

Module, with delayed contacts at the opening of the input channels, for emergency stop, gate monitoring, solid state output devices and magnetic safety sensor

#### Main functions

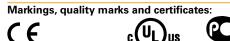
5C

- For safety applications up to SIL 3 / PL e
- Single or dual channel input circuit
- Choice between automatic start, manual start or monitored start
- Connection of the input channels to opposite potentials
- Connectible to solid-state output circuits (for example optical barriers), 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)



Approval UL: Approval GOST:

E131787 POCC IT.AB24.B04512

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

Electromagnetic Compatibility 2004/108/EC

# **Technical data**

#### Housing

Made of polyamide PA 6.6 self-extinguishing, class V0 (UL94) IP40 (housing), IP20 (terminals) Protection degree: Dimensions: see page 5/82, shape C

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 ISO 13849-1

>10 millions of operations

>100.000 operations

24 Vac/dc; 50...60 Hz

120 Vac; 50...60 Hz

230 Vac; 50...60 Hz

resistance PTC, Ih=0,5 A

see "CODE STRUCTURE"

2 NO safety instantaneous contacts,

1 NC auxiliary instantaneous contact,

intervention > 100 ms, reset > 3 s

outside 3, inside 2

see page 7/34

-25°C...+55°C

4 kV

250 V

0,5 kg

10%

±15% of Un

< 10 VA

< 5 W

≤ 50 Ω

< 30 mA

> 200 ms

< 150 ms

< 20 ms

< 150 ms

infinite

Ш

# 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  $t_{MIN}$ : Operating time t<sub>A</sub>: Releasing time  $t_{R1}^{A}$ : Releasing time in absence of power supply  $t_{R2}$ : Releasing time delayed contacts t<sub>R2</sub>: Simultaneity time t<sub>c</sub>:

#### In conformity with standards:

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

#### **Output circuit**

Output contacts:

2 NO safety delayed 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 (instantaneous cont.), 36 (delayed cont.) A<sup>2</sup> Min. current: 10 mA ≤ 100 mΩ Contacts resistance: 6 A, F type Contact protection fuse: The number and the load capacity of output contacts can be increased by using expansion modules or contactors See page See page 5/51 - 5/61.

# **Code structure** CS AT-00V024-T

#### Releasing time delayed contacts (t<sub>P2</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
- from 30 to 300 s, step 30 s 4

# Kind of connection

- ν screw terminals
- М connector with screw terminals
- Х connector with spring terminals

		Releasing time delayed contacts (				
		TF0.5	fixed 0,5 s			
		TF1	fixed 1 s			
		TF3	fixed 3 s			
Supply voltage						
024	24 Vac/dc		<b>±</b> 15%			
120	120 Vac		±15%			
230	230 Vac		±15%			

#### Data type approved by UL

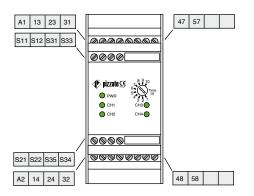
Rated operating voltage (Un):	24 Vac/dc; 5060 Hz 120 Vac; 5060 Hz 230 Vac; 5060 Hz			
Rated power consumption AC:	< 10 VA			
Rated power consumption DC:	< 5 W			
Max switching voltage:	230 Vac			
Max switching current per contact:	6 A			
Utilization category	C300			
Notes: - Use 60° or 75 °C copper (Cu) conductor and wire size No. 30-12 AWG. - Terminal tightening torque of 5-7 Lb In. - Only for 24 Vac/dc version, supply from remote class 2 source or limited volt and limited energy. - Surrounding air of 55 °C.				

5/29

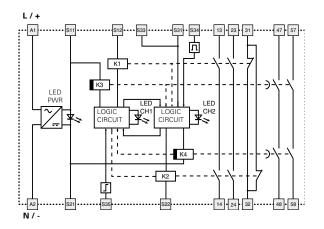


Itage

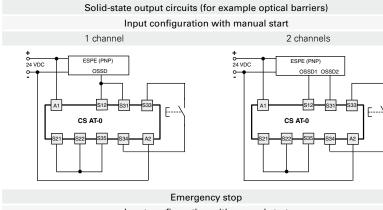
#### **Terminals layout**



#### Internal wiring diagram

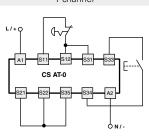


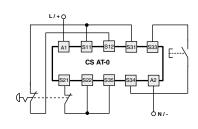
#### Inputs configuration



Input configuration with manual start



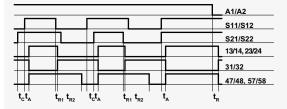




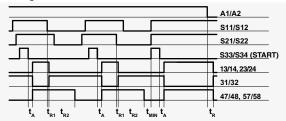
2 channels

#### **Operation diagrams**

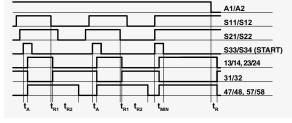
Configuration with automatic start



Configuration with monitored start



Configuration with manual start



Legend:

 $\begin{array}{l} \textbf{t}_{\text{MN}} \text{:} \text{Min. period of start impulse} \\ \textbf{t}_{c} \text{:} \text{:} \text{Simultaneity time} \end{array}$ 

Releasing time in absence of t power supply

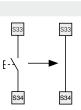
Adjustable releasing time delayed t<sub>R2</sub> contacts (see "Code structure")

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  $t_{n1}$  and  $t_{n2}$  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  $t_{MIN}$  time referred to the start.

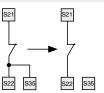
#### Automatic start

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.



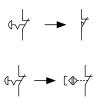
#### Monitored start

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. The sensors can only be used in the 2-channel configuration.



Application example See page 5/61

t<sub>A</sub>: Operating time Releasing time t\_,:



Module, with delayed contacts at the opening of the input channels, for emergency stop, gate monitoring, solid state output devices and magnetic safety sensor

#### Main functions

**5C** 

- For safety applications up to SIL 3 / PL e
- Single or dual channel input circuit
- Choice between automatic start, manual start or monitored start
- Connection of the input channels to opposite potentials
- Connectible to Solid-state output circuits (for example optical barriers), 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 (A) Direct current: DC13 (6 operations/minute) Ue (V) 24 le (A)

Markings, quality marks and certificates:



Approval UL: Approval GOST:

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E131787 POCC IT.AB24.B04512

Complying with the requirements requested by:

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

# **Code structure**

# CS AT-10V024-TF1

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

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

# Kind of connection

- ν screw terminals
- М connector with screw terminals
- Х connector with spring terminals

### **Technical data**

#### Housing

Made of polyamide PA 6.6 self-extinguishing, class V0 (UL94) IP40 (housing), IP20 (terminals) Protection degree: Dimensions: see page 5/82, shape C

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 ISO 13849-1

see page 7/34

-25°C...+55°C

4 kV

Ш

250 V

0,5 kg

>10 millions of operations

>100.000 operations

24 Vac/dc; 50...60 Hz

120 Vac; 50...60 Hz

outside 3, inside 2

### 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):

230 Vac: 50...60 Hz Max residual ripple in DC: 10% Supply voltage tolerance: ±15% of Un Rated power consumption AC: < 10 VA Rated power consumption DC: < 5 W **Control circuit** Protection against short circuits: resistance PTC, Ih=0,5 A intervention > 100 ms, reset > 3 s Operating time of PTC:

Max input resistance: ≤ 50 Ω Current for each input: < 30 mA Min. period of start impulse t<sub>MIN</sub>: > 200 ms Operating time t<sub>4</sub>: < 150 ms Releasing time t<sub>R1</sub>: < 20 ms Releasing time in absence of power supply t<sub>n</sub>: < 150 ms Releasing time delayed contacts t<sub>R2</sub>: see "CODE STRUCTURE" Simultaneity time t infinite

#### In conformity with standards:

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

#### Output circuit Output contacts:

2 NO safety delayed contacts. Contacts type: forced guided contacts silver alloy, gold plated Contacts material: 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  $\Sigma$  Ith<sup>2</sup>: 72 (instantaneous cont.), 36 (delayed cont.) A<sup>2</sup> Min. current: 10 mA Contacts resistance: ≤ 100 mΩ Contact protection fuse: 6 A, F type The number and the load capacity of output contacts can be increased by using expansion modules or contactors See page See page 5/51 - 5/61.

#### Data type approved by UL

Rated operating voltage (LIn)

hated operating voltage (on).
Rated power consumption AC:
Rated power consumption DC:
Max switching voltage:
Max switching current per contact:
Utilization category
Note: - Use 60° or 75 °C copper (Cu) conductor an

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

3 NO safety instantaneous contacts,

nd wire size No. 30-12 AWG - Terminal tightening torque of 5-7 bit.
- Only for 24 Vac/dc version, supply from remote class 2 source or limited voltage and limited energy.
- Surrounding air of 55 °C.



+15%

±15%

±15%

Releasing time delayed contacts (t<sub>no</sub>)

TF0.5 fixed 0,5 s

**TF1** fixed 1 s

TF3 fixed 3 s

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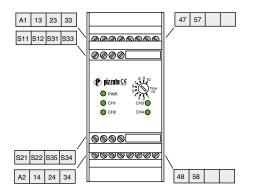
Supply voltage

024 24 Vac/dc

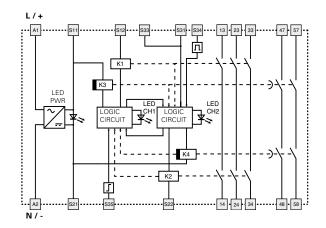
120 120 Vac

230 230 Vac

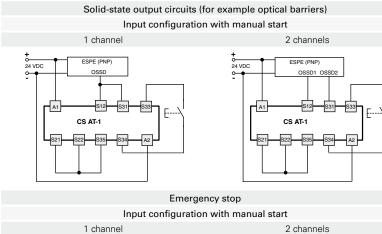
#### **Terminals layout**



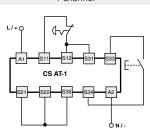
#### Internal wiring diagram

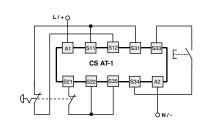


#### Inputs configuration



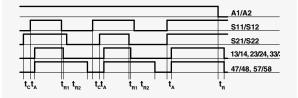
#### 1 channel





#### **Operation diagrams**

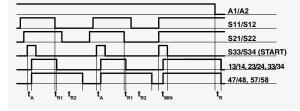
Configuration with automatic start



Configuration with monitored start

		A1/A2
		S11/S12
		S21/S22
		S33/S34 (START)
		13/14, 23/24, 33/34
		47/48, 57/58
$\mathbf{t}_{A} \mathbf{t}_{R1} \mathbf{t}_{R2}$	$\begin{array}{c c}   &   &   &   &   \\ t_{A} & t_{R1} & t_{R2} & t_{MIN} & t_{A} \end{array}$	t <sub>R</sub>

Configuration with manual start



Legend:

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

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

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

Releasing time in absence of t

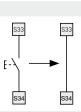
- power supply
- Adjustable releasing time delayed t<sub>R2</sub> contacts (see "Code structure")

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.

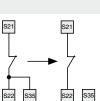
#### Automatic start

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.



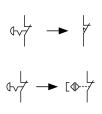
#### Monitored start

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. The sensors can only be used in the 2-channel configuration.



Application example See page 5/61



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

#### Main functions

**5C** 

- For safety applications up to SIL 3 / PL e
- Single or dual channel input circuit
- Choice between automatic start, manual start or monitored start
- Connectible to electromechanical contacts or to magnetic safety sensor
- 45 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 Ie (A) 3 Direct current: DC13 (6 operations/minute) Ue (V) 24 Ie (A) 4

Markings, quality marks and certificates:

CE



Approval UL: Approval GOST:

E131787 POCC IT.AB24.B04512

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

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

# **Technical data**

#### Housing

Made of polyamide PA 6.6 self-extinguishing, class V0 (UL94)Protection degree:IP40 (housing), IP20 (terminals)Dimensions:see page 5/82, shape C

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 ISO 13849-1

>10 millions of operations

resistance PTC, Ih=0,5 A

see "Code structure"

intervention > 100 ms, reset > 3 s

2 NO safety instantaneous contacts,

>100.000 operations

outside 3, inside 2

see page 7/34

-25°C...+55°C

2.5 kV

250 V

0.3 ka

 $\leq 50 \Omega$ 

< 30 mA

> 100 ms

< 70 ms

< 15 ms

< 100 ms

infinite

Ш

# 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):24 Vac/dc; 50...60 HzMax residual ripple in DC:10%Supply voltage tolerance:±15% of UnRated power consumption AC:< 10 VA</td>Rated power consumption DC:< 5 W</td>

#### **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  $t_R$ : Releasing time delayed contacts  $t_{R2}$ : Simultaneity time  $t_c$ :

#### In conformity with standards:

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

#### Output circuit

Output contacts:

1 NO safety delayed contact. Contacts type: forced quided 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 A<sup>2</sup> Min. current: 10 mA ≤ 100 mΩ Contacts resistance: Contact protection fuse: 6 A, F type The number and the load capacity of output contacts can be increased by using expansion modules or contactors See page See page 5/51 - 5/61.

# Code structure

# CS AT-30V024-TF1 Releasing time delayed contacts (t<sub>p</sub>)

#### 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 contacts (t<sub>n2</sub>)TF0.5fixed 0,5 sTF1fixed 1 sTF3fixed 3 s

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# Supply voltage

024 24 Vac/dc ±15%

#### Data type approved by UL

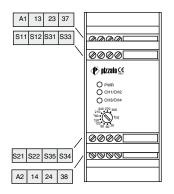
Rated operating voltage (Un): Rated power consumption AC: Rated power consumption DC: Max switching voltage: Max switching current per contact: Utilization category 24 Vac/dc; 50...60 Hz < 10 VA < 5 W 230 Vac 6 A

C300

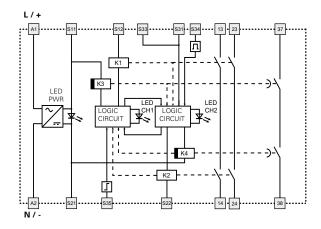
Notes: - Use 60° or 75 °C copper (Cu) conductor and wire size No. 30-12 AWG. - Terminal tightening torque of 5-7 Lb In. - Only for 24 Vac/dc version, supply from remote class 2 source or limited voltage and limited energy. - Surrounding air of 55 °C.



#### **Terminals layout**



#### Internal wiring diagram



#### Inputs configuration

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

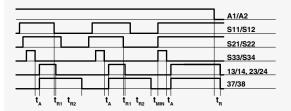
and S34 terminals.

#### **Operation diagrams**

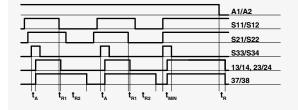
Configuration with automatic start



Configuration with monitored start



Configuration with manual start



Legend:

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

Operating time

Releasing time t\_,:

S21

S22

S35

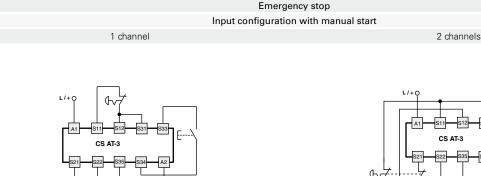
S35

S22

- Releasing time in absence of t
  - power supply
- Adjustable releasing time delayed t<sub>R2</sub> 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  $\mathbf{t}_{n1}$  and  $\mathbf{t}_{n2}$  times referred to S11/S12 input, the  $\mathbf{t}_{n}$  time referred to the supply, the  $\mathbf{t}_{n}$  time referred to S11/S12 input and to the start, and the  $\mathbf{t}_{MN}$  time referred to the start.



Monitored start

As regards the indicated diagrams, in order to S21

activate the module with

the monitored start, it is

necessary to remove the

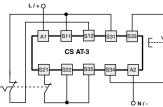
connection between S22

and S35 terminals.

όn/

S33

S34



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 The contacts. sensors can only be used in the 2-channel configuration

Application example See page 5/61

General Catalog 2013-2014

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

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

S33

S34

E-