

# TECHNICAL DATA SHEET

## SAFETY DOOR SWITCHES DEVICE DK-OX-D6 series



For illustration purposes only

### Contents

- Product features
- Technical data
- Electrical wiring
- Accessories
- Installation diagram
- Back unlocking
- Safety door bolt

**Product Features**

- All-metal structure, strong, safe and durable;
- Multiple functions: with mechanism locking and monitoring functions;
- Multiple coding methods: unique coding and universal coding methods are optional.
- Independent redundant dual output: prevent safety hazards caused by failure of a single circuit;
- Cascade connection of door switches can reduce the number of input points;
- Small appearance: cross-sectional size 30mm\*30mm;
- Flexible installation: can be directly installed on an aluminum frame not exceeding 30mm

**DK-OX-D6 series**

**Suitable for monitoring**

- Safety doors      Safety windows

**Applicable industries**

- Automated production lines
- Robotic production lines
- Dangerous test areas
- Isolated areas, etc.



**Forced safety output**

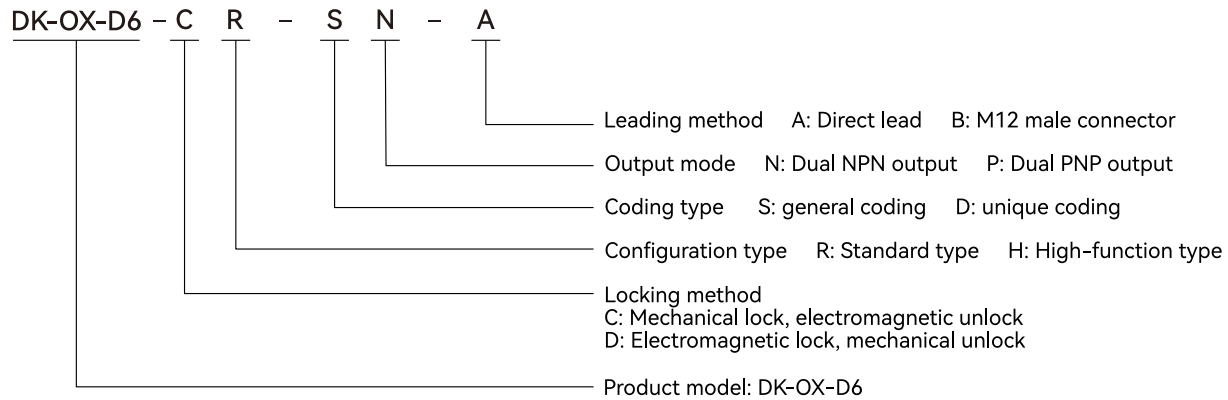
- Forced safety output At least 2 NC contacts for safety monitoring
- Additional multiple auxiliary signal contact combinations are available



## Model Description

### Main sensor model:

Selection example: DK-OX-D6-CR-SN-A



Note\* The default cable is 3m. If you need other lengths, please contact customer service

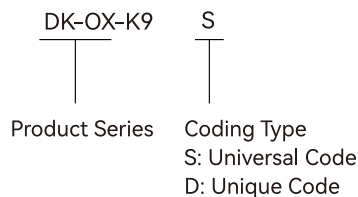
### The difference between standard type and high-function type

|                       | Standard type | High-function |
|-----------------------|---------------|---------------|
| Safety output channel | ●             | ●             |
| AUX output channel    | ●             | ●             |
| Safety input channel  | ●             | ●             |
| Lock input channel    | ●             | ●             |
| EDM                   |               | ●             |
| Reset                 |               | ●             |

### Actuator Model:



Selection example: DK-OX-K9S



## Model List

| Locking method       | Configuration type | Encoding type  | Output method | Lead method   | Model            |
|----------------------|--------------------|----------------|---------------|---------------|------------------|
| Mechanical lock      | Standard type      | Universal code | NPN           | Direct outlet | DK-OX-D6-CR-SN-A |
|                      |                    |                |               | M12 connector | DK-OX-D6-CR-SN-B |
|                      |                    |                | PNP           | Direct outlet | DK-OX-D6-CR-SP-A |
|                      |                    |                |               | M12 connector | DK-OX-D6-CR-SP-B |
|                      |                    | Unique code    | NPN           | Direct outlet | DK-OX-D6-CR-DN-A |
|                      |                    |                |               | M12 connector | DK-OX-D6-CR-DN-B |
|                      |                    |                | PNP           | Direct outlet | DK-OX-D6-CR-DP-A |
|                      |                    |                |               | M12 connector | DK-OX-D6-CR-DP-B |
|                      | High-function type | Universal code | NPN           | Direct outlet | DK-OX-D6-CH-SN-A |
|                      |                    |                |               | M12 connector | DK-OX-D6-CH-SN-B |
|                      |                    |                | PNP           | Direct outlet | DK-OX-D6-CH-SP-A |
|                      |                    |                |               | M12 connector | DK-OX-D6-CH-SP-B |
|                      |                    | Unique code    | NPN           | Direct outlet | DK-OX-D6-CH-DN-A |
|                      |                    |                |               | M12 connector | DK-OX-D6-CH-DN-B |
|                      |                    |                | PNP           | Direct outlet | DK-OX-D6-CH-DP-A |
|                      |                    |                |               | M12 connector | DK-OX-D6-CH-DP-B |
| Electromagnetic lock | Standard type      | Universal code | NPN           | Direct outlet | DK-OX-D6-DR-SN-A |
|                      |                    |                |               | M12 connector | DK-OX-D6-DR-SN-B |
|                      |                    |                | PNP           | Direct outlet | DK-OX-D6-DR-SP-A |
|                      |                    |                |               | M12 connector | DK-OX-D6-DR-SP-B |
|                      |                    | Unique code    | NPN           | Direct outlet | DK-OX-D6-DR-DN-A |
|                      |                    |                |               | M12 connector | DK-OX-D6-DR-DN-B |
|                      |                    |                | PNP           | Direct outlet | DK-OX-D6-DR-DP-A |
|                      |                    |                |               | M12 connector | DK-OX-D6-DR-DP-B |
|                      | High-function type | Universal code | NPN           | Direct outlet | DK-OX-D6-DH-SN-A |
|                      |                    |                |               | M12 connector | DK-OX-D6-DH-SN-B |
|                      |                    |                | PNP           | Direct outlet | DK-OX-D6-DH-SP-A |
|                      |                    |                |               | M12 connector | DK-OX-D6-DH-SP-B |
|                      |                    | Unique code    | NPN           | Direct outlet | DK-OX-D6-DH-DN-A |
|                      |                    |                |               | M12 connector | DK-OX-D6-DH-DN-B |
|                      |                    |                | PNP           | Direct outlet | DK-OX-D6-DH-DP-A |
|                      |                    |                |               | M12 connector | DK-OX-D6-DH-DP-B |

Note\* The default cable is 3m. If you need other lengths, please contact customer service

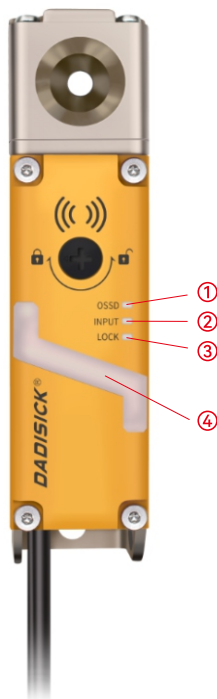
## Technical Parameters

|                                |                                  |   |
|--------------------------------|----------------------------------|---|
| Standards                      |                                  | ISO13849-1 (Category 4/PlE); IEC/EN60947-5-3  |
| Certification                  |                                  | CE  |
| Lock method                    |                                  | Mechanical lock/electromagnetic lock  |
| Safety output                  |                                  | NPN*2/PNP*2   |
| Response time                  | Lock → Unlock                    | 100ms (independent work)  |
|                                | Unlock → Lock                    |   |
| Lock                           | Lock holding force Fzh           | ≥2000N  |
|                                | Lock bolt insertion deviation    | ≤2mm  |
|                                | Mechanical durability            | >1 million times (door operation speed 1m/s)  |
|                                | Operation frequency              | 1Hz   |
|                                | Minimum radius of revolving door | ≥220mm  |
|                                | Manual unlocking                 | front, back   |
| Cascade connection             |                                  | up to 20 units  |
| Control output (OSSD output)   | Output type                      | Transistor output x2  |
|                                | Maximum load current             | ≤200mA  |
|                                | Residual voltage (ON)            | <2.5V@200mA   |
|                                | Voltage when OFF                 | ≤2V@cable 5m  |
|                                | Leakage current                  | ≤0.5mA  |
|                                | Maximum load capacity            | 2.2uF   |
|                                | Load connection resistance       | ≤2.5Ω   |
| AUX output (non-safety output) | Output type                      | Transistor output   |
|                                | Number of outputs                | 1   |
|                                | Maximum load current             | 50mA  |
|                                | Residual voltage (when ON)       | ≤2.5V@50mA  |
| External input (break current) | Safety input                     | 1.5mA*2   |
|                                | Reset/EDM input                  | About 10mA*1  |
|                                | Lock control input               | About 10mA*1  |
| Power supply                   | Operating voltage                | DC24V±15%   |
|                                | Rated power                      | 4.6W (no load)  |
| Protection                     |                                  | Safety circuit breaker protection, current limit, overload protection, overvoltage protection, overheating protection stop and restart, reverse polarity protection, transient noise protection, failure pulse protection |
| Environmental resistance       | Enclosure protection grade       | IP65  |
|                                | Action environment temperature   | -20°C~55°C (no freezing)  |
|                                | Storage environment temperature  | -25°C~70°C (no freezing)  |
|                                | Action environment humidity      | 5%~95%RH  |
|                                | Storage environment humidity     | 5%~95%RH  |
|                                | Vibration resistance             | 10 to 55Hz, double amplitude 2.0mm, 5 minutes in each direction of X, Y, and Z (IEC60947-5-3)   |
|                                | Impact resistance                | 30g 6 times in each direction of X, Y, and Z (IEC60947-5-3)   |
| Risk time                      |                                  | 100ms   |
| Start time                     |                                  | 3.5s  |
| Material                       |                                  | Nylon/zinc alloy/stainless steel  |

**Accessory model list**

| Category         | Product Image   | Product Name   | Model   |
|------------------|---|--|---|
| Actuator         |    | Universal coded actuator   | DK-OX-K9S   |
|                  |   | Unique coded actuator  | DK-OX-K9D   |
| Mounting bracket |    | Mounting bracket for pivot<br>(Applicable to hinged doors and leaf doors that open to the left)  | OX-K9-L   |
|                  |    | Mounting bracket for pivot<br>(Applicable to hinged doors and leaf doors that open to the right) | OX-K9-L1  |
|                  |   | Sliding mounting bracket<br>(Applicable to sliding doors that open to the left)                  | OX-K9-T1  |
|                  |  | Sliding mounting bracket<br>(Applicable to sliding doors that open to the right)                 | OX-K9-T2  |
| M12 cable        |  | Standard cable (8-pin)   | The standard line length is 3m.<br>For details, please contact customer service |
|                  |   | High-performance cable (12-pin)  |   |

## Indicator light status description



| Number | Name                   | Light color | Status description  |
|--------|------------------------|-------------|---|
| ①      | Output indicator light | Red, Green  | OSSD output: green<br>OSSD off: red<br>OSSD error: red flashing (2Hz)<br>EDM error: red flashing (1Hz)  |
| ②      | Input indicator light  | Green       | Normal input: on<br>No input (waiting for input): off<br>Waiting for RSET reset: 1Hz flashing   |
| ③      | Lock indicator light   | Green       | Door locked: on<br>Lock abnormality: 2Hz flashing<br>(electromagnet error, optocoupler error)<br>No RFID: 1Hz flashing<br>Unlocked: off   |
| ④      | Status indicator light | Red, Green  | Locked and output: green light<br>No output: red light<br>Voltage error: red light flashing 2Hz<br>Internal fault self-check error: red light flashing 1Hz<br>Internal data calibration error: green light flashing 1Hz |

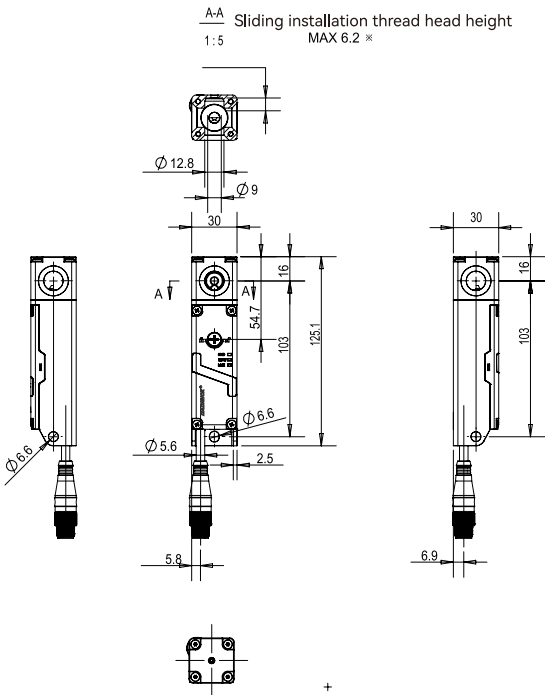
## LED status during normal operation

| Working status              | Indicator light  | Status description   |
|-----------------------------|--|--|
| Close the door and lock it  | <p>Working status indicator: green light on<br/>OSSD output indicator: green light on<br/>INPUT input indicator: yellow light on<br/>LOCK lock indicator: green light on</p>       | <ol style="list-style-type: none"> <li>1. Detect that the key signal is normal,</li> <li>2. Detect that the key is inserted in place and the door is closed</li> <li>3. The input signal is normal</li> <li>3. Lock and output normally</li> </ol> |
| Unlock the door and open it | <p>Working status indicator: red light on<br/>OSSD output indicator: red light on<br/>INPUT input indicator: yellow light on<br/>LOCK lock indicator: off</p>                      | <ol style="list-style-type: none"> <li>1. No key signal detected</li> <li>2. Key not inserted properly, door opened</li> <li>3. Input signal normal</li> <li>3. Not locked and no output</li> </ol>  |
| Close the door and lock it  | <p>Working status indicator: red light on<br/>OSSD output indicator: red light on<br/>INPUT input indicator: yellow light on<br/>LOCK lock indicator: green light low flashing</p> | <ol style="list-style-type: none"> <li>1. Key signal not detected</li> <li>2. Input signal normal</li> <li>3. Locked but no output</li> </ol>  |
| Close the door and lock it  | <p>Working status indicator: red light on<br/>OSSD output indicator: red light on<br/>INPUT input indicator: off<br/>LOCK lock indicator: green light on</p>                       | <ol style="list-style-type: none"> <li>1. No input signal</li> <li>3. Locked but no output</li> </ol>  |

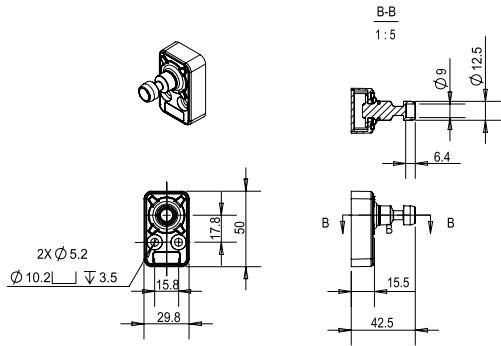
| LED status during normal operation |                 |  |
|------------------------------------|-----------------|--|
| Working status                     | Indicator light | Status description   |
| OSSD error                         |                 | Working status indicator: green light on<br>OSSD output indicator: green light on<br>INPUT input indicator: yellow light on<br>LOCK lock indicator: green light on<br>1. OSSD short circuit or incorrect wiring.<br>2. Inductive load causes voltage surge on OSSD.<br>3. OSSD is affected by electrical interference.<br>4. OSSD failure. |
| EDM error                          |                 | Working status indicator: red light on<br>OSSD output indicator: red light on<br>INPUT input indicator: yellow light on<br>LOCK lock indicator: off<br>EDM input is not wired correctly  |
| Lock abnormality                   |                 | Working status indicator: red light on<br>OSSD output indicator: red light on<br>INPUT input indicator: yellow light on<br>LOCK lock indicator: off<br>Electromagnet error or optocoupler error  |
| Hardware failure                   |                 | Working status indicator: red light on<br>OSSD output indicator: red light on<br>INPUT input indicator: off<br>LOCK lock indicator: green light on<br>1. Internal fault self-check error<br>2. Hardware failure  |

**Product Dimensions**

DK-OX-D6 safety door switch

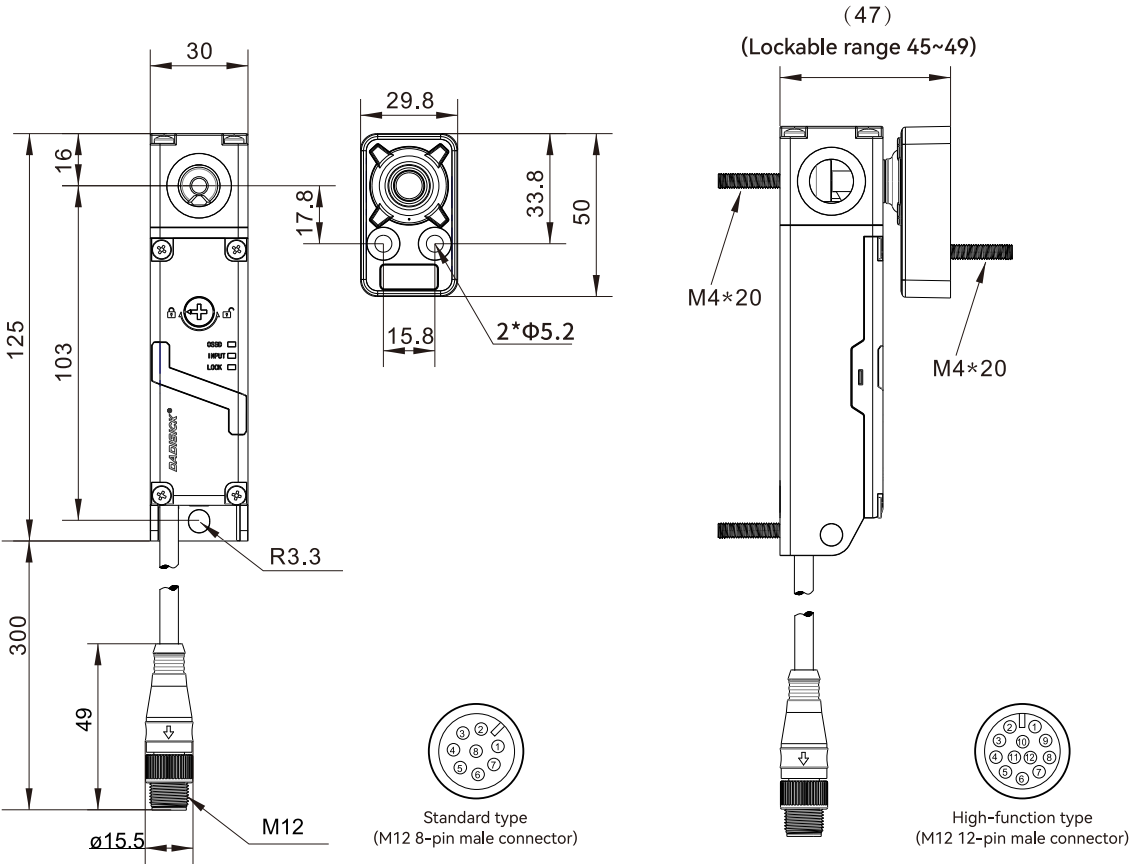


DK-OX-K9 operation key

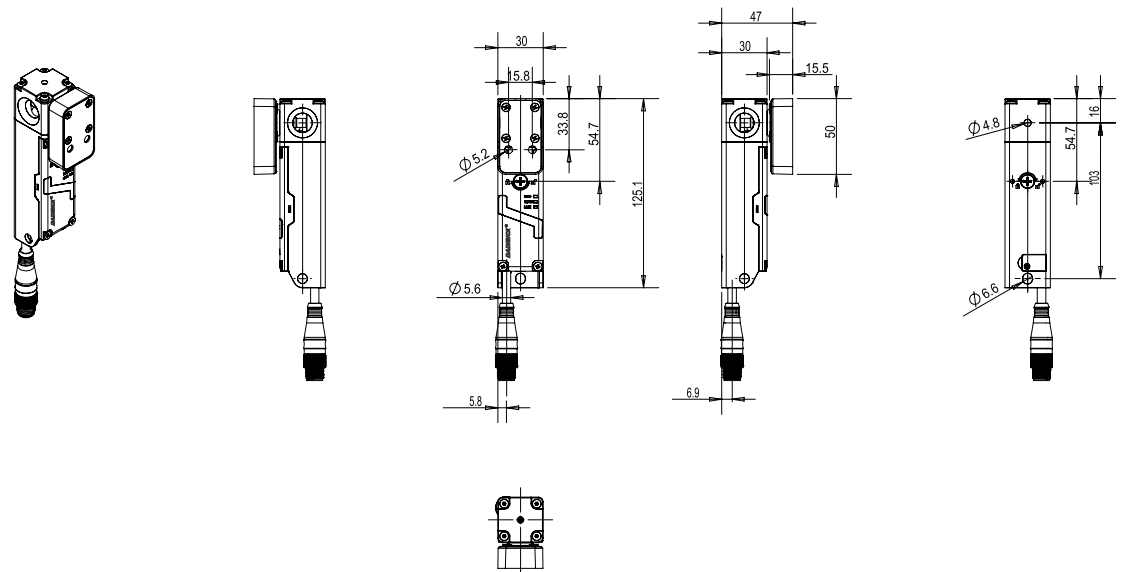


Unit: mm

**Product Dimensions**

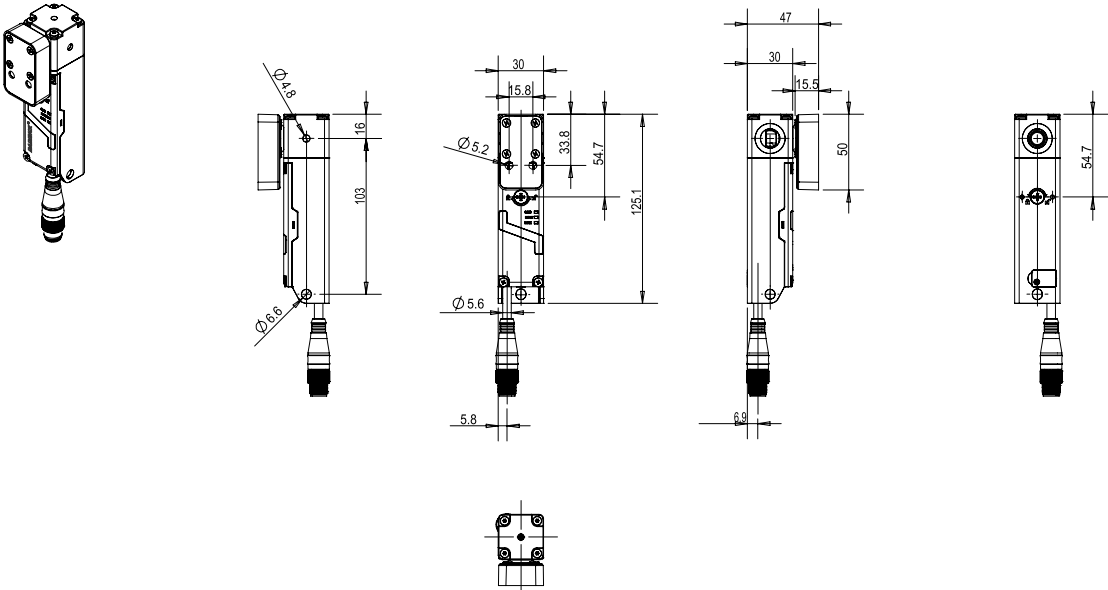


**DK-OX-D6 safety door switch and DK-OX-K9 shaft installation (applicable to hinged doors and hinged doors)**

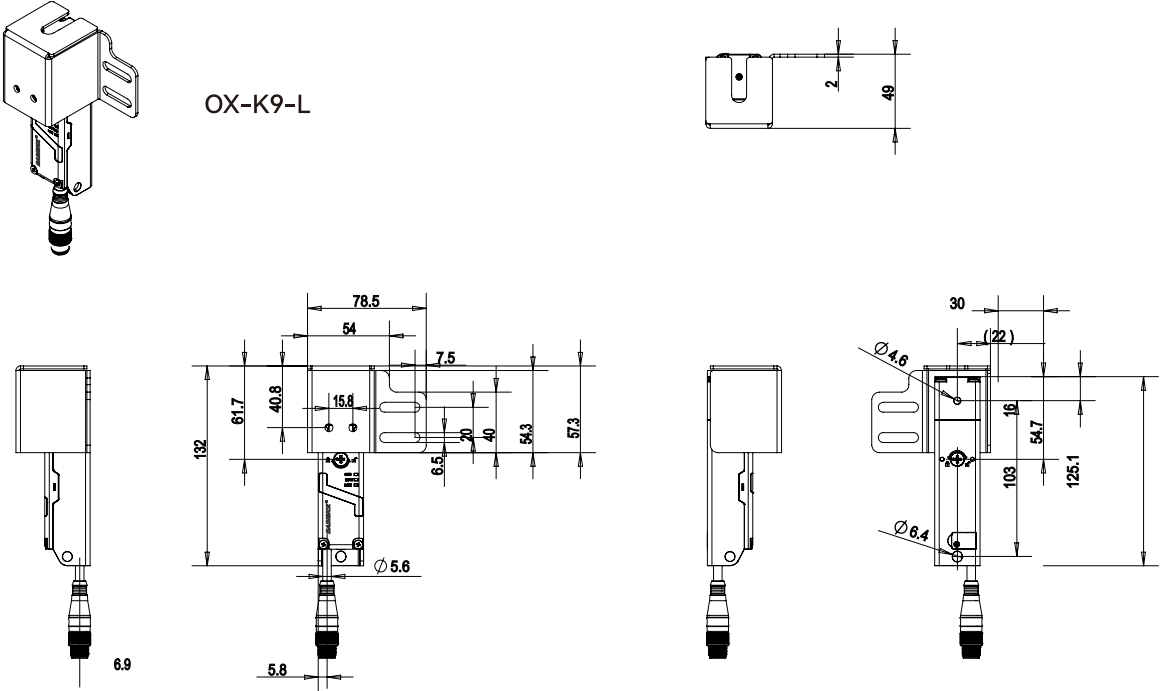


Unit: mm

DK-OX-D6 safety door switch and DK-OX-K9 sliding installation (suitable for sliding doors)

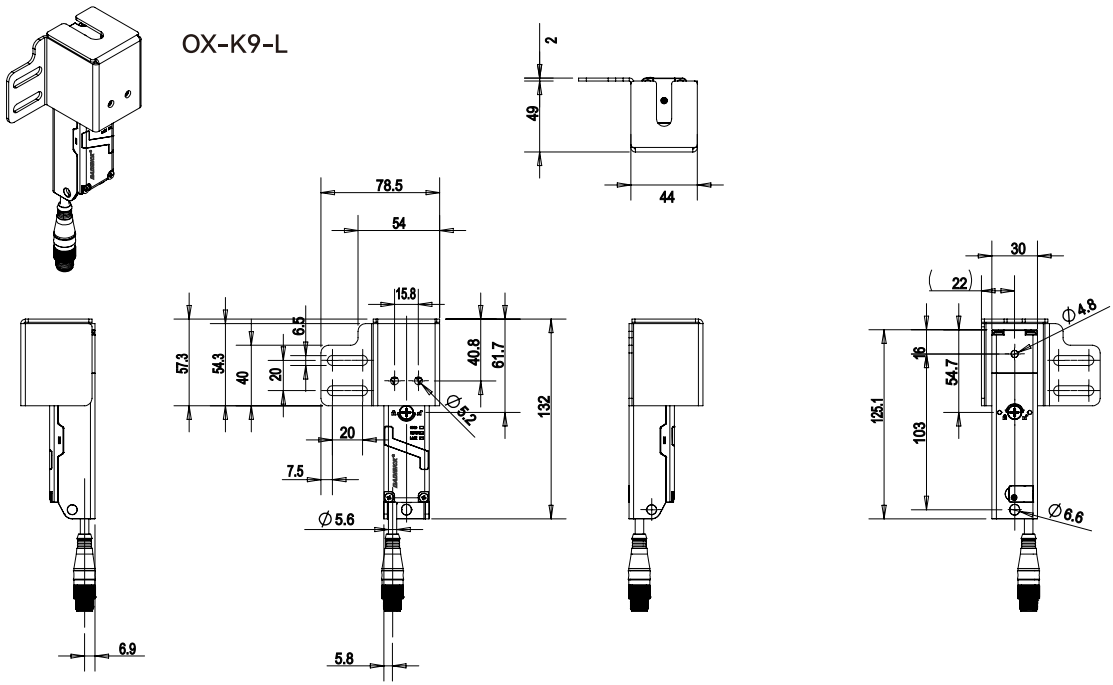


OX-K9-L mounting bracket for pivot (door opening to the right), DK-OX-D6 safety door switch and OX-K9 pivot mounting

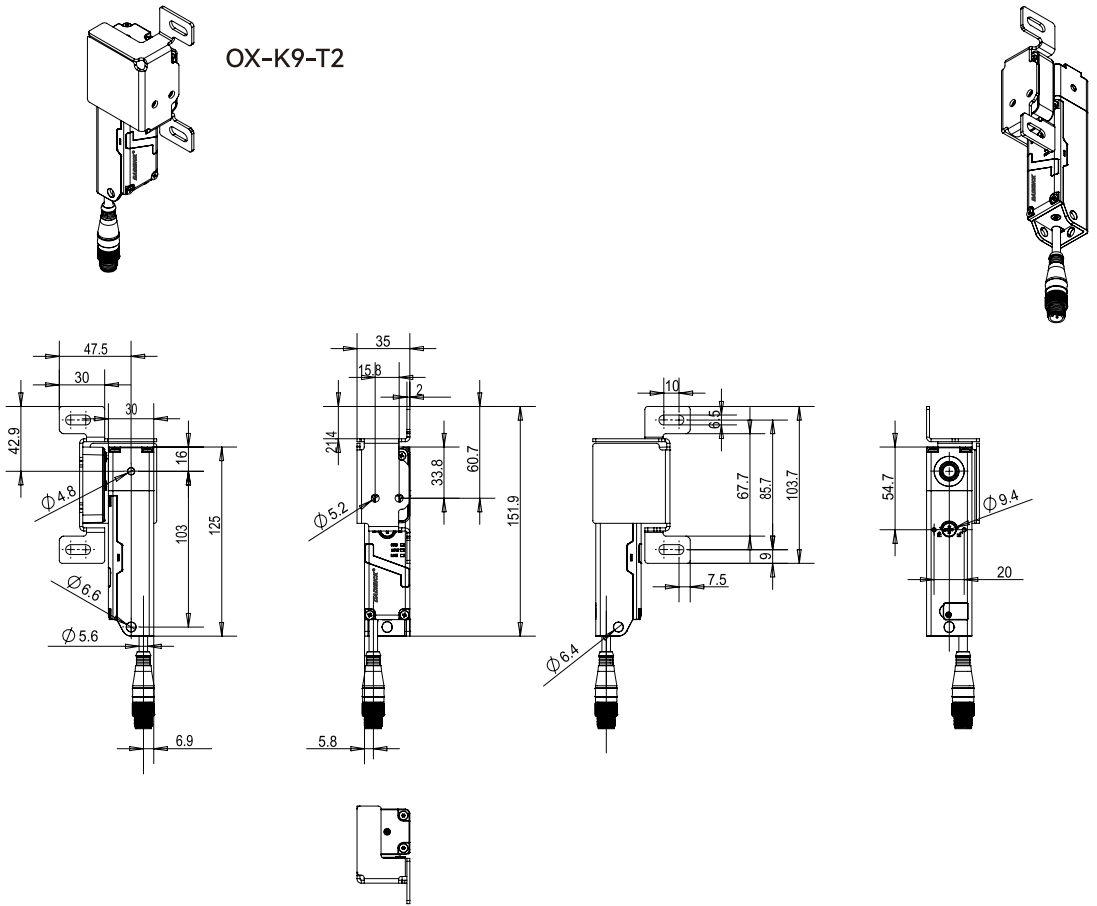


Unit: mm

OX-K9-L mounting bracket for pivot (door opens to the left), DK-OX-D6 safety door switch and OX-K9 pivot mounting

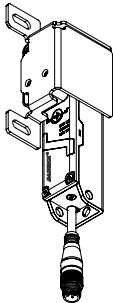


Sliding mounting bracket OX-K9-T2 (door opens to the right), DK-OX-D6 safety door switch and DK-OX-K9 sliding mounting

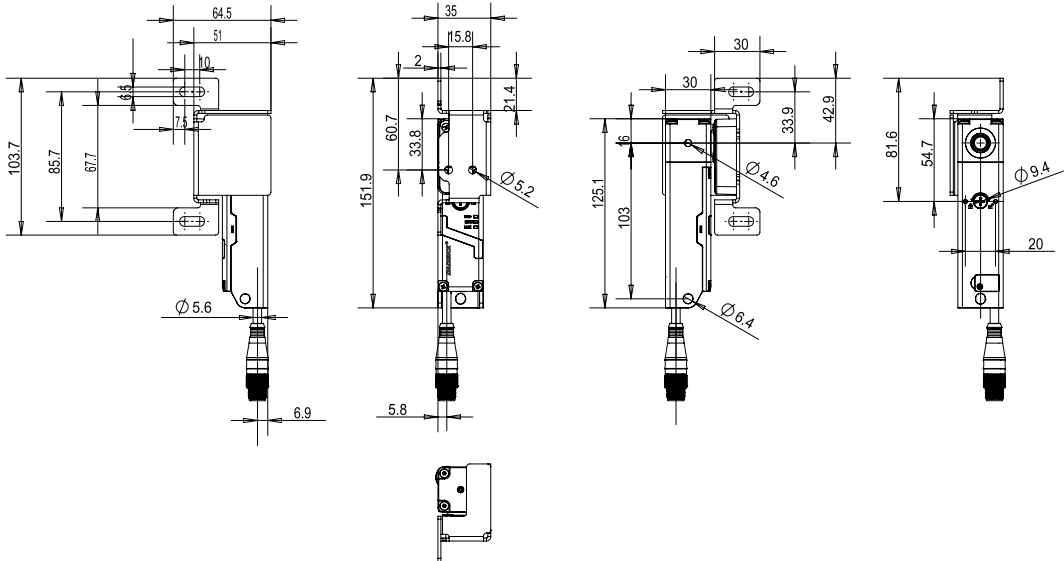
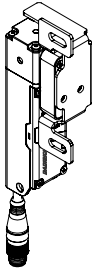


Unit: mm

Sliding mounting bracket OX-K9-T1 (door opens to the left), DK-OX-D6 safety door switch and OX-K9 sliding mounting



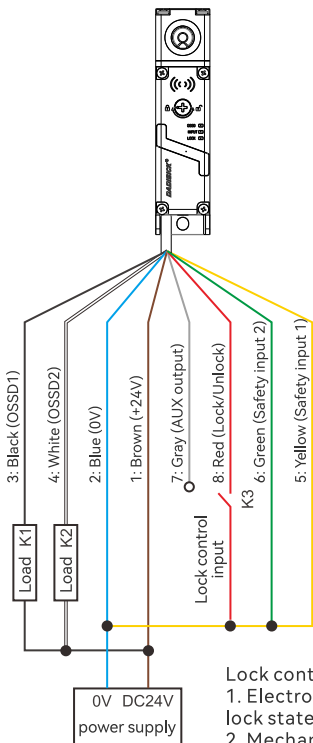
OX-K9-T1



Unit: mm

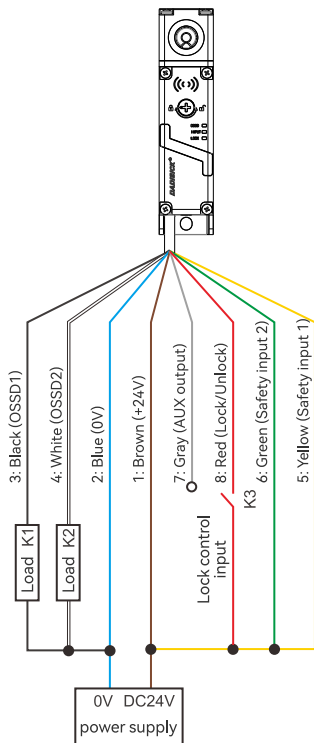
Product Wiring Diagram

DK-OX-D6 safety door switch standard type (NPN, no cascade)



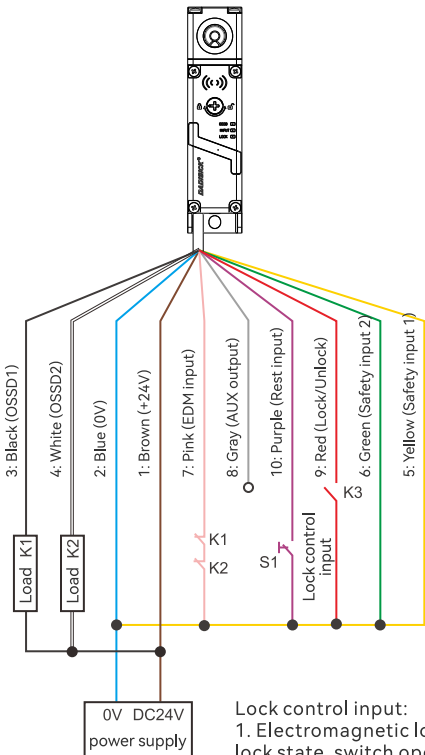
Lock control input:  
 1. Electromagnetic lock, mechanical release: K3, switch closed lock state, switch open unlock state;  
 2. Mechanical lock, electromagnetic release: K3, switch open lock state, switch closed unlock state.

DK-OX-D6 safety door switch standard type (PNP, no cascade)



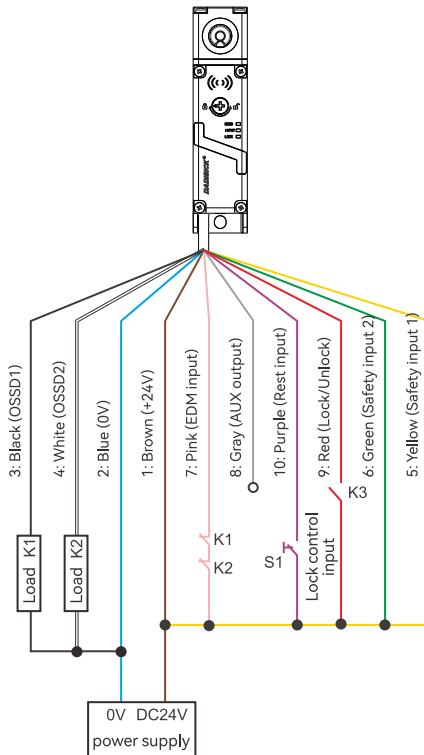
Lock control input:  
 1. Electromagnetic lock, mechanical release: K3, switch closed lock state, switch open unlock state;  
 2. Mechanical lock, electromagnetic release: K3, switch open lock state, switch closed unlock state.

DK-OX-D6 safety door switch high-function type (NPN, no cascade)



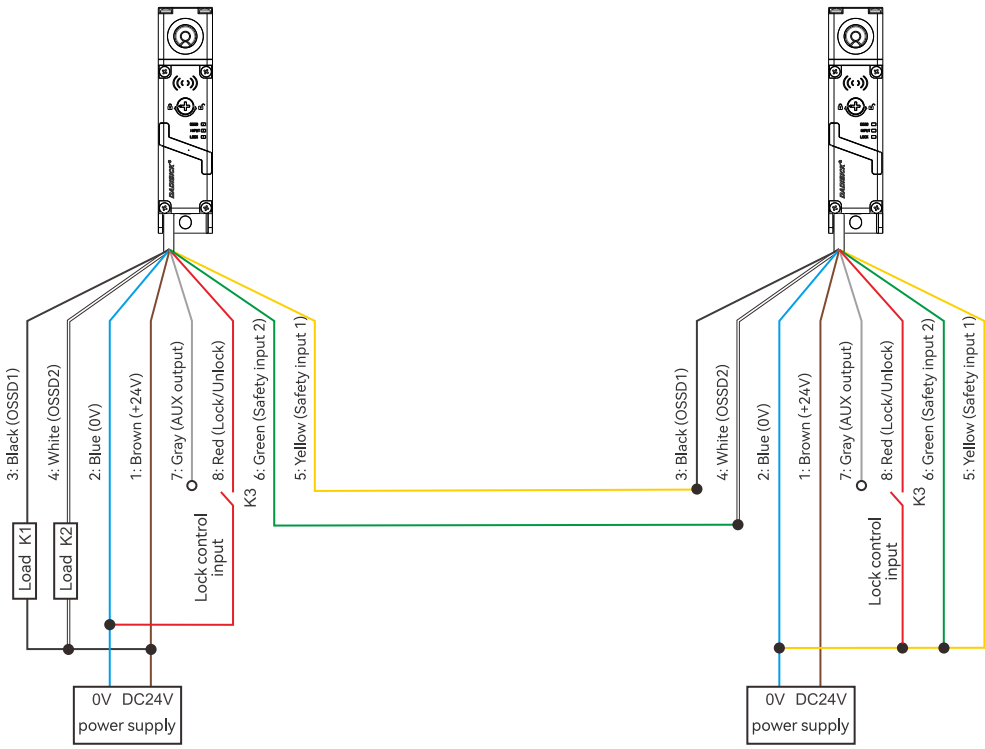
Lock control input:  
 1. Electromagnetic lock, mechanical release: K3, switch closed lock state, switch open unlock state;  
 2. Mechanical lock, electromagnetic release: K3, switch open lock state, switch closed unlock state.  
 Note: When the EDM function is not in use, the pink line (EDM input) and the gray line (AUX output) can be short-circuited.

DK-OX-D6 safety door switch high-function type (PNP, no cascade)



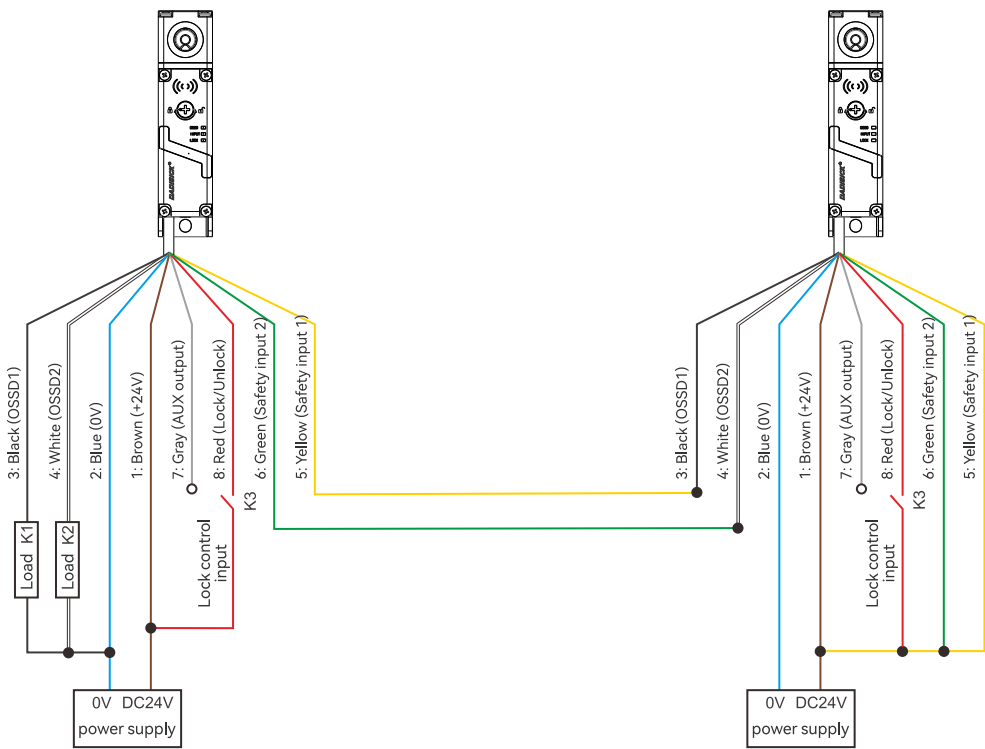
Lock control input:  
 1. Electromagnetic lock, mechanical release: K3, switch closed lock state, switch open unlock state;  
 2. Mechanical lock, electromagnetic release: K3, switch open lock state, switch closed unlock state.  
 Note: When the EDM function is not in use, the pink line (EDM input) and the gray line (AUX output) can be short-circuited.

**DK-OX-D6 safety door switch standard type (NPN, cascade)**



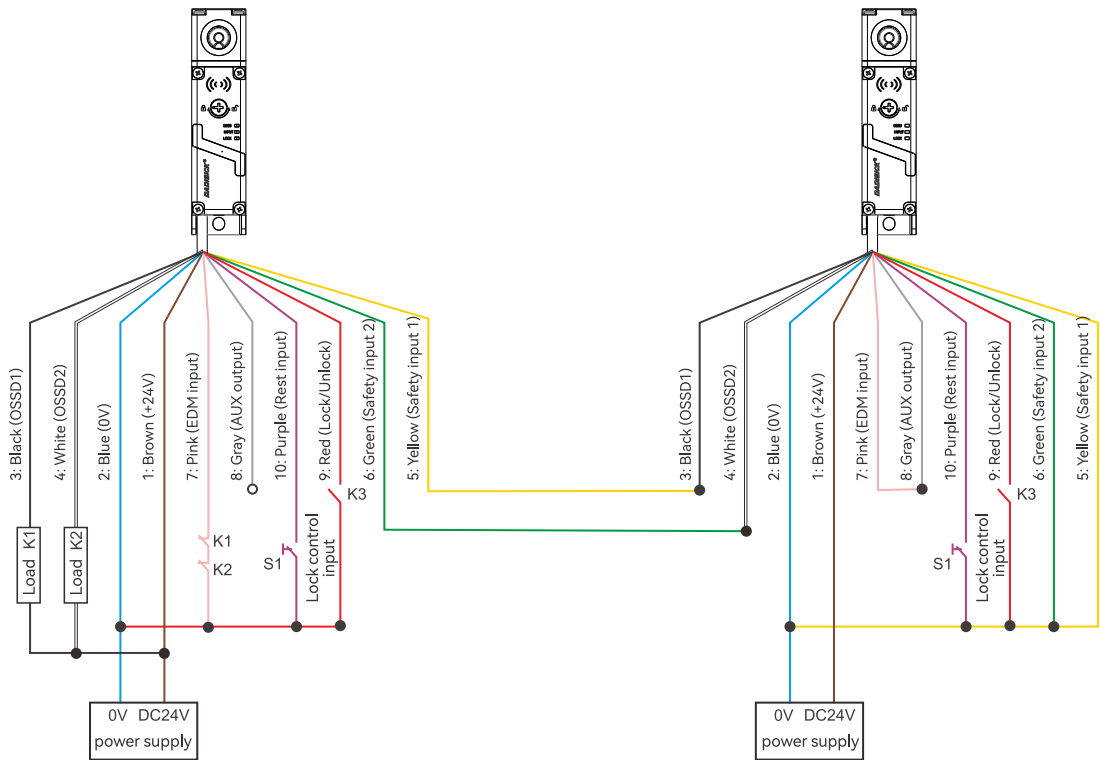
Lock control input:  
 1. Electromagnetic lock, mechanical release: K3, switch closed lock state, switch open unlock state;  
 2. Mechanical lock, electromagnetic release: K3, switch open lock state, switch closed unlock state.

**DK-OX-D6 safety door switch standard type (PNP, cascade)**



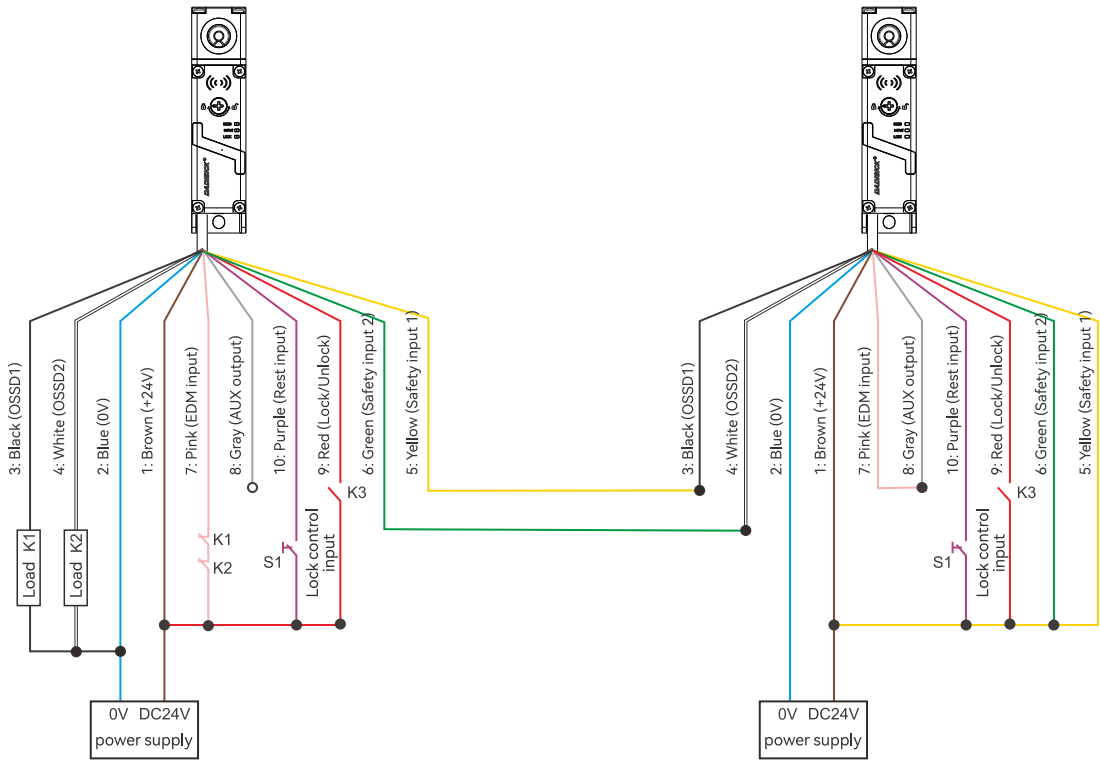
Lock control input:  
 1. Electromagnetic lock, mechanical release: K3, switch closed lock state, switch open unlock state;  
 2. Mechanical lock, electromagnetic release: K3, switch open lock state, switch closed unlock state.

DK-OX-D6 safety door switch high function type (NPN, cascade)



Lock control input:  
 1. Electromagnetic lock, mechanical release: K3, switch closed lock state, switch open unlock state;  
 2. Mechanical lock, electromagnetic release: K3, switch open lock state, switch closed unlock state.  
 Note: When the EDM function is not in use, the pink line (EDM input) can be connected to 0V or short-circuited with the gray line (AUX output)

DK-OX-D6 safety door switch high function type (PNP, cascade)



Lock control input:  
 1. Electromagnetic lock, mechanical release: K3, switch closed lock state, switch open unlock state;  
 2. Mechanical lock, electromagnetic release: K3, switch open lock state, switch closed unlock state.  
 Note: When the EDM function is not in use, the pink line (EDM input) can be connected to 24V or short-circuited with the gray line (AUX output)