

Fail-safe digital module DM-F local, for fail-safe shutdown via hardware signal Us: 24 V DC 2 relay enabling circuits, 2 relay outputs, safety function can be set via DIP switch, maximum achievable SIL IEC 61508: 3, maximum achievable PL ISO 13849-1: E



product brand name	SIRIUS
Product designation	Fail-safe digital module
Design of the product	for emergency off and safety doors
Product type designation	DM-FL

General technical data	
• Product function EMERGENCY OFF function	Yes
• Product function Automatic start	Yes
• Product function Light barrier monitoring	Yes
• Product function Light array monitoring	Yes
• Product function protective door monitoring	Yes
• Product function magnetically operated switch monitoring NC-NO	Yes
• Product function magnetically operated switch monitoring NC-NC	Yes
• Product feature cross-circuit-proof	Yes
• Product function Pressure-sensitive mat monitoring	Yes
• Product function monitored start-up	Yes
Product component	

<ul style="list-style-type: none"> <li>• input for thermistor connection</li> </ul>	No
<ul style="list-style-type: none"> <li>• Digital input</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• input for analog temperature sensors</li> </ul>	No
<ul style="list-style-type: none"> <li>• input for ground fault detection</li> </ul>	No
<ul style="list-style-type: none"> <li>• Relay output</li> </ul>	Yes
<b>consumed active power</b>	3 W
<ul style="list-style-type: none"> <li>• Insulation voltage with degree of pollution 3 at AC rated value</li> </ul>	300 V
<b>Surge voltage resistance rated value</b>	4 000 V
<ul style="list-style-type: none"> <li>• Protection class IP</li> </ul>	IP20
<b>Shock resistance</b>	
<ul style="list-style-type: none"> <li>• acc. to IEC 60068-2-27</li> </ul>	15g / 11 ms
<b>Vibration resistance</b>	
<ul style="list-style-type: none"> <li>• acc. to IEC 60068-2-6</li> </ul>	1 ... 6 Hz: 15 mm, 6 ... 500 Hz: 2g
<b>Operating frequency maximum</b>	360 1/h
<b>Switching capacity current of the NO contacts of the relay outputs at AC-15</b>	
<ul style="list-style-type: none"> <li>• at 24 V</li> </ul>	3 A
<ul style="list-style-type: none"> <li>• at 120 V</li> </ul>	3 A
<ul style="list-style-type: none"> <li>• at 240 V</li> </ul>	1.5 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> </ul>	4 A
<ul style="list-style-type: none"> <li>• at 60 V</li> </ul>	0.55 A
<ul style="list-style-type: none"> <li>• at 125 V</li> </ul>	0.22 A
<ul style="list-style-type: none"> <li>• at 250 V</li> </ul>	0.11 A
<b>Switching capacity current of relay enabling circuits at AC-15</b>	
<ul style="list-style-type: none"> <li>• at 24 V</li> </ul>	3 A
<ul style="list-style-type: none"> <li>• at 120 V</li> </ul>	3 A
<ul style="list-style-type: none"> <li>• at 240 V</li> </ul>	1.5 A
<b>Switching capacity current of relay enabling circuits at DC-13</b>	
<ul style="list-style-type: none"> <li>• at 24 V</li> </ul>	4 A
<ul style="list-style-type: none"> <li>• at 60 V</li> </ul>	0.55 A
<ul style="list-style-type: none"> <li>• at 125 V</li> </ul>	0.22 A
<ul style="list-style-type: none"> <li>• at 250 V</li> </ul>	0.11 A
<b>Mechanical service life (switching cycles)</b>	
<ul style="list-style-type: none"> <li>• typical</li> </ul>	10 000 000
<b>Electrical endurance (switching cycles)</b>	
<ul style="list-style-type: none"> <li>• typical</li> </ul>	100 000
<b>Buffering time in the event of power failure</b>	60 ms
<b>Recovery time</b>	

<ul style="list-style-type: none"> <li>• after power failure typical</li> <li>• after opening of the safety circuits typical</li> </ul>	<p>8 s</p> <p>250 ms</p>
<b>Make time with automatic start</b>	
<ul style="list-style-type: none"> <li>• typical</li> <li>• maximum</li> <li>• at DC maximum</li> <li>• after power failure typical</li> <li>• after power failure maximum</li> </ul>	<p>50 ms</p> <p>100 ms</p> <p>100 ms</p> <p>8 000 ms</p> <p>8 200 ms</p>
<b>Backslide delay time after opening of the safety circuits typical</b>	50 ms
<b>Backslide delay time in the event of power failure</b>	
<ul style="list-style-type: none"> <li>• typical</li> <li>• maximum</li> </ul>	<p>40 ms</p> <p>80 ms</p>
<b>Reference code acc. to DIN EN 81346-2</b>	F
<b>Continuous current of the NO contacts of the relay outputs</b>	5 A
<b>Type of input characteristic</b>	Type 2 in accordance with EN 61131-2
<b>Certificate of suitability</b>	
<ul style="list-style-type: none"> <li>• according to ATEX directive 2014/34/EU</li> </ul>	BVS 06 ATEX F001
Explosion device group and category according to ATEX directive 2014/34/EU	II (2) G, II (2) D, I (M2)

## Electromagnetic compatibility

<b>EMC emitted interference</b>	
<ul style="list-style-type: none"> <li>• acc. to IEC 60947-1</li> </ul>	class A
<b>EMI immunity acc. to IEC 60947-1</b>	corresponds to degree of severity 3
<b>Conducted interference</b>	
<ul style="list-style-type: none"> <li>• due to burst acc. to IEC 61000-4-4</li> <li>• due to conductor-earth surge acc. to IEC 61000-4-5</li> <li>• due to conductor-conductor surge acc. to IEC 61000-4-5</li> <li>• due to high-frequency radiation acc. to IEC 61000-4-6</li> </ul>	<p>2 kV network connection / 1 kV control connection</p> <p>1 kV</p> <p>0.5 kV</p> <p>10 V</p>
<b>Field-bound parasitic coupling acc. to IEC 61000-4-3</b>	10 V/m
<b>Electrostatic discharge acc. to IEC 61000-4-2</b>	6 kV contact discharge / 8 kV air discharge
<b>Conducted HF-interference emissions acc. to CISPR11</b>	corresponds to degree of severity A
<b>Field-bound HF-interference emission acc. to CISPR11</b>	corresponds to degree of severity A

## Inputs/ Outputs

<b>Product function</b>	
<ul style="list-style-type: none"> <li>• Parameterizable inputs</li> <li>• Parameterizable outputs</li> </ul>	<p>Yes</p> <p>Yes</p>

<b>Number of inputs</b>	5
<b>Input version with safety-related function</b>	2 sensor inputs 24 V DC, 1 start signal input 24 V DC, 1 cascading input 24 V DC, 1 feedback circuit input 24 V DC
<b>Design of input</b>	
• cascading input/functional switching	Yes
• feedback input	Yes
• Start input	Yes
<b>Pulse duration</b>	
• of the sensor input minimum	30 ms
• of the ON pushbutton input minimum	0.2 s
• of the cascading input minimum	0.2 s
• <b>number of digital inputs</b>	0
• Number of digital inputs with a common reference potential	4
• digital input version type 1 acc. to IEC 61131	No
• Digital input version Type 2 acc. to IEC 61131	Yes
<b>number of analog inputs</b>	0
<b>Number of sensor inputs</b>	
• 1-channel or 2-channel	1
• 2-channel	1
<b>Number of outputs</b>	2
• <b>number of semiconductor outputs</b>	0
<b>Number of outputs as contact-affected switching element</b>	2
• as NO contact	
— safety-related instantaneous contact	2
<b>number of analog outputs</b>	0
<b>Switching behavior</b>	monostable
<b>Property of contacts of the relay outputs</b>	Fail-safe NO contacts
<b>Wire length for digital signals maximum</b>	1 500 m

Product Function	
• Suitability for use position switch monitoring	Yes
• suitability for use EMERGENCY-OFF circuit monitoring	Yes
• Suitability for use valve monitoring	No
• Suitability for use opto-electronic protection device monitoring	Yes
• Suitability for use tactile sensor monitoring	No
• Suitability for use magnetically operated switch monitoring	Yes
• Suitability for use proximity switch monitoring	No
• Suitability for use safety switch	Yes

- Suitability for use safety-related circuits

Yes

### Installation/ mounting/ dimensions

• mounting position	any
Mounting type	screw and snap-on mounting
Height	106 mm
Width	45 mm
Depth	124 mm
Required spacing	
• top	40 mm
• bottom	40 mm
• left	0 mm
• right	0 mm

### Connections/ Terminals

Product function	
• removable terminal for auxiliary and control circuit	Yes
• type of connectable conductor cross-sections solid	1x (0.5 ... 4.0 mm <sup>2</sup> ), 2x (0.5 ... 2.5 mm <sup>2</sup> )
• Type of connectable conductor cross-sections finely stranded with core end processing	1x (0.5 ... 2.5 mm <sup>2</sup> ), 2x (0.5 ... 1.5 mm <sup>2</sup> )
• Type of connectable conductor cross-sections at AWG conductors solid	1x (20 ... 12), 2x (20 ... 14)
• Type of connectable conductor cross-sections at AWG conductors stranded	1x (20 ... 14), 2x (20 ... 16)
Tightening torque	
• with screw-type terminals	0.8 ... 1.2 N·m
Tightening torque [lbf·in]	
• with screw-type terminals	7 ... 10.3 lbf·in

### Ambient conditions

Installation altitude at height above sea level	
• 1 maximum	2 000 m
• 2 maximum	3 000 m; max. +50 °C (no protective separation)
• 3 maximum	4 000 m; max. +40 °C (no protective separation)
Environmental category	
• during operation acc. to IEC 60721	3K6 (no formation of ice, no condensation, relative humidity 10 ... 95%), 3C3 (no salt mist), 3S2 (sand must not get into the devices), 3M6
• during storage acc. to IEC 60721	1K6 (no condensation, relative humidity 10 ... 95%), 1C2 (no salt mist), 1S2 (sand must not get into the devices), 1M4
• during transport acc. to IEC 60721	2K2, 2C1, 2S1, 2M2
• Relative humidity during operation	5 ... 95 %
Contact rating of auxiliary contacts according to UL	B300 / R300

## Short-circuit protection

<b>Design of short-circuit protection</b> <ul style="list-style-type: none"> <li>per output</li> </ul>	Fuse links: gG 6 A, quick-response 10 A (IEC 60947-5-1), miniature circuit-breaker C char.: 1.6 A (IEC 60947-5-1) or 6 A (I <sub>K</sub> < 500 A)
<b>Design of the fuse link</b> <ul style="list-style-type: none"> <li>for short-circuit protection of relay enabling circuits required</li> </ul>	gL/gG: 4 A

## Safety related data

<b>Safety device type acc. to IEC 61508-2</b>	Type B
<b>Type of the safety-related wiring of the inputs</b>	single-channel and two-channel
<b>Safety Integrity Level (SIL)</b> <ul style="list-style-type: none"> <li>at single-channel evaluation acc. to IEC 61508</li> <li>at two-channel evaluation acc. to IEC 61508</li> </ul>	1 3
<b>SIL Claim Limit (subsystem)</b> <ul style="list-style-type: none"> <li>at single-channel evaluation acc. to IEC 62061</li> <li>at two-channel evaluation acc. to IEC 62061</li> </ul>	1 3
<b>Performance level (PL)</b> <ul style="list-style-type: none"> <li>at single-channel evaluation acc. to EN ISO 13849-1</li> <li>at two-channel evaluation acc. to EN ISO 13849-1</li> <li>Category at two-channel evaluation acc. to EN ISO 13849-1</li> <li>Category at single-channel evaluation acc. to EN ISO 13849-1</li> </ul>	d e 4 2
<b>Stop category acc. to DIN EN 60204-1</b>	0
<b>Average diagnostic coverage level (DCavg)</b> <ul style="list-style-type: none"> <li>at single-channel evaluation</li> <li>at two-channel evaluation</li> </ul>	90 % 99 %
<b>Diagnostics test interval by internal test function maximum</b>	28 800 s
<b>Failure rate [FIT]</b> <ul style="list-style-type: none"> <li>at rate of recognizable hazardous failures (<math>\lambda_{dd}</math>)</li> <li>at rate of non-recognizable hazardous failures (<math>\lambda_{du}</math>)</li> </ul>	867.96 FIT 7.06 FIT
<b>PFDavg with low demand rate</b> <ul style="list-style-type: none"> <li>at single-channel evaluation acc. to IEC 61508</li> <li>at two-channel evaluation acc. to IEC 61508</li> </ul>	0.00065 0.00002
<b>Hardware fault tolerance</b> <ul style="list-style-type: none"> <li>at single-channel evaluation acc. to IEC 61508</li> <li>at two-channel evaluation acc. to IEC 61508</li> </ul>	0 1

<b>T1 value for proof test interval or service life acc. to IEC 61508</b>	20 y
<b>Safe state</b>	Safety outputs switched off
<b>Protection against electrical shock</b>	finger-safe
<b>Contact reliability</b>	0.1 million operating cycles (AC15, 230 V, 2 A)

### Galvanic isolation

<b>(electrically) protective separation acc. to IEC 60947-1</b>	All circuits in SIMOCODE pro are with protective separation, i.e. they are designed with doubled creepage paths and clearances. NOTICE: The information in the "Protective Separation" test report, No. 2668, must be observed.
<ul style="list-style-type: none"> <li>• <b>design of the electrical isolation</b></li> </ul>	Protective separation in accordance with IEC 60947-1 for all circuits, up to installation altitude of 2000 m

### Control circuit/ Control

<b>Type of voltage of the control supply voltage</b>	DC
<b>Control supply voltage at DC</b>	
<ul style="list-style-type: none"> <li>• rated value</li> </ul>	24 V
<b>operating range factor control supply voltage rated value at DC</b>	
<ul style="list-style-type: none"> <li>• initial value</li> <li>• full-scale value</li> </ul>	0.8 1.2

### Certificates/ approvals

General Product Approval	EMC	For use in hazardous locations
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For use in hazardous locations	Functional Safety/Safety of Machinery	Declaration of Conformity	Test Certificates	Marine / Shipping
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[Explosion Protection Certificate](#)

[Type Examination Certificate](#)



[Miscellaneous](#)

[Type Test Certificates/Test Report](#)



Marine / Shipping	other
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[Confirmation](#)

[PROFINET-Certification](#)



Profibus

#### 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=3UF7320-1AB00-0>

##### Cax online generator

<http://support.automation.siemens.com/WW/CAXorder/default.aspx?lang=en&mlfb=3UF7320-1AB00-0>

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

<https://support.industry.siemens.com/cs/ww/en/ps/3UF7320-1AB00-0>

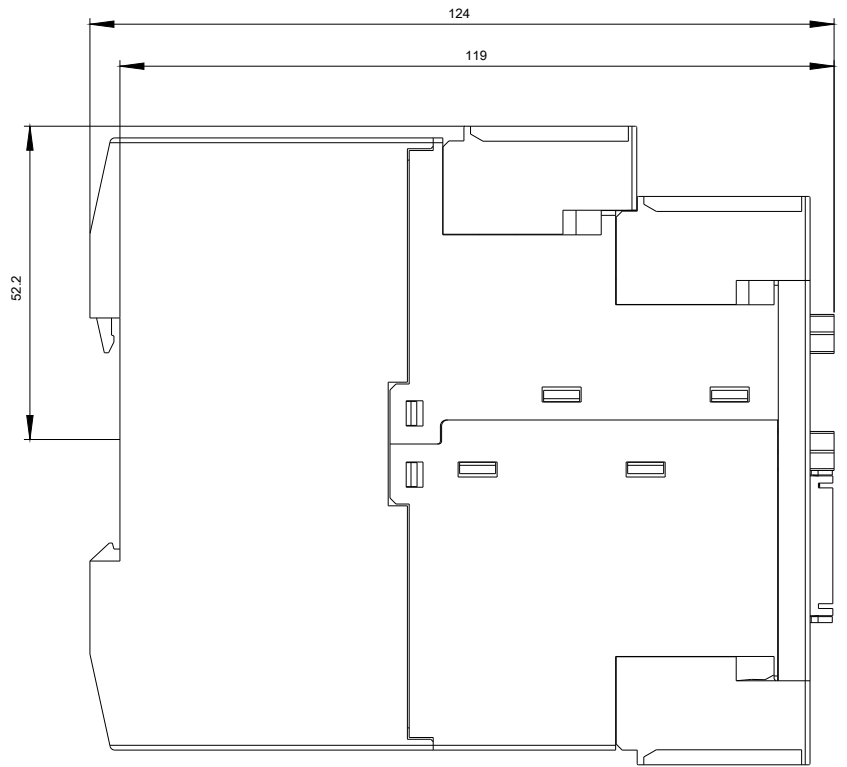
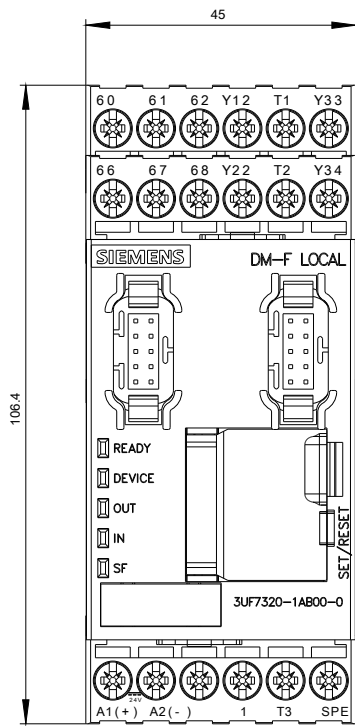
##### Image database (product images, 2D dimension drawings, 3D models, device circuit diagrams, EPLAN macros, ...)

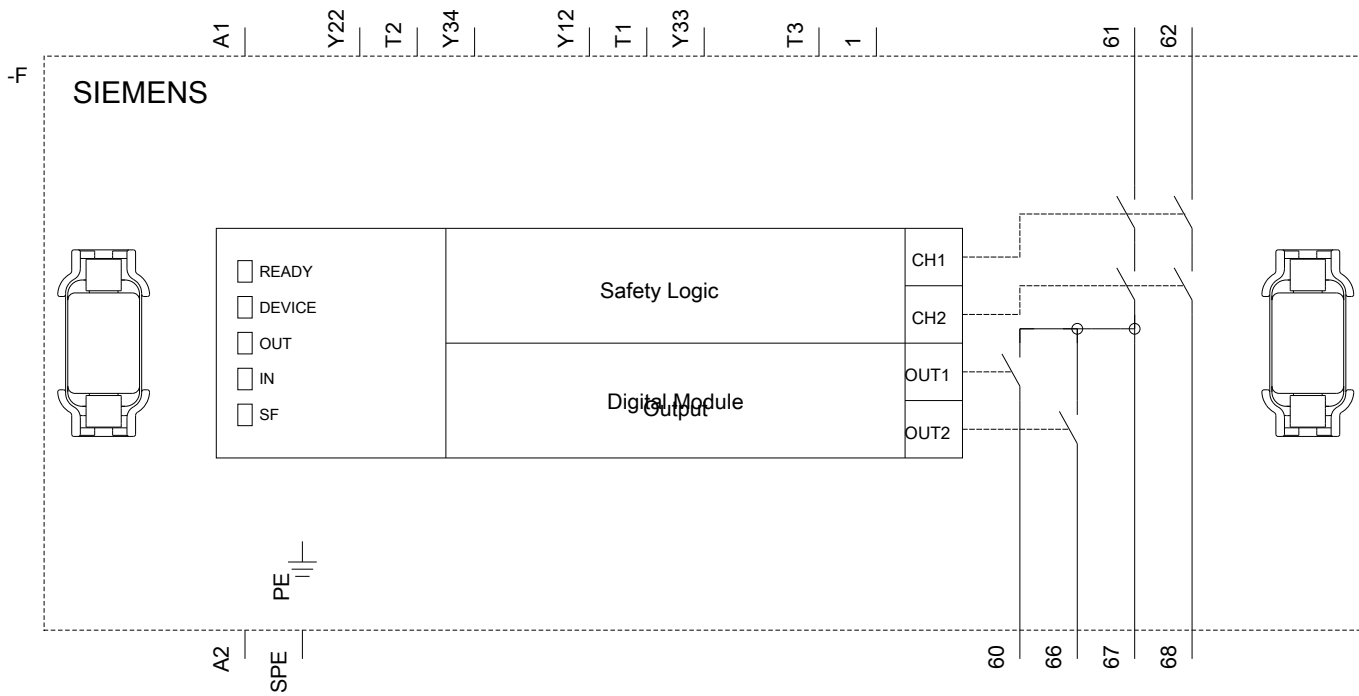
[http://www.automation.siemens.com/bilddb/cax\\_de.aspx?mlfb=3UF7320-1AB00-0&lang=en](http://www.automation.siemens.com/bilddb/cax_de.aspx?mlfb=3UF7320-1AB00-0&lang=en)

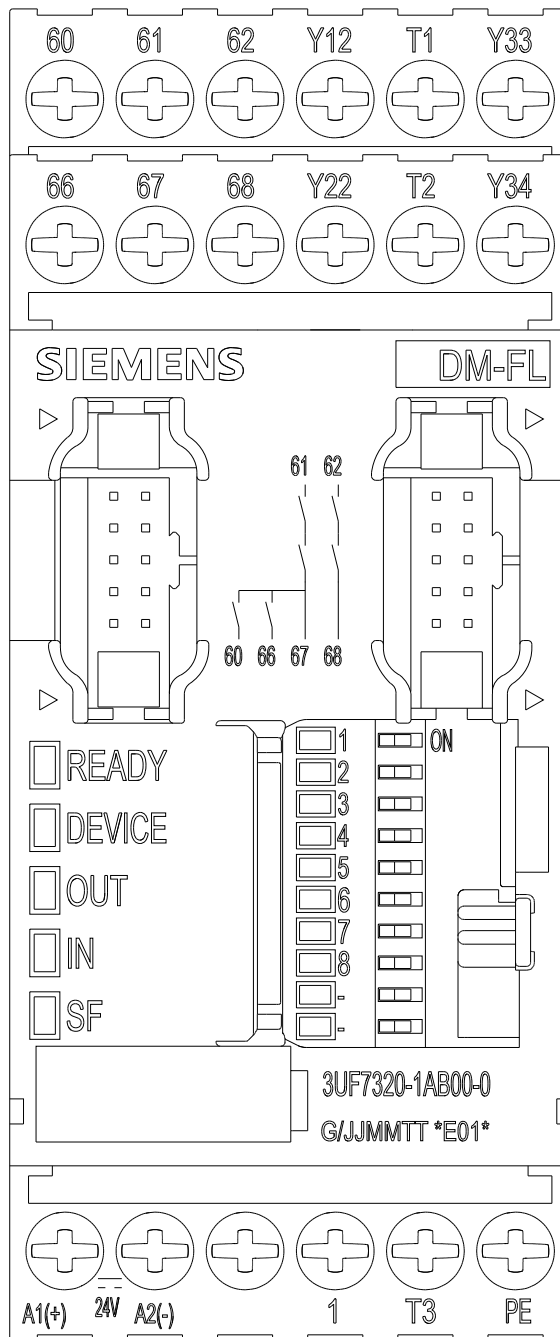
##### Test report No. A0258, protective separation

<https://support.industry.siemens.com/cs/ww/en/view/109748152>









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