Solutions for Packaging Machinery
ABOUT CARLO GAVAZZI

Carlo Gavazzi Automation is an international group active in designing, manufacturing and marketing electronic equipment targeted at the global markets of industrial and building automation.

Our history is full of firsts and our products are installed in a huge number of applications all over the world. With more than 80 years of successful operation, our experience is unparalleled.

We have our headquarters in Europe and numerous offices around the world.

Our R&D competence centres and production sites are located in Denmark, Italy, Lithuania, Malta and the People’s Republic of China.

We operate worldwide through 22 of our own sales companies and also selected representatives in more than 65 countries, from the United States in the West to the Pacific Rim in the East.

Our core competence in automation spans four product lines: Sensors, Switches, Controls and Fieldbuses.

Our wide array of products includes sensors, monitoring relays, timers, energy management system, solid state relays, safety devices and fieldbus systems.

We focus our expertise on offering state-of-the-art product solutions in selected market segments.

Our customers include original equipment manufacturers of packaging machines, plastic-injection moulding machines, food and beverage production machines, conveying and material handling equipment, door and entrance control systems, lifts and escalators, as well as heating, ventilation and air-conditioning devices.
DESIGNED TO MEET MARKET REQUIREMENTS

The packaging machinery industry requires constant changes and innovations to meet the demands of a constantly evolving market.

This means new technology to produce more reliable and flexible machinery with a multitude of possibilities for packaging. To meet these needs, the industry has gradually introduced more automation and more sophisticated electronic controls.

In today’s packaging production lines, the different stages are completed in minutes rather than in hours compared to years past.

In all types of packaging machinery – in all sectors of industry - each component must meet the strict requirements of the individual application. This is to guarantee the continuity of production and the conformity of the packaged product to quality standards.

For many years, Carlo Gavazzi photoelectric, inductive and capacitive sensors have proven to be the best solution in applications for filling and checking. In shrink wrapping applications, careful control of heating is essential for good results. Solid state relays are used to switch the heaters on and off in order to maintain the correct temperature.

The packaging industry also needs safety devices to guarantee the safety of the operators engaged in the work area, ensuring safe operation of the machines.

Carlo Gavazzi’s comprehensive safety range includes safety light curtains and key switches that detect intrusions within the non-safe zone/s and shut down the machinery in a controlled manner via standard and/or configurable safety modules.

For all its products, Carlo Gavazzi offers easy installation, high precision and long term reliability.
Carlo Gavazzi offers a complete range of automation components for the packaging industry.

In a bottling line UA ultrasonic sensors are used to verify that the appropriate level of a product is in the container before it is sealed and shipped. Ultrasonic sensors are also used to measure the level of ingredients – either liquid or solid – in a container. The continual analog output signal allows for better control of the process. The level of solid material, such as ground coffee, coffee beans or flour, can be accurately detected using photoelectric sensors.

The new PA /PH 18 sensors come with a new mounting bracket which allows fast mounting and space saving, but also have a smooth design. Axial, radial and square versions are available. Important benefits are that objects do not hit the sensors as often and the conveyor can be cleaned much more easily.

For accurate control of the filling process, a PD30 sensor can also provide an output signal when the product is at the appropriate fill level. A background suppression sensor sets the detecting depth, excluding the shiny bottom of the tin, assuring safe detection irrespective of the colour or material of the contents.
Carlo Gavazzi products have many applications in the inspection-detection field. For bottling lines that have darker or less transparent bottles, PA18 through beam sensors can be used to detect the presence of the bottles. The new family of products is from 40% to 60% smaller than existing housings.

The sensor has a manual potentiometer and for some versions no adjustment is necessary: simply connect the sensor and you are up and running. Furthermore, the specialised optics of the PD30CNG - combined with a reflector - are perfect for detecting clear bottles on a conveyor.

To verify that a bottle cap is present on the bottle a PD60 fiber optic amplifier with a fiber optic cable and lens are positioned above the bottles and programmed to detect any reflection from the bottle cap. The PD12 colour sensor recognises up to four separate colours, and gives an output for each. For instance, it can verify that a multi-colour sponge is positioned correctly, so that packaging is consistent and orderly.

In some confectionery applications, it is necessary to detect if a cake decoration is present or properly positioned. The PD30 diffuse sensor can recognise the coloured decoration on top of the cake.
Multiple bottles are bundled together and shrink-wrapped. Carlo Gavazzi solid state relays (RM or RG series) allow fast switching of heaters that enable accurate control of the process temperature thus maintaining an even shrink of the plastic wrap. Solid state solutions allow frequent switching without affecting the lifetime of the switch, unlike mechanical contactors.

In order to verify that the shrink-wrap has been added, a PD30CNG clear object sensor is positioned to focus at the level of the bottle necks. If the shrink-wrap is present, the clear object sensor will have a continuous output as the package passes by.

Diffuse reflective photoelectric sensors with long detecting distance (PD112) detect goods on the pallet to ensure that wrapping is stopped at the required height.

In hot-melt heating systems the high temperature ECH sensors have proven their capability and reliability. Other applications include automatic continuous processes of thermoforming, filling and sealing. The RG range offers a wide variety of solutions, starting from just solid state switching of heaters to more sophisticated solutions that apart from the switching function integrate monitoring features that are able to detect load and system malfunctions to guarantee a reliable thermal process.
Once a container is filled, the next step is to apply the appropriate label. Contrast sensors (PD60CNK) are used to detect the presence of a mark on a bottleneck label, which confirms that the bottle is in correct position for the main label to be applied. Furthermore, these sensors detect the presence of security bands that are required on many bottles and containers. They recognise the difference between the security band and bottle cap. Precise control of labels, even small labels, is an important part of the packaging process. The surfaces of the labels are often reflective. The photoelectric proximity sensors provide the necessary sensitivity for maximum reliability. Colour sensors are used for detection of coloured labels, marks, tags, wires, liquids, etc. The PD12 is a fibre optic amplifier made specifically for recognition of 1 or 1-4 colours. Teaching of the colours is easily performed by means of the “Teach-in” function. Each colour has a separate output which can be delayed up to 5 secs by means of the built-in timer. Detection of labels, marks and double sheets, as well as holes and edges, are typical applications for the PF80 fork sensor.

**Labelling**

<table>
<thead>
<tr>
<th>Inductive sensors</th>
<th>Photoelectric sensors</th>
<th>Photoelectric sensors</th>
<th>Photoelectric fork sensor</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICB</td>
<td>PD60</td>
<td>PD12</td>
<td>PF80</td>
</tr>
</tbody>
</table>

CARLO GAVAZZI Automation Components. Specifications are subject to change without notice. Illustrations are for example only.
Carlo Gavazzi’s safety devices are especially popular in the packaging machinery market segment. They must be able to prevent access to dangerous areas, until the machines are completely stopped. For example, the new CERTUS configurable safety module offers up to 128 inputs and 16 pairs of programmable solid state outputs in a compact modular system, managing and monitoring at the same time safety sensors and commands such as: safety light curtains, photocells, emergency stops, two-hand controls, mechanical switches, laser scanners, and safety mats. CERTUS is certified to the highest safety levels: SIL+, SILCL 3, PL e and Cat.4, and its advantages to the packaging industry are endless. Safety light curtains, types 2 and 4, with the muting function provide easy access to load and unload optimising productivity output. The type 4 safety light curtains also feature the EDM function to control the reliability of external devices. The safety modules (used with safety light curtains, safety photo sensors, emergency stop buttons or safety magnetic switches) close the safety control loop.

Our safety magnetic switches (SMS, CLS) are commonly used in pharmaceutical, and food and beverage plants, thanks to their ability to be easily cleaned of germs, bacteria, etc. All of this makes Carlo Gavazzi the clear choice for safety components in your packaging machinery applications.
Safety devices and energy efficiency

Carlo Gavazzi offers a vast array of products to improve energy efficiency and to ensure the monitoring of entire processes - all from one source. Energy management components, for instance, provide vital information for operators to identify consumption trends and take corrective action. EM21 72 DIN energy meters can monitor all the main parameters of an electric line or load. Monitoring relays DPB01/PP01 or DPB71 monitor phase sequence-loss and over-under voltage of the mains to set up a check system.

Carlo Gavazzi timers - available in four different housings (standard DIN-rail, Plug-in, 48x48 and MiniD housing) - provide correct, reliable solutions for every application. Stack lights, beacons and buzzers are used on packaging machinery as visual or audible signalling if any malfunction occurs. Emergency stop switches allow the complete shutdown of systems or processes to protect operators and avoid damage to the machines.
### Our product range

#### Photoelectric sensors

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
</table>
| **PD30** | • World standard housing style  
• Power supply: 10 to 30 VDC  
• NPN or PNP transistor output  
• Connection cable or built-in M8 connector  
• Sensitivity adjustment by Teach-in or by potentiometer  
• Approvals/Marks: CE - UL 508  

**MAIN FEATURES**  
• Background suppression version, with accurate detection  
• Long detecting distances  
• Protection: reverse polarity, short circuit and transients |

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
</table>
| **PC50** | • Dimensions: 17 x 50 x 50 mm  
• Sensing distance up to 20 m  
• Modulated infrared light  
• Make and break switching function selectable  
• Cable and plug version  
• Approvals/Marks: CE - UL CSA  

**MAIN FEATURES**  
• Adjustable sensitivity  
• High EMC immunity  
• Protection: reverse polarity, short circuit and transients |

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
</table>
| **PA18, PH18** | • Standard M18 cylindrical housing  
• Power supply: 10 to 30 VDC  
• Separate models available for NPN or PNP outputs  
• Range: 1 m (Axial), 0.8 m (Radial)  
• Sensitivity adjustment by potentiometer  
• Approvals/Marks: CE - cULus  

**MAIN FEATURES**  
• ECOLAB approved/CE-marking /cULus  
• Approved according to UL508  
• Diagnostic LED indication (Green and Yellow LED)  
• Short-circuit, reverse polarity and overload protection |

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
</table>
| **PD112** | • Dimensions: 25 x 45 x 112 mm  
• Long range Back Ground Suppression (BGS) sensor  
• Power supply receiver: 10 to 30 VDC  
• NPN and PNP NO or NC output  
• Emitter with Mute Input for testing sensor function  
• 2,5 m sensing distance  

**MAIN FEATURES**  
• Light beam approved to Safety Category 2  
• UL325, UL508, EN12445, EN12453, EN12978  
• Long detection range on black objects |

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
</table>
| **PD60, PD12** | • Fibre optic contrast sensor, (PD60 retroreflective polarized for transparent objects)  
• Operational voltage 10 - 30 VDC (PD60), 24 VDC (PD12)  
• Teach-In (keyboard or remote setup)  
• Approvals/Marks: CE - cUL  

**MAIN FEATURES**  
• Light or dark switching selectable (PD60)  
• Detection of 1 or up to 4 recorded colours  
• Microprocessor controlled and EEPROM parameter storage  
• High immunity to shiny surfaces |

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
</table>
| **PF80** | • Dimensions: 12 x 37.5 x 80 mm. Slot width 3 mm  
• Teach-In: push button or by wire  
• Rated operational voltage 10 - 30 VDC  
• Aluminium housing  
• Approvals/Marks: CE  

**MAIN FEATURES**  
• High speed of detection  
• Detection of transparent material  
• Detection of labels, marks and double sheets |
Our product range

<table>
<thead>
<tr>
<th>Ultrasonic sensors</th>
<th>Inductive sensors</th>
<th>Conductive level controllers / probes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>UA12 / UA18 / UA30</strong></td>
<td><strong>ICB12 / ICB18 / ICB30</strong></td>
<td><strong>CLD / CLH</strong></td>
</tr>
<tr>
<td>• Up to 6 m sensing distance</td>
<td>• M12, M18 and M30 Nickel-brass housing in short or long barrel lengths</td>
<td>• Multiple filling and emptying applications</td>
</tr>
<tr>
<td>• Analogue output 4-20 mA or 0-10 VDC</td>
<td>• Standard and double distance sensing ranges</td>
<td>• Rated operational voltage: 24 VAC/DC, 115 VAC or 230 VAC</td>
</tr>
<tr>
<td>• Switching output with two setpoints</td>
<td>• Output functions: NO or NC, NPN or PNP</td>
<td>• Output: 2 x 8 A/250 VAC SPDT relay</td>
</tr>
<tr>
<td>• M12, M18 or M30 versions</td>
<td>• Two metre oil resistant PVC cable or M12 plug version</td>
<td>• Flexible conductive level probe CLH (up to 5 electrodes)</td>
</tr>
<tr>
<td>• Housing material: plastic or AISI316L Stainless Steel</td>
<td>• Protection: reverse polarity, short circuit, transients</td>
<td>MAIN FEATURES</td>
</tr>
<tr>
<td>• Approvals/Marks: CE - cULus</td>
<td></td>
<td>• Easy installation on DIN rails or with 11 pin circular plug</td>
</tr>
</tbody>
</table>

**MAIN FEATURES**
- Excellent EMC performance and precision
- Detects clear, transparent and shiny targets, solid objects, liquid or granules.
- Protection: short circuit, transient and reverse polarity

**Ultrasonic sensors**

<table>
<thead>
<tr>
<th><strong>CA / EC</strong></th>
<th><strong>CD</strong></th>
<th><strong>ECH</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Dimensions: M, M18, M30</td>
<td>• Dimensions: 28 x 46 x 5.5 mm</td>
<td>• Sensor diameter: M30, teflon and stainless steel</td>
</tr>
<tr>
<td>• Trippleshield™ sensor protection</td>
<td>• Trippleshield™ sensor protection</td>
<td>• Adjustable sensing distance: 4 to 15 mm, factory set for 10 mm</td>
</tr>
<tr>
<td>• Plastic housing, DC and AC versions</td>
<td>• Sensing distance: 1 - 10 mm</td>
<td>• Output: transistor NPN or PNP, make &amp; break switching</td>
</tr>
<tr>
<td>• Sensing distance 0.5-12 mm</td>
<td>• Teach-in via push button or wire input</td>
<td>• Power supply: 10 to 40 VDC</td>
</tr>
<tr>
<td>• Approvals/Marks: CE - UL-CSA</td>
<td>• Approvals/Marks: CE - UL-CSA</td>
<td>MAIN FEATURES</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Provided with a separate teflon sensor head in M30 for temperature application within the range of -196°C and +180°C</td>
</tr>
</tbody>
</table>

**Inductive sensors**

<table>
<thead>
<tr>
<th><strong>Capacitive sensors</strong></th>
<th><strong>Capacitive sensors</strong></th>
<th><strong>Capacitive sensors</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CA / EC</strong></td>
<td><strong>CD</strong></td>
<td><strong>ECH</strong></td>
</tr>
<tr>
<td>• Thin profile</td>
<td>• Selectable make-or-break switching by means of Teach-in function</td>
<td>• Selectable make-or-break switching by means of Teach-in function</td>
</tr>
<tr>
<td>• Selectable make-or-break switching by means of Teach-in function</td>
<td>• Protection: short circuit, transient and reverse polarity</td>
<td>• Protection: short circuit, transient and reverse polarity</td>
</tr>
<tr>
<td>• Sensing face can withstand temperatures up to 120°C</td>
<td>• Protection: short circuit, transient and reverse polarity</td>
<td>• Protection: reverse polarity, short-circuit, transients</td>
</tr>
<tr>
<td>• Protection: short circuit, transient and reverse polarity</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# Packaging Machinery

## Our product range

<table>
<thead>
<tr>
<th>PCB mount solid state relays</th>
<th>1-phase solid state relays</th>
<th>1-phase solid state switches</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>RP1</strong></td>
<td><strong>RM1.., RAM1..</strong></td>
<td><strong>RGS1.., RGC1..</strong></td>
</tr>
</tbody>
</table>

**RP1**
- Dimensions: 25.4 x 43 x 10.5 mm
- Operational voltage range: 24-480 VAC
- Rated operational current: 3, 5, 7.5, 10 AAC
- Control input ranges: 4-32 VDC, 16-32 VAC
- Approvals/Marks: CE - cURus - VDE (RP1..3,5,6)

**MAIN FEATURES**
- Zero cross or random switching
- 4 kV isolation between input & output
- Accessories for DIN mount option available

**RM1.., RAM1..**
- Dimensions: 58.2 x 44.8 x 28.8 mm, panel mount
- Rated operational voltage: up to 660 VAC
- Rated operational current: 25, 50, 75, 100, 125 AAC
- Control input ranges: 4-32 VDC, 20-280 VAC
- Approvals/Marks: CE - cURus - CSA - VDE (RAM1A..)

**MAIN FEATURES**
- Zero cross or random switching
- Low noise emission - EN55011 class B conformance

**RGS1.., RGC1..**
- Product width: 17.5 mm up to 70 mm, DIN or panel mount
- Ratings up to 660 VAC, 90 AAC, 18000 A²s
- Integrated output overvoltage protection
- Control input ranges: 4-32 VDC, 20-275 VAC (24-190 VDC)
- Approvals/Marks: CE-cULus (RGC) - cURus (RGS) - CSA (RGS) - VDE - GL (RGC up to 30 AAC)

**MAIN FEATURES**
- Integrated heatsink (RGC1..), without heatsink (RGS1..)
- 100 kA short circuit current rating
- Optional overtemperature protection

## 1-phase solid state switches with current monitoring

<table>
<thead>
<tr>
<th><strong>RGC1S.., RGS1S..</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Product width: 22.5 mm up to 70 mm, DIN or panel mount</td>
</tr>
<tr>
<td>Ratings: up to 660 VAC, 90 AAC, 18000 A²s</td>
</tr>
<tr>
<td>Integrated output overvoltage protection</td>
</tr>
<tr>
<td>Control input range: 4-32 VDC</td>
</tr>
<tr>
<td>Approvals/Marks: CE - cULus (RGC1S) - cURus (RGS1S) - CSA (RGS1S)</td>
</tr>
</tbody>
</table>

**MAIN FEATURES**
- Partial load failure detection (1/6)
- Monitoring for SSR and load circuit malfunction
- TEACH by local push button or remote signal

## 3-phase solid state contactors

<table>
<thead>
<tr>
<th><strong>RGC3A.., RGC2A..</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Product width: up to 70 mm, DIN rail mount</td>
</tr>
<tr>
<td>Ratings: up to 660 VAC 75 AAC/pole (RGC2), 65 AAC/pole (RGC3) @ 40°C</td>
</tr>
<tr>
<td>Motor ratings up to 11 kW @ 400 VAC, 25 HP @ 600 VAC</td>
</tr>
<tr>
<td>Control input range: 5-32 VDC, 20-275 VAC (24-190 VDC)</td>
</tr>
<tr>
<td>Approvals/Marks: CE - cULus</td>
</tr>
</tbody>
</table>

**MAIN FEATURES**
- 3-phase, 2-pole (RGC2) or 3-pole (RGC3) switching
- Monitoring for SSR and load circuit malfunction (RGC..M)
- 100 kA short circuit current rating

## Soft starters

<table>
<thead>
<tr>
<th><strong>RSGD</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor rating: up to 22 kW in 45 mm</td>
</tr>
<tr>
<td>Ramp up time: 1 - 20 sec</td>
</tr>
<tr>
<td>Internally bypassed</td>
</tr>
<tr>
<td>Multi-voltage operation: RSGD40: 220 - 400 VAC, RSGD60: 220 - 600 VAC</td>
</tr>
<tr>
<td>Wide control voltage range: Option E: 110 - 400 VAC, Option F: 24 VAC/DC</td>
</tr>
</tbody>
</table>

**MAIN FEATURES**
- Easy to use and setup
- Current balancing algorithm
- Auxiliary relays for top of ramp and alarms

---

CARLO GAVAZZI Automation Components. Specifications are subject to change without notice. Illustrations are for example only.
Our product range

<table>
<thead>
<tr>
<th>CERTUS configurable safety module</th>
<th>CERTUS configurable I/O expansion modules</th>
<th>CERTUS Data and Diagnostics modules + CERTUS bus transfer</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CMM (CERTUS Master Module)</strong></td>
<td><strong>C I/O</strong></td>
<td><strong>DDC + CBT</strong></td>
</tr>
<tr>
<td>• 4 non-safety test outputs for sensor monitoring</td>
<td>• Wide range of Input/Output, Input only or Output only (both OSSD and standard relay) expansion units to serve different application requirements</td>
<td>• DDC: Expansion unit for Diagnostics and Data Communication:</td>
</tr>
<tr>
<td>• 2 non-safety programmable digital signal outputs</td>
<td>• In addition to the safety Inputs/Outputs, different models offer a variety of non-safety Inputs/Outputs such as: inputs for Start / Restart interlock and EDM, test outputs for sensor monitoring or programmable digital signalling</td>
<td>- C PFBUS - Profibus DP, - C DNET - DeviceNET</td>
</tr>
<tr>
<td>• 2 non-safety inputs for Start / Restart interlock and EDM</td>
<td></td>
<td>- C CAN - CANopen, - C EIP - Ethernet IP</td>
</tr>
<tr>
<td>• CAN config memory card slot</td>
<td></td>
<td>- C ECAT - EtherCAT, - C PFNET - PROFINET</td>
</tr>
<tr>
<td>• LOG file containing the last 5 configuration modifications</td>
<td></td>
<td>- C OAMS - Universal Serial Bus</td>
</tr>
<tr>
<td>• 24 connectors in 22.5 mm</td>
<td>• Subject to the model selected the models offer the following eight combinations</td>
<td>• Bus Transfer: Interface module allowing connection of remote expansions via bus</td>
</tr>
<tr>
<td>• Connection with other exp. units via rear bus</td>
<td>- 8 Inputs 2 Outputs; 12 Inputs 8 test Outputs</td>
<td></td>
</tr>
<tr>
<td><strong>SC4 / SC2</strong></td>
<td><strong>NES02D / NES13D / NLG</strong></td>
<td><strong>SMS / CLS</strong></td>
</tr>
<tr>
<td>• Dimensions: 36.9 x 32.3 mm in lengths from 300 to 1500 mm for type 2, and from 150 to 1650 mm for type 4</td>
<td>• Safety modules for gate and emergency stop (NE) and light curtain (NL)</td>
<td>• Dimensions: 88 x 25 x 13 mm</td>
</tr>
<tr>
<td>• 24 VDC supply with two PNP transistor outputs</td>
<td>• 2NO / 3NO safety outputs</td>
<td>• Normally open or closed output</td>
</tr>
<tr>
<td>• IEC-61496-2 environment light rejection</td>
<td>• IP40 protection for housing and IP20 protection for terminals</td>
<td>• Up to 100 VAC switching</td>
</tr>
<tr>
<td>• Approvals/Marks: CE - cULus</td>
<td>• Approvals/Marks: CE - cULus</td>
<td>• 250 mA maximum output</td>
</tr>
<tr>
<td><strong>MAIN FEATURES</strong></td>
<td><strong>MAIN FEATURES</strong></td>
<td><strong>MAIN FEATURES</strong></td>
</tr>
<tr>
<td>• Selectable Manual/Automatic Restart, EDM and Anti-interference</td>
<td>• Safety category 4</td>
<td>• Rugged plastic housing</td>
</tr>
<tr>
<td></td>
<td>• Compact body</td>
<td></td>
</tr>
<tr>
<td><strong>SAFE LIGHT CURTAINS</strong></td>
<td><strong>STANDARD SAFETY MODULES</strong></td>
<td><strong>SAFETY MAGNETIC SENSORS AND UNITS</strong></td>
</tr>
<tr>
<td><strong>SC4 / SC2</strong></td>
<td><strong>NES02D / NES13D / NLG</strong></td>
<td><strong>SMS / CLS</strong></td>
</tr>
<tr>
<td>• Dimensions: 36.9 x 32.3 mm in lengths from 300 to 1500 mm for type 2, and from 150 to 1650 mm for type 4</td>
<td>• Safety modules for gate and emergency stop (NE) and light curtain (NL)</td>
<td>• Dimensions: 88 x 25 x 13 mm</td>
</tr>
<tr>
<td>• 24 VDC supply with two PNP transistor outputs</td>
<td>• 2NO / 3NO safety outputs</td>
<td>• Normally open or closed output</td>
</tr>
<tr>
<td>• IEC-61496-2 environment light rejection</td>
<td>• IP40 protection for housing and IP20 protection for terminals</td>
<td>• Up to 100 VAC switching</td>
</tr>
<tr>
<td>• Approvals/Marks: CE - cULus</td>
<td>• Approvals/Marks: CE - cULus</td>
<td>• 250 mA maximum output</td>
</tr>
<tr>
<td><strong>MAIN FEATURES</strong></td>
<td><strong>MAIN FEATURES</strong></td>
<td><strong>MAIN FEATURES</strong></td>
</tr>
<tr>
<td>• Selectable Manual/Automatic Restart, EDM and Anti-interference</td>
<td>• Safety category 4</td>
<td>• Rugged plastic housing</td>
</tr>
<tr>
<td></td>
<td>• Compact body</td>
<td></td>
</tr>
<tr>
<td><strong>SAFE LIGHT CURTAINS</strong></td>
<td><strong>STANDARD SAFETY MODULES</strong></td>
<td><strong>SAFETY MAGNETIC SENSORS AND UNITS</strong></td>
</tr>
</tbody>
</table>
## Packaging Machinery

### Our product range

<table>
<thead>
<tr>
<th>Monitoring relays</th>
<th>Monitoring relays</th>
<th>Monitoring relays Current transformers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DPA01</strong></td>
<td><strong>DPB01</strong></td>
<td><strong>DIB01 / A82</strong></td>
</tr>
<tr>
<td>• Dimensions: 81 x 22.5 x 99.5 mm DIN-rail housing</td>
<td>• Dimensions: 81 x 22.5 x 99.5 mm DIN-rail housing</td>
<td>• Dimensions: 81 x 22.5 x 99.5 mm DIN-rail housing</td>
</tr>
<tr>
<td>• 3-phase monitoring relay for phase sequence and phase loss</td>
<td>• TRMS 3-phase over and under voltage, phase sequence and phase loss monitoring relays</td>
<td>• TRMS AC/DC over or under current monitoring relay</td>
</tr>
<tr>
<td>• Supply range from 208 to 690 VAC covered by two multi-voltage relays</td>
<td>• 3 phase AC (own power supply); regenerated voltage</td>
<td>• Direct measuring or throughcurrent transformer (A82)</td>
</tr>
<tr>
<td>• Approvals/Marks: UL, CCC and CSA approved</td>
<td>• Power supply 208 to 480 VAC</td>
<td>• A02: true RMS AC current metering transformer for 25, 50, 100, 250 or 500 AAC</td>
</tr>
<tr>
<td><strong>MAIN FEATURES</strong></td>
<td><strong>MAIN FEATURES</strong></td>
<td><strong>MAIN FEATURES</strong></td>
</tr>
<tr>
<td>• Detects when all phases are present and have the correct sequence</td>
<td>• Selection of measuring range by DIP-switches</td>
<td>• Programmable latching or inhibit at set level</td>
</tr>
<tr>
<td>• LED indication for relay and power supply ON</td>
<td>• LED indication for relay, alarm and power supply ON</td>
<td>• LED indication for relay, alarm and power supply ON</td>
</tr>
<tr>
<td><strong>SPD</strong></td>
<td><strong>SPD</strong></td>
<td><strong>DIB01 / A82</strong></td>
</tr>
<tr>
<td>• DIN-rail housing</td>
<td>• DIN-rail housing</td>
<td>• Dimensions: 81 x 22.5 x 99.5 mm DIN-rail housing</td>
</tr>
<tr>
<td>• Short circuit protection</td>
<td>• Short circuit protection</td>
<td>• TRMS AC/DC over or under current monitoring relay</td>
</tr>
<tr>
<td>• 1-phase AC</td>
<td>• 1-phase AC</td>
<td>• Direct measuring or throughcurrent transformer (A82)</td>
</tr>
<tr>
<td>• Rated input voltage: 115/230 VAC selectable 100/240 VAC</td>
<td>• Rated input voltage: 115/230 VAC selectable 100/240 VAC</td>
<td>• A02: true RMS AC current metering transformer for 25, 50, 100, 250 or 500 AAC</td>
</tr>
<tr>
<td>• Approvals/Marks: UL, cUL listed and TÜV/CE approved</td>
<td>• Approvals/Marks: UL, cUL listed and TÜV/CE approved</td>
<td>• Approvals/Marks: UL and CSA approved</td>
</tr>
<tr>
<td><strong>MAIN FEATURES</strong></td>
<td><strong>MAIN FEATURES</strong></td>
<td><strong>MAIN FEATURES</strong></td>
</tr>
<tr>
<td>• Overload protection</td>
<td>• Overload protection</td>
<td>• Programmable latching or inhibit at set level</td>
</tr>
<tr>
<td>• Parallel versions available</td>
<td>• Parallel versions available</td>
<td>• LED indication for relay, alarm and power supply ON</td>
</tr>
<tr>
<td>• High efficiency</td>
<td>• High efficiency</td>
<td>• A02: easy interface to PLC or setpoint relays</td>
</tr>
</tbody>
</table>

### Energy meters

<table>
<thead>
<tr>
<th><strong>EM210</strong></th>
<th><strong>DAA51, DMB51</strong></th>
<th><strong>SPD</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• 3-phase energy meters with CT connection</td>
<td>• Dimensions: 81 x 17.5 x 67.2 mm DIN-rail housing</td>
<td>• DIN-rail housing</td>
</tr>
<tr>
<td>• Solid or split-core 5A CT</td>
<td>• Delay on operate function (DAA), multifunction (DMB)</td>
<td>• Short circuit protection</td>
</tr>
<tr>
<td>• Dimensions: 4-DIN rail module or 72 x 72 housing</td>
<td>• Combined AC and DC power supply</td>
<td>• 1-phase AC</td>
</tr>
<tr>
<td>• Class 1 (kWh) acc. to EN62053-1</td>
<td>• Repeatability: &lt; 0.2%</td>
<td>• Rated input voltage: 115/230 VAC selectable 100/240 VAC</td>
</tr>
<tr>
<td>• Pulse open collector or serial RS485 output</td>
<td>• Approvals/Marks: UL, CSA, RINA approved</td>
<td>• Approvals/Marks: UL, cUL listed and TÜV/CE approved</td>
</tr>
<tr>
<td><strong>MAIN FEATURES</strong></td>
<td><strong>MAIN FEATURES</strong></td>
<td><strong>MAIN FEATURES</strong></td>
</tr>
<tr>
<td>• Very compact and space saving meter</td>
<td>• Delay on operate/release; interval (manual/automatic start);</td>
<td>• Overload protection</td>
</tr>
<tr>
<td>• Can be installed both on DIN-rail or on the panel</td>
<td>• Double interval; symmetrical recycler (ON or OFF first);</td>
<td>• Parallel versions available</td>
</tr>
<tr>
<td>• On request, MID annex D certification available</td>
<td>• Timing range from 0.1s to 100h</td>
<td>• High efficiency</td>
</tr>
</tbody>
</table>
## OUR SALES NETWORK IN EUROPE

### AUSTRIA - Carlo Gavazzi GmbH
Ketzargasse 374, A-1230 Wien
Tel: +43 1 888 4112
Fax: +43 1 889 10 53
office@carlogavazzi.at

### BELGIUM - Carlo Gavazzi NV/SA
Mechelsesteenweg 311, B-1800 Vilvoorde
Tel: +31 2 257 4120
Fax: +31 2 257 41 25
sales@carlogavazzi.be

### DENMARK - Carlo Gavazzi Handel A/S
Over Hadstenvej 40, DK-8370 Hadsten
Tel: +45 89 60 6100
Fax: +45 86 98 15 30
handel@gavazzi.dk

### FINLAND - Carlo Gavazzi OY AB
Petaksentie 2-4, FI-00630 Helsinki
Tel: +358 9 756 2000
Fax: +358 9 756 20010
myynti@gavazzi.fi

### FRANCE - Carlo Gavazzi Sarl
Zac de Paris Nord II, 69, rue de la Belle Etolie, F-95956 Roissy CDG Cedex
Tel: +33 1 49 38 98 60
Fax: +33 1 48 63 27 43
france.team@carlogavazzi.fr

### GERMANY - Carlo Gavazzi GmbH
Pforststr. 10-14
D-64293 Darmstadt
Tel: +49 6151 81000
Fax: +49 6151 81 00 40
info@gavazzi.de

### GREAT BRITAIN - Carlo Gavazzi UK Ltd
4.4 Frimley Business Park, Frimley, Camberley, Surrey GU16 7SG
Tel: +44 1 276 854 110
Fax: +44 1 276 682 140
sales@carlogavazzi.co.uk

### ITALY - Carlo Gavazzi SpA
Via Milano 13, I-20020 Lainate
Tel: +39 02 931 761
Fax: +39 02 931 763 01
info@gavazziacbu.it

### NETHERLANDS - Carlo Gavazzi BV
Wijkermeerweg 23,
NL-1948 NT Beverwijk
Tel: +31 251 22 9345
Fax: +31 251 22 60 55
info@carlogavazzi.nl

### NORWAY - Carlo Gavazzi AS
Melkeveien 13, N-3919 Porsgrunn
Tel: +47 35 93 0800
Fax: +47 35 93 08 01
post@gavazzi.no

### PORTUGAL - Carlo Gavazzi Lda
Rua dos Jerónimos 38-B,
P-1400-212 Lisboa
Tel: +351 21 361 7060
Fax: +351 21 362 13 73
carlogavazzi@carlogavazzi.pt

### SPAIN - Carlo Gavazzi SA
Avda. Iparraguirre, 80-82,
E-48940 Leioa (Bizkaia)
Tel: +34 94 480 4037
Fax: +34 94 431 6081
gavazzi@carlogavazzi.es

### SWITZERLAND - Carlo Gavazzi AG
Verkauf Schweiz/Vente Suisse
Sumpfstrasse 3,
CH-6312 Steinhausen
Tel: +41 41 747 4535
Fax: +41 41 740 45 40
info@carlogavazzi.ch

### USA - Carlo Gavazzi Inc.
750 Hastings Lane,
Buffalo Grove, IL 60089, USA
Tel: +1 847 465 6100
Fax: +1 847 465 7373
sales@carlogavazzi.com

### CANADA - Carlo Gavazzi Inc.
2660 Meadowvale Boulevard
Mississauga, ON L5N 6M6, Canada
Tel: +1 905 542 0979
Fax: +1 905 542 22 48
gavazzi@carlogavazzi.com

### MEXICO - Carlo Gavazzi Mexico S.A. de C.V.
Carretera La Matanza no. 28, Fracc. Los Pastores
Naucalpan de Juárez, EDOMEX CP 53340
Tel & Fax: +52.55.5373.7042
mexicosales@carlogavazzi.com

### BRAZIL - Carlo Gavazzi Automação Ltda.
Av. Francisco Matarazzo, 1732
Conj 2108 - Barra Funda - São Paulo /SP
CNP 01401-000
Tel: +55 11 3052 0832
Fax: +55 11 3057 1753
info@carlogavazzi.com.br

### SINGAPORE - Carlo Gavazzi Automation Singapore Pte. Ltd.
61 Tai Seng Avenue
#05-06 UE Print Media Hub
Singapore 534167
Tel: +65 67 466 990
Fax: +65 67 461 980
info@carlogavazzi.com.sg

### MALAYSIA - Carlo Gavazzi Automation (M) SDN. BHD.
D12-06-G, Block D12,
Pusat Perdagangan Dana 1,
Jalan PJU 1A/46, 47301 Petaling Jaya,
Selangor, Malaysia.
Tel: +60 3 7842 7299
Fax: +60 3 7842 7399
sales@gavazzi.malaysia.com

### CHINA - Carlo Gavazzi Automation (China) Co. Ltd.
Unit 2308, 23/F,
News Building, Block 1, 1002
Middle Shennan Zhong Road,
Shenzhen, China
Tel: +86 755 83699500
Fax: +86 755 83699300
sales@carlogavazzi.cn

### HONG KONG - Carlo Gavazzi Automation Hong Kong Ltd.
Unit 3 12/F Crown Industrial Bldg. ,
106 How Ming St., Kwun Tong,
Kowloon, Hong Kong
Tel: +852 23041228
Fax: +852 23443689

## OUR SALES NETWORK IN THE AMERICAS

### USA - Carlo Gavazzi Inc.
750 Hastings Lane,
Buffalo Grove, IL 60089, USA
Tel: +1 847 465 6100
Fax: +1 847 465 7373
sales@carlogavazzi.com

### CANADA - Carlo Gavazzi Inc.
2660 Meadowvale Boulevard
Mississauga, ON L5N 6M6, Canada
Tel: +1 905 542 0979
Fax: +1 905 542 22 48
gavazzi@carlogavazzi.com

### MEXICO - Carlo Gavazzi Mexico S.A. de C.V.
Carretera La Matanza no. 28, Fracc. Los Pastores
Navoapan de Juárez, EDOMEX CP 53340
Tel & Fax: +52.55.5373.7042
mexicosales@carlogavazzi.com

### BRAZIL - Carlo Gavazzi Automação Ltda.
Av. Francisco Matarazzo, 1732
Conj 2108 - Barra Funda - São Paulo /SP
CNP 01401-000
Tel: +55 11 3052 0832
Fax: +55 11 3057 1753
info@carlogavazzi.com.br

### SINGAPORE - Carlo Gavazzi Automation Singapore Pte. Ltd.
61 Tai Seng Avenue
#05-06 UE Print Media Hub
Singapore 534167
Tel: +65 67 466 990
Fax: +65 67 461 980
info@carlogavazzi.com.sg

### MALAYSIA - Carlo Gavazzi Automation (M) SDN. BHD.
D12-06-G, Block D12,
Pusat Perdagangan Dana 1,
Jalan PJU 1A/46, 47301 Petaling Jaya,
Selangor, Malaysia.
Tel: +60 3 7842 7299
Fax: +60 3 7842 7399
sales@gavazzi.malaysia.com

### CHINA - Carlo Gavazzi Automation (China) Co. Ltd.
Unit 2308, 23/F,
News Building, Block 1, 1002
Middle Shennan Zhong Road,
Shenzhen, China
Tel: +86 755 83699500
Fax: +86 755 83699300
sales@carlogavazzi.cn

### HONG KONG - Carlo Gavazzi Automation Hong Kong Ltd.
Unit 3 12/F Crown Industrial Bldg. ,
106 How Ming St., Kwun Tong,
Kowloon, Hong Kong
Tel: +852 23041228
Fax: +852 23443689

## OUR COMPETENCE CENTRES AND PRODUCTION SITES

### DENMARK - Carlo Gavazzi Industri A/S
Hadsten

### CHINA - Carlo Gavazzi Industri A/S
Kunshan (Kunshan) Co., Ltd.
Kunshan

### HEADQUARTERS

Carlo Gavazzi Automation SpA
Via Milano, 13 - I-20020
Lainate (MI) Italy
Tel: +39 02 931 761
info@gavazziautomation.com