



M MECHAN CONTROLS

Installation Instruction for O-Type Safety Switches

OHE1 Coded Magnetic / ODNK Uniquely Coded RFID with OSSD Outputs



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Machine Safety for People and Productivity

O-Type Features and Benefits



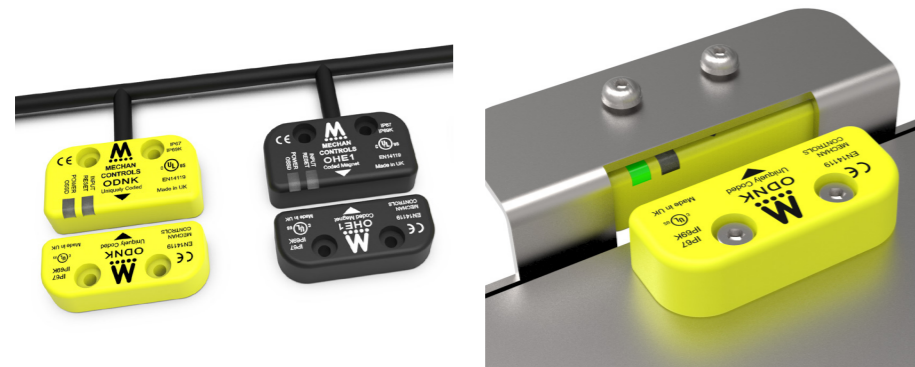
- OHE1 Coded Magnetic / ODNK Uniquely Coded RFID
- Maintain PL-e when Connected in Series using OSSD Outputs
- Advanced LED Diagnostic Display
- External Device Monitoring (Advanced type)
- 2 Amp Safety Output Rating (Pre-Wired) 1Amp (Quick Disconnect)
- Multiple Operating Angles for Easy Installation (ODNK)
- Meets the Requirements for CAT4 and SIL3

The O-Type range combines 40+ years of experience designing and manufacturing machine guard safety products with the latest in safety technology. Their unique design means 30 O-Type switches can be connected in series maintaining PL-e status.

OHE1	ODNK
The OHE1 uses coded magnetic technology that meets the requirements of low/medium level coding in accordance with EN ISO 14119. The OHE1 also includes misalignment indication to improved installation.	The ODNK has individually coded RFID technology that meets the requirements of type 4 in accordance with EN ISO 14119. Due to the unique design, the switch can be mounted and operated on 4 sides making it incredibly versatile.

O-Type safety switches include two LEDs for indication. They are able to provide visual diagnostics for ALL states of the device. This means the user can easily fault find without needing to access the control panel.

The O-Type safety switches are available with a feature called EDM (external device monitoring, this means the outputs can be used to monitor the state of contactors without the need for a safety control unit.

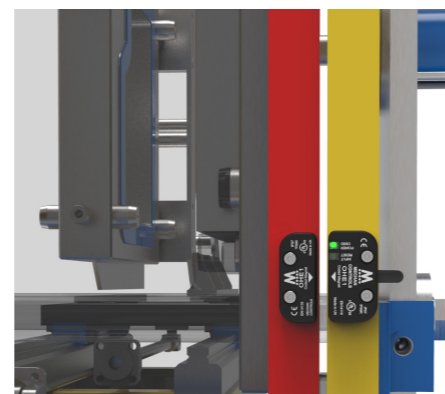


Designed for Series Connection

The O-Type range features OSSD outputs designed to maintain a high level of functional safety even through series connection.

Overhanging LED Display

Our new LED design means you can see the indication when mounted on multiple faces.



Slim Line Design for Small Guards

The slim line design means the O-Type are suitable for applications with smaller guarding.

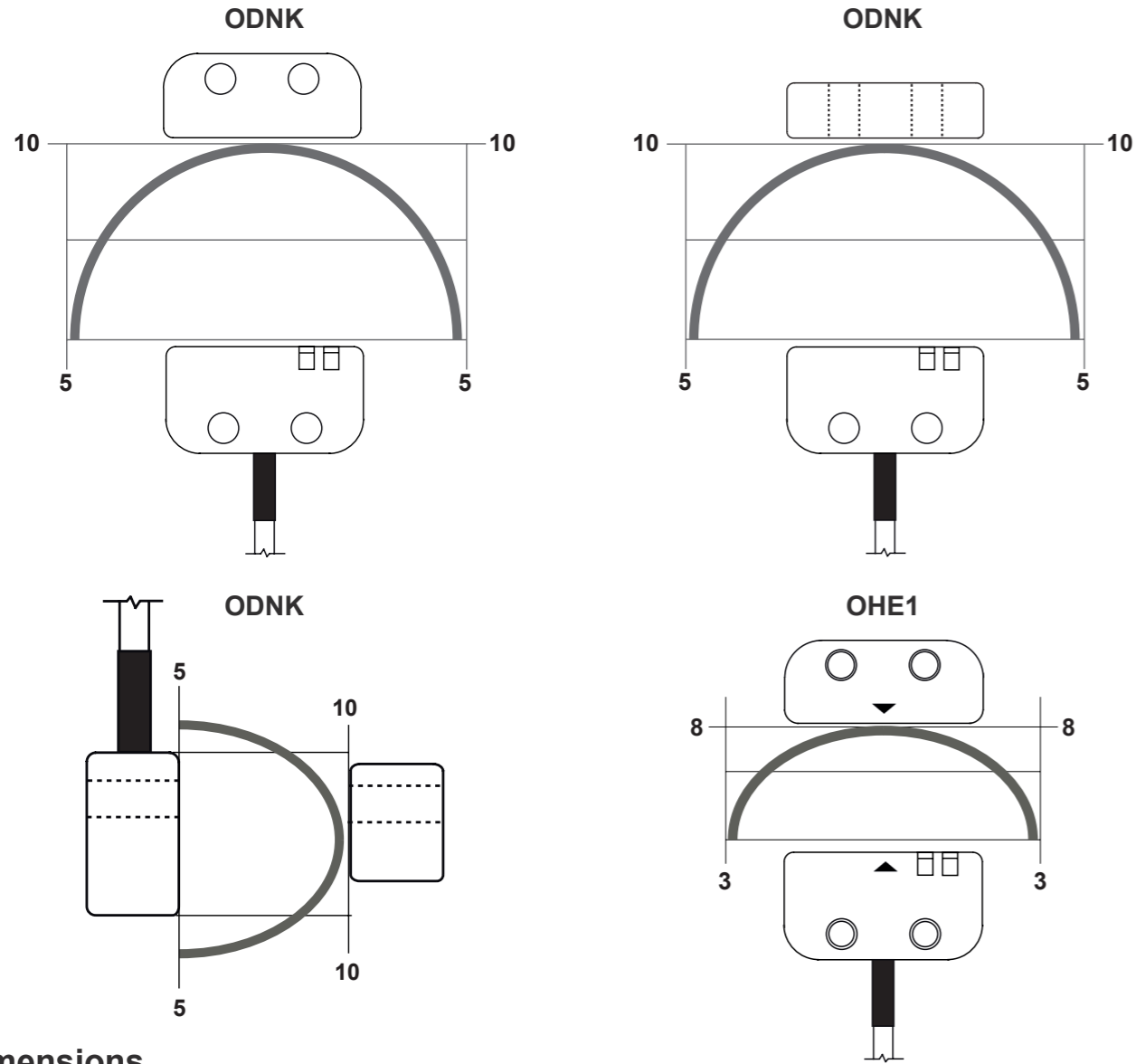
Technical Specification

	ODNK	OHE1
Electrical Data of Safety Outputs		
Safety Contact Type	PNP type OSSD	PNP type OSSD
No. of OSSD Inputs	2	2
No. of OSSD Outputs	2	2
OSSD Pulse Width	400 µs	400 µs
Maximum Current per Output	2 A, max.; Status ON (+24V DC) - Door Closed	2 A, max.; Status ON (+24V DC) - Door Closed
Short Circuit Detection	YES	YES
Over Current Protection	YES	YES
Electrical Data of Inputs and EDM		
Operating Voltage	24Vdc	24Vdc
Rated Current Consumption	2.5mA	2.5mA
Switching time EDM	400ms	400ms
Electrical Data of Auxiliary Output		
Operating Voltage	24Vdc	24Vdc
Output Type	PNP	PNP
Maximum Current per Aux Output	2 A, max.; Status ON (+24V DC) - Door Open	2 A, max.; Status ON (+24V DC) - Door Open
Short Circuit Detection	YES	YES
Over Current Protection	YES	YES
Power Supply Electrical Data		
Supply Voltage Options	24VDC (+/- 15%)	24VDC (+/- 15%)
Operating Current at min. Power	20mA	20mA
- With all Outputs at max. Power	550mA	550mA
External Protection Fuse	1.8 A Fast Acting	1.8 A Fast Acting
Overvoltage Category	III	III
General Information		
Construction	Yellow ABS	Black ABS
IP Rating	IP67 / IP69K	IP67 / IP69K
Operating Temperature	-10°C to +60°C	-10°C to +60°C
Fixing	4 X M4 Security Screws	4 X M4 Security Screws
Connection	Pre-Wired or M12 QD	Pre-Wired or M12 QD
Technology	RFID	Coded Magnetic
Coding	Individually Coded (4 Billion Codes)	Magnetically Coded (One Generic Code)
Indication	See page 4	See page 4

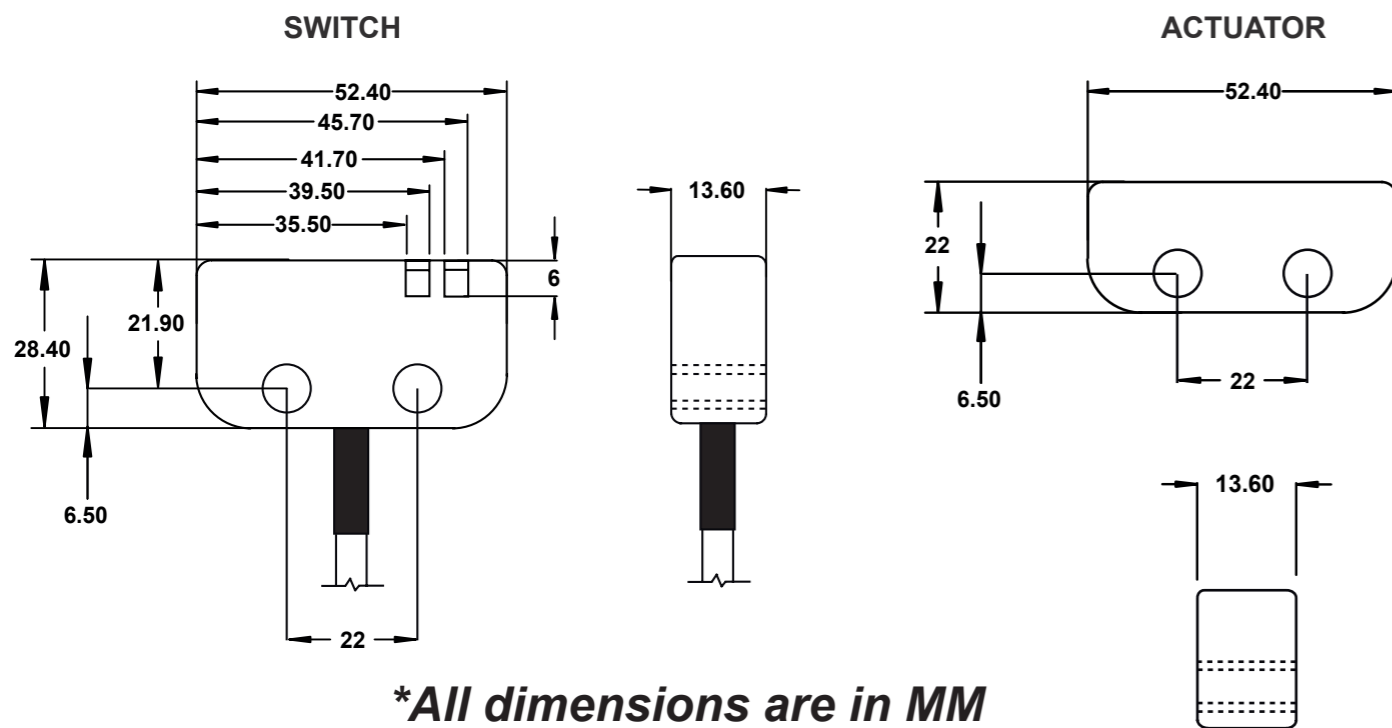
Safety Related Data			
B10d	10,000000	PFH	1.1 x 10 ⁻⁹
TM (Mission Time)	>100 Years	PFHd	1.12 x 10 ⁻⁹
DC	99%	SFF	99.5%
MTTFd	High > 385 Years (Based on usage rate of 360 Days/Year, 24 Hours/Day, 10 Operations/Hour)		
SIL up to	SIL 3 acc. to EN 62061		
Performance Level (PL) up to	PL-e acc. to EN ISO 13849-1		
Safety Category up to	CAT4 acc. to EN ISO 13849-1		
Coding	ODNK Type 4 acc. to EN ISO 14119 / OHE1 Type 2 acc. to EN ISO 14119		

Safety Standards	
Approvals	CE Complies with all relevant sections of the CE Marking Directive
	TUV Approved (Pending)
	cULus 508 Industrial Control
International Directives	Machinery Directive 2006/42/EC; Low Voltage Directive 2006/95/EC; EMC Directive 2014/30/EU; RoHS Directive 2011/65/EC
International Standards	EN 12100 Safety of Machinery. General principles for design.
	EN ISO 14119 Safety of Machinery. Interlocking devices associated with guards. Principles for design and selection.
	EN ISO 13849 Safety of Machinery. Safety related parts of control systems.
	EN ISO 62061 Safety of Machinery. Functional safety of safety related electrical, electronic and programmable electronic control systems
	EN 60204 Safety of Machinery. Electrical equipment of machines.
	EN 60947-5-1 Low-voltage switchgear and controlgear.
	EN 60947-5-3 Low-voltage switchgear and controlgear.

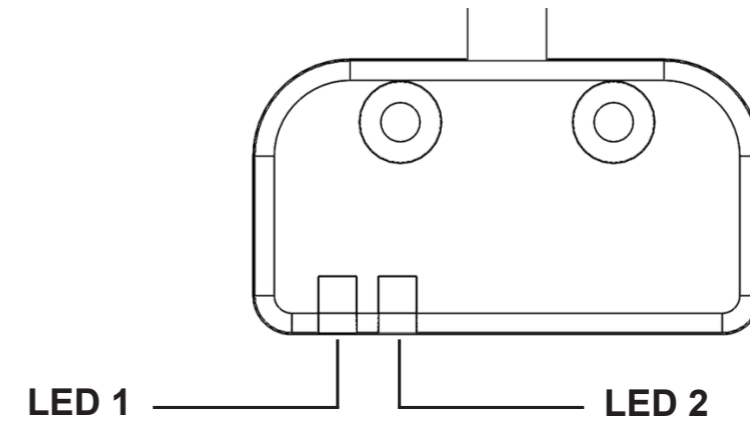
Lateral and Vertical Mounting



Dimensions



Indication

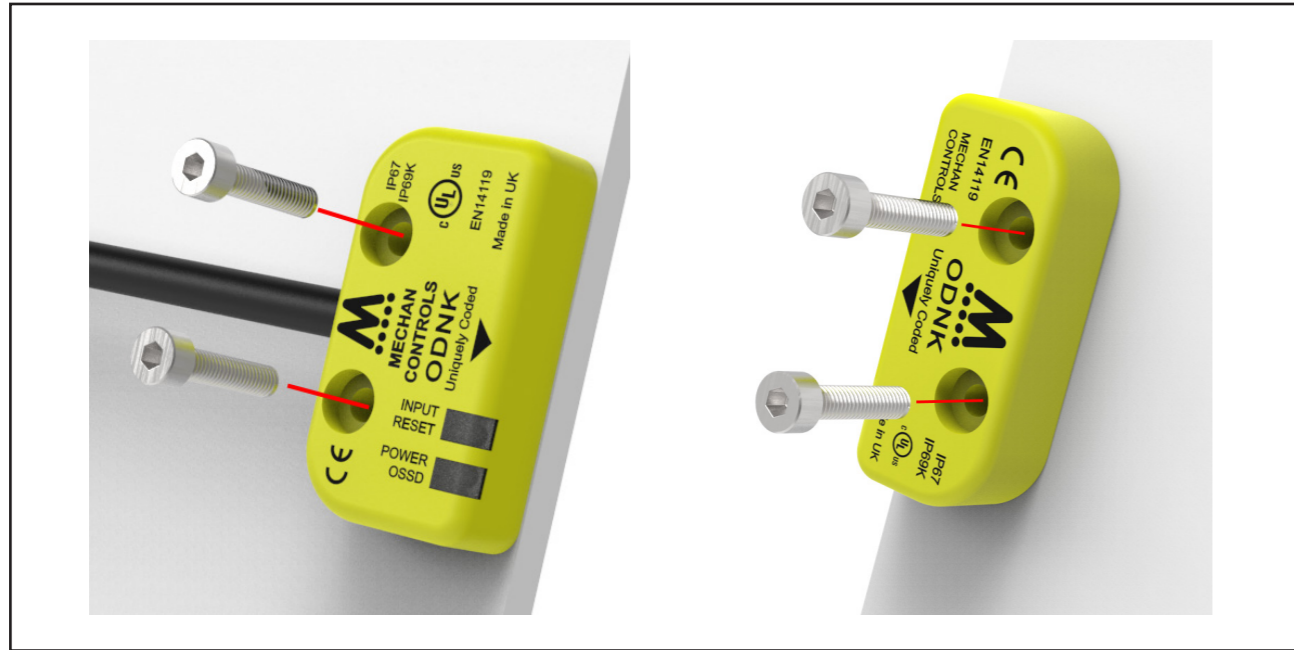


LED 1				
Colour	LED Status	OHE1	ODNK	Description
	None	✓	✓	No Supply
	Solid Yellow	✓	✓	Supply is outside operating voltage
	Solid Red	✓	✓	Supply is in operating parameters (no actuator present)
	Flashing Yellow	x	✓	(Incorrect Actuator Code ODNK only) OR OSSD input fault
	Flashing Yellow	✓	x	(Misalignment Indication OHE1 only) OR OSSD input fault
	Flashing Red	✓	✓	OSSD Output fault - Restart the switch to clear the fault
	Flashing Green	✓	✓	Actuator present but no output present
	Solid Green	✓	✓	OSSD Outputs are present and operating without error

LED 2				
Colour	LED Status	OHE1	ODNK	Description
	Solid Yellow	✓	✓	Actuator present but OSSD inputs are not present
	Solid Blue	✓	✓	Actuator and OSSD inputs present: external circuit needs resetting
	Flashing Yellow	✓	✓	OSSD Input fault (both OSSD inputs must go low to reset)
	Flashing Purple	x	✓	Switch is set to teach voltage (17v) and is ready to be taught
	Solid Purple	x	✓	Switch has been taught the new actuators code

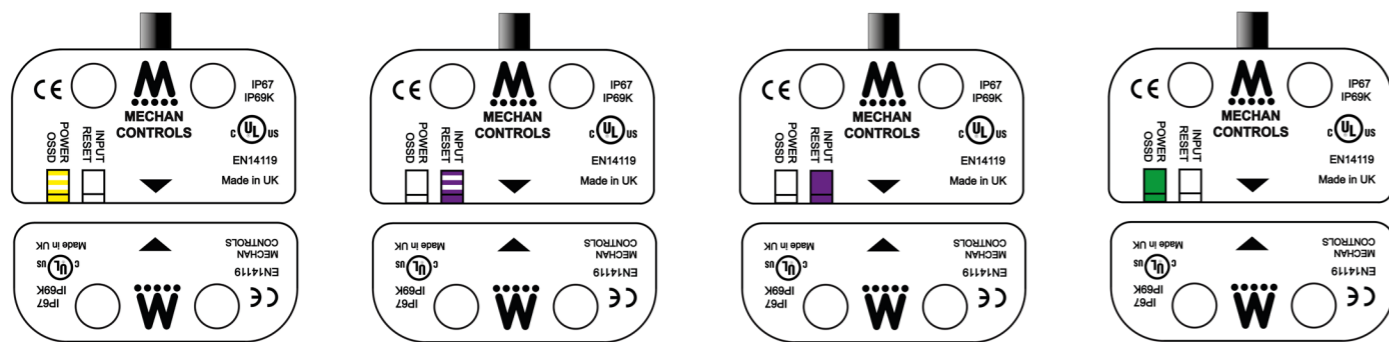
Installing an O-Type Safety Switch

- Drill holes or use a mounting plate to secure the switch and actuator
- Use the security screws provided in the packaging
- It is important that the switch and actuator are correctly aligned (See page 3)
- **Leave a minimum gap of 2mm between the switch and acuator (ODNK - sliding approach only)**



Teach Mode (ODNK Only)

If during installation you lose or break the accompanying actuator, it is possible to re-teach a new part by following these steps:



Step 1

LED 1 Flashing yellow indicates a incorrect coded actuator has been detected.

Step 2

Drop the supply to 0v then bring back up to 17v. LED 2 will begin to flash purple meaning it is ready to accept a new code.

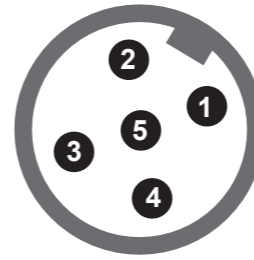
Step 3

Bring the new actuator within operating distance of the switch. LED 2 will stop flashing and turn solid purple. This means the new code has been accepted.

Step 4

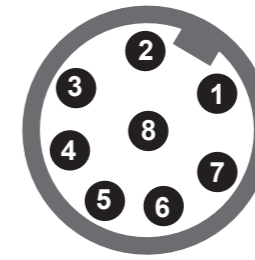
Increase the supply to 24Vdc. LED 2 will switch OFF or turn blue (if connected in monitored reset.) and LED 1 will change to green.

M12 Connections



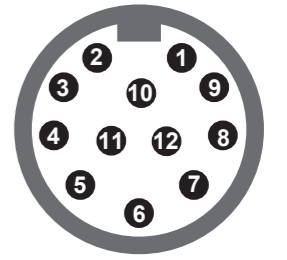
Simple Connection Type (M12, 5 pins, Male)

PIN	Function	Wire Colour
1	+24VDC	Brown
2	OSSD 1 Output	Grey
3	0V	Blue
4	OSSD 2 Output	Black
5	Auxiliary	White



Standard Connection Type (M12, 8 pins, Male)

PIN	Function	Wire Colour
1	Auxiliary	White
2	+24VDC	Brown
3	NOT USED	Green
4	OSSD 2 Input	Yellow
5	OSSD 1 Output	Grey
6	OSSD 2 Output	Pink
7	0V	Blue
8	OSSD 1 Input	Red



Advanced Connection Type (M12, 12 pins, Male)

PIN	Function	Wire Colour
1	Auxiliary	White
2	+24Vdc	Brown
3	NOT USED	Green
4	OSSD 2 Input	Yellow
5	OSSD 1 Output	Grey
6	OSSD 2 Output	Pink
7	0V	Blue
8	OSSD 1 Input	Red
9	Reset / EDM Input	Black
10	A / M Select	Violet
11	NOT USED	Grey / Pink
12	NOT USED	Red / Blue

Pre-Wired Connections

Function	Current (Min)	Standard	Advanced
+24VDC	6.5A	Brown	Brown
0V	1.5A	Blue	Blue
OSSD 1 Output	2A	Grey	Grey
OSSD 2 Output	2A	Pink	Pink
Auxiliary	2A	White	White
OSSD 1 Input	1.5A	Red	Red
OSSD 2 Input	1.5A	Yellow	Yellow
A/M Select	1.5A	Orange (not used)	Orange (see note 1)
Reset / EDM	1.5A	Green (not used)	Green (see note 1)

Note 1: Advanced Connection

Orange Connect to 0v for automatic reset or +24Vdc for monitored reset. If multiple switches are wired in series, the reset will be controlled by the last connected switch.

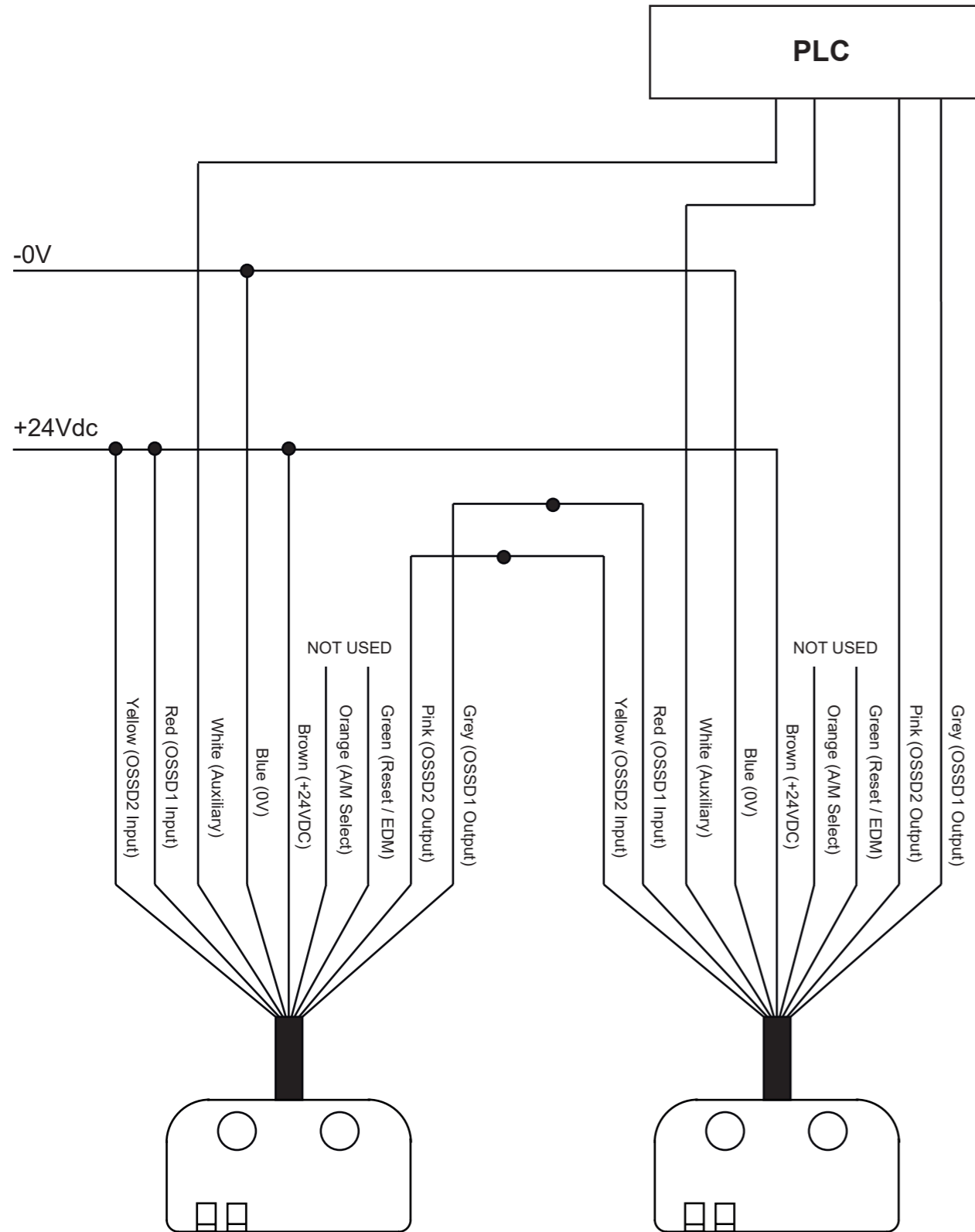
Green Connect to a momentary push button if installed in monitored reset configuration or +24Vdc if wired for automatic reset. If multiple switches are wired in series, the reset will be controlled by the last connected switch.

Wiring Example

Standard Connection

Maximum Cable Length	30 m
Maximum Number of Connected Units	30

The O-Type can be connected, provided that compatibility is checked, to safety modules or safety PLCs with OSSD inputs.

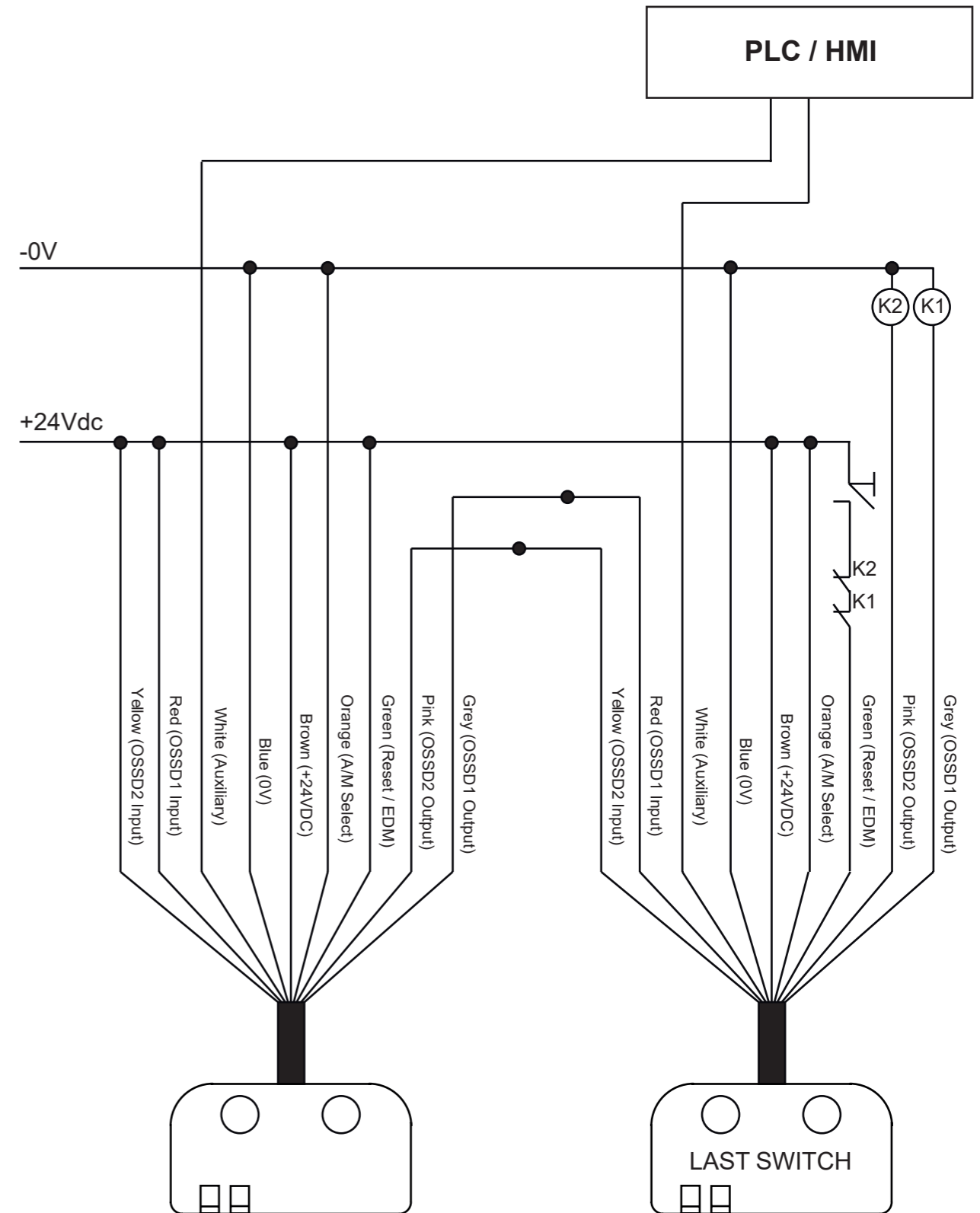


Wiring Example

Advanced Connection

Maximum Cable Length	30 m
Maximum Number of Connected Units	30

The contactors and relays must be force guided in order to safely monitor the external device.

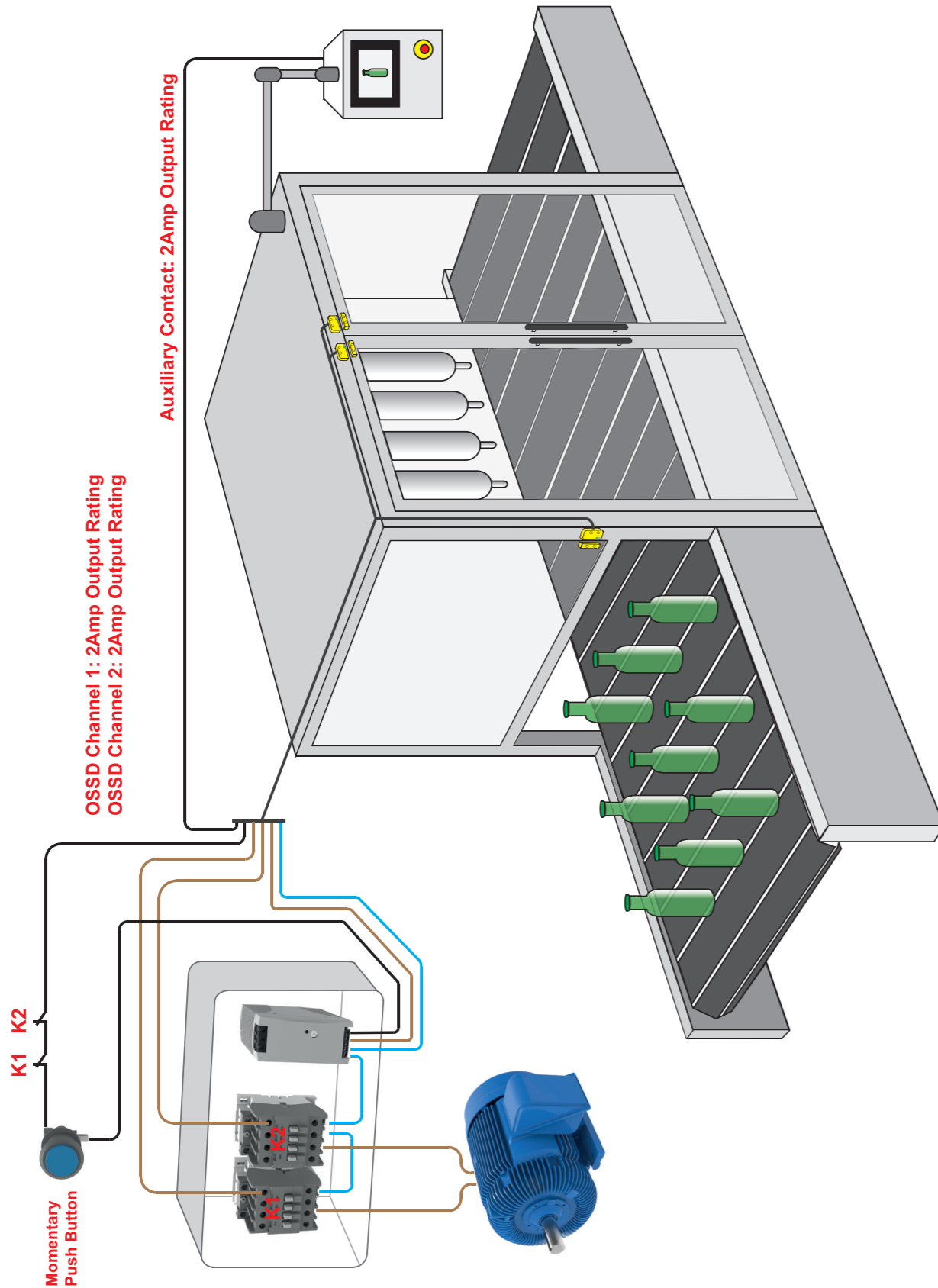


Note: The last switch is used to monitor the external device and control the reset function via a push button.

Advanced Connection

Example of three O-Type safety switches connected in series using the EDM feature. The two outputs from the last switch are being used to monitor the state of the contactors. The last switch is also configured in monitored reset to a momentary push button.

The auxiliary is connected to the HMI however, this can also be connected to a PLC or LED indicator.



Product Selection

***-21-24DC-EDM-03M

Version	
OHE1	Coded Magnetic
ODNK	Unique Code RFID

OSSD Safety Channels	
2	2 Outputs / 2 Inputs

Signalling Output	
1	1 Auxiliary Output

Supply Voltage	
24DC	24Vdc

Connection Type	
03M	3 Metre Pre-Wired
06M	6 Metre Pre-Wired
10M	10 Metre Pre-Wired
5LQD	5-PIN M12 150mm Leaded QD
8LQD	8-PIN M12 150mm Leaded QD
12LQD	12-PIN M12 150mm Leaded QD

Function	
EDM	External Device Monitoring

Stock Code	Part Description	Inputs	Outputs	EDM	Connection
365.001	OHE1-21-24DC-03M	2	2	NO	03 metre 9-core pre-wired (2-Core not used)
365.002	OHE1-21-24DC-06M	2	2	NO	06 metre 9-core pre-wired (2-Core not used)
365.003	OHE1-21-24DC-10M	2	2	NO	10 metre 9-core pre-wired (2-Core not used)
365.004	OHE1-21-24DC-EDM-03M	2	2	YES	03 metre 9-core pre-wired
365.005	OHE1-21-24DC-EDM-06M	2	2	YES	06 metre 9-core pre-wired
365.006	OHE1-21-24DC-EDM-10M	2	2	YES	10 metre 9-core pre-wired
365.007	OHE1-21-24DC-5LQD	0	2	NO	5-PIN M12 150mm Leaded QD (Male)
365.008	OHE1-21-24DC-8LQD	2	2	NO	8-PIN M12 150mm Leaded QD (Male)
365.009	OHE1-21-24DC-EDM-12LQD	2	2	YES	12-PIN M12 150mm Leaded QD (Male)
365.010	OHE1-ACT	-	-	-	OHE1 Actuator Only
365.011	ODNK-21-24DC-03M	2	2	NO	03 metre 9-core pre-wired (2-Core not used)
365.012	ODNK-21-24DC-06M	2	2	NO	06 metre 9-core pre-wired (2-Core not used)
365.013	ODNK-21-24DC-10M	2	2	NO	10 metre 9-core pre-wired (2-Core not used)
365.014	ODNK-21-24DC-EDM-03M	2	2	YES	03 metre 9-core pre-wired
365.015	ODNK-21-24DC-EDM-06M	2	2	YES	06 metre 9-core pre-wired
365.016	ODNK-21-24DC-EDM-10M	2	2	YES	10 metre 9-core pre-wired
365.017	ODNK-21-24DC-5LQD	0	2	NO	5-PIN M12 150mm Leaded QD (Male)
365.018	ODNK-21-24DC-8LQD	2	2	NO	8-PIN M12 150mm Leaded QD (Male)
365.019	ODNK-21-24DC-EDM-12LQD	2	2	YES	12-PIN M12 150mm Leaded QD (Male)
365.020	ODNK-ACT	-	-	-	ODNK Actuator Only

Cable Accessories

Stock Code	Part Description	Type
	5 Core 1 Key Way M12 5M	05 Metre M12 5-PIN Female Connector
	5 Core 1 Key Way M12 10M	10 Metre M12 5-PIN Female Connector
356.073	8 Core 1 Key Way M12 5M	05 Metre M12 8-PIN Female Connector
356.077	8 Core 1 Key Way M12 10M	10 Metre M12 8-PIN Female Connector
	12 Core 1 Key Way M12 5M	05 Metre M12 12-PIN Female Connector
	12 Core 1 Key Way M12 10M	10 Metre M12 12-PIN Female Connector

Information

Safety Assessment

A risk assessment should take place to establish that the specifications of these safety switches are suitable for the application required. Please contact Mechan Controls for further information.

The products may only be installed, commissioned, operated, maintained by competent persons.

A competent person is a qualified and knowledgeable person who, because of their training, experience and current professional activity, has the specialist knowledge required. An understanding of European and International laws, directives and standards is recommended.

Maintenance

It is recommended to check the safe operation of the switches and look for signs of damage or excessive wear on a weekly basis. Damaged units should be replaced or returned to the manufacturer for repair where practical.

Disclaimer

In the interest of product development specifications are subject to change without notice. It is the responsibility of the user to ensure compliance with any acts or by-laws in place. All information regarding Mechan equipment is believed to be accurate at the time of printing. Responsibility cannot be accepted for errors or omissions.

Warranty

Warranty will be void if the following points are true:

- The product was not used for its intended purpose
- Damaged was caused by usage not stated in the manual
- Modifications have been made to the products (e.g exchanging components)
- Operating personnel are not suitably qualified

Warning!



Removing the actuator from the guard may lead to loss of safety resulting in serious injury or death.

Security screws are provided with every O-Type safety switch.



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