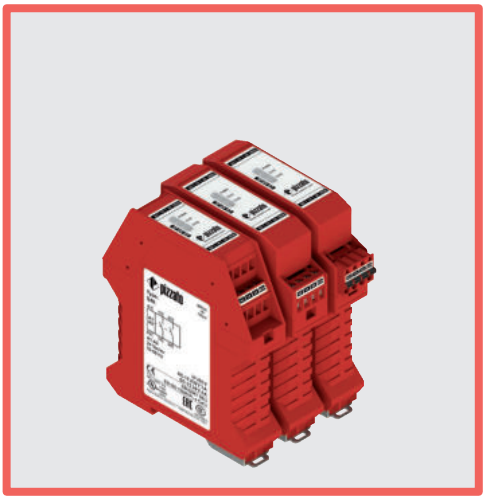
Safety module **CS AR-20 / CS AR-21**



Module for emergency stops and end position monitoring for movable guards

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)
- Reduced housing width of 22.5 mm
- 2 NO safety contacts
- Supply voltage: 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 oper. cycles/min.)
Ue (V) 24
Ie (A) 4

Quality marks:

EC type examination certificate: IMQ CP 432 DM
UL approval: E131787
CCC approval: 2013010305640211
EAC approval: RU C-IT.УТ03.B.00035/19

Compliance with the requirements of:

Machinery Directive 2006/42/EC,
EMC Directive 2014/30/EC,
RoHS Directive 2011/65/EU.

Technical data

Housing

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

Protection degree acc. to EN 60529:	IP40 (housing), IP20 (terminal strip)
Dimensions:	see page 317, design A

General data

SIL level (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 375
Ambient temperature:	-25°C…+55°C
Mechanical endurance:	>10 million operating cycles
Electrical endurance:	>100,000 operating cycles
Pollution degree:	external 3, internal 2
Rated impulse withstand voltage (U_{imp}):	4 kV
Rated insulation voltage (U_i):	250 V
Overvoltage category:	II

Supply

Rated supply voltage (U_n):	24 Vac/dc; 50…60 Hz 120 Vac; 50…60 Hz 230 Vac; 50…60 Hz
Max. DC residual ripple in DC:	10%
Supply voltage tolerance:	±15% of U_n
Power consumption AC:	< 5 VA
Power consumption DC:	< 2 W

Control circuit

Protection against short circuits:	PTC resistance, Ih=0.5 A
PTC times:	Response time > 100 ms, release time > 3 s
Maximum resistance per input:	≤ 50 Ω
Current per input:	70 mA (typical)
Min. duration of start impulse t_{MIN}:	> 100 ms
Response time t_A:	< 50 ms
Release time in absence of power supply t_R:	< 100 ms
Simultaneity time t_C:	unlimited

In compliance with standards:

EN 60204-1, EN ISO 13855, EN 1037, EN ISO 12100, EN ISO 13850, EN 60529, EN 61000-6-2, EN 61000-6-3, EN 61326-1, EN 60664-1, EN 60947-1, EN 50581, EN ISO 13849-1, EN ISO 13849-2, EN 62061, UL 508, CSA C22.2 n° 14-95, GB/T14048.5-2017

Output circuit

Output contacts:	2 NO safety contacts
Contact type:	forcibly guided
Material of the contacts:	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 263-272.

Code structure

CS AR-20V024

Start mode	
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
120	120 Vac
230	230 Vac

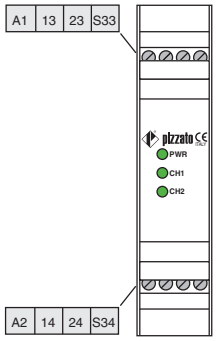
Features approved by UL

Rated supply voltage (U_n):	24 Vac/dc; 50…60 Hz 120 Vac; 50…60 Hz 230 Vac; 50…60 Hz
Power consumption AC:	< 5 VA
Power consumption DC:	< 4 W
Electrical ratings:	230/240 Vac 6 A general use C300 pilot duty

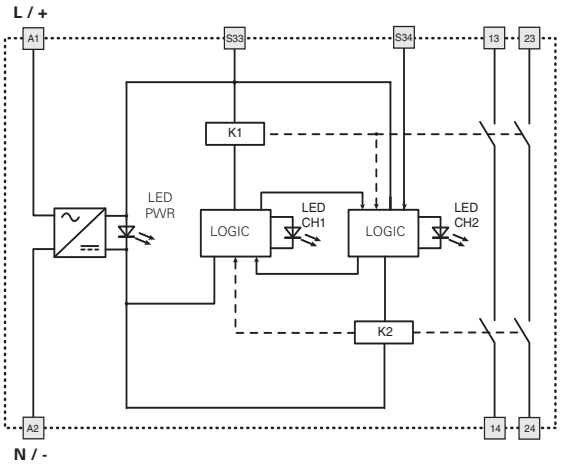
Notes:
- Use 60 or 75°C copper (Cu) conductor and wire size No. 30-12 AWG, stranded or solid.
- The terminal tightening torque of 5-7 lb in.
- Only for 24 Vac/dc versions: supply from remote Class 2 source or limited voltage limited energy.

Safety module CS AR-20 / CS AR-21

Pin assignment

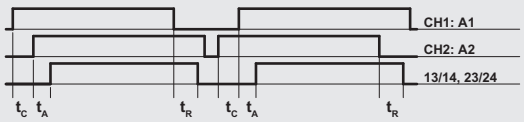


Internal block diagram

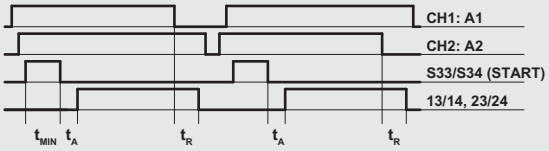


Function diagrams

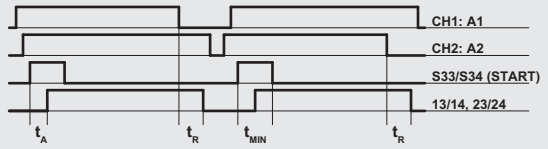
Configuration with automatic start (CS AR-20 only)



Configuration with monitored start (CS AR-21 only)



Configuration with manual start (CS AR-20 only)

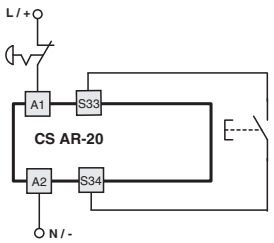


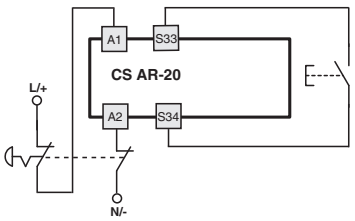
Legend:
t_{MIN}: Min. duration of start impulse
t_C: simultaneity time
t_A: response time
t_R: release time in absence of power supply

Notes:
The configurations with one channel are obtained taking into consideration the CH1:A1 input only. 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

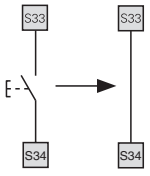




The diagram does not show the exact position of the terminals in the product

Automatic start

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

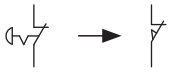


Monitored start

Use module CS AR-21 with the circuit diagrams for manual start.

Movable guard monitoring

The safety module can monitor emergency stop circuits and control circuits for movable guards. Replace the emergency stop contacts with the switch contacts.



Application examples See page 273