

The CS series safety modules have been studied with clear aims of safety and reliability for the product. The design, development and production of these units have been faced with the passion for quality that distinguishes Pizzato Elettrica, adding further controls where possible. Maximum safety is the basic principle for this range of products.

During the design phase of these products, principles of over-sizing were adopted, and the circuit schemes have been checked by independent third party institutes. Also the selection of the components used has been made with accurate quality aims, and the basic parts, such as relays with forced guided contacts, have been chosen among the best brands existing. The production phase itself, completely developed within the company Pizzato Elettrica, is supervised with a

	Dreduct on de	Cumples and the second	For ap	oplicatio	ons till	Output contacts			Housing
	Product code	Supply voltages	PL	SIL	Safety category	instantaneous	delayed	feedback.	thickness
	Safety modules for emergency stop and gate monitoring								
	CS AR-01	24 Vac/dc; 120 Vac; 230 Vac	е	3	4	2 NO + 1 NC	-	-	22,5 x 114 mm
	CS AR-02	24 Vac/dc; 120 Vac; 230 Vac	е	3	4	3 NO	-	-	22,5 x 114 mm
	CS AR-04	24 Vac/dc; 120 Vac; 230 Vac	е	3	4	3 NO + 1 NC	-	-	22,5 x 114 mm
	CS AR-05	24 Vac/dc; 120 Vac; 230 Vac	е	3	4	3 NO + 1 NC	-	-	22,5 x 114 mm
	CS AR-06	24 Vac/dc; 120 Vac; 230 Vac	е	3	4	3 NO + 1 NC	-	-	22,5 x 114 mm
	CS AR-07	24 Vac/dc	е	3	4	4 NO + 1 NC		-	22,5 x 129 mm
	CS AR-08	24 Vac/dc; 120 Vac; 230 Vac	е	3	4	2 NO	-	-	22,5 x 114 mm
	CS AR-20	24 Vac/dc; 120 Vac; 230 Vac	е	3	3	2 NO	-	-	22,5 x 114 mm
	CS AR-21	24 Vac/dc; 120 Vac; 230 Vac	е	3	3	2 NO	-	-	22,5 x 114 mm
	CS AR-22	24 Vac/dc; 120 Vac; 230 Vac	е	3	3	3 NO + 1 NC	-	-	22,5 x 114 mm
N	CS AR-23	24 Vac/dc; 120 Vac; 230 Vac	е	3	3	3 NO + 1 NC	-	-	22,5 x 114 mm
N	CS AR-24	24 Vac/dc	е	3	3	4 NO + 1 NC	-	-	22,5 x 114 mm
,	CS AR-25	24 Vac/dc	e	3	3	4 NO + 1 NC	-	-	22,5 x 114 mm
	CS AR-40	24 Vac/dc	d	2	2	2 NO	-	-	22,5 x 91 mm
	CS AR-41	24 Vac/dc	d	2	2	2 NO	-	-	22,5 x 91 mm
2	CS AR-46		С		1	1 NO	•	-	22,5 x 91 mm
l	C5 AR-51	24 Vac/dc	e	3	4	2 NO	-	-	22,5 x 114 mm
	Safety modules for at the opening of th	<sup>•</sup> emergency stop and gate e input channels	e moni <sup>.</sup>	toring	with d	elayed contac	ts		
	CS AT-03	24 Vac/dc; 120 Vac; 230 Vac	е	3	4 (2)	2 NO + 1 NC	2 NO	-	45 x 114 mm
	CS AT-13	24 Vac/dc; 120 Vac; 230 Vac	е	3	4 (2)	3 NO	2 NO	-	45 x 114 mm
	<b>CS AT-2</b> ③	24 Vac/dc	е	3	4 (2)	2 NO	1 NO	-	22,5 x 114 mm
	Safety timer modu	le				·			
	CS FS-03	24 Vac/dc; 120 Vac; 230 Vac	0	1	0	-	1 NO + 2 NC	-	22,5 x 114 mm
N	CS FS-23	24 Vdc; 120 Vac	d	2	3	-	1 NO +1 NC +1 CO	-	45 x 114 mm
N	<b>CS FS-3</b> ③	24 Vdc; 120 Vac	d	2	3	-	1 NO +1 NC +1 CO	-	45 x 114 mm
1	<b>CS FS-5</b> ③	24 Vdc; 120 Vac	d	2	3	-	1 NO +1 NC +1 CO	-	45 x 114 mm
	Safety modules for	<sup>,</sup> bimanual controls or syn	chroni	sm cho	eck				
l	CS DM-01	24 Vac/dc; 120 Vac; 230 Vac	III C aco	cording to	5 EN 574	3 NO + 1 NC	-	-	22,5 x 114 mm
	Standstill monitor	safety module							
N	CS AM-0	24 230 Vac/dc	d	2	3	2 NO + 1 NC	-	-	45 x 114 mm
	Expansion modules with instantaneous contacts or delayed contacts at de-energizing								
	CS ME-01	24 Vac/dc	1	1	0	5 NO + 1 NC	-	1 NC	22,5 x 114 mm
N	CS ME-03	24 Vdc	1	1	1	3 NO	-	1 NC	22.5 x 91 mm
	CS ME-20VU24-5	24 Vdc	0	1	0	-	4 NO + 2 NC	1 NC	22,5 x 114 mm
	CS ME-30VU24-6	24 Vdc	1	1	1	-	4 NO + 2 NC	1 NC	45 x 114 mm
	CS ME-31VU24-TS12	24 Vdc	1	1	1	-	4 NO + 2 NC	1 NC	45 x 114 mm
	<ul> <li>Available with this proc</li> <li>Not available with this</li> <li>Dependent from the bac</li> <li>Safety category 4 for in contacts, category 3 for delayed</li> </ul>	duct ③ Delayed contacts product 0 fixed time ase module 1 from 0,3 to 3 product 2 from 1 to 10 s contacts 4 from 30 to 30	releasing s, step 0 s, step 1 s s, step 3 0 s, step 0 s, step	time ,3 s s 30 s	(4)   V N X	Kind of connection screw termina connector with connector with	ls a screw terminals a spring terminals	<ul> <li>Releasing power supply</li> <li>TF0.5 0,5 s f</li> <li>TF1 1 s fixe</li> <li>TF2 2 s fixe</li> <li>TF3 3 s fixe</li> </ul>	time in absence of ixed time ed time ed time ed time ed time



**1**A

functional testing on 100% of the production. Every single piece produced is verified in a computerised testing station that prints the safety module label, identified from a unique serial number, only when the product passes every test.

Pizzato Elettrica has improved also the more practical aspects, using compact housings and with LED signals of the operation state of the modules. Particular attention has been paid to the connection possibilities, allowing the customer to choose between fixed clamps or plug-in connectors and screw or spring terminals. Finally, the range of products provides different supply tensions with a wide tolerance on nominal values to avoid any problem in the less industrialised countries.

			0 14		_								IR
Product code	Autom. or manual start	Monitored start	Opposite potentials inputs	Equipoten- tial inputs		pe of i │────	inputs   I®-7	(⑦)    -  -  -  -  -  -  -  -  -  -  -  -	Kind o V	f connec M	tion (④)	Page	2
										■,			2A
CS AR-01				-		-	-	-				pag. 4/125	
CS AR-02				-		-	-	-				pag. 4/127	ZR
CS AR-04				-		-	-	-				pag. 4/129	
CS AR-05		-						-				pag. 4/131	20
CS AR-06	-							-				pag. 4/131	
CS AR-07				-		-	-	-	-			pag. 4/133	20
CS AR-08								-				pag. 4/135	ZU
CS AR-20		-		-		-	-	-				pag. 4/139	
CS AR-21	-			-		-	-	-				pag. 4/139	<b>2E</b>
CS AR-22		-		-		-	-	-				pag. 4/141	
CS AR-23	-	-	-	-		-	-	-				pag. 4/141	2
CS AB-25	_	-	-	_		-	-	-				pag. 4/143	3
CS AB-40	-	-	_	_		_	_	_				pag. 4/145	
CS AR-41	-		-	-		-	-	-				pag. 1/110	<b>3</b> A
CS AR-46		-		-		-		-				pag. 4/147	
CS AR-51				-		-	-					pag. 4/149	3 <b>R</b>
													3C
CS AT-03				-				-				pag. 4/151	
CS AT-13				-				-				pag. 4/153	Д
<b>CS AT-2</b> ③				-		-		-				pag. 4/155	-
												Ê,	<b>4</b> A
<b>CS FS-0</b> ③	-	-		-		-	-	-				pag. 4/157	
CS FS-23	-	-		-		-	-	-				pag. 4/159	4 <b>b</b>
CS FS-3 <sup>3</sup>	-	-		-		-	-	-				pag. 4/161	
CS FS-5 <sup>3</sup>			-			-		-				pag. 4/163	<b>4C</b>
								1					4D
CS DM-01	-	-		-		-	-	-				pag. 4/165	
											-	M	4E
CS AM-01	-	-	-	-		-	-	-				pag. 4/167	4F
			-	-									4G
CS ME-01	-	-	0	0	_	-	-	-			_	pag. 4/169	
CS ME-03	-	-	-				-	-				pag. 4/171	<b>4H</b>
CS ME-20VU24-5	-	-		$\bigcirc$		-	-	-				pag. 4/173	
CS ME-30VU24-®	-	-				-	-	-				pag. 4/175	5
G IVIE-31V024-1312	-			U		-	-	-				pay. 4/170	J
<ul> <li>Keleasing time in absence of power supply</li> </ul>	e	Uype of in	puts	4 4 -									
TF1 1 s fixed time		r Elec											6
12 s fived time		T Elec	trosensible dev	rices with PNP c	putput								
12 S HAEU LITTE		™7 Safe   -   Safe	ety magnetic se ety mats and sa	nsor fety edges with	4 wires	6							



#### Module for emergency stop and gate monitoring

#### Main functions

- 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:
- 24 Vac/dc, 120 Vac, 230 Vac

#### **Utilization categories**

Alternate current: AC15 (50...60 Hz) Ue (V) 230 le (A) 3 Direct current: DC13 (6 operations/minute) Ue (V) 24 le (A) 6

#### Markings, quality marks and certificates:

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Approval UL:

118 F13178

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: Dimensions:	IP40 (housing), IP20 (terminals) see page 4/177, shape A			
General data	up to SIL 3 according to EN IEC 62061			
Performance Level (PL):	up to PL e according to EN ISO 13849-1			
Safety category:	up to category 4 according to EN 954-1			
Safety parameters:	see page 6/32			
Ambient temperature:	-25°C+55°C			
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			
Weight:	11 0.3 Ka			
	0,3 Kg			
Power supply				
Rated operating voltage (Un):	24 Vac/dc; 5060 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 VV			
Control circuit				
Protection against short circuits:	resistance PTC, Ih=0,5 A			
Operating time of PTC:	intervention > 100 ms, reset > 3 s			
Current for each input:	≤ 50 Ω 30 mΔ			
Min. period of start impulse t:	100 ms			
Operating time $t_{A}$ :	50 ms			
Releasing time $t_{R1}^{\circ}$ :	20 ms			
Releasing time in absence of power supply $t_R$ :	70 ms			
Simultanelty time t <sub>c</sub> :	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 60947-1, EN 62061, EN 13849-1, UL 508, CSA C22.2 nº 14-95

#### **Output circuit**

Output contacts: Contacts type: Contacts material: Max switching voltage: Max switching current per contact: Conventional free air thermal current Ith: Max currents sum  $\Sigma$  Ith<sup>2</sup>: Contacts resistance Contact protection fuse: contactors See page 4/169 - 4/176

2 NO safety c ontacts, 1 NC auxiliary contact forced guided contacts silver alloy, gold plated 230/240 Vac; 300 Vdc 6 A 6 A 72 ≤ 100 mΩ 6 A

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

#### **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	<b>±</b> 15%			
120	120 Vac	<b>±</b> 15%			
230	230 Vac	<b>±</b> 15%			

#### Items available on stock

#### CS AR-01V024

### Data type approved by UL

Rated operating voltage (Un):

Rated power consumption AC: Rated power consumption DC: Max switching voltage: Max switching current per contact: Utilization category

24 Vac/dc; 50...60 Hz 120 Vac; 50...60 Hz 230 Vac; 50...60 Hz < 5 VA < 2 W 230 Vac 6 A



Notes

and limited energy.

C300

Voles. 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

**1**A

**1B** 

2

**2**A

**2B** 

**2C** 

**2D** 

**2E** 

3

**3A** 

**3B** 

**3C** 

4

**4**A

5

6

# Safety module CS AR-01

#### **Terminals layout**



#### Internal wiring diagram



Configuration with automatic	start	
		A1/A2 S11/S12 S21/S22 13/14, 23/24 31/32 t <sub>R</sub>
Configuration with monitored	d start	
		A1/A2 S11/S12 S21/S22 S33/S34 (START) 13/14, 23/24 31/32 t <sub>R</sub>
Configuration with manual st	art	
		A1/A2 S11/S12 S21/S22 S33/S34 (START) 13/14, 23/24 31/32 t <sub>R</sub>
Legend: t : Min period of start impulse	t: Belea	sing time

**Operation diagrams** 

t<sub>c</sub>: t<sub>A</sub>: Simultaneity time Operating time

Releasing time in absence of t<sub>R</sub>: 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  $t_{n,1}$  time referred to S11/S12 input, the  $t_n$  time referred to the supply, the  $t_A$  time referred to S11/S12 input and to the start, and the  $\mathbf{t}_{\text{MIN}}$  time referred to the start.

#### Inputs configuration





#### Module for emergency stop and gate monitoring

#### Main functions

- 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:
- 24 Vac/dc, 120 Vac, 230 Vac

#### Utilization categories

Alternate current: AC15 (50...60 Hz) Ue (V) 230 le (A) 3 Direct current: DC13 (6 operations/minute) Ue (V) 24 le (A) 6

#### Markings, quality marks and certificates:

CE

us E131787

Approval UL:

Complying with the requirements requested by: Low Voltage Directive 2006/95/EC, Machinery Directive 2006/42/EC, Electromagnetic Compatibility 2004/108/EC

# **Technical data**

<b>Housing</b> Made of polyamide PA 6.6 self-extinguishing, cl Protection degree: Dimensions:	ass V0 (UL94) IP40 (housing), IP20 (terminals) see page 4/177, shape A
General data SIL level (SIL CL): Performance Level (PL): Safety category: Safety parameters: Ambient temperature: Mechanical endurance: Electrical endurance: Pollution degree: Rated impulse with stand voltage (Uimp): Rated insulation voltage (Ui): Over-voltage category: Weight:	up to SIL 3 according to EN IEC 62061 up to PL e according to EN ISO 13849-1 up to category 4 according to EN 954-1 see page 6/32 -25°C+55°C >10 millions of operations >100.000 operations outside 3, inside 2 4 kV 250 V II 0,3 Kg
<b>Power supply</b> Rated operating voltage (Un): Max residual ripple in DC: Supply voltage tolerance: Rated power consumption AC: Rated power consumption DC:	24 Vac/dc; 5060 Hz 120 Vac; 5060 Hz 230 Vac; 5060 Hz 10% ±15% of Un < 5 VA < 2 W
<b>Control circuit</b> Protection against short circuits: Operating time of PTC: Max input resistance: Current for each input: Min. period of start impulse $t_{MIN}$ : Operating time $t_{A}$ : Releasing time $t_{R1}$ : Releasing time in absence of power supply $t_{R}$ : Simultaneity time $t_{c}$ :	resistance PTC, lh=0,5 A intervention > 100 ms, reset > 3 s $\leq$ 50 $\Omega$ 30 mA 100 ms 50 ms 20 ms 70 ms 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 60947-1, EN 62061, EN 13849-1, UL 508, CSA C22.2 n° 14-95

#### **Output circuit**

•	
Dutput contacts:	3 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 Ith:	6 A
Max currents sum $\Sigma$ lth <sup>2</sup> :	72
Contacts resistance:	≤ 100 mΩ
Contact protection fuse:	6 A
he number and the load capacity of output contacts c	an be increased by using expansion modules or
contactors See page 4/169 - 4/176	

#### **Code structure**

**CS AR-02V024** 

#### Kind of connection

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

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

#### Data type approved by UL

Rated operating voltage (Un):

	230 \/
Bated power consumption AC:	< 5 V/
Bated power consumption DC:	< 2 W
Max switching voltage:	230 Va
Max switching current per contact:	6 A
Utilization category	C300

24 Vac/dc; 50...60 Hz 120 Vac; 50...60 Hz 'ac; 50...60 Hz А ac

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.





A1/A2

S11/S12

S21/S22

A1/A2

A1/A2 S11/S12

S21/S22

S11/S12 S21/S22

S33/S34 (START) 13/14, 23/24, 33/34

13/14, 23/24, 33/34

1

**1**A

**1**B

2

**2**A

**2B** 

**2C** 

**2D** 

**2E** 

3

**3A** 

**3B** 

**3C** 

4

**4**A

**4B** 

**4C** 

**4D** 

**4E** 

4F

**4G** 

**4H** 

5

6

# Safety module CS AR-02

**Terminals layout** 



#### Internal wiring diagram



#### Inputs configuration



**Operation diagrams** 

Configuration with automatic start

Configuration with monitored start

Configuration with manual start



#### Module for emergency stop and gate monitoring

#### Main functions

- 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 le (A) 3 current: DC13 (6 operations/minute) Direct Ue (V) 24 le (A) 6

#### Markings, quality marks and certificates:

CE Approval UL:

US E131787

Complying with the requirements requested by: Low Voltage Directive 2006/95/EC, Machinery Directive 2006/42/EC,

Electromagnetic Compatibility 2004/108/EC

# **Technical data**

Housing Made of polyamide PA 6.6 self-extinguishing, cl	ass V0 (UL94)
Protection degree: Dimensions:	see page 4/177, shape A
General data	
SIL level (SIL CL):	up to SIL 3 according to EN IEC 62061
Safety category:	up to rategory 4 according to EN ISO I3849-1
Safety parameters:	see page 6/32
Ambient temperature:	-25°C+55°C
Mechanical endurance:	>10 millions of operations
Electrical endurance:	>100.000 operations
Pollution degree:	outside 3, inside 2
Rated insulation voltage (Ui).	250 V
Over-voltage category:	
Weight:	0,3 Kg
Power supply	
Rated operating voltage (Un):	24 Vac/dc; 5060 Hz 120 Vac; 5060 Hz 230 Vac: 5060 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 PIC, Ih=0,5 A
Operating time of PTC: May input resistance:	Intervention > 100 ms, reset > 3 s $< 50 \Omega$
Current for each input:	30 mA
Min. period of start impulse t <sub>MIN</sub> :	100 ms
Operating time t <sub>A</sub> :	50 ms
Releasing time t <sub>R1</sub> :	20 ms
Releasing time in absence of power supply $t_R$ :	70 ms
Simultaneity time t <sub>c</sub> :	intinite

#### 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 60947-1, EN 62061, EN 13849-1, UL 508, CSA C22.2 n° 14-95

#### Output circuit

output onoun	
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 Ith:	6 A
Contacts resistance:	≤ 100 mΩ
Contact protection fuse:	6 A
The number and the load capacity of output contacts of	an be increased by using expansion modules or
contactors See page 4/169 - 4/176	

#### **Code structure**

# **CS AR-04V024**

#### Kind of connection

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

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

### Items available on stock

#### CS AR-04V024

#### Data type approved by UL

Rated operating voltage (Un):

Rated power consumption AC:
Rated power consumption DC:
Max switching voltage:
Max switching current per contact:
Utilization category

24 Vac/dc; 50...60 Hz 120 Vac; 50...60 Hz 230 Vac; 50...60 Hz < 5 VA < 2 W 230 Vac 6 A

C300

Voles. - 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.





S22 S35

S35 S22

S34

S34

A1

• A2

N/-



Module for emergency stop, gate monitoring, Electro-sensitive protection devices (ESPE) and magnetic safety sensor

#### Main functions

- 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 ESPE, 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 le (A) 3 Direct current: DC13 (6 operations/minute) Ue (V) 24 le (A) 6

Markings, quality marks and certificates:

C E

Approval UL: E131787

Complying with the requirements requested by: Low Voltage Directive 2006/95/EC,

Machinery Directive 2006/42/EC, Electromagnetic Compatibility 2004/108/EC

# **Technical data**

Housing Made of polyamide PA 6.6 self-extinguishing, cla Protection degree: Dimensions:	ass V0 (UL94) IP40 (housing), IP20 (terminals) see page 4/177, shape A
General data SIL level (SIL CL): Performance Level (PL): Safety category: Safety parameters: Ambient temperature: Mechanical endurance: Electrical endurance: Pollution degree: Rated impulse with stand voltage (Uimp): Rated insulation voltage (Ui): Over-voltage category: Weight:	up to SIL 3 according to EN IEC 62061 up to PL e according to EN ISO 13849-1 up to category 4 according to EN 954-1 see page 6/32 -25°C+55°C >10 millions of operations >100.000 operations outside 3, inside 2 4 kV 250 V II 0,3 Kg
<b>Power supply</b> Rated operating voltage (Un): Max residual ripple in DC: Supply voltage tolerance: Rated power consumption AC: Rated power consumption DC:	24 Vac/dc; 5060 Hz 120 Vac; 5060 Hz 230 Vac; 5060 Hz 10% ±15% of Un < 5 VA < 2 W
$\label{eq:control circuit} \begin{array}{l} \textbf{Control circuit} \\ Protection against short circuits: \\ Operating time of PTC: \\ Max input resistance: \\ Current for each input: \\ Min. period of start impulse t_{MIN}: \\ Operating time t_{A}: \\ Releasing time t_{R1}: \\ Releasing time in absence of power supply t_R: \\ Simultaneity time t_C: \end{array}$	resistance PTC, Ih=0,5 A intervention > 100 ms, reset > 3 s $\leq$ 50 $\Omega$ 30 mA 250 ms 200 ms 15 ms 70 ms 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 60947-1, EN 62061, EN 13849-1, UL 508, CSA C22.2 nº 14-95

#### Output circuit

Suput on our	
Dutput 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 Ith:	6 A
Contacts resistance:	≤ 100 mΩ
Contact protection fuse:	6 A
The number and the load capacity of output contacts of contactors See page 4/169 - 4/176	can be increased by using expansion modules or

#### **Code structure**

# **CS AR-05V024**

US

#### Kind of start

- 05 manual or automatic start
- 06 monitored start

#### Kind of connection

- V screw terminals
- Μ connector with screw terminals
- Х connector with spring terminals

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

### Data type approved by UL

Rated operating voltage (Un):

Rated power consumption AC: Rated power consumption DC: Max switching voltage: Max switching current per contact: Utilization category

24 Vac/dc; 50...60 Hz 120 Vac; 50...60 Hz 230 Vac; 50...60 Hz < 5 VA < 2 W 230 Vac 6 A

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.



C300



**1A** 

**1B** 

2

**2A** 

**2B** 

**2C** 

**2D** 

**2E** 

3

**3**A

**3B** 

**3C** 

4

**4**A

**4B** 

**4C** 

**4D** 

**4E** 

4F

**4G** 

**4H** 

5

6

# Safety module CS AR-05-06

**Terminals layout** 



## Internal wiring diagram



#### Inputs configuration



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0N/-

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

ŀ



0 N/-

Operation diagrams		
Configuration with automatic start (CS AR-05 only)		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		
Configuration with monitored start (CS AB-06 only)		
$\begin{array}{c} A1/A2 \\ S11/S12 (+/S12) \\ S21/S22 (+/S52) \\ S12/S34 (START) \\ 13/14, 23/24, 33/34 \\ t_A t_{R1} t_A t_{R1} t_{MIN} t_A t_R \end{array}$		
Configuration with manual start (CS AR-05 only)		
$\begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} $		
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.



page **4/132** 



#### Module for emergency stop and gate monitoring

#### Main functions

- 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 le (A) 3 Direct current: DC13 (6 operations/minute) Ue (V) 24 le (A) 6

#### Markings, quality marks and certificates:

C E

Approval UL:

Complying with the requirements requested by: Low Voltage Directive 2006/95/EC, Machinery Directive 2006/42/EC, Electromagnetic Compatibility 2004/108/EC

# **Technical data**

#### н

Housing Made of polyamide PA 6.6 self-extinguishing, cla Protection degree: Dimensions:	ass V0 (UL94) IP40 (housing), IP20 (terminals) see page 4/177, shape B
General data SIL level (SIL CL): Performance Level (PL): Safety category: Safety parameters: Ambient temperature: Mechanical endurance: Electrical endurance: Pollution degree: Rated impulse with stand voltage (Uimp): Rated insulation voltage (Ui): Over-voltage category: Weight:	up to SIL 3 according to EN IEC 62061 up to PL e according to EN ISO 13849-1 up to category 4 according to EN 954-1 see page 6/32 -25°C+55°C >10 millions of operations >100.000 operations outside 3, inside 2 4 kV 250 V II 0,3 Kg
<b>Power supply</b> Rated operating voltage (Un): Max residual ripple in DC: Supply voltage tolerance: Rated power consumption AC: Rated power consumption DC:	24 Vac/dc; 5060 Hz 10% ±15% of Un < 5 VA < 2 W

#### **Control circuit**

resistance PTC, Ih=0,5 A Protection against short circuits: 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<sub>MIN</sub>: 100 ms 70 ms Operating time t<sub>4</sub>: Releasing time t<sub>B1</sub> 40 ms Releasing time in absence of power supply t<sub>B</sub>: 80 ms Simultaneity time t<sub>c</sub>: 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 60947-1, EN 62061, EN 13849-1, UL 508, CSA C22.2 nº 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; 220 Vdc
Max switching current per contact:	6 A
Conventional free air thermal current Ith:	6 A
Max currents sum $\Sigma$ lth <sup>2</sup> :	72
Contacts resistance:	≤ 100 mΩ
Contact protection fuse:	6 A
The number and the load capacity of output contacts contactors See page $4/169 = 4/176$	can be increased by using expansion modules or

#### **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%

#### Data type approved by UL

Rated operating voltage (Un): Rated power consumption AC Rated power consumption DC: Max switching voltage: Max switching current per contact: Utilization category

24 Vac/dc; 50...60 Hz < 5 VA < 2 W 230 Vac 6 A C300

Notes Voles. - 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





#### Inputs configuration



5

6



Module for emergency stop, gate monitoring, Electro-sensitive protection devices (ESPE) and magnetic safety sensor

#### Main functions

- Single or dual channel input circuit
- Choice between automatic start, manual start or monitored start
- Connectible to ESPE, 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) Ue (V) 230 le (A) 3 Direct current: DC13 (6 operations/minute) Ue (V) 24 le (A) 6

#### Markings, quality marks and certificates:

CE

us E131787

Approval UL:

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 V() (UI 94)		
Protection degree: Dimensions:	IP40 (housing), IP20 (terminals) see page 4/177, 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:	up to category 4 according to EN 954-1	
Safety parameters:	see page 6/32	
Ambient temperature:	-25°C+55°C	
Electrical endurance.		
Pollution degree:	outside 3 inside 2	
Rated impulse with stand voltage. (Uimp).	4 kV	
Rated insulation voltage (Ui):	250 V	
Over-voltage category:	11	
Weight:	0,3 Kg	
Power supply		
Rated operating voltage (Un):	24 Vac/dc; 5060 Hz	
	120 Vac; 5060 Hz	
	230 Vac; 5060 Hz	
Max residual ripple in DC:	IU%	
Pated newer concurrentian AC:		
Rated power consumption DC:	< 2 W	
Control circuit		
Protection against short circuits:	resistance PTC, Ih=0,5 A	
Operating time of PTC:	intervention > 100 ms, reset > 3 s	
Max input resistance:	≤ 50 <b>Ω</b>	
Current for each input:	30 mA	
Min. period of start impulse t <sub>MIN</sub> :	200 ms	
Operating time t <sub>A</sub> :	150 ms	
Releasing time t <sub>R1</sub> :	20 ms	
Simultaneity time t <sub>-</sub> :	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 60947-1, EN 62061, EN 13849-1, UL 508, CSA C22.2 n° 14-95

#### **Output circuit**

Dutput 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 Ith:	6 A
$M$ ax currents sum $\Sigma$ lth <sup>2</sup> :	36
Contacts resistance:	≤ 100 mΩ
Contact protection fuse:	6 A
he number and the load capacity of output contacts of	an be increased by using expansion modules or
contactors See page 4/169 - 4/176	

#### **Code structure**

# **CS AR-08V024**

#### Kind of connection

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

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

## Items available on stock

#### CS AR-08V024

#### Data type approved by UL

Rated operating voltage (Un):

Rated power consumption AC:
Rated power consumption DC:
Max switching voltage:
Max switching current per contac
Utilization category

24 Vac/dc; 50...60 Hz 120 Vac; 50...60 Hz 230 Vac; 50...60 Hz < 5 VA < 2 W 230 Vac 6 A

Voles. - 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.

t: C300





**1**A

**1**B

2

**2**A

**2B** 

**2C** 

**2D** 

**2E** 

3

**3A** 

**3B** 

**3C** 

4

**4**A

**4B** 

**4C** 

**4D** 

**4E** 

4F

**4G** 

**4H** 

5

6

# Safety module CS AR-08

**Terminals layout** 



#### Internal wiring diagram



#### Inputs configuration







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



Configuration with automatic start



Configuration with monitored start



Configuration with manual start



 $t_{min}$ : Min. period of start impulse  $t_c$ : Simultaneity time  $t_x$ : Operating "

Releasing time t<sub>R1</sub>: t<sub>R</sub>: Releasing time in absence of power supply

S33

S34

E-

S33

S34

Note:

The configurations with one channel are obtained taking into consideration only the CH1 input. In this case it is necessary to consider the  $t_{\rm st}$  time referred to CH1 input, the  $t_{\rm s}$  time referred to the supply, the  $t_{\rm s}$  time referred to CH1 input and to the start, and the  $\mathbf{t}_{\text{MIN}}$  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 circuits or monitoring safety magnetic sensors. Replace the emergency stop contacts with switches contacts or with the sensors contacts.



### Application examples: safety gates monitoring, up to category 4 according to EN 954-1





Safety gate monitoring through two switches with different technology. System in safety category 4

#### Application examples: light barrier monitoring, up to category 4 according to EN 954-1





Electro-sensible barrier monitoring (ESPE) with two outputs OSSD. System in safety category 2 or 4 according to the barrier.

#### Application examples: guard monitoring in mixed technology, sensor + switch, up to category 4 according to EN 954-1



Safety gate monitoring through one switch and one inductive sensor. The positive opening of the switch is required. System in safety category 4.

### Application examples: switch and emergency push button monitoring, up to category 3 according to EN 954-1



F-



**1**A

**1**B

2

**2**A

**2B** 

**2C** 

**2D** 

**2E** 

3

**3A** 

**3B** 

**3C** 

4

**4**A

**4B** 

**4C** 

**4D** 

**4E** 

4F

**4G** 

**4H** 

5

6

# Application examples: safety magnetic sensors monitoring, up to category 4 according to EN 954-1



Safety gate monitoring through one coded magnetic sensor. System in safety category 4.

#### Application examples: series of switches and magnetic sensors monitoring, up to category 3 according to EN 954-1



Control of more guards through switches and magnetic sensors. System in category 3.

• The use of one single switch for guard requires that in the risk analysis stage it would be possible to exclude the mechanical breaking of the same. • The sensor must have double coded channel.

• Verify possible requirements of the type C standard concerning own machinery.

#### Application examples: possibility of parallel modules reset, up to category 4 according to EN 954-1





#### Module for emergency stop and gate monitoring

#### Main functions

- Single or dual channel input circuit
- Choice between automatic start, manual start (CS AR-20 only) or monitored start (CS AR-21 only)
- Connection of the input channels to opposite potentials
- 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 le (A) 3 Direct current: DC13 (6 operations/minute) Ue (V) 24 le (A) 6

#### Markings, quality marks and certificates:

CE

US E131787

Approval UL:

Complying with the requirements requested by: Low Voltage Directive 2006/95/EC, Machinery Directive 2006/42/EC,

Electromagnetic Compatibility 2004/108/EC

# **Technical data**

#### н

Made of polyamide PA 6.6 self-extinguishing, Protection degree: Dimensions:	class V0 (UL94) IP40 (housing), IP20 (terminals) see page 4/177, shape A
General data SIL level (SIL CL): Performance Level (PL): Safety category: Safety parameters: Ambient temperature: Mechanical endurance: Electrical endurance: Pollution degree: Rated impulse with stand voltage (Uimp): Rated insulation voltage (Ui): Over-voltage category: Weight:	up to SIL 3 according to EN IEC 62061 up to PL e according to EN ISO 13849-1 up to category 3 according to EN 954-1 see page 6/32 -25°C+55°C >10 millions of operations >100.000 operations outside 3, inside 2 4 kV 250 V II 0,2 Kg
Power supply Rated operating voltage (Un): Max residual ripple in DC: Supply voltage tolerance: Rated power consumption AC: Rated power consumption DC:	24 Vac/dc; 5060 Hz 120 Vac; 5060 Hz 230 Vac; 5060 Hz 10% ±15% of Un < 5 VA < 2 W
Control circuit Protection against short circuits: Operating time of PTC: Max input resistance: Current for each input: Min. period of start impulse $t_{MIN}$ : Operating time $t_a$ :	resistance PTC, lh=0,5 A intervention > 100 ms, reset > 3 s $\leq$ 50 $\Omega$ 70 mA 100 ms 50 ms

In conformity with standards:

Simultaneity time t<sub>c</sub>:

Releasing time in absence of power supply t<sub>p</sub>:

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 60947-1, EN 62061, EN 13849-1, UL 508, CSA C22.2 n° 14-95

70 ms

infinite

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 Ith:	6 A
Max currents sum $\Sigma$ lth <sup>2</sup> :	36
Contacts resistance:	≤ 100 mΩ
Contact protection fuse:	6 A
The number and the load capacity of output contacts c	an be increased by using expansion modules or
contactors See page 4/169 - 4/176	

#### **Code structure**

# **CS AR-20V024**

#### Kind of start

- 20 manual or automatic start
- 21 monitored start

#### Kind of connection

- V screw terminals
- connector with screw terminals Μ
- **X** connector with spring terminals

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

# Items available on stock

#### CS AR-20V024

#### Data type approved by UL

Rated operating voltage (Un):

Rated power consumption AC: Rated power consumption DC: Max switching voltage: Max switching current per contact: Utilization category Notes

24 Vac/dc; 50...60 Hz 120 Vac; 50...60 Hz 230 Vac; 50...60 Hz < 5 VA < 2 W 230 Vac 6 A

Voles. 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.



C300



CH1: A1

CH1: A1

CH2: A2 S33/S34 (START)

CH1: A1 CH2: A2

Operating time Releasing time in absence of

power supply

t<sub>A</sub>: t<sub>R</sub>:

The configurations with one channel are obtained taking into consideration only the CH1:A1 input. In this case it is necessary to consider the  $\mathbf{t}_{\mathbf{r}}$  referred to CH1:A1 input , the  $\mathbf{t}_{\mathbf{k}}$  time referred to CH1:A1 input and to the start, and the  $\mathbf{t}_{\mathbf{k}\mathbf{N}\mathbf{N}}$  time

S33/S34 (START)

13/14, 23/24

13/14, 23/24

t,

t,

CH2: A2 13/14, 23/24

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

#### **Terminals layout**



## Internal wiring diagram



# Inputs configuration



Legend

t

Note:

Nin. period of start impulse

Simultaneity time

referred to the start.

**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)

Automatic start





#### 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.





1

**2B** 

**2C** 

**2D 2E** 

3

**3**A **3B** 

**3C** 

4

**4**A

**4B** 

**4C** 

- **4E**
- 4F

**4H** 

5

6





#### Module for emergency stop and gate monitoring

#### Main functions

- Single or dual channel input circuit
- Choice between automatic start, manual start (CS AR-22 only) or monitored start (CS AR-23 only)
- Connection of the input channels to opposite potentials
- 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 le (A) 3 Direct current: DC13 (6 operations/minute) Ue (V) 24 le (A) 6

#### Markings, quality marks and certificates:

CE

Approval UL: E131787

# Complying with the requirements requested by: Low Voltage Directive 2006/95/EC,

Machinery Directive 2006/42/EC, Electromagnetic Compatibility 2004/108/EC

# **Technical data**

#### ŀ

<b>tousing</b> Vlade of polyamide PA 6.6 self-extinguishing, class V0 (UL94)			
Protection degree: Dimensions:	IP40 (housing), IP20 (terminals) see page 4/177, shape A		
General data			
SIL level (SIL CL): Performance Level (PL): Safety category: Safety parameters: Ambient temperature: Mechanical endurance: Electrical endurance: Pollution degree: Rated impulse with stand voltage (Uimp): Rated insulation voltage (Ui): Over-voltage category: Meight:	up to SIL 3 according to EN IEC 62061 up to PL e according to EN ISO 13849-1 up to category 3 according to EN 954-1 see page 6/32 -25°C+55°C >10 millions of operations >100.000 operations outside 3, inside 2 4 kV 250 V II 0,2 Kg		
Power supply			
Rated operating voltage (Un): Max residual ripple in DC: Supply voltage tolerance: Rated power consumption AC: Rated power consumption DC:	24 Vac/dc; 5060 Hz 120 Vac; 5060 Hz 230 Vac; 5060 Hz 10% ±15% of Un < 5 VA < 2 W		
<b>Control circuit</b> Protection against short circuits: Operating time of PTC: Max input resistance: Current for each input:	resistance PTC, lh=0,5 A intervention > 100 ms, reset > 3 s $\leq$ 50 $\Omega$ 70 mA		

Min. period of start impulse t<sub>MIN</sub>: Operating time t<sub>4</sub>: Releasing time in absence of power supply t<sub>p</sub>: Simultaneity time t<sub>c</sub>:

#### 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 60947-1, EN 62061, EN 13849-1, UL 508, CSA C22.2 n° 14-95

100 ms

50 ms

60 ms

infinite

#### **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 Ith:	6 A
Contacts resistance:	≤ 100 mΩ
Contact protection fuse:	6 A
The number and the load capacity of output contacts of contactors See page 4/169 - 4/176	can be increased by using expansion modules or

#### **Code structure**

# **CS AR-22V024**

#### Kind of start

- 22 manual or automatic start
- 23 monitored start

#### Kind of connection

- V screw terminals
- connector with screw terminals Μ
- **X** connector with spring terminals

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

#### Data type approved by UL

Rated operating voltage (Un):

HzRated power consumption AC: Rated power consumption DC: Max switching voltage: Max switching current per contact: 6 A Utilization category C300

24 Vac/dc; 50...60 Hz 120 Vac; 50...60 Hz 230 Vac; 50...60 < 5 VA < 2 W 230 Vac

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.







CH1: A1

CH2: A2

1

**1**A

**1B** 

2

**2A** 

**2B** 

**2C** 

**2D** 

**2E** 

3

**3**A

**3B** 

**3C** 

4

# Safety module CS AR-22 / CS AR-23

#### **Terminals layout**



#### Internal wiring diagram



#### Inputs configuration



13/14,23/24,33/34 41/42 Configuration with monitored start (CS AR-23 only) CH1: A1 CH2: A2 S33/S34 (START) 13/14,23/24,33/34 41/42 t\_

Configuration with automatic start (CS AR-22 only)

Configuration with manual start (CS AR-22 only)



 $t_{\text{MIN}}$ : Min. period of start impulse  $t_{c}$ : Simultaneity time

**Operation diagrams** 

Operating time Releasing time in absence of t<sub>A</sub>: t<sub>R</sub>: 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  $\mathbf{t}_{\mathbf{x}}$  referred to CH1:A1 input , the  $\mathbf{t}_{\mathbf{x}}$  time referred to CH1:A1 input and to the start, and the  $\mathbf{t}_{\mathbf{MN}}$  time referred to the start.

> **4**A **4B**

6





replacing the emergency stop contacts with switches contacts.





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#### Module for emergency stop and gate monitoring

#### Main functions

- 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 le (A) 3 Direct current: DC13 (6 operations/minute) Ue (V) 24 le (A) 6

#### Markings, quality marks and certificates:

Approval UL:

E131787

Complying with the requirements requested by: Low Voltage Directive 2006/95/EC, Machinery Directive 2006/42/EC, Electromagnetic Compatibility 2004/108/EC

# **Technical data**

#### н

Made of polyamide PA 6.6 self-extinguishing, o Protection degree: Dimensions:	class V0 (UL94) IP40 (housing), IP20 (terminals) see page 4/177, shape A
General data SIL level (SIL CL): Performance Level (PL): Safety category: Safety parameters: Ambient temperature: Mechanical endurance: Electrical endurance: Pollution degree: Rated impulse with stand voltage (Uimp): Rated insulation voltage (Ui): Over-voltage category: Weight:	up to SIL 3 according to EN IEC 62061 up to PL e according to EN ISO 13849-1 up to category 3 according to EN 954-1 see page 6/32 -25°C+55°C >10 millions of operations >100.000 operations outside 3, inside 2 4 kV 250 V II 0,3 Kg
<b>Power supply</b> Rated operating voltage (Un): Max residual ripple in DC: Supply voltage tolerance: Rated power consumption AC: Rated power consumption DC:	24 Vac/dc; 5060 Hz 10% ±15% of Un < 5 VA < 2 W

resistance PTC, Ih=0,5 A Protection against short circuits: 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<sub>MIN</sub>: 100 ms Operating time t<sub>A</sub>: 70 ms Releasing time t<sub>B1</sub> 40 ms Releasing time in absence of power supply t<sub>B</sub>: 80 ms Simultaneity time t<sub>c</sub>: 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 60947-1, EN 62061, EN 13849-1, UL 508, CSA C22.2 nº 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 Ith:	6 A
Max currents sum $\Sigma$ lth <sup>2</sup> :	72
Contacts resistance:	≤ 100 mΩ
Contact protection fuse:	6 A
The number and the load capacity of output contacts ca	an be increased by using expansion modules or
contactors See page 4/169 - 4/176	, , ,

#### **Code structure**

# **CS AR-24V024**

US

#### Kind of start

24 manual or automatic start

25 monitored start

#### Kind of connection

- V screw terminals
- connector with screw terminals Μ
- **X** connector with spring terminals

Supply voltage 024 24 Vac/dc ±15%

Data type approved by UL Rated operating voltage (Un): Rated power consumption AC Rated power consumption DC: Max switching voltage: Max switching current per contact: Utilization category

24 Vac/dc; 50...60 Hz < 5 VA < 2 W 230 Vac 6 A C300

Notes Voles. - 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





**1**A

**1B** 

2

**2A** 

**2B** 

**2C** 

**2D** 

**2E** 

3

**3A** 

**3B** 

**3C** 

4

**4**A

5

6

# Safety module CS AR-24 / CS AR-25

**Terminals layout** 







Internal wiring diagram



Configuration with manual start (CS AR-24 only)



 $t_{min}$ : Min. period of start impulse  $t_c$ : Simultaneity time  $t_x$ : Operating "

**Operation diagrams** 

Releasing time t<sub>R1</sub>: t<sub>p</sub>: 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  $\mathbf{t}_n$  time referred to S11/S12 input, the  $\mathbf{t}_n$  time referred to S11/S12 input, the  $\mathbf{t}_n$  time referred to S11/S12 input and to the start, and the  $\boldsymbol{t}_{\text{MIN}}$  time referred to the start.

#### Inputs configuration





#### Module for emergency stop and gate monitoring

#### Main functions

- 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) Ue (V) 230 le (A) 3 Direct current: DC13 (6 operations/minute) Ue (V) 24 le (A) 6

#### Markings, quality marks and certificates:

US E131787

Approval UL:

# 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

Housing		
Made of polyamide PA 6.6 self-extin	guishing, class V0 (UL94)	
Protection degree:	IP40 (housing), IP20 (terminals)	
Dimensions:	see page 4/178, 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	

Performance Level (PL): Safety category: Safety parameters: Ambient temperature: Mechanical endurance: Electrical endurance: Pollution degree: Rated impulse with stand voltage (Uimp): Rated insulation voltage (Ui): Over-voltage category: Weight:

#### Power supply

Rated operating voltage (Un): Max residual ripple in DC: Supply voltage tolerance: Rated power consumption AC: Rated power consumption DC:

#### **Control circuit**

Protection against short circuits: Operating time of PTC: Max input resistance: Current for each input: Min. period of start impulse t<sub>MIN</sub>: Operating time t<sub>4</sub>: Releasing time in absence of power supply t<sub>p</sub>: Simultaneity time t<sub>c</sub>:

# < 5 VA < 2 W

24 Vac/dc; 50...60 Hz

resistance PTC, Ih=0,5 A intervention > 100 ms, reset > 3 s ≤ 50 Ω 70 mA 100 ms 50 ms 50 ms infinite

up to category 2 according to EN 954-1

see page 6/32 -25°C...+55°C

outside 3, inside 2

4 kV

250 V

0,2 Kg

10%

±15% of Un

Ш

>10 millions of operations >100.000 operations

#### 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 60947-1, 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 lth:	6 A
Max currents sum $\Sigma$ lth <sup>2</sup> :	36
Contacts resistance:	≤ 100 mΩ
Contact protection fuse:	6 A
The number and the load capacity of output contacts	can be increased by using expansion modules or
contactors See page 4/169 - 4/176	

#### **Code structure**

# **CS AR-40V024**

#### Kind of start

40 manual or automatic start

41 monitored start

#### Kind of connection

- V screw terminals
- connector with screw terminals Μ
- **X** connector with spring terminals

Supply voltage

024 24 Vac/dc ±15%



Voles. - 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





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.





6

**4D** 

**4**E

4F

**4G** 

**4H** 

5



#### Module for emergency stop, gate monitoring and magnetic safety sensor

#### Main functions

- Small 22,5 mm housing
- 1 NO safety contacts
- Supply voltages:
- 24 Vac/dc

#### **Utilization categories**

Alternate current: AC15 (50...60 Hz) Ue (V) 230 le (A) 3 Direct current: DC13 (6 operations/minute) Ue (V) 24 le (A) 6

#### Markings, quality marks and certificates:

CE

Approval UL: E131787

## Complying with the requirements requested by: Low Voltage Directive 2006/95/EC,

Machinery Directive 2006/42/EC, Electromagnetic Compatibility 2004/108/EC

# **Technical data**

#### н

Housing Made of polyamide PA 6.6 self-extinguishing, cla Protection degree: Dimensions:	lass V0 (UL94) IP40 (housing), IP20 (terminals) see page 4/178, shape D	
General data SIL level (SIL CL): Performance Level (PL): Safety category: Safety parameters: Ambient temperature: Mechanical endurance: Electrical endurance: Pollution degree: Rated impulse with stand voltage (Uimp): Rated insulation voltage (Ui): Over-voltage category: Weight:	up to SIL 1 according to EN IEC 62061 up to PL c according to EN ISO 13849-1 up to category 1 according to EN 954-1 see page 6/32 -25°C+55°C >10 millions of operations >100.000 operations outside 3, inside 2 4 KV 250 V II 0,2 Kg	
<b>Power supply</b> Rated operating voltage (Un): Max residual ripple in DC: Supply voltage tolerance: Rated power consumption AC: Rated power consumption DC:	24 Vac/dc; 5060 Hz 10% ±15% of Un < 5 VA < 2 W	

#### **Control circuit**

Protection against short circuits: Operating time of PTC: Max input resistance: Current for each input: Operating time t<sub>4</sub>: Releasing time t<sub>B1</sub>: Releasing time in absence of power supply t<sub>p</sub>: Simultaneity time t<sub>c</sub>:

#### resistance PTC, Ih=0,5 A intervention > 100 ms, reset > 3 s ≤ 50 Ω 20 mA 15 ms 20 ms 100 ms 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 60947-1, 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 Ith:	6 A
Contacts resistance:	≤ 100 m <b>Ω</b>
Contact protection fuse:	6 A
The number and the load capacity of output contacts	can be increased by using expansion modules or
contactors See page 4/169 - 4/176	



# **CS AR-46V024**

US

#### Kind of connection

- V screw terminals
- М connector with screw terminals
- X connector with spring terminals



024 24 Vac/dc ±15%

#### Data type approved by UL

Rated operating voltage (Un): Rated power consumption AC Rated power consumption DC: Max switching voltage: Max switching current per contact: Utilization category

24 Vac/dc; 50...60 Hz < 5 VA < 2 W 230 Vac 6 A C300

Notes Voles. - 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





**2D** 

**2E** 

3

**3**A

3**B** 

**3C** 

4

**4**A

# Safety module CS AR-46

# **Terminals layout**

**Operation diagrams** 



#### Internal wiring diagram



#### Inputs configuration

switches contacts or with the sensors contacts.

	5			<b>1</b> D
		Emergency stop		4 <b>D</b>
		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	4 <b>C</b>
	L/+0 ( E77	L/+ 0 0 E 7 7		<b>4D</b>
	CS AR-46	CS AR-46	CS AR-46	<b>4</b> E
				4F
				<b>4G</b>
Ga	te monitoring and safety magnetic sensors.			<b>4H</b>
The cor sto mo	e safety module can ntrol both emergency op circuits, gate nitoring circuits or			5
sat Re stc	place the emergency population contacts with the formula f			6

6

[Φ



#### Module for emergency stop, gate monitoring, safety mats and safety edges with 4 wires technology

#### Main functions

- Dual channel input circuit
- Choice between automatic start, manual start or monitored start
- Connection of the input channels to opposite potentials
- · Connectible to electromechanical contacts, to safety mats or to safety edges
- Output contacts:
- 2 NO safety contacts,
- · Supply voltages:
- 24 Vac/dc

#### Utilization categories

Alternate current: AC15 (50...60 Hz) Ue (V) 230 le (A) 3 Direct current: DC13 (6 operations/minute) Ue (V) 24 le (A) 6

Markings, quality marks and certificates:

Approval UL:

#### Complying with the requirements requested by: Low Voltage Directive 2006/95/EC, Machinery Directive 2006/42/EC,

E131787

Electromagnetic Compatibility 2004/108/EC

# **Technical data**

#### . н

Housing		
Made of polyamide PA 6.6 self-extinguishing, class V0 (UL94)		
Protection degree:	IP40 (housing), IP20 (terminals)	
Dimensions:	see page 4/177, 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:	up to category 4 according to EN 954-1	
Safety parameters:	see page 6/32	
Ambient temperature:	-25°C+55°C	

>10 millions of operations >100.000 operations

outside 3, inside 2

24 Vac/dc; 50...60 Hz

4 kV

250 V

0,3 Kg

10% ±15% of Un

< 5 VA

< 2 W

Ш

5 Ambient temperature: Mechanical endurance: Electrical endurance: Pollution degree: Rated impulse with stand voltage (Uimp): Rated insulation voltage (Ui): Over-voltage category: Weight:

#### Power supply

Rated operating voltage (Un): Max residual ripple in DC: Supply voltage tolerance: Rated power consumption AC: Rated power consumption DC:

#### **Control circuit**

resistance PTC, Ih=0,5 A Protection against short circuits: Operating time of PTC: intervention > 100 ms, reset > 3 s Max input resistance: ≤200 Ω Current for each input: 10 mA Min. period of start impulse t<sub>MIN</sub>: 150 ms 120 ms Operating time t<sub>4</sub>: Releasing time t<sub>B1</sub> < 10 ms Releasing time in absence of power supply t<sub>p</sub>: 80 ms Simultaneity time t<sub>c</sub>: 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 60947-1, EN 62061, EN 13849-1, UL 508, CSA C22.2 n° 14-95

#### **Output circuit**

	0.000
Jutput 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 Ith:	6 A
Max currents sum $\Sigma$ lth <sup>2</sup> :	36
Contacts resistance:	≤ 100 mΩ
Contact protection fuse:	6 A
he number and the load capacity of output contacts c	an be increased by using expansion modules or
contactors See page 4/169 - 4/176	

#### **Code structure**

# **CS AR-51V024**

US

#### Kind of connection

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



024 24 Vac/dc ±15%

#### Data type approved by UL

Rated operating voltage (Un): Rated power consumption AC Rated power consumption DC: Max switching voltage: Max switching current per contact: Utilization category

24 Vac/dc; 50...60 Hz < 5 VA < 2 W 230 Vac 6 A C300

Voles. - 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





**1**A

**1**B

2

**2A** 

**2B** 

**2C** 

**2D** 

**2E** 

3

**3A** 

**3B** 

**3C** 

4

**4**A

**4B** 

**4C** 

**4D** 

**4E** 

4F

## Safety module CS AR-51

#### **Terminals layout**



#### PE terminal connection

The PE terminal has to be connected to the equipotential circuit of machine protection if it is necessary.

This connection is made for functional reason, to reduce effects of an insulation fault on the machine operation. In particular, faults towards ground on

control circuits must not cause an unwanted starting, either dangerous movements or obstruct the machine stop

#### "EXT. FAULT" LED function

When a pressure is exerted on surfaces of a bumper or a safety mat or a bumper, we obtain a short-circuit between the two conductive elements which form the device and are connected to the entry channels of the safety module.

The produced signal cause the LED EXT.FAULT lighting to signal the short-circuit between channels and the output contacts opening, which produce the block of the control circuit and the safety setting of the machine. The EXT.FAULT LED does not activate in the case of wires or internal connection interruption of safety mat or bumper.





#### Inputs configuration



Emergency stop

Input configuration with manual start







#### **Operation diagrams**

Configuration with automatic start



Configuration with monitored start



Configuration with manual start



Releasing time t<sub>R1</sub>: t<sub>c</sub>: Releasing time in absence of power supply



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 add the connection between S34 and S37 terminals.



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#### Gate monitoring

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



**4G** 4H 5



Module for emergency stop and gate monitoring with delayed contacts at the opening of the input channels

#### **Main functions**

- Single or dual channel input circuit
- Choice between automatic start, manual start or monitored start
- Connection of the input channels to opposite potentials
- Connectible to ESPE, to electromechanical contacts or to magnetic safety sensor
- 45 mm housing
- 2 NO safety instantaneous contacts, 1 NC auxiliary instantaneous contact,
- 2 NO safety delayed contacts.
- Supply voltages:
- 24 Vac/dc, 120 Vac, 230 Vac

#### **Utilization categories**

Alternate current: AC15 (50...60 Hz) Ue (V) 230 le (À) 3 Direct current: DC13 (6 operations/minute) Ue (V) 24 le (A) 6

Markings, quality marks and certificates:

CE

US E131787

Approval UL:

Complying with the requirements requested by: Low Voltage Directive 2006/95/EC, Machinery Directive 2006/42/EC, Electromagnetic Compatibility 2004/108/EC

# **Technical data**

<b>Housing</b> Made of polyamide PA 6.6 self-extinguishing, cl Protection degree: Dimensions:	ass V0 (UL94) IP40 (housing), IP20 (terminals) see page 4/178, shape C
<b>General data</b> SIL level (SIL CL): Performance Level (PL): Safety category:	up to SIL 3 according to EN IEC 62061 up to PL e according to EN ISO 13849-1 up to category 4 (instantaneous contacts) category 3 (delayed contacts) according to EN 954-1
Safety parameters: Ambient temperature: Mechanical endurance: Electrical endurance: Pollution degree: Rated impulse with stand voltage (Uimp): Rated insulation voltage (Ui): Over-voltage category: Weight:	see page 6/32 -25°C+55°C >10 millions of operations >100.000 operations outside 3, inside 2 4 KV 250 V II 0,5 Kg
Power supply Rated operating voltage (Un):	24 Vac/dc; 5060 Hz 120 Vac; 5060 Hz 230 Vac; 5060 Hz
Max residual ripple in DC: Supply voltage tolerance: Rated power consumption AC: Rated power consumption DC:	10% ±15% of Un < 10 VA < 5 W
Control circuitProtection against short circuits:Operating time of PTC:Max input resistance:Current for each input:Min. period of start impulse $t_{MIN}$ :Operating time $t_A$ :Releasing time $t_{R1}$ :Releasing time in absence of power supply $t_R$ :Releasing time delayed contacts $t_{R2}$ :Simultaneity time $t_c$ :	resistance PTC, Ih=0,5 A intervention > 100 ms, reset > 3 s $\leq$ 50 $\Omega$ 30 mA 200 ms 150 ms 20 ms 150 ms see "CODE STRUCTURE" infinite
n conformity with standards: EC 60947-1, EN 60947-1, IEC 60204-1, EN 6020 EN ISO 12100-1, EN ISO 12100-2, EN ISO 138 EN 61000-6-3, EN 62326-1, EN 60664-1, EN 60 CSA C22.2 nº 14-95	04-1, EN ISO 13849-1, EN 999, EN 1037, 50, IEC 529, EN 60529, EN 61000-6-2, 947-1, EN 62061, EN 13849-1, UL 508,

Output circuit Output contacts:

Contacts type: Contacts material: Max switching voltage: Max switching current per contact: Conventional free air thermal current Ith: Max currents sum  $\Sigma$  lth<sup>2</sup>: Contacts resistance: Contact protection fuse:

2 NO safety instantaneous contacts, 1 NC auxiliary instantaneous contact, 2 NO safety delayed contacts. forced guided contacts silver alloy, gold plated 230/240 Vac; 300 Vdc 6 A 6 A 72 (instantaneous cont.), 36 (delayed cont.) ≤ 100 mΩ 6 A

The number and the load capacity of output contacts can be increased by using expansion modules or contactors See page 4/169 - 4/176

# **Code structure**

# CS AT-00V024-1

Sup

024

120

230

### Releasing time delayed contacts (t<sub>R2</sub>)

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

## Kind of connection

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

	Releasing time delayed cont			
	TF0.5	fixed 0,5 s		
	TF1	fixed 1 s		
	TF3	fixed 3 s		
ply voltage				
24	Vac/dc	±15%		
120	Vac	±15%		
230 \/ac		+15%		

#### Data type approved by UL

Rated operating voltage (Un):	24 Vac/dc; 5060 Hz 120 Vac; 5060 Hz 230 Vac; 5060 Hz
Rated power consumption AC: Rated power consumption DC: Max switching voltage: Max switching current per contact: Utilization category	< 10 VA < 5 W 230 Vac 6 A 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. - Surrounding air of 55 °C.



**1**A

**1B** 

2

**2**A

**2B** 

**2C** 

**2D** 

**2E** 

3

**3**A

**3B** 

**3C** 

4

**4**A

**4B** 

**4C** 

**4D** 

**4E** 

4F

**4G** 

**4H** 

# Safety module CS AT-0

#### **Terminals layout**



#### Internal wiring diagram



#### Inputs configuration







2 channels

Configuration with automatic start	
$\begin{array}{c} \hline \\ \hline $	A1/A2 S11/S12 S21/S22 13/14, 23/24 31/32 47/48, 57/58 t <sub>R</sub>
Configuration with monitored start	
	A1/A2 S11/S12 S21/S22 S33/S34 (START) 13/14,23/24 31/32 47/48, 57/58 t <sub>R</sub>
Configuration with manual start	
	A1/A2 S11/S12 S21/S22 S33/S34 (START) 13/14,23/24 31/32 47/48,57/58

Legend:  $\substack{t_{\text{MIN}}: \\ \text{Min. period of start impulse} \\ t_c: \\ \text{Simultaneity time} }$ 

**Operation diagrams** 

Operating time Releasing time t<sub>R1</sub>:

Releasing time in absence of t<sub>R</sub>: power supply t<sub>R2</sub>

S33

S34

E-

S33

S34

Adjustable releasing time delayed contacts (see "Code structure")

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  $t_{R1}$  and  $t_{R2}$  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.

#### 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 with the sensors contacts.



5 6



Module for emergency stop and gate monitoring with delayed contacts at the opening of the input channels

#### Main functions

- Single or dual channel input circuit
- Choice between automatic start, manual start or monitored start
- Connection of the input channels to opposite potentials
- Connectible to ESPE, to electromechanical contacts or to magnetic safety sensor
- 45 mm housing
- 3 NO safety instantaneous contacts,
- 2 NO safety delayed contacts. · Supply voltages:
- 24 Vac/dc, 120 Vac, 230 Vac

#### Utilization categories

Alternate current: AC15 (50...60 Hz) Ue (V) 230 le (À) 3 Direct current: DC13 (6 operations/minute) Ue (V) 24 le (A) 6

Markings, quality marks and certificates:

 $(\epsilon)$ Approval UL:

115 E131787

Complying with the requirements requested by: Low Voltage Directive 2006/95/EC,

Machinery Directive 2006/42/EC, Electromagnetic Compatibility 2004/108/EC

# **Technical data**

Protection degree: Dimensions:	IP40 (housing), IP20 (terminals) see page 4/178, shape C
General data	up to SIL 3 according to EN IEC 62061
Performance Level (PL): Safety category:	up to PL e according to EN ISO 13849-1 up to category 4 (instantaneous contacts) category 3 (delayed contacts)
Safety parameters: Ambient temperature: Mechanical andurance:	according to EN 954-1 see page 6/32 -25°C+55°C
Electrical endurance: Pollution degree: Rated impulse with stand voltage. (Uimp):	>100.000 operations outside 3, inside 2 4 KV
Rated insulation voltage (Ui): Over-voltage category: Weight:	250 V II 0.5 Kg
Power supply	
Rated operating voltage (Un):	24 Vac/dc; 5060 Hz 120 Vac; 5060 Hz 230 Vac: 5060 Hz
Max residual ripple in DC:	10%
Supply voltage tolerance:	±15% of Un
Rated power consumption AC: Rated power consumption DC:	< 10 VA < 5 W
Control circuit	
Protection against short circuits: Operating time of PTC: Max input resistance: Current for each input:	resistance PTC, Ih=0,5 A intervention > 100 ms, reset > 3 s $\leq$ 50 $\Omega$ 30 mA
Min. period of start impulse t <sub>MIN</sub> :	200 ms
Operating time t <sub>A</sub> :	150 ms
Releasing time t <sub>R1</sub> :	20 ms
Releasing time in absence of power supply $t_{R}$ : Releasing time delayed contacts $t_{R2}$ : Simultaneity time $t_{c}$ :	150 ms see "CODE STRUCTURE" infinite

EN 61000-6-3, EN 62326-1, EN 60664-1, EN 60947-1, EN 62061, EN 13849-1, UL 508, CSA C22.2 n° 14-95

#### **Output circuit** Output contacts:

Contacts type: Contacts material: Max switching voltage: Max switching current per contact: 6 A Conventional free air thermal current Ith: 6 A Max currents sum  $\Sigma$  lth<sup>2</sup>: Contacts resistance: ≤ 100 mΩ Contact protection fuse: 6 A The number and the load capacity of output contacts can be increased by using expansion modules or contactors See page 4/169 - 4/176

3 NO safety instantaneous contacts, 2 NO safety delayed contacts. forced guided contacts silver alloy, gold plated 230/240 Vac; 300 Vdc 72 (instantaneous cont.), 36 (delayed cont.)

**Code structure** 

# CS AT-10V024-1

### Releasing time delayed contacts (t<sub>R2</sub>)

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

# Kind of connection

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

	Releasi	ontacts (t <sub>R2</sub>	
	TF0.5	fixed 0,5 s	
	TF1	fixed 1 s	
	TF3	fixed 3 s	
Supply voltage			
024	24 Vac/dc	±15%	
120	120 Vac	<b>±</b> 15%	
230	230 Vac	±15%	

#### Data type approved by UL

Rated operating voltage (Un):
Rated power consumption AC: Rated power consumption DC: Max switching voltage: Max switching current per contac Utilization category
INOIC.

24 Vac/dc; 50...60 Hz 120 Vac; 50...60 Hz 230 Vac; 50...60 Hz < 10 VA < 5W230 Vac 6A C300

Note: - Use 60° or 75 °C copper (Cu) conductor and wire size No. 30-12 AWG. - Terminal tightening torque of 5-7 Lb In. - Only for 24 Vac/dc version, supply from remote class 2 source or limited voltage and limited energy. - Surrounding air of 55 °C.



**1**A

**1**B

2

**2**A

**2B** 

**2C** 

**2D** 

**2E** 

3

**3A** 

**3B** 

**3C** 

4

**4**A

**4B** 

**4C** 

**4D** 

**4E** 

4F

**4G** 

**4H** 

# Safety module CS AT-1

#### **Terminals layout**



#### Internal wiring diagram



#### Inputs configuration



Input configuration with manual start





2 channels

Operation diagrams
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
Configuration with monitored start
A1/A2 S11/S12 S21/S22 S33/S34 (START) 13/14, 23/54 (START) 13/14, 23/54

Configuration with manual start

t,



t<sub>R1</sub> t<sub>R2</sub> t<sub>MIN</sub> t<sub>A</sub>

t, t<sub>R1</sub> t<sub>R2</sub>

Legend:  $\substack{t_{\text{MIN}}: \\ \text{Min. period of start impulse} \\ t_c: \\ \text{Simultaneity time} }$ Operating time

Releasing time t<sub>R1</sub>:

Releasing time in absence of t<sub>R</sub>: power supply t<sub>R2</sub>

S33

E-

S33

t<sub>R</sub>

Adjustable releasing time delayed contacts (see "Code structure")

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  $t_{R1}$  and  $t_{R2}$  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.

#### 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 with the sensors contacts.



5 6



Module for emergency stop and gate monitoring and magnetic safety sensor with delayed contacts at the opening of the input channels

#### Main functions

- Single or dual channel input circuit • Choice between automatic start, manual start or monitored start
- Connectible to electromechanical contacts or to magnetic safety sensor
- 22,5 mm housing
- 2 NO safety instantaneous contacts,
- 1 NO safety delayed contact.
- · Supply voltages:
- 24 Vac/dc

#### Utilization categories

Alternate current: AC15 (50...60 Hz) Ue (V) 230 le (A) 3 Direct current: DC13 (6 operations/minute) Ue (V) 24 le (A)

### Markings, quality marks and certificates:

Approval UL:

E131787

Complying with the requirements requested by: Low Voltage Directive 2006/95/EC, Machinery Directive 2006/42/EC,

Electromagnetic Compatibility 2004/108/EC

# **Technical data**

#### Housing

Made of polyamide PA 6.6 self-extinguishing, class V0 (UL94) IP40 (housing), IP20 (terminals) Protection degree: Dimensions: see page 4/178, shape A

#### **General data**

SIL level (SIL CL): Performance Level (PL): Safety category:

Safety parameters: Ambient temperature: Mechanical endurance: Electrical endurance: Pollution degree: Rated impulse with stand voltage (Uimp): Rated insulation voltage (Ui): Over-voltage category: Weight:

#### **Power supply**

Rated operating voltage (Un): Max residual ripple in DC: Supply voltage tolerance: Rated power consumption AC: Rated power consumption DC:

#### **Control circuit**

Protection against short circuits: Operating time of PTC: Max input resistance: Current for each input: Min. period of start impulse t<sub>MIN</sub>: Operating time t<sub>4</sub>: 70 ms Releasing time t<sub>B1</sub> Releasing time in absence of power supply t<sub>p</sub>: Releasing time delayed contacts  $t_{R2}$ : Simultaneity time t

# ±15% of Un < 10 VA < 5 Wresistance PTC, Ih=0,5 A intervention > 100 ms, reset > 3 s ≤ 50 Ω 30 mA 100 ms

up to SIL 3 according to EN IEC 62061

up to PL e according to EN ISO 13849-1

up to category 4 (instantaneous contacts)

category 3 (delayed contacts) according to EN 954-1 see page 6/32

-25°C...+55°C >10 millions of operations

>100.000 operations

24 Vac/dc; 50...60 Hz

outside 3, inside 2

4 KV 250 V

0,3 Kg

10%

Ш

15 ms 100 ms see "Code structure" 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 60947-1, EN 62061, EN 13849-1, UL 508, CSA C22.2 n° 14-95

#### **Output circuit**

Output contacts:

Contacts type: Contacts material: Max switching voltage: Max switching current per contact: 6 A Conventional free air thermal current Ith: 6 A Contacts resistance: ≤ 100 mΩ Contact protection fuse: 6 A contactors See page 4/169 - 4/176

2 NO safety instantaneous contacts, 1 NO safety delayed contact. forced guided contacts silver alloy, gold plated 230/240 Vac; 300 Vdc

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

# **Code structure** CS AT-20V024-TF1

#### Releasing time delayed contacts $(t_{po})$

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

### Kind of connection

#### V screw terminals

- M connector with screw terminals
- Х connector with spring terminals

Releasing time delayed contacts (t<sub>R2</sub>) **TF0.5** fixed 0.5 s TF1 fixed 1 s **TF3** fixed 3 s ....

## Supply voltage

024 24 Vac/dc ±15%

#### Data type approved by UL

Rated operating voltage (Un): Rated power consumption AC Rated power consumption DC Max switching voltage: Max switching current per contact: Utilization category

24 Vac/dc; 50...60 Hz < 10 VA < 5 W 230 Vac 6 A 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. - Surrounding air of 55 °C.



Ç.

1

**1**A

**1B** 

2

**2A** 

**2B** 

**2C** 

**2D** 

**2E** 

3

**3**A

**3B** 

**3C** 

4

**4**A

**4B** 

**4C** 

**4D** 

**4E** 

4F

**4G** 

**4H** 

5

6

# Safety module CS AT-2

**Terminals layout** 



#### Internal wiring diagram



Opera	tion diagrams		
Configu	ration with automa	tic start	
	t <sub>R1</sub> t <sub>R2</sub> t <sub>c</sub> t <sub>A</sub>		A1/A2 S11/512 S21/522 13/14,23/24 37/38 t <sub>R</sub>
Configu	ration with monito	red start	
		t <sub>R1</sub> t <sub>R2</sub> t <sub>MIN</sub> t <sub>A</sub>	A1/A2 S11/S12 S21/S22 S33/S34 13/14, 23/24 37/38 t <sub>R</sub>
Configu	ration with manual	start	
			A1/A2 S11/S12 S21/S22 S33/S34 13/14, 23/24 37/38 t <sub>R</sub>
Legend: t <sub>MIN</sub> : Min. t <sub>c</sub> : Simu t <sub>A</sub> : Oper t <sub>R1</sub> : Relea	period of start impuls Itaneity time ating time asing time	e t <sub>R</sub> : t <sub>R2</sub> :	Releasing time in absence of yower supply Adjustable releasing time delaye yontacts (see "Code structure")

The configurations with one channel are obtained taking into consideration only the S11/S12 input. In this case it is necessary to consider the  $t_{p_1}$  and  $t_{p_2}$  times referred to S11/S12 input, the  $t_p$  time referred to the supply, the  $t_q$  time referred to S11/S12 input and to the start, and the  $t_{MIN}$  time referred to the start.

contacts

switches contacts or with the sensors contacts.

with

stop

S22 S35

#### Inputs configuration Emergency stop Input configuration with manual start 1 channel 2 channels L/+0 L/+( ŀ A1 A1 S11 S1 CS AT-2 CS AT-2 S22 S21 A2 ſ δN/ 6N/-The diagram does not show the exact position of clamps in the product Monitored start Gate monitoring and safety magnetic sensors. Automatic start As regards the indicated As regards the indicated The safety module can to S21 S21 S33 S33 diagrams, in order to diagrams, in order control both emergency activate the module with activate the module with gate stop circuits, the automatic start, it is the monitored start, it is monitoring circuits or necessary to short the E necessary to remove the safety magnetic sensors. start button between S33 connection between S22 Replace the emergency

S22 S35

and S35 terminals.

# ₽v7 → [Φ--7

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

and S34 terminals.

🔹 🕩 pizzato 🕬 🕬 🖉 🖉 🔶 🔶 pizzato 🕬 🖗

S34

S34



#### Safety timer module with delayed contacts at energizing

#### Main functions

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

#### **Utilization categories**

Alternate current: AC15 (50...60 Hz) Ue (V) 230 le (A) 3 Direct current: DC13 (6 operations/minute) Ue (V) 24 le (A) 6

#### Markings, quality marks and certificates:

CE

Approval UL: E131787

#### Complying with the requirements requested by: Low Voltage Directive 2006/95/EC, Machinery Directive 2006/42/EC,

Electromagnetic Compatibility 2004/108/EC

# **Technical data**

#### н

Housing Made of polyamide PA 6.6 self-extinguishing, Protection degree: Dimensions:	class V0 (UL94) IP40 (housing), IP20 (terminals) see page 4/177, 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:	up to category 4 according to EN 954-1 (dependent from the circuit structure)
Safety parameters:	see page 6/32
Ambient temperature:	-25°C+55°C
Mechanical endurance:	>10 millions of operations
Electrical endurance:	>100.000 operations
Pollution degree:	outside 3, inside 2
Rated impulse with stand voltage (Uimp):	4 KV
Rated insulation voltage (Ui):	250 V
Over-voltage category:	
Weight:	0,2 Kg
Power supply	
Rated operating voltage (Un):	24 Vac/dc; 5060 Hz 120 Vac; 5060 Hz 230 Vac: 5060 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: Operating time of PTC: Operating time t<sub>A</sub>: Releasing time in absence of power supply t<sub>B</sub>:

resistance PTC, Ih=0,5 A intervention > 100 ms, reset > 3 s see "Code structure" 40 ms

#### 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 60947-1, EN 62061, EN 13849-1, UL 508, CSA C22.2 n° 14-95

#### **Output circuit** Output contacts: 1 NO safety contact, 2 NC auxiliary contacts, Contacts type: forced guided contacts Contacts material: silver allov Max switching voltage: 230/240 Vac; 300 Vdc Max switching current per contact: 6 A Conventional free air thermal current Ith: 6 A Contacts resistance: ≤ 100 mΩ Contact protection fuse: 6 A The number and the load capacity of output contacts can be increased by using expansion modules or contactors See page 4/169 - 4/176

#### **Code structure**

# CS FS-01V024-1

US

# Operating time t

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

## Kind of connection

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

	Operating time t <sub>A</sub>		
	TF0.5	fixed 0,5 s	
	TF1	fixed 1 s	
	TF3	fixed 3 s	
	<b>TF10</b>	fixed 10 s	
Supply voltage			
024	24 Vac/dc	±15%	
120	120 Vac	±15%	
230	230 Vac	±15%	

#### Data type approved by UL

Rated operating voltage (Un):	24 Vac/dc; 5060 Hz
	120 Vac; 5060 Hz
	230 Vac; 5060 Hz
Rated power consumption AC:	< 5 VA
Rated power consumption DC:	< 2 W
Max switching voltage:	230 Vac
Max switching current per contact:	6 A
Utilization category	C300
Note:	
- Use 60° or 75 °C copper (Cu) conductor and	d wire size No. 30-12 AWG
- remninal lightening lorgue of 5-7 LD IN.	

Only for 24 Vac/dc version, supply from remote class 2 source or limited voltage and limited energy. - Surrounding air of 55 °C.





**3**A

**3B** 

**3C** 

4

**4**A

# Safety module CS FS-0

# **Terminals layout**



Operations diagram	1
A1/02	1 <b>A</b>
	1B
	2
Legend:	2A
$\mathbf{t}_{\mathbf{k}}$ : Adjustable operating time (see Code structure ) $\mathbf{t}_{\mathbf{k}}$ : Releasing time in absence of power supply	2B
	2C
	2D
	<b>2E</b>
	3

# Internal wiring diagram



#### **Circuit structure**





The diagram shown displays the operation principle of a typical circuit for the control of a door-lock system with door blocking when interlock safety switch is not energized, and manual release of the single doors.

In order to obtain the complete wiring diagram with different modalities of electrical blocking or with automatic door release, please contact our technical office.

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



Safety timer module with delayed contacts at energizing

#### Main functions

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

#### **Utilization categories**

Alternate current: AC15 (50...60 Hz) Ue (V) 230 Ie (A) 3 Direct current: DC13 (6 operations/minute) Ue (V) 24 Ie (A) 6

#### Markings, quality marks and certificates:

CE

**E**131787

Approval UL:

**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 4/178 shape C

#### General data

SIL level (SIL CL): Performance Level (PL): Safety category: Safety parameters: Ambient temperature: Mechanical endurance: Electrical endurance: Pollution degree: Rated impulse with stand voltage (Uimp): Rated insulation voltage (Ui): Over-voltage category: Weight:

#### Power supply

Rated operating voltage (Un):

Max residual ripple in DC: Supply voltage tolerance: Rated power consumption AC: Rated power consumption DC:

#### **Control circuit**

Protection against short circuits: Operating time of PTC: Operating time  $t_A$ : Releasing time in absence of power supply  $t_R$ :

## \_\_\_\_\_

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 60947-1, EN 62061, EN 13849-1, UL 508, CSA C22.2 n° 14-95

#### **Output circuit**

Output contacts:

Contacts type: Contacts material: Max switching voltage: Max switching current per contact: Conventional free air thermal current lth: Max currents sum  $\Sigma$  lth<sup>2</sup>: Contacts resistance: Contact protection fuse: Error signalling output (Y14): Rated operational voltage (Ue): Rated operational current (le): The number and the load capacity of output contacts can contactors. See page 4/169 - 4/176 1 NO safety contact, 1 NC auxiliary contact, 1 CO auxiliary contact, forced guided contacts silver alloy 230/240 Vac; 300 Vdc 6 A 36  $\leq$  100 m $\Omega$ 6 A Type PNP 24 VDC 10 mA

up to SIL 2 according to EN IEC 62061

up to PL d according to EN ISO 13849-1

up to category 3 according to EN 954-1

see page 6/32

-25°C...+55°C

4 KV 250 V

0,2 Kg

10%

< 5 VA

< 2 W

40 ms

Ш

>10 millions of operations

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

resistance PTC, Ih=0,5 A

see "Code structure"

intervention > 100 ms, reset > 3 s

>100.000 operations

outside 3, inside 2

24 Vdc (A1-A2)

±15% of Un

The number and the load capacity of output contacts can be increased by using expansion modules or contactors. See page 4/169 - 4/176

Data type approved by UL

Rated operating voltage (Un):

Rated power consumption AC:

#### Code structure

# CS FS-20VU24-TFxx

## Operating time t<sub>A</sub>

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

# Kind of connection

V screw terminals

- M connector with screw terminals
- **X** connector with spring terminals

TFxx xx s (fixed time)
Supply voltage

±15%

**±**15%

U24 24 Vdc

120 120 Vac

Operating time t<sub>A</sub>

#### Rated power consumption DC: Max switching voltage: Max switching current per contact: Utilization category Note:

Note: - Use 60° or 75 °C copper (Cu) conductor and wire size No. 30-12 AWG. - Terminal tightening torque of 5-7 Lb In. - Only for 24 Vac/dc version, supply from remote class 2 source or limited voltage and limited energy. - Surrounding air of 55 °C.



24 Vdc<sup>-</sup>

< 5 VA

< 2 W

230 Vac

6 A

C300

120 Vac; 50...60 Hz



# Safety module CS FS-2

### **Terminals layout**



Opera S FS-2•	•••• Delay	<b>gram</b> / on				
lormal o	peration wi	ithout faults			41/42 - R1/R2	
				<b></b>	17/18	
					35/36	
				1	35/38	
Logondi	μ τ <sub>A</sub>		ι τ <sub>я</sub>			
t <sub>A</sub> : Ad t <sub>R</sub> : Re	justable oper leasing time i	ating time (se in absence of	e "Code stru power supp	icture") y		

### Internal wiring diagram



**4D** 

**4E** 

4F

**4G** 

4H

5

6



Safety timer module with ON pulse function

#### Main functions

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

#### **Utilization categories**

Alternate current: AC15 (50...60 Hz) Ue (V) 230 le (A) 3 Direct current: DC13 (6 operations/minute) Ue (V) 24 le (A) 6

#### Markings, quality marks and certificates:

CE

E131787

Approval UL:

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 4/178 shape C

up to SIL 2 according to EN IEC 62061

up to PL d according to EN ISO 13849-1

up to category 3 according to EN 954-1

see page 6/32

-25°C...+55°C

4 KV

250 V

0,2 Kg

10%

< 5 VA

< 2 W

40 ms

200 ms

24 Vdc (A1-A2)

±15% of Un

Ш

outside 3, inside 2

>10 millions of operations >100.000 operations

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

resistance PTC, Ih=0,5 A

see "Code structure"

1 NO safety contact,

1 NC auxiliary contact,

intervention > 100 ms, reset > 3 s

#### General data

SIL level (SIL CL): Performance Level (PL): Safety category: Safety parameters: Ambient temperature: Mechanical endurance: Electrical endurance: Pollution degree: Rated impulse with stand voltage (Uimp): Rated insulation voltage (Ui): Over-voltage category: Weight:

#### Power supply

Rated operating voltage (Un):

Max residual ripple in DC: Supply voltage tolerance: Rated power consumption AC: Rated power consumption DC:

#### **Control circuit**

Protection against short circuits: Operating time of PTC: Operating time t<sub>4</sub>: Releasing time in absence of power supply t<sub>B</sub>: Start-up time t<sub>s</sub>:

#### 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 60947-1, EN 62061, EN 13849-1, UL 508, CSA C22.2 n° 14-95

#### **Output circuit**

Output contacts:

Operating time t,

±15%

 $\pm 15\%$ 

**U24** 24 Vdc

120 120 Vac

1 CO auxiliary contact, forced guided contacts Contacts type: Contacts material: silver alloy Max switching voltage: 230/240 Vac; 300 Vdc Max switching current per contact: 6 A Conventional free air thermal current Ith: 6 A Max currents sum  $\Sigma$  lth<sup>2</sup>: 36 Contacts resistance: ≤ 100 mΩ Contact protection fuse 6 A Type PNP Error signalling output (Y14): Rated operational voltage (Ue): 24 VDC Rated operational current (le): 10 mA The number and the load capacity of output contacts can be increased by using expansion modules or contactors. See page 4/169 - 4/176

#### **Code structure**

# CS FS-30VU24-TFxx

# Operating time t,

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

### Kind of connection

- V screw terminals
- M connector with screw terminals
- Х connector with spring terminals

	Data type approved t
<b>TFxx</b> xx s (fixed time)	Rated operating voltage (Un):
	Rated power consumption AC: Rated power consumption DC Max switching voltage: Max switching current per con Utilization category
Supply voltage	

## Data type approved by UL

ntact.

Note: - Use 60° or 75 °C copper (Cu) conductor and wire size No. 30-12 AWG. - Terminal tightening torque of 5-7 Lb In. - Only for 24 Vac/dc version, supply from remote class 2 source or limited voltage and limited energy. - Surrounding air of 55 °C.



24 Vdc

< 5 VA

< 2 W

230 Vac

6 A

C300

120 Vac; 50...60 Hz





**3C** 

4

**4**A

**4B** 

**4C** 

**4D** 

**4E** 

4F

**4G** 

4H

5

6

# Safety module CS FS-3

## **Terminals layout**



<u>a</u>@@@

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🕑 pizzato 😒

O PWR O OUT FAULT DELAY: xx sec

<u>@@@@</u>

## Internal wiring diagram



Operations	diagram			
CS FS-3••••• [ Normal operatic	Delay off on without fault	S		1
		L 	<u>A1/A2 - B1/B2</u> 17/18	1
		-	35/36	
Operation withc	t <sub>A</sub>			2
			A1/A2 - B1/B2	2
			17/18 25/26	2
	<b>t</b>	• •	35/36	2
Legend:	*A1	<b>'</b> R <b> </b>		2
t <sub>A1</sub> : Operating t <sub>R</sub> : Releasing t <sub>s</sub> : Start-up tir	time if power sup time in absence one	opply is minor to $t_A$ of power supply		
				00
				00

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

#### Main functions

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

#### **Utilization categories**

Alternate current: AC15 (50...60 Hz) Ue (V) 230 le (A) 3 Direct current: DC13 (6 operations/minute) Ue (V) 24 le (A) 6

#### Markings, quality marks and certificates:

CE

US E131787

Approval UL:

Complying with the requirements requested by: Low Voltage Directive 2006/95/EC, Machinery Directive 2006/42/EC, Electromagnetic Compatibility 2004/108/EC

# **Technical data**

#### ŀ

Housing Made of polyamide PA 6.6 self-extinguishing, c	ass V0 (UL94)
Protection degree: Dimensions:	IP40 (housing), IP20 (terminals) see page 4/178 shape C
General data	
SIL level (SIL CL):	up to SIL 2 according to EN IEC 62061
Performance Level (PL):	up to PL d according to EN ISO 13849-1
Safety category:	up to category 3 according to EN 954-1
Safety parameters:	see page 6/32
Ambient temperature:	-25°C+55°C
	> 10 millions of operations
Pollution degree:	> 100.000 operations
Pollution degree.	
Bated insulation voltage (Lii):	250 V
Over-voltage category:	
Weight:	0,2 Kg
Power supply	
Rated operating voltage (Un):	24 Vdc (A1-A2)
	120 Vac; 5060 Hz (B1-B2)
Max residual ripple in DC:	10%
Supply voltage tolerance:	±15% of Un
Rated power consumption AC:	< 5 VA
Rated power consumption DC:	< 2 W
Control circuit	
Protection against short circuits:	resistance PIC, Ih=0,5 A
Operating time of PTC:	intervention $> 100$ ms, reset $> 3$ s
Operating time t <sub>A</sub> :	see "Code structure"
Releasing time in absence of power supply t <sub>R</sub> :	40 ms
Input circuit	4 50 0
IVIAX Input resistance:	$\leq 50 \Omega$
Stort up time t :	0 IIIA 40 ma
Minimum endurance of input signal t <sub>MIN</sub> :	50 ms

#### 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 60947-1, EN 62061, EN 13849-1, UL 508, CSA C22.2 n° 14-95

1 NO safety contact,

1 NC auxiliary contact,

#### **Output circuit**

Output contacts:

Operating time t.

**±**15%

120 120 Vac

	I CO auxiliary contact,
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 Ith:	6 A
Max currents sum $\Sigma$ lth <sup>2</sup> :	36
Contacts resistance:	≤ 100 m <b>Ω</b>
Contact protection fuse:	6 A
Error signalling output (Y14):	Type PNP
Rated operational voltage (Ue):	24 VDC
Rated operational current (le):	10 mA
The number and the load capacity of output contacts c	an be increased by using expansio

modules or contactors. See page 4/169 - 4/176

on

# **Code structure**

# CS FS-50VU24-TFxx

#### Operating time t<sub>4</sub>

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

# Kind of connection

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

Operating time t <sub>A</sub>			Data type approved by UI		
	TFxx	xx s (fixed tim	e)	Rated operating voltage (Un):	2
				Rated power consumption AC: Rated power consumption DC: Max switching voltage: Max switching current per contact:	
Sup	ply voltage	9		Utilization category	(
U24	24 Vdc	+15%		Note:	

Note: - Use 60° or 75 °C copper (Cu) conductor and wire size No. 30-12 AWG. - Terminal tightening torque of 5-7 Lb In. - Only for 24 Vac/dc version, supply from remote class 2 source or limited voltage and limited energy. - Surrounding air of 55 °C.



24 Vdc;

< 5 VA

< 2 W

230 Vac 6 A

C300

120 Vac; 50...60 Hz



**1A** 

**1B** 

2

**2A** 

2**B** 

**2C** 

**2D** 

**2E** 

3

**3A** 

3**B** 

**3C** 

4

**4**A

A1/A2 - B1/B2

safety output

# Safety module CS FS-5

### **Terminals layout**



#### Internal wiring diagram



 Configuration with automatic start	
	A1/A2 - B1/B2 activation conditions safety output
Configuration with manual start	A1/A2 - B1/B2 activation conditions start safety output

**Operations diagram** 

#### Inputs configuration

iputo configuration			
	Ga	ate monitoring	<b>4B</b>
1 c	channel	2 channels	4 <b>C</b>
o.t.	7 ON		4D
	2-552-627 <sub>E</sub>		<b>4E</b>
CS FS-5	S34A2		4F
	6.		4G
Automatic start			4H
As regards the indicated diagrams, in order to activate the module with	S11		5
necessary to short the E- start button between S33 and S34 terminals.	► 		6



Bimanual control device according to EN 574 type III C or safety module with synchronism control

#### Main functions

- Input circuit with 2 channels for bimanual control device or safety gate
- Connection of the input channels to opposite potentials
- 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 le (A) 3 Direct current: DC13 (6 operations/minute) Ue (V) 24 le (A) 6

#### Markings, quality marks and certificates:



#### 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, cl Protection degree: Dimensions:	ass V0 (UL94) IP40 (housing), IP20 (terminals) see page 4/177, shape A		
General data SIL level (SIL CL): Performance Level (PL): Safety category: Device type for bimanual control: Safety parameters: Ambient temperature: Mechanical endurance: Electrical endurance: Pollution degree: Rated impulse with stand voltage (Uimp): Rated insulation voltage (Ui): Over-voltage category: Weight:	up to SIL 3 according to EN IEC 62061 up to PL e according to EN ISO 13849-1 up to category 4 according to EN 954-1 EN 574: type III C see page 6/32 -25°C+55°C >10 millions of operations >100.000 operations outside 3, inside 2 4 KV 250 V II 0,3 Kg		
<b>Power supply</b> Rated operating voltage (Un):	24 Vac/dc; 5060 Hz 120 Vac; 5060 Hz 230 Vac; 5060 Hz		
Max residual ripple in DC: Supply voltage tolerance: Rated power consumption AC: Rated power consumption DC:	10% ±15% of Un < 5 VA < 2 W		
Control circuit         Protection against short circuits:         Operating time of PTC:         Max input resistance:         Current for each input:         Operating time $t_A$ :         Releasing time $t_B$ :         Releasing time time basence of power supply times	resistance PTC, lh=0,5 A intervention > 100 ms, reset > 3 s $\leq$ 50 $\Omega$ 30 mA 50 ms 20 ms 70 ms		

#### In conformity with standards:

Time range for synchronized control t<sub>s</sub>:

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 60947-1, EN 62061, EN 13849-1, UL 508, CSA C22.2 n° 14-95

< 0,5 s

#### **Output circuit**

Dutput 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 Ith:	6 A
Contacts resistance:	≤ 100 mΩ
Contact protection fuse:	6 A
he number and the load capacity of output contacts ca contactors See page 4/169 - 4/176	an be increased by using expansion modules or

#### **Code structure**

# CS DM-01V024

#### Kind of connection

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

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

## Items available on stock

#### CS DM-01V024

#### Data type approved by UL

Rated operating voltage (Un):

Rated power consumption AC:	
Rated power consumption DC:	
Max switching voltage:	
Max switching current per conta	c
Utilization category	

24 Vac/dc; 50...60 Hz 120 Vac; 50...60 Hz 230 Vac; 50...60 Hz < 5 VA < 2 W 230 Vac 6 A

Voles. - 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

t: C300





**1**A

**1**B

2

**2**A

**2B** 

**2C** 

**2D** 

**2E** 

3

**3**A

# Safety module CS DM-01

**Terminals layout** 



# Internal wiring diagram



## Inputs configuration

Bimanual control device type III C according to EN 574



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



Feedback circuit for external contactors

N /-

K3 K4

**Operations diagram** 

to the feedback circuit of the safety module.

**3B 3C** 4

**4**A

**4B** 

**4C** 

**4D** 

**4E** 

4F

**4G** 

**4H** 

5

6

Safety gate monitoring with automatic start wiring and simultaneity between channels < 0,5 s (safety category 4)







#### Standstill monitor safety module

#### **Main functions**

- Single or dual channel input circuit
- Residual voltage at motor-stop selectable on 10 position
- Galvanic separation between control circuit and measure circuit
- 45 mm housing
- · 2 NO safety contacts,
- 1 NC auxiliary contact
- 2 Semiconductor outputs:
- 1 output for failure state signalling
- 1 output for signalling outputs state
- Possibility to connect single-phase or threephase motors to measuring circuits.
- Supply voltages:
- 24 ... 230 Vac/dc

#### **Utilization categories**

Alternate current: AC15 (50...60 Hz) Ue (V) 230 le (A) 3 Direct current: DC13 (6 operations/minute) Ue (V) 24 le (A) 6

#### Markings, quality marks and certificates:



# Complying with the requirements requested by:

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

# **Technical data**

<b>lousing</b> Made of polyamide PA 6.6 self-extinguishing, cla Protection degree: Dimensions:	ass V0 (UL94) IP40 (housing), IP20 (terminals) see page 4/178, shape C
General data SIL level (SIL CL): Performance Level (PL): Safety category: Safety parameters: Ambient temperature: Mechanical endurance: Clectrical endurance: Pollution degree: Rated impulse with stand voltage (Uimp): Rated insulation voltage (Ui): Over-voltage category: Neight:	up to SIL 2 according to EN IEC 62061 up to PL d according to EN ISO 13849-1 up to category 3 according to EN 954-1 see page 6/32 -25°C+55°C >10 millions of operations >100.000 operations outside 3, inside 2 4 KV 250 V II < 0,3 Kg
<b>Power supply</b> Rated operating voltage (Un): Max residual ripple in DC: Supply voltage tolerance: Rated power consumption AC: Rated power consumption DC:	24 230 Vac/dc; 5060 Hz 10% ±15% of Un < 6 VA < 2 W
nput circuit /oltage between terminals L1-L2-L3: requency: nput impedance: Stopped motor threshold voltage: Started motor threshold voltage: nput impedance Y1-Y2: START Y1-Y2 circuit current: nput voltage RESET: nput current RESET:	$\begin{array}{l} 0690 \ \text{Vac} \\ 03 \ \text{KHz} \\ > 1 \ \text{M}\Omega \\ \text{from 20 mV to 500 mV}_{adjustable on 10 \text{ positions}} \\ \text{double than the stopped motor threshold voltage} \\ < 24 \ \text{Vdc} \\ < 70 \ \text{mA} \\ 24 \ \text{Vdc} \pm 20\% \\ 10 \ \text{mA} \end{array}$
<b>Control circuit</b> Operating time t <sub>A</sub> : Releasing time t <sub>R1</sub> : Releasing time in absence of power supply: Simultaneity time: est: Test duration:	2 s 20 ms max 3 s 3 s Self-test when the power is supplied and after the RESET input is activated 2,5 s (During the test in the measuring circuits the voltage must be lower than the stopped motor threshold)
n conformity with standards: EC 60947-1, EN 60947-1, IEC 60204-1, EN 6020 EN ISO 12100-1, EN ISO 12100-2, EN ISO 1388 EN 61000-6-3, EN 62326-1, EN 60664-1, EN 608 CSA C22.2 n° 14-95	4-1, EN ISO 13849-1, EN 999, EN 1037, 50, IEC 529, EN 60529, EN 61000-6-2, 947-1, EN 62061, EN 13849-1, UL 508,
Dutput circuit Dutput contacts:	2 NO safety contacts, 1 NC auxiliary contact

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

Contacts type: Contacts material: Max switching voltage: Max switching current per contact: Conventional free air thermal current Ith: Contacts resistance: Contact protection fuse: Semiconductor outputs:

forced guided contacts silver alloy, gold plated 230/240 Vac; 300 Vdc 6 A 6 A ≤ 100 mΩ 6 A PNP outputs galvanically separated, protected from over voltage and short circuit 24 Vdc 50mA 24 Vdc ±20%

### **Code structure**

# **CS AM-01VE01**

Setting range of the stopped motor voltage 01 20 ... 500 mV, range 53 mV

#### Kind of connection

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

Switching voltage:

Switching current: External supply voltage:

contactors. 4/169 - 4/176

page 4/167

Ó





**Expansion modules for output contacts** 

#### Main functions

- Possibility of control with 1 or 2 channelsConnection of the input channels to opposite
- potentials
- Small 22,5 mm housing
- Output contacts:
- 5 NO safety contacts,
- 1 NC auxiliary contact,
- 1 NC feedback contact
- Supply voltages: 24 Vac/dc

#### **Utilization categories**

Alternat	e curre	ent: AC15 (5060 Hz)
Ue (V)	230	
le (A)	3	
Direct c	urrent:	DC13 (6 operations/minute)
Ue (V)	24	
le (A)	6	

#### Markings, quality marks and certificates:

CE

Approval UL:

**CUL**US E131787

**Complying with the requirements requested by:** Low Voltage Directive 2006/95/EC, Machinery Directive 2006/42/EC, Electromagnetic Compatibility 2004/108/EC

# **Technical data**

#### Housing

Made of polyamide PA 6.6 self-extinguishing, class V0 (UL94) Protection degree: IP40 (housing), IP20 (terminals) Dimensions: see page 4/177, shape A

# General data

SIL level (SIL CL): Performance Level (PL): Safety category:

Safety parameters: Ambient temperature: Mechanical endurance: Electrical endurance: Pollution degree: Rated impulse with stand voltage (Uimp): Rated insulation voltage (Ui): Over-voltage category: Weight:

#### **Power supply**

Rated operating voltage (Un): Max residual ripple in DC: Supply voltage tolerance: Rated power consumption AC: Rated power consumption DC:

#### **Control circuit**

**Output circuit** 

Protection against short circuits: Operating time of PTC: Max input resistance: Operating time  $t_A$ : Releasing time in absence of power supply  $t_R$ : Simultaneity time  $t_c$ : resistance PTC, Ih=0,5 A intervention > 100 ms, reset > 3 s  $\leq$  50  $\Omega$  40 ms 40 ms infinite

up to SIL 3 according to EN IEC 62061

(dependent on the base module)

>10 millions of operations >100.000 operations

see page 6/32

-25°C...+55°C

4 kV

ll 0,3 Kg

250 V

10% ±15% of Un

< 5 VA

< 2 W

outside 3, inside 2

24 Vac/dc; 50...60 Hz

up to PL e according to EN ISO 13849-1 up to category 4 according to EN 954-1

#### 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 60947-1, EN 62061, EN 13849-1, UL 508, CSA C22.2 n° 14-95

# Output contacts: Contacts type: Contacts material: Max switching voltage: Max switching current per contact: Conventional free air thermal current Ith: Max currents sum Σ Ith<sup>2</sup>: Contacts resistance:

±15%

Contact protection fuse:

Supply voltage

024 24 Vac/dc

5 NO safety contacts, 1 NC auxiliary contact, 1 NC feedback contact forced guided contacts silver alloy, gold plated 230/240 Vac; 300 Vdc 6 A 6 A 72 ≤ 100 mΩ 6 A

#### **Code structure**

# CS ME-01V024

Kind of connection

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



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





# **Expansion module CS ME-01**

### **Terminals layout**



Operations diagram		1
	A1/A2	1 <b>A</b>
	Y1/Y2 13/14, 23/34, 43/44, 53/54	1 <b>B</b>
	61/62	2
Legend:		<b>2A</b>
<b>t</b> <sub><b>n</b></sub> : Releasing time in absence	e of power supply	2 <b>B</b>
		2 <b>C</b>
		<b>2D</b>
		<b>2E</b>
		3
		<b>3A</b>
		3 <b>B</b>
		3 <b>C</b>
		4
		<b>4A</b>

#### Internal wiring diagram



#### Inputs configuration



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

A2

Y1 ---- Y2

**4B** 

**4C** 

**4D** 

**4E** 

4F

**4G** 

4H

5

6



#### **Expansion modules for output contacts**

#### Main functions

- Light barrier module (ESPE type 2 and 4)
- 2 OSSD inputs
- Small 22,5 mm housing
- Output contacts:
- 3 NO safety contacts,
- 1 NC feedback contact/EDM contact
- Supply voltages: 24 Vdc

# **Technical data**

#### н .

Made of polyamide PA 6.6 self-extingu	uishing, class V0 (UL94)
Protection degree: Dimensions:	IP40 (housing), IP20 (terminals) see page 4/178, shape D
General data	
SIL level (SIL CL): Performance Level (PL):	up to SIL 3 according to EN IEC 62061

up to category 4 according to EN 954-1

(dependent on the ESPE)

>10 millions of operations >100.000 operations

see page 6/32

-25°C...+55°C

4 kV

Ш

250 V

0,2 Kg

outside 3, inside 2

Safety category:

Safety parameters: Ambient temperature: Mechanical endurance: Electrical endurance: Pollution degree: Rated impulse with stand voltage (Uimp): Rated insulation voltage (Ui): Over-voltage category: Weight:

#### Power supply

24 Vdc Rated operating voltage (Un): Max residual ripple in DC: 10% ±20% of Un Supply voltage tolerance: Rated power consumption DC: < 2 WStart power consumption: < 3 W

#### **Control circuit**

Dperating time t <sub>^</sub> :	40 ms
Releasing time t <sub>R1</sub> :	15 ms

#### **Utilization categories**

Alternate current: AC15 (50...60 Hz) Ue (V) 230 le (A) 3 Direct current: DC13 (6 operations/minute) Ue (V) 24 le (A) 6

#### Markings, quality marks and certificates:

(F

Approval UL:

lis E131787

Complying with the requirements requested by: Low Voltage Directive 2006/95/EC, Machinery Directive 2006/42/EC, Electromagnetic Compatibility 2004/108/EC

#### 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 60947-1, EN 62061, EN 13849-1, UL 508, CSA C22.2 n° 14-95

#### **Output circuit**

Output contacts:

Supply voltage

**U24** 24 Vdc

Contacts type: Contacts material: Max switching voltage: Max switching current per contact: Conventional free air thermal current Ith: Max currents sum  $\Sigma$  lth<sup>2</sup>: Contacts resistance: Contact protection fuse:

±15%

3 NO safety contacts, 1 NC feedback contact forced guided contacts silver alloy, gold plated 230/240 Vac; 300 Vdc 6 A 6 A 36 ≤ 100 mΩ 6 A

# **Code structure**

**CS ME-03VU24** 

Kind of connection

- V screw terminals
- connector with screw terminals М
- X connector with spring terminals



24 Vdc < 2 W 230 Vac C300

Voles. 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





# Expansion module CS ME-03 Terminals layout



Operations diagram	1
051	1A
	1B
t <sub>A</sub> t <sub>R1</sub>	2
Legend: $ t_{A^{*}} $	2A
$t_{R1}$ : Releasing time	<b>2B</b>
	2 <b>C</b>
	2D
	<b>2E</b>
	3
	3A
	3B
	3C
	4
	<b>4A</b>

## Internal wiring diagram



### Inputs configuration

1 channel	Electro-sensitive protection devices ESPE 2 channels	4 <b>C</b>
24 VDC EDM OSSD	ESPE (PNP) EDM OSSD1 OSSD2	4D
		4E
		4F
		4G

4H 5

**4B** 

6

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



### Expansion module with delayed contacts at de-energizing

#### Main functions

- Possibility of control with 1 or 2 channels
- 4 delayed time 0,5 1 2 and 3 s
- Small 22,5 mm housing
- Output contacts:
- 4 NO safety contacts,
- 2 NC auxiliary contact,
- 1 NC feedback contact
- Supply voltages: 24 Vdc

#### Utilization categories

Alternat	e curr	ent: AC15 (5060 Hz)
Ue (V)	230	
le (A)	3	
Direct c	urrent	: DC13 (6 operations/minute)
Ue (V)	24	
le (A)	6	

#### Markings, quality marks and certificates:

(F

Approval UL:

lis E131787

Complying with the requirements requested by: Low Voltage Directive 2006/95/EC, Machinery Directive 2006/42/EC, Electromagnetic Compatibility 2004/108/EC

# **Technical data**

#### Housing

Made of polyamide PA 6.6 self-extinguishing, class V0 (UL94) IP40 (housing), IP20 (terminals) Protection degree: Dimensions: see page 4/177, shape A

#### General data

SIL level (SIL CL): Performance Level (PL): Safety category:

Safety parameters: Ambient temperature: Mechanical endurance: Electrical endurance: Pollution degree: Rated impulse with stand voltage (Uimp): Rated insulation voltage (Ui): Over-voltage category: Weight:

#### Power supply

Rated operating voltage (Un): Max residual ripple in DC: Supply voltage tolerance: Rated power consumption DC:

# **Control circuit**

Max input resistance: Operating time  $t_A$ : Releasing time in absence of power supply t<sub>n</sub>:

≤ 50 Ω < 100 ms see Code structure

up to SIL 3 according to EN IEC 62061

(dependent on the base module)

>10 millions of operations >100.000 operations

see page 6/32 -25°C...+55°C

4 KV 250 V

0,2 Kg

24 Vdc

10% ±15% of Un

< 2 W

Ш

outside 3, inside 2

up to PL e according to EN ISO 13849-1 up to category 4 according to EN 954-1

#### 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 60947-1, EN 62061, EN 13849-1, UL 508, CSA C22.2 nº 14-95

#### **Output circuit**

Output contacts:

#### Contacts type: Contacts material: Max switching voltage: Max switching current per contact: Conventional free air thermal current Ith: Contacts resistance: Contact protection fuse:

4 NO safety contacts, 2 NC auxiliary contact, 1 NC feedback contact forced guided contacts silver alloy, gold plated 230/240 Vac; 300 Vdc 6 A 6 A ≤ 100 mΩ 6 A

#### **Code structure**

# CS ME-20VU24-TF1

## Kind of connection

- V screw terminals
- Μ connector with screw terminals
- connector with spring terminals Х

Releasing time on de-energisation (t <sub>R</sub> )		
TF05	fixed 0,5 s	
TF1	fixed 1 s	
TF2	fixed 2 s	
TF3	fixed 3 s	

#### Data type approved by UL

Rated operating voltage (Un): Rated power consumption DC: Max switching voltage: Max switching current per contact: Utilization category

24 Vdc < 2 W 230 Vac 6 A 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. - Supply from remote class 2 source or limited voltage and limited energy.





**2D** 

**2E** 

3

**3**A

3**B** 

**3C** 

4

**4**A

**4B** 

**4C** 

**4D** 

**4E** 

4F

**4G** 

4H

5

6

# **Expansion module CS ME-20**

## **Terminals layout**



Operations diagram	
	1A
	A1/A2 Y1/Y2 17/18, 27/28, 37/38, 47/48
	55/56, 65/66
Legend: <b>t</b> : Operating time	2A
$\mathbf{\hat{r}_{g}}$ : Releasing time in absence of power	supply (see "Code structure")
	20

#### Internal wiring diagram



#### Inputs configuration







2 channels control



#### Expansion module with delayed contacts at de-energizing

#### Main functions

- Possibility of control with 1 or 2 channels
- Fixed or adjustable delayed time
- 45 mm housing
- Output contacts:
- 4 NO safety contacts,
- 2 NC auxiliary contact,
- 1 NC feedback contact
- Supply voltages: 24 Vdc

#### Utilization categories

Alternat	e curr	ent: AC15 (5060 Hz)
Ue (V)	230	
le (A)	3	
Direct c	urrent	: DC13 (6 operations/minute)
Ue (V)	24	
le (A)	6	

#### Markings, quality marks and certificates:

(F

Approval UL:

lis E131787

Complying with the requirements requested by: Low Voltage Directive 2006/95/EC, Machinery Directive 2006/42/EC, Electromagnetic Compatibility 2004/108/EC

# **Technical data**

#### н-.

Housing								
Protection degree: Dimensions:	IP40 (housing), IP20 (terminals) see page 4/178, shape C							
<b>General data</b> SIL level (SIL CL):	up to SIL 3 according to EN IEC 62061							

Performance Level (PL): Safety category:

Safety parameters: Ambient temperature: Mechanical endurance: Electrical endurance: Pollution degree: Rated impulse with stand voltage (Uimp): Rated insulation voltage (Ui): Over-voltage category: Weight:

#### Power supply

Rated operating voltage (Un): Max residual ripple in DC: Supply voltage tolerance: Rated power consumption DC:

**Control circuit** 

Max input resistance: Operating time  $t_A$ : Releasing time in absence of power supply t<sub>n</sub>:

≤ 50 Ω < 200 ms see Code structure

up to PL e according to EN ISO 13849-1 up to category 4 according to EN 954-1

(dependent on the base module)

>10 millions of operations >100.000 operations

see page 6/32 -25°C...+55°C

4 kV 250 V

24 Vdc

10% ±15% of Un

< 2 W

Ш 0,4 Kg

outside 3, inside 2

#### 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 60947-1, EN 62061, EN 13849-1, UL 508, CSA C22.2 nº 14-95

#### **Output circuit**

# Max switching current per contact: Conventional free air thermal current Ith: Contacts resistance: Contact protection fuse:

4 NO safety contacts, 2 NC auxiliary contact, 1 NC feedback contact forced guided contacts silver alloy, gold plated 230/240 Vac; 300 Vdc 6 A 6 A ≤ 100 mΩ 6 A

### **Code structure**

# **CS ME-30VU24-TF1**

Fixed or adjustable time

- 0 Fixed time
- 1 Adjustable time

#### Kind of connection

- V screw terminals
- connector with screw terminals Μ
- connector with spring terminals Х

#### Releasing time on de-energisation (t<sub>R</sub>) fixed 1 s TF1 (CS ME-30 only) .... fixed 12 s **TF12** (CS ME-30 only) from 1 to 12 s, step 1 s **TS12**

(CS ME-31 only)

## Data type approved by UL

Rated operating voltage (Un): Rated power consumption DC: Max switching voltage: Max switching current per contact: Utilization category

24 Vdc < 2 W 230 Vac 6 A 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. - Supply from remote class 2 source or limited voltage and limited energy.







**1**A

**1B** 

2

**2A** 

**2B** 

**2C** 

**2D** 

**2E** 

3

**3**A

**3B** 

**3C** 

4

**4**A

**4B** 

**4C** 

**4D** 

**4E** 

4F

**4G** 

**4H** 

5

6

# Expansion module CS ME-30 / CS ME-31

#### **Terminals layout**



Internal wiring diagram



 $\begin{array}{c|c} & A1/A2 \\ \hline & Y1/Y2 \\ \hline & Y1/Y2 \\ \hline & Y1/Y3 \\$ 

#### Release time selection $t_{R}$ (CS ME-31 only)

**Operations diagram** 



	DIP SWITCH	t <sub>R</sub> (s)	
ON OFF		1	
ON OFF		2	
ON OFF		3	
ON OFF		4	
ON OFF		5	
ON OFF		6	
ON OFF		7	
ON OFF		8	
ON OFF		9	
ON OFF		10	
ON OFF		11	
ON OFF		12	

# Inputs configuration

1 channel control





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





# Shape A, 22,5 mm thickness housing

#### **Connection data**

Terminals driving torque: Cross section of the conductors:

0,5...0,6 Nm 0,2...2,5 mm<sup>2</sup> 24...12 AWG

#### Installation

Snap mounting on DIN-rail



111.5

110.5

Z*[[[[[[*]]

7000

114

Connector with screw terminals

22.5

Connector with spring terminals



Screw terminals

Installation

#### Shape B, 22,5 mm thickness housing

#### **Connection data**

Terminals driving torque: Cross section of the conductors:

Snap mounting on DIN-rail

0,5...0,6 Nm 0,2...2,5 mm<sup>2</sup> 24...12 AWG



Connector with screw terminals



Connector with spring terminals



**1**A

**1B** 

2

**2A** 

110.5

# Shape C, 45 mm thickness housing

#### **Connection data**

Terminals driving torque: Cross section of the conductors:

# Installation

Snap mounting on DIN-rail



111.5

114

וחחחח

45 111.5 0000 000 0000 0000 66 ୭୭୭୭ ବରରର 114

Screw terminals

### Shape D, 22,5 mm thickness housing

# **Connection data**

Installation

Terminals driving torque: Cross section of the conductors:

Snap mounting on DIN-rail

0,2...2,5 mm<sup>2</sup> 24...12 AWG

0,5...0,6 Nm

0,5...0,6 Nm

0,2...2,5 mm<sup>2</sup>

24...12 AWG



# 22.5 88.5 0000 0006 99 0000 0000 91 >

Screw terminals





Connector with spring terminals

45

Connector with spring terminals