

**From SG-EFS 1X4 ZK2/1
to SG-EFS 104/2W**

A simple swap!



Type	SG-EFS 1X4 ZK2/1	SG-EFS 104/2W
Safety classifications		
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 _D	313 years	256 years
DC B _{avg} _{10D} [× 10 ⁶]	90% 2	60% 1.8
Times		
Reaction time	< 10 ms	< 15 ms
Re-start time	< 190 ms	< 50 ms
Control unit Inputs		
Types of sensors	SM, SL, MSL, SB	SM, SL, MSL, SB
Monitoring type	Resistor 1k2	Resistor 1k2
Monitoring circuits	1	1
Control unit Outputs		
Switching channels	1× 2-channel	1× 2-channel
Switching current (min. / max.)	10 mA / 2 A	- / 4 A
Switching capacity (max.)	500 VA / 48 W	1000 VA / 96 W
additional outputs	1 Signal circuit	1 Signal circuit
Mechanical operating conditions		
Attachment	Mounting rail IEC 60715	Mounting rail IEC 60715
IEC 60529: Degree of protection	IP20	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
Variants	SG-EFS 104 ZK2/1 1000841 AC/DC 24 V SG-EFS 114 ZK2/1 1001272 AC 115 V SG-EFS 134 ZK2/1 1000842 AC 230 V	SG-EFS 104/2W 1005196 AC/DC 24 V A power supply unit must be connected upstream with a connecting voltage AC 115 V or AC 230 V . 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).
Connections		
Supply voltage	A1, A2	A1, A2
Sensor	Y1, Y2	Y1, Y2
Switching channel 1	13, 14	13, 14
Switching channel 2	23, 24	23, 24
Signal circuit	31, 32	41, 42
Signal output Sensor	-	AC: M1, S1 DC: M1, A2
Signal output Fault	-	AC: M2, S1 DC: M2, A2
Reset manual	5, 6	S1, S3
Reset automatic	7, 8	S1, S2

LED indicators

Until now		Meaning	Now			
SG-EFS 1X4 ZK2/1			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

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:

$$T = t_1 + t_2$$

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.

An identical performance level

When determining the performance levels for a pressure-sensitive protection device according to ISO 13856 the values DC_{avg} and $MTTF_D$ now play an important role. The connected sensors in contrast must no longer be taken into consideration due to the fault exclusions according to ISO 13849-2 Table D.8.

Only the values of the control unit still apply. On the basis of a presumed high $MTTF_D$ value of the control unit, such a pressure-sensitive protection device can only reach a maximum of PL d.

Until now	ISO 13849-1	Now
SG-EFS 1X4 ZK2/1		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!