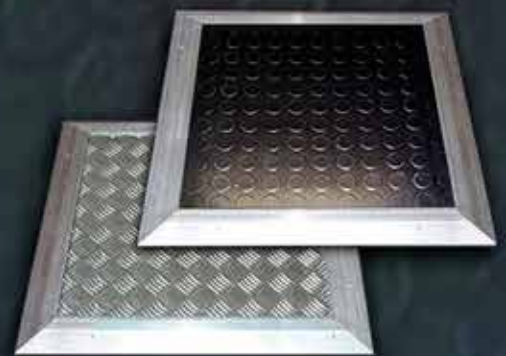
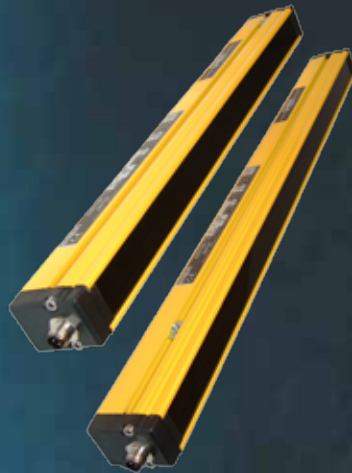
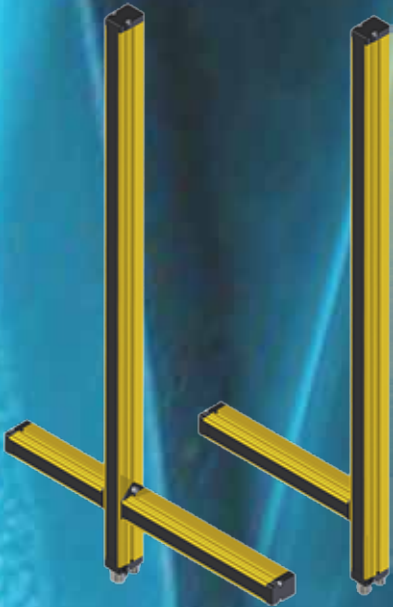


Safety protection



- Barriers
- Ribbon switches
- Edges
- Mats
- Bumpers

General catalog

■ Our company

This catalog represents in synthetic form the range of our production.

Two new barriers EFESTO 4 and KEEPER, are introduced to complete the wide type of present production ASTER and ARTscan.

Besides one series of products, as ribbon switches, edges, mats, bumper add to above products for the application on safety market.

Beyond, are available one line of "NO SAFETY BARRIERS" that is offered for wide applications on the automation, measure control and counting system on industrial field.

Grein is present on the world market from 45 years and establish a reference point for all the potential customers of different country to satisfy the requirements on the specific sector.

Our technicians justified, from an enquire of the market, are continuously to resarch of new products for different needs of different enquires. All the products are manufactured in accordance with European standard for the utilization on the customers.

On the case of futher details, see the web site www.grein.it



■ Index for category of products

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■ New barriers EFESTO 4 and KEEPER

This new generation of barriers represent an ideal solution for safety problems on the machinery and on industrial plants. The range of the different models permit the wide application of cat. 4 and they are designed under the directive conformity:

- 2006/42/CE machinery directive
- 2006/95/CE directive low voltage
- 2004/108/CE directive electromagnetic compatibility

The elegant aesthetic form, the small dimensions of the cross section of transmitter/receiver (that permit a sure admission to the productive process) as well as the low price respect the competition, have helped to extend the employ of these units in all the case where is necessary to protect the operators from the risks of dangerous machinery.

Reference to European standard :

IEC/EN 61496/1-2	electro-sensible device for protection
EN – ISO 13849-1	safety on machinery
IEC/EN 62061	functional safety of the electrical and electronic system to program the machinery control
IEC 61508	functional safety of electrical and electronic system

NOTE:

The EFESTO 4 curtains are normally employed as straight element. They replace the Aster models for their different characteristic. The Keeper curtains are formed by an straight element plus lateral arms to "T" and "L" shape, containing the muting sensors. They replace the old model of barriers ARTscan.



■ Technical characteristics

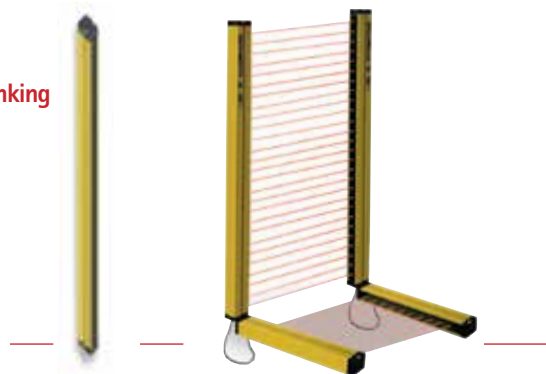
synchronisation of signal TX/RX	optic system
emission angle of TX/RX	5° total
wave length	850 nm
resolutions	14, 20, 30, 40, 55, 65, 175, 185, 320, 330 mm
max. range	6 - 15 - 30 - 60m
output signal	2 PNP 500 mA protected against short circuit and overload
connectors	M12 5/8 poles or M23 17 poles (on fuction of model)
power supply	24 Vcc ± 10% PELV
reponse time	from 5 to 30 msec. on function of beams number
max. distance of connection	100 meters
enclosure	extruder aluminum (section 36 x 50 mm.) yellow color RAL 1021
protection	IP 65
relative humidity	95%
working temperature	0 ÷ 65 °C
safety level	SIL 3 - SIL-CL3 - PL-e - Cat. 4

On the case it will be required the power relay, see pag. 29

■ Applications:

series EFESTO 4 straight or version master/slave (see pag. 8) – muting –blanking

- punch presses
- stamping presses
- die cutters
- robotic area
- assembling lines
- machinery for wood and ceramic employ
- packing and wrapping machinery
- automatic warehouse



series Keeper with muting sensors inside the arm (version T or L) or external

- palettizer machinery
- robotic area
- assembling line
- automatic industrial warehouse
- way for automatic AGV vehicle



■ Muting function

An optional muting system using sensor, is available to allow the temporary suspension of the safety function while the machinery is working or other material handling operation take place without switching off the machine. This is designed to facilitate applications during the return of the tool to the die position on the presses, or during the forming of metal to encrease productivity, or on the paletizzer or wrapping machine.

Each system consist of one set of barriers and sensors that must be activated within 2 sec.

Of each other to start the muting action otherways muting will not occur.

During the muting operation, other forms of protection must be utilized to prevent that the operators entering into dangerous area near the machine.

Any interruption of the sequence or malfunction of the sensors, will be detected and muting will not occur.

An override circuit to allow pallet removal is available in case of blockage inside the machine, power loss or not synchronisation of muting sensors.

During this operation the machinery must operate under max. safety, so that the operator cannot enter into dangerous area.



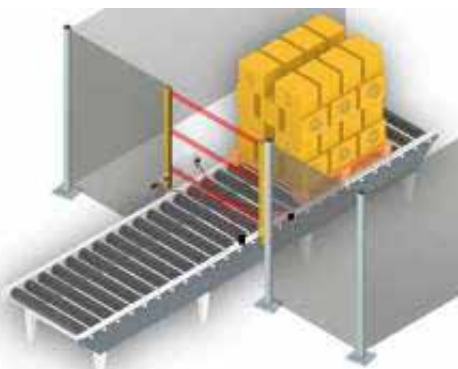
■ Muting MU with 2 separated sensors for Efesto 4 units

- Independent from the speed of movement of packing
- Any sensors may be used even not safety
- range 15 m.
- height protected 170 –3050 mm.
- resolution 14 – 320 mm.
- movement of the pallets in two direction (front and back)
- simultaneity delay for sensors signal 2 sec. max.
- override circuit to bypass muting function



■ Muting with incorporated sensors on the arms or external for Keeper units

These barriers are designed for the protection of the machine with elevated automation, to permit the admittance of the material that must be worked, maintaining the protection of operators that can enter on dangerous area near the machine



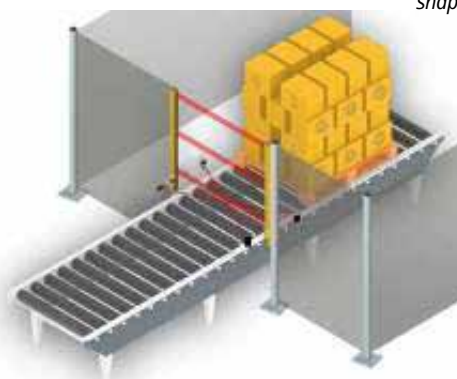
muting type with "T" shape at cross beams

Tecnical characteristic :

- self-control with signaling LED
- override system to bypass the muting control
- range (for across beams of the sensors) 0.8 –2.50 m.
- range (for parallel beams of sensors) 0.8 – 5 m.
- working distance for straight units (without arms) 15 m.

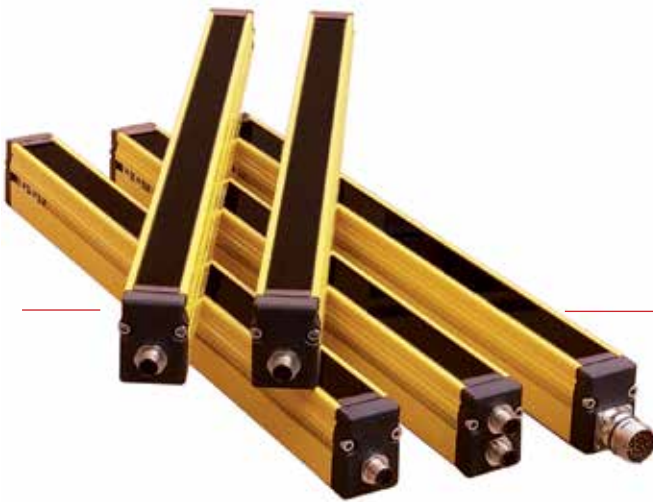
general characteristic:

- streight model with external sensors without arms
- "L" shape with incorporated muting sensors
- "T" shape with incorporated muting sensors
- Beams type : across or parallel



muting type with "L" shape at cross beams

■ Efesto 4 barriers



The new generation of the optic barriers EFESTO 4 are designed for the protection of the fingers – hands – arms – body.

Resolution from 14 up to 330 mm. Height protected from 170 up to 3000 mm Cat. 4

Muting and blanking on request

They find large application on all the system where is necessary to protect the operators working on dangerous area.

■ Technical characteristics and code

Emitter	with connector M12 4 poles male
TEST	to simulate the break beams to facilitate the safety chain of machine
Receiver	
Out put	2 x NPN protected from short circuit
BARGRAPH	3 LED for alignment indication

other characteristics in function of the model

Reset	starting of barrier
type	manual or automatic
Restart automatic time	100ms
Blanking	obstructed beams
n. beams	1 - 2 - 3
type	with or without presence of object
Configuration	through different connexions
height protected	from 100 up to 3000 mm.
MUTING	
type of muting	with 2 sensors to control the simultaneously time
muting enable	capability or not capability the function
override	available in case of blockage of muting system
muting lamp	lamp 24 volt 500 mA max.
EDM	control for external power contactors
OSSD-S	signaling output OSSD
MUTE - F	barrier OFF on fase of muting
BARGRAPH	3 LED for indication od alignment

NOTE

The relay modules of the pag 29 change the solid state output into relays 3A 250V



■ Main feature of AL barriers



On large presses or presses brake (where vertical protection is installed a long distance from the danger point) it may be necessary to protect the operator when he passed through the vertical barrier. This applications can be resolved using two units connected to only one box, considering that the inter-connection cable of two curtains has a max. length of 500 mm.

For this special application as "L" shape barrier is available consisting of two units one vertical with resolution 14 or 30 mm and one horizontal with highest resolution to detect the legs of operator. Only one control box, is connected to two barriers.

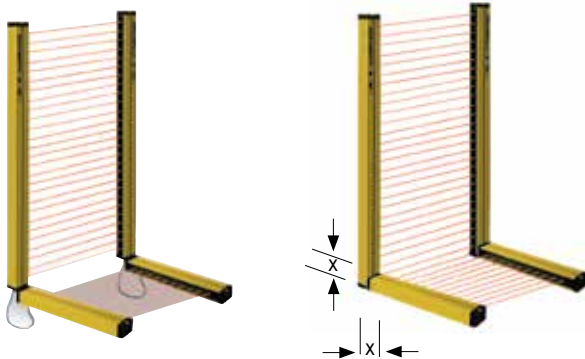
Besides with the box series DB is possible to control two barriers for the protections of front and rear of the presses.

Only one box control four barriers.

Alignment system (on request) with LED indicator to facility the installation.

Are available two systems of the connection of the barriers:

- with a cable of 500mm
- with a square connections to maintain constant the resolution



N.B.

Master M must be identified for vertical barriers and Slave S must be identified for horizontal barriers

■ Blanking system (optional)

beam blanking is an important function to allow selected areas of the sensing field to be disabled. This is particularly useful for those applications where, for example, a work piece obstructing the curtains or possibly moving up and down with the curtain

The configuration is applied through 3 wires on the receiver. The blanking function does not leave the last beam (near the cap of barrier) as it is utilized as synchronism between emitter and receiver.

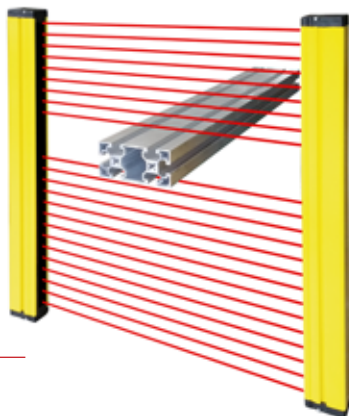
Two types of working are available:

blanking without presence of products :

this function permit to introduce on dangerous area an object without block the barrier.

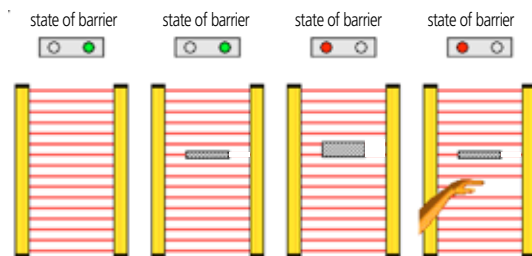
blanking with presence of products :

this function permit to maintain the object inside the dangerous area without block the barrier.



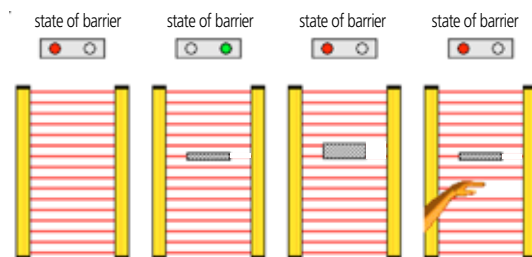
example : blanking of one beam without required presence of object :

- with all the free beams, the protected area is free
- with one beam OFF the area is considered free and the output signal are on ON state
- with two beams OFF the area is considered OFF and also the output signal are on OFF state.



example : blanking of one beam with required presence of object :

- if the movable object is not present, the output signal is OFF
- with one beam OFF the area is considered free and the output signal are on ON state
- with two beams OFF the area is considered OFF and also the output signal are on OFF



■ Technical characteristics and code

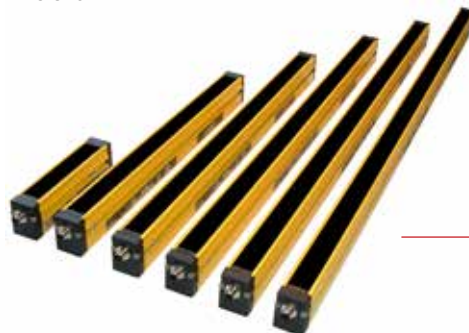
Resolution 14mm Range 6m							
optic code	n. beams	protected height PH (mm)	sensible height SH (mm)	Hight of barrier H (mm)	time response (ms)	Mttf (years)	PL
0240 A	24	254	234	326	6	100	e
0360 A	36	374	354	446	11	100	e
0480 A	48	494	474	566	11	100	e
0600 A	60	614	594	686	11	100	e
0700 A	72	734	714	806	16	84,06	e
0850 A	84	854	834	926	16	76,09	e
0950 A	96	974	954	1046	16	69,51	e
1100 A	108	1094	1074	1166	16	63,97	e
1200 A	120	1214	1114	1286	21	59,25	e
1300 A	132	1334	1314	1406	21	55,18	e
1400 A	144	1454	1434	1526	21	51,63	e
1500 A	156	1574	1554	1646	26	48,51	e
1700 A	168	1694	1674	1766	26	45,75	e
1800 A	180	1814	1794	1886	26	43,28	e
1900 A	192	1934	1914	2006	31	41,07	e
2000 A	204	2054	2034	2126	31	39,07	e
2200 A	216	2174	2154	2246	31	38,53	e
2300 A	228	2294	2274	2366	31	35,61	e

Resolution 20mm Range 15m							
optic code	n. beams	protected height PH (mm)	sensible height SH (mm)	Hight of barrier H (mm)	time response (ms)	Mttf (years)	PL
0240 AL	24	260	240	326	6	100	e
0360 AL	36	380	360	446	11	100	e
0480 AL	48	500	480	566	11	100	e
0600 AL	60	620	600	686	11	100	e
0700 AL	72	740	720	806	16	84,06	e
0850 AL	84	860	840	926	16	76,09	e
0950 AL	96	980	960	1046	16	69,51	e
1100 AL	108	1100	1080	1166	16	63,97	e
1200 AL	120	1220	1200	1286	21	59,25	e
1300 AL	132	1340	1320	1406	21	55,18	e
1400 AL	144	1460	1440	1526	21	51,63	e
1500 AL	156	1580	1560	1646	26	48,51	e
1700 AL	168	1700	1680	1766	26	45,75	e
1800 AL	180	1820	1800	1886	26	43,28	e
1900 AL	192	1940	1920	2006	31	41,07	e
2000 AL	204	2060	2040	2126	31	39,07	e
2200 AL	216	2180	2160	2246	31	38,53	e
2300 AL	228	2300	2280	2366	31	35,61	e

NOTE

Mttf = medium time of damaged

PL = safety level in accordance with EN 13.849



■ Technical characteristics and code

Resolution 30mm Range 15m							
optic code	n. beams	protected height PH (mm)	sensible height SH (mm)	Hight of barrier H (mm)	time reponse (ms)	Mttf (years)	PL
0150 B	6	174	126	273	6	100	e
0210 B	8	222	174	273	6	100	e
0240 B	9	246	198	297	6	100	e
0300 B	12	318	270	369	6	100	e
0360 B	14	366	318	417	6	100	e
0390 B	15	390	342	441	6	100	e
0450 B	18	462	414	513	6	100	e
0540 B	21	534	486	585	6	100	e
0600 B	24	606	558	657	6	100	e
0680 B	27	678	630	729	11	100	e
0750 B	30	750	702	801	11	100	e
0820 B	33	822	774	873	11	100	e
0900 B	36	894	846	945	11	100	e
0970 B	39	966	918	1017	11	100	e
1050 B	42	1038	990	1089	11	100	e
1100 B	45	1110	1062	1161	11	100	e
1200 B	48	1182	1134	1233	11	100	e
1250 B	51	1254	1206	1305	11	100	e
1350 B	54	1326	1278	1377	11	100	e
1400 B	57	1398	1350	1449	11	100	e
1500 B	60	1470	1422	1521	11	100	e
1650 B	66	1614	1566	1665	11	100	e
1800 B	72	1758	1710	1809	16	100	e
1950 B	78	1902	1854	1953	16	100	e
2100 B	84	2046	1998	2097	16	100	e
2200 B	90	2190	2142	2241	16	100	e
2300 B	96	2334	2286	2385	16	100	e
2450 B	102	2478	2430	2529	16	100	e
2650 B	108	2622	2574	2673	16	99,18	e
2750 B	114	2776	2718	2817	21	97,15	e
2900 B	120	2910	2862	2961	21	95,21	e
3000 B	126	3054	3006	3105	21	93,35	e

Resolution 40mm Range 30m							
optic code	n. beams	protected height PH (mm)	sensible height SH (mm)	Hight of barrier H (mm)	time reponse (ms)	Mttf (years)	PL
0150 BL	6	185	135	273	6	100	e
0210 BL	8	233	183	273	6	100	e
0240 BL	9	257	207	297	6	100	e
0300 BL	12	329	279	369	6	100	e
0360 BL	14	377	327	417	6	100	e
0390 BL	15	401	351	441	6	100	e
0450 BL	18	473	423	513	6	100	e
0540 BL	21	545	495	585	6	100	e
0600 BL	24	617	567	657	6	100	e
0680 BL	27	689	639	729	11	100	e
0750 BL	30	761	711	801	11	100	e
0820 BL	33	833	783	873	11	100	e
0900 BL	36	905	855	945	11	100	e
0970 BL	39	977	927	1017	11	100	e
1050 BL	42	1049	999	1089	11	100	e
1100 BL	45	1121	1071	1161	11	100	e
1200 BL	48	1193	1143	1233	11	100	e
1250 BL	51	1265	1215	1305	11	100	e
1350 BL	54	1337	1287	1377	11	100	e
1400 BL	57	1409	1359	1449	11	100	e
1500 BL	60	1481	1431	1521	11	100	e
1650 BL	66	1625	1575	1665	11	100	e
1800 BL	72	1769	1719	1809	16	100	e
1950 BL	78	1913	1863	1953	16	100	e
2100 BL	84	2057	2007	2097	16	100	e
2200 BL	90	2201	2151	2241	16	100	e
2300 BL	96	2345	2295	2385	16	100	e
2450 BL	102	2489	2439	2529	16	100	e
2650 BL	108	2633	2583	2673	16	99,18	e
2750 BL	114	2777	2727	2817	21	97,15	e
2900 BL	120	2921	2871	2961	21	95,21	e
3000 BL	126	3065	3015	3105	21	93,35	e

NOTE

Mttf = medium time of damaged

PL = safety level in accordance with EN 13.849

■ Technical characteristics and code

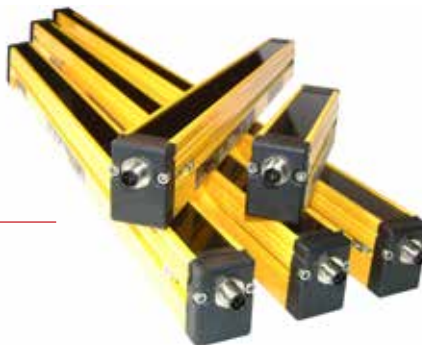
Resolution 55mm Range 15m							
optic code	n. beams	protected height PH (mm)	sensible height SH (mm)	Hight of barrier H (mm)	time response (ms)	Mtff (years)	PL
0150 C	3	200	102	273	6	100	e
0250 C	5	296	198	297	6	100	e
0300 C	6	344	246	369	6	100	e
0400 C	8	440	342	441	6	100	e
0450 C	9	488	390	513	6	100	e
0600 C	12	632	534	657	6	100	e
0750 C	15	776	678	801	6	100	e
0900 C	18	920	822	945	6	100	e
1050 C	21	1064	966	1089	6	100	e
1200 C	24	1208	1110	1233	6	100	e
1350 C	27	1352	1254	1377	11	100	e
1500 C	30	1496	1398	1521	11	100	e
1650 C	33	1640	1542	1665	11	100	e
1800 C	36	1784	1686	1809	11	100	e
1950 C	39	1928	1830	1953	11	100	e
2100 C	42	2072	1974	2097	11	100	e
2200 C	45	2216	2118	2241	11	100	e
2300 C	48	2360	2262	2385	11	100	e
2450 C	51	2504	2406	2529	11	100	e
2650 C	54	2648	2550	2673	11	100	e
2750 C	57	2792	2694	2817	11	100	e
2900 C	60	2936	2838	2961	11	100	e
3000 C	63	3080	2982	3105	11	100	e

Resolution 65mm Range 30m							
optic code	n. beams	protected height PH (mm)	sensible height SH (mm)	Hight of barrier H (mm)	time response (ms)	Mtff (years)	PL
0150 CL	3	211	111	273	6	100	e
0250 CL	5	307	207	297	6	100	e
0300 CL	6	355	255	369	6	100	e
0400 CL	8	451	351	441	6	100	e
0450 CL	9	499	399	513	6	100	e
0600 CL	12	643	543	657	6	100	e
0750 CL	15	787	687	801	6	100	e
0900 CL	18	931	831	945	6	100	e
1050 CL	21	1075	975	1089	6	100	e
1200 CL	24	1219	1119	1233	6	100	e
1350 CL	27	1363	1263	1377	11	100	e
1500 CL	30	1507	1407	1521	11	100	e
1650 CL	33	1651	1551	1665	11	100	e
1800 CL	36	1795	1695	1809	11	100	e
1950 CL	39	1939	1839	1953	11	100	e
2100 CL	42	2083	1983	2097	11	100	e
2200 CL	45	2227	2127	2241	11	100	e
2300 CL	48	2371	2271	2385	11	100	e
2450 CL	51	2515	2415	2529	11	100	e
2650 CL	54	2659	2559	2673	11	100	e
2750 CL	57	2803	2703	2817	11	100	e
2900 CL	60	2947	2847	2961	11	100	e
3000 CL	63	3091	2991	3105	11	100	e

NOTE

Mtff = medium time of damaged

PL = safety level in accordance with EN 13.849



■ Technical characteristics and code

Resolution 175mm		Range 30m				
Opric code	n. beams	protected height PH (mm)	sensible height SH (mm)	Hight of barrier H (mm)	Mtff (years)	PL
0400 D	4	414	513	6	100	e
0700 D	6	702	801	6	100	e
1000 D	8	990	1089	6	100	e
1300 D	10	1278	1377	6	100	e
1600 D	12	1566	1665	6	100	e
1900 D	14	1854	1953	6	100	e
2200 D	16	2142	2241	6	100	e
2500 D	18	2430	2529	6	100	e
2800 D	20	2718	2817	6	100	e

Resolution 185mm		Range 30m				
Opric code	n. beams	protected height PH (mm)	sensible height SH (mm)	Hight of barrier H (mm)	Mtff (years)	PL
0400 DL	4	423	513	6	100	e
0700 DL	6	711	801	6	100	e
1000 DL	8	999	1089	6	100	e
1300 DL	10	1287	1377	6	100	e
1600 DL	12	1575	1665	6	100	e
1900 DL	14	1863	1953	6	100	e
2200 DL	16	2151	2241	6	100	e
2500 DL	18	2439	2529	6	100	e
2800 DL	20	2727	2817	6	100	e

Resolution 320mm		Range 15m				
Opric code	n. beams	protected height PH (mm)	sensible height SH (mm)	Hight of barrier H (mm)	Mtff (years)	PL
0600 E	4	558	657	6	100	e
1000 E	6	990	1089	6	100	e
1500 E	8	1422	1521	6	100	e
1900 E	10	1854	1953	6	100	e
2300 E	12	2286	2385	6	100	e
2800 E	14	2718	2817	6	100	e

Resolution 330mm		Range 30m				
Opric code	n. beams	protected height PH (mm)	sensible height SH (mm)	Hight of barrier H (mm)	Mtff (years)	PL
0600 EL	4	567	657	6	100	e
1000 EL	6	999	1089	6	100	e
1500 EL	8	1431	1521	6	100	e
1900 EL	10	1863	1953	6	100	e
2300 EL	12	2295	2385	6	100	e
2800 EL	14	2727	2817	6	100	e

NOTE

Mtff = medium time of damaged

PL = safety level in accordance with EN 13.849

■ Resolutions and code

Model	Function							Connection RX		
	RA	RM	EDM	BLNK	MUTE	O-S	M-F	M12 5P	M12 8P	M23-17P
EF-a...	•							•		
EF-b...	•	•	•						•	
EF-c...	•			•					•	
EF-d...	•	•	•	•		•		•	•	
EF-e...	•	•	•		•			•	•	
EF-f1...	•	•	•		•	•			•	•
EF-f2...	•	•	•		•		•			•

RA automatic reset **RM** manual reset **EDM** control external contactors
BLNK floating blanking **MUTE** input 2 sensor plus override plus lampe signal
O-S signaling output of OSST
M-F signaling output of vertical barrier in OFF condition during muting

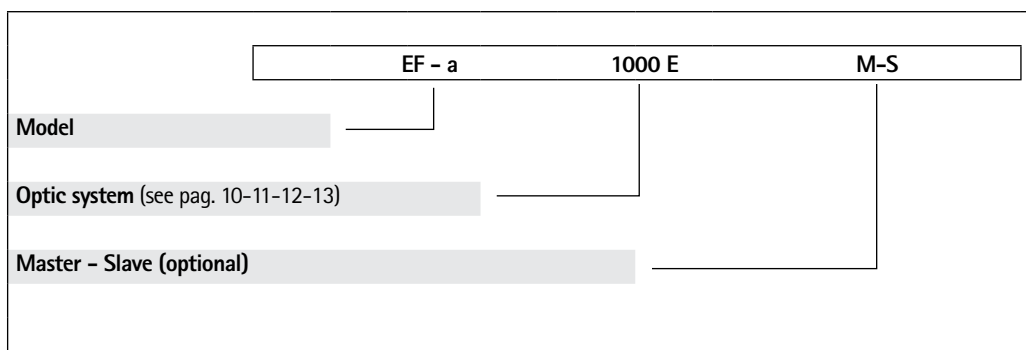
CONNECTIONS RX

M12-5P Connector M12 - 5 Poles - male
 M12-8P Connector M12 - 8 Poles - male
 M23-17P Connector M23 - 17 Poles - male

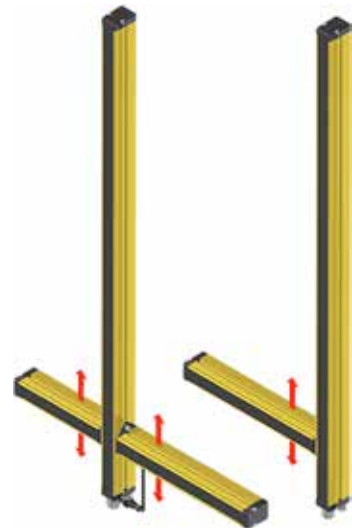
The emitter is always connected to M12 4 poles



■ Code



■ Keeper barriers



They represent a model of barriers with innovation characteristics respect the old system. Every units are available of the arms at "T" and "L" shape on which are included the sensors for muting. The barrier type straight, dont include the sensors that are external from the system. Resolution from 14 – 320 mm. Hight protected from 250 up to 3000 mm.

They find application on palletizers, on automatic stores, on robotic areas, etc.

■ General characteristics

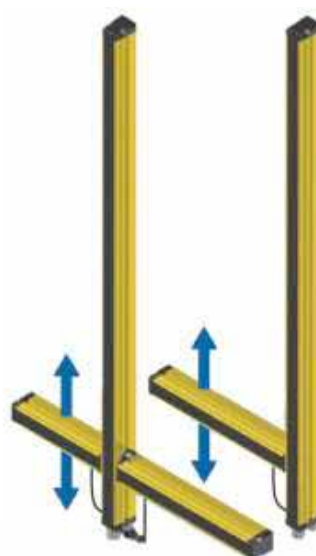
These units have a big facility of the connection with M12 device and the use of shielded cable of max 100 m. The relay module of pag. 29 connected only on request, change the solid state output into power relay.

emitter	with connector M12
test	to simulate the beams OFF
receiver	
output	2 x PNP protectec under short circuit
Reset	starting of barrier
type	automatic or manual
restart automatic time	100msec.
EDM	external control switches
BARGRAPH	3 LED for different indication
MUTING	temporary OFF of barrier
external muting	two sensors
arms muting	Parallel or across beams with 2 or 4 sensors
muting enable	ON /OFF the function of muting
override	allow pallet removal on case of blocage
lamp signalling	external lamp for signaling muting function
OSSD-S	output signal of the OSSD output
MUTE - F	external signal for indication muting function

Keeper with fixed arms



Keeper with movable arms



Keeper without arms



Description of other functions

Model	other function			receiver connection		
	MUTE-E	O-S	M-F	M12 5P	M12 8P	M23 17P
KP- e				•	•	
KP-f1	•	•				•
KP-f2	•		•			•

- MUTE-E input function of muting
- O-S Output signal of safety signal
- M-F signal of vertical barrier on OFF state during the muting

CONNECTIONS RX

- M12-5P Connector M12 – 5 Poles – male
- M12-8P Connector M12 – 8 Poles – male
- M23-17P Connector M23 – 17 Poles – male

The emitter is always connected to M12 4 poles



type of muting	movable arms
LPM 1	Muting L with 2 parallel sensors /RX right
LPM 2	Muting L with 2 parallel sensors /RX left
LXM 1	Muting L with 2 across sensors / RX right
LXM 2	Muting L with 2 across sensors / RX left
TXM 1	Muting T with 2 across sensors /RX right
TXM 2	Muting T with 2 across sensors /RX left
TPM 3	Muting T with 4 parallel sensors
type of muting	fixed arms
LPF 1	Muting L with 2 parallel sensors /RX right
LPF 2	Muting L with 2 parallel sensors /RX left
LXF 1	Muting L with 2 across sensors / RX right
LXF 2	Muting L with 2 across sensors / RX left
TXF 1	Muting T with 2 across sensors /RX right
TXF 2	Muting T with 2 across sensors /RX left
TPF 3	Muting T with 4 parallel sensors
type of muting	external sensors
TPi 3	Muting T for 4 external parallel sensors
TXi 3	Muting T for 2 external across sensors
LPi 3	Muting L for 2 external parallel sensors
LXi 3	Muting L for 2 external across sensors

	Kp-e	1000E	LXF 1
model			
optic (see pag. 18)			
muting type			

Technical characteristics and code

Optic type "A" Resolution 14mm							
optic code	n. beams	protected hight PH (mm)	sensible hight SH (mm)	Hight of barrier H (mm)	time reponse (ms)	Mttf (years)	PL
0240 A	24	254	234	326	6	100	e
0360 A	36	374	354	446	6	100	e
0480 A	48	494	474	566	6	100	e
0600 A	60	614	594	686	11	100	e
0700 A	72	734	714	806	11	84,06	e
0850 A	84	854	834	926	11	76,09	e
0950 A	96	974	954	1046	11	69,51	e
1100 A	108	1094	1074	1166	11	63,97	e

Optic type "C" Resolution 55mm							
optic code	n. beams	protected hight PH (mm)	sensible hight SH (mm)	Hight of barrier H (mm)	time reponse (ms)	Mttf (years)	PL
0300 C	6	344	246	368	6	100	e
0450 C	9	488	390	512	6	100	e
0600 C	12	632	534	656	6	100	e
0750 C	15	776	678	800	6	100	e
0900 C	18	920	822	944	6	100	e
1050 C	21	1064	966	1088	6	100	e
1200 C	24	1208	1110	1232	6	100	e
1350 C	27	1352	1254	1376	11	100	e
1500 C	30	1496	1398	1520	11	100	e
1650 C	33	1640	1542	1664	11	100	e
1800 C	36	1784	1686	1808	11	100	e
1950 C	39	1928	1830	1952	11	100	e
2100 C	42	2072	1974	2096	11	100	e
2200 C	45	2216	2118	2240	11	100	e
2300 C	48	2360	2262	2384	11	100	e
2450 C	51	2504	2406	2528	11	100	e
2650 C	54	2648	2550	2672	11	100	e
2750 C	57	2792	2694	2816	11	100	e
2900 C	60	2936	2838	2960	11	100	e
3000 C	63	3080	2982	3104	11	100	e

NOTE

Mttf = medium time of damaged

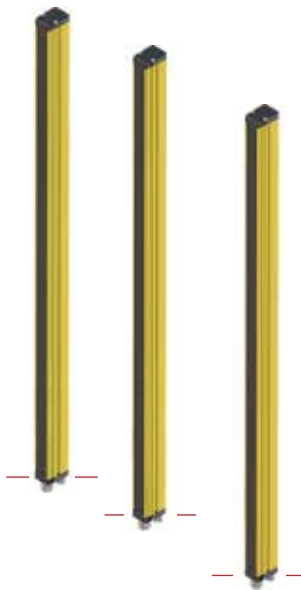
PL = safety level in accordance with EN 13.849

Optic type "B" Resolution 30mm							
optic code	n. beams	protected hight PH (mm)	sensible hight SH (mm)	Hight of barrier H (mm)	time reponse (ms)	Mttf (years)	PL
0300 B	12	318	270	368	6	100	e
0450 B	18	462	414	512	6	100	e
0600 B	24	606	558	656	6	100	e
0750 B	30	750	702	800	11	100	e
0900 B	36	894	846	944	11	100	e
1050 B	42	1038	990	1088	11	100	e
1200 B	48	1182	1134	1232	11	100	e
1350 B	54	1326	1278	1376	11	100	e
1500 B	60	1470	1422	1520	11	100	e
1650 B	66	1614	1566	1664	11	100	e
1800 B	72	1758	1710	1808	16	100	e
1950 B	78	1902	1854	1952	16	100	e
2100 B	84	2046	1998	2096	16	100	e
2200 B	90	2190	2142	2240	16	100	e
2300 B	96	2334	2286	2384	16	100	e
2450 B	102	2478	2430	2528	16	100	e
2650 B	108	2622	2574	2672	16	99,18	e

Optic type "D" Resolution 175mm							
Optic code	n. beams	protected hight PH (mm)	sensible hight SH (mm)	Hight of barrier H (mm)	Mttf (years)	PL	
0400 D	4	414	512	6	100	e	
0700 D	6	702	800	6	100	e	
1000 D	8	990	1088	6	100	e	
1300 D	10	1278	1376	6	100	e	
1600 D	12	1566	1664	6	100	e	
1900 D	14	1854	1952	6	100	e	
2100 D	16	2142	2240	6	100	e	
2400 D	18	2430	2528	6	100	e	
2700 D	20	2718	2816	6	100	e	
3000 D	22	3006	3104	6	100	e	

Optic type "E" Resolution 320mm							
Optic code	n. beams	protected hight PH (mm)	sensible hight SH (mm)	Hight of barrier H (mm)	Mttf (years)	PL	
0600 E	4	558	656	6	100	e	
1000 E	6	990	1088	6	100	e	
1500 E	8	1422	1520	6	100	e	
1900 E	10	1854	1952	6	100	e	
2200 E	12	2286	2384	6	100	e	
2700 E	14	2718	2816	6	100	e	

■ Aster barriers



This line of products is formed by two type of barriers : model BE and IN.

Together supply a power relay output 3 A 250 volt.

The type BE is formed by a external box, while the type IN has the incorporated box on the receiver.

They find application on all the system where is necessary to protect the operators in dangerous area and they are designed of cat. 2 and 4

The line of Aster units, after a long period, will be replaced by a new model EFESTO 4, that are provided of new function more functional and flexible for the large application

Technical characteristics and code

Range 15 mt.			Model		Range 30 mt.						
Resolution 30 mm	Protected height PH	Sensitive height PH	Type BE with external box	Type IN with integral box	Resolution 40 mm	Protected height PH	Sensitive height PH	Type BE with external box	Type IN with integral box	Barrier height H	Response time
Series AST/B					Series AST/BL						
AST-075/B	102 mm	54 mm	A-0011	A-1011	AST-075/BL	113 mm	63 mm	A-0012	A-1012	176 mm	9 ms
AST-150/B	174 mm	126 mm	A-0021	A-1021	AST-150/BL	185 mm	135 mm	A-0022	A-1022	176 mm	9 ms
AST-210/B	222 mm	174 mm	A-0031	A-1031	AST-210/BL	233 mm	163 mm	A-0032	A-1032	224 mm	10 ms
AST-240/B	246 mm	198 mm	A-0041	A-1041	AST-240/BL	257 mm	207 mm	A-0042	A-1042	248 mm	10 ms
AST-300/B	318 mm	270 mm	A-0051	A-1051	AST-300/BL	329 mm	279 mm	A-0052	A-1052	320 mm	10 ms
AST-360/B	366 mm	318 mm	A-0061	A-1061	AST-360/BL	377 mm	327 mm	A-0062	A-1062	368 mm	11 ms
AST-390/B	390 mm	342 mm	A-0071	A-1071	AST-390/BL	401 mm	351 mm	A-0072	A-1072	392 mm	11 ms
AST-450/B	462 mm	414 mm	A-0081	A-1081	AST-450/BL	473 mm	423 mm	A-0082	A-1082	464 mm	11 ms
AST-540/B	534 mm	486 mm	A-0091	A-1091	AST-540/BL	545 mm	495 mm	A-0092	A-1092	536 mm	12 ms
AST-600/B	606 mm	558 mm	A-0101	A-1101	AST-600/BL	617 mm	567 mm	A-0102	A-1102	608 mm	12 ms
AST-680/B	678 mm	630 mm	A-0111	A-1111	AST-660/BL	689 mm	639 mm	A-0112	A-1112	680 mm	14 ms
AST-750/B	750 mm	702 mm	A-0121	A-1121	AST-750/BL	761 mm	711 mm	A-0122	A-1122	752 mm	14 ms
AST-820/B	822 mm	774 mm	A-0131	A-1131	AST-820/BL	833 mm	783 mm	A-0132	A-1132	824 mm	15 ms
AST-900/B	894 mm	846 mm	A-0141	A-1141	AST-900/BL	905 mm	855 mm	A-0142	A-1142	896 mm	15 ms
AST-970/B	966 mm	918 mm	A-0151	A-1151	AST-970/BL	977 mm	927 mm	A-0152	A-1152	968 mm	16 ms
AST-1050/B	1038 mm	990 mm	A-0161	A-1161	AST-1050/BL	1049 mm	999 mm	A-0162	A-1162	1040 mm	16 ms
AST-1100/B	1110 mm	1062 mm	A-0171	A-1171	AST-1100/BL	1121 mm	1071 mm	A-0172	A-1172	1112 mm	17 ms
AST-1200/B	1182 mm	1134 mm	A-0181	A-1181	AST-1200/BL	1193 mm	1143 mm	A-0182	A-1182	1184 mm	17 ms
AST-1250/B	1254 mm	1206 mm	A-0191	A-1191	AST-1250/BL	1265 mm	1215 mm	A-0192	A-1192	1256 mm	18 ms
AST-1350/B	1326 mm	1278 mm	A-0201	A-1201	AST-1350/BL	1337 mm	1287 mm	A-0202	A-1202	1328 mm	18 ms
AST-1400/B	1398 mm	1350 mm	A-0211	A-1211	AST-1400/BL	1409 mm	1359 mm	A-0212	A-1212	1400 mm	19 ms
AST-1500/B	1470 mm	1422 mm	A-0221	A-1221	AST-1500/BL	1481 mm	1431 mm	A-0222	A-1222	1472 mm	20 ms
AST-1650/B	1614 mm	1566 mm	A-0231	A-1231	AST-1650/BL	1625 mm	1575 mm	A-0232	A-1232	1616 mm	21 ms
AST-1800/B	1758 mm	1710 mm	A-0241	A-1241	AST-1800/BL	1769 mm	1719 mm	A-0242	A-1242	1760 mm	22 ms
AST-1950/B	1902 mm	1854 mm	A-0251	A-1251	AST-1950/BL	1913 mm	1863 mm	A-0252	A-1252	1904 mm	23 ms
AST-2100/B	2046 mm	1998 mm	A-0261	A-1261	AST-2100/BL	2057 mm	2007 mm	A-0262	A-1262	2048 mm	24 ms

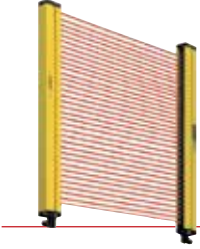

Resolution 55 mm	Protected height PH	Sensitive height PH	Type BE with external box	Type IN with integral box	Resolution 65 mm	Protected height PH	Sensitive height PH	Type BE with external box	Type IN with integral box	Barrier height H	Response time
Series AST/C					Series AST/CL						
AST-100/C	152 mm	54 mm	A-0301	A-1301	AST-100/CL	163 mm	63 mm	A-0302	A-1302	176 mm	8 ms
AST-150/C	200 mm	102 mm	A-0311	A-1311	AST-150/CL	211 mm	111 mm	A-0312	A-1312	176 mm	8 ms
AST-250/C	296 mm	198 mm	A-0321	A-1321	AST-250/CL	307 mm	207 mm	A-0322	A-1322	248 mm	9 ms
AST-300/C	344 mm	246 mm	A-0331	A-1331	AST-300/CL	355 mm	255 mm	A-0332	A-1332	320 mm	9 ms
AST-400/C	440 mm	342 mm	A-0341	A-1341	AST-400/CL	451 mm	351 mm	A-0342	A-1342	392 mm	9 ms
AST-450/C	488 mm	390 mm	A-0351	A-1351	AST-450/CL	499 mm	399 mm	A-0352	A-1352	464 mm	10 ms
AST-600/C	632 mm	534 mm	A-0361	A-1361	AST-600/CL	643 mm	543 mm	A-0362	A-1362	608 mm	10 ms
AST-750/C	776 mm	678 mm	A-0371	A-1371	AST-750/CL	787 mm	687 mm	A-0372	A-1372	752 mm	11 ms
AST-900/C	920 mm	822 mm	A-0381	A-1381	AST-900/CL	931 mm	831 mm	A-0382	A-1382	896 mm	11 ms
AST-1050/C	1064 mm	966 mm	A-0391	A-1391	AST-1050/CL	1075 mm	975 mm	A-0392	A-1392	1040 mm	12 ms
AST-1200/C	1208 mm	1110 mm	A-0401	A-1401	AST-1200/CL	1219 mm	1119 mm	A-0402	A-1402	1184 mm	12 ms
AST-1350/C	1352 mm	1254 mm	A-0411	A-1411	AST-1350/CL	1363 mm	1263 mm	A-0412	A-1412	1328 mm	13 ms
AST-1500/C	1496 mm	1398 mm	A-0421	A-1421	AST-1500/CL	1507 mm	1407 mm	A-0422	A-1422	1472 mm	14 ms
AST-1650/C	1640 mm	1542 mm	A-0431	A-1431	AST-1650/CL	1651 mm	1551 mm	A-0432	A-1432	1616 mm	14 ms
AST-1800/C	1784 mm	1686 mm	A-0441	A-1441	AST-1800/CL	1795 mm	1695 mm	A-0442	A-1442	1760 mm	15 ms
AST-1950/C	1928 mm	1830 mm	A-0451	A-1451	AST-1950/CL	1939 mm	1839 mm	A-0452	A-1452	1904 mm	15 ms
AST-2100/C	2072 mm	1974 mm	A-0461	A-1461	AST-2100/CL	2083 mm	1983 mm	A-0462	A-1462	2048 mm	16 ms

Resolution 175 mm	Protected height PH	Sensitive height PH	Type BE with external box	Type IN with integral box	Resolution 185 mm	Protected height PH	Sensitive height PH	Type BE with external box	Type IN with integral box	Barrier height H	Response time
Series AST/D					Series AST/DL						
AST-450/D		414 mm	A-0501	A-1501	AST-450/DL		423 mm	A-0502	A-1502	464 mm	8.8 ms
AST-750/D		702 mm	A-0511	A-1511	AST-750/DL		711 mm	A-0512	A-1512	752 mm	9.2 ms
AST-1050/D		990 mm	A-0521	A-1521	AST-1050/DL		999 mm	A-0522	A-1522	1040 mm	9.6 ms
AST-1350/D		1278 mm	A-0531	A-1531	AST-1350/DL		1287 mm	A-0532	A-1532	1328 mm	10 ms
AST-1650/D		1566 mm	A-0541	A-1541	AST-1650/DL		1575 mm	A-0542	A-1542	1616 mm	10.4 ms
AST-1950/D		1854 mm	A-0551	A-1551	AST-1950/DL		1863 mm	A-0552	A-1552	1904 mm	10.8 ms

Resolution 320 mm	Protected height PH	Sensitive height PH	Type BE with external box	Type IN with integral box	Resolution 330 mm	Protected height PH	Sensitive height PH	Type BE with external box	Type IN with integral box	Barrier height H	Response time
Series AST/E					Series AST/EL						
AST-600/E		558 mm	A-0561	A-1561	AST-600/EL		567 mm	A-0562	A-1562	608 mm	8.8 ms
AST-1050/E		990 mm	A-0571	A-1571	AST-1050/EL		999 mm	A-0572	A-1572	1040 mm	9.2 ms
AST-1500/E		1422 mm	A-0581	A-1581	AST-1500/EL		1431 mm	A-0582	A-1582	1472 mm	9.6 ms
AST-1950/E		1854 mm	A-0591	A-1591	AST-1950/EL		1863 mm	A-0592	A-1592	1904 mm	10 ms

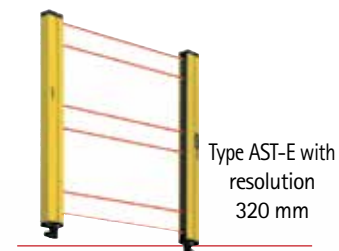
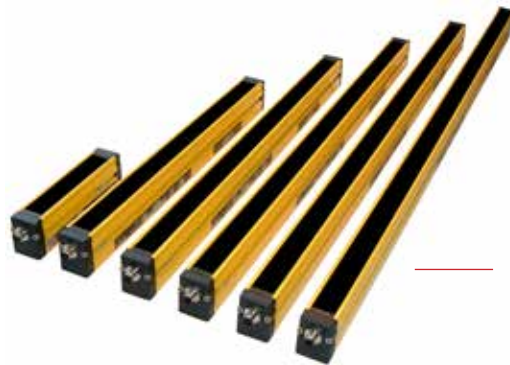
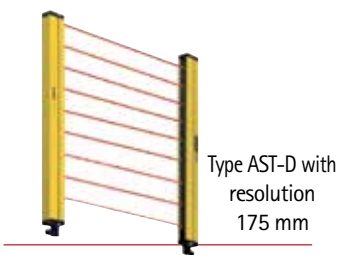
The model of barriers type IN with incorporated box have an extension of 165 mm (not sensitive)
All the units are delivered with connectors type C. If required the M12 connector see the code page 27.

Code identification of curtains

	Model	level	type	connection	alignement	muting
 Type AST-B with resolution 30 mm	see table					
	category 2	=2				
	category 4	=4				
	single	=0				
	master	=1				
	slave	=2				
	connector type C	=0				
	type M12	=1				
 Type AST-C with resolution 55 mm	without display	=0				
	with display	=1				
	without muting	=0				only for IN series
	with muting	=1				only for IN series

For order of complete barrier specify:

- Code of barrier
- Code of box (see pag 22-23)
- Code of brackets and accessory (see pag 28)



Control units

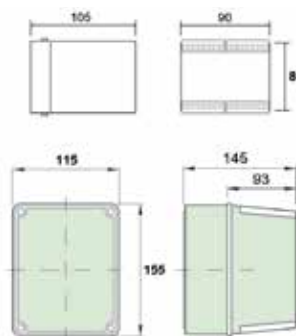
Employed only for barriers BE-AL series

Are available 5 models: BT - RT - SB - DB - RT/JNC

- LED signalling for power supply
- LED " " for the conditions of barrier
- LED " " for muting
- Connection through plug-in terminal block
- Output safety contacts 2NO + 1NC 3 Amp 250 Volt
- Power consumption 12 VA
- Automatic and manual reset
- Test circuit connection

- Feedback input for control of the machine's final switching device (FSD)
- Override circuit to bypass the muting function
- Enclosure in ABS IP 20. On request IP 56
- DIN rail mounting
- Connection with shielded cable to TX/RX up to 50 m
- Power supply: 24 volt d.c./a.c. 110-230 volt a.c. (to be specified when ordering)
- Muting circuit (optional):
 - Type MS with 4 sensors for RT box
 - Type MU with two sensors + override for BT-SB-DB boxes
- Remote lamp for muting
- Grey colour of enclosure for category 4
- Green colour of enclosure for level 2

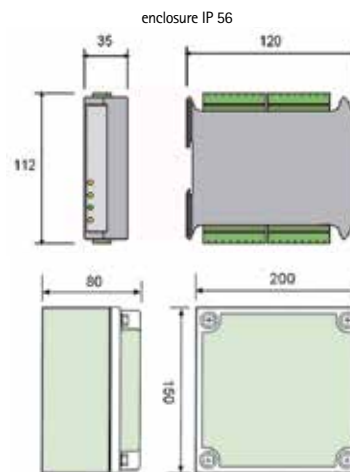
Box series BT



Available at 24 Volt d.c. + muting MU (optional)

Available at 24-110-220 Volt a.c. without muting MU

Box series SB

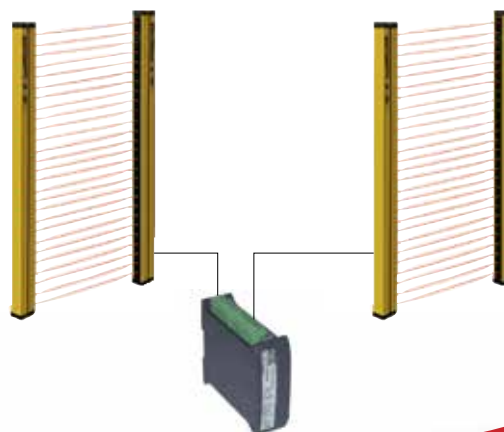


Available at 24 Volt d.c. 24 - 110-220 Volt a.c.

No muting MU

Box series DB to control two barriers

- Adapt for front and rear protection of every machinery
- Easy alignment
- No muting
- Low cost
- Characteristics similar to the previous models



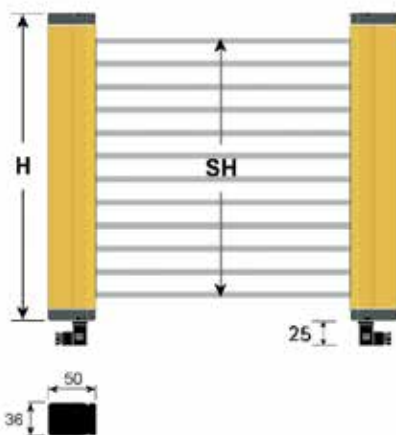
Identification code of boxes

	Model	supply	category	enclosure	muting
box BT	= B01				
box SB	= B03				
box DB	= B04				
A1 - 24 V c.a.	= 1				
A2 - 110 V c.a.	= 2				
A3 - 230 V c.a.	= 3				
A5 - 24 V c.c.	= 5				
category 2	= 2				
category 4	= 4				
enclosure IP 20	= 2				
enclosure IP 56	= 5				
no muting	= 0				
muting MU	= 1				

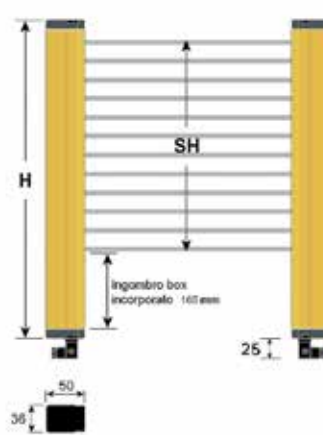


Barriers dimensions

Dimensions BE series with external box

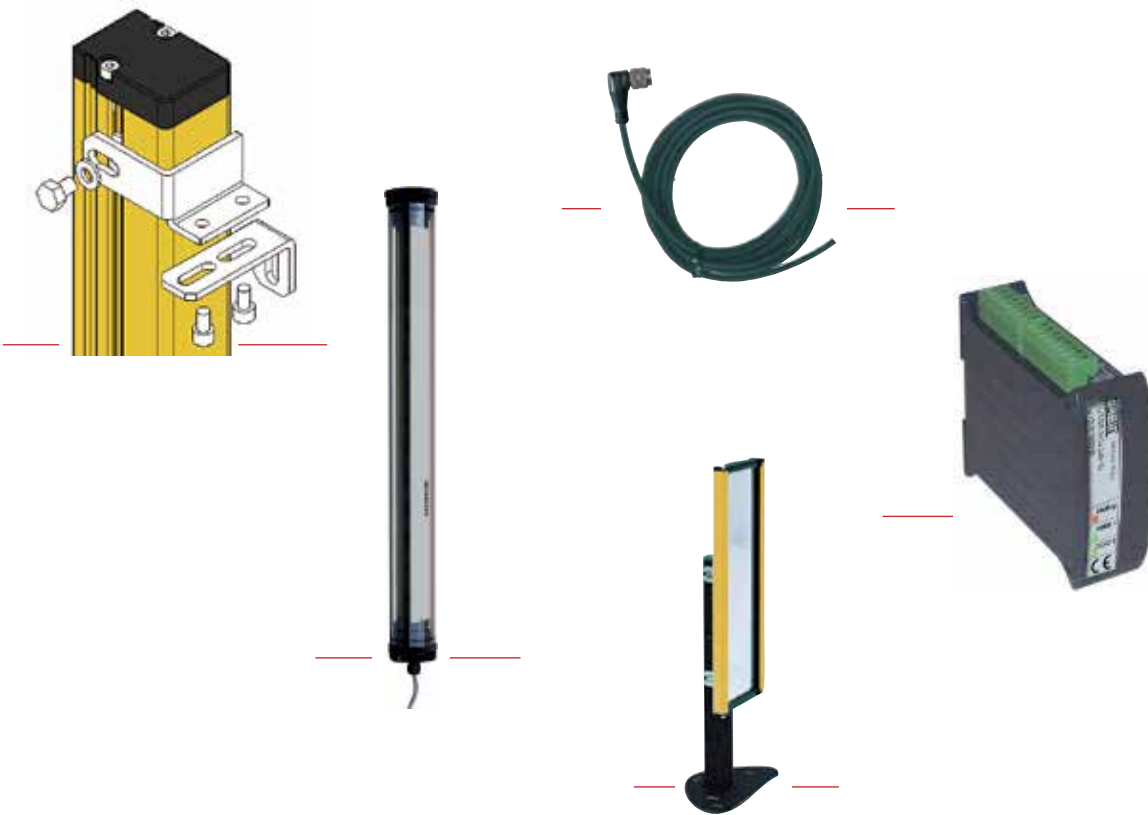


Dimensions IN series with INCORPORATO box



The type with incorporated box series IN, have an extension of 165mm not sensitive

■ Accessories



Different components are offered to complete the different enquires of the market.

- Acrylic protection to render tight IP 67 for barriers
- mirror and floor post for perimetral protection
- cables of connection from 3 up to 20 m.
- brackets for installation of the curtains
- interface module to change the solid state into power relay

■ Acrylic protection

To render water tight IP 67 for the protection of the barrier against the water jets for the cleaning of the machines by splashes.

Model and code identification

Plexiglass tube (diam. 60/70 mm) complete of two caps, one blind and one with cable gland	Code		
	cable 3 meters	cable 5 meters	cable 10 meters
VET-1 for 075 - 150 - 210 - 240 (cut under-size)	D-13	D-15	D-110
VET-2 for 300 - 360 - 390 (cut under-size)	D-23	D-25	D-210
VET-3 for 450 - 540 - 600 - 680 - 750 (cut under-size)	D-33	D-35	D-310
VET-4 for 820 - 900 - 970 -1050 - 1200 (cut under-size)	D-43	D-45	D-410
VET-5 for 1250 - 1350 - 1400 -1500 (cut under-size)	D-53	D-55	D-510
VET-6 for 1650 - 1800 - 1950 (cut under-size)	D-63	D-65	D-610
Brackets			
VET-70/60 kit complete of for 4 bracket	D-05		



■ Heating protection in acrylic enclosure

The hard protection is designed for industrial applications. It is available in acrylic housing for the protection against wash down water-dust-dirt-oil and it is ideal for heavy industrial processing or outdoor safety and security system. This protection has internal heating elements controlled by thermostat and it is adapt to resolve the problem when during the winters is possible to have the block of barrier for the presence of ice or hoarfrost. Inside the tube are fixed the resistance to produce a heat to eliminate this phenomenon to warranty the good working up to -15°. The output cable is formed by 6 wires: 4 for barrier - 2 for resistance.

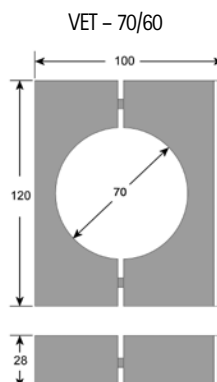
Model and code identification

Heating tube (diam. 60/70 mm) complete of two caps, one blind and one with cable gland	Code		
	cable 3 meters	cable 5 meters	cable 10 meters
VETR-1 for 075 - 150 - 210 - 240 (cut under-size)	DR-13	DR-15	DR-110
VETR-2 for 300 - 360 - 390 (cut under-size)	DR-23	DR-25	DR-210
VETR-3 for 450 - 540 - 600 - 680 - 750 (cut under-size)	DR-33	DR-35	DR-310
VETR-4 for 820 - 900 - 970 -1050 - 1200 (cut under-size)	DR-43	DR-45	DR-410
VETR-5 for 1250 - 1350 - 1400 - 1500 (cut under-size)	DR-53	DR-55	DR-510
VETR-6 for 1650 - 1800 - 1950 (cut under-size)	DR-63	DR-65	DR-610
Brackets			
VET-70/60 kit complete of for 4 bracket	D-05		

■ Particular of the brackets

Dimensions protections

The dimension of the barriers are reported at page 10 adding 90 mm due to the thickness of the caps plus 25 mm of cable gland.



■ Mirrors

The dimension of the barriers are reported at page 10 adding 90 mm due to the thickness of the caps plus 25 mm of cable gland.

By using mirrors in conjunction with a single barrier, an efficient and cost effective protection system can be provided around 2 or 3 sides of area to be guarded. When mirrors are used as part of multi-side barrier, it should be noted that each mirror will cause a range loss of approximately 25 %. This range loss can be compensated by using a special long range (60 meters) barriers. Particular care must be taken when installing mirrors and brackets in order to maintain beam alignment in the event of shock and vibration.

They are employed with ASTER - ARTScan -B series barriers (except L and T - ARTScan model).

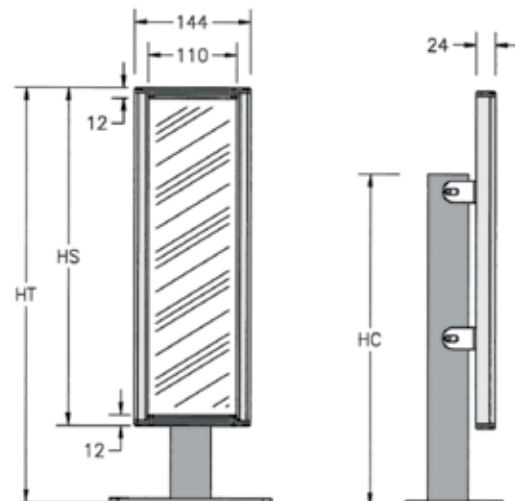
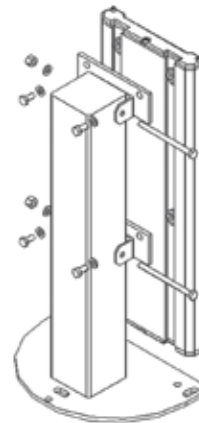
N.B.

The model WAB mirrors include also the floor post

Model	HS (mm)	HC (mm)	HT (min/max)	Code
WAB-501	390	385	400/570	D-50
WAB-502	710	705	720/1050	D-51
WAB-503	1030	1025	1040/1530	D-52
WAB-504	1350	1345	1360/2010	D-53
WAB-505	1670	1345	1680/2320	D-54
WAB-506	1830	1345	1840/2480	D-55
WAB-507	1990	1345	2000/2640	D-56

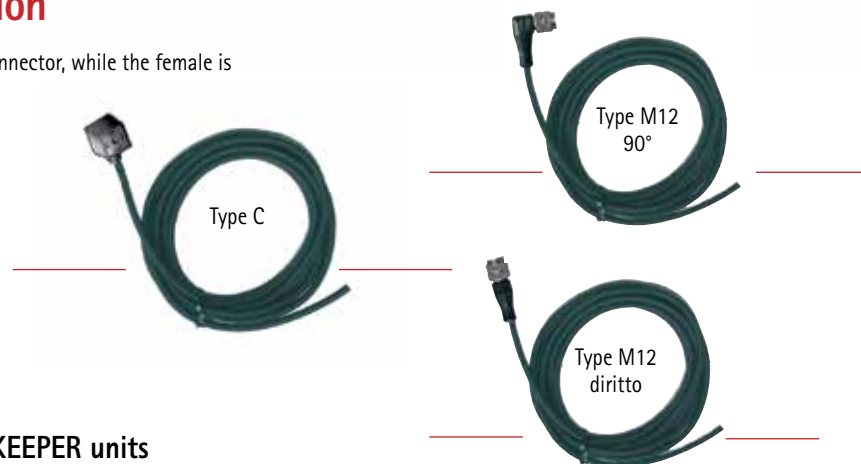
■ Floor post

Model	HC (mm)	Code
SCFS-3022	700	D-61
SCFS-3023	1020	D-62
SCFS-3024	1340	D-63



■ Cable of connection

on the barrier is assembling the male connector, while the female is mounted on the cable



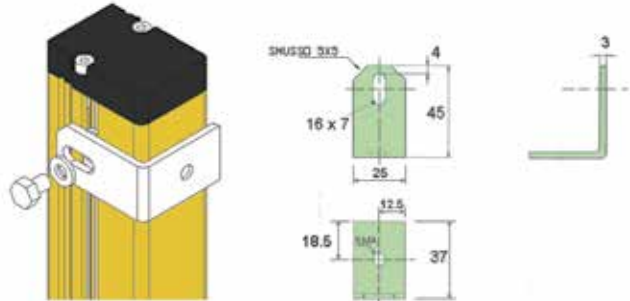
MODELS for EFESTO 4 and KEEPER units

for EFESTO / KEEPER barriers		Code
CAVM12-05F4/D	Cable M12 4 poles right shielded female 5 m. for TX	E-84-5
CAVM12-10F4/D	Cable M12 4 poles right shielded female 10m per TX	E-84-10
CAVM12-05F5/D	Cable M12 5 poles right shielded female 5m per RX a / d / e (see pag. 14-17)	E-85-5
CAVM12-10F5/D	Cable M12 5 poles right shielded female 10m per RX a / d / e (see pag. 14-17)	E-85-10
CAVM12-05F8/D	Cable M12 8 poles right shielded female 5m per RX b / c / d / e (see pag. 14-17)	E-88-5
CAVM12-10F8/D	Cable M12 8 poles right shielded female 10m per RX b / c / d / e (see pag. 14-17)	E-88-10
CAVM23-05F17/D	Cable M23 17 poles right shielded female 5m per RX f (see pag. 14-17)	E-817-5
EFESTO / KEEPER	for connections to relè module (see pag. 29)	
CAVM12-10FF4/D	Cable M12 4 poles fem+fem schermato 10m	E-94-10
CAVM12-10FF5/D	Cable M12 5 poles fem+fem schermato 10m	E-95-10
CAVM12-10FF8/D	Cable M12 8 poles fem+fem schermato 10m	E-98-10
CAVM23-10FF17/D	Cable M23 17 poles fem+fem diritta schermato 10m	E-917-10
for ASTER TX RX barriers	for connections to relè module (see pag. 29)	
CAVM12-03/D	Cable 3m with M12 4 poles fem. right	E-20
CAVM12-03/S	Cable 3m with M12 4 poles fem. 90°	E-21
CAVM12-05/D	Cable 5m with M12 4 poles fem. right	E-22
CAVM12-05/S	Cable 5m with M12 4 poles fem. 90°	E-23
CAVM12-10/D	Cable 10m with M12 4 poles fem. right	E-24
CAVM12-10/S	Cable 10m with M12 4 poles fem. 90°	E-25
CAVM12-15/D	Cable 15m with M12 4 poles fem. right	E-26
CAVM12-20/D	Cable 20m with M12 4 poles fem. right	E-27
for ASTER IN barriers for RX		
CAV05/14/P/FD	Cable 5m with connector 7/8" 14 poles F	E-31
CAV10/14/P/FD	Cable 10m with connector 7/8" 14 poles F	E-32
CAV20/14/P/FD	Cable 20m with connector 7/8" 14 poles F	E-33
for ASTER BE barriers		
CAV03/C	Cable 3m with connector fem. type C	E-10
CAV05/C	Cable 5m with connector fem. type C	E-11
CAV10/C	Cable 10m with connector fem. type C	E-12

■ Brackets

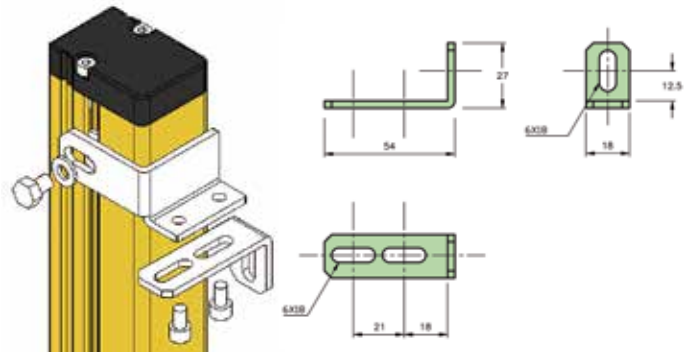
Bracket model STGM

Simple bracket for easy adjustment of the curtain. The special nut inside the aluminium profile allows the barrier height to be easily adjusted.



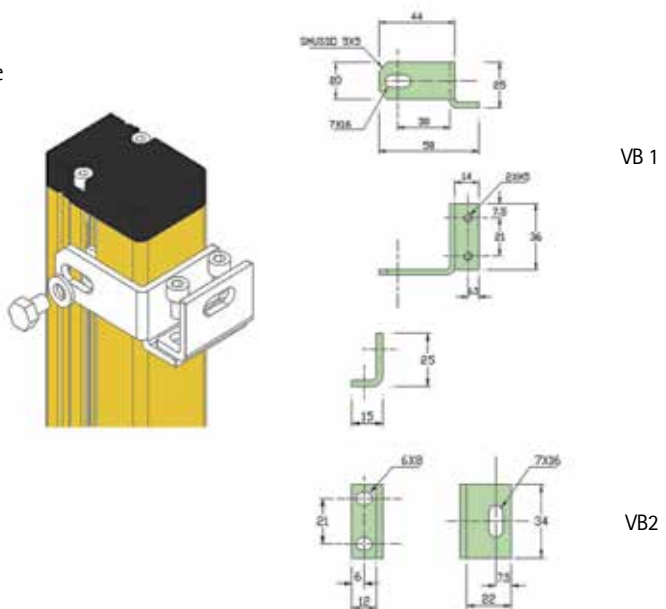
Bracket model STDL

Bracket at double "L" to permit the lateral fixing of the barrier with possibility of angular and lateral regulation.



Bracket model STVB

Compact bracket comprising two parts: VB1 and VB2 which allows installation in confined space and allowing easy adjustment on three axes.



Cross section of aluminium profile

Along the profile there is a channel on which is placed a special nut for fixing the brackets of barrier. In case it is necessary to change the position of the nut, it is necessary to remove the cap (see those without connector).



■ Module relay output 3 A 250 Volt

The following modules connected to EFESTO 4 and KEEPER curtains, change the solid state output into power relay. They can be connected to the version of barriers EDM, EF b, EF d, EF e, EF f, KP e, KPf1, KPf2

REL 011 module at DIN connection

REL 012 module at DIN connection with lamp for muting



REL 021 B module with reset key and lamp for out put state for barrier mod. EF b



REL 021 D module as above for barrier model EF d



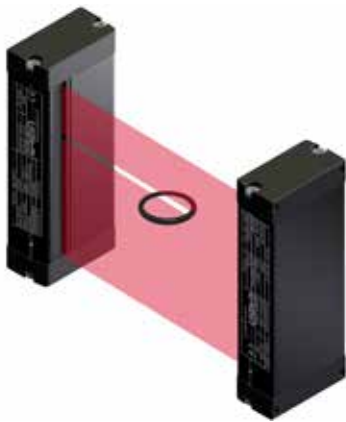
REL 022 E module as above plus key for override for barriers model EF e and KP e



REL 022 F module as above for type EFF - KP f1 - KP f2



■ No safety curtains



they are equipments for industrial and civil application where is required to survey, to measure, to identify object of different form.

They are of two types : series NI for identify the passage or presence of object
series NS for identify areas and dimensions

■ Barriers no safety type NI

These curtains are realized to detect the passage and the presence of object, also with small diameter of 0,9 mm. at high speed of crossing.

The detection is independent by a type of material and its colour.

The units are employed also for glass-cloth and transparent film. The system NI is based on a pang net of beams to make a scan of the area. The break of one beam, block the system under control.

The high speed of survey and the resolution of the system is ideal for:

- expulsion pieces from presses
- counting pieces from machinery
- control and presence of material on painting plant or on rolling machines.

All the circuit are assemblyed inside the barriers and it is not necessary other module.

To resolve evry enquires, two different out-put are supplied:

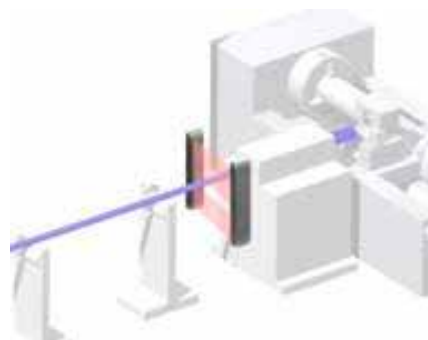
out A 24 volt at beams cross 0 Volt beam free

out B 0 volt at beams cross 24 volt beam free

200 different models are available as following table :

Resolution	from model	to model	height
0,9 mm	NI 01 - 40	NI-H 01 - 800	35 795 mm
2 mm	NI 02 - 40	NI-H 02 - 1280	35 1275 mm
4 mm	NI 04 - 40	NI-H 04 - 2560	35 2555 mm
8 mm	NI 08 - 80	NI-H 08 - 2900	70 2880 mm
12 mm	NI 12 - 100	NI-H 12 - 2900	95 2880 mm
25 mm	NI 25 - 100	NI-H 25 - 2900	95 2880 mm
Range	range : from 50 mm. up to 8 m. on function of type.		

For details see the site www.grein.it



■ Barriers no safety type NS

These curtains are realized to give informations of dimensions-position and form of object detected
 The system is formed by an emitter and receiver that generates a grill of parallel beams to detect the presence of object, to cause the form and position, to transfer to the control system. the interaxe of beams can be from 5 to 12 mm. interpolated 10 - 24 - 48 mm

The height of the curtains are between 80 to 2900 mm. with range up to 10 m.

Different out put are supplied:

analog, 0-10 volt or 4 - 20 mA

type A gives the position of first beam cross, to control the position of object

type B gives the proportional signal on the basis of number of cross beams, to determined the dimension of the object under control

serial, RS 485 with protocol mod. BUS-RTU supplied the indication of the state of beams :
 free or engaged

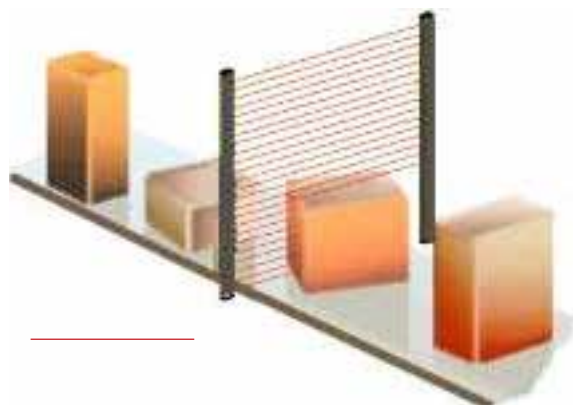
All the circuit are contained on the barriers and it is no necessary any external module in order to reduce the dimension- cost and time of installation.

Applications:

- control of body or vehicle on automatic door.
- control of obstacle on automatic parking
- level control
- measure of packing dimensions
- automation in general

150 different models are available as following table :

Resolution	to model	up to model	height of detection
5 mm interp.	NS-T 05- 80	NS-T 05- 1200	from 80 up to 1200 mm
12 mm interp.	NS-T 12- 095	NS-T 12- 2900	from 94 up to 2878 mm
10 mm	NS 10- 080	NS 10- 2400	from 92 up to 2412 mm
24 mm	NS 24- 095	NS 24- 2900	from 95 up to 2902 mm
48 mm	NS 48- 095	NS 48- 2900	from 142 up to 2926 mm



■ Pressure sensitive devices and edges

conforming to EN-ISO 13856-2



These products are formed by a ribbon switches to elevated sensibility to the pressure. They can be assembling to the special rubber (EPDM) to prevent damage on the big door – gates – automatic store – elevator flat – etc.

■ Principle of operation

The system uses pressure ribbon switches that offer a broad range of sheathing materials, switch lengths, exterior colour and lead wire combination, as well as substantial resistance to moisture and chemicals.

They are employed to control the movement of machines or other moving part, that can cause accidents.

The ribbon switches are a continuous NO contact.

These ribbons have fail-safe wiring conform to category 3 of EN 954 when used in connection with our PS-3 controllers.

The elements are normally open, momentary contact, pressure actuated switch. They are available in lengths ranging from 0,2 m to 300 m. The conductors are made from a precisely formulated alloy which has a low resistance to produce a highly consistent switching action, together with an external long mechanical life expectancy. They are designed for more than 3 millions operations at any given point.

Self adhesive backing or foam tapes hold and position the switch. For permanent mounting in commercial vehicle or industrial use, we provide aluminium or PVC extruded channel.

They are also available in do-it-yourself kits for field fabrication and installation.

Applications

For industrial safety:

- switches of emergency on every type of machine
- control on conveyors
- for control applications are available types for use with 2 wires without resistor no safety
- for safety applications are available model with:
 - 4 wires without resistor
 - 2 wires with resistor

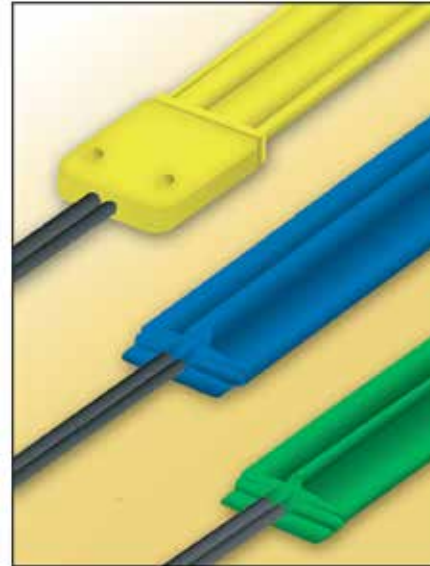
For civilians:

- signalings of incomes for opening doors
- controls for handicapped people
- alarms for banks
- drive chronometers for swimming pools

Chemical characteristic:

Optimal resistance to:

- oil-petro-kerosene
- acid and alkaline
- alcohol and tetrachloride



Specifications and ratings:

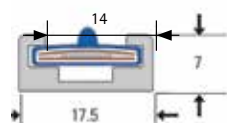
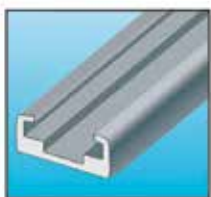
- | | |
|-------------------------|--|
| - Operating voltage | 32 Vcc / ca |
| - Operating current | 1 A max. |
| - Dielectric resistance | 1000 V / d.c. |
| - Electrical resistance | 4 ohm / m |
| - Cable connections | PVC normal
other for special applications |
| - Operating temperature | -15 +60°C |
| - Protection degree | IP 65 |
| - Operating life | 3 millions of operation |
| - Material covering | PVC |
| - Typical weight | 45 gr. / m |

Are available 2 types without resistance for applications not safety
Are available for safety the model with 4 wires without resistance and model with 2 wires with resistance 8,2 Kohm

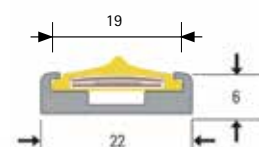
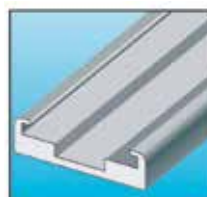


Aluminium channel

Type 404 (for 102-A and 102-F types)



Type 406 (for 202-L type) also in PVC plastic



Standard types

Ribbon	102-A	102-F	202-L
Profile			
Dimensions	14 x 4 mm	14 x 8,5 mm	19 x 5 mm
Actuating force	2 Newton (0,2 Kg)	15 Newton (1,5 Kg)	5 Newton (0,5 Kg)
Bend radius	10 mm	60 mm	15 mm
Description	Lowest profile for tight spaces or to prevent accident actuation	Low profile contoured switch which can be bent around smoothly curved corners used as a hand or foot activated machine Stop/Start.	General purpose switch for industrial, medical, and transportation applications.

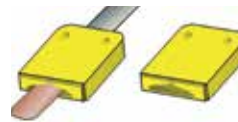
Terminals for 102/A and 102/F

type LD with welded cable or terminal type D with cable 500mm



Terminals with connector 202/L

type C for model 202-L with cable 500 mm



Identification code of ribbon switches:

	Model	lengths	type cables	output side	cable lengths	sealing	aluminium channel
Ribbon blue color	102-A						
Ribbon red color	102-F						
Ribbon yellow color	202-L						
To specify in mm							
4 wires fail safe	F						
2 wires fail safe with R=8,2KOhm	R						
2 wires no safety	S						
Only one side	O						
From two sides	E						
From final sides (with R=8,2KOhm)	X						
500 mm	1						
2000 mm	2						
On request	3						
Sealing with connector	C						
Sealing with connector	D						
Sealing with welding	LD						
Aluminium channel type 404-406	Y						
No channel	N						

Note: the ribbon with resistor has only 2 wires

■ Pressure sensitive devices conforming to EN ISO 13856-2



■ Characteristics

The sensing edges are pressure sensitive devices designed to protect both personnel and equipment in industrial environments. They are in a range of different profiles and sensitivities to suit various applications. These edges are fail-safe wiring conforming to category 3 of EN 954 when used in conjunction with PS-3 controllers.

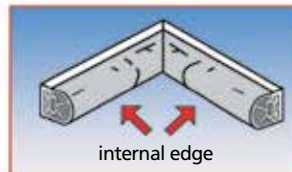
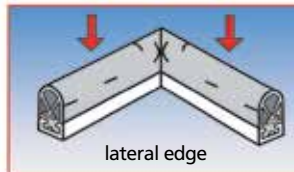
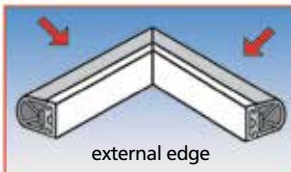
The construction of the sensing edge is based on a continuous length of ribbon encased in a durable housing material which is fitted into a choice of channel.

pag. 38-39.

■ Main features

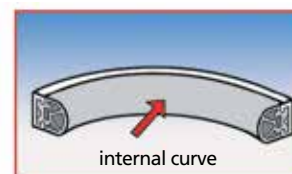
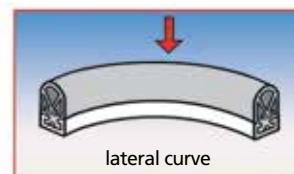
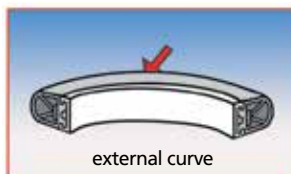
- Wide range of models
- Low pressure actuation
- Custom configuration
- Fail - safe operation
- Multiple sensors connected in series
- Operative angle more of 45 °
- Connection with 2 or 4 wires, depends of the employ of resistance of 8,2kohm
- Cable connection in PVC normal type
- Other for special applications

Right and angle edges



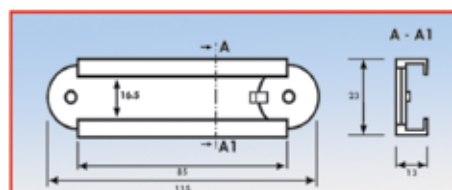
In case of special design for perimeter protection, specify on the drawing.

Curved edges

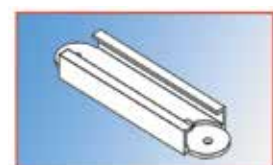


■ Curved edges flexible sensing for GR 503 – GR 747 –GR 748 – 757

The support BS-3 is realized to resolve the problem of curved edges in way very simple without interfere from a radius required. The min. radius is 1.5 m. The solution proposal gives a big advantages as the customer can decide the value of the bended.



Dimensions of type BS 3



■ Guide to edges selection

To choose the right bump switch for the application required, consider the following three characteristics which define the performance:

- Actuating force of the rubber before the contact closure
- Activation of the contact through further pressure
- Overtravel distance after the contact closure

These characteristics vary depending on the housing selected and the

position of the sensor inside the rubber, as reported on the following table:

Housing type	Compliance	Activation	Overtravel
low profile	none	immediate	minimal
medium profile	some	after compliance	some
high profile T	minimal	immediate	maximun
high profile B	moderate	after compliance	maximun

■ Applications

- doors and industrial gates
- personnel lifts
- automatic store
- conveyor systems
- robotics areas
- medical table

- The edge with high profile type T have the cavity for sensor on high position.
- The edge with high profile type B have the cavity for sensor on low position.

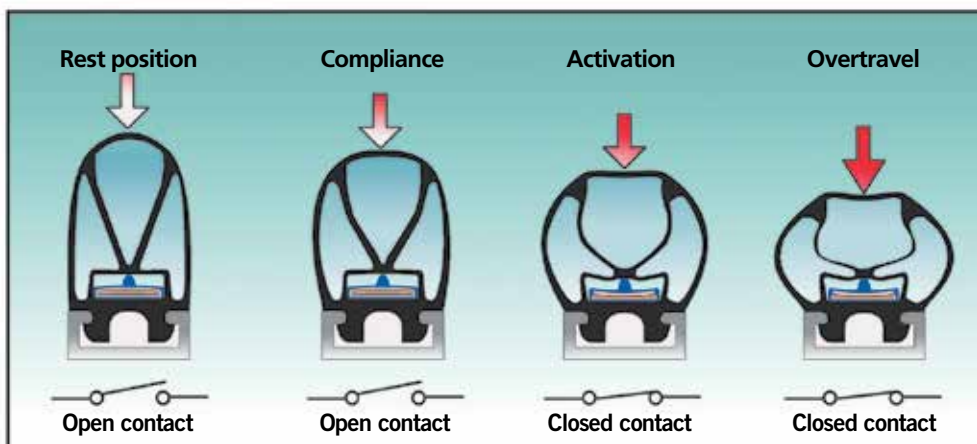
Features

- **Rest position**
the edge in normal condition is ready to work (with NO contact)

- **Compliance**
compression of the housing before contact closure occurs (with NO contact)

- **Activation**
the point at which contact closure occurs (with NC contact)

- **Overtravel**
the distance of the housing can compress after contact closure occurs (with NC contact)



■ Specifications

Edges on nitrilic rubber

Operating temperature

- 15 + 65 °C

Protection class of the sensor

IP 56 on request IP 65

Max operating voltage

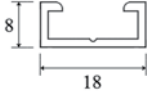
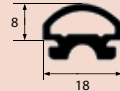
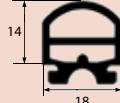
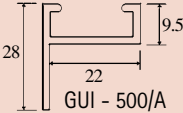

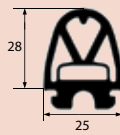
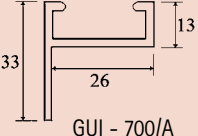
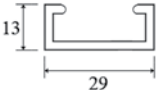
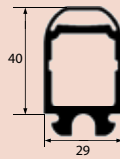
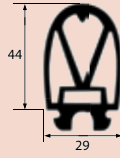
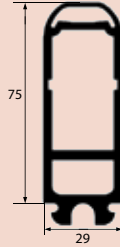
32 volt d.c./a.c.

Max operating current

1 Ampere

Hardness of rubber

70 Shore

Aluminium channel (angle or flat)		Drawing	Type	Material	weight/m	Colour
Ad angolo	Piatta					
	 GUI - 300/P		GR-306	EPDM	300	Black
			GR-316	EPDM	350	Black
 GUI - 500/A	 GUI - 500/P		GR-503	EPDM	600	Black
 GUI - 700/A	 GUI - 700/P		GR-747	EPDM	700	Black
			GR-748	NBR	900	Black
			GR-757	EPDM	1100	Black

Edges available with 5 m of length

- Type NBR

elastomery to resist lubricating oil and cooling liquid on tool machinery

- Type on etil-propilic resin EPDM

to resist to acid and atmosferic agents

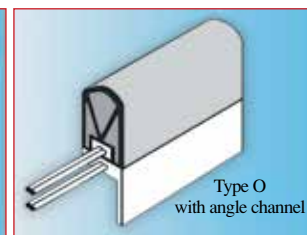
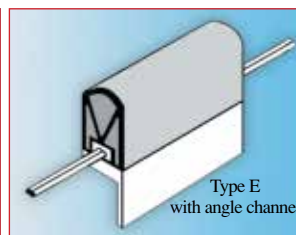
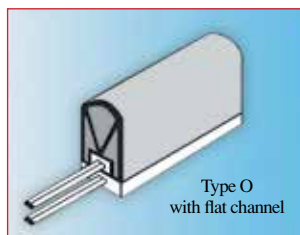
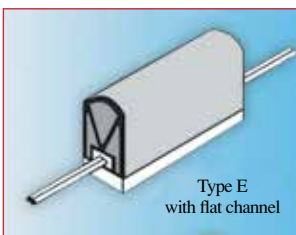
Actuating distance	Overtravel movement	Actuating force	Description	Applications
		**		
< 1,5 mm	2 mm	50 Newton < 5 Kg	Miniature edge for compact spaces working at minimum pressure.	<ul style="list-style-type: none"> - sliding doors - conveyors system - disable facility - medical table
2 mm	2,8 mm	50 Newton < 5 Kg	Edge with low profile ideal for easy installation where space is restricted.	<ul style="list-style-type: none"> - sliding doors - robotic system - escalators - medical table
< 7 mm	5 mm	100 Newton < 10 Kg	Compact edge ideal for a wide range of applications to satisfy most mounting arrangements in accordance to head-on side impact.	<ul style="list-style-type: none"> - big moving doors at high speed - lift door - mobile vehicle
< 1,7 mm	21 mm	40 Newton < 4 Kg	Bordo ad alta sensibilità quando è richiesto un azionamento immediato. Funziona alla minima pressione.	<ul style="list-style-type: none"> - moving door - lift door - public bus door - theatrical stage
< 6 mm	17 mm	65 NNewton < 6,5 Kg	Compact edge adapt for lateral pressure ideal for a lot of applications in particular used where is the presence of oil on tool machine.	<ul style="list-style-type: none"> - door of tool machine - lateral bumper - escalator mobile - lift door
< 1,5 mm	35 mm	58 Newton < 5,8 Kg	Sensing edge which is typically used where is immediate activation required with big overtravel.	<ul style="list-style-type: none"> - big mobile door at high speed - escalator mobile - lift door - rotating doors

test effected with test rod diam. 80 mm

Identification code of edges

	Model	length	type of channel	materials of channel	type of cable	cable output	cable lengths	caps fitted
GR-306 in EPDM	= 306							
GR-316 in EPDM	= 316							
GR-503 in EPDM	= 503							
GR-747 in EPDM	= 747							
GR-748 in NBR	= 748							
GR-757 in EPDM	= 757							
to specify in mm								
flat for every type	= F							
angle for GR-747-748-757	= A							
curve for GR-503-747-748-757	= C							
aluminium	= A							
PVC for curve edges	= P							
fail safe 4 wires	= F							
fail safe 2 wires (with R=8,2KOhm)	= R							
no safe 2 wires	= S							
output only one side	= O							
output on two sides	= E							
output with final resistor	= X							
500 mm	= 1							
2000 mm	= 2							
on request	= 3							
end cap for types GR-306-316-503-747-748-757	= Y							
no caps	= N							

Note: All edges are black, except the GR-748 type that is available in a yellow version



Example of applications



Theater stage and auditorium



Medical equipment

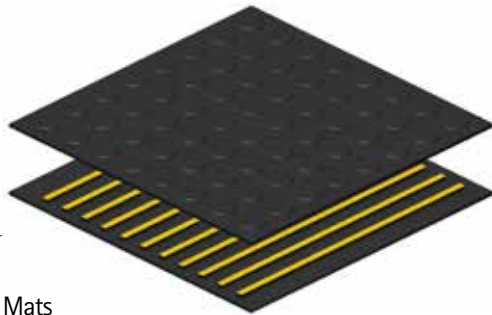


Factory automation

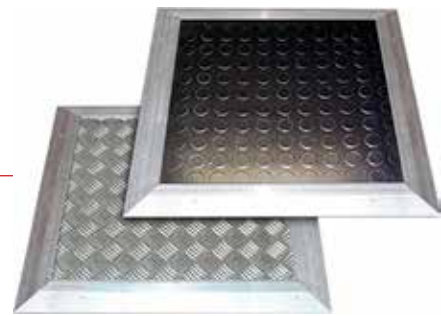


Transportation and handicapped accessibility

■ Safety mats



Mats



Mats



Kiddie Rides



Mats

They are sensitive device to control the presence of body in dangerous area.
They operates when pressure is applied to the mat surface giving the block of the safety system.
Are used on wood – ceramics machines – mobile escalator – automatic store – robotic areas –
kiddie rides – etc.

■ Main features of mats in accordance EN ISO 13856-1

■ Characteristics

Safety mats are devices which are used to guard the floor area around a dangerous zone. They can be used to provide primary guarding where other type of guarding may be inflexible or impractical and also to provide secondary guarding i.e. they can be used in conjunction with an interlocked fence or light curtain to protect awkward shaped machinery. In essence to provide presence-sensing of operators for as long as they remain inside a dangerous area.

A safety mat operates when pressure (usually from an operator's foot) is applied to the mat surface.

The result is a signal being to the safety mat controller which in turn will be send a stop to the machine control system. The dimensions and the positioning of the mats should be in accordance with the guidelines in EN 999. The mat will be supplied for every form and dimensions. An aluminium edge is be used to fix the mats in position on the floor.



■ Technical characteristics

- Maximum dimension for single mat 1500 x 2500 mm
- Top on PVC of 4 mm thickness
- Bottom on PVC of 3 mm tickness
- Depth 9 mm
- Weight about 12 Kgs/sqm
- Actuation force 25 Kgs with test rod of 80 mm diam.
45 Kgs " " " 200 mm "
- Static load 60 kgs/sqcm
- Operating voltage 32 volt d.c.
- Switching current 1 Ampere 24 volt
- Dead zone 30 mm around outer edge
- Operating temperature - 10 ° + 60 ° C
- Response time 40 msec.

Applications

- Dangerous area for operators
- Automatic stores
- Conveyor systems
- Wood machinery
- Assembling lines
- Mobile escalators
- Robotics area

Range of types

- Models TO/1 - 2 - 3 standard type in bull PVC
- Models MO/1 - 2 - 3 standard plus aluminium protection cover
- Models MZ/1 - 2 - 3 standard as MO plus zinc metal sheet on the bottom when the surface of the floor is not uniform
- Type 1 is intended for a surface up to 1 sqm
- Type 2 is intended for max width up to 1m and max length of 2.5m
- Type 3 is " " " " " " 1.5 m " " " "
- The cable of 4 wires are normally supplied

■ Identification code

Type	Code
For surfaces in PVC up to 1 sqm.	TO-1 (+ size to specify)
For surfaces in alluminium up to 1 sqm.	MO-1 (+ size to specify)
For surfaces with zinc metal sheet up to 1 sqm.	MZ-1 (+ size to specify)
For surfaces width 1 m and lenght up to 2,5 m in PVC	TO-2 (+size to specify)
For surfaces width 1 m in alluminium and lenght up to 2,5 m	MO-2 (+ size to specify)
For surfaces width 1 m with zinc metal sheet lenght up to 2,5 m	MZ-2 (+ size to specify)
For surfaces width 1,5 m and lenght up to 2,5 m in PVC	TO-3 (+ size to specify)
For surfaces width 1,5 m in alluminium and lenght up to 2,5 m	MO-3 (+ size to specify)
For surfaces width 1,5 m with zinc metal sheet lenght up to 2,5 m	MZ-3 (+ size to specify)
Mat for strong application	CKP/ S1 (+ size to specify)
Alluminium edging AG-11 / 1	AG-11 / 1
Alluminium edging AL-12 / 2	AL-12 / 2
Alluminium edging AE-13 / 2	AE-13 / 2
Corner in PVC SGFG / 05	SGFG / 05
Type of mat without aluminium edging	SB
Type of mat with aluminium edging fixed on the unit	BM
Type of mat with aluminium edging not fixed	BS

Example: MZ1-0800-0800-3000-AL12/2-BS

Mat 800 x 800 mm with cable L = 3000 mm. with aluminium protection cover plus zinc metal sheet on the bottom complete of aluminium edging supplied melted.

Accessoires

Type GUI-TP1 for mats type TO - MO 1-2-3



Type GUI-TP2 for mats type TO-1-2-3 (depletion phase)



■ Bumpers

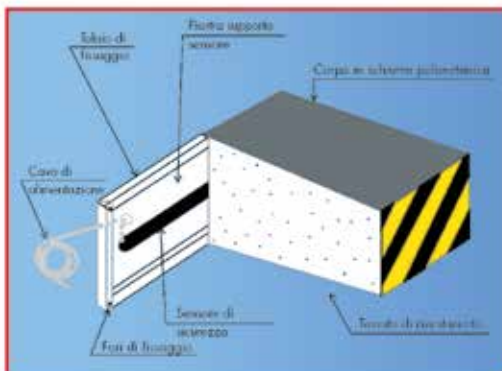
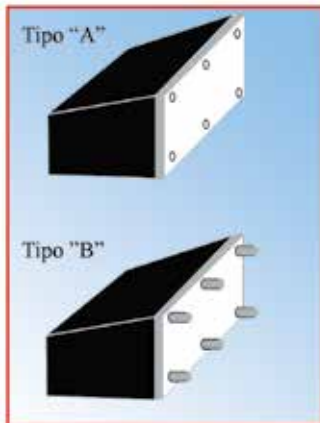


They are utilized to prevent collision of the operator against vehicles or movement machines. The bumper are able to absorb the impact and to produce a signal to stop the machine. They are used on AGV trolley – mobile platform for airplane – automatic store – etc.

■ Main features on bumper

The bumpers are the latest innovation for safety on transport vehicles or on moving machinery that can crash and harm personnel. This sensing device utilizes a highly durable and flexible thermoplastic material which when pressed, closes the internal sensors.

They are formed by a poliuretanic foam (designed under customer drawing) with ribbon switches incorporated inside. The bumper is designed for fail-safe circuit to ensure proper monitoring of the system.



■ Technical characteristics

- Zinc steel frame for fixing to the machine
- Aluminum plate to close the bumper and to fix the ribbons
- Corp on poliuretanic foam
- External housing:
 - Standard with water proof tissue
 - Special with anti-flame to resist to melting metal
 - Special design with PVC cover for out-side installation i.e. for tripod
- Colour black with oblique yellow lines on front
- Activation force 5-7 Kgs
- Electrical circuit 1 A 24 volt d.c.
- Chemical resistance: good for water - acid - base - alcohol - solvent ect.
- Cable for power 5 wires L = 3 m
- Water tight IP 65
- Temperature 0 - 55 C °
- Actuating distance about 10-30 mm (depending from dimensions)
- Compression of the housing before contact closure occurs: depending on depth of bumper. It is very important to avoid the collision with operators.

Applications

- Pallets wrap machinery
- Automatic guided vehicle
- Large moving equipments
- Work plat form
- Telescopic conveyors
- Aircraft loaders

Brackets system for installation:

The metal sheet can be supply on two different versions:

Type A)

sheet with holes 8.5 mm the number depend from the length.

Type B) sheet with captive screws M 6 L = 30 mm

Characteristics

Compression before contact closure:	10 %	of the depth
Max compression	60 %	" "
Indeformabile part	30 %	" "
Height of bumper	0.5	of width
Max length	3	m

■ Generalità

La gamma delle unità di controllo "PS" è disponibile in quattro modelli:

- This control units are designed to be used in conjunction with Safety Mats, Sensing Edge, Ribbon Switches and Sensing Bumpers, to form a complete safety system. They exceed the levels of Category 3 as given by EN954-1.

Four versions of the PS controller are available, all with the same high level of safety integrity but varying in the type.

The range of the control units is formed by 4 types:

- PS-1 for level 1 application's at low risk with 2 wires of connection (No safety)

- PS-3 for level 3 application's "Fail Safe" with 4 wires of connection without resistance
- PS-3/RS for level 3 application's "Fail Safe" with 2 wirew with resistor of 8,2Kohm for 1 sensor or edge.
- PS-3/RD as above but for 2 sensors or edges.

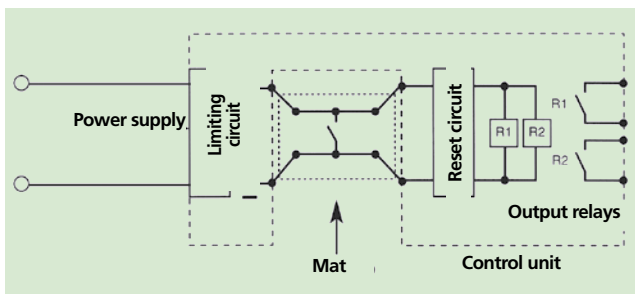
General for safety model PS3 (with 4 wires) without resistor in accordance EN 13849-1

The connections can be with 2 or 4 wires. All the control box are designed to supply safety to the plant against the short circuit or the cut of the connection cable.

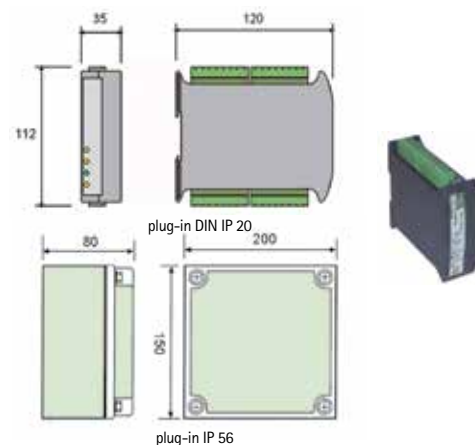
At open circuit (switch-edge-mat-bumper) on normal condition the two relays are supplied, while the pressure on the sensors (with NC contact) causes the relays to switch OFF. A limiting circuit prevents short circuit of the supply. The interruption of the cable or the sensors are detected in the OFF condition of two relays, as the short circuit on the contacts of relays. For these reasons the circuit is named "fail-safe" and meets category 3 as given by EN 954.

Characteristics

- automatic and manual reset
- enclosure protection IP 20 or IP 56
- working temperature -10° + 65°
- output relè 2NO+1NC 2 A 230 V
- response time from 9 to 16 msec
- DIN rail mounting
- power supply see table
- power consumption 300 mA
- max controlled lenght for edges 60 m
- max controlled area for mats 15 sqm



Dimensions



Control PS 3/RS with 2 wires with resistor for 1 sensor

When are required the connection with 2 wires is necessary to connect a resistance of 8,2 kohm (inside the sensor) in order to guaranty the safety of level 3.

This type of box, control only 1 sensor.

Control PS 3/RS with 2 wires with resistor for 2 sensors

It is identical to the previous type with the difference that are controlled two independent sensors, particular applied for the frontal and the rear protection of the machine.

The technical characteristics are identical of PS3/RS with the difference of the output relè with contacts 2NO 2A 250 V as the wiring.

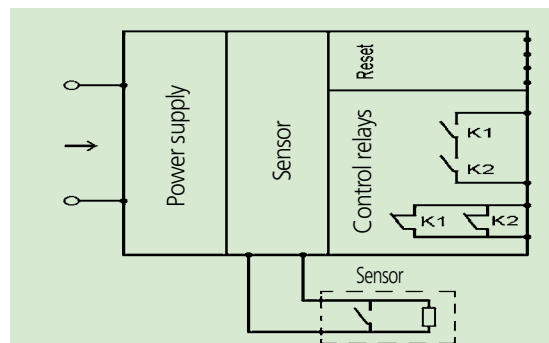
Dimensions and code identifications of the boxes

Level 1 with 2 wires		Code
PS-1 / A1 DIN box	24 V c.a.	P-09
PS-1 / A2 DIN box	110 V c.a.	P-10
PS-1 / A3 DIN box	220 V c.a.	P-11
PS-1 / A5 DIN box	24 V c.c.	P-12
PS-1-56 / A1 enclosure IP56	24 V c.a.	P-13
PS-1-56 / A2 enclosure IP56	110 V c.a.	P-14
PS-1-56 / A3 enclosure IP56	220 V c.a.	P-15
PS-1-56 / A5 enclosure IP56	24 V c.c.	P-16
Level 3 for 1 sensor with 2 wires with resistance		
PS-3RS / A1 DIN box	24 V c.a.	P-21
PS-3RS / A5 DIN box	24 V c.c.	P-22
PS-3RS / 56A1 enclosure IP56	24 V c.a.	P-23
PS-3RS / 56A5 enclosure IP56	24 V c.c.	P-24
Level 3 for 2 sensor with 2 wires with resistance		
PS-3RD / A1 DIN box	24 V c.a.	P-25
PS-3RD / A5 DIN box	24 V c.c.	P-26
PS-3RD / 56A1 enclosure IP56	24 V c.a.	P-27
PS-3RD / 56A5 enclosure IP56	24 V c.c.	P-28

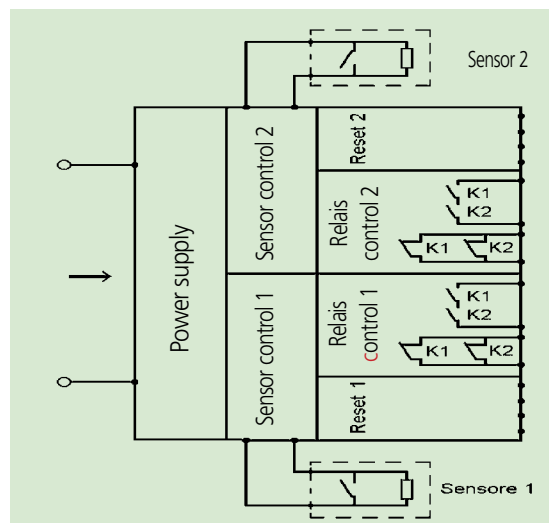
Technical characteristics

- automatic and manual reset
- enclosure protection IP 20 or IP 56
- working temperature -10° + 65°
- output relè 1NO/NC 2 A 230 V
- response time 10 msec
- DIN rail mounting
- power supply see table
- power consumption 300 mA
- max controlled lenght for edges 60 m
- max controlled area for mats 15 sqm
- max lenght of connection wires 250m with the section of 0,35 sqmm

Wiring connection of PS3/RS



Wiring connection of PS3/RD





■ Commercial organization

Europe

Italy
Croatia
Finland
France
Poland
Czech Republic
Rumania
Slovakia
Slovenia
Spain
Switzerland
Turkey
Hungary

America

Brasil
Canada
Colombia

Asia

China
India

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