CONTROL UNIT OR CONTROL DEVICE FOR SAFETY MATS, SAFETY EDGES AND SAFETY BUMPERS

The control unit is an apparatus conceived and used to constantly check proper operation of a sensor (safety mat, safety edge or safety bumper).
Pressure exerted on the sensor causes the output contact of the control device to break.
The control unit constantly verifies good operation of both the sensor and the connecting circuit.
A control device is capable of supervising and controlling several sensors but it cannot perform the self-diagnosis to detect which of the sensors is faulty.
If several sensors are installed, it is a good practice to use one control unit every 3 or 4 sensors.

Models available:
GP02/E
GP02R.T - GP02R.T1
GP04T - GP04R
GP02R and GP02R-C only for edges with electric resistance, 8.2 kΩ

DESCRIPTION

Emergency stop circuit of the sensor used to manage and control the sensor and equipped with two safety relays with forced opening contacts.

The relays, which are usually activated, deactivate if the following conditions arise:

- Power failure
- Activation of the safety mat, edge and bumper.
- Internal faults to the control unit;
- Breaking of the circuit inside the safety mat, safety edge and safety bumpers or interruption of connecting cables between the control unit and the sensor (safety mat, edge and bumper).

The devices are supplied with automatic reset function. Manual reset function also available.
In case the control unit is used without reset function, this option may be supplied through the control system of the machine (please refer to EN 13849-1 Standard).

OPERATION

Two separate channels detect voltage at the ends of sensor terminals (safety mat, edges, bumper) and each channel switches a safety relay with forced opening contacts.

MODELS:

GP02/E GP02R.T (automatic reset) - **G02R.T1** (manual reset)

Supply voltage is limited by a current limiting switch and relevant piloting circuit in order to prevent short-circuit currents to arise during the closing phase of the sensor (safety mat, edge and bumper). The control unit performs a self-control cycle each time a cycle or a putting into operation is executed. Input terminals are provided for:

- Test signal which activates/deactivates the circuit of the control device by stimulating the activation of the sensor and verifying the system efficiency;
- Manual/Feedback reset signal.

The two modules differ in the number of output contacts: model GP02/E has one NO safety contact whereas model GP02/E-S2 and GP02R have two safety NO contacts.

GP04T

Safety unit for 4-wires sensor with 2 static outputs type OSSD (PNP).

GP02R AND GP02R FOR SAFETY EDGES WITH ELECTRIC RESISTANCE 8.2 KΩ

Two symmetrical circuits detect the current circulating in the edge set for the 8.2 KΩ resistance.

When a variation resulting from a fault or an edge activation is detected, the output relays are de-energized. They break the safety contacts.

GP04R

Safety control units for 2-wires resistive sensor, 8.2 KΩ, with 2 static outputs OSSD (PNP).

TECHNICAL FEATURES

	GP02/E	GP02R.T	GP02R 8,2kΩ	GP02R-C 8,2kΩ
PL	e			
Category	3			
PFH_D (1/h)	$4.94*10^{-8}$	$4.94*10^{-8}$	$4.29*10^{-8}$	
No. of operations/year	80000	40000	40000	18000
T_{10D} [years]	9.25*	>20	>20	>20
Usage categories	DC13 – 1.5 A AC1 – 3A	DC13 – 1A	DC13 – 1A	AC15 – 3A DC13 – 3A
Electrical data				
Supply voltage	24 Vdc ± 10%			
Current consumption with sensor activated (24Vdc) [mA]	15			
Current consumption with reset module (24Vdc) [mA]	90	≤ 120	≤ 120	15
Internal protection of power supply	YES (1 A)	YES (280 mA)	YES (280 mA)	
Inputs				
Connectable sensor	4 wires		Resistive 8.2kΩ 2 wires	
Input short-circuit detection	YES			
Input connection interruption detection	YES			
Max length of connection cables [m]	100			
Min section of connection cables	0.35 mm^2 ($1mm^2$ L>20m)			
Max resistance of sensor/s, activated [Ω]	40	100	40	
Voltage applied to inputs	24 Vdc			
Max current (peak value) [mA]	200			
Safety outputs				
Number of safety outputs	1	2	2	
Rated voltage/Max switchable voltage [Vac/Vdc]	250/400	230/300	230/300	
Rated current in AC15 230 Vac/DC13 24 Vdc [A]	64 in DC	1.5 A / 1.2 A	1.5 A / 1.2 A	
Material of standard contacts	AgNi	$AgSnO_2$	$AgSnO_2$	
Rated current in Vdc	24			
Rated power AC/DC VA (50 Hz)/W	-/0.7	-/0.25	-/0.25	
Delay to energizing (reset)	25 ms (typical)	12 ms	12 ms	
Delay to de-energizing (trip)	10 ms (typical)	< 25 ms	17 ms	
Protection against over-current	6 A quick-action / 4 A delayed	4 A quick-action / 2 A delayed		
Mechanical life	10^7			
Signal outputs				
Number of signal outputs	1			
Max operating voltage – Vac	125			
Max operating voltage – Vdc	30			
Max current 110 Vac [A]	0.2			
Max current 24 Vdc [A]	0.5			
Environmental characteristics				
Operating temperature [°C]	0 / +50	-25 / +50	-25 / +50	-25 / +55
Storage temperature [°C]	-20 / +70	-25 / +70		
Max relative humidity	85%			
Degree of protection of terminals	IP20			
Degree of protection of casing	IP30			IP65
Dimensions				
Width [mm]	35	22,5		120
Height [mm]	90	114		75
Depth [mm]	70	99		155
Weight [g]	150	140		410
Material of the casing	ABS	PA66-FR		GW PLAST 75
Installation	On 35 mm Omega rail			By screws
EC Declaration	16CMAC0048	16CMAC0050	16CMAC0049	
References standard	EN ISO 13856-1; EN ISO 13856-2; EN ISO 13856-3; EN ISO 13849-1			
Other European Directives				
2012/19/UE	RAEE			
2011/65/UE	RoHS			

TECHNICAL FEATURES

		Type GP04 R	Type GP04 T
PL		e	
Category		3	
Diagnostic covering [%]		86.2	
PFH_D (1/h)		$5*10^{-8}$	
Usage categories		DC13	
Electrical data			
Supply voltage		24 Vdc ± 10%	
Current consumption with sensor activated (24VDC) [mA]		15	
Current consumption with reset module (24VDC) [mA]		15	
Inputs			
Connectable sensor		2 wires (resistive)	4 wires
Input short-circuit detection		Yes	
Input connection interruption detection		Yes	
Max length of connecting cables (m)		100	
Min section of connecting cables		0.35 mm^2 (1mm^2 L>20m)	
Max resistance of sensor/s, activated [Ω]		100	
Voltage applied to inputs		24 Vdc	
Max current (peak value) [mA]		2	
Safety outputs			
Number of safety outputs		2	
Type of outputs mode		Static	
Type of output control		PNP Source	
Rated supply voltage/ Max switchable voltage [Vac/Vdc]		24/30	
Rated current in AC15 230 Vac/DC13 24 Vdc [A]		0.4 DC	
Rated power supply voltage Vdc		24	
Rated power AC/DC VA (50 Hz)/W		-/0.25	
Delay to energizing (reset)		< 10 ms	
Delay to de-energizing (activation)		< 10 ms	
Protection against over-currents		1 A quick-action	
Mechanical life		10^7	
Signalisation outputs			
Number of signalisation outputs		1	
Max operating voltage	Vac	125	
	Vdc	30	
Max current 110Vac [A]		0.2	
Max current 24Vdc [A]		0.5	
Environmental characteristics			
Operating temperature [°C]		-10 / +55	
Storage temperature [°C]		-20 / +70	
Max relative humidity		85%	
Degree of protection of terminals		IP20	
Degree of protection of casing		IP30	
Dimensions			
Width [mm]		22.5	
Height [mm]		98	
Depth [mm]		56,4	
Weight [g]		60	
Material of the casing		PA - UL94V0	
Installation		On Omega rail, 35 mm	
EC Declaration		20CMAC0023	
Reference standards		EN ISO 13856-1; EN ISO 13856-2; EN ISO 13856-3; EN ISO 13849-1	
Other European Directives			
2012/19/UE		RAEE	
2011/65/UE		RoHS	

WIRELESS SAFETY SYSTEM FOR CONDUCTIVE EDGES

TRANSCEIVER INTERFACE

Model SAFESRCT 868 MHz "FM" - INPUT OF SAFETY EDGE SIGNAL 8,2kΩ

Model SAFEPRC4 - 433 MHz "FM" - INPUT OF SAFETY EDGE SIGNAL NC/8,2kΩ
Model SAFEPRC8 - 868 MHz "FM" - INPUT OF SAFETY EDGE SIGNAL NC/8,2kΩ

STATIONARY WIRELESS "TRANSCEIVER" RADIO SAFETY

Model SAFESRCRX 868 MHz "FM" - SAFETY OUTPUTS 2 NC/8,2kΩ

Model SAFEDECX4 - 433 MHz "FM" - SAFETY OUTPUTS 3 NC/8,2kΩ
Model SAFEDECX8 - 868 MHz "FM" - SAFETY OUTPUTS 3 NC/8,2kΩ

CONTROLLABLE SAFETY DEVICES 8
MAXIMUM RANGE 30 m
DEGREE OF PROTECTION IP65
OPERATING TEMPERATURE -20 ... +55°C

RADIOSAFE is made up of high technology appliances, protected by sturdy and easy-to-install enclosures ensuring a high degree of protection against environmental conditions.
The transmission via radio between the "transceiver" interface (safety edge interface) and the stationary "transceiver" eliminates the need that one or more safety edges to be connected to the control unit by wires. This ensures a more manageable and safe application of the safety edge directly onto the gate in movement.
Radiosafeis a highly professional safety device which, in combination with 8.2kΩ safety edges, meets the safety provisions required by ENI ISO 12978:2003+A1:2009 Standard.
The stationary "transceiver" directly connects to the safety edge and is installed on the moving part of the installation.
The transceiver unit is able to manage up to 8 security device via radio and is fitted with 3 safety outputs NC/8.2kΩ settable by jumpers. The interface is protected by a semi-transparent cover which allows verifying the status of the safety devices and the level of battery charge (via LEDs).
Each radio controlled safety device can be associated with one of the three safety outputs by a dip-switch.
The 3V lithium battery (for SAFEPR model) is highly reliable under all weather conditions and ensures a high level of safety and top performance in all environments.
Alkaline battery (for model SAFESFRCT).

Note: The choice of operating frequency for the safety edge should be made after taking into consideration the operating frequency of the other units in the installation.

E.g. If the control units are working at 433 MHz, it is good practice to use a safety radio edge that works at 868 MHz and vice-versa.