



**CARLO GAVAZZI**

# **Product Overview**

# Introduction

Carlo Gavazzi is a multinational electronics group active in the design, manufacture and marketing of electronic and electrical components targeted for the global markets of industrial and building automation.

Founded over 90 years ago, our experience and knowledge are unparalleled. Our core competence in automation spans across four product ranges: Sensors, Switches, and Controls.

Our wide array of products includes solid state relays, proximity, photoelectric, IO-Link and other sensors, monitoring relays, energy metering, EV-charging solutions, motor controllers, contactors, power supplies, IIoT solutions, and many other products.

We have our headquarters in Europe and numerous offices spanning the globe. Our R&D competence centers and manufacturing facilities are located in Denmark, Italy, Lithuania,

Malta and China. With 23 wholly-owned sales companies and exclusive distributors in 60 other countries, from the Pacific Rim in the East to North America in the West, you are assured that product support, service and inventory are only a phone call or email away.

Carlo Gavazzi products have earned the independent approval of the relevant bodies which govern our own industry and the many industries we serve. They are developed and manufactured in full compliance with the most important international standard regulations.

Carlo Gavazzi manufacturing facilities operate with the requirements of ISO14001:2004 Environmental Management System standard. Focus is on the reduction of environmental damage arising from our production processes in particular air pollution, chemical waste and rejects.



# Index

Inductive Proximity Sensors.....	4	Soft Starters and Solid State Contactors for Motors.....	17
Capacitive Proximity Sensors.....	5	Industrial Relays and Sockets.....	18
Photoelectric Sensors.....	6	Limit Switches.....	19
Magnetic Sensors.....	8	Push Buttons and Pilot Lights.....	20
Optical and Conductive Level Sensors.....	9	Power Supplies.....	21
Ultrasonic and Wind Sensors.....	10	Monitoring Relays.....	22
IO-Link Sensors and Accessories.....	11	Energy Meters, Data Loggers and Transducers.....	24
Sensor Accessories.....	12	Energy Meters and Transducers for DIN Rail Mounting.....	25
Solid State Relays for Panel Mounting.....	13	Timers.....	26
Solid State Relays and Solid State Contactors for DIN Rail Mounting.....	14	Digital Panel Meters.....	27
Solid State Relays and SCRs with Monitoring Functions.....	15	Safety Modules.....	28
Contactors, Overloads, Manual Motor Starters, and Circuit Protection.....	16	General Purpose Dupline® and DuplineSafe.....	29

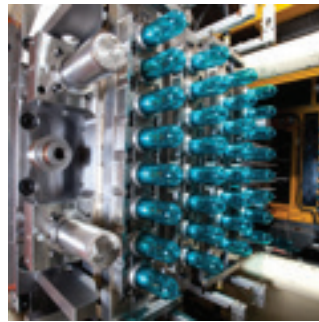
# Our Strategic Industries

Carlo Gavazzi products are the result of decades of extensive research and development. Our Engineering, Marketing and Sales Departments assure you that all of our products are designed with key integrated features to meet or exceed the demanding application requirements and provide the necessary benefits.

Below are several of the strategic industries where Carlo Gavazzi has a presence worldwide. We are members of many of their trade organizations, and participate in their trade shows and write technical papers or white papers for their trade journals.



Food and Beverage



Plastics



Conveyors



Mobile Equipment



Semiconductors



Agriculture



Manufacturing Machinery



HVAC



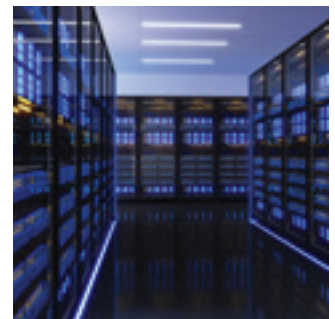
EV Charging Stations



Energy and Building Efficiency



Access Controls



Data Centers



PV Energy Storage Systems



Elevators and Escalators



Mining



Distribution

# Inductive Proximity Sensors

Carlo Gavazzi offers a comprehensive range of inductive sensors for detecting the presence of metal. These sensors are used extensively in packaging and plastics machinery, on assembly lines and conveyor systems. They are available with a wide variety of styles and features.

Carlo Gavazzi cylindrical inductive sensors are available in a wide variety of diameters, lengths, and configurations. Standard, extended and extra extended sensing ranges are available, providing up to 40mm sensing range. For particularly tough applications, Carlo Gavazzi offers IP69K-rated sensors for harsh wash-down applications, high temperature sensors, and full metal housed sensors. Flat-pack, fork-shaped and micro/limit switch housings are also available for specialty applications.



Miniature IBS & ICS	Durable ICS, IA & EI	General Purpose ICB	Full Metal Housing ICF	For Mobile Equipment ICS-E1
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Miniature inductive proximity sensors with sensing ranges up to 1.3mm. 3 wire DC. M5 threaded, 4mm and 6.5mm smooth barrel. Stainless steel, IP67 housing. Flush or non-flush mounting. M8 or 2m cable connection. 6kHz speed. IO-Link versions of these sensors are shown on page 11.



Inductive proximity sensors in M8, M12, M18 and M30 stainless steel & nickel plated brass IP67 housings. Sensing ranges up to 4mm (M8, M12), 8mm (M18) and 15mm (M30). NAMUR, 2 wire DC and 3 wire DC options. Flush or non-flush mounting. M8, M12 or 2m cable connection.



**ICB** Series in M12, M18 and M30 nickel plated brass IP67 housings. Sensing range up to 10mm (M12), 20mm (M18) and 40mm (M30). 3 wire DC output. Quasi-flush or non-flush mounting. Connection choice of 2m cable or M12 plug. IO-Link versions of these sensors are shown on page 11.



**ICF** Series full stainless steel housing in M12, M18 and M30. Metal face resistant up to 260 bar pressure (M12). Extended sensing ranges up to 22mm (M30), 14mm (M18), 8mm (M12). IP69K, ECOLAB certified, rated from -40 to 85°C (-40 to 185°F). 3 wire DC. Flush or non-flush mounting. IO-Link communications on board, more info on page 11.



**ICS-E1** Series high performance for harsh environments. M12, M18 and M30 stainless steel housings. IP69K rated, -40 to 85°C (-40 to 185°F) operating temp. 3 wire, 8-60VDC. Flush or non-flush, up to 22mm sensing distance. High EMC immunity, load dump protection. Connection choice of 2m PUR cable or M12 plug. E1 approval for mobile equipment.

Cube Style, Rotable Head IRC	Loop Detector Amplifiers LDP & LDD
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**IRC40** Series rotating head and mounting bracket for different mounting positions. 4 wire, complementary output. Operating temperature -25° to +80°C (-13° to +176°F). 40x40mm plastic housing, IP69K rated for harsh environments. M12 plug connectivity. Flush and non-flush mounting, extended sensing range up to 40mm. IRC40 long housing available with AC and AC/DC supply.



**LDP and LDD** Amplifiers single and dual loop types, universal supply voltage 24-240VAC/VDC, plug in and DIN rail mounting. Loop inductance input between 20uH and 1000uH, adjustable sensitivity, 2 SPDT relay outputs. Advanced diagnostics, automatic sensitivity and frequency.

# Capacitive Proximity Sensors

Carlo Gavazzi capacitive sensors will detect conductive or non-conductive materials. The patented and proven TRIPLESIELD™ design has become the standard all other capacitive proximity sensors are measured against. Now in its fourth generation, TRIPLESIELD™ provides outstanding electromagnetic immunity and protection against electrostatic discharge, surges and electrical noise from inverters, mobile phones, and contactors. Carlo Gavazzi capacitive sensors are available in a wide variety of physical sizes and configurations, providing up to 30mm sensing range. Also, flat-pack style sensors are available. They are ideal for level sensing in pipes and tubes, plastics machinery, whirlpools, and pellet stoves. Presence detection of water based liquids, ignoring the buildup of dirt/moisture/foam, is possible using the CD34's foreground suppression technology.



M12 CA12	M18 CA18CA/CL	M30 CA30CA/CLC, EC30	Chemical Resistant CA..LF/LN	Hazardous Locations CB18/32
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Capacitive proximity sensors, TRIPLESIELD™ technology, high immunity to EMI, humidity compensation. Thermoplastic housing, IP67 rated, -20 to +85°C (-4 to +185°F) operating temperature. Sensing ranges up to 8mm. Teach in button or wire. 4 wire DC, NPN or PNP auto-detection with programmable NO or NC output and alarm output. 2m cable or M12 plug.



Capacitive proximity sensors, TRIPLESIELD™ technology. AC, AC/DC 2 wire or DC 4 wire. High immunity to EMI, dust and humidity compensation. Flush, non-Flush, IP67, IP69K. Thermoplastic. Sensing ranges up to 12mm. Teach-in DC versions available. NPN, PNP (or auto-detect), SCR, NO & NC output. Dust or temperature alarm DC versions. 2m cable or M12 plug.



Capacitive proximity sensors with TRIPLESIELD™ technology. AC, AC/DC 2 wire or DC 4 wire. High immunity to EMI. Dust and humidity compensation. Flush, non-Flush, IP67, IP69K. Thermoplastic or Stainless steel housings. Sensing ranges up to 30mm. Teach-in DC versions, NPN, PNP (auto-detect), SCR, NO & NC output. Dust or temp alarm DC versions. 2m cable or M12 plug.



Capacitive proximity sensors with TRIPLESIELD™ technology. Adjustable sensing distance of 3-8mm (flush) or 3-12mm (non-flush). M18 cylindrical in polypropylene (black), PVC or Teflon housings with 2m cable. Ideal for use in level applications in chemical, semiconductor and food & beverage industries.



ATEX approved Capacitive AC or DC proximity sensors, Ø18 & Ø32 mm (TRIPLESIELD™). IP67, sensing distances up to 12mm (Ø18) and up to 20mm (Ø32) non-flush mount. NO or NC with ON or OFF delay output (AC models), relay, SCR, NPN or PNP with NO or NC output (DC models). Ideal for detecting grain or solids in tanks, silos or containers in ATEX Zones 20 or 22.

Relay Output CA30CLN & VC11/12	Liquid Detector CD34	Flat Pack EC55 & VC55	Flat Pack CD46	Flat Pack CD50
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Capacitive level sensor for solid, fluid or granulated substances, in M30 PBT threaded housing or smooth Ø32 thermoplastic housing (for PG36 screw gland). 21-265VAC/DC supply and 2A SPDT output. Adjustable sensing distance up to 12mm. Versions with adjustable (ON or OFF) time delay.



Compact (34x16x8mm) design is ideally suited for detection of water based liquids. Foreground suppression ignores dirt, moisture or foam build up from certain liquids. Choice of NPN or PNP, NO or NC output. Available in 2m cable or pigtail with M8 connector. IP69K ECOLAB approved housings.



Capacitive DC-proximity sensors. **EC55** features TRIPLESIELD™ technology. Sensing distance up to 25mm, flush or non-flush. NPN or PNP, NO & NC output. 2m cable or M12 connector. **VC55** is a basic sensor with sensing distance up to 10mm. Choice of NPN or PNP, NO or NC output, with 2m cable. Ideal for level and plastic machinery applications.



Capacitive DC-proximity sensors with TRIPLESIELD™ technology. PBT, IP68 housing. Teachable switch point 1-10mm, nonflush. NPN or PNP, selectable NO or NC output. 2m or M12 connectivity. A perfect solution for pellet stove applications or any other level sensing application where this sensor can be strapped around a plastic pipe, tube or feeding chamber.



Capacitive level detector. 3-wire DC sensor with open collector NPN or PNP, NO or NC transistor output. Fixed sensing distance and detection through a non-metallic wall. Sensing distance up to 10mm thickness. IP67, Noryl housing. 2m cable connectivity. Ideal for level detection in whirlpools and tubs.

# Photoelectric Sensors

Carlo Gavazzi offers a wide range of photoelectric sensors which are used extensively in packaging machinery, automatic door systems, material handling and many other industrial applications. Available in diffuse reflective (with or without background suppression), retro-reflective (polarized and non-polarized) and through beam styles. Carlo Gavazzi photoelectric sensors are available in many physical configurations to accommodate a vast array of mounting and sensing requirements. Versions with IP69K and ECOLAB approvals are also available for harsh environments.



Miniature, Basic <b>PD30..SA/IS</b>	Miniature, Advanced <b>PD30CNT..RT, MU, DU</b>	Miniature SS <b>PD30ETD/T</b>	Point Spot <b>PD30..PS</b>	Versatile <b>PH18..SA</b>
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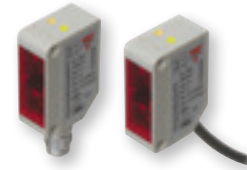
Compact size sensors in a reinforced plastic housing. High accuracy detection in a small package. Top or back potentiometer adjustment. Available in diffuse (1m), retro-reflective (6m), through-beam (15m) polarized (6m) and background suppression (200mm). Transparent object detection versions available. IO-link versions are also available (see page 11).



Compact size through-beam sensors in a reinforced plastic housing. High accuracy in a small package. Top or back potentiometer adjustment. 15m sensing distance. Remote teach, mute function or dust alarm options available. Background suppression, diffuse, retro-reflective and polarized options available in IO-Link (see page 11).



Stainless steel sensors with IP69K ratings, NEMA rated and ECOLAB approved. Rugged design fit for harsh environments, high-pressure washing, abrasive disinfectants and cleaning agents. Available in wide angle diffuse (200mm) and through beam (15m). Background suppression, diffuse, retro-reflective and polarized options available in IO-Link (see page 11).



High sensing performance using PointSpot light source, which eliminates any halo effect. Background suppression (250mm) and polarized retroreflective (5m). 4 wire DC. Potentiometer adjustment. NPN or PNP, with NO and NC output function. IP67 housing. PointSpot sensors with IO-Link are also available, (see page 11).



Small sensors ECOLAB approved in versatile IP69K housings provide for side mounting with screws, or front mounting with the 18mm threaded barrel. Potentiometer adjustment, available in diffuse (1m), background suppression (200mm), polarized (5m), retroreflective (6.5m), through beam (20m) sensing functions. 2m PVC cable or M12 plug.

<b>M18 PA18CA/R</b>	<b>M18 - AC Type PA18CL/AL</b>	<b>Time of Flight LD30</b>	<b>Compact PC50</b>
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M18 family of cost-effective general purpose DC 4-wire sensors in IP69K plastic housings (axial and radial type). Background suppression (200mm), diffuse (1m), diffuse wide angle (0.4m), polarized (5m), retro-reflective (6.5m), through-beam (20m). 2m PVC cable or M12 plug. Sensors are ECOLAB approved.



Supply voltage 20 to 250VAC. Nickel plated brass or thermoplastic housings, IP67. Diffuse (400mm), polarized (2m), retro-reflective (3m) with immunity to reflecting surfaces. 2-wire, NO or NC SCR output type. 2m PVC cable or M12 plug.



Laser time of flight measurement allows reliable and accurate detection even at longer distances. IP67 plastic housing or IP69K ECOLAB certified stainless steel housing for washdown environments. Diffuse (1m), retro-reflective (6m), and background suppression (200mm, 250mm, 350mm). IO-Link functionality (see page 11).



Compact size of full range AC/DC or DC 4 wire sensors in a reinforced plastic housing. Diffuse reflective (1m), background suppression (500mm), retro reflective (10m), polarized (6m) and through beam (20m). NO and NC, NPN, PNP or Relay output. The long sensing range and sensitivity adjustment make for a very flexible sensor. 2m cable or M12 swivel connector

# Photoelectric Sensors (continued)

Carlo Gavazzi photoelectric sensors are ideally suited for many diverse industries and applications, including the largest selection of UL 325 approved sensors for the automatic door and gate industry. The sensors have been designed to fit seamlessly into a wide variety of doors and gates. Easy setup, excellent performance, and reliability make Carlo Gavazzi a leader in the door and gate industry.

Carlo Gavazzi also offers a variety of powerful photoelectric sensor amplifiers, ideal for extremely wet, foggy, or dusty environments, such as car washes and wood processing applications.



Doors and Gates <b>PD98</b>	Door Sensors <b>PD86</b>	Doors and Gates <b>PD140</b>	Battery Powered <b>PD180</b>	Slimline <b>PD70</b>
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Through beam AC/DC sensors (up to 30m) in a durable polycarbonate housing. Designed for the domestic and industrial door markets. The sensing functions can be verified through a sensor mute input. High neighbor immunity. UL325 approval.



Versatile polarized retroreflective sensor for automatic door systems. IP66 plastic or metal alloy housing. Detects in one of three directions by adjusting the sensing angle within the housing. 24VAC/DC supply, Relay output, with up to 12m range. UL325 approval.



UL325 sensors for door or gate widths up to 60m. 24VAC/DC supply with a SPDT relay output. Adj. lenses in the horizontal (200°) and vertical planes (30°). Rugged vandal resistant, aluminum and polycarbonate housing. Optional **ADP Series** green laser alignment tool. UL325 approval.



Through beam AC/DC sensors in polycarbonate housing, designed for the door and automatic gate markets. Sensing function can be verified through a sensor mute input. Lens adjustment 200° horizontal and ±30° vertical. UL325 approval.



Specially designed for doors and entrance control. Slim housing design. Emitter with test input for evaluation of the sensor function. Available in 10-30VDC version. Sensing range up to 12m. Modulated, infrared light.

Rectangular <b>PMD/P/RS/T</b>	Through Beam <b>PE12, PB10 &amp; PB18</b>	Background Suppression <b>PD112</b>	Remote Amplifier System <b>S142 &amp; MOF</b>	Remote Amplifier System <b>MPF</b>
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Full size range of AC/DC or DC-sensors in a reinforced plastic housing. Diffuse (0.8m), retro reflective (10m), polarized retro reflective (12m) and through beam (20m). Mute input to verify sensing function. Ideal for industrial and door applications. UL325 approval.



Through beam DC-sensors specially designed for door and entrance control with sensing distance up to 15 m. The sensing functions can be validated through a sensor mute input. NPN or PNP, NO or NC outputs.



Long range 2.5m background suppression DC sensor in a durable plastic housing. Outstanding black object detection of 1.8m. Based on triangulation detection principle - detect any object, while ignoring background disturbances from steady or moving objects.



**MOF** are powerful robust through-beam sensors for use with the **S142** amplifiers for optimized space / performance ratios. Sensing distances up to 50m and three different detection angles. Ideal for harsh environments containing water, dust etc.



Remote amplified system consists of sensors in 3 different housing choices and a separate amplifier in choice of 1, 2 or 3 channels. Meets all global door standards. Has test input and relay output.

# Magnetic Sensors

Carlo Gavazzi offers a comprehensive range of magnetic sensors for use in proximity sensing applications.

A wide variety of styles are available, including rectangular and cylindrical. In addition, special coded magnets and sensors are available for use in safety applications. Magnetic sensors are frequently used in elevators and lifts, gate control, level detection, and access control. In elevator (lift) installations, normally open sensors are used for re-alignment of the lift car with the floor, and the bistable version is used to recognize the top and the bottom floors. Carlo Gavazzi's color coded magnetic sensors help installers to manage sensors, reducing the possibility of mistakes and time loss.



<b>M8 FMM</b>	<b>M10 FMA &amp; FSA</b>	<b>M12 FMC, FMP &amp; FS</b>	<b>Ø 13.5 FS</b>	<b>M16 FSB &amp; FSM</b>
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M8 cylindrical proximity magnetic sensors in stainless steel housing. PVC cable with NO, and change over output function. Operating distance up to 27mm.



M10 cylindrical proximity magnetic sensors in nickel plated brass housing. PVC cable with NO, and NC output function. Operating distance up to 23mm.



Cylindrical M12 magnetic sensors, color-coded plastic housing. Multiple output options: normally open, normally closed, change over, bistable. IP67 protection degree. Ideal for elevator applications.



Cylindrical proximity magnetic sensor in Ø 13.5 plastic housing. PVC cable with NO, NC, and change over output function. Operating distance up to 12mm.



M16 cylindrical proximity magnetic sensors in plastic (FSB) or brass (FSM) housing. PVC or silicon cable. Change over output function. Operating distance up to 8mm depending on the magnet. High temperature sensor.

<b>Flat type MC, MM &amp; MS</b>	<b>Safety Compact Type MC36</b>	<b>Safety Standard Type MC88</b>
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Standard proximity magnetic sensor series in plastic rectangular housing. Different dimensions are available, also miniature sensors. The sensor switching is side type with different operating distances.



Encoded safety magnetic sensors in IP67 PBT housing (36 x 26 x 13mm) rated from -25 to 80°C (-13 to 176°F). Offered with left or right exit, 2m cable or M8 connector, with or without LED indicator. Equipped with two outputs (2NO, 1NO&1NC) and in combination with the **MC36CM** actuator have a safe switch on distance of 5mm and a safe switch-off distance of 15mm.



Encoded safety magnetic sensors, IP67 PBT housing (88 x 25 x 13mm) rated from -25 to 80°C (-13 to 176°F). Left or right exit, 2m cable, M8 or Pigtail M12, with or without LED indicator. Offered with 2 or 3 outputs (2NO, 1NO and 1NC, 2NO&1NC). Safe switch on distances up to 18mm and a safe switch-off distances of up to 30mm using the **MC88CM** coded actuators.



# Optical and Conductive Level Sensors

Carlo Gavazzi offers a variety of level sensing and control technologies and products to meet the needs of most level control applications.

Conductive level control uses the electrical conductivity of the liquid to detect and control the level of liquids, and is well suited for most level control applications found in multiple industries, such as agricultural, chemical, food and beverage, water distribution and water treatment. These conductive sensors include a variety of probes and controllers, for filling, emptying applications for up to four point level control.

Optical level sensors use infrared light for the detection of liquids. Carlo Gavazzi optical level sensors are self-contained with emitter, receiver and built-in amplifier. Optical sensors are popular in the food and beverage and chemical industries. They are often used in the level detection of acids, bases, solvents, or potentially explosive environments where conductive sensors cannot be used.



Optical - Plastic VP	Optical - Metal VP A/B	Conductive Probe VN, VP, VS & VT	Modular Probe CLH	Hanging Probe A94 & VH
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Optical level sensors, built-in amplifier and modulated or unmodulated infrared light. 2 wire AC supply, SCR, NO or NC. 3 wire DC supply, NPN, PNP, NO or NC output. Polysulfone housing resistant to most acids and bases or polyamide 12 housing resistant to various solvents. 2m cable. ATEX version available.



High end optical level sensors with modulated infrared light with built-in amplifier. 4 wire, DC voltage supply, NPN, PNP, NO and NC output. Stainless steel or nickel-plated brass housings, with glass or polysulfone tip resistant to most acids and bases. 2m oil resistant cable or M12 connector.



Level sensing probes to control filling and emptying of conductive liquids. Use with **CLD/P** controllers below. Includes up to four insulated or non-insulated electrodes 1 meter long, cut to length to suit the application. Housings available in nylon (**VN**), PVC (**VPC**), polypropylene (**VPP**), food grade stainless steel (**VS**), and Teflon (**VT**).



Modular level sensing probes to control filling and emptying of conductive liquids. Use with **CLD/P** controllers below. Up to five **CLE** insulated or non-insulated electrodes can be used. Probes are 1m long and add up to virtually any length as required by the application. Kynar (PVDF) and polyolefine (FR) electrode insulation available.



Conductive level sensing probes for liquid level detection. Hanging probe for single level point detection in swimming pools. 5m Neoprene cable connections. The **A94** has two probes in one part, separated by an insulating barrier constructed of the polyester housing material. Detection functions determined by the amplifier used.

1 Level Controller CLD1	2 Level Controller CLD2 & CLP2	4 Level Controller CLD4 & CLP4	Cascading Controller CLP2
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Single point level controller (with adjustable ON or OFF time delay) for liquids with sensitivity range from 5K $\Omega$  to 150K $\Omega$ . 17.5mm wide housing mounts easily on DIN rail. For filling or emptying applications. Supply voltage of 24VAC/DC, with one 8A output and diagnostic LEDs.



Dual-point level controller for conductive liquids, which can control up to two levels of filling or emptying. Adjustment sensitivity from 250 $\Omega$  to 500K $\Omega$ . DIN rail mount (**CLD2**) or 11-pin plug-in (**CLP2**). Supply voltage of 24VAC/DC, 115VAC or 230VAC. **CLD2EB1BU** is 240VAC/DC. Up to two 8A outputs and diagnostic LEDs.



Multi-point level controller for conductive liquids, which can control up to four levels of filling or emptying. Adjustment sensitivity from 250 $\Omega$  to 500K $\Omega$ . DIN rail mount (**CLD4**) or 11-pin plug-in (**CLP4**). Supply voltage of 24VAC/DC, 115VAC or 230VAC. Two 8A outputs and diagnostic LEDs.



Cascade up to seven amplifiers for filling or emptying of up to two level points. Adjustment sensitivity from 250 $\Omega$  to 500K $\Omega$ . Supply voltage of 24VAC/DC, 115VAC or 230VAC. 8A SPDT output and diagnostic LEDs. Easy installation into an 11 pin circular socket.

# Ultrasonic and Wind Sensors

Carlo Gavazzi's ultrasonic sensors provide contactless distance measurement and object detection in tough applications. Because the technology is based on the reflection of sound, they are an ideal solution for detecting almost any type or color of material, even transparent objects. They provide superior performance, even where dust, steam, fumes and temperature variations are present.

Both on/off switching and analog output versions are available for sensing distances up to 6 meters (19.6 feet). Carlo Gavazzi also carries outdoor anemometers and wind vanes, which are the ideal solutions to detect wind speed and direction in applications such as wind turbines, cranes, weather stations and greenhouses.



<b>M12 UA12</b>	<b>Short-bodied M18 UA18</b>	<b>M18 UA18</b>	<b>M30 UA30</b>	<b>M30 Extended UA30</b>
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Multi-function M12 diffuse ultrasonic sensor in IP65 stainless steel housing. Sensing distance up to 200mm. One PNP or NPN switching output and setup of NO or NC via a remote teach function. M12 plug connection.



Short bodied multi-function multi-function M18 diffuse ultrasonic sensor in IP67 PBT plastic or stainless steel housing. Sensing distance up to 2.2m. Two transistor outputs, or one analog and transistor output. Standard switching, adjustable hysteresis or window modes via a simple pushbutton set-up. 2m cable or M12 plug connection.



Multi-function M18 diffuse ultrasonic sensor in IP67 PBT plastic or stainless steel housing. Sensing distance up to 2.2m. Two transistor outputs, or one analog and transistor output. Standard switching, adjustable hysteresis or window modes via a simple pushbutton set-up. 2m cable or M12 plug connection.



Multi-function M30 diffuse ultrasonic sensor in IP67 PBT plastic or stainless steel housing. Sensing distance up to 3.5m. Two transistor outputs, or one analog and transistor output. Standard switching, adjustable hysteresis or window modes via a simple pushbutton set-up. 2m cable or M12 plug connection.



Multi-function M30 diffuse ultrasonic sensor in IP67 PBT plastic housing, with a Ø40 head that protrudes 20mm. Sensing distance up to 6m. Two transistor outputs, or one analog and transistor output. Standard switching, adjustable hysteresis or window modes via a simple pushbutton set-up. 2m cable or M12 plug connection.

<b>Anemometer DWS-V</b>	<b>Wind Vane DWS-D</b>
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Cup anemometer with optoelectronic detection for measuring air speed. Built-in heater and dust sealing. Inputs and outputs protected against reverse polarity and transients.



Relative wind vane for measurement of the relative wind direction. Optoelectronic detection. Built-in heater and dust sealing. Inputs and outputs protected against reverse polarity and transients.

# IO-Link Sensors and Accessories

With the advent of Industry 4.0, industrial automation is undergoing a complete revolution as more and more information and functionality is now available from the field devices. This is possible thanks to IO-Link, which has been recognized as the official standard interface for sensors and actuators. CARLO GAVAZZI's inductive, capacitive, and photoelectric sensors feature integrated IO-Link communications, which offer great functionality and data, never available before.

Once connected to an IO-Link master, or our SCTL55 IO-Link Smart Configurator, sensors can be programmed according to the application requirements, enabling new functionalities and allowing process data exchange. Some functionality includes logic gates, time delays, sensing distance or hysteresis adjustment, RPM counter, rotational speed monitoring, temperature monitoring, 3 switching modes, diagnostics for predictive maintenance (operation hours, quality of run, operating cycles, temp monitoring) and much more.

The new capacitive sensors with IO-Link communications can be configured to more than a half million combinations! In addition, IO-Link sensors can operate in a non-IO-Link system and behave just as a standard sensor, with the difference that they are configured as the application demands. In this way, non-IO-Link sensors can be easily replaced, since they can use the current standard nonshielded cables and architecture in place.



Inductive Ø4 & M5 IBS04 & ICS05	Inductive M8 ICS08	Inductive M12, M18, M30 ICB	Inductive M12, M18, M30 ICF	Capacitive M12, M18, M30 CA
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Miniature inductive sensors in stainless steel housings. Smooth Ø4mm (IBS) or threaded M5 (ICS) barrels are IP67 and -25 to 70°C / -13 to 158°F rated. Flush mount sensing up to 1.3mm, with detection speeds up to 6Khz.



M8 inductive sensors in robust stainless steel housings, rated from -25 to 80°C / -13 to 176°F. Available in short and long barrels, flush (2mm) and nonflush (4mm).



M12, M18, M30 inductive sensors in short or long metal housing. Configurable via IO-Link with application functions of frequency monitoring and RPM counter. M12 flush (4mm) or non-flush (8mm), M18 flush (8mm) or non-flush (14mm), M30 flush (15mm) or non-flush (22mm) sensing.



M12, M18, M30 inductive sensors with full stainless steel housing. Easy configuration and advanced monitoring such as low margin alarm, proximity alarm, or activation level via IO-Link. Suitable for harsh environments with IP69K and -40 to 85°C and up to 100°C for 15 minutes. M12 flush (4mm) or non-flush (8mm), M18 flush (8mm) or non-flush (14mm), M30 flush (15mm) or non-flush (22mm) sensing.



M12, M18, M30 capacitive sensors in plastic or stainless steel housing. Configurable via IO-Link: output type, time delay, logic gates, output inverter, dust alarms, external teach and diagnostics. M12 flush (4mm) or non-flush (8mm), M18 flush (8mm) or non-flush (12mm), M30 flush (16mm) or non-flush (25mm) sensing.

Photoelectric PD30	Photoelectric LD30	Smart Configurator SCTL55	IO-Link Master YL212C..IO	IO Link Master YN115C..IO
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Miniature size IP67 plastic housing or IP69K ECOLAB certified stainless steel housing with red or infrared light. Available in diffuse reflective (1m), polarized retro-reflective (6m), and background suppression (200mm, 250mm, 350mm). Applications functions included: pattern recognition, speed & length, divider, object & gap monitoring.



Laser time of flight measurement allows reliable and accurate detection even at longer distances. IP67 plastic housing or IP69K ECOLAB certified stainless steel housing for washdown environments. Diffuse (1m), retro-reflective (6m), and background suppression (200mm, 250mm, 350mm). Applications functions include pattern recognition, speed length, divider, object & gap monitoring.



Easily program IO-Link sensors in the machine, development lab, or shop without any additional equipment or software. 5.5" (140mm) HD touch screen, internal memory and micro SD port to save sensors' parameters and high capacity, rechargeable Li-ion batteries. Wi-Fi capabilities to access IODD files, applications or updates.



Rugged IP67 machine mount design, with PROFINET IO or EtherNet/IP™, both also support OPC UA and Modbus TCP protocols. Provides IO-Link devices access to multiple controllers at the same time. Two Fast Ethernet ports and eight IO-Link ports to connect sensors or actuators. Compatible with IO-Link V1.0 & V1.1.



IP20 DIN rail mount housing, with PROFINET IO or EtherNet/IP™, both also support OPC UA and Modbus TCP protocols. Provides IO-Link devices access to multiple controllers at the same time. They have two Fast Ethernet ports and eight IO-Link ports to connect sensors or actuators. Compatible with IO-Link V1.0 and V1.1.

# Sensor Accessories

Carlo Gavazzi offers a variety of high quality accessories to support our wide range of sensors. PVC and PUR cordsets are available in various lengths and configurations.

A wide range of reflectors for retro-reflective sensors, and mounting brackets of all shapes and sizes are available.



M12 Cordsets <b>CON1</b>	AC/DC Cordsets <b>CONH</b>	M8 Cordsets <b>CON5</b>	Double Ended Cordsets <b>CON</b>	M12 IP67 Terminals <b>CONE14NF-S/A</b>
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IP68 PVC cordsets, available with straight or right angle M12 connector. 3, 4 or 5 pin/wire connection for DC sensors. Cable lengths in 2m and 5m, with other lengths available upon request.



IP67 PVC cordsets, available with straight or right angle M12 connector. 3 pin/wire connection for AC/DC sensors. Cable lengths in 2m and 5m, with other lengths available upon request.



IP67 PVC cordsets, available with straight or right angle M12 connector. Available with 3 pin/wire connection for AC sensors. Cable lengths in 2m and 5m, with other lengths available upon request.



IP68 PVC double-ended cordsets available straight or right angle, M12 or M8 connectors, 3 or 4 pin/wire connection for DC sensors. Cable lengths in 2m and 5m, with other lengths available upon request.



IP67 terminal for hardwiring, straight or right angle M12 connector. Available with 4 pin/terminal connections for DC sensors.

Reflectors <b>ER</b>	Mounting Brackets <b>AMB</b>	Universal Bracket <b>AMB4-30</b>
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A comprehensive range of reflectors and reflective tape for use with photoelectric sensors. Reflectors can be screw mounted or are provided with an adhesive backing. **ER681** is a heated reflector, ideal for cold installations.



Galvanized or stainless steel mounting brackets for M8, M12, M18 or M30 sensors.



Universal mounting bracket for all cylindrical sensors with Ø4 to Ø30 mm. The mounting adaptor is supplied complete with 2 mounting heads (Ø18 and Ø30 mm) and 5 adaptor bushings (Ø4, Ø5, Ø8, Ø12 and Ø14 mm).

# Solid State Relays for Panel Mounting

Carlo Gavazzi is the preeminent innovator in the design and manufacture of solid state relays. They feature direct copper bonding technology for increased life and reliability. No other manufacturer in the industry offers as wide an offering of the various 'switching types' or the vast product breadth.

On this page, you can see our full range of single-pole, two-poles and three-pole, three-phase chassis mount type relays, which typically get mounted to an electrical enclosure's back panel, or to one of the dozens of various heat sinks Carlo Gavazzi offers.

Most zero switching solid state relays are used to switch resistive loads, to control heating elements in plastics, packaging, food processing, coffee making and solder reflow machinery. They are also used extensively as a solid state means to control motors – some relays are UL dual rated with amperage and Hp rating, and lighting loads.



Zero/Instant-on Switching <b>RF1A &amp; RF1B</b>	Zero/Instant-on Switching <b>RM1A &amp; RM1B</b>	Zero/Instant-on Switching <b>RAM1A &amp; RAM1B</b>	Analog Switching <b>RM1E</b>	Zero/Instant-on Switching <b>RGS1A &amp; RGS1B</b>
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Compact chassis mount **RF1** relay requires 30% of the space that a standard hockey puck relay needs. They feature fast-on tabs and a pre-attached thermal interface, which ensure quick installation. These SSRs are ideal for resistive loads, up to 25AAC, and 280VAC. Integrated transils provide protection against over-voltages.



The chassis mount, single-phase relay is the most widely used industrial SSR. It can be used for resistive and inductive loads. **RM1A** zero switching type and **RM1B** instant-on type, are available in 25, 50, 75 and 100AAC outputs, for up to 660VAC. MOV and snubber output protection is standard on all models.



The single phase, chassis mount relay can be used for resistive and inductive loads. **RAM1A** zero switching type and **RAM1B** instant-on type, are available in 25, 50, 75, 100, and 125AAC outputs, for up to 690VAC. The built-in snubber secures transient protection. **RAM1A..G** is Glow wire Certified according to UL60335-1 and offers integrated overvoltage protection.



The analog switching relay works in accordance with the phase angle control principle, where the switching point and voltage at the output varies proportionally to the proportional input which can be 4-20mA or 0-10VDC. **RM1E** offers output ratings of 25, 50, 75 and 100AAC at up to 660VAC.



Slim **RGS1** panel mountable solid state relays are only 17.5mm wide. Nominal current ratings include 25, 50, 75 and 90AAC at up to 660VAC. Narrow width and larger output terminals make it ideal compared to standard chassis mount (hockey puck) SSRs.

## DC Switching **RM1D**



The **RM1D** SSRs are used in fast switching applications of small DC loads with high input/output isolation of 3,750Vrms. The DC output switches ON and OFF in accordance with the applied DC control voltage. Outputs of up to 100A at a maximum of 60VDC, up to 50A at a maximum of 200VDC, and up to 10A at a maximum of 500VDC.

## 2-Pole Zero Switching **RA2A**



2-pole SSR minimizes the space requirements without compromising performance. Two SSRs are built into a single **RA2A** 'hockey puck' SSR. Relay is rated up to 40AAC per pole, up to 660VAC. 0.25" fast-on terminals are utilized on output terminals for quick wiring. Choice of fast-on or pin-header for input voltage.

## 2-Pole Zero Switching **RK**



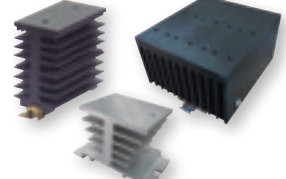
The **RK** is a series of 2-pole SSRs contained in one housing with the possibility to control each pole independently (**RKD2** models) or both poles together (**RK2** models). Ratings are up to 660VAC, 75AAC per pole. Input connectivity options include a 2.54mm male cable connector or a pluggable 5.08mm spring terminal.

## 3-Phase Zero Switching **RZ3A**



This heat sink mountable 3-phase zero switching **RZ3A** SSR is designed to switch resistive and inductive loads up to 75 and 20AAC respectively, at up to 660VAC. Built-in varistors provide transient protection for heavy industrial applications. Optional over-temperature protection is also offered.

## Heat Sinks **RHS**

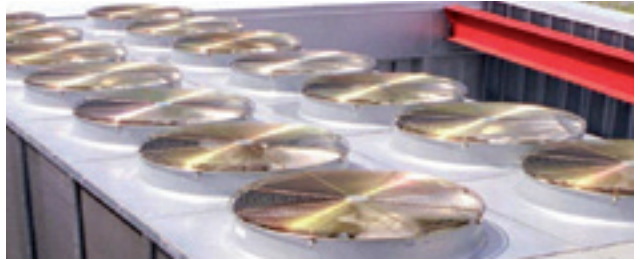


**RHS** Heat sinks are a necessary accessory for any chassis mount relay where more than 5 amps are being switched. Available for DIN rail, panel and through-the-wall mounting of one to multiple SSRs, the product offering dissipates from 4.0 to 0.12°C/W. Optional cooling fans are also offered.

# Solid State Relays and Solid State Contactors for DIN Rail Mounting

Carlo Gavazzi offers a complete range of Solid State Relays and Contactors which have an integrated DIN-rail adapter and/or a heat sink. Devices presented in this page are easy to specify and install. There is no need to calculate the heat sink size, apply thermal grease or properly mount the relay onto a heat sink.

Carlo Gavazzi's RGC Series features a full range of single-, two and three-pole, three phase devices. Standard integrated MOV and snubber protection, optional high I2t rating, and default 100kA SCCR when paired with a proper fuse, make them ideal devices for use in industrial panels. The single phase RGC Series allows the user to select the position of the line and load power terminals. Terminals can be either side-by-side, on the bottom of the device, resembling conventional 'hockey-puck' SSR layout, or have the line terminal on the top, and the load terminal on the bottom, resembling the layout of an electromechanical contactor. Such an option allows the user to either keep all the low voltage wiring in the top wire tray and the power wiring in the bottom wire tray or separate line and load cables.



<b>Zero/Instant-on Switching RP1A/B...M1/2</b>	<b>DC Switching RP1D...M1/2</b>	<b>Zero Switching RGS1A...DIN</b>	<b>Zero/Instant-on Switching RGC1A/B Mini</b>	<b>Zero Switching RGC1A...32 Mini</b>
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**RP1A** or **RP1B** are solid state relays for printed circuit board mounting, but when ordered with M1 (230VAC) or M2 (480VAC) suffix, they leave factory attached to a DIN rail adapter. Voltage rating includes 230VAC (12.5mm wide) and 480VAC (25mm wide), current rating up to 5.5AAC.



**RP1D...M1/2** is a DC PCB SSRs that is factory mounted on a DIN rail adapter. The device is rated either 1, 4 or 8ADC at up to 60 (M1 suffix) or 350VDC (M2 suffix). The RP1D relay is ideal for applications where there is a need for fast switching of small DC loads.



**RGS1A** with suffix DIN is a variant of panel mount **RGS1A** relay. Relay is factory attached to a DIN rail adapter, which also acts as a small heat sink. **RGS1A...DIN** relays are available for applications up to 660VAC and 12AAC. Both contactor (E) and SSR (U) terminal layouts are available.



Mini size **RGC1** solid state relays and contactors with integrated heat sink maximize panel space. Up to 25AAC/3Hp in 17.5mm width and up to 30AAC / 5Hp in 22.5mm width. Up to 1,800 A2s I2t and 1,200 Vp blocking voltage. Nominal rating at 40°C. IP20 and MOV protection standard.



Mini 17.5mm **RGC1A...32** relay offers switching currents that are normally found in 22.5mm or even 45mm wide devices. Two output terminal versions are available, screw or box clamp, with respective current ratings of 30A or 37AAC at 40°C. I2t rating of 18,000 A2s is standard on all **RGC1A...32** models.

<b>Zero/Instant-on Switching RGC1A/B Midi</b>	<b>Zero/Instant-on Switching RGC1A/B Power</b>	<b>2-Pole Zero Switching RGC2A</b>	<b>3-Pole Zero Switching RGC3A</b>	<b>3-Pole Zero Switching RGC3A...48A</b>
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Midi size **RGC1** model with integrated heat sink features 35.5mm wide construction. Electrical ratings of 43AAC/10Hp at 40°C and voltage up to 660VAC. High I2t rating of 18,000 A2s is available on some models. Both contactor (E) and SSR (U) terminal layouts are available.



Power line of the **RGC1** with maximum output rating of 85AAC/15Hp at 40°C. 65AAC/15Hp version uses natural air convection cooling, while the 85AAC/15Hp version uses a built-in fan to achieve its high rating. MOV protection is standard. 100KAAC SCCR UL508 rating.



Two-pole, three-phase, zero-switching, **RGC2A** solid state contactors are ideal for applications where frequent switching is required. Maximum rating per pole is 75AAC/25Hp at 40°C, 660VAC. MOV and snubber protection are standard.



Three-pole, three-phase, zero-switching, **RGC3A** solid state contactors can be used in 3-phase applications where all poles must open. Max. rating per pole is 65AAC/25Hp at 40°C, 660VAC. MOV and snubbers are standard.



**RGC3A..48** is a three-pole, three-phase variant of the RGC3A, where a conventional, DIN-rail mountable heat sink is replaced with one that can be panel or thru-wall mounted. Amperage rating of 48AAC/25Hp at 40°C per phase is achieved without the use of a cooling fan.

# Solid State Relays and SCRs with Monitoring Functions

Carlo Gavazzi Solid State Relays have evolved to integrate monitoring functions such as mains loss, load loss, partial heater break and over-temperature protection.

Different models are available to accommodate different application and installation requirements. In the slim-line single-, two- and three-pole models are available in the RGS and RGC Series. RGS.P and RGC.P SCR (or proportional controllers) Series comes with various switching method options such as phase angle, full cycle and burst that are ideal in heating applications where precise control is required. This includes plastic and rubber processes as well as semiconductor wafer fabrication processes.

The latest evolution in the SSR and SCR range is the NRG system that enables OEMs to upgrade their designs to embrace the Industry 4.0 and IIoT. NRG controller can communicate directly with the machine PLC in the most common industrial protocols: EtherNET/IP, Profinet, EtherCAT, Modbus TCP and RTU.



1-Pole Monitoring RGS...M & RGC...M	1-Pole Current Sensing RGS1S & RGC1S	2-Pole & 3-Pole Monitoring RGC2..M & RGC3..M	1-Pole SCR RGS1P & RGC1P	2-Pole & 3-Pole SCR RGC2P & RGC3P
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The **RG1..M** solid state devices incorporate monitoring functions for detection of mains and load loss, SSR open and short circuits and internal faults. The RGS1A..M is rated up to 90AAC with proper heat sink, while the RGC1..M is rated up to 65A. Line voltage rating is up to 660VAC.



This **RG** design is capable of load switching as well as detecting of full or partial load failures, open or short SSR circuit, and SSR over temperature. Product is available in versions without heat sink (**RGS1S**) or with heat sink (**RGC1S**). Available current range is up to 85AAC at 40°C.



The **RGC2A** and **RGC3A** solid state contactors are available with the system monitoring option that is offering detection of SSR over-heating, mainsz and load loss. The **RGC2/3..M** features LEDs for load and alarm indication as well as transistor alarm and auxiliary outputs. The monitoring option is available on most **RGC2A** and **RGC3A** devices.

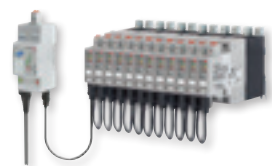


Analog switching **RGS1P** panel mount SCR & **RGC1P** SCR with integrated heat sink is a single pole device that provides proportional output control. This microprocessor controlled device offers the flexibility of five switching modes in one flexible package: Maximum current range is 63AAC, controlled by 4-20mA, 0-5, 1-5 or 0-10VDC.



The **RGC2/3P** solid state controllers, provide proportional output control. This microprocessor controlled device offers several switching modes such as phase angle, full distributed cycle or soft start. Maximum current range is up to 75AAC (**RGC2P**) and 65AAC (**RGC3P**), controlled by several types of analog input signals.

## Monitoring & Comms NRG System



The **NRG** is a system consisting of a master controller and up to 32 slave **RG..N** solid state relays and contactors. The **NRG** system offers control and monitoring via Modbus, ProfiNet, EthernetIP, EtherCAT, and Modbus TCP. The **RGS1A..N** is rated up to 90AAC with proper heat sink, while the **RG1..N** is rated up to 65AAC with integrated heat sink.

# Contactors, Overloads, Manual Motor Starters, and Circuit Protection

Carlo Gavazzi is proud to present our expanded range of contactors and overloads, as well as our comprehensive offering of manual motor starters and circuit breakers. The product offering starts with mini-contactors in a compact 12 A frame size (7.5 Hp), followed by midi-contactors in up to 100 A frame sizes (75 Hp), and topped off with the power-contactors which offer up to 800 A frame sizes (600 Hp). All of the midi-contactors, 9 to 100 A (5 to 75 Hp), also have CSA elevator ratings. For price conscious application requirements, we offer definite purpose contactors available in one, two, three and four pole output configurations with maximum output ratings from 25 to 90 A.

Electronic overloads, manual motor starters and other contactor accessories are also available.

Our extensive range of 1, 2, & 3-pole UL489 and UL1077 circuit breakers, rounds out the product offering. Available from 0.5 to 63 A in the GMB (branch circuit protection) and 1 to 63 A in the GSB (supplementary protection).



Mini Contactors <b>CGM</b>	IEC Midi Contactors <b>CC</b>	IEC Power Contactors <b>CC</b>	Mini Overloads <b>CGT-12M</b>	IEC Overloads <b>GT</b>
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Electromechanical 3-phase switching. AC3 480VAC rating 6, 9 and 12AAC. cUL ratings up to 7.5Hp. One auxiliary contact. Full arrangement of AC and DC coils and accessories. Connection choices of screw, cage clamp, fast-on and pin terminals.



Rugged 3 or 4-pole contactors with AC3 480VAC ratings of 9-100AAC, cUL ratings of 5-75Hp. Full range of AC or DC coils. Screw and lug terminals. One or two sets of auxiliary contacts. Accessories include overloads, reversing kits, extra auxiliary contacts and surge suppression units.



Rugged 3 or 4-pole contactors with AC3 480VAC rating from 130-800AAC. cUL ratings of 75-600Hp. Two sets of auxiliary contacts are standard. Popular upgrades include extra auxiliary contacts, overloads and reversing interlocks. Full arrangement of AC, DC or AC/DC coils.



Bi-metallic overloads fit all sizes of mini contactors and protect motors from overloading and phase loss. One frame size and thirteen overload ranges protect motors with nominal rating ranging from 0.1-13AAC.



Rugged bi-metallic **GT** overloads attach directly to all sizes of **CC** contactors and protect motors from overloading and phase loss. Seven frame sizes protect motors ranging from 0.1-800AAC. Direct and separate mounting models are available.

Electronic Overloads <b>CGE</b>	Manual Motor Starters <b>GMS</b>	Definite Purpose Contactors <b>GDP</b>	UL 489 Circuit Breakers <b>GMB</b>	UL 1077 Circuit Breakers <b>GSB</b>
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Electronic overloads use solid state technology to detect overload and phase loss, as well as phase reversal and unbalance. Wide overload range and user selectable trip class. Three frame sizes, protecting motors from 0.3-85AAC. Direct, separate and through-hole mounting styles.



Manual motor starters combine functionality of bi-metallic overloads with magnetic short circuit protection. Available in three frame sizes with full load ratings up to 100AAC and short circuit protection up to 100kA. Adapters are available for direct connection to **CC** contactor sizes from 9 through 100AAC.



Cost-effective range of contactors offered in single, single+shunt, two and four pole normally open contact arrangements for 25-40AAC maximum AC3 ratings with screw or lug load terminals standard and in three pole from 25-90AAC with lug load terminals standard. Multiple 0.25" fast-ons are also standard for control and load terminals.



UL 489 miniature circuit breakers provide reliable protection in wide range of applications including branch circuit protection of HVACR equipment, power supplies, motors, receptacles and other equipment. 1, 2 and 3 pole arrangements are available, ranging from 0.5A to 63A and has short circuit interrupt capacity of 10kA.



UL 1077 supplementary protectors offer overcurrent protection for specific applications where branch circuit protection is already provided by another device or is not required. Product is available in 1, 2, and 3-pole variations, ranging from 1 to 63Amps and has a short circuit rating of 5kA.



# Soft Starters and Solid State Contactors for Motors

Carlo Gavazzi offers a wide range of soft starters for single and three phase motor applications. What differentiates us from competition is the self-learning control that enables the soft starter to automatically adjust to the load requirements thereby facilitating and minimizing user adjustments. With the exception of RGTS, all the soft starters are equipped with internal electro-mechanical relays to bypass the semi-conductors when the motor reaches full speed, thereby reducing heat losses in the panel.

We have a series of soft starters that is dedicated to HVAC applications such as heat pumps, roof top units (RTUs) and chillers. The RSBS, HDMS, RSBT Series are specifically designed for limiting the starting current of compressors. RSGD and RSGT Series is designed for general motor applications such as fans, pumps, mixers and conveyors. Integrated motor overload protection, wrong phase sequence detection and also Modbus RTU communication help our customers minimize the components in the panel. RGC Series is a solid state contactor with UL motor ratings. RR2A is a reversing relay that is suitable for applications that require bi-directional switching.



1-Phase Motors <b>RGTS</b>	1-Ph Compressors & Pumps <b>HDMS</b>	1-Phase Compressors <b>RSBS</b>	3-Phase Compressors <b>RSBT</b>	3-Phase Motors <b>RSGD</b>
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The **RGTS** is a full solid-state, compact and easy to use soft starter for single phase two wire AC induction motors. Motor ramp-up time and initial torque can be adjusted through the built-in potentiometers. Three amperage ratings are available; 12, 16 and 25AAC, while the operational voltage range is 100-240VAC.



The **HDMS** is a soft starter for single phase scroll compressors, hydraulic and submersible pumps up to 253VAC and 37AAC. Through an innovative control strategy, Capacitor Start-Capacitor Run motors can now be started without a start capacitor. Modbus RTU, NFC and class 10 overload are standard.



Compact single phase scroll compressor soft starter with integrated start capacitor. **RSBS** is available in standard 25A and High Pressure 32A sizes. High Pressure version provides a dynamic current limiting that ensures compressor starting even at higher starting pressures with maximum current limit of 80AAC.



The **RSBT** are easy to use softstarters for scroll compressors. It is equipped with patented auto-adaptive algorithm that automatically adapts itself to performance of each specific compressor. The **RSBT** is rated up to 32A at up to 400VAC and up to 95A at up to 480VAC. Modbus RTU is available.



The **RSGD** is an extremely compact and easy to use 3-phase soft starter for AC induction motors rated up to 100Arms. The starting parameters can be easily setup through 3 selector switches. The integrated motor overload protection (Class 10) and Modbus communication on larger frame models, result in a higher installation flexibility.

3-Phase Motors <b>RSGT</b>	1-Pole Solid State Contactors <b>RGC1A</b>	3-Phase Solid State Contactors <b>RGC2A &amp; RGC3A</b>	Reversing Relays <b>RR2A</b>
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3-phase controlled soft starter for centrifugal pumps. Three frame sizes are available with amperage rating ranging from 12 to 90AAC. The **RSGT** has a number of diagnostic functions including phase-sequence, over and under voltage, dry-run, SCR short circuit and Class 10 motor overload protection. Models available with Modbus communication.



Single phase **RGC1** solid state contactors can be used to control resistive loads as well as be part of AC induction motors starter. UL approved Hp ratings range from 1/3Hp (AC53a: 5A) at 115VAC to 15Hp (AC53a: 20A) at 660VAC. Robust construction of the **RGC1** family allows for up to 30 starts per hour.



These two and three pole products are solid state alternatives to electromechanical contactors. **RGC2A** or **RGC3A** offer maximum motor rating of 28AAC / 25HP at 660VAC and 40°C. MOV and snubber protection are standard. Models with system monitoring, over-temperature alarm and auxiliary output are available.



The **RR2A** is solid state reversing relay for 3-phase induction motors. LED indication for "forward" and "reverse" mode indication. Motor rating: three phase up to 7.5 Hp. The output is protected from excessive voltage fluctuations (transients) by built-in varistors.

# Industrial Relays and Sockets

Carlo Gavazzi offers a comprehensive range of electromechanical relays for industrial control panels. Many of our relays come standard with a push-to-test button as well as an orange flag or LED indicator.

Carlo Gavazzi relays are frequently used in control panels, in HVAC control systems, pump and compressor control, as well as electronic consumer products. These are typically used to switch loads such as heaters, lights and motors. Additionally, Carlo Gavazzi offers a complete range of relay sockets, for back panel or DIN rail mounting.



Industrial <b>RCP</b>	Midi Industrial <b>RMIA</b>	Midi Industrial <b>RPY 1/2/3/4</b>	Slim <b>RSLM</b>	Power 1 & 2 Pole <b>C F/S &amp; N A/F/P</b>
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2 and 3 pole relays for a wide range of industrial applications. Available in 8 or 11 pin versions from 6VDC-110VDC and 6VAC-230VAC. Up to 10AAC output contacts. Pair with **ZDP** sockets.



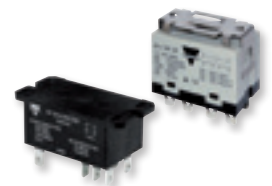
High switching power (2 or 4 pole, up to 10AAC) in a very compact relay size. Available from 5VDC-110VDC and 6VAC-230VAC. Standard indicating LED, push arm and test flag. Pair with **ZMI** sockets and auxiliary modules.



Available in 1, 2, 3 and 4 pole changeover contact configurations for up to 10AAC (2, 3 and 4 pole) or 16AAC loads (1 pole). High switching power and high reliability for a wide range of industrial applications. Pair with **ZPY** sockets.



Slim 5mm wide relay with 6A switching capacity. Suitable for use with PLCs, valves actuation or solenoids. DIN rail or PCB mount. Pair with **ZRLS** sockets.



High power relay, in a sealed design, ideal for vending machines, copiers, compressors and control equipment. Switching capacity up to 30AAC. Reinforced insulation 4 kV / 8 mm (0.31").

Sockets <b>ZDP</b>	Sockets <b>ZMI</b>	Sockets <b>ZPY</b>	Sockets <b>ZRLS</b>
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Sockets for **RCP** relays, rated voltage / rated current 10 A at 400 VAC. Terminal type: screw cage



Sockets for **RMIA** relays, rated voltage / rated current 10 A at 300 VAC. Terminal type: screw cage



Sockets for **RPY** relays, rated voltage / rated current 10 A at 300 VAC. Terminal type: screw cage



Sockets for **RSLM** relays, rated voltage / rated current 6 A at 250 VAC. Terminal type: screw cage or spring loaded terminal

# Limit Switches

Carlo Gavazzi offers a complete range of limit and safety switches with a wide variety of actuator types. They provide machine manufacturers and panel builders with unparalleled solutions, which enable machinery to operate correctly, thus minimizing process stops and personnel risk.

Limit and safety switches, classified by application, allow for an easier selection of the right switch.

There are over 8,000 different limit switch types for industrial automation as well as for the elevator and door industries. Limit switches facilitate reliable and safe operation of machinery.



<b>Compact, Pre-Wired, Right Exit</b> <b>PS21M</b>	<b>Compact, Pre-Wired, Bottom Exit</b> <b>PS31M</b>	<b>Miniature, 30mm Wide</b> <b>PS21L</b>	<b>Full Size, 40mm Wide</b> <b>PS31L</b>	<b>Robust, 50mm Wide</b> <b>PS42L</b>
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Miniature limit switch with 20mm mounting hole spacing. Pre-wired with 1m (3.3 ft.) of cable, right exit. 15 different actuator options. 2 different contact block choices. Double insulation, positive opening operation. Available in metal or plastic housing. Fully potted, IP67 rated.



Miniature limit switch with 25mm mounting hole spacing. Pre-wired with 1m (3.3 ft.) of cable. 15 different actuator options. 2 different contact block choices. Double insulation, positive opening operation. Available in metal or plastic housing. Fully potted with IP67 rating.



Miniature standard housing, with one cable/conduit entry. 25 different actuator options. 6 different contact block choices. Double insulation, positive opening operation. Available in metal (IP66 rated) or plastic housing (IP65 rated). Robust switch in a small package.



Full-size, standard housing, with one cable/conduit entry. 20 different actuator options. 10 different contact block choices. Positive opening operation, double insulation. Available in metal (IP66) or plastic (IP65) housing. Robust switch in traditional package.



Compact standard housing, with two cable/conduit entries. 18 different actuator options. 6 different contact block choices. Positive opening operation, double insulation. Available in metal (IP66) or plastic (IP65) housing. Robust switch in compact package.

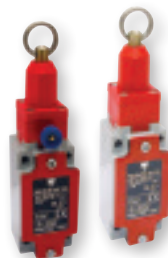
<b>Robust, 60mm Wide</b> <b>PS43L</b>	<b>Safety – Manual Reset</b> <b>PS21K</b>	<b>Safety – Cable Pull</b> <b>PS21R/31R/42R/43R</b>	<b>Safety – Door Interlock</b> <b>PS21S/31S/42S/43S</b>	<b>Safety – Hinge Type</b> <b>PS21H</b>
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Large standard housing, with three cable/conduit entries. 20 different actuator options. 10 different contact block choices. Positive opening operation. Available in metal (IP66) housing. Robust switch in large package.



Safety switch, which becomes disabled when tripped, requiring manual reset. Typically used for detecting over-travel conditions. 2 different housing size options. 5 different actuator options. Positive opening operation, double insulation. Available in metal (IP65) or plastic (IP65) housings.



Emergency stop switch, ideal for providing worker access over long areas (such as conveyors). Double insulation, positive opening operation. Available with or without manual reset button. 4 different housing size options fit most preventative guard doors.



Safety switch used to monitor guard doors, and restrict machine operation when safety doors are not properly closed. Double insulation, positive opening operation. 4 different housing size options. Choice of 7 different keys, to fit most guard doors.



Safety switch used to monitor swinging guard doors and restrict machine operation when safety doors are not properly closed. Double insulation, positive opening operation. Switch mounts on top of machine, and pin is inserted into the door hinge or lever, typically secured to top of door. 2 different housing size options.

# Push Buttons and Pilot Lights

Industrial manufacturing equipment command devices are of great importance in human-machine interfacing, which is precisely why Carlo Gavazzi offers a complete range of push buttons and pilot lights.

These products are designed to provide users with the flexibility to meet the requirements of a broad range of applications.

Economical in size and flexible in function, they can be mounted to switch boards, control panels, operator's consoles, on conveyors and in elevators/lifts.

Pushbuttons, selector switches, mushroom head type, key switch and pilot lights are available in six different colors and multiple contact configurations.



Push Buttons PB..IF,..IE,..IM4	Emergency Stop PB..EM4	Selector Switches PB..KRS,..LRS,..ISRS	I/O Push Buttons PB..IOL	Push Button Boxes PBBOX
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Pushbutton switches to open or close electric contacts. They are mostly used to start / stop electric circuits or devices like lamps, motors, etc. Choice of several colors, illuminated or nonilluminated. Flush and extended options. Maintained or spring-return operation. 22mm hole size. 40 & 60mm mushroom head, push-pull options.



Red emergency stop pushbutton switches. Twist-to-release or key-reset function. 40mm and 60mm button size options. 22mm hole size.



Selector switches are mechanical switches that can be turned right, center or left to open or to close the electric contacts. Short and long handle options. Several different color choices, including illuminated options. 22mm hole size. Keyed selector switches are also available for higher security applications.



I/O push button switches are mostly used to start/stop electric circuits/devices like lamps, motors, etc. Illuminated or non-illuminated, with red and green buttons in 22mm hole size.



Plastic boxes for push button and pilot lights. **PBBOX** series is available in choice of yellow or grey cover, and 1-5 holes.

High Lens PL..HL	Low Lens PL..LL	Flash Light PL..FL	Two Color PL..TC	Buzzer/Flashing PL..BZ
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Pilot lights are panel mounted (22mm hole) lamp assemblies consisting of the indicator housing, an internal high brightness pure color LED, terminals, and a lens. Choice of 5 colors (red, white, blue, yellow, green) and offered in several voltage ranges. Compact versions available for shallow panels.



Pilot lights are panel mounted (22mm hole) lamp assemblies consisting of the indicator housing, an internal high brightness pure color LED, terminals, and a lens. Choice of 5 colors (red, white, blue, yellow, green) in a low profile lens. Compact versions available for shallow panels.



Flashing pilot lights are panel mounted (22mm hole) lamp assemblies consisting of the indicator housing, an internal high brightness pure color LED, terminals, and a lens. Choice of 5 colors (red, white, blue, yellow, green). Available in 2 voltage ranges.



Two-color pilot light (red and green) are panel mounted lamp assemblies consisting of the indicator housing, two-color internal high brightness pure color LED, terminals and a lens. Available in 3 different voltage ranges. Conserve panel space and minimize cutouts with this dual-function indicator.



Buzzers (black) or flashing buzzers (red) are panel mounted device assemblies consisting of the housing, an internal lamp or buzzer, terminals and a cover. For 22mm panel holes. Available in 4 different voltage ranges.

# Power Supplies

Carlo Gavazzi power supplies, from 5 watts to 480 watts, are found wherever DC power is required, with a variety of output voltages from 5VDC to 48VDC.

SPDE and SPDC DIN rail power supplies offer the features required for today's industrial automation applications, and feature reduced housing sizes which conserve valuable panel space.

The SPMA series is approved for Class I, Division II hazardous locations. The majority of power supplies up to 100 watts are UL1310 Class 2 or UL62368 Low Power Source (LPS) certified. At merely 2.2" deep, the SPMA & SPME low profile power supplies are perfect for shallow panels and commercial installations.

Compact SPPC enclosed power supplies are ideal for vending machines, commercial food ovens and warming equipment.

For critical applications, a complete line of UPS controllers and battery chargers are available.



1-Phase SPDE	Bi-Phase SPDE	3-Phase SPDE	1-Phase SPDC	Low Profile SPMA
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Single phase DIN-rail mount power supplies offer high performance within an extremely compact footprint. Power ratings from 75 to 480 W with 12, 24 & 48 VDC output. Efficiency rating of up to 94% at 230 VAC. Features such as DC OK output relay (for **SPDE..R** models) and built-in protection functions ensure a high degree of reliability.



This compact bi-phase series is available with output power levels of 120W and 240W, with a voltage of 24 VDC. Input voltage range of 180 VAC to up 600 VAC. All models available with a DC OK relay. Active PFC is available in the 240W model.



The compact 3-phase series is available with output power levels of 240W and 480W, with voltages of 24 or 48 VDC. Input voltage range of 320-600VAC. All models available with a DC OK relay. Active PFC and RS485 serial communication is available in the 480W model.



High efficiency and performance in slim housing. Built-in active PFC, DC OK relay output, Power Boost, and parallel connectivity are included. Output power: 120, 240, or 480 watts. Output voltages of 12, 24, or 48V DC.



These power supplies feature a low profile depth of 2.2" (56.5mm). Output power levels consist of 7.5, 10, 15, 25, 30, 35, 54, 60, 72, 91 and 100 watts in voltages of 5, 12, 15 and 24 VDC. Most models are UL1310 Class 2 compliant.

Low Profile SPME	Enclosed Power SPPC	Power Supply & UPS SPUB
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Modular single phase power supplies feature a low profile depth of 2.2" (58mm). Output power levels consist of 15, 24, 36, 54, 60, 90, and 100W in voltages of 12 and 24 VDC. Models <100W are UL62368 Low Power Source (LPS) compliant.



Compact, powerful 25, 35, 50, 75, 150, 200, 240, 320, 480, 600 and 800W enclosed power supplies, which includes built-in fans (>150W) with speed control, as well as active PFC (>150W). They feature universal AC/DC input, high efficiency, very low standby power consumption, and high MTBF. Output voltages are 5, 12, 15, 24, 36 and 48VDC.



A fully independent DC UPS unit with a unique energy management concept. The power for the load is managed independently from charging the battery, with priority given to the load. Continuous output is 5A, with up to 10A possible by utilizing power from the battery. Racks for DIN-rail mounting of batteries are also available.

# Monitoring Relays

Carlo Gavazzi monitoring relays are used in a wide range of applications to protect one of the most critical elements in manufacturing and process control: the motor. Whether your target concern is compressors, pumps, HVAC systems or conveyors, the Carlo Gavazzi monitoring relay offers a long lasting, and reliable, solution to protect your investment and minimize costly downtime. Our family of monitoring relays will detect overloads, phase sequence and phase loss, regenerated voltage, phase asymmetry, tolerance, power factor and leakage current. We capture anomalies before they become serious problems.

Additionally, our monitoring relays are the solid choice to detect broken heater elements and are well suited for monitoring of lighting systems within an automated building system.



Current Relays <b>DIA &amp; DIB</b>	Current Relays <b>DIC</b>	Voltage Relays <b>DUA, DUB &amp; DUC</b>	Undervoltage Relay <b>DUB72</b>	3-Phase Relays <b>DPA &amp; DPB</b>
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**DIA** AC/DC over current monitoring relay and **DIB** TRMS AC/DC over or under current monitoring relay. Direct input measurement or for use with a current transformer. 11-pin **PIA/PIB** plug-in types are also available. 5A maximum monitoring (higher with a CT).



TRMS AC/DC over+under, over+over or under+under current and voltage monitoring relays. **DIC01** can also perform +/- DC measurement. 11-pin **PIC** plug-in types are also available. 10V maximum monitoring; up to 500AAC (1 or 3-phase) with an **MI** or **MP** CT.



**DUA** AC/DC over voltage monitoring relay and **DUB** TRMS AC/DC over or under voltage monitoring relay. **DUC** features over+under, over+over or under+under voltage monitoring. 11-pin **PUA/PUB/PUC** plug-in types are also available. 500VAC/DC maximum monitoring.



**DUB72** Double under voltage monitoring relay approved for use in Class I Div. 2 hazardous locations. This relay can be used to help prevent brownouts in 24VDC supplied systems in any application, including hazardous environments. Two independent outputs for pre-alarm and alarm.



**DPA** phase loss and sequence relay and **DPB** over+under voltage, as well as phase sequence and loss monitoring relay. 11-pin **PPA/PPB** plug-in types are also available. 690VAC maximum monitoring.

3-Phase Relays <b>DPD</b>	3-Phase Multi-function <b>DPD</b>	Earth Leakage Relays <b>DEA71 &amp; DEB71</b>	Frequency Relays <b>DFB &amp; DFC</b>	Power Factor Monitor <b>DWA &amp; DWB</b>
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TRMS over+under, phase sequence and phase loss, two relay alarm outputs plus phase asymmetry and tolerance monitoring relay. 11-pin **PPC** plug-in types are also available. 690VAC maximum monitoring.



3-phase voltage and frequency monitoring relay provides protection against phase reversal/loss and if the phase asymmetry, voltage or frequency are not within the user-configured settings. The **DPD** settings can be modified through a smartphone/tablet or via a USB NFC Reader/Writer. 552VAC maximum monitoring.



Earth leakage monitoring relay, used with core balance current transformer (**CTG**) and circuit breakers to provide protection against fault currents and to reduce fire hazards. **DEA71** has fixed settings for fast installation, and **DEB71** has adjustable sensing ranges and time delay to customize for any application.



Over+under 50/60Hz frequency monitoring of its own power supply. Programmable latch/inhibit function, and adjustable delay ON alarm. 11-pin **PFB** plug-in types are also available.



Over or under Cos $\phi$  monitoring relay (**DWA**) and TRMS AC active power and power factor monitoring relay (**DWB**) for balanced 3-phase system. 11-pin **PWA** plug-in types are also available. 480VAC max. monitoring, maximum current is determined by the primary of the **MI**, **MP** or 5A secondary CT.

# Monitoring Relays (continued)

Carlo Gavazzi monitoring relays are available, with the same functions, in up to three different housings: the standard DIN-rail mount types, perfect for industrial panels, the plug-in housing to allow fast and safe replacement (without moving cables), and the Mini-D housings for spacesaving compact DIN-rail mounting.

When considering lifts/elevators, escalators and cranes, the direction of the motion must be 100% correct. Phase sequence relays are a fast, reliable and easy-to-maintain solution. In overload conditions, the motor temperature can damage and eventually burn up the motor. The DPA51 provides detection of the voltage regenerated by the motor during phase loss. This means that the motor won't overheat, burn or cause danger.

For critical loads, such as ventilation fans, water circulation pumps, lighting, etc., the EIS H provides a simple and effective way to quickly detect that a device has stopped working. With this early alert, corrective actions can be taken before critical problems arise.



Interface Protection <b>DPC02</b>	Temperature Relays <b>DTA</b>	Current Relay w/Thru Hole <b>EISH</b>	Current Relay w/Thru-Hole <b>DIA 53</b>	Current Relay w/Thru-Hole <b>DIB 100A</b>
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The **DPC02** 3-phase monitoring relay for maximum and minimum voltage and frequency, phase sequence and phase loss. It also checks that the frequency and voltage are within the limits required by the utility company. 690VAC maximum monitoring.



The **DTA** thermistor relay used to monitor the temperature of the coils of a motor with built-in PTCs. 11-pin **PTA** plug-in types are also available.



The **EISH** is a compact current monitoring relay with built-in current transformer and solid state output, ideal for connecting to PLCs or controllers. The self-powered unit detects AC current from 200mA up to 60A, with no setpoint adjustment required. Ideal for prompt detection of critical load failure.



The **DIA Series** TRMS AC current monitoring relays is selfpowered, compact and features a built-in current transformer that measures from 2-100AAC. Output is a normally open NPN-PNP open collector. Through-hole size is 12mm.



The **DIB Series** TRMS AC over or under current monitoring relay with a built-in current transformer that measures from 2A to 100A AC. Through-hole size of 12mm.

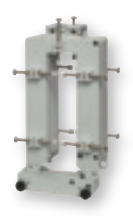
Current Transducers <b>E83 &amp; A82</b>	Current Transformers <b>CTD</b>	Current Transformers <b>CTD-S</b>	Core Balance Transformer <b>CTG</b>	Alternating Relays <b>DLA</b>
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The **E83 Series** compact AC current metering transducer with 7 selectable primary ranges up to 50AAC and a 12mm through hole. Also offered in a cabled version, the **A82 Series** comes in a 25, 50, 100, 250 and 500AAC primary range with a 0-20mA, 4-20mA or 0-10VDC output and 27mm through hole.



Cable/Bus-bar type current transformer with DIN-rail/bus-bar and panel mounting facility. The **CTD** series is rated maximum primary currents from 50 to 2,000AAC.



The **CTD-S** split-core current transformer with bus-bar mounting facility. Rated maximum primary currents from 100 to 2,000AAC.



**CTG** core balance transformer used with **DEA71** and **DEB71** to detect residual current on monitored line. Provides output when a current imbalance is detected. 6 models with through hole sizes from 35mm to 210mm.



**DLA** relay will automatically alternate two or three pumps in a multiple pump system.

# Energy Meters, Data Loggers and Transducers

Carlo Gavazzi supplies energy meters and power analyzers that provide information so that operators can identify consumption trends and take corrective actions. Analyzing the power profile, operators can aggregate loads and negotiate favorable terms with the utility company.

Carlo Gavazzi's energy management program also includes hardware and software products for data-logging of instantaneous electrical and environmental variables and energy consumption profiles. VMUC or UWP platforms use industry standard communication protocols, can provide complete stand-alone, data-logging solution or function as data gateway to IoT servers. Also offered is a wide range of current transformers, that can be connected with all the existing wire terminals and installed either on DIN-rail, around busbars or directly onto back panels.



1 to 3 Ph. Power Analyzer <b>WM15</b>	Modular Power Analyzers <b>WM20/30/40</b>	Branch Circuit Analyzer <b>WM50 &amp; TCD12</b>	Current Transformers <b>CTDX/S &amp; CTA/V</b>	Rogowski Coils <b>ROG4</b>
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**WM15** is a power analyzer for one-, two- and three-phase systems. Variations include a static output (pulse or alarm), with option of a Modbus RTU communication port, or with a M-Bus port. The self-powered version can be installed on systems up to 415 VLL, while the version using auxiliary power supply (120-240 VAC/DC) can be installed on systems up to 600 VLL.



Modular power analyzers for 3-phase systems up to 690VAC, with simplified user interface and LCD data display. Options include optical port, Modbus-RTU, BACnet-IP, or Profibus-DP comms. **WM20** supports 2 outputs. **WM30** supports 4 outputs and is Go Solar California eligible. **WM40** supports 6 inputs (for utility metering) and 8 outputs, with built-in datalogger.



Multichannel power analyzer. Using the **TCD12** split-core current sensors, the **WM50** can monitor any combination of single, two and three-phase loads for a maximum of 96 channels. Optional modules: Modbus-RTU or TCP/IP communication, I/O module or analog and temperature probe input module. Meter is rated up to 550VAC.



Full range of current transformers and sensors. DIN-rail, cable or bus-bar mounting options include solid core **CTDX** or split core **CTDS** series, rated up to 3200A primary with 1A or 5A secondary. Miniature cable mount split core options include **CTA** series with input up to 600A and 5A secondary, and **CTV** series with input up to 800A and 333 mV output.



**ROG4** series Rogowski coil current sensors are flexible, easy to install, and highly accurate. For measuring currents up to 4000A, with output of 100-120mV. External coil diameters range from 90 to 290mm. Accuracy to +/- 1%.

Gateway & Controller <b>UWP 4.0</b>	Data-logging System <b>VMUC-EM</b>	Pulse Counter <b>VMU-MC &amp; VMU-OC</b>	Wireless Gateway <b>UWPA &amp; UWPM</b>	IoT Services <b>EM2 Server &amp; MAIA Cloud</b>
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The **UWP4.0** is a monitoring gateway and controller that allows local and remote monitoring and control of installations where Energy Efficiency Management and Building Automation functions are needed. The **UWP4.0** can connect to various meters and devices. Features include an embedded web server, Microsoft Azure certified, and Amazon AWS compatibility.



The **VMU-C EM** is a modular system with integrated web server that records, monitors and transmits analog and digital signals with a focus on energy efficiency. Data is transmitted via protocols such as FTP, HTTP, and Modbus TCP/IP. Microsoft Azure Certified. Expansion modules include **VMU-O** with two digital inputs and two relay outputs, and **VMU-P** for environmental variables.



The **VMU-MC** is a pulse concentrator that makes totalizers available to master systems such as **VMU-C EM**. Furthermore, it controls up to three **VMU-OC** accessory modules via local bus to integrate from 2 to a maximum of 11 digital inputs. Each **VMU-MC** has two digital inputs, while the **VMU-OC** offers three digital outputs.



**UWPA** is an endpoint adapter that provides LoRa® or LoRaWAN® communication to an RS485 Carlo Gavazzi meter. **UWPM** is a master concentrator that permits **UWP 4.0** to gather data from multiple **UWPA**. Up to 10km range is possible, with embedded end-to-end AES 128 encryption. Low operating costs, with no SIM cards or fees.



The **Em2 Server** is installed locally to provide display and control of energy usage. Each monitored location is equipped with one **VMU-C EM** or **UWP** unit to gather data and transmit usage data to the **Em2 Server**. Centralized data base and web-server access for up to 20 locations per license. Multi-campus monitoring and control is available through **MAIA Cloud VPN**.



# Energy Meters and Transducers for DIN Rail Mounting

Power quality and accurate measurements are becoming more and more important in a number of applications (EV charging, photovoltaics, hospitals, heavy industries, etc). Utilities need an instrument with a high accuracy to monitor the distribution system or the generation plants. Carlo Gavazzi offers a broad range of power transducers that give early warning of power quality problems.

Real time power consumption monitoring allows overloads to be anticipated. In commercial buildings and production facilities, cost allocation and load control are becoming more and more important because of the need to save money or issue the energy bill when needed. In airports and infrastructures it is of fundamental importance to have a powerful control of the mains, since medium voltage systems and very high currents are involved.



<b>AC EV 1 Ph. Energy Meter EM511</b>	<b>DC EV Energy Meter DCT1</b>	<b>2 &amp; 3 Ph. Energy Analyzer EM530 &amp; EM540</b>	<b>1 to 3 Ph. Energy Analyzer EM210</b>	<b>1 to 3 Ph. Energy Analyzer EM270 &amp; EM280</b>
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**EM511** is a compact, single phase energy meter rated up to 240V and 45A. With a reading resolution of 0.1Wh and compliance with CTEP and NTEP certification requirements, it is ideal for EV charging applications, in addition to any general purpose application. Bidirectional, with options for kWh pulse output or RS485 (Modbus).

For DC applications up to 1,000V at 600A, **DCT1** comes with an integrated shunt, flexible power cable mounting and -25°C to +70°C operational temperature range. Meets CTEP and NTEP certification, along with European MID and Eichrecht security requirements for global EV charging applications and can be used in photovoltaic, storage and DC As A Service applications.

2- and 3-phase compact energy analyzers for current applications up to 10,000A via CT (**EM530**) or direct connect up to 65A (**EM540**). Both models are self-powered, have programmable display with slide show function, and include digital output or RS485 Modbus. High speed data refresh rate ideal for load balancing and energy storage applications up to 415 VLL AC.

3-phase **EM210** energy analyzer with removable front LCD display. Can be used as a panel or DIN rail meter or transducer. Current measurements are carried out by means of external 5A (**CTD**), 333mV (**CTV**), or **ROG4K** (Rogowski coil) current transformers. Pulse output or RS485 port are available. Max. voltage rating of 415 VLL AC.

Multi-channel power analyzers for up to 6 single or 2-three phase systems, installable on panels or DIN rails. **EM270** manages current input via two TCD solid core current transformer blocks, while **EM280** manages current via solid or split core TCD blocks. Both models feature a removable LCD display. Max voltage rating of 415 VLL AC.

<b>1 to 3 Ph. Energy Analyzer EM271 &amp; ET272</b>	<b>2x3-Ph Power Analyzer EM330 &amp; ET330</b>	<b>3-Ph Energy Analyzer EM24</b>	<b>1-Ph Power Analyzer CPA</b>	<b>Power Transducers CPT</b>
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Multi-load power analyzers for 6 single or 2 three-phase systems installable on panels or DIN rails. Manages current input via two groups of **TCD..M** split-core current sensors. The **EM271** is equipped with a removable LCD display, while **ET272** contains no display. Both feature RS485 port, and optional dual pulse outputs. Max. voltage rating of 415 VLL AC.

The **EM330** energy meter and the **ET330** energy transducer are designed for active energy metering and for cost allocation. Housing for DIN-rail mounting. The transducer is provided with RS485 Both require external 5A AC CTD current transformers. Max. voltage rating of 480 VLL AC.

Three-phase energy analyzer for DIN-rail mounting with LCD display and configuration joystick. The **EM24** requires 5A CTD current transformers. It can be equipped with 2 digital outputs or 3 digital inputs (pulse counting). Communication options include Modbus RTU or Modbus TCP/IP Ethernet. Max. voltage rating of 690 VLL AC on some models.

The **CPA** is a family of power analyzers and current transducers for ac 1-phase or dc installation monitoring. Current is measured via a built-in transformer, while voltage measurement requires a wired connection. The **CPA** is rated up to 300AAC / 400ADC and 800VAC / 1,000VDC. RS485 Modbus in the standard.

3-phase compact power transducer for the measurement of the main electrical variables also on board machines. Housing for DIN-rail mounting, with up to 3 analog outputs, RS485 communication port alarm outputs or "Dupline" bus. Max. voltage rating of 800 VLL AC.

# Timers

Carlo Gavazzi offers a comprehensive range of timers that can be mounted within the enclosure or through the front panel. Available in several different housing styles, each has either a SPDT, DPDT or 4PDT relay output and features one or more common timing functions: On Delay, Off Delay, True Delay on Release, One Shot, Zero Speed, Star-Delta and Recycler. Most feature multi-voltage supply and timing ranges from 0.1 second through 100 hours. This wide range of functionality means Carlo Gavazzi has a solution for most of your timing applications.



Delay on Operate <b>DAA</b>	Delay on Release <b>DBA &amp; DBB</b>	Recycler <b>DCB</b>	Star Delta <b>DAC</b>	Multifunction <b>DMB &amp; DMC</b>
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Our multi-voltage delay on operate timer with seven time ranges covering 0.1 second to 100 hours. SPDT or DPDT relay output. Clearly marked front knobs allow simple setup. 11-pin plug-in version is also offered (**PAA**).



Multi-voltage delay on release (**DBA**) and true delay on release (**DBB**) series are available with up to seven time ranges covering 0.1 second to 100 hours. SPDT or DPDT relay output. Each features simple setup and clearly marked front knobs. 11-pin plug-in versions are also offered (**PBA/PBB**).



A variety of processes require an event to take place for a certain time and then wait for another delay. This recycler series offers full flexibility for both ON and OFF time from 0.1 second to 100 hours. Also available in 11-pin plug-in version, **PCB**.



Star-delta is a proven solution to avoid undesired inrush current while starting a motor, as well as the subsequent voltage drop. This compact series is also available in an 11-pin plug-in version, **PAC**.



Universally powered, each series features seven timing functions in a compact housing. The **DMB Series** has a SPDT relay and the **DMC** offers a choice of SPDT or two SPDT relays, one of which can be configured as instantaneous. 11-pin plug-in versions are offered as **PMB01** and **PMC01**.

Mini-E <b>EAS, EBS &amp; ECS</b>	Multifunction <b>FAA, FMB &amp; FMC</b>	Multifunction <b>HAA</b>
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Single-function and compact, these low cost timers feature two wire connections and a solid-state SCR output. Dedicated timing functions are on-delay (**EAS**), interval (**EBS**) and recycler (**ECS**). Available with screw or fastons terminals.



This series offers the panel builder the choice of a front panel installation or 8-pin (**FAA08**) or 11-pin (**FAA01**) socket/DIN-rail installation inside the enclosure. Easy adjustment and clear LED indication offer simplicity of operation for one of four timing functions using the **FAA** or the seven functions of the **FMB**.



This popular miniature housing provides multifunction and multi-voltage supply with just two models, a DPDT (**HAA08**) and 4PDT (**HAA14**). Each features delay on operate, symmetrical recycler "ON" first, symmetrical recycler "OFF" first and Interval timing functions.

# Digital Panel Meters

Carlo Gavazzi offers a comprehensive range of digital panel meters which measure voltage, current, frequency, temperature resistance and rate. The UDM modular family provides unique flexibility and advanced solutions using 3.5 and 4.0 digit display configurations. These products are used in all types of process industries, as well as agriculture, plastics, food & beverage, packaging and other industries. The UDM front housing is rated IP67, NEMA12 and NEMA4X.



Volt/Amp Indicators <b>DI3-72</b>	Volt-Amp Panel Meters <b>LDM30 &amp; LDM35</b>	Modular Controllers <b>UDM35</b>	Modular Controllers <b>UDM40</b>	Signal Conditioners <b>USC</b>
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72x72mm 1-phase AC/DC voltmeter and ammeter with 3-digit red LED display for panel mounting.



1/8 DIN **LDM30** 1-phase AC volt-meter and ammeter with 3-digit red LED display for panel mounting. 1/8 DIN **LDM35** features 3.5 digit display, panel mounted AC/DC multi-signal controller with up to two alarm set points.



1/8 DIN 3.5 digit 1-phase TRMS AC/DC and pulse multi-signal panel meter with plug-in modules for power supply, measuring inputs, serial communications, digital and analog outputs.



1/8 DIN 4-digit 1-phase TRMS AC/DC and pulse multi-signal panel meter with plug-in modules for power supply, measuring inputs, serial communications, digital and analog outputs. The multi-color display can be programmed to display up to three different colors.



DIN-rail mount microprocessor-based signal conditioner for current, voltage, temperature, resistance, rate, frequency, speed and period measurements. Plug-in modules provide ease of installation.

# Safety Modules

Carlo Gavazzi offers a comprehensive range of safety modules that meet international standards such as ISO13849-1, IEC62061, EN81-20. These safety modules are the perfect solutions for OEMs, Integrators and Safety Engineers who must meet various machine safety requirements to keep personnel safe from dangerous areas.

Carlo Gavazzi safety modules are designed to provide the most comprehensive protection for equipment and personnel. They meet Safety Category 4, Performance Level “e”, in accordance with EN ISO13849-1, and are offered with electromechanical relays in the SM series or with OSSD (output switching signal devices) outputs in the CM series. These safety modules provide great flexibility for safe monitoring of safety circuits on machinery, which protect personnel from danger. Safety modules are perfect for Emergency Stops, Safety Gates, Magnetic Switches, Safety Limit Switches, Elevator Leveling or Two-Hand control.



## Multipurpose SMS20/31

## Multipurpose, Anti-Valent SMSA31

## Two-Hand Control SM2H

## Elevator Leveling SMS20

## Expansion Module SME41



Category 4, Performance Level “e” according to standard EN ISO13849-1. 2 safety inputs. Auto, manual start/reset. Forcibly guided safety output relay (3NO&1NC or 2NO). LED indicators for input/outputs and power. Ideal for E-Stops, safety gates, safety magnetic switches, safety limit switches, safety limit switches and elevator car leveling or pit inspection.

Category 4, Performance Level “e” according to standard EN ISO13849-1. 2 safety inputs to monitor the safety state of safety gates, safety magnetic switches and safety limit switches in anti-valent mode. Auto, manual start/reset. Forcibly guided safety output relay (3NO & 1NC aux). LED indicators for safety inputs/outputs and power status.

Category 4, Performance Level “e” according to standard EN ISO13849-1. 2 safety inputs to monitor the safe operation of type IIIC two-hand control consoles. Forcibly guided safety output relay (2NO & 1NC aux). LED indicators for safety inputs/outputs and power status.

Category 4, Performance Level “e” according to standard EN ISO13849-1. 2 safety inputs. Auto, manual start/reset. Forcibly guided safety output relay (2NO). LED indicators for Inputs/outputs and power. Ideal for elevator car leveling or pit inspection.

Category 4, Performance Level “e” according to standard EN ISO13849-1. Used in combination with the SMS or CM series to expand the number of safety relay outputs. Forcibly guided safety output relay (4NO & 1NC aux). LED indicators for safety inputs/outputs and power status.

## Certus Safety Modules CM40/30D

## Adjustable Output Delay CM22D

## Certus, Elevator Leveling CL20D



Cat 4, PL “e” according to standard EN ISO13849-1, SIL3 per IEC62061 and SILcl3 per IEC61508. 2 safety inputs, 3 (CM3) or 4 (CM4) OSSD outputs. 4 LEDs for status and error indication. Suitable for E-stop, emergency-gate, limit switch, non contact switch, safety light curtains (ESPE Type 4, Type 2), safety light beam (single beam) and safety mats.

Cat 4, PL “e” according to standard EN ISO13849-1, SIL3 per IEC62061 and SILcl3 per IEC61508. 2 safety inputs, 4 OSSD outputs (2 are delay adjustable). 4 LEDs for status and error indication. Suitable for E-stop, emergency-gate, limit switch, non contact switch, safety light curtains (ESPE Type 4, Type 2), safety light beam (single beam) and safety mats.

Meets EN 81-20 requirements. Cat 4, PL “e” according to standard EN ISO13849-1, SIL3 per IEC62061 and SILcl3 per IEC61508. 2 safety inputs, 2 OSSD outputs and 2 aux outputs (1NC&1NO). 4 LEDs for status and error indication. Ideal solution for floor leveling and re-leveling of elevator car.

# General Purpose Dupline® and DuplineSafe

Dupline® is a versatile bus for industrial, commercial and building automation, currently with more than 120,000 installations worldwide. It is used for transferring discrete and analog signals over distances up to 6.2 miles/10Km. The Dupline® range consists of general purpose fieldbus I/O modules and various types of connectivity gateways for PCs, PLCs, etc. The strength of the Dupline® system lies in a unique set of features allowing flexible and cost-effective solutions for a wide range of applications: factory process monitoring, railway systems and water distribution.

DuplineSafe offers a flexible and easy-to-wire solution complying with EN954-1 Cat 4 and at the same time, the fast and precise diagnostic features reduce production stops in large machines and plants. It represents the ideal solution for long conveyor runs, where the immediate indication and diagnosis of causes for production stops enables significant downtime reduction.



Channel Generator	Digital I/O	Analog I/O	Fieldbus Gateways	Repeaters
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Generates Dupline signal carrier. Up to 128 Dupline channels. The maximum number of channels is selectable (8, 16, 24, 32, 40, 48, 56, 64, 96 or 128), thus increasing the fieldbus reaction speed. 24V DC supply voltage and a 2-DIN housing. Modbus-RTU slave interface. Micro-USB port for direct connection to PC for programming.



Numerous digital input modules accepting contact and voltage signals, and receiver modules with relay, NPN and PNP outputs. Available in DIN-rail housings and compact, bus-powered housings for decentralized installations.



Input or output modules for 0-20mA, 4-20mA and 0-10VDC signals. Each device can handle four input or output signals. Output modules are offered in DIN-rail housings and input modules are available in various compact, bus-powered housings for decentralized installations.



Fieldbus gateways are typically used for interfacing the Dupline bus to PLCs and PCs. Versions available for Profibus-DP, Modbus-RTU, Modbus/TCP and DeviceNet. Gateways also have an integrated channel generator, therefore a channel generator isn't required.



The Dupline repeater functions to regenerate the Dupline carrier signal in order to extend the bus up to another 10Km (6.2 miles). This category includes optical repeaters for sending the signals over fiber optic transmission cables.

DuplineSafe Safety Receiver	DuplineSafe Input Transmitter	DuplineSafe Gateway / Repeater	DuplineSafe Optical Converter	Programming and Test Units
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Monitors up to 63 DuplineSafe inputs and is approved per IEC61508-SIL3



Completely bus-powered safety input has a voltage-free input and uses two Dupline channels for redundancy. Typically mounted by customers inside of a bulk cord or rope pull switch. Available in plug-in or pigtailed versions.



Passive gateway with safety mapping is DIN-rail mounted and reads and controls up to 128 inputs and outputs through Profibus-DP. Also offered is an isolated DuplineSafe repeater, for extending the transmission distance. These can be cascaded.



Optical repeaters allow part of the DuplineSafe system to run on multimode fiberoptics. Electrical to optical and optical to electrical devices.



The hand-held configuration unit for DuplineSafe quickly connects to, and programs the sensors and monitors. It features an LCD display and 12-key tactile keyboard, powered by a standard 9VDC battery. The more compact programming and test unit is for Dupline Industrial.





# A Global Force in Industrial and Building Automation

CARLO GAVAZZI has a multitude of sales offices spanning the Americas (not to mention, hundreds of distributors).

Therefore, we can be viewed as "your local automation resource," assisting you every step of the way in finding the proper solution for your various application requirements.

Naturally, our job is simplified as we have such a vast range of solutions to offer you via our comprehensive product package.

Our worldwide sales offices make us an ideal business partner, especially for manufacturers of exported machinery, as our products are available locally and they are RoHS and CE marked.

Customers and distributors across the globe: Argentina, Australia, Austria, Belgium, Bolivia, Bosnia, Brazil, Bulgaria, Canada, Chile, China, Colombia, Costa Rica, Czech Republic, Croatia, Denmark, Dominican Republic, Ecuador, Egypt, El Salvador, Estonia, Finland, France, Germany, Greece, Guatemala, Honduras, Hungary, Hong Kong, Iceland, India, Indonesia, Iran, Ireland, Italy, Jamaica, Japan, Jordan, Kenya, Korea, Kuwait, Lebanon, Malaysia, Malta, Mexico, Netherlands, New Zealand, Nicaragua, Norway, Pakistan, Panama, Paraguay, Peru, Philippines, Poland, Portugal, Puerto Rico, Romania, Russia, Saudi Arabia, Serbia, Singapore, Slovakia, Slovenia, South Africa, Spain, Sultanate of Oman, Sweden, Switzerland, Taiwan, Thailand, Tunisia, Turkey, Trinidad and Tobago, Ukraine, United Arab Emirates, United Kingdom, Uruguay, United States, Venezuela, Vietnam, and many more countries.

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