

Fail-safe digital module DM-F local, for fail-safe shutdown via hardware signal Us: 110...240 V AC/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	

• input for thermistor connection	No
• Digital input	Yes
• input for analog temperature sensors	No
• input for ground fault detection	No
• Relay output	Yes
Apparent power consumption	9.5 V·A
Consumed active power	4.5 W
Insulation voltage	
• with degree of pollution 3 rated value	300 V
Protection class IP	IP20
Shock resistance	
• acc. to IEC 60068-2-27	15g / 11 ms
Vibration resistance	
• acc. to IEC 60068-2-6	1 ... 6 Hz: 15 mm, 6 ... 500 Hz: 2g
Operating frequency maximum	360 1/h
Switching capacity current of the NO contacts of the relay outputs at AC-15	
• at 24 V	3 A
• at 120 V	3 A
• at 240 V	1.5 A
Switching capacity current of the NO contacts of the relay outputs at DC-13	
• at 24 V	4 A
• at 60 V	0.55 A
• at 125 V	0.22 A
• at 250 V	0.11 A
Switching capacity current of relay enabling circuits at AC-15	
• at 24 V	3 A
• at 120 V	3 A
• at 240 V	1.5 A
Switching capacity current of relay enabling circuits at DC-13	
• at 24 V	4 A
• at 60 V	0.55 A
• at 125 V	0.22 A
• at 250 V	0.11 A
Mechanical service life (switching cycles)	
• typical	10 000 000
Electrical endurance (switching cycles)	
• typical	100 000
Buffering time in the event of power failure	200 ms
Recovery time	

<ul style="list-style-type: none"> • after power failure typical • after opening of the safety circuits typical 	<p>8 s</p> <p>250 ms</p>
Make time with automatic start	
<ul style="list-style-type: none"> • typical • maximum • at DC maximum • at AC maximum • after power failure typical • after power failure maximum 	<p>50 ms</p> <p>100 ms</p> <p>100 ms</p> <p>100 ms</p> <p>8 000 ms</p> <p>8 200 ms</p>
Backslide delay time after opening of the safety circuits typical	50 ms
Backslide delay time in the event of power failure	
<ul style="list-style-type: none"> • typical • maximum 	<p>220 ms</p> <p>320 ms</p>
Reference code acc. to DIN EN 81346-2	F
Reference code acc. to DIN EN 61346-2	F
Continuous current of the NO contacts of the relay outputs	5 A
Type of input characteristic	Type 2 in accordance with EN 61131-2
Certificate of suitability	
<ul style="list-style-type: none"> • according to ATEX directive 2014/34/EU 	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	
EMC emitted interference	
<ul style="list-style-type: none"> • acc. to IEC 60947-1 	class A
EMI immunity acc. to IEC 60947-1	corresponds to degree of severity 3
Conducted interference	
<ul style="list-style-type: none"> • due to burst acc. to IEC 61000-4-4 • due to conductor-earth surge acc. to IEC 61000-4-5 • due to conductor-conductor surge acc. to IEC 61000-4-5 • due to high-frequency radiation acc. to IEC 61000-4-6 	<p>2 kV network connection / 1 kV control connection</p> <p>2 kV</p> <p>1 kV</p> <p>10 V</p>
Field-bound parasitic coupling acc. to IEC 61000-4-3	10 V/m
Electrostatic discharge acc. to IEC 61000-4-2	6 kV contact discharge / 8 kV air discharge
Conducted HF-interference emissions acc. to CISPR11	corresponds to degree of severity A
Field-bound HF-interference emission acc. to CISPR11	corresponds to degree of severity A

Inputs/ Outputs	
Product function	

<ul style="list-style-type: none"> • Parameterizable inputs 	Yes
<ul style="list-style-type: none"> • Parameterizable outputs 	Yes
Number of inputs	5
Input version with safety-related function	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
Design of input	
<ul style="list-style-type: none"> • cascading input/functional switching 	Yes
<ul style="list-style-type: none"> • feedback input 	Yes
<ul style="list-style-type: none"> • Start input 	Yes
Pulse duration	
<ul style="list-style-type: none"> • of the sensor input minimum 	30 ms
<ul style="list-style-type: none"> • of the ON pushbutton input minimum 	0.2 s
<ul style="list-style-type: none"> • of the cascading input minimum 	0.2 s
Number of digital inputs	0
<ul style="list-style-type: none"> • with a common reference potential 	4
Digital input version	
<ul style="list-style-type: none"> • Type 1 acc. to IEC 61131 	No
<ul style="list-style-type: none"> • Type 2 acc. to IEC 61131 	Yes
Number of analog inputs	0
Number of sensor inputs	
<ul style="list-style-type: none"> • 1-channel or 2-channel 	1
<ul style="list-style-type: none"> • 2-channel 	1
Number of outputs	2
Number of semiconductor outputs	0
Number of outputs as contact-affected switching element	2
<ul style="list-style-type: none"> • as NO contact 	
<ul style="list-style-type: none"> — safety-related instantaneous contact 	2
Number of analog outputs	0
Switching behavior	monostable
Property of contacts of the relay outputs	Fail-safe NO contacts
Wire length for digital signals maximum	1 500 m

Product Function

Suitability for use	
<ul style="list-style-type: none"> • position switch monitoring 	Yes
<ul style="list-style-type: none"> • EMERGENCY-OFF circuit monitoring 	Yes
<ul style="list-style-type: none"> • valve monitoring 	No
<ul style="list-style-type: none"> • opto-electronic protection device monitoring 	Yes
<ul style="list-style-type: none"> • tactile sensor monitoring 	No
<ul style="list-style-type: none"> • magnetically operated switch monitoring 	Yes
<ul style="list-style-type: none"> • proximity switch monitoring 	No
<ul style="list-style-type: none"> • safety switch 	Yes

- 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 electrical connection	
• for auxiliary and control current circuit	screw-type terminals
Type of connectable conductor cross-sections	
• solid	1x (0.5 ... 4.0 mm ²), 2x (0.5 ... 2.5 mm ²)
• finely stranded with core end processing	1x (0.5 ... 2.5 mm ²), 2x (0.5 ... 1.5 mm ²)
• at AWG conductors solid	1x (20 ... 12), 2x (20 ... 14)
• 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; No protective separation at 40 °C
Ambient temperature	
• during operation	-25 ... +60 °C
• during storage	-40 ... +80 °C
• during transport	-40 ... +80 °C
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

<ul style="list-style-type: none"> during transport acc. to IEC 60721 	2K2, 2C1, 2S1, 2M2
Relative humidity	
<ul style="list-style-type: none"> during operation 	5 ... 95 %
Contact rating of auxiliary contacts according to UL	B300 / R300

Short-circuit protection

Design of short-circuit protection	
<ul style="list-style-type: none"> per output 	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 ($I_K < 500$ A)
Design of the fuse link	
<ul style="list-style-type: none"> for short-circuit protection of relay enabling circuits required 	gL/gG: 4 A

Safety related data

Safety device type acc. to IEC 61508-2	Type B
Type of the safety-related wiring of the inputs	single-channel and two-channel
<ul style="list-style-type: none"> Safety Integrity Level (SIL) at single-channel evaluation acc. to IEC 61508 	1
<ul style="list-style-type: none"> Safety integrity level (SIL) at two-channel evaluation according to IEC 61508 	3
<ul style="list-style-type: none"> SIL Claim Limit (subsystem) at single-channel evaluation acc. to IEC 62061 	1
<ul style="list-style-type: none"> SIL claim limit (subsystem) at two-channel evaluation according to IEC 62061 	3
Performance level (PL)	
<ul style="list-style-type: none"> at single-channel evaluation acc. to EN ISO 13849-1 	d
<ul style="list-style-type: none"> at two-channel evaluation according to EN ISO 13849-1 	e
Category	
<ul style="list-style-type: none"> at two-channel evaluation according to EN ISO 13849-1 	4
<ul style="list-style-type: none"> at single-channel evaluation acc. to EN ISO 13849-1 	2
Stop category acc. to DIN EN 60204-1	0
Safe failure fraction (SFF)	99 %
Average diagnostic coverage level (DCavg)	
<ul style="list-style-type: none"> at single-channel evaluation 	90 %
Diagnostics test interval by internal test function maximum	28 800 s
Failure rate [FIT]	
<ul style="list-style-type: none"> at rate of recognizable hazardous failures (λ_{dd}) 	879.12 FIT
<ul style="list-style-type: none"> at rate of non-recognizable hazardous failures (λ_{du}) 	7.17 FIT
PFDavg with low demand rate	

<ul style="list-style-type: none"> • at single-channel evaluation acc. to IEC 61508 	0.00065
<ul style="list-style-type: none"> • at two-channel evaluation acc. to IEC 61508 	0.00002
<ul style="list-style-type: none"> • Hardware fault tolerance at single-channel evaluation acc. to IEC 61508 	0
<ul style="list-style-type: none"> • HFT at two-channel evaluation according to IEC 61508 	1
T1 value for proof test interval or service life acc. to IEC 61508	20 y
Safe state	Safety outputs switched off
Protection against electrical shock	finger-safe
Contact reliability	0.1 million operating cycles (AC15, 230 V, 2 A)

Galvanic isolation

(electrically) protective separation acc. to IEC 60947-1	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.
Design of the electrical isolation	Protective separation in accordance with IEC 60947-1 for all circuits, up to installation altitude of 2000 m

Control circuit/ Control

Type of voltage of the control supply voltage	AC/DC
Control supply voltage at AC	
<ul style="list-style-type: none"> • at 50 Hz rated value 	110 ... 240 V
<ul style="list-style-type: none"> • at 60 Hz rated value 	110 ... 240 V
Control supply voltage frequency 1	50 ... 60 Hz
Control supply voltage frequency	
<ul style="list-style-type: none"> • 1 rated value 	50 Hz
<ul style="list-style-type: none"> • 2 rated value 	60 Hz
Control supply voltage at DC	
<ul style="list-style-type: none"> • rated value 	110 ... 240 V
Operating range factor control supply voltage rated value at DC	
<ul style="list-style-type: none"> • initial value 	0.85
<ul style="list-style-type: none"> • Full-scale value 	1.1
Operating range factor control supply voltage rated value at AC at 50 Hz	
<ul style="list-style-type: none"> • initial value 	0.85
<ul style="list-style-type: none"> • Full-scale value 	1.1
Operating range factor control supply voltage rated value at AC at 60 Hz	
<ul style="list-style-type: none"> • initial value 	0.85
<ul style="list-style-type: none"> • Full-scale value 	1.1

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,...)

www.siemens.com/sirius/catalogs

Industry Mall (Online ordering system)

<https://mall.industry.siemens.com/mall/en/en/Catalog/product?mlfb=3UF7320-1AU00-0>

Cax online generator

<http://support.automation.siemens.com/WW/CAXorder/default.aspx?lang=en&mlfb=3UF7320-1AU00-0>

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

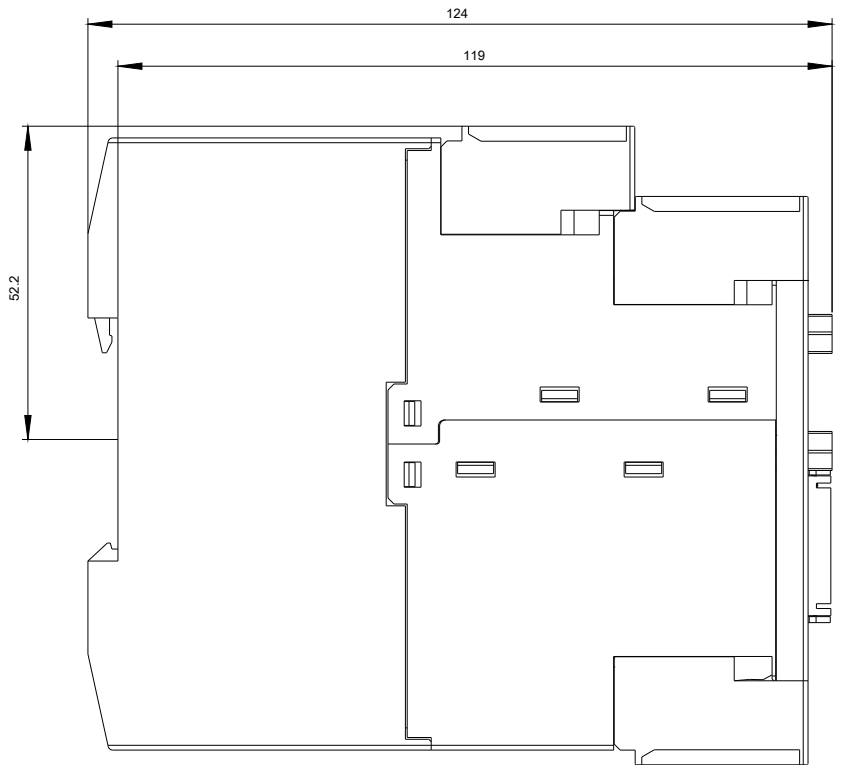
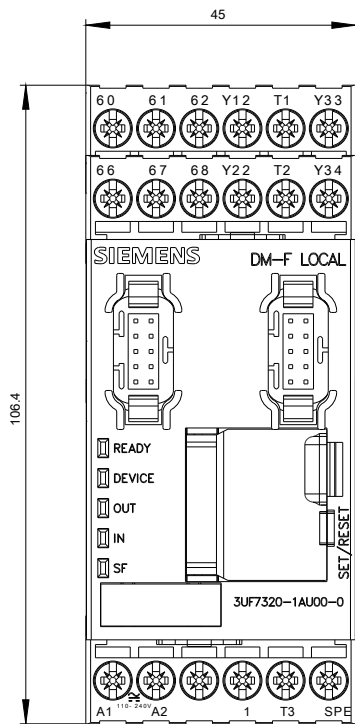
<https://support.industry.siemens.com/cs/ww/en/ps/3UF7320-1AU00-0>

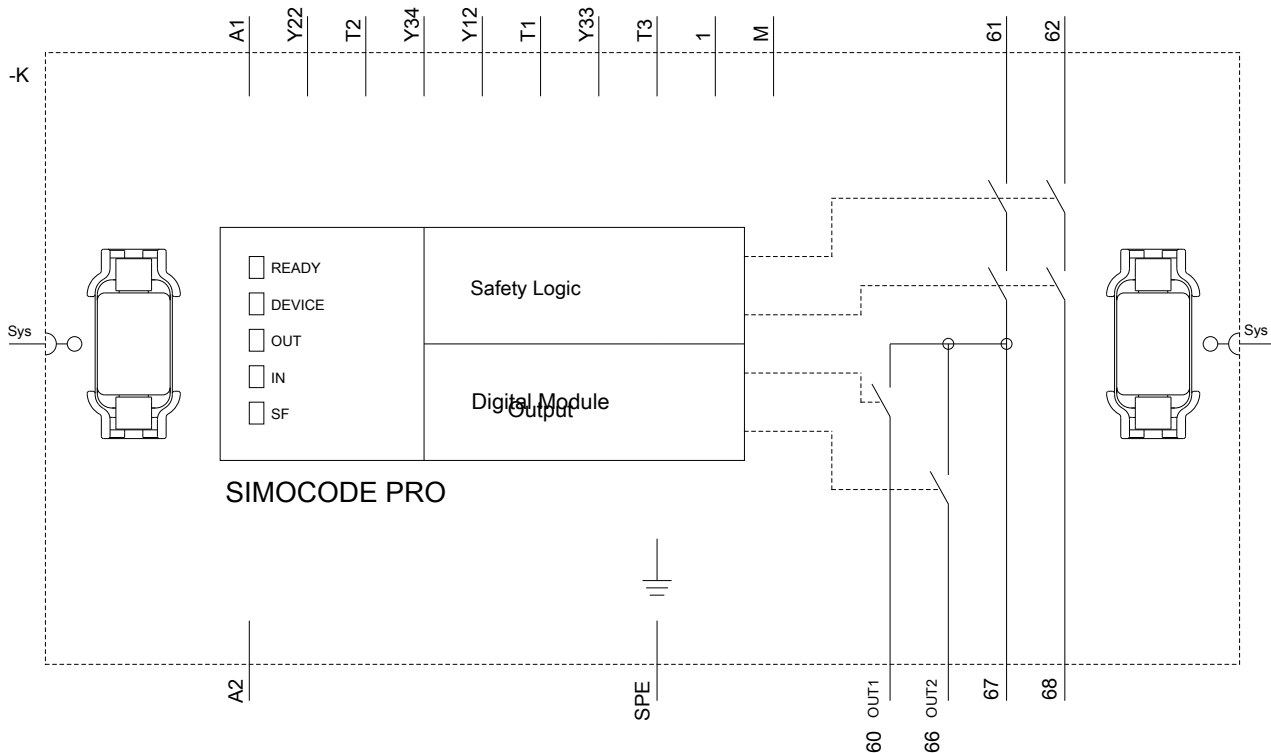
Image database (product images, 2D dimension drawings, 3D models, device circuit diagrams, EPLAN macros, ...)

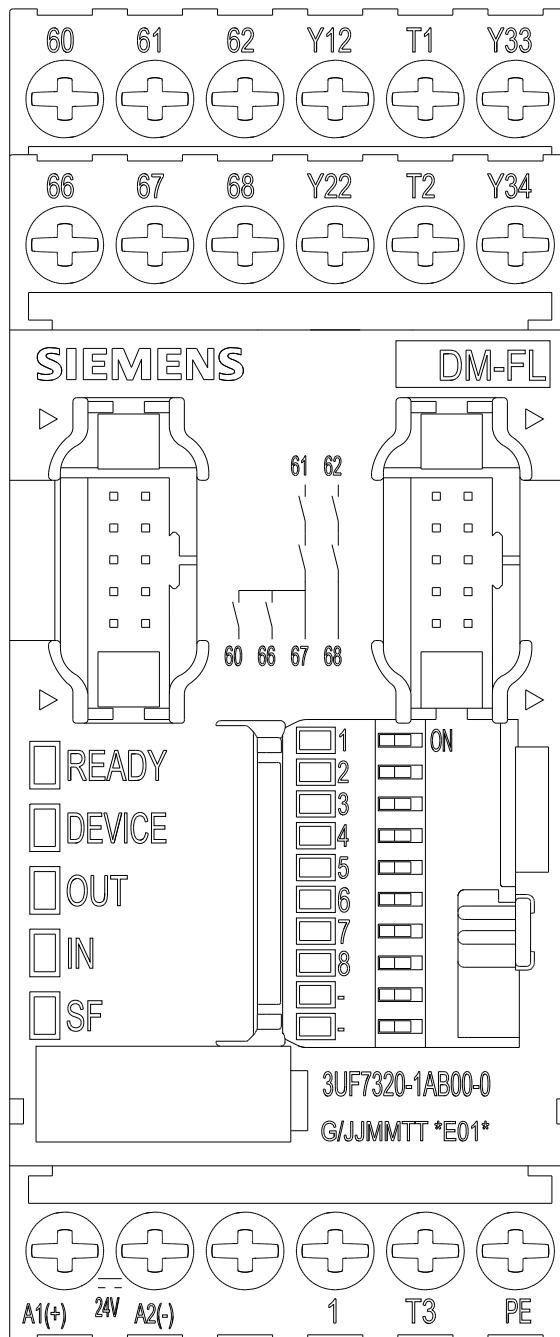
http://www.automation.siemens.com/bilddb/cax_de.aspx?mlfb=3UF7320-1AU00-0&lang=en

Test report No. A0258, protective separation

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







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