SAFEMASTER
Emergency Stop Module
RK 5942

Translation
of the original instructions

DOLD

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0275080

Contents

Before installing, operating or maintaining this device, these instructions must be carefully read and understood.

Keep instructions for future reference

The installation must only be done by a qualified electrican!

Do not dispose of household garbage!
The device must be disposed of in compliance with nationally applicable rules and requirements.

To help you understand and find specific text passages and notes in the operating instructions, we have important information and information marked with symbols.

Symbol and Notes Statement

DANGER:
Indicates that death or severe personal injury will result if proper precautions are not taken.

WARNING:
Indicates that death or severe personal injury can result if proper precautions are not taken.

CAUTION:
Indicates that a minor personal injury can result if proper precautions are not taken.

INFO:
Referred information to help you make best use of the product.

ATTENTION:
Warns against actions that can cause damage or malfunction of the device, the device environment or the hardware / software result.

General Notes

The product hereby described was developed to perform safety functions as a part of a whole installation or machine. A complete safety system normally includes sensors, evaluation units, signals and logical modules for safe disconnections. The manufacturer of the installation or machine is responsible for ensuring proper functioning of the whole system. DOLD cannot guarantee all the specifications of an installation or machine that was not designed by DOLD. The total concept of the control system into which the device is integrated must be validated by the user. DOLD also takes over no liability for recommendations which are given or implied in the following description. The following description implies no modification of the general DOLD terms of delivery, warranty or liability claims.

Designated Use

The RK 5942 is used to interrupt a safety circuit in a safe way. It can be used to protect people and machines in applications with e-stop buttons and safety gates.
When used in accordance with its intended purpose and following these operating instructions, this device presents no known residual risks. Nonobservance may lead to personal injuries and damages to property.

Safety Notes

Risk of electrocution!
Danger to life or risk of serious injuries.

- Disconnect the system and device from the power supply and ensure they remain disconnected during electrical installation.
- The device may only be used for the applications described in the mutually applicable operating instructions / data sheet. The notes in the respective documentation must be heeded. The permissible ambient conditions must be observed.
- The contact protection of the elements connected and the insulation of the supply cables must be designed in accordance with the requirements in the operating instructions / data sheet.
- Note the VDE and local regulations, particularly those related to protective measures.

Risk of fire or other thermal hazards!
Danger to life, risk of serious injuries or property damage.

- The device may only be used for the applications described in the mutually applicable operating instructions / data sheet. The notes in the respective documentation must be heeded. The permissible ambient conditions must be observed. In particular, the current limit curve must be heeded.
- The device may only be installed and put into operation by experts who are familiar with this technical documentation and the applicable health and safety and accident prevention regulations.

Functional error!
Danger to life, risk of serious injuries or property damage.

- The device may only be used for the applications described in the mutually applicable operating instructions / data sheet. The notes in the respective documentation must be heeded. The permissible ambient conditions must be observed.
- The device may only be installed and put into operation by experts who are familiar with this technical documentation and the applicable health and safety and accident prevention regulations.
- The unit should be panel mounted in an enclosure rated at IP 54 or superior. Dust and dampness may lead to malfunction.

Installation fault!
Danger to life, risk of serious injuries or property damage.

- Make sure of sufficient protection circuitry at all output contacts for capacitive and inductive loads.

Attention!

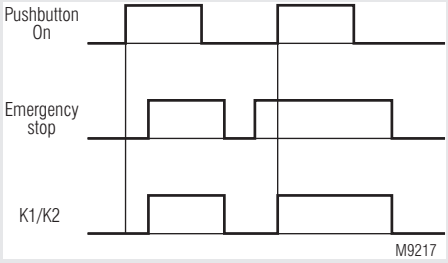
- The safety function must be triggered during commissioning.
- AUTOMATIC START !
  According to IEC/EN 60 204-1 part 9.2.5.4.2 and 10.8.3 it is not allowed to restart automatically after emergency stop.
  Therefore the machine control has to disable the automatic start after emergency stop.
- For removing the pluggable terminals blocks, the unit must be switched off. The terminals blocks A1+ / A2, 13 / 14 and S28+ / S28 can only be plugged on the assigned position.
- The contact S28+ must not be connected after the e-stop contact e.g. to A1 of the e-stop module.
- Opening the device or implementing unauthorized changes voids any warranty

SAFEMASTER
Emergency Stop Module
RK 5942

RK 5942._ _ RK 5942.01PC RK 5942.01PCA

- **According to**
  - **Performance Level (PL) e and category 4 to EN ISO 13849-1**
  - **SIL Claimed Level (SIL CL) 3 to IEC/EN 62061**
  - **Safety Integrity Level (SIL) 3 to IEC/EN 61508 and IEC/EN 61511**
- 1- or 2-channel operation
- Output: 1 NO contact and 1 semiconductor monitoring output
- LED-indicator for relay 1 / 2 and supply voltage
- Width 17.5 mm and 64 mm depth

Function Diagramm



Approvals and Markings

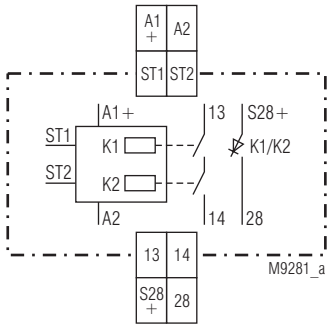
Applications

- Protection of people and machines
- Emergency stop circuits on machines

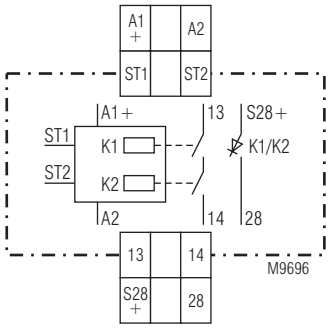
Indicators

LED PWR:	On, when supply connected
LED K1/K2:	On, when relay K1 and K2 energized

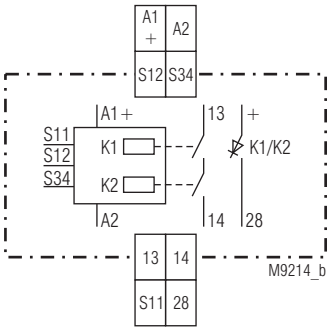
Circuit Diagrams



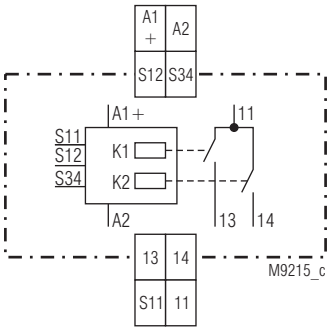
RK 5942.01



RK 5942.01PC
RK 5942.01PCA



RK 5942.02

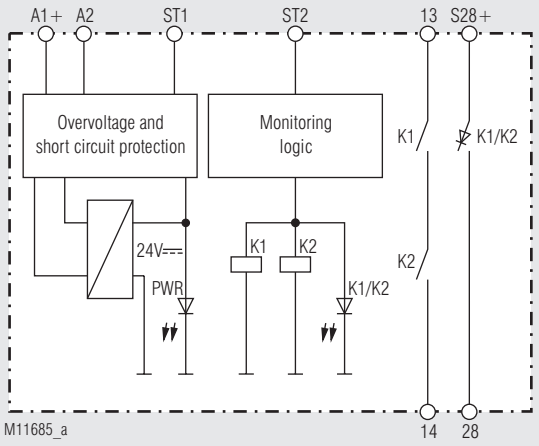


RK 5942.03

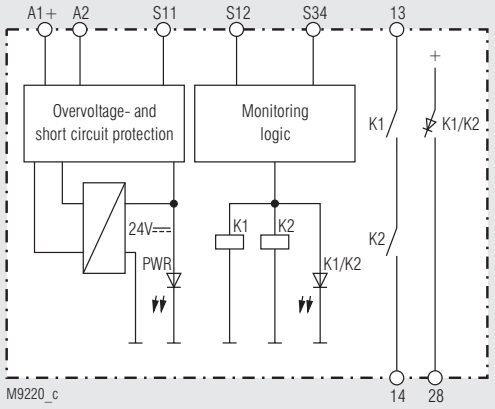
Connection Terminals

Terminal designation	Signal description
A1+	+ / L
A2	- / N
ST2, S12, S34	Conrol input
ST1, S11	Control output
11, 13, 14	Forcibly guided NO contacts for release circuit
S28+	Supply for semiconductor outputs
28	Semiconductor monitoring output

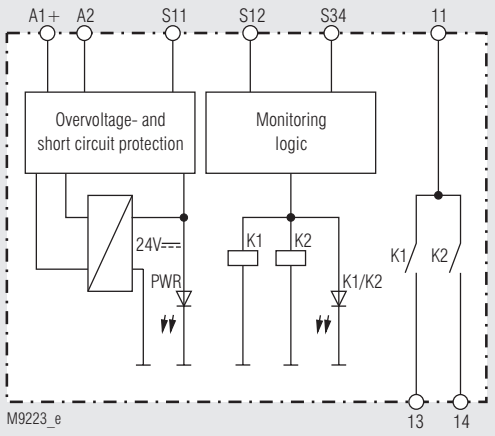
Block Diagrams



RK 5942.01



RK 5942.02



RK 5942.03

Technical Data

Input

Nominal voltage U_N:	DC 24 V
Voltage range	
at 10 % residual ripple:	DC 0.9 ... 1.1 U_N
Nominal consumption:	2.2 W
Control voltage on ST1 or S11:	Typ. DC 22,5 V
Control current:	Typ. 95 mA
Recovery time:	0.5 s

Output

Contacts	
RK 5942.01, RK 5942.02:	1 NO contact, 1 semiconductor monitoring output
RK 5942.03:	2 NO contacts, with common source terminal

The semiconductor output can only be used for monitoring. The contact S28+ must not be connected after the e-stop contact e.g. to A1 of the e-stop module.

Operate delay:	Typ. 80 ms
Release delay:	Typ. 70 ms
Contact type:	Forcibly guided
Thermal current I_{th}:	Max. 5 A (see continouos current limit curve)
Nominal output voltage:	AC 250 V
Switching capacity	
to AC 15:	
NO contacts:	3 A / AC 230 V IEC/EN 60947-5-1
to DC 13:	
NO contacts:	2 A / DC 24 V IEC/EN 60947-5-1
to DC 13:	4 A / DC 24 V at 0.1 Hz
Electrical life	
at 5 A, AC 230 V cos φ = 1:	> 10^5 switching cycles
Permissable operating frequency:	600 switching cycles / h
Short circuit strength	
max. fuse rating:	6 A gG / gL IEC/EN 60947-5-1
line circuit braker:	B 6
Mechanical life:	10 x 10^6 switching cycles
Semiconductor output:	DC 24 V, 100 mA, short circuit strong (see continouos current limit curve)
Output voltage at 100 mA:	DC 21.5 V

General Data

Operating mode:	Continuous operation
Temperature range	
Operation:	- 15 ... + 55 °C
Storage:	- 25 ... + 85 °C
altitude:	≤ 2000 m
Clearance and creepage distances	
rated impuls voltage / pollution degree:	4 kV / 2 (basis insulation) IEC 60664-1
EMC	IEC/EN 61326-3-1, IEC/EN 62061
nterference suppression:	Limit value class B EN 55011
Degree of protection	
Housing:	IP 40 IEC/EN 60529
Terminals:	IP 20 IEC/EN 60529
Housing:	Thermoplastic with V0 behaviour according to UL subject 94
Vibration resistance:	Amplitude 0.35 mm frequency 10 ... 55 Hz, IEC/EN 60068-2-6
Climate resistance:	15 / 055 / 04 IEC/EN 60068-1
Terminal designation:	EN 50005
Wire fixing:	Plus-minus terminal screws M 3.5 box terminals or cage clamp terminals
Mounting:	DIN rail IEC/EN 60715
Weight:	110 g

Dimensions

Width x height x depth	
RK 5942.01; .02; .03:	17,5 x 90 x 71 mm
RK 5942.01PC:	17,5 x 122 x 71 mm
RK 5942.01PCA:	17,5 x 124 x 71 mm
Mounting depth:	64 mm

Standard Types

RK 5942.01 DC 24 V

Article number:	0058689
• Output:	1 NO contact, 1 semiconductor
• Nominal voltage U_N:	DC 24 V
• Width:	17.5 mm

RK 5942.02 DC 24 V

Article number:	0058690
• Output:	1 NO contact, 1 semiconductor
• Nominal voltage U_N:	DC 24 V
• Width:	17.5 mm

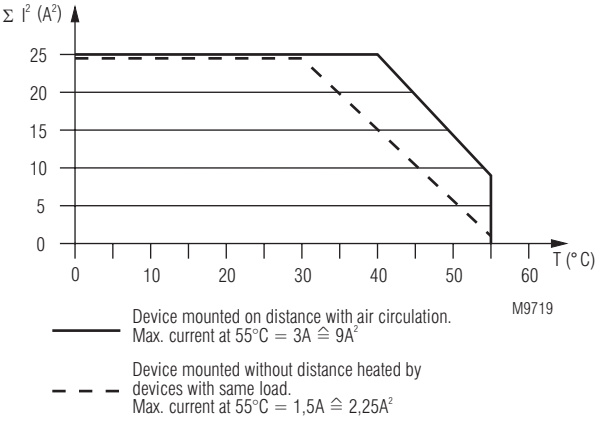
Troubleshooting

Failure	Potential cause
LED "PWR" does not light up	- Power supply not connected
Device cannot be activated	- Start button defective e. g. ST1-ST2 or S12-S34 not bridged - A safety relay is welded (replace device)

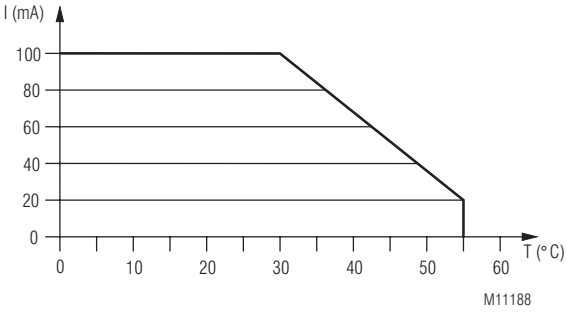
Maintenance and repairs

- The device contains no parts that require maintenance.
- In case of failure, do not open the device but send it to manufacturer for repair.

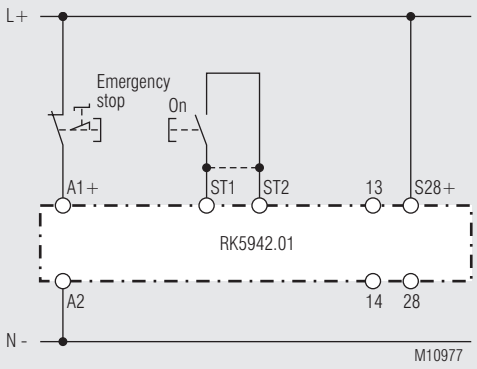
Characteristics



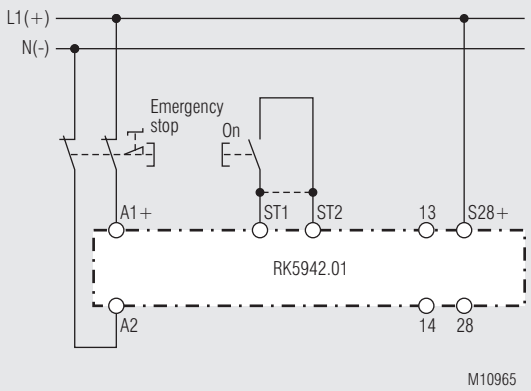
Continouos current limit curve output contacts



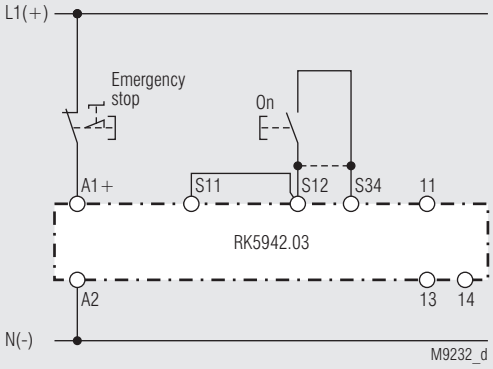
Continouos current limit curve semiconductor outputs



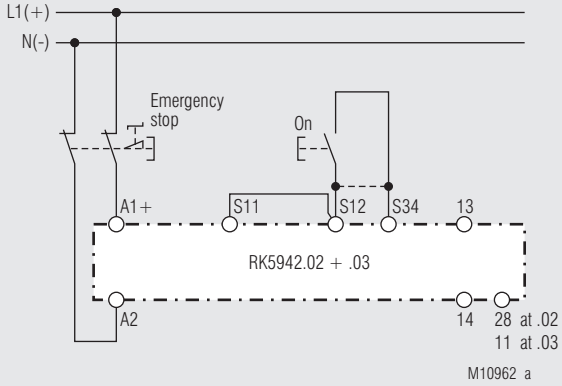
Single channel emergency-stop circuit without feed back loop, with or without automatic restart.
For automatic restart terminals S12 - S34 must be linked.
No ON-pushbutton necessary.
Suited up to SIL2, Performance Level d, Cat. 3*)



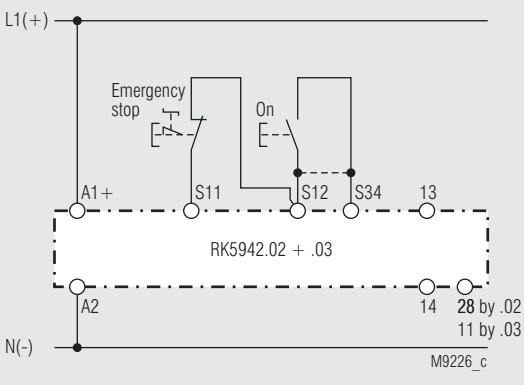
2-channel emergency-stop circuit without feed back loop, as option with or without automatic restart.
For automatic restart terminals S12 - S34 must be linked.
No ON-pushbutton necessary.
Suited up to SIL3, Performance Level e, Cat. 4



Single channel emergency-stop circuit without feed back loop, with or without automatic restart.
For automatic restart terminals S12 - S34 must be linked.
No ON-pushbutton necessary.
Suited up to SIL2, Performance Level d, Cat. 3*)

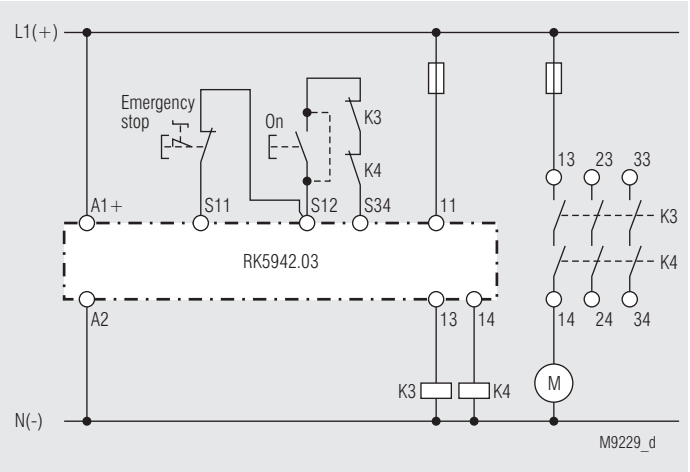


2-channel emergency-stop circuit without feed back loop, as option with or without automatic restart.
For automatic restart terminals S12 - S34 must be linked.
No ON-pushbutton necessary.
ATTENTION ! When this application is used with RK5942.02, it must be guarateed that the external circuit on contact 28 has no feedback influence. I.e. no external voltage must be connected to contact 28.
Suited up to SIL3, Performance Level e, Cat. 4

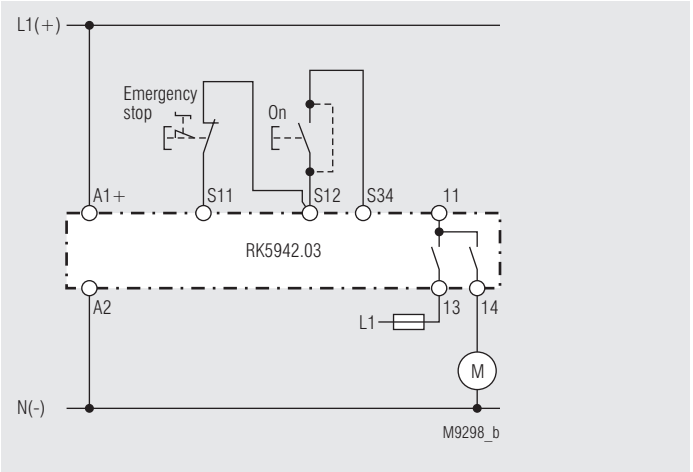


Single channel emergency-stop circuit without feed back loop, with or without automatic restart.
For automatic restart terminals S12 - S34 must be linked.
No ON-pushbutton necessary.
Suited up to SIL2, Performance Level d, Cat. 3*)

*) Suited up to SIL3, Performance Level e, Cat. 4, when the complete e-stop circuit is within the same cabinet.



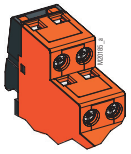
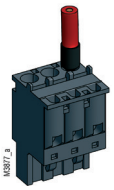
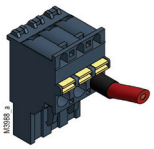
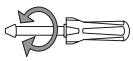
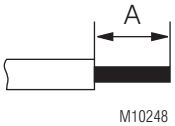
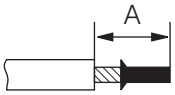
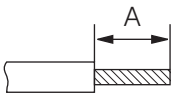
Contact reinforcement by external contactors.
At a thermal current I_{th} > 5 A the output contacts can be reinforced by external contactors with forcibly guided contacts.
Functioning of the external contactors is monitored by looping the NC contacts into the start circuit (S12 - S34).
ATTENTION ! For applications of safety stops the load must be connected to the contacts in series with 2 NO contacts.
Suited up to SIL2, Performance Level d, Cat. 3*)



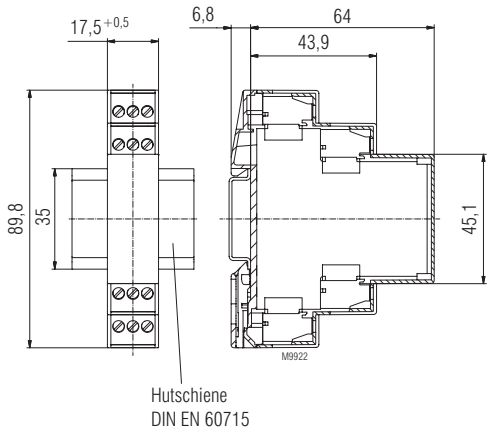
ATTENTION ! For applications of safety stops the load must be connected to the contacts in series with 2 NO contacts.
Suited up to SIL2, Performance Level d, Cat. 3*)

*) Suited up to SIL3, Performance Level e, Cat. 4, when the complete e-stop circuit is within the same cabinet.

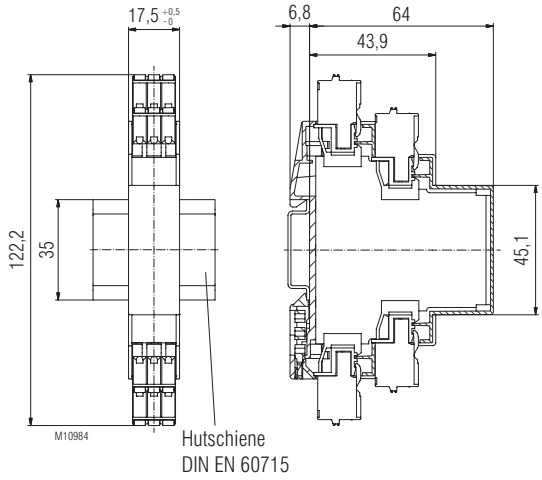
DE	**Anschlusstechnik**
EN	**Connection Technology**
FR	**Technologie de connexion**

	Schraubklemmen, nicht abnehmbar Screw terminals, fixed Bornes à vis, fixes	Federkraftklemmen, abnehmbar Cage clamp terminals, pluggable Bornes ressorts, amovibles	Federkraftklemmen, abnehmbar Cage clamp terminals, pluggable Bornes ressorts, amovibles
			
	ø 4 mm / PZ 1 1,2 Nm 10,6 LB. IN	DIN 5264-A; 0,6 x 3,5	
 M10248	A = 10 mm 1 x 0,5 ... 6 mm² 1 x AWG 20 to 10	A = 10 mm 1 x 0,2 ... 2,5 mm² 1 x AWG 24 to 12	
 M10249	A = 10 mm 1 x 0,5 ... 6 mm² 1 x AWG 20 to 10	A = 10 mm 1 x 0,25 ... 2,5 mm² 1 x AWG 24 to 12 2 x 0,5 ... 1,5 mm² mit TWIN-Aderendhülse	
 M10250		A = 10 mm 1 x 0,2 ... 2,5 mm² 1 x AWG 24 to 12	

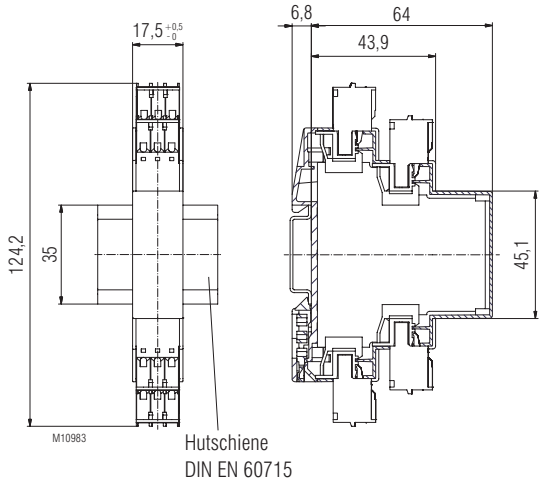
DE	**Maßbilder (Maße in mm)**
EN	**Dimensions (dimensions in mm)**
FR	**Dimensions (dimensions en mm)**



RK5942.01



RK5942.01PC



RK5942.01PCA

DE	**Sicherheitstechnische Kenndaten**
EN	**Safety Related Data**
FR	**Données techniques sécuritaires**

EN ISO 13849-1:		
Kategorie / Category:	4	
PL:	e	
$MTTF_d$:	1442,5	a (year)
DC_{avg}:	99,0	%
d_{op}:	365	d/a (days/year)
h_{op}:	24	h/d (hours/day)
t_{cycle}:	3600	s/cycle
	≙ 1	/h (hour)

IEC/EN 62061 IEC/EN 61508 IEC/EN 61511:		
SIL CL:	3	IEC/EN 62061
SIL:	3	IEC/EN 61508 / IEC/EN 61511
HFT*):	1	
DC:	99,0	%
PFH_D:	3,21E-10	h^{-1}
T_1:	20	a (year)
*) HFT = Hardware-Fehlertoleranz Hardware failure tolerance Tolérance défauts Hardware		

Anforderung seitens der Sicherheits-funktion an das Gerät Demand to our device based on the evaluated neccessary safety level of the application. Consigne résultant de la fonction sécuritaire de l'appareil		Intervall für zyklische Überprüfung der Sicherheitsfunktion Intervall for cyclic test of the safety function Interval du contrôle cyclique de la fonction sécuritaire
nach, acc. to, selon EN ISO 13849-1	PL e with Cat. 3 or Cat. 4	einmal pro Monat once per month mensuel
	PL d with Cat. 3	einmal pro Jahr once per year annuel
nach, acc. to, selon IEC/EN 62061, IEC/EN 61508	SIL CL 3, SIL 3 with HFT = 1	einmal pro Monat once per month mensuel
	SIL CL 2, SIL 2 with HFT = 1	einmal pro Jahr once per year annuel
nach, acc. to, selon EN 61511	SIL 3	einmal pro Jahr once per year annuel

Info

DE	Die angeführten Kenndaten gelten für die Standardtype. Sicherheitstechnische Kenndaten für andere Geräteausführungen erhalten Sie auf Anfrage. Die sicherheitstechnischen Kenndaten der kompletten Anlage müssen vom Anwender bestimmt werden.
EN	The values stated above are valid for the standard type. Safety data for other variants are available on request. The safety relevant data of the complete system has to be determined by the manufacturer of the system.
FR	Les valeurs données sont valables pour les produits standards. Les valeurs techniques sécuritaires pour d'autres produits spéciaux sont disponibles sur simple demande. Les données techniques sécuritaires de l'installation complète doivent être définies par l'utilisateur.

DE	**EG-Konformitätserklärung**
EN	**CE-Declaration of Conformity**
FR	**Déclaration de conformité européenne**

EG - Konformitätserklärung
Declaration of Conformity
Déclaration de conformité européenne

Hersteller:
Manufacturer: / Fabricant:
Anschrift:
Address: / Adresse:

E. Dold & Söhne GmbH & Co. KG

Bregstraße 18
78120 Furtwangen
Germany

Produktbezeichnung:
Product description:
Désignation du produit:

Not-Aus-Modul
Emergency Stop Module
Module d'arrêt d'urgence

RK5942.kk
RK5942.kkttt

mit:
with:
avec:

kk = 01, 02, 03
ttt= PC, PCA

Das bezeichnete Produkt stimmt mit den Vorschriften folgender europäischer Richtlinien überein:
The indicated product is in conformance with the regulations of the following european directives:
Le produit désigné est conforme aux instructions des directives européennes:

Maschinenrichtlinie: *Machinery directive: / Directives Machines:*	2006/42/EG	EU-Abl. L157/24, 09.06.2006
EMV - Richtlinie: *EMC - Directive: / Directives- CEM::*	2014/30/EU	EU-Abl. L96/79, 29.03.2014
RoHS - Richtlinie *RoHS -Directive: / Directives - RoHS:*	2011/65/EU	EU-Abl. L174/88, 01.07.2011

Prüfgrundsätze:
Basis of Testing:
Lignes de contrôle:

EN ISO 13849-1:2015
EN 62061:2005 + A2:2015
EN 61000-6-1:2007
EN 61000-6-3:2007 + A1:2011
EN 61511-1:2017
EN 61508 Parts 1, 2 :2010
EN 61000-6-2:2005
EN 61000-6-4:2007 + A1:2011

Die Übereinstimmung eines Baumusters des bezeichneten Produktes mit der oben genannten Maschinenrichtlinie wurde bescheinigt durch:
Consistency of a production sample with the marked product in accordance to the above machiney directive has been certified by:
La conformité d'un échantillon du produit désigné aux directives machines susmentionnées a été certifiée par:

Benannte Stelle:
Certification office: / l´organisme notifié:
Nummer der benannten Stelle:
Number of certification office:/ Numéro de l´organisme notifié:
Nummer der Bescheinigung:
Certification number: / Numéro de certificat:
Ausstelldatum :
Date of issue: / Date de délivrance:

TÜV Süd Product Service GmbH
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Für die Zusammenstellung der technischen Unterlagen ist bevollmächtigt:
For the compilation of technical documents is authorized:
Pour la composition des documents techniques est autorisé:

Gamal Hagar, Entwicklungsleiter / R&D Manager

Rechtsverbindliche Unterschrift:
Signature of authorized person:
Signature autorisée :

ppa. A. Dold

Christian Dold, Produktmanagement / Productmanagement

Ort, Datum :
Place, Date: / Lieu, date:

Furtwangen, 04.01.2022

Diese Original - Erklärung bescheinigt die Übereinstimmung mit den genannten Richtlinien, beinhaltet jedoch keine Zusicherung von Eigenschaften. Die Sicherheitshinweise der Produktdokumentation sind zu beachten.
This original declaration confirms the conformity of the mentioned directives but does not comprise any guarantee of the product characteristics. The safety directives of the product documentation are to be considered.
Cette déclaration originale certifie la conformité des directives nommées mais ne comprend aucune garantie des caractéristiques du produit. Les directives de sécurité de la documentation du produit sont à considérer.

DE	**Notizen**
EN	**Notice**
FR	**Note**