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Application

The DS-MLZ safety interlock switch is designed for the leading edge of machine guard doors, providing robust guard locking, tamper-resistant interlock mechanism, and machine control functions in one device.

They deliver reliable position-interlock detection for moving guards and keep the guard door locked until solenoid voltage is applied.

RFID-coded actuators provide a high coding level in accordance with ISO 14119.

Operation

The switch is rigidly mounted to the fixed machine or guard frame, while the actuator is fitted to the moving guard frame and aligned with the switch entry aperture.

During guard closure, the actuator enters the switch head and is locked by a spring-to-lock bolt. The switch then verifies the actuator's RFID code. OSSD outputs are enabled only when the guard is closed, the code is valid, and the actuator is locked.

When solenoid power is applied, the lock releases so the actuator can be withdrawn. An adjustable spring-ball catch in the switch head provides light latching when unlocked.

Technical Specifications

Safety

Standards	ISO 13849-1, IEC 62061, IEC 61508, IEC 60947-5-3, ISO 14119
Safety functions	Guard interlocking Complies with the requirements of IEC 60947-5-3. Classified as a type 4 device with high coding acc. to ISO 14119.
	Guard locking With lock monitoring for person and process protection.
Certifications	CE, TUV, cULus

Safety Data

Category	4
Performance Level	e
MTTF _d	773a (High)
DC	99%
Mission Time (T ₁)	20a
PFH _d	7.94 x 10 ⁻¹⁰ (0.8 % of SIL 3)
PFD _{av}	6.94 x 10 ⁻⁵ (7 % of SIL 3)

Power Supply

Operating voltage	24 V DC +10%/-15% SELV/PELV acc. to IEC 61131-2 UL – Class 2 Power Supply
Current – normal operation	50 mA
Current – solenoid energised peak	500 mA

Inputs/Outputs

Safety output type	PNP, short circuit protected
Safety output voltage	24 V DC
Safety output max. current	0.1 A
Auxiliary output type	PNP, short circuit protected
Auxiliary output voltage	24 V DC
Auxiliary outputs current	0.1 A
Safety input voltage	24 V DC
Safety input current	2 mA

Electrical

Dielectric withstand	250 V AC
Insulation resistance	100 M ohms

Device Characteristics

Actuator coding level	Type 4 (RFID), High
Assured operating (Sao)	10 mm
Assured release (Sar)	20 mm
Assured locking distance	6 mm
Response time (interlock)	60 ms max.
Response time (safety inputs)	20 ms max.

Mechanical Data

Maximum holding force (F1)	4000 N
Rated holding force (Fzh)	3077 N
Adjustable ball catch	30 N – 100 N
Mechanical life expectancy	2.5 x 10 ⁶ cycles

Environmental Data

Operating temperature	-25°C to 55°C (UL max. 40°C)
Enclosure protection	IP 67 / IP 69K
Maximum operating altitude	2000 m



Additional Parts

 <p>473350</p> <p>DS-MLZ sliding handle bolt and mounting plate</p>	 <p>470410-L - left-hand 470410-R - right-hand (shown)</p> <p>MLZ single action latching pull handle stainless-steel</p>
 <p>470401</p> <p>Rear release button (90mm)</p>	 <p>470403</p> <p>Optional spring catch for sliding handle</p>
 <p>210005</p> <p>Rear Escape Handle</p>	

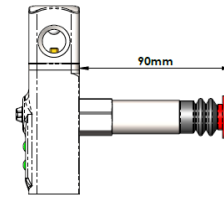
Single Action Latching Pull Handle SS



The Single Action Pull Handle is designed to reduce the risk of accidental or unintended guard re-closure and re-latching.

Once opened, the handle automatically rests so a stainless-steel arm with a silicone bumper plate obstructs re-closure. To re-close the guard, the operator must intentionally press the thumb switch on top of the handle. This lifts the bumper plate, allowing the guard to close and the machine to restart.

Rear Release Button

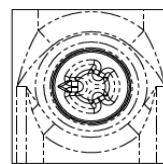


The switch can be mounted to allow access to the rear release button from inside the guarded area.

Pressing and holding the button releases the lock mechanism and disables the OSSD outputs, allowing the guard to be pushed open.

The rear release button is an optional accessory (part number 470401) fitted by removing the seal plug at the rear of the switch.

Auxiliary Release



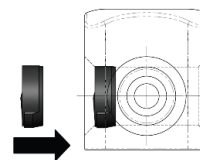
The auxiliary release function is operated using a special tool.

Insert the tool into the front auxiliary-release mechanism and rotate it clockwise to mechanically override the lock mechanism and release the guard.



140123
Auxiliary release tool

Head Entry Blocking Plug



Each switch includes two optional silicone head-entry plugs for added tamper resistance or head protection. Firmly press the plugs into unused head apertures, with the arrow pointing down toward the main switch body, as shown (left).

Safety Requirements and User Responsibilities



The switches must be connected to a safety controller (or safety relay) that monitors the OSSD outputs.

When connected independently or in series to a PLe Category 4 controller, they maintain PLe in accordance with ISO 13849-1.

Record RFID codes as required by factory rules and the application risk assessment.

The risk assessment must include the risk from spare actuators. Spare actuators must not be readily available and must be securely controlled.

The safety functions and mechanical operation must be tested regularly. For applications with infrequent guard access, provide a manual function test to detect possible fault accumulation: at least once per month for PLe, or once per year for PLd (ISO 13849-1). Where possible, the machine control system should request and monitor these tests and stop or prevent machine start if a test is not completed (see ISO 14119).

The user is responsible for ensuring correct overall system and machine functionality.

Ensure the switch holding force (Fzh) is sufficient for normal static forces. Dynamic effects, such as guard bounce, must not create impact forces that exceed the holding force. If expected impact forces exceed the specified holding force, design measures must be implemented to reduce the force.

IDEM, its subsidiaries, and affiliates cannot guarantee all characteristics of any system or product not designed by IDEM.

Installation



Install all IDEM interlock switches in accordance with the risk assessment for the specific application. Installation must be carried out only by competent personnel and in accordance with these instructions:

1. Use M5 (or appropriate) mounting bolts to fix the switch and actuator mounting plates. Required tightening torque is 4.0 Nm. Do not mount adjacent switches or actuators closer than 100 mm. The actuator can enter through any of the three switch-head entry apertures.
2. Always fit a mechanical stop to the guard to prevent damage to the switch front. Ensure correct actuator-to-aperture alignment. Use alignment guides so the actuator enters and locks without striking the switch housing sides.
3. The RFID code is factory set. If RFID actuator replacement is required, contact IDEM at technical@idemsafety.com.
4. After installation, check operation of all control circuits and the locking function.
5. If fitted, the auxiliary release is operated using a special tool and must be used only in exceptional circumstances.
6. Adjust the spring-ball catch during installation to provide light latching during guard closing; refer to mounting dimensions.
7. For installation of handle and rear-release accessories, refer to mounting dimensions.
8. See also Safety Precautions and Precautions for Correct Use.

Precautions for Correct Use – Prohibited Conditions



DO NOT store or use the product under the following conditions:

1. In direct sunlight.
2. Where it is subject to excessive vibration or mechanical shock.
3. Where it is subject to static electricity or other electrical noise.
4. Where it may be exposed to radioactivity.
5. Close to power supply lines.

Safety Precautions – Mandatory

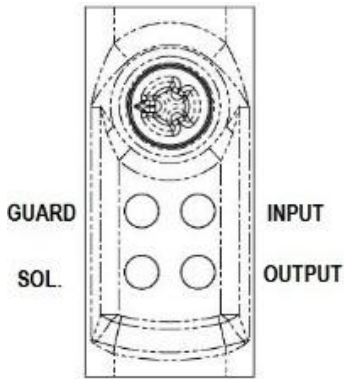


Failure to follow these precautions may result in serious injury, death, or property damage.

1. Do not use the switches where flammable or explosive gases may be present.
2. Turn power OFF before wiring or making control connections.
3. Do not operate outside the rated supply voltage or ambient temperature range.
4. Ensure the +24 VDC line does not contact the outputs. Bypassing the safety function may cause serious injury or death.
5. Do not use on systems with a positive ground (earth). If safety outputs short to positive ground, the safety function may be bypassed, which may cause serious injury or death.
6. Do not connect loads beyond the rated safety-output values. Safety-output failure may cause serious injury.
7. Do not use the auxiliary output for a safety function. Serious injury or death may occur.

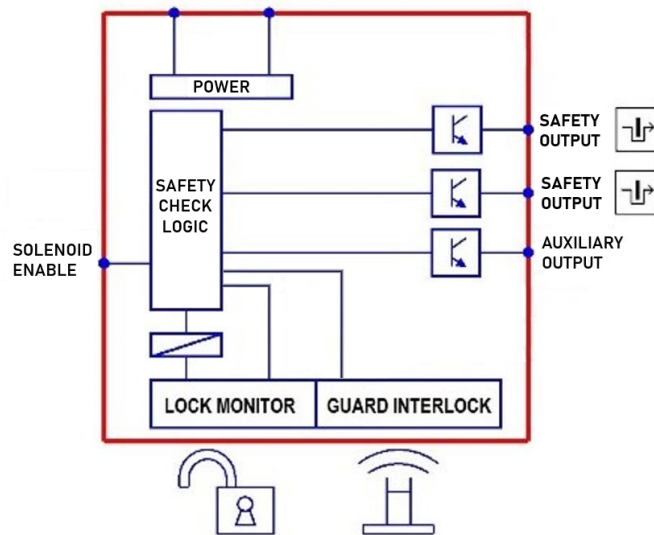


Diagnostics and Indication



Guard	Green (steady)	Guard closed and locked
	Green (flashing)	Guard closed and unlocked
	Red (steady)	Guard open
	Red (flashing)	Guard closed, code invalid
Input	Green (steady)	Safety inputs on
	Green (flashing)	Safety input missing
	Off	Safety inputs off
Output	Green (steady)	Safety outputs on
	Green (flashing)	Safety output short 0V
	Red (flashing)	Safety output external fault
	Off	Safety outputs off
Solenoid	Red (steady)	Solenoid energised, unlocked
	Red (flashing)	Solenoid energised, stuck at locked position
	Off	De-energised
	Individual LEDs indicate status for specific device functions; in some cases, LED combinations are used to provide alternative diagnostic information:	
Guard Red (flashing) + Output Red (flashing)		Supply voltage out of range.
Input red (steady) followed by an LED sequence		Internal fault

Internal Circuit



Troubleshooting

Actuator Replacement/Teach-in Procedure

1. Energise the solenoid and remove the existing actuator.
2. Install the new actuator and close the guard.
3. Power ON, LED sequence – All flashing RED.
4. Power OFF.
5. Power ON, LED sequence – All flashing GREEN.
6. Power OFF.
7. Teach process complete

WARNING!: At next power on the switch will resume normal operation.

Part Numbers

Switch



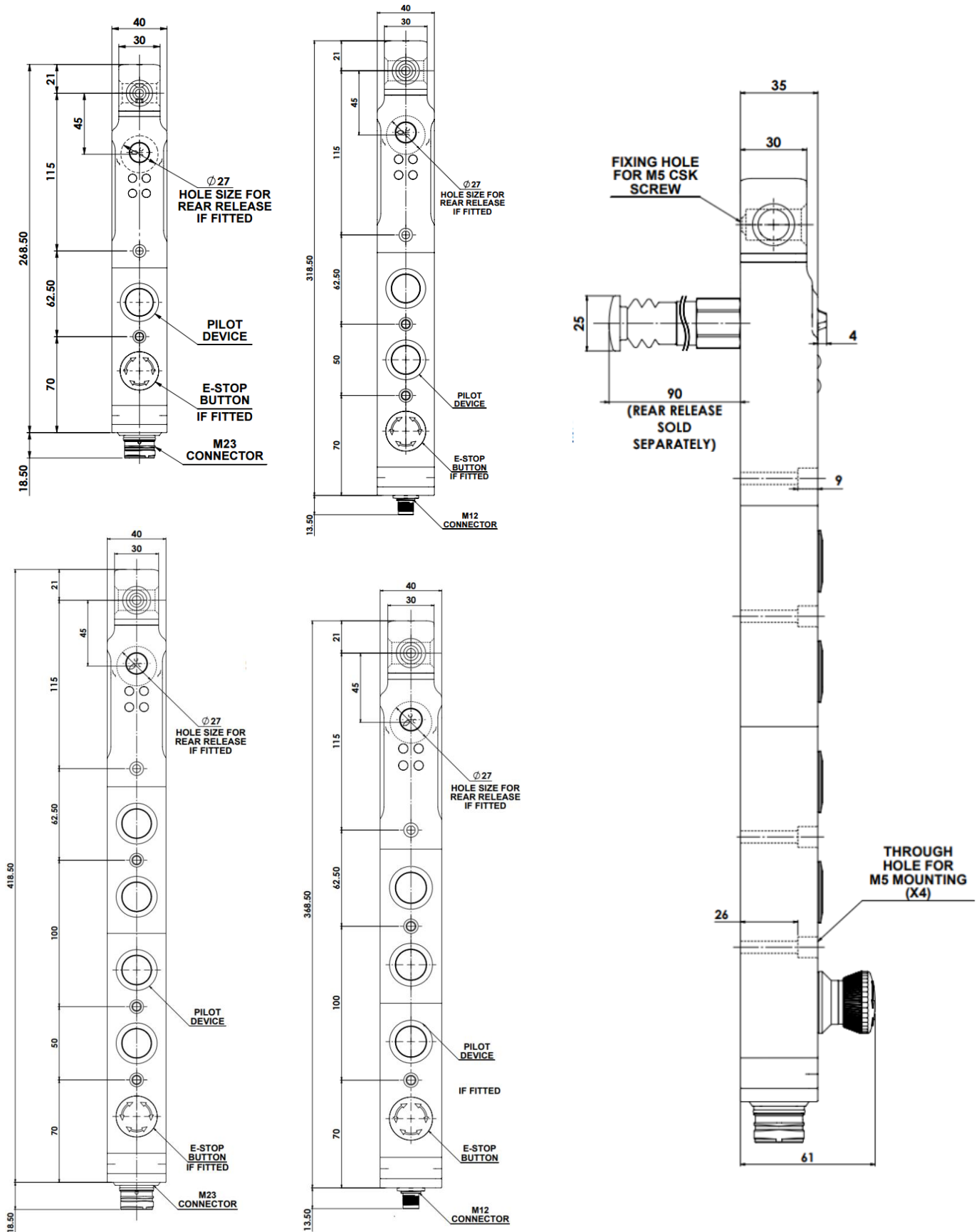
The DS-MLZ is part of a configured system.
For specific part numbers or more information, visit www.idemsafety.com or contact sales@idemsafety.com

Accessories

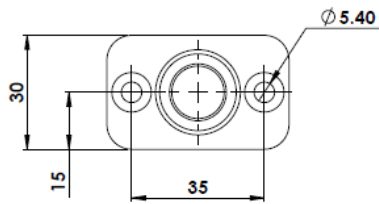
470401	Rear release button (90 mm).
470402	Sliding handle bolt
470403	Optional spring catch for sliding handle
470410-L	Single action latching pull handle stainless-steel (Left)
470410-R	Single action latching pull handle stainless-steel (Right)
470420	Spare / replacement actuator
210005	Rear ball handle for sliding bolt



DS-MLZ Switch

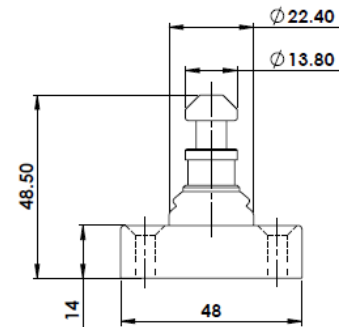


DS-MLZ Actuator

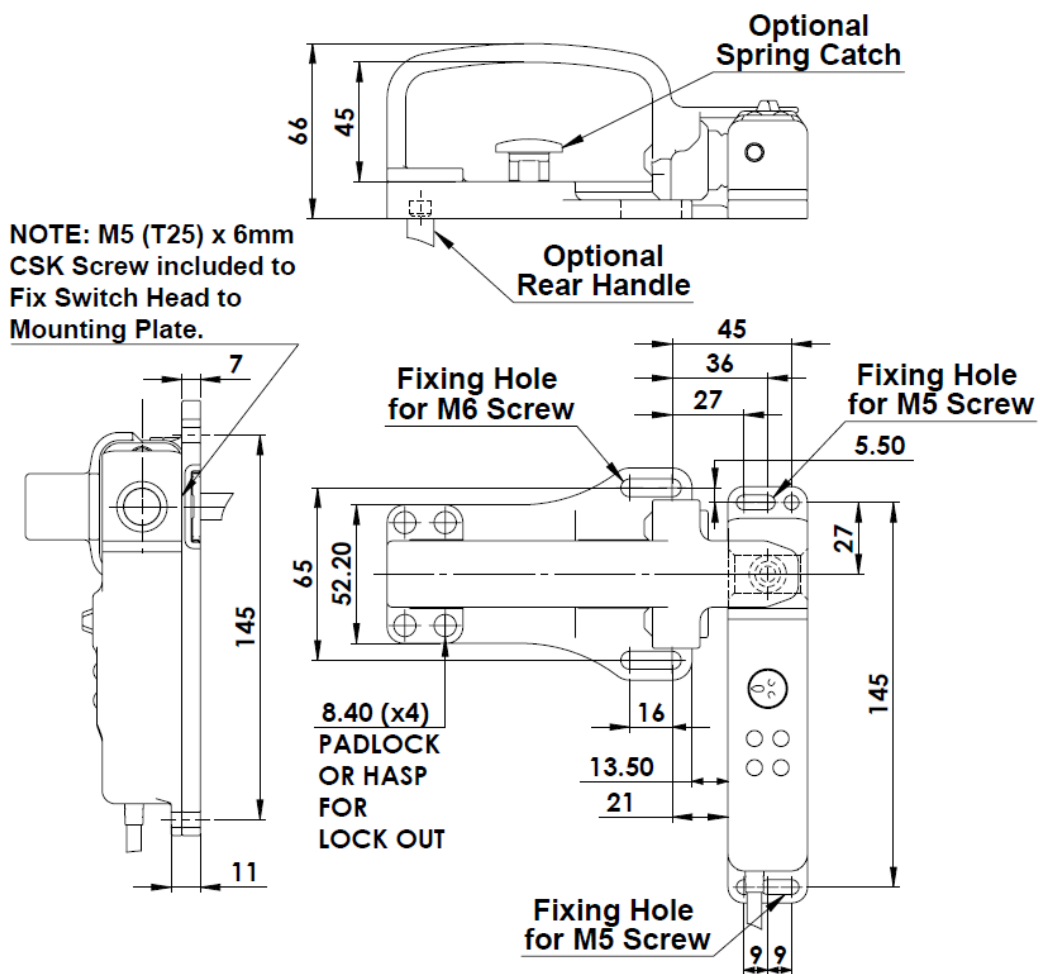


ACTUATOR

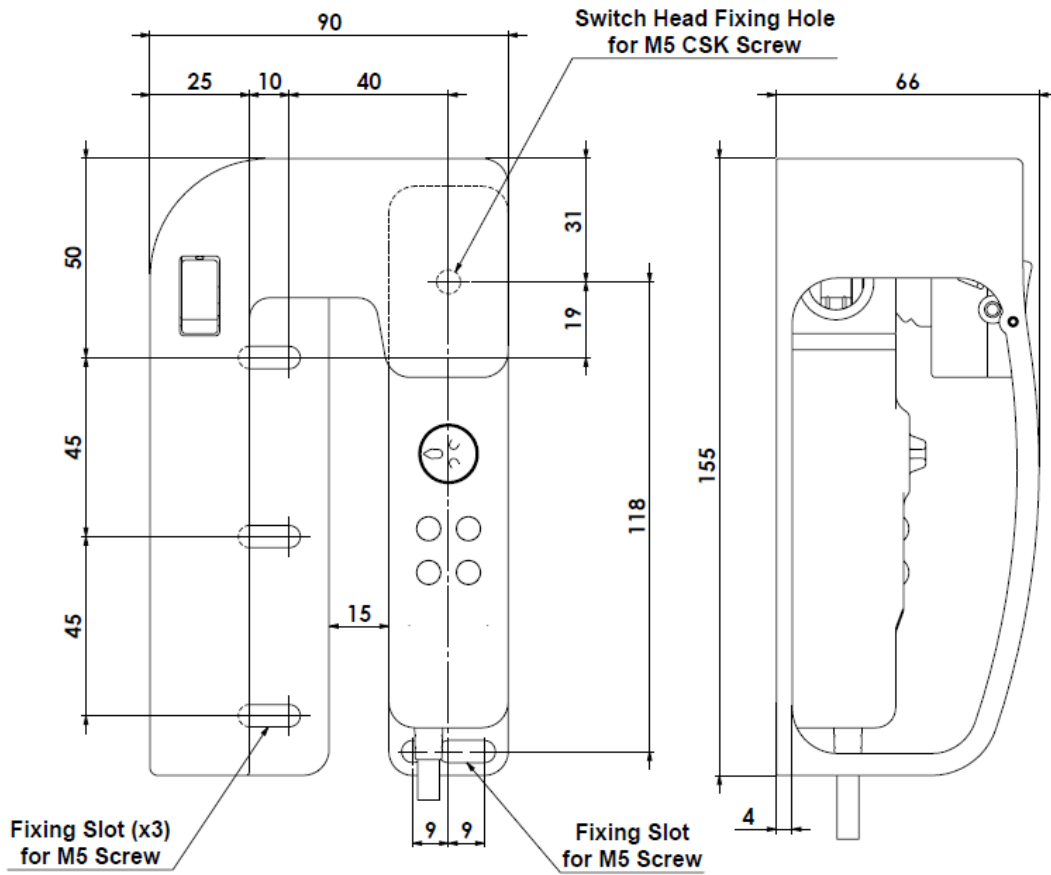
Fixing: 2 X M5 CSK



MLZ Sliding Gate Handle



MLZ Single Action Latching Pull Handle



Company Information



IDEM SAFETY SWITCHES LTD

2 Ormside Close, Hindley Green
Wigan, United Kingdom
WN2 4HR

+44 (0) 1942 257070
sales@idemsafety.com

WWW.IDEMSAFETY.COM



IDEM SAFETY SWITCHES USA

2574 South Beverly Street
Boise, Suite 100
ID 83709

+1 (510) 445 0751
salesusa@idemsafety.com

WWW.IDEMSAFETYUSA.COM



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