DADISICK®

TECHNICAL DATA SHEET

ELECTROMAGNETIC SAFETY SWITCH
Electromagnetic Force Strong Locking
DK-OX-D51 series

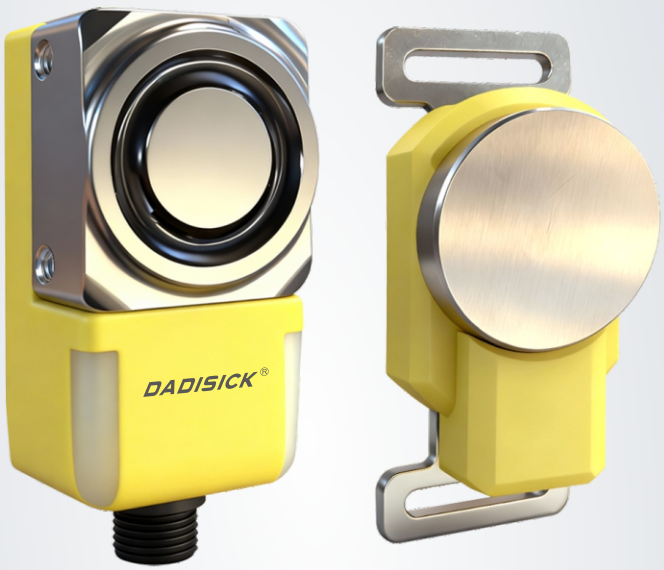

Figure can vary

Contents

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Product Introduction

- **Compact size;**
- **Both the main body and the sensor plate are planar structures;**
- **Strong electromagnetic locking for extremely high reliability;**
- **High-brightness status indicator light;**
- **Easy installation, capable of withstanding ±4° tilt and ±5mm lateral offset;**
- **The elastic gap structure of the sensor plate prevents the door from being half-open.**

Safety Output

Two safety outputs are available, with PNP and NPN signals selectable.
Supports both locking and opening/closing linkage modes.
General and independent encoding are selectable.

LED Indicator Lights

Safety switch status reminder, clear at a glance.
High-definition, high-brightness indicator lights with multiple colors: red, green, orange.

Safety Features

1-channel AUX auxiliary output.
Spring structure eliminates backlash in opening and closing directions.
Dual-channel output enhances the reliability of the safety system.
Dual LED indicators allow for easy identification of abnormal conditions from multiple angles.

Model Selection

Selection Example: DK-OX-D51-D-SN

DK-OX-D51 – D – S N

Output Modes:
N: Dual NPN Output
P: Dual PNP Output

Encoding Type:
S: General Encoding
D: Unique Encoding

Locking methods:
Electromagnetic locking
Mechanical unlocking

Product Series: DK-OX-D51

Note: The default cable length is 2m. Please contact customer service if you require other lengths.

System module diagram

Magnetic security door lock set

Model	Description
DK-OX-D51-S-SP	RFID magnetic security door lock kit, flat mounting, 2xPNP security outputs, universal coding sensor
DK-OX-D51-S-SN	RFID magnetic security door lock body, flat mounting, 2xNPN security outputs, universal coding sensor
DK-OX-D51-D-SP	RFID magnetic security door lock body, flat mounting, 2xPNP security outputs, independent coding sensor
DK-OX-D51-D-SN	RFID magnetic security door lock body, flat mounting, 2xNPN security outputs, independent coding sensor

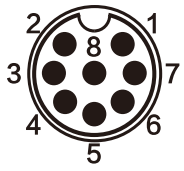
Technical parameters

Standard Parameters	
Retaining force when locked	500N
Retaining force when unlocked	<20N
Working Distance	
Sa0 (OFF->ON)	0.1mm
Sar (ON->OFF)	15mm
Response Time (ms)	
Lock Unlock -- Lock	30 ms
Lock -- Lock Unlock	<300 ms
Control Output (OSSD Output)	
Output method	Transistor output x 2
Maximum load current	200mA
AUX Output (Non-Safety Output)	
Output method	Transistor output
Maximum load current	50 mA
External Input	
Security Input	Approximately 2mA x 2
Lock Control Input	Approximately 2 mA
AUX Input	Approximately 2 mA

Power supply	
Power supply voltage	24VDC
Voltage tolerance	+15%/-20%
Power consumption	3.2W
	Power reverse connection protection, output short circuit protection, output surge protection, output reverse connection protection
Environmental resistance	
Operating ambient temperature	-20 to 55°C (non-freezing)
Storage ambient temperature	-25 to 70°C (non-freezing)
Operating ambient humidity	5% to 95%RH
Storage ambient humidity	5% to 95%RH
Vibration resistance	10 to 55Hz, dual amplitude 2.0mm, 5 minutes in each of the X, Y, and Z directions (IEC60947-5-3)
Shock resistance	30G, 6 times in each of the X, Y, and Z directions
Material	
Sensor body	PBT, PET/PAR, TPC, PC, plated steel
Induction element	PBT, SUS304, nickel-plated steel
Mounting bracket	Aluminum, coated steel (screws: steel)
Weight	
Sensor body	240g
Induction element	130g

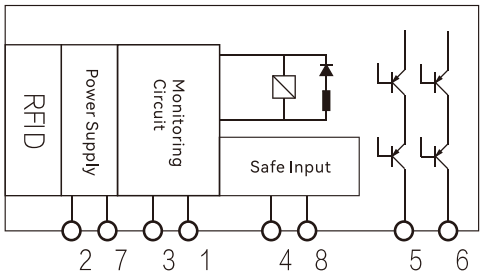
Connection parameters

Wiring method: M12-8 aviation connector male

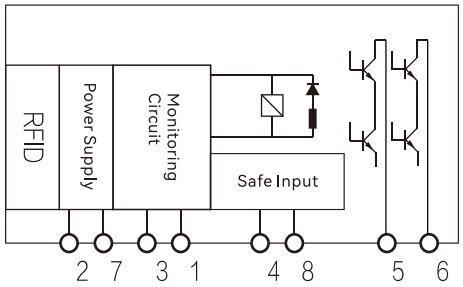


Pin	Definitions	Explanations
1	AUX	AUX Output/Input
2	24VDC	Power Supply Positive 24VDC
3	Control	Lock Control Input
4	SI2	Safety Input 2
5	OSSD1	OSSD Output 1
6	OSSD1	OSSD Output 2
7	0V	Power Supply Negative 0V
8	SI1	Safety Input 1

System module diagram

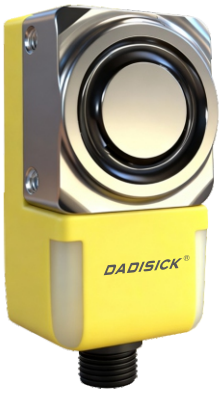
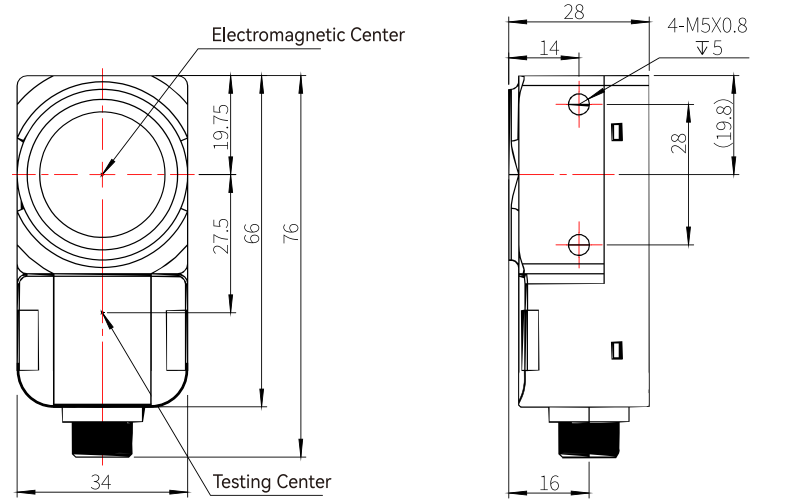
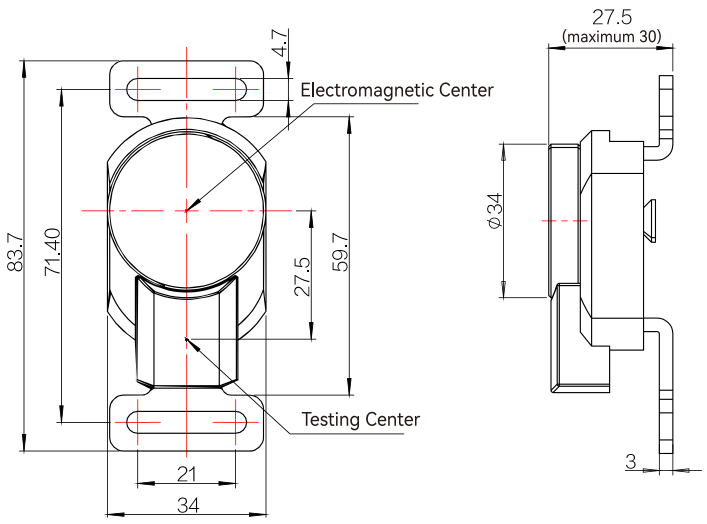


DK-OX-D51-S-SP

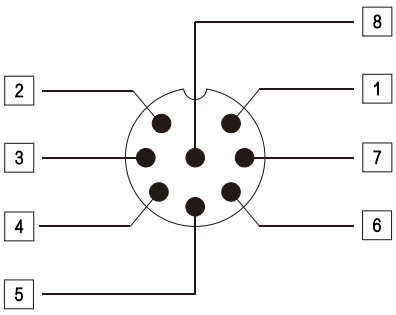


DK-OX-D51-S-SN

Line sequence function description

Safety door switch DK-OX-D51	Safety switch lock body dimension drawing
	Unit: mm 
	Unit: mm 

Line sequence function description



M12-8 Pin	Definitions	Explanations
1	AUX*1	Lock output/OSSD on/off function to select input
2	24VDC	Power Supply Positive 24VDC
3	Control	Lock Control Input
4	SI2	Safety Input 2
5	OSSD1	OSSD Output 1/Sensor Pairing Enable
6	OSSD1	OSSD Output 2
7	0V	Power Supply Negative 0V
8	SI1	Safety Input 1

Note: *1 The AUX signal is a non-safety signal and is only used as an auxiliary output. It cannot be used as a safety output of a safety control system. The AUX output is unavailable when used as a selection input for the OSSD on/off function.

LED Status Instructions

Type	Model	LED Indicator Status	Description
Lock linkage	DK-OX-D51-S-SP DK-OX-D51-S-SN	Red and green flashing alternately	No sensor detected
		Orange light on	Sensor detected, security input not detected
		Orange light flashing	Unlocked state, sensor and security input detected
		Green light on	Locked state, working normally
		Red light flashing	System malfunction alarm, restart required
Open/close linkage	DK-OX-D51-D-SP DK-OX-D51-D-SN	Red and green flashing alternately	No sensor detected
		Orange light on	Sensor detected, security input not detected
		Green light on	Sensor detected status, security input normal, output normal
		Red light flashing	System malfunction alarm, restart required

LED Status Instructions

The DK-OX-D51 series products have two working modes: locking linkage and opening/closing linkage, and support product cascading.

Product Model	DK-OX-D51-S/D-SP	DK-OX-D51-S/D-SN
OSSD Signal	PNP Signal	NPN Signal
OSSD Function Setting	Lock-in Linkage/Open/Close Linkage	Lock-in Linkage/Open/Close Linkage
AUX Signal	PNP Signal	NPN Signal
AUX Function *1	Lock-in Linkage/OSSD Open/Close Linkage Selection	Lock-in Linkage/OSSD Open/Close Linkage Selection
Cascading Function	Supports Safe Input Cascading	Supports Safe Input Cascading
Lock Function	PNP Signal	NPN Signal

The AUX input is set to lock linkage output by default. When the OSSD opening/closing linkage function is selected, the AUX input must be used as a selection signal input, connected to 24V (PNP model) or 0V (NPN model). In this case, the AUX output will be unusable.

Note: The locking function uses the magnetic force of an electromagnet to keep the door closed. Do not use the locking function in safety-related control applications.

OSSD signal

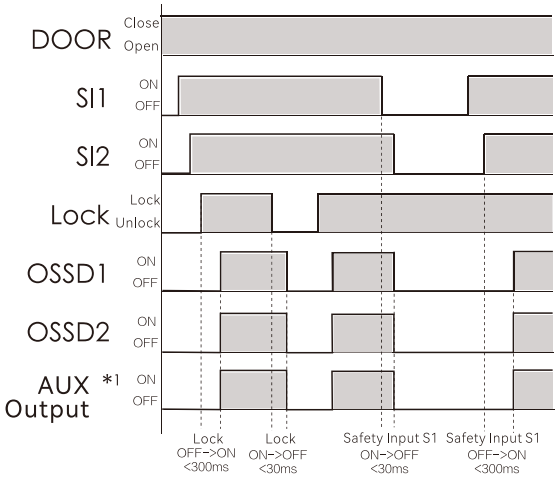
OSSD signal output conditions vary depending on the mode. See the table below for specific signal output conditions:

OSSD signal output	Lock-in linkage mode	Open/close linkage mode
OSSD ON output condition	● Security inputs SI1 & SI2 are both ON ● Lock input is ON (locked) ● Door sensor and body are aligned and matched for recognition.	● Security input SI1 & SI2 are both ON ● Door sensor and main body are aligned and matched for identification.
OSSD OFF output condition	● Self-test in progress/Device malfunction ● Safety inputs SI1 & SI2 are not both ON ● Lock input is off ● Door sensor not aligned with the device or not recognized	● Safety inputs SI1 & SI2 are not both ON ● Door sensor and main body are not aligned or not matched for recognition

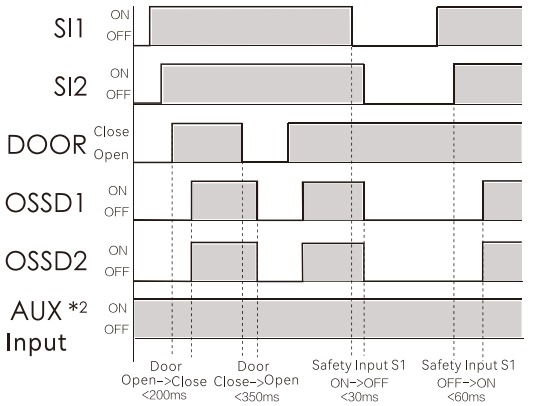
OSSD Linkage Mode Selection and Setting Method

	Needle serial number (AUX)	OSSD lock linkage mode	OSSD open/close linkage mode
DK-OX-D51-S/D-SP	1	Leave blank or connect to PLC or other inputs	Connect to +24V
DK-OX-D51-S/D-SN	1	Leave blank or connect to PLC or other inputs	Connect to 0V

Time series diagram



Locking linkage sequence diagram *1
DK-OX-D51-S/D-SP



Opening and closing linkage timing diagram *2
DK-OX-D51-S/D-SP

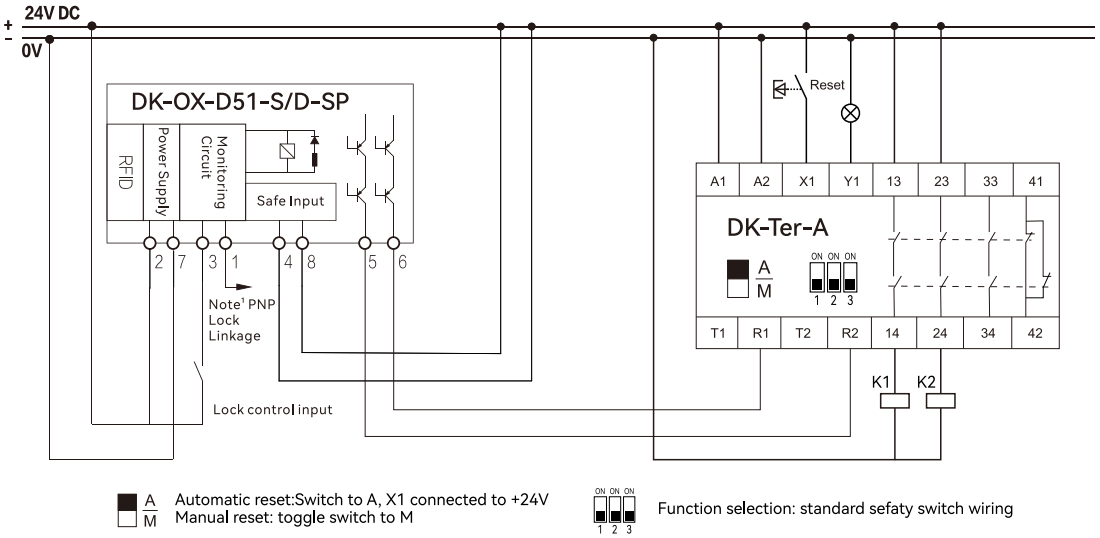
AUX Output *1: The AUX output can be left floating or connected to a signal input device.

Timing Diagram *1: The diagram uses a PNP signal as an example.

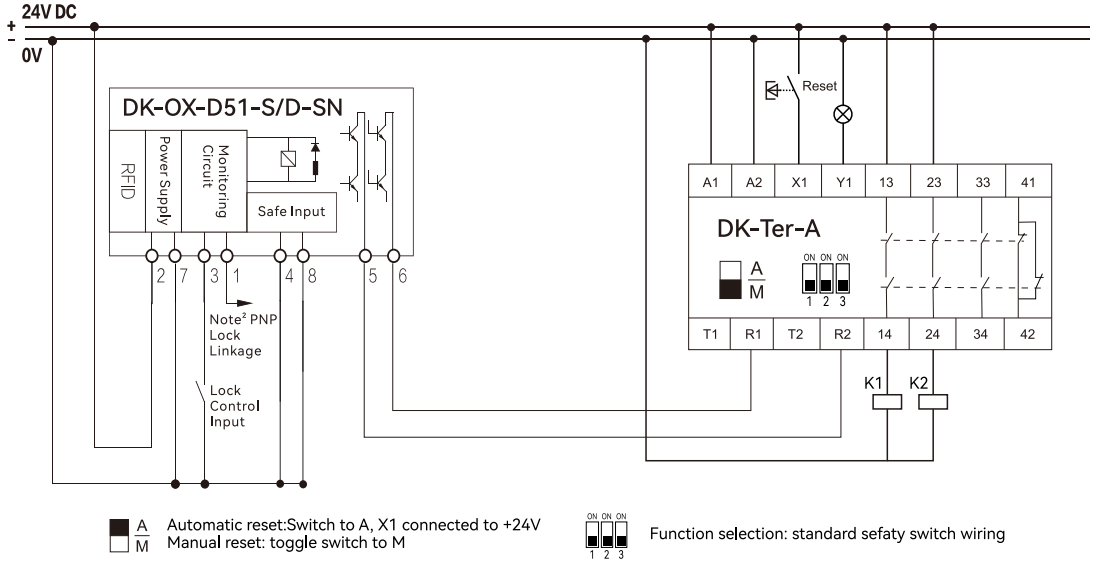
AUX Input *2: When selecting OSSD on/off linkage, the AUX input should be connected to a PNP signal (PNP model product), therefore the AUX output is unavailable.

Timing Diagram *2: The diagram uses a PNP model signal as an example.

Connection Example



Example 1. DK-OX-D51-S/D-SP and safety relay DK-Ter-A form a dual-channel system with automatic reset and OSSD locking linkage.



Example 3. DK-OX-D51-S/D-SN and safety relay DK-Ter-A form a dual-channel configuration with manual reset and OSSD locking linkage.