



SIRIUS SAFETY RELAY WITH RELAY ENABLING CIRCUITS,  
 230 V AC, 22.5MM, SCREW CONNECTION,  
 BASIC UNIT, AUTO START,  
 MONITORED START INSTANTANEOUS: 3S,  
 DELAYED: 0S, SIGNALING CIRCUIT: 1NC,  
 MAX. ERR. CAT. EN954-1: 4 SIL: 3,  
 PL: E SIL: 3, PL: E

General technical details:

<b>product brand name</b>		SIRIUS
<b>product designation</b>		safety relays
<b>Design of the product</b>		for EMERGENCY-STOP units
<b>protection class IP / of the housing</b>		IP40
<b>Protection class IP / of the terminal</b>		IP20
<b>Protection against electrical shock</b>		finger-safe
<b>Insulation voltage / rated value</b>	V	300
<b>Ambient temperature</b>		
• during storage	°C	-40 ... +80
• during operating	°C	-25 ... +60
<b>Air pressure</b>		
• according to SN 31205	kPa	90 ... 106
<b>Relative humidity</b>		
• during operating phase	%	10 ... 95
<b>Installation altitude / at a height over sea level / maximum</b>	m	2,000
<b>Resistance against vibration / according to IEC 60068-2-6</b>		5 ... 500 Hz: 0,75 mm
<b>Resistance against shock</b>		15g / 11 ms
<b>Impulse voltage resistance / rated value</b>	V	4,000
<b>EMC emitted interference</b>		IEC 60947-5-1, IEC 61000

<b>Installation environment relating to EMC</b>		This product is suitable for Class A environments only. It can cause undesired radio-frequency interference in residential environments. If this is the case, the user must take appropriate measures.
<b>Item designation</b> • according to DIN EN 61346-2		F
<b>Number of sensor inputs</b> • 1-channel or 2-channel		1
<b>Type of the safety-related wiring / of the inputs</b>		single-channel and two-channel
<b>Product feature / transverse contact-secure</b>		Yes
<b>safety Integrated Level</b> • according to IEC 61508		SIL3
<b>SIL claim limit (for a subsystem) / according to EN 62061</b>		3
<b>Performance Level (PL)</b> • according to ISO 13849-1		e
<b>Category / according to ISO 13849-1</b>		4
<b>Hardware fault tolerance / according to IEC 61508</b>		1
<b>Safety device type / according to IEC 61508-2</b>		Type A
<b>Probability of dangerous failure per hour (PFHD) / with high demand rate / according to EN 62061</b>	1/h	0.94E-9
<b>Average probability of failure on demand (PFDavg) / with low demand rate / according to IEC 61508</b>	1/h	0.831E-6
<b>T1 value / for proof test interval or service life / according to IEC 61508</b>	a	20
<b>Number of outputs / as contact-affected switching element</b> • as NC contact / for reporting function / instantaneous switching • as NO contact / safety-related / instantaneous switching • as NO contact / safety-related/ delayed switching		1 3 0
<b>Number of outputs / as contact-less semiconductor switching element</b> • safety-related • delayed switching • non-delayed • for reporting function • delayed switching • non-delayed		0 0 0 0
<b>Stop category / according to DIN EN 60204-1</b>		0

#### General technical details:

<b>Design of the input</b> • reducing-entrance • start-up entrance		Yes Yes
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<b>Design of the electrical connection / jumper socket</b>		No
<b>Operating cycles / maximum</b>	1/h	2,000
<b>Switching capacity current</b>		
• of NO contacts of relay outputs		
• at DC-13		
• at 24 V	A	4
• at 115 V	A	0.2
• at 230 V	A	0.1
• at AC-15		
• at 24 V	A	4
• at 115 V	A	4
• at 230 V	A	4
• of NC contacts of relay outputs		
• at DC-13		
• at 24 V	A	4
• at 115 V	A	0.2
• at 230 V	A	0.1
• at AC-15		
• at 24 V	A	4
• at 115 V	A	4
• at 230 V	A	4
<b>Thermal current / of the contact-affected switching element / maximum</b>	A	5
<b>Electrical operating cycles as operating time / typical</b>		200,000
<b>Mechanical operating cycles as operating time / typical</b>		10,000,000
<b>Design of the fuse link / for short-circuit protection of the NO contacts of the relay outputs / required</b>		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)
<b>Resistance to direct current / of the cable / maximum</b>	Ω	50
<b>Cable length / between sensor and electronic evaluation device / with Cu 1.5 mm<sup>2</sup> and 150 nF/km / maximum</b>	m	1,000
<b>Make time / with automatic start</b>		
• typical	ms	400
<b>Make time / with automatic start / after mains power cut</b>		
• typical	ms	110
• maximum	ms	170
<b>Make time / with monitored start</b>		
• maximum	ms	30
• typical	ms	20
<b>Backslide delay time / after opening of the safety circuits / typical</b>	ms	8
<b>Backslide delay time / at mains power cut</b>		

• typical	ms	40
• maximum	ms	45
<b>Recovery time / after opening of the safety circuits / typical</b>	ms	20
<b>Recovery time / after mains power cut / typical</b>	ms	60
<b>Pulse duration</b>		
• of the sensor input / minimum	ms	35
• of the ON pushbutton input / minimum	ms	35

Control circuit:		
<b>Type of voltage / of the controlled supply voltage</b>		AC
<b>Control supply voltage frequency</b>		
• 1 / rated value	Hz	50
• 2 / rated value	Hz	60
<b>Control supply voltage / 1 / at 50 Hz / for AC / rated value</b>	V	230
<b>Control supply voltage / 1 / at 60 Hz / for AC / rated value</b>	V	230
<b>operating range factor control supply voltage rated value / of the magnet coil</b>		
• at 50 Hz		0.85 ... 1.1
• for AC		
• at 60 Hz		0.85 ... 1.1
• for AC		

Installation/mounting/dimensions:		
<b>Built in orientation</b>		any
<b>Type of mounting</b>		snap-on mounting
<b>Width</b>	mm	22.5
<b>Height</b>	mm	103.6
<b>Depth</b>	mm	118

Connections:		
<b>Design of the electrical connection</b>		screw-type terminals
<b>Type of the connectable conductor cross-section</b>		
• solid		1x (0.5 ... 2.5 mm <sup>2</sup> ), 2x (0.5 ... 1.5 mm <sup>2</sup> )
• finely stranded		
• with wire end processing		1x (0.5 ... 2.5 mm <sup>2</sup> ), 2x (0.5 ... 1 mm <sup>2</sup> )
• without wire end processing		1x (0.5 ... 2.5 mm <sup>2</sup> ), 2x (0.5 ... 1.5 mm <sup>2</sup> )
<b>Type of the connectable conductor cross-section / for AWG conductors</b>		
• solid		2x (20 ... 14)
• stranded		2x (20 ... 14)

## Product Function:

### Product function

• light barrier monitoring	No
• standstill monitoring	No
• protective door monitoring	Yes
• automatic start	Yes
• magnetic switch monitoring Normally closed contact-Normally open contact	No
• rotation speed monitoring	No
• laser scanner monitoring	No
• monitored start-up	Yes
• light grid monitoring	No
• magnetic switch monitoring Normally closed contact-Normally closed contact	Yes
• emergency stop function	Yes
• step mat monitoring	No

### Suitability for interaction / pressing control

No

### Acceptability for application

• monitoring of floating sensors	Yes
• monitoring of non-floating sensors	No
• safety cut-out switch	Yes
• position switch monitoring	Yes
• EMERGENCY-OFF circuit monitoring	Yes
• valve monitoring	No
• tactile sensor monitoring	No
• magnetically operated switches monitoring	Yes
• safety-related circuits	Yes

## Certificates/approvals:

### Verification of suitability

• TÜV (German technical inspectorate) certificate	UL / CSA
• UL-registration	Yes
	Yes

### General Product Approval



CCC



CSA



GOST



UL

## Further information:

### Information- and Downloadcenter (Catalogs, Brochures,...)

<http://www.siemens.com/industrial-controls/catalogs>

### Industry Mall (Online ordering system)

<http://www.siemens.com/industrial-controls/mall>

Cax online generator:

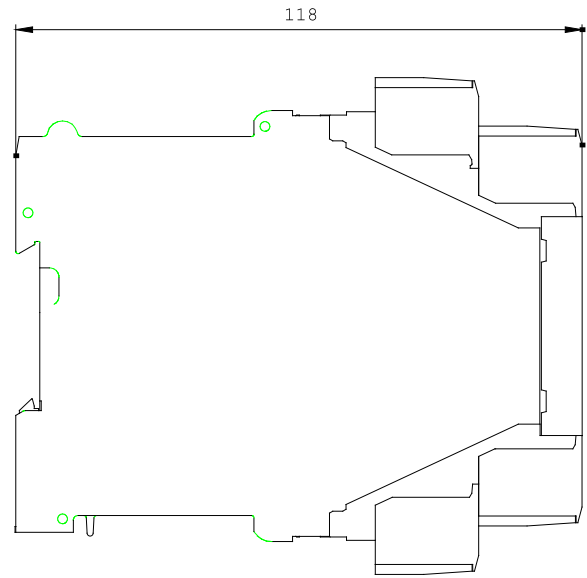
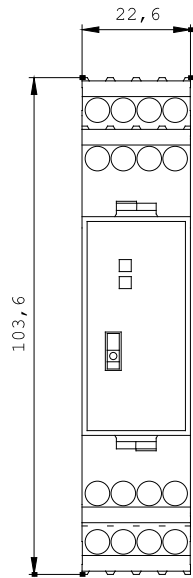
<http://www.siemens.com/cax>

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

<http://support.automation.siemens.com/WW/view/en/3TK2820-1AL20/all>

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

[http://www.automation.siemens.com/bilddb/cax\\_en.aspx?mlfb=3TK2820-1AL20](http://www.automation.siemens.com/bilddb/cax_en.aspx?mlfb=3TK2820-1AL20)



last change:

Apr 9, 2012