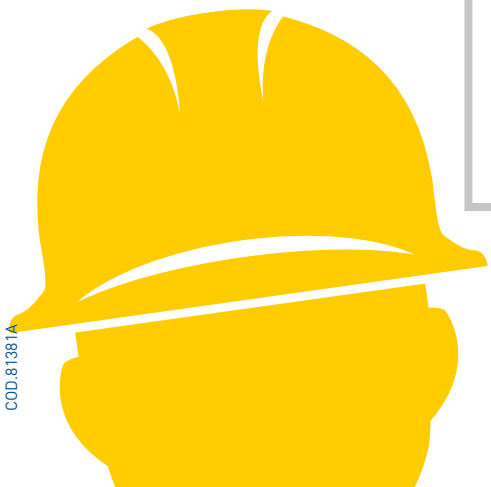


ENG



**PLASTICS
MACHINERY
BY GEFRAN:
INDUSTRY 4.0,
SAFETY &
GREEN SOLUTIONS**

4.0



COD.81381A

GEFRAN



GEFRAN



Gefran

Over fifty years of experience, an organisation highly focused on the customer's needs and constant technological innovation make Gefran a benchmark in the design and production of 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.

Sensors

A complete range of precision devices for measuring process variables such as temperature, force, pressure and position. The key components are made in "clean rooms" that are protected against all types of interference to guarantee full measurement precision.

Automation

Gefran offers a wide range of products dedicated to indicating and regulating process variables: automation platforms, regulators and indicators, static units and power controllers able to improve production process efficiency, even from the energy standpoint.

Drive and Motion Control

A complete range of electric drives for regulation the speed of AC and DC motors, inverters and converters. The devices are designed and made using the very latest technologies in the modern Drive and Motion Control unit in Gerezano. To respond to the specific requirements of every individual client, Gefran also offers custom made solutions.

Gefran Soluzioni s.r.l.

Gefran Soluzioni offers consultancy, design and manufacturing services for automation equipment and electrical panels for the control of industrial processes and machines. Gefran works side by side with clients to improve the performance of their technological processes and guarantee continuity, attention to the sustainable maximising of value.

Gefran interprets the Smart Factory paradigm with a product catalogue that meets connectivity, factory data acquisition, monitoring and diagnostic maintenance needs. Devices with functions designed to further energy efficiency according to the most recent safety directives.

Focus on the environment and workers' safety are the two cornerstones supporting Gefran products.

As regards environmental impact, Gefran offers a wide range of Melt pressure sensors with fluid free transmitters or filled with Green mixes, in line with the RoHS directive.

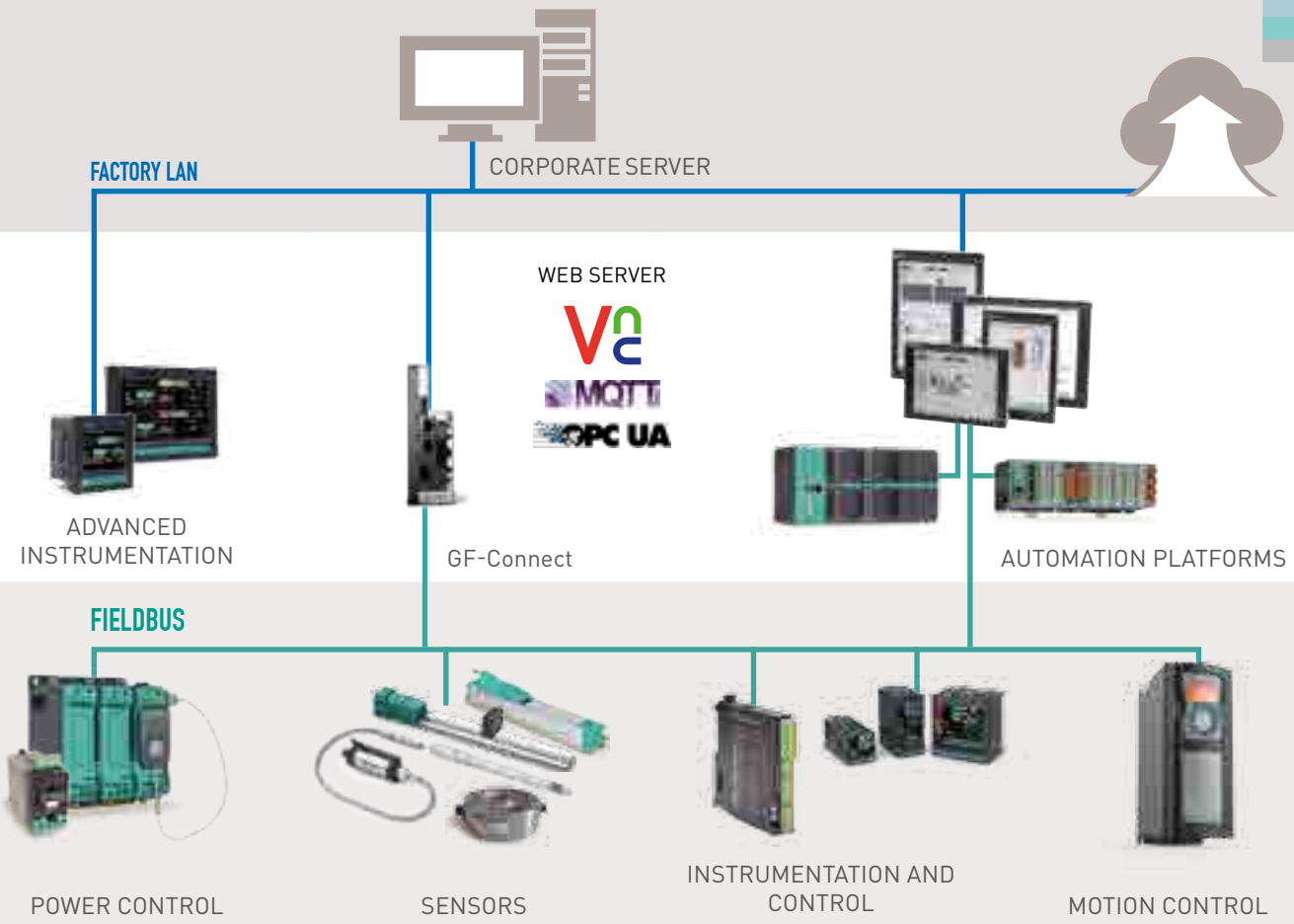
From the safety standpoint, Gefran sensors are PL"c" and SIL2 certified while inverters are equipped with an integrated safety module (STO - SIL3, PLE category) that allows the motor to be cut-off without using drive output safety contactors.



2 MONITORING and CONTROL

1 DATA ACQUISITION

0 SENSORS and INSTRUMENTATION



SENSORS

MELT PRESSURE SENSORS	8	TEMPERATURE SENSORS: THERMOCOUPLES	22
IMPACT melt pressure sensors: fluid free technology	10	TCM MgO	22
NaK melt pressure sensors: sodium-potassium filled technology	12	STRAIN AND FORCE SENSORS WITH SENSORMATE TECHNOLOGY	24
Oil melt pressure sensors: oil filled technology	14	DLC	24
POSITION TRANSDUCERS: MAGNETOSTRICTIVE DEVICES AND POTENTIOMETERS	16	GE1029-A	25
ONP1 - A	16	GE1029 & VDA-TRIO	26
IK4 - E	17	SL76	27
MK4 - C	18	QE1008W-SET	28
MK4 - S	19	IN-SENSOR	30
PY1	20		
PRESSURE SENSORS	21		
KS SIL2	21		

AUTOMATION

AUTOMATION PLATFORMS

Gefran Soluzioni srl	34
GCube Modula	36
GCube Performa	37
eXtru*	38
Plastic template	40
Control and operator panels	42
Remote I/Os and PLC racks	44

CONTROLLERS AND PROGRAMMERS

650/1250/1350	46
Zapper	46
GFXTERM04	47

INFRARED LAMP POWER CONTROL (IR)

IR 12 – IR 24	50
GFX4-IR	52
GTF	53

STATIC CONTACTORS AND SOLID STATE RELAYS

GTS	54
GQ	55

MOTION

INVERTERS FOR INDUSTRIAL APPLICATIONS

ADV200	58
ADV200 LC	60
ADP200	62

SERVODRIVE

AXV300	64
--------	----



SENSORS



SAFETY ABOVE ALL

- Safe overpressure detection PL "c" certified (EN 13849-1 and EN 1114-1)
- Self-diagnosis functions for fault condition monitoring
- Atex intrinsically safe certification (II 1GD)



I71



IX2



KE1



WX1



W70





A WORLD OF GREEN SENSORS

- Patented fluid free technology
- Environmentally friendly filling fluid
- FDA approved filling fluid



IE0



KE3



WN2



INDUSTRY 4.0: SMARTER IS BETTER

- Quick and accurate sensor configuration
- Smart sensors for integrated process control
- Flexible sensors for flexible production management

HKE1



HART
COMMUNICATION PROTOCOL

HWX2



KD0



CANopen

WD3





IMPACT melt pressure sensors: fluid free technology

IMPACT is Gefran's exclusive series of high-temperature pressure sensors that use the piezoresistive principle.

The main characteristic of IMPACT sensors is that they do not contain any transmission fluid.

The sensitive element, directly positioned behind the contact diaphragm, is made from silicon by means of microprocessing techniques. The micro structure includes the measurement membrane and piezoresistors.

The minimum deflection required by the sensitive element makes it possible to use very robust mechanics.

The process contact diaphragm can be up to 10 times thicker than the diaphragm used in traditional Melt sensors. Autozero function always available.

- PATENTED FLUID FREE TECHNOLOGY
- SAFE OVERPRESSURE DETECTION PL "C" CERTIFIED (EN 13849-1 AND EN 1114-1)
- RELAY OUTPUT VERSION AVAILABLE
- ATEX INTRINSICALLY SAFE CERTIFICATION (II 1G)

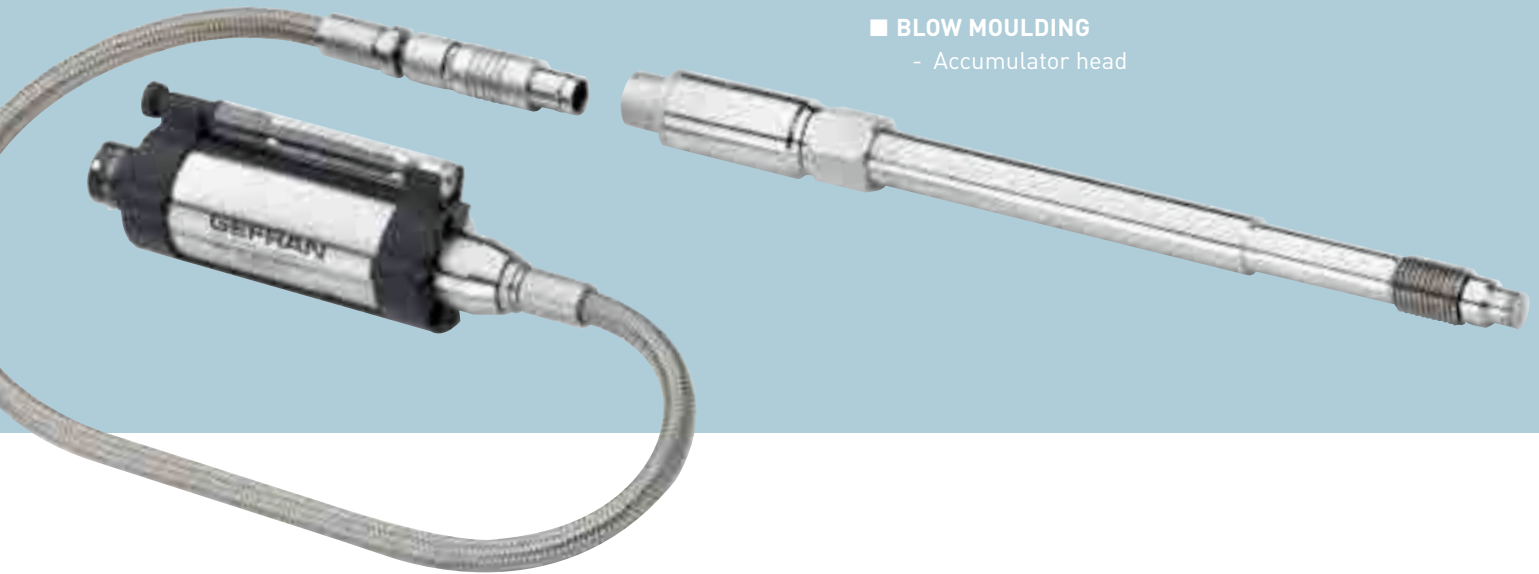


Advantages

- COMPLETE RoHS DIRECTIVE COMPATIBILITY
- VERY ROBUST IN CONTACT DIAPHRAGM → LONG PRODUCT LIFE
- FLOATING STEM & MODULAR CONNECTION → VERY EASY TO INSTALL & UNINSTALL

Applications

- EXTRUSION
 - Profile lines
 - Compounders
 - Sheet lines
 - Pipe lines
 - Food
- BLOW MOULDING
 - Accumulator head



NaK melt pressure sensors: sodium-potassium filled technology

The Gefran "NaK" series of pressure transmitters are state-of-the-art products suitable for use in very high temperature environments.

Thanks to well proven Gefran Sodium-Potassium (NaK) filling technology, the media temperature can go up to 538°C (1000°F) while maintaining excellent stability.

The constructive principle is based on the hydraulic transmission of pressure.

Physical measurements are transformed into electrical measurements by means of the strain-gauge technology.

The autozero function (magnetic or external), provides the product with simple, easy access to output adjustment for best performance.

- ENVIRONMENTAL FRIENDLY FILLING FLUID (NaK)
- VERY HIGH TEMPERATURE MEDIA: UP TO 538°C
- SAFE OVERPRESSURE DETECTION PL "C" CERTIFIED (EN 13849-1 AND EN 1114-1)
- HART PROTOCOL AND CANOPEN DIGITAL VERSIONS AVAILABLE



NaK
PLC

HART
COMMUNICATION PROTOCOL

CANopen



Advantages

- COMPLETE RoHS DIRECTIVE COMPATIBILITY
- QUICK AND ACCURATE SENSOR CONFIGURATION
- SMART SENSORS FOR INTEGRATED PROCESS CONTROL

Applications

- **EXTRUSION**
 - Profile lines
 - Compounders
 - Sheet lines
 - Pipe lines
 - Food
- **BLOW MOULDING**
 - Accumulator head





Oil melt pressure sensors: oil filled technology

The Gefran "W" series of pressure transmitters are products suitable for use in high temperature environments.

Thanks to well proven Gefran oil filling technology, the media temperature can go up to 315°C (600°F) while maintaining very good stability.

The constructive principle is based on the hydraulic transmission of pressure.

Physical measurements are transformed into electrical measurements by means the strain-gauge technology.

The autozero function (magnetic or external), provides the product with simple, easy access to output adjustment for best performance.

- FDA APPROVED FILLING FLUID
- SAFE OVERPRESSURE DETECTION PL "C" CERTIFIED (EN 13849-1 AND EN 1114-1)
- HART PROTOCOL AND CANOPEN DIGITAL VERSIONS AVAILABLE
- ATEX INTRINSICALLY SAFE CERTIFICATION

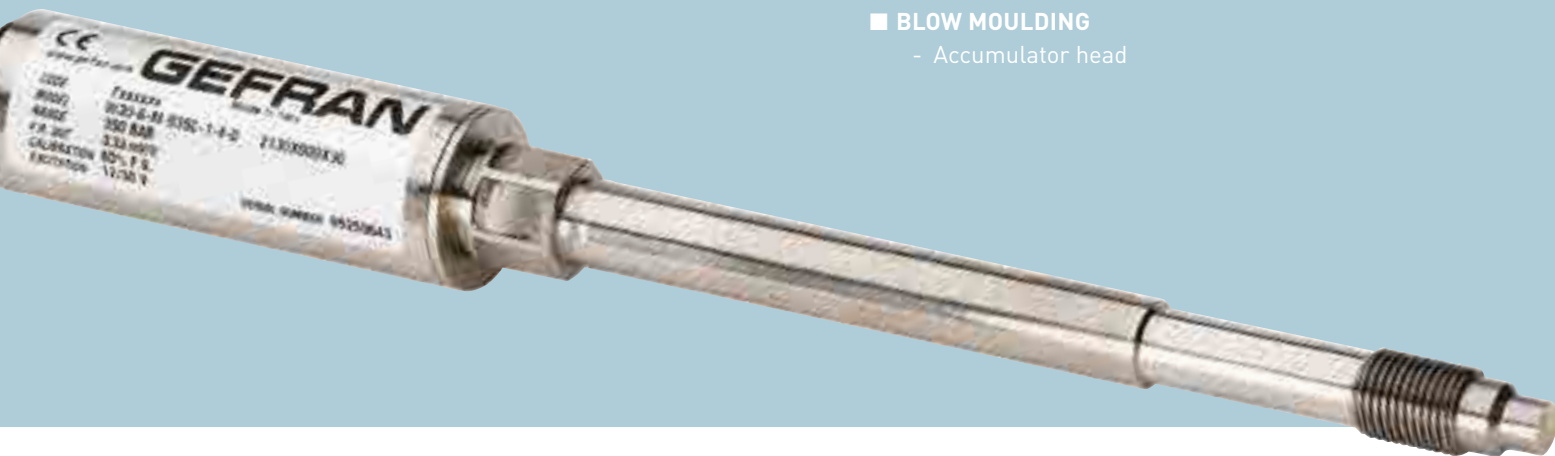


Advantages

- COMPLETE RoHS DIRECTIVE COMPATIBILITY
- SELF-DIAGNOSIS FUNCTIONS FOR FAULT CONDITION MONITORING
- FLEXIBLE SMART SENSORS FOR FLEXIBLE PRODUCTION MANAGEMENT

Applications

- **EXTRUSION**
 - Profile lines
 - Compounders
 - Sheet lines
 - Pipe lines
 - Food
- **BLOW MOULDING**
 - Accumulator head



ONP1 - A

CONTACTLESS MAGNETOSTRICTIVE LINEAR POSITION TRANSDUCER (ANALOG OUTPUT)

Contactless linear position transducer with Gefran ONDA magnetostrictive technology for longer lifespan. The absence of electrical contact on the cursor eliminates all wear and tear and guarantees almost infinite lifespan. The ONDA technology solution (patented by Gefran) provides an essential modular structure with compact size for simple installation.

- SLIDING OR FLOATING CURSOR
- STANDARD VALVE OR M12 CONNECTOR
- IP65 PROTECTION



Advantages

- CONTACTLESS TECHNOLOGY FOR INFINITE PRODUCT LIFESPAN
- EXCELLENT COMPATIBILITY THANKS TO THE VOLTAGE OR CURRENT OUTPUT
- ACCURATE MEASUREMENT: REPEATABILITY < 0.01 mm

Applications

- AUTOMATIC SCREEN CHANGER
 - Screen change control

IK4 - E

CONTACTLESS MAGNETOSTRICTIVE LINEAR POSITION TRANSDUCER (ETHERNET OUTPUT)

Contactless absolute linear position transducer with Ethernet communication based on new ONDA+ technology. The Ethernet interface is embedded in complex systems with long communication distances, guaranteeing rapid and secure data transmission. The absence of contact on the cursor eliminates all wear and ensures an almost infinite transducer lifespan. The many advantages include digital communication, smaller size for easier installation, high protection rating for harsh environments, excellent linearity, repeatability and resistance to vibration and shock for exceptional reliability.

- **ETHERNET INTERFACE: DIGITAL COMMUNICATION FOR SMART MANUFACTURING**
- **POSITION AND ABSOLUTE SPEED MEASUREMENTS**
- **UP TO FOUR CURSOR READINGS SIMULTANEOUSLY**

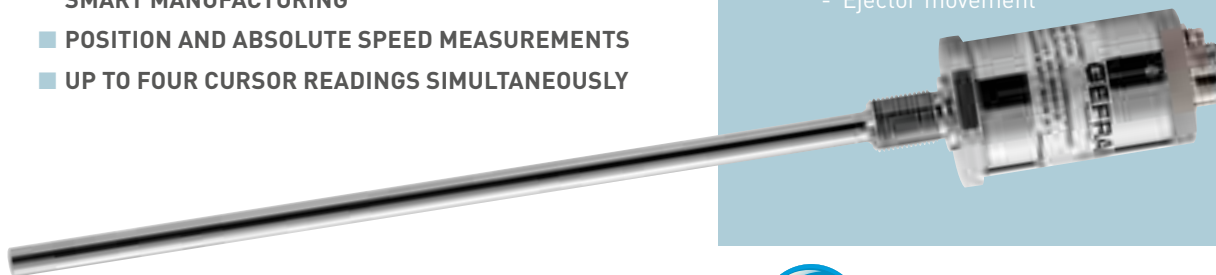


Advantages

- **CONTACTLESS TECHNOLOGY FOR INFINITE PRODUCT LIFESPAN**
- **MULTIPLE POSITION READINGS**
- **PREDICTIVE MAINTENANCE FUNCTIONALITY**

Applications

- **INJECTION MOULDING MACHINE**
 - Carriage positioning
 - Injection cylinder positioning
 - Mould opening/closing control
 - Ejector movement



MK4 – C

CONTACTLESS MAGNETOSTRICTIVE LINEAR POSITION TRANSDUCER (CANOPEN OUTPUT)

Contactless linear position transducer with magnetostrictive technology. The absence of electrical contact on the cursor eliminates all wear and guarantees an almost infinite lifespan. The MK4 CANopen has an integrated microprocessor to process the measurement and diagnose the transducer. The CAN field bus communication system provides fast and safe data transmission. The use of the CANopen DS-301 protocol and Device Profile DS-406 provides quick and easy integration of the transducer in the control and automation system

- POSITION AND ABSOLUTE SPEED MEASUREMENTS
- ONE OR TWO CURSOR VERSIONS AVAILABLE
- CANOPEN INTERFACE: DS-301 V4.01 DEVICE PROFILE DS-406 V2.0

Advantages

- CONTACTLESS TECHNOLOGY FOR INFINITE PRODUCT LIFESPAN
- PREDICTIVE MAINTENANCE FUNCTIONALITY
- SENSOR DIAGNOSTICS CAPABILITY

Applications

- INJECTION MOULDING MACHINE
 - Carriage positioning
 - Injection cylinder positioning
 - Mould opening/closing control
 - Ejector movement

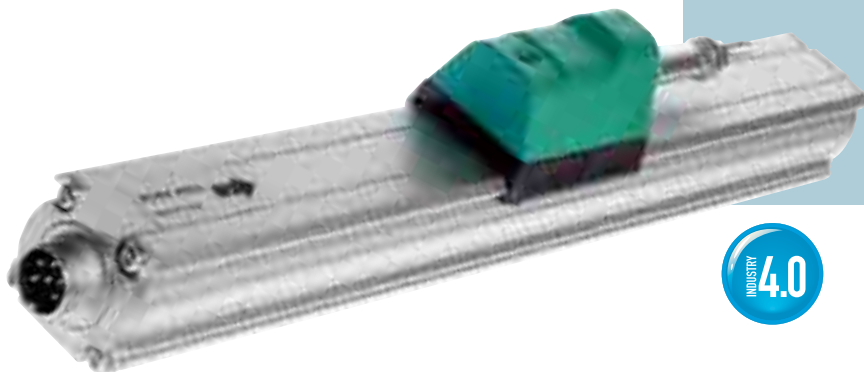


MK4 – S

CONTACTLESS MAGNETOSTRICTIVE LINEAR POSITION TRANSDUCER (SYNCHRONOUS SERIAL OUTPUT)

Contactless linear position transducer with ONDA magnetostrictive technology, with RS422-SSI digital output interface. The absence of electrical contact on the cursor eliminates all wear and guarantees an almost infinite lifespan. Compact size for simple installation. Full protection in harsh environments with high levels of contamination and dust. Excellent linearity, repeatability and resistance to mechanical vibration and shocks.

- **SYNCHRONOUS SERIAL INTERFACE (SSI)**
- **DATA FORMAT: BINARY OR GRAY CODE; INCREMENTAL/ DECREMENTAL**
- **OPERATING TEMPERATURE: -30...+90°C**



Advantages

- **CONTACTLESS TECHNOLOGY FOR INFINITE PRODUCT LIFESPAN**
- **OUTPUT DATA RESOLUTION AVAILABLE FROM 1 TO 40 μm**
- **HIGH NOISE IMMUNITY THANKS TO THE DIGITAL SIGNAL**

Applications

- **EXTRUSION BLOW MOULDING**
 - Carriage movement
 - Mould opening/closing control
 - Air blowing nozzle positioning



PY1

POTENTIOMETER TOUCH VERSION

Potentiometers are electro-mechanical devices that provide a ratiometric voltage output: the range of output voltages depends on the voltage used to power the transducer.

The small size of the transducer makes it suitable for installation in confined spaces and for detecting small shifts.

The side connection creates a through-rod structure with double rod support, guaranteeing greater overall strength of the transducer.

Installation is simplified by the lack of electrical signal variation at output outside theoretical electrical stroke.

Ideal for small mechanical devices, valves, test tools and benches.

- DOUBLE CONTROL ROD SUPPORT
- INFINITE RESOLUTION
- CABLE OR CONNECTOR OUTPUT

Advantages

- PRECISE AND ACCURATE MEASUREMENT
- SPACE-SAVING SOLUTION
- EASY TO INSTALL

Applications

- BLOW MOULDING
 - Continuous extrusion blow moulding machine
 - Accumulator extrusion blow moulding machine



KS SIL2

KS transmitters are based on film sensing elements deposited on a stainless steel diaphragm.

Thanks to the latest state-of-the-art SMD electronics and compact all stainless steel construction, these products are extremely robust and reliable and come with SIL2 certification.

KS transmitters are suitable for all industrial applications, especially on hydraulics (injection presses, pumps, power packs, fluid power, etc.) under severe conditions usually with high levels of shock, vibration, pressure and temperature peaks.

- HIGH ACCURACY
- FLUIDFREE SENSING ELEMENT
- FAST RESPONSE TIME



Advantages

- ALL STAINLESS STEEL CONSTRUCTION
- SIL 2 APPROVAL → HIGH RELIABILITY
- PROTECTION AGAINST PRESSURE PEAKS

Applications

- INJECTION
 - Hybrid injection moulding machine
- BLOW MOULDING
 - Accumulator extrusion blow moulding machine



TCM MgO

MINERAL OXIDE (MgO) THERMOCOUPLE FOR USE IN THE PLASTIC INDUSTRY

Designed for direct melt contact measurement with flat or blade tip.

Sliding tip available for direct flush measurement.

½ -20 UNF or M18x1.5 thread. Stem material available in stainless steel or Hastelloy.

Wired with multiple solutions: cable, compensated connector and steel protected sheath.



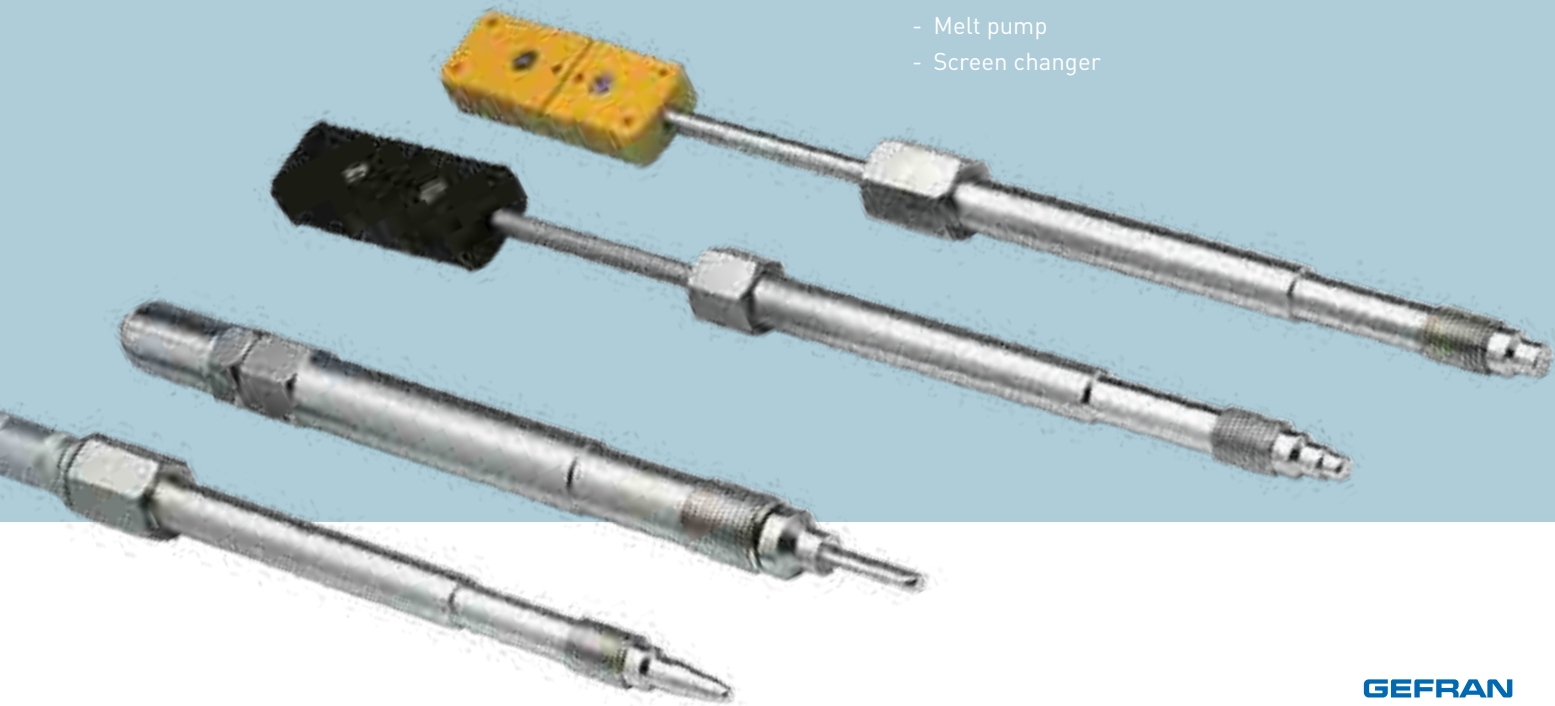
- THERMO-ELEMENT WITH COMPACT INSULATION AND CONTINUOUS METAL SHEATHING (MgO INSULATION)
- MAX TEMPERATURE LIMIT: - 40 ... + 400° C
- THERMOCOUPLE OR PT100 OUTPUT SIGNAL

Advantages

- MELT TEMPERATURE DIRECT MEASUREMENT
- ACCURATE PROCESS CONTROL
- SLIDING BLADE DESIGN FOR DIRECT FLUSH READING

Applications

- MELT TEMPERATURE DIRECT MEASUREMENTS IN PLASTIC EXTRUSION PROCESSES:
 - Barrell
 - Head
 - Melt pump
 - Screen changer



DLC

DIAPHRAGM LOAD CELL

Pancake like diaphragm load cell designed for use in full electric injection moulding machines. The Flat-Body design allows for easy integration into the injection unit without adding to the machine length. Available with standardized mV/V output or an EEPROM module to allow for higher mV/V-Output for better signal/noise ratio.

- **DESIGNED TO INTEGRATE WITH MACHINE**
- **WITH OR WITHOUT INTEGRATED AMPLIFIER**
- **GOOD LINEARITY**

Advantages

- **CUSTOMIZED AND RELIABLE SOLUTION FOR INJECTION FORCE MEASUREMENT**
- **FLAT-BODY DESIGN TO MINIMIZE MACHINE SIZE**
- **EEPROM FUNCTION FOR SENSITIVITY DETECTION**

Applications

- **FULL ELECTRIC INJECTION MOULDING MACHINES:**
 - Injection force measurement



GE1029-A

TIE BAR STRAIN SENSOR WITH INTEGRATED AMPLIFIER

Press-on strain sensors measure surface-strain directly at the mounting location on cylindrical structures, similar to bonded strain gauges. The GE1029A tie bar strain sensor presses strain gauges under a stainless protective foil onto the cylindrical surface to be measured with such force that friction replaces the bonding normally used to fix strain gauges.

The mounting with the stainless steel straps is very stable and the strain gauge is protected.

The sensor cannot be overloaded.

The sensors do not need to be recalibrated once they have been replaced or remounted. A different pair of steel straps is needed for each tie bar diameter outside the tolerance of $\pm 2\text{mm}$.

They need a cyclical reset.

- DIRECT SURFACE STRAIN READING ON CYLINDERS
- WITH INTEGRATED AMPLIFIER
- ONE SYSTEM FOR MULTIPLE TIE BAR DIAMETERS (25...250MM)



Advantages

- SPACE-SAVING SOLUTION WITH INTEGRATED AMPLIFIER
- BENDING COMPENSATED SYSTEM FOR VERY ACCURATE MEASUREMENTS
- SMART SOLUTION: NO MOUNTING HOLE NECESSARY

Applications

- INJECTION MOULDING MACHINES
 - Tie bar elongation measurement
 - On-line control of clamping force
 - Test and check the load on all 4 tie bars

GE1029 & VDA-TRIO

TIE BAR STRAIN SENSOR WITH TRIO AMPLIFIER

The VDA-TRIO/DUO series is a high end digital strain gauge amplifier with up to 3 different outputs. Three independent outputs are generated by just one sensor (GE1029): clamping force, mould protection and cavity pressure profile measurements. The tolerance band of the mould protection has to be generated in the controller by a dry cycle (cycle without injection).

The cavity pressure profile too has to be generated in the controller. The system works with toggle machines only.

■ THREE PARAMETERS IN ONE SYSTEM:

- Clamping force
- Mould protection
- Cavity pressure profile



Advantages

- AVOIDS RUPTURE DURING MOULD CLOSING (MOULD PROTECTION)
- KEEPS THE CLAMPING FORCE UNDER CONTROL
- OPTIMISES THE INJECTION CYCLE

Applications

- INJECTION MOULDING TOGGLE MACHINES

SL76

LINK SENSOR WITHOUT AMPLIFIER

Strain link sensors pick up surface-strain between the 2 mounting locations. The strain between the mounting areas is mechanically amplified inside the sensor. Thanks to their rugged design, these sensors are used in heavy industrial environments. In the event of overload, these sensors may get an offset. They need a cyclical reset.

- **MECHANICALLY AMPLIFY THE STRAIN BETWEEN THE 2 MOUNTING AREAS**
- **IDEAL FOR TENSION MODE**
- **SPECIFICALLY DESIGNED FOR DYNAMIC APPLICATIONS**



Advantages

- **INDIRECT AND PRECISE ON-LINE CONTROL OF CLAMPING FORCE**
- **QUICK AND EASY MOUNTING ON PLATEN**
- **VERY ACCURATE TENSION MEASUREMENT**

Applications

- **INJECTION MOULDING MACHINES:**
 - Clamping force measurements



QE1008W-SET

MAGNET MOUNT WIRELESS STRAIN SENSOR

Magnet-press-on strain sensors QE1008W measure the surface-strain directly at the mounting location, similarly to bonded strain gauges.

The compact set is ready in minutes and allows the alignment of injection moulding machines in the shortest time possible. The QE1008W is mounted in seconds and needs no cables. It presses strain gauges under the stainless protective foil by means of 2 magnets onto the surface to be measured with such force that friction replaces the bonding normally used to fix strain gauges. Mounting is very fast and the strain gauge is protected. The sensor cannot be overloaded. The integrated amplifier and wireless module make this unit a state-of-the-art sensor with unsurpassed features and ease of use.

- **COMPLETE SET WITH SENSORS AND RECEIVER WITH USB INTERFACE FOR SOFTWARE ALIGNMENT**
- **WIRELESS TRANSMISSION**
- **MAGNET MOUNTING**





Advantages

- QUICK CALIBRATION DATA STORAGE FOR SMART MACHINE COMMISSIONING
- CLAMPING FORCE CHECK ON ALL 4 TIE BARS SIMULTANEOUSLY
- FAST AND EASY SENSOR INSTALLATION

Applications

- INJECTION MOULDING MACHINES
 - Test and check the machine
 - Tie bar elongation and clamping force measurements
 - Optimise SL and SB strain sensor locations



IN-SENSOR

NOZZLE PRESSURE SENSOR

Injection moulding machines need regular checks of the nozzle pressure compared to the load cell used behind the screw (on full electric IMM) or, more in general, compared to the reference system used. This sensor is for preventive maintenance and is not an on-line pressure sensor.

Set in carrying case with IN sensor, monitor for pressure display and heater band with controller. The IN type nozzle pressure sensor is mounted on the machine between the mould and the injection nozzle. Installation is very fast and easy thanks to the presence of the magnetic base that allows the nozzle check to be mounted on the mould.

For measuring various pressures (up to 4000 bar), the tip of the IN can be heated (the maximum temperature is 230°C) with the heater bands. In this way, the injected plastic in the dead volume remains liquid. The pressure when the melt temperature is above 230°C (max 400°C) can also be measured with just one shot. In this way, after solidification the plastic has to be removed with every shot.

The IN sensor can be used together with the DAK (nozzle touch force sensor, the force with which the nozzle is pressed against the mould): double measurement at the same time, melt pressure and contact force.

- SET TO MEASURE NOZZLE MELT PRESSURES OF UP TO 4000 BAR
- MULTI-SHOT AND PRESSURE STEPS POSSIBLE WITH HEATER BAND UP TO 230°C
- SINGLE-SHOT PRESSURE POSSIBLE WITH MELT TEMPERATURES OF UP TO 400°C

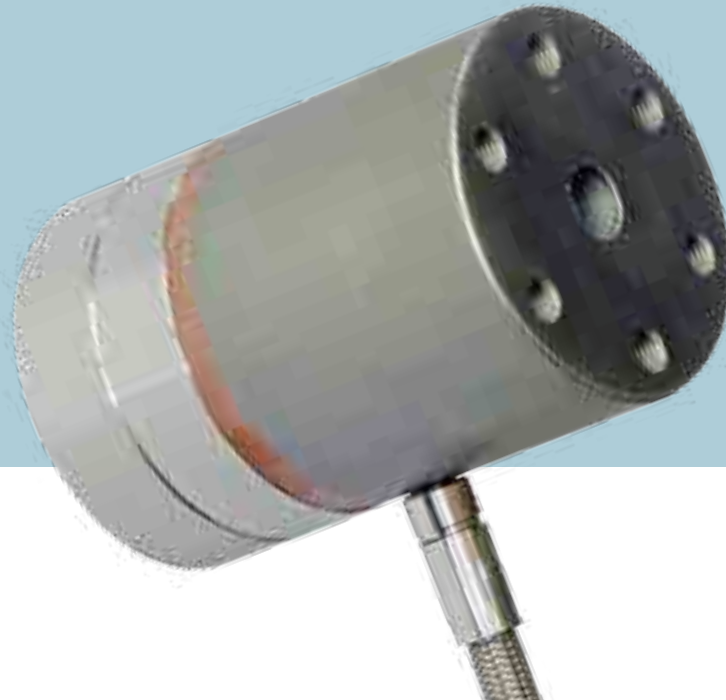


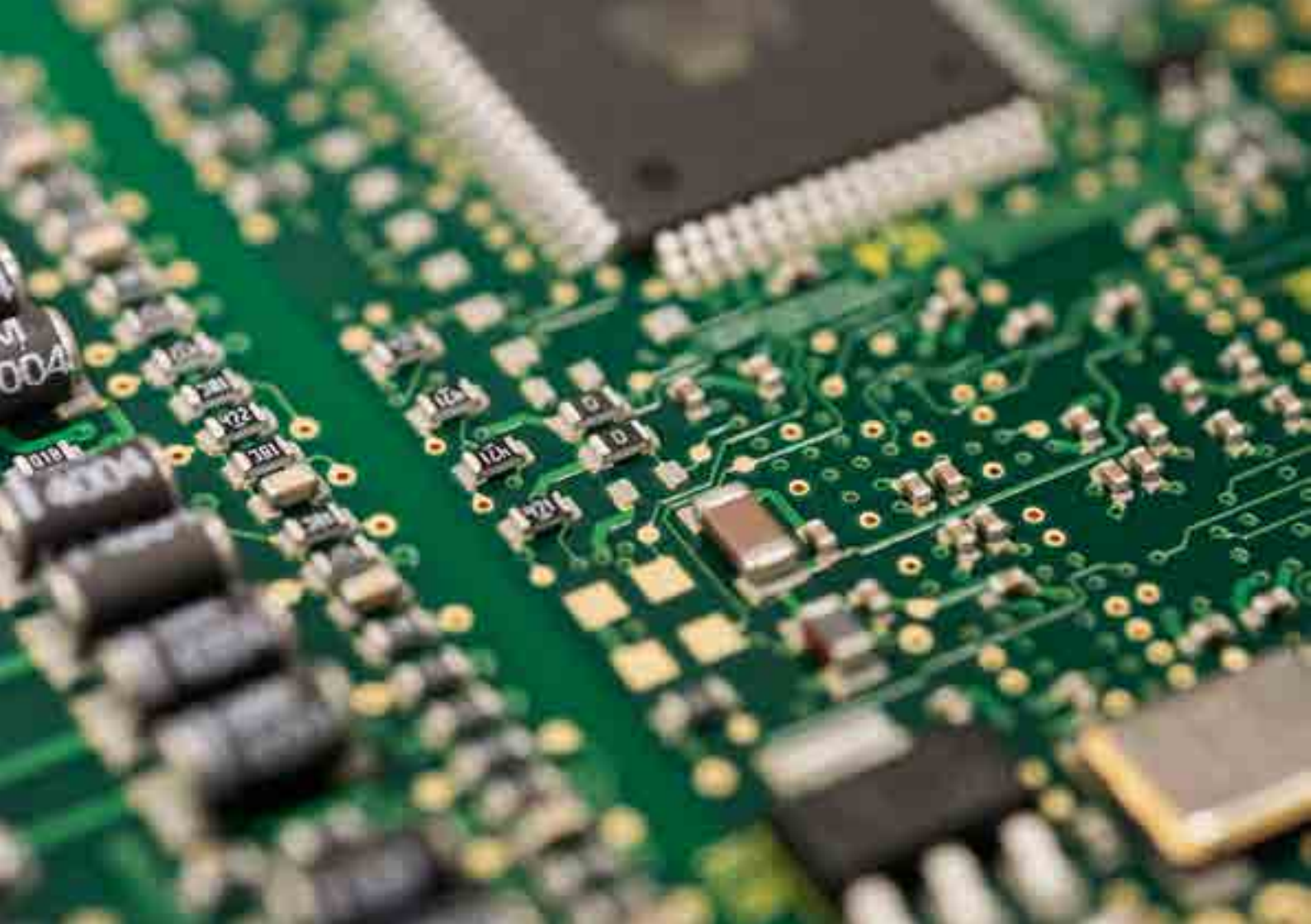
Advantages

- A SMART WAY FOR NOZZLE PRESSURE CHECKS
- MULTISHOT (230°C MAX) OR SINGLESHOT (400°C MAX) PRESSURE MEASUREMENTS
- FAST MACHINE DATA ACQUISITION SET-UP

Applications

- FULL ELECTRIC INJECTION MOULDING MACHINES:
 - Check and adjust injection pressure
 - Nozzle pressure comparison with the load cell measurement
 - Nozzle force touch measurement too (with DAK sensor)







AUTOMATION



Gefran Soluzioni srl

Gefran Soluzioni is a company dedicated to providing design and consultancy services for the creation of equipment that is certified to comply with the most common international standards.

The industrial environments in which GS has specific expertise and know-how usually involve all the sectors related to the transformation of plastic materials, the heat treatment of glass and metals and the control of autoclaves.

The GS Sales and Technical departments can assist a wide range of clients with vastly different needs: OEMs, SIs and End Users are a daily reality for GS.

- **PANEL MECHANICAL DESIGN**
- **ELECTRICAL DESIGN, SIZING AND ELECTRICAL DIAGRAMS**
- **ELECTRICAL PANEL MANUFACTURING**
- **ON BOARD MACHINE WIRING**
- **INSPECTION, TESTING AND SAFETY CHECKS**
- **COMMISSIONING AT THE CUSTOMER'S PREMISES**

SERVICES

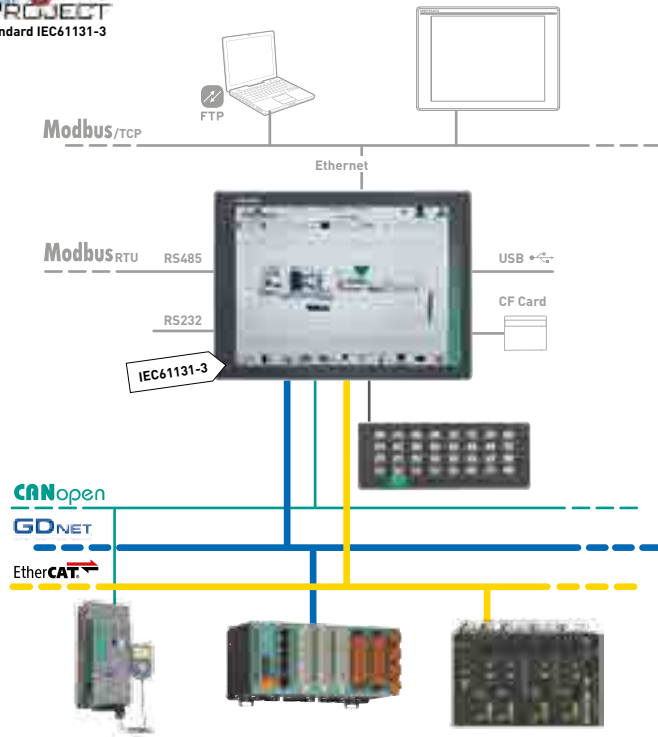
Gefran Soluzioni completes its offer with services for builders and end users.

Highly qualified engineers provide services in Italy and abroad.

These services provide:

- **GUARANTEED CONTINUITY FOR HARDWARE AND SOFTWARE SOLUTIONS**
- **THE EXPERTISE OF A TEAM OF PROCESS ENGINEERS TO ASSIST EACH CUSTOMER IN THE SPECIFICS OF THE APPLICATION**
- **ELECTRICAL-ELECTRONIC REVAMPING OF EQUIPMENT.**





GCube Modula

AUTOMATION PLATFORM BASED ON THE REMOTE I/O CONCEPT

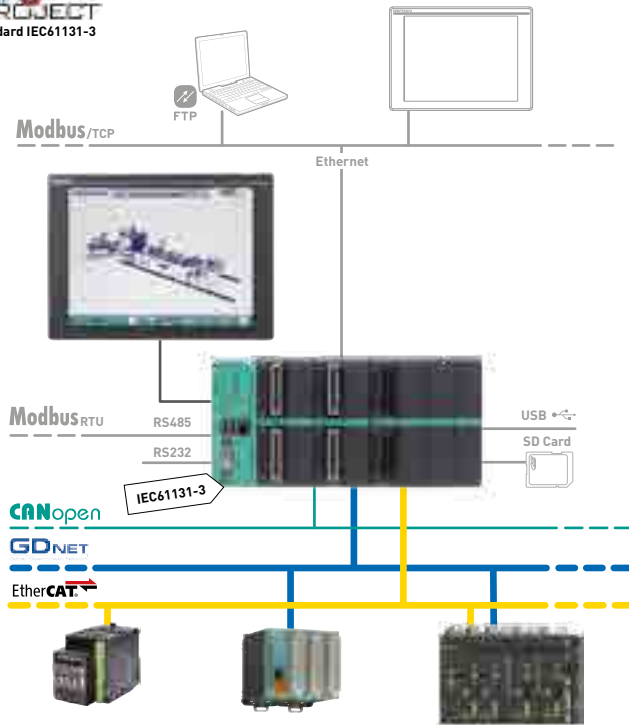
The GCube Modula platform stands out for its calculation power and the flexibility offered by the new **eViewLT** Pc panel and by the combination of the full series of remote modules from the **GILOGIKII** family.

THIS solution is indicated for applications in which an extended layout of the machine itself is required.

The new **eViewLT** PC panel offers the option of creating a network of I/Os based on Ethernet real-time fieldbuses

- ETHERCAT MASTER
- SCALABLE
- MULTI PROTOCOL





GCube Performa

AUTOMATION PLATFORM BASED ON THE PLC CONCEPT

The GCube Performa platform stands out for its compact size and the calculation power provided by the combination of operator panels from the **ePanel** series and from the **ePCLoLogic400** PLC rack.

This solution is indicated for applications in which the space available for installation needs to be optimised.

The **ePCLoLogic400** rack can be integrated and expanded by means of the range of remote I/Os from the **GILOGIK II** series and offers the option of managing Ethernet real-time fieldbuses

- CONFIGURED AND TESTED SOLUTION
- CAN BE EXPANDED LOCALLY
- SCALABLE SOLUTION





CANopen



eXtru+

COMPACT AUTOMATION SPECIFICALLY FOR EXTRUSION

eXtru+ is the compact control system devised by Gefran for laboratory extrusion and compounding. It comes ready-for-use, can be fully programmed and features advanced technological functions.

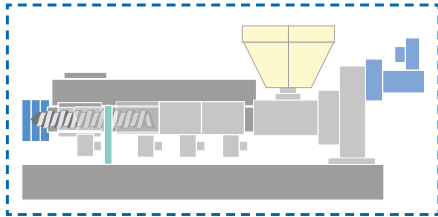
It consists of units for the control (PLC) and management (HMI) of the **GF_Vedo 70CT** machine and I/O remote modules with CANopen fieldbus communication as well DIN rail installation and has IP20 protection rating.

In addition, the solution offers a response to the growing demand for efficiency in managing heat regulation in automated machines thanks to its functions of saving and energy efficiency management linked to a proper strategy of use in heat regulation zones during start-up and maintenance phases.

The main advantages include:

- IMMEDIATE START-UP
- ZERO DEVELOPMENT COSTS
- FAST AND EASY PERSONALISATION





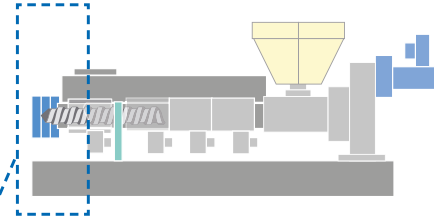
MACHINE MANAGEMENT

Digital inputs
Digital outputs



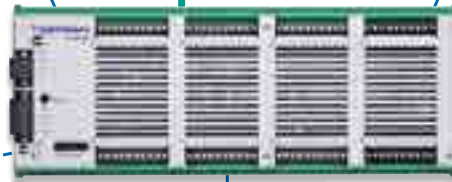
GF_VEDO SL 70CT

CANopen

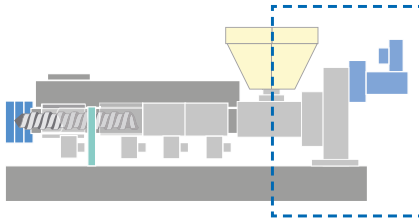


PRESSURE SENSOR (Melt)

Value and alarm read

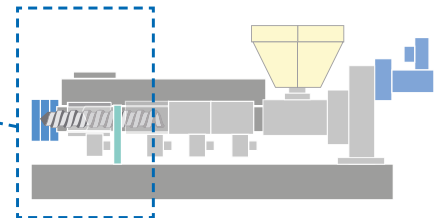


CAN-IO



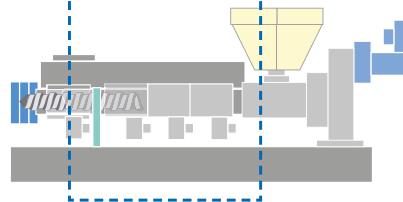
EXTRUDER MOTOR

Speed reference
Speed and current read



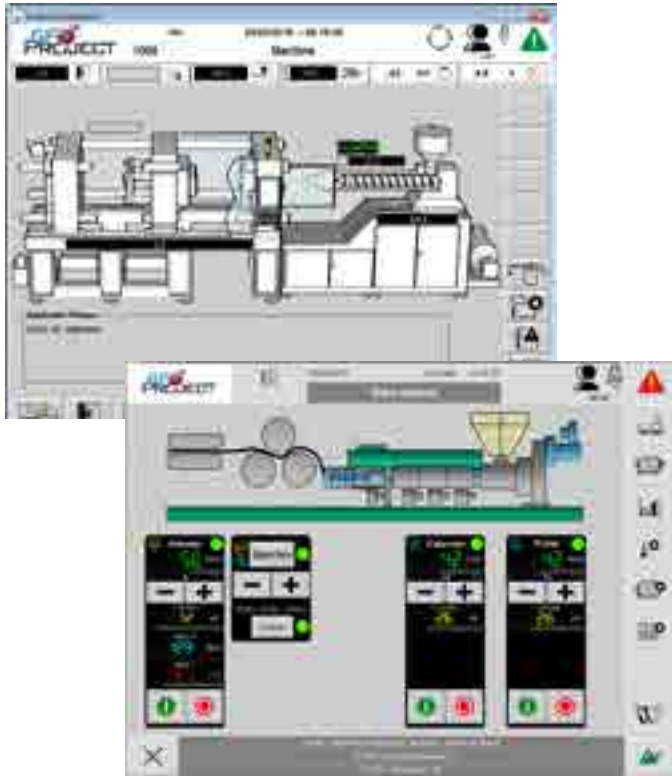
AUXILIARY MOTOR

Speed reference
Speed and current read



ZONE TERMOREGOLAZIONE

Dual-action (hot/cold) zone
and Heater Break alarm



Plastic template

As a result of extensive experience in plastic processing machine control, Gefran has developed Templates specific for the following applications:

- Injection
- Extrusion
- Blowing

Templates are default software applications that provide the scalable control of the various machine settings:

- extrusion plants, with control from one to 9 extruders for a total of 128 heat regulation zones and various line accessories (dosing management, melt pumps, calenders, calibrators, drive, cutters, corrugators, wrapping machines, etc.) with advanced functions for energy savings in temperature control and integrated Euromap 27 to manage auxiliaries
- hydraulic, hybrid, two-story, FEM, double/triple injection machines
- continuous and accumulation blowing machines, with Parison control up to 300 master points, hole test control, digital and analogue axes.



Innovative solutions for efficient power management have been introduced for temperature control.

Based on Gefran's extensive experience in temperature control, 2 process phases have been identified where specific energy optimisation controls have been developed. The first Warmup phase, that includes an Energy Saving function, and a second Production phase, that includes the Smart Power Manager function.

In addition to process control applications, Templates provide a series of functions typical to automation systems:

- **ACTIVE AND HISTORICAL ALARM MANAGEMENT**
- **USER MANAGEMENT**
- **RECIPE MANAGEMENT (CONFIGURATION AND PRODUCTION)**
- **MULTILANGUAGE MANAGEMENT**
- **PREVENTIVE MAINTENANCE MANAGEMENT**
- **GRAPHS FOR TEMPERATURE AND ANALOG TRENDS**
- **OPERATOR ACCESS LOG**

- **WEEKLY CLOCK FOR TEMPERATURE CONTROL ACTIVATION**
- **REMOTE ACCESS**
- **CONNECTION TO HMI/SCADA VIA MODBUS TCP**
- **DATA LOG MANAGEMENT**





Control and operator panels

The Gefran catalogue offers a wide range of solutions for control and display.

GF_Vedo SL, AXM view and eView LT panels ensure perfect integration of control and display in one product alone. They are available in various formats starting from 3.5" to 15" units and ensure an excellent capacity for data storage and recipe registration.

- TOUCH-SCREEN
- INTEGRATED ETHERNET INTERFACE
- INTEGRATED PLC RUNTIME
- VERTICAL OR HORIZONTAL INSTALLATION





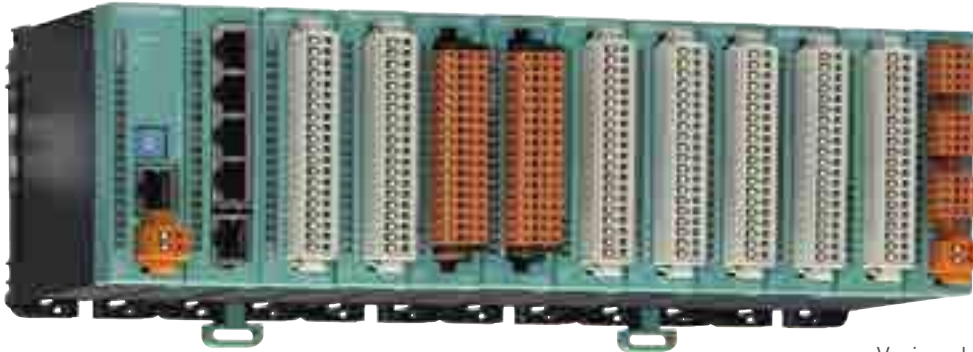
Gefran eGT-I and ePanel operator panels come with colour display with high contrast and excellent viewing angles. The practical touch-screen lets users display and modify automation data. They can be installed in panels, in cabinets and also on control desks and, combined with the PLC from the **ePCLogic400** series, can provide an efficient and reliable solution for a wide range of industrial machines.

Gefran panels are also available with an integrated keyboard specifically for plastic material transformation machines.

- COLOUR TOUCH-SCREEN
- INDUSTRIAL MONITORS
- SLIM, COMPACT DESIGN
- PERSONALISED DESIGN

Remote I/Os and PLC racks

GILOGIK II is the range of Gefran high performance, remote, modular I/Os. The compact design GILOGIK II system consists of a wide range high density I/O modules and offers many advantages for installation, especially where space is limited.



- SPACE-SAVING DESIGN
- PARALLEL BACKPLANE
- FAST-ETHERNET PROTOCOL
GDNET / CANOPEN
- MODULAR SOLUTION

Various backplanes are available (2, 4, 8, 12 and 18 slot) for installing digital, analog and functional modules.

Fast-Ethernet GDNet or CANopen communication protocols take place via fieldbus modules to be installed at the start of the backplane.



CAN-IO is the system of compact I/O remote modules with the CANopen protocol. Complete with fieldbus diagnostic and input/output status LEDs, **CAN IO** allows various signals to be acquired from the field. The system is easy to install, features rapid wiring and is the ideal solution for small/large applications.



ePCLogi400 is the complete solution for the control of processes and automation which, with just one **preconfigured and expandable module** manages the sequence control and processing procedures. The PLC can be fully personalised to meet customer requirements in terms of the power of the CPU, the number and type of inputs and outputs and adapts perfectly to the machine or system to be controlled.

- SOLUTION WITH NO FANS OR HARD DISKS
- INSTALLATION ON DIN RAIL
- READY-FOR-USE

650/1250/1350

PID 1/16, 1/8 AND 1/4 DIN TEMPERATURE REGULATORS

Gefran series 650/1250/1350 PID temperature regulators are devices with an LCD operator interface and universal input. They are available in 1/16, 1/8 and 1/4 DIN versions.

Depending on the version, the regulators come with **double or triple display** 4 and 5 digit white-green-amber colours and **4 and 7 digit white-green-amber triple displays with a bargraph**.

The messages can be scrolled and set by the user to meet his or her needs. These regulators can act as KWh meters and count the number of output cycles.

Models are available for **valve control** and **setpoint programmers**.

- CONFIGURABLE LOGIC FUNCTIONS
- TC, RTD, LINEAR mV, V AND mA INPUTS
- FRONT PROTECTION: IP 65 RATING
- REGULATION: HOT/COLD PID
- INSULATED ANALOG OUT
- MODBUS SERIAL COMMUNICATIONS

Zapper

BATTERY POWERED PORTABLE CONFIGURATOR FOR INSTRUMENTATION

The Zapper is a battery powered portable device for cloning the configuration parameters of Gefran series 650/1250/1350 regulators. No power source required for configuring devices.

Using just three keys, you can carry out simple tasks such as copy/paste/check the program selected up to a maximum number of storable programs even when the battery is low.

Applications

- EXTRUSION
- CHILLERS
- WELDING APPLICATIONS FOR PACKAGING MACHINES



GFXTERMO4

4-ZONE PID TEMPERATURE CONTROLLER

The GFXTERMO4 multi-loop controller is able to independently control 4 temperature control loops. Furthermore, due to the availability of a wide range of communication protocols, GFXTERMO4 can be easily included in any industrial automation architecture.

- 4 SETTABLE INPUTS TC, RTD, mA, V
- 4 INDEPENDENT HOT/COLD PID
- 4 SETTABLE OUTPUTS: RELAY/LOGIC/TRIAC/CONTINUOUS
- 4 AUXILIARY ANALOG INPUTS
- 2 DIGITAL INPUTS
- 8 SETTABLE ALARM THRESHOLDS
- DIN BAR FITTING



Applications

- INJECTION PRESSES
- THERMOFORMING
- EXTRUSION
- PACKAGING MACHINES
- HOT RUNNERS



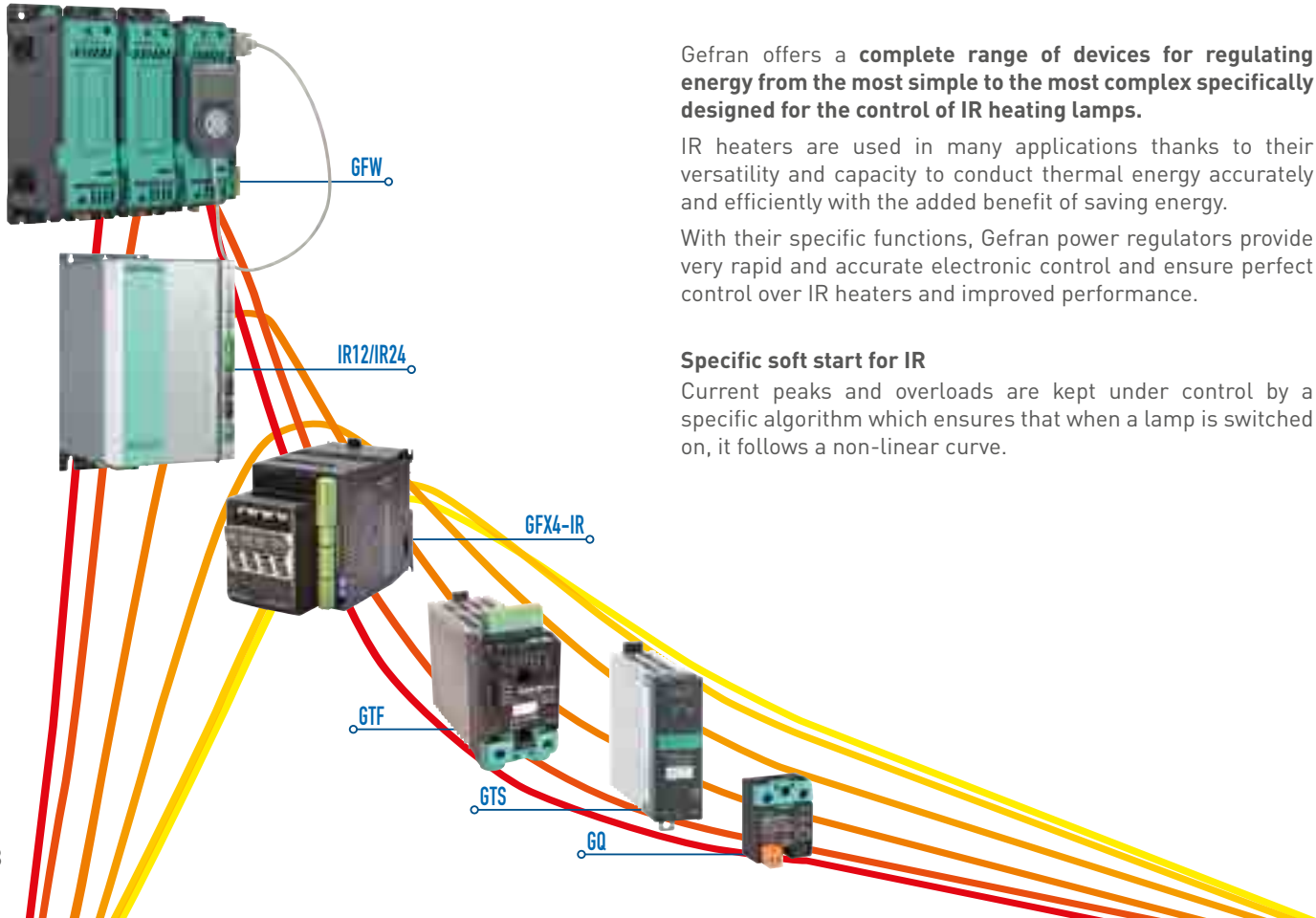
Modbus TCP/RTU



CANopen EtherCAT



GEFRAN



Gefran offers a **complete range of devices for regulating energy from the most simple to the most complex specifically designed for the control of IR heating lamps.**

IR heaters are used in many applications thanks to their versatility and capacity to conduct thermal energy accurately and efficiently with the added benefit of saving energy.

With their specific functions, Gefran power regulators provide very rapid and accurate electronic control and ensure perfect control over IR heaters and improved performance.

Specific soft start for IR

Current peaks and overloads are kept under control by a specific algorithm which ensures that when a lamp is switched on, it follows a non-linear curve.

Selection of firing mode and switching

The half single cycle firing mode and switching regulate IR lamps decrease "flickering" with no EMC noise emission: no filters required. Phase angle control ensures the lamp is emits power in a perfectly stable manner.

Feedback functions

Feedback regarding voltage, current and power allow perfect regulation: variations on voltage and current are automatically corrected so as to always provide the process with the exact quantity of power required whatever the conditions.

Broken lamp detection

Accurate and rapid reading of RMS currents means that broken lamps can be detected regardless of firing or switching mode. An automatic self-learning procedure of the characteristics of the lamps improves the accuracy of fault detection.

Current limits

No risk of exceeding the limit. The peak current and RMS current values are always under control.

Advantages

- **LONGER LAMP LIFESPAN: UP TO 20% ENERGY SAVINGS THANKS TO IR SOFT START.**
- **RELIABLE PERFORMANCE: FOR DEMANDING APPLICATIONS SUCH AS PHOTOVOLTAIC.**
- **TEMPERATURE AND POWER AUTO-TUNING: UP TO 40% COST SAVINGS FOR AN ALL-IN-ONE REGULATION LOOP.**
- **COMPACT: UP TO 50% SMALLER FOR HIGH DENSITY APPLICATIONS.**

Applications

- **COMPOSITE AND PLASTIC MATERIAL WELDING**
- **PREHEATING ON BLOW MOULDING LINES**
- **THERMOFORMING**



IR 12 – IR 24

MULTI-CHANNEL POWER CONTROLLERS

The IR 12 – IR 24 multi-channel power controllers are ideal for controlling SWIR lamps in industrial heating systems.

The powerful and compact IR12 and IR24 multi-channel power controllers are the perfect solution for heating systems that use IR lamps of any type.

Compact sturdy metal housings for wall mounting are available as part of the all-in-one philosophy. These house all the components needed for full control of sets of IR lamps for power usage of up to 60KW.

Different models are available: IR-24 with 24 adjustable independent outputs and IR-12 with 12 outputs. Both have Modbus RTU communication options or can be fitted with a Profinet fieldbus.

- 12 AND 24 INDEPENDENT 9A/CH CHANNELS
- CONTROL IN FAST ZERO-CROSSING, HALF-SINGLE-CYCLE AND PHASE-ANGLE
- INTEGRATED EXTRA FAST FUSES
- CURRENT BALANCING WITH TIME-SHARING
- COMPENSATION FOR VOLTAGE FLUCTUATIONS
- VOLTAGE AND CURRENT DIAGNOSTICS (DISCONNECTED LOAD, LINE VOLTAGE)
- SCR TEMPERATURE AND SHORT-CIRCUIT DIAGNOSTICS, OPEN FUSE

Applications

- COMPOSITE AND PLASTIC MATERIAL WELDING
- PREHEATING ON BLOW MOULDING LINES
- THERMOFORMING

Modbus 

GFX4-IR

4-ZONE TEMPERATURE CONTROLLER FOR INFRARED LAMPS (IR)

The GFX4-IR multi-loop controller is able to independently control 4 temperature control loops complete with static units (SSR) for infrared lamp control (IR). Furthermore, due to the availability of a wide range of communication protocols, GFX4-IR can be easily included in any industrial automation architecture.

Fully settable trip functions such as Zero crossing, HSC Half Single Cycle, PH Phase Angle, soft start, current limitation, voltage feedback and power feedback can control loads such as infrared lamps (long waves, medium waves, short waves).

- 4 INDEPENDENT HOT/COLD PID
- 30, 60, 80 kW STATIC UNITS
- VOLTAGE OVERLOAD PROTECTION
- TA INPUT LOAD DISCONNECTION PROTECTION
- OVERHEAT ALARM FUNCTION
- INTEGRATED FUSES
- FIELDBUS COMMUNICATIONS



- CURRENT LIMIT
- VOLTAGE, CURRENT, POWER FEEDBACK (V,I,P)
- FRONT PROTECTION: IP 20 RATING

Applications

- COMPOSITE AND PLASTIC MATERIAL WELDING
- PREHEATING ON BLOW MOULDING LINES
- THERMOFORMING



Modbus TCP/RTU

PROFIBUS DP

PROFIBUS PA

CANopen

EtherCAT

EtherNet/IP

DeviceNet

GTF

CONFIGURABLE POWER CONTROLLER WITH MODBUS RTU SERIAL COMMUNICATION

GTF is a 25 to 250A single-phase modular power controller with the following settable trip types: ZC "zero crossing", BF "burst firing", HSC "half single cycle", PA "phase angle" and settable control inputs such as digital, programmable analog V, I or Potentiometer.

- CONFIGURABLE ANALOG COMMAND INPUT (0 - 10V, 4 - 20 mA)
- RATED VOLTAGES 480 Vac, 600 Vac E 690 Vac
- VOLTAGE OVERLOAD PROTECTION
- OVERHEAT ALARM FUNCTION
- MODBUS RTU DIGITAL COMMUNICATION
- INTEGRATED FUSE FOR SIZES > 150 A
- PID TEMPERATURE CONTROL FUNCTION
- FRONT PROTECTION: IP 20 RATING
- CURRENT LIMIT
- VOLTAGE, CURRENT, POWER FEEDBACK (V,I,P)

Applications

- EXTRUSION LINES
- WELDING APPLICATIONS FOR PACKAGING MACHINES
- POLYMERISATION PLANTS
- THERMOFORMING MACHINES
- RUBBER VULCANISATION PLANTS



Modbus

GEFRAN

GTS

STATIC SINGLE-PHASE UNITS WITH HEAT SINK

Gefran offers a range of static GTS units with current ranges from 10A to 120A and nominal voltages of 230Vac and 480Vac.

Static single-phase power units for resistive loads complete with heat dissipation radiator; zero crossing firing mode for governing double SCR connected in antiparallel.

Logic command in Vdc and Vac. DIN rail mounting

- 3-32 Vdc, 20-260 Vac LOGIC CONTROL INPUT
- FRONT PROTECTION: IP 20 RATING
- LOAD DISCONNECTION PROTECTION
- OVERHEAT AND DISCONNECTED LOAD ALARM FUNCTION
- INTEGRATED HEAT SINK
- NOMINAL OPERATING TEMPERATURE 40°C
- NOMINAL LOAD VOLTAGE 230 Vac, 480 Vac, 600 Vac

Applications

- EXTRUSION LINES
- INJECTION PRESSES FOR PLASTIC
- PACKAGING AND WRAPPING MACHINES
- POLYMERISATION PLANTS
- SYNTHETIC FIBRE PRODUCTION
- RUBBER VULCANISATION PLANTS



GQ

SOLID STATE, SINGLE-PHASE RELAY WITH SCR

The switching relay for zero crossing with double SCR output in antiparallel is the solid state relay most frequently used in industrial applications: can also be used for **resistive, inductive and capacitive loads**.

Zero switching. Double SCR output in antiparallel. Logic command in Vdc (3...32Vdc). LED display. Integrated IP20 rated shell.

- 3-32 Vdc LOGIC CONTROL INPUT
- FRONT PROTECTION: IP 20 RATING
- NOMINAL OPERATING TEMPERATURE 40°C
- INTERNAL MOV OVERLOAD PROTECTION

Applications

- EXTRUSION LINES
- THERMOFORMING
- PACKAGING MACHINES
- WRAPPING MACHINES





MOTION



ADV200

FIELD-ORIENTED VECTOR INVERTER

The ADV200 inverter series is an **innovative drive concept**, the result of constant technological research and of the experience that Gefran has gained while always working alongside the key operators in the sector.

Designed and developed to meet the real needs of System Integrators and machine manufacturers and to guarantee the utmost innovation and economic competitiveness in international markets. Based on **extreme mechanical modularity and on a powerful programming platform that is intuitive and completely “open”**, the ADV200 offers absolute **flexibility of integration with the highest level of performance** in any system architecture of the most modern automation.



Functions

- INTEGRATED EMC FILTERS ON THE WHOLE RANGE
- DC SIDE INDUCTANCE UP TO 160kW
- AUTO-CALIBRATION OF SPEED-CURRENT-FLOW REGULATORS AND MOTOR IDENTIFICATION DATA WITH MOTOR IN MOTION AND STOPPED
- TORQUE CONTROL
- SIMPLIFIED START-UP MENU
- INSTANTANEOUS OVERLOAD UP TO 180%
- I2T THERMAL PROTECTION FOR MOTOR, DRIVE AND BRAKING RESISTORS
- MULTI-SPEED FUNCTION (16 PROGRAMMABLE)
- 4 INDEPENDENT AND PROGRAMMABLE RAMPS WITH JERK
- MOTORPOTENTIOMETER FUNCTION
- FLYING RESTART FUNCTION
- DROOP FUNCTION
- DOUBLE MOTOR MANAGEMENT
- PID BLOCK FUNCTION
- MAINS LOSS DETECTION MANAGED THROUGH CONTROLLED STOP AND/OR ENERGY OPTIMIZATION
- VARIABLE SWITCHING FREQUENCY
- CONSTANT TORQUE AND VARIABLE TORQUE OPERATING MODE
- ADVANCED PROGRAMMING VIA MDPLC TOOL (AS PER IEC 61131-3)
- PROGRAMMING KEYPAD WITH 5 COMPLETE SETS OF DRIVE PARAMETERS.



ADV200 LC

LIQUID COOLED FIELD-ORIENTED VECTOR INVERTER

The ADV200-LC series is used in applications where the main requirements are: **robustness, long life, and maximum reliability.**

The Liquid cooling systems of electrical and mechanical units, already widely used in plastic processing equipment, significantly reduce the size of the electrical drive. Thanks to a very robust dissipation system, the ADV200-LC series supports the already available air-cooled line (ADV200) and integrates with great flexibility in existing systems.



Functions

- INTEGRATED EMC FILTERS ON THE WHOLE RANGE
- DC SIDE INDUCTANCE UP TO 200 kW
- AUTO-CALIBRATION OF SPEED-CURRENT-FLOW REGULATORS AND MOTOR IDENTIFICATION DATA WITH MOTOR IN MOTION AND STOPPED
- TORQUE CONTROL
- SIMPLIFIED START-UP MENU
- INSTANTANEOUS OVERLOAD UP TO 180%
- I2T THERMAL PROTECTION FOR MOTOR, DRIVE AND BRAKING RESISTORS
- MULTI-SPEED FUNCTION (16 PROGRAMMABLE)
- 4 INDEPENDENT AND PROGRAMMABLE RAMPS WITH JERK
- ANTI-CONDENSATION FUNCTION
- MOTORPOTENTIOMETER FUNCTION
- FLYING RESTART FUNCTION
- DROOP FUNCTION
- DOUBLE MOTOR MANAGEMENT
- PID BLOCK FUNCTION
- MAINS LOSS DETECTION MANAGED THROUGH CONTROLLED STOP AND/OR ENERGY OPTIMIZATION
- VARIABLE SWITCHING FREQUENCY
- CONSTANT TORQUE AND VARIABLE TORQUE OPERATING MODE
- INTEGRATED HUMIDITY SENSOR
- MANAGEMENT OF EXTERNAL SOLENOID (IF PRESENT) TO CONTROL FLOW OF COOLING LIQUID FOR DRIVE AND MOTOR
- ADVANCED PROGRAMMING VIA MDPLC TOOL (AS PER IEC 61131-3)
- PROGRAMMING KEYPAD WITH 5 COMPLETE SETS OF DRIVE PARAMETERS.

ADP200

INVERTER FOR HYBRID INJECTION SYSTEM WITH SERVOPUMP

The ADP200 inverter series represents an innovative concept in inverter technology and is the result of constant technological research and the know-how in plastics applications acquired by Gefran.

Based on **modular hardware configurations and a powerful programming platform that is completely “open”**, the ADP200 guarantees completely flexible integration and high performance thanks to **PID control dedicated to injection machinery.**

- **FOC CLOSED LOOP**
- **SINGLE AND MULTI-PUMP CONTROL**
- **PRECISE PRESSURE AND FLOW CONTROL**
- **HIGH STABILITY**



The control of hybrid injection machines is the perfect technological combination of a hydraulic system mated with electrical regulation with a brushless motor and drive system.

The Gefran ADP200 inverter is the right solution for managing servo-pumps thanks to the high degree of regulation in terms of the precision of control over pressure and flow not to mention the benefits of energy savings that traditional hydraulic systems cannot match.

The control of the oil pressure and flow rate is performed accurately and constantly in line with the needs of the injection machine and, as such, reduces the waste of oil that is typical of conventional systems.

With its high performance characteristics and specific software for single and multi-pump solutions, the ADP200 ensures key benefits regarding energy saving and subsequent economic competitiveness not to mention excellent production quality standards.



ECO-FRIENDLY

Energy savings thanks to:

- USE OF AN EVOLVED SERVODRIVE SYSTEM
- DECREASED HYDRAULIC FLUID TEMPERATURE
- REDUCTION IN CO2 EMISSIONS



Functions

- SELF-TUNING IN ROTATION AND STAND STILL OF SPEED-CURRENT-FLOW REGULATORS AND MOTOR DATA IDENTIFICATION
- SPECIFIC PID FUNCTION BLOCKS FOR INJECTION MOULDING MACHINE CONTROL
- FLOW AND PRESSURE LIMIT CONTROL
- PRESSURE SENSOR STATUS CONTROL
- ADAPTIVE FEEDFORWARD

HIGH PRECISION

Optimal performance for pressure and speed control

EXCELLENT REPEATABILITY

Advanced performance characteristics thanks to the use of closed loop servodrive

LOW NOISE EMISSIONS

Low dB levels for a better working environment

- AUTOMATIC SWITCHOVER BETWEEN CLOSED-LOOP SPEED AND PRESSURE CONTROL
- AUTOMATIC CALIBRATION OF SPEED AND PRESSURE LOOPS
- PUMP ROTATION DIRECTION IDENTIFICATION
- MULTIPUMP CONVERGENT AND DIVERGENT CONTROL

AXV300

MODULAR SERVODRIVES

The range of AXV300 modular drives is the result of the experience gained by Gefran in over 30 years of working in close partnership with the leading industrial automation manufacturers.

Powering each “multi-axis” system by means of “common DC bus” ensures the **clean power formula thanks to the standard use of Active Front End technology**, which further increases dynamic performance and at the same time, offers **energy savings by regenerating to the grid and avoiding unnecessary waste on brake resistance**.

This structurally excellent range of modular axes includes a **wide range of power combinations for up to a total of 120 kW** thanks to the choice of **7 mechanical sizes** with nominal currents from 5A to 200A for motor modules as well as regenerative or AC/DC power supply units.



CANopen

Functions

- AUTO-CALIBRATION OF CURRENT REGULATOR
- I2T OVERLOAD: SLOW (150% IN X 60 SEC) AND FAST (200% IN X 0.5 SEC);
- OPERATING MODES
 - Torque and/or Speed (directly on axis module)
 - Position: on CU module in MDPLC
- ELS, ELECTRONIC LINE SHAFT (ELECTRIC SHAFT) IN IEC61131-3 ENVIRONMENT
- SYNCHRONISED COMMUNICATION BETWEEN CONTROL UNIT AND AXIS MODULES THROUGH FIBRE OPTIC SYSTEM WITH GSTAR PROTOCOL
- PC PROGRAMMING USING GF_eXpress CONFIGURATOR
- ADVANCED PROGRAMMING VIA MDPLC TOOL (AS PER IEC 61131-3)



GEFRAN DEUTSCHLAND GmbH

Philipp-Reis-Straße 9a
D-63500
Seligenstadt
Ph. +49 (0) 61828090
Fax +49 (0) 6182809222
vertrieb@gefran.de

SIEI AREG - GERMANY

Gottlieb-Daimler Strasse 17/3
D-74385
Pleidelsheim
Ph. +49 (0) 7144 897360
Fax +49 (0) 7144 8973697
info@sieiareg.de

SENSORMATE AG

Steigweg 8,
CH-8355 Aadorf, Switzerland
Ph. +41(0)52-2421818
Fax +41(0)52-3661884
<http://www.sensormate.ch>

GEFRAN FRANCE SA

PARC TECHNOLAND
Bâtiment K - ZI Champ Dolin
3 Allée des Abruzzes
69800 Saint-Priest
Ph. +33 (0) 478770300
Fax +33 (0) 478770320
commercial@gefran.fr

GEFRAN BENELUX NV

ENA 23 Zone 3, nr. 3910
Lammerdries-Zuid 14A
B-2250 OLEN
Ph. +32 (0) 14248181
Fax +32 (0) 14248180
info@gefran.be

GEFRAN UK Ltd

Clarendon Court
Winwick Quay
Warrington
WA2 8QP
Ph. +44 (0) 8452 604555
Fax +44 (0) 8452 604556
sales@gefran.co.uk

GEFRAN MIDDLE EAST ELEKTRIK VE ELEKTRONIK San. ve Tic. Ltd. Sti

Yesilkoy Mah. Ataturk
Cad. No: 12/1 B1 Blok K:12
D: 389 Bakirkoy /Istanbul TURKIYE
Ph. +90212 465 91 21
Fax +90212 465 91 22

GEFRAN SIEI Drives Technology Co., Ltd

No. 1285, Beihe Road, Jiading
District, Shanghai,
China 201807
Ph. +86 21 69169898
Fax +86 21 69169333
info@gefran.com.cn

GEFRAN SIEI - ASIA

31 Ubi Road 1
#02-07,
Aztech Building,
Singapore 408694
Ph. +65 6 8418300
Fax +65 6 7428300
info@gefran.com.sg

GEFRAN INDIA

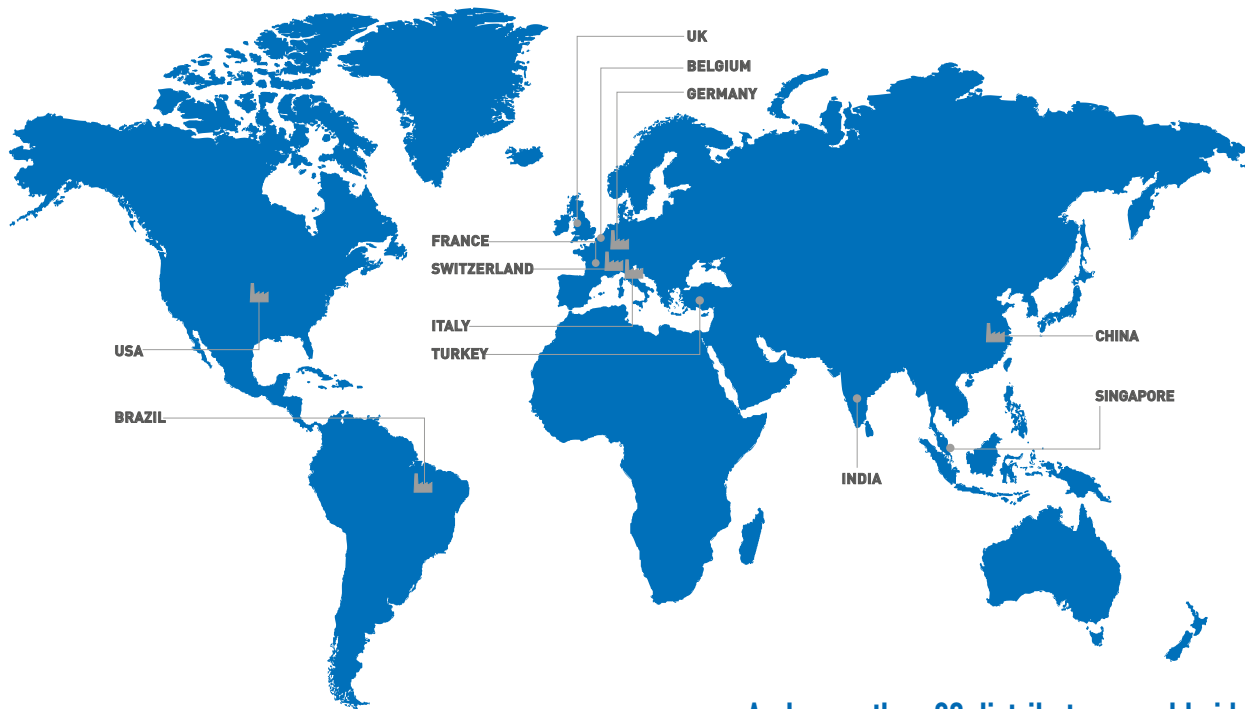
Survey No. 191/A/1,
Chinchwad Station Road, Chinchwad,
Pune-411033, Maharashtra
Ph. +91 20 6614 6500
Fax +91 20 6614 6501
gefran.india@gefran.in

GEFRAN Inc.

8 Lowell Avenue
WINCHESTER - MA 01890
Toll Free 1-888-888-4474
Fax +1 (781) 7291468
info.us@gefran.com

GEFRAN BRASIL ELETRÔELETRÔNICA

Avenida Dr. Altino Arantes,
377 Vila Clementino
04042-032 SÃO PAULO - SP
Ph. +55 (0) 1155851133
Fax +55 (0) 1132974012
comercial@gefran.com.br



... And more than 80 distributors worldwide



GEFRAN HEADQUARTER

Via Sebina, 74
25050 PROVAGLIO D'ISEO (BS) ITALY
Ph. +39 03098881
Fax +39 0309839063

Drive & Motion Control Unit

Via Carducci, 24
21040 GERENZANO (VA) ITALY
Ph. +39 02967601
Fax +39 029682653

