

**From SG-EFS 134 ZK2/1 LR  
to SG-EFS 104/2W**

**A simple swap!**



Type	SG-EFS 134 ZK2/1 LR	SG-EFS 104/2W
<b>Safety classifications</b>		
ISO 13856: Reset function	with/without	with/without
ISO 13849-1:2015 only control unit as a pressure-sensitive protection device ISO 13856	Category 3 PL e Category 3 PL d	Category 3 PL d Category 3 PL d
MTTF <sub>D</sub>	313 years	256 years
DC <sub>avg</sub>	90%	60%
B <sub>10D</sub> [ × 10 <sup>6</sup> ]	2	1.8
<b>Times</b>		
Reaction time	< 10 ms	< 15 ms
Re-start time	< 190 ms	< 50 ms
<b>Control unit Inputs</b>		
Types of sensors	SM, SP, SL, MSL, SB	SM, SP, SL, MSL, SB
Monitoring type	Resistor 8k2	Resistor 8k2
Monitoring circuits	1	1
<b>Control unit Outputs</b>		
Switching channels	1 × 2-channel	1 × 2-channel
Switching current (min. / max.)	- / 2 A	- / 4 A
Switching capacity (max.)	960 VA / 24 W	1000 VA / 96 W
additional outputs	1 Signal circuit	1 Signal circuit
<b>Mechanical operating conditions</b>		
Attachment	Mounting rail IEC 60715	Mounting rail IEC 60715
IEC 60529: Degree of protection	IP40	IP20
Operating temperature	-20 to +50 °C	-25 to +55 °C
Dimensions (W × H × D)	45 × 75 × 105 mm	22.5 × 99 × 114.5 mm
<b>Variants</b>	<b>SG-EFS 134 ZK2/1 LR</b>	<b>SG-EFS 104/2W</b>
Part number	1003157	1005196
Connecting voltage U <sub>s</sub>	AC 230 V	AC/DC 24 V
		A power supply unit must be connected upstream with a connecting voltage <b>AC 230 V</b> . Maysер recommends a top-hat rail power supply with an output voltage of 24 V and output power of min. 5 W (e.g. Mean Well HDR-15-24).
<b>Connections</b>		
Supply voltage	9, 10	A1, A2
Sensor	1, 2	Y1, <b>Y3</b>
Switching channel 1	12, 13	13, 14
Switching channel 2	15, 16	23, 24
Signal circuit	7, 8	<b>41, 42</b>
Signal output Sensor	-	AC: M1, S1 DC: M1, A2
Signal output Fault	-	AC: M2, S1 DC: M2, A2
Reset manual	5, 6	<b>S1, S3</b>
Reset automatic	R, R	<b>S1, S2</b>

## LED indicators

Until now		Meaning	Now			
SG-EFS 134 ZK2/1 LR			SG-EFS 104/2W			
K1	K2	LED off: ○ LED on: ●	Power	Sensor	Output	Fault
○	○	No supply voltage	○	○	○	○
●	●	Control unit ready for operation	●	●	●	○
○	○	Sensor activated	●	○	○	○
○	○	Fault at sensor	●	○	○	●

## Successful change: the last few steps

### Inverting the signal circuit

With the SG-EFS 134 ZK2/1 LR, the signal circuit works the same way as the switching channels, whereas on the SG-EFS 104/2W it works opposite to the switching channels.

Invert the signal circuit with a downstream relay. Mayser recommends a top-hat relay (e.g. finder S48 or finder S75).

### Take reaction time into consideration

$T$  = Follow-through time of the complete system

$t_1$  = Response time safety edge

$t_2$  = Stopping time of the machine

$t_{SX}$  = Response time of the sensor SX

$t_{SG}$  = Reaction time of the control unit SG

The slightly longer reaction time of the SG-EFS 104/2W is put into perspective if the follow-through time of the whole system is taken into consideration:

$$T = t_1 + t_2$$

$$\text{where } t_1 = t_{SX} + t_{SG}$$

$$T = t_{SX} + t_{SG} + t_2$$

The reaction time of the control unit only makes up a small proportion of the follow-through time. However, the safety function should always be reviewed and – if critical – be calculated again.

### Check safety function

Until now	ISO 13849-1	Now
SG-EFS 134 ZK2/1 LR		SG-EFS 104/2W
3	Category	3
medium	$DC_{avg}$	low
high	$MTTF_D$	high
d	achieved PL	d

The change to an equivalent pressure-sensitive protective device now just needs to be documented in your safety assessment under the relevant protective function. Finished!