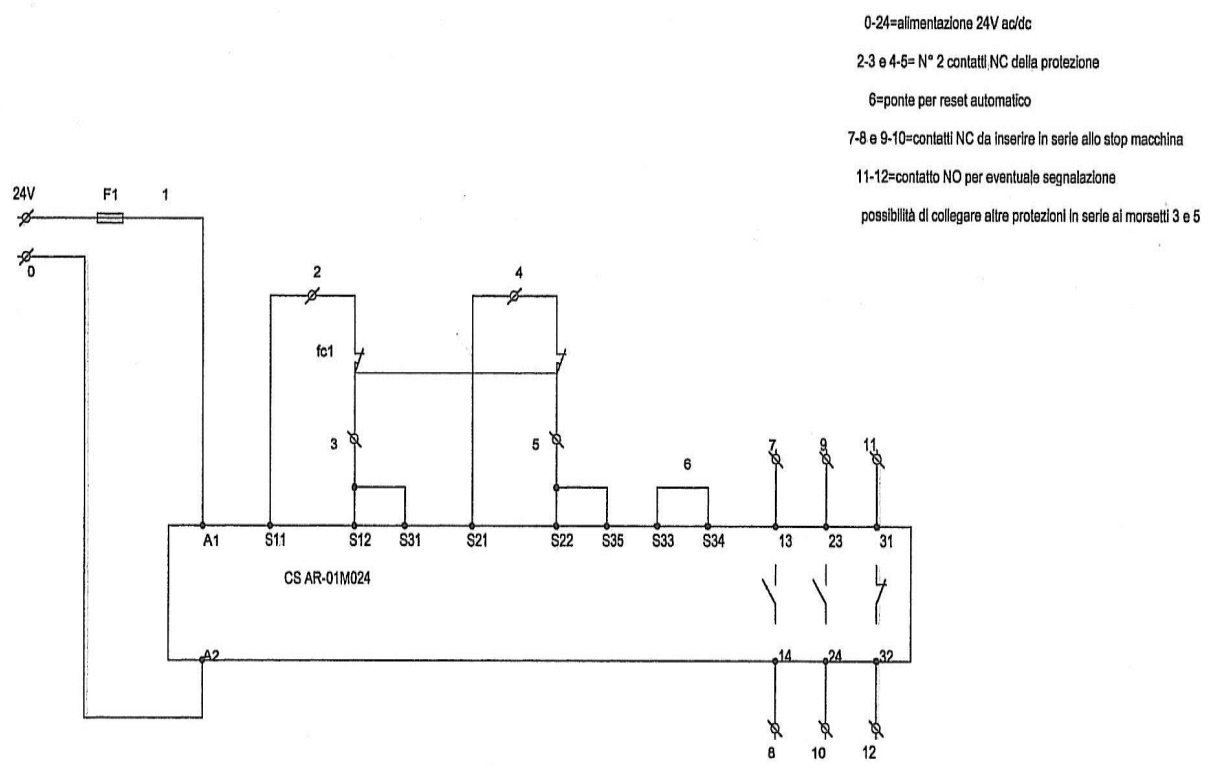
The standard EN 954-31.12.2011 has expired.
The EN 954-1 has definitely been replaced by EN ISO 13849-1.
What changes with the new rules?
The new EN ISO 13849-1:
introduces the concept of **Performance Level (PL)** as an indicator of the reliability of a safety function, it also contains indications of reliability concerning the determination of safety levels. There are a number of other important factors that should be considered in the design stage to achieve compliance in accordance with EN ISO 13849-1 and in accordance with the Machinery Directive. Among these are included: "MTTF", "Diagnostic Coverage", the system architecture (structure) and Common Cause Failure (common cause failures).
The PL needed for a given safety function must be determined on the basis of risk assessment and obtained by proper choice of architecture, enables the use of suitable and sufficient
test coverage.
To ensure the necessary diagnostic coverage, REPAR2 produces a box (see photo), called SAFETY MODULE BOX, conceived as a terminal board where more micros can be easily connected according to the number of guards installed on the machine.

See attached diagram:



Caratteristiche tecniche

Custodia

Custodia in poliammide PA 6.6, autoestinguente V0 secondo UL 94	
Grado di protezione:	IP40 (custodia), IP20 (morsettiera)
Dimensioni:	vedere pagina 5/81, forma A

Generali

Livello SIL (SIL CL):	fino a SIL 3 secondo EN IEC 62061
Performance Level (PL):	fino a PL e secondo EN ISO 13849-1
Categoria di sicurezza:	fino a categoria 4 secondo EN 954-1
Parametri di sicurezza:	vedi pagina 7/32
Temperatura ambiente:	-25°C...+55°C
Durata meccanica:	>10 milioni di cicli di manovre
Durata elettrica:	>100.000 cicli di manovre
Grado di inquinamento:	esterno 3, interno 2
Tensione ad impulso (Uimp):	4 kV
Tensione nominale di isolamento (Ui):	250 V
Categoria di sovratensione:	II
Peso:	0,3 kg

Alimentazione

Tensioni di alimentazione nominale (Un):	10 ... 30 Vdc 24 Vac/dc; 50...60 Hz 120 Vac; 50...60 Hz 230 Vac; 50...60 Hz
Ondulazione residua Max in DC:	10%
Tolleranza sulla tensione di alimentazione:	±15% di Un
Assorbimento AC:	< 5 VA
Assorbimento DC:	< 2 W

Circuito di controllo

Protezione al corto circuito:	resistenza PTC, Ih=0,5 A
Tempi della PTC:	intervento > 100 ms, ripristino > 3 s
Resistenza massima per ingresso:	≤ 50 Ω
Corrente per ingresso:	30 mA
Durata min impulso di start t_{MIN}:	100 ms
Tempo di eccitazione t_A:	50 ms
Tempo di ricaduta t_{R1}:	20 ms
Tempo di ricaduta in mancanza di alimentazione t_R:	70 ms
Tempo di contemporaneità t_C:	infinito

Conformità alle norme:
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

Circuito d'uscita

Contatti d'uscita:	2 contatti NO di sicurezza, 1 contatto NC di segnalazione
Tipo di contatti:	a guida forzata
Materiale dei contatti:	lega d'argento placcata oro
Tensione massima commutabile:	230/240 Vac; 300 Vdc
Corrente massima per ramo:	6 A
Corrente termica in aria libera Ith:	6 A
Massima somma delle correnti Σ Ith^2:	72 A^2
Corrente minima:	10 mA
Resistenza dei contatti:	≤ 100 mΩ
Fusibile di protezione esterno:	6 A tipo F

La portata ed il numero dei contatti d'uscita possono essere aumentati mediante moduli di espansione o contattori. Vedere pagina 5/49 - 5/58 e 5/79

Technical data

Housing

Made of polyamide PA 6.6 self-extinguishing, class V0 (UL94)	
Protection degree:	IP40 (housing), IP20 (terminals)
Dimensions:	see page 5/81, shape A

General data

SIL level (SIL CL):	up to SIL 3 according to EN IEC 62061
Performance Level (PL):	up to PL e according to EN ISO 13849-1
Safety category:	up to category 4 according to EN 954-1
Safety parameters:	see page 7/32
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:	II
Weight:	0,3 Kg

Power supply

Rated operating voltage (Un):	10 ... 30 Vdc 24 Vac/dc; 50...60 Hz 120 Vac; 50...60 Hz 230 Vac; 50...60 Hz
Max residual ripple in DC:	10%
Supply voltage tolerance:	±15% of Un
Rated power consumption AC:	< 5 VA
Rated power consumption DC:	< 2 W

Control circuit

Protection against short circuits:	resistance PTC, Ih=0,5 A
Operating time of PTC:	intervention > 100 ms, reset > 3 s
Max input resistance:	≤ 50 Ω
Current for each input:	30 mA
Min. period of start impulse t_{MIN}:	100 ms
Operating time t_A:	50 ms
Releasing time t_{R1}:	20 ms
Releasing time in absence of power supply t_R:	70 ms
Simultaneity time t_C:	infinite

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

Output circuit

Output contacts:	2 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 Σ Ith^2:	72 A^2
Min. current:	10 mA
Contacts resistance:	≤ 100 mΩ
Contact protection fuse:	6 A, F type

Caratteristiche principali

- Ingresso a 1 o a 2 canali
- Possibilità di start automatico, start manuale (solo CS AR-05) o start controllato (solo CS AR-06)
- Collegabile ad ESPE, a contatti elettromeccanici o a sensori magnetici di sicurezza
- Contatti d'uscita:
  3 contatti NO di sicurezza,
  1 contatto NC di segnalazione
- Tensione di alimentazione:
  24 Vac/dc, 120 Vac, 230 Vac

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

Categorie d'impiego

Corrente alternata: AC15 (50...60 Hz)
Ue (V) 230
Ie (A) 3
Corrente continua: DC13 (6 cicli di op./minuto)
Ue (V) 24
Ie (A) 6

Marcature, marchi e attestati:

CE cULus

Omologazione UL: E131787

Conformi ai requisiti richiesti da:
Direttiva Bassa Tensione 2006/95/EC,
Direttiva Macchine 2006/42/EC,
Compatibilità Elettromagnetica 2004/108/EC

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 cULus

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