MAYSER®

Innovative by tradition.

From SG-EFS 104 ZK2/1i 8k2
to SG-EFS 104/2W

A simple swap!

Type	SG-EFS 104 ZK2/1i 8k2	SG-EFS 104/2W	
Safety classifications			
ISO 13856: Reset function	with/without	with/without	
ISO 13849-1:2015			
only control unit	Category 3 PL e	Category 3 PL d	
as a pressure-sensitive protection device ISO 13856	Category 3 PL d	Category 3 PL d	
$MTTF_D$	313 years	256 years	
DC_{avg}	90%	60%	✓
$B_{10D} [\times 10^6]$	2	1.8	
Times			
Reaction time	< 10 ms	< 15 ms	✓
Re-start time	< 250 ms	< 50 ms	
Control unit Inputs			
Types of sensors	SM, SP, SL, MSL, SB	SM, SP, SL, MSL, SB	
Monitoring type	Resistor 8k2	Resistor 8k2	✓
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 ZK2/1i 8k2**	**SG-EFS 104/2W**	
Part number	1005212	1005196	✓
Connecting voltage U_s	AC/DC 24 V	AC/DC 24 V	
Connections			
Supply voltage	A1, A2	A1, A2	
Sensor	Y1, Y2	Y1, **Y3**	
Switching channel 1	13, 14	13, 14	
Switching channel 2	23, 24	23, 24	
Signal circuit	33, 34	**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 104 ZK2/1i 8k2			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 104 ZK2/1i 8k2, 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 S7S).

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:

$$T = t_1 + t_2$$
$$\text{where} \quad t_1 = t_{SX} + t_{SG}$$

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

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 104 ZK2/1i 8k2		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!