

TECHNICAL DATA SHEET

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

Contents

- Functional Description
- Application Scenarios
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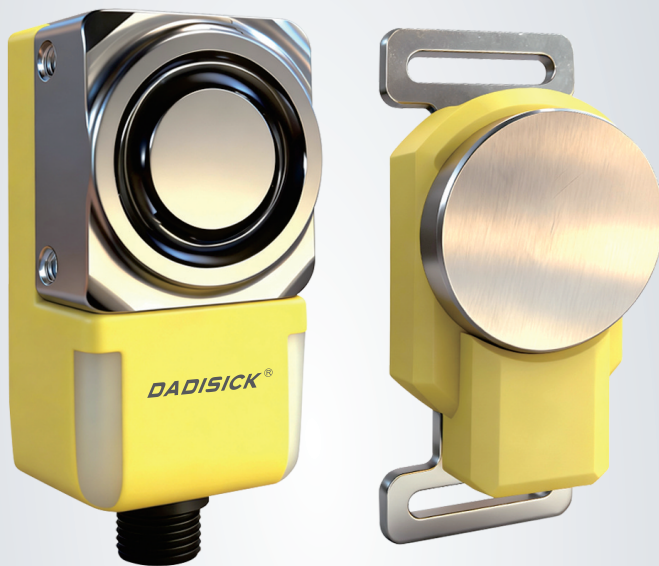


Figure can vary

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 $\pm 4^\circ$ tilt and $\pm 5\text{mm}$ 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

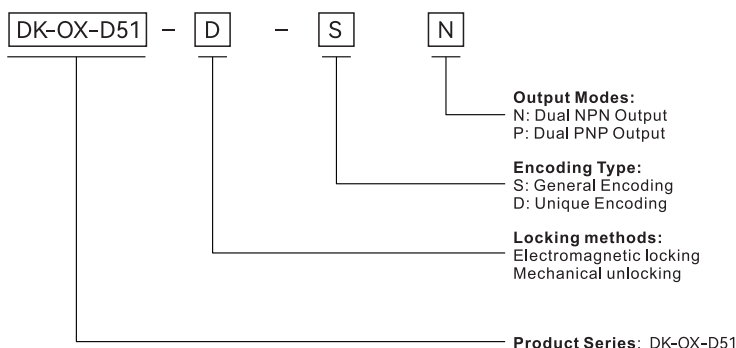
Safety switch status reminder, clear at a glance.
High-definition, high-brightness indicator lights with multiple colors: red, green, orange.

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



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

System module diagram

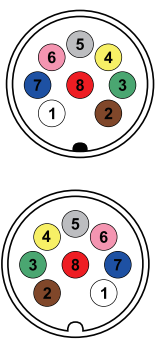
Magnetic security door lock set

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

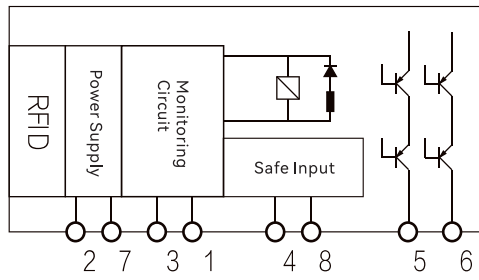
Technical parameters

Standard Parameters		Power supply	
Retaining force when locked	500N	Power supply voltage	24VDC
Retaining force when unlocked	<20N	Voltage tolerance	+15%/-20%
Working Distance		Power consumption	3.2W
Sa0 (OFF->ON)	0.1mm	Power reverse connection protection, output short circuit protection, output surge protection, output reverse connection protection	
Sar (ON->OFF)	15mm	Environmental resistance	
Response Time (ms)		Operating ambient temperature	-20 to 55°C (non-freezing)
Lock Unlock -- Lock	30 ms	Storage ambient temperature	-25 to 70°C (non-freezing)
Lock -- Lock Unlock	<300 ms	Operating ambient humidity	5% to 95%RH
Control Output (OSSD Output)		Storage ambient humidity	5% to 95%RH
Output method	Transistor output x 2	Vibration resistance	10 to 55Hz, dual amplitude 2.0mm, 5 minutes in each of the X, Y, and Z directions (IEC60947-5-3)
Maximum load current	200mA	Shock resistance	30G, 6 times in each of the X, Y, and Z directions
AUX Output (Non-Safety Output)		Material	
Output method	Transistor output	Sensor body	PBT, PET/PAR, TPC, PC, plated steel
Maximum load current	50 mA	Induction element	PBT, SUS304, nickel-plated steel
External Input		Mounting bracket	Aluminum, coated steel (screws: steel)
Security Input	Approximately 2mA x 2	Weight	
Lock Control Input	Approximately 2 mA	Sensor body	240g
AUX Input	Approximately 2 mA	Induction element	130g

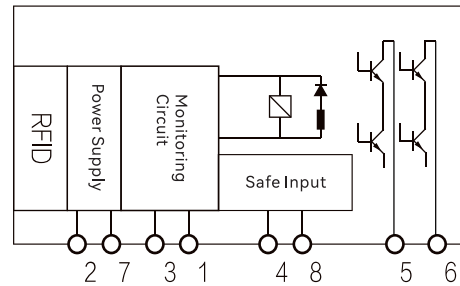
Connection parameters

Wiring method	M12 8-Pin Connector			
 M12 8-Pin A-Coded Female Connector M12 8-Pin A-Coded Male Connector	Pin	Color	Definitions	Explanations
	1	White	AUX	AUX Output/Input
	2	Brown	24VDC	Power Supply Positive 24VDC
	3	Green	Control	Lock Control Input
	4	Yellow	SI2	Safety Input 2
	5	Gray	OSSD1	OSSD Output 1
	6	Pink	OSSD1	OSSD Output 2
	7	Blue	0V	Power Supply Negative 0V
	8	Red	SI1	Safety Input 1

System module diagram



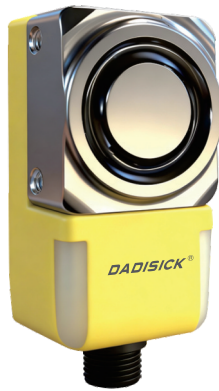
DK-OX-D51-S-SP



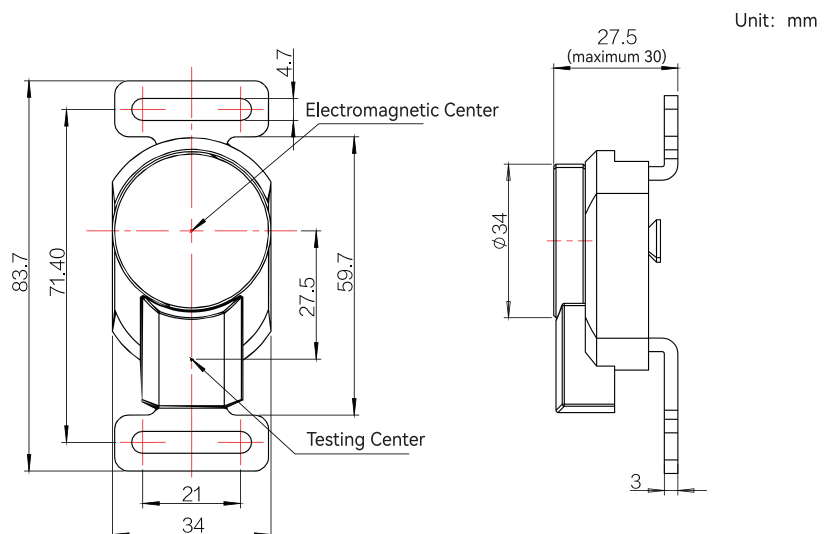
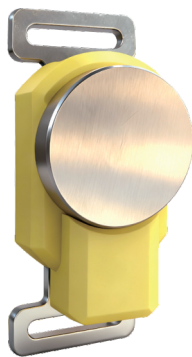
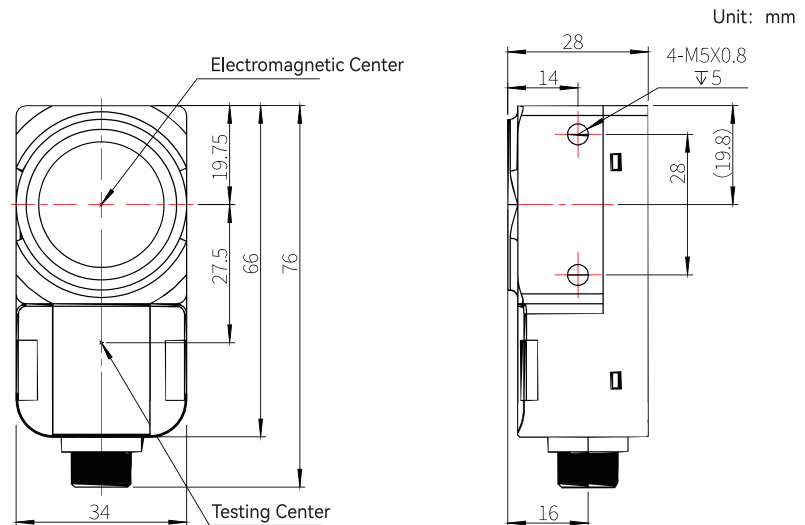
DK-OX-D51-S-SN

Line sequence function description

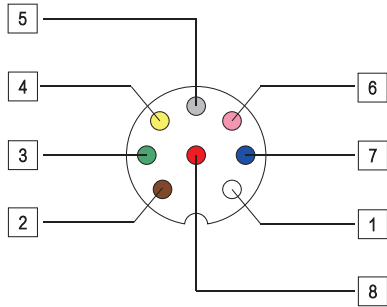
Safety door switch DK-OX-D51



Safety switch lock body dimension drawing



Line sequence function description



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

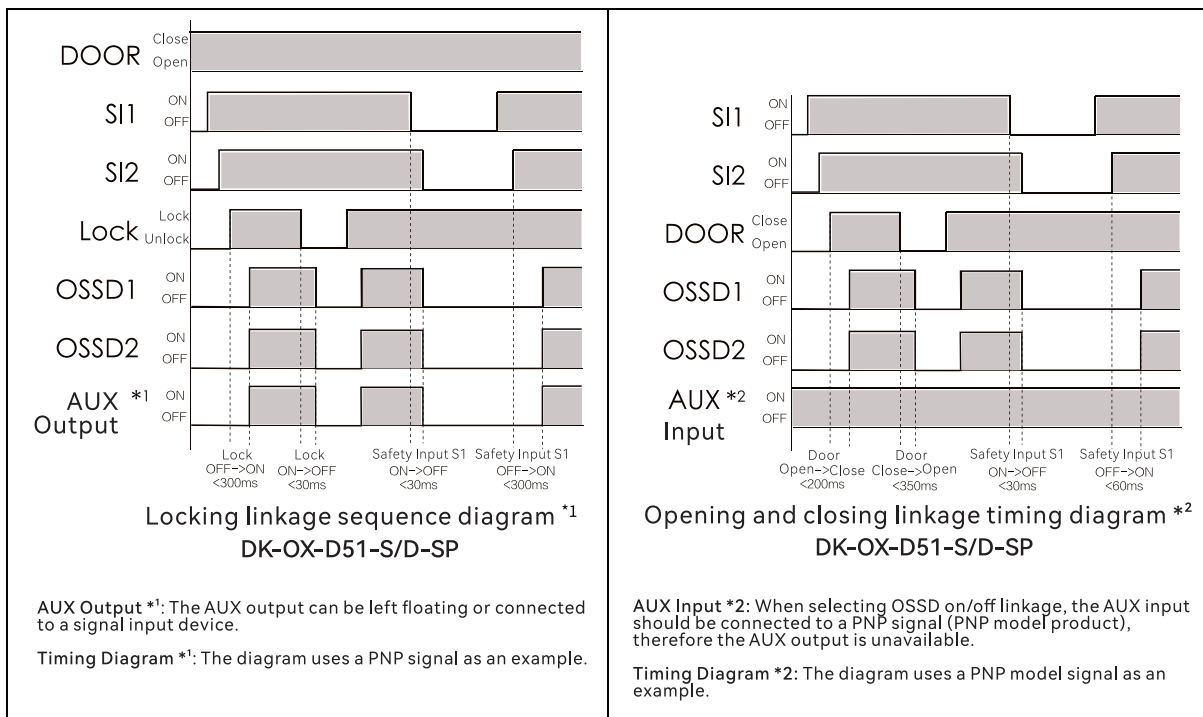
OSSD signal output conditions vary depending on the mode. See the table below for specific signal output conditions:

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

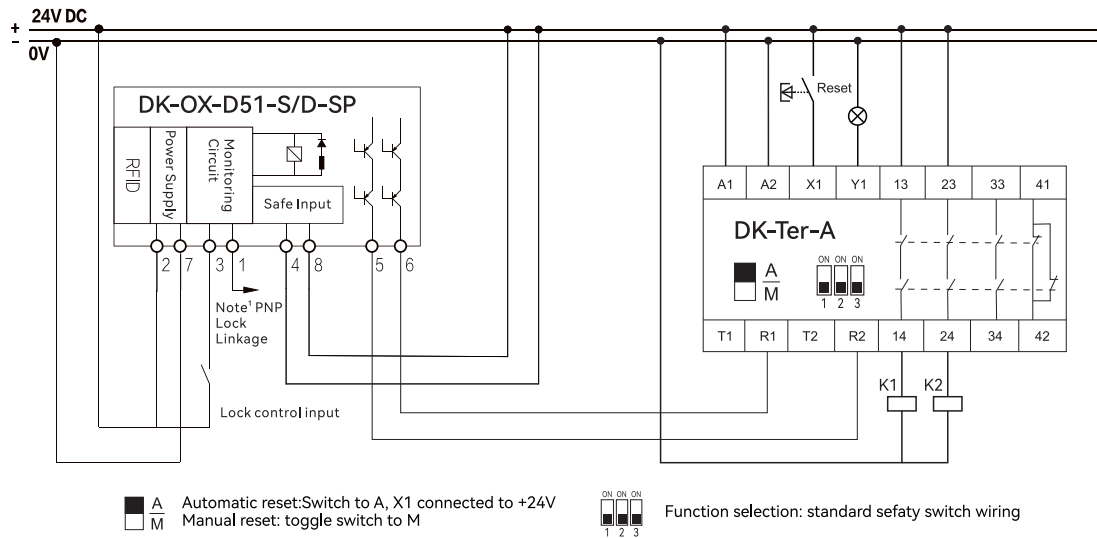
OSSD Linkage Mode Selection and Setting Method

	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

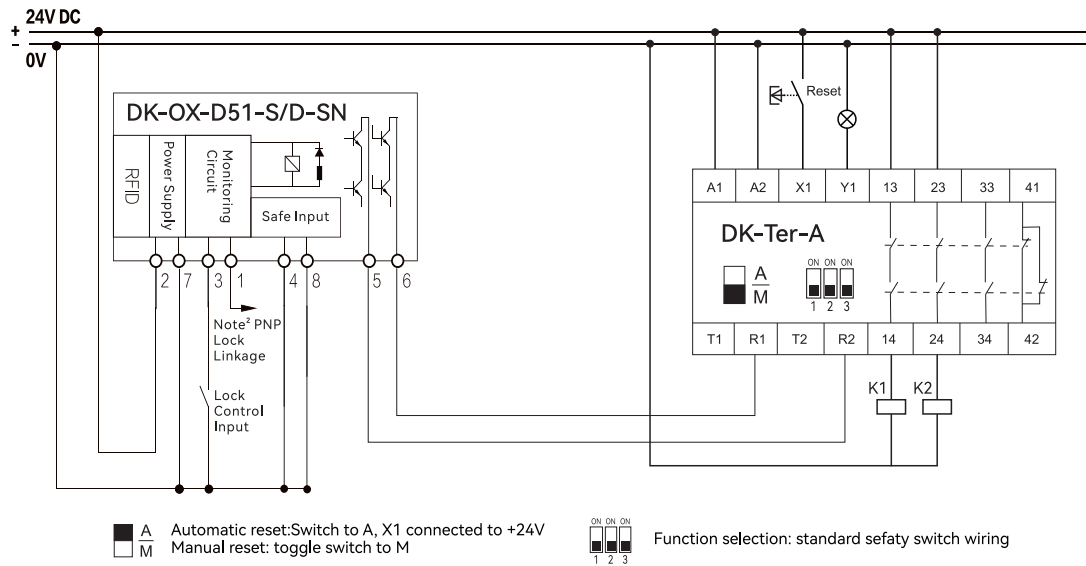
Time series diagram



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.