plates.
«Diaphragm» technology is also used in cases of excessively high pressure and pulsating phenomena.

■ ***Manometric tube***

For very high pressure, the sensor used is a stainless steel tube curved into a C shape which is closed at one end and which changes position under the effect of pressure.

### Differential pressure

A differential pressure switch is fitted with two connections : one of them (HP) is connected to the highest pressure, the other (BP) to the lowest pressure which means, in the majority of cases, that it has to be fitted the right way round. The resultant of the two different pressures acts on the internal mechanism which then functions like a standard instrument.

### Absolute pressure

The pressure switch is fitted with a differential measuring element with bellows, one of which is vacuum sealed so as not to be affected by atmospheric pressure.

### Temperature

Two types of bulbs are used :

■ *The directly connected bulb.*

■ *The capillary bulb allowing an installation away from the sensor.*

# 3 Intrinsic safety

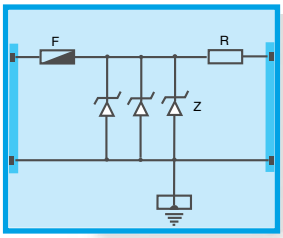
Securing sites equipped with electrical installations on which explosive atmospheres may occur is a prime requirement for any industrial company.
The electrical safety systems provided by GEORGIN concern industrial sites equipped with electrical installations on which explosive atmospheres may occur.
Several protection methods can be used for the instruments installed in potentially explosive areas. GEORGIN offers its customers four of those methods, i.e. flameproof enclosures, increased safety, double protection and, in particular, intrinsic safety.
This is based on the principle of the "intrinsic safety electrical circuit" defined by the CENELEC European standard as a "circuit within which no thermal effect produced under the test conditions prescribed by the standard is capable of causing inflammation in a given explosive atmosphere."
Since the 1st of July 2003, the ATEX 94/9EC (users) and 99/92EC (manufacturers) directives have introduced requirements concerning the installation and interfacing of equipment in dangerous areas.

***These intrinsic safety circuits are made up of two main parts :***

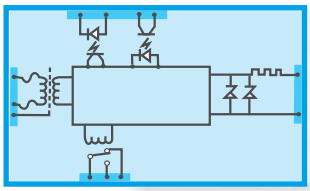
- The **"intrinsic safety"** equipment intended for installation in the dangerous area (sensor, loop indicator, pilot lamp...)
- The **"associated"** equipment where only the circuits directly connected to the explosive area are intrinsically safe. It is located in a safe area (signal conditioners, power supplies...) or installed in an area with risks of explosion (remote Inputs/Outputs).

An intrinsic safety circuit can be designed in two ways:

- either earth referenced, the so called **"Zener barriers"**




- or completely insulated from the earth, it is then said to be a **"galvanic insulation"** circuit



**GEORGIN uses both methods of insulation and is thus able to meet the requirements of each type of installation.**

Intrinsic safety equipment must remain safe even if faults occur in components or connections.

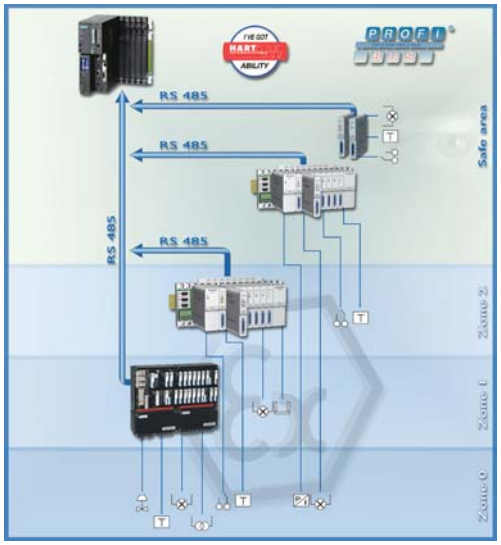
If the equipment's design allows it to remain safe even when a combination of 2 faults is present, it belongs to the "ia" category.

If it remains safe when one fault is present, it belongs to the "ib" category.

***Throughout its catalogue, GEORGIN offers category "ia" equipment, which means that it can be used in all areas and, in particular, in the areas of permanent danger.***

# 4 Fieldbus technology Remote I/O

The increasing use of digital signals and the new "Network" architectures has caused GEORGIN to expand its range of interfaces, in this instance, remote I/O's on fieldbuses.
These systems are located as near as possible to the sensors and actuators, i.e. directly in the areas with risks of explosions, and are used for digital communication between the sensors and actuators and the PLC or DCS control systems.
They are used to interface all the instruments installed in hazardous area, intrinsic safety sensors and actuators, Non IS devices (flameproof transmitters, encapsulated solenoid valves,...)
The data is transported on a pair of wires by digital communication using the Profibus DP or Modbus RTU protocol.
The first mentioned is the main fieldbus protocol in the process industry and can be used to directly configure our systems from any common DCS system (Siemens, Emerson, ABB, Honeywell,...).




The HART information can also be accessed via the Profibus DP protocol thus allowing for maintenance of the pool of analogue instruments (sensors and actuators).

## Electronic Measurement

*Operating principle : the distortion under pressure of a sensitive element results in resistance fluctuations of a* WHEATSTONE *strain gauge bridge.*
GEORGIN *uses two technologies for their sensors, i.e. strain gauges with thick layer coating on a ceramic base plate as well as silicium semiconductor strain gauge.*
*These transmitters can be powered by our range of converters described on pages* 20-21 *and* 22.

### *Transmitter*
**TR/TA Series**
**Industrial Model**

***Version*** *: relative and absolute pressure*
- *Thick enameled strain gauge on ceramic*
- 0.4…+400 *bar*
- 4-20 *mA - 2 wires signal*
- *Global error* : 0.2 % F.S.
- *Origin and span adjustment*

***Options*** *:*
- *Flush diaphragm*
- *Cable output or stainless steel head*
- *Intrinsically safe* ATEX
- *Rangeability*
- *Reinforced maximum pressure*

Connector type
DIN 43650

1" GM connection

### *Transmitter*
**TR/TA Series**
**Flush sensor**

***Key benefits*** *:*
- *Food and pharmaceutical compatibility*
- *No fluid retention area*
- *No fluid pollution risk (no filling liquid)*
- *Direct detection of cell breaking*

DIN 43650
connector

Cable connection

### *Transmitter*
**GR/GA Series**
**Compact industrial model**

***Version*** *: relative and absolute pressure*
- *Thick enameled strain gauge on ceramic*
- -1…+250 *bar*
- 4-20 *mA - 2 wires signal*
- *Global error* : 1% FS *or* 0.5% FS

***Options*** *:*
- M12 *connector or cable output*
- *Intrinsically safe* ATEX

*Operating principle: As a measuring diaphragm material, the sensor uses a single crystal silicon that has minimal hysteresis and fatigue, which improves the transmitter's characteristics by improving long term stability and reliability.*

## SMART *transmitter*
**ProcessX Series**

*Gauge, absolute, differential pressure and level transmitters*
- *Output: 4-20mA and Hart® protocols*
- *Power supply: 10.5 to 45 Vcc*
- *Wetted parts materials: Stainless Steel 316L, Hastelloy, Tantalum, ...*
- *Burnout according NAMUR NE43 recommendation*
- *100 : 1 range depending on the maximum span*
- *Long term stability: ± 0.1% of max. span/10 years*

**FKG *model*** *Gauge pressure transmitter*
*Span: -1 to 500 bar (5 ranges)*
*Accuracy: 0.062% (0.04% as an option)*

**FKA *model*** *Absolute pressure transmitter*
*Span: 0 to 100 bar (5 ranges)*
*Accuracy: 0.2% (0.1% as an option)*

**FKC *model*** *Differential pressure transmitter*
*Span: +/- 10mbar to +/- 30bar (14 ranges)*
*Static pressure up to 300bar (1035bar on request)*
*Accuracy: 0.065% (0.04% as an option)*

**FKE *model*** *Level transmitter*
*Span: 600mmWC to 300mWC (5 ranges)*
*Accuracy: 0.165% (0.1% as an option)*

**Options :**
- *Analogue or digital Indicator*
- *Flameproof housing*
- *Stainless Steel housing*
- *Chlorine service,*
- *Oxygen service,*
- *Side vent,*

...
- *Hand Held Communicator*
- *Intrinsically safe* ATEX
- SIL2 *Capability*

FKP *and* FKH *are dedicated for direct process mounting. Global specifications are the same as versions with flange process connection except for accuracy* (0.1 *to* 0.2%), *range* (16:1) *and process wetted parts* (316L *Stainless Steel*).

**FKP *model*** *Gauge pressure transmitter*
*Span: -1 to 100 bar (4 ranges)*
*Accuracy: 0.1%*

**FKH *model*** *Absolute pressure transmitter*
*Span: 0 to 30 bar (3 ranges)*
*Accuracy: 0.2% Précision: 0.2%*

## *Digital indicator*
**ProcessX Series**

*The digital indicator is based on LCD technology and shows the information on 2 lines each of 6 digits. The indicator can be used to configure ProcessX transmitters.*

## Electronic Measurement

*Operating principle : measurement is carried out by using* RTD *or thermocouple sensors.*
GEORGIN *offers several models of probes, transmitters and housings adapted for a wide scope of applications. These temperature sensors can be connected to our various range of converters described on pages* 20, 21, 22 *and* 26..

### *Temperature sensors*

**S2000 and S4000 Series**

■ ***Resistance probes :***
- RTD100, RTD1000, Ni100,...
- 2, 3, 4-*wires technology (for* RTD)
- *Simple or double type*
- *Accuracy Class :* A *or* B *according to* IEC751

■ ***Thermocouples :***
- B, E, J, K, N, R, S, T, W, ...*types*

**Heads :** B, DAN, DANW, MA, ... *types and Ex d housings*
**Process connection :** *fixed, sliding, by flange or sanitary type.*
**Options :** *removable probe, lagging extension, ...*

*Available in* ATEX

### *Programmable converters*

**TiXo Series**

- *Head mounting converters*
- RTD *or universal input*
- 4/20 *mA linearised output*
- *Galvanic isolation according to model* (TiXo2)
- HART *version according to model* (TiXo3)
- *Easy and fast programming with* ProgressXmanager *software or with* FDT / DTM *concept*

*Available in* ATEX

SIL2 *Capability*

## *Temperature transmitters*

### S2000 and S4000 Series

*The temperature sensor and transmitter is a combination of a RTD or thermocouple probe with a transmitter located in temperature sensor's head.*

- **Sensors :**
- RTD *or thermocouple*
- *Simple or double type*
- *Accuracy Class :* A *or* B *according to* IEC751

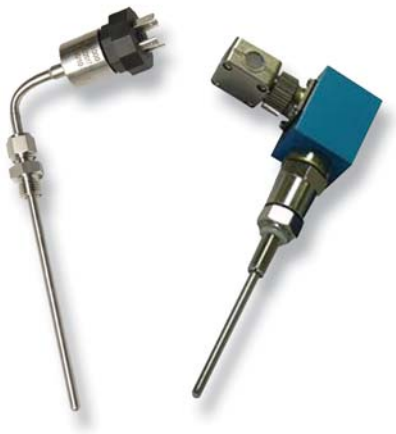
- **Power supply :**
- 4/20 mA *loop powered*

- **Transmitters :**
- *Fixed or programmable ranges*
- *For uses between* -200 *to* +2300°C
- 4/20 mA *linearised output*

- **Heads :**
- B, DAN, DANW, ... *types and Ex d housings*

- **Process connections :**
- *Fixed, sliding or plain stem*
- *Welded or barstock thermowells : to weld or to screw*

*Available in* ATEX



## *Specific design*

- **Electrical connection**
- DIN 43650 *connector*
- *Cable output*
- LEMO *connector, ...*

- **Process connection :**
- M12, M14, 1", 1"1/2, ...

- **Temperature element :**
- 90° *angled probe*
- *Pipe sensor, ...*

# PRESSURE

## Pressure switch
### P Series
**Industrial model**

**Version** : *relative, differential and absolute pressure*
**Housing** : IP66 *aluminium alloy with front scale*
**Sensors** :
*bellows, diaphragm or manometric tube*
**Microswitch** : 1*or* 2 SPDT
**Ranges** :
-1...+800 *bar relative* (40 *ranges*)
2.5 *mbar to* 90 *bar differential*
(*static* 250 *bar*)
**Options** : *breather, drain, electrical connection at* 40°, *ball bearing mechanism, potentiometer output, pneumatic cells*
**Approvals** : VERITAS

*Available in* ATEX

SIL2 *Capability*

## Pressure switch
### F Series
**Compact Industrial model**

**EXCELLENT SHOCKS AND VIBRATIONS RESISTANCE**

**Version** : *relative, differential and absolute pressure*
**Housing** : IP66 *aluminium alloy with internal scale*
*bellows, diaphragm or manometric tube*
**Microswitch** : 1 *or* 2 SPDT
**Ranges** :
-1...+800 *bar relative* (40 *ranges*)
20 *mbar to* 100 *bar differential*
(*static* 250 *bar*)
**Option** : *Front scale, breather, line resistance, pneumatic cells*

*Available in* ATEX

SIL2 *Capability*


## Pressure switch
**G Series**

**Small size model**

***Version*** : *relative pressure*
***Housing*** : *polyarylamide* -IP 66
***Sensors*** : *bellows, diaphragm, manometric tube*
***Microswitch*** : 1 *or* 2 SPDT
***Ranges*** : 1…+400 *bar* ( 10 *ranges* )

*Available in* ATEX

SIL2 *Capability*

## Pressure switch
**U Series**

**Low cost model**

***Version*** : *relative pressure*
***Housing*** : *polyarylamide* - IP65
***Sensor*** : *diaphragm*
***Microswitch*** : 1 SPDT
0.5…+40 *bar* ( 4 *ranges* )
***Approbation*** :
*Domestic use* : EN60730

SIL2 *Capability*

## Pressure switch
**AIRGAS Series**

**Specific application**

**FOR VENTILATORS SECURITY AND BURNERS CONTROL**

***Version*** : *relative and differential pressure*
***Housing*** : *painted steel cover*
***Sensor*** : *diaphragm*
***Microswitch*** : 1 *or* 2 SPDT
-500…+1100 *mbar relative*
10 *to* 1100 *mbar differential* (*static* 4 *bar*)

*Available in* ATEX

## Pneumatic pressure switch
**C Series**

**Compact model**

***Version*** : *relative pressure*
***Sensor*** : *diaphragm*
*Pneumatic cell* NO *or* NC
***Range*** : 2...+20 *bar*

## TEMPERATURE

### *Temperature switch*
**P Series**

**Industrial model**

**Version** : *direct or remote bulb*
**Housing** : IP66 *aluminium alloy with front scale*
**Sensor** : *direct bulb, capillary and bulb (2 to 20 meter)*
**Microswitch** : 1 *or* 2 SPDT
**Ranges** : -90°…+600°C ( 11 *ranges* )
**Options** : *breather, drain, electrical connection at 40°, capillary armour, thermowell,…*
**Approvals** : VERITAS, GOST-R

*Available in* ATEX

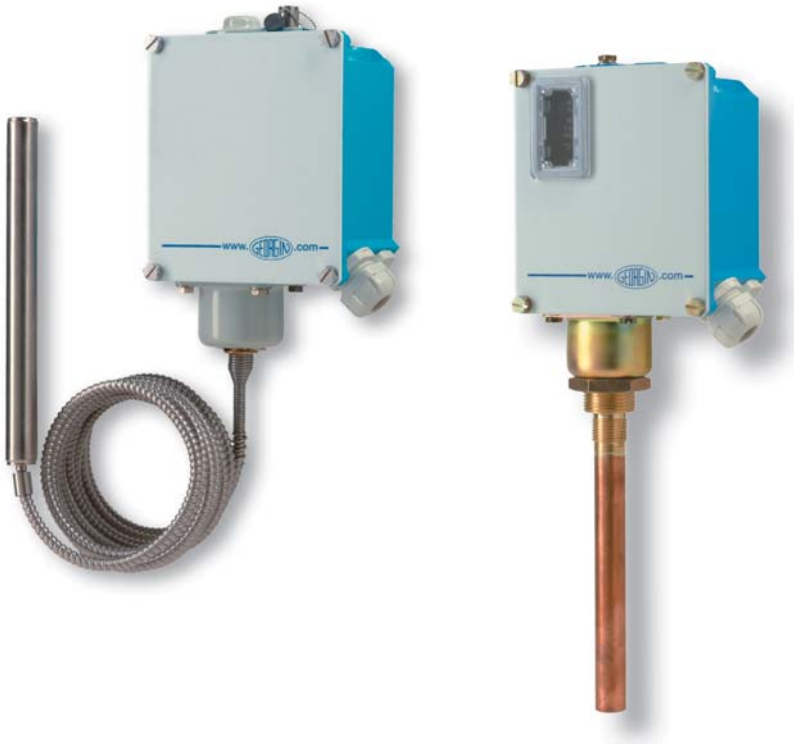
### *Temperature switch*
**F Series**

**Compact Industrial model**

**Version** : *direct or remote bulb*
**Housing** : IP66 *aluminium alloy with internal scale*
**Sensor** : *direct bulb, capillary and bulb (2 to 20 meter)*
**Microswitch** : 1 *or* 2 SPDT
**Ranges** : -90°…+380°C ( 10 *ranges* )
**Options** : *capillary armour, front scale, thermowell,…*
**Approvals** : GOST-R

*Available in* ATEX

SIL2 *Capability*



## Temperature switch
### G Series
**Small size model**

**Version** : *direct or remote bulb*
**Housing** : *polyarylamide* -IP 66
**Sensor** : *direct bulb, capillary and bulb (2 to 20 meter)*
**Microswitch** : 1 *or* 2 SPDT
**Ranges** : -20°...+250°C (5 *ranges*)

*Available in* ATEX

## Temperature switch
### U Series
**Low cost model**

**Version** : *remote bulb*
**Housing** : *polyarylamide* -IP 65
**Sensor** : *capillary and bulb*
**Microswitch** : 1 SPDT
**Ranges** : -20°...+210°C
(5 *ranges*)

### TEMPERATURE CONTROL

*Working principle used is based on vapour actuation : temperature which creates a pressure into the bulb, becomes a force through a bellows. Such technology allows a quick response time and a measurement independant from ambient temperature of the instrument .*

## SPECIFIC APPLICATIONS

# MARINE


### Pressure and Temperature switch
**PM Series**

**Use** : *any Navy boats*
**Version** : *relative, differential and absolute pressure, temperature.*
**Ranges** : -1…+800 *bar* / -50…+600°C
**Microswitches** : 1 *or* 2 *hermetically sealed*
**Connections** :
- *Process* : 1/2"BSP M, 1/4" BSPF, M20x1.5
- *Electrical* : *compression gland* BVP1 *or* CMDEL *and terminals*

**Mechanism** : *ball bearing balance*
**Mounting** : *strong plate*

### Pressure and Temperature switch
**FM Series**

**Use** : *any Navy boats*
**Version** : *relative, differential and absolute pressure, temperature.*
**Ranges** : -1…+400 *bar* / -50°…+120°C
**Microswitches** : 1 *or* 2 *gold plated* SPDT *with redondancy*
**Connections** :
- *Process* : M20x1.5, 1/2" BSPM
- *Electrical* : 10M *or specific gland and terminals*

**Mechanism** : *flexible arm*

### Pressure and Temperature switch
**MN/NG Series**

**Use** : *any Navy boats*
**Version** : *relative, differential and absolute pressure, temperature.*
**Ranges** : -1…+400 *bar* / -50°…+125°C
**Microswitches** : 1 *or* 2 *gold plated* SPDT *with redondancy*
**Connections** :
- *Process* : M20x1.5
- *Electrical* : *compression gland* AGB/T, 10M *or* CMDEL *and terminals*

**Mechanism** : *flexible arm*
**Options** : *line resistance, submersible*

*Quality certification*
**FRENCH NAVY**

# RAILWAY

### Pressure and Temperature switch
**G Series**

**Use** : *any train*
**Version** : *relative and differential pressure, temperature*
**Ranges** :
-1…+30 *bar* / 0…+120°C
**Microswitch** : 1 *or* 2 SPDT
**Housing** : *polyarylamide housing* -IP 65
**Mechanism** : *flexible arm, vibrations proof*
**Connection** :
- *Electrical connector* FRB, ISO *or customised terminals*
- *Process* : 1/4 BSPF *or by specific flange*

**Mounting** : *flanged or direct*

*Certification*
**SNCF**

# ENERGY

## Pressure and Temperature switch

**J Series**

**Use** : *railway*
**Version** : *relative pressure, temperature.*
**Ranges** : 0…+10 *bar* / -20…+210°C
**Set point** : *set in workshop*
**Connection** :
- *Electrical* : ISO 4400 *connector, cable*
- *Process* : 1/4 BSPF *or by specific flange*

**Mounting** : *flanged or direct*

## Pressure and Temperature switch

**PE Series**

**Use** : *power plant or electricity transmission*
**Version** : *relative, differential and absolute pressure, temperature*
**Ranges** : -1…+1000 *bar* / -90°…+600°C
**Microswitches** :
1 *or 2 hermetically sealed* SPDT
**Connections** :
- *Process* : 1/2"BSP M, 1/2 NPT M, 1/4"BSP F
- *Electrical* : *connection at 40°, cable, terminals*

**Options** : *nuclear type painting, heat treated, helium test*
**Mounting** :
*according to power plant*

## Temperature switch

**FE Series**

**Use** : *transformers*
**Version** : *temperature* 25°…+115°C
**Microswitches** :
*reinforced dielectric strength* 2000V, *shocks* 5KV
**Capillary** : *armoured with* PVC *coating*

**Mechanism** : *flexible arm*
**Connection** :
- *Process* : 1/2 BSPM, M18, M20, M22

**Options** : *dielectric insulation of thermostatic sensor*

*Qualification* **EDF**
*Agrement* **N°82**

# ACCESSORIES

## Diaphragm seals
**S300 to S773 Series**

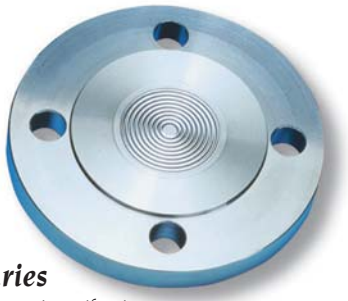
- Sensing element isolation against corrosion, impurities, viscosity, contamination.
- Several materials available (stainless steel, Tantalum, Hastelloy, PTFE, Monel...)
- Direct mounting or through capillary
- Threaded, welded or flanged process connection

## Cocks
**A3200 Series**

- Cone gauge cocks in steel or st. steel

## Manifolds
**A3300 Series**

- 2, 3, 5 ways.
- 316L stainless steel, Monel, PVDF
- Direct or remote mounting



## Capillaries
- Protection against vibrations and pulsations.
- Protection against over-heating

## Dampeners
**A3100 Series**

- Protection against pulsations

## Adaptators, fittings to weld :
**A3500 - A3600 - A3700 Series**

- Stainless steel, steel or brass
- Various process connections

## Syphons
**A3000 - A3010 Series**

- To prevent over-heating



## Limitors
**A3400 Series**

- Protection against pressure peaks

## Pressure gauges

**M5000 to M5200 Series**

- Relative, absolute and differential pressure
- Class 1 - 1.6 - 2.5
- Stainless steel housing IP 65
  diameters : 63, 100, 150 mm
- Laminated safety glass
- Back or bottom connection
- Copper or stainless steel tube
- Ranges -1…+1600 bar
- **Options :** electrical contacts, oil filling, chemical seals


## Industrial thermometers

**T7000 - T7100 Series**

- Bimetallic or gas expansion types
- Version : direct bulb or with capillary
- Stainless steel housing IP65
- Class 1
- Diameters : 100 or 150 mm
- Ranges : –200°…+600°C
- **Options :** electrical contacts, oil filling



## Indicators

**GSI and IND Series**

- Loop powered plug-in on DIN43650 connector
- Front panel mounting indicator, 4 and 4 1/2 digits, 4-20mA output signal, relays or SPDT outputs as option


## Calibration bench

**LP-MP-HP Series**

- Portable, accurate
- Local checking
- One site calibration
- 3 ranges : - 1 +10 Bar
  - 1 +25 Bar
  - 0 +700 Bar
- Files connections on PC

EX

# Measurement and control in hazardous areas

*The use of certified electrical instruments is mandatory for installation located in explosive atmospheres.*

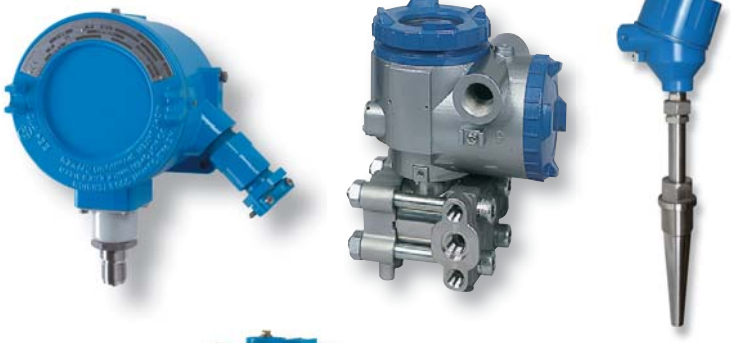
*According to hazardous areas, several protection methods are proposed :*

## *Flameproof protection*

**Ex d IIC T6**

***Explosion proof housing***

*Applicable for pressure and temperature switches P and F series and for temperature sensors S2000 and S4000 series*
*Equipment categories 2*
*For zones 1, 2, 21* and 22*



***With explosion proof microswitch(es)***

*Applicable for pressure and temperature switches F*
*Equipment categories 2* and 3*
*For zones 1, 2, 21* and 22*

## *Flameproof and increased safety protection*

**Ex de IIC T6**

*Applicable for pressure and temperature switches P and F*
*Equipment categories 2* and 3*
*For zones 1, 2, 21* and 22*

*Offshore Application*

## *Intrinsic safety protection*

**Ex ia IIC T6**

*Applicable for pressure and temperature switches P, F, G and Airgas,*
*pressure transmitters TR/TA and GR/GA*
*and temperature transmitters S2000 and S4000*
*Equipment categories 1*, 2* and 3*
*For zones 0, 1, 2, 20* 21* and 22*

*Associated device*

**[Ex ia] IIC**

**SAFE AREA**

**HAZARDOUS AREA**

**ATEX 94/9/CE**

**SERIES 6**

### INTRINSIC SAFETY

*An Intrinsically safe equipment installed in hazardous area must be interfaced with a barrier, the assembly so called an IS loop. This barrier excludes spark, arc or any thermal effect which may ignite an explosive mixture in normal or abnormal operation conditions in hazardous area.*



## *Pneumatic version*

*These devices do not have any self-ignition sources and are not included in the scope of ATEX directive. For this reason, they can be installed in hazardous area.*

*Applicable for pressure and temperature switches P and F.*

** according to selected options, equipment categories may be modified for Dust zones.*

## SIGNALS INTERFACES

## BETWEEN SAFE AND HAZARDOUS AREAS

ATEX

# Operating principle of this type of protection

*This principle is based on the apprehension of the intrinsic safety circuit which is "a circuit within which no spark and no temperature effect produced under the prescribed test conditions may provoke the outbreak of fire in a given explosive environment." GEORGIN is hazardous environment equipment specialist and the company is a leading expert in intrinsic safety, offering its customers a complete range of interfaces, all of which meet ATEX :*

*These interfaces gather relays and signal converters and are available for* ***3 different types of mounting*** *:*

- *Rail mounting,*
- *Backplanes plug-in modules,*
- *Cards for 19" racks.*

# Rail mounting

### Relays RDN Series

***On/Off signals relays***

ABS *housing - 70 x 100 x 21.5 mm*

- *Switch or proximity sensors (Namur) input*
- *1 or 2 channels*
- *24 - 48 Vdc / 110 - 230Vac*
- *Front face LED*
- *Loop checking*
- *Connection : plug-in cage clamp terminals*

**Options** *: alarms, transistor output*

SIL2 *Capability*



### Converters Power supplies BXN Series

***Analogue signals converters***
***Power supplies for transmitters, lamps, solenoid valves***

ABS *housing - 90 x 135 x 21.5 mm*

- *Inputs : 4-20mA -Volts - Pt100 - TC - Potentiometer*
- *Compatible HART protocol*
- *1 2 or 4 independent channels*
- *24 - 48 Vdc / 110 - 230 Vac*
- *Front face LED*

SIL2 *Capability*

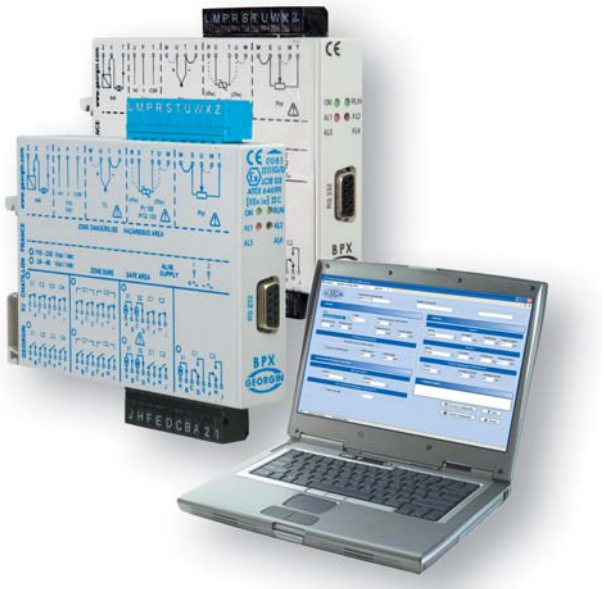


# Programmable universal converter and trip amplifier ProgressX family

**BPX Series**

***Programmable converter and trip amplifier for any measurement signal types***

- ABS *housing 90 x 135 x 21.5mm*
- RTD100, TC, *potentiometer, mV, V, mA input*
- *1 or 2 4...20mA outputs*
- *2 or 4 programmable thresholds*
- HART *protocol compatible*
- *Processor, threshold and power* LED's
- *Configuration under Windows® environment*
- 24-48 *Vdc* / 110-230 *Vac*




# Plug-in modules for backplanes

**Relays - Converters - Power supplies**
**BE Series**

***On/Off signals relays***
***Analogue signals converters***
***4-20 mA transmitter power supplies***

- *Compact series for mounting into system cabinets*
- *Modules number for each backplane on request* (8-16 ...)
- *Plug-in* ABS *housing - 88 x 110 x 21.5 mm*
- *1 or 2 independent channels*
- *Inputs* : Switch *or proximity sensor* (Namur ), 4-20mA -Volts - RTD100 - TC - *Potentiometer*
- HART *protocol compatible*
- **Options** : *earth busbar - alarms - tags - connection through connector for* PLC's

SIL2 *Capability*

# SIGNALS INTERFACES
# BETWEEN SAFE AND HAZARDOUS AREAS

## Eurocards for 19" rack

**Relays - Converters - Power supplies**
**CE Series**

***On/Off signal relays***
***Analogue signal converters***
***4-20 mA transmitter power supplies***

- *Eurocards*
- *14 or 21 cards by rack*
- *Individual supply by card*
- *Any type of signal : switches relays, proximity sensors (Namur), 4-20mA, Volts, Pt100, TC, potentiometer, ...*
- *Upto 6 channels by card (relay)*
- *Connections : soldering or screw terminals, flat cable and screw terminals*
- *Partition between I.S. and non I.S inputs/outputs*
- *Integration and wiring of control cabinets on request*

## Zener barriers with earth reference

### *Zener Barriers*
**BZC/BZG Series**

- *All type of signals interfacing*
- *Simple or double model*
- *13mm tightness with 1 or 2 channels*
- *Installation in sale or hazardous (Zone 2) area ATEX and IECEx certifications*
- *Certification for a Safety Instrumented System (SIL2 or SIL3)*
- *Removable label holder on the front*
- *Current flow signalling Led on the front*

BZC


BZG

## *Intrinsically safe analogue indicators*

### GSI Series

- *Located in zones 0, 1, 2, 20, 21, 22*
- *IP66 field mounting or panel mounting housing*
- *3 1/2 and 4 1/2 digits display*
- *4-20mA loop powered*
- *Front face programming*
- ***Options** : alarms, backlight, internal calibrator,...*


*4 1/2 digits indicator*


*Set point station with 3 1/2 digits indicator*


*3 1/2 digits indicator*


*Field mounting (3 1/2 or 4 1/2 digits)*

*Combined Indicator : 3 1/2 digits and bargraph (h=95 mm)*


*Plug-in indicator DIN 43650*

**INTRINSIC SAFETY**

## *Intrinsically safe pilot lamps*

### VSI Series

- *Located in Ex area*
- *IP 65*
- *LED lightening*
- *Colours : blue, yellow, red, green, white*

## REMOTE I/O

ATEX


### Overview

**LB / FB systems**

*Remote I/O for installation in zone 1 or 2 (gas)*

- *Modbus* RTU, *Profibus* DP, DPV1
- FDT, DTM *concept*
- HART *protocol via Profibus* DPV1 *or via service bus using standard software*
- *Output and input signals can be mixed on the same backplane*
- *Hot swapping*
- *Communication and power supply redundancy*
- *Diagnostic and self monitoring*
- ATEX *certification*
- *Link to all major* DCS : *Siemens, Honeywell,* ABB, *Emerson, Foxboro, Yokogawa, Schneider…*

### Zone 2 mounting

**Local Bus system**

*Plug-in modules on backplanes,* DIN *rail mounting*

- *Mounting in zone 2, or safe area in cabinets*
- *Binary, analogue,* RTD100, TC, *voltage, frequency signals*
- IS *and* NIS *interfaces available on the same backplane*
- *Up to 92 analogue signals and 184 digital signals on the same remote I/O station*



## *Zone 1 mounting*

### Field Bus system

*Plug-in modules on backplanes in field housing IP66 certified*

- *Intelligent combination of hazardous area protection methods*
- *Encapsuled modules for rough environments*
- *Installation in zone 1 in polyester or stainless steel housing*
- *Interfaces for EEx d devices*
- *EEx i and EEx e interfaces can be mixed on the same unit*
- *Not hot work permit required for maintenance*
- *Up to 96 analogue signals and 192 digital signals on the same remote I/O station*



## *Mounting*

### LB / FB series

- *Installation in polyester or stainless steel housing*
- *Communication on copper or optic fiber*
- *Customized decentralized stations on request*

## OTHER LINES

### *Programmable signal conditioners and trip amplifiers ProgressX Family*

**BPX Series**

*Analogue, low level signals converters and trip amplifiers type* BPX
ABS *housing* 90x135x21.5 *mm*

- 4-20mA, *mV, V, TC, Pt100, potentiometer*
- 1 *or* 2 *outputs* 4-20mA
- 2 *or* 4 *programmable thresholds*
- HART *protocol compatible*
- *Processor, thresholds and power* LED's
- *Power supply* : 24-28 Vdc/110-230 Vac
- *Configuration under Windows® environment*

### *Trip amplifier*

**SDN Series**

- *Inputs* :
  *Transmitters,* 4-20 *mA,* 0-20 *mA*
- *Outputs* :
  2 *trips and* LCD *displays*
- *Power supply* : 24 Vdc/110 Vac - 230 Vac
- *Rail mounting*


### *Galvanic isolated signal conditioners*

**BVN Series**

- *Inputs* :
  - *Actuators*
  - 4-20 *mA transmitters*
  - TC
  - Pt100
  - *Potentiometer*
  - *Variable resistance*
- HART *protocol compatible*
- *Power supply* : 24-48 Vdc/110-230 Vac




### *Draught burner regulator*

**Moderator B Series**

*Domestic use*


**Moderator M Series**

*Industrial use*

## REFERENCES

**OIL**
*Ineos, Exxon Mobil, Total, AGIP, Sonatrach, QAPCO, Shell…*

**GAS**
*Air liquide, GDF, Linde, NIGC, Gazprom…*

**CHEMICAL, PHARMACEUTICS AND COSMETICS**
*Arkema, Asmidal, Arak Petrochemicals, Aventis-Sanofi, BASF, BASELL, Clariant, GCT, Innovene, L'Oréal, OCP, Rhodia, Solvay…*

**ENERGY**
*Areva TD, Alstom Power, EDF, Electrabel, NTPC, VATech, MAPNA…*

**NAVAL**
DCN, *Navantia, STM, SEMT, Pielstick, Wartsilä…*

**AERONAUTIC - SPACE**
EADS, CNES *Kourou…*

**RAILWAYS**
*Alstom, Faiveley Transport, RATP, Siemens, SNCF…*

**ENGINEERING**
*Amec Spie, Cegelec, Technip, Foster Wheeler, Lurgi, Clemessy, Ingerop, Sogequip…*

**AUTOMOTIVE INDUSTRY METALLURGY**
*Continental, ISPAT, Michelin, Pechiney, PSA, Renault, Sollac…*

**FOOD PROCESSING INDUSTRY**
*Danone, Yoplait, Roquette, Tereos, Kronenbourg…*

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*Ateliers François Atlas Copco, Babcock, Burton Corblin, Cegelec, Ineo, SNEF, Stein Energie…*

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## QUALITY ISO 9001-V2008

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