



SIRIUS safety relay with relay enabling circuits (EC) 230 V AC, 22.5 mm Screw terminal Basic device Auto-start, monitored start EC instantaneous: 3 NO EC delayed: 0 NO SC: 1NC max. error category EN 13849-1: 4 Maximum achievable PL according to EN 13849-1: e Maximum achievable SIL according to IEC 61508: 3

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	IP40
protection class IP of the terminal	IP20
touch protection against electrical shock	finger-safe
insulation voltage rated value	300 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: 0.75 mm
shock resistance	15g / 11 ms
surge voltage resistance rated value	4 000 V
EMC emitted interference	IEC 60947-5-1, IEC 61000
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 EN 61346-2	F
number of sensor inputs	1
• 1-channel or 2-channel	
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	3
SIL Claim Limit (subsystem) according to EN 62061	3
category according to EN ISO 13849-1	4
hardware fault tolerance according to IEC 61508	1
safety device type according to IEC 61508-2	Type A
PFHD with high demand rate according to EN 62061	0.00000000094 1/h
Average probability of failure on demand (PFDavg) with low demand rate acc. to IEC 61508	0.00000083 1/y
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	
• as NO contact	1

— 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	
• feedback input	Yes
• start input	Yes

Outputs

type of electrical connection plug-in socket	No
operating frequency maximum	2 000 1/h
switching capacity current	
• of the NO contacts of the relay outputs at DC-13	
— at 24 V	4 A
— at 115 V	0.2 A
— at 230 V	0.1 A
• of the NO contacts of the relay outputs at AC-15	
— at 24 V	4 A
— at 115 V	4 A
— at 230 V	4 A
• of the NC contacts of the relay outputs at DC-13	
— at 24 V	4 A
— at 115 V	0.2 A
— at 230 V	0.1 A
• of the NC contacts of the relay outputs at AC-15	
— at 24 V	4 A
— at 115 V	4 A
— at 230 V	4 A
thermal current of the switching element with contacts maximum	5 A
electrical endurance (operating cycles) typical	200 000
mechanical service life (operating cycles) typical	10 000 000
design of the fuse link for short-circuit protection of the NO contacts of the relay outputs required	gL/gG: 10 A or quick-response: 10 A or MCB type B: 2 A or MCB type C: 1.6 A or SITOP select diagnostics module (order No.: 6EP1961-2BA00)
DC resistance of the cable maximum	50 Ω
wire length between sensor and electronics evaluation device with Cu 1.5 mm² and 150 nF/km maximum	1 000 m

Times

make time with automatic start	
• typical	400 ms
make time with automatic start after power failure	
• typical	110 ms
• maximum	170 ms
make time with monitored start	
• maximum	30 ms
• typical	20 ms
backslide delay time after opening of the safety circuits typical	8 ms
backslide delay time in the event of power failure	
• typical	40 ms
• maximum	45 ms
recovery time after opening of the safety circuits typical	20 ms
recovery time after power failure typical	60 ms
pulse duration	
• of the sensor input minimum	35 ms

- of the ON pushbutton input minimum

35 ms

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	0.85 ... 1.1
— at 60 Hz	0.85 ... 1.1

Installation/ mounting/ dimensions

mounting position	any
fastening method	snap-on mounting
width	22.5 mm
height	103.6 mm
depth	118 mm

Connections/ Terminals

type of electrical connection	screw-type terminals
type of connectable conductor cross-sections	
• solid	1x (0.5 ... 2.5 mm ²), 2x (0.5 ... 1.5 mm ²)
• finely stranded	
— with core end processing	1x (0.5 ... 2.5 mm ²), 2x (0.5 ... 1 mm ²)
— without core end processing	1x (0.5 ... 2.5 mm ²), 2x (0.5 ... 1.5 mm ²)
type of connectable conductor cross-sections at AWG cables	
• solid	1x (20 ... 14), 2x (20 ... 16)
• stranded	1x (20 ... 14), 2x (20 ... 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	Yes
• safety-related circuits	Yes

Certificates/ approvals

certificate of suitability	UL / CSA
• TÜV (German technical inspectorate) certificate	Yes
• UL approval	Yes
• BG BIA approval	No

General Product Approval

EMC

Functional Safety/Safety of



[Type Examination Certificate](#)

Test Certificates

other

[Type Test Certificates/Test Report](#)

[Special Test Certificate](#)

[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=3TK2820-1AL20>

Cax online generator

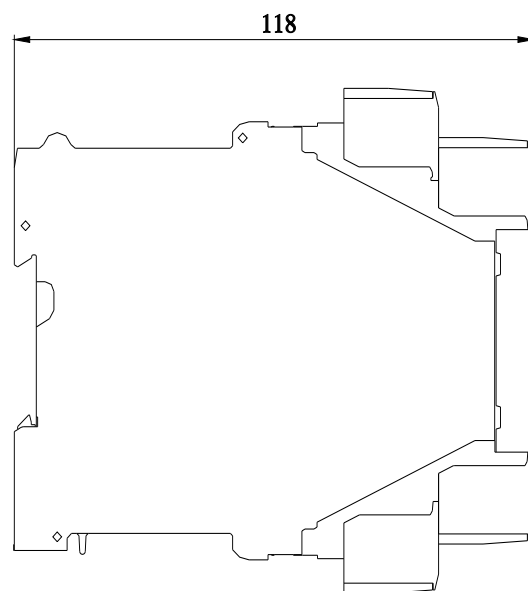
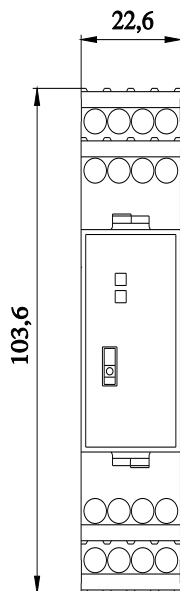
<http://support.automation.siemens.com/WW/CAXorder/default.aspx?lang=en&mlfb=3TK2820-1AL20>

Service&Support (Manuals, Certificates, Characteristics, FAQs,...)

<https://support.industry.siemens.com/cs/ww/en/ps/3TK2820-1AL20>

Image database (product images, 2D dimension drawings, 3D models, device circuit diagrams, EPLAN macros, ...)

http://www.automation.siemens.com/bilddb/cax_de.aspx?mlfb=3TK2820-1AL20&lang=en



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