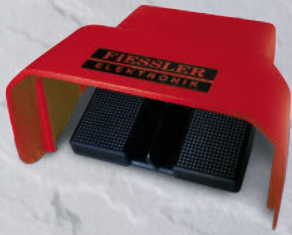


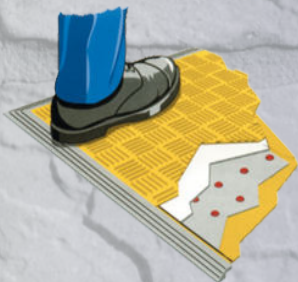
**FMSC**  
**switching**  
**device**

two-hand



foot pedal

standstill  
monitor



contact mat

PSDI





# Innovation



## Our passion:

Fiessler Elektronik has been producing optoelectronic components for the industry since 1956. The resulting development and production of the first fully electronic safety light curtain and safety light grid on the basis of the transmitter-receiver principle began in 1965.

Nearly 30 years later in 1996, Fiessler Elektronik was the first manufacturer worldwide to introduce the groundbreaking innovation of a specially coupled motion safety solution for blanking presses (AKAS®).

In 2005, Fiessler Elektronik completed its solution for blanking presses with its programmable FPSC safety control.

Permanent product care and new developments in dialogue with our customers is what guarantees perfect solutions and high quality products. Certifications, quality monitoring and prototype tests in accordance with worldwide standards are a matter of course for Fiessler Elektronik.

## Our vision:

We protect people from accidents and have convincing high quality innovative, user-friendly safety solutions for the customers and are always willing to provide the customer with help and advice.

# Service



## Service – worldwide

Fiessler Elektronik serves customers in all industrial regions of the world. The service network of Fiessler Elektronik is available in more than 30 countries.

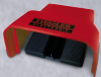
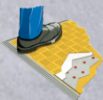



These support points provide effective supervision to machine manufacturers as well as end users.

# FMSC switching device

## type overview

### electronic switching device




With the electronic switching device you can retrofit and installed different switching device functions easily. At the respective machine the integration of the finished switching device with the integration diagram will be very quickly and easily.

Hardware overview			Inputs	Safety output	Standard outputs	Cross-circuit detection
FMSC FP	 page 5	12	4	5	Yes	
FMSC STM	 page 6	11	3	5	Yes	
FMSC ESM	 page 7	12	4	4	Yes	
FMSC THC	 page 8	10	2	2	Yes	
FMSC PSDI	 page 9	12	2	5	No	



# FMSC switching device

## Type overview

additional functions	basic function	emergency stop	safety door	relay monitoring	restart	restart interlock
 <b>FMSC FP</b> foot pedal evaluation	foot pedal evaluation	YES	NO	YES	YES	NO
 <b>FMSC STM</b> contact mat evaluation	contact mat evaluation	YES	NO	YES	YES	optional
 <b>FMSC ESM</b> standstill monitor	standstill monitor	NO	YES	optional	YES	optional
 <b>FMSC THC</b> two-hand-control	two-hand-control	optional	NO	optional	YES	NO
 <b>FMSC PSDI</b> PSDI control	PSDI control	NO	NO	optional	YES	YES

YES : connection necessary  
 optional : feature configurable  
 NO : feature not included



## foot pedal switching device FMSC-FP

With the foot pedal switching device, a second foot switch can be easily and cost-effectively retrofitted to an existing system

The device has the possibility to connect two foot switches in four operating modes. A selector switch (S0) can be used to set whether only one foot switch, foot switch 1 OR 2 or foot switch 1 AND 2 is active at a time.

Via the safety outputs the already existing (S2, K1 and K2) as well as the retrofitted (S3,K3) foot switch can be connected. The relays connected to the outputs are monitored for their switching states. Four further outputs are available for displaying an operating mode selection error (P1) or foot pedal contact error (P2, P4) and for request (P3) to pressing the restart button (S1).

## FMSC switching device

### technical data FMSC-FP

#### Inputs

- 4 different foot pedal operating modes:
- only foot pedal 1
  - only foot pedal 3
  - foot pedal 1 or 2
  - foot pedal 1 and 2
- restart-button  
foot pedal connection  
emergency stop (2-channel)

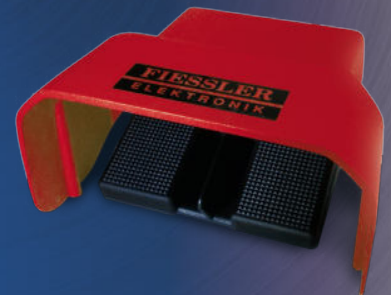
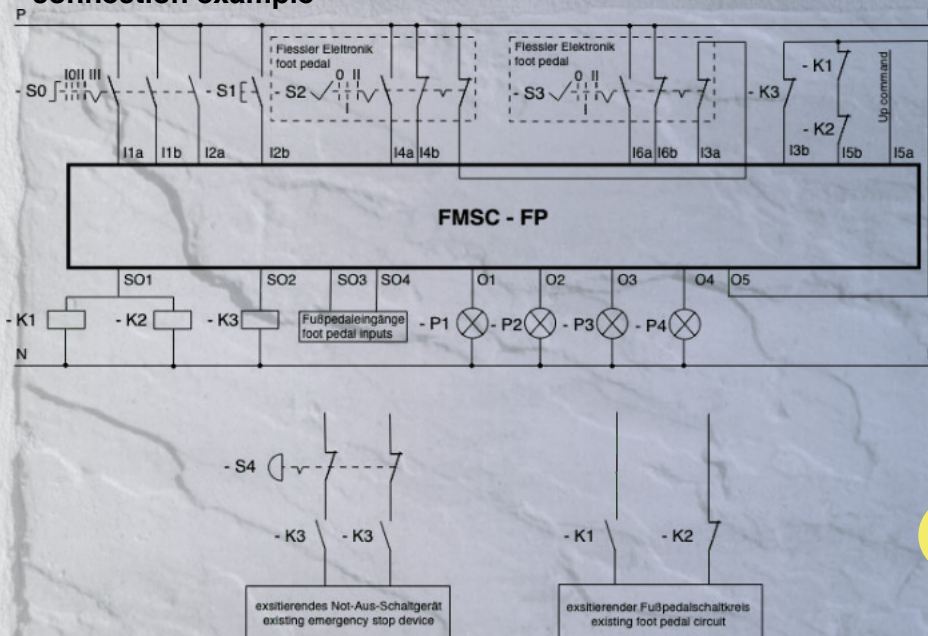
#### outputs

4 safety outputs for releas the foot pedal

#### message outputs

error operating mode selection and foot pedal contacts, restart necessary

#### connection example



## safety contact mat switching device FMSC-STM

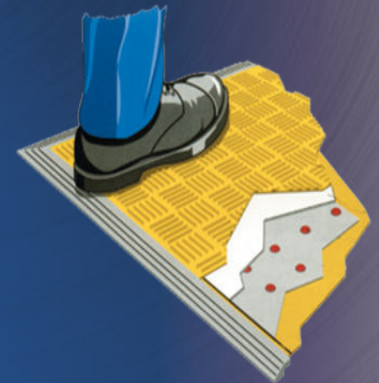
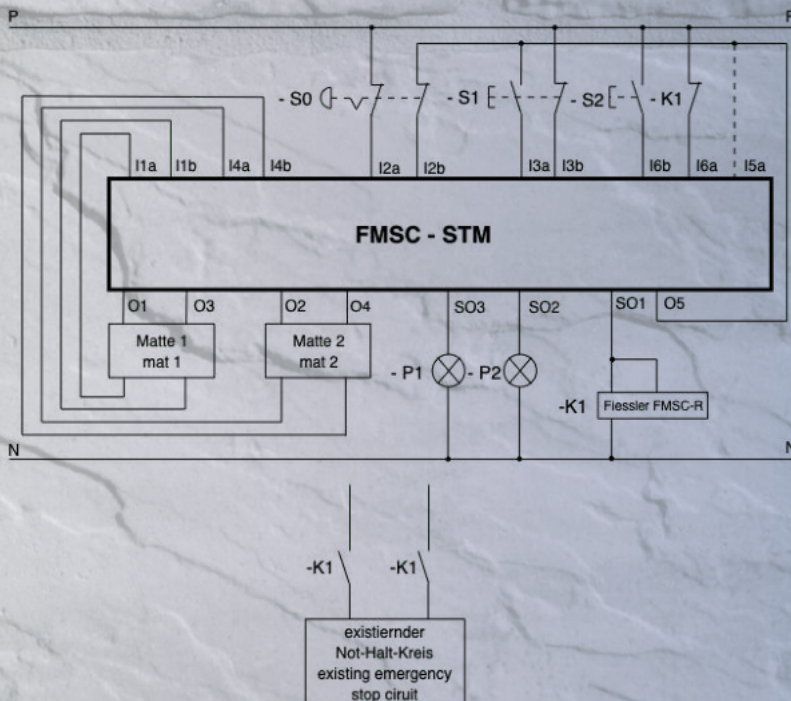
The safety contact mat switching device can be used to integrate safety contact mats and optionally an emergency stop circuit into a system. The device has two contact mat circuits whereby one circuit (mat 2) can be bridged via a dead man's switch (S1). If a contact mat is actuated, the system can be stopped via the safe relay release output (K1). The safety relay connected to this output is monitored for the switching states. Optionally, an input can be used to select whether a restart interlock should be active or not. The connection of an additional two-channel Emergency stop circuit (S0) is possible. Two further outputs are available for displaying a monitoring error (P2) or the request (P1) to pressing a restart button (S2).

## FMSC switching device

### technical data FMSC-STM

<b>inputs</b>	2 safety contact mat circuits deadman's switch emergency stop (2-channel) restart button restart interlock
<b>outputs</b>	1 safety output 4 contact mat connectors
<b>message outputs</b>	restart necessary, error
<b>optionally</b>	restart interlock

#### connection example



# standstill monitor switching device

## FMSC-ESM

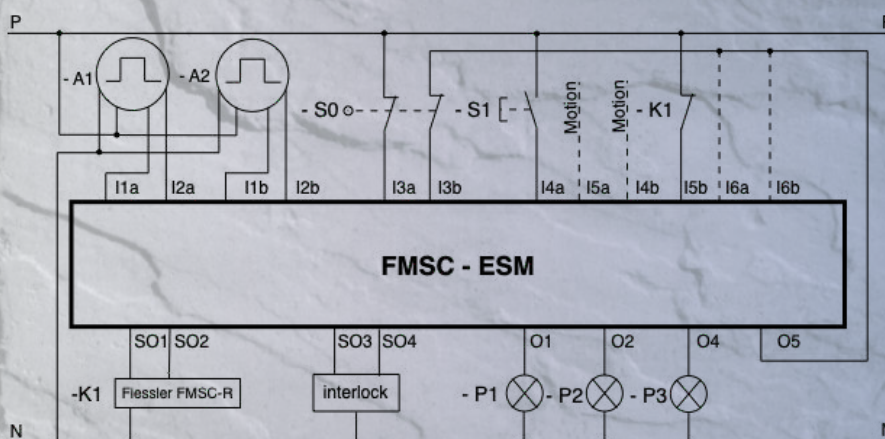
The standstill monitor switching device can be used to monitor two encoders (A1/A2) of an axis for safe standstill.

As soon as the motion input is set, the system has to move for a short time, otherwise the safe outputs (K1) are switched off. If a movement has been detected, the system can stop as often as required and accelerate again. If the device receives a standstill command, the system has 1s time to brake the axes, otherwise the outputs are switched off. The optional safety relay connected to the output is monitored for its switching states. The safety door (S0) can only be opened when the machine is at a standstill.

Optionally, an input can be used to select whether a restart interlock should be active or not. Three outputs are available for displaying a fault (P2), a safety gate open (P3) or actuating a restart button (S1, P1).

<b>sensor type</b>	Rotationsgeber
<b>resolution rotary encoder</b>	300-800 PPR
<b>smallest possible detectable rotation speed of the rotary encoders</b>	>= 1U/min
<b>inputs</b>	encoder 1 A/B encoder 2 A/B safety door switch (2-channel) restart-button motion
<b>outputs</b>	2 safety outputs, machine standstill
<b>message outputs</b>	Error, safety door open
<b>optionally</b>	contactor control, restart interlock

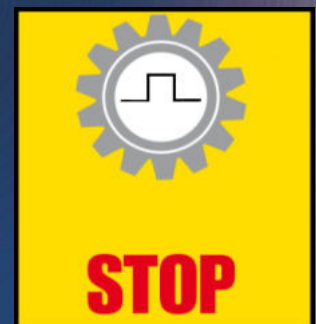
### connection example



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## FMSC switching device

### technical data FMSC-ESM





## two-hand-control switching device FMSC-THC

With the two-hand switching device, a safety-related release and interruption can be realized during metalworking presses as well as other working machines with dangerous closing movements.

After pressing the two buttons (S0 and S1) within the tolerance time, the system can switch safety relays (K1) via the safe outputs. The optional safety relay connected to these outputs is monitored for the switching states. Optionally, an input can be used to select whether an emergency stop circuit (S2) should be active or not. Further outputs are available for displaying a monitoring error (P2) or the request (P1) to pressing a restart button (S3).

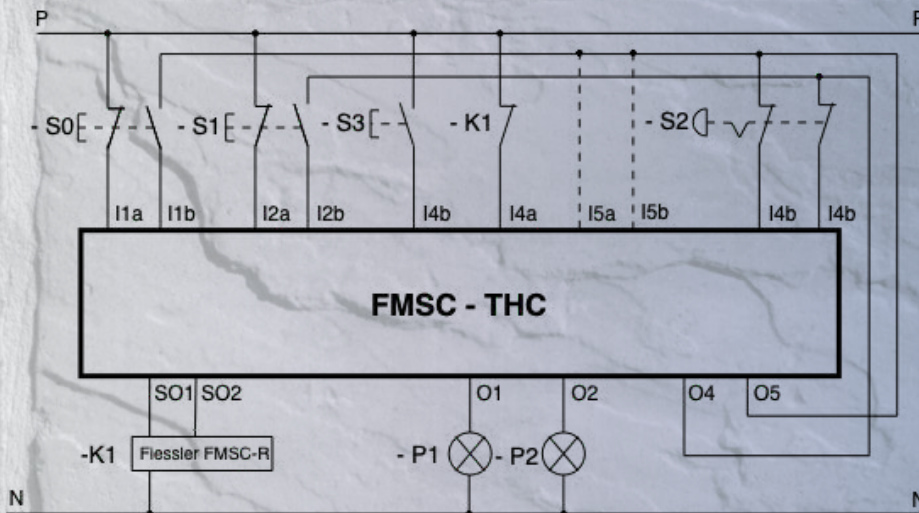
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## FMSC switching device

### technical data FMSC-THC

<b>safety level</b>	Typ III-C according to DIN EN ISO 13851
<b>inputs</b>	2 push-buttons each with NC contact and NO contact Emergency stop (2-channel) restart-button
<b>outputs</b>	2 safety outputs
<b>message output</b>	Restart necessary, error
<b>optionally</b>	Emergency stop function contactor control

### connection example



# Precence Sensing Device Initiation FMSC-PSDI

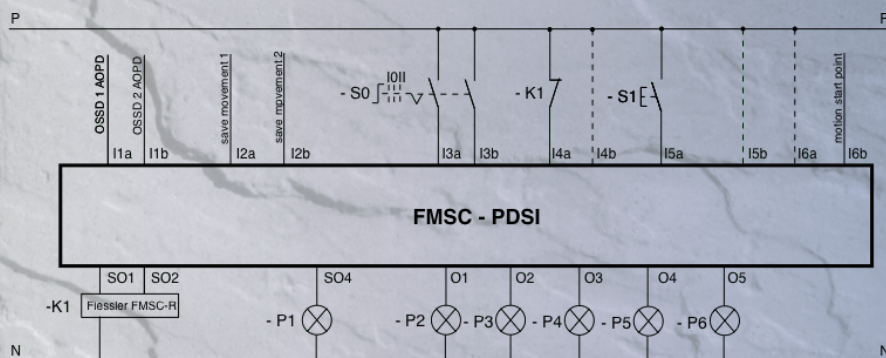
The PSDI control can be used to implement 1-stroke, 2-stroke or protective operation on a light curtain. The individual operating modes can be selected via a selector switch. If the system is in the Start Point monitor, the start button (S1) must be pressed.

Then, depending on the selection, the number of interruptions must be made. By pressing the start button again, the safe outputs SO1 and SO2 are enabled. The optimal safety relay connected to these outputs is monitored for the switching states. Optionally, an input can be used to select whether the interruptions are only counted at the Motion Start Point or during safe movement. An input is also used to select whether a start is possible in all positions after an interruption or only in the Motion Start Point.

Further outputs are available for displaying a monitoring error (P6), the interruption request (P4), the muting signal (P1), Motion Start Point (P5) or the request (P1,P2) for actuating a Start button (S1).

<b>Inputs</b>	OSSD1/2 AOPD operating mode selector switch restart-/start-/PSDI start-button
<b>Outputs</b>	2 safety outputs 24V AOPD
<b>message output</b>	restart, PSDI start, motion start point and Interruption necessary, error
<b>optionally</b>	contactor control break count position only at motion start point start at all positions

## connection example



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## FMSC switching device

## technical data FMSC-PSDI



# FMSC switching device

## Technical data

### Technical specification

Safety design of hardware

### FMSC switching device

SIL 3 (IEC61508),  
pl e EN ISO 13849-1

### Electrical specification

Power supply

24V DC

Tolerance range

18 ... 30,0 V DC max. 10% ripple

Current consumption device  
+ current consumption

typ. 20 mA

Fuse for power supply

T 20 A extern

Terminal connection  
power supply  
input level  
output level

screw- or spring type  
max. 2,5 mm<sup>2</sup>  
max. 1,5 mm<sup>2</sup>  
max. 2,5 mm<sup>2</sup>

Interface

Mirco USB for programming,  
hardware diagnosis and  
Debug-Mode

### Mechanical specification

Design size (hxbxt) without  
connectors  
Installation on top hat rail

### FMSC switching device

114,5 x 22,5 x 99 mm

according to DIN 50 022

Protection class housing

IP 20

Protection class terminals

IP 20

Weight

130 gr / 170 gr with connectors

### Environmental conditions

Operating temperature range

0 ... + 55° C

Storage temperature range

-25° C ... +70° C

Relative humidity

10% ... 95% RH

Creep distance

DIN EN 50 178

Oscillation

DIN EN 60 068-2-6

EMC

DIN EN 61 000-6-2

Condensation

not allowed



# FMSC switching device

## Technical data

<b>Inputs</b>	<b>FMSC switching device</b>
Number of inputs	6 (24V) and 6 (24V oder 5V)
Galvanic isolation	no
Signal level at log "0"	0 ... 8V DC at 24V 0 ... 1,5V DC at 5V
Signal level at log "1"	15 ... 28V DC at 24V 3,5 ... 6V DC at 5V
Input current	4 mA (at 24V)
min impulse duration	> 0,5ms/ > 10ns with edge detection
Status displayed via	LED

<b>Outputs - safe</b>	<b>FMSC switching device</b>
Number of outputs - safe	4
Galvanic isolation	no
Output current at log "1"	max. 4 A
Short circuit protection	electronically
Status displayed via	LED

<b>Outputs - Standard</b>	<b>FMSC switching device</b>
Number of outputs - standard	5
Galvanic isolation	no
Output current at log "1"	max. 0,5 A
Short circuit protection	electronically
Status displayed via	LED

### Device error codes

Detailed error description using two seven-segment displays.  
Structure of the error code:

Format: Ex/xx/device no.

Ex: either E0 or E9 (type of error)  
xx: error number



# FMSC Lieferprogramm

## Innovative solutions

### Safety light curtains

Typ 4, SIL 3, PL e  
Typ 2, SIL 1, PL c  
high range up to 60 m  
Safety controller integrated

Blanking and cascading  
Protective field height up to 2500 m  
Finger and hand guard, entrance protection

### AKAS® press brake safety system

fully automatic adjustment  
after tool change  
laser-optics safety light grid

innovative finger guard through  
continuous bending without stop

### FMSC safety PLC

Emergency shutdown  
(fast shut down) max. 0.5 ms  
Expandable with up to 16  
expansion modules

Easiest programming  
Cat 4, SIL 3, PL e

### Safety contact mats

Typ 3, SIL 2, PL d  
Series connection of up to  
ten mats  
Load capacity up to 2000N  
single component casting also  
in several colors

individual sizes and shapes  
Polyurethane, aluminum or  
Stainless steel surface  
with integrally cast ramp rail  
available

### Safety laser scanner

Cat 3, SIL 2, PL d  
Protective field 4 m, range 7 m  
Metering section 50 m range

Easy assembly  
Warning field 15 m  
Several programmable sections

### Safety foot pedals

Single-pedal or double-pedal

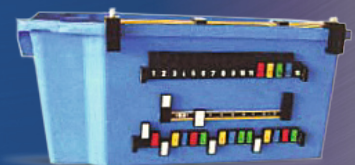
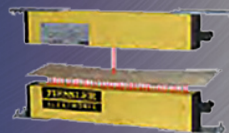
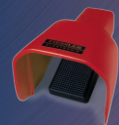
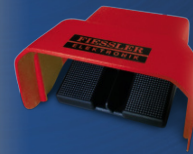
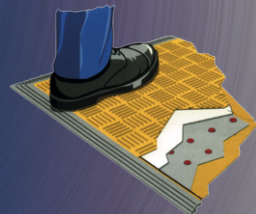
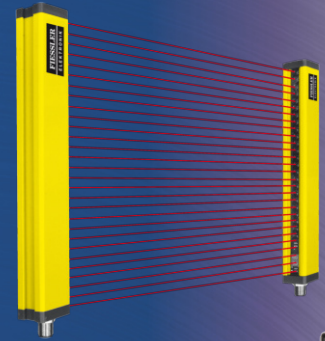
### Controlling, detecting and measuring

Measuring light curtains  
Loop sensors  
Directional counting light barriers

Hole detectors  
Encoding strips

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