



SIRIUS safety relay Basic unit Advanced series Relay enabling circuits 3 NO contacts plus Relay signaling circuit 1 NC contact  $U_s = 24\text{ V DC}$  Spring-type terminal (push-in)

<b>product brand name</b>	SIRIUS
<b>product category</b>	Safety relays
<b>product designation</b>	safety relays
<b>design of the product</b>	Relay enabling circuits
<b>product type designation</b>	3SK1
<b>product line</b>	Advanced basic unit
<b>Product Function</b>	
<b>product function parameterizable</b>	sensor floating / sensor non-floating, monitored start-up / automatic start, 1-channel / 2-channel sensor connection, cross-circuit detection, startup testing, antivalent sensors, 2-hand switches
<b>product function</b>	
<ul style="list-style-type: none"> <li>• automatic start</li> <li>• light barrier monitoring</li> <li>• protective door monitoring</li> <li>• magnetically operated switch monitoring NC-NO</li> <li>• magnetically operated switch monitoring NC-NC</li> <li>• laser scanner monitoring</li> <li>• light array monitoring</li> <li>• EMERGENCY OFF function</li> <li>• monitored start-up</li> <li>• pressure-sensitive mat monitoring</li> </ul>	<ul style="list-style-type: none"> <li>Yes</li> <li>Yes</li> <li>Yes</li> <li>Yes</li> <li>Yes</li> <li>Yes</li> <li>Yes</li> <li>Yes</li> <li>Yes</li> <li>No</li> </ul>
<b>product feature cross-circuit-proof</b>	Yes
<b>suitability for interaction press control</b>	Yes
<b>suitability for operation device connector 3ZY12</b>	Yes
<b>suitability for use</b>	
<ul style="list-style-type: none"> <li>• monitoring of floating sensors</li> <li>• monitoring of non-floating sensors</li> <li>• position switch monitoring</li> <li>• EMERGENCY-OFF circuit monitoring</li> <li>• opto-electronic protection device monitoring</li> <li>• magnetically operated switch monitoring</li> <li>• safety switch</li> <li>• safety-related circuits</li> </ul>	<ul style="list-style-type: none"> <li>Yes</li> <li>Yes</li> <li>Yes</li> <li>Yes</li> <li>Yes</li> <li>Yes</li> <li>Yes</li> <li>Yes</li> </ul>
<b>General technical data</b>	
certificate of suitability UL approval	Yes
<b>power loss [W] maximum</b>	2 W
<b>insulation voltage rated value</b>	300 V
<b>degree of pollution</b>	3
<b>overvoltage category</b>	3
<b>surge voltage resistance rated value</b>	4 000 V

protection class IP of the enclosure	IP20
<b>shock resistance</b>	10 g / 11 ms
<b>vibration resistance according to IEC 60068-2-6</b>	5 ... 500 Hz: 0.75 mm
<b>operating frequency maximum</b>	360 1/h
<b>reference code according to IEC 81346-2</b>	F
<b>Substance Prohibitance (day/month/year)</b>	11/05/2012
<b>SVHC substance name</b>	Lead CAS-No. 7439-92-1 Lead monoxide (lead oxide) CAS-No. 1317-36-8 2-methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one CAS-No. 71868-10-5 Melamine CAS-No. 108-78-1 6,6'-di-tert-butyl-2,2'-methylenedi-p-cresol CAS-No. 119-47-1 4,4'-isopropylidenediphenol (Bisphenol A, BPA) CAS-No. 80-05-7
<b>Net Weight</b>	0.245 kg
<b>Ambient conditions</b>	
installation altitude at height above sea level maximum	4 000 m
• note	Derating, see Product Notification 109792701
<b>ambient temperature</b>	
• during operation	-25 ... +60 °C
• during storage	-40 ... +80 °C
relative humidity during operation	10 ... 95 %
air pressure according to SN 31205	900 ... 1 060 hPa
<b>Electromagnetic compatibility</b>	
<b>installation environment regarding EMC</b>	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.
<b>EMC emitted interference</b>	IEC 60947-5-1, Class A
<b>Safety related data</b>	
product function suitable for safety function	Yes
<b>safe state</b>	Safety outputs switched off
<b>test wear-related service life necessary</b>	Yes
<b>function test interval maximum</b>	1 a
<b>diagnostics test interval by internal test function maximum</b>	600 s
<b>stop category according to IEC 60204-1</b>	0
<b>IEC 62061</b>	
SIL Claim Limit (subsystem) according to EN 62061	3
<b>Safety Integrity Level (SIL)</b>	
• according to IEC 62061	SIL 3
• at single-channel evaluation according to IEC 62061	1
• at 2-channel evaluation according to IEC 62061	3
<b>PFHD with high demand rate according to IEC 62061</b>	0,0000000025
<b>ISO 13849</b>	
category according to EN ISO 13849-1	4
<b>performance level (PL)</b>	
• according to ISO 13849-1	PL e
• at single-channel evaluation according to ISO 13849-1	c
• at 2-channel evaluation according to ISO 13849-1	e
<b>category</b>	
• according to ISO 13849-1	4
• at 2-channel evaluation according to ISO 13849-1	4
<b>overdimensioning according to ISO 13849-2 necessary</b>	No
<b>IEC 61508</b>	
<b>Safety Integrity Level (SIL)</b>	
• according to IEC 61508	3
• at single-channel evaluation according to IEC 61508	1
• at 2-channel evaluation according to IEC 61508	3
<b>safety device type according to IEC 61508-2</b>	Type B
<b>PFHD with high demand rate according to IEC 61508</b>	0,0000000025
<b>Safe failure fraction (SFF)</b>	99 %
<b>hardware fault tolerance</b>	
• according to IEC 61508	1

<ul style="list-style-type: none"> <li>• at single-channel evaluation according to IEC 61508</li> <li>• at 2-channel evaluation according to IEC 61508</li> </ul>	<p>0</p> <p>1</p>
<b>T1 value</b>	
<ul style="list-style-type: none"> <li>• of service life according to IEC 61508</li> <li>• for proof test interval or service life according to IEC 61508</li> </ul>	<p>20 a</p> <p>20 a</p>
<b>Electrical Safety</b>	
<b>touch protection against electrical shock</b>	finger-safe
<b>Short-circuit protection</b>	
<b>design of the fuse link</b>	
<ul style="list-style-type: none"> <li>• for short-circuit protection of the NO contacts of the relay outputs required</li> <li>• for short circuit protection of the NC contacts of the relay outputs required</li> </ul>	<p>gL/gG: 6A or circuit breaker type A: 3A or circuit breaker type B: 2A or circuit breaker type C: 1A</p> <p>Diazed or Neozed fuses, operating class gL/gG: 6 A or MCB type A: 2 A or MCB type B: 2 A or MCB type C: 1 A</p>
<b>Inputs</b>	
<b>design of input</b>	
<ul style="list-style-type: none"> <li>• cascading input/functional switching</li> <li>• feedback input</li> <li>• start input</li> </ul>	<p>Yes</p> <p>Yes</p> <p>Yes</p>
pulse duration of the sensor input minimum	75 ms
number of sensor inputs 1-channel or 2-channel	1
<b>Outputs</b>	
<b>number of outputs as contact-affected switching element</b>	
<ul style="list-style-type: none"> <li>• as NC contact <ul style="list-style-type: none"> <li>— for signaling function instantaneous contact</li> </ul> </li> <li>• as NO contact <ul style="list-style-type: none"> <li>— safety-related instantaneous contact</li> <li>— safety-related delayed switching</li> </ul> </li> </ul>	<p>1</p> <p>3</p> <p>0</p>
<b>mechanical service life (operating cycles) typical</b>	10 000 000
<b>thermal current of the switching element with contacts maximum</b>	5 A
<b>switching capacity current of the NO contacts of the relay outputs at DC-13</b>	
<ul style="list-style-type: none"> <li>• at 24 V</li> <li>• at 115 V</li> <li>• at 230 V</li> </ul>	<p>5 A</p> <p>0.2 A</p> <p>0.1 A</p>
<b>switching capacity current of the NO contacts of the relay outputs at AC-15</b>	
<ul style="list-style-type: none"> <li>• at 115 V</li> <li>• at 230 V</li> </ul>	<p>5 A</p> <p>5 A</p>
<b>switching capacity current of the NC contacts of the relay outputs at DC-13</b>	
<ul style="list-style-type: none"> <li>• at 24 V</li> <li>• at 115 V</li> <li>• at 230 V</li> </ul>	<p>1 A</p> <p>0.2 A</p> <p>0.1 A</p>
<b>switching capacity current of the NC contacts of the relay outputs at AC-15</b>	
<ul style="list-style-type: none"> <li>• at 24 V</li> <li>• at 115 V</li> <li>• at 230 V</li> </ul>	<p>2 A</p> <p>1.5 A</p> <p>1.5 A</p>
<b>total current maximum</b>	12 A
<b>operational current at 17 V minimum</b>	5 mA
<b>Times</b>	
<b>make time with automatic start</b>	
<ul style="list-style-type: none"> <li>• at DC maximum</li> </ul>	110 ms
<b>make time with automatic start after power failure</b>	
<ul style="list-style-type: none"> <li>• typical</li> <li>• maximum</li> </ul>	<p>6 500 ms</p> <p>6 500 ms</p>
<b>make time with monitored start</b>	
<ul style="list-style-type: none"> <li>• maximum</li> </ul>	110 ms
<b>backslide delay time after opening of the safety circuits</b>	40 ms

<b>typical</b>	
<b>backslide delay time in the event of power failure</b>	
• typical	30 ms
• maximum	50 ms
<b>recovery time after opening of the safety circuits typical</b>	30 ms
<b>recovery time after power failure typical</b>	6.5 s
<b>pulse duration</b>	
• of the ON pushbutton input minimum	0.15 s

#### Control circuit/ Control

<b>type of voltage of the control supply voltage</b>	DC
<b>control supply voltage at DC rated value</b>	24 V
<b>operating range factor control supply voltage rated value of magnet coil at DC</b>	
• initial value	0.8
• full-scale value	1.2

#### Installation/ mounting/ dimensions

<b>mounting position</b>	any
<b>fastening method</b>	screw and snap-on mounting
<b>height</b>	100 mm
<b>width</b>	22.5 mm
<b>depth</b>	121.5 mm
<b>required spacing</b>	
• for grounded parts at the side	5 mm

#### Connections/ Terminals

<b>type of electrical connection</b>	spring-loaded terminal (push-in)
<b>wire length</b>	
• with Cu 1.5 mm <sup>2</sup> and 150 nF/km per sensor circuit maximum	4 000 m
<b>type of connectable conductor cross-sections</b>	
• solid	1x (0.5 ... 1.5 mm <sup>2</sup> ), 2x (0.5 ... 1.5 mm <sup>2</sup> )
• finely stranded with core end processing	1x (0.5 ... 1.0 mm <sup>2</sup> ), 2x (0.5 ... 1.0 mm <sup>2</sup> )
• finely stranded without core end processing	1x (0.5 ... 1.5 mm <sup>2</sup> ), 2x (0.5 ... 1.5 mm <sup>2</sup> )
• for AWG cables solid	1x (20 ... 16), 2x (20 ... 16)
• for AWG cables stranded	1x (20 ... 16), 2x (20 ... 16)
<b>type of electrical connection plug-in socket</b>	No

#### Approvals Certificates

<b>Environment</b>	<b>General Product Approval</b>				
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[Environmental Con-  
firmations](#)



<b>General Product Ap- proval</b>	<b>EMV</b>	<b>Functional Safety</b>	<b>Test Certificates</b>	<b>Maritime application</b>
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[Type Examination Cer-  
tificate](#)

[Type Test Certific-  
ates/Test Report](#)



<b>Maritime application</b>	<b>other</b>				
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[Confirmation](#)

[Confirmation](#)



#### Railway

**Further information**

**Information on the packaging**

<https://support.industry.siemens.com/cs/ww/en/view/109813875>

**Information for data generation and storage**

<https://support.industry.siemens.com/cs/ww/en/view/109995012>

**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=3SK1121-2AB40>

**Cax online generator**

<https://support.automation.siemens.com/WW/CAXorder/default.aspx?lang=en&mlfb=3SK1121-2AB40>

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

<https://support.industry.siemens.com/cs/ww/en/ps/3SK1121-2AB40>

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

[https://www.automation.siemens.com/bilddb/cax\\_de.aspx?mlfb=3SK1121-2AB40&lang=en](https://www.automation.siemens.com/bilddb/cax_de.aspx?mlfb=3SK1121-2AB40&lang=en)



