

## Safety relays ESM-BL.. and ESM-BA..



- ▶ ESM-BL.. up to category 3 according to EN 954-1
- ▶ ESM-BA.. up to category 4 according to EN 954-1
- ▶ LED status indicators
- ▶ 1-channel or 2-channel control
- ▶ Up to 3 redundant safety contacts
- ▶ Auxiliary contact optional
- ▶ Short circuit and earth fault/ground fault monitoring optional



### Relay outputs

The outputs are electrically decoupled and of redundant design

### Connection options

By using suitable wiring the following functions can be selected:

- ▶ Relay start with automatic start or a start button
- ▶ Monitoring of downstream relays or contactors

On the series **ESM-BA..** safety relays, by using suitable wiring it is also possible to select:

- ▶ Simultaneity monitoring to monitor safety components over time
- ▶ Relay start using a monitored start button
- ▶ Short circuit monitoring to detect short circuits between the connection cables and to shut down the outputs or prevent relay starting if necessary
- ▶ Earth fault/ground fault monitoring to detect short circuits between the connection cables and earth or ground and to shut down the outputs or prevent relay starting if necessary

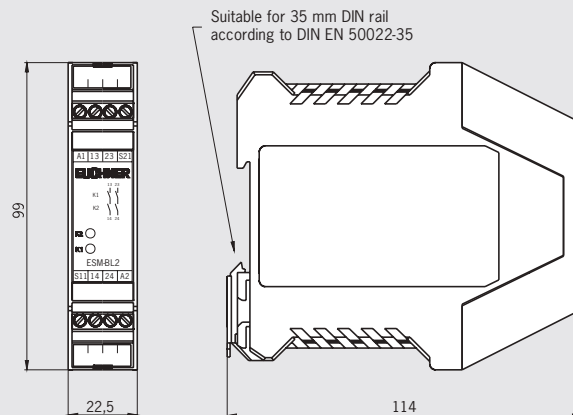
### Auxiliary contacts

On series ESM-BA3.. relays an electrically separate normally closed contact is available as an auxiliary contact

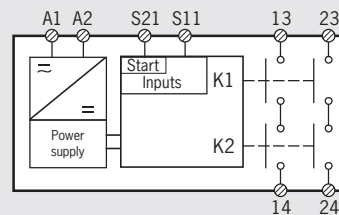
### Safety relay ESM-BL..



### Dimension drawing



### Block diagram



### Technical data outputs

Parameter	Value		
Minimum switching current at 24 V DC	20 mA		
Maximum switching voltage	DC 24 V / AC 250 V		
Utilization category * according to EN IEC 60947-5-1	$U_e$	$I_e$	$\Sigma I_e$
	AC-12	250 V	6 A
	AC-15	230 V	4 A
	DC-12	24 V	1,25 A
DC-13	24 V	2 A	12 A

$U_e$  = Switching voltage

$I_e$  = Maximum switching current per contact

$\Sigma I_e$  = Maximum switching current for all safety contacts (cumulative current)

\* See page 29 for information about the utilization category

### Ordering table

Series	Version	Outputs	AC/DC 24 V	AC 115 V	AC 230 V
ESM	BL Safety relay	2	085 607	085 608	085 609
		2 NO	ESM-BL201	ESM-BL202	ESM-BL203

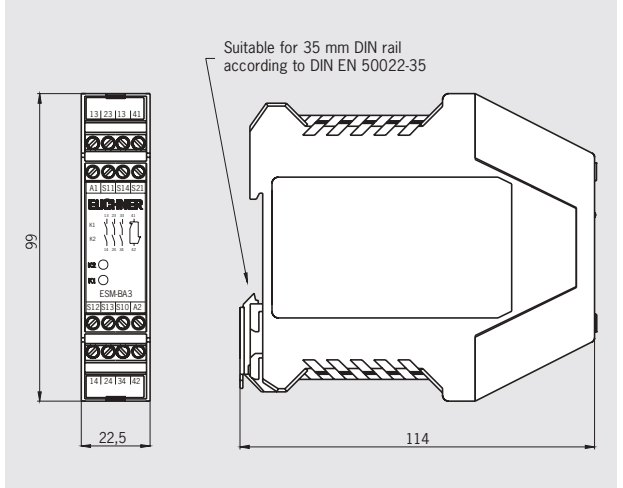
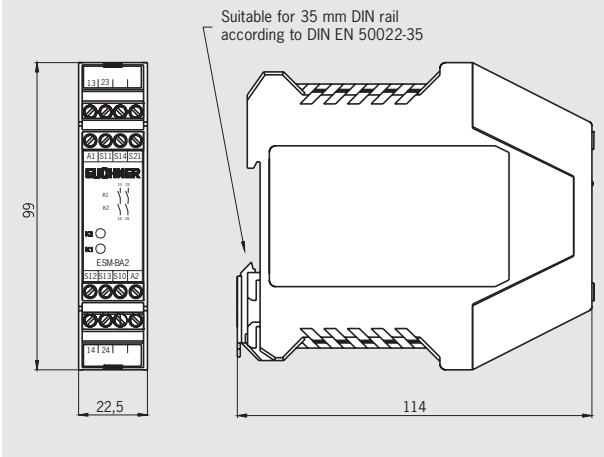


## Safety relay ESM-BA2..

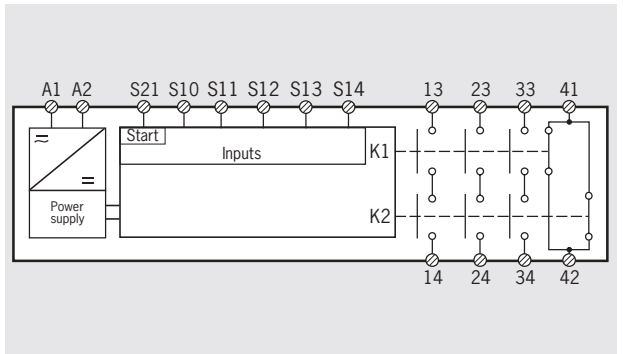
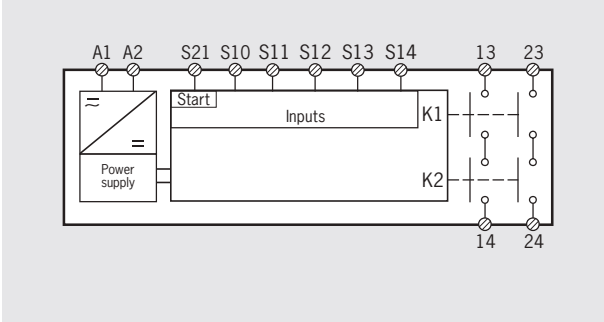
## Safety relay ESM-BA3..



### Dimension drawing



### Block diagram



### Technical data outputs

Parameter	Value		
Minimum switching current at 24 V DC	20 mA		
Maximum switching voltage	DC 24 V / AC 250 V		
Utilization category * according to EN IEC 60947-5-1	$U_e$	$I_e$	$\Sigma I_e$
	AC-12	250 V	6 A
	AC-15	230 V	4 A
	DC-12	24 V	1,25 A
	DC-13	24 V	2 A

$U_e$  = Switching voltage

$I_e$  = Maximum switching current per contact

$\Sigma I_e$  = Maximum switching current for all safety contacts (cumulative current)

\* See page 29 for information about the utilization category

Parameter	Value			
Minimum switching current at 24 V DC	20 mA			
Maximum switching voltage	DC 24 V / AC 250 V			
Utilization category * according to EN IEC 60947-5-1	$U_e$	$I_e$	$\Sigma I_e$	
	AC-12	Ue 250 V	8 A	
	AC-15	Ue 250V	3 A	
	DC-12	Ue 24 V	2 A	
	DC-13	Ue 24 V	2 A	
	ESM-BA302	AC-12	Ue 250 V	8 A
	ESM-BA303	AC-15	Ue 250V	3 A
		DC-12	Ue 50 V	8 A
		DC-13	Ue 24 V	3 A

$U_e$  = Switching voltage

$I_e$  = Maximum switching current per contact

$\Sigma I_e$  = Maximum switching current for all safety contacts (cumulative current)

\* See page 29 for information about the utilization category

### Ordering table

Series	Version	Outputs	AC/DC 24 V	AC 115 V	AC 230 V
ESM	BA Safety relay	2	<b>085 610</b>	<b>085 611</b>	<b>085 612</b>
		2 NO	ESM-BA201	ESM-BA202	ESM-BA203
		3	<b>085 613</b>	<b>087 412</b>	<b>087 413</b>
		3 NO + 1 NC	ESM-BA301	ESM-BA302	ESM-BA303

For technical data see page 21





## Housing



Parameter	Value					Unit
Housing material	Polyamide PA6.6					
Dimensions	114 x 99 x 22.5					mm
Weight	Approx. 0.25					kg
Connection type	Connection terminals					
Connection terminals	0.14 ... 2.5					mm <sup>2</sup>
Ambient temperature	<b>Base</b>	<b>ESM-BL2.. ESM-BA2..</b>	<b>ESM-BA3..</b>	<b>ESM-BT4..</b>	<b>ESM-2H..</b>	
	at U <sub>B</sub> = 24 V DC	-15 ... 60	-15 ... 40	-15 ... 40	-15 ... 40	°C
	at U <sub>B</sub> = 115/230 V AC	-15 ... 40	-15 ... 40	-	-	°C
	<b>Contact expansion</b>	<b>ESM-ES3.. ESM-TE3...</b>				
	at U <sub>B</sub> = 24 V DC	-15 ... 60				°C
	at U <sub>B</sub> = 115/230 V AC	-15 ... 40				°C
Degree of protection acc. to EN IEC 60529	IP 20					
Degree of contamination	2					
Mounting	35 mm DIN rail acc. to DIN EN 50022-35					
Life	<b>Base</b>	<b>ESM-BL2.. ESM-BA2..</b>	<b>ESM-BA3..</b>	<b>ESM-BT4..</b>	<b>ESM-2H..</b>	
	Mechanical	1 x 10 <sup>7</sup>		1 x 10 <sup>6</sup>	1 x 10 <sup>7</sup>	operating cycles
	Electrical	1 x 10 <sup>5</sup>		1 x 10 <sup>5</sup>	1 x 10 <sup>5</sup>	operating cycles
	<b>Contact expansion</b>	<b>ESM-ES3.. ESM-TE3...</b>				
	Mechanical	1 x 10 <sup>7</sup>				operating cycles
	Electrical	1 x 10 <sup>5</sup>				operating cycles

## Connection ESM-BL2..



Parameter	Value			Unit
Operating voltage	ESM-BL201	24 ± 10% <sup>1)</sup>		V AC/DC
	ESM-BL202	115 ± 10%		V AC
	ESM-BL203	230 ± 10%		V AC
Reverse polarity protection	On ESM-BL201			
Rated supply frequency	50 ... 60			Hz
Power consumption	Approx. 4			VA
Control voltage for start button	18.6 ... 26			V DC
Control cable length (cross-section 0.75 mm <sup>2</sup> )	Max. 1000			m
Control current for start button	Approx. 40			mA
Contact fuses	T4 / F6			A
Rated impulse withstand voltage	2.5			kV
Leakage path and air gap acc. to DIN VDE 0110-1	4			kV
<b>Safety contacts</b>	<b>2 NO contacts (redundant)</b>			
Minimum switching current at 24 V DC	20			mA
Maximum switching voltage	24			V DC
	250			V AC
Breaking capacity acc. to	6 A AC 250 V 2 A DC 24 V			
Utilization category <sup>2)</sup> according to EN IEC 60947-5-1		<b>U<sub>e</sub></b>	<b>I<sub>e</sub></b>	<b>Σ I<sub>e</sub></b>
	AC-12	250 V	6 A	12 A
	AC-15	230 V	4 A	
	DC-12	24 V	1,25 A	
	DC-13	24 V	2 A	
LED indicators	2, status display for relays K1 and K2			

1) All the electrical connections must either be isolated from the mains supply by a safety transformer according to EN IEC 61558-2-6 with limited output voltage in the event of a fault, or by other equivalent isolation measures.

2) See page 29 for information about the utilization category.

U<sub>e</sub> = Switching voltage      I<sub>e</sub> = Maximum switching current per contact

Σ I<sub>e</sub> = Maximum switching current for all safety contacts (cumulative current)

## Connection ESM-BA2..



Parameter	Value		Unit
Operating voltage	ESM-BA201	24 ± 10% <sup>1)</sup>	V AC/DC
	ESM-BA202	115 ± 10%	V AC
	ESM-BA203	230 ± 10%	V AC
Reverse polarity protection	On ESM-BA201		
Rated supply frequency	50 ... 60		Hz
Power consumption	Approx. 4		VA
Control voltage for start button	18.6 ... 26		V DC
Control cable length (cross-section 0.75 mm <sup>2</sup> )	Max. 1000		m
Control current for start button	Approx. 40		mA
Contact fuses	T4 / F6		A
Rated impulse withstand voltage	2.5		kV
Leakage path and air gap acc. to DIN VDE 0110-1	4		kV
<b>Safety contacts</b>	<b>2 NO contacts (redundant)</b>		
Minimum switching current at 24 V DC	20		mA
Maximum switching voltage	24		V DC
	250		V AC
Utilization category <sup>2)</sup> according to EN IEC 60947-5-1		<b>U<sub>e</sub></b>	<b>I<sub>e</sub></b>
	AC-12	250 V	6 A
	AC-15	230 V	4 A
	DC-12	24 V	1,25 A
	DC-13	24 V	2 A
			Σ I <sub>e</sub>
			12 A
LED indicators	2, status display for relays K1 and K2		

## Connection ESM-BA3..



Parameter	Value		Unit
Operating voltage	ESM-BA301	24 ± 10% <sup>1)</sup>	V AC/DC
	ESM-BA302	115 ± 10%	V AC
	ESM-BA303	230 ± 10%	V AC
Reverse polarity protection	On ESM-BA201		
Rated supply frequency	50 ... 60		Hz
Power consumption	Approx. 7		VA
Control voltage for start button	18.6 ... 26		V DC
Control cable length (cross-section 0.75 mm <sup>2</sup> )	Max. 1000		m
Control current for start button	Approx. 60		mA
Contact fuses	Slow-blow T6 / quick-blow F8		A
Rated impulse withstand voltage	2.5		kV
Leakage path and air gap acc. to DIN VDE 0110-1	4		kV
<b>Safety contacts</b>	<b>3 NO contacts (redundant)</b>		
Minimum switching current at 24 V DC	20		mA
Maximum switching voltage	50		V DC
	250		V AC
Utilization category <sup>2)</sup> according to EN IEC 60947-5-1	ESM-BA301		<b>U<sub>e</sub></b>
		AC-12	250 V
		AC-15	250 V
		DC-12	24 V
		DC-13	24 V
	ESM-BA302/303	AC-12	250 V
		AC-15	250 V
		DC-12	50 V
		DC-13	24 V
		8 A	
		3 A	
		2 A	
		2 A	
		8 A	
		3 A	
		8 A	
		3 A	
		Σ I <sub>e</sub>	
		15 A	
LED indicators	2, status display for relays K1 and K2		
<b>Auxiliary contacts</b>	<b>1 NC contact</b>		
Maximum switching voltage	24		V DC
	250		V AC
Utilization category <sup>2)</sup> according to EN IEC 60947-5-1		<b>U<sub>e</sub></b>	<b>I<sub>e</sub></b>
	AC-12	250 V	2 A
	AC-15	230 V	2 A
	DC-12	24 V	1,25 A
	DC-13	24 V	1,25 A

1) All the electrical connections must either be isolated from the mains supply by a safety transformer according to EN IEC 61558-2-6 with limited output voltage in the event of a fault, or by other equivalent isolation measures.

2) See page 29 for information about the utilization category.

U<sub>e</sub> = Switching voltage      I<sub>e</sub> = Maximum switching current per contact

Σ I<sub>e</sub> = Maximum switching current for all safety contacts (cumulative current)