





## When technology and experience meet your expectations



Application Durability



Set-up





Inventory Reduction







Friendly

Productivity





Saving

Optimization

## Monitoring is the art of knowledge!

If you are in control of your system parameters, everything properly runs and your downtime and maintenance cost decrease. Our people at Carlo Gavazzi learned this fundamental lesson through our thirty years experience designing and manufacturing monitoring relays. The most sophisticated measuring techniques, together with the highest attention to make the unit really easy to set up, make Carlo Gavazzi Monitoring Relays the optimum solution wherever electrical parameters have to be measured.

The family is available, with the same functions, in three different housings: the standard DIN-rail one, perfect for industrial panels, the Plug-in housing to allow fast and safe replacement (without rewiring), the Mini-D housing for DIN-rail mounting, which can be mounted in electrical panels as well as in smaller ones (buildings or special industrial applications).





The standard high-performance DIN-rail housings



Plug-in versions for maximum flexibility



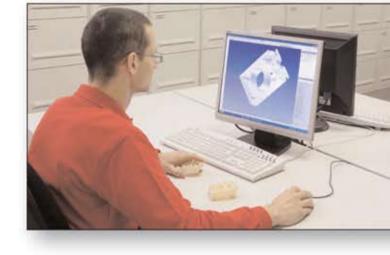


The small norm DIN-rail housing for the new challenges



# Not all applications are the same... so we are always looking for new solutions

Our way of developing products always starts from listening. We begin from the final application, meeting people to understand the critical issue. We design the products so that they really fulfill or exceed the monitoring needs. The final result is outstanding performance.



# A guarantee of reliability by our specialised manufacturing centers

Our monitoring relays are manufactured in accordance to the latest and most reliable techniques, and every test is performed to deliver a product that assures customers satisfaction.

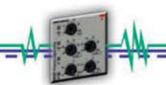




## (E 71 (F) (GL)

## A certified quality

The **high quality** of production is guaranteed by the ISO9001 certification of the factory, as well by the continuous tests and improvements of the production processes. CE tests, UL and CSA approvals, mean that three independent bodies have tested and approved the units, a statement to the level of development and production of our products. Some of them are also provided with other specific and high demanding approvals, like Germanischer Lloyd.





## The easy way to find your solution

	Select your Function Level			
Select your Measured Value	SINGLE FUNCTIONS	EXTENDED FUNCTIONS	FULL FUNCTIONS	
	React when the setpoint is overtaken or for major failures (phase sequence and loss)	Delay time, more ranges, TRMS measurement and more	For complete monitoring Two setpoints Two output relays	
Current	DIA01 PIA01 DIA53*	DIBO1 PIBO1 DIBO2 PIBO2 DIB71*	DICO1 PICO1	
Voltage	DUA01 PUA01 DUA52* DUA55*	DUB01 PUB01 DUB02 PUB02 DUB03 PUB03 DUB71*	DUCO1 PUCO1	
3-phase	DPA01 PPA01 DPA02 PPA02 DPA03 PPA03 DPA51* DPA71* DPA53* DPA55*	DPB01 PPB01 DPB02 PPB02 DPB51* DPB71*	DPC01 PPC01 DPC02 DPC71* PPC71	
Temperature	DTA01 PTA01 DTA02 PTA02			
Frequency		DFB01 PFB01	DFC01	
Power	DWA01 PWA01	DWB01 PWB01 DWB02 PWB02 DWB03 PWB03		
Others	DLA71° DLA73°			

First letter: **D** = for DIN-rail - **P** = for plug-in - • are Mini-D housings

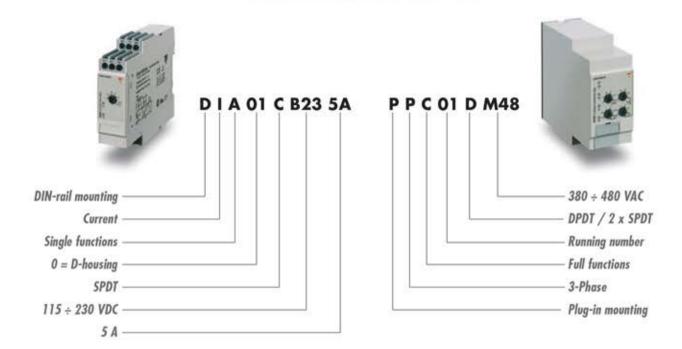
## Find more technical information on "www.ProductsOnline.info"

You can find all the details you need to develop your project on our website, in the Products Online page. Our documentation is available in English, French, German, Spanish, Danish and Italian.





## How to dial our item code



## The output - add the code:

- C SPDT relay
- D DPDT relay or 2xSPDT relays
- S solid state
- T 3xSPST relays

#### The power supply - add the code:

724 24 VDC

748 48 VDC

B48 24 & 48 VAC

B23 115 & 230 VAC

M44 208 to 480 VAC

M23 208 to 240 VAC

M24 24 to 240 VAC

M48 380 to 480 VAC

M60 400 to 600 VAC

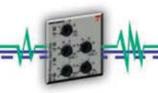
M69 600 to 690 VAC

#### The range - add the code:

5MA 1, 2 & 5 mA AC/DC 50MA 10, 20 & 50 mA AC/DC 500MA 100, 200 & 500 mA AC/DC 5A 1, 2 & 5 A AC/DC 10 A AC/DC 10A 20A 20 A AC (DIA53 only) 50A 50 A AC (DIA53 only) 100 A AC (DIA53 only) 100A 150MV 60 & 150 mV (DIB02, PIB02) 10V 1, 2, 5 & 10 V AC/DC 500V 20, 50, 200 & 500 V AC/DC

AV0 combined ranges







## Water and Pumps Applications

## Your automation challenge

What happens to my pumps if the water is over and the system goes on running? What if the phase sequence is not correct or one phase fails?



#### Our solution

The lack of human surveillance on pumps may produce major problems due to incorrect phase sequence. DPA01, PPA01 and DPA51 detect the phase sequence and loss along with the voltage regenerated by the pump's motor: the maintenance departement can be easily and promptly notified before a system failure occurs. Besides, pumps load monitoring allows to recognize if the pump is dry or blocked by some materials. DIB01, PIB01 or DIB71 are a solution for overload monitoring; DWB01, PWB01 for dry running and overload protection; DWB02, PWB02 offer full protection.



## Our product proposal

- DPA01, PPA01, DPA51: 3-Phase sequence and loss monitoring relays
- DWB01/02, PWB01/02: 3-Phase cosφ, active power monitoring relays
- DIBO1, PIBO1, DIB71: current relays

#### Your automation challenge

Water and pumps markets need components with high reliability, compact size and easy set-up. In case of pumps alternating, sometimes the function is carried out by dedicated boards or PLCs. Very often the control panel is so simple that just the pump alternating relay is used.



#### Our solution

**DLA71** and **DLA73** are specifically made for pumping system where two (or three) pumps have to work in parallel: they manage the signal from the inputs (floaters, pressure switches, etc.), sequentially activating the working cycle of the pumps and fairly splitting their starts.



DLA71

- DLA71: pumps alternating relay (DLA71...2P for 2 pumps, DLA71...3P for 3 pumps)
- DLA73: pumps alternating relay for 2 pumps



## **Energy Generation Applications**

#### Your automation challenge

Since there is an increased use of generators in many applications, it's absolutely necessary that the mains from the generator are of high quality to prevent damages to the connected load. Besides, in some countries the mains electrical parameters have to be according to specific regulations.



#### Our solution

Carlo Gavazzi's 3-phase monitoring relays, DPC01 and PPC01, can guarantee that the voltage levels of all the phases (if necessary even the phase-neutral voltages) are correct. With DPC02 the user also knows if the speed of the generator (that is the frequency of the mains) is correct. If the generation system is used to sell energy to the electric company, DPC02 can be used as interface relay to separate the generator from the mains if this is required. Finally DUA52 can monitor the voltage level of the start-up battery.



## Our product proposal

- DPC01, PPC01: 3-phase mains quality relay
- DPC02: 3-phase voltage and frequency monitoring relay
- DUA52: battery level monitoring relay

## **Telecomunication**

### Your automation challenge

If a Base Station for mobile phones isn't correctly supplied, the communication will be interrupted.

Usually the Base Station is provided with a power generator that has to be connected when the normal power supply has some defection.



#### Our solution

For this application, **DUA55** (1-phase) or **DPA55** (3-phase) are the ideal solution: they detect if all the phases are within the voltage window set limit and the 3-phase monitoring relay recognizes if the phases have the correct sequence, before connecting the generator. If one of the above mentioned conditions fails, the monitoring relay sends an alarm signal to the sistem. If you need to separatly set the upper and lower voltage limits, or a delay time, the perfect solution is **DPB71**.



- DUA55: 1-phase window monitoring relay
- DPA55: 3-phase window monitoring relay
- DPB51, DPB71: 3-phase over and under voltage relays







## Material Handling

#### Your automation challenge

All the industrial applications where sophisticated mechanical machines are used to manufacture, package, mix... require high quality mains. A faulty system can cause poor product results.



#### Our solution

Carlo Gavazzi's DPB01, PPB01 or DPB71 keep the mains fully monitored, to prevent from loose or dangerous working mode. Furthermore, the most important amperages of the process can be easily monitored by our DIA53, a 17.5 mm DIN-rail unit capable of directly measuring up to 100 A and providing a transistor output with no need of auxiliary voltage.



## Our product proposal

- DIA53: over current relay
- DIA01 and PIA01: over current relays
- DPB01 and PPB01, DPB71: 3-phase over and under voltage relays

## Food and Beverage

### Your automation challenge

Industrial plants using advanced machine for food & beverage require to quickly stop the manufacturing process in case of phase loss or to protect the motor from overload.



#### Our solution

DPA01 or the new DPB51 (mini DIN-rail housing, perfect to be mounted on the front panel saving a lot of space) allow to stop the machineries in case of phase loss or wrong phase sequence (or under/over voltage with DPB51). Besides, DIB01100A (for current monitoring) or DWB01 (for power factor control) can be used in order to detect an overload.



- DPA01: 3-phase sequence and loss monitoring relay with regenerated voltage detection.
- DPB51: 3-phase over and under voltage relay
- DIBO1100A: over current relay
- DWB01: 3-phase cosφ monitoring relay





## Lift

## Your automation challenge

For lifts, escalators and all people moving equipment, the direction of the motion must be 100% correct. Phase sequence relays are a fast, reliable and easy to maintain solution. Additionally with an overload, the motor temperature can damage and eventually destroy the motor itself.



#### Our solution

In addition to the phase sequence monitoring, **DPA03** detects the voltage regenerated by the motor in case of phase loss. This means that you'll reduce the risk that your motor won't overheat, burn up or cause danger to the people. **DTA01**, **DTA02**, **PTA01** and **PTA02**, our thermistor relays, measure the temperature inside the motor, allowing a prompt disconnection in case of overheating.



## Our product proposal

- DPA03: 3-Phase sequence and loss monitoring relay with undervoltage detection
- DTA01: thermistor relay for motor temperature protection

## HVAC

#### Your automation challenge

Correct motor direction means higher efficiency of the compressor (in some cases incorrect rotation means immediate breakdown). Furthermore, starting more than one compressor at the same time can cause a high inrush current with several problems, such as EMC noise or low mains voltage.



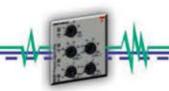
#### Our solution

Our smallest multivoltage phase sequence and loss relay, DPA51, prevents from incorrect rotation direction as well as from single phasing, while DPA53, with undervoltage setpoint, can let the compressor work at its best. Finally, DAC51, the smallest star-delta timer on the market, prevents from inrush currents. Carlo Gavazzi multirange and multivoltage modular timers optimize the space in the cabinet.



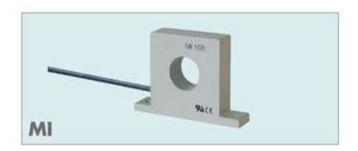
- DPA51: 3-Phase sequence and loss monitoring relay
- DPA53: 3-Phase sequence and loss monitoring relay with undervoltage detection
- DAC01, PAC01, DAC51: star-delta timers







## **Accessories: Current Transformers**



AC current transformers for 5, 20, 100, 500 AAC. Output voltage (0.4-4 Vp) is proportional to the measured current. To be used with:

DUA01/PUA01, DIB02/PIB02, DIC01/PIC01, DWA01/PWA01, DWB01/PWB01, DWB02/PWB02, DWB03/PWB03.



3-phase transformers for 5, 20, 100 or 500 AAC. Output voltage (0.4-4 Vp) is proportional to the highest measured current.

To be used with:

DUA01/PUA01, DIB02/PIB02, DIC01/PIC01.



AC current metering transformer for 25, 50, 100, 250 or 500 AAC. The transformer outputs are 0-20 mADC or 4-20 mADC in accordance with IEC 60381. A green LED indicates that power supply is ON.

To be used with:

DIB01/PIB01, DIC01/PIC01 or directly connected to a PLC.



AC current metering transformer with 7 knob selectable ranges. The transformer output is 4-20 mADC in accordance with IEC 60381. A green LED indicates that power supply is ON. 12 mm hole and the built-in current transformer make it suitable for most applications and easy to install. For mounting on DIN-rail or directly on surface by screws.





## All our monitoring relays references

#### CURRENT RELAYS

#### DIA01C7245A DIA01C7485A DIA01CB485A DIA01CB235A DIA53S72420A DIA53S72420AF DIA53S72450A DIA53S72450AF DIA53S724100A DIA53S724100AF DIB01C7245MA DIB01C7485MA DIB01CB485MA DIBO1CB235MA DIB01C72450MA DIB01C74850MA DIB01CB4850MA DIB01CB2350MA DIB01C724500MA DIB01C748500MA DIB01CB48500MA DIB01CB23500MA DIB01C7245A DIB01C7485A DIBO1CB485A DIBO1CB235A

DIB01C72410A DIB01C74810A DIBO1CB4810A DIB01CB2310A DIB01CM24100A DIB71CD485MA DIB71CB235MA DIB71CD4850MA DIB71CB2350MA DIB71CD48500MA DIB71CB23500MA DIB71CD485A DIB71CB235A DIB02C724150MV DIB02C748150MV DIB02CB48150MV DIBO2CB23150MV DICO1D724AVO DIC01D748AV0 DICO1DB48AVO DIC01DB23AV0 PIA01C7245A PIA01C7485A PIA01CB485A PIA01CB235A PIBO1C7245MA

PIBO1C7485MA PIBO1CB485MA PIBO1CB235MA PIB01C72450MA PIB01C74850MA PIBO1CB4850MA PIBO1CB2350MA PIB01C724500MA PIB01C748500MA PIBO1CB48500MA PIBO1CB23500MA PIB01C7245A PB01C7485A PIBO1CB485A PIBO1CB235A PIB01C72410A PIB01C74810A PIBO1CB4810A PIBO1CB2310A PIB02C724150MV PIB02C748150MV PIBO2CB48150MV PIBO2CB23150MV PICO1C724AVO PICO1C748AVO PICO1CB48AVO

#### **3-PHASE RELAYS**

DPA01CM44
DPA01CM60
DPA01CM69
DPA01DM23
DPA01DM48
DPA02CM23
DPA02CM40
DPA03CM23
DPA03CM48
DPA03CM69
DPA51CM44
DPA71DM23
DPA71DM48
DPA53CM23
DPA53CM48
DPA55CM44
DPB01CM23
DPB01CM23N
DPB01CM48
DPB01CM48N
DPB01CM48NW4
DPB01CM48W4
DPB02CM23
DPB02CM48
DPB51CM44
DPB71CM23
DPB71CM48
DPC01DM23
DPC01DM48
DPC01DM69

DPC01DM11400HZ DPC01DM23400HZ DPC01DM48400HZ DPC01DM49400HZ DPC01DM69400HZ DPC02DM23 DPC02DM48 DPC02DM49 DPC02DM69 DPC71DM23 DPC71DM48 PPA01CM44 PPA01DM23 PPA01DM48 PPA02CM23 PPA02CM40 PPA03CM23 PPA03CM48 PPB01CM23 PPB01CM23N PPB01CM48 PPB01CM48N PPB01CM48NW4 PPB01CM48W4 PPB02CM23 PPB02CM48 PPC01DM23 PPC01DM48 PPC71DM23 PPC71DM48

#### **VOLTAGE RELAYS**

DUA01C724500V
DUA01C748500V
DUA01CB48500V
DUA01CB23500V
DUA52C724
DUA52C748
DUA55CM44
DUB01C72410V
DUB01C74810V
DUB01CB4810V
DUB01CB2310V
DUB01C724500V
DUB01C748500V
DUB01CB48500V
DUB01CB23500V
DUB71CB4810V
DUB71CB2310V
DUB71CB48500V
DUB71CB23500V
DUB02CT23
DUB03CW24

DUC01D724500V

DUC01D748500V DUC01DB48500V DUC01DB23500V PUA01C724500V PUA01C748500V PUA01CB48500V PUA01CB23500V PUB01C72410V PUB01C74810V PUB01CB4810V PUB01CB2310V PUB01C724500V PUB01C748500V PUB01CB48500V PUB01CB23500V PUB02CT23 PUB03CW24 PUC01C724500V PUC01C748500V PUC01CB48500V PUC01CB23500V

#### **POWER RELAYS**

PICO1CB23AVO

DWA01CM235A
DWA01CM485A
DWB01CM2310A
DWB01CM4810A
DWB01CM6910A
DWB02CM2310A
DWB02CM4810A
DWB02CM6910A
DWB03CM2310A
DWB03CM4810A
DWB03CM6910A
PWA01CM235A
PWA01CM485A
PWB01CM2310A
PWB01CM4810A
PWB02CM2310A
PWB02CM4810A
PWB03CM2310A
PWB03CM4810A

#### TEMPERAT. RELAYS

DTA01C024	
DTA01C724	
DTA01C115	
DTA01C230	
DTA02C024	
DTA02C724	
DTA02C115	
DTA02C230	
PTA01C024	
PTA01C724	
PTA01C115	
PTA01C230	
PTA02C024	
PTA02C724	
PTA02C115	
PTA02C230	

#### FREQUEN. RELAYS

DFB01CM24	
DFC01DB48	
DFC01DB23	
PFB01CM24	

#### OTHERS RELAYS

DLA71DB482P DLA71DB232P DLA71TB483P DLA71TB233P DLA73TB482P DLA73TB232P BELGIUM - Carlo Gavazzi NV/SA Schaarbeeklei 213/3, B-1800 Vilvoorde Tel: +32 2 257 4120 Fax: +32 2 257 41 25 sales@carlogavazzi.be

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