SIEMENS

Data sheet 3TK2850-1AL20

SIRIUS safety relay with contactor relay enabling circuits (EC) 230 V DC, 90 mm Screw terminal EC instantaneous: 3 NO EC delayed: 0 SC: 0 Autostart/monitored start Basic device Maximum achieved SIL: 2, PL: d

product brand name	SIRIUS
product designation	safety relays
design of the product	for EMERGENCY-STOP and safety doors
General technical data	
protection class IP of the enclosure	IP20
protection class IP of the terminal	IP20
touch protection against electrical shock	finger-safe
insulation voltage rated value	690 V
ambient temperature	
● during storage	-40 ... +80 °C
● during operation	-25 ... +60 °C
air pressure according to SN 31205	90 ... 106 kPa
relative humidity during operation	10 ... 95 %
installation altitude at height above sea level maximum	2 000 m
vibration resistance according to IEC 60068-2-6	5 ... 500 Hz: 0,075 mm
shock resistance	5g / 11 ms
surge voltage resistance rated value	6 000 V
EMC emitted interference	IEC 60947-5-1, IEC 60000-4-3, IEC 60000-4-5, IEC 60000-4-6
installation environment regarding EMC	This product is suitable for Class A environments only. In household environments, this device can cause unwanted radio interference. The user is required to implement appropriate measures in this case.
reference code according to DIN 40719 extended according to IEC 204-2 according to IEC 750	KT
reference code according to EN 61346-2	F
contact reliability	one incorrect switching operation of 100 million switching operations (17 V, 5 mA)
number of sensor inputs	
● 1-channel or 2-channel	1
design of the cascading	none
type of the safety-related wiring of the inputs	single-channel and two-channel
product feature cross-circuit-proof	Yes
Safety Integrity Level (SIL)	
● according to IEC 61508	2
SIL Claim Limit (subsystem) according to EN 62061	2
category according to EN ISO 13849-1	3
hardware fault tolerance according to IEC 61508	1
safety device type according to IEC 61508-2	Type B
PFHD with high demand rate according to EN 62061	0.000000012 1/h
T1 value for proof test interval or service life according to IEC 61508	20 y
number of outputs as contact-affected switching element	

● as NC contact	
— for signaling function instantaneous contact	0
● as NO contact	
— safety-related instantaneous contact	3
— safety-related delayed switching	0
number of outputs as contact-less semiconductor switching element	
● safety-related	
— delayed switching	0
— instantaneous contact	0
● for signaling function	
— delayed switching	0
— instantaneous contact	0
stop category according to EN 60204-1	0
Inputs	
design of input	
● cascading input/functional switching	No
● feedback input	Yes
● start input	Yes
Outputs	
type of electrical connection plug-in socket	Yes
operating frequency maximum	1 000 1/h
switching capacity current	
● of the NO contacts of the relay outputs at DC-13	
— at 24 V	10 A
— at 115 V	1 A
— at 230 V	0.3 A
● of the NO contacts of the relay outputs at AC-15	
— at 115 V	6 A
— at 230 V	6 A
● of the NC contacts of the relay outputs at DC-13	
— at 24 V	10 A
— at 115 V	1 A
— at 230 V	0.3 A
● of the NC contacts of the relay outputs at AC-15	
— at 115 V	6 A
— at 230 V	6 A
mechanical service life (operating cycles) typical	30 000 000
maximum permissible voltage for safe isolation between electronics evaluation device and enabling circuit according to EN 60947-1	400 V
design of the fuse link for short-circuit protection of the NO contacts of the relay outputs required	gL/gG: 10 A
DC resistance of the cable maximum	250 Ω
wire length between sensor and electronics evaluation device with Cu 1.5 mm² and 150 nF/km maximum	2 000 m
Times	
make time with automatic start	
● typical	100 ms
● at AC maximum	200 ms
make time with automatic start after power failure	
● typical	350 ms
● maximum	500 ms
make time with monitored start	
● maximum	100 ms
● typical	60 ms
backslide delay time after opening of the safety circuits typical	30 ms
backslide delay time in the event of power failure	
● typical	100 ms
● maximum	120 ms
recovery time after opening of the safety circuits typical	20 ms
recovery time after power failure typical	0.02 s

pulse duration	
● of the sensor input minimum	20 ms
● of the ON pushbutton input minimum	0.02 s
● of the cascading input minimum	0.02 s
Control circuit/ Control	
type of voltage of the control supply voltage	AC
control supply voltage frequency	
● 1 rated value	50 Hz
● 2 rated value	60 Hz
control supply voltage 1 at AC	
● at 50 Hz rated value	230 V
● at 60 Hz rated value	230 V
operating range factor control supply voltage rated value of magnet coil	
● at AC	
— at 50 Hz	0.9 ... 1.15
— at 60 Hz	0.9 ... 1.15
Auxiliary circuit	
contact reliability of auxiliary contacts	< 1 error per 100 million operating cycles
Installation/ mounting/ dimensions	
mounting position	any
fastening method	screw and snap-on mounting
width	90 mm
height	132 mm
depth	108 mm
Connections/ Terminals	
type of electrical connection	screw-type terminals
type of connectable conductor cross-sections	
● solid	1x (0.2 ... 2.5 mm²), 2x (0.2 ... 1.0 mm²)
● finely stranded	
— with core end processing	1x (0.25 ... 2.5 mm²), 2x (0.25 ... 1.0 mm²)
type of connectable conductor cross-sections at AWG cables	
● solid	2x (24 ... 18)
● stranded	2x (24 ... 18)
Product Function	
product function	
● light barrier monitoring	No
● standstill monitoring	No
● protective door monitoring	Yes
● automatic start	Yes
● magnetically operated switch monitoring NC-NO	No
● rotation speed monitoring	No
● laser scanner monitoring	No
● monitored start-up	Yes
● light array monitoring	No
● magnetically operated switch monitoring NC-NC	Yes
● EMERGENCY OFF function	Yes
● pressure-sensitive mat monitoring	No
suitability for interaction press control	No
suitability for use	
● monitoring of floating sensors	Yes
● monitoring of non-floating sensors	No
● safety switch	Yes
● position switch monitoring	Yes
● EMERGENCY-OFF circuit monitoring	Yes
● valve monitoring	No
● tactile sensor monitoring	No
● magnetically operated switch monitoring	No
● safety-related circuits	Yes
Certificates/ approvals	
certificate of suitability	UL, CSA, EN 60204-1, EN ISO 12100, EN 954-1, IEC 61508
● TÜV (German technical inspectorate) certificate	Yes

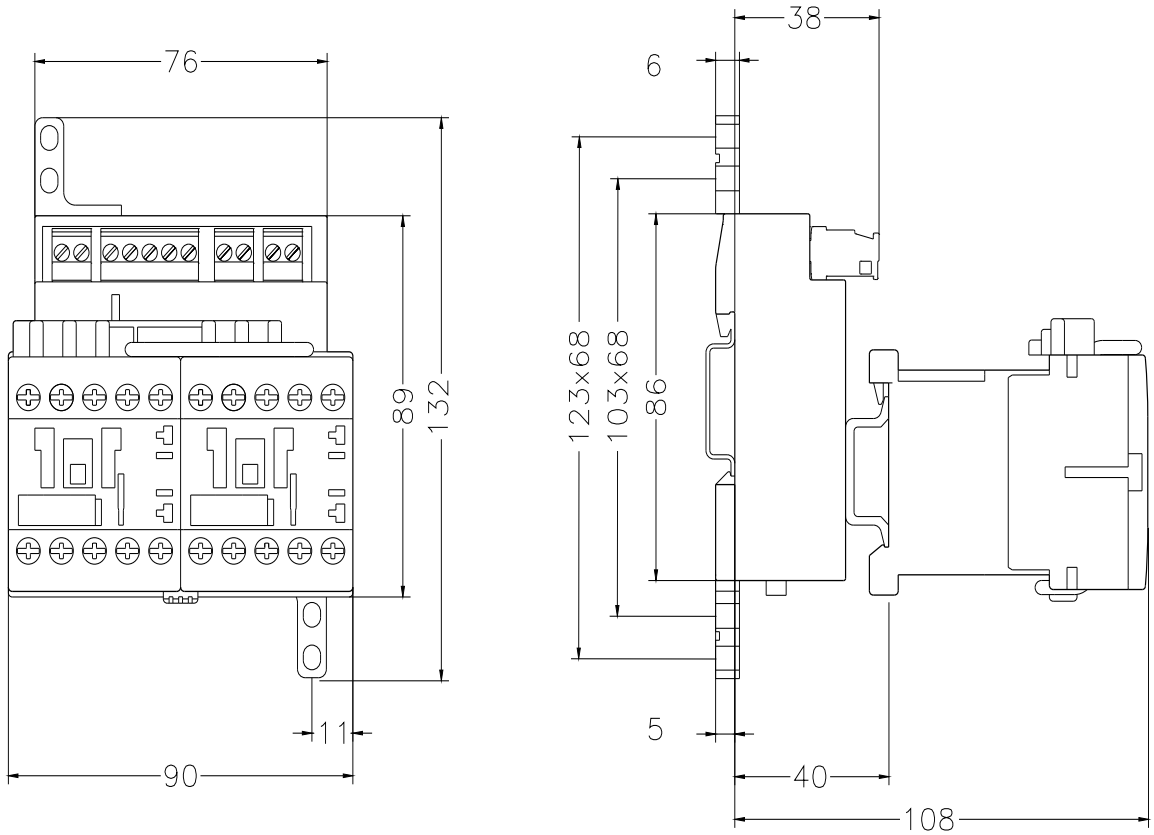
● UL approval	Yes
● BG BIA approval	Yes

General Product Approval	EMC	Functional Safety/Safety of Machinery
CSA CCC UL EAC RCM		Type Examination Certificate

Test Certificates	other
Special Test Certific-ate	Confirmation

Further information

Information- and Downloadcenter (Catalogs, Brochures,…)
https://www.siemens.com/ic10
Industry Mall (Online ordering system)
https://mall.industry.siemens.com/mall/en/en/Catalog/product?mlfb=3TK2850-1AL20
Cax online generator
http://support.automation.siemens.com/WW/CAXorder/default.aspx?lang=en&mlfb=3TK2850-1AL20
Service&Support (Manuals, Certificates, Characteristics, FAQs,...)
https://support.industry.siemens.com/cs/ww/en/ps/3TK2850-1AL20
Image database (product images, 2D dimension drawings, 3D models, device circuit diagrams, EPLAN macros, ...)
http://www.automation.siemens.com/bilddb/cax_de.aspx?mlfb=3TK2850-1AL20&lang=en



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