CARLO GAVAZZI
Automation Components

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## Building Automation

## Solutions for

# HVAC systems

# HVAC systems

## Solutions for

**Air Handling Units** **Heat pumps** **Chillers** **Roof Tops** **Pellet Burners**

### 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 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: Sense, Switch, Control and Fieldbus.

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 airconditioning devices.

## DESIGNED TO MEET MARKET REQUIREMENTS

It is becoming more and more important to have an energy-efficient integrated HVAC system for buildings. That is why HVAC components, such as Heat Pumps, Rooftops, Chillers and Air Handling Units need more effective control and additional functions so as to improve overall performance.
Communication is important, both for the building management system, using buses such as BACnet, and for the individual units, where Modbus implementation is becoming more and more common, involving components such as the main controller, the compressor, the expansion valve, the energy meter and the soft starter.

Our energy meters and soft starters include Modbus communication, facilitating better system management, thus reducing costs, enabling quicker fault-finding and providing increased flexibility. Thanks to these features it is now possible to be advised if and when the system is under-performing (too much electrical energy for the thermal energy delivered). In addition, if a failure should occur, a remote communication delivers an alarm to the supervising system, resulting in shorter down time and quicker and less expensive maintenance.
Monitoring functions on the 3-phase supply (for values such as phase sequence, phase loss or voltage level) facilitate the reduction of the number of failures due to abnormal grid conditions, improving machine reliability in providing the thermal delivery. Our state-of-the-art range of soft starters for scroll compressor control provides our customers with additional features beyond simple soft starting and alarm indication. Thanks to the patented auto-adaptive algorithm, they improve compressor lifetime, reduce refrigerant leakage, lower the noise impact of the machine and help to avoid possible utility fines.
Our range of solid-state relays provides functions such as booster heating, de-frosting, de-humidification and heating only when required.
Carlo Gavazzi offers a wide selection of products dedicated to HVAC to maximize operating efficiency in both new and retrofit environments.

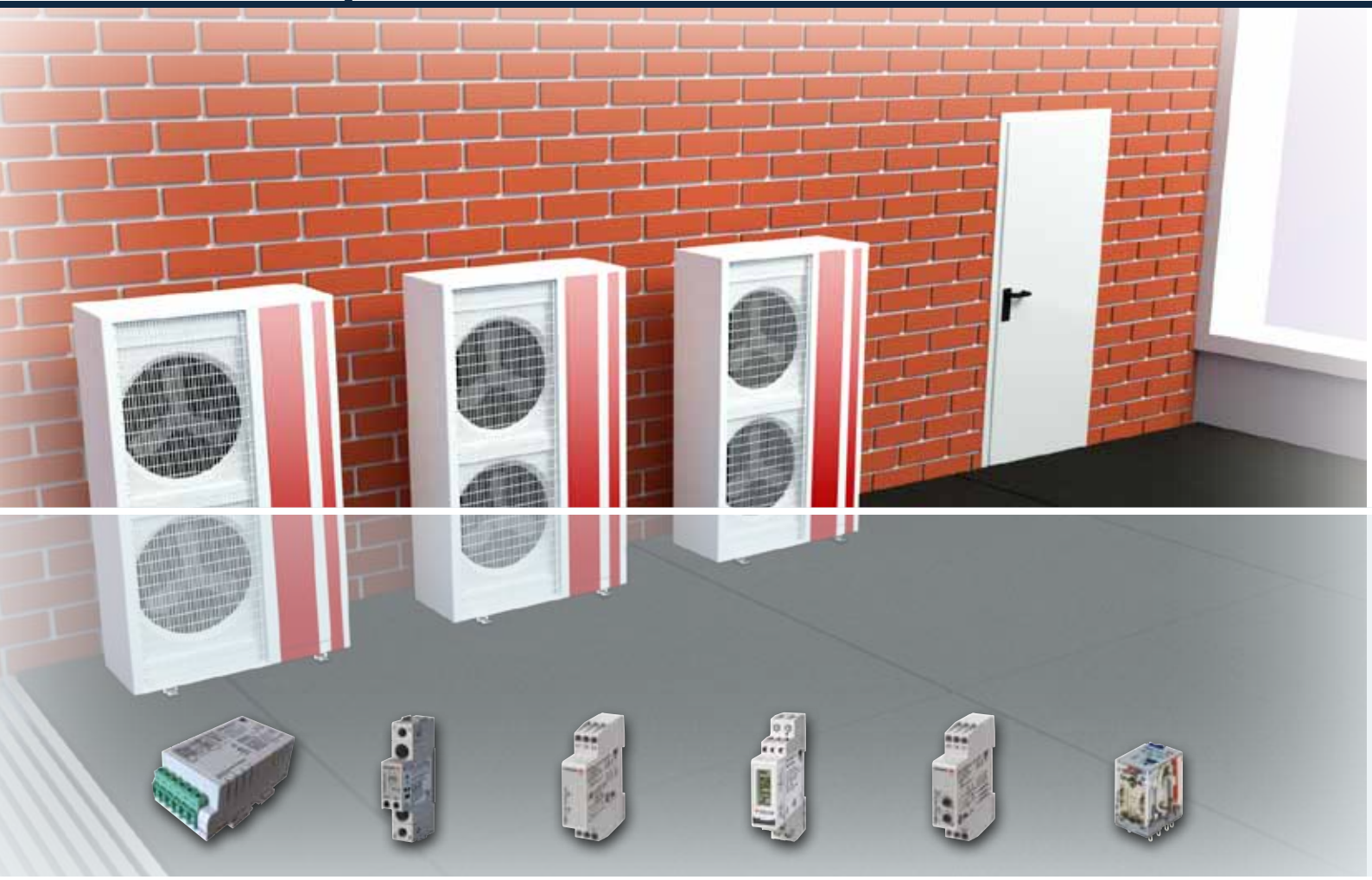
# HVAC systems

## Air Handling Units

| Environmental Sensors | Energy Meters | Soft Starters | Solid State Relays | Power Transducers | Monitoring Relays | Solid State Relays |
|---|---|---|---|---|---|---|
| CGESCO2<br>CGESHT<br>CGESAIRVEL | EM23 | RSGD<br>RSDR | RGC3P<br>RGC2P<br>RJ1P | CPT | DWA01 | RG<br>RM |

In an Air Handling Unit, the control of the air quality is becoming more and more important in order to reach the most comfortable conditions for occupancy.
The RGC2P analogue 3-phase solid state relay can control the heat delivered by a 3-phase resistor pack in order to provide heat either for heating (e.g. in sites where a regular heating system is not used) or, more often, for de-humidification. In the latter case only the immediately-required heat is delivered to ensure optimal de-humidification at the lowest cost.
The RGC2P comes in variants of up to 75 A in sizes of 54 and 70 mm.
When using single speed fans (e.g. when regular and constant air exchange is needed), the RSGD soft starter is used to avoid mechanical shock to the fan and the ducts, especially where there are canvas ducts which can be easily damaged.

# Heat Pumps



| Soft Starters | Solid State Relays | Monitoring Relays | Energy Meters | Timers | Electromechanical Relays |
|---|---|---|---|---|---|
| RSBS - RSBD<br>RSBS HP<br>RSBT | RG<br>RM<br>RGC2P | DPA51 | EM10<br>EM23 | DAA51<br>DMB51 | RMIA |

In many countries, new buildings, as well as refurbished ones, have to use a certain percentage of renewable energy. As Heat Pumps use thermal energy from the earth or from the air, which is renewable, they are being more and more frequently installed in heating and cooling systems in residential buildings and infrastructures. Since in buildings there is no specifically trained operator, a number of features are of prime importance.

Our range of scroll compressor soft starters RSBS (1-phase) and RSBD-RSBT (3-phase) ensure safe and correct starting at all times and avoids any problems related to current peaks and consequent voltage dips when compressors are started, as well as resulting in less mechanical stress to the compressor and the pipes.

Models from 12 A to 95 A ensure complete coverage of scroll compressor capacity.

In some countries there are specific restrictions on peak current, making soft starter installation mandatory. Our soft starters are also able to fit into the smallest cabinets. When installing a heat pump there are two options, based on the power required. One option is to calculate the heat demand of the building at the coldest time of the year and install a heat pump with the power to cope with this demand. The disadvantage of this is that the installation is more expensive and the machine runs most of the times at partial load, affecting the COP (Coefficient of Performance). The other option is to install a lower-powered heat pump for less demanding conditions and use an alternative energy source as support for the remaining time. This means a lower installation cost and better overall performance, which counterbalance the reduction in COP caused by the electrical resistors, as they are in use for a limited number of hours per year. In this scenario our solid state relays RGC2P help modulating the heat delivered by the resistors, improving the overall COP of the machine.

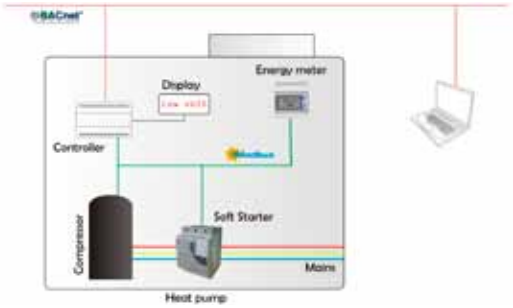
# HVAC systems

## Chillers

| Monitoring Relays | Switching Power Supply | Soft Starters | Power Analysers | Energy Meters | Power Transducers | Timers |
|---|---|---|---|---|---|---|
| DPB51 - DPA51<br>DLA71 - DPA53 | SPD<br>SPM<br>SPPC | RSBD - RSDR<br>RSBT - RSHR | WM40<br>WM30 | EM21<br>EM23 | CPT | DAA51<br>DAC51 |

In medium and large size Chillers, incorrect phase sequence or phase loss can result in serious problems for both scroll and screw type compressors, with consequent high repair costs. Apart from the incorrect wiring, the cause could be a blown fuse, or maintenance work on the mains. The DPA51 monitoring relay already protects a very large number of compressors and will continue to do so for a long time thanks to its features: small size, multi-voltage and regenerated voltage detection. When more protection is needed, the choice can be the DPA53 (which includes under-voltage detection) and the DPB51 (both over- and under-voltage detection), according to requirements.

The larger the compressor, the higher the need is for measuring the electrical energy of the chiller (which can be quite a large part of the total building consumption). Our CPT power transducer and the EM21 and EM23 energy meters are all equipped with Modbus communication, which allows the controller in the chiller to send information back to the Building Management System (BMS), together with thermo-dynamic information.
The WM30 and WM40 power analyzers, with BACnet port, can deliver this information directly to the BMS.
All these devices are compact, allowing easy installation even in limited space.



# Roof Tops

| Monitoring Relays | Switching power supply | Soft Starters | Power Analysers | Energy Meters | Solid State Relays | Timers | Environmental Sensors |
|---|---|---|---|---|---|---|---|
| DPA53 - DPA51<br>DPB51 | SPM<br>SPD<br>SPPC | RSBT<br>RSDR - RSBD | WM40<br>WM30 | EM24 | RGC3P<br>RGC3A<br>RJ1P | DAA51<br>DAC51 | CGESHT<br>CGESAIRVEL<br>CGESCO2 |

Rooftop units combine many functions for building comfort that need to be coordinated. They often use multiple scroll compressors to modulate the refrigeration capacity, so the size of the RSBT and the RSBD soft starters is important, as they must fit into existing cabinets. As these products do not need any specific settings, installation and commissioning are easily carried out.
The CG-ES environmental sensor series, both for wall and duct mounting, sends the air quality measurement (such as humidity, temperature, $CO_2$ and air velocity) to the unit controller with single or combined measure. The RGC2P combined with a 3-phase resistor allows extra heating for de-humidifying, while the RGC3P controls the speed of heat exchanger fans. When working with screw compressors, a star-delta start can be performed using the DAC51, which includes some gap time to reduce the star-to-delta sparks and current peaks.

# Pellet Burners

| Inductive Proximity Sensors | Capacitive Sensors | Solid State Relays |
|---|---|---|
| ICB12 | EC30<br>CD50<br>CA18/CA30 | RM1A<br>RP10 |

To avoid fossil fuel consumption, in many countries heating is made by using Pellet Burners. For domestic heating the Pellet Burners use a remote reservoir of some cubic meters (usually located in the basement) and a feeding system to transfer pellets from the main reservoir to a smaller one in the burner. To activate the system, in case of low level or to stop the transfer of the pellets because the burner reservoir is full, our capacitive sensors CA18, CA30, EC30 or CD50 are used. Their main features are excellent EMC immunity and high sensing capability in order to allow correct detection in all conditions, especially where powder remains on the reservoir surface.

ICB Inductive sensors are used to detect the position of the dampers so as to direct the air flow where needed. Solid state relays RP10 and RM1A are used to start the water pumps or the smoke fan. High frequency and silent operation make the burners suitable to be installed in environments such as kitchens or bathrooms.

# Our expertise in scroll compressors

| Soft Starters | Monitoring Relays | Soft Starters |
|---|---|---|
| **RSBS**<br>**RSBS HP** | **DPA51** | **RSBD**<br>**RSBT** |

In a Heat Pump, as well as in a Rooftop or in a Chiller unit, the compressor is the heart of the system. It supplies the inverse cycle and is also the most expensive and energy-consuming device in the machine. When starting, the scroll compressor operates in a very abrupt way and this can lead to undesirable effects to the machine itself and to the nearby environment. A direct on-line (DOL) start is performed in just 3 cycles (around 60 ms) for a 3-phase machine and a little more for 1-phase ones. This can result in rapid inrush current (around 8 times the nominal current) and significant vibrations. The first effect of high inrush current is voltage fluctuations during starts, especially where the grid is not so resistant, as in many domestic or commercial environments or in locations far from the energy source. This leads to lights flickering and potential interference with equipment such as LAN networks, Wifi, smartphones and tablets. The second effect is that the nominal current for the utility contract may be exceeded, which could result in fines from the energy supplier or having to increase the contract power at a higher cost. In addition, direct on-line starts cause wear and tear to the coils, reducing the lifetime of the compressor.Vibrations mainly cause a shock to the motor, starting from the shaft, which means shorter compressor lifetime. They also lead to mechanical shock to the pipes which, especially in the long term and for larger machines, can cause refrigerant leakage. Last but not least, the noise of a direct on-line start can be rather annoying. These problems can be solved by using our range of soft starters specifically designed for scroll compressor applications. Inrush current is reduced by 50 to 55% and the compressor is started within 1s, allowing a smooth start and proper compression and lubrication. The 3-phase RSBD and RSBT soft starters are provided with an auto-adaptive algorithm which ensures the best inrush current reduction at every start. As the soft starter follows the changes in the compressor and the system over time, no setting is needed. At the same time, when unexpected conditions occur, such as a very high pressure difference in the refrigeration circuit, the soft starter will react ensuring starting even in the worst conditions.

# Our product range

## Phase sequence and loss relays

### DPA51 / DPA53

- Dimensions: 81 x 17.5 x 67.2 mm DIN rail housing
- Phase sequence and loss relay
- 3 phase AC (own power supply); regenerated voltage
- Power supply 208 to 480 VAC (±15%)
- Undervoltage detection
- UL, CSA and CCC approved

**MAIN FEATURES**
- Compressor protection from reverse running and phase loss
- 17.5 mm width: the smallest in the market
- Plug&Play: no settings needed

## Phase relay under/over voltage

### DPB51 / DPB71

- Dimensions: 81 x 17,5 or 35.5 (DPB71) x 67,2 mm DIN rail housing
- TRMS 3-phase over/under voltage, phase sequence and loss
- 3 phase AC (own power supply); regenerated voltage
- Power supply 208 to 480 VAC (+/- 15%)
- Undervoltage detection
- UL and CSA approved

**MAIN FEATURES**
- Compressors protection from reverse running and phase loss
- Detects L-L and L-N voltage
- 17.5 mm width: the smallest in the market
- Independent voltage setpoints and built-in delays

## Cosϕ relays

### DWA01

- Dimensions 83 x 22.5 x 99.5 mm DIN rail housing
- Cosϕ monitoring relays
- 3 phase AC (own power supply); regenerated voltage
- Power supply 208 to 240 VAC or from 380 to 480 VAC
- UL and CSA approved

**MAIN FEATURES**
- Detects any potentially dangerous change of the cosϕ
- Direct current connection or by CT
- Easy setup

## Pump alternating relays

### DLA71

- Dimensions: 81 x 35.5 x 67.2 mm DIN rail housing
- Pump alternating relay for 2 or 3 pumps
- Galvanically separated power supply, 24/48 or 115/230 VAC
- 2x or 3x 5A SPST relay output
- UL and CSA approved

**MAIN FEATURES**
- Built-in function for automaticrotation of the pumps
- Built-in delay for the second or thirdpump in case simultaneous activation is required
- Plug and play: no settings needed

## AC Current transformer

### E83

- Dimensions: 56 X 22.5 X 49 mm
- 7 input ranges
- Ouput 4-20 mA DC
- No power supply
- UL, CSA approved

**MAIN FEATURES**
- Easy interface to PLC
- Built in hall sensor for current sensing
- LED indication

## Timers

### DAA51 / DAC51

- Dimensions: 81 x 17.5 x 67.2 mm DIN rail housing
- Delay on operating function (DAA), start/delta function (DAC)
- Universal power supply
- Repeatability: < 0.2%
- UL and CSA approved

**MAIN FEATURES**
- Extended delay-on-operating time, selectable from 0.1 s to 100 h
- Star-delta control function with star and star-to-delta adjustable times
- Protection against frequent compressor starting and from big inrush currents

# Our product range

## Timers

### DMB51

- Dimensions: 81 x 17,5 x 67,2 mm DIN rail housing
- Delay on operate 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 0.1 s to 100 h

## 3-phase scroll compressor soft starters

### RSBT

- Enhanced current reduction capability with patented auto-adaptive algorithm
- Integrated advanced diagnostic functions
- 3-phase controlled and internally bypassed
- Compliant with Residential (Class B) Limits for Emissions
- cULus listed, VDE (EN60335-2-40)

### MAIN FEATURES

- Plug&Play: no external settings needed
- Typicallly >50% scroll compressor inrush current reduction
- Compact dimensions: better panel space savings

## 3-phase scroll compressor soft starters

### RSBD 45mm

- Current balancing algorithm to reduce unbalance on uncontrolled phase
- Patented auto-adaptive algorithm for better inrush current reduction
- 2-phase controlled and internally bypassed
- Alarm and top of ramp indication
- cULus, CCC

### MAIN FEATURES

- Plug&Play: no external settings needed
- Operational current: 12 AAC up to 45 AAC @40°C
- Multi-voltage operation: 220 - 400 VAC

## 3-phase scroll compressor soft starters

### RSBD / RSBT

- Enhanced current reduction capability with patented auto-adaptive algorithm
- Integrated advanced diagnostic functions
- 2-phase (RSBD) and 3-phase (RSBT)controlled and internally bypassed solutions
- Top of ramp and alarm relay indication

### MAIN FEATURES

- No external settings required
- Mutli-voltage operation: 220-480 VAC 50/60 Hz
- Operational current: 55/70/95 AAC
- Internally supplied

## 3-phase scroll compressor soft starters

### RSBD / RSBT Modbus

- Modbus RTU over RS485 serial communication
- User settable device address: 1 - 247
- Enhanced current reduction capability with patented auto-adaptive algorithm.
- cULus

### MAIN FEATURES

- Communication of instantaneous variables (current, voltage, kWh, power factor)
- Remote start/stop via Modbus
- Alarm discrimination for quicker fault diagnosis

## 1-phase scroll compressor soft starters

### RSBS / RSBS HP

- Current limit starting
- Advanced diagnostic functions
- Internally bypassed
- Up to 12 starts per hour
- cULus listed, EN60335-2-40 approval

### MAIN FEATURES

- Plug&Play: no external settings needed
- Space saving IP20 design
- Integrated starting capacitor
- Optimised algorithm for high pressure starts (RSBS HP)

# Our product range

## 22 kW compact motor soft starters

### RSGD 45mm

- Operational voltage range: 187 - 440 VAC, 187 - 660 VAC
- Operational current range: 12 AAC up to 45 AAC
- Control voltage : 24 VAC/DC, 110 - 400 VAC
- Auxiliary relays for top of ramp and alarms
- cULus, CCC

**MAIN FEATURES**
- Compact dimensions: up to 22 kW in 45 mm wide housing
- Easy to setup: standard 3-knob setting
- Internally bypassed and supplied

## 3-phase 280 kW soft starters

### 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 run signal and alarms

## 1-phase solid state relays

### RM1A, RAM1A

- Dimensions: 58.2 x 44.8 x 28.8 mm, panel mount
- Rated operational voltage: up to 660VAC
- Rated current: 25 AAC, 50 AAC, 75 AAC, 100 AAC, 125 AAC
- Control input: 4-32 VDC, 20-280 VAC
- CE - cURus - CSA - VDE (RAM)

**MAIN FEATURES**
- Zero cross or Random switching
- Suited for resistive, inductive or capactive loads
- Integrated output overvoltage protection (RM1)

## 1-phase solid state relays

### RGS1A

- Dimensions: 90 x 17.5 x 50.6 mm, panel mount
- Rated operational voltage: up to 660 VAC
- Rated current: 25 AAC, 50 AAC, 75 AAC, 90 AAC
- Control input: 4-32 VDC, 20-275 VAC (24-190 VDC)
- CE - cURus - CSA - VDE

**MAIN FEATURES**
- Integrated output overvoltage protection
- Spring pluggable control terminal optionally available
- Box clamp power terminals available to handle 25 $mm^2$ / AWG3 cables

## 1-phase solid state contactors

### RGC1A

- Product width 17.5 mm up to 70 mm, DIN mount
- Rated operational voltage: up to 660 VAC
- Rated current: up to 85 AAC @ 40 oC
- Control input: 4-32 VDC, 20-275 VAC (24-190 VDC)
- CE - cULus - VDE - GL (up to 30 AAC)

**MAIN FEATURES**
- Integrated heatsink
- 100 kA short circuit current rating
- Optional overtemperature protection

## 3-phase solid state contactors

### RGC2A, RGC3A

- Product width 54 mm up to 70 mm, DIN mount
- Rated operational voltage: up to 660 VAC
- Rated current: up to 75 AAC/pole (RGC2A), 65 AAC/pole (RGC3A) @ 40°C
- Control input: 5-32 VDC, 20-275 VAC (24-190 VDC)
- CE - cULus

**MAIN FEATURES**
- Integrated output overvoltage protection
- Optional monitoring for SSR and load circuit malfunction (RGC..M)
- 100 kA short circuit current rating

# Our product range

## 1-phase proportional controllers

### RM1E

- Dimensions: 58.2 x 44.8 x 28.8 mm, panel mount
- Rated operational voltage: up to 660 VAC
- Rated current: 25 AAC, 50 AAC, 100 AAC
- Control input: 4-20 mA, 0-10V
- CE - cURus - CSA

### MAIN FEATURES

- Phase angle switching
- Integrated overvoltage protection
- 0 to 99% power output control

## 1-phase proportional controllers

### RJ1P

- Dimensions: 81.7 x 45 x 107 mm, DIN mount
- Rated operational voltage: up to 660 VAC
- Rated current: up to 50 AAC @ 25°C
- Control input: 4-20 mA, 0-10 V
- CE - cURus

### MAIN FEATURES

- Integrated heatsink
- Phase angle or Distributed full cycle switching
- Optional ovetemperature protection

## 3-phase proportional controllers

### RGC2P, RGC3P

- Product width 54 mm up to 70 mm, DIN mount
- Rated operational voltage: 180 - 660 VAC
- Rated current: up to 75 AAC/pole (RGC2P), 65 AAC/pole (RGC3P) @ 40°C
- Control input: 0-20 mA, 4-20 mA, 12-20 mA, 0-10 V, 0-5 V, 1-5 V, external potentiometer
- CE - cULus

### MAIN FEATURES

- Integrated output overvoltage protection
- Phase angle, Distributed full cycle or Soft start as switching modes
- Integrated monitoring for SSR and load circuit malfunction

## Environmental sensors $CO_2$

### CGESC02

- $CO_2$ sensor
- Duct and wall mounting
- Working range 0-2000 ppm / 0-5000 ppm
- 3 outputs: 0-10 V; 4-20 mA; switching output
- Supply voltage: 24 V AC/DC

### MAIN FEATURES

- High accuracy ±50 ppm (+2%) at 2000 ppm
- Auto-calibration
- Plug&Play: no settings needed

## Environmental sensors humidity and temp.

### CGESHT

- Relative Humidity and Temperature sensor
- Duct and wall mounting
- Working range 0...95% RH; 0...50°C
- 2 outputs: 0-10 V; 4-20 mA; Supply voltage: 24 V AC/DC

### MAIN FEATURES

- Different probe length
- Display
- Plug&Play: no settings needed

## Environmental sensors air velocity

### CGESAIRVEL

- Air Velocity sensor
- Duct mounting
- Working range 0...10/15/20 m/s
- Outputs: 0-10 V; 4-20 mA;
- Supply voltage: 24 V AC/DC

### MAIN FEATURES

- Low angular dependence
- Very good accuracy at low air velocity
- Plug&Play: no settings needed

# HVAC systems

## Power transducers

### CPT

- Dimensions: 83.5 x 45 x 98.5 mm 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 size power transducer
- Provides electrical variables set to a PLC to manage compressors and other loads
- Suitable for on-board panel installation

## Energy meters

### EM10 DIN

- Single-phase energy meters with direct connection
- Current input up to 32 A
- 1 DIN module dimension
- Class 1 (kWh) acc. to EN62053-1
- Pulse open collector output

**MAIN FEATURES**
- Direct measurement in a very compact housing to save space
- Suitable to measure generated energy
- MID Annex D certification available

## Energy meters

### EM2172D

- Dimensions: 4-DIN rail module or 72 x 72 mm housing
- 3-phase energy meters with CT connection
- Solid or split-core 5 A CT
- 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
- On request, MID annex D certification available

## Energy meters

### EM23, EM24

- Single-phase and 3-phase energy meters with direct connection
- Current rates up to 32 A (EM10) or 65 A (EM23 and EM24)
- 1 or 4 DIN rail housing dimensions (EM10, EM23 and EM24)
- Class 1 (kWh) acc. to EN62053-1
- Pulse open collector output
- Modbus conection port (EM24)

**MAIN FEATURES**
- Direct measurement in a very compact housing to save space
- Enables and simplifies energy cost allocation
- MID Annex D certification available

## Smart modular power analysers

### WM30/WM40

- Dimensions: 96 x 96 mm panel mounting housing.
- Accuracy 0.2 % (voltage, current)
- Universal power supply
- Front protection degree IP65, NEMA4X, NEMA12
- cULus approved

**MAIN FEATURES**
- Provides installation data to a SCADA to manage the whole system
- Modular housing to build the instrument according to the real application needs
- Modbus, Ethernet and BACnet-IP communication ports available

## Capacitive sensors

### CA18

- Dimensions: M18 / M30
- Tripleshield™ sensor protection
- Plastic housing, DC and AC versions
- Sensing distance 0.5-12 mm
- Approv/Marks: CE - UL - CSA

**MAIN FEATURES**
- Optimised features for level detection in plastic and rubber applications
- Sensing face can withstand temperatures up to 120°C
- Protection: short circuit, transient and reverse polarity

## Capacitive sensors

### CA30

- 4 - 12 mm sensing distance adjustable
- Time delay on operate or release, up to 10 minutes adjustable
- Multi voltage supply: 20.4 to 255 VAC/DC
- 2 A, SPDT relay output
- Housing M30 x 100 mm

### MAIN FEATURES

- Level sensor for solid, fluid or granulated substances
- CE, cULus approved
- IP67, NEMA 1, 2, 4, 4X, 5, 6, 6P, 12

## Capacitive sensors

### EC30

- High EMC Immunity.
- M30 mm housing, easy to mount
- Power supply 10-40 VDC, 200 mA NPN or PNP, NO and NC
- Power supply 20-250 VAC, 500 mA SCR, NO or NC
- CE, UL and CSA approved

### MAIN FEATURES

- Reliable detection of pellets in the burner's feeding system

## Capacitive sensors

### CD50

- Dimensions: 50 x 30 x 7 mm
- Flat pack sensor, easy to mount
- Power supply 10-30 VDC, 50 mA NPN or PNP, NO or NC
- CE approved

### MAIN FEATURES

- Detection of condensed water from Airconditioning system

## Inductive Proximity Sensors

### ICB Series

- M12 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 oil resistant PVC cable or M12 plug version
- Protection: reverse polarity, short circuit, transients

### MAIN FEATURES

- High precision and programmable outputs thanks to the microprocessor technology
- Eco-friendly potting material made from recycled corn by-productand resistance to vibration and impacts

## Conductive level systems

### CLD / CLP

- Exact level detecting with insulated electrodes
- SPDT 8 A relay output
- Power supply 24 VAC/DC, 115 VAC or 230 VAC
- CE, UL and CSA approved

### MAIN FEATURES

- Detection of condensed water from Airconditioning system
- Easy to install with simple electrodes

## Conductive level probes

### CLH

- 1 - 5 stainless steel electrodes
- Ø 4 user defined electrode length
- Insulation available in Kynar or Polyolefine
- 1 1/2" pipe thread mounting
- IP65/68 rating

### MAIN FEATURES

- -20°C to 90°C
- Replaceable electrodes

# Our product range

## Photoelectric level sensors

### VP, VPA or VPB

- 3/8 "pipe thread x 70,5 (74 mm) housing
- Power supply 10-40 VDC, 200 mA NPN or PNP, NO and NC
- CE approved

## Switching power supply

### SPD

- DIN rail housing
- 1-phase (5-480 W), 2-phase (100 W), 3-phase (120-960 W)
- Rated input voltage: 85-264 VAC (1-phase), 380-575 VAC (2-phase), 340-575 VAC / 480-820 VDC (3-phase)
- Approvals/Marks: UL, cUL listed and TÜV/CE approved

### MAIN FEATURES

- Power Factor Correction (PFC)
- Parallel versions available
- High efficiency (up to 93%)

## Switching power supply

### SPM

- DIN rail housing
- Universal input 90-264 VAC / 120-370 VDC
- Single phase and battery charger versions available
- Approvals/Marks: UL, cUL listed and TÜV/CE approved

### MAIN FEATURES

- Operating temperature w/o derating -25°C to +60°C
- Short circuit and Overload protection
- High efficiency (up to 89%)

## Switching power supply

### SPPC 150

- AC input selectable by switch
- Input voltage range: 88Vac~132Vac / 176Vac~264Vac
- Output protections: OLP / OVP / SCP
- Wide operating temperature (-25C to 70C)
- 105C long life electrolytic capacitors

### MAIN FEATURES

- Competitive price and compact size
- DC output: 5, 12, 15, 24 and 48V
- Good efficiency and high reliability

## Switching power supply with PFC

### SPPC 150 F

- Universal input voltage range: 85Vac ~ 264Vac / 120Vdc ~ 370Vdc
- High reliability
- Output protections: OLP / OVP / SCP
- 105C long life electrolytic capacitors
- 100% full load burn-in test

### MAIN FEATURES

- Built-in active PFC (Power Factor Correction) function: PF > 0.98 @ 115VAC and PF > 0.95 @ 230VAC
- Competitive price and compact size
- DC output: 5, 12, 15, 24 and 48V
- High efficiency (typ): 82%-87%

## Electromechanical relays

### RMIA Series

- 2 x 10 A and 4 x 5 A versions
- DC coils from 6 to 220 V
- AC coils from 6 to 380 V
- Free wheeling diode integrated
- Sockets for PCB or DIN rail installations

### MAIN FEATURES

- Contacts suitable for High Inrush loads
- Very compact size
- LED, latchable mechanical pushbutton and flag as standard

## Electromechanical relays

### RCP Series

- 2 x 10 A and 3 x 10 A contacts
- Industry standard relay
- High immunity to supply voltage fluctuation
- DC coils from 6 to 110 V
- AC coils from 6 to 230 V

### MAIN FEATURES

- Octal and Undecal
- LED, latchable mechanical pushbutton and flag as standard
- Wide selection of sockets for PCB and DIN rail

# Notes

# Notes

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