



Module for emergency stop, gate monitoring and magnetic safety sensors

Main features

- For safety applications up to SIL CL 3/PL e
- Input with 1 or 2 channels
- Choice between automatic start, manual start or monitored start
- Connection of the input channels to opposite potentials
- Small 22.5 mm housing
- Output contacts:
2 NO safety contacts,
1 NC auxiliary contact
- Supply voltage:
10 ... 30 Vdc, 24 Vac/dc, 120 Vac, 230 Vac

Utilization categories

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

Ue (V) 230

Ie (A) 3

Direct current: DC13 (6 op. cycles/minute)

Ue (V) 24

Ie (A) 4

Markings, quality marks and certificates:



UL approval: E131787

EC type examination certificate: IMQ CP 432 DM

EAC approval: RU C-IT DM94.B.01024

CCC approval: 2013010305640211

In conformity with the requirements of:

Low Voltage Directive 2006/95/EC,

Machinery Directive 2006/42/EC,

EMC Directive 2004/108/EC

Technical data

Housing

PA 6.6 polyamide housing, self-extinguishing, V0 acc. to UL 94

Protection degree:

IP40 (housing), IP20 (terminal strip)

Dimensions:

see page 283, design A

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 ISO 13849-1

Safety parameters:

see page 333

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 voltage (Uimp):

4 kV

Rated insulation voltage (Ui):

250 V

Overvoltage category:

II

Weight:

0.3 kg

Supply

Rated supply voltage (Un):

10 ... 30 Vdc
24 Vac/dc; 50...60 Hz
120 Vac; 50...60 Hz
230 Vac; 50...60 Hz

DC maximum residual ripple:

10%

Supply voltage tolerance:

±15% of Un

AC consumption:

< 5 VA

DC consumption:

< 2 W

Control circuit

Protection against short circuits:

resistance PTC, I_h=0.5 A

PTC timing:

intervention > 100 ms, reset > 3 s

Maximum input resistance:

≤ 50 Ω

Input current:

< 30 mA

Min. duration of start impulse t_{MIN}:

> 100 ms

Operating time t_A:

< 50 ms

Releasing time t_{R1}:

< 20 ms

Releasing time in absence of power supply t_R:

< 70 ms

Simultaneity time t_C:

infinite

In conformity 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 62326-1, 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:

2 NO safety contacts,
1 NC auxiliary contact
forcibly guided

Contact type:

gold-plated silver alloy

Contact material:

230/240 Vac; 300 Vdc

Maximum switching voltage:

6 A

Max. current per contact:

6 A

Conventional free air thermal current I_{th}:

72 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 pages 231-240.

Code structure

CS AR-01V024

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

Supply voltage		
024	24 Vac/dc	±15%
120	120 Vac	±15%
230	230 Vac	±15%
E02	10 ... 30 Vdc	

Stock items

CS AR-01V024

Characteristics approved by UL

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

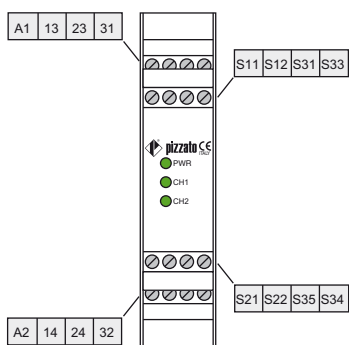
Notes:

- Use 60° or 75 °C copper (Cu) conductor, rigid or flexible, wire size AWG 30-12.
- 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. (Supply from Remote Class 2 Source or limited voltage limited energy).

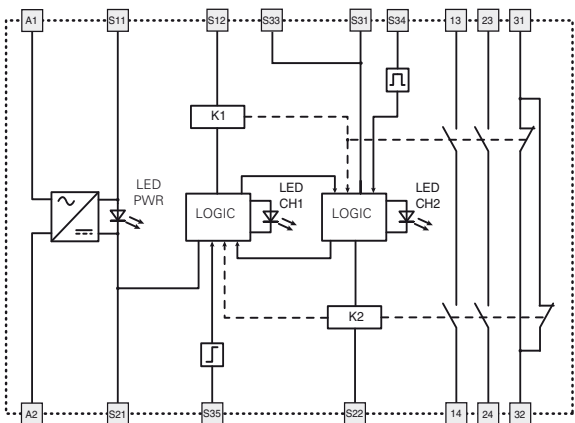


Safety module CS AR-01

Terminal layout

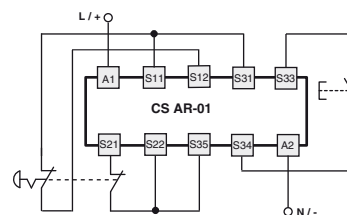
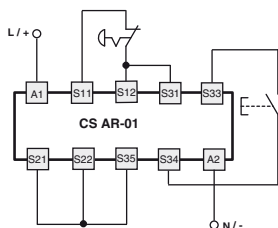


Internal diagram



Input configuration

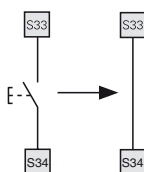
Emergency stop circuits	
Input configuration with manual start	
1 channel	2 channels



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

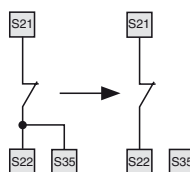
Automatic start

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



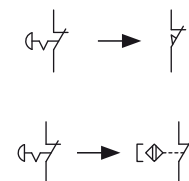
Monitored start

With regard to the indicated diagrams, it is necessary to remove the connection between S22 and S35 in order to activate the monitored start module.



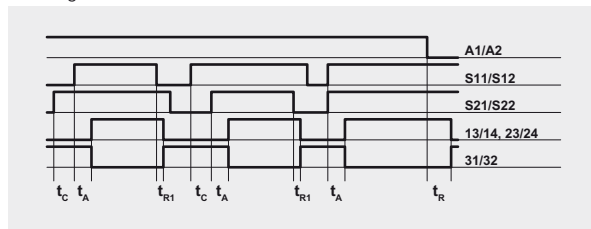
Movable guard monitoring and magnetic safety sensors

The safety module can control emergency stop circuits, movable guard monitoring circuits or magnetic safety sensors. Replace the emergency stop contacts with switch contacts or sensor contacts. The sensors can only be used in 2-channel configuration.

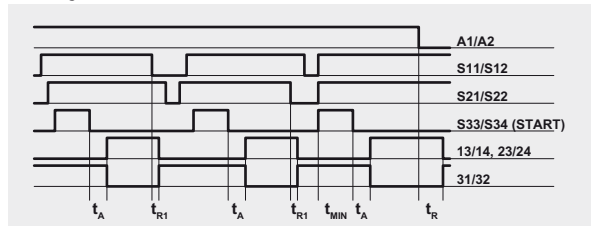


Operation diagrams

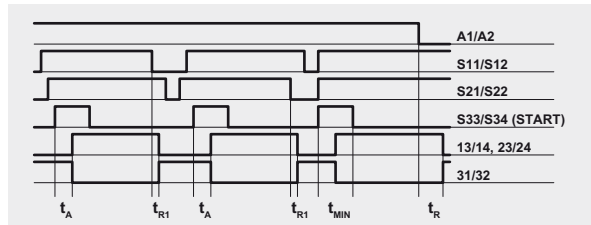
Configuration with automatic start



Configuration with monitored start



Configuration with manual start



- Legend:
- t_{MIN} : Min. duration of start impulse
 - t_C : simultaneity time
 - t_A : operating time
 - t_{R1} : releasing time
 - t_R : releasing time in absence of power supply

Notes: The configurations with one channel are obtained taking into consideration only the S11/S12 input. In this case it is necessary to consider time t_{R1} referred to input S11/S12, time t_R referred to the supply, time t_A referred to input S11/S12 and to the start, and time t_{MIN} referred to the start.



Module for emergency stop, gate monitoring and magnetic safety sensors

Main features

- For safety applications up to SIL CL 3/PL e
- Input with 1 or 2 channels
- Choice between automatic start, manual start or monitored start
- Connection of the input channels to opposite potentials
- Small 22.5 mm housing
- Output contacts:
3 NO safety contacts
- Supply voltage:
10 ... 30 Vdc, 24 Vac/dc, 120 Vac, 230 Vac

Utilization categories

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

Ue (V) 230

Ie (A) 3

Direct current: DC13 (6 op. cycles/minute)

Ue (V) 24

Ie (A) 4

Markings, quality marks and certificates:



UL approval: E131787

EC type examination certificate: IMQ CP 432 DM

EAC approval: RU C-IT DM94.B.01024

CCC approval: 2013010305640211

In conformity with the requirements of:

Low Voltage Directive 2006/95/EC,

Machinery Directive 2006/42/EC,

EMC Directive 2004/108/EC

Technical data

Housing

PA 6.6 polyamide housing, self-extinguishing, V0 acc. to UL 94

Protection degree:

IP40 (housing), IP20 (terminal strip)

Dimensions:

see page 283, design A

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 ISO 13849-1

Safety parameters:

see page 333

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 voltage (Uimp):

4 kV

Rated insulation voltage (Ui):

250 V

Overvoltage category:

II

Weight:

0.3 kg

Supply

Rated supply voltage (Un):

10 ... 30 Vdc

24 Vac/dc; 50...60 Hz

120 Vac; 50...60 Hz

230 Vac; 50...60 Hz

DC maximum residual ripple:

10%

Supply voltage tolerance:

±15% of Un

AC consumption:

< 5 VA

DC consumption:

< 2 W

Control circuit

Protection against short circuits:

resistance PTC, I_h=0.5 A

PTC timing:

intervention > 100 ms, reset > 3 s

Maximum input resistance:

≤ 50 Ω

Input current:

< 30 mA

Min. duration of start impulse t_{MIN}:

> 100 ms

Operating time t_A:

< 50 ms

Releasing time t_{RI}:

< 20 ms

Releasing time in absence of power supply t_R:

< 70 ms

Simultaneity time t_c:

infinite

In conformity 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 62326-1, 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:

3 NO safety contacts,

Contact type:

forcibly guided

Contact material:

gold-plated silver alloy

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:

72 A²

Minimum current:

10 mA

Contact resistance:

≤ 100 mΩ

External protection fuse:

4 A

The number and the load capacity of output contacts can be increased by using expansion modules or contactors. See pages 231-240.

Code structure

CS AR-02V024

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

Supply voltage		
024	24 Vac/dc	±15%
120	120 Vac	±15%
230	230 Vac	±15%
E02	10 ... 30 Vdc	

Characteristics approved by UL

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

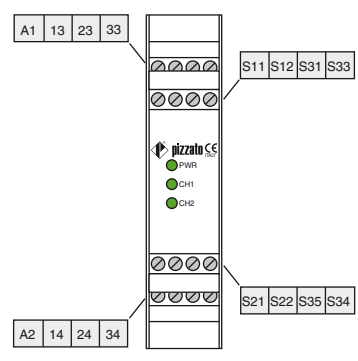
Notes:

- Use 60° or 75°C copper (Cu) conductor, rigid or flexible, wire size AWG 30-12.
- 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. (Supply from Remote Class 2 Source or limited voltage limited energy).

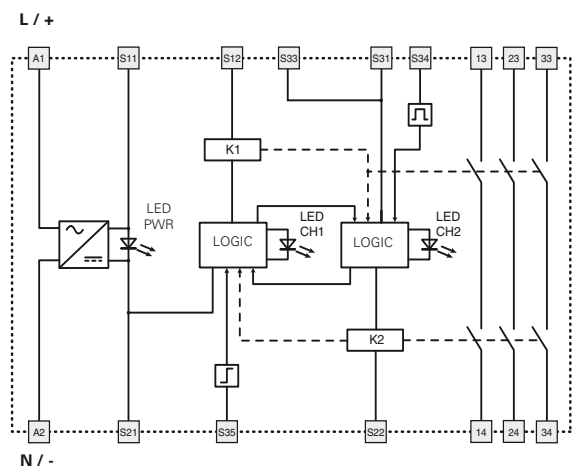


Safety module CS AR-02

Terminal layout

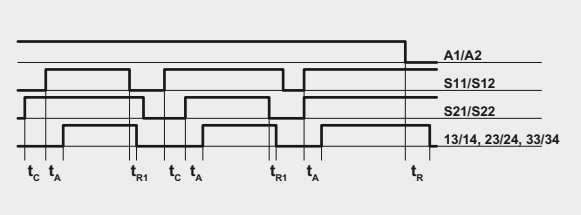


Internal diagram

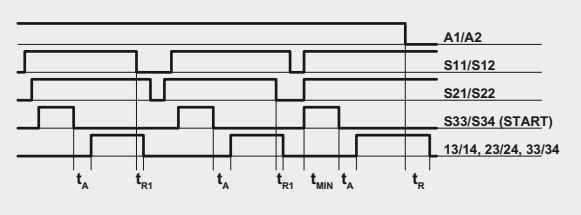


Operation diagrams

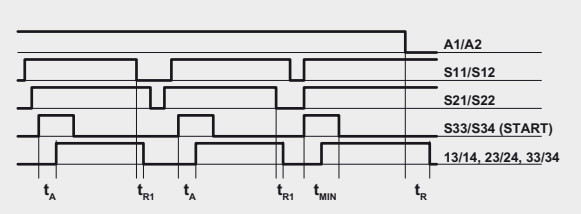
Configuration with automatic start



Configuration with monitored start



Configuration with manual start

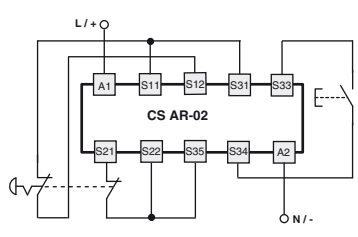
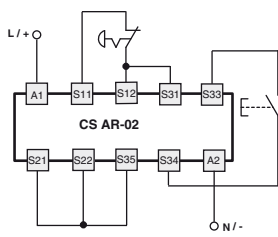


Legend:
 t_{MIN} : min. duration of start impulse
 t_c : simultaneity time
 t_a : operating time
 t_{r1} : releasing time
 t_r : releasing time in absence of power supply

Notes:
 The configurations with one channel are obtained taking into consideration only the S11/S12 input. In this case it is necessary to consider time t_{r1} referred to input S11/S12, time t_r referred to the supply, time t_a referred to input S11/S12 and to the start, and time t_{MIN} referred to the start.

Input configuration

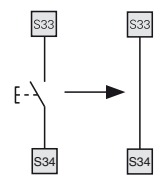
Emergency stop circuits	
Input configuration with manual start	
1 channel	2 channels



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

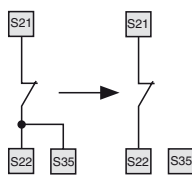
Automatic start

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



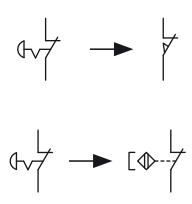
Monitored start

With regard to the indicated diagrams, it is necessary to remove the connection between S22 and S35 in order to activate the monitored start module.



Movable guard monitoring and magnetic safety sensors

The safety module can control emergency stop circuits, movable guard monitoring circuits or magnetic safety sensors. Replace the emergency stop contacts with switch contacts or sensor contacts. The sensors can only be used in 2-channel configuration.





Module for emergency stop, gate monitoring and magnetic safety sensors

Main features

- For safety applications up to SIL CL 3/PL e
- Input with 1 or 2 channels
- Choice between automatic start, manual start or monitored start
- Connection of the input channels to opposite potentials
- Small 22.5 mm housing
- Output contacts: 3 NO safety contacts, 1 NC auxiliary contact
- 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 op. cycles/minute)

U_e (V) 24

I_e (A) 4

Markings, quality marks and certificates:



UL approval: E131787

EC type examination certificate: IMQ CP 432 DM

EAC approval: RU C-IT DM94.B.01024

CCC approval: 2013010305640211

In conformity with the requirements of:

Low Voltage Directive 2006/95/EC,

Machinery Directive 2006/42/EC,

EMC Directive 2004/108/EC

Technical data

Housing

PA 6.6 polyamide housing, self-extinguishing, V0 acc. to UL 94

Protection degree:

IP40 (housing), IP20 (terminal strip)

Dimensions:

see page 283, design A

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 ISO 13849-1

Safety parameters:

see page 333

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 voltage (U_{imp}):

4 kV

Rated insulation voltage (U_i):

250 V

Overvoltage category:

II

Weight:

0.3 kg

Supply

Rated supply voltage (U_n):

24 Vac/dc; 50...60 Hz

120 Vac; 50...60 Hz

230 Vac; 50...60 Hz

DC maximum residual ripple:

10%

Supply voltage tolerance:

±15% of U_n

AC consumption:

< 5 VA

DC consumption:

< 2 W

Control circuit

Protection against short circuits:

resistance PTC, I_h=0.5 A

PTC timing:

intervention > 100 ms, reset > 3 s

Maximum input resistance:

≤ 50 Ω

Input current:

< 30 mA

Min. duration of start impulse t_{MIN}:

> 100 ms

Operating time t_A:

< 50 ms

Releasing time t_{R1}:

< 20 ms

Releasing time in absence of power supply t_R:

< 70 ms

Simultaneity time t_C:

infinite

In conformity 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 62326-1, 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:

3 NO safety contacts

1 NC auxiliary contact

forcibly guided

Contact type:

gold-plated silver alloy

Contact material:

230/240 Vac; 300 Vdc

Maximum switching voltage:

6 A

Max. current per contact:

6 A

Conventional free air thermal current I_{th}:

64 A²

Minimum current:

10 mA

Contact resistance:

≤ 100 mΩ

External protection fuse:

4 A

The number and the load capacity of output contacts can be increased by using expansion modules or contactors. See pages 231-240.

Code structure

CS AR-04V024

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

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

Stock items

CS AR-04V024

Characteristics approved by UL

Rated supply voltage (U_n):

24 Vac/dc; 50...60 Hz

120 Vac; 50...60 Hz

230 Vac; 50...60 Hz

AC consumption:

< 5 VA

DC consumption:

< 2 W

Maximum switching voltage:

230 Vac

Max. current per contact:

6 A

Utilization category

C300

Notes:

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

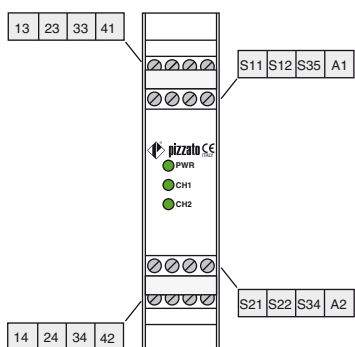
- Terminal tightening torque of 5-7 Lb In.

- Only for 24 Vac/dc version, supply from remote class 2 source or limited voltage and limited energy. (Supply from Remote Class 2 Source or limited voltage limited energy).

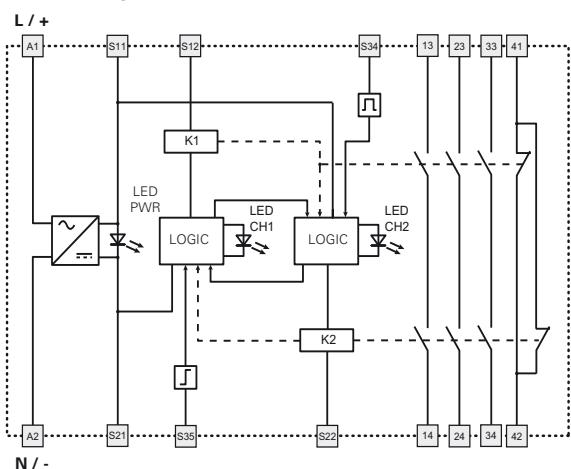


Safety module CS AR-04

Terminal layout

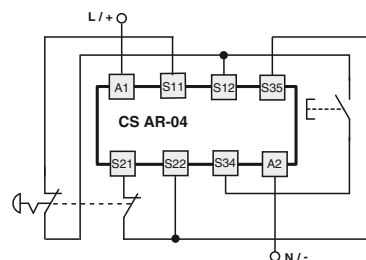
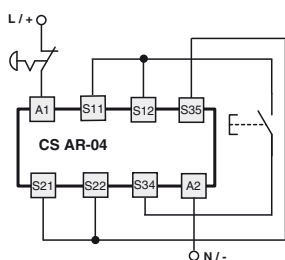


Internal diagram



Input configuration

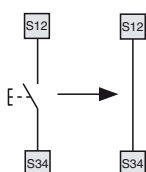
Emergency stop circuits	
Input configuration with manual start	
1 channel	2 channels



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

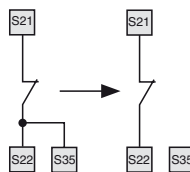
Automatic start

With regard to the indicated diagrams, bridge the start button between S12 and S34 in order to activate the automatic start module.



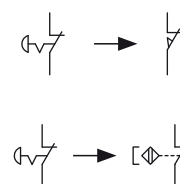
Monitored start

With regard to the indicated diagrams, it is necessary to remove the connection between S22 and S35 in order to activate the monitored start module.



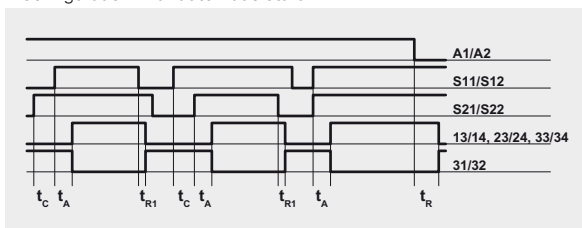
Movable guard monitoring and magnetic safety sensors

The safety module can control emergency stop circuits, movable guard monitoring circuits or magnetic safety sensors. Replace the emergency stop contacts with switch contacts or sensor contacts. The sensors can only be used in 2-channel configuration.

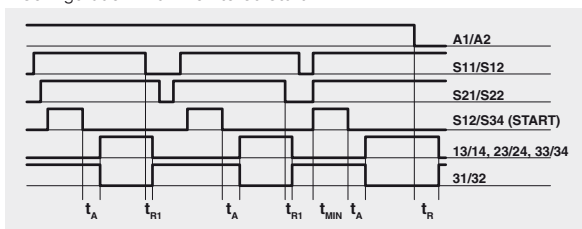


Operation diagrams

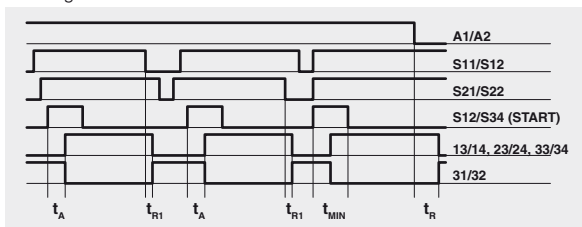
Configuration with automatic start



Configuration with monitored start



Configuration with manual start



Legend:

- t_{MIN} : min. duration of start impulse
- t_c : simultaneity time
- t_a : operating time
- t_{r1} : releasing time
- t_r : releasing time in absence of power supply

Notes:

The configurations with one channel are obtained taking into consideration only the effect of the S11/S12 input on the supply. In this case it is necessary to consider time t_{r1} referred to input S11/S12, time t_r referred to the supply, time t_a referred to input S11/S12 and to the start, and time t_{MIN} .



Module for emergency stop, gate monitoring, solid-state output circuits (e.g. light curtains) and magnetic safety sensor

Main features

- For safety applications up to SIL CL 3/PL e
- Input with 1 or 2 channels
- Choice between automatic start, manual start (CS AR-05 only) or monitored start (CS AR-06 only)
- Can be connected to solid-state output circuits (e.g. light curtains), to electromechanical contacts or to magnetic safety sensors
- Output contacts:
 - 3 NO safety contacts,
 - 1 NC auxiliary contact
- 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 op. cycles/minute)

U_e (V) 24

I_e (A) 4

Markings, quality marks and certificates:



UL approval: E131787

EC type examination certificate: IMQ CP 432 DM

EAC approval: RU C-IT DM94.B.01024

CCC approval: 2013010305640211

In conformity with the requirements of:

Low Voltage Directive 2006/95/EC,

Machinery Directive 2006/42/EC,

EMC Directive 2004/108/EC

Technical data

Housing

PA 6.6 polyamide housing, self-extinguishing, V0 acc. to UL 94

Protection degree:

IP40 (housing), IP20 (terminal strip)

Dimensions:

see page 283, design A

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 ISO 13849-1

Safety parameters:

see page 333

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 voltage (U_{imp}):

4 kV

Rated insulation voltage (U_i):

250 V

Overvoltage category:

II

Weight:

0.3 kg

Supply

Rated supply voltage (U_n):

24 Vac/dc; 50...60 Hz

120 Vac; 50...60 Hz

230 Vac; 50...60 Hz

10%

DC maximum residual ripple:

Supply voltage tolerance:

±15% of U_n

AC consumption:

< 5 VA

DC consumption:

< 2 W

Control circuit

Protection against short circuits:

resistance PTC, I_h=0.5 A

PTC timing:

intervention > 100 ms, reset > 3 s

Maximum input resistance:

≤ 50 Ω

Input current:

< 30 mA

Min. duration of start impulse t_{MIN}:

> 250 ms

Operating time t_A:

< 200 ms

Releasing time t_{R1}:

< 20 ms

Releasing time in absence of power supply t_R:

< 70 ms

Simultaneity time t_C:

infinite

In conformity 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 62326-1, 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:

3 NO safety contacts

1 NC auxiliary contact

forcibly guided

Contact type:

gold-plated silver alloy

Contact material:

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:

64 A²

Minimum current:

10 mA

Contact resistance:

≤ 100 mΩ

External protection fuse:

4 A

The number and the load capacity of output contacts can be increased by using expansion modules or contactors. See pages 231-240.

Code structure

CS AR-05V024

Start type

05 manual or automatic start

06 monitored start

Connection type

V screw terminals

M connector with screw terminals

X connector with spring terminals

Supply voltage

024 24 Vac/dc ±15%

120 120 Vac ±15%

230 230 Vac ±15%

Stock items

CS AR-05V024

Characteristics approved by UL

Rated supply voltage (U_n):

24 Vac/dc; 50...60 Hz

120 Vac; 50...60 Hz

230 Vac; 50...60 Hz

< 5 VA

AC consumption:

DC consumption:

Maximum switching voltage:

230 Vac

Max. current per contact:

6 A

Utilization category

C300

Notes:

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

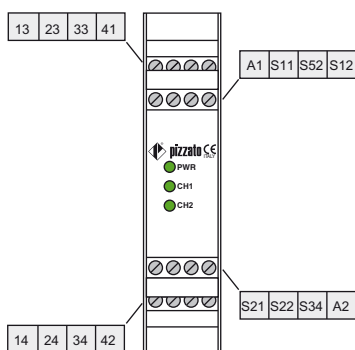
- Terminal tightening torque of 5-7 Lb In.

- Only for 24 Vac/dc version, supply from remote class 2 source or limited voltage and limited energy. (Supply from Remote Class 2 Source or limited voltage limited energy).

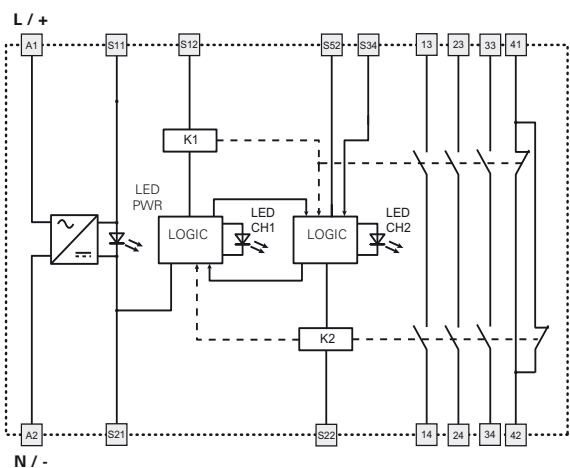


Safety module CS AR-05-06

Terminal layout



Internal diagram



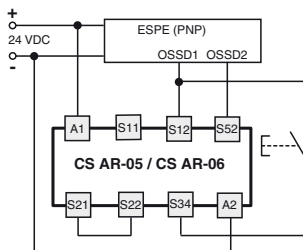
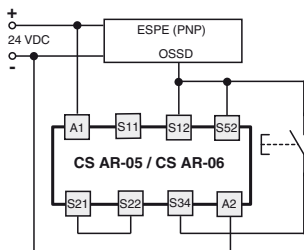
Input configuration

Solid state output circuits (e.g. light curtains)

Input configuration with manual start (CS AR-05)

1 channel

2 channels

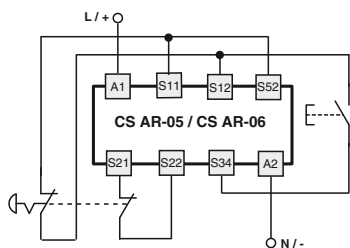
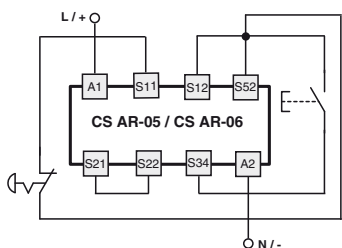


Emergency stop circuits

Input configuration with manual start (CS AR-05)

1 channel

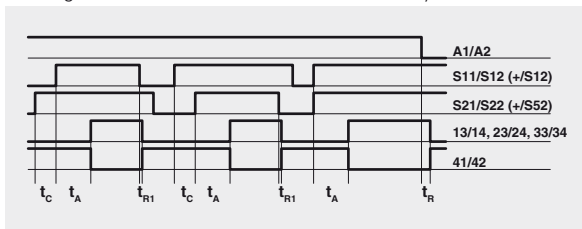
2 channels



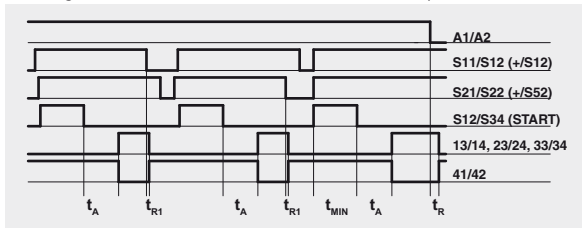
The diagram does not show the exact position of terminals in the product

Operation diagrams

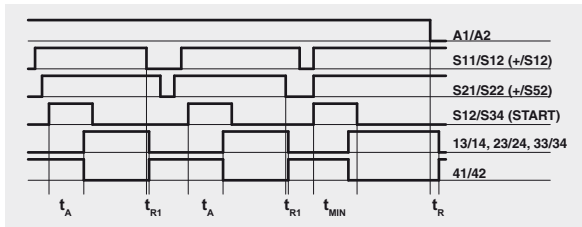
Configuration with automatic start (CS AR-05 only)



Configuration with monitored start (CS AR-06 only)



Configuration with manual start (CS AR-05 only)



Legend:

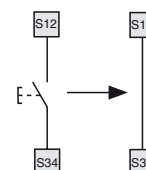
- t_{MIN} : min. duration of start impulse
- t_C : simultaneity time
- t_A : operating time
- t_{R1} : releasing time
- t_R : releasing time in absence of power supply

Notes:

The configurations with one channel are obtained taking into consideration only the CH1 input. In this case it is necessary to consider time t_{R1} referred to input CH1, time t_R referred to the supply, time t_A referred to input CH1 and to the start, and time t_{MIN} referred to the start.

Automatic start (CS AR-05 only)

Bridge the start button between S12 and S34 in order to activate the automatic start module.

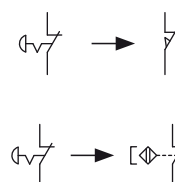


Monitored start

Use the CS AR-06 module following the diagrams for the manual start.

Movable guard monitoring and magnetic safety sensors

The safety module can control emergency stop circuits, movable guard monitoring circuits or magnetic safety sensors. Replace the emergency stop contacts with switch contacts or sensor contacts. The sensors can only be used in 2-channel configuration.





Module for emergency stop and gate monitoring

Main features

- For safety applications up to SIL CL 3/PL e
- Input with 1 or 2 channels
- Choice between automatic start, manual start or monitored start
- Connection of the input channels to opposite potentials
- Small 22.5 mm housing
- Output contacts:
 - 4 NO safety contacts,
 - 1 NC auxiliary contact
- Supply voltage:
 - 24 Vac/dc

Utilization categories

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

U_e (V) 230

I_e (A) 3

Direct current: DC13 (6 op. cycles/minute)

U_e (V) 24

I_e (A) 4

Markings, quality marks and certificates:



UL approval: E131787

EC type examination certificate: IMQ CP 432 DM

EAC approval: RU C-IT ДМ94.В.01024

CCC approval: 2013010305640211

In conformity with the requirements of:

Low Voltage Directive 2006/95/EC,

Machinery Directive 2006/42/EC,

EMC Directive 2004/108/EC

Technical data

Housing

PA 6.6 polyamide housing, self-extinguishing, V0 acc. to UL 94

Protection degree:

IP40 (housing), IP20 (terminal strip)

Dimensions:

see page 283, design B

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 ISO 13849-1

Safety parameters:

see page 333

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 voltage (U_{imp}):

4 kV

Rated insulation voltage (U_i):

250 V

Overtoltage category:

II

Weight:

0.3 kg

Supply

Rated supply voltage (U_n):

24 Vac/dc; 50...60 Hz

DC maximum residual ripple:

10%

Supply voltage tolerance:

±15% of U_n

AC consumption:

< 5 VA

DC consumption:

< 2 W

Control circuit

Protection against short circuits:

resistance PTC, I_h=0.5 A

PTC timing:

intervention > 100 ms, reset > 3 s

Maximum input resistance:

≤ 50 Ω

Input current:

< 30 mA

Min. duration of start impulse t_{MIN}:

> 100 ms

Operating time t_A:

< 70 ms

Releasing time t_{R1}:

< 40 ms

Releasing time in absence of power supply t_R:

< 80 ms

Simultaneity time t_c:

infinite

In conformity 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 62326-1, 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:

4 NO safety contacts

1 NC auxiliary contact

forcibly guided

Contact type:

gold-plated silver alloy

Contact material:

230/240 Vac; 220 Vdc

Maximum switching voltage:

6 A

Max. current per contact:

6 A

Conventional free air thermal current I_{th}:

72 A²

Minimum current:

10 mA

Contact resistance:

≤ 100 mΩ

External protection fuse:

4 A

The number and the load capacity of output contacts can be increased by using expansion modules or contactors. See pages 231-240.

Code structure

CS AR-07M024

Connection type

M connector with screw terminals

X connector with spring terminals

Supply voltage

024 24 Vac/dc ±15%

Stock items

CS AR-07M024

Characteristics approved by UL

Rated supply voltage (U_n): 24 Vac/dc; 50...60

Hz

AC consumption: < 5 VA

DC consumption: < 2 W

Maximum switching voltage: 230 Vac

Max. current per contact: 6 A

Utilization category C300

Notes:

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

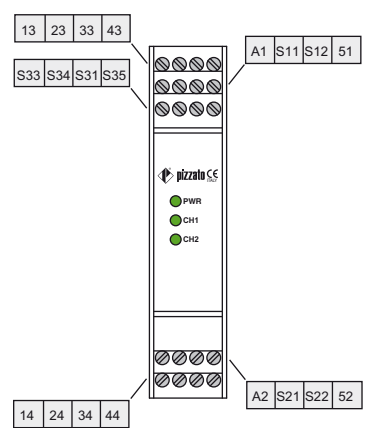
- Terminal tightening torque of 5-7 Lb In.

- Only for 24 Vac/dc version, supply from remote class 2 source or limited voltage and limited energy. (Supply from Remote Class 2 Source or limited voltage limited energy).

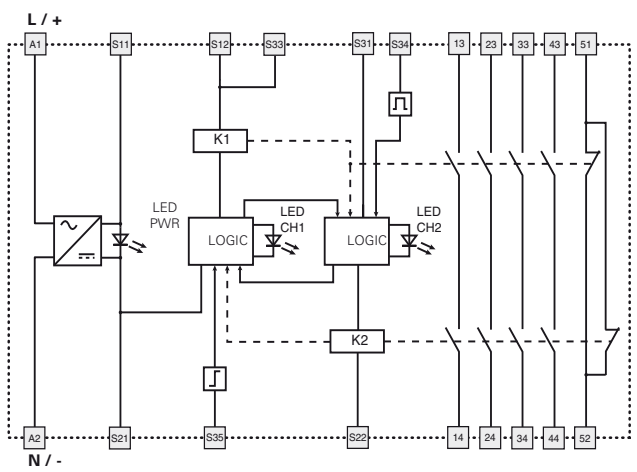


Safety module CS AR-07

Terminal layout

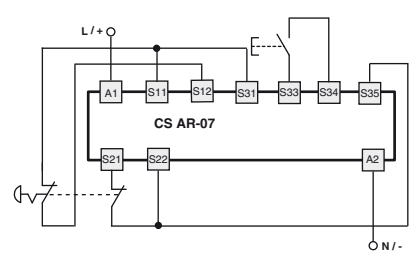
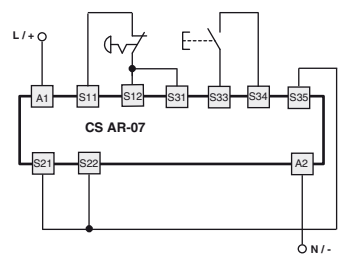


Internal diagram



Input configuration

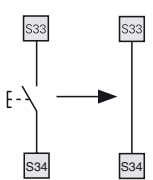
Emergency stop circuits	
Input configuration with manual start	
1 channel	2 channels



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

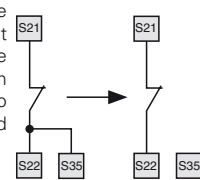
Automatic start

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



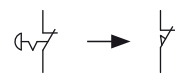
Monitored start

With regard to the indicated diagrams, it is necessary to remove the connection between S22 and S35 in order to activate the monitored start module.



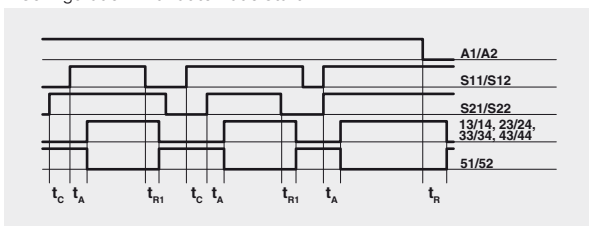
Movable guard monitoring

The safety module can control emergency stop circuits or movable guard monitoring circuits. Replace the emergency stop contacts with the switch contacts.

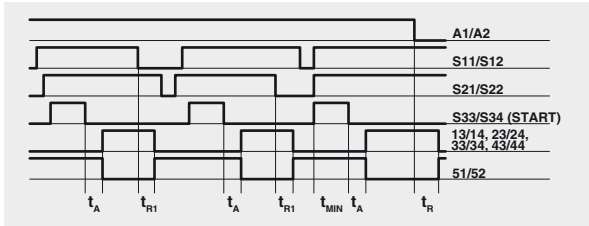


Operation diagrams

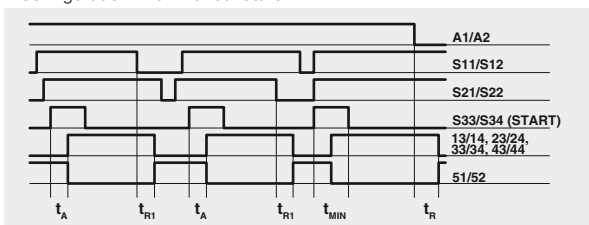
Configuration with automatic start



Configuration with monitored start



Configuration with manual start



- Legend:
- t_{MIN} : min. duration of start impulse
 - t_C : simultaneity time
 - t_A : operating time
 - t_{R1} : releasing time
 - t_{R2} : releasing time in absence of power supply

Notes: The configurations with one channel are obtained taking into consideration only the S11/S12 input. In this case it is necessary to consider time t_{R1} referred to input S11/S12, time t_R referred to the supply, time t_A referred to input S11/S12 and to the start, and time t_{MIN} referred to the start.



Module for emergency stop, gate monitoring, solid-state output circuits (e.g. light curtains) and magnetic safety sensor

Main features

- For safety applications up to SIL CL 3/PL e
- Input with 1 or 2 channels
- Choice between automatic start, manual start or monitored start
- Can be connected to solid-state output circuits (e.g. light curtains), to electromechanical contacts or to magnetic safety sensors
- Output contacts:
 - 2 NO safety contacts
- Supply voltage:
 - 12 Vdc, 24 Vac/dc, 120 Vac, 230 Vac
- Possibility of parallel reset of several modules

Utilization categories

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

U_e (V) 230

I_e (A) 3

Direct current: DC13 (6 op. cycles/minute)

U_e (V) 24

I_e (A) 4

Markings and quality marks:



UL approval: E131787

EC type examination certificate: IMQ CP 432 DM

TÜV SÜD approval: Z10 10 09 75157 002

EAC approval: RU C-IT DM94.B.01024

CCC approval: 2013010305640211

In conformity with the requirements of:

Low Voltage Directive 2006/95/EC,

Machinery Directive 2006/42/EC,

EMC Directive 2004/108/EC

Code structure

CS AR-08V024

Connection type		Supply voltage	
V	screw terminals	U12	12 Vdc -10% ... 15%
M	connector with screw terminals	024	24 Vac/dc ±15%
X	connector with spring terminals	120	120 Vac ±15%
		230	230 Vac ±15%

Stock items

CS AR-08V024

Technical data

Housing

PA 6.6 polyamide housing, self-extinguishing, V0 acc. to UL 94

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

Dimensions: see page 283, design A

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 ISO 13849-1

Safety parameters: see page 333

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 voltage (U_{imp}): 4 kV

Rated insulation voltage (U_i): 250 V

Overvoltage category: II

Weight: 0.3 kg

Supply

Rated supply voltage (U_n): 12 Vdc

24 Vac/dc; 50...60 Hz

120 Vac; 50...60 Hz

230 Vac; 50...60 Hz

10%

DC maximum residual ripple:

Supply voltage tolerance: ±15% of U_n

AC consumption: < 5 VA

DC consumption: < 2 W

Control circuit

Protection against short circuits: resistance PTC, I_h=0.5 A

PTC timing: intervention > 100 ms, reset > 3 s

Maximum input resistance: ≤ 50 Ω (15 Ω)*

Input current: < 30 mA (70 mA)*

Min. duration of start impulse t_{MIN}: > 200 ms (100 ms)*

Operating time t_A: < 150 ms (220 ms)*

Releasing time t_{RI}: < 20 ms (15 ms)*

Releasing time in absence of power supply t_R: < 150 ms (50 ms)*

Simultaneity time t_C: infinite

* version CS AR-08•U12

In conformity 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 62326-1, 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: 2 NO safety contacts,

forcibly guided

Contact type: gold-plated silver alloy

Contact material: 230/240 Vac; 300 Vdc

Maximum switching voltage:

Max. current per contact: 6 A

Conventional free air thermal current I_{th}:

Max. total current Σ I_{th}²: 36 A²

Minimum current: 10 mA

Contact resistance: ≤ 100 mΩ

External protection fuse: 4 A

The number and the load capacity of output contacts can be increased by using expansion

modules or contactors. See pages 231-240.

Characteristics approved by UL

Rated supply voltage (U_n): 24 Vac/dc, 50...60 Hz, 120 Vac; 50...60

Hz: 230 Vac; 50...60 Hz

AC consumption: < 5 VA

DC consumption: < 2 W

Maximum switching voltage: 230 Vac

Max. current per contact: 6 A

Utilization category: C300

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

- 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. (Supply from Remote Class 2 Source or limited voltage limited energy).

Characteristics approved by TÜV SÜD

Rated supply voltage (U_n): 24 Vac/dc, ± 15%, 120 Vac ± 15%, 230

Vac ± 15%

Consumption: 5 VA max. AC, 2 W max. DC

Rated operating current (max.): 4 A

Max. 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 conformity with standards: 2006/42/EEC Machine Directive,

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

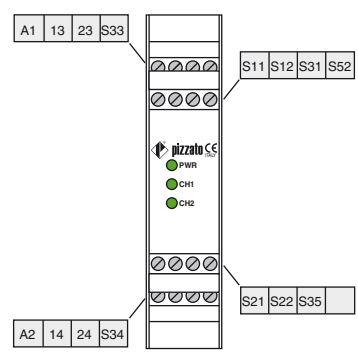
A1:2005, EN 61508-1:1998 (SIL CL 1-3), EN 61508-2:2000

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



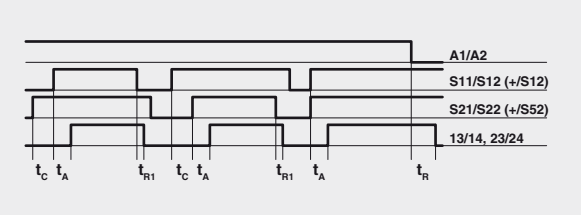
Safety module CS AR-08

Terminal layout

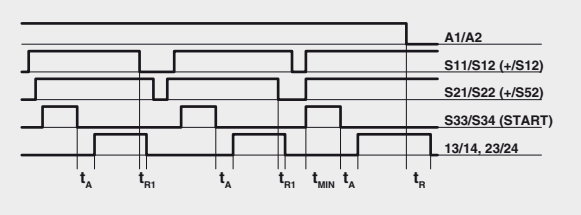


Operation diagrams

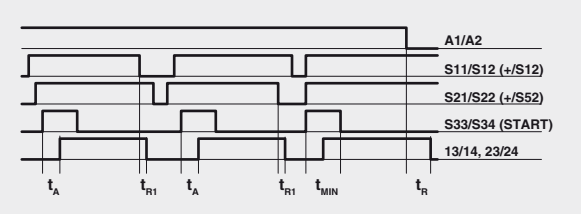
Configuration with automatic start



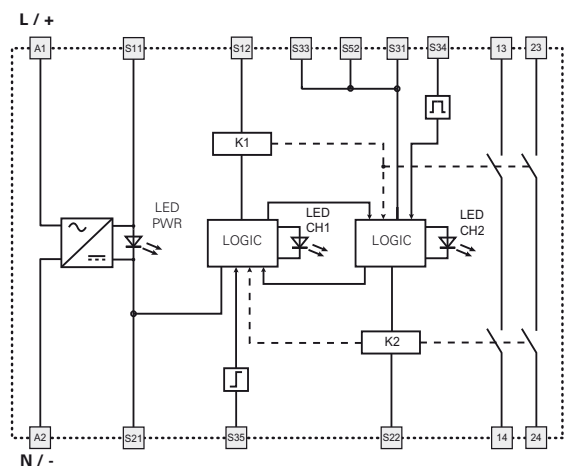
Configuration with monitored start



Configuration with manual start



Internal diagram



Legend:

- t_{MIN} : min. duration of start impulse
- t_c : simultaneity time
- t_A : operating time
- t_{R1} : releasing time
- t_r : releasing time in absence of power supply

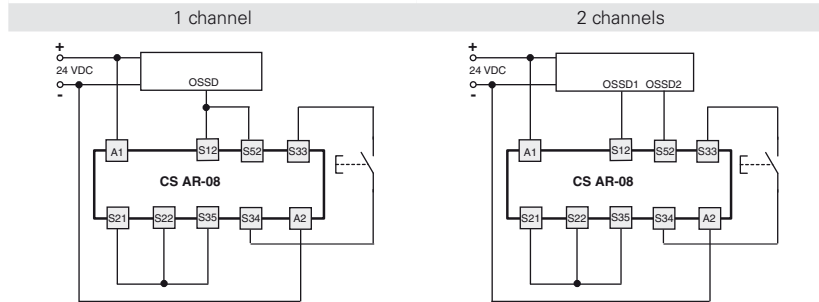
Notes:

The configurations with one channel are obtained taking into consideration only the CH1 input. In this case it is necessary to consider time t_{R1} referred to input CH1, time t_A referred to the supply, time t_A referred to input CH1 and to the start, and time t_{MIN} referred to the start.

Input configuration

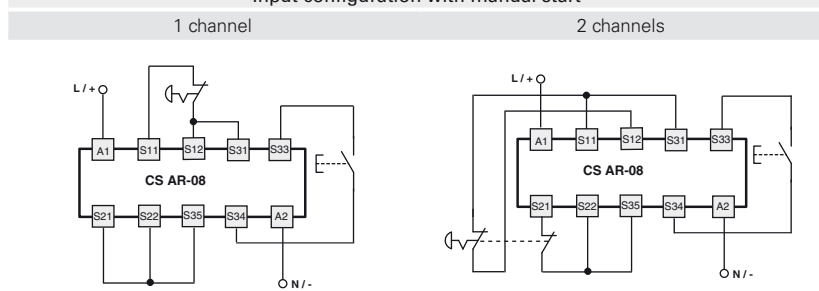
Solid state output circuits (e.g. light curtains)

Input configuration with manual start



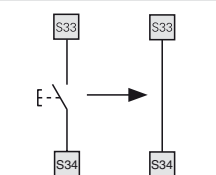
Emergency stop circuits

Input configuration with manual start



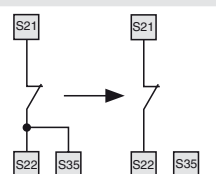
Automatic start

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



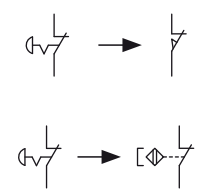
Monitored start

With regard to the indicated diagrams, it is necessary to remove the connection between S22 and S35 in order to activate the monitored start module.



Movable guard monitoring and magnetic safety sensors

The safety module can control emergency stop circuits, movable guard monitoring circuits or magnetic safety sensors. Replace the emergency stop contacts with switch contacts or sensor contacts. The sensors can only be used in 2-channel configuration.



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



Module for emergency stop and gate monitoring

Main features

- For safety applications up to SIL CL 3/PL e
- Input with 1 or 2 channels
- Choice between automatic start, manual start (CS AR-20 only) or monitored start (CS AR-21 only)
- Small 22.5 mm housing
- 2 NO safety 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 op. cycles/minute)

U_e (V) 24

I_e (A) 4

Markings, quality marks and certificates:



UL approval: E131787

EAC approval: RU C-IT ДМ94.В.01024

CCC approval: 2013010305640211

In conformity with the requirements of:

Low Voltage Directive 2006/95/EC,

Machinery Directive 2006/42/EC,

EMC Directive 2004/108/EC

Technical data

Housing

PA 6.6 polyamide housing, self-extinguishing, V0 acc. to UL 94

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

Dimensions: see page 283, design A

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. 3 acc. to EN ISO 13849-1

Safety parameters: see page 333

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 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

DC maximum residual ripple: 10%

Supply voltage tolerance: ±15% of U_n

AC consumption: < 5 VA

DC consumption: < 2 W

Control circuit

Protection against short circuits: resistance PTC, I_h=0.5 A

PTC timing: intervention > 100 ms, reset > 3 s

Maximum input resistance: ≤ 50 Ω

Input current: < 70 mA

Min. duration of start impulse t_{MIN}: > 100 ms

Operating time t_A: < 50 ms

Releasing time in absence of power supply t_R: < 100 ms

Simultaneity time t_C: infinite

In conformity 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 62326-1, 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: 2 NO safety contacts

Contact type: forcibly guided

Contact material: gold-plated silver alloy

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

The number and the load capacity of output contacts can be increased by using expansion modules or contactors. See pages 231-240.

Code structure

CS AR-20V024

Start type

20 manual or automatic start

21 monitored start

Connection type

V screw terminals

M connector with screw terminals

X connector with spring terminals

Supply voltage

024 24 Vac/dc ±15%

120 120 Vac ±15%

230 230 Vac ±15%

Stock items

CS AR-20V024

Characteristics approved by UL

Rated supply voltage (U_n): 24 Vac/dc; 50...60 Hz

120 Vac; 50...60 Hz

230 Vac; 50...60 Hz

AC consumption: < 5 VA

DC consumption: < 2 W

Maximum switching voltage: 230 Vac

Max. current per contact: 6 A

Utilization category: C300

Notes:

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

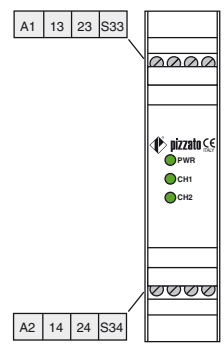
- Terminal tightening torque of 5-7 Lb In.

- Only for 24 Vac/dc version, supply from remote class 2 source or limited voltage and limited energy. (Supply from Remote Class 2 Source or limited voltage limited energy).

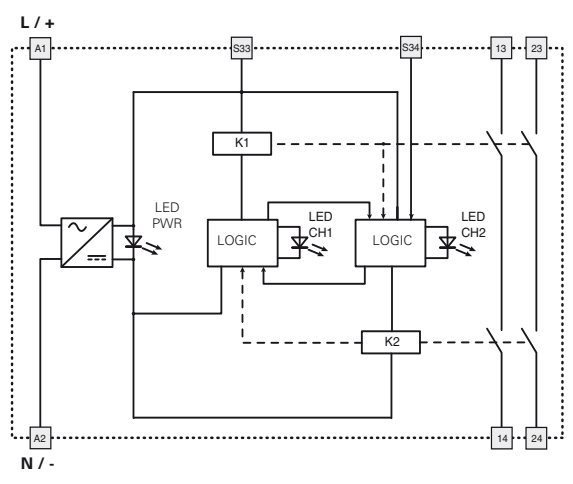


Safety module CS AR-20 / CS AR-21

Terminal layout

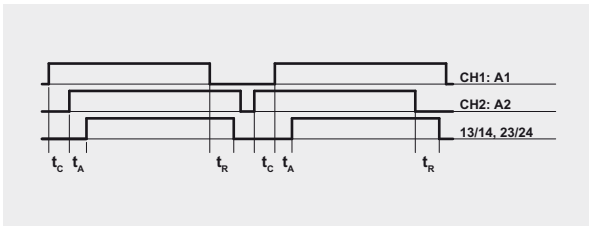


Internal diagram

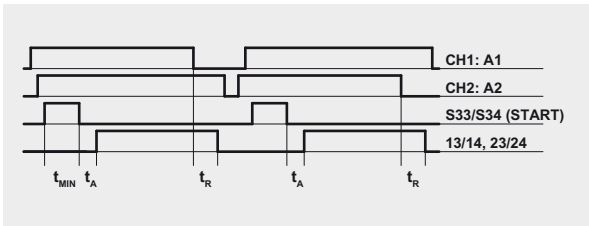


Operation diagrams

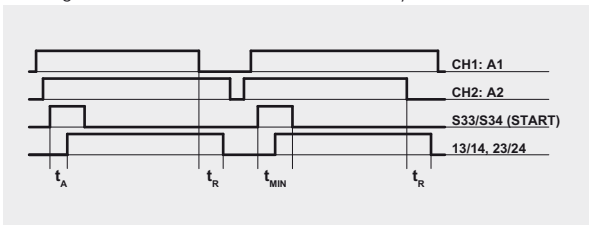
Configuration with automatic start (CS AR-20 only)



Configuration with monitored start (CS AR-21 only)



Configuration with manual start (CS AR-20 only)

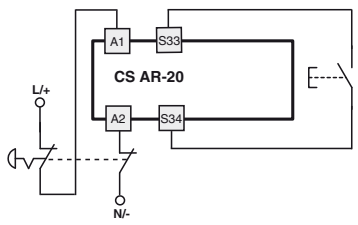
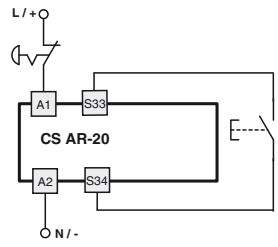


Legend:
t_MIN: min. duration of start impulse
t_c: simultaneity time
t_A: operating time
t_R: releasing time in absence of power supply

Notes:
The configurations with one channel are obtained taking into consideration only the CH1:A1 input. In this case it is necessary to consider time t_R referred to input CH1:A1, time t_A referred to input CH1:A1 and to the start, and time t_MIN referred to the start.

Input configuration

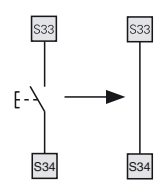
Emergency stop circuits	
Input configuration with manual start	
1 channel	2 channels



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

Automatic start

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

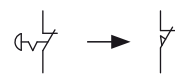


Monitored start

Use the CS AR-21 module following the diagram for the manual start.

Movable guard monitoring

The safety module can control emergency stop circuits or movable guard monitoring circuits. Replace the emergency stop contacts with the switch contacts.



Application examples See page 241



Module for emergency stop and gate monitoring

Main features

- For safety applications up to SIL CL 3/PL e
- Input with 1 or 2 channels
- Choice between automatic start, manual start (CS AR-22 only) or monitored start (CS AR-23 only)
- Small 22.5 mm housing
- 3 NO safety contacts, 1 NC auxiliary contact
- 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 op. cycles/minute)

U_e (V) 24

I_e (A) 4

Markings, quality marks and certificates:



UL approval: E131787

EAC approval: RU C-IT ДМ94.В.01024

CCC approval: 2013010305640211

In conformity with the requirements of:

Low Voltage Directive 2006/95/EC,

Machinery Directive 2006/42/EC,

EMC Directive 2004/108/EC

Technical data

Housing

PA 6.6 polyamide housing, self-extinguishing, V0 acc. to UL 94

Protection degree:

IP40 (housing), IP20 (terminal strip)

Dimensions:

see page 283, design A

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. 3 acc. to EN ISO 13849-1

Safety parameters:

see page 333

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 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

DC maximum residual ripple:

10%

Supply voltage tolerance:

±15% of U_n

AC consumption:

< 5 VA

DC consumption:

< 2 W

Control circuit

Protection against short circuits:

resistance PTC, I_h=0.5 A

PTC timing:

intervention > 100 ms, reset > 3 s

Maximum input resistance:

≤ 50 Ω

Input current:

< 70 mA

Min. duration of start impulse t_{MIN}:

> 100 ms

Operating time t_A:

< 50 ms

Releasing time in absence of power supply t_R:

< 75 ms

Simultaneity time t_C:

infinite

In conformity 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 62326-1, 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:

3 NO safety contacts,

1 NC auxiliary contact

Contact type:

forcibly guided

Contact material:

gold-plated silver alloy

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:

80 A²

Minimum current:

10 mA

Contact resistance:

≤ 100 mΩ

External protection fuse:

4 A

The number and the load capacity of output contacts can be increased by using expansion modules or contactors. See pages 231-240.

Code structure

CS AR-22V024

Start type

22 manual or automatic start

23 monitored start

Connection type

V screw terminals

M connector with screw terminals

X connector with spring terminals

Supply voltage

024 24 Vac/dc ±15%

120 120 Vac ±15%

230 230 Vac ±15%

Stock items

CS AR-22V024

Characteristics approved by UL

Rated supply voltage (U_n):

24 Vac/dc; 50...60 Hz

120 Vac; 50...60 Hz

230 Vac; 50...60 Hz

AC consumption:

< 5 VA

DC consumption:

< 2 W

Maximum switching voltage:

230 Vac

Max. current per contact:

6 A

Utilization category

C300

Notes:

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

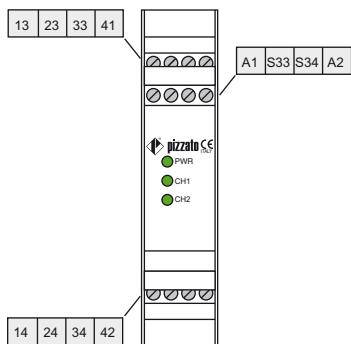
- Terminal tightening torque of 5-7 Lb In.

- Only for 24 Vac/dc version, supply from remote class 2 source or limited voltage and limited energy. (Supply from Remote Class 2 Source or limited voltage limited energy).

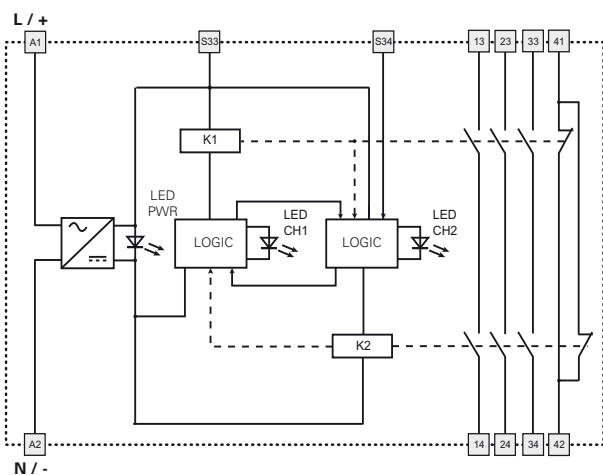


Safety module CS AR-22 / CS AR-23

Terminal layout

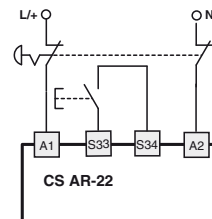
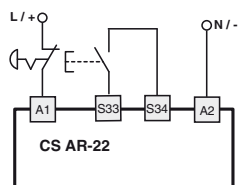


Internal diagram



Input configuration

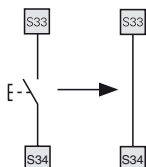
Emergency stop circuits	
Input configuration with manual start	
1 channel	2 channels



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

Automatic start

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

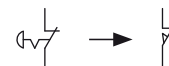


Monitored start

Use the CS AR-23 module following the diagram for the manual start.

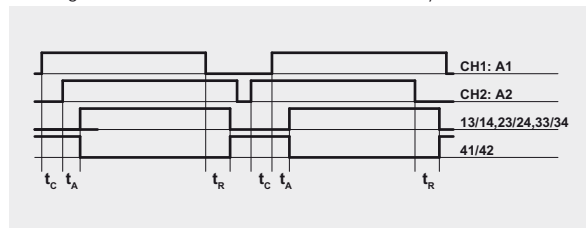
Movable guard monitoring

The safety module can control emergency stop circuits or movable guard monitoring circuits. Replace the emergency stop contacts with the switch contacts.

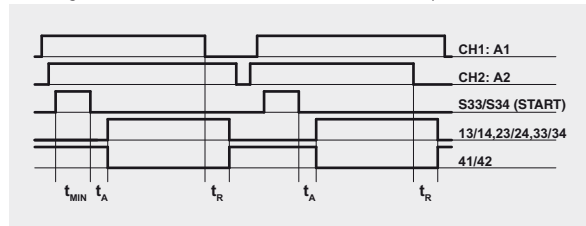


Operation diagrams

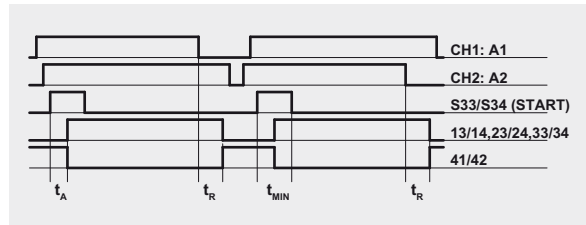
Configuration with automatic start (CS AR-22 only)



Configuration with monitored start (CS AR-23 only)



Configuration with manual start (CS AR-22 only)



Legend:

- t_{MIN} : min. duration of start impulse
- t_c : simultaneity time
- t_A : operating time
- t_R : releasing time in absence of power supply

Notes:

The configurations with one channel are obtained taking into consideration only the CH1:A1 input. In this case it is necessary to consider time t_R referred to input CH1:A1, time t_A referred to input CH1:A1 and to the start, and time t_{MIN} referred to the start.



Module for emergency stop and gate monitoring

Main features

- For safety applications up to SIL CL 3/PL e
- Input with 1 or 2 channels
- Choice between automatic start, manual start (CS AR-24 only) or monitored start (CS AR-25 only)
- Small 22.5 mm housing
- 4 NO safety contacts
1 NC auxiliary contact
- Supply voltage:
24 Vac/dc

Utilization categories

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

U_e (V) 230

I_e (A) 3

Direct current: DC13 (6 op. cycles/minute)

U_e (V) 24

I_e (A) 4

Markings, quality marks and certificates:



UL approval: E131787

EAC approval: RU C-IT ДМ94.В.01024

CCC approval: 2013010305640211

In conformity with the requirements of:

Low Voltage Directive 2006/95/EC,

Machinery Directive 2006/42/EC,

EMC Directive 2004/108/EC

Technical data

Housing

PA 6.6 polyamide housing, self-extinguishing, V0 acc. to UL 94

Protection degree:

IP40 (housing), IP20 (terminal strip)

Dimensions:

see page 283, design A

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. 3 acc. to EN ISO 13849-1

Safety parameters:

see page 333

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 voltage (U_{imp}):

4 kV

Rated insulation voltage (U_i):

250 V

Overvoltage category:

II

Weight:

0.3 kg

Supply

Rated supply voltage (U_n):

24 Vac/dc; 50...60 Hz

DC maximum residual ripple:

10%

Supply voltage tolerance:

±15% of U_n

AC consumption:

< 5 VA

DC consumption:

< 2 W

Control circuit

Protection against short circuits:

resistance PTC, I_h=0.5 A

PTC timing:

intervention > 100 ms, reset > 3 s

Maximum input resistance:

≤ 50 Ω

Input current:

< 30 mA

Min. duration of start impulse t_{MIN}:

> 100 ms

Operating time t_A:

< 85 ms

Releasing time t_{RI}:

< 40 ms

Releasing time in absence of power supply t_R:

< 170 ms

Simultaneity time t_c:

infinite

In conformity 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 62326-1, 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:

4 NO safety contacts,

1 NC auxiliary contact

Contact type:

forcibly guided

Contact material:

gold-plated silver alloy

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:

72 A²

Minimum current:

10 mA

Contact resistance:

≤ 100 mΩ

External protection fuse:

4 A

The number and the load capacity of output contacts can be increased by using expansion modules or contactors. See pages 231-240.

Code structure

CS AR-24V024

Start type

24 manual or automatic start

25 monitored start

Connection type

V screw terminals

M connector with screw terminals

X connector with spring terminals

Supply voltage

024 24 Vac/dc ±15%

Characteristics approved by UL

Rated supply voltage (U_n): 24 Vac/dc; 50...60

Hz

AC consumption: < 5 VA

DC consumption: < 2 W

Maximum switching voltage: 230 Vac

Max. current per contact: 6 A

Utilization category C300

Notes:

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

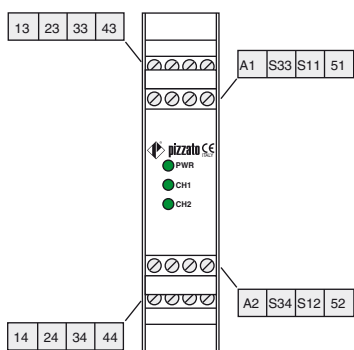
- Terminal tightening torque of 5-7 Lb In.

- Only for 24 Vac/dc version, supply from remote class 2 source or limited voltage and limited energy. (Supply from Remote Class 2 Source or limited voltage limited energy).

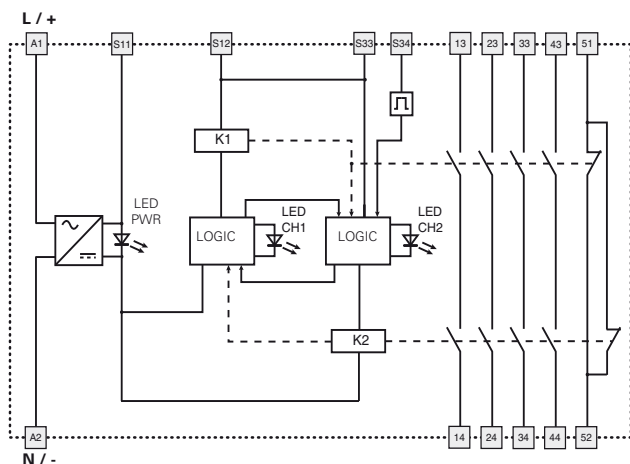


Safety module CS AR-24 / CS AR-25

Terminal layout

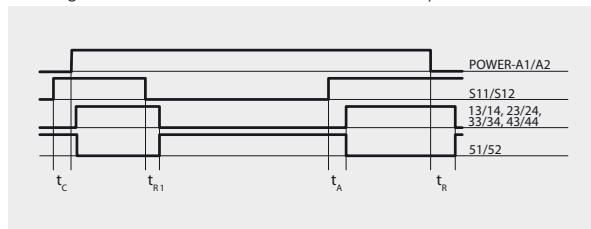


Internal diagram

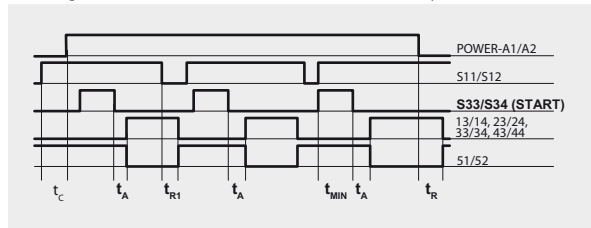


Operation diagrams

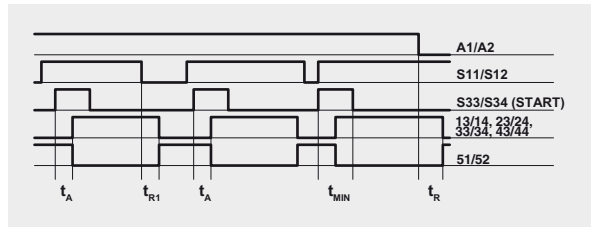
Configuration with automatic start (CS AR-24 only)



Configuration with monitored start (CS AR-25 only)



Configuration with manual start (CS AR-24 only)

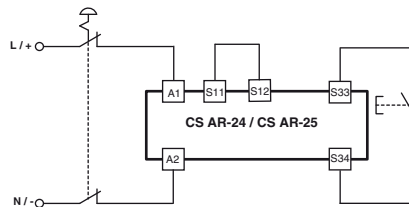
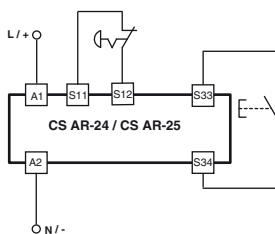


- Legend:
- t_{MIN} : min. duration of start impulse
 - t_C : simultaneity time
 - t_A : operating time
 - t_{R1} : releasing time
 - t_R : releasing time in absence of power supply

Notes:
The configurations with one channel are obtained taking into consideration only the S11/S12 input. In this case it is necessary to consider time t_{R1} referred to input S11/S12, time t_R referred to the supply, time t_A referred to input S11/S12 and to the start, and time t_{MIN} referred to the start.

Input configuration

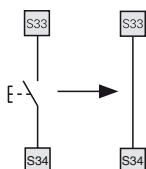
Emergency stop circuits	
Input configuration with manual start	
1 channel	2 channels



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

Automatic start

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



Monitored start

Use the CS AR-25 module following the diagram for the manual start.

Movable guard monitoring

The safety module can control emergency stop circuits or movable guard monitoring circuits. Replace the emergency stop contacts with the switch contacts.



Application examples See page 241



Module for emergency stop and gate monitoring

Main features

- For safety applications up to SIL CL 2/PL d
- Choice between automatic start, manual start (CS AR-40 only) or monitored start (CS AR-41 only)
- Small 22.5 mm housing
- 2 NO safety contacts
- Supply voltage: 24 Vac/dc

Utilization categories

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

U_e (V) 230

I_e (A) 3

Direct current: DC13 (6 op. cycles/minute)

U_e (V) 24

I_e (A) 4

Markings, quality marks and certificates:



UL approval: E131787

EAC approval: RU C-IT ДМ94.В.01024

CCC approval: 2013010305640211

In conformity with the requirements of:

Low Voltage Directive 2006/95/EC,

Machinery Directive 2006/42/EC,

EMC Directive 2004/108/EC

Technical data

Housing

PA 6.6 polyamide housing, self-extinguishing, V0 acc. to UL 94

Protection degree:

IP40 (housing), IP20 (terminal strip)

Dimensions:

see page 284, design D

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. 2 acc. to EN ISO 13849-1

Safety parameters:

see page 333

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 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

DC maximum residual ripple:

10%

Supply voltage tolerance:

±15% of U_n

AC consumption:

< 5 VA

DC consumption:

< 2 W

Control circuit

Protection against short circuits:

resistance PTC, I_h=0.5 A

PTC timing:

intervention > 100 ms, reset > 3 s

Maximum input resistance:

≤ 50 Ω

Input current:

< 70 mA

Min. duration of start impulse t_{MIN}:

> 100 ms

Operating time t_A:

< 50 ms

Releasing time in absence of power supply t_R:

< 105 ms

Simultaneity time t_C:

infinite

In conformity 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 62326-1, 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:

2 NO safety contacts

Contact type:

forcibly guided

Contact material:

silver alloy

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

The number and the load capacity of output contacts can be increased by using expansion modules or contactors. See pages 231-240.

Code structure

CS AR-40V024

Start type

40 manual or automatic start

41 monitored start

Connection type

V screw terminals

M connector with screw terminals

X connector with spring terminals

Supply voltage

024 24 Vac/dc ±15%

Characteristics approved by UL

Rated supply voltage (U_n): 24 Vac/dc; 50...60 Hz

AC consumption: < 5 VA

DC consumption: < 2 W

Maximum switching voltage: 230 Vac

Max. current per contact: 6 A

Utilization category: C300

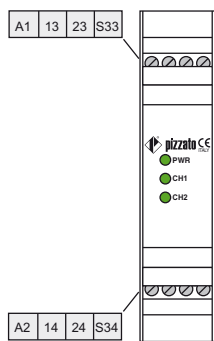
Notes:

- Use 60° or 75°C copper (Cu) conductor, rigid or flexible, wire size AWG 30-12.
- 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. (Supply from Remote Class 2 Source or limited voltage limited energy).

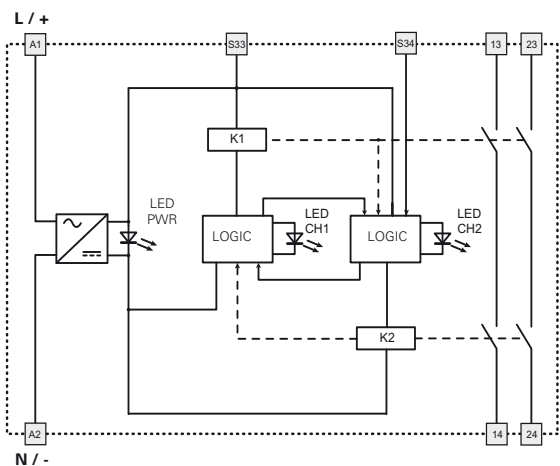


Safety module CS AR-40 / CS AR-41

Terminal layout

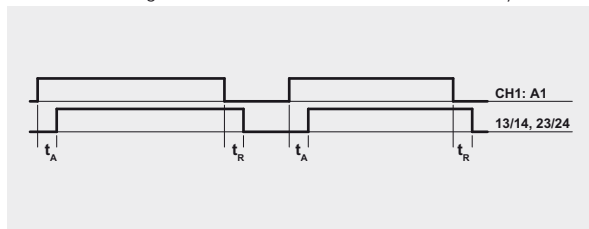


Internal diagram

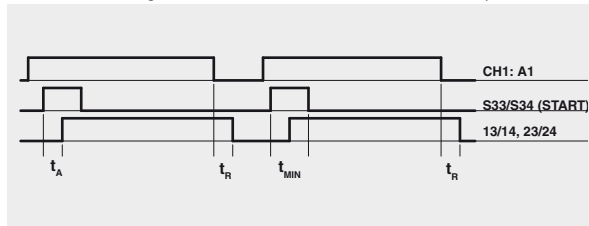


Operation diagrams

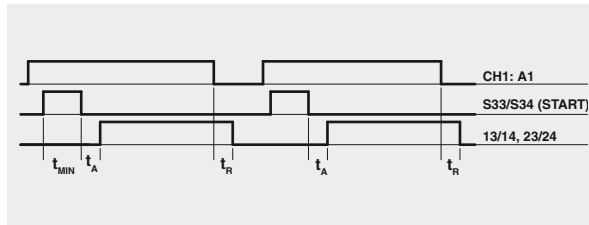
1-channel configuration with automatic start (CS AR-40 only)



1-channel configuration with manual start (CS AR-40 only)



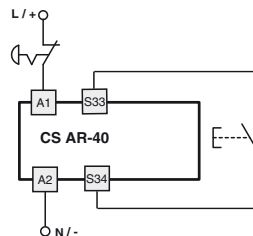
1-channel configuration with monitored start (CS AR-41 only)



Legend:
t_{MIN}: Min. duration of start impulse
t_A: operating time
t_R: releasing time in absence of power supply

Input configuration

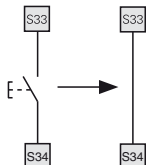
Emergency stop circuits 1-channel input configuration with manual start



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

Automatic start

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

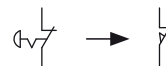


Monitored start

Use the CS AR-41 module following the diagram for the manual start.

Movable guard monitoring

The safety module can control emergency stop circuits or movable guard monitoring circuits. Replace the emergency stop contacts with the switch contacts.





Module for emergency stop, gate monitoring, devices and magnetic safety sensors

Main features

- For safety applications up to SIL CL 1/PL c
- Small 22.5 mm housing
- 1 NO safety contacts
- Supply voltage: 24 Vac/dc

Utilization categories

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

U_e (V) 230

I_e (A) 3

Direct current: DC13 (6 op. cycles/minute)

U_e (V) 24

I_e (A) 4

Markings, quality marks and certificates:



UL approval: E131787

EAC approval: RU C-IT ДМ94.В.01024

CCC approval: 2013010305640211

In conformity with the requirements of:

Low Voltage Directive 2006/95/EC,

Machinery Directive 2006/42/EC,

EMC Directive 2004/108/EC

Technical data

Housing

PA 6.6 polyamide housing, self-extinguishing, V0 acc. to UL 94

Protection degree:

IP40 (housing), IP20 (terminal strip)

Dimensions:

see page 284, design D

General data

SIL CL:

up to SIL CL 1 acc. to EN 62061

Performance Level (PL):

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

Safety category:

up to cat. 1 acc. to EN ISO 13849-1

Safety parameters:

see page 333

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 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

DC maximum residual ripple:

10%

Supply voltage tolerance:

±15% of U_n

AC consumption:

< 5 VA

DC consumption:

< 2 W

Control circuit

Protection against short circuits:

resistance PTC, I_h=0.5 A

PTC timing:

intervention > 100 ms, reset > 3 s

Maximum input resistance:

≤ 50 Ω

Input current:

< 20 mA

Operating time t_A:

< 15 ms

Releasing time t_{R1}:

< 20 ms

Releasing time in absence of power supply t_R:

< 100 ms

Simultaneity time t_C:

infinite

In conformity 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 62326-1, 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 contacts

Contact material:

silver alloy

Maximum switching voltage:

230/240 Vac; 300 Vdc

Max. current per contact:

6 A

Conventional free air thermal current I_{th}:

6 A

Minimum current:

10 mA

Contact resistance:

≤ 100 mΩ

External protection fuse:

4 A

The number and the load capacity of output contacts can be increased by using expansion modules or contactors. See pages 231-240.

Code structure

CS AR-46V024

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

Supply voltage		
024	24 Vac/dc	±15%

Characteristics approved by UL

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

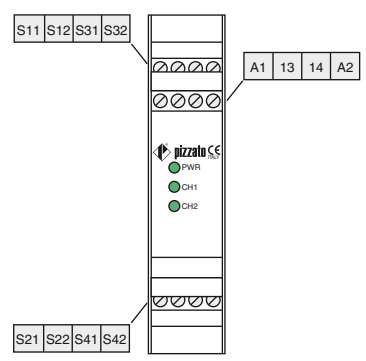
Notes:

- Use 60° or 75 °C copper (Cu) conductor, rigid or flexible, wire size AWG 30-12.
- 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. (Supply from Remote Class 2 Source or limited voltage limited energy).

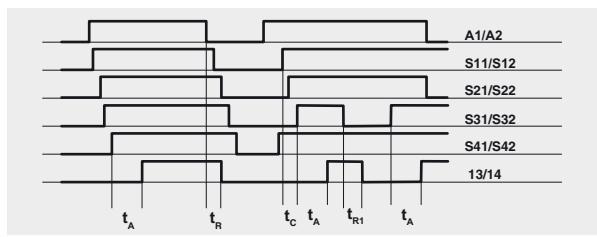


Safety module CS AR-46

Terminal layout

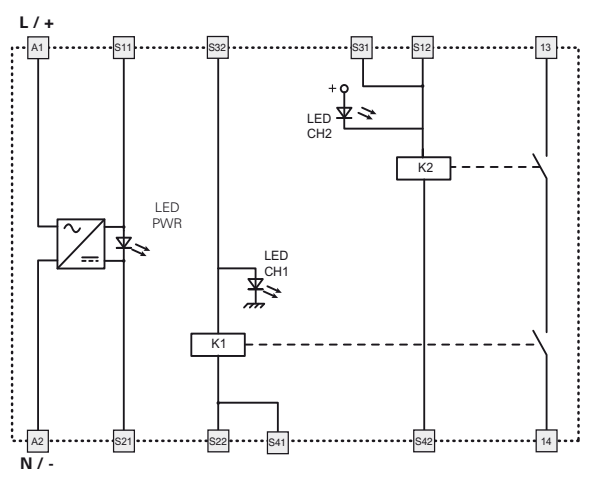


Operation diagrams



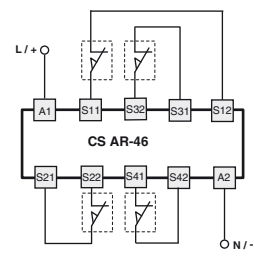
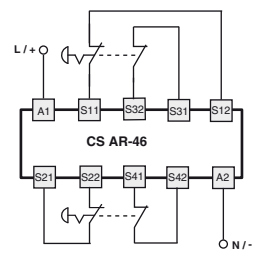
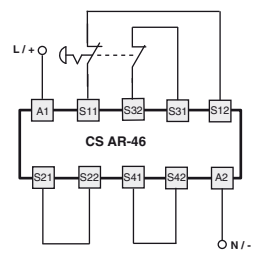
Legend:
 t_c : simultaneity time
 t_A : operating time
 t_{R1} : releasing time
 t_A'' : releasing time in absence of power supply

Internal diagram



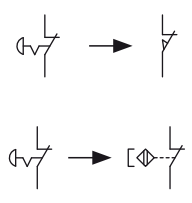
Input configuration

Emergency stop circuits		
Input configuration with automatic start		
2 channels and 1 emergency stop button	2 channels and 2 emergency stop buttons	2 channels and 4 switches



Movable guard monitoring and magnetic safety sensors

The safety module can control emergency stop circuits, movable guard monitoring circuits or magnetic safety sensors. Replace the emergency stop contacts with switch contacts or sensor contacts. The sensors can only be used in 2-channel configuration.





Module for emergency stop, gate monitoring and magnetic safety sensors

Main features

- For safety applications up to SIL 3 / PL e
- Choice between automatic start, manual start or monitored start
- Connection of the input channels to opposite potentials
- Small 22.5 mm housing
- Output contacts:
2 NO safety contacts, 1NO opto-decoupled, for signalling
- Supply voltage: 24 Vac/dc
- Insensitivity to voltage dips

Utilization categories

Alternating current: AC15 (50...60 Hz)
 U_e (V) 230
 I_e (A) 3
 Direct current: DC13 (6 op. cycles/minute)
 U_e (V) 24
 I_e (A) 4

Markings, quality marks and certificates:



IMQ certificate of conformity no. 340.
 (Standard: EN 81-1:1998 + A3:2009, EN 81-2:1998 + A3:2009)
 EC type examination certificate: IMQ CP 432 DM
 (Machinery Directive)
 IMQ type examination certificate no. 236
 (Machinery Directive)
 UL approval: E131787
 EAC approval: RU C-IT DM94.B.01024
 CCC approval: 2013010305640211

In conformity with the requirements of:

Low Voltage Directive 2006/95/EC,
 Machinery Directive 2006/42/EC,
 EMC Directive 2004/108/EC

Technical data

Housing

PA 6.6 polyamide housing, self-extinguishing, V0 acc. to UL 94
 Protection degree: IP40 (housing), IP20 (terminal strip)
 Dimensions: see page 283, design A

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 ISO 13849-1
 Safety parameters: see page 333
 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 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; ±15%; 50...60 Hz
 DC maximum residual ripple: 10%
 AC consumption: < 5 VA
 DC consumption: < 2.5 W

Control circuit

Protection against short circuits: resistance PTC, I_h=0.5 A
 PTC intervention timing: intervention > 100 ms, reset > 3 s
 Maximum input resistance: ≤ 50 Ω
 Input current: < 40 mA
 Min. duration of start impulse t_{MIN}: > 50 ms
 Operating time t_A: < 120 ms
 Releasing time t_{RI}: < 15 ms
 Releasing time in absence of power supply t_R: < 65 ms
 Simultaneity time t_C: infinite
 Operating time from power supply switch on: < 300 ms

Auxiliary signalling circuit

Auxiliary output (Y43-Y44): 1NO opto-decoupled
 Rated operating voltage (U_e): 24 Vdc
 Rated operating current (I_e): 25 mA
 Rated impulse withstand voltage (U_{imp}): 4 kV
 Releasing time t_{R2}: < 1 ms

In conformity 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 62326-1, 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: 2 NO safety contacts,
 Contact type: forcibly guided
 Contact material: gold-plated silver alloy
 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 type F
 The number and the load capacity of output contacts can be increased by using expansion modules or contactors. See pages 231-240.

Code structure

CS AR-91V024

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

Supply voltage		
024	24 Vac/dc	±15%

Characteristics approved by UL

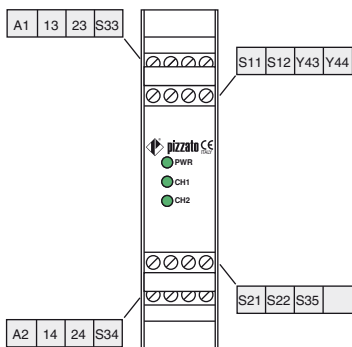
Rated supply voltage (U_n): 24 Vac/dc; 50...60 Hz
 AC consumption: < 5 VA
 DC consumption: < 2.5 W
 Maximum switching voltage: 230 Vac
 Max. current per contact: 6 A
 Utilization category: C300

Notes:
 - Use 60° or 75 °C copper (Cu) conductor, rigid or flexible, wire size AWG 30-12.
 - 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. (Supply from Remote Class 2 Source or limited voltage limited energy).



Safety module CS AR-91

Terminal layout

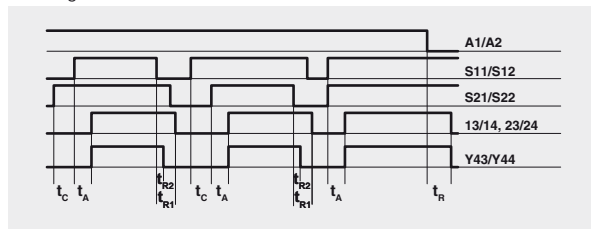


Voltage dips, short interruptions and voltage variations

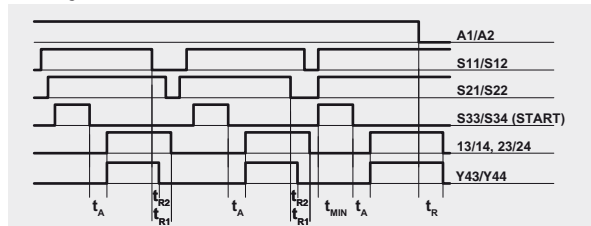
The CS AR-91 safety module has a built-in voltage drop sensor which serves to protect and safeguard the internal state of the safety relays, in the event of dips or short voltage interruptions. This is to prevent unwanted switching states in relation to the state of the inputs from occurring. When the input voltage is restored, the equipment always starts correctly and consistently with the inputs state. With brief voltage dips and interruptions, the safety module maintains its normal performance, while with longer voltage interruptions the safety outputs open which, along with the automatic start, are restored when the voltage is restored. With manual or monitored start, the operator will need to carry out a system reset.

Operation diagrams

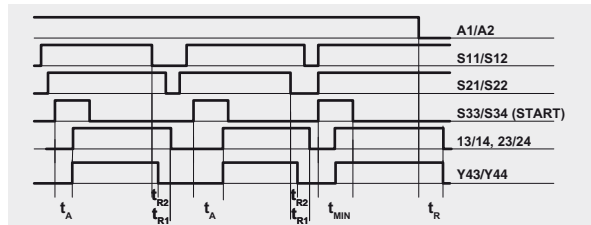
Configuration with automatic start



Configuration with monitored start



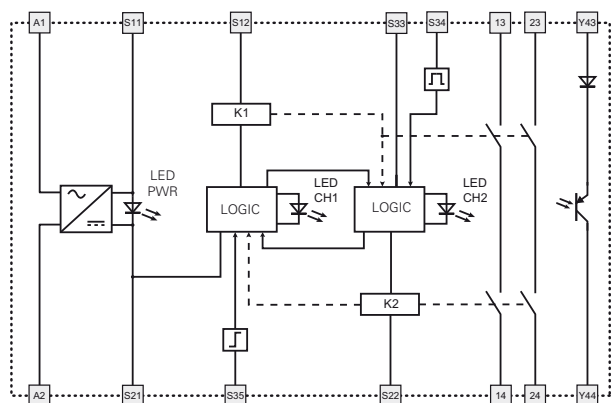
Configuration with manual start



Legend:
t_MIN: min. duration of start impulse
t_c: simultaneity time
t_A: operating time
t_R1: releasing time
t_R2: releasing time in absence of power supply

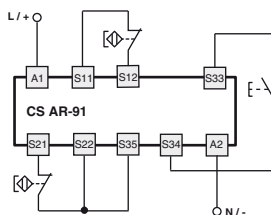
Notes:
The configurations with one channel are obtained taking into consideration only the S11/S12 input. In this case it is necessary to consider time t_R1 referred to input S11/S12, time t_R referred to the supply, time t_A referred to input S11/S12 and to the start, and time t_MIN referred to the start.

Internal diagram



Input configuration

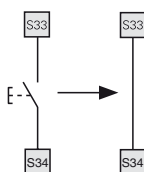
Input configuration with magnetic sensors 2 channels



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

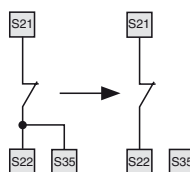
Automatic start

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



Monitored start

With regard to the indicated diagrams, it is necessary to remove the connection between S22 and S35 in order to activate the monitored start module.



Movable guard monitoring and magnetic safety sensors

The safety module can control emergency stop circuits, movable guard monitoring circuits or magnetic safety sensors. Replace the emergency stop contacts with switch contacts or sensor contacts. The sensors can only be used in 2-channel configuration.

