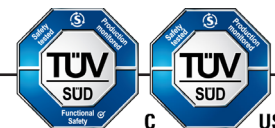


Operating Instructions: ATOM



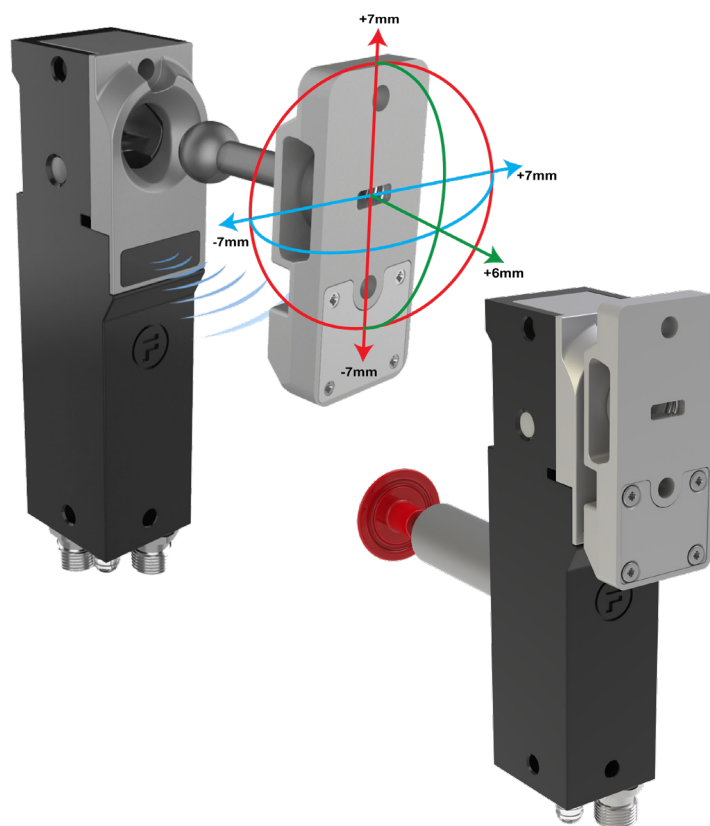
Description

ATOM is a compact, ultra-robust, RFID, interlocking device with a high-level coded actuator. As typical with products from Fortress Interlocks, ATOM is externally approved and is suitable for applications up to PLe (Cat. 4). The metal housing and high retention force then suits ATOM for heavier industry applications.

The self-centering actuator allows for inaccuracy and misalignment in moveable guards, both hinged and sliding. Additionally, ATOM's head has an open design manufactured in stainless steel to prevent dust, dirt and corrosion from impacting performance.

Available in multiple hardware variants, the device can be configured for many applications. Multiple units can also be connected together with OSSD (Output Signal Switching Device) functionality preventing fault masking. The large LED lens at the base provides clear state indication from all angles and at a distance.

An Escape Release (ER) option is available for Safety-on-guard-Locking (SOGL) variants.



Important:

The ATOM interlocking device (The Device) is designed for use according to the installation and operating instructions enclosed. It must be installed by competent and qualified personnel who have read and understood the whole of this document prior to commencing installation.

If the device is used in a manner not specified by the manufacturer, the protection provided by the device may be impaired. Any modification to the device or deviation from these instructions invalidates all warranties.

The Device must be installed in electrical installations meeting the requirements of the applicable IEC standards.

The Device is not to be used as a Mains Isolator or Emergency Stop.

The Device is a component to be added to a permanent electrical installation meeting the requirements of the applicable IEC/EN standards.

All the voltages used within the connected circuits must be derived from a Safety Extra Low Voltage or Protected Extra Low Voltage power supply (SELV or PELV).

The device contains a single electrical circuit; all inputs outputs and power supply have a common voltage reference, 0V.

The Device meets the requirements of the standard ISO 14119 – Safety of machinery, interlocking devices associated with guards. Principles for design and selection.

DO NOT LEAVE AUXILIARY RELEASE DRIVER BIT IN PLACE!

Access to the Auxiliary Release Driver Bit and the availability of any spare ATOM Actuator assemblies must be securely controlled as they could make it possible to bypass the safety Devices and allow access to areas that may have a residual hazard.

BEWARE OF INTENTIONAL MISUSE CAUSED BY OPERATORS WANTING TO BYPASS SAFETY SYSTEMS.

THE INSTALLER SHOULD ASSESS THE RISKS AND MITIGATE AGAINST THEM.

The installation and operation of the ATOM device must take into account the requirements of ISO 14119, in particular Section 7 - Design for minimising defeat possibilities.

In order to maintain device safety rating, overall system must be validated to BS ISO 13849-2 and/or evaluated in accordance with BS 62061.

IF YOU HAVE ANY QUESTIONS OR QUERIES OF ANY NATURE WHATSOEVER PLEASE CONTACT THE SUPPLIER WHO WILL BE PLEASED TO ADVISE AND ASSIST.

Operating Instructions: ATOM

Power-to-release (unlock) Safety-on-Guard-Locking (SOGL)	Power-to-release (unlock) Safety-on-Guard (SOG)	Power-to-Lock Safety-on-Guard (SOG)
The recommended set up for most machine guarding applications and ideal for machines with run-down times. The Device unlocks when power supplied. Safety circuits change state when the device locks or unlocks.	Popular configuration for where the solenoid performs a process control function rather than a safety function. The Device unlocks when power supplied. Safety circuits change state when actuator is engaged or removed.	When power is supplied to the solenoid the device becomes locked. Allows for faster access and exit in the event of a power failure or power off event. Safety circuits change state when actuator is engaged or removed.

Part No.	Solenoid Locking Type	Switch Configuration	M12 Connector Types	Optional Escape Release
ATM-100A1-A	Power-to-release (unlock)	Safety-on-Guard-Locking (SOGL)	Single 5 Pin M12	No
ATM-100A2-A	Power-to-release (unlock)	Safety-on-Guard-Locking (SOGL)	2 x 5 Pin M12 in 'Daisy-Chain' configuration	No
ATM-100A3-A	Power-to-release (unlock)	Safety-on-Guard-Locking (SOGL)	Single 8 Pin M12	No
ATM-100A4-A	Power-to-release (unlock)	Safety-on-Guard-Locking (SOGL)	2 x 5 Pin M12	No
ATM-110A1-A	Power-to-release (unlock)	Safety-on-Guard (SOG)	Single 5 Pin M12	No
ATM-110A2-A	Power-to-release (unlock)	Safety-on-Guard (SOG)	2 x 5 Pin M12 in 'Daisy-Chain' configuration	No
ATM-110A3-A	Power-to-release (unlock)	Safety-on-Guard (SOG)	Single 8 Pin M12	No
ATM-110A4-A	Power-to-release (unlock)	Safety-on-Guard (SOG)	2 x 5 Pin M12	No
ATM-610A1-A	Power-to-Lock	Safety-on-Guard (SOG)	Single 5 Pin M12	No
ATM-610A2-A	Power-to-Lock	Safety-on-Guard (SOG)	2 x 5 Pin M12 in 'Daisy-Chain' configuration	No
ATM-610A3-A	Power-to-Lock	Safety-on-Guard (SOG)	Single 8 Pin M12	No
ATM-610A4-A	Power-to-Lock	Safety-on-Guard (SOG)	2 x 5 Pin M12	No
ATM-100A1-A-ER1	Power-to-release (unlock)	Safety-on-Guard-Locking (SOGL)	Single 5 Pin M12	Yes
ATM-100A2-A-ER1	Power-to-release (unlock)	Safety-on-Guard-Locking (SOGL)	2 x 5 Pin M12 in 'Daisy-Chain' configuration	Yes
ATM-100A3-A-ER1	Power-to-release (unlock)	Safety-on-Guard-Locking (SOGL)	Single 8 Pin M12	Yes
ATM-100A4-A-ER1	Power-to-release (unlock)	Safety-on-Guard-Locking (SOGL)	2 x 5 Pin M12	Yes

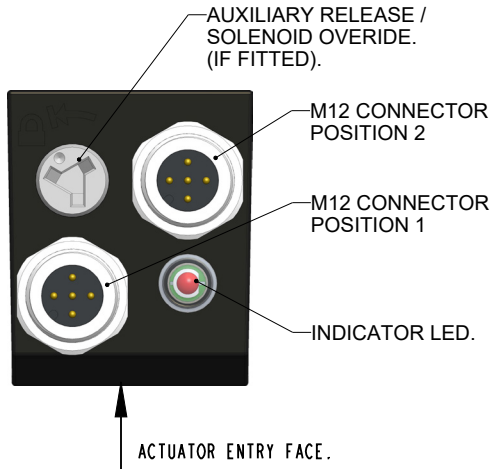
General Data	ATOM Product Type		
	Power-to-release (unlock), Safety-on-Guard-Locking	Power-to-release (unlock), Safety-on-Guard	Power-to-Lock, Safety-on-Guard
Housing Materials	Passivated and painted Zinc Alloy to BS12844 ZA3 and Stainless Steel to BS3146-2:1975 (ANC4B)		
Mechanical Life	1,000,000 Switching Operations		
Holding Force F	5 kN	8 kN	8 kN
Holding Force F_{zh}	6 kN	9.2 kN	9.2 kN
Maximum Holding Force, F_{1max}	12 kN	12 kN	12 kN
Minimum Actuating Radius	150 mm (see fig.5)		
Maximum Actuating Frequency	720 Operations per Hour		

Operating Instructions: ATOM

Environmental Data	
Ingress Protection	IP65 and IP67
Environment Type	Indoor
Operational Pollution Degree (IEC 664)	2
Ambient Temperature	-20°C * to +55°C (-4°F to +131°F)
*Note, the ATOM Device will only continue to work below freezing point (0°C) where it can be guaranteed that ice will not form on or in the device as it could cause the mechanical parts to bind and jam.	
Maximum Relative Humidity	50% at 70°C
Maximum Altitude	2000m
Vibration	Tested in accordance with GS-ET-19 and BS 60947-5-2
Electrical Data	
Operating Voltage, U_e	24V DC (+/- 10%)
Rated Insulation Voltage, U_i	60V
Rated Impulse Withstand Voltage, U_{imp}	500V
Voltage Drop, U_d	<3.5V
Rated Operating Currents	400mA
Minimum Operational Current	100mA
Off-State Current	<0.5mA
Rated Conditional Short-circuit Current	100 A
Overvoltage Category	Type 2
Electromagnetic Compatibility (EMC)	Conforms to BS 60947-5-3
To Meet UL Requirements	The device must be connected to a Limited Voltage/Current Circuit A 4A fuse must be fitted to the device power supply
RFID Sensor Data (as defined in EN 60947-5-2)	
Coding Type (as per BS EN ISO 14119)	High
Safety Output Timing Data	
Safety Response Time	<200ms
Safety Input Low to Safety Output Low	<25ms
Gate Open to Safety Output Low (SOG)	<200ms
Unit unlocked to Safety Output Low	<200ms
I/O Current Draw and Limits	
Safety Outputs	50mA Limit Each
Monitor	200mA Limit
Solenoid Drive	3.5mA Draw
Safety Inputs	3.5mA Draw Each

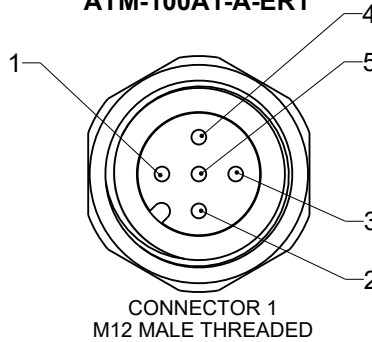
Wiring and Connection Information

ATOM CONNECTOR POSITIONS



SINGLE 5 PIN M12 CONNECTOR

ATM-100A1-A
ATM-110A1-A
ATM-610A1-A
ATM-100A1-A-ER1

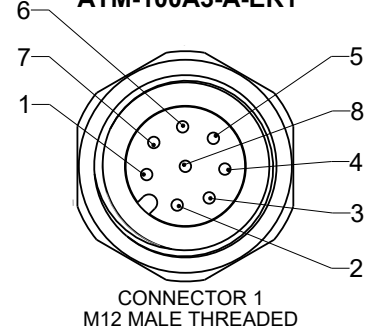


CONNECTOR 1
M12 MALE THREADED

		SIGNAL
CONNECTOR 1 M12 MALE	PIN 1	24V
	PIN 2	OUTPUT 1
	PIN 3	0V
	PIN 4	OUTPUT 2
	PIN 5	SOLENOID DRIVE

SINGLE 8 PIN M12 CONNECTOR

ATM-100A3-A
ATM-110A3-A
ATM-610A3-A
ATM-100A3-A-ER1



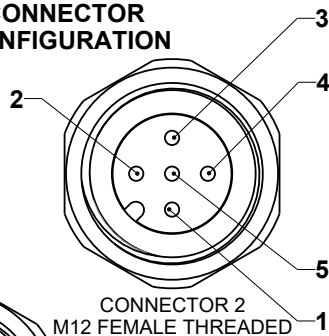
CONNECTOR 1
M12 MALE THREADED

		SIGNAL
CONNECTOR 1 M12 MALE	PIN 1	INPUT 2
	PIN 2	24V
	PIN 3	OUTPUT 1
	PIN 4	OUTPUT 2
	PIN 5	MONITOR
	PIN 6	INPUT 1
	PIN 7	0V
	PIN 8	SOLENOID DRIVE

Wiring and Connection Information

DOUBLE 5 PIN M12 CONNECTOR IN 'DAISY-CHAIN' CONFIGURATION

ATM-100A2-A
ATM-110A2-A
ATM-610A2-A
ATM-100A2-A-ER1



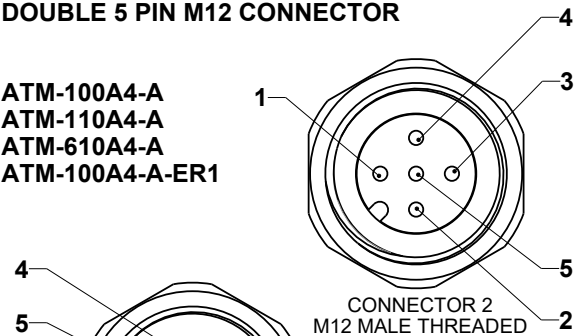
CONNECTOR 2
M12 FEMALE THREADED

CONNECTOR 1
M12 MALE THREADED

		SIGNAL			SIGNAL
CONNECTOR 1 M12 MALE	PIN 1	24V	CONNECTOR 2 M12 FEMALE	PIN 1	24V
	PIN 2	OUTPUT 1		PIN 2	INPUT 1
	PIN 3	0V		PIN 3	0V
	PIN 4	OUTPUT 2		PIN 4	INPUT 2
	PIN 5	SOLENOID DRIVE		PIN 5	SOLENOID DRIVE

DOUBLE 5 PIN M12 CONNECTOR

ATM-100A4-A
ATM-110A4-A
ATM-610A4-A
ATM-100A4-A-ER1



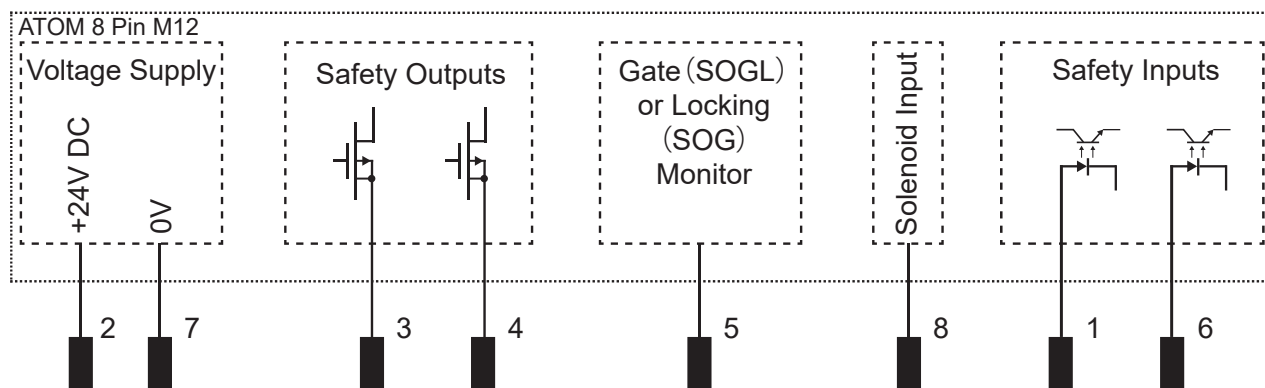
CONNECTOR 2
M12 FEMALE THREADED

CONNECTOR 1
M12 MALE THREADED

		SIGNAL			SIGNAL
CONNECTOR 1 M12 MALE	PIN 1	24V	CONNECTOR 2 M12 FEMALE	PIN 1	
	PIN 2	OUTPUT 1		PIN 2	
	PIN 3	0V		PIN 3	0V
	PIN 4	OUTPUT 2		PIN 4	SOLENOID DRIVE
	PIN 5			PIN 5	

Operating Instructions: ATOM

Wiring Diagram



Two Safety Outputs

Dual channel OSSD outputs with “low” voltage to indicate the safe state.

Must be connected to the next OSSD Device or an external evaluation device.

The External Evaluation Device must:

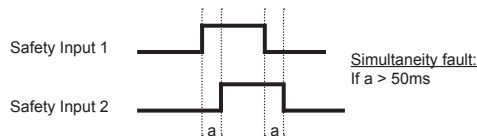
- Monitor both signals are high before it can leave its safe state
- Monitor that both signals are synchronous
- Have a Diagnostic Coverage of at least 99%

Two Safety Inputs

Dual channel safety inputs with “low” voltage to indicate the safe state

Must be connected to the previous OSSD device or 24V
A fault will be detected if the inputs are not synchronous (see timing fault diagram). A full input cycle is needed to clear the fault.

Safety Inputs Timing Faults



Solenoid Drive Input

Solenoid Drive input with “high” voltage to activate the solenoid.

For Power-to-release (unlock) (PTU) devices the solenoid will unlock the device.

For Power-to-lock (PTL) devices the solenoid will lock the device.

For Safety-on-Guard-Locking (SOGL) devices the input must be driven from a safe and monitored source to be able to achieve PLe.

Monitor Output

Control output with “high” voltage to indicate active condition
For Safety-on-Guard-Locking (SOGL) devices the monitor is activated when the gate is opened.

For Safety-on-Guard (SOG) devices the monitors is activated when the device is unlocked.

Daisy Chain information

The number of devices that can be wired in series depends on two main criteria:

1. Power line voltage drop
2. Total Safety Response Time

Voltage Drop

Each ATOM Device in series draws current and causes a voltage drop on the power line.

The greater the number of devices + distance, the grater the voltage drop.

The voltage requirement for ATOM is 24+10%-15%, this means the voltage must not drop below 20.4V to ensure correct operation.

A typical application with devices spaced 5m apart, wired with 22 AWG cable would allow for 4 devices in series. For more detailed calculation please see the Voltage Drop Tool on the Fortress website.

The maximum number of devices permitted in series is 8.

Safety Response Time

Each ATOM Device in series will increase the total safety response time of the line.

The maximum safety response time for one device is 200ms.

The increase response time per additional device is 25ms.

The total response time can be calculated using:

$T = 200\text{ms} + (n-1) \times 25\text{ms}$, where n = the number of ATOM devices in the line

Operating Instructions: ATOM

Safety Data		ATOM Product Type			
		Power-to-release (unlock), Safety-on-Guard-Locking	Power-to-release (unlock), Safety-on-Guard	Power-to-Lock, Safety-on-Guard	Power-to-release (unlock), Safety-on-Guard-Locking, with Escape Release (ER)
Safety Function 1	Monitor Safety Inputs are High	√	√	√	√
Safety Function 2	Monitor door is closed	√	√	√	√
Safety Function 3	Keep the door Locked	√			√
Safety Function 4	Locking means overridden and safety contacts opened on operation of Escape Release				√
Safe State 1	1 OSSD output is low	√	√	√	√
Safe State 2	Door is Locked	√			√
Performance Level (ISO 13849-1:2015)		Up to PLe			
Category (ISO 13849-1:2015)		Up to Cat.4			
SIL (according to IEC 62061)		Up to SIL CL3			
Diagnostic Coverage		A maximum DC of 99% can be achieved with suitable monitoring.			
PFH		4.16x10-9			
Device Type (according to ISO 14119)		Type 2	Type 4 with Lock		
Demand mode (according to 62061)		High			
Applicable Standards		ISO 14119, ISO 13849, IEC 61508, 60947-5-2, BS 62061			

Functioning
Power-to-release (unlock) Solenoid Type Closing and Locking
The ATOM Interlocking Device is closed by inserting the Atom Actuator assembly into the upper head portion of the ATOM Switch assembly (See Fig.1). Once inserted, the internal mechanism then locks the Actuator assembly into the ATOM switch placing the Device into its Locked-State.
Unlocking
The Device is unlocked when voltage is applied to the Solenoid Drive pin.
Opening
Once unlocked, the ATOM Actuator assembly can be removed from the ATOM Switch assembly.
Auxiliary Release Function
In the event of power failure, the ATOM Interlocking Device can be released and unlocked using the supplied Auxiliary Release Driver Bit irrespective of the state of the solenoid.
- Use the Auxiliary Release Driver Bit (with an appropriate Screwdriver) to drive and rotate the Override Spindle 90° clockwise. (See Fig.2). - Remove the ATOM Actuator from the ATOM Switch. - Rotate the Override Spindle 90° anti-clockwise back to its 'Locked' position and restore any necessary protection.
Note; Auxiliary Release Driver Bit must be securely controlled during normal operation to prevent misuse.
Escape Release Function
An ATOM Interlocking Device with Escape Release (ER) can be unlocked using the inbuilt Escape Release function.
To unlock and open a locked ATOM Interlocking Device via an Escape Release;
- Operate the Escape Release by pushing onto the Escape Release knob (see Fig.1) - Open the guarded area by pushing open the now unlocked Gate/Door.
Note, ATOM with Escape Release (ER) is only suitable for hinged style Gate/Doors, and only where no other locking or latching means is used.
Note, the state of the Safety Outputs will change on the operation of the Escape Release knob not on the opening of the Gate/Door.

Operating Instructions: ATOM

To reset and relock an ATOM Interlocking Device after an Escape Release operation;

- First isolate power to the guarded machine to ensure it cannot restart when Safety Outputs go high.
- Pull on Escape Release knob (see Fig.1)
- Close the Gate/Door of the guarded area.
- Test that the Escape Release has been fully reset by checking status of Safety Outputs are low and also checking Gate/Door of guarded area is sufficiently locked and secured.

Power-to-Lock Solenoid Type Closing

The ATOM Interlocking Device is closed by inserting the Atom Actuator assembly into the upper head portion of the ATOM Switch assembly (See Fig.1). Note, in all Power-to-Lock solenoid type devices the Device will remain in its unlocked-state until the solenoid is energised.

Locking

The Device is locked when voltage is applied to the Solenoid Drive pin.

Unlocking

The Device is unlocked when voltage is removed from the Solenoid Drive pin.

Opening

Once unlocked, the ATOM Actuator can be removed from the ATOM Switch.

There is no Auxiliary Release function on a Power-to-Lock Solenoid type ATOM Device.

Figure 1: Product Images

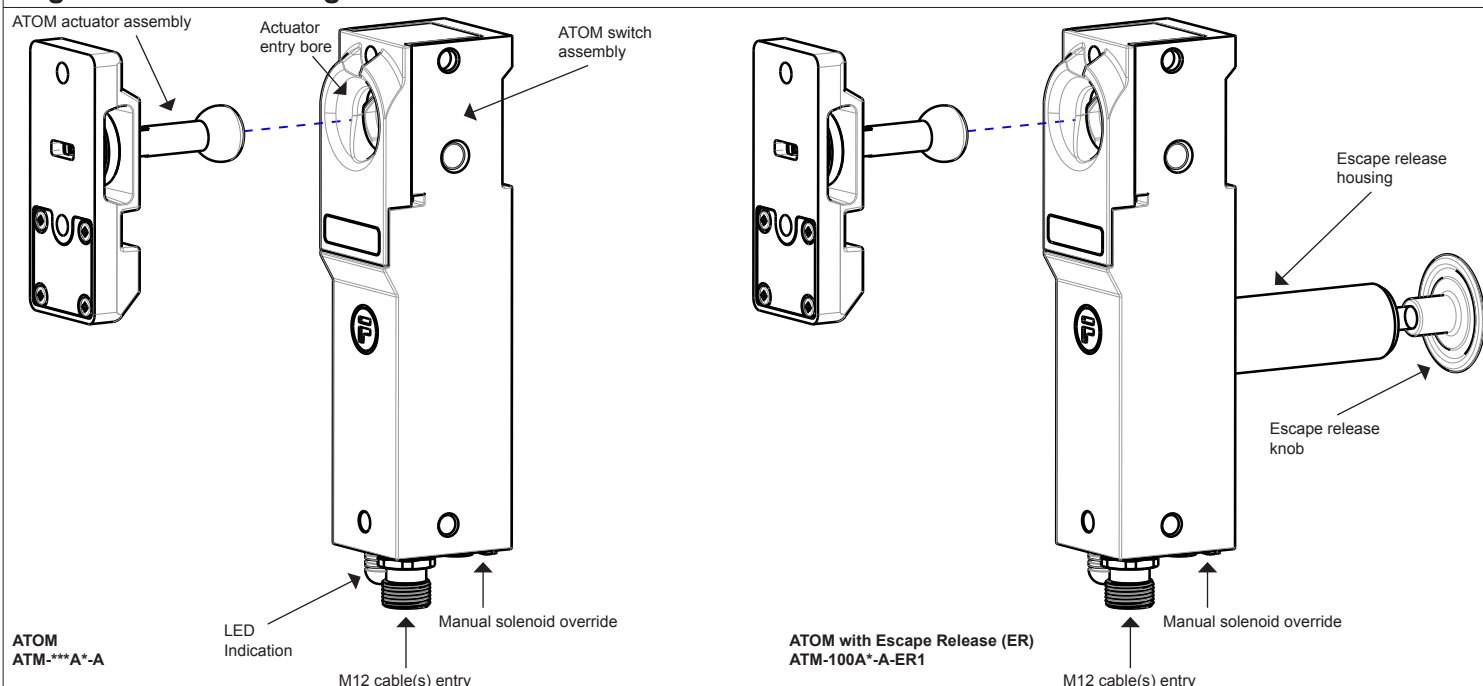
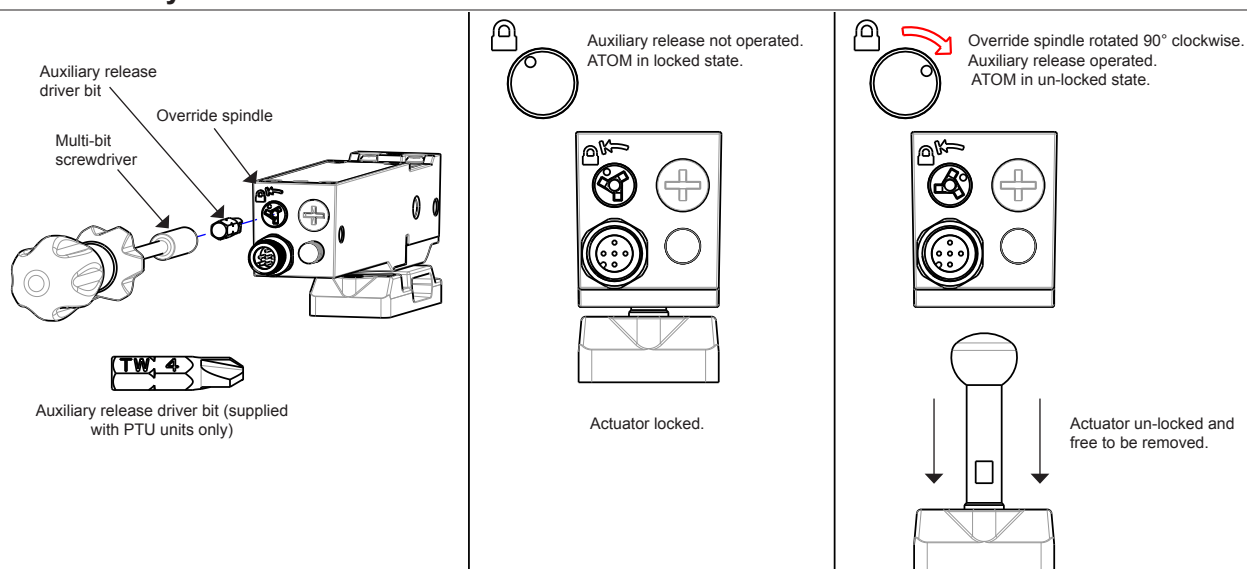


Figure 2: Auxiliary Release Function



Operating Instructions: ATOM

LED Output

ATOM Interlocking Device state is indicated by LED at the base of the device. If a device is in a fault state, a full cycle of the inputs or power cycle may be required to clear the fault state. If fault state cannot be cleared contact Fortress Technical Support.

Led Pattern	Status	State	Cause	Troubleshooting	Safety Output State	
					Safety on Guard Locking (SOGL)	Safety on Guard (SOG)
Off	○	Off	No power supply	Check continuity from power supply to device	Low	Low
Green	●	Locked			High	High
Green / Red	● ●	Unlocked, Actuator In			Low	High
Red	●	Actuator Out			Low	Low
Red Flash	⚡	Overridden	Auxiliary release left in unlocked position	Check that the auxiliary release has been rotated fully anti-clockwise	Low	High
Green Flash	⚡	Safety Inputs Low	Safety Input signal from previous device low	Check the safety state of the previous device, or continuity from the 24V supply if the first device in the chain	Low	Low
Amber	●	Unlocking Fault	Unable to unlock, possibly due to tension on actuator	Check for any obstruction of the mechanism. Press actuator tightly towards the device to release any tension	Low	High
Amber Flash	⚡	Safety Input Fault	Mismatch between two safety input signals	Confirm continuity from the previous device on both safety inputs, then reset fault by cycling the safe state of the previous device	Low	Low
2 Amber Flash	⚡ ⚡	Safety Output Fault	Short circuit on safety output signals	Confirm the safety outputs are not shorted together, or to any other signal	Low	Low
3 Amber Flash	⚡ ⚡ ⚡	Wrong RFID Actuator Used	Actuator from another device used by mistake	Confirm serial number of actuator matches that of the device	Low	Low
Long Amber + Flash	● ⚡	Locking Fault	Device unable to lock	Check for any obstruction of the mechanism. Press actuator tightly towards the device to release any tension.	Low	High
Long Amber + 2 Flash	● ⚡ ⚡	RF Lost Whilst Locked	RF signal from actuator lost whilst in the locked state	Check that mechanism has not been rotated without the actuator – see instructions on Actuator Does Not Enter.	Low	Low
Long Amber + 3 Flash	● ⚡ ⚡ ⚡	Under / Over Voltage	Insufficient supply voltage to device.	Measure the supply voltage at the device is within specification	Low	Low

Mounting Instructions

Tools and Fixings Required

4 x M5 Screws for securing ATOM Switch and Actuator.

- Screws must be suitable length for a minimum of 10mm thread engagement.
- Screws must be security type to prevent unauthorised removal or tampering, for example pin-hex or pin-torx anti-tamper security screws.
- Minimum required screw type and class; 12.9 Grade High Tensile Steel to maintain FZH value.
 - Note; F_{1max} value was achieved using four 12.9 Grade High Tensile Steel M5 Cap Head bolts
- Required torque setting; 8-12 Nm.

4 x M5 Nut / T-Nut / Threaded Hole for securing ATOM Switch and Actuator.

Driver suitable for securing M5 fixing screws.

Auxiliary Release Driver Bit (provided) to operate Auxiliary Release Function.

1/4" Driver to suit Auxiliary Release Driver Bit.

Adhesive Threadlocker to secure mounting fixings from loosening due to vibration. Threadlocker must be 'middle strength' or greater.

For units with Escape Release (ER) ONLY – A drill and 30mm hole saw for inserting Escape Release (ER) feature through the fence post.

Additional Tools required for ATOM with Escape Release (ER) only;

Drill with min. 21mm hole saw for cutting required hole through Gate/Door post for Escape Release housing.

Mechanical Mounting Instructions

1. Locate the ATOM Interlocking Device so that operation of the Auxiliary Release function, Escape Release function (if applicable), Functional testing, Electrical testing, Scheduled Inspection and Maintenance and final unit replacement are all easily possible.
2. Operate the Auxiliary Release function to remove the ATOM Actuator from the ATOM Switch assembly. Note, this step is not applicable for Power-to-Lock solenoid type devices.
3. **For ATOM with Escape Release (ER) only** – Remove Escape Release knob (see Fig.1) by unscrewing it anti-clockwise.
4. Prepare the Door/Gate of the guarded area by cutting any required holes or threads following the dimensions of Fig. 4 and Figures 7-11.
5. **For ATOM with Escape Release (ER) only** – Drill a minimum 21mm hole in Door/Gate post to allow for Escape Release housing. See Fig. 10 for required hole location.
 - Note; ATOM with Escape Release (ER) suitable for door/gate post thickness up to 56mm. For anything greater than 56mm an extension kit will be required, please contact Fortress for more information
6. Mount the ATOM Switch and ATOM Actuator assemblies to appropriate parts of the machine or guarding.
 - The ATOM Actuator must be correctly aligned and oriented with the ATOM Switch as per the assembly dimensions of Fig. 9 and Fig. 11.
 - All mounting surfaces should be flat, stable and suitable of providing a minimum of 10mm M5 thread engagement or sufficient support to either an M5 Nut or M5 T-Nut. See Fig.3 and Fig.4 for some mounting examples.
7. **For ATOM with Escape Release (ER) only** – Re-attach Escape Release knob (see Fig.1) by screwing it on clockwise.
 - Note; the escape release knob must be secured against tampering, removal or loosening using adhesive thread locker.
8. Perform Mechanical Function tests before completing installation and commission. See Mechanical Function test section.
 - Note; Lid assembly does not need to be removed during mounting. Removing the lid assembly may foul product IP level.

Mount the complete ATOM Interlocking Device only in the correctly assembled condition.

- The complete machine guarding installation must conform to all relevant design, construction and installation standards and guidelines.
- Any gap around the perimeter of the machine and guarding when closed and locked (Safety Outputs High) must not exceed the limits specified in BS 294 & BS 953.
- All fixing screws used to mount the Device must be permanently prevented from removal. If mounting fixings are visible, they must be secured against removal by personnel using standard tools, manipulation and un-authorised or un-identifiable removal. If mounting fixings are not visible or hidden, they must be secured against removal or loosening due to vibration. In both cases, a middle strength adhesive threadlocker is required.
- The Device must not be used as a mechanical stop. Where applicable, precautions must be made to ensure the door or gate of any guarded area has sufficient support and stops to prevent the impact on the Device.

Figure 3: Extrusion Profile Mounting Application Example

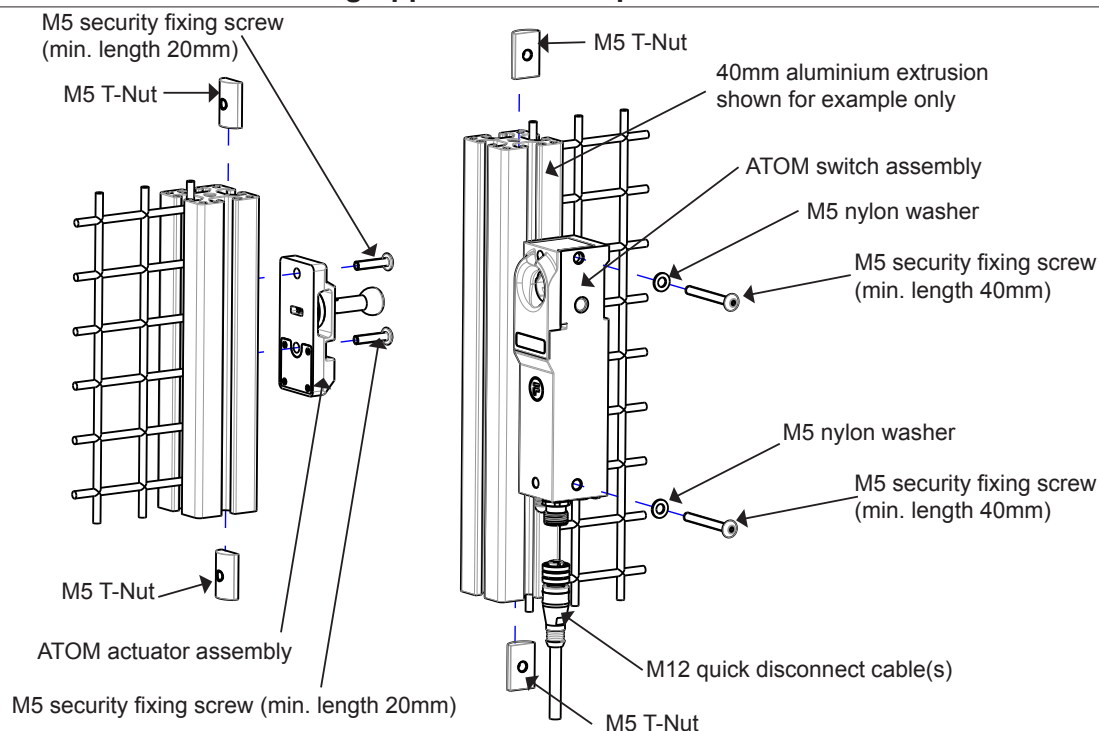


Figure 4: Plates and Guards Mounting Application Example

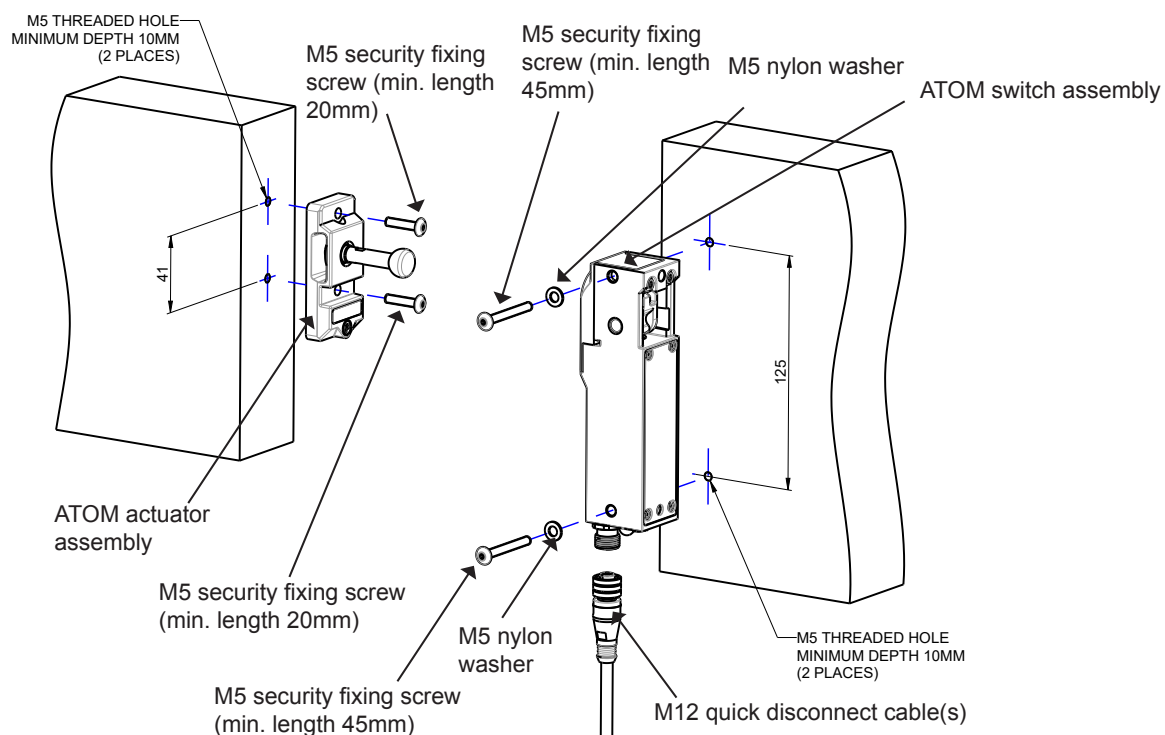


Figure 5: ATOM Device with Escape Release Mounting Example

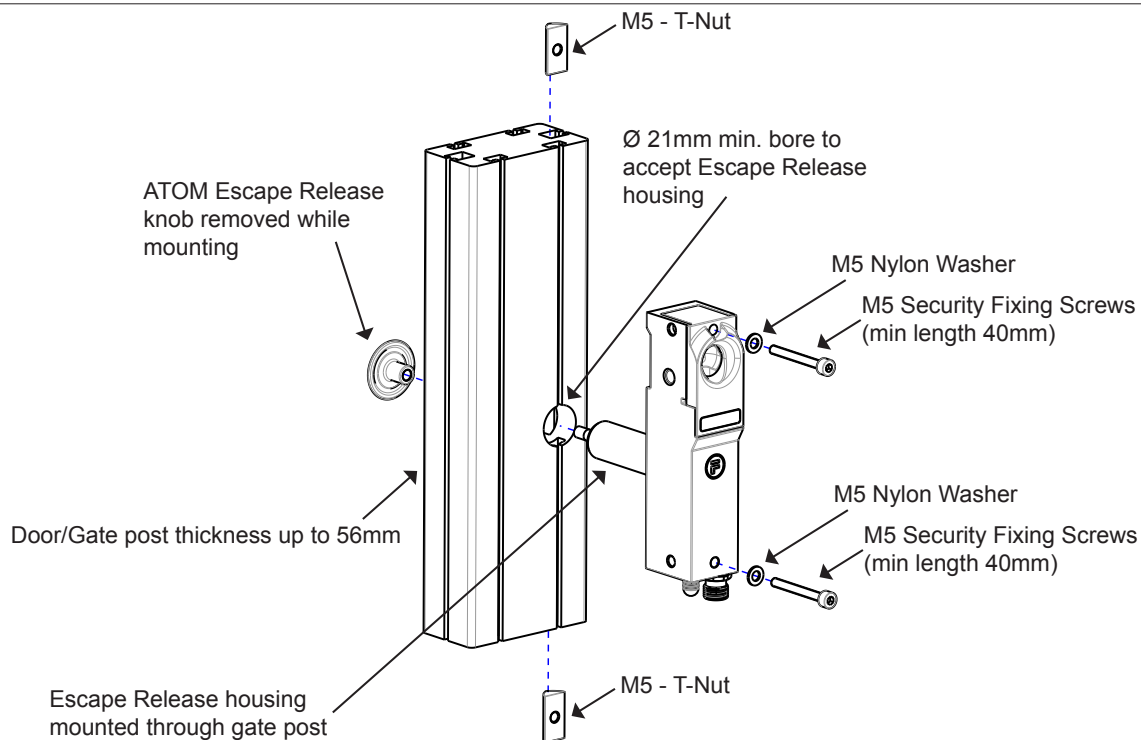
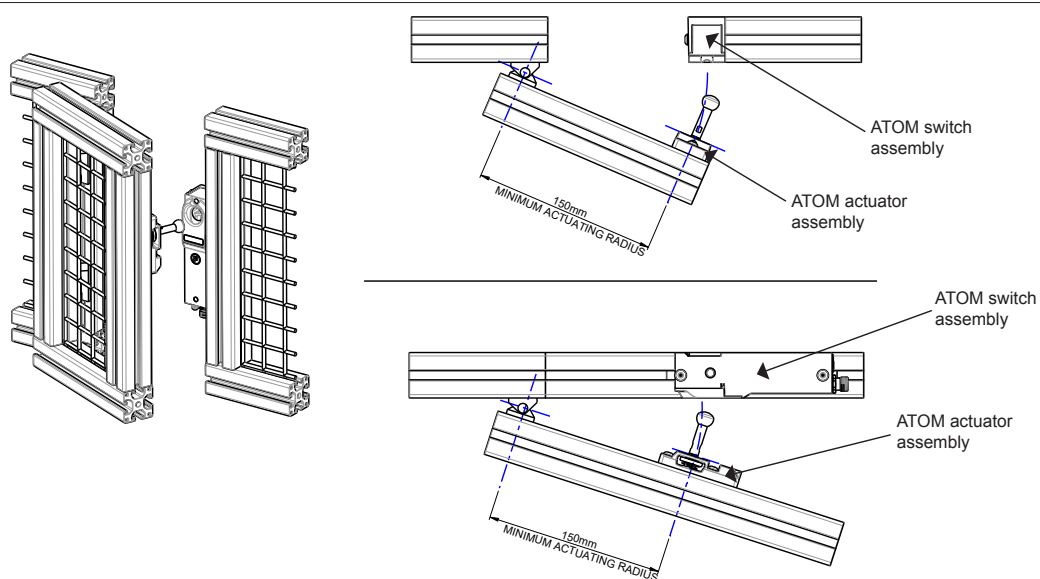


Figure 6: Hinged Door Application Example



Electrical Connection Instructions

1. Make sure the electrical supply is isolated and safe before any installation.
2. Insert appropriate M12 Connector cabling into base of ATOM Enclosure assembly.
 - Note; suitable connectors and cabling must be used to maintain IP65 and IP67 sealing.
3. Perform Electrical Function tests before completing installation and commission. See Electrical Function test section.
 - Ensure that all circuits connected to the ATOM Interlocking Device are derived from a Safety Extra Low Voltage or Protected Extra Low Voltage power supply (SELV or PELV).
 - Ensure the electrical connection and installation of the ATOM Device and complete guarding application is performed according to all relevant local standards and guidelines.
 - Note; Lid assembly does not need to be removed during electrical installation. Removing the lid assembly may foul product IP level.

Mechanical Function Test (Unpowered)

Power-to-release (unlock) ATOM Interlocking Devices

1. Insert the ATOM Actuator into the ATOM Switch.
 - **It must lock into position.**
2. Operate the Auxiliary Release Function and remove the ATOM Actuator from the ATOM Switch.
3. Return the Override Spindle to its Locked position (See fig.2) and reinsert the ATOM Actuator into the ATOM Switch.
 - **It must lock into position.**
4. Press the Escape Release (ER) knob and remove the actuator, re-insert actuator and reset Escape Release (ER) knob, the actuator should be locked in position.

Power-to-release (unlock) ATOM Interlocking Devices with Escape Release (ER)

Follow steps 1 to 3 above.

4. Push the Escape Release knob (see fig.1) and remove the ATOM Actuator from the ATOM Switch.
5. Pull on Escape Release knob to reset Escape Release.
6. Reinsert the ATOM Actuator into the ATOM Switch.
 - **It must lock into position.**

Power-to-Lock ATOM Interlocking Devices

1. Insert the ATOM Actuator into the ATOM Switch.
 - **It must not lock into position.**

Electrical Function Test (Powered)

1. Close the guard, ensure the ATOM Device is in its Locked-State and start the machine.
 - **It must not be possible to open the guard!**
 - **The Safety Outputs should be High.**
 2. Switch off the machine, unlock the ATOM Device and open the guard.
 - **The machine must not start when the guard is open!**
 - **The Safety Outputs should be Low.**
 3. Close the guard, ensure the ATOM Device is in its Locked-State so the machine could start.
 - **It must not be possible to open the guard!**
 - **Press the Escape Release (ER) knob.**
 - **Check the Safety Output signal is now low.**
 - **Open the guard and reset the Escape Release (ER) knob and then close the guard.**
 - **The guard must now be locked again.**
- Additional test for Power-to-release (unlock) ATOM Interlocking Devices with Escape Release (ER);**
4. Push the Escape Release knob (see fig.1)
 - **The guarded machine must not start when the Escape Release is operated.**
 - **The Safety Outputs should be Low** (note, the state of the Safety Outputs will change on the operation of the Escape Release knob not on the opening of the Gate/Door).
 5. Open the guard, reset the Escape Release by pulling on Escape Release knob and re-close the guard.
 - **The Safety Outputs should be High.**
 - **It must not be possible to open the guarded area.**

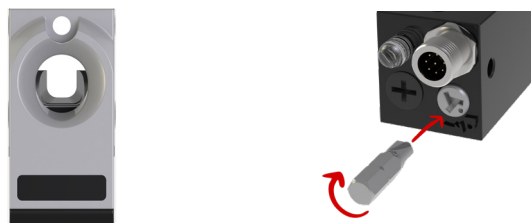
Warning: This Device does not contain the Machine Reset or Restart facility after an escape or auxiliary release of the guard locking. Additional measures are required to achieve the reset of the machine system.

Actuator Does Not Enter Head - Correcting A Rolled Mechanism

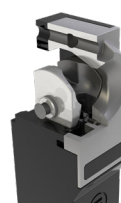
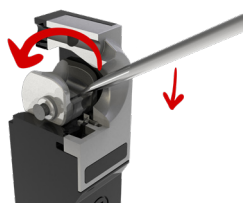
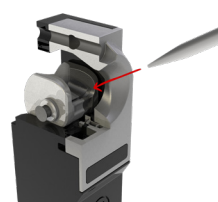
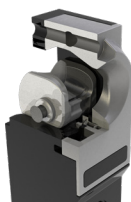
In some scenarios such as cleaning or high vibration, the ATOM Interlocking Device can have the closing mechanism of the Switch Body mechanically operated without inserting the Actuator. Note, if this happens The ATOM Actuator assembly will be blocked from entering the ATOM Switch Body and the Device will fault as the correct RFID actuator is not present. To mechanically reset the Device if the head has been left in its closed position;

1. Place the Device into its Unlocked state.

- For Power-to-release (unlock) Devices use the Auxiliary Release function as described in the Functioning section of this document.



2. Engage a flat bladed screwdriver into the slot in the head mechanism of the ATOM Switch Body and push downwards to rotate the head to its forward position. The head is now repositioned to allow for entry of the ATOM Actuator assembly.



3. Return the Device to its main operating state.

- For Power-to-release (unlock) Devices ensure the Auxiliary Release function has been reset to the 'locked' position. See Functioning section for details.

Maintenance and Inspection

Regular inspection of the following is necessary to ensure trouble-free, lasting operation:

- Secure mounting of components. (See Mechanical Mounting Instructions).
- Debris and wear.

If used on an infrequent basis, the complete Interlocking system must be functionally tested at least once every month. See Mechanical and Electrical Function tests listed above for test requirements.

WD40 lubricant, or equivalent, should be applied to the Head Portion of the ATOM Switch assembly every 10,000 operations. There are no user serviceable parts in this product. If any damage or wear is found with a device, please contact your local Fortress stockist.

The complete ATOM Interlocking Device must be replaced after 1 million switching operations.

For ATOM Interlocking Device with Escape Release (ER), regular proof testing of the escape release function (minimum once per year) is crucial. See Mechanical Function Testing and Electrical Testing sections for details.

Disposal

The ATOM Interlock Device does not contain any certified hazardous materials so should be disposed of as industrial waste.

Liability Coverage is Voided Under the Following Conditions:

1. If these instructions are not followed.
2. Non-compliance with safety regulations.
3. Installation and electrical connection not performed by authorised personnel.
4. Non-implementation of functional checks.

Protection Against Environmental Influences

In order to maintain full mechanical and electrical performance, the Device must be protected against the ingress of all foreign bodies such as swarf, sand, blasting shot etc.

The Device is not suited for use in corrosive environments.

The Device is only suitable for dusty environments where careful consideration has been given to environment requirements, product selection and mounting positions. Contact your local Fortress stockist for guidance and details.

Where possible the Device must be mounted away from the guarded machine or by the use of anti-vibration mountings in order to avoid the effects of vibration, shock and bump.

The manufacturer reserves the right to modify the design at any time and without notice.

This guide should be retained for future reference.

Figure 7: Dimensional Drawing - ATOM Switch Body only

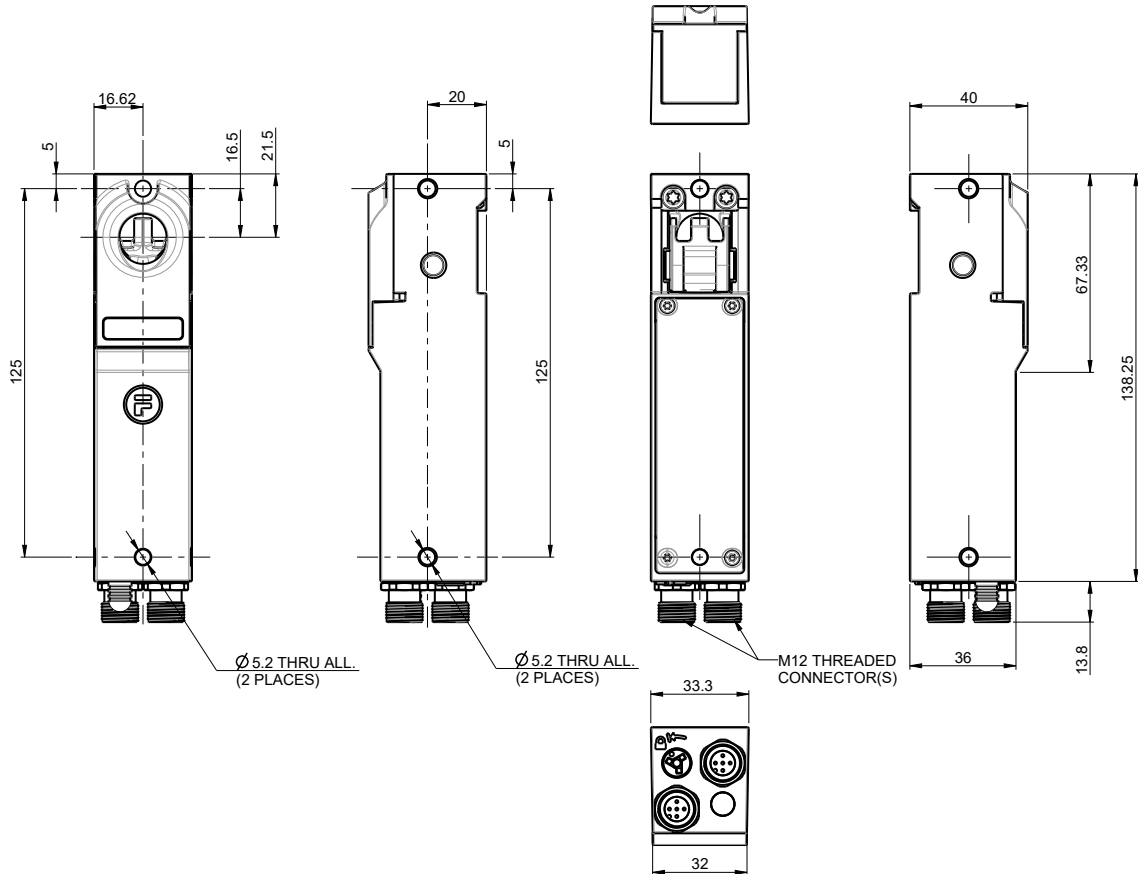


Figure 8: Dimensional Drawing - ATOM Actuator only

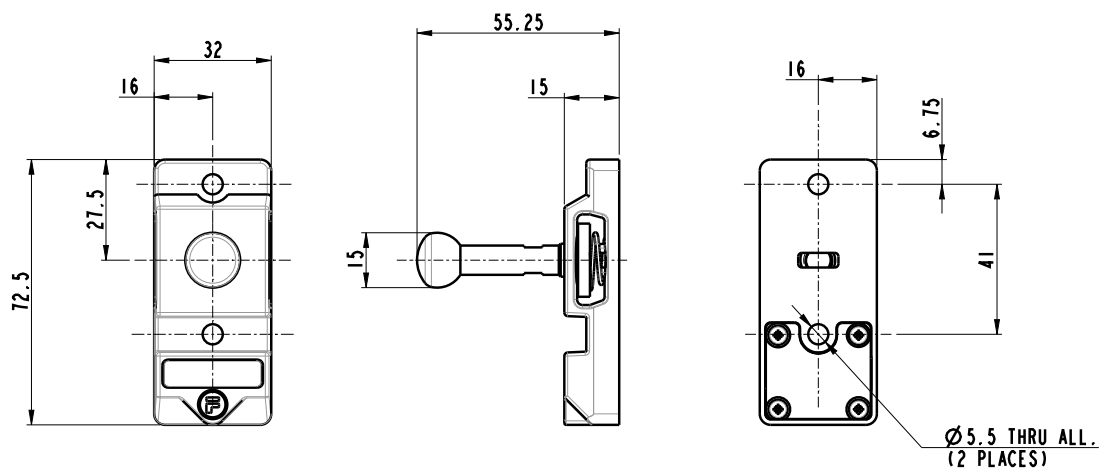


Figure 9: Dimensional Drawing - ATOM Interlocking Device

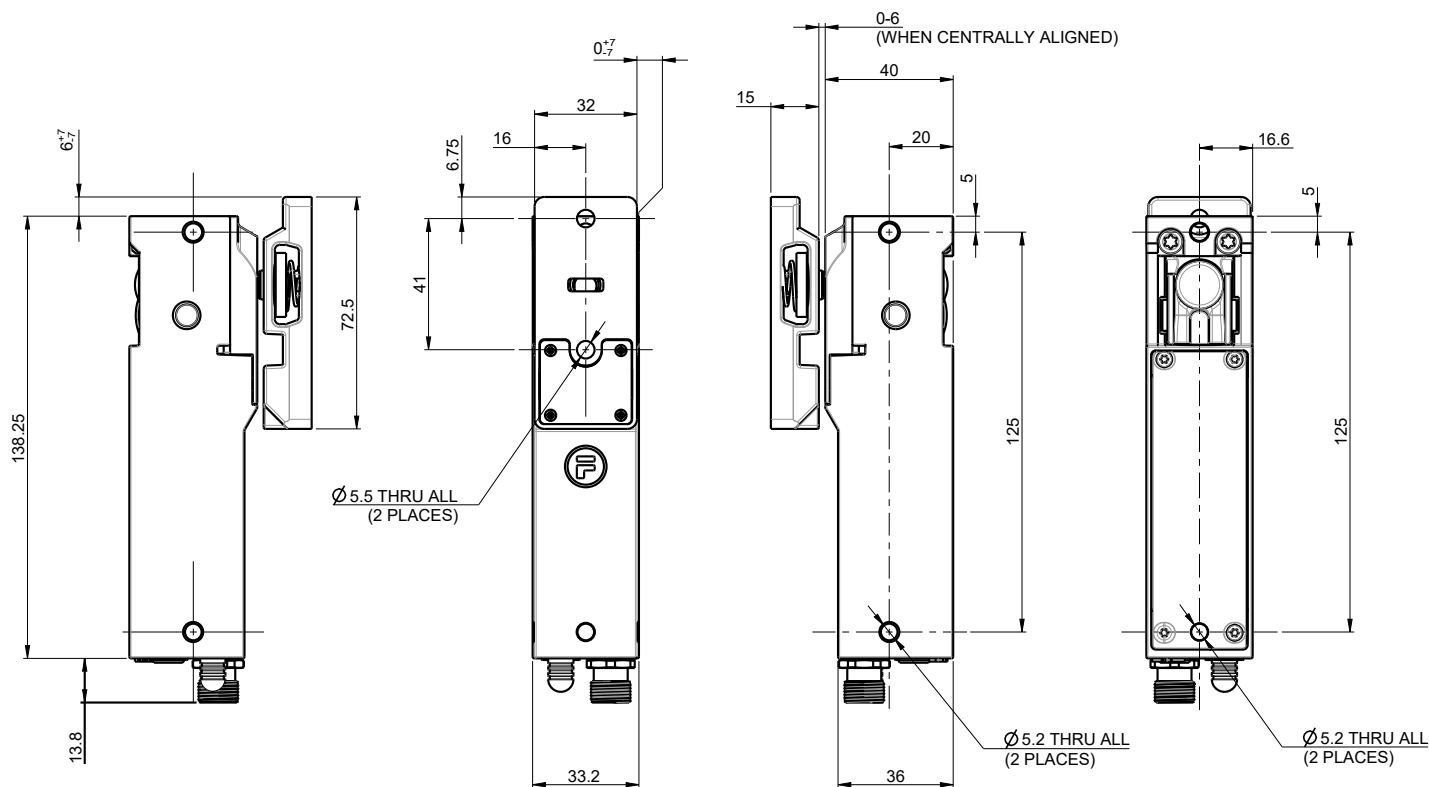


Figure 10: Dimensional Drawing - ATOM Switch Body with Escape Release only

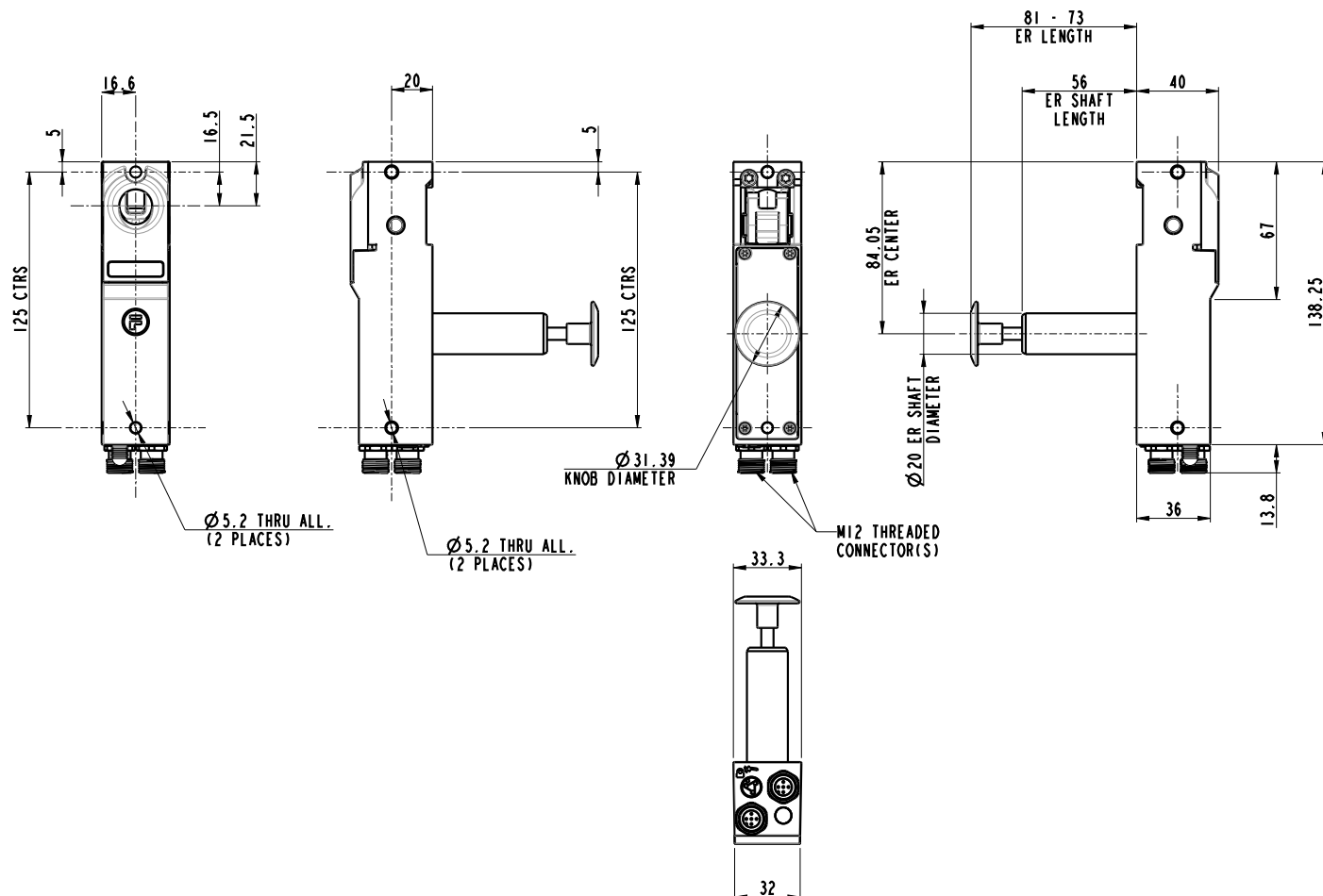
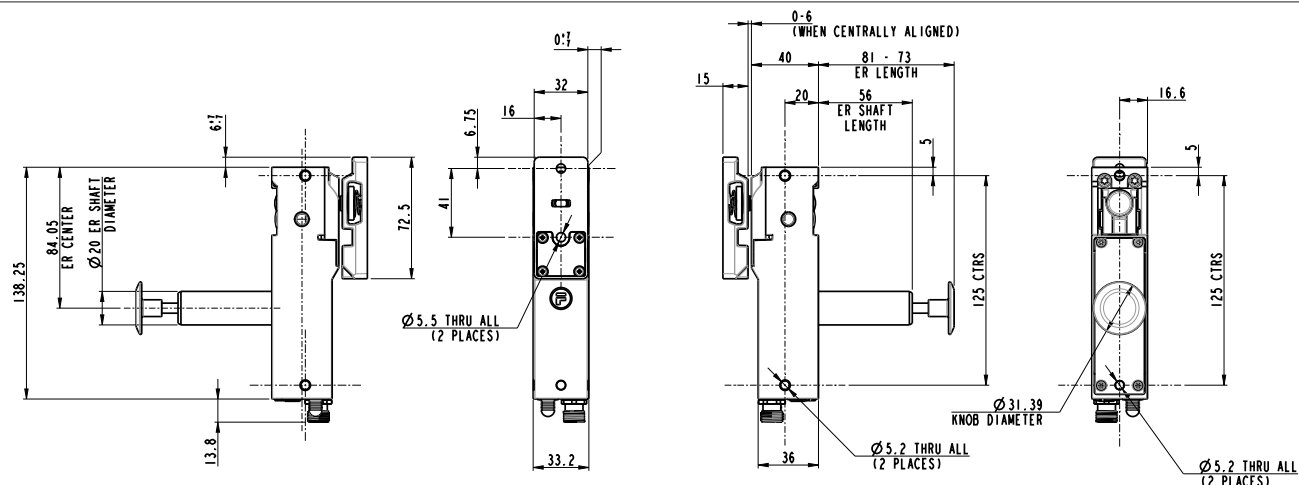
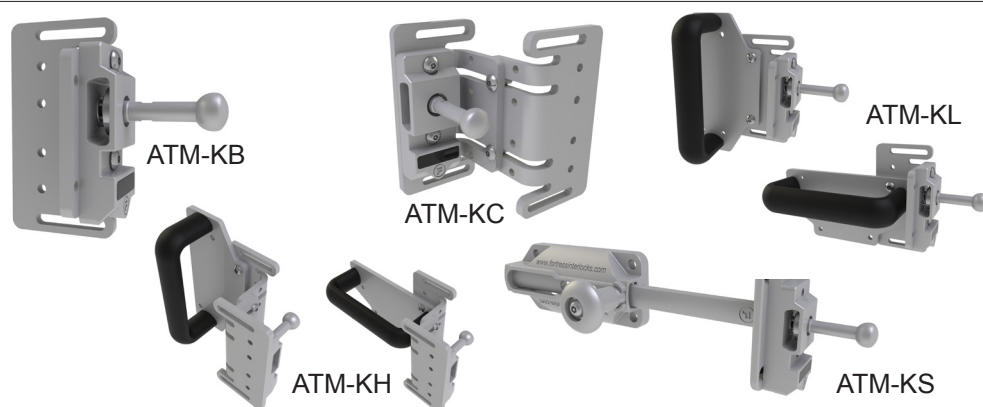


Figure 11: Dimensional Drawing - ATOM Interlocking Device with Escape Release (ER)



Description

Brackets for simplified mounting.



ATOM Brackets Options

Part No.	Description
ATM-KB	Slide angled bracket for sliding gates (not compatible for ATOM with Escape Release (ER))
ATM-KC	Angled bracket(s) for hinged gates
ATM-KL	With handle for sliding gates (not compatible for ATOM with Escape Release (ER))
ATM-KH	With handle for hinged gates
ATM-KS	Slidebar-style retractable actuator (not compatible for ATOM with Escape Release (ER))

ATOM Cordset

Part No.	Cable Length	Description
CABLE-2M-AT1	2m	To suit 5 Pin M12 connectors.
CABLE-5M-AT1	5m	
CABLE-10M-AT1	10m	
CABLE-2M-AT3	2m	To suit 8 Pin M12 connectors.
CABLE-5M-AT3	5m	
CABLE-10M-AT3	10m	
CABLE-2M-ATD	2m	To suit X 5 Pin M12 daisy chain connectors.
CABLE-5M-ATD	5m	
CABLE-10M-ATD	10m	

ATOM Shorting Plug

Part No.	Description
SHORTING-PLUG-ATD	To terminate last ATOM Device at end of daisy chain.