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 sensors 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.
GEFRAN FOR METALS PROCESSING

Gefran’s drive and power supply technologies provide cutting-edge solutions for the main metalworking processes. The control of the main types of motors, asynchronous, synchronous brushless and DC, together with systems for energy management and recovery make up a dedicated application proposal for both single-axis and coordinated systems applications, used in the most diverse types of machinery.

The control functions integrated on board the drive, based on standard Gefran applications, or designed to customer specifications, are true “machine management systems” with important benefits such as:

- Reduced system complexity
- Elimination of delays and disturbances on the transmission of variables, typical of solutions with separate drives and axis boards.

Gefran’s application know-how is geared towards meeting the specific needs of operators in the sector:

- Control optimization
- Process precision
- Process quality
- Machine reliability
- Plant efficiency
- Energy savings and ecological protection
- Maximisation of production.

COMMUNICATION SOLUTIONS

Using optional boards, Gefran inverters and power supplies enable rapid communications with all the main field buses used in machines and installations.
ADV200 INVERTER
ADV200 inverters operate in a power range from 0.75kW up to 1.6MW for the control of asynchronous and synchronous brushless motors. They are available for power supplies from 400VAC to 480VAC and 690VAC networks or for a common DC Bus power supply, ensuring the engineering and creation of coordinated system application architectures. The compactness of modular mechanical devices with the integration of accessories such as EMC filters and DC inductance, provide for a substantial reduction of plant space and the optimization of wiring costs, as well as real design flexibility thanks to the product solutions with both air and liquid cooling.

ADP200 INVERTER
ADP200 inverters are specifically designed for electro-hydraulic machine automation. They combine a high dynamic regulator for pressure and flow control in servo-pump systems and are therefore dedicated to die-casting, pressing and metal bending applications. They control brushless motors in a range from 7.5kW up to 75kW and for power supplies from 400VAC – 480VAC networks.

TPD32 EV CONVERTERS
The TPD32 EV converter line is available with a current range from 20 to 4800A in 2 and 4 quadrant configurations for power supplies from 230VAC...690VAC...1000VAC networks and also in a version with 12-pulse parallel and series rectifier bridges with the extended benefits in terms of reduced harmonic content on the network. Dedicated system configurations offer wide benefits for space optimization inside switch panels and for easy use and service, thanks to innovative “compact power frames” up to 2400A tetraquadrants.
When several AC motors contribute to the production of a finished product, some of them absorb energy from the power grid, while others often act as brakes and therefore as energy generators. Correct energy balance can be obtained in these systems, resulting in savings on operating costs, by creating a common DC bus system to which all the inverters that control the motors are connected. In some processing phases in rolling systems and in large sheet metal cutting lines, the energy generated by motors can be a high percentage or nearly the same as the driving energy. The use of braking resistors in these applications is certainly inefficient, requires considerable space and can therefore be economically disadvantageous. Therefore, it is much less costly to regenerate the energy back to the grid in these applications. FFE200 (Fundamental Front End) just as the AFE200 power supplies enable bi-directional circulation of energy from a common DC bus.
SOLUTIONS WITH COMMON DC BUS POWER SUPPLIES

REGENERATIVE POWER SUPPLIES
Gefran offers energy recovery solutions using AFE200 (Active Front End) and FFE200 (Fundamental Front End) systems, which allow the energy produced by motors to be regenerated back to the grid when they operate as brakes. This type of solution is ideal for some metal processing machines, such as mechanical presses that operate in the 4 working quadrants and for motors that alternate work as motors and brakes and therefore as energy generators.

Advantages of regenerative solutions:
- Operation on the 4 quadrants
- High system dynamics
- Energy savings
- Operation at \( \cos \phi = 1 \) (only AFE)
- “THD” Total Harmonic distortion <3% (AFE only)

Regenerative power supplies are designed to operate on networks from 400VAC up to 690VAC.

The AFE200 version is available in a power range from 22kW up to 1.8MW. The FFE200 version is available in a power range from 350kW up to 3.8MW.

AC/DC POWER SUPPLIES
The SMB200 is a one-way AC/DC power supply designed for common DC bus systems. It has been designed to operate on networks from 400VAC up to 690VAC in a power range from 100kW up to 5.3MW in heavy duty.

Any excess energy generated by the motors can be dissipated through resistors using the BU200 braking units available for networks from 400VAC up to 690VAC in a current range from 20A up to 300A in heavy duty.
GEFRAN DRIVES IN METAL WORKING

SOFTWARE

GF-EXPRESS PROGRAMMING SOFTWARE

Applications
- Configuring parameters of Gefran devices (Instruments, Drives, Sensors)
- Tuning control parameters with on-line tests and trends
- Managing parameter archive for multiple configuration.

Features
- Guided product selection
- Multiple languages
- Creation and storage of recipes
- Oscilloscope
- Simplified settings
- Parameter printout
- Network autoscan

GF_eXpress software configures the parameters of the automation components, drives and sensors in the Gefran catalogue. The graphic interface makes selecting and configuring parameters easy and intuitive. Devices are grouped according to product type and functions. Products are searched by means of a context search and a display of product photos. This provides a single device library for all Gefran products. Complete configuration information for every device is given in XML format to facilitate expansion of the catalogue and parameters. The adoption of the XML format for the description of the configuration information of all the individual devices facilitates the expansion of the catalog and its parameters.

SOFTSCOPE

SoftScope is a software oscilloscope with synchronous sampling (buffered with a minimum sampling time of 1ms). With SoftScope, the user can easily and quickly display a number of specific variables, such as commissioning variables, variables for testing performance levels achieved or for tuning control loops.

Acquisition of Softscope during injection

Example of Pressure tuning

SoftScope can be used to define the following parameters:
- Trigger conditions (e.g. climbing leading edge of a specific signal)
- Recording quality (a multiple of the basic clock at 1ms)
- Recording duration period
- System sizes to be recorded.

“MDPLC” ADVANCED DEVELOPMENT ENVIRONMENT

The Motion Drive Programmable logic controller (MDPlc) development environment is a tool for the development of industrial applications based on the ADV200 series of drives. It is an integrated tool that allows writing, compiling, downloading and debugging of the applications. MDPlc allows complete personalisation of the drives according to the application requirements using a “friendly” and powerful graphic interface. The importance of the MDPlc's performance is particularly evident when defining advanced applications. The primary feature of MDPlc is its ability to create an application code for the drives in assembly language, by compiling the application written in the MDPlc environment with PLC languages in compliance with the IEC 61131-3 international standard.

When using an MDPlc application with the ADV200, the drive's basic functions continue to be executed. Two MDPlc application programs can be stored on the drive. One of the two applications (1 or 2) is enabled via a parameter. The languages that can be used to program specific custom applications are:
- Instruction List (IL)
- Structured Text (ST)
- Ladder Diagram (LD)
- Function Block Diagram (FBD)
- Sequential Flow Chart (SFC)