CARLO GAVAZZI
Automation Components

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1931–2011

CARLO GAVAZZI

Building Automation

Solutions for
Lifts and Escalators

Solutions for Lifts & Escalators

| Electric lift | Hydraulic lift | Home lift | Escalator | Goods lift |

ABOUT CARLO GAVAZZI

Carlo Gavazzi Automation is a multinational electronics group active in the design, manufacture and marketing of 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 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 21 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: Sense, Switch, Control, Fieldbus and EcoEnergy equipment.

Our wide array of products includes sensors, monitoring relays, timers, solid-state relays, electronic motor controllers, energy management equipment, fieldbus systems and componets for renewable energy.
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 materials handling equipment, door and entrance control systems, lifts and escalators, as well as heating, ventilation and air-conditioning devices.

DESIGNED TO MEET MARKET REQUIREMENTS

Carlo Gavazzi, thanks to its 30 years of expertise in providing components for Lift and Escalator equipment, is able to offer innovative and reliable solutions so as to maximize comfort and reduce operational costs.

Lifts and Escalators includes three main segments: new equipment, modernization and maintenance.

Market trends show that Asia will be a key source of demand for "new" elevators in the coming years, thanks to the very active construction market and the trend to concentrate people in high-rise buildings, while in Europe and North America, sales of maintenance and upgrading services are expected to grow at higher rates than new equipment sales, supported by an expanding installation base, safety requirements and the ageing of current installations.

Lift door closing is now safer thanks to the new Carlo Gavazzi BFL series of light curtains. Providing door re-open signals by detecting people-movement in the entrance area, the BFL ensures effective protection for people and objects during lift access.

With an increased number of beams and a higher degree of protection, this is the ideal solution for customers having special space requirements.

Designed according to the EN81-70 (Safety Rules for the Construction and Installation of Lifts), the installation of the BFL series in new and existing plants can fulfill the European Safety Standards.

Fast and cost-effective installation, diagnostic LEDs, reliability, high immunity to light even if reflected from shiny objects, mean less downtime for elevator door operations.

Carlo Gavazzi magnetic proximity sensors are used in the Lifts and Escalators market for many applications, such as cabin levelling, speed monitoring and cabin presence detection.

Accuracy and speed, combined with availability of various output functions, ensure the best signal for economical high speed elevator control.

Moreover, our range includes several accessories so as to provide customers with powerful and user-friendly solutions.

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Electric lift

Proximity magnetic sensors	Photoelectric sensors	Light curtains for lift	Monitoring relays	Dupline	Timers	Energy meters	Power supplies
SPB2 FMP	PE12 PD70 PA18	BFL	DPA51 DPA53 DTA01	G349600..700 G219600..700 G21404421700	DAA51 DMB51	EM21 EM23	SPD

Lifts of this type make any number of trips per day, from a few to hundreds. So their components have to guarantee maximum reliability, accuracy and robustness. Carlo Gavazzi offers a wide range of components to make sure these requirements are met: from the top-selling SPB2 and FMP series of magnetic switches to detect the presence of the cabin at various depths in the shaft, to the DPA51, designed to detect any phase sequence or loss failure in the system.

The cabin door can be equipped with the PE12 or PD70 photo sensors or, when full door coverage is required, with the BFL light curtain, available in two shapes with up to 194 beams. Other user-friendly solutions, like NC/NO programmable output and automatic blanking, make installation easy and extend the lift's service life. The PS limit switch series ensures reliable detection of the cabin position.

We also offer a range of panel products: these include the DPA53 to detect very low power supply voltage to avoid the cabin stopping in mid-shaft, the 24VDC switching power supplies (used increasingly in lift electrical panels), the DTA01/DTA02 PTC relays to detect over-heating in the lift engine, the FSA hour meter to correlate preventive maintenance to actual usage of the lift, and our well-known DAA51 and DMB51 timers and RMI relays. A special role is reserved for energy meters, used increasingly to ensure the lift complies with LEED requirements or other energy-saving policies and legislation. Our EM21 and EM23 counters or CPT transducer (when no visualization is required) are excellent cost-effective solutions when panel space is limited.

Finally, the RAD01 and RAD02 microwave radars keep the lift door open while there are people outside (i.e. in hospitals).

Hydraulic lift

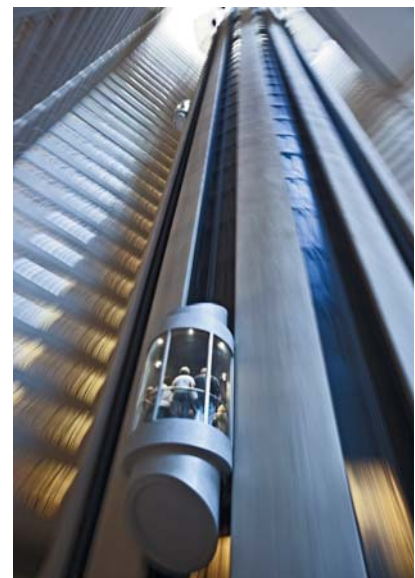| Proximity magnetic sensors	Photoelectric sensors	Light curtains for lift	Safety modules	Counters	Monitoring relays	Industrial relays	Soft starters
SPB2 FMP	PE12 PD70 PA18	BFL	NA12DLIFT	FSA	DTA01	RMI	RSHR RSDR

A hydraulic elevator system lifts a car using a hydraulic ram, a fluid driven piston mounted inside the cylinder. The cylinder is connected to a fluid-pumping system that controls the movement of the elevator. Fluid from the tank is forced into a pipe leading to the cylinder so that as fluid collects within the cylinder, it pushes the piston up, thus lifting the elevator car.

On Hydraulic Lifts it is particularly important to safely regulate cabin / floor levelling. If the cabin is not at the same level as the floor, when the door opens, this could be dangerous for passengers.

In order to avoid any kind of accident, Carlo Gavazzi's solution is to control cabin levelling by means of a Safety contact, according to the norms included in the Lifts and Machinery Directives.

Our solution consists of two mono-stable magnetic sensors mounted on the cabin and connected to a safety module, allowing the safety control system to effectively operate the level adjustment.

Moreover, two additional mono-stable magnetic sensors give an indication of the correct levelling to the control system.

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

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Proximity magnetic sensors	Photoelectric sensors	Light curtains for lift	Radar sensors	Safety modules	Timers	Industrial relays	Soft starters
SPB2 FMP	PE12	BFL	RAD01 RAD02	NA12DLIFT NLG13	DAA51 DMB51	RMI	RSHR

This special kind of lift usually does not have a cabin door; therefore the user is exposed to the risk of damage by accidentally banging against the wall. Until now, the start button has had to be held pressed for the whole duration of the lift's run; the advantage was that the user could not move while the lift was running, avoiding any risk.

The "universal automatic operation" allows the button to be pressed only once and then it can be released, just like a standard lift. Since the user is now free to move, another protection must be added on every entrance to the cabin. This is achieved by the use of safety sensors and a safety module. Two pairs of BFL Ligh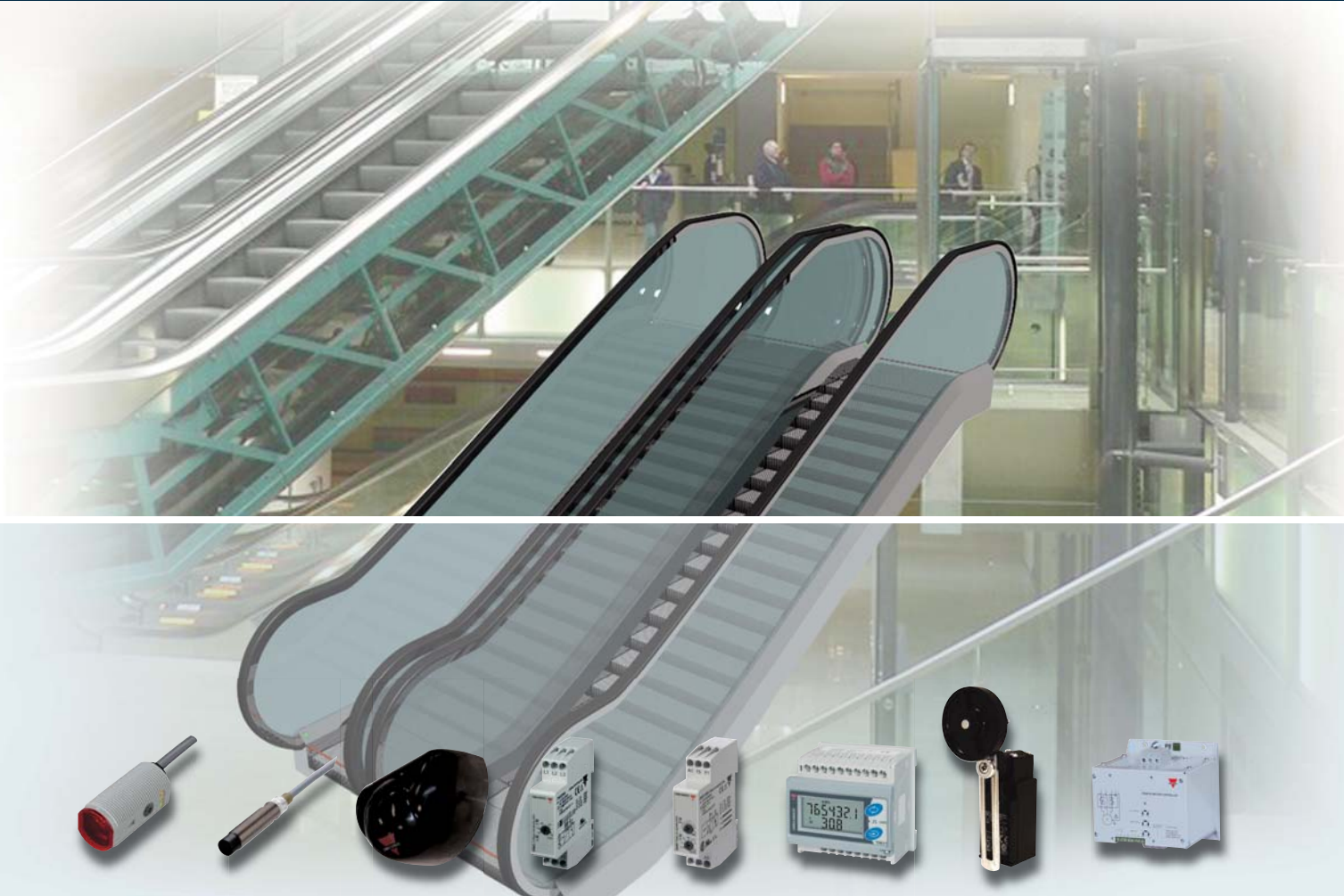t curtains are mounted on the cabin entrance. The safety module receives the signal from the BFLs if any beam is interrupted and makes the lift stop in the case of a dangerous situation. The platform can move again only when any obstacle between the barriers is removed and the module receives a new start command. Carlo Gavazzi offers a kit - including 2 pairs of light curtains and the safety module - certified according to the norm EN81-41, for redundant protection. This kit has been designed to prevent any entry of the user in dangerous areas during the operation of the lift and it is the ideal solution for elevator platforms without doors.

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Escalator

Photoelectric sensors	Inductive sensors	Radar sensors	Monitoring relays	Timers	Energy meters	Limit switches	Soft starters
PA18 PE12	ICB12	RAD01 RAD02	DPA51 DPA53 DTA01	DAA51 DMB51	EM21	PS	RSDR RSHR

Carlo Gavazzi considers the full range of indoor and outdoor application needs when designing and manufacturing products for the escalator market.
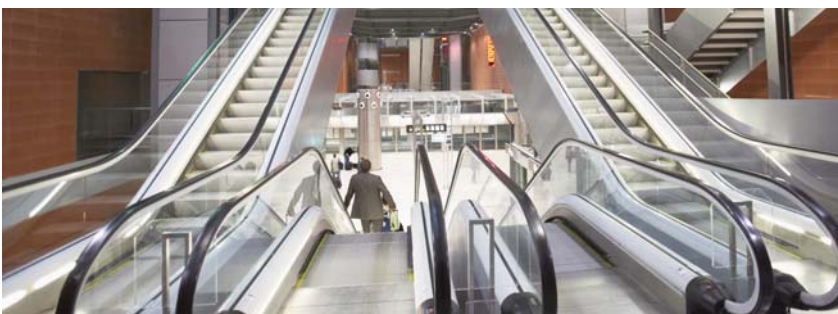
Its range includes inductive proximity sensors to ascertain the speed, position and direction of the escalator, as well as photoelectric sensors to detect commuters using the state-of-the-art intelligent escalator and switch from standby mode to normal mode (dual-speed mode). For single ECO-speed escalators, Carlo Gavazzi also offers a wide selection of soft-starter motors to handle capacities up to 1050 KW. Furthermore, in line with the global attention to energy conservation issues, energy meters are available to monitor energy efficiency.
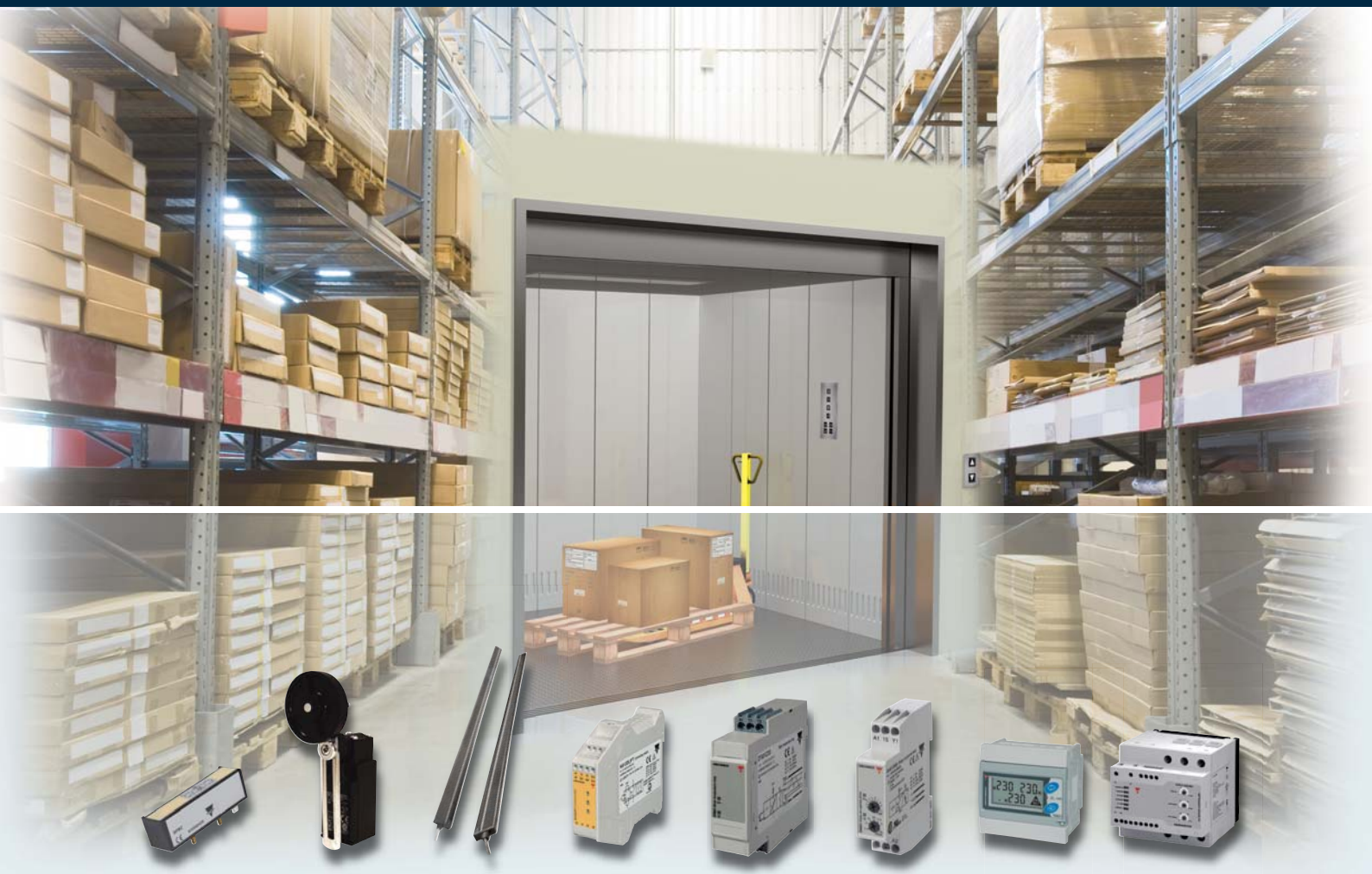
Monitoring relays provide additional control features to anticipate possible malfunctions in the escalator control and power system such as over/under voltage/current, phase loss, abnormal phase sequence and motor over-heating, etc.

For escalator control panels, the Carlo Gavazzi offer includes industrial mechanical relays; timers/counters; safety modules and many other devices.

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Proximity magnetic sensors	Limit switches	Light curtains for lift	Safety modules	Monitoring Relays	Timers	Energy meters	Soft starters
SPB2 FMP	PS	BFL	NA12DLIFT	DPA51 DPA53 DTA01	DAA51 DMB51	EM21	RSHR RSDR

Built to withstand the rigours of harsh working environments, goods lifts are particularly suitable for use in industrial and commercial stores. They are ideal for locations requiring efficient transfer of goods from one floor to another, such as shopping malls, department stores, hotel and leisure establishments.

There are many different types of goods lift: rope or hydraulic lifts, miniature lifts of the kind used in restaurants to carry food, or huge lifts for cars or lorries. The only thing they have in common is that normally they are not used to carry people (unless they have to drive cars in and out of the cabin). Construction characteristics may differ from those of a standard lift, like the absence of a segregated shaft or cabin doors.

For this reason, Carlo Gavazzi recommends use of special components in addition to the features available on standard electrical or hydraulic lifts.

For instance, the BFL light curtain can be used to monitor the platform edges (when there are no cabin walls) and avoid contact between the goods in the lift and external objects, or to monitor the space below the cabin (to keep the space clear and avoid the risk of injury). In these cases, the availability of two different shapes ensures a better match with space constraints, while the customised length option makes the fitter's job easier and more effective.

For hydraulic lifts, the NA12DLIFT is an even more important component than for ordinary lifts, to correct sudden shifts of position caused by platform loading and unloading. And for large oil pump motors, our RSHR and RSDR soft-starters help reduce the starting current and mitigate mechanical stress on all components.

Dupline® bus technology

Dupline master modules	Dupline master modules	Dupline I/O modules	Dupline I/O modules	Dupline Output modules	Dupline Input modules
G349600..700	G219600..700	G21404421700	G214055.0700	G213055.1700	G213055.1700

The wiring of traditional elevator control systems is quite expensive and complex. Each push button, lamp, floor indicator etc. needs its own wiring, which makes the initial installation cost high. Expansion is also a problem and even ongoing maintenance costs are expensive.

With Dupline®, Carlo Gavazzi offers a complete bus solution which is ready-to-use for smans as well as medium-sized and large elevator companies. Dupline® can be easily applied in all phases of a project and does not require PCs or other advanced equipment, which most elevator installers are not trained to use.

Space- and cost saving I/O boards with 2 inputs and 2 outputs are mounted in each floor fixture and connected to the pushbuttons and lamps. In the elevator car, where the number of signals is higher, boards with 4 or 8 inputs /outputs are used.

Mounting the I/O boards into the fixtures, assigning addresses to them and wiring them to the pushbuttons and lamps can be done at the factory, where the labour cost is lower than on-site. Moreover, the wiring on-site is simply a question of dropping a 3-wire cable from top to bottom and connecting it to the I/O boards at the floors and in the car. It is fast and the risk of wiring mistakes is low.
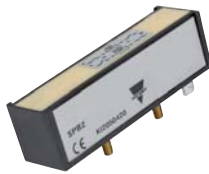
The 3-wire cable provides each I/O board with 24 VDC power supply and bi-directional communication to the elevator controller.

The Master module interfaces Dupline® to any elevator controller with a RS232 or RS485 port. Dedicated plug & play versions have been developed for all major PLC brands. The Dupline® data automatically becomes accessible in the PLC memory as soon as it is connected. Dupline® is used in more than 1500 new elevators each year and the number is growing continuously. There is a very positive feedback from the users, who appreciate the simplicity, reliability and cost-effectiveness of Dupline® bus system.

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Lifts & Escalators

Our product range

Cylindrical Proximity Magnetic Sensors	Cylindrical Proximity Magnetic Sensors	Inductive Proximity Sensors

SPB2

- Dimensions: 85 x 24 x 25.5 mm
- Housing material: plastic with two metal shielded sides
- Operating distance: 5 - 30 (mm)
- Output function: bistable
- Degree of protection: IP 65 (SPB2) - IP67 (SPB22MT)

MAIN FEATURES
- Easy and fast mounting
- Cable or faston connector output
- Reduced magnetic interference when mounted side by side with other sensors

FMP

- Housing material: plastic with M12 diameter
- Operating distance: 7 - 26 (mm)
- Output functions: NO, NC, bistable or CO
- Front side switching
- Degree of protection: IP 67

MAIN FEATURES
- Different housing colours based on the output function
- Threaded body and two plastic nuts included for easy mounting
- Supports and brackets for simple sensor positioning (on request)

ICB12

- Nickel-brass housing in short or long barrel lenghts
- Standard and double distance sensing ranges
- Output functions: NO or NC, NPN or PNP
- Two meter PVC cable or M12 plug version
- Protection: reverse polarity, short circuit, transients

MAIN FEATURES
- High performance potting material made from recycled corn by-product
- Air-core sensing coil with higher immunity to magnetic fields
- Highest reliability, stability and resistance to mechanical sress

Photoelectric Sensors	Photoelectric Sensors	Photoelectric Sensors

PE12

- Dimensions Ø12 x 29 mm Click-in
- Through-beam sensors, 15m sensing distance
- Cable or pig-tail versions
- Power supply from 10 to 30 VDC
- CE and cULus

MAIN FEATURES
- Detects interruptions of the light beam
- Fast mounting, ESPE2 viewing angle
- Plug and play: no settings needed

PD70

- Dimensions 11.6 x 11.6 x 70 mm
- Through-beam sensors, 12m sensing distance
- Cable or M8 plug versions
- Power supply from 10 to 30 VDC
- CE and cULus

MAIN FEATURES
- Detects interruptions of the light beam
- Slim housing, ESPE2 viewing angle
- Plug and play: no settings needed

PA18

- Dimensions M18 x 39 mm
- Diffuse reflective sensors, 1 m detecting distance
- Cable or M12 plug versions
- Power supply from 10 to 30 VDC
- CE and cULus

MAIN FEATURES
- Sensors used to directly detect human presence
- Fast mounting, smooth finish
- Sensitivity adjustment

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Our product range

Light curtains for Lift	Radar Sensors	Safety Modules

BFL1x4E200 /BFL1x4S200

- Side and Edge versions
- Timeout and blanking function
- Configurable output
- Extended power supply range
- UL, CSA approved

MAIN FEATURES
- 1 item with 6 configurable outputs
- Voltage free output: no need for external boxes
- Plastic housing for a galvanic insulation

RAD01/RAD02

- Dimensions 118 x 80 x 53 mm
- K-Band radar sensor,
- Up to 4 m mounting height
- Power supply from 12 to 24 VAC/DC
- CE, cURus and FCC

MAIN FEATURES
- RAD01 Bi-directional detection
- RAD02 Uni-directional detection
- RAD02 Lateral traffic suppression
- IR-Remote control functionality

NA12DLIFT

- Lift cabin levelling module
- Input from magnetic sensors
- Feedback circuit for external contactor monitoring
- 24V AC/DC power supply voltage
- 2 safety relay outputs

MAIN FEATURES
- Certified according to the Lift Directive
- Only 22 mm wide
- Plug and play : no settings needed

Safety Modules	Monitoring Relays	Monitoring Relays

NLG13

- Safety module for light curtains in home lift
- Performance level "e" (cat.4)
- PNP inputs
- 24V DC power supply voltage
- 3 safety relay outputs

MAIN FEATURES
- Certified according to the Machine Directive
- Only 22 mm wide
- BFL + NLG certified

DPA51

- Dimensions 81x17,5x67,2mm DIN-rail housing
- Phase sequence and loss relay
- 3 phase AC (own power supply); regenerated voltage
- Power supply from 208 to 480 VAC (± 15%)
- UL, CSA and CCC approved

MAIN FEATURES
- Motor protection from reverse running and phase loss
- 17.5 mm width: the smallest on the market
- Plug and play: no settings needed

DPA53

- Dimensions 81x17,5x67,2mm DIN-rail housing
- Phase sequence, loss and undervoltage relay
- 3 phase AC (own power supply)
- Power supply from 208 to 480 VAC (2 models)
- UL, CSA and CCC approved

MAIN FEATURES
- Motor protection from reverse running and wrong phase voltage
- 17.5 mm width: the smallest on the market
- Plug and play: only undervoltage threshold to be set

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Our product range

Monitoring Relays	Timers	Dupline Master Modules

DTA/PPA 01/02

- Dimensions 22.5 mm Euronorm for DIN-rail or 36 mm plug-in version
- Motor temperature relay
- Measuring ranges: PTC according to EN 44081
- Power supply: 24 to 48 VAC/DC, 110, 230 VAC
- UL, CSA approved

MAIN FEATURES
- Protection from high temperatures of the coils of a motor with built-in PTCs.
- Alarm resettable by external contactor or reset button
- Test button allowing the simulation of the fault condition

DAA51, DMB51

- Dimensions 81x17,5x67,2mm DIN-rail housing
- Delay on operating function (DAA), multifunction (DMB)
- Combined AC and DC power supply
- Repeatability: < 0.2%
- UL , CSA, RINA approved

MAIN FEATURES
- Delay on operate/release; interval (manual/automatic start);
- Double interval; symmetrical recycler (ON or OFF first)
- Timing range from 0.1s to 100h

G349600..700

- Dimensions 77x72x70 mm DIN-rail housing
- Generates Dupline carrier signal
- RS485/RS232 interface for Lift Controller
- Power supply from 20 to 30 VDC
- Synchronizes 24 VDC power supply with Dupline

MAIN FEATURES
- Generates 3-wire system with power and communication
- Plug&Play versions available for specific PLC brands
- Possibility to multidrop up to 16 units as modbus slaves

Dupline Master Modules	Dupline I/O modules	Dupline I/O module

G219600..700

- Dimensions 86x54 mm Open PCB
- Generates Dupline carrier signal
- RS485 interface for Lift Controller
- Power supply from 20 to 30 VDC
- Synchronizes 24 VDC power supply with Dupline

MAIN FEATURES
- Generates 3-wire system with power and communication
- Plug&Play versions available for specific PLC brands
- Possibility to multidrop up to 16 units as modbus slaves

G21404421700

- Dimensions 54x40 mm Open PCB
- 2 contact inputs
- 2 PNP transistor outputs
- Powered by Dupline 3-wire bus
- LED indications for supply and carrier

MAIN FEATURES
- Used as interface for buttons and lamps at landing stations
- Input pulse prolongation to catch short button activations
- Simplifies the wiring to the Lift Controller

G214055.0700

- Dimensions 74x59 mm Open PCB
- 4 contact inputs
- 4 PNP transistor outputs
- Powered by Dupline 3-wire bus
- LED indications for supply and carrier

MAIN FEATURES
- Used as interface for buttons and lamps in the car
- Input pulse prolongation to catch short button activations
- Simplifies the wiring to the Lift Controller

Our product range

Dupline Output module	Dupline Input modules	Energy Meters

G213055.1700

- Dimensions 74x59 mm Open PCB
- 8 PNP or NPN transistor outputs
- Powered by Dupline 3-wire bus
- LED indications for supply and carrier
- Operating temperature -20 C to 50C

MAIN FEATURES
- Used as interface for floor indicators
- The same 8 Dupline addresses can be used for all floor indicators
- Simplifies the wiring to the Lift Controller

G213055.1700

- Dimensions 74x59 mm Open PCB
- 8 contact or voltage inputs
- Powered by Dupline 3-wire bus
- LED indications for supply and carrier
- Operating temperature -20 C to 50C

MAIN FEATURES
- Used as general purpose inputs
- Input pulse prolongation to catch short button activations
- Simplifies the wiring to the Lift Controller

EM23

- 3-phase energy meters with direct connection
- Direct connection up to 65 A
- Dimensions 4-DIN rail module housings
- Class 1 (kWh) acc. to EN62053-1
- Pulse open collector output

MAIN FEATURES
- Direct measurement in a very compact housing to save space
- Allows local energy allocation for cost allocation purposes
- On request, MID annex D certification available

Energy Meters	Power Transducer	Switching Power Supplies

EM2172D, EM2172R

- 3-phase energy meters with CT connection
- Solid or split-core 5A CT (72D) or split-core current sensors (72R)
- Dimensions 4-DIN rail module or 72x72 mm housing
- Class 1 (kWh) acc. to EN62053-1
- Pulse open collector or serial RS485 output

MAIN FEATURES
- Very compact and space saving meter
- The same meter can be installed both on DIN-rail or on the panel
- Available as a kit including 3 split-core current sensors (90, 150 or 250 A)

CPT

- Dimensions 83.5x45x98.5mm DIN-rail housing
- Accuracy 0.5 % (voltage, current)
- Measurement by CT and VT
- Front protection degree IP20
- Analogue, digital, pulse or serial outputs available

MAIN FEATURES
- Very compact power transducer
- Provides electrical variables set to a PLC to manage compressors and other loads
- Suitable for on-board panel installation

SPD

- DIN-rail housing
- Short circuit protection
- 1-phase AC
- Rated input voltage: 115/230 VAC selectable 100/240 VAC
- UL, cUL listed and TÜV/CE approved

MAIN FEATURES
- Overload protection
- Parallel versions available
- High efficiency

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Our product range

3-phase 7.5kW soft starters	3-phase 280kW soft starters	Limit Switches

RSHR

- Operational Voltage: Up to 600 VAC 50/60 Hz
- Motor Rating: 3-phase up to 22 kW @ 400 V
- Ramp up time: 1 - 10 sec
- Ramp down time: 1 - 30 sec
- UL, cUL, CSA approvals

MAIN FEATURES
- Up to 50 starts per hour
- Wide range of operating temperature: -20C to +60°C
- Internally bypassed: less heat dissipation

RSDR

- Motor Rating: Up to 280 kW @400 V
- Ramp up time: 0.5 - 30 sec
- Internally bypassed
- 6-wire connection capability
- UL approved

MAIN FEATURES
- Multi voltage operation: 230 - 460 VAC, 50/60 Hz
- Auxiliary relays for top of ramp and alarms

PS...

- Over 50 different head types
- Thermoplastic or metal housing
- 10 contact block types
- 10A contact rating
- Degree of protection IP67

MAIN FEATURES
- over 1.000.000 life cycles
- 4 families featuring over 8000 different types
- Prewired version

Counters	Industrial Relays

FSA01, FSA02

- 24 x 48 mm housing
- Counting up to 100,000 hours
- Battery lifetime 8 years
- NPN/PNP or AC/DC inputs
- Reset button with locking function

MAIN FEATURES
- Preventive maintenance ensured
- Can be connected straight to the pump for time counting
- Front IP65 protection for all environments

RMI ...

- 2 or 3 poles
- Max load: 12A / 250VAC
- DC coils: 6 ÷ 110VDC
- AC coils: 6 ÷ 230VAC
- Degree of protection IP40

MAIN FEATURES
- High switching power
- Long life (minimum100.000 electrical ops.)
- Standard with LED, Push with arm and Flag

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