



Module for emergency stop, gate monitoring and magnetic safety sensor (CS AR-01•E02 only)

Main functions

- For safety applications up to SIL 3 / PL e
- Single or dual channel input circuit
- 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 voltages: 10 ... 30 Vdc, 24 Vac/dc, 120 Vac, 230 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

Certificate CE type n°: IMQ123

Approval GOST: POCC IT.AB24.B04512

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 5/81, shape A

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:

upto cat. 4 according to EN ISO 13849-1

Safety parameters:

see page 7/34

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 (Uimp):

4 kV

Rated insulation voltage (Ui):

250 V

Over-voltage category:

II

Weight:

0,3 kg

Power supply

Rated operating voltage (Un):

10 ... 30 Vdc

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 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

Max input resistance:

≤ 50 Ω

Current for each input:

< 30 mA

Min. period 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:

IEC 60947-1, EN 60947-1, 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:

2 NO safety contacts,

1 NC auxiliary contact

forced guided contacts

silver alloy, gold plated

230/240 Vac; 300 Vdc

Contacts type:

Contacts material:

Max switching voltage:

6 A

Max switching current per contact:

6 A

Conventional free air thermal current I_{th}:

72 A²

Max currents sum Σ I_{th}²:

10 mA

Min. current:

≤ 100 mΩ

Contacts resistance:

6 A, F type

Contact protection fuse:

The number and the load capacity of output contacts can be increased by using expansion modules or contactors See page See page 5/51 - 5/61.

Code structure

CS AR-01V024

Kind of connection	
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	

Items available on stock

CS AR-01V024

Data type approved by UL

Rated operating voltage (Un): 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

Notes:

- Use 60° or 75 °C copper (Cu) conductor and wire size No. 30-12 AWG.

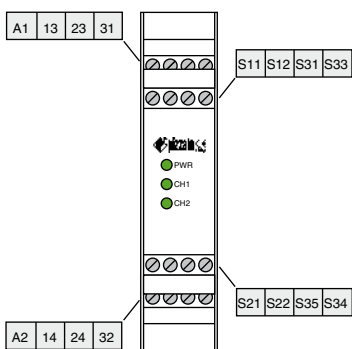
- Terminal tightening torque of 5-7 Lb In.

- Only for 24 Vac/dc version, supply from remote class 2 source or limited voltage and limited energy.



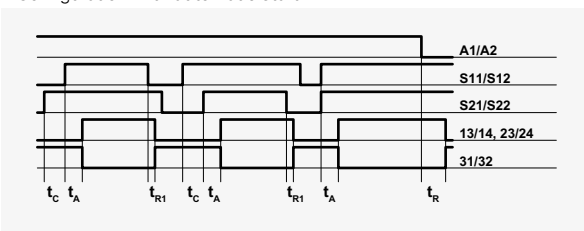
Safety module CS AR-01

Terminals layout

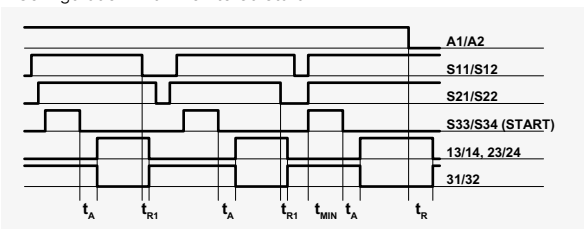


Operation diagrams

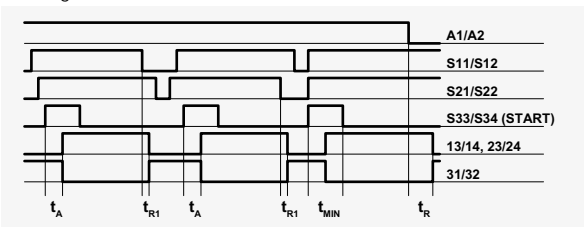
Configuration with automatic start



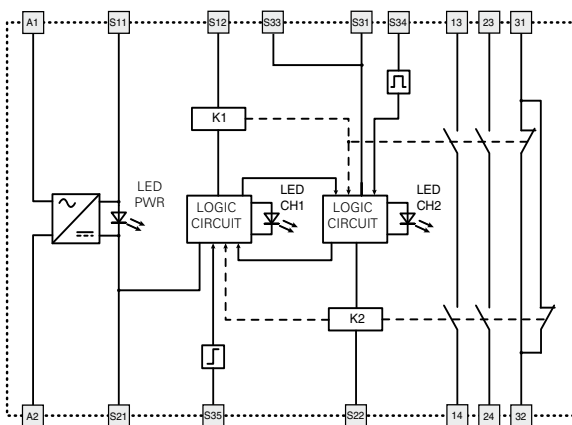
Configuration with monitored start



Configuration with manual start



Internal wiring diagram

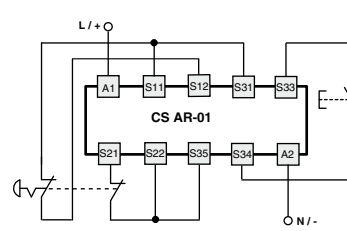
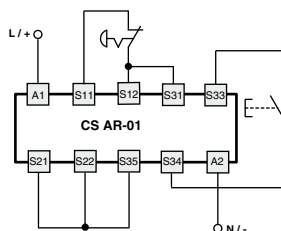


- Legend:
- t_{MIN} : Min. period of start impulse
 - t_c : Simultaneity time
 - t_A : Operating time
 - t_{R1} : Releasing time
 - t_R : Releasing time in absence of power supply

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

Inputs configuration

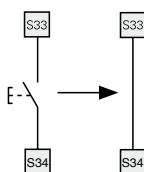
Emergency stop	
Input configuration with manual start	
1 channel	2 channels



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

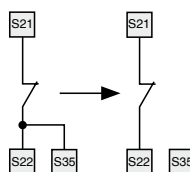
Automatic start

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.



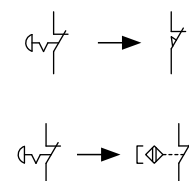
Monitored start

As regards the indicated diagrams, in order to activate the module with the monitored start, it is necessary to remove the connection between S22 and S35 terminals.



Gate monitoring and safety magnetic sensors (CS AR-01VE02 version only)

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



Application example See page 5/61



Module for emergency stop, gate monitoring and magnetic safety sensor (CS AR-02•E02 only)

Main functions

- For safety applications up to SIL 3 / PL e
- Single or dual channel input circuit
- 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 voltages:
10 ... 30 Vdc, 24 Vac/dc, 120 Vac, 230 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

Approval GOST: POCC IT.AB24.B04512

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 5/81, shape A

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:

upto cat. 4 according to EN ISO 13849-1

Safety parameters:

see page 7/34

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 (Uimp):

4 kV

Rated insulation voltage (Ui):

250 V

Over-voltage category:

II

Weight:

0,3 kg

Power supply

Rated operating voltage (Un):

10 ... 30 Vdc

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 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

Max input resistance:

≤ 50 Ω

Current for each input:

< 30 mA

Min. period 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:

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:

3 NO safety c ontacts,

Contacts type:

forced guided contacts

Contacts material:

silver alloy, gold plated

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:

72 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 See page 5/51 - 5/61.

Code structure

CS AR-02V024

Kind of connection	Supply voltage
V screw terminals	024 24 Vac/dc ±15%
M connector with screw terminals	120 120 Vac ±15%
X connector with spring terminals	230 230 Vac ±15%
	E02 10 ... 30 Vdc

Data type approved by UL

Rated operating voltage (Un):	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

Notes:

- Use 60° or 75 °C copper (Cu) conductor and wire size No. 30-12 AWG.

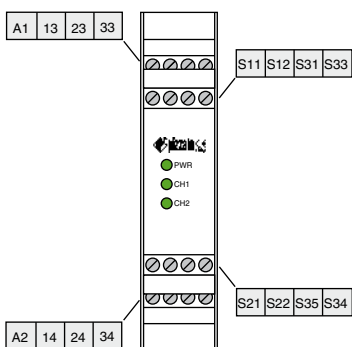
- Terminal tightening torque of 5-7 Lb In.

- Only for 24 Vac/dc version, supply from remote class 2 source or limited voltage and limited energy.

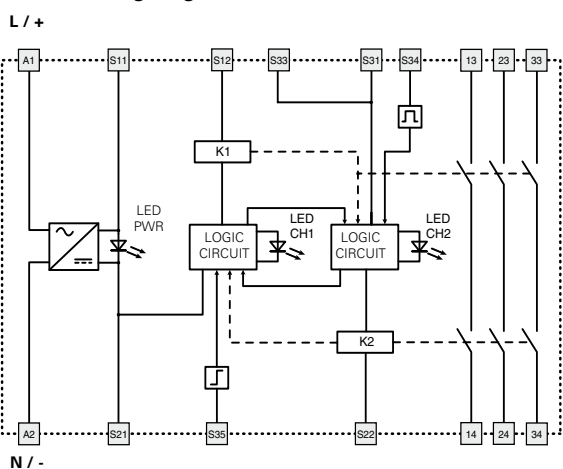


Safety module CS AR-02

Terminals layout

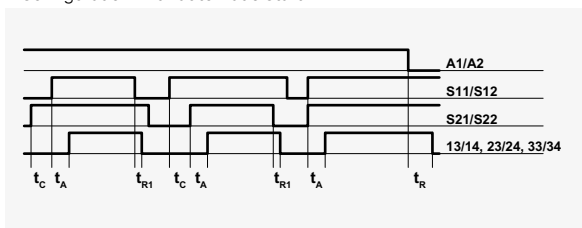


Internal wiring diagram

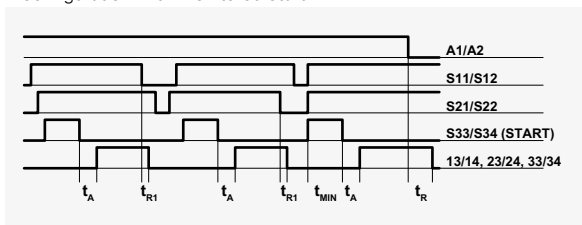


Operation diagrams

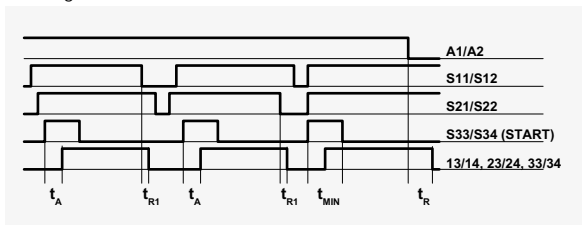
Configuration with automatic start



Configuration with monitored start



Configuration with manual start



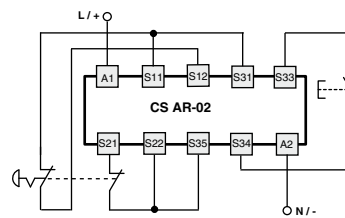
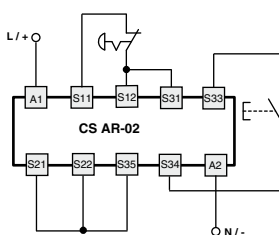
Legend:

- t_{MIN} : Min. period of start impulse
- t_c : Simultaneity time
- t_A : Operating time
- t_{R1} : Releasing time
- t_R : Releasing time in absence of power supply

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

Inputs configuration

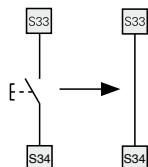
Emergency stop	
Input configuration with manual start	
1 channel	2 channels



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

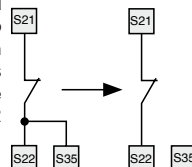
Automatic start

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.



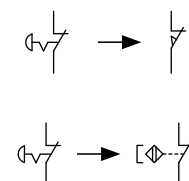
Monitored start

As regards the indicated diagrams, in order to activate the module with the monitored start, it is necessary to remove the connection between S22 and S35 terminals.



Gate monitoring and safety magnetic sensors (CS AR-02VE02 version only)

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



Application example See page 5/61



Module for emergency stop, gate monitoring and magnetic safety sensor (CS AR-04•024 only)

Main functions

- For safety applications up to SIL 3 / PL e
- Single or dual channel input circuit
- 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 voltages: 24 Vac/dc, 120 Vac, 230 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
 Approval GOST: POCC IT.AB24.B04512

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 5/81, shape A

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: upto cat. 4 according to EN ISO 13849-1
 Safety parameters: see page 7/34
 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 (Uimp): 4 kV
 Rated insulation voltage (Ui): 250 V
 Over-voltage category: II
 Weight: 0,3 kg

Power supply

Rated operating voltage (Un): 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 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
 Max input resistance: ≤ 50 Ω
 Current for each input: < 30 mA
 Min. period 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:

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: 3 NO safety contacts
 1 NC auxiliary contact
 forced guided contacts
 Contacts type: silver alloy, gold plated
 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}: 6 A
 Max currents sum Σ I_{th}²: 64 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 See page 5/51 - 5/61.

Code structure

CS AR-04V024

Kind of connection	Supply voltage
V screw terminals	024 24 Vac/dc ±15%
M connector with screw terminals	120 120 Vac ±15%
X connector with spring terminals	230 230 Vac ±15%

Items available on stock

CS AR-04V024

Data type approved by UL

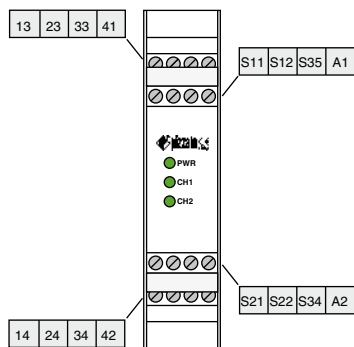
Rated operating voltage (Un): 24 Vac/dc; 50...60 Hz
 120 Vac; 50...60 Hz
 230 Vac; 50...60 Hz
 Rated power consumption AC: < 5 VA
 Rated power consumption DC: < 2 W
 Max switching voltage: 230 Vac
 Max switching current per contact: 6 A
 Utilization category: C300

Notes:
 - 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.

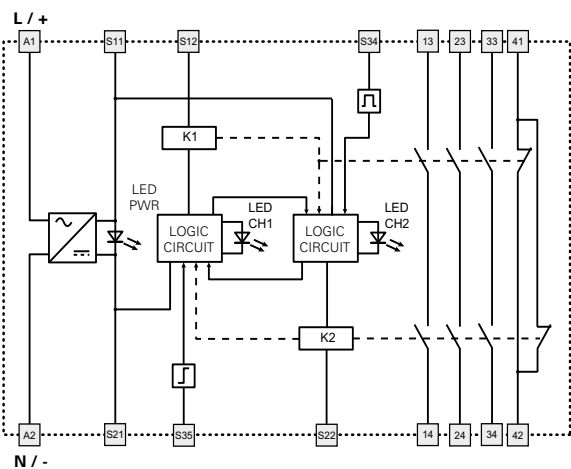


Safety module CS AR-04

Terminals layout

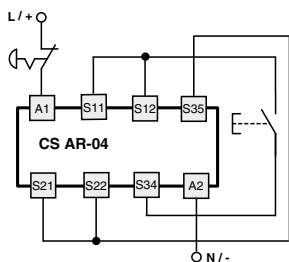


Internal wiring diagram

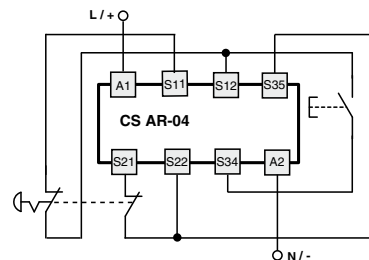


Inputs configuration

Emergency stop	
Input configuration with manual start	
1 channel	2 channels

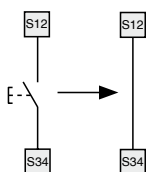


The diagram does not show the exact position of clamps in the product



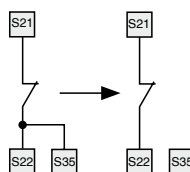
Automatic start

As regards the indicated diagrams, in order to activate the module with the automatic start, it is necessary to short the start button between S12 and S34 terminals.



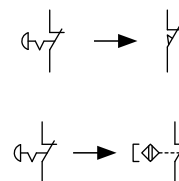
Monitored start

As regards the indicated diagrams, in order to activate the module with the monitored start, it is necessary to remove the connection between S22 and S35 terminals.



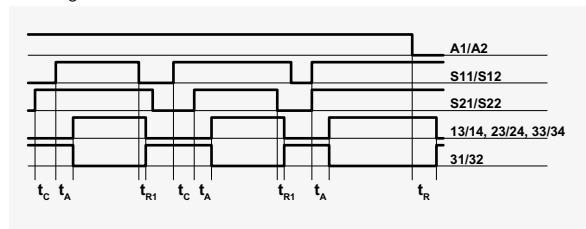
Gate monitoring and safety magnetic sensors (CS AR-04V024 version only)

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

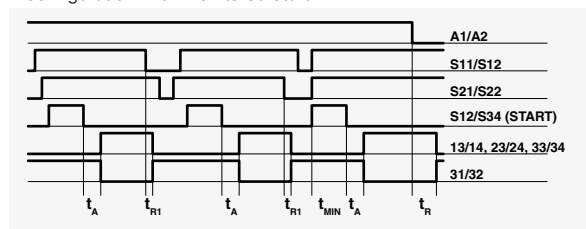


Operation diagrams

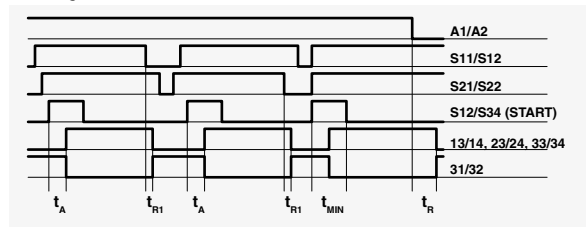
Configuration with automatic start



Configuration with monitored start



Configuration with manual start



Legend:

- t_{MIN} : Min. period of start impulse
- t_c : Simultaneity time
- t_A : Operating time
- t_{R1} : Releasing time
- t_R : Releasing time in absence of power supply

Note:

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



Module for emergency stop, gate monitoring, solid-state output circuits (for example optical barriers) and magnetic safety sensor

Main functions

- For safety applications up to SIL 3 / PL e
- Single or dual channel input circuit
- Choice between automatic start, manual start (CS AR-05 only) or monitored start (CS AR-06 only)
- Connectible to solid-state output circuits (for example optical barriers), to electromechanical contacts or to magnetic safety sensor
- Output contacts:
3 NO safety contacts,
1 NC auxiliary contact
- Supply voltages: 24 Vac/dc, 120 Vac, 230 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
 Approval GOST: POCC IT.AB24.B04512

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 5/81, shape A

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: upto cat. 4 according to EN ISO 13849-1
 Safety parameters: see page 7/34
 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 (Uimp): 4 kV
 Rated insulation voltage (Ui): 250 V
 Over-voltage category: II
 Weight: 0,3 kg

Power supply

Rated operating voltage (Un): 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 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
 Max input resistance: ≤ 50 Ω
 Current for each input: < 30 mA
 Min. period of start impulse t_{MIN}: > 250 ms
 Operating time t_A: < 200 ms
 Releasing time t_{R1}: < 15 ms
 Releasing time in absence of power supply t_R: < 70 ms
 Simultaneity time t_C: infinite

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: 3 NO safety contacts
 1 NC auxiliary contact
 forced guided contacts
 Contacts type: silver alloy, gold plated
 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}: 64 A²
 Max currents sum Σ I_{th}²: 10 mA
 Min. current: ≤ 100 mΩ
 Contacts resistance: 6 A, F type
 Contact protection fuse:
 The number and the load capacity of output contacts can be increased by using expansion modules or contactors See page See page 5/51 - 5/61.

Code structure

CS AR-05V024

Kind of start	
05	manual or automatic start
06	monitored start
Kind of connection	
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%

Items available on stock

CS AR-05V024

Data type approved by UL

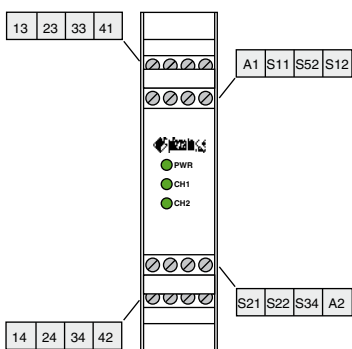
Rated operating voltage (Un): 24 Vac/dc; 50...60 Hz
 120 Vac; 50...60 Hz
 230 Vac; 50...60 Hz
 Rated power consumption AC: < 5 VA
 Rated power consumption DC: < 2 W
 Max switching voltage: 230 Vac
 Max switching current per contact: 6 A
 Utilization category: C300

Notes:
 - 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.

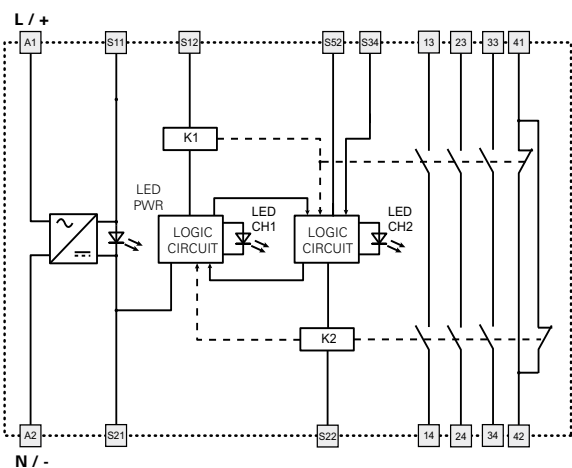


Safety module CS AR-05-06

Terminals layout



Internal wiring diagram



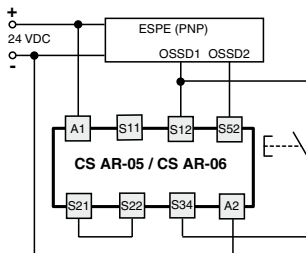
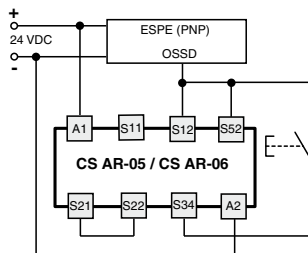
Inputs configuration

Solid-state output circuits (for example optical barriers)

Input configuration with manual start

1 channel

2 channels

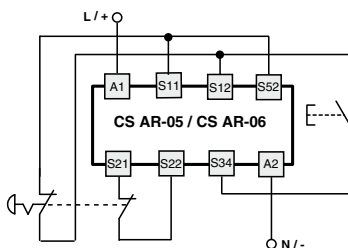
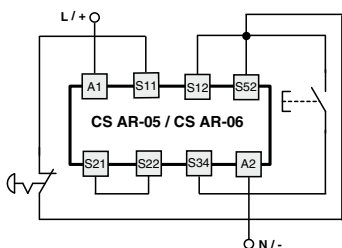


Emergency stop

Input configuration with manual start

1 channel

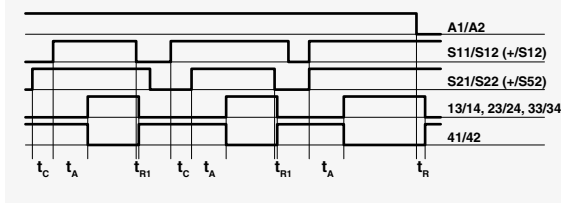
2 channels



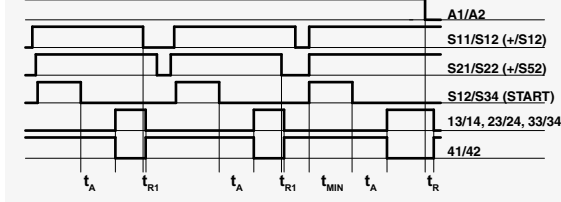
The diagram does not show the exact position of clamps in the product

Operation diagrams

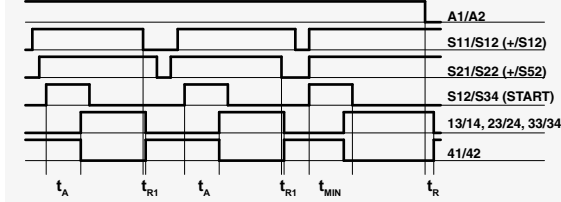
Configuration with automatic start (CS AR-05 only)



Configuration with monitored start (CS AR-06 only)



Configuration with manual start (CS AR-05 only)



Legend:

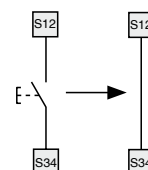
- t_{MIN} : Min. period of start impulse
- t_C : Simultaneity time
- t_A : Operating time
- t_{R1} : Releasing time
- t_{Rr} : Releasing time in absence of power supply

Note:

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

Automatic start (CS AR-05 only)

As regards the indicated diagrams, in order to activate the module with the automatic start, it is necessary to short the start button between S12 and S34 terminals.

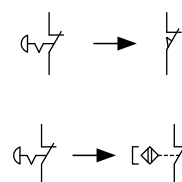


Monitored start

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

Gate monitoring and safety magnetic sensors

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





Module for emergency stop and gate monitoring

Main functions

- For safety applications up to SIL 3 / PL e
- Single or dual channel input circuit
- 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 voltages:
 - 24 Vac/dc

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

Approval GOST: POCC IT.AB24.B04512

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 5/81, shape B

General data

SIL level (SIL CL):

up to SIL 3 according to EN IEC 62061

Performance Level (PL):

upto PL e according to EN ISO 13849-1

Safety category:

uptocat. 4 according to EN ISO 13849-1

Safety parameters:

see page 7/34

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 (Uimp):

4 kV

Rated insulation voltage (Ui):

250 V

Over-voltage category:

II

Weight:

0,3 kg

Power supply

Rated operating voltage (Un):

24 Vac/dc; 50...60 Hz

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

Max input resistance:

≤ 50 Ω

Current for each input:

< 30 mA

Min. period 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:

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:

4 NO safety contacts

1 NC auxiliary contact

forced guided contacts

silver alloy, gold plated

230/240 Vac; 220 Vdc

Contacts type:

6 A

Contacts material:

6 A

Max switching voltage:

72 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 See page 5/51 - 5/61.

Code structure

CS AR-07M024

Kind of connection

M connector with screw terminals

X connector with spring terminals

Supply voltage

024 24 Vac/dc ±15%

Items available on stock

CS AR-07M024

Data type approved by UL

Rated operating voltage (Un): 24 Vac/dc; 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

Notes:

- Use 60° or 75 °C copper (Cu) conductor and wire size No. 30-12 AWG.

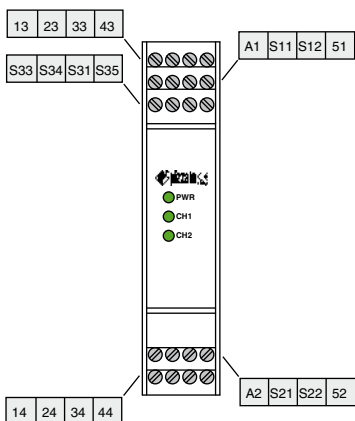
- Terminal tightening torque of 5-7 Lb In.

- Only for 24 Vac/dc version, supply from remote class 2 source or limited voltage and limited energy.

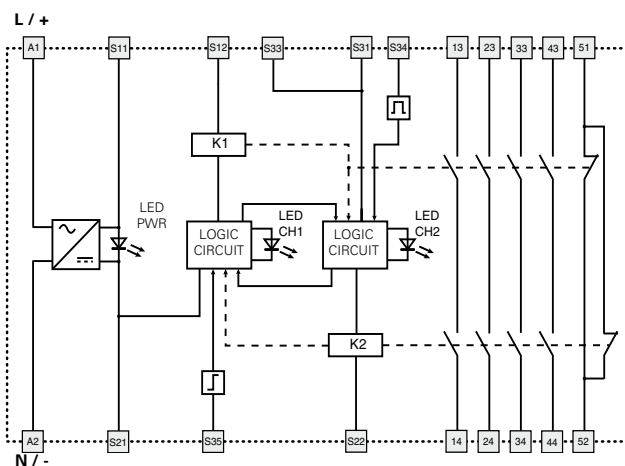


Safety module CS AR-07

Terminals layout

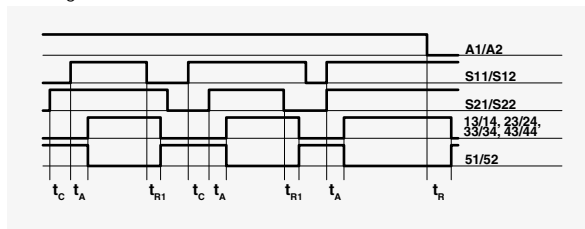


Internal wiring diagram

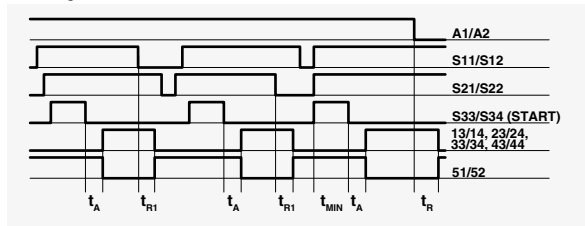


Operation diagrams

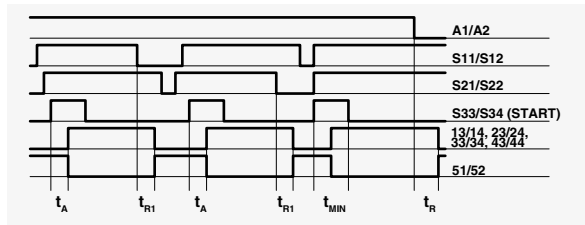
Configuration with automatic start



Configuration with monitored start



Configuration with manual start

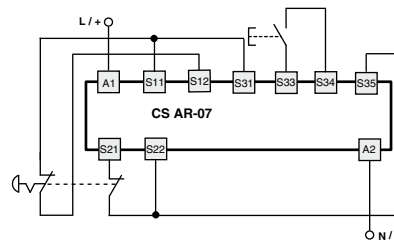
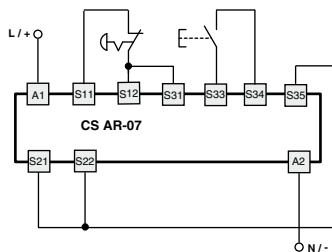


Legend:
t_MIN: Min. period of start impulse
t_c: Simultaneity time
t_A: Operating time
t_R1: Releasing time
t_R: Releasing time in absence of power supply

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

Inputs configuration

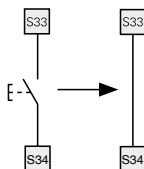
Emergency stop	
Input configuration with manual start	
1 channel	2 channels



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

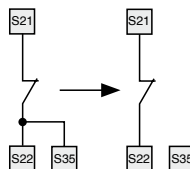
Automatic start

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.



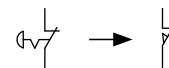
Monitored start

As regards the indicated diagrams, in order to activate the module with the monitored start, it is necessary to remove the connection between S22 and S35 terminals.



Gate monitoring

The safety module can control both emergency stop circuits and gate monitoring circuits, replacing the emergency stop contacts with switches contacts.



Application example See page 5/61



Module for emergency stop, gate monitoring, solid state output devices and magnetic safety sensor

Main functions

- For safety applications up to SIL 3 / PL e
- Single or dual channel input circuit
- Choice between automatic start, manual start or monitored start
- Connectable to solid-state output circuits (for example optical barriers), to electromechanical contacts or to magnetic safety sensor
- Output contacts:
2 NO safety contacts,
- Supply voltages:
24 Vac/dc, 120 Vac, 230 Vac
- Possibility of parallel modules reset

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 and quality marks:



Approval UL: E131787

Approval TÜV SÜD: Z10 10 09 75157 002

Approval GOST: POCC IT.AB24.B04512

Complying with the requirements requested by:

Low Voltage Directive 2006/95/EC,

Machinery Directive 2006/42/EC,

Electromagnetic Compatibility 2004/108/EC

Code structure

CS AR-08V024

Kind of connection	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%

Items available on stock

CS AR-08V024

Technical data

Housing

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

Protection degree:

IP40 (housing), IP20 (terminals)

Dimensions:

see page 5/81, shape A

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:

upto cat. 4 according to EN ISO 13849-1

Safety parameters:

see page 7/34

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:

0,3 kg

Power supply

Rated operating voltage (U_n):

12 Vdc

24 Vac/dc; 50...60 Hz

120 Vac; 50...60 Hz

230 Vac; 50...60 Hz

10%

Max residual ripple in DC:

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

Max input resistance:

≤ 50 Ω (15 Ω)*

Current for each input:

< 30 mA (70 mA)*

Min. period 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:

IEC 60947-1, EN 60947-1, 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:

2 NO safety contacts,

Contacts type:

forced guided contacts

Contacts material:

silver alloy, gold plated

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:

4 A

The number and the load capacity of output contacts can be increased by using expansion modules or contactors See page See page 5/51 - 5/61.

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

- Use 60° or 75° 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.

Data type approved by TÜV SÜD

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

Rated power consumption: 5 VA max AC, 2 W max DC

Output switching current (max): 4 A

Output switching power (max): 1380 VA

Working temperature: -25 °C ... + 55 °C

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

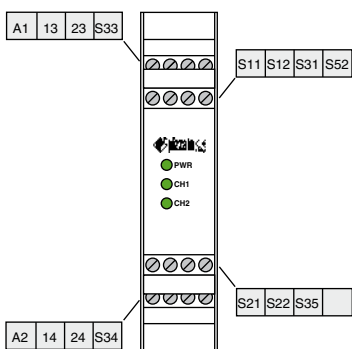
Protection degree: IP40 (housing), IP20 (terminals)

Tested according to: 2006/42/EEC Machine Directive, EN ISO 13849-1:2008 (up to Cat. 4 PL e), EN 50178:1997, EN 60947-5-3/A1:2005, EN 61508-1:1998 (SIL 1-3), EN 61508-2:2000 (SIL 1-3), EN 61508-4:1998 (SIL 1-3), IEC 62061:2005 (SIL CL 3)

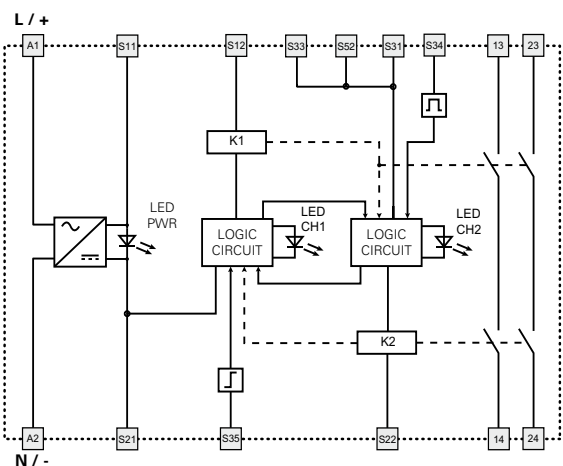


Safety module CS AR-08

Terminals layout



Internal wiring diagram

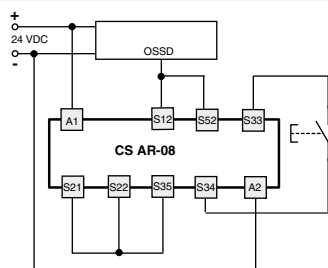


Inputs configuration

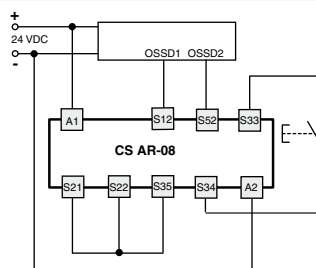
Solid state output devices (e.g. light curtains)

Input configuration with manual start

1 channel



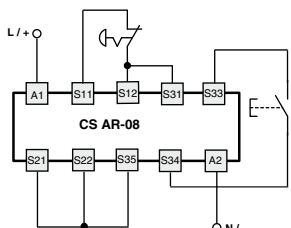
2 channels



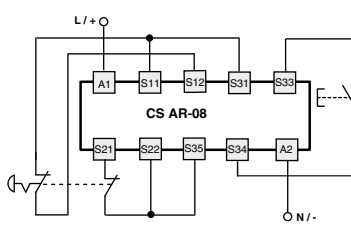
Emergency stop

Input configuration with manual start

1 channel



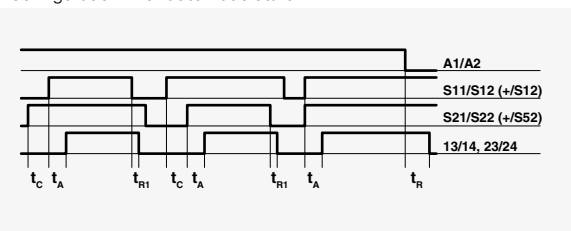
2 channels



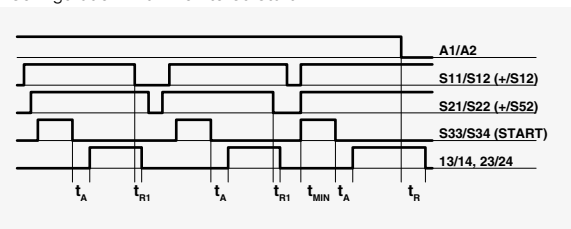
The diagram does not show the exact position of clamps in the product

Operation diagrams

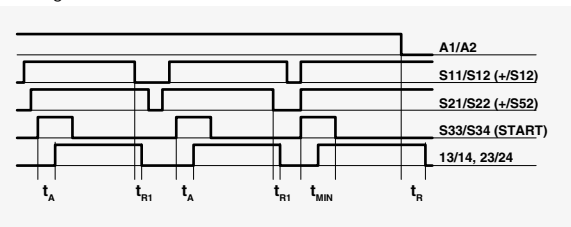
Configuration with automatic start



Configuration with monitored start



Configuration with manual start



Legend:

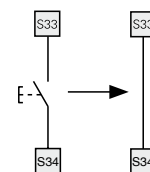
- t_{MIN} : Min. period of start impulse
- t_c : Simultaneity time
- t_A : Operating time
- t_{R1} : Releasing time
- t_r : Releasing time in absence of power supply

Note:

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

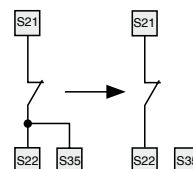
Automatic start

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.



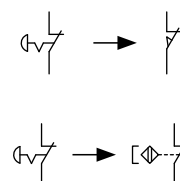
Monitored start

As regards the indicated diagrams, in order to activate the module with the monitored start, it is necessary to remove the connection between S22 and S35 terminals.



Gate monitoring and safety magnetic sensors.

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



Application example See page 5/61



Module for emergency stop and gate monitoring


Main functions

- For safety applications up to SIL 3 / PL e
- Single or dual channel input circuit
- 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 voltages: 24 Vac/dc, 120 Vac, 230 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
 Approval GOST: POCC ITAB24.B04512

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 5/81, shape A

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: upto cat.3 according to EN ISO 13849-1
 Safety parameters: see page 7/34
 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 (Uimp): 4 kV
 Rated insulation voltage (Ui): 250 V
 Over-voltage category: II
 Weight: 0,2 kg

Power supply

Rated operating voltage (Un): 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 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
 Max input resistance: ≤ 50 Ω
 Current for each input: < 70 mA
 Min. period of start impulse t_{MIN}: > 100 ms
 Operating time t_A: < 50 ms
 Releasing time in absence of power supply t_R: < 70 ms
 Simultaneity time t_C: infinite

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: 2 NO safety contacts
 Contacts type: forced guided contacts
 Contacts material: silver alloy, gold plated
 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
 The number and the load capacity of output contacts can be increased by using expansion modules or contactors See page 5/51 - 5/61.

Code structure

CS AR-20V024

Kind of start	
20	manual or automatic start
21	monitored start
Kind of connection	
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%

Items available on stock

CS AR-20V024

Data type approved by UL

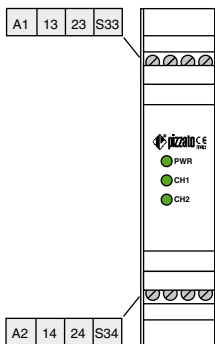
Rated operating voltage (Un): 24 Vac/dc; 50...60 Hz
 120 Vac; 50...60 Hz
 230 Vac; 50...60 Hz
 Rated power consumption AC: < 5 VA
 Rated power consumption DC: < 2 W
 Max switching voltage: 230 Vac
 Max switching current per contact: 6 A
 Utilization category: C300

Notes:
 - 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.

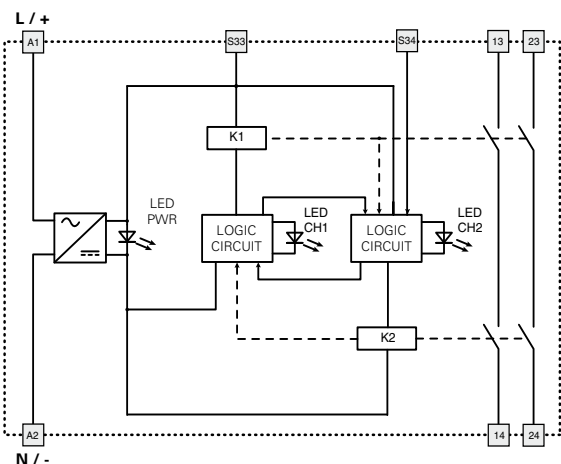


Safety module CS AR-20 / CS AR-21

Terminals layout

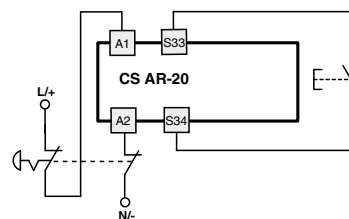
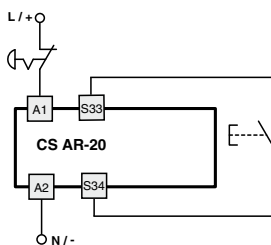


Internal wiring diagram



Inputs configuration

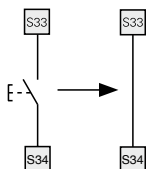
Emergency stop	
Input configuration with manual start	
1 channel	2 channels



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

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.

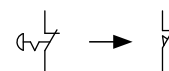


Monitored start

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

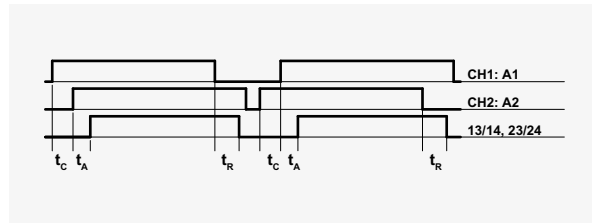
Gate monitoring

The safety module can control both emergency stop circuits and gate monitoring circuits, replacing the emergency stop contacts with switches contacts.

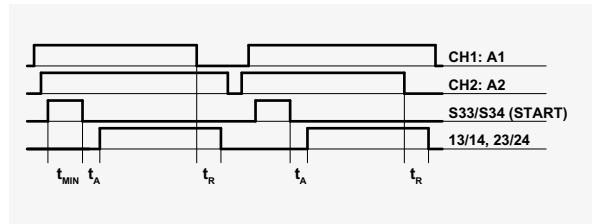


Operation diagrams

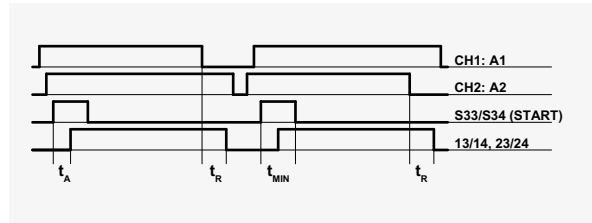
Configuration with automatic start (CS AR-20 only)



Configuration with monitored start (CS AR-21 only)



Configuration with manual start (CS AR-20 only)



Legend:

- t_{MIN} : Min. period of start impulse
- t_c : Simultaneity time
- t_a : Operating time
- t_r : Releasing time in absence of power supply

Note:

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

Application example See page 5/61



Module for emergency stop and gate monitoring

Main functions

- For safety applications up to SIL 3 / PL e
- Single or dual channel input circuit
- 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 voltages: 24 Vac/dc, 120 Vac, 230 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
 Approval GOST: POCC.ITAB24.B04512

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 5/81, shape A

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: upto cat. 3 according to EN ISO 13849-1
 Safety parameters: see page 7/34
 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 (Uimp): 4 kV
 Rated insulation voltage (Ui): 250 V
 Over-voltage category: II
 Weight: 0,2 kg

Power supply

Rated operating voltage (Un): 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 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
 Max input resistance: ≤ 50 Ω
 Current for each input: < 70 mA
 Min. period of start impulse t_{MIN}: > 100 ms
 Operating time t_A: < 50 ms
 Releasing time in absence of power supply t_R: < 60 ms
 Simultaneity time t_C: infinite

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, IEC 61508, EN 13849-1, UL 508, CSA C22.2 n° 14-95

Output circuit

Output contacts: 3 NO safety contacts, 1 NC auxiliary contact
 Contacts type: forced guided contacts
 Contacts material: silver alloy, gold plated
 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: 80 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 5/51 - 5/61.

Code structure

CS AR-22V024

Kind of start	
22	manual or automatic start
23	monitored start
Kind of connection	
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%

Items available on stock

CS AR-22V024

Data type approved by UL

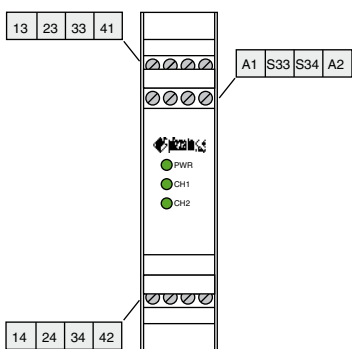
Rated operating voltage (Un): 24 Vac/dc; 50...60 Hz
 120 Vac; 50...60 Hz
 230 Vac; 50...60 Hz
 Rated power consumption AC: < 5 VA
 Rated power consumption DC: < 2 W
 Max switching voltage: 230 Vac
 Max switching current per contact: 6 A
 Utilization category: C300

Notes:
 - 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.

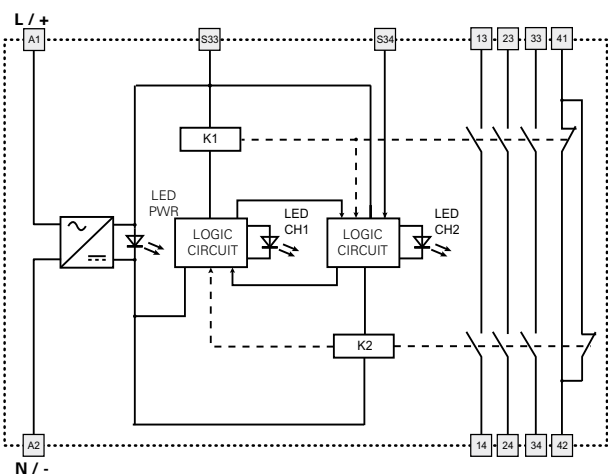


Safety module CS AR-22 / CS AR-23

Terminals layout

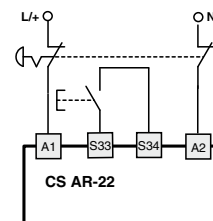
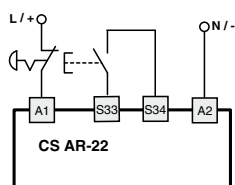


Internal wiring diagram



Inputs configuration

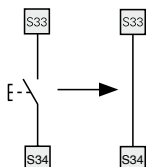
Emergency stop	
Input configuration with manual start	
1 channel	2 channels



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

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.

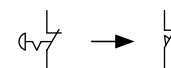


Monitored start

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

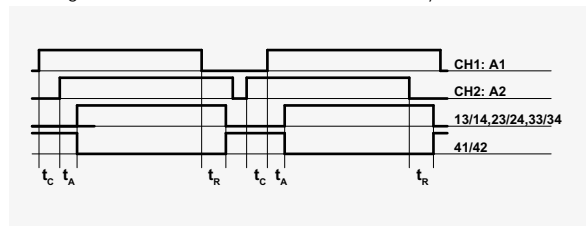
Gate monitoring

The safety module can control both emergency stop circuits and gate monitoring circuits, replacing the emergency stop contacts with switches contacts.



Operation diagrams

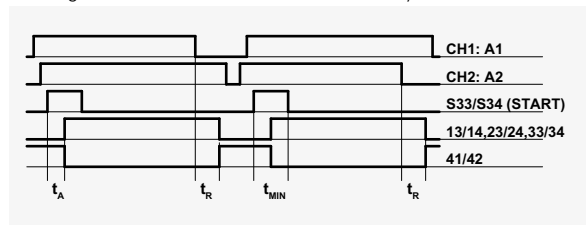
Configuration with automatic start (CS AR-22 only)



Configuration with monitored start (CS AR-23 only)



Configuration with manual start (CS AR-22 only)



- Legend:
- t_{MIN} : Min. period of start impulse
 - t_c : Simultaneity time
 - t_A : Operating time
 - t_R : Releasing time in absence of power supply

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



Module for emergency stop and gate monitoring

Main functions

- For safety applications up to SIL 3 / PL e
- Single or dual channel input circuit
- 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

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
 Approval GOST: POCC ITAB24.B04512

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 5/81, shape A

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: upto cat.3 according to EN ISO 13849-1
 Safety parameters: see page 7/34
 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 (Uimp): 4 kV
 Rated insulation voltage (Ui): 250 V
 Over-voltage category: II
 Weight: 0,3 kg

Power supply

Rated operating voltage (Un): 24 Vac/dc; 50...60 Hz
 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
 Max input resistance: ≤ 50 Ω
 Current for each input: < 30 mA
 Min. period of start impulse t_{MIN}: > 100 ms
 Operating time t_A: < 70 ms
 Releasing time t_{RI}: < 40 ms
 Releasing time in absence of power supply t_R: < 80 ms
 Simultaneity time t_c: infinite

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: 4 NO safety contacts
 1 NC auxiliary contact
 Contacts type: forced guided contacts
 Contacts material: silver alloy, gold plated
 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: 72 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 5/51 - 5/61.

Code structure

CS AR-24V024

Kind of start	
24	manual or automatic start
25	monitored start
Kind of connection	
V	screw terminals
M	connector with screw terminals
X	connector with spring terminals

Supply voltage	
024	24 Vac/dc ±15%

Data type approved by UL

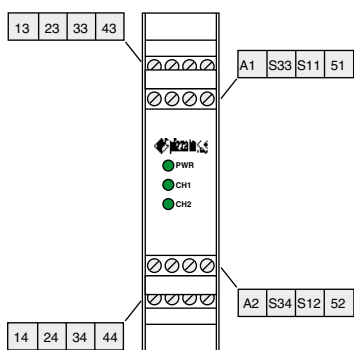
Rated operating voltage (Un): 24 Vac/dc; 50...60 Hz
 Rated power consumption AC: < 5 VA
 Rated power consumption DC: < 2 W
 Max switching voltage: 230 Vac
 Max switching current per contact: 6 A
 Utilization category: C300

Notes:
 - 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.

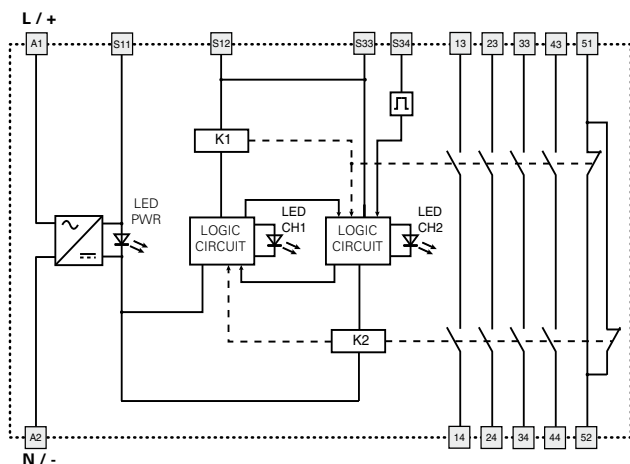


Safety module CS AR-24 / CS AR-25

Terminals layout

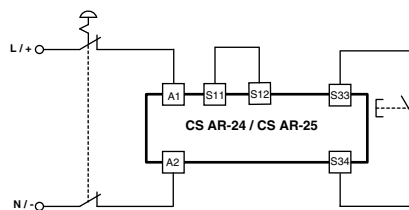
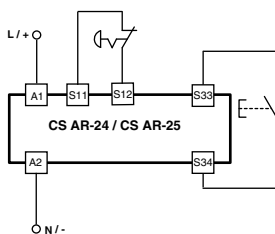


Internal wiring diagram



Inputs configuration

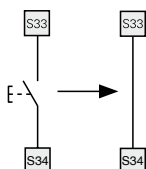
Emergency stop	
Input configuration with manual start	
1 channel	2 channels



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

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.

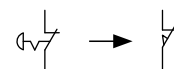


Monitored start

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

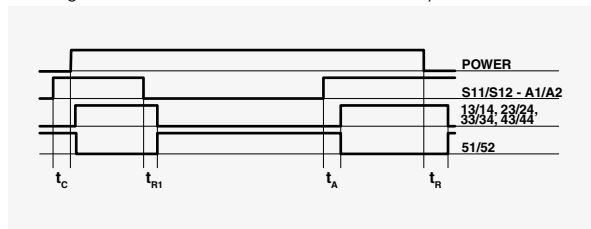
Gate monitoring

The safety module can control both emergency stop circuits and gate monitoring circuits, replacing the emergency stop contacts with switches contacts.

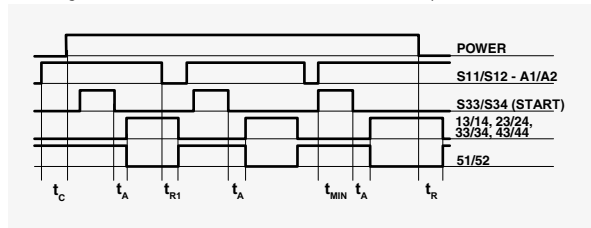


Operation diagrams

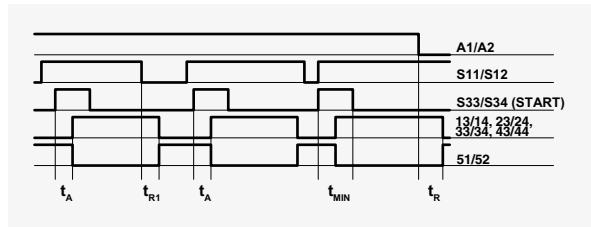
Configuration with automatic start (CS AR-24 only)



Configuration with monitored start (CS AR-25 only)



Configuration with manual start (CS AR-24 only)



- Legend:
- t_{MIN} : Min. period of start impulse
 - t_c : Simultaneity time
 - t_A : Operating time
 - t_R : Releasing time
 - t_{R1} : Releasing time in absence of power supply

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

Application example See page 5/61



Module for emergency stop and gate monitoring

Main functions

- For safety applications up to SIL 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 voltages: 24 Vac/dc

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

Approval GOST: POCC ITAB24.B04512

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 D

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:

upto cat. 2 according to EN ISO 13849-1

Safety parameters:

see page 7/34

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

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

Max input resistance:

≤ 50 Ω

Current for each input:

< 70 mA

Min. period of start impulse t_{MIN}:

> 100 ms

Operating time t_A:

< 50 ms

Releasing time in absence of power supply t_R:

< 50 ms

Simultaneity time t_C:

infinite

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:

2 NO safety contacts

Contacts type:

forced guided contacts

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 Σ I_{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 See page 5/51 - 5/61.

Code structure

CS AR-40V024

Kind of start

40 manual or automatic start

41 monitored start

Kind of connection

V screw terminals

M connector with screw terminals

X connector with spring terminals

Supply voltage

024 24 Vac/dc ±15%

Data type approved by UL

Rated operating voltage (U_n): 24 Vac/dc; 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

Notes:

- Use 60° or 75 °C copper (Cu) conductor and wire size No. 30-12 AWG.

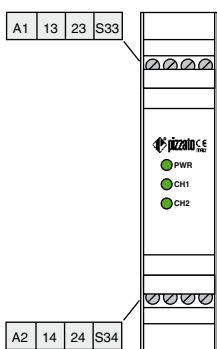
- Terminal tightening torque of 5-7 Lb In.

- Only for 24 Vac/dc version, supply from remote class 2 source or limited voltage and limited energy.

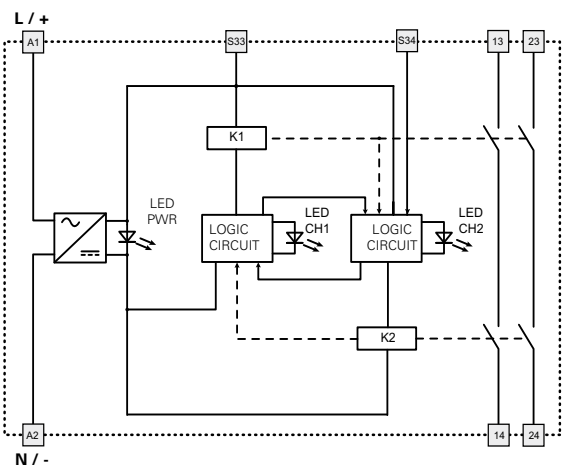


Safety module CS AR-40 / CS AR-41

Terminals layout

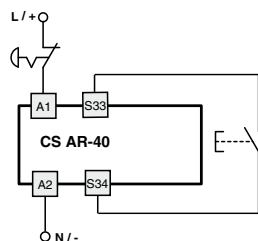


Internal wiring diagram



Inputs configuration

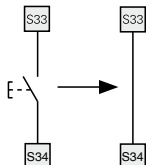
Emergency stop
Input configuration with manual start



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

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.

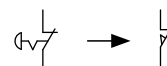


Monitored start

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

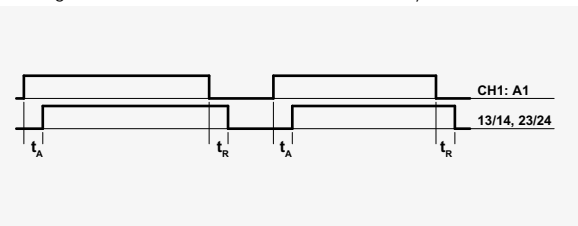
Gate monitoring

The safety module can control both emergency stop circuits and gate monitoring circuits, replacing the emergency stop contacts with switches contacts.

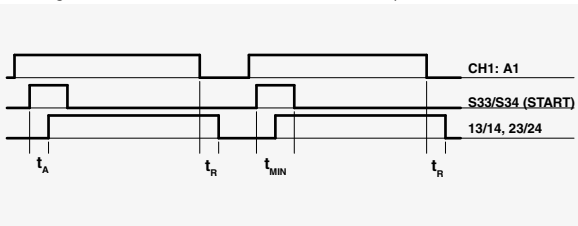


Operation diagrams

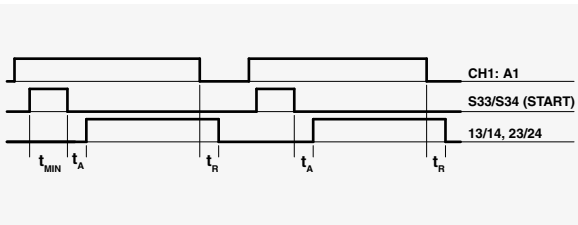
Configuration with automatic start (CS AR-40 only)



Configuration with manual start (CS AR-40 only)



Configuration with monitored start (CS AR-41 only)



- Legend:
- t_{MIN} : Min. period of start impulse
 - t_A : Operating time
 - t_R : Releasing time in absence of power supply



Module for emergency stop, gate monitoring and magnetic safety sensor

Main functions

- For safety applications up to SIL 1 / PL c
- Small 22,5 mm housing
- 1 NO safety contacts
- Supply voltages:
24 Vac/dc

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

Approval GOST: POCC ITAB24.B04512

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 D

General data

SIL level (SIL CL):

up to SIL 1 according to EN IEC 62061

Performance Level (PL):

up to PL c according to EN ISO 13849-1

Safety category:

upto cat. 1 according to EN ISO 13849-1

Safety parameters:

see page 7/34

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

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

Max input resistance:

≤ 50 Ω

Current for each input:

< 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:

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 contacts

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

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 5/51 - 5/61.

Code structure

CS AR-46V024

Kind of connection	
V	screw terminals
M	connector with screw terminals
X	connector with spring terminals

Supply voltage	
024	24 Vac/dc ±15%

Data type approved by UL

Rated operating voltage (U _n):	24 Vac/dc; 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

Notes:

- Use 60° or 75 °C copper (Cu) conductor and wire size No. 30-12 AWG.

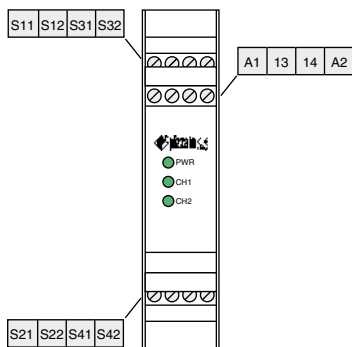
- Terminal tightening torque of 5-7 Lb In.

- Only for 24 Vac/dc version, supply from remote class 2 source or limited voltage and limited energy.

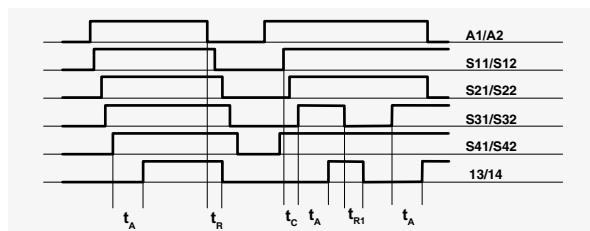


Safety module CS AR-46

Terminals layout

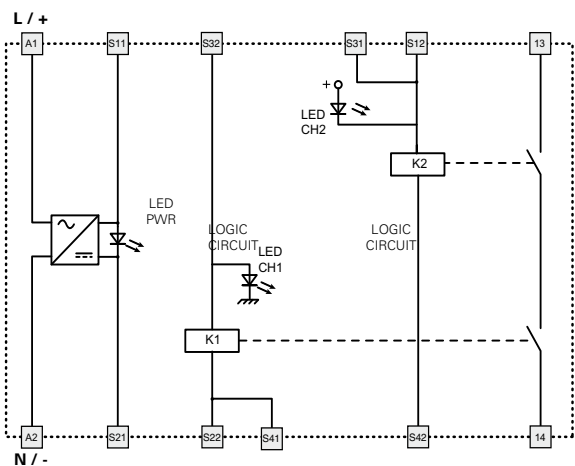


Operation diagrams



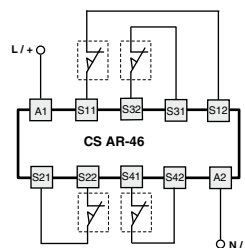
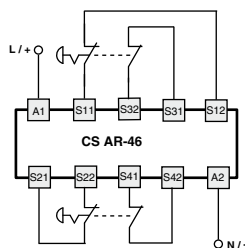
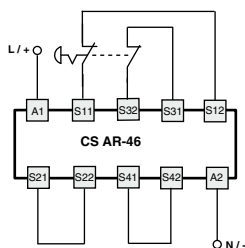
Legend:
 t_c : Simultaneity time
 t_A : Operating time
 t_{R1} : Releasing time
 t_A'' : Releasing time in absence of power supply

Internal wiring diagram



Inputs configuration

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



Gate monitoring and safety magnetic sensors.

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

