



Safety timer module with delayed contacts at energizing

Main features

- For safety applications up to SIL CL 3/PL e
- Timing circuits by means of safety system with self-monitoring and redundancy
- Release command for interlocked safety devices
- 45 mm housing
- Output contacts:
 - 1 NO safety contact,
 - 2 NC auxiliary contacts
- Supply voltage:
 - 24 Vac/dc, 120 Vac, 230 Vac

Utilization categories

Alternating current: AC15 (50...60 Hz)

U_e (V) 230

I_e (A) 3

Direct current: DC13 (6 oper. cycles/min.)

U_e (V) 24

I_e (A) 4

Quality marks and certificates:



EC type examination certificate: IMQ CP 432

DM UL approval: E131787

CCC approval: 2013010305640211

EAC approval: RU C-IT.AQ35.B.00454

Compliance with the requirements of:

Low Voltage Directive 2014/35/EU,

Machinery Directive 2006/42/EC,

EMC Directive 2014/30/EU

Technical data

Housing

Polyamide housing PA 66, self-extinguishing V0 acc. to UL 94

Protection degree:

IP40 (housing), IP20 (terminal strip)

Dimensions:

see page 296, design C

General data

SIL CL:

up to SIL CL 3 acc. to EN 62061

Performance Level (PL):

up to PL e acc. to EN ISO 13849-1

Safety category:

up to cat. 4 acc. to EN ISO13849-1 (depending on circuit structure)

Safety parameters:

see page 349

Ambient temperature:

-25°C...+55°C

Mechanical endurance:

>10 million operating cycles

Electrical endurance:

>100,000 operating cycles

Pollution degree:

external 3, internal 2

Impulse withstand voltage (U_{imp}):

4 kV

Rated insulation voltage (U_i):

250 V

Overvoltage category:

II

Weight:

0.2 kg

Supply

Rated supply voltage (U_n):

24 Vac/dc; 50...60 Hz

120 Vac; 50...60 Hz

230 Vac; 50...60 Hz

Max. DC residual ripple in DC:

10%

Supply voltage tolerance:

±15% of U_n

Power consumption AC:

< 5 VA

Power consumption DC:

< 2 W

Control circuit

Protection against short circuits:

PTC resistance, I_h=0.5 A

PTC times:

Response time > 100 ms, release time > 3 s

Response time t_A:

see "Code structure"

Release time in absence of

power supply t_R:

< 60 ms

In compliance with standards:

EN 60204-1, EN ISO 13855, EN 1037, EN ISO 12100, EN ISO 13850, EN 60529,

EN 61000-6-2, EN 61000-6-3, EN 61326-1, EN 60664-1, EN 60947-1, EN ISO 13849-1,

EN ISO 13849-2, EN 62061, UL 508, CSA C22.2 n° 14-95

Output circuit

Output contacts:

1 NO safety contact,
2 NC auxiliary contacts
forcibly guided

Contact type:

silver alloy

Material of the contacts:

230/240 Vac; 300 Vdc

Maximum switching voltage:

6 A

Max. current per contact:

6 A

Conventional free air thermal current (I_{th}):

36 A²

Max. total current Σ I_{th}²:

10 mA

Minimum current:

≤ 100 mΩ

Contact resistance:

4 A

External protection fuse:

The number and the load capacity of output contacts can be increased by using expansion modules or contactors. see page 241-250.

Code structure

CS FS-11V024-TF1

Response time (t _A)	
0	Fixed time (see Tfx)
1	0,3 ... 3 s, 0,3 s steps
2	1 ... 10 s, 1 s steps
3	3 ... 30 s, 3 s steps
4	30 ... 300 s, 30 s steps

Response time (t _A)	
TF0.5	0.5 s fixed time
TF1	1 s fixed time
TF3	3 s fixed time
TF10	10 s fixed time

Supply voltage	
024	24 Vac/dc
120	120 Vac
230	230 Vac

Connection type	
V	Screw terminals
M	Connector with screw terminals
X	Connector with spring terminals

Stock items

CS FS-14V024

Features approved by UL

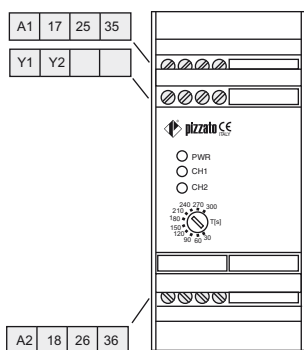
Rated supply voltage (U _n):	24 Vac/dc; 50...60 Hz 120 Vac; 50...60 Hz 230 Vac; 50...60 Hz
Power consumption AC:	< 5 VA
Power consumption DC:	< 2 W
Maximum switching voltage:	230 Vac
Max. current per contact:	6 A
Utilization category	C300

Notes:
- Use 60 or 75 °C copper (Cu) conductors, rigid or flexible, wire size 30-12 AWG.
- Tightening torque for terminal screws of 5-7 lb in.
- Only for 24 Vac/dc versions: power supply only with class 2 sources or with limited voltage and energy. (Supply from Remote Class 2 Source or limited voltage limited energy).

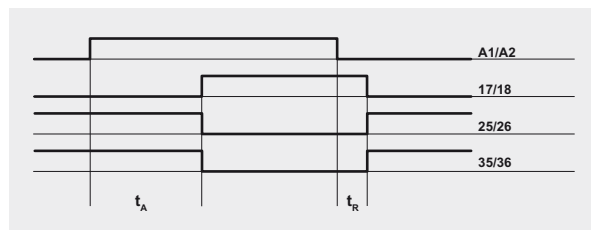


Safety module CS FS-1

Pin assignment

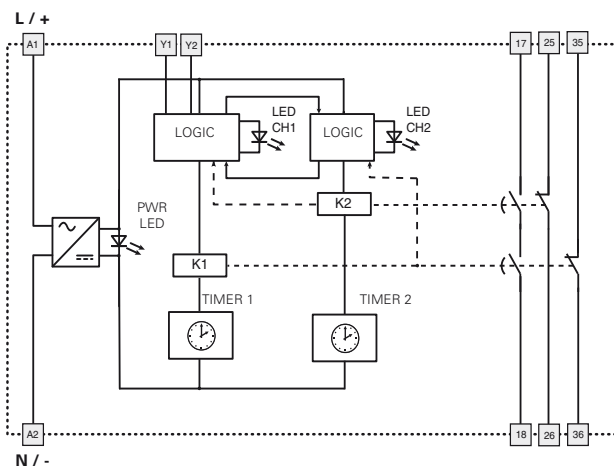


Function diagram



Legend:
 t_A : adjustable response time (see "Code structure")
 t_R : release time in absence of power supply

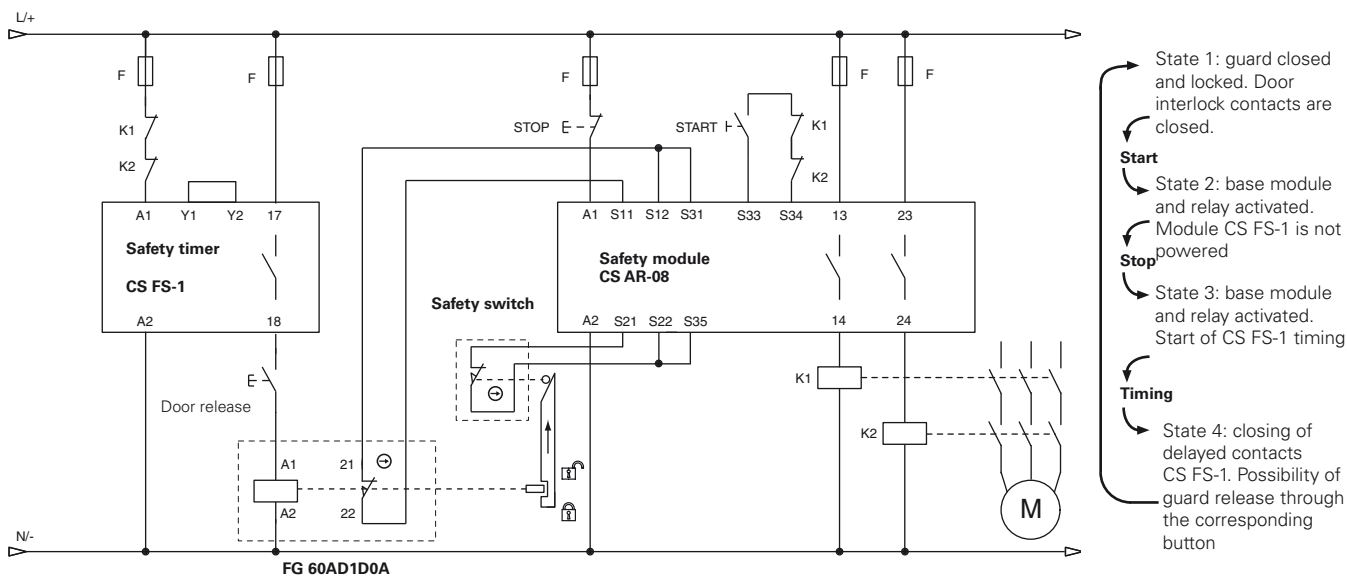
Internal block diagram



Y1-Y2: optional feedback inputs from any external contactors which are directly controlled by the module.

Circuit structure

Monitoring of a door-lock system with manual release



The diagram illustrates the operating principle of a typical circuit for monitoring a door-lock system with interlock in the de-energised state and manual release of the individual doors. For the complete electrical wiring diagrams with various types of electrical locking and release of the doors, please contact our technical office.

The diagram does not show the exact position of the terminals in the product

Items with code on **green** background are stock items



Safety timer module with delayed contacts at energizing

Main features

- For safety applications up to SIL CL 2/PL d
- Timing circuits by means of safety system with self-monitoring and redundancy
- Release command for interlocked safety devices
- 45 mm housing
- Output contacts:
 - 1 NO safety contacts, 1 NC auxiliary contact, 1 CO auxiliary contact
- Supply voltage:
 - 24 Vdc, 120 Vac

Utilization categories

Alternating current: AC15 (50...60 Hz)

U_e (V) 230

I_e (A) 3

Direct current: DC13 (6 oper. cycles/min.)

U_e (V) 24

I_e (A) 4

Quality marks:



EC type examination certificate: M6A 161075157013

UL approval: E131787

CCC approval: 2013010305640211

TÜV SÜD approval: Z10 12 04 75157 003

EAC approval: RU C-IT.A.135.B.00454

Compliance with the requirements of:

Low Voltage Directive 2014/35/EU,

Machinery Directive 2006/42/EC,

EMC Directive 2014/30/EU

Technical data

Housing

Polyamide housing PA 66, self-extinguishing V0 acc. to UL 94

Protection degree:

IP40 (housing), IP20 (terminal strip)

Dimensions:

see page 296, design C

General data

SIL CL:

up to SIL CL 2 acc. to EN 62061

Performance Level (PL):

up to PL d acc. to EN ISO 13849-1

Safety category:

up to cat. 3 acc. to EN ISO13849-1

Safety parameters:

see page 349

Ambient temperature:

-25°C...+55°C

Mechanical endurance:

>10 million operating cycles

Electrical endurance:

>100,000 operating cycles

Pollution degree:

external 3, internal 2

Impulse withstand voltage (U_{imp}):

4 kV

Rated insulation voltage (U_i):

250 V

Overtoltage category:

II

Weight:

0.2 kg

Supply

Rated supply voltage (U_n):

24 Vdc (A1-A2)

120 Vac; 50...60 Hz (B1-B2)

Max. DC residual ripple in DC:

10%

Supply voltage tolerance:

±15% of U_n

Power consumption AC:

< 5 VA

Power consumption DC:

< 2 W

Control circuit

Protection against short circuits:

PTC resistance, I_h=0.5 A

PTC times:

Response time > 100 ms, release time > 3 s

Response time t_A:

see "Code structure"

Release time in absence of power supply t_R:

< 100 ms

In compliance with standards:

EN 60204-1, EN ISO 13855, EN 1037, EN ISO 12100, EN ISO 13850, EN 60529,

EN 61000-6-2, EN 61000-6-3, EN 61326-1, EN 60664-1, EN 60947-1, EN ISO 13849-1,

EN ISO 13849-2, EN 62061, UL 508, CSA C22.2 n° 14-95

Output circuit

Output contacts:

1 NO safety contact,

1 NC auxiliary contact,

1 CO auxiliary contact,

forcibly guided

Contact type:

silver alloy

Material of the contacts:

230/240 Vac; 300 Vdc

Maximum switching voltage:

6 A

Max. current per contact:

6 A

Conventional free air thermal current (I_{th}):

36 A²

Max. total current Σ I_{th}²:

10 mA

Minimum current:

≤ 100 mΩ

Contact resistance:

4 A

External protection fuse:

Type: PNP

Error signal output (Y14):

24 Vdc

Rated operating voltage (U_o):

10 mA

Rated operating current (I_e):

The number and the load capacity of output contacts can be increased by using expansion modules or contactors. See page 241-250.

Code structure

CS FS-20VU24-TFxx

Response time (t_A)

0 Fixed time (see Tfx)

1 0,3 ... 3 s, 0,3 s steps

2 1 ... 10 s, 1 s steps

3 3 ... 30 s, 3 s steps

4 30 ... 300 s, 30 s steps

Response time (t_A)

TFxx xx = s

(fixed time)

Supply voltage

U24 24 Vdc

120 24 Vdc (A1-A2)

120 Vac (B1-B2)

Connection type

V Screw terminals

M Connector with screw terminals

X Connector with spring terminals

Features approved by UL

Rated supply voltage (U_n): 24 Vdc; 120 Vac; 50...60 Hz:

Power consumption AC: < 5 VA

Power consumption DC: < 2 W

Maximum switching voltage: 230 Vac

Max. current per contact: 6 A

Utilization category: C300

- Use 60 or 75 °C copper (Cu) conductors, rigid or flexible, wire size 30-12 AWG.

- Tightening torque for terminal screws of 5-7 lb in.

- Only for 24 Vac/dc versions: power supply only with class 2 sources or with limited voltage and energy. (Supply from Remote Class 2 Source or limited voltage limited energy).

Features approved by TÜV SÜD

Rated supply voltage (U_n): 24 Vdc; ± 15%, 120 Vac ± 15%

Power consumption: 5 VA max AC, 2 W max DC

Rated operating current (max.): 4 A

Maximum switching load (max.): 1380 VA

Ambient temperature: -25°C ... +55°C

Storage temperature: -25 °C ... + 70°C

Protection degree: IP40 (housing), IP20 (terminal strip)

In compliance with standards: 2006/42/EEC Machine Directive,

EN ISO 13849-1 (up to cat. 4 PL e), EN 50178:1997, EN 60947-5-3/

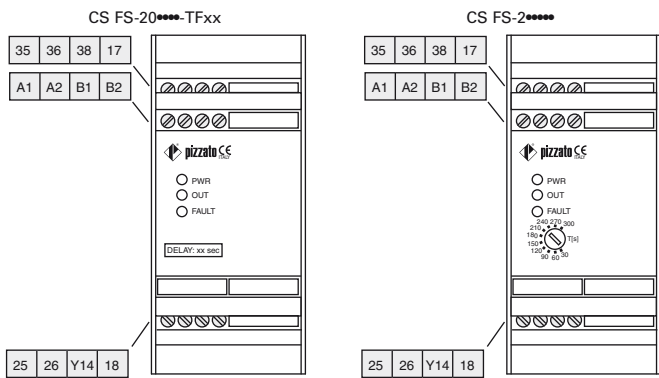
A1:2005, EN 61508-1:1998 (SIL CL 1-3), EN 61508-2:2000 (SIL CL

1-3), EN 61508-4:1998 (SIL CL 1-3), IEC 62061:2005 (SIL CL 3)



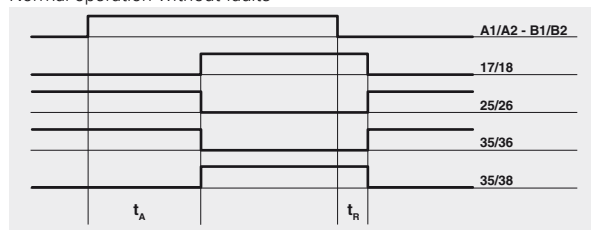
Safety module CS FS-2

Pin assignment



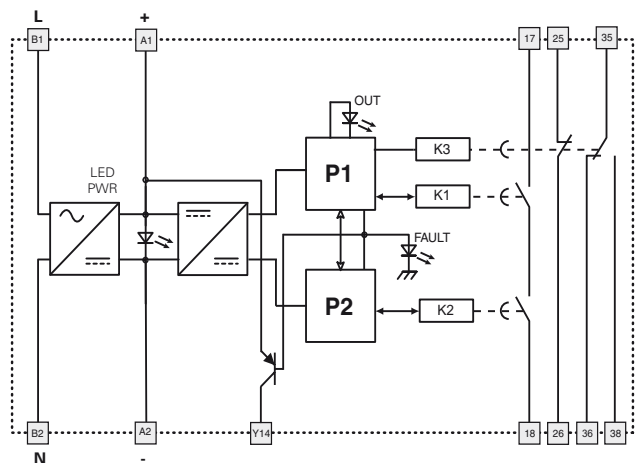
Function diagram

CS FS-2 Delay on Normal operation without faults



Legend:
 t_A : adjustable response time (see "Code structure")
 t_R : release time in absence of power supply

Internal block diagram



A1-A2: 24 Vdc
 B1-B2: 120 Vac

Y14: auxiliary output, activated when the module enters fault state.



Safety timer modules with response delay

Main features

- For safety applications up to SIL CL 2/PL d
- Timing circuits by means of safety system with self-monitoring and redundancy
- Release command for interlocked safety devices
- 45 mm housing
- Output contacts:
 - 1 NO safety contacts, 1 NC auxiliary contact, 1 CO auxiliary contact
- Supply voltage:
 - 24 Vdc, 120 Vac

Utilization categories

Alternating current: AC15 (50...60 Hz)

U_e (V) 230

I_e (A) 3

Direct current: DC13 (6 oper. cycles/min.)

U_e (V) 24

I_e (A) 4

Quality marks:



EC type examination certificate: M6A 161075157013

UL approval: E131787

CCC approval: 2013010305640211 TÜV

SÜD approval: Z10 12 04 75157 003

EAC approval: RU C-IT.AQ35.B.00454

Compliance with the requirements of:

Low Voltage Directive 2014/35/EU,

Machinery Directive 2006/42/EC,

EMC Directive 2014/30/EU

Technical data

Housing

Polyamide housing PA 66, self-extinguishing V0 acc. to UL 94

Protection degree:

IP40 (housing), IP20 (terminal strip)

Dimensions:

see page 296, design C

General data

SIL CL:

up to SIL CL 2 acc. to EN 62061

Performance Level (PL):

up to PL d acc. to EN ISO 13849-1

Safety category:

up to cat. 3 acc. to EN ISO13849-1

Safety parameters:

see page 349

Ambient temperature:

-25°C...+55°C

Mechanical endurance:

> 10 million operating cycles

Electrical endurance:

> 100,000 operating cycles

Pollution degree:

external 3, internal 2

Impulse withstand voltage (U_{imp}):

4 kV

Rated insulation voltage (U_i):

250 V

Overvoltage category:

II

Weight:

0.2 kg

Supply

Rated supply voltage (U_n):

24 Vdc (A1-A2)

120 Vac; 50...60 Hz (B1-B2)

Max. DC residual ripple in DC:

10%

Supply voltage tolerance:

±15% of U_n

Power consumption AC:

< 5 VA

Power consumption DC:

< 2 W

Control circuit

Protection against short circuits:

PTC resistance, I_h=0.5 A

PTC times:

Response time > 100 ms, release time > 3 s

Release time t_A:

see "Code structure"

Release time in absence of power supply t_R:

< 100 ms

Start-up time t_S:

< 200 ms

In compliance with standards:

EN 60204-1, EN ISO 13855, EN 1037, EN ISO 12100, EN ISO 13850, EN 60529,

EN 61000-6-2, EN 61000-6-3, EN 61326-1, EN 60664-1, EN 60947-1, EN ISO 13849-1,

EN ISO 13849-2, EN 62061, UL 508, CSA C22.2 n° 14-95

Output circuit

Output contacts:

1 NO safety contact,
1 NC auxiliary contact,
1 CO auxiliary contact,
forcibly guided

Contact type:

silver alloy

Material of the contacts:

Maximum switching voltage:

230/240 Vac; 300 Vdc

Max. current per contact:

6 A

Conventional free air thermal current (I_{th}):

6 A

Max. total current Σ I_{th}²:

36 A²

Minimum current:

10 mA

Contact resistance:

≤ 100 mΩ

External protection fuse:

4 A

Error signal output (Y14):

Type: PNP

Rated operating voltage (U_o):

24 Vdc

Rated operating current (I_o):

10 mA

The number and the load capacity of output contacts can be increased by using expansion modules or contactors. See page 241-250.

Code structure

CS FS-30VU24-TFxx

Release time (t_A)

0 Fixed time (see Tfx)

1 0,3 ... 3 s, 0,3 s steps

2 1 ... 10 s, 1 s steps

3 3 ... 30 s, 3 s steps

4 30 ... 300 s, 30 s steps

Release time (t_A)

TFxx xx = s (fixed time)

Supply voltage

U24 24 Vdc

120 24 Vdc (A1-A2)

120 Vac (B1-B2)

Connection type

V Screw terminals

M Connector with screw terminals

X Connector with spring terminals

Features approved by UL

Rated supply voltage (U_n): 24 Vdc; 120 Vac; 50...60 Hz;

Power consumption AC: < 5 VA

Power consumption DC: < 2 W

Maximum switching voltage: 230 Vac

Max. current per contact: 6 A

Utilization category: C300

- Use 60 or 75 °C copper (Cu) conductors, rigid or flexible, wire size 30-12 AWG.

- Tightening torque for terminal screws of 5-7 lb in.

- Only for 24 Vac/dc versions: power supply only with class 2 sources or with limited voltage and energy. (Supply from Remote Class 2 Source or limited voltage limited energy).

Features approved by TÜV SÜD

Rated supply voltage (U_n): 24 Vdc; ± 15%, 120 Vac ± 15%

Power consumption: 5 VA max AC, 2 W max DC

Rated operating current (max.): 4 A

Maximum switching load (max.): 1380 VA

Ambient temperature: -25°C ... +55°C

Storage temperature: -25 °C ... + 70 °C

Protection degree: IP40 (housing), IP20 (terminal strip)

In compliance with standards: 2006/42/EEC Machine Directive,

EN ISO 13849-1 (up to cat. 4 PL e), EN 50178:1997, EN 60947-5-3/

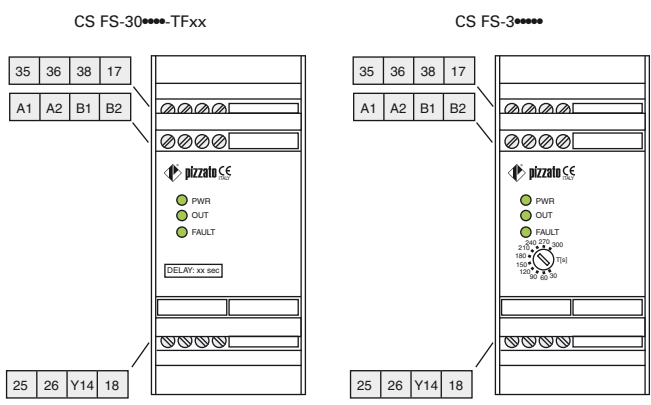
A1:2005, EN 61508-1:1998 (SIL CL 1-3), EN 61508-2:2000 (SIL CL

1-3), EN 61508-4:1998 (SIL CL 1-3), IEC 62061:2005 (SIL CL 3)

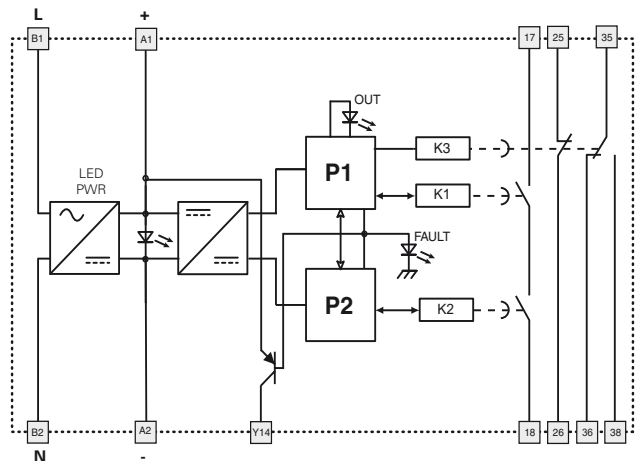


Safety module CS FS-3

Pin assignment



Internal block diagram

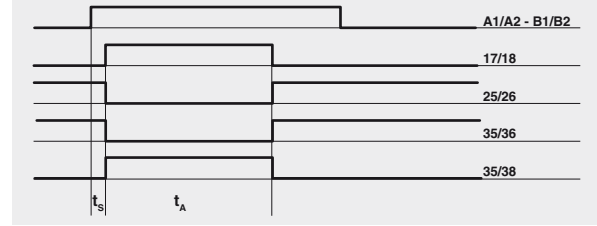


A1-A2: 24 Vdc
 B1-B2: 120 Vac

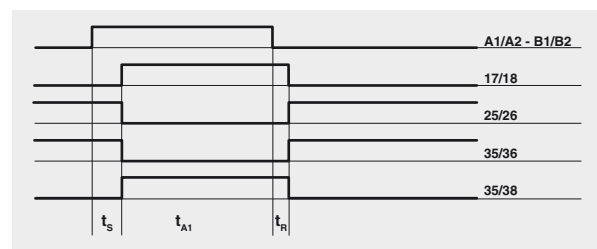
Y14: auxiliary output, activated when the module enters fault state.

Function diagram

CS FS-3**** Delay off
 Normal operation without faults



Operation without power supply



- Legend:
- t_A: release time (see "Code structure")
 - t_{A1}: release time if duration of power supply is less than t_A
 - t_R: release time in absence of power supply
 - t_S: start-up time



Safety timer module with delayed contacts upon opening of the input

Main features

- For safety applications up to SIL CL 2/PL d
- Timing circuits by means of safety system with self-monitoring and redundancy
- Release command for interlocked safety devices
- 45 mm housing
- Output contacts: 1 NO safety contact, 1 NC auxiliary contact, 1 CO auxiliary contact,
- Supply voltage: 24 Vdc, 120 Vac

Utilization categories

Alternating current: AC15 (50...60 Hz)

U_e (V) 230

I_e (A) 3

Direct current: DC13 (6 oper. cycles/min.)

U_e (V) 24

I_e (A) 4

Quality marks:



EC type examination certificate: M6A 161075157013

UL approval: E131787

CCC approval: 2013010305640211 TÜV

SUD approval: Z10 12 04 75157 003

EAC approval: RU C-IT.AJ35.B.00454

Compliance with the requirements of:

Low Voltage Directive 2014/35/EU,

Machinery Directive 2006/42/EC,

EMC Directive 2014/30/EU

Technical data

Housing

Polyamide housing PA 66, self-extinguishing V0 acc. to UL 94

Protection degree:

IP40 (housing), IP20 (terminal strip)

Dimensions:

see page 296, design C

General data

SIL CL:

up to SIL CL 2 acc. to EN 62061

Performance Level (PL):

up to PL d acc. to EN ISO 13849-1

Safety category:

up to cat. 3 acc. to EN ISO13849-1

Safety parameters:

see page 349

Ambient temperature:

-25°C...+55°C

Mechanical endurance:

>10 million operating cycles

Electrical endurance:

>100,000 operating cycles

Pollution degree:

external 3, internal 2

Impulse withstand voltage (U_{imp}):

4 kV

Rated insulation voltage (U_i):

250 V

Overtoltage category:

II

Weight:

0.2 kg

Supply

Rated supply voltage (U_n):

24 Vdc (A1-A2)

Max. DC residual ripple in DC:

10%

Supply voltage tolerance:

±15% of U_n

Power consumption AC:

< 5 VA

Power consumption DC:

< 2 W

Control circuit

Protection against short circuits:

PTC resistance, I_h=0.5 A

PTC times:

Response time > 100 ms, release time > 3 s

Release time t_a:

see "Code structure"

Release time in absence of power supply t_R:

< 100 ms

Input circuit

Maximum resistance per input:

≤ 50 Ω

Current per input:

< 8 mA

Response time t_s:

< 110 ms

Min. duration input signal t_{MIN}:

> 50 ms

In compliance with standards:

EN 60204-1, EN ISO 13855, EN 1037, EN ISO 12100, EN ISO 13850, EN 60529,

EN 61000-6-2, EN 61000-6-3, EN 61326-1, EN 60664-1, EN 60947-1, EN ISO 13849-1,

EN ISO 13849-2, EN 62061, UL 508, CSA C22.2 n° 14-95

Output circuit

Output contacts:

1 NO safety contact,

1 NC auxiliary contact,

1 CO auxiliary contact,

forcibly guided

silver alloy

Contact type:

Material of the contacts:

Maximum switching voltage:

230/240 Vac; 300 Vdc

Max. current per contact:

6 A

Conventional free air thermal current (I_{th}):

6 A

Max. total current Σ I_{th}²:

36 A²

Minimum current:

10 mA

Contact resistance:

≤ 100 mΩ

External protection fuse:

4 A

Error signal output (Y14):

Type: PNP

Rated operating voltage (U_e):

24 Vdc

Rated operating current (I_e):

10 mA

The number and the load capacity of output contacts can be increased by using expansion modules or contactors. See page 241-250.

Code structure

CS FS-50VU24-TFxx

Release time (t_a)

0 Fixed time (see Tfx)

1 0,3 ... 3 s, 0,3 s steps

2 1 ... 10 s, 1 s steps

3 3 ... 30 s, 3 s steps

4 30 ... 300 s, 30 s steps

Release time (t_a)

TFxx xx = s (fixed time)

Supply voltage

U24 24 Vdc

120 24 Vdc (A1-A2)

120 Vac (B1-B2)

Connection type

V Screw terminals

M Connector with screw terminals

X Connector with spring terminals

Features approved by UL

Rated supply voltage (U_n): 24 Vdc; 120 Vac; 50...60 Hz;

Power consumption AC: < 5 VA

Power consumption DC: < 2 W

Maximum switching voltage: 230 Vac

Max. current per contact: 6 A

Utilization category: C300

- Use 60 or 75 °C copper (Cu) conductors, rigid or flexible, wire size 30-12 AWG.

- Tightening torque for terminal screws of 5-7 lb in.

- Only for 24 Vac/dc versions: power supply only with class 2 sources or with limited voltage and energy. (Supply from Remote Class 2 Source or limited voltage limited energy).

Features approved by TÜV SÜD

Rated supply voltage (U_n): 24 Vdc; ± 15%, 120 Vac ± 15%

Power consumption: 5 VA max AC, 2 W max DC

Rated operating current (max.): 4 A

Maximum switching load (max.): 1380 VA

Ambient temperature: -25°C ... +55°C

Storage temperature: -25 °C ... + 70 °C

Protection degree: IP40 (housing), IP20 (terminal strip)

In compliance with standards: 2006/42/EEC Machine Directive,

EN ISO 13849-1 (up to cat. 4 PL e), EN 50178:1997, EN 60947-5-3/

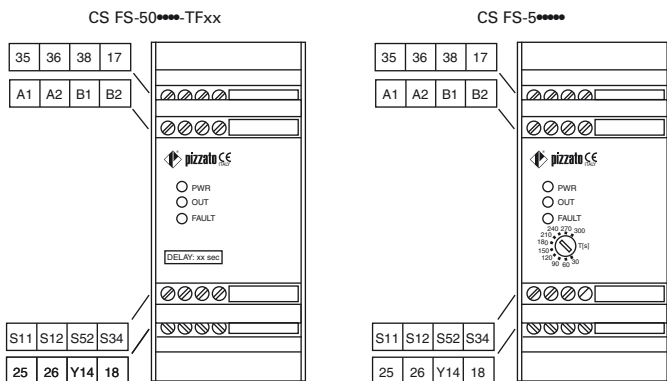
A1:2005, EN 61508-1:1998 (SIL CL 1-3), EN 61508-2:2000 (SIL CL

1-3), EN 61508-4:1998 (SIL CL 1-3), IEC 62061:2005 (SIL CL 3)

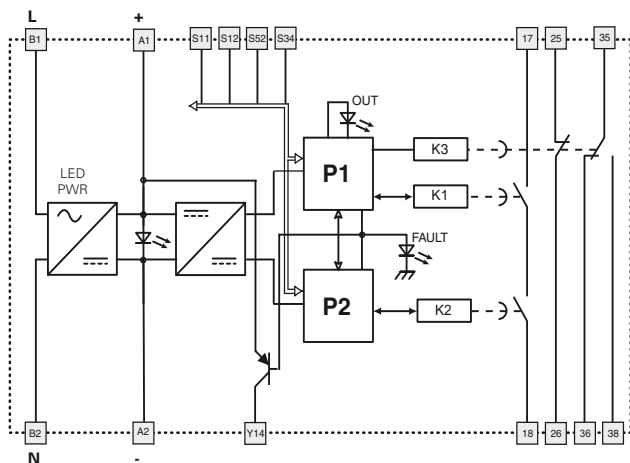


Safety module CS FS-5

Pin assignment



Internal block diagram

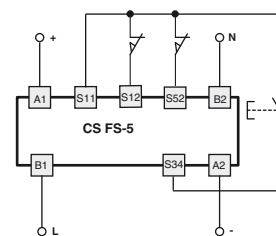
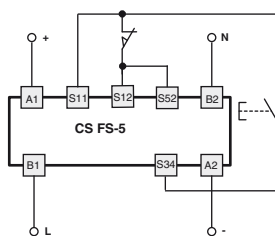


A1-A2: 24 Vdc
 B1-B2: 120 Vac

Y14: auxiliary output, activated when the module enters fault state.

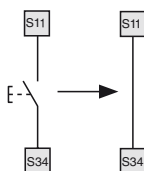
Input configuration

Movable guard monitoring	
Input configuration with manual start	
1 channel	2 channels



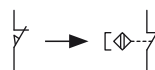
Automatic start

With regard to the indicated diagrams, bridge the start button between S33 and S34 in order to activate the automatic start module.



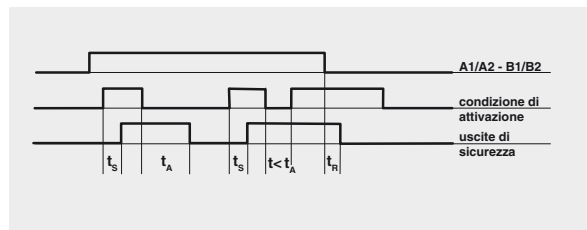
Monitoring of movable guards and magnetic safety sensors

The safety module can monitor control circuits for movable guards as well as magnetic safety sensors. To do this, the switch contacts must be replaced with sensors. The sensors can only be used in 2-channel configuration.

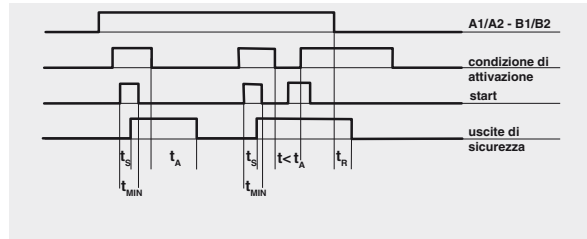


Function diagram

Configuration with automatic start



Configuration with manual start



Legend:
 t_A : release time (see "Code structure")
 t_R : release time in absence of power supply
 t_s : response time
 t_{MIN} : min. duration input signal