

SURROUND YOURSELF with SAFETY

TECHNICAL DOCUMENTATION



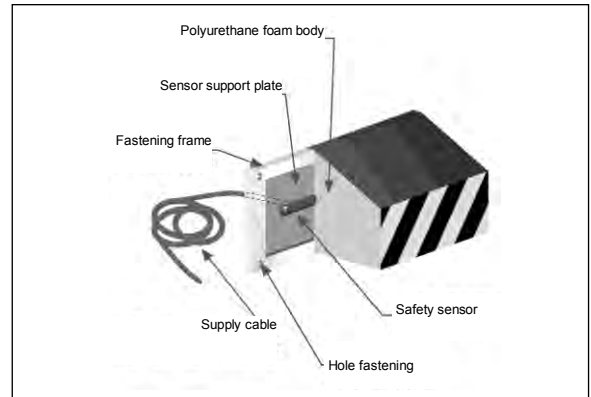
SENSITIVE SHOCK ABSORBER

The sensitive shock absorber is used to protect people from shocks against vehicles or moving parts, such as AGV, elevators, fork lifts, automatic stores...

With a minimum compression of the shock absorber, after a pre-run, the internal contact of the sensor closes (NO to NC) and the control unit produces immediately a stop signal eliminating the danger situation. After the pre-run, the shock absorbers allows an "overrun" compression, variable according to the shock absorber depth, to release the shock.

The shock absorbers are made of polyurethane foam, stuck onto a frame, and covered by a protection fabric. Inside, a sensitive element "sensor" is present, on a supporting plate.

The supply cable is a 4 poles cable 4*0,35mm² FROR 300/500 standard length 3 m. We can supply different lengths, upon request.



The shock absorber coating can be:

- 1 Fabric (standard)
- 2 PVC (for externals)
- 3 Anti-spark (fire protection)
- 4 Painted (impermeable)

In the standard version, the shock absorber is supplied with a black fabric coating, front side with yellow and black stripes. Upon request, other colours or coatings can be supplied.

DIMENSIONING OF THE SENSITIVE SHOCK ABSORBER

To find out the correct depth of the shock absorber, see the following data:

Pre-run (up to commutation point):

S_B = 20% of shock absorber depth

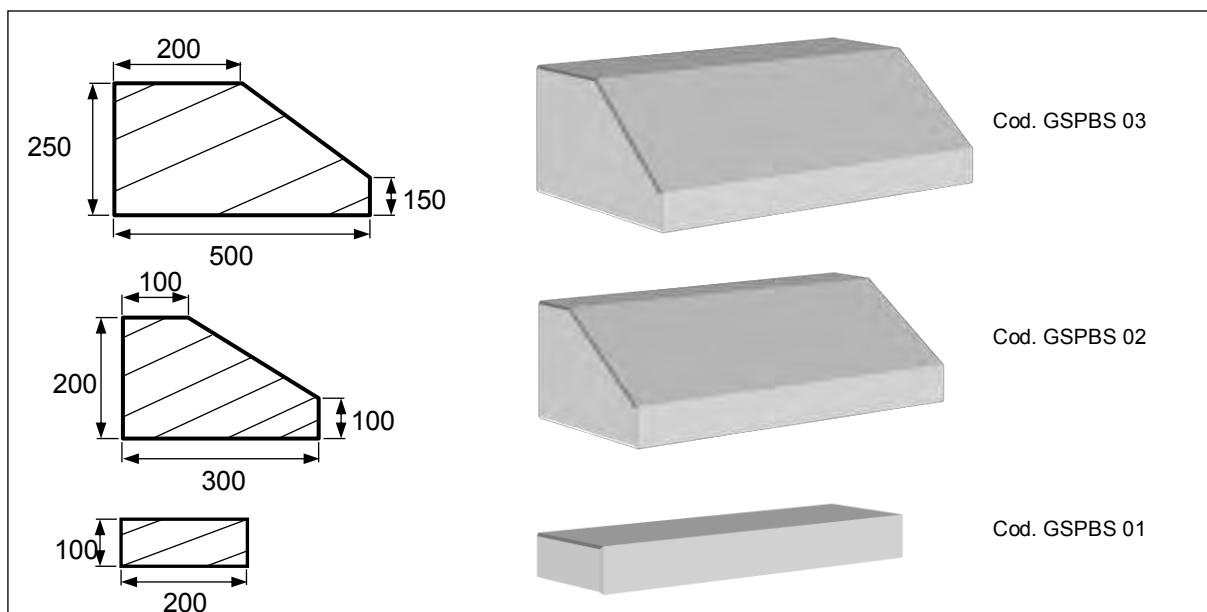
Overrun (max.deformation):

S_V = 50% of shock absorber depth

Part not to be deformed: 30% of shock absorbed depth

The choice of the shock absorber depth is made considering the stop space and the overrun S_V if required.

Available shapes



Upon request, different shapes and dimensions are available. For shock absorbers with special shape, contact our technical Office.

The shock absorbers are available with max. length 3000 mm. For larger size, they can be divided into several parts.

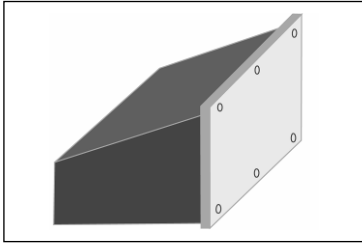
TECHNICAL FEATURES

Description	Bumper GSBPS01	Bumper GSBPS02	Bumper GSBPS03
Pre-run	< 20% depth of shock absorber		
Overrun without deformation	50% depth of shock absorber 30% depth of shock absorber		
Actuation force with $\Phi 80$ mm at 10 mm/s	32N	56N	24N
Actuation force with $\Phi 80$ mm at 100 mm/s	48N	56N	32N
Max admissible load	500N	500N	500N
Max length of sensor*	3000 mm		
Weight in kg / m	5,5	8	11
Max response time (constant speed 100 mm/s specimen 1, point 3)	<200 ms with Gamma System devices		
Max operating speed	100 mm/s		
Min operating speed	10 mm/s		
Mechanical life	10000 operations		
Max operating voltage	24 Vdc/ac		
Max operating current	30 mA		
Power cord	4x0,35mm ² standard length 3 m 4x1 mm ² length >20 m (max 100 m)		
Output contact	NO		
Operating temperature of sensor	-10°C + 50°C		
Type of coating	<i>Yellow/black tissue, PVC and anti-spark</i>		
Degree of protection (according to EN 60529) of sensor	IP 54		
Reference standard	Tests carried out in conformity with EN 1760-3, EN ISO 13849-1 Standards		
Safety parameters	Sensor GSBPS01 - GSBPS02 - GSBPS03 combined with GP02/E	Sensor GSBPS01 - GSBPS02 - GSBPS03 combined with GP02R.T	
Category	3	3	
PL	e	e	
PFH	8,58*10 ⁻⁸	8,58*10 ⁻⁸	
No. of operations/year	7000	7000	
EC-type certificate	10DM4SA110	11DM4SC13	
Usage category	DC13(24) – 1,5 A AC15(230) – 2 A AC1(230) – 1,5 A	AC15(230) – 4 A	
Mission time [years]	20	20	
Max length of sensor	3 m (For bigger dimensions, they can be divided into several parts and then connecting sensors in series).		

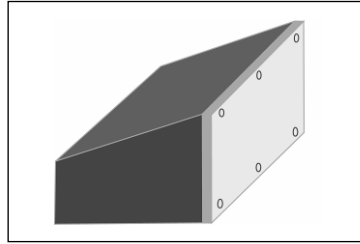
FASTENING OF SENSITIVE SHOCK ABSORBER

The shock absorber is fastened to the machine by a frame, featuring one of the three configurations :

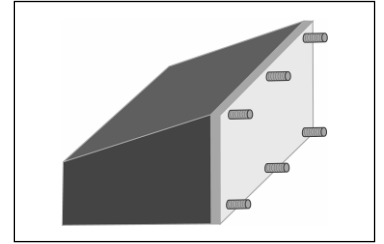
A- Plate protruding from the shock absorber, holes \varnothing 8,5 mm for fastening to the machine through screws and bolts;
Plate width upon customer's request (drawing A)



A



B



C

B- Plate along the shock absorber, with threaded holes (specify the thread) for fastening through screws from inside (drawing B). **The type "B" fastening is not suggest for the external application.**

C- Plate long the shock absorber, with bolt screws M6 length 30 mm, for fastening through nuts from inside (drawing C)

HOW TO ORDER A SENSITIVE SHOCK ABSORBER

When ordering, always supply a drawing of the shock absorber: height, width, depth. Indicate the coating material (ex. fabric), type of fastening

plate (ex. version B) and cable length, if different from the standard one.

CONTROL UNIT/DEVICE TO CONTROL MATS EDGES AND SHOCK ABSORBERS

The control unit is a device to control the function of a sensor (mat, edge or shock absorber) by blade contacts.

The blade contact is a NO contact that closes, causing the opening of the outlet contact of the control unit.

The control unit controls the operation of the sensor and the connection circuit, and allows to

transform the NO signal of the blade contact into a NC safety signal.

A control device can control several sensors, but cannot perform the auto-diagnose indicating which sensor is faulty. If more sensors are used, use a control unit every 3-4 sensors.

MODELS AVAILABLE:

GP02/E

GP02R.T – GP02R.T1

GP02R and GP02R-C Only for edges with electrical resistance 8,2kΩ

CONTROL UNIT

Description

Emergency stop circuit, used to manage and control a sensor, having two safety relays terminals with forced opening contacts.

The two relays, normally excited, are deenergized in the following conditions:

- No supply
- Operation of mat, edge, shock absorber.
- Internal faults
- Interruption of the internal circuit of mat, edge, shock absorber or connection cables between control unit and sensor (mat, edge, shock absorber).

The devices are supplied with **automatic reset** but they can be transformed into **manual reset**.

If a control unit is used **without rearming** the function must be supplied by the control system of the machine (see std. EN 13849-1).

Operation

Two separate channels detect the voltage at the end of the safety terminals of the mat, and each channel commutes a safety relay with forced opening contacts.

Models GP02/E- GP02R.T(automatic restart)- GP02R.T1(manual restart)

The supply voltage is limited by a specific group and the pilot circuit, to avoid short circuit currents while closing the sensor (mat, edge, shock absorber). The control unit controls itself, as well as any other operation.

Inlet terminals are foreseen for:





- Test signal activating/deactivating the circuit of the control device simulating the operation of the sensor and checking the system efficiency.
- Signal of manual reset/ feedback-action.

The two modules are differentiated by the number of outlet contacts: model GP02/E has a NO safety contact, whereas model GP02/E-S2 and GP02R.T has two NO safety contacts.

Model GP02R and GP02R-C only for edges with electrical resistance 8,2kΩ

Two symmetric circuits detect the current in the edge, adjusted for a resistance of 8,2 kΩ. When the circuits detect a variation of ± 4 kΩ, caused by a fault or operation of the edge, they desexcite the outlet relays, that open the safety contacts.

TECHNICAL FEATURES

	TYPE GP02/E	TYPE GP02R.T	TYPE GP02R 8,2k Ω	TYPE GP02R-C 8,2k Ω
Reference Standards: EN ISO13849-1, EN1760-EN60947-5-1 EN 50205 (type A)				
PL	e			
Category	3			
PFH (1/h)	4,29*10 ⁻⁸			
No. of operations/year	35000	50000	5000	5000
Usage categories	DC13(24) – 1,5 A AC1(230) – 3A	AC15(230) – 1,2 A	AC15(230) -4 A	AC15(230) – 3A DC13(24) – 3A
Mission time [years]	20			
Electrical data				
Supply voltage	24 VDC \pm 10%			
Current consumption with mat activated (24VDC)	15 mA			
Current consumption with reset module 24VDC)	90 mA			
Internal protection of power supply	YES (1 A)			
Inputs				
Input short-circuit detection	YES			
Input connection interruption detection	YES			
Max length of connection cables	100 m			
Min section of connection cables	0,35 mm ² (1mm ² L>20m)			
Max resistance of sensor	100 ohm	40 ohm		
Voltage applied to inputs	24 VDC			
Max current (peak value)	200 mA			
Safety outputs				
Number of safety outputs	1 NO	2 NO		
Rated voltage/Max switchable voltage VAC	250/400	230/300		
Rated current	6 A	AC15 230 VAC 1,5A DC13 24VDC 1,2 A		
Material of standard contacts	AgNi	AgSnO ₂		
Rated supply voltage	V AC50/60hz	-		
	V DC	24		
Rated power AC/DC VA (50 Hz)/W	-/0,7	-/0,25		
Delay to energizing (reset)	25 ms (typical)	12 ms		
Delay to de-energizing (trip)	10 ms (typical)	13 ms		
Protection against over-current	4 A quick-action/2 A delayed			
Mechanical life	10 ⁹	10 ⁷		
Signal outputs				
Number of signal outputs	1			
Max operating voltage	VAC	125		
	VDC	30		
Max current 110VAC	0,2A			
Max current 24VDC	0,5A			
Environmental characteristics				
Operating temperature [°C]	0 / 55	-25 /+50		
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			
EC-TYPE CERTIFICATION	RP10DM4SA113	RP11DM4SC12	RP10M4SA107	

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