

Safety timer module with delayed contacts at energizing

Main functions

- For safety applications up to SIL 3 / PL e
- Timed circuits through safety system with self-monitoring and redundancy
- Suitable to control safety interlocked devices
- Small 22,5 mm housing
- Output contacts:
 - 1 NO safety contact,
 - 2 NC auxiliary contacts,
- Supply voltages:
 - 24 Vac/dc, 120 Vac, 230 Vac

Utilization categories

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

U_e (V) 230

I_e (A) 3

Direct current: DC13 (6 operations/minute)

U_e (V) 24

I_e (A) 4

Markings, quality marks and certificates:



Approval UL: E131787

Complying with the requirements requested by:

Low Voltage Directive 2006/95/EC,

Machinery Directive 2006/42/EC,

Electromagnetic Compatibility 2004/108/EC

Technical data

Housing

Made of polyamide PA 6.6 self-extinguishing, class V0 (UL94)

Protection degree:

IP40 (housing), IP20 (terminals)

Dimensions:

see page 5/82, shape C

General data

SIL level (SIL CL):

up to SIL 3 according to EN IEC 62061

Performance Level (PL):

up to PL e according to EN ISO 13849-1

Safety category:

up to category 4 according to EN 954-1 (dependent from the circuit structure)

Safety parameters:

see page 7/32

Ambient temperature:

-25°C...+55°C

Mechanical endurance:

>10 millions of operations

Electrical endurance:

>100.000 operations

Pollution degree:

outside 3, inside 2

Rated impulse with stand voltage (U_{imp}):

4 kV

Rated insulation voltage (U_i):

250 V

Over-voltage category:

II

Weight:

0,2 Kg

Power supply

Rated operating voltage (U_n):

24 Vac/dc; 50...60 Hz

120 Vac; 50...60 Hz

230 Vac; 50...60 Hz

Max residual ripple in DC:

10%

Supply voltage tolerance:

±15% of U_n

Rated power consumption AC:

< 5 VA

Rated power consumption DC:

< 2 W

Control circuit

Protection against short circuits:

resistance PTC, I_h=0,5 A

Operating time of PTC:

intervention > 100 ms, reset > 3 s

Operating time t_A:

see "Code structure"

Releasing time in absence of power supply t_R:

40 ms

In conformity with standards:

IEC 60947-1, EN 60947-5-1, IEC 60204-1, EN 60204-1, EN ISO 13849-1, EN 999, EN 1037, EN ISO 12100-1, EN ISO 12100-2, EN ISO 13850, IEC 529, EN 60529, EN 61000-6-2, EN 61000-6-3, EN 62326-1, EN 60664-1, EN 60947-5-1, EN 62061, EN 13849-1, UL 508, CSA C22.2 n° 14-95

Output circuit

Output contacts:

1 NO safety contact,
2 NC auxiliary contacts,
forced guided contacts

Contacts type:

silver alloy

Contacts material:

silver alloy

Max switching voltage:

230/240 Vac; 300 Vdc

Max switching current per contact:

6 A

Conventional free air thermal current I_{th}:

6 A

Max currents sum ΣI_{th}^2 :

36 A²

Min. current:

10 mA

Contacts resistance:

≤ 100 mΩ

Contact protection fuse:

6 A, F type

The number and the load capacity of output contacts can be increased by using expansion modules or contactors See page 5/49 - 5/58 and 5/79

Code structure

CS FS-11V024-TF1

Operating time t_A

0	Fixed time (see TFx)
1	from 0,3 to 3 s, step 0,3 s
2	from 1 to 10 s, step 1 s
3	from 3 to 30 s, step 3 s
4	from 30 to 300 s, step 30 s

Operating time t_A

TF0.5	fixed 0,5 s
TF1	fixed 1 s
TF3	fixed 3 s
TF10	fixed 10 s

Supply voltage

024	24 Vac/dc	±15%
120	120 Vac	±15%
230	230 Vac	±15%

Kind of connection

V	screw terminals
M	connector with screw terminals
X	connector with spring terminals

Data type approved by UL

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

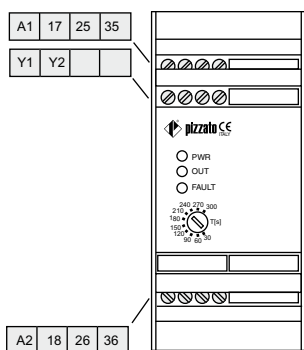
Note:

- Use 60° or 75 °C copper (Cu) conductor and wire size No. 30-12 AWG.
- Terminal tightening torque of 5-7 Lb In.
- Only for 24 Vac/dc version, supply from remote class 2 source or limited voltage and limited energy.

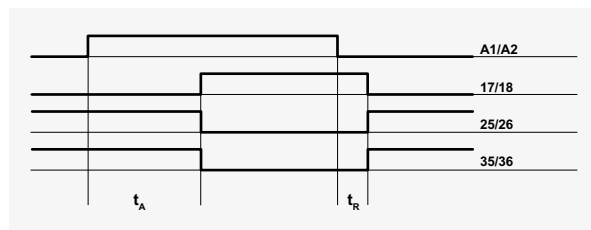


Safety module CS FS-1

Terminals layout

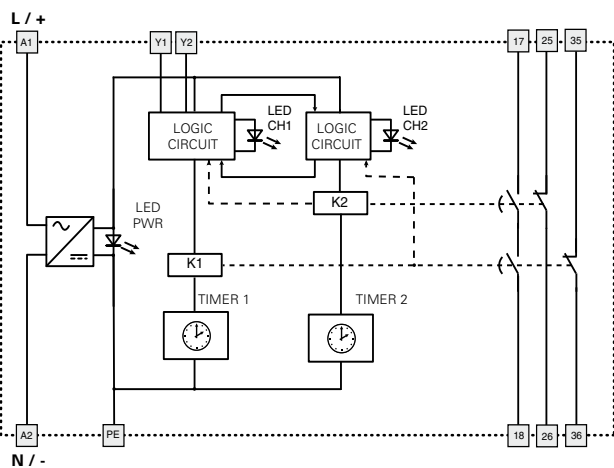


Operations diagram



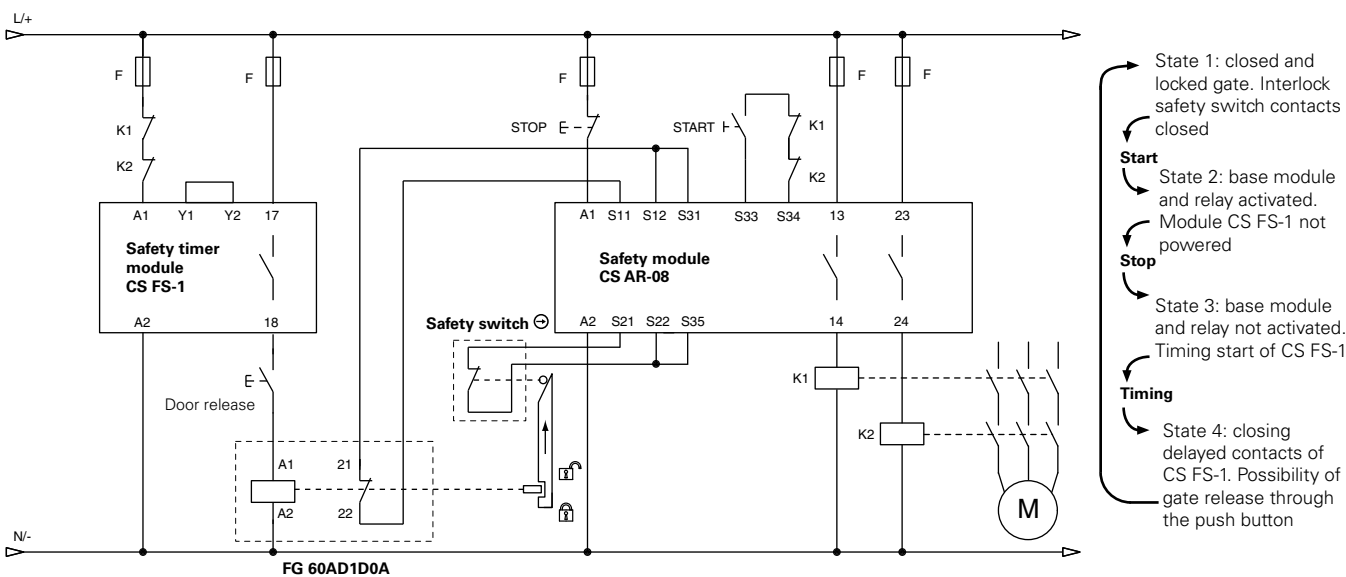
Legend:
 t_A : Adjustable operating time (see "Code structure")
 t_R : Releasing time in absence of power supply

Internal wiring diagram



Circuit structure

Control of a door-lock system with manual release



The diagram shown displays the operation principle of a typical circuit for the control of a door-lock system with door blocking when interlock safety switch is not energized, and manual release of the single doors. In order to obtain the complete wiring diagram with different modalities of electrical blocking or with automatic door release, please contact our technical office.

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



Safety timer module with delayed contacts at energizing

Main functions

- For safety applications up to SIL 2 / PL d
- Timed circuits through safety system with self-monitoring and redundancy
- Suitable to control safety interlocked devices
- 45 mm housing
- Output contacts:
 - 1 NO safety contact,
 - 1 NC auxiliary contact,
 - 1 CO auxiliary contact,
- Supply voltages:
 - 24 Vdc, 120 Vac

Utilization categories

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

Ue (V) 230

Ie (A) 3

Direct current: DC13 (6 operations/minute)

Ue (V) 24

Ie (A) 4

Markings, quality marks and certificates:



Approval UL: E131787

Complying with the requirements requested by:

Low Voltage Directive 2006/95/EC,

Machinery Directive 2006/42/EC,

Electromagnetic Compatibility 2004/108/EC

Technical data

Housing

Made of polyamide PA 6.6 self-extinguishing, class V0 (UL94)

Protection degree:

IP40 (housing), IP20 (terminals)

Dimensions:

see page 5/82 shape C

General data

SIL level (SIL CL):

up to SIL 2 according to EN IEC 62061

Performance Level (PL):

up to PL d according to EN ISO 13849-1

Safety category:

up to category 3 according to EN 954-1

Safety parameters:

see page 7/32

Ambient temperature:

-25°C...+55°C

Mechanical endurance:

>10 millions of operations

Electrical endurance:

>100.000 operations

Pollution degree:

outside 3, inside 2

Rated switching with stand voltage (Uimp):

4 KV

Rated insulation voltage (Ui):

250 V

Over-voltage category:

II

Weight:

0,2 Kg

Power supply

Rated operating voltage (Un):

24 Vdc (A1-A2)

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

Max residual ripple in DC:

10%

Supply voltage tolerance:

±15% of Un

Rated power consumption AC:

< 5 VA

Rated power consumption DC:

< 2 W

Control circuit

Protection against short circuits:

resistance PTC, I_h=0,5 A

Operating time of PTC:

intervention > 100 ms, reset > 3 s

Operating time t_A:

see "Code structure"

Releasing time in absence of power supply t_R:

40 ms

In conformity with standards:

IEC 60947-1, EN 60947-5-1, IEC 60204-1, EN 60204-1, EN ISO 13849-1, EN 999, EN 1037, EN ISO 12100-1, EN ISO 12100-2, EN ISO 13850, IEC 529, EN 60529, EN 61000-6-2, EN 61000-6-3, EN 62326-1, EN 60664-1, EN 60947-5-1, EN 62061, EN 13849-1, UL 508, CSA C22.2 n° 14-95

Output circuit

Output contacts:

1 NO safety contact,

1 NC auxiliary contact,

1 CO auxiliary contact,

forced guided contacts

Contacts type:

silver alloy

Contacts material:

Max switching voltage:

230/240 Vac; 300 Vdc

Max switching current per contact:

6 A

Conventional free air thermal current I_{th}:

6 A

Max currents sum ΣI_{th}^2 :

36 A²

Min. current:

10 mA

Contacts resistance:

≤ 100 mΩ

Contact protection fuse:

6 A, F type

Error signalling output (Y14):

Type PNP

Rated operational voltage (Ue):

24 VDC

Rated operational current (Ie):

10 mA

The number and the load capacity of output contacts can be increased by using expansion modules or contactors. See page 5/49 - 5/58 and 5/79

Code structure

CS FS-20VU24-TFxx

Operating time t_A

0	Fixed time (see TFxx)
1	from 0,3 to 3 s, step 0,3 s
2	from 1 to 10 s, step 1 s
3	from 3 to 30 s, step 3 s
4	from 30 to 300 s, step 30 s

Operating time t_A

TFxx xx s (fixed time)

Supply voltage

U24	24 Vdc	±15%
120	24 Vdc (A1-A2)	±15%
	120 Vac (B1-B2)	±15%

Kind of connection

V	screw terminals
M	connector with screw terminals
X	connector with spring terminals

Data type approved by UL

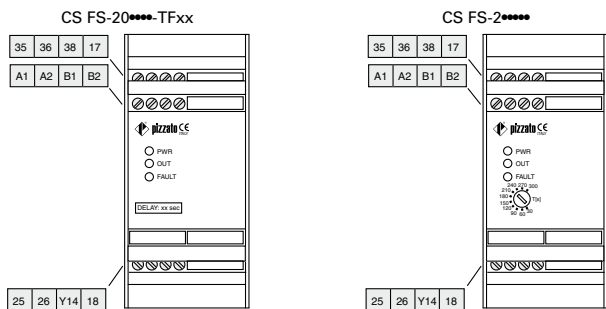
Rated operating voltage (Un):	24 Vdc; 120 Vac; 50...60 Hz
Rated power consumption AC:	< 5 VA
Rated power consumption DC:	< 2 W
Max switching voltage:	230 Vac
Max switching current per contact:	6 A
Utilization category	C300

Note:
- Use 60° or 75 °C copper (Cu) conductor and wire size No. 30-12 AWG.
- Terminal tightening torque of 5-7 Lb In.
- Only for 24 Vac/dc version, supply from remote class 2 source or limited voltage and limited energy.



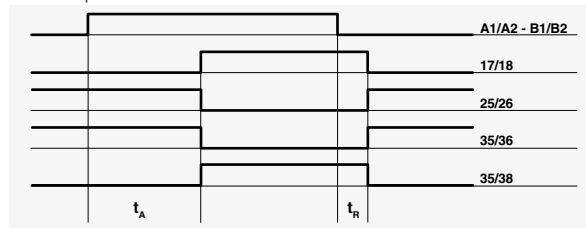
Safety module CS FS-2

Terminals layout



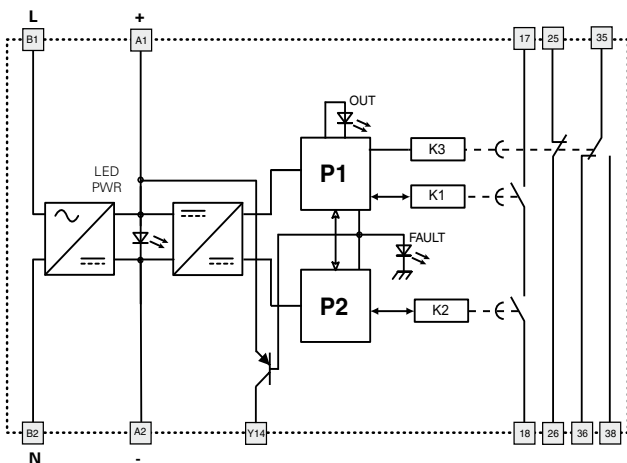
Operations diagram

CS FS-2**** Delay on
Normal operation without faults



Legend:
 t_A : Adjustable operating time (see "Code structure")
 t_R : Releasing time in absence of power supply

Internal wiring diagram



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



Safety timer module with ON pulse function

Main functions

- For safety applications up to SIL 2 / PL d
- Timed circuits through safety system with self-monitoring and redundancy
- Suitable to control safety interlocked devices
- 45 mm housing
- Output contacts:
 - 1 NO safety contact,
 - 1 NC auxiliary contact,
 - 1 CO auxiliary contact,
- Supply voltages:
 - 24 Vdc, 120 Vac

Utilization categories

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

U_e (V) 230

I_e (A) 3

Direct current: DC13 (6 operations/minute)

U_e (V) 24

I_e (A) 4

Markings, quality marks and certificates:



Approval UL: E131787

Complying with the requirements requested by:

Low Voltage Directive 2006/95/EC,

Machinery Directive 2006/42/EC,

Electromagnetic Compatibility 2004/108/EC

Technical data

Housing

Made of polyamide PA 6.6 self-extinguishing, class V0 (UL94)

Protection degree:

IP40 (housing), IP20 (terminals)

Dimensions:

see page 5/82 shape C

General data

SIL level (SIL CL):

up to SIL 2 according to EN IEC 62061

Performance Level (PL):

up to PL d according to EN ISO 13849-1

Safety category:

up to category 3 according to EN 954-1

Safety parameters:

see page 7/32

Ambient temperature:

-25°C...+55°C

Mechanical endurance:

>10 millions of operations

Electrical endurance:

>100.000 operations

Pollution degree:

outside 3, inside 2

Rated impulse with stand voltage (U_{imp}):

4 KV

Rated insulation voltage (U_i):

250 V

Over-voltage category:

II

Weight:

0,2 Kg

Power supply

Rated operating voltage (U_n):

24 Vdc (A1-A2)

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

Max residual ripple in DC:

10%

Supply voltage tolerance:

±15% of U_n

Rated power consumption AC:

< 5 VA

Rated power consumption DC:

< 2 W

Control circuit

Protection against short circuits:

resistance PTC, I_h=0,5 A

Operating time of PTC:

intervention > 100 ms, reset > 3 s

Releasing time t_A:

see "Code structure"

Releasing time in absence of power supply t_R:

40 ms

Start-up time t_S:

200 ms

In conformity with standards:

IEC 60947-1, EN 60947-5-1, IEC 60204-1, EN 60204-1, EN ISO 13849-1, EN 999, EN 1037, EN ISO 12100-1, EN ISO 12100-2, EN ISO 13850, IEC 529, EN 60529, EN 61000-6-2, EN 61000-6-3, EN 62326-1, EN 60664-1, EN 60947-5-1, EN 62061, EN 13849-1, UL 508, CSA C22.2 n° 14-95

Output circuit

Output contacts:

1 NO safety contact,
1 NC auxiliary contact,
1 CO auxiliary contact,
forced guided contacts

Contacts type:

silver alloy

Contacts material:

230/240 Vac; 300 Vdc

Max switching voltage:

6 A

Max switching current per contact:

6 A

Conventional free air thermal current I_{th}:

36 A²

Max currents sum Σ I_{th}²:

10 mA

Min. current:

≤ 100 mΩ

Contacts resistance:

Contact protection fuse:

6 A, F type

Error signalling output (Y14):

Type PNP

Rated operational voltage (U_e):

24 VDC

Rated operational 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 See page 5/49 - 5/58 and 5/79

Code structure

CS FS-30VU24-TFxx

Releasing time t_A

- | | |
|---|-----------------------------|
| 0 | Fixed time (see TFxx) |
| 1 | from 0,3 to 3 s, step 0,3 s |
| 2 | from 1 to 10 s, step 1 s |
| 3 | from 3 to 30 s, step 3 s |
| 4 | from 30 to 300 s, step 30 s |

Releasing time t_A

TFxx xx s (fixed time)

Supply voltage

U24	24 Vdc	±15%
120	24 Vdc (A1-A2)	±15%
	120 Vac (B1-B2)	±15%

Kind of connection

- | | |
|----------|---------------------------------|
| V | screw terminals |
| M | connector with screw terminals |
| X | connector with spring terminals |

Data type approved by UL

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

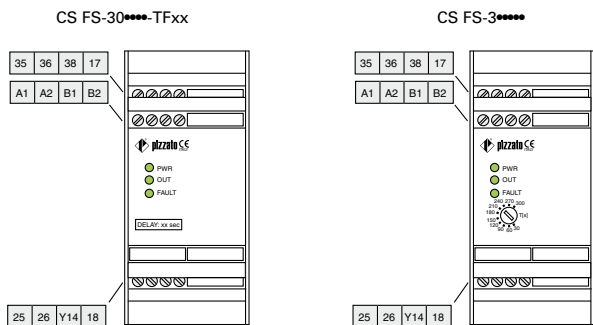
Note:

- Use 60° or 75 °C copper (Cu) conductor and wire size No. 30-12 AWG.
- Terminal tightening torque of 5-7 Lb In.
- Only for 24 Vac/dc version, supply from remote class 2 source or limited voltage and limited energy.



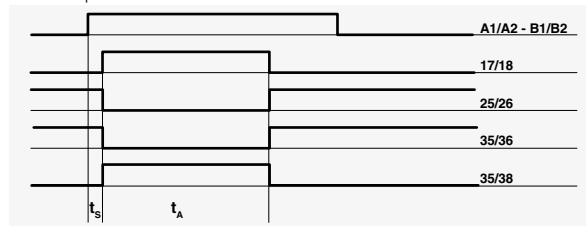
Safety module CS FS-3

Terminals layout

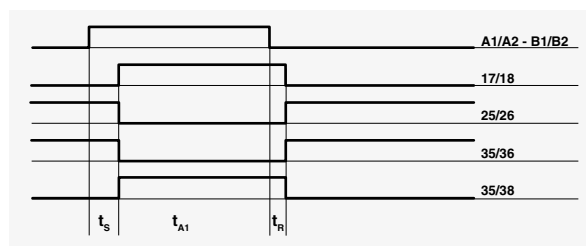


Operations diagram

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

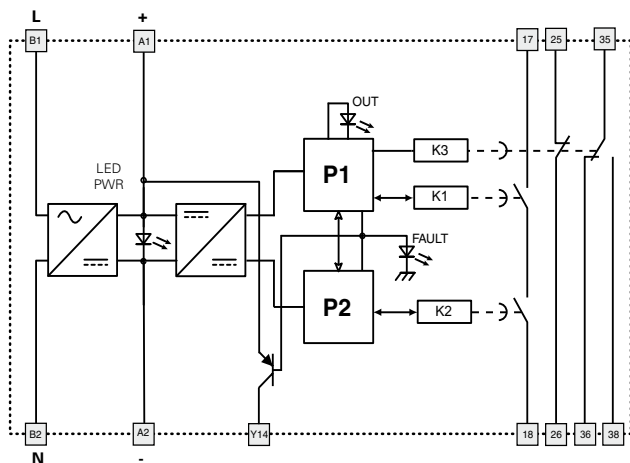


Operation without power supply



- Legend:
- t_A : Adjustable releasing time (see "Code structure")
 - t_{A1} : Releasing time if power supply is minor to t_A
 - t_R : Releasing time in absence of power supply
 - t_S : Start-up time

Internal wiring diagram



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



Safety timer module with delayed contacts at opening of the input channels

Main functions

- For safety applications up to SIL 2 / PL d
- Timed circuits through safety system with self-monitoring and redundancy
- Suitable to control safety interlocked devices
- 45 mm housing
- Output contacts:
 - 1 NO safety contact,
 - 1 NC auxiliary contact,
 - 1 CO auxiliary contact,
- Supply voltages:
 - 24 Vdc, 120 Vac

Utilization categories

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

U_e (V) 230

I_e (A) 3

Direct current: DC13 (6 operations/minute)

U_e (V) 24

I_e (A) 4

Markings, quality marks and certificates:



Approval UL: E131787

Complying with the requirements requested by:

Low Voltage Directive 2006/95/EC,

Machinery Directive 2006/42/EC,

Electromagnetic Compatibility 2004/108/EC

Technical data

Housing

Made of polyamide PA 6.6 self-extinguishing, class V0 (UL94)

Protection degree:

IP40 (housing), IP20 (terminals)

Dimensions:

see page 5/82 shape C

General data

SIL level (SIL CL):

up to SIL 2 according to EN IEC 62061

Performance Level (PL):

up to PL d according to EN ISO 13849-1

Safety category:

up to category 3 according to EN 954-1

Safety parameters:

see page 7/32

Ambient temperature:

-25°C...+55°C

Mechanical endurance:

>10 millions of operations

Electrical endurance:

>100.000 operations

Pollution degree:

outside 3, inside 2

Rated impulse with stand voltage (U_{imp}):

4 kV

Rated insulation voltage (U_i):

250 V

Over-voltage category:

II

Weight:

0,2 Kg

Power supply

Rated operating voltage (U_n):

24 Vdc (A1-A2)

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

Max residual ripple in DC:

10%

Supply voltage tolerance:

±15% of U_n

Rated power consumption AC:

< 5 VA

Rated power consumption DC:

< 2 W

Control circuit

Protection against short circuits:

resistance PTC, I_h=0,5 A

Operating time of PTC:

intervention > 100 ms, reset > 3 s

Releasing time t_A:

see "Code structure"

Releasing time in absence of power supply t_R:

40 ms

Input circuit

Max input resistance:

≤ 50 Ω

Input current:

8 mA

Activation time t_S:

40 ms

Minimum endurance of input signal t_{MIN}:

50 ms

In conformity with standards:

IEC 60947-1, EN 60947-5-1, IEC 60204-1, EN 60204-1, EN ISO 13849-1, EN 999, EN 1037, EN ISO 12100-1, EN ISO 12100-2, EN ISO 13850, IEC 529, EN 60529, EN 61000-6-2, EN 61000-6-3, EN 62326-1, EN 60664-1, EN 60947-5-1, EN 62061, EN 13849-1, UL 508, CSA C22.2 n° 14-95

Output circuit

Output contacts:

1 NO safety contact,

1 NC auxiliary contact,

1 CO auxiliary contact,

forced guided contacts

Contacts type:

silver alloy

Contacts material:

Max switching voltage:

230/240 Vac; 300 Vdc

Max switching current per contact:

6 A

Conventional free air thermal current I_{th}:

6 A

Max currents sum Σ I_{th}²:

36 A²

Min. current:

10 mA

Contacts resistance:

≤ 100 mΩ

Contact protection fuse:

6 A, F type

Error signalling output (Y14):

Type PNP

Rated operational voltage (U_e):

24 VDC

Rated operational 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 5/49 - 5/58 and 5/79

Code structure

CS FS-50VU24-TFxx

Releasing time t_A

- | | |
|---|-----------------------------|
| 0 | Fixed time (see TFxx) |
| 1 | from 0,3 to 3 s, step 0,3 s |
| 2 | from 1 to 10 s, step 1 s |
| 3 | from 3 to 30 s, step 3 s |
| 4 | from 30 to 300 s, step 30 s |

Releasing time t_A

TFxx xx s (fixed time)

Supply voltage

U24	24 Vdc	±15%
120	24 Vdc (A1-A2)	±15%
	120 Vac (B1-B2)	±15%

Data type approved by UL

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

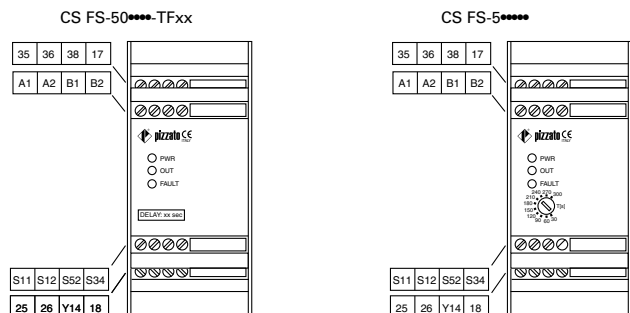
Note:

- Use 60° or 75 °C copper (Cu) conductor and wire size No. 30-12 AWG.
- Terminal tightening torque of 5-7 Lb In.
- Only for 24 Vac/dc version, supply from remote class 2 source or limited voltage and limited energy.



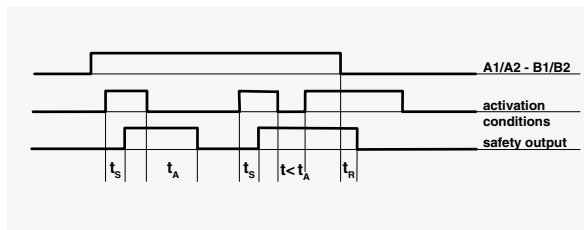
Safety module CS FS-5

Terminals layout

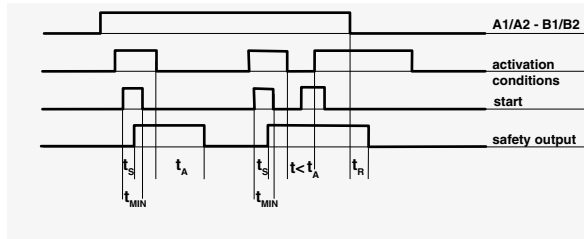


Operations diagram

Configuration with automatic start

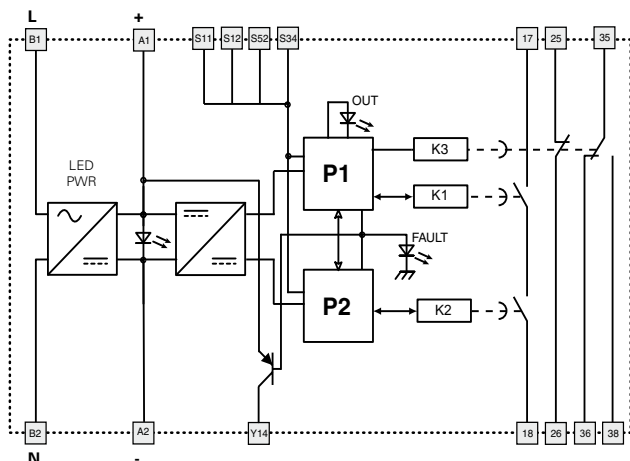


Configuration with manual start



- Legend:
- t_A : Adjustable releasing time (see "Code structure")
 - t_R : Releasing time in absence of power supply
 - t_s : Activation time
 - t_{MIN} : Minimum endurance of input signal

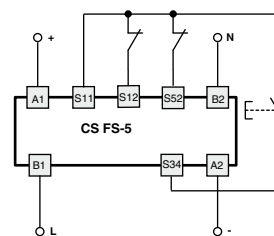
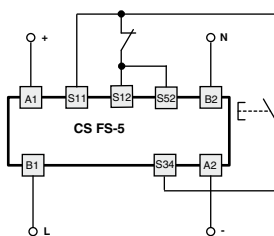
Internal wiring diagram



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

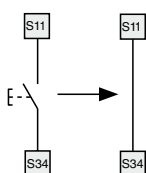
Inputs configuration

Gate monitoring	
Input configuration with manual start	
1 channel	2 channels



Automatic start

As regards the indicated diagrams, in order to activate the module with the automatic start, it is necessary to short the start button between S33 and S34 terminals.



Gate monitoring and safety magnetic sensors.

The safety module can control both gate monitoring circuits or safety magnetic sensors. Replace the switches contacts with the sensors contacts. The sensors can only be used in the 2-channel configuration.

