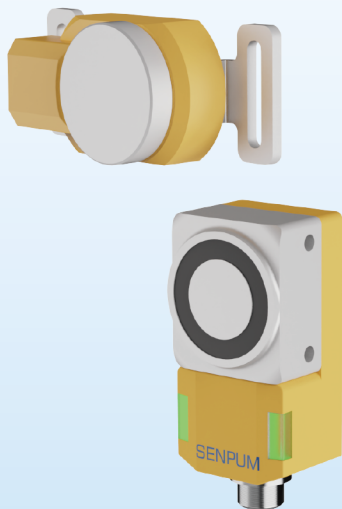


Safety Interlock Switches

DS-M Series



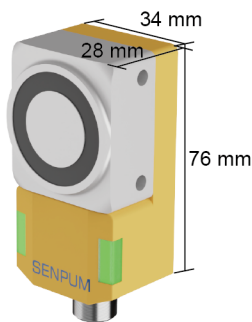
Electromagnetic force strongly locks the door, even if the door is shifted, it can be closed tightly

Firmly closes and locks the door even if it shifts or swings; copes with tilts of $\pm 4^\circ$ and lateral tilts of ± 5 mm.



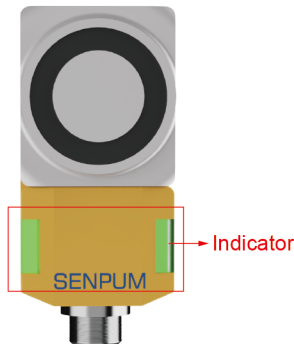
Ultra-compact unit for quick and easy installation

With dimensions of only 34 mm x 28 mm x 76 mm, it can be installed without concern for the mounting position in installations where miniaturization is required.



“Visualization” of status

Indicators can be viewed from all angles; the operating status can be seen at a glance, and even if there is a problem, it can be restored without any problem.



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Fast Delivery Standard Models



Most products are in stock. Upon receiving your order, we will arrange prompt shipment to minimize your downtime-related costs and losses.



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More
Features

- Flexible and easy to install.
- New development for improved impact resistance.
- Wide range of detection even if the door is misaligned.

Applications



Door lock and monitoring



Prevents misdirected entry



Electromagnetic force to lock the door

Safety Interlock Switches DS-M Series Selection Guide

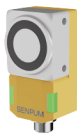
Please use the following steps to help you select the best DS-M Series model for your situation.

Step 1

Selection of Door Switch and Matcher

Door Switch

DS-ML51

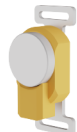


Holding force 500 N

OSSD	NPN		DS-ML51N
	PNP		DS-ML51P
Type			M12 Connector
			Standard
OSSD action	Locked linkage		☐
	Open and closed linkage		☐
AUX	Open and closed linkage		☐
Cascade connection			☐ (up to 20 units)
Connection method	M12 Connector		8-pin
Simplified wiring unit			☐
GC-Link		☐	
Locking function		Solenoid lock	

Matcher

DS-MAL5



Universal coding	DS-MAL5M
Individual coding	DS-MAL5U

Step 2

Selection of M12 Connector Cable



Area Sensors/Safety Light Curtains/
Safety Interlock Switches

SA-V
SA-M
SA-H
SA2A
SL-R
SA-T
DS-M

Fiber Optic Sensors

Photoelectric Sensors

Color Sensors

Laser Sensors

Proximity Sensors

Precision Contact
Sensors

Area Sensors/
Safety Light Curtains

Laser Scanners

Digital Contact Sensors

Laser Displacement
Sensors

Laser Micrometers

Confocal Displacement
Sensors

Barcode Readers

AI Vision Sensors

RFID

Infrared Temperature
Sensors

Pressure Sensors

Flow Sensors

Magnetic Sensors

Ultrasonic Sensors

Magnetic Scales

Static Eliminators



SENPUM
0882

SA-V

SA-M

SA-H

SA2A

SL-R

SA-T

DS-M

Area Sensors/Safety Light Curtains/
Safety Interlock Switches

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Ultrasonic Sensors

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Static Eliminators

DS-M

Safety Interlock Switches

STEP
2

Selection of M12 Connector Cable

Standard type (8 pins)

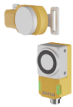
Appearance	Length	Weight	Model
L-type (female) —Loose wire	3 m	Approx. 160 g	DS-P8L3
Straight type (female) —Loose wire	3 m	Approx. 160 g	DS-P8C3
	5 m	Approx. 230 g	DS-P8C5
	10 m	Approx. 420 g	DS-P8C10

Specifications

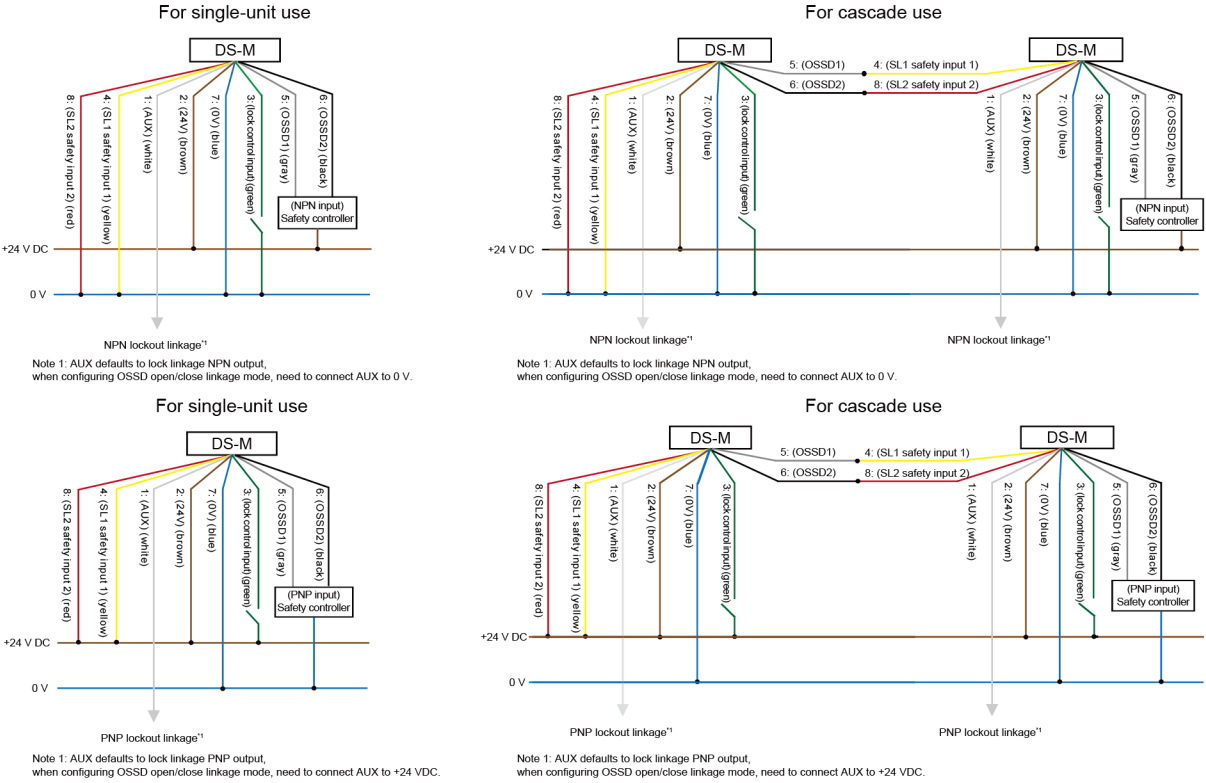
Model		DS-ML51N	DS-ML51P
		NPN	PNP
Holding force when locked		500 N	
Holding force when lock release*1		Approx. 20 N	
Working distance	Sao(OFF→ON)	0.1 mm	
	Sar(OFF→ON)	15 mm	
Response time	Lock → Lock release	30 ms	
	Lock release → Lock	Less than 300 ms	
Control output (OSSD output)	Output method	Transistor output × 2	
	Maximum load current	150 mA	
	Residual voltage (when ON)	1.0 V	
	Voltage when OFF	0.9 V	
AUX output (non-safety system output)	Output method	Transistor output	
	Maximum load current	350 mA	
	Residual voltage (when ON)	≤2 V	
External input (short-circuit current)	Safety input	Approx. 1.8 mA × 2	
	Lock control input	Approx. 1.8 mA	
	AUX input	Approx. 2 mA	
Power supply	Power voltage	24 VDC ±20%	
	Power consumption	3.6 W	
Protection circuit		Reverse connection and short connection protection	
Environmental resistance	Housing rating	IP67	
	Operating ambient temperature	-20 to +55 °C (no freezing)	
	Storage ambient temperature	-25 to +70 °C (no freezing)*2	
	Operating ambient humidity	5 to 95% RH	
	Storage environment humidity	5 to 95% RH	
	Vibration resistance	10 to 55 Hz, Double amplitude 2.0 mm, 5 minutes in each of the X, Y, and Z directions (IEC 60947-5-3)	
	Shock resistance	30 G, 6 times in each of the X, Y and Z directions (IEC 60947-5-3)	
Applicable standards (safety)		EN61508, IEC61508 (SIL3), EN ISO13849-1:2015 (PL e, Category 4)	
		ENISO14119 (Type4), IEC60947-5-3, EN60947-5-3	
Material	Door switch	PBT, PET/PAR, TPC, PC, tempered film	
	Matcher	PBT, SUS304, steel nickel-plated	
	Mounting bracket	Aluminum, painted steel (screws: steel)	
Weight	Door switch	Approx. 240 g	
	Matcher	Approx. 130 g	

*1 When changing from the Locked state to the Locked Unlocked state, the retention force will increase based on the residual magnetic force until the matcher is detached from the unit.

*2 For long-term storage, store at 55 °C or lower.



I/O Circuit Diagrams

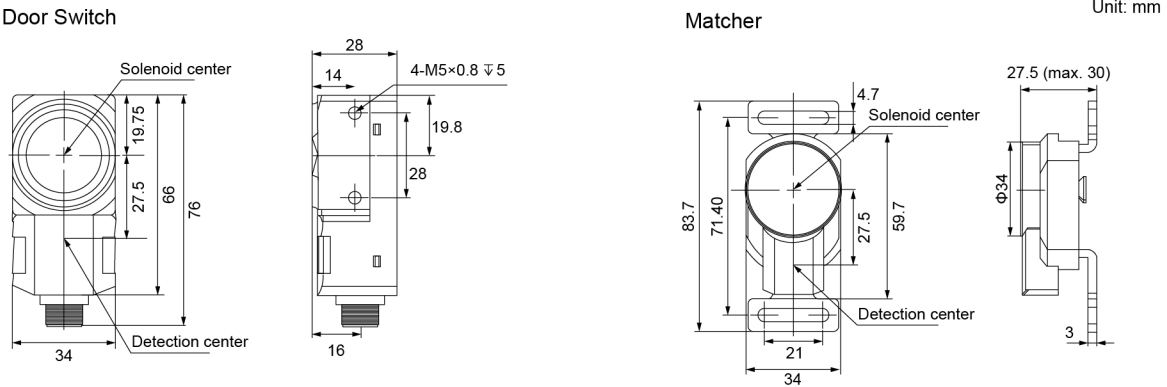


Connection Cable Wire Sequence Functional Description

No.	Definition	Description
1	AUX	AUX output
2	24 VDC	Power positive 24 VDC
3	Control	Lockout control input
4	SL1	Safety input 1
5	OSSD1	OSSD output 1
6	OSSD2	OSSD output 2
7	0 V	Power negative 0 V
8	SL2	Safety input 2

Note: *1 The AUX signal is a non-safety signal and is used only as an auxiliary output, not as a safety output of the safety control system. The AUX output is not available when used as a selection input for the OSSD open/close linkage function.

Dimensions



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