

## Pressure-Sensitive Mat Systems

Safety mats for protection of people around machinery, robots & other hazardous areas

Signal mats for activation of a device or counter through presence detection

**Safe, reliable, low maintenance**

■ Wide variety of sizes & shapes available

■ Easy to install

■ Safety category 3 systems available

■ Manufactured in the USA

# Pressure-Sensitive Mats

## Durable and reliable

BBC Bircher Smart Access pressure-sensitive mats are durable products with well-balanced sensitivity that are ideal for a variety of safety or control applications. In combination with a BBC Bircher cat. 3 safety controller, BBC Bircher safety mats are type-tested according to EN ISO 13856-1 and correspond to PL e and Safety Category 3 according to EN ISO 13849-1. The unique edge design allows multi-mat systems to have consistent detection across seams without the need for joining trim. This benefit reduces installation time and material costs.



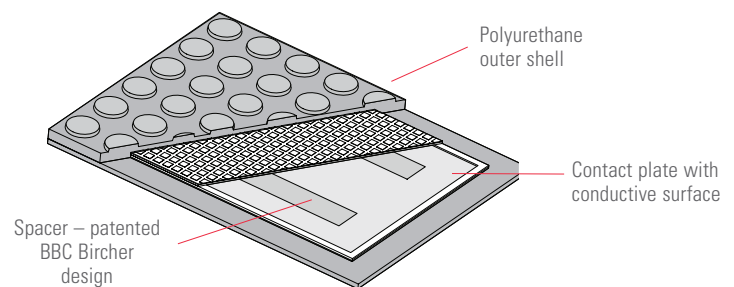
## Your benefits

- Maintenance-free
- Easy to install: two-wire fail-safe connection achieved when used with BBC Bircher safety controller & resistor
- Custom shapes & sizes available
- Can also be wired as a four-wire system for use with a 3rd party safety controller<sup>1</sup>
- Molded, totally sealed design is water resistant
- Multiple activation zones available
- Mats can be easily joined together to create larger systems
- Mats are silicone-free, PVC-free option also available
- Manufactured in the USA – quick turnaround time



## Mat design

BBC Bircher Smart Access pressure-sensitive mats consist of copper clad epoxy sheets encapsulated in black polyurethane compound. Copper offers superior corrosion resistance compared to other safety mat contact plates.

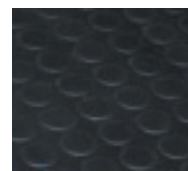


*Non-standard knob surface pattern shown above*

## Surface pattern options



Standard non-skid surface



Knob surface

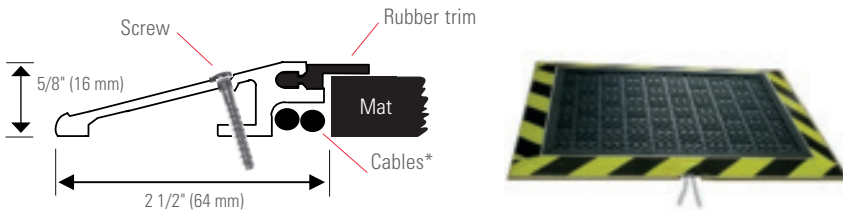


Smooth surface (no pattern)

## Aluminum trim options

### Aluminum ramp trim

Use extruded aluminum ramp trim to secure pressure-sensitive mats to the floor. Ramp trim increases safety by minimizing stumbling hazards and shifting of the mat system. Black & yellow awareness tape can be added to ramp trim for additional visibility. Ramp trim can withstand vehicle traffic.

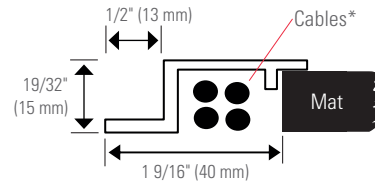


Ramp trim adds an additional 2 1/2" (64 mm) to each side on which it is used.

\*Please refer to technical data on page 4 for standard supplied cable diameter.

### Aluminum machine-side trim

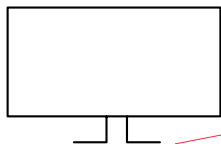
Use extruded aluminum machine-side trim to secure pressure-sensitive mats to the floor in close proximity to machinery. Machine-side trim is not suitable for vehicle traffic.



Machine-side trim adds an additional 1 9/16" (40 mm) to each side on which it is used.



## Standard mats



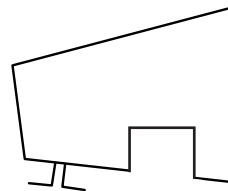
Standard cable exit location

- Two 12' (4 m) 2-conductor cable leads exiting the middle of the longer side
- Black non-skid diamond surface pattern
- Width and length measurement in inches (mat measurement only – not including dimensions with trim)
- **Sample part number** denoting standard 24" x 36" mat:  
**CESM-21CB-2436**
- **Sample part number** denoting standard 24" x 36" ramp trim kit:  
**ASSY ES-S2436**

Standard mat & corresponding ramp trim kit sizes  
(width x length in inches):

24" x 24"	24" x 30"	24" x 36"	24" x 42"	24" x 48"
24" x 60"	24" x 72"	30" x 30"	30" x 36"	30" x 42"
30" x 48"	30" x 60"	30" x 72"	36" x 36"	36" x 42"
36" x 48"	36" x 60"	36" x 72"	42" x 42"	42" x 48"
42" x 60"	42" x 72"	48" x 48"	48" x 60"	48" x 72"

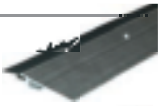





## Custom mats & mat systems





- Create large custom systems with multiple mats
- Cut-out, mitre & multiple zone options available
- Customer-specified cable length
- Customer-specified cable exit location (two 2-conductor leads in any length located at least 2" from a corner – only on sides that will not be joined against another mat)
- Standard BBC Bircher Smart Access mat options will be used if custom options are not specified
- Customer-specified trim: ramp and/or machine-side options available
- Drawings are required

## Accessory Order Information

Safeguarding requirements for the majority of safety mat applications can be met with the products listed below. Contact BBC Bircher Smart Access for additional information or custom designs.

Part No.	Description	
<b>ES-S</b>	Aluminum ramp trim, to fit all safety mats with mitre cutting, holes, screws & rubber trim (specify mat system dimensions)	
<b>ES-SZ</b>	Aluminum machine-side trim, cut to length without mitre cutting, holes or screws	
<b>ES-Tape</b>	Yellow/black adhesive awareness tape Sold in 108 ft (33 m) rolls	
<b>ES-WID</b>	8.2kOhm resistor – one supplied complimentary per mat system	
<b>ES-CON</b>	Lead wire connector kit – 2 pieces Crimp splices & shrink tubing	
<b>ES-EC</b>	Extension cable – 2 x 20 AWG wires (0.5 <sup>2</sup> mm dia.) inside 5 AWG (4.5 mm dia.) PVC jacket	

## Safety Controller Order Information

Part No.	Description	
<b>210985 ESD3-04-24ACDC</b>	Automatic reset, 24 VAC/DC	
<b>210983 ESD3-04-115AC</b>	Automatic reset, 115 VAC	
<b>210984 ESD3-04-230AC</b>	Automatic reset, 230 VAC	
<b>210994 ESD3-06-24ACDC</b>	External (manual) reset, 24 VAC/DC	
<b>991003 SMPS</b>	Switched mode power supply, DIN rail mount Input = 100 - 240 VAC, Output = 24 VDC	

## Safety Controller Features

- Rated PL e, meets safety category 3 acc. to EN ISO 13849-1 when used with the safety mat. (certificate available upon request)
- Easy to wire: fail-safe wiring using 2 lead wires and an external terminating 8.2kOhm resistor
- Two input terminals to connect multiple mats/edges
- Automatic or external (manual) reset options
- Redundant safety outputs
- Auxiliary output
- DIN rail mount

The following chart provides the **safety output** logic of all BBC Bircher Smart Access ESD3 series controllers.

### Safety Output Logic

System operative (ie. machine running)	Sensor actuated (ie. person steps on mat)	Wire failure / no voltage (ie. broken wire)
Closed	Open	Open

The additional **auxiliary output** can be used to operate a light, buzzer, etc. For the auxiliary output logic of the entire ESD3 controller series, please visit our website.

## Technical Data

<b>Mats</b>	
<b>Material</b>	Polyurethane compound
<b>Color</b>	Black
<b>Min/max dimensions (Length x width)</b>	Max. 48" x 72" (1219 x 1828 mm) Min. 8" x 8" (200 x 200 mm) Tolerance: +1/-1.5 mm
<b>Thickness</b>	Thickness: .4" (10 mm) Tolerance: ± 1.5 mm
<b>Weight (approximate)</b>	Mat: 4 lbs/ft <sup>2</sup> (20 kg/m <sup>2</sup> ) Ramp trim: 0.4 lbs/ft (0.6kg/m)
<b>Inactive zone</b>	1 ¼" (32 mm) on cable side ¾" (19 mm) on other sides
<b>Operating temperature</b>	32° to 125° F (0° C to 50° C)
<b>Loading capacity</b>	2,900 lbs/in <sup>2</sup> (2,000 N/cm <sup>2</sup> )
<b>Vehicle capacity</b>	For 6,000 repetitions Solid rubber tire 2,200 lbs (1000 kg)/tire Pneumatic tire (90 mm dia.) 4,400 lbs (2000 kg)/tire
<b>Voltage</b>	Max. 24 VDC/VAC, 0.5 A
<b>Insulation strength</b>	>1500 VAC
<b>Reaction time</b>	< 20 ms
<b>Actuating force</b>	< 66 lbs (30 kg) Typical force is 10-23 lbs (4.5- 10.5 kg)

BBC Bircher Smart Access safety mats meet the actuating force requirements defined by EN ISO 13856-1 and ANSI/RIA 15.06. The mat shall respond to a force of 66 lbs (30 kg) applied to a flat disc with 3.15" (80 mm) diameter placed anywhere on the effective sensing area

<b>Protection class</b>	NEMA 4 (IP67)
<b>Insulation resistance</b>	>1500 VAC
<b>Lead wires</b>	2 x 20 AWG wires (0.5 mm <sup>2</sup> dia) inside 5 AWG (4.5 mm dia) PVC jacket
<b>Standards conformity when used w/safety controller</b>	PL e, Safety Cat. 3 acc. to EN ISO 13849-1, tested acc. to EN ISO 13856-1
<b>Chemical resistance</b>	Weathering, ozone, oils, gasoline water at 68° F (20° C), paraffin, solvents, diluted acids

**Operating life**  
More than 1 million cycles at the same position with test piece of 3.15" (80 mm) diameter with a force of 170 lbf (76 lg/750 N) vertical down to the surface. Contact loaded with 24V/0.5A

### ESD3 Controllers

<b>Protection class</b>	NEMA 1 (IP 30)
<b>Operating temperature</b>	0° to 125° F (-15° to 50° C)
<b>Safety output</b>	2 Relays: 2A/250 VAC To be connected in series to meet safety category 3
<b>Auxiliary output</b>	1 relay: 1A/30 VAC
<b>Power consumption</b>	Max. 5 VA
<b>Power supply</b>	24 VACDC ± 10% / 115 VAC ± 10% / 230 VAC ± 10%
<b>Reaction time</b>	< 50 ms
<b>Dimensions (L x W x D)</b>	4" x 1 ¾" x 3" (104 x 45 x 79 mm)
<b>Weight</b>	9 ounces (250 g)

Note: Technical details and recommendations concerning our products are based on experience and are an aid for the orientation of the user. Details stated in our brochures and data sheets do not guarantee special properties of the products. This does not apply to special product properties confirmed in writing or individually on a case-by-case basis. Subject to technical alterations.

### BBC Bircher Smart Access

870 Pratt Ave N  
Schaumburg, IL 60193  
Phone 847 952 3730  
Fax 847 952 2005  
sales@bircheramerica.com  
www.bircher.com