Salvo™

Salvo Safety System

Salvo System Installation Guide

No Compromise on Safety.

SENTRIC SAFETY GROUP

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Installation of the system must only be undertaken by suitably qualified and competent personnel.

Safety Information

	Read the contents of this guide carefully before installation.

Symbols Used

	**Warning** This symbol warns you of a potential fault or hazard. If you do not observe this warning message, there is a risk of severe property damage, personal injury, or death.
	**Caution** This symbol warns you of a potential fault. Failure to observe this warning message may result in the malfunctioning or complete failure of the product or any systems connected to it.
	The electrical warning icon indicates the presence of a hazard which could result in electrical shock.

Compliance

The manufacturer operates a Quality Management System certified to ISO 9001.

Regulatory Compliance

These products have been assessed and marked in accordance with applicable CE and UKCA requirements.

For the European Union, conformity has been demonstrated in accordance with:
Machinery Regulation (EU) 2023/1230.
Low Voltage Directive 2014/35/EU.
Electromagnetic Compatibility Directive 2014/30/EU.
RoHS Directive 2015/863.
REACH Directive 1907/2006.

For the United Kingdom, the products comply with:
The Supply of Machinery (Safety) Regulations 2008 & 2011 Amendment.
The Electrical Equipment (Safety) Regulations 2016.
The Electromagnetic Compatibility Regulations 2016.

For installations within the United States, relevant requirements include:
OSHA 29 CFR 1910.176 – Handling materials and dock safety.
OSHA 29 CFR 1910.178 – Powered industrial trucks.
National Electrical Code (NFPA 70).

For installations within Canada, applicable requirements include:
Canadian Electrical Code, Part I (CSA C22.1).
Provincial Occupational Health and Safety Regulations.
CSA Z432 – Safeguarding of Machinery.
CSA C22.2 standards applicable to installed electrical equipment.

Compliance has been established against applicable harmonised/designated standards, including:
ISO 12100 Safety of machinery - Risk assessment and risk reduction.
ISO 14119 Principles for the design and selection of interlocking devices associated with machine guards.
Performance Level (PL), Mean Time to Dangerous Failure (MTTFd), and B10d values have been assessed in accordance with the requirements of ISO 13849-1.

Electrical installation shall be carried out in accordance with BS 7671 (IET Wiring Regulations, current edition) and the Electricity at Work Regulations 1989.

The installer and site operator are responsible for identifying and complying with all applicable federal, provincial/state and local regulations.

For Individual Product Compliance, refer to Product User Guides.

Safety Considerations

Only suitably qualified and competent personnel must carry out the installation work.

Before installation, the installer shall ensure all associated energy sources are isolated in accordance with site lockout/tagout procedures.

Isolation shall be verified prior to commencing work. Installation shall not proceed until safe isolation has been confirmed.

Installation must be done in accordance with this installation manual and regulatory requirements.

Use only specified components and parts for installation work.

The installer shall ensure that all wiring is secured, that specified cables are used, and that no external forces act on the terminal connections or cables. Improper connections or installation may result in fire.

All fixings must be fully tightened and checked prior to commissioning.

Safely dispose of all packaging and transportation materials in accordance with site requirements.

Installation may involve drilling into concrete, working at height near dock edges, and performing electrical work.

Work at height shall only be carried out where necessary and using suitable access equipment. Ensure ladders, platforms, or other access equipment are stable and positioned on a secure surface.

Do not overreach while working at height. Where there is a risk of falling, appropriate fall protection measures shall be implemented in accordance with site safety procedures.

After installation, it is essential to carry out the commissioning checklist to ensure that the system performs as intended.

It is the user's responsibility to implement appropriate management controls and risk assessments for master and spare keys. Without proper control, these keys may be used to defeat trapped key interlock systems. Further guidance can be found in ISO 14119.

Where applicable, Risk Assessment and Method Statement (RAMS) reviewed and acknowledged by the installer and site management.

Site Hazards & Controls

	Installation shall be carried out in accordance with the site's health and safety rules and risk and method statements. Permit to work may be required by site rules. Installation at loading bays presents additional risk from moving vehicles and equipment. The installer shall maintain a controlled working area with barriers to cordon off the workspace and remain aware of vehicle movement during installation.

Electrical Safety & Isolation Requirements

	All electrical work shall be carried out by a competent and qualified person in accordance with BS 7671 (UK), the National Electrical Code (USA), or the applicable national wiring regulations in the country of installation (e.g. IEC 60364-based standards within the EU).

Personal Protective Equipment (PPE)

The installer shall wear appropriate PPE in accordance with the task, site rules and Risk & Method Statement (RAMS).

	No work shall be undertaken on live circuits.

Contents

1. INTRODUCTION

1.1. Manual Overview

The installation guide contains instructions on how to install and commission the Salvo™ system. The manual provides procedures for mechanical and electrical installation as well as configuration.

For any questions or clarification regarding this equipment, contact the project manager or Castell Safety International Ltd. for advice and assistance.

1.2. Intended Audience

This guide is intended for the personnel responsible for installing and configuring the Salvo system and related components.

1.3. Product Documentation

1.3.1. Document revision history

Revision	Change	Author	Design	NPD	Compliance	Marketing	Date
1	New release	JB	MG	SM	NP	NC	09.06.26

1.3.2. Related documentation

Name of Document
UM-EN - Castell - Salvo - SWL - 0526
MM-EN - Castell - Salvo - SCP - 0426
UM-EN - Castell - Salvo - SGL - 0526
UM-EN - Castell - Salvo - Susie - 0526
UM-EN - Castell - Salvo - Salvotype1 - 0626

UM-EN - Castell -Salvo - SwapBodyLock - 0626
UM-EN - Castell - Salvo - SalvoClub - 0626
UM-EN - Castell - Salvo - Bollard - 0626
UM-EN-Castell-Salvo-SMDLKit-0626
UM-EN-Castell-Salvo-SAPDKit-0626
Refer to Salvo Control Panel (SCP) - Sentric Safety Group Ltd. Global for the latest revision user manuals.

1.4. Document Symbols

	The information icon alerts the reader to relevant facts and important information.
	This symbol highlights when a separate detailed manual is available. All illustrations in this manual are for guidance only. Actual products may vary in appearance, dimensions, and configuration.

1.5. Term Definition

Term	Definition
Alerting system	Audible or visual alarm that activates if the Salvo vehicle lock (SGL/Susie Lock) is not returned to the storage enclosure within a defined time after key release.
Authorised	System state in which loading or unloading operations are permitted.
Alerting system countdown timer	Time-based function that starts when the trapped key is released and monitors the return of the SGL to storage.
Dock door	Physical door separating the warehouse from the trailer, opened and closed manually or automatically by the warehouse operator.
Dock safety interlock	Safety logic that links the status of the vehicle restraint, dock door, and signalling devices to prevent unsafe loading dock conditions.
Indoor beacon	Indoor visual indicator that informs the warehouse operator whether loading and unloading is authorised.
Indoor beacon – Green	Indicates that loading and unloading operations

	are authorised.
Indoor beacon – Red	Indicates that loading and unloading operations are not authorised.
Limit switch	Sensor that detects whether the dock door is closed and communicates this status to the SCP Control Panel.
Manual dock door	Dock door that requires manual operation and is not powered or automated.
Normal operating sequence	Intended step-by-step sequence of actions and system behaviour during trailer arrival, loading or unloading, and departure.
Not authorised	System state in which loading or unloading operations must not take place.
Outdoor traffic light	Outdoor visual indicator that informs the vehicle driver whether departure from the dock is permitted.
Outdoor traffic light - Green	Indicates that the vehicle is allowed to depart from the dock.
Outdoor traffic light - Red	Indicates that the vehicle must remain stationary and must not depart.
Salvo system	Integrated vehicle restraint and dock safety system that prevents trailer departure during loading and unloading operations by interlocking vehicle restraint, dock door status, and visual signalling.
SCP (Salvo Control Panel)	Control panel that manages system logic, key trapping, indicator signals, and interaction with safety devices.
SCP push button	Illuminated button on the SCP Control Panel confirms key can be released.
SCP push button - Off	Indicates that no user action is available or required.
SCP push button - Steady Illuminated	Indicates that a user action is available, key can be removed.
SGL (Salvo Gladhand Lock)	Air brake coupling device that restrains the vehicle when connected to the trailer's emergency air brake line.
Susie	Air brake coupling device that restrains the vehicle when connected to the trailer's emergency air brake line (UK).

Vehicle Lock	SGL /Susie - mechanical locking device designed to fit on trailer emergency brake line connectors. Its purpose is to prevent reconnection of the air brake hose, so the truck cannot drive away until loading/unloading is complete.
Storage enclosure	Enclosure used to store the Vehicle Lock when not in use and monitor its presence.
Trailer not restrained	Condition in which the trailer is free to depart from the loading dock.
Trailer restrained	Condition in which the trailer is secured by the Vehicle Lock and cannot safely depart from the loading dock.
Trapped key	Key inserted into the SCP Control Panel and turned to energise the solenoid, preventing its removal until safe conditions are met.
Vehicle driver	Individual operating the truck or trailer who relies on the outdoor traffic lights to determine whether departure from the dock is permitted.
Vehicle restraint	Mechanism or device that physically or pneumatically prevents a trailer from moving away from the loading dock during loading or unloading operations.
Warehouse operator	Person responsible for operating the Salvo system at the dock, including securing the vehicle, operating the dock door, and managing the loading and unloading process.

1.6. System Component Definition

Part Number	Product Name	Product Description
SALVO - SCP	Salvo Control Panel	System control panel for indoor or outdoor installation.
SALVO - SGL	Salvo Gladhand Lock (SGL)	Air brake coupling device that restrains the vehicle when coupled to the air brake emergency line.
SALVO - BEA - RED / GRN	Salvo Beacon Unit - Red / Green Beacon	Indoor lighting system to inform the forklift driver of authorisation status: green – authorised to open the dock door; red – not authorised to open the dock door and indicates that the vehicle at the bay is not restrained.

		This unit also hosts the power supply for the SCP Control Panel.
SALVO - KIT - SADL	Salvo SADL C / W Short Chain Kit	Door locking system that gets unlocked and allows the warehouse operator to manually open the door only when the vehicle lock is coupled and the key trapped in the SCP Control Panel.
SALVO-TRL24	Salvo Traffic Lights Red / Green 24V DC	Outdoor lighting system that indicates to the vehicle driver when they are allowed to drive away (green) or the vehicle is restrained and departure is not allowed (red).
SALVO - SLS	Salvo Safety Limit Switch Kit	Sensor that confirms to the SCP Control Panel that the door is closed.
SALVO - ENCL - BEA - ALM	Salvo Storage Enclosure C / W Beacon Alarm Sensor	Outdoor enclosure to store the SGL and Susie that triggers an alarm if the SGL or Susie is not returned to the enclosure within a set time after the trapped key has been released from the Salvo SCP Control Panel.

2. SALVO SYSTEM OVERVIEW

2.1. System Overview

The Salvo Loading Dock Safety System is designed to prioritise safety, utilising trapped key interlocking principles to enforce a safe sequence, preventing accidental drive-aways during loading and unloading by interlocking the trailer's emergency air brakes with the door lock.

The system is designed to reduce the risk of unintended vehicle departure by controlling the operational sequence between restraint devices and dock equipment. It does not prevent vehicle movement independently and must be used with appropriate vehicle restraints and site controls.

2.2. System Architecture

2.2.1. General Overview

The Salvo system is a dock interlock control system designed to coordinate mechanical key interlock devices with powered dock equipment.

The system supervises dock door enable, dock leveller enables, and traffic light signalling based on mechanical interlock state and door position feedback.

The Salvo Control Panel (SCP) acts as the coordination interface between mechanical interlocks and powered equipment. The system is hardwired unless otherwise specified.

2.2.2. Electrical Interfaces

The SALVO SCP interfaces with external equipment using:

	• Voltage-free relay contacts • 24V control inputs • Switched signalling outputs The SCP: • Does not power door or leveller motors • Does not replace the primary controller of powered equipment • Provides enable/inhibit logic only

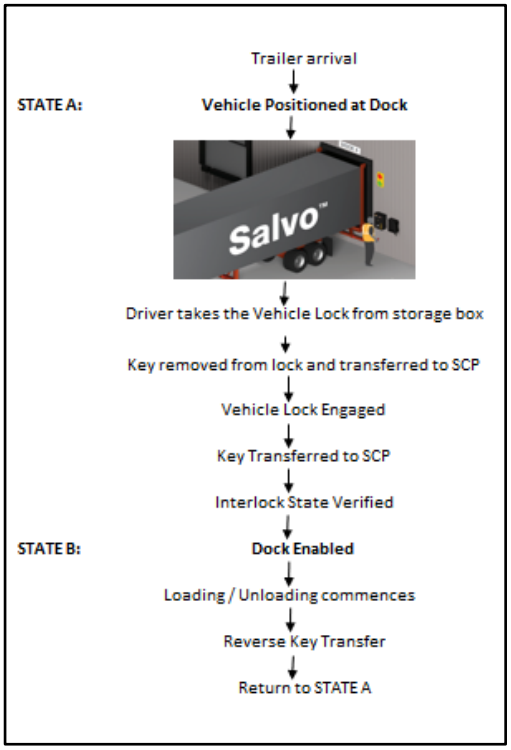
2.2.3. Mechanical Interfaces

Mechanical interlock devices are mounted to structural dock elements or approved brackets.

	Interfaces include: • Salvo SCP • Salvo Manual Door Lock (SMDL-AI) • Salvo Access Door Lock (SADL) • Salvo Bollard • Salvo Pedestal Mechanical components: • Must be installed on rigid surfaces • Must maintain alignment tolerances • Must not be modified

2.3. Functional Description

2.3.1. Interlock Operating Principle



The Salvo system enforces a controlled sequence between securing the vehicle and activating the dock door activation.

Operation is dependent upon mechanical key transfer.

Enable signals are only provided when all required interlock conditions are satisfied.

Figure 1: Salvo Operating Principle Diagram

2.4. Safety and Responsibility Boundaries

2.4.1. Electrical Interface Boundaries

The Salvo system provides an interlock control function to safeguard against powered dock operation until vehicle immobilisation has been confirmed.

The system contributes to risk reduction when properly installed and integrated.

2.4.2. Limits of Application

The Salvo system:

- Is not a mechanical vehicle restraint
- Does not provide primary door safety protection
- Does not replace statutory safety devices
- Does not control motor overcurrent protection
- Does not prevent mechanical failure of dock equipment

2.4.3. Foreseeable Misuse

Bypassing or defeating the safety interlock is strictly prohibited. The SCP and related Salvo components must be selected, installed, operated, and maintained in a manner that minimises opportunities for defeat, bypass, tampering, or unauthorised override.

For the SCP control box, reasonably foreseeable misuse includes use of a master key to override the system. Master keys shall be strictly controlled and held only by authorised senior personnel under defined conditions.

Deliberate removal of the M4 button-head screws securing the SCP lid, opening the control box and manually operating the internal plunger associated with the interlock key switch to override the locking function and allow operation without the authorised key.

These examples are provided to highlight known categories of foreseeable misuse and do not limit the installer's or site operator's obligation to identify and control other site-specific misuse, bypass, tampering, or defeat scenarios that may arise from the actual installation, operating environment, staffing practices, key-control procedures, or maintenance practices.

These scenarios constitute intentional defeat of the safety function and can lead to hazardous operation, including serious injury or death.

The user shall carry out a documented risk assessment of the complete installation, identify any additional reasonably foreseeable misuse, and implement suitable risk reduction and procedural controls (including control of master keys and access to the SCP) before placing the equipment into service.

3. PRE-INSTALL REQUIREMENTS

3.1. Required Tools & Test Equipment

The below list represents the typical tools and equipment required for installation of the Salvo system.

Additional tools or materials may be necessary depending on site conditions, substrate type, local regulations, or project specific requirements.

The installer is responsible for assessing site conditions and ensuring that all appropriate tools, equipment and protective measures are available and calibrated prior to commencing work.

Installation shall not proceed where suitable tools or test equipment are not available.

Hand Tools	Drilling Equipment	Test Equipment	Installation Materials	Access and Safety Equipment
PZ2 crosshead screwdriver	Hammer drill	Calibrated voltage tester (minimum CAT III rating)	Wall anchors / expansion fixings	Suitable access equipment
Flat-blade screwdriver	Masonry drill bits	Proving unit	Suitable bolts and washers	lockout/tagout device
Calibrated torque screwdriver	HSS drill bits (for steel substrates)	Multimeter	Suitable IP65 cable glands and IP65 blanking plugs	PPE as required by site rules and RAMS
Spirit level	Core drill (25–32 mm) where wall penetrations are required	Continuity tester (for protective earth verification)	Cable markers or printed ferrules	
Measuring tape	Deburring tool (for steel installations)		Cable ties / P-clips / trunking / Conduit	
Pencil or marker			Silicone sealant, or approved fire-stop compound	

Cable cutters				
Cable stripping tool				
Calibrated Ferrule crimping tool (if ferrules are used)				
Socket set or spanners				
General installation tools				

3.2. Site Checklist

A site installation checklist is provided as a separate document to support verification of installation readiness and completion.

The checklist shall be completed by the installer prior to commissioning and retained as part of the project documentation.

Refer to the attached **WI-112 Salvo Commissioning & Check Sheet** for full details.

4. UNPACKING, INSPECTION, TRACEABILITY

4.1. Delivery Inspection

Upon receipt of equipment:

- Inspect packaging for visible damage.
- Verify contents against the delivery documentation and project bill of materials.
- Confirm all components are present and undamaged.

Any discrepancies, damage, or shortages shall be recorded and reported to the project manager prior to installation.

Equipment suspected of damage shall not be installed.

4.2. Product Identification and Rating Verification

Before installation, verify and record on the Salvo Check List & Commissioning Sheet:

- Product model number.
- Serial number (where applicable).

Confirm that the supplied equipment matches the approved design documentation.

These details shall be retained as part of the installation and commissioning record.

4.3. Regulatory and Suitability Check

Prior to installation, confirm that:

- The equipment rating is suitable for the power supply.
- The enclosure IP rating is appropriate for the installation environment.
- The intended application matches the product's defined use.

The equipment shall not be modified or applied outside its intended purpose.

4.4. Installation Materials Verification

The installer shall verify that all required installation materials are available and suitable, including:

- Correct cable types and sizes (advised size 1.5 mm^2).
- Mounting hardware appropriate to the substrate.
- Cable glands and connectors.
- Containment and mechanical protection.

Materials shall comply with applicable local electrical and safety regulations.

4.5. Non-Conformance Control

Where equipment is found to be:

- Damaged.
- Incorrectly rated.
- Incomplete.
- Non-compliant with project specification.

Installation shall not proceed.

The item shall be quarantined and reported to the project manager for resolution.

5. INSTALLATION

5.1. Handling and Lifting

5.1.1. Manual Handling

- Risk of injury due to improper lifting.
- Verify component mass before handling.
- Use suitable lifting equipment where necessary.
- Do not lift by cables or protruding components.
- The installer shall observe site manual handling requirements and RAMS.

5.1.2. General mounting rules

All Salvo system components shall be installed in accordance with this installation manual and applicable site and statutory requirements. Installation must be carried out by a qualified and competent installer. The installer and user are responsible for ensuring correct installation, proper operation, and adherence to all relevant safety and regulatory requirements.

1. Structural Mounting

Components shall be mounted to rigid, load-bearing structures.
Mounting surfaces shall withstand operational forces without deformation.
Non-structural panels or cladding shall not be used as primary support.

2. Alignment

Mechanical devices shall be installed within specified alignment tolerances.
Binding, distortion, or incomplete engagement is not permitted.
Alignment shall be verified prior to commissioning.
Refer to the relevant product manual for tolerance values.

3. Fasteners

Suitable fasteners shall be used.
Damaged or substitute hardware shall not be used.

4. Environmental Suitability

Installation location shall comply with the component's environmental rating.
Cable entries shall be sealed appropriately.

5. Drilling

Verify the substrate is suitable before drilling. Use anchors rated for the load and installation environment.

Do not proceed if the floor condition is cracked, uneven, or unsuitable for anchoring.
Improper fixing may result in structural failure or detachment.
Do not drill any additional holes in the Salvo SCP enclosures.

6. Accessibility and Protection

Devices shall be mounted to allow safe operation and inspection.
Components shall be positioned to prevent unauthorised bypass or tampering.

7. Prohibited Actions

The following are not permitted:
Modification of interlock devices.
Welding on installed components.
Installation under mechanical stress.
Deviation from specified hardware or mounting methods.

8. Vibration

Avoid mounting on flexible or vibrating surfaces.

9. Verification

After installation, the installer shall verify:
All fasteners are secure and electrical connections have been pull-tested.
Mechanical engagement is correct.
No unintended movement is present.

10. Dimensions

Dimensions in this guide are in metric (mm).

5.1.3. Electrical Safety

Installation must be carried out by a qualified and competent installer. The installer and user are responsible for ensuring correct installation, proper operation, and adherence to all relevant safety and regulatory requirements.

Power supply selection and installation shall comply with recognised electrical standards and local regulations, including:

- BS 7671 (UK).
- NFPA 70 – National Electrical Code (U.S.).
- CSA C22.1 – Canadian Electrical Code.
- IEC 60364 – Electrical Installations (international reference).

Compliance with these standards remains the responsibility of the installer and site operator.

Isolate and lock off all associated supply circuits before commencing work. Failure to isolate the supply or correctly

terminate conductors may result in electric shock, overheating, or system malfunction.

A suitable lockout/tagout procedure shall be implemented for all Salvo equipment before installation.

Before handling internal components, discharge static electricity from your body and avoid contact with PCB tracks and terminals.

Do not energise any of the units until all wiring has been completed and inspected.

Changes or modifications not expressly approved by Sentric Safety Group Ltd. could void the user's authority to operate the equipment.

This equipment has been tested and complies with the limits for a Class A digital device under Part 15 of the FCC Rules. These limits are intended to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

The equipment generates, uses and may radiate radio frequency energy. If not installed and used in accordance with this manual, it may cause interference to radio communications. Operation in a residential area is likely to cause interference, in which case the user will be responsible for correcting the interference at their own expense.

This device contains licence-exempt transmitter(s) and/or receiver(s) that comply with Innovation, Science and Economic Development Canada (ISED) licence-exempt RSS standards. Operation is subject to the following conditions:

- This device may not cause interference.
- This device must accept any interference received, including interference that may cause undesired operation.

Correct installation of fixings and cable entries is required to maintain IP65 enclosure rating and ensure reliable operation.

Cables installed in areas exposed to vehicle or forklift movement may be subject to mechanical damage. Where risk of impact exists, use suitably rated armoured cable or provide mechanical protection.

Damaged cabling may result in unsafe operation or electrical hazard.

Use appropriate cable types and protection.

Verify conductor identification and tighten terminals to the specified torque.

5.2. Coupling

	The following components form part of the Salvo system architecture. Detailed Installation, user and maintenance instructions for these products are provided in their respective product manuals.

5.2.1. Salvo Components

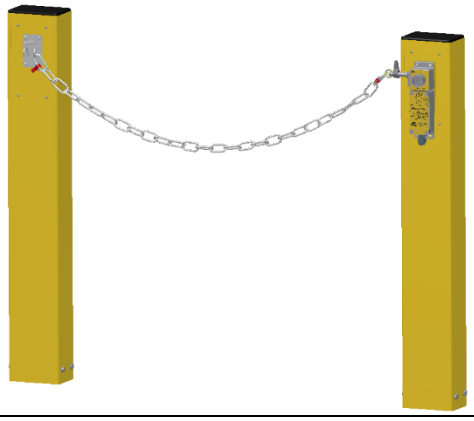
Salvo Swap Body Lock	Function	User Guide
	The Salvo Swap Body Lock is a key-operated mechanical locking device designed to fit into the twist lock aperture on a swap body trailer.	UM-EN-Castell-Salvo-SwapBodyLock-0626
Salvo Susie Lock	**Function**	**User Guide**
	The Salvo Susie Lock is a key-operated mechanical locking device designed to fit on to all UK trailer, emergency brake line connectors. Its purpose is to safeguard against reconnection of the air brake hose.	UM-EN-Castell-Salvo-Susie-0526
Salvo SGL	**Function**	**User Guide**
	The Salvo Gladhand (SGL) is a mechanical interlock device fitted to the trailer air brake gladhand connection. Its purpose is to safeguard against reconnection of the air brake hose.	UM-EN-Castell-Salvo-SGL-0526

Salvo Type 1	Function	User Guide
	The Salvo Type 1 lock is a key-operated mechanical locking device designed to fit on to all Australian trailer, emergency brake line connectors. Its purpose is to safeguard against reconnection of the air brake hose.	UM-EN-Castell-Salvo-Salvotype1-0626
Salvo SWL	**Function**	**User Guide**
	The Salvo Steering Wheel Lock (SWL) enables safe loading and unloading operations for rigid vehicles and box trucks 7.5 tonnes and larger.	UM-EN-Castell-Salvo-SWL-0526
Salvo Bollard	**Function**	**User Guide**
	The Salvo Bollard assembly consists of two floor-mounted posts connected by a safety chain. One post incorporates the interlock housing and key mechanism (where applicable).	UM-EN-Castell-Salvo-Bollard-0626
Salvo SPAS	**Function**	**User Guide**
	The Salvo Presence and Alarming System alerts users when a Salvo Susie or SGL is not placed back into the Salvo Storage Enclosure after use.	
Salvo SCP	**Function**	**User Guide**
	The Salvo Control Panel (SCP) provides the primary interface between the Salvo coupling devices and the associated loading bay door controls.	

Salvo SMDL-AI	**Function**	**User Guide**
	The SMDL-AI (Salvo Manual Door Lock) is a mechanical interlock used to secure loading bay doors in the closed position	UM-EN-Castell-Salvo-SMDLKit-0626
Salvo SADL	**Function**	**User Guide**
	The Salvo Automatic Door Lock (SADL) is a solenoid-controlled locking device that secures the loading bay door	UM-EN-Castell-Salvo-SAPDKit-0626
Salvo Power & Beacon	**Function**	**User Guide**
	Salvo Power Supply converts 110/240VAC to 24V DC to power the SCP, providing a safer power level at the user interface.	
Traffic Lights	**Function**	**User Guide**
	Salvo Traffic Lights provide visual indication of the loading bay status and may be installed internally, externally, or on both sides of the bay.	
Salvo Club	**Function**	**User Guide**
	The Salvo Club secures a vehicle's steering wheel during loading and unloading. It can be fitted to steering wheels of various sizes and remains locked when the Castell key is removed. Once procedures are complete, reinserting the Castell key allows removal of the Salvo Club.	UM-EN-Castell-Salvo-SalvoClub-0626

5.3. Loading Bay Barriers

5.3.1. Salvo Bollard

Description	Salvo Bollard
The Salvo Bollard assembly consists of two floor-mounted posts connected by a safety chain. One post incorporates the interlock housing and key mechanism (where applicable). The Salvo Bollard can be fitted with either of the following interlocks: SMDL-AI or SADL.	

WARNING

Mechanical Installation. Refer to section 5.1.2
Do not install on uneven or degraded surfaces.

Bollard Variants and Interlock Options

Two types of Salvo bollards are available, which can be configured with a range of interlock options depending on the site requirements.

The bollards may be supplied with one of three interlock configurations. The selected configuration will be defined by the project specification and supplied documentation.

5.3.1.1. Bollard Variant

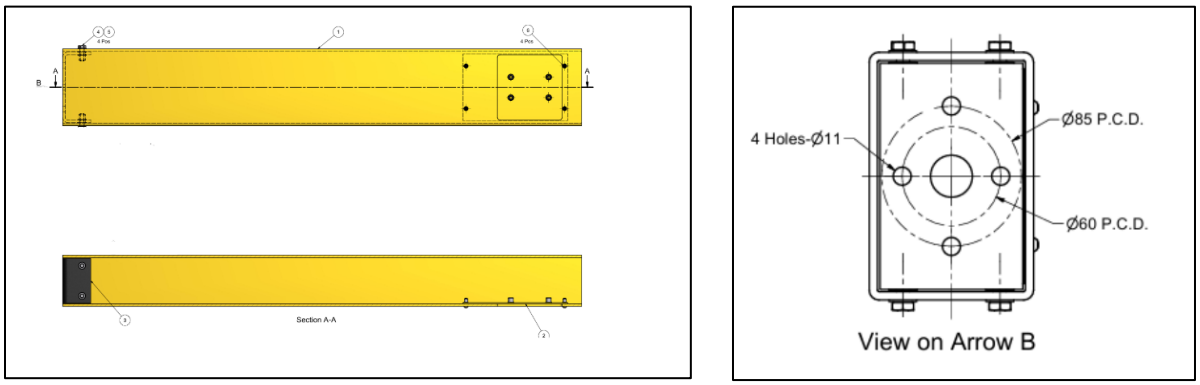


Figure 2: 006523-5 Salvo Manual Chain Barrier Bollard

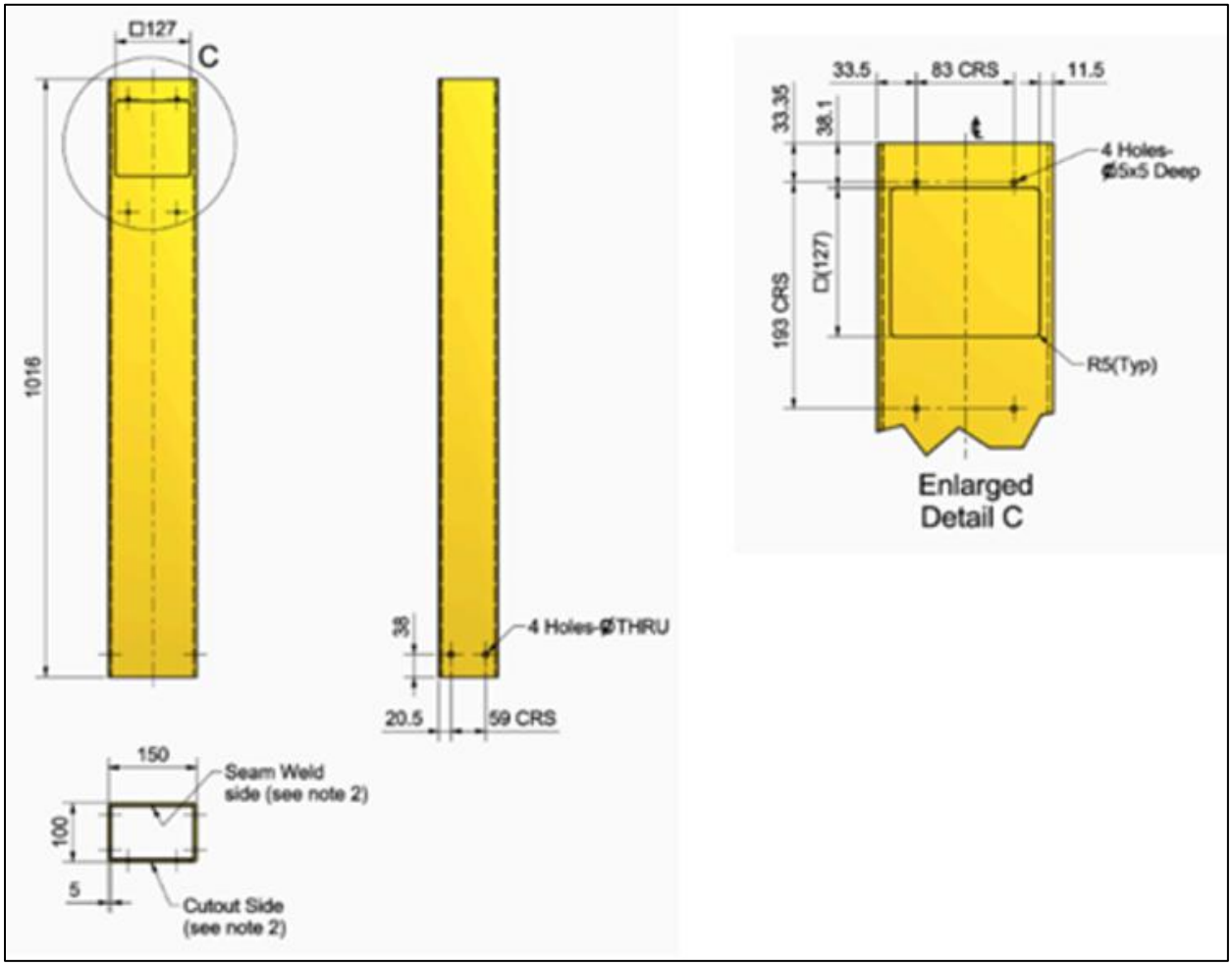


Figure 3: 006522-3 Salvo Automatic Chain Barrier Bollard

5.3.1.2. Mounting of the Unit

	Correct alignment of the footplate and bollard is essential to ensure proper engagement of the interlock components.

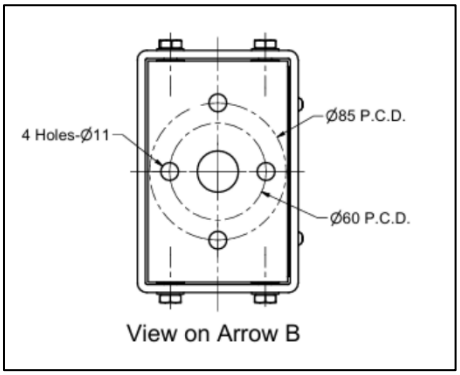
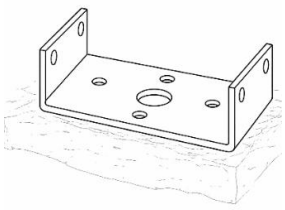
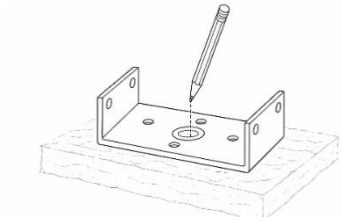
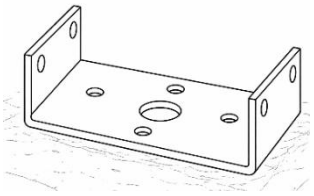
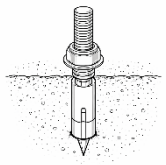
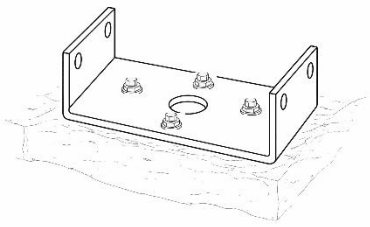
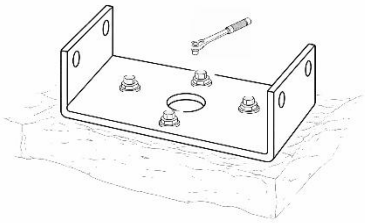


Figure 4: Footplate Hole Dimensions

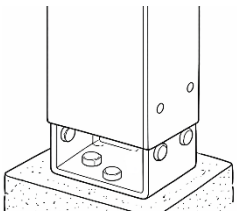
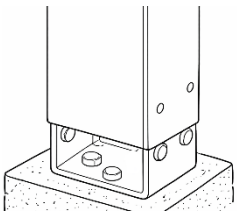
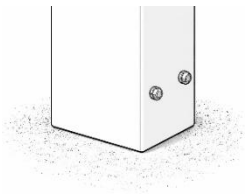
Position and Mark Footplate

1	2	3
Place the footplate in the required location on the warehouse floor. Confirm the position relative to the loading bay layout.	Using the footplate as a template, mark the fixing hole positions on the floor.	Remove the footplate and drill the fixing holes using a suitable masonry 10mm drill bit for the selected anchors.
		

Fix Footplate to Floor

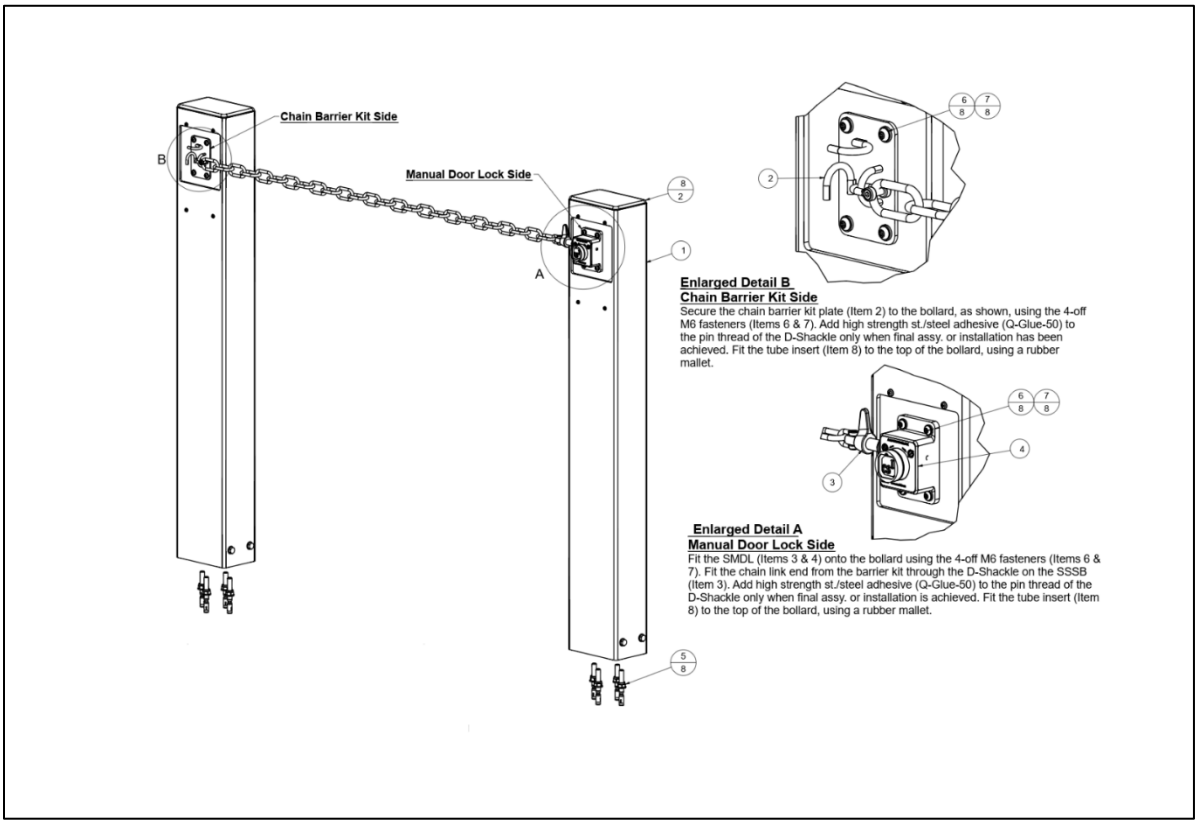
1	2	3
Clear all dust and debris from the drilled holes. Insert the four anchors into the floor.	Position the footplate over the anchors and install the fixing bolts	Tighten the bolts progressively in a diagonal sequence to distribute load evenly. Torque 20-30 Nm Ensure the plate sits flat and level against the floor.
		

Install Bollard onto Footplate

1	2	3
Lower the bollard vertically over the installed footplate, aligning the internal fixing points.	Ensure the bollard sits fully down onto the plate without rocking or distortion.	Secure the bollard to the footplate using the bolts provided. Tighten evenly to ensure full engagement. Torque 20-30 Nm
		

5.3.1.3. Bollard Interlock Variants

Fit the applicable interlock in accordance with the project requirements.



*Please note, two options exist for this kit, Hand 1 and Hand 2.

Figure 4: 006515-6 SCB-SMDL-AI-1 Salvo Chain Barrier - AI - Hand 1

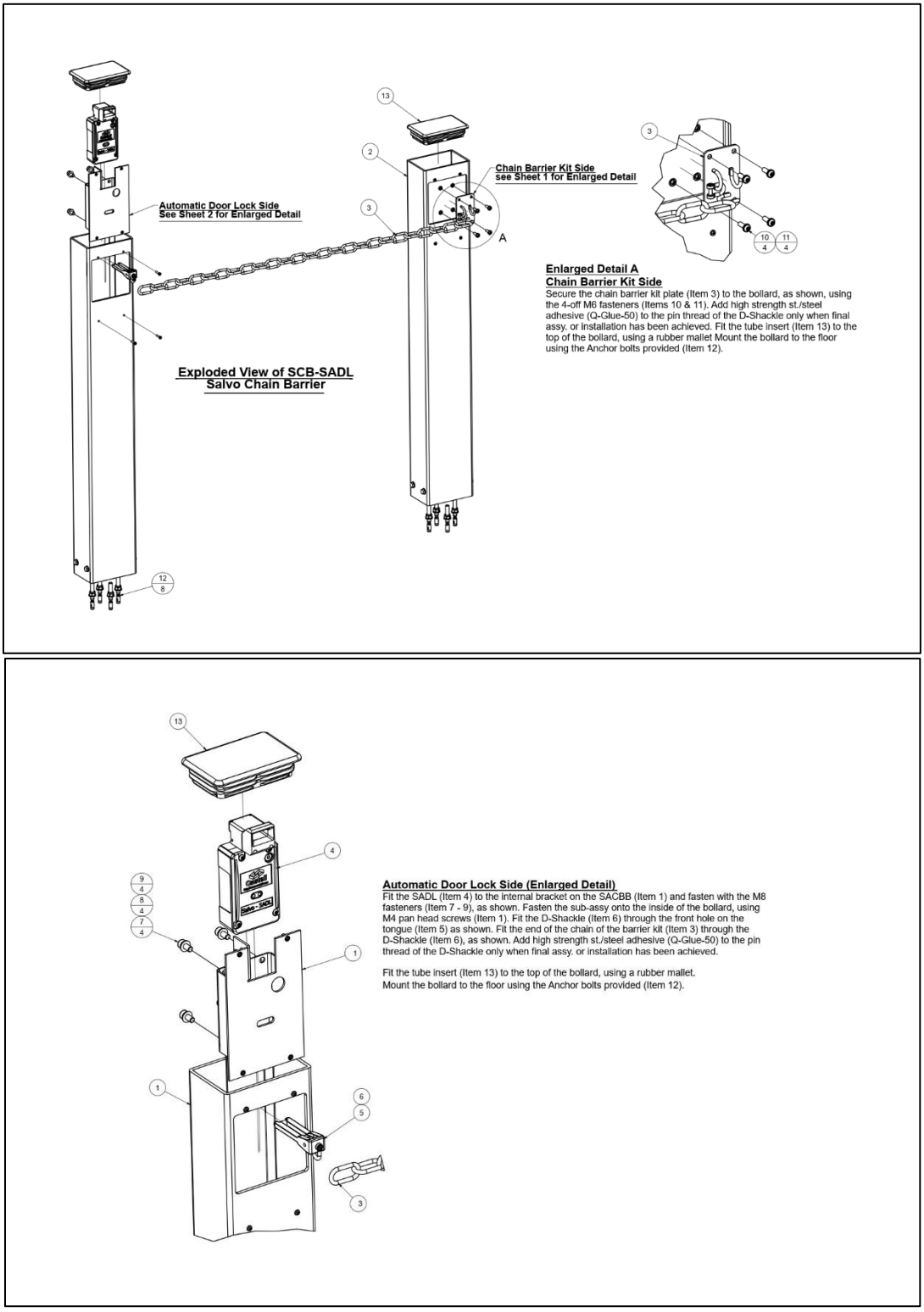


Figure 5: 006517-4 SCB-SADL Salvo Chain Barrier

Final Verification

1	2	3
Confirm the bollard is secure and stable. There shall be no visible movement under manual force.	Verify that all fixings are fully tightened.	Inspect the installation area and remove debris before proceeding to commissioning.

5.4. Peripherals (SCP Only)

5.4.1. Pedestal

Description	Pedestal
The Salvo Pedestal is bolted to the floor of the yard and is used primarily for installations that have a narrow bay pitch, limited wall access and fixing space. The pedestal is used in conjunction with Salvo Control Panel and Salvo Enclosure, double box.	

WARNING

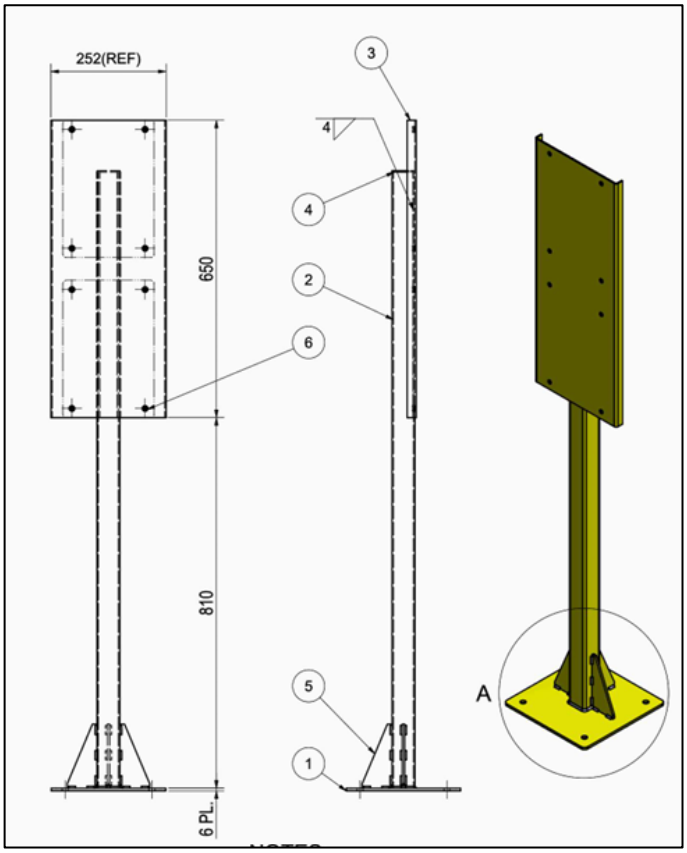
Mechanical Installation. Refer to section 5.1.2
Do not install on uneven or degraded surfaces.

Parts Required	Quantity
Pedestal	1

Technical Data

Post Material	Mild Steel
Weight	15 kg
Dimensions	See Drawing attached
Height	1.46m
Colour	Safety Yellow

5.4.1.1. Drawings



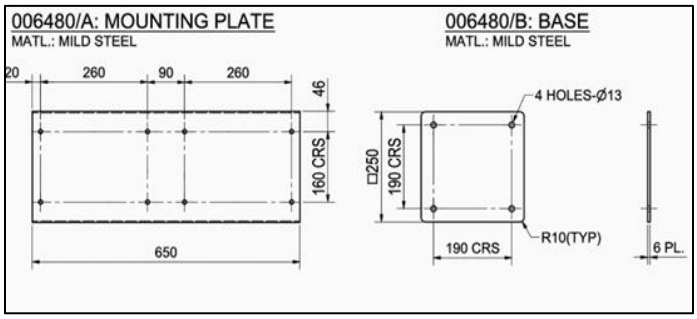
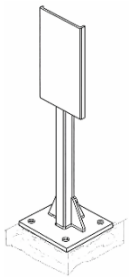
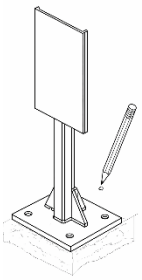
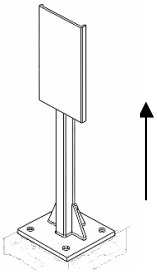


Figure 6: 006480-3 Pedestal (Units-mm)

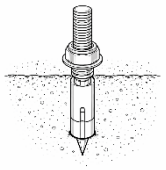
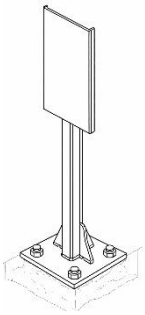
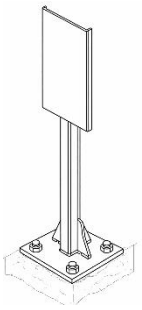
5.4.1.2. Mounting of the Unit

	The pedestal shall be installed vertically and securely fixed to ensure correct operation of any mounted equipment. The pedestal shall be installed at a height appropriate to the intended operator and application. Where supporting an SCP or control device, the operating interface should typically be positioned at approximately 1500 mm above finished floor level, unless otherwise specified. Maintain adequate clearance around the pedestal to ensure safe access and unobstructed operation.

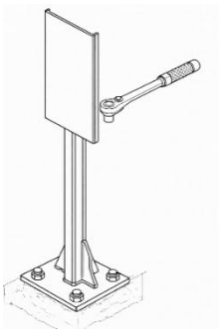
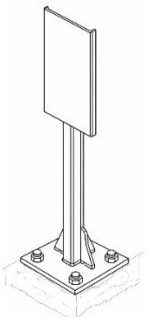
Position and Mark Baseplate

1	2	3
Position the pedestal baseplate at the approved location in accordance with the site layout drawing. Confirm that the location provides adequate clearance for operation and maintenance of the mounted equipment.	Using the baseplate as a template, mark the fixing hole positions on the floor.	Remove the pedestal and drill the fixing holes to suit the supplied anchors.
		

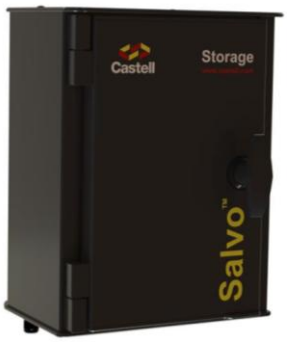
Secure Baseplate to floor

1	2	3
Clear all dust and debris from the drilled holes. Insert the four anchors to the drilled holes on the floor.	Reposition the pedestal over the anchors. Install the fixing bolts and tighten.	Verify that the pedestal is level and vertical before final tightening.
		

Final Fixing

1	2	3
Final-tighten all bolts Torque 20-30 Nm	Confirm that the pedestal is stable and free from movement under manual force.	Inspect the installation area and remove debris before proceeding with mounting of associated equipment.
		

5.4.2. Storage Box

Description	Storage Box
The Salvo Storage Enclosure provides secure and weather-protected storage for the SGL/Susie when not in use. The enclosure may be installed in a location appropriate to site operations, such as the external or internal warehouse wall, adjacent to the loading bay door, or on a pedestal between loading bays. In addition to storage, the enclosure can incorporate sensors to detect the presence of the SGL/Susie device as part of the Salvo interlock sequence.	

WARNING

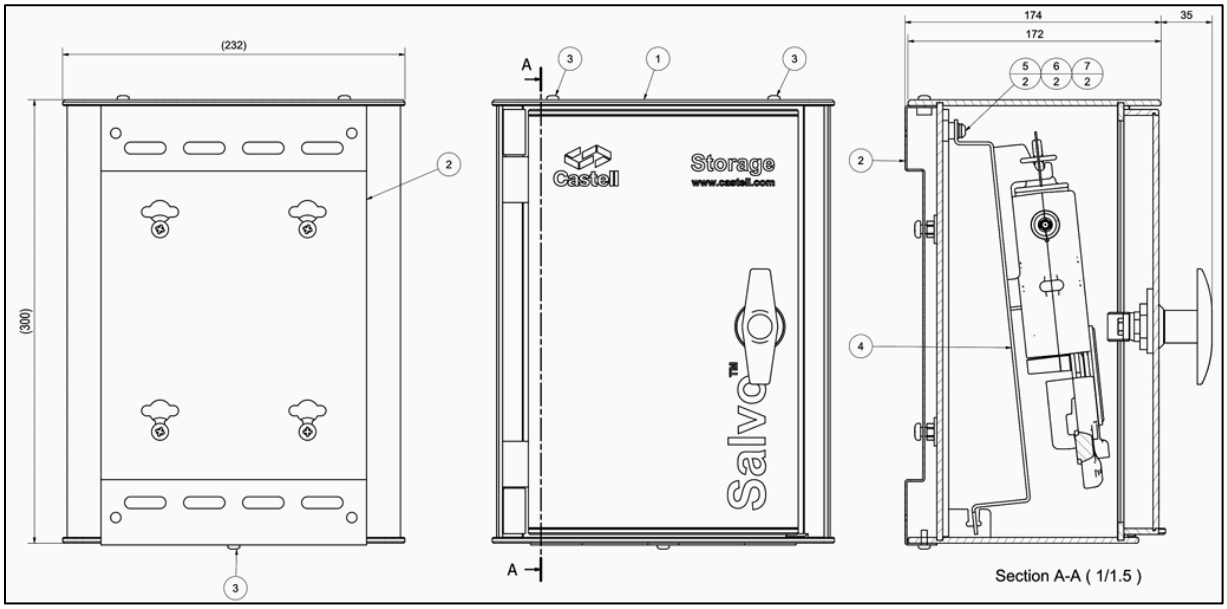
Mechanical Installation. Refer to section 5.1.2
Do not install on cracked, uneven, or non-load-bearing surfaces.

Parts Required	Quantity
Storage Box	1

Technical Data

Material	ABS/FR (R59M) UL94 5VA Rated
Weight (Box with mounting plate)	2.55kg
Dimensions	232mm(W) x 302mm(H) x 172mm(D) (174mm with Mounting Plate)

5.4.2.1. Drawings



SGL/SUSIE for visual info only

Figure 7: 008002-4 Storage Unit Enclosure (Units -mm)

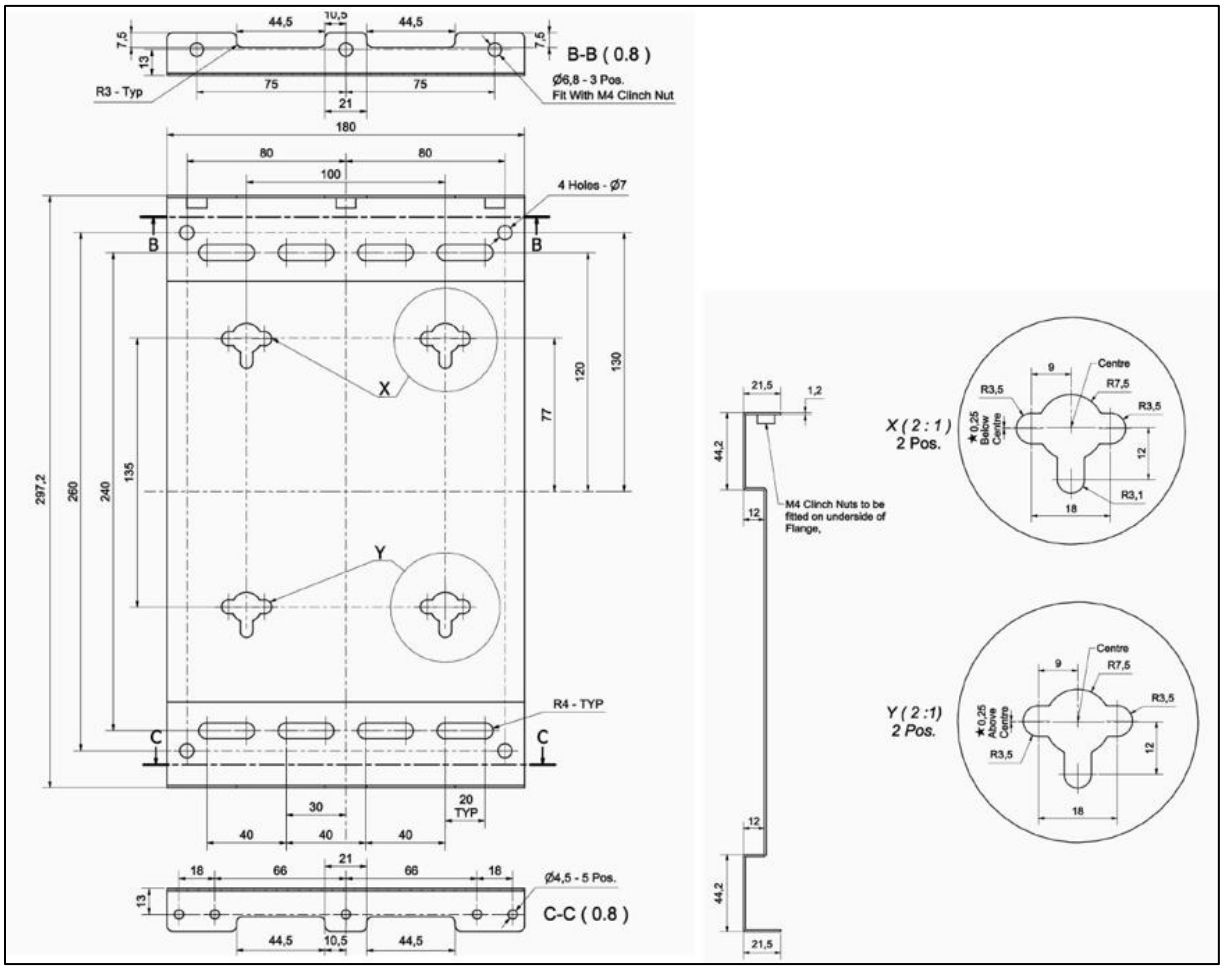
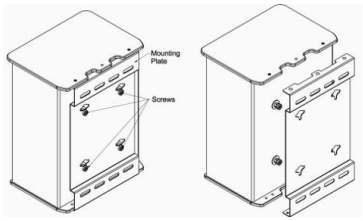


Figure 9: 008016-2 SCP/Storage Mounting Bracket (Units -mm)

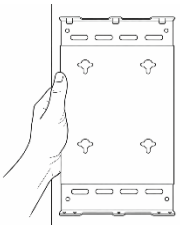
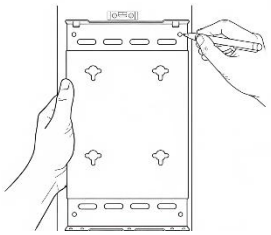
Mounting of the Unit

	The enclosure shall be mounted at a height that allows safe and convenient access to the stored Susie or Palm/Glad Hand lock. Where installed adjacent to a loading bay, position the enclosure so that the operator can access it without stepping into active vehicle paths.

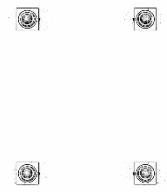
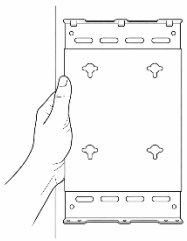
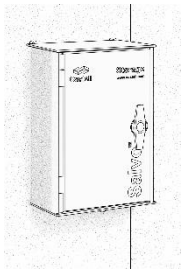
Select Mounting Location

1	2	3
Detach the mounting bracket from the box. Select a mounting position appropriate to site operations and the intended interlock sequence.	Ensure the location, is accessible to the operator, protected from vehicle impact and does not obstruct emergency routes and pedestrian routes.	Confirm sufficient clearance is available to allow the enclosure door to open fully without obstruction.
		

Mark and Drill Fixing Points

1	2	3
Hold the bracket against the wall or mounting surface at the approved height and position. Using a spirit level, confirm the enclosure is vertical.	Mark the fixing hole positions using the rear mounting holes as a template.	Remove the bracket and drill the holes appropriate to the selected anchors and substrate type.
		

Fix Enclosure to Surface

1	2	3
Clear all dust and debris from drilled holes. Insert the selected wall anchors.	Reposition the bracket and install the appropriate fixings.	Tighten fixings progressively to ensure the enclosure sits flat against the surface without distortion. Install the Enclosure onto the mounting bracket. Verify the enclosure is secure and free from movement. Fasten the three provided M4x10 anti temper screws after installation (one at the bottom and two at top) Torque for closing lid: 1.2Nm
		

5.4.3. Presence Alarm (Alarming System)

Description	Presence Alarming System
The Salvo Presence and Alarming System alerts users when a Salvo Susie or SGL is not placed back into the Salvo Storage Enclosure after use.	 

	**WARNING** Mechanical Installation. Refer to section 5.1.2 Do not install on cracked, uneven, or non-load-bearing surfaces.

Prerequisite:

This unit works with the Salvo Storage Box. Ensure installation of the storage box is complete beforehand.

Parts Required	Quantity
SALVO SPAS	1

5.4.3.1. Drawings

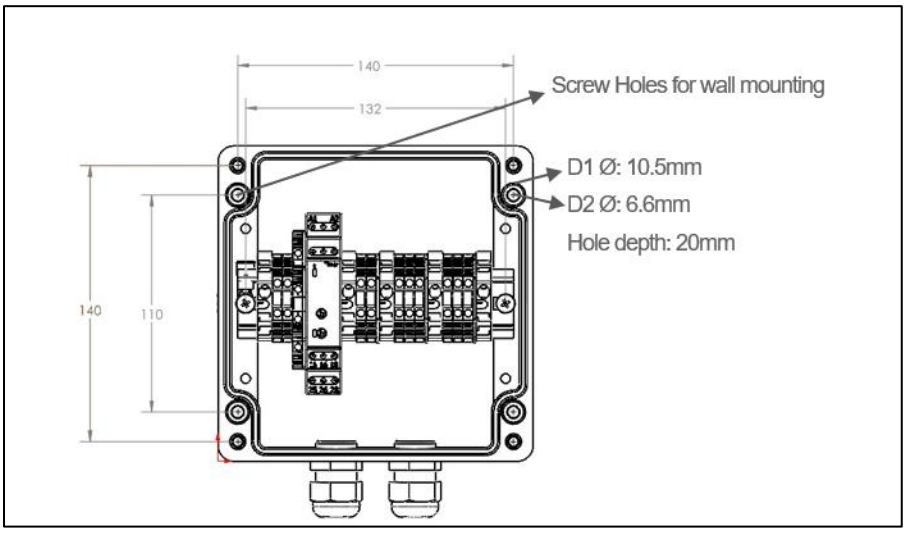


Figure 8: Enclosure Dimensions (Units -mm)

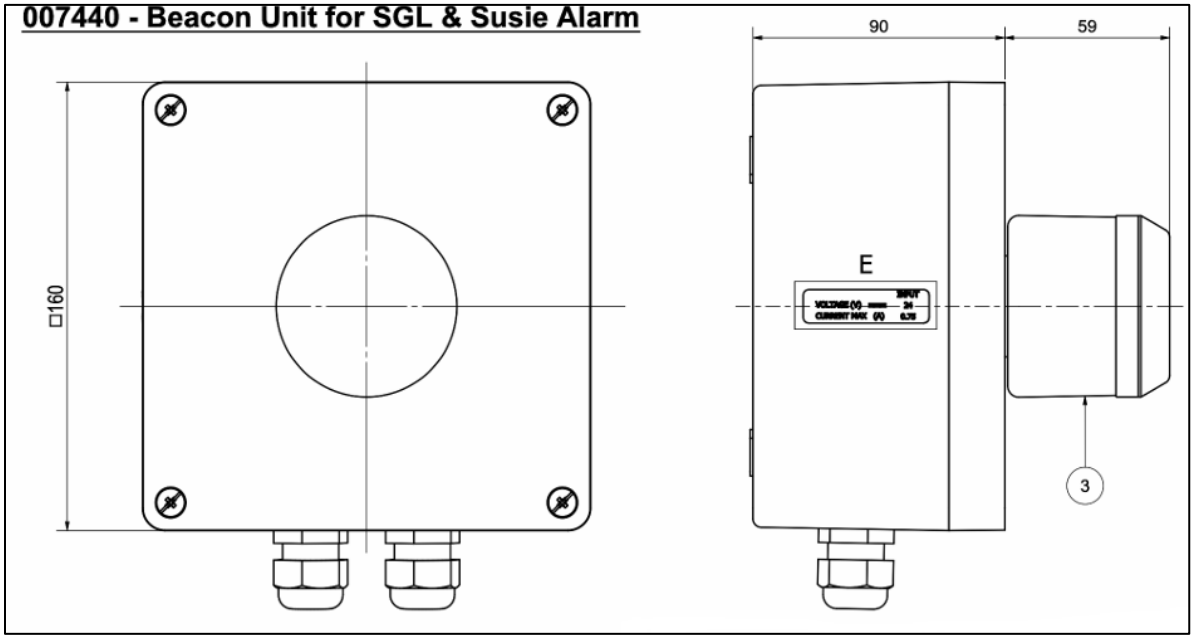
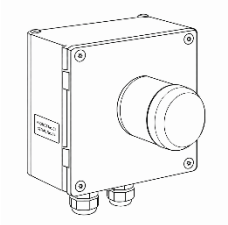


Figure 9: 007440-3 (Units -mm)

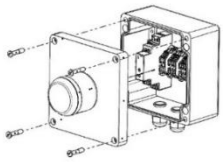
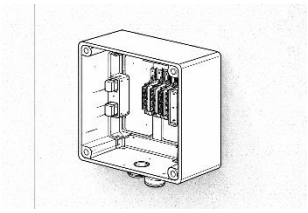
5.4.3.2. Mounting of the Unit

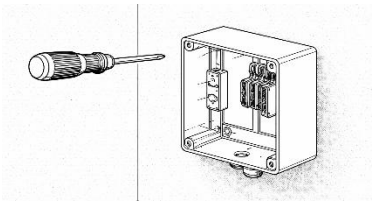
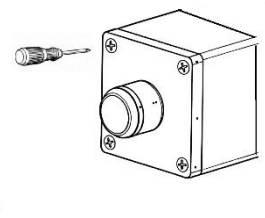
	Correct installation of fixings and cable entries is required to ensure reliable sensor operation. No brackets are provided for the alarm box. Use provided fixing holes, do not drill the back of the box.

Select Mounting Location

1	2
Select a mounting position (next to storage box) or appropriate to site operations.	Ensure the location is clearly visible and not obstructed.
	

Install SPAS

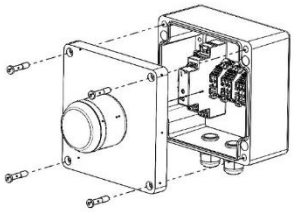
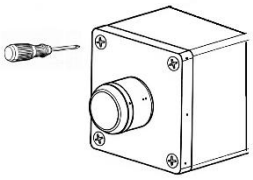
1	2	3
Open the alarm box using the appropriate tool.	Hold the enclosure against the wall or mounting surface at the approved height and position. Mark the fixing hole positions using the rear mounting holes as a template.	Drill mounting holes into the wall to suit appropriate fixings.
		

4	5
Fasten the alarm box to the wall.	Tighten fixings progressively to ensure the enclosure sits flat against the surface without distortion. Verify the enclosure is secure and free from movement.
	

WARNING

Electrical Hazard. Refer to section 5.1.3

Wire the SPAS

1	2	3
If the box has been closed, re-open alarm box by unscrewing the top cover.	Wire the unit using the appropriate wiring diagram.	Replace the top of the Alarm Box and secure using four screws.
	See wiring diagrams below and use the applicable diagram. 3 Wire Option	

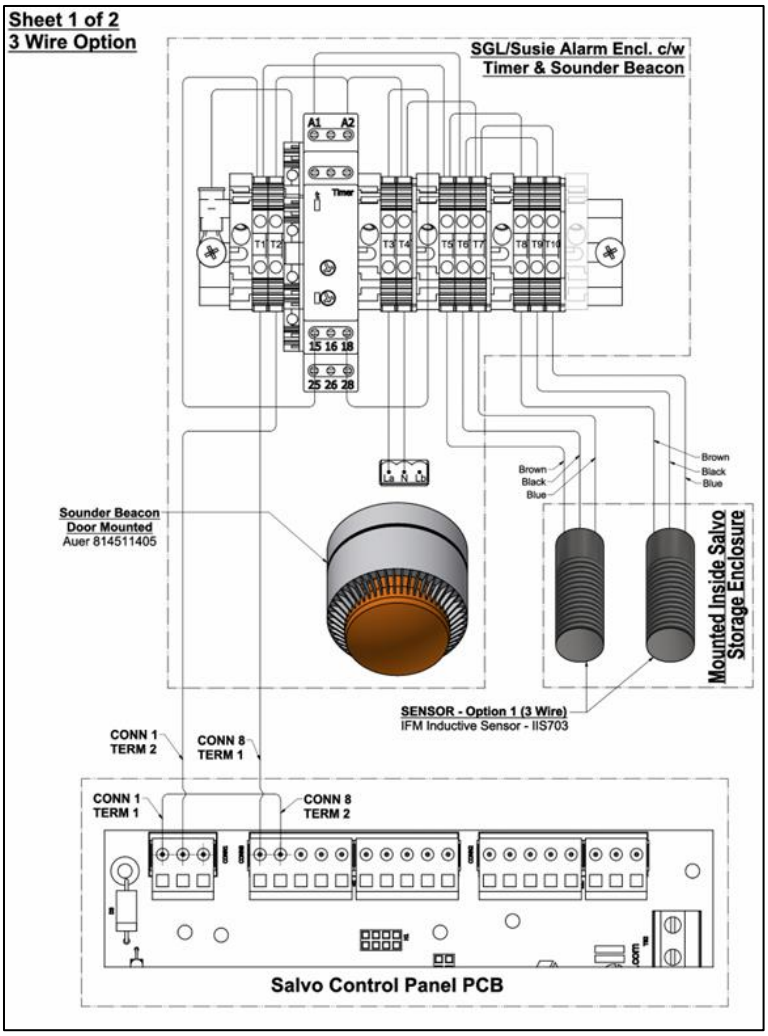


Figure 12: 007454-1 (3) Wire option

5.4.3.3. SPAS Timer Configuration

	The presence alarm timer is set onsite to a suggested time of 2 minutes. Adjustment is not normally required. If a different delay period is required for site operation, the timer setting may be adjusted as described below.

	**WARNING** Electrical Hazard. Refer to section 5.1.3

Using a small flat-blade screwdriver, adjust the Time Range selector to the required range (seconds, minutes, or hours).

Timer Configuration

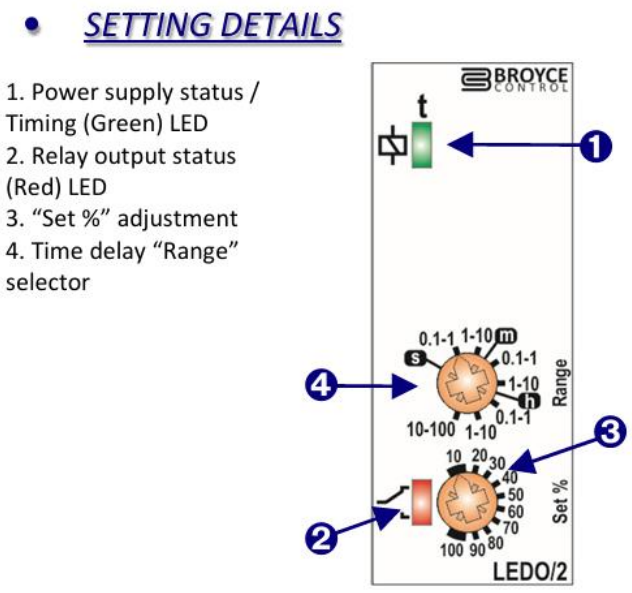


Figure 13: RS102-6125

For detailed product specifications refer to the manufacturer datasheet for the RS Pro Delay Timer (Stock No. 102-6125).

5.4.4. Traffic Light

Description	Traffic Light
Salvo Traffic Lights provide visual indication of the loading bay status and may be installed internally, externally, or on both sides of the bay. **External (Yard Side):** Red – Door open. Vehicle shall not depart. Green – Door closed. Vehicle may depart.	 UK Variant  USA Variant
	Signal colour application shall follow recognised safety colour conventions, including: ANSI Z535.1 (U.S.) IEC 60073 / ISO colour coding principles (international reference).

	WARNING Mechanical Installation. Refer to section 5.1.2 Ensure water ingress protection is maintained.

Purpose:

Mount and wire the red/green traffic light assembly to provide clear visual indication of loading bay status to vehicle operators.

Prerequisite:

Multi-core cabling installed and terminated at the SCP.

- 24V traffic light assembly available (Castell SETL or equivalent 24V red/green signal light).
- If installed externally, the unit shall be rated for outdoor use (minimum IP rating appropriate to environment).

Parts Required	Quantity
Traffic Light	1

5.4.4.1. Drawings

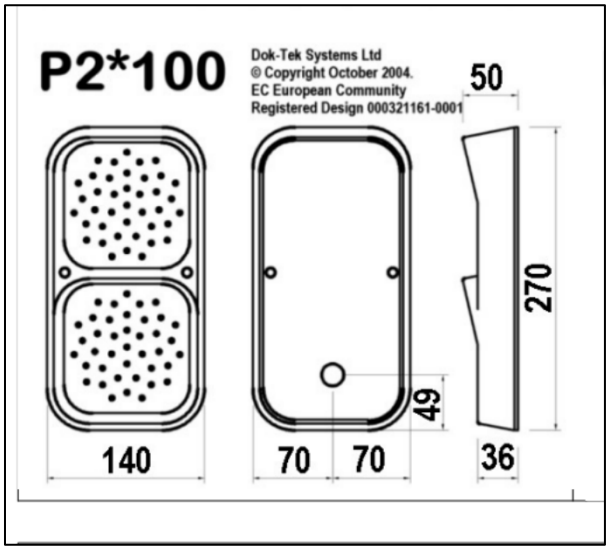


Figure 14: P1_P2_Series_2016 Traffic light- Dock Tek (Units-mm)

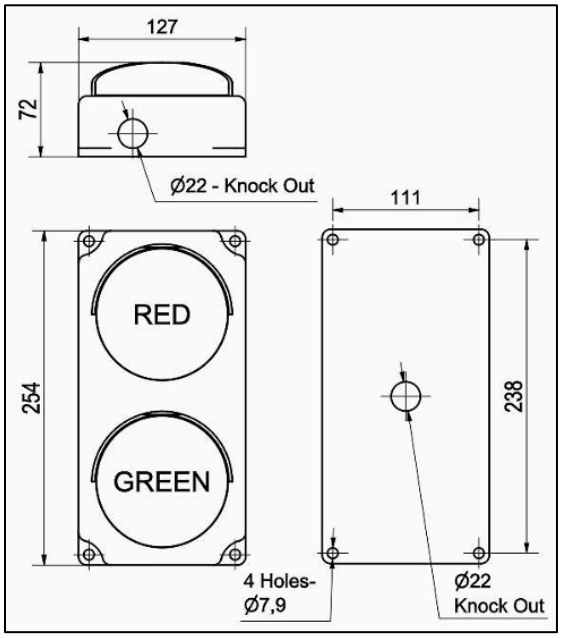


Figure 15: 008031-1-Traffic light – Steady Burn (Units-mm)

5.4.4.2. Install Traffic Light

	The traffic light shall be mounted within the normal field of vision of the intended viewer. The installer shall confirm visibility from: • The driver's side when the vehicle is docked, and • The dock operating position internally. The signal shall not be obstructed.

1	2	3
Choose a mounting location where the signal can be clearly seen by approaching vehicles from at least 20 m (65 ft) away. (drivers side) Avoid positions where buildings, equipment, or structural features could block the view.	Install the traffic light on the side of the loading bay door. (drivers side)	Mark out the bracket fixing points and drill the mounting holes to match the bracket pattern. Secure the bracket to the building, route cable to SCP. Fit traffic light to mounting bracket and secure with suitable fixings.

4
Once positioned, check visibility from the driver's seated position with a vehicle parked at the dock. The signal must not be obscured by dock shelters, levellers, structural elements or nearby equipment.

5.4.4.3. Wire Traffic Light

	**WARNING** Electrical Hazard. Refer to section 5.1.3

1	2	3
Route the signal cable from the traffic light to the SCP. Use suitable containment or conduit where required by site conditions or applicable regulations.	Secure the cable at regular intervals in accordance with recognised installation practice and relevant electrical standards.	Maintain the minimum bend radius specified by the cable manufacturer throughout the installation.

4
Terminate the conductors within the SCP enclosure in accordance with the wiring diagram.

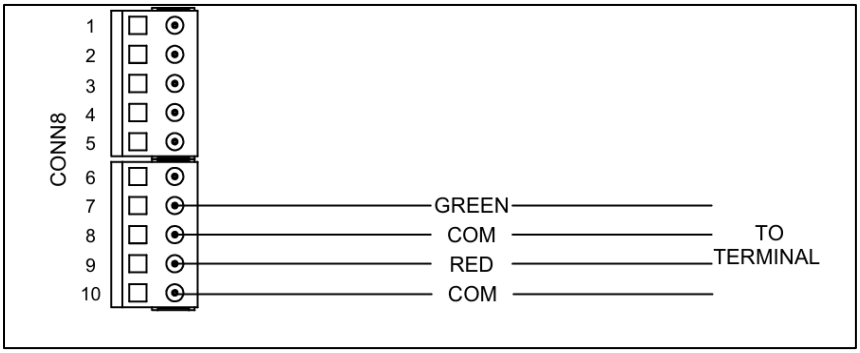


Figure 16: 008031-1 Traffic Light Wiring

5.4.4.4. Verification

1	2	3
Once system is energised carry out verification checks.	Confirm that the red and green signals operate correctly in line with the defined system status conditions. Green- Dock Door / Barrier closed Red – Dock Door/ Barrier open	Verify that the traffic light is clearly visible from: The driver's approach direction. The driver's side position when docked.

5.5. Powered Doors

5.5.1. Salvo SCP (Salvo Control Panel)

Description	Salvo Control Panel	
The Salvo Control Panel (SCP) provides the primary interface between the Salvo coupling devices and the associated loading bay door controls. The unit is supplied as a wall-mounted enclosure incorporating an interlock key switch, which enables controlled operation of the loading bay in accordance with the interlock sequence. The Push button indicates completion of the loading process. Electrical connections are made via plug-in terminals on the internally mounted printed circuit board (PCB).		
		The SCP operates as part of the Salvo interlock and warning system and does not function as an independent safety control device.

WARNING

Electrical Hazard. Refer to section 5.1.3

Parts Required	Quantity
SCP ENCLOSURE ASSEMBLY	1

5.5.1.1. Pre-Installation Checks and Site Preparation

Purpose:

To confirm that all equipment, tools and site conditions are suitable before installation begins. Early verification reduces delays, faults and rework.

Inspect Package Contents	Verify Peripheral Devices
1. Open the SCP packaging on a clean, dry surface away from vehicle routes and work traffic. 2. Check the contents against the parts list and confirm all items are present. 3. Inspect the SCP enclosure for damage, including cracks, deformation or impact marks. Check cable entry knockouts and the Castell lock assembly for integrity. 4. Inspect the mounting plate for distortion. The plate shall sit flat against a straight edge with no visible gap exceeding 1 mm. 5. Check that the interlock key switch operates smoothly. Insert the key and rotate clockwise. The mechanism shall turn without excessive force and return correctly to the free position. 6. If any item is missing or damaged, do not proceed with installation. Report the issue and obtain replacement components before continuing.	Where integrating with existing equipment (e.g. traffic lights, SADL, SPSB, door controls, dock leveller), verify correct operation of each device independently before system wiring begins. 1. Confirm the traffic light illuminates correctly on both red and green channels when supplied with 24V. 2. Confirm the SADL bolt retracts and extends correctly when energised and de-energised. 3. Confirm the SPSB provides a stable 24V output (±1 V) when connected to the mains supply. 4. Confirm the door control panel completes a full open and close cycle. 5. Confirm the dock leveller completes a full raise and lower cycle. Record the results. Any device that does not operate correctly shall be repaired or replaced before proceeding.

Verify Supply Voltage	Site Preparation
1. Identify the supply circuit designated to feed the SPSB unit. 2. Using a calibrated voltage tester (minimum CAT III rating), verify correct operation of the tester against a known live source or approved proving unit. 3. Measure the supply voltage at the intended point of connection. Expected values: • 230 VAC ±10% (207–253 V), or • 110 VAC ±10% (99–121 V), as applicable. 4. Where practicable, confirm voltage stability under load. Fluctuations greater than ±10% may indicate supply or circuit issues and shall be reported. 5. After verification, isolate the supply at the local distribution board. 6. Apply lockout and a personal danger tag to the isolator. 7. Confirm the circuit is safely isolated using the tester, then re-prove the tester to complete the safe isolation procedure (GS38 or equivalent).	1. Clear the work area of debris, obstructions and trip hazards. 2. Ensure the loading bay is inactive and the work area has the correct barriers and signage to allow safe working. 3. Ensure adequate lighting is available at the work location. Provide task lighting where necessary. 4. Confirm that appropriate emergency equipment, including first aid and fire protection, is accessible within the work area.

5.5.1.2. Drawings

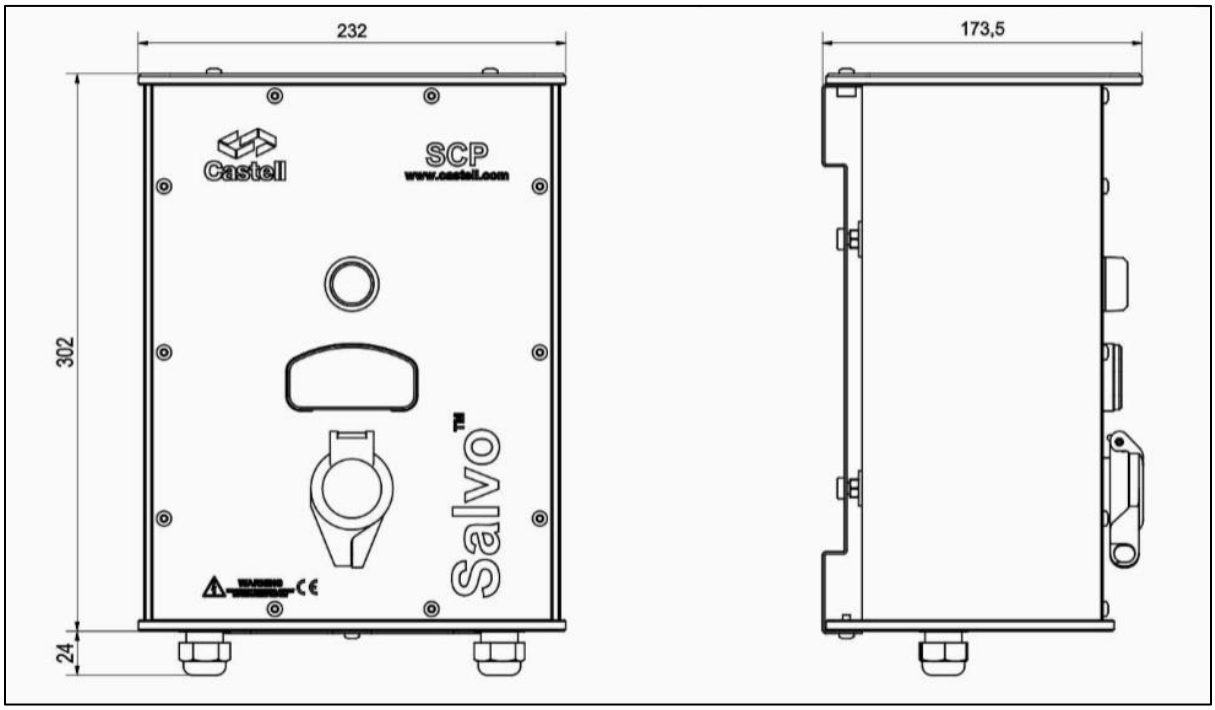


Figure 17: 008024-1 SCP and Storage Unit Enclosure (Units -mm)

5.5.1.3. SCP Mounting Location and Cable Route

Purpose:

To select a suitable mounting position for the SCP in line with the intended operating sequence, and to define cable routes to all associated devices.

Prerequisite:

Pre-installation checks completed.
Site layout available and reviewed.
Project Manager consulted where the system configuration is unclear.

Select Mounting Configuration

The SCP may be mounted in one of three configurations, selected according to the defined operational responsibility for control of the interlock key.

	If the required configuration is unclear, do not proceed with installation. Confirm the arrangement with the site project manager. Correct installation of fixings and cable entries is required to maintain the enclosure IP rating and ensure reliable operation.

Configuration	Location	Operated By	Typical Application
Internal wall mount	Inside warehouse, usually adjacent to dock control.	Warehouse staff	Staff control loading/unloading sequence from inside
External wall mount	Outside warehouse, usually beneath traffic lights	Shunter / driver	Driver controls coupling from the yard side
External pedestal mount	Outside warehouse, free-standing	Shunter / driver	No suitable wall surface, or SCP shared between bays

Mounting Height / Position
1. The recommended mounting height is 1500 mm (59 in.) from finished floor level to the centre of the key switch. This provides a comfortable and accessible operating height for most users. 2. Where mounted externally beneath traffic lights, position the SCP directly below the light assembly. The key switch shall face the direction of approach of the operator (driver or shunter). 3. Where mounted internally, position the SCP adjacent to the existing door controls and within arm's reach of the operator. The operator shall be able to view both the SCP status indicators and the loading bay door without changing position. 4. Maintain a minimum clear space of 150 mm (6 in.) below the enclosure to allow access for cable entry and gland installation. 5. Confirm that the selected location does not obstruct emergency exits, fire protection equipment, or designated pedestrian routes. 6. Mark the proposed position on the mounting surface and record the location photographically prior to drilling or fixing.

Cable Routes

	Where possible Power and signal cables shall be routed in separate containment to reduce electromagnetic interference and maintain system reliability.

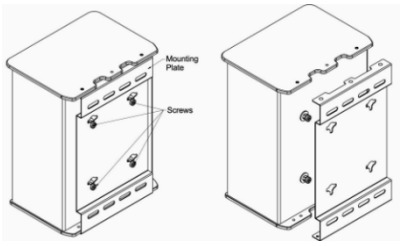
	**WARNING** Electrical Hazard. Refer to section 5.1.3

1. Using the site layout drawing, identify the route for each cable run between the SCP and associated equipment, including the SPSB, traffic lights, SADL (or door control panel), dock leveller controls, and mains supply.
2. Measure each cable run and allow adequate length to accommodate routing around obstacles, service loops at enclosures, and installation tolerance.
3. Select the appropriate cable type for each run based on the installation environment:
    a) Steel Wire Armoured (SWA) cable – Use where cables may be exposed to vehicle traffic, forklift movement, or potential mechanical damage.
    b) CY or SY screened flexible cable – Use where cables are protected within trunking, conduit, or fixed barriers.
    c) Signal and control cables – Minimum conductor cross-section 1.5 mm^2. Refer to the wiring diagram (Drawing 008023 or 008024) to determine the required number of cores.
4. Route mains and power cables (mains to SPSB and 24V from SPSB to SCP) separately from signal and control cables to minimise electromagnetic interference.
5. Where the SCP is mounted externally, identify the wall penetration point for cable entry. The penetration shall:
    a) Be positioned above potential ground-level water pooling.
    b) Be accessible from both sides for installation and inspection.
    c) Be fitted with a suitable conduit sleeve or approved through-wall sealing system.
6. Record all cable types, lengths and core counts in a cable schedule for procurement and inclusion in as-built documentation.

5.5.1.4. Mount the SCP Enclosure

	**WARNING** Mechanical Installation. Refer to section 5.1.2

Separate the Mounting Plate

1	2
Place the SCP unit face-down on a clean, padded surface to prevent damage to the front panel.	Using a PZ2 crosshead screwdriver, loosen the four rear retaining screws. The screws are captive and shall not be removed from the enclosure.
	

1	2
Slide the mounting plate downward and away from the enclosure until it disengages fully.	Set the enclosure aside in a secure location to prevent accidental impact or damage.

5.5.1.5. Fix the mounting plate to the wall

1	2	3
Position the mounting plate at the marked location. The cable entry slots shall face downward. The flat face of the plate (without the raised engagement hooks) shall sit against the wall.	Using a spirit level, confirm the plate is level and plumb. Adjust as required.	Mark the four fixing positions through the elongated mounting slots. For mounting plate dimensions, See figure 9: 008016-2

4	5	6
Remove the plate and drill the fixing holes as appropriate for the substrate: a) Masonry / concrete: Use a hammer drill with suitable fixings and Drill to the depth required for the selected anchors.	Remove all dust and debris from the drilled holes and insert the selected wall anchors.	Reposition the mounting plate, aligning the slots with the installed anchors.

b) Steel frame: Use an appropriately sized HSS drill bit. Deburr all holes after drilling. c) Hollow substrate (e.g. plasterboard, composite panel): Use cavity fixings rated for a minimum 15 kg pull-out load.		

7	8	9
Fit plate using appropriate fixings and washers as required. Tighten progressively in a diagonal sequence (top-left, bottom-right, top-right, bottom-left) to distribute load evenly.	Final-tighten all bolts. Do not overtighten. The plate shall be secure and free from distortion. Where expansion anchors are used, tighten in accordance with the anchor manufacturer's recommended torque (typically 8-12 Nm for M8).	After tightening, re-check the plate for level and alignment.

5.5.1.6. Attach the SCP Enclosure to Mounting Plate

	Ensure the enclosure is fully engaged with the mounting hooks before installing the retaining screws. Incorrect seating may result in incomplete locking. Be careful not to damage the gasket when opening the enclosure.

1	2	3
Lift the SCP enclosure and align the keyhole engagement slots on the rear of the enclosure with the raised hooks at the top of the mounting plate.	Slide the enclosure downward until it engages fully with the mounting plate. A positive engagement should be felt as the hooks seat into the rear channels.	Open the front cover of the enclosure and locate the three fixing screws and adaptor provided. Fit the torx screws with the adaptor, one in the bottom and two at the top. Torque 1.2 Nm Verify its securely fitted to the mounting plate and prevents upward removal.

4
Fit the enclosure cover with the 10 torx screws provided. Torque 2 Nm **Caution:** Do not overtighten and Ensure all 10 screws are fitted to maintain IP65 integrity.

Important
Missing or loose screws can compromise seal integrity and affect system performance.

Verify	• Mounting plate is fixed flush to the wall surface with no visible gap. • All four wall bolts are tight, and the plate does not move under firm hand pressure. • Plate is level (verified with spirit level after final tightening). • SCP enclosure is locked onto the plate and cannot be lifted off. • Three torx screws are installed and tight. • Minimum 150 mm clear space below enclosure for cable entry.

5.5.1.7. Install Cabling and Containment

	Maintain enclosure integrity, strain relief and cable segregation throughout installation. Suitable gland installation is essential to ensure IP65 rating. The installer shall route and terminate all conduits so that water cannot enter or drain into the SCP control box.

	WARNING Electrical Hazard. Refer to section 5.1.3 Risk of interlock failure due to water ingress, improper sealing, damaged gaskets, or incorrect installation can allow water to enter safety components and cabling. Water ingress may cause interlock failure, resulting in loss of protection and increasing the risk of serious injury or death. Ensure all enclosures, glands, and cable entries are correctly sealed, inspected after installation, and rechecked after any maintenance. Immediately remove the system from service if signs of water ingress or damage are detected.

Prepare Cable Entries

1	2
Open the SCP enclosure front cover.	Locate the two M20 knockouts at the base of the enclosure.

3	4
Install suitable IP65 cable glands into the prepared openings. Tighten the internal locknuts to secure the glands. Ensure each gland sits firmly against the outer surface of the enclosure with no movement.	If only one cable entry is required, fit an IP65 blanking plug to any unused openings to maintain the IP65 rating of the enclosure.

Route Cables

1	2	3
Install cabling ensuring adequate length for terminating.	Where cables pass through an external wall: a) Core a hole of suitable diameter for the conduit sleeve and Angle the hole slightly downward toward the external face to reduce the risk of water ingress. b) Install the conduit sleeve and seal both ends using silicone sealant or an approved fire-stop compound, as required by local regulations. c) Route the cable through the installed sleeve.	Ensure cables are adequately supported to avoid straining or damaging terminations. Where installed externally, fixings shall be UV-resistant and suitable for the environment.

4	5	6
Maintain the minimum bend radius throughout the cable run to prevent conductor damage: • SY/CY cable: minimum 6 × cable outer diameter • SWA cable: minimum 12 × cable outer diameter	Route power cables (mains supply and 24V) separately from signal and control cables wherever practicable. Maintain a minimum separation of 100 mm (4 in.) where cables run in parallel.	Ensure adequate cabling to allow for re termination and maintenance.

Prepare and Terminate Conductors

1	2	3
Feed each cable through the appropriate cable gland and into the enclosure. Leave sufficient slack to allow neat routing to the PCB terminals without strain.	Confirm the cable cannot be withdrawn under moderate tension. This provides strain relief and maintains the IP65 seal.	Remove the outer sheath of each cable to expose the individual conductors. Take care not to damage the conductor insulation.

4	5	6
Strip each conductor to an exposed length of 12 mm. Use bootlace ferrules with a minimum length of 12mm. Where required, crimp the correct size bootlace ferrule onto each conductor using an appropriate crimping tool.	Ensure cables are identified at each end. Use cable restraint brackets to tie cables back.	Route internal wiring neatly to the PCB connector blocks. Ensure wiring does not interfere with the enclosure locking mechanism or the key solenoid.

7	8
Insert each conductor into the correct push-fit terminal. After termination, apply a gentle pull test to each conductor to confirm it is securely retained.	Fit the enclosure cover with the 10 torx screws provided. Torque 2 Nm **Caution:** Do not overtighten and Ensure all 10 screws are fitted to maintain IP65 integrity.

Important
Missing or loose screws can compromise seal integrity and affect

Verify	• Ensure cable terminations are fitted and tight (unused entries blanked) • All cables routed with correct bend radii and secured • Power and signal cables segregated where possible • Wall penetrations sealed (external installations) • All conductors stripped to 12 mm and fitted with markers at both ends • No cables foul the enclosure lock mechanism or key solenoid

The required cable sizes and terminal allocations are summarised below:

Connection	Connector/Terminal	Cable Size	Rating	Notes
24V power	Connector 1, Term 1 and 2	1.5 mm^2	20 W	+ve to Term 1, –ve to Term 2
Earth	Connector 1, Term 3	1.5 mm^2	—	Green/yellow, bonded to enclosure earth
SADL / Door closed	Connector 2, Term 1–4	1.5 mm^2	—	See Step 5.6.1.2 for wiring detail
Dock leveller interface	Connector 2, Term 5 and 6	1.5 mm^2	6 A	Volt-free contacts
Auto door interface	Connector 2, Term 7 and 8	1.5 mm^2	6 A	Volt-free contacts
Beacon	Connector 8, Term 5 and 6	1.5 mm^2	6 A	+ve to Term 5, –ve to Term 6
Green traffic light	Connector 8, Term 7 and 8	1.5 mm^2	6 A	+ve to Term 7, –ve to Term 8

Red traffic light	Connector 8, Term 9 and 10	1.5 mm^2	6 A	+ve to Term 9, –ve to Term 10
SADL return	Connector 8, Term 10	1.5 mm^2	0 V or negative—	SADL Terminal 1 to Conn 8 Term 10
Aux 1	Connector 8 (aux terminals)	1.5 mm^2	6 A	Changeover contacts for other peripherals

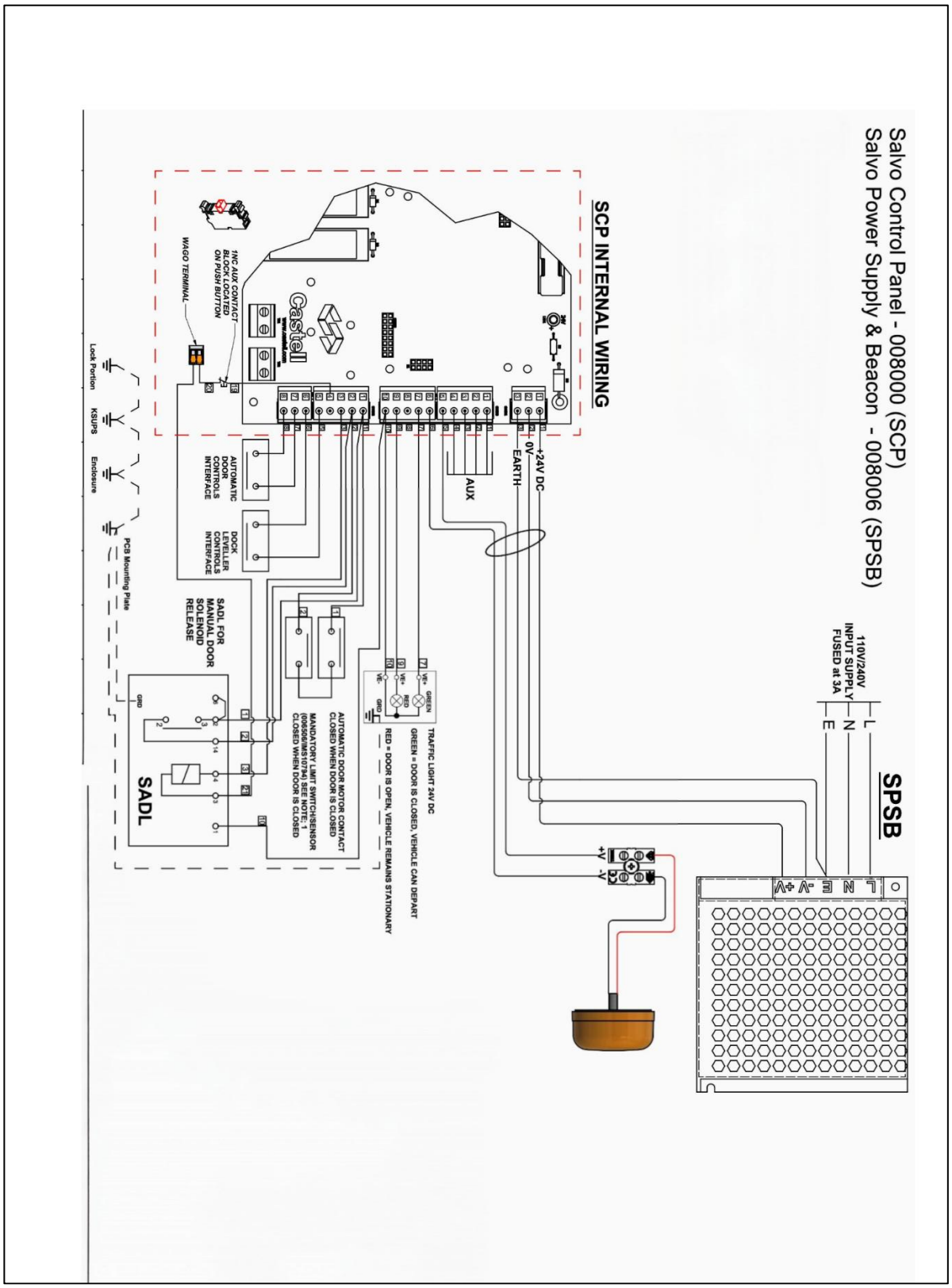


Figure 18: 008023-5 Amber Beacon

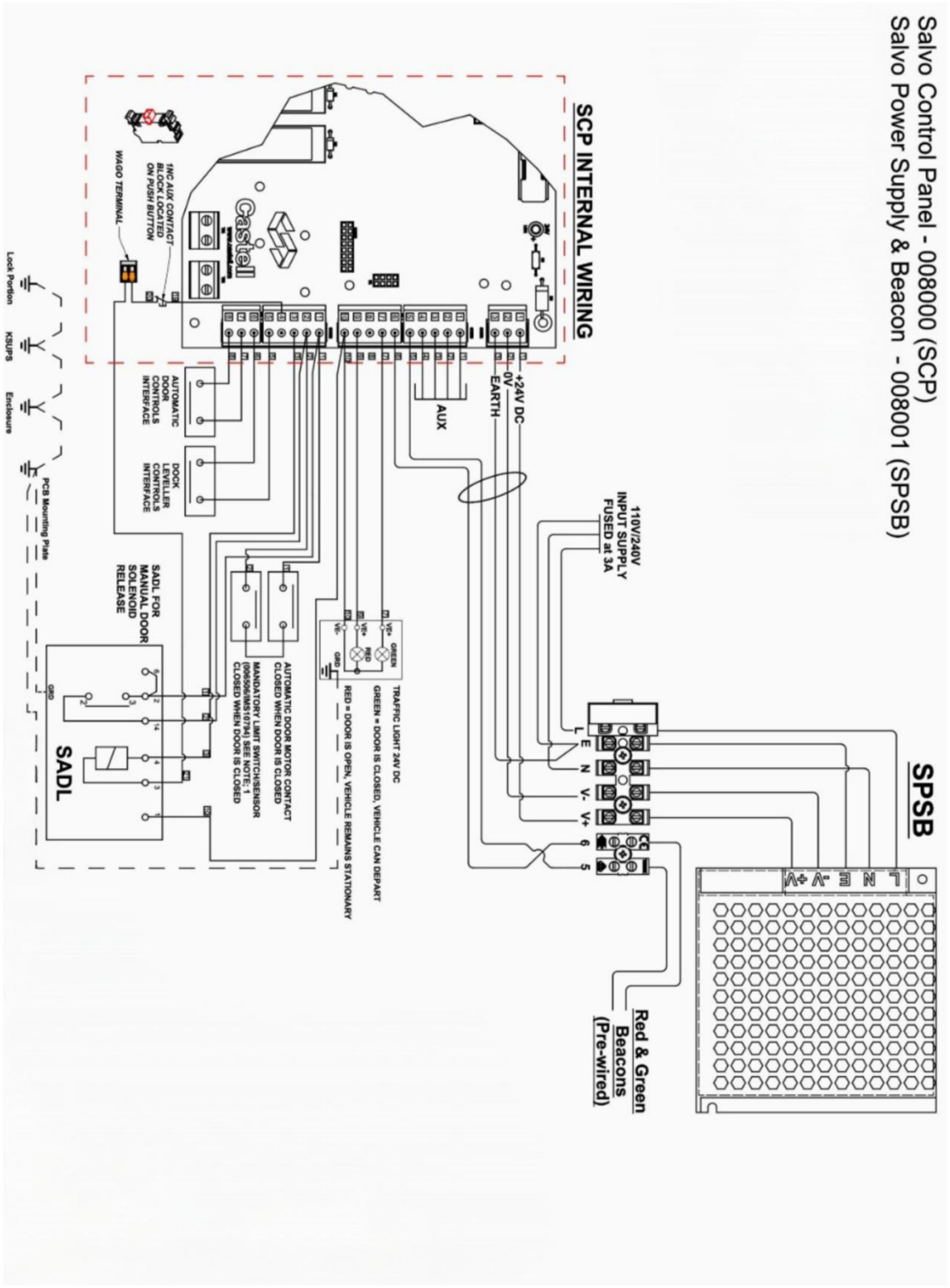


Figure 19: 008022-5 Red & Green Beacon

5.5.2. Salvo Power Supply & Beacon

<table>
<tr><th>Description</th><th colspan="2">Salvo Power Supply</th></tr>
<tr><td rowspan="2">Salvo Power Supply converts 110/240VAC to 24V DC to power the SCP, providing a safer power level at the user interface.

The SPSB is mounted to the interior wall of the warehouse, adjacent to the Loading Bay and is combined with an Amber Beacon to provide notification that the Loading Bay has been activated and is safe to open the bay door and commence loading or unloading.</td><td colspan="2"> 
</td></tr>
<tr><td></td><td>The beacon operates as part of the Salvo interlock and warning system and does not function as an independent safety control device.</td></tr>
</table>

Purpose:

Mount and wire the SPSB unit which provides regulated 24V power to the SCP and drives the amber beacon.

Prerequisite:

Multi-core cabling is in place. SPSB unit available. Mains supply remains isolated.

Parts Required	Quantity
Salvo Power Supply Beacon	1

5.5.2.1. Drawings

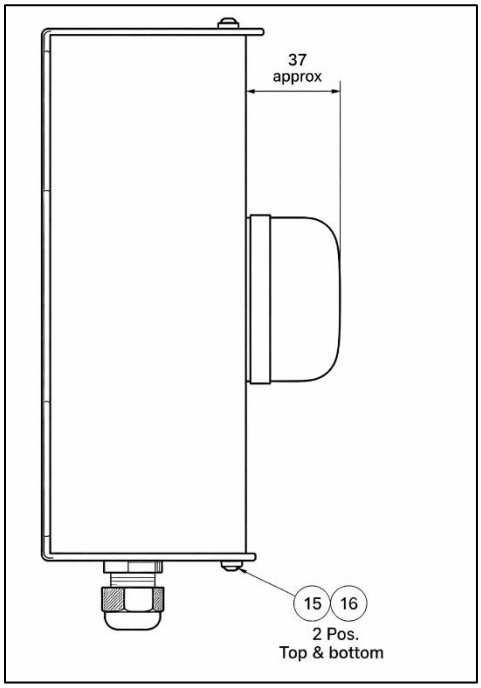


Figure 20: 008006-1 Salvo Beacon Unit (Units-mm)

5.5.2.2. Mounting of the Unit

	Install the SPSB in accordance with recognised electrical installation practice and maintain the specified 50 mm (2 in.) clearance to ensure adequate ventilation. The installer is responsible for selecting fixings appropriate to the mounting substrate.

	WARNING Mechanical Installation. Refer to section 5.1.2

1	2	3
Select a mounting location that allows safe access for maintenance, is protected from potential vehicle impact, and lies within the intended cable route.	Mount the SPSB on a vertical surface. Provide adequate ventilation around the enclosure and maintain a minimum clearance of 50 mm (2 in.) on all sides to ensure proper airflow.	Mark the four fixing positions and drill the mounting holes. Fit and secure the enclosure using relevant fixings suitable for the substrate

4
After installation, confirm that the SPSB is level, securely fixed, and free from movement.

5.5.2.3. Wiring the SPSB to the SCP

WARNING

Electrical Hazard. Refer to section 5.1.3

Connect the 24V output from the SPSB to the SCP:

SCP Terminal	Connector	Wire To	Function
Terminal 1	Connector 1	+V terminal of SPSB PSU	24V positive supply
Terminal 2	Connector 1	–V terminal of SPSB PSU	24V negative / 0V
Terminal 3	Connector 1	Earth terminal of SPSB PSU	Protective earth

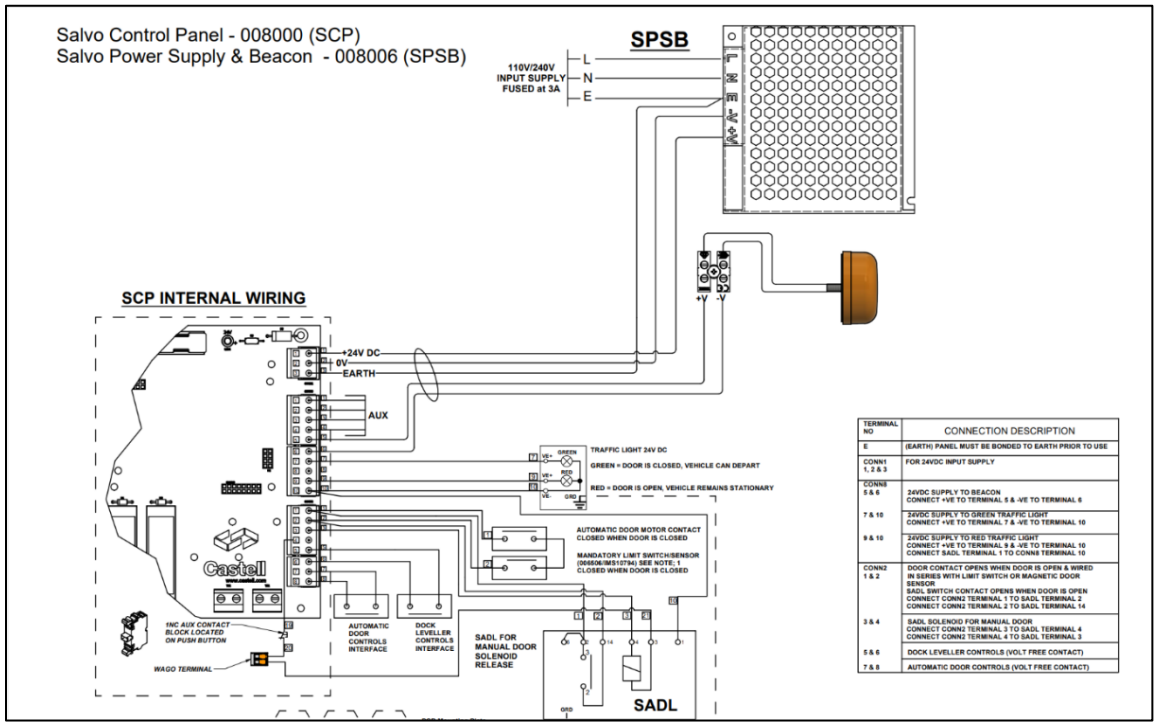


Figure 21: Wiring Guide SCP- SPSB

5.5.2.4. Wiring the SCP to Beacon

	**WARNING** Electrical Hazard. Refer to section 5.1.3

WIRING - SCP to RED & GREEN BEACON

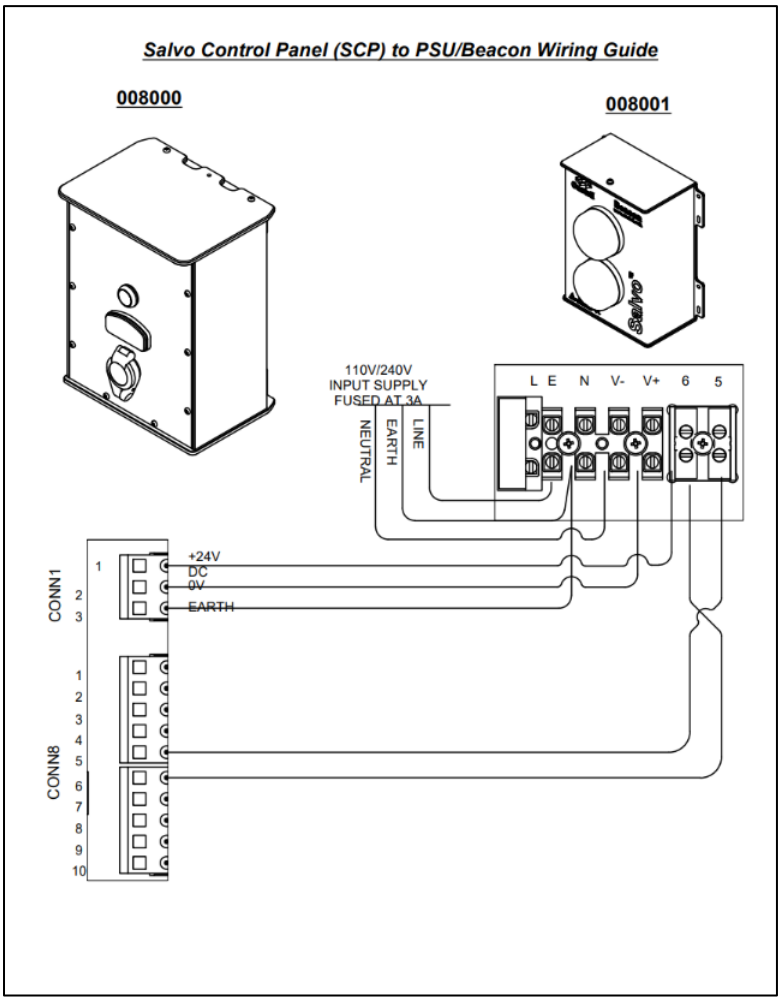


Figure 22: 008026-3 Wiring Guide SCP- Red to Green

	**WARNING** Electrical Hazard. Refer to section 5.1.3

WIRING - SCP to AMBER BEACON

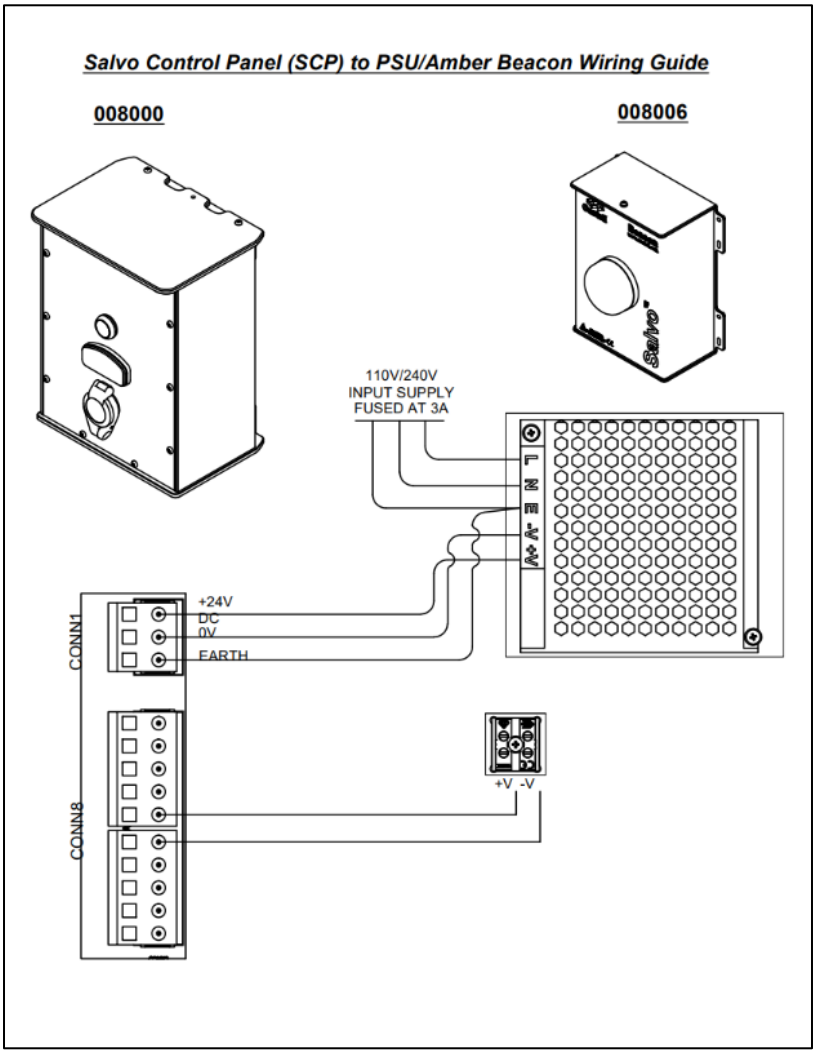


Figure 23: 008027-2 Wiring Guide SCP- Amber

5.5.2.5. Verification

1	2	3
Tighten all terminal connections to a torque of 0.5 Nm. Do not overtighten. Carry out a pull test to ensure cables are secure.	Verify continuity of the protective earth connection from the SCP enclosure, through the SPSB, to the building earth. Confirm continuity using an approved tester. Measured resistance shall not exceed 1 Ω.	Confirm Beacon & SPSB are wired to the correct SCP terminals.

5.5.3. Salvo Door Sensor

<table>
<tr><th>Description</th><th colspan="2">Salvo Door Sensor</th></tr>
<tr><td rowspan="2">The Salvo Door Sensor is used in conjunction with a signal from the door control panel to provide confirmation the loading bay door is closed.

If a door-down confirmation signal is not available, a dual-redundant arrangement can be achieved by installing the Salvo Door Sensor together with an additional Salvo sensor.

The sensor should be installed in accordance with these instructions and positioned as close to the door frame as practical to reduce the risk of accidental damage.</td><td colspan="2">  </td></tr>
<tr><td></td><td>The sensor operates as part of the Salvo interlock and warning system and does not function as an independent safety control device.</td></tr>
</table>

Purpose:

To detect the position of the loading bay door and provide a status signal to the Salvo system to confirm no loading is in progress.

Prerequisite:

- SCP and associated system components installed, or installation location defined.
- Door type and control system confirmed.
- Where available, the door-down confirmation signal from the door control panel identified.
- Suitable mounting location identified on the door frame or adjacent structure.

5.5.3.1. Drawings

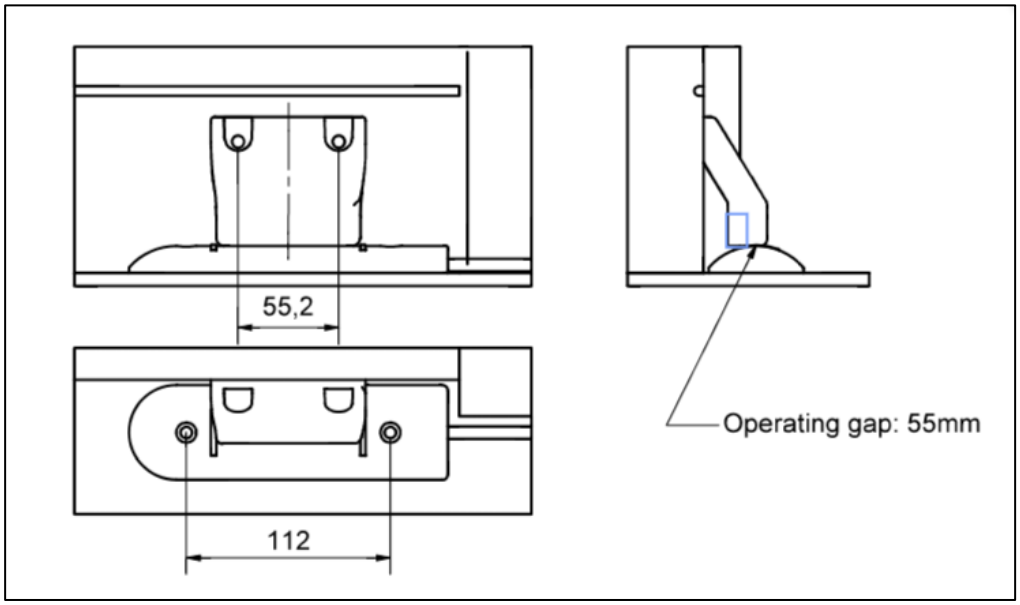


Figure 24: IMS10794-2 Door Sensor Dimensions

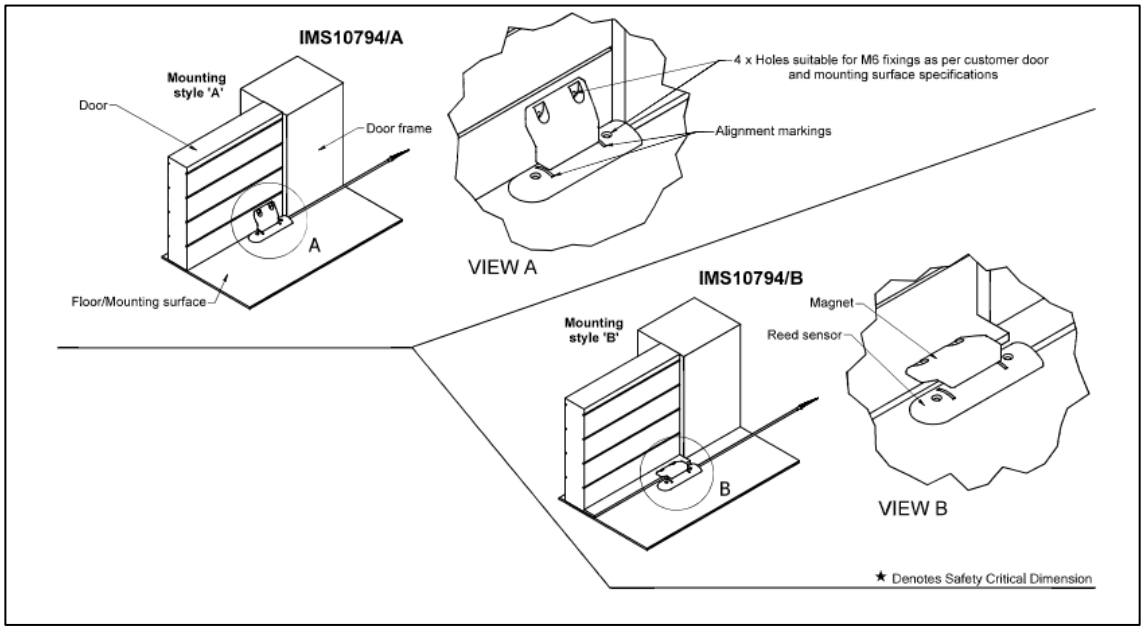
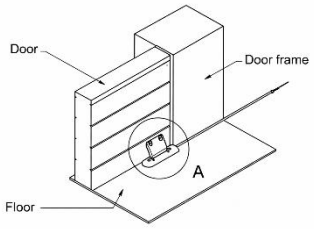
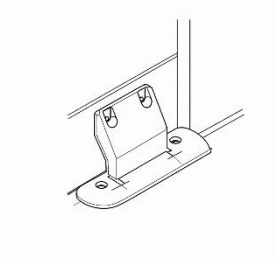
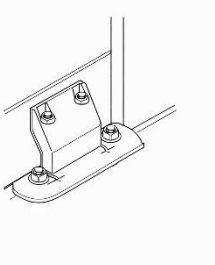


Figure 25: IMS10794-2 Door Sensor Mounting Options

5.5.3.2. Mounting of the Unit

	Mount the sensor as close as practicable to the door frame to minimise the risk of accidental damage. Ensure correct alignment between the sensor and its detection target. Misalignment may prevent reliable detection of the door position.The sensor is unidirectional so any of its contacts can be wired on either terminal.

	WARNING Mechanical Installation. Refer to section 5.1.2 Ensure the sensor is installed where it cannot be struck by the moving door, lifting equipment, or vehicles.

1	2	3
Select a suitable mounting location for the magnet and reed sensor. Mount the reed (sensor) side of the device on the fixed structure and the magnet side on the moving door component.	Ensure the reed sensor and magnet are aligned and positioned in line with each other when the door is in the required position.	Fix the sensor and magnet securely using appropriate fasteners suitable for the mounting surface (e.g. metal or concrete).
		

4
Verify the mounting is secure and that the sensor cannot move or be struck by door components during operation.

	WARNING Electrical Hazard. Refer to section 5.1.3 Power to the Salvo Control Panel (SCP) must be isolated.

WIRING – Salvo Door Sensor

1	2	3
Remove the 10 screws securing the front cover of the SCP and open the enclosure. Retain all screws for reassembly.	From the Salvo Door Sensor cable, identify the red and black conductors. • Crimp suitable ferrules to these wires. • Cut and safely isolate the remaining unused conductors.	Connect the red and black wires to CONN 2 terminals 1 and 2 on the PCB in series with the door closed signal from the door panel. Tighten the terminal screws to ensure a secure electrical connection. Carry out a pull test to ensure cables are secure.

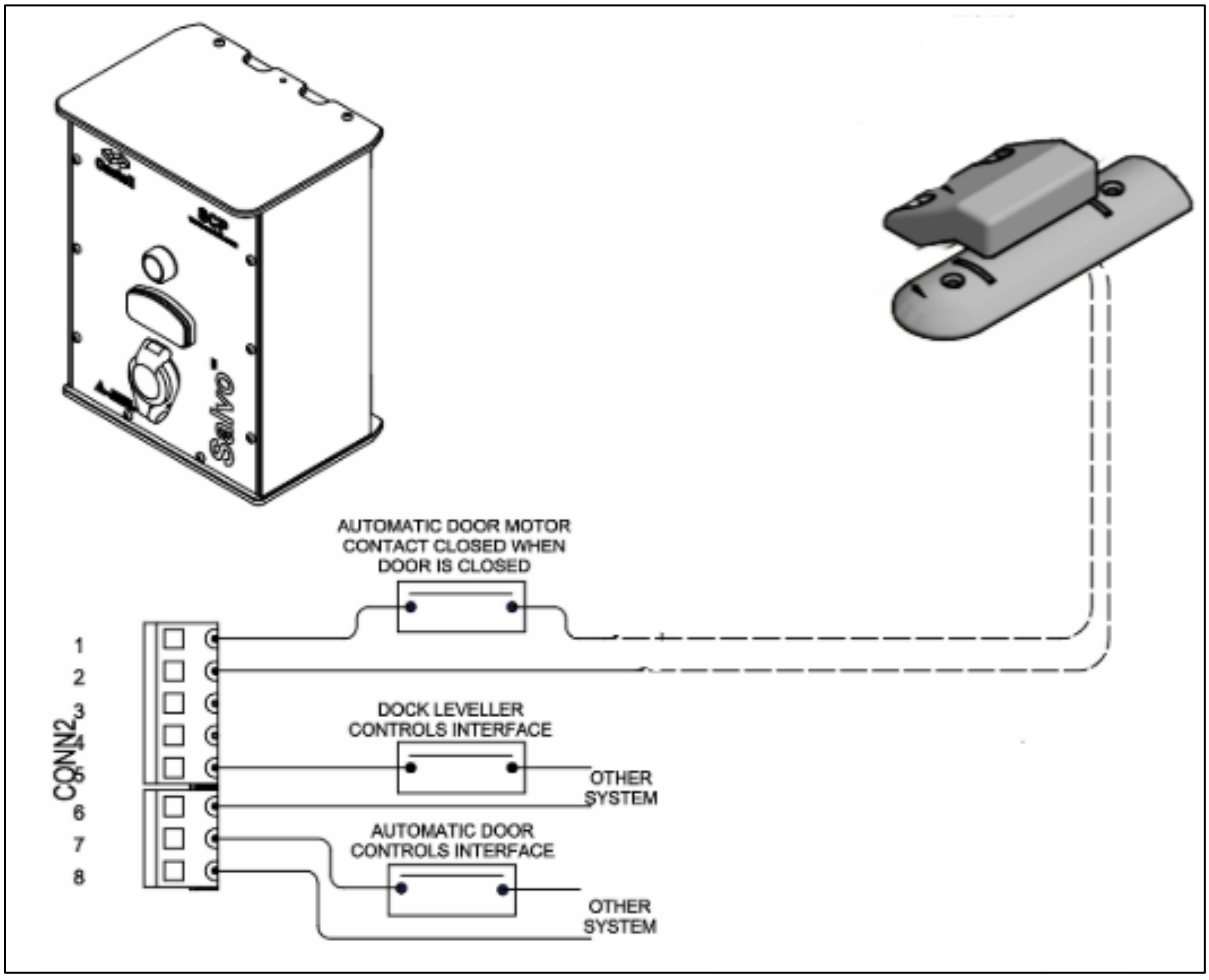


Figure 26: 008029-1 Door Sensor Wiring

Reassembly & Testing

1	2
Confirm with the door closed that both contacts are closed, check with a continuity meter Close the SCP enclosure. Reinstall the 10 cover screws and tighten evenly using a suitable tool. Torque to 1.2 Nm.	Restore power to the SCP. Operate the door through a full cycle and verify the sensor correctly detects the door position.

5.5.4. Salvo Limit Switch

<table>
<tr><th>Description</th><th colspan="2">Salvo Limit Switch</th></tr>
<tr><td rowspan="2">The limit switch is a mechanical position detection device used to monitor and control the movement of equipment.

It operates by physical contact, where a moving component actuates the lever, triggering an electrical signal to:
• Indicate position (e.g. open/closed)
• Stop or start movement</td><td colspan="2">  </td></tr>
<tr><td></td><td>The sensor operates as part of the Salvo interlock and warning system and does not function as an independent safety control device</td></tr>
</table>

<table>
<tr><td></td><td>WARNING

Mechanical Installation. Refer to section 5.1.2

Ensure the sensor is installed where it cannot be struck by the moving door, lifting equipment, or vehicles.

Ensure supplied glands are used to maintain water ingress protection.</td></tr>
</table>

Purpose:

The limit switch is a mechanical position detection device used to monitor and control the movement of equipment.

It operates by physical contact, where a moving component actuates the lever, triggering an electrical signal to indicate position. (open/close)

Prerequisite:

- Confirm correct switch type, rating, and configuration (NO/NC contacts) for the application
- Verify mounting location is rigid, accessible, and suitable for actuation
- Ensure all required fasteners, tools, and wiring components are available
- Isolate all electrical power before installation

Parts Required	Quantity
Salvo -LS	1

5.5.4.1. Drawings

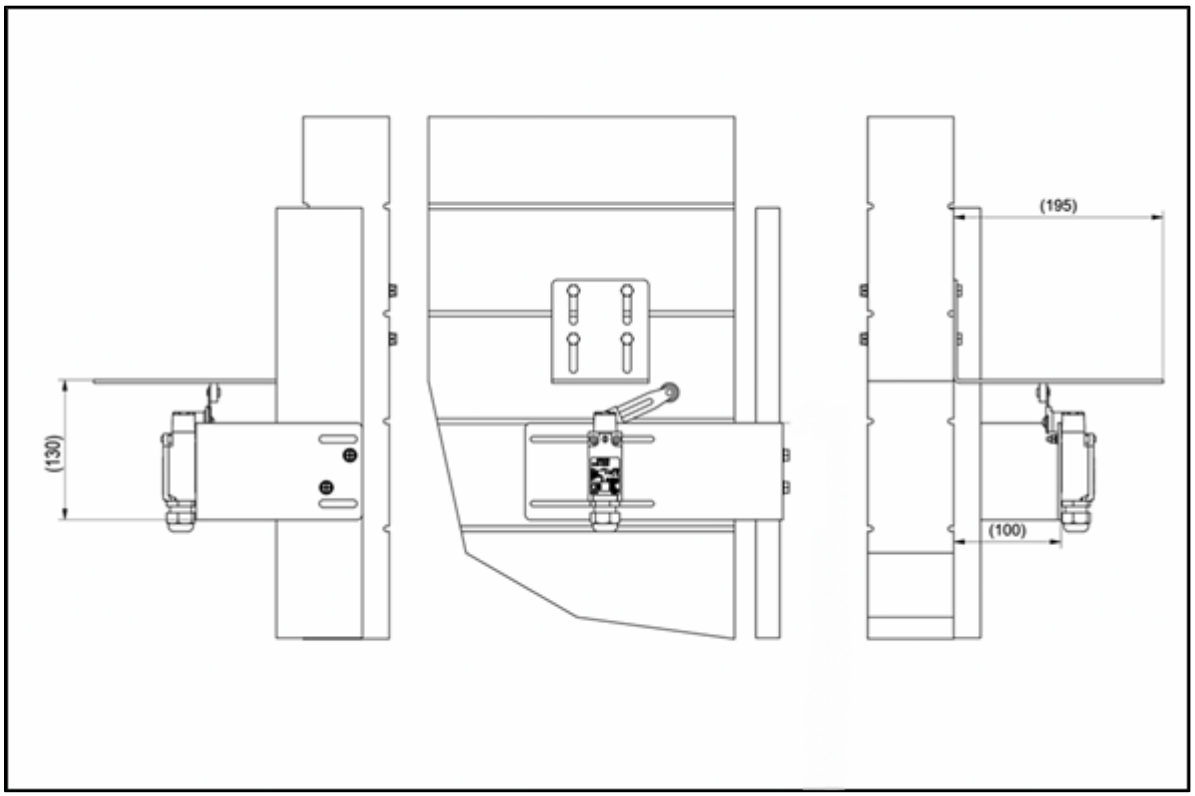
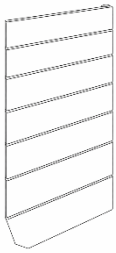
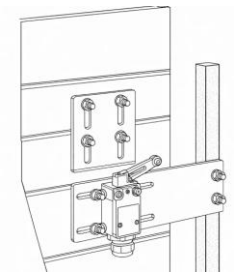
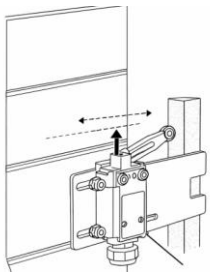


Figure 27: 006506-7 Limit Switch

5.5.4.2. Mounting of the Unit

	Do not drop the Switch. Doing so may result in the Switch not performing to its full capacity. Do not attempt to disassemble or modify the Switch. Doing so may cause the Switch to malfunction. Ensure the actuator lever is not subjected to excessive force or over-travel. Ensure correct environmental protection (IP rating) is maintained. Do Not use the switch as a mechanical stop.

1	2	3
Select a rigid mounting surface adjacent to the moving mechanism and ensure the actuator lever can be fully engaged by the moving part without obstruction. Position the switch so the lever operates within its designed travel range (no over-travel).	Install the SLS door bracket. Secure the limit switch using the M4x35 fasteners through the mounting slots/holes. Use M4x35 and Nylok Nuts Do not overtighten—this will distort the housing. Ensure the unit is firmly fixed with no movement or vibration.	Adjust the switch position so the actuator lever is triggered consistently at the required point. The lever should be engaged smoothly by the moving component, not struck violently.
		

4
Verify full actuation by manually operating the mechanism.

	**WARNING** Electrical Hazard. Refer to section 5.1.3 Power to the Salvo Control Panel (SCP) must be isolated.

WIRING – Salvo Limit Switch

1	2	3
Remove the screws securing the front cover of the SCP and open the enclosure. Retain all screws for reassembly.	From the Salvo Door Sensor cable, identify the red and black conductors. • Crimp suitable ferrules to these wires. • Cut and safely isolate the remaining unused conductors.	Connect and wire the switch as per diagram below. Tighten the terminal screws to ensure a secure electrical connection. Torque 0.6-0.8Nm. Carry out a pull test to ensure connection.

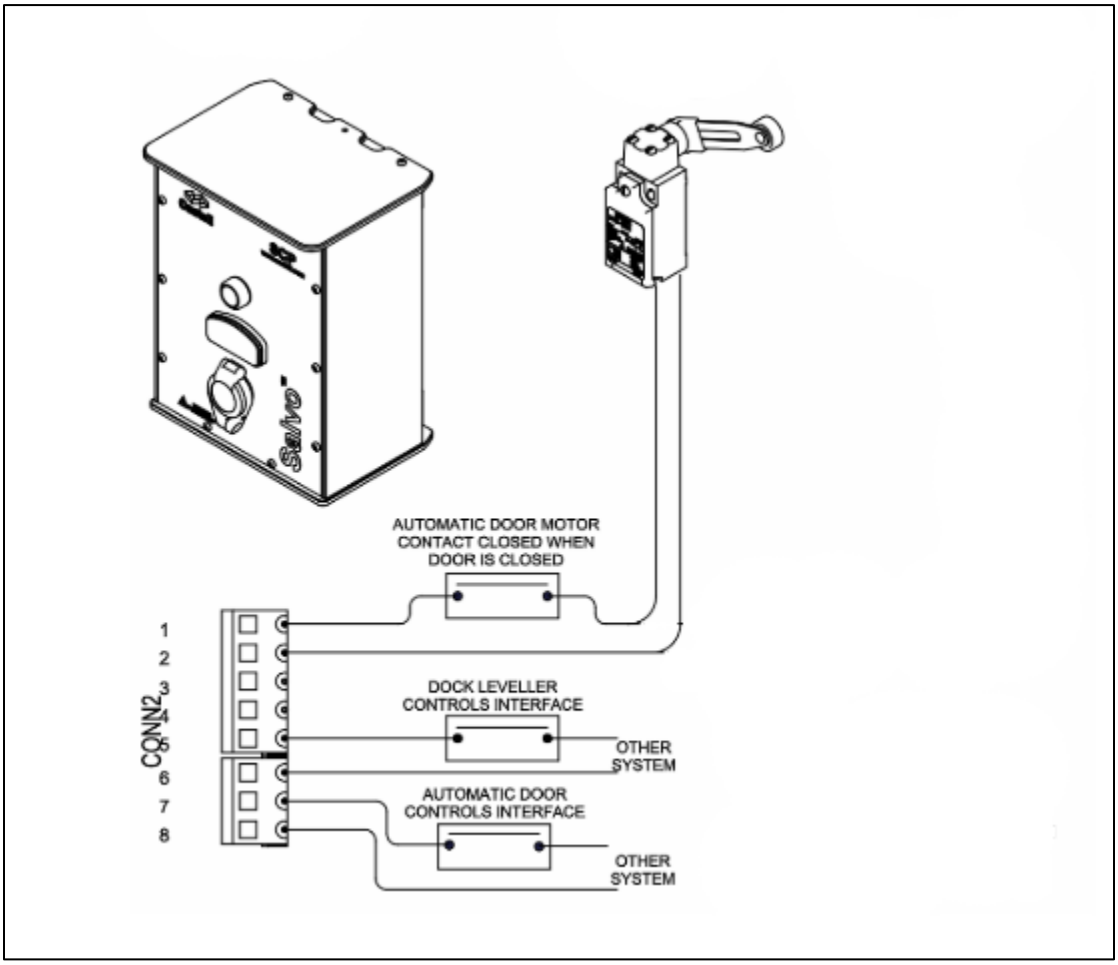


Figure 28: 008029-1 Limit Switch Wiring

Reassembly & Testing

1	2
Confirm with the door closed that both contacts are closed, check with a continuity meter Close the SCP enclosure. Reinstall the cover screws and tighten evenly using a suitable tool. Recommended tightening Torque: 1.2 Nm.	Restore power to the SCP. Operate the door through a full cycle and verify the sensor correctly detects the door position.

5.6. Manual Doors

5.6.1. SADL (Automatic Door Lock)

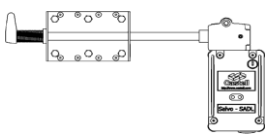
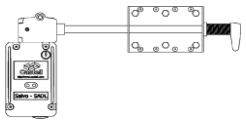
Description	Salvo SADL	
The Salvo Automatic Door Lock (SADL) is a solenoid-controlled locking device that secures the loading bay door. The lock operates in response to signals received from the Salvo Control Panel (SCP). The unit incorporates a locking bolt that passes through the door running rail and into the lock body. When the correct signal is received from the SCP, the solenoid releases the locking bolt, allowing the door to be opened.		
		The SADL operates as part of the Salvo interlock and warning system and does not function as an independent safety control device

Purpose:

The Salvo Automatic Door Lock (SADL) is used to mechanically secure the loading bay door. The lock engages a bolt through the door running rail to prevent the door from being opened until a release signal is received from the Salvo Control Panel (SCP).

Prerequisite:

- Salvo Control Panel (SCP) installed, or installation location defined.
- Door type and running rail are confirmed as suitable for installation of the locking bolt.
- Suitable mounting location identified on the door frame or adjacent structure.
- Power to the SCP isolated before commencing electrical work.

Parts Required	Quantity	Specification	
SADL	(1) Select only 1 hand	Hand 1	
SADL	(1) Select only 1 hand	Hand 2	

For alternative options and full product details, refer to the relevant product brochure or installation parts list.

5.6.1.1. Drawings

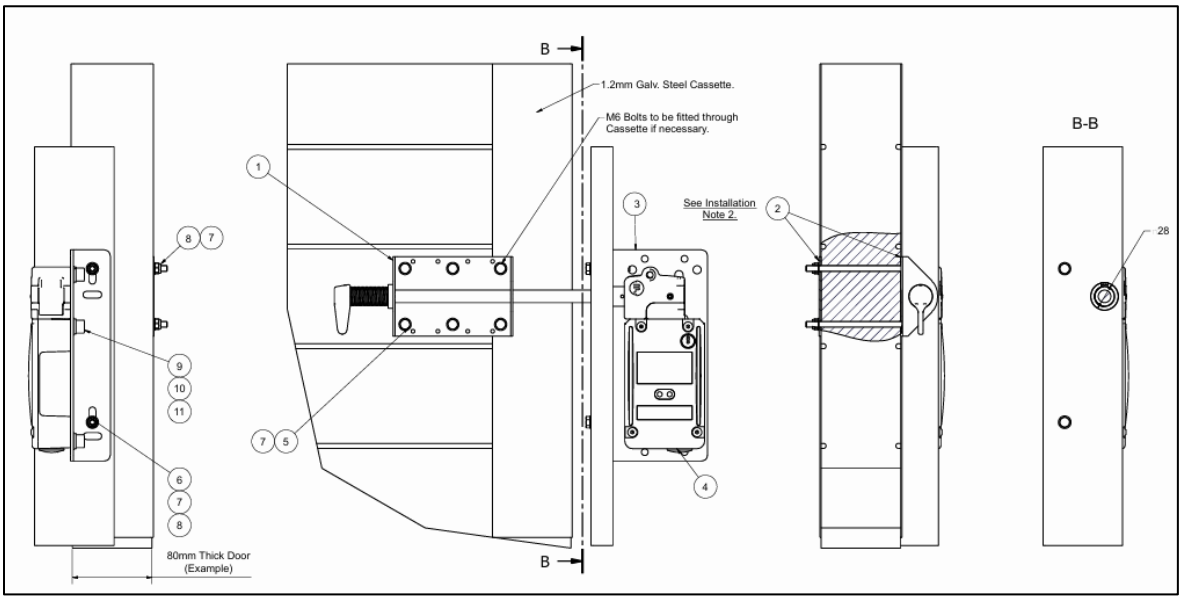


Figure 29: 006479-6 Salvo Automatic Door Control

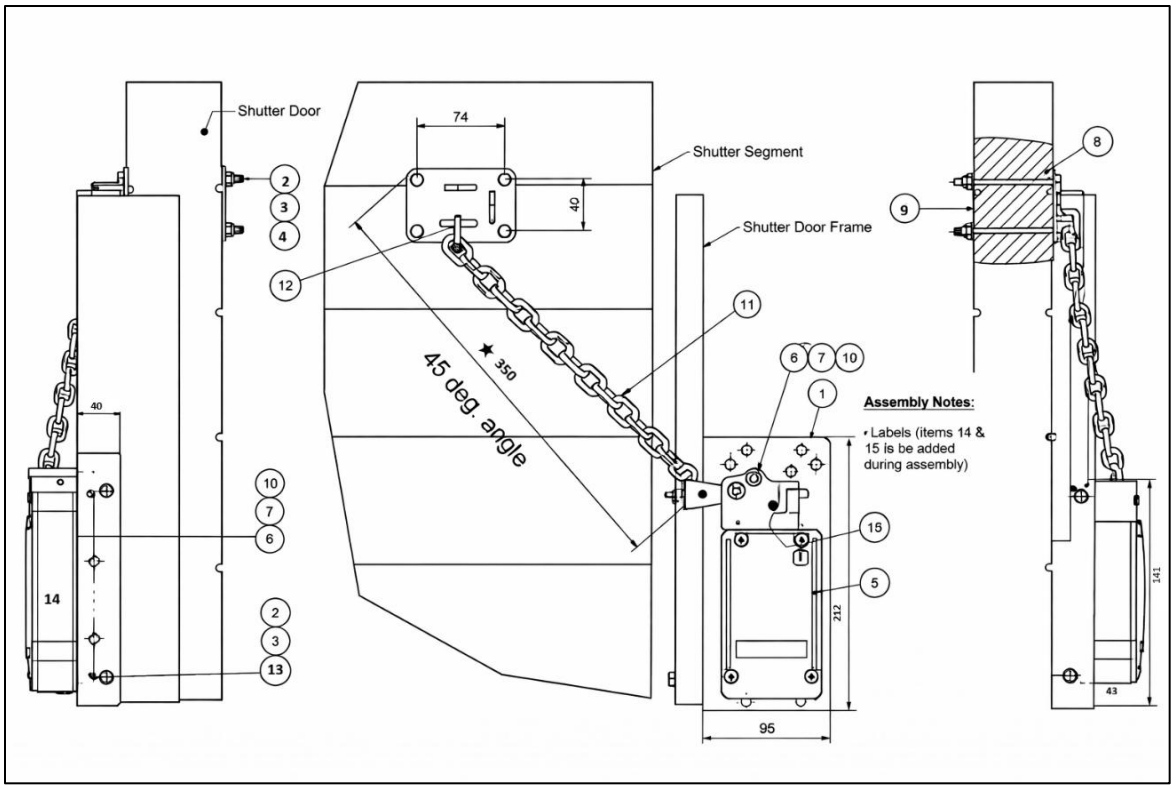
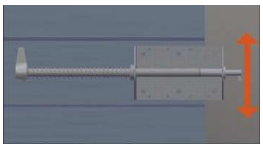
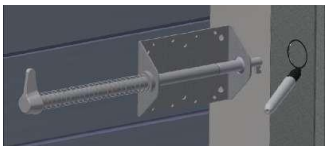


Figure 30: 007051-8 Salvo SLDMC Automatic Door Control

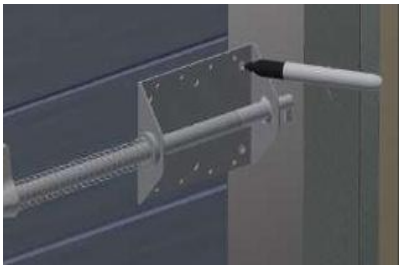
5.6.1.2. Mounting of the Unit

	Correct alignment between the locking bolt and the door running rail is essential for reliable operation. Verify the bolt travels freely and engages the rail without obstruction before completing installation.

	WARNING Mechanical Installation. Refer to section 5.1.2

1	2	3
Ensure the door is fully closed. Identify a suitable position for the locking bolt so that it can pass through the door running rail without interference from existing door fixings or hardware. As a general guide, the lock should be installed between 1.5 m and 2.0 m above finished floor level, unless otherwise specified.	Mark the position of the bolt clearance hole on the inside face of the door running guide. Ensure the proposed location allows the locking bolt to pass through freely and does not interfere with existing bay controls or door hardware.	Drill the clearance hole in the door running guide using a 28 mm hole saw (tank cutter). Ensure the hole is clean and free from burrs to allow unobstructed movement of the locking bolt.
		

4	5	6
Determine the position of the lock door, ensuring that the bolt entry hole aligns. Use the hole in the door running guide to align the lock.	Use the hole in the door running guide to align the lock.	Mark and drill the positions of the mounting bracket holes.
		

7	8	9
Fix the lock and bracket in place with the screws provided.	With the door fully closed, engage the locking bolt through the previously drilled clearance hole in the door running guide and into the lock body. While the bolt is engaged, mark the positions of the fixing holes on the door.	Drill the marked fixing holes in the door. (6mm clearance for 6mm fixings supplied) Secure the assembly using the supplied bolts, washers and nuts. Tighten all fixings securely and trim any excess bolt length if necessary.
		

WIRING – SADL

	**WARNING** Electrical Hazard. Refer to section 5.1.3 Power to the Salvo Control Panel (SCP) must be isolated.

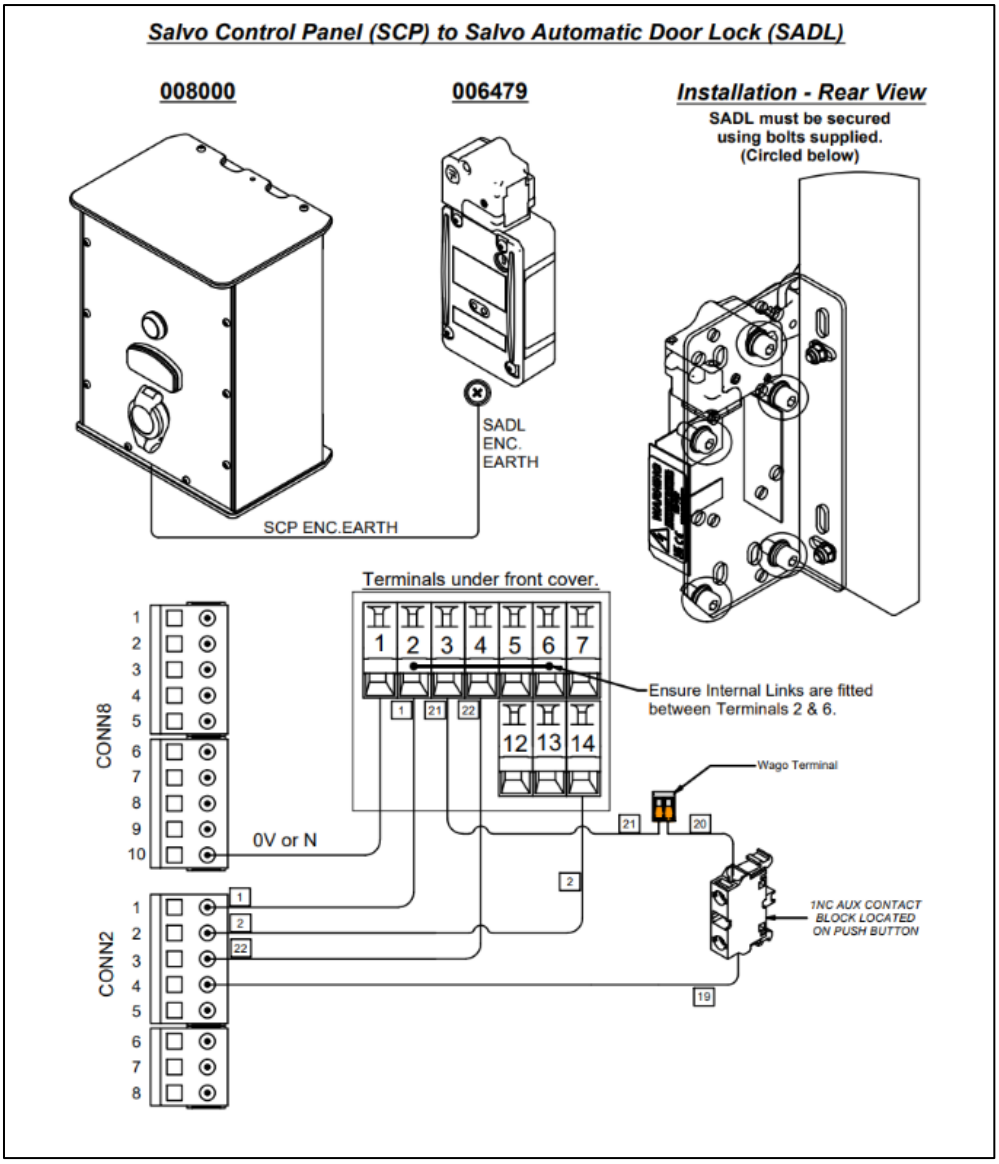


Figure 31: 008028-3 SCP to SADL

5.6.2. SMDL-AI

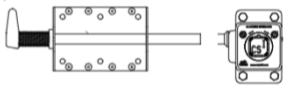
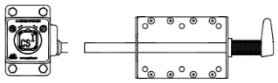
Description	Salvo SMDL-AI	
The SMDL-AI (Salvo Manual Door Lock) is a mechanical interlock used to secure loading bay doors in the closed position. The unit incorporates a locking bolt that passes through the door running rail and into the lock body. When the bolt is engaged, the door cannot be opened. The locking bolt can only be disengaged when the interlock key is inserted and turned, allowing the door to be opened.		
		The SMDL-AI operates as part of the Salvo interlock and warning system and does not function as an independent safety control device

Purpose:

The SMDL-AI (Salvo Manual Door Lock) is used to mechanically secure the loading bay door in the closed position as part of the Salvo interlock system. The locking bolt prevents the door from being opened until the interlock key is inserted and operated.

Prerequisite:

- Suitable mounting location identified on the door frame or adjacent structure.
- Door type and running rail are confirmed as suitable for installation of the locking bolt.
- Door positioned in the fully closed position prior to installation.
- Clearance confirmed to ensure the locking bolt can pass through the door running rail without obstruction.

Parts Required	Quantity	Specification	
SMDL-AI	(1) Select only 1 hand	Hand 1	
SMDL-AI	(1) Select only 1 hand	Hand 2	

For alternative options and full product details, refer to the relevant product brochure or installation parts list.

5.6.2.1. Drawings

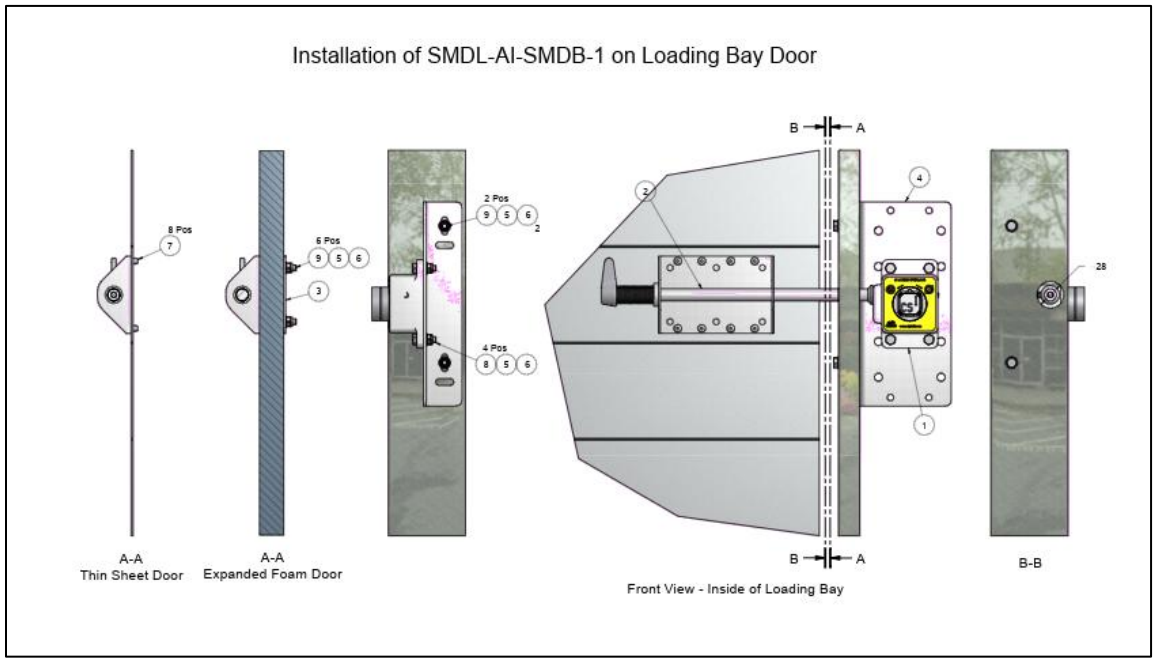


Figure 32: 006510-1 SMDL-AI

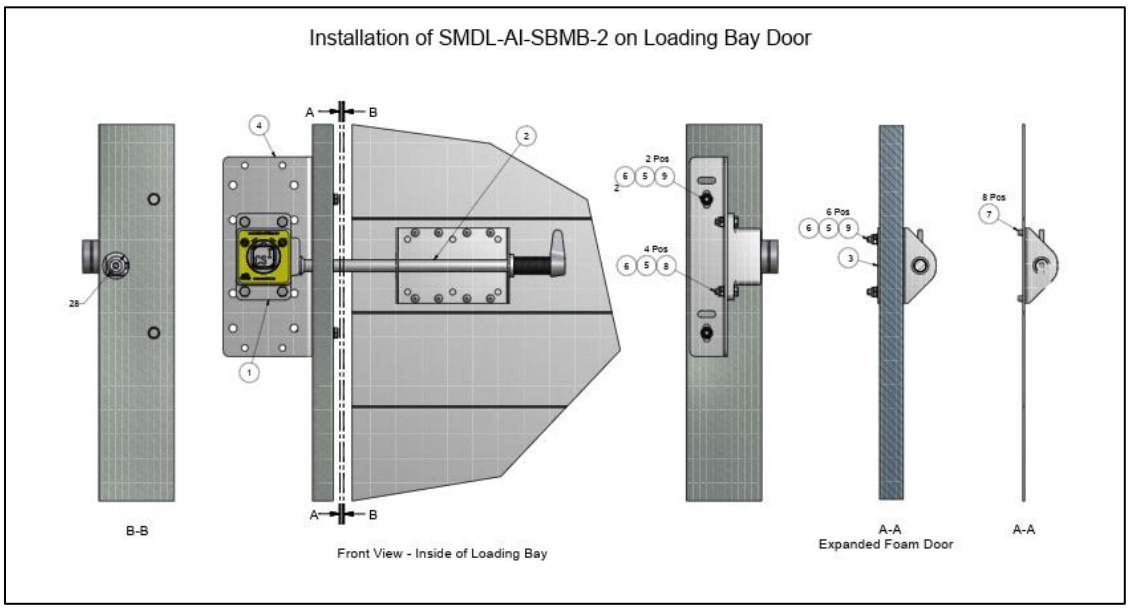


Figure 33: 006511-1 SMDL-AI

CAUTION

Care must be taken to follow the correct COSHH procedures when handling high strength adhesive.

Drawing Note 1: Add high strength st/steel adhesive (Q-Glue-500) to the pin thread of the D-Shackle only when final assembly or installation has been achieved.

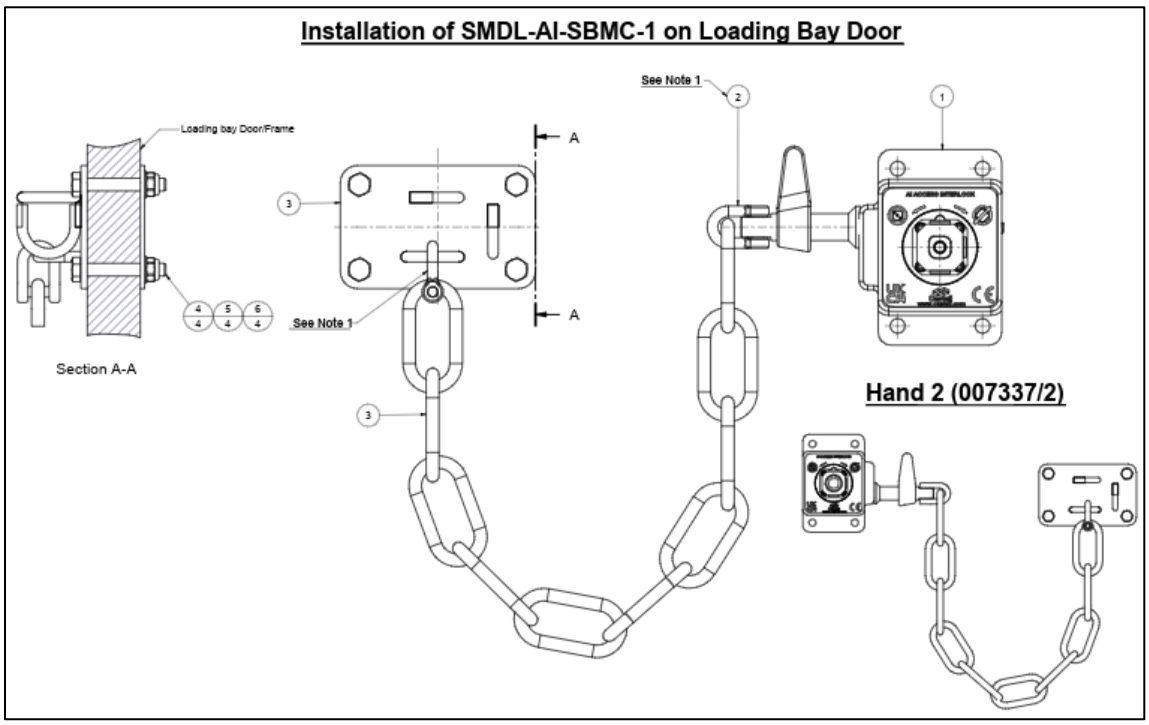


Figure 34: 007337-3 SMDL-AI SBMC:

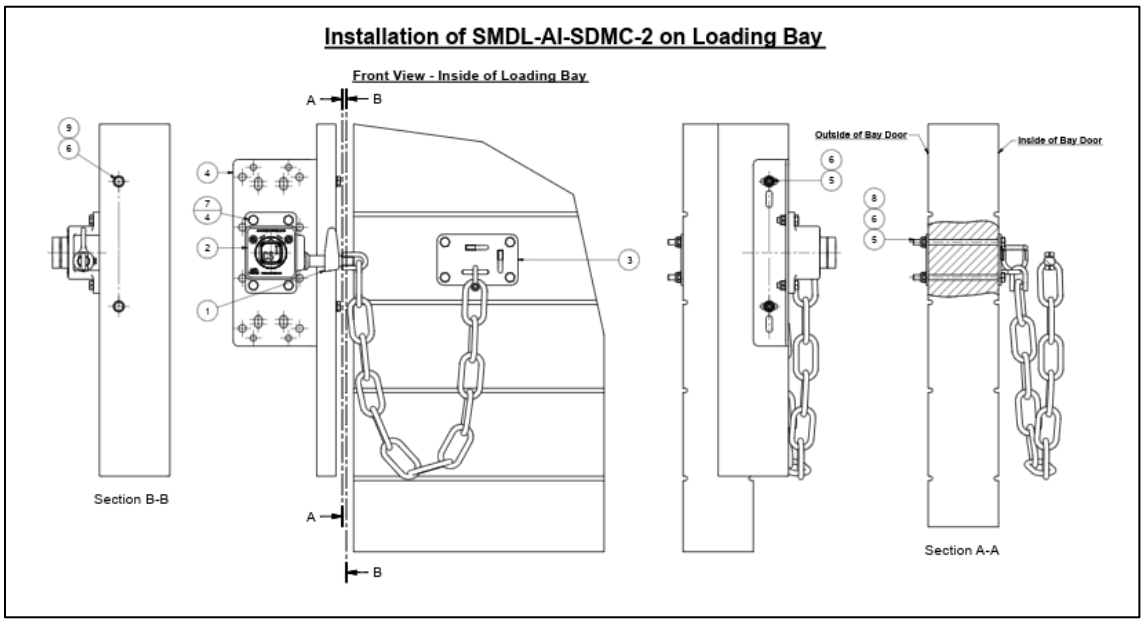
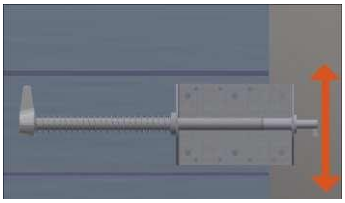
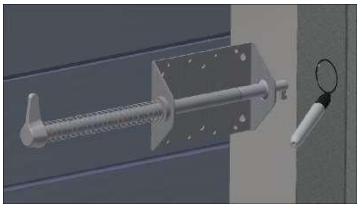


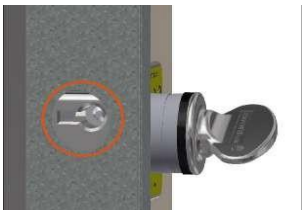
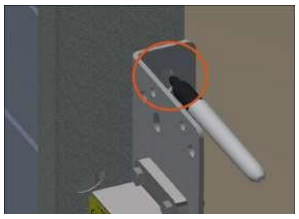
Figure 35: 007043-3 SMDL-AI SDMC

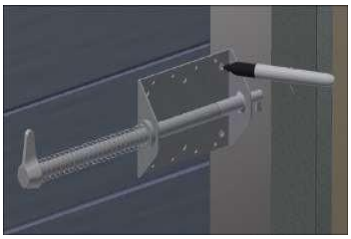
5.6.2.2. Mounting of the Unit

	Verify that the bolt can pass freely through the clearance hole without obstruction before final tightening of the mounting fixings. Misalignment may prevent the lock from engaging or disengaging correctly.

	WARNING Mechanical Installation. Refer to section 5.1.2

1	2	3
Ensure the door is fully closed. Identify a suitable position for the locking bolt so that it can pass through the door running rail without interference from existing door fixings or hardware. As a general guide, the lock should be installed between 1.5 m and 2.0 m above finished floor level, unless otherwise specified.	Mark the position of the bolt clearance hole on the inside face of the door running guide. Ensure the proposed location allows the locking bolt to pass through freely and does not interfere with existing bay controls or door hardware.	Drill the clearance hole in the door running guide using a 28 mm hole saw (tank cutter). Ensure the hole is clean and free from burrs to allow unobstructed movement of the locking bolt.
		

4	5	6
Position the door so that the previously drilled bolt clearance hole aligns with the locking bolt. Confirm that the bolt can enter the hole freely without obstruction.	Use the clearance hole in the door running guide to align the lock body so that the locking bolt lines up correctly with the hole. Ensure the bolt can pass through the guide without obstruction before marking the fixing positions.	Mark the positions of the mounting bracket fixing holes. Remove the bracket and drill the holes to suit the selected fixings and mounting surface.
		

7	8	9
Position the lock and mounting bracket over the drilled fixing holes and secure them using the screws provided. Tighten the fixings evenly and confirm that the lock is firmly mounted and correctly aligned with the bolt clearance hole.	With the door fully closed, engage the locking bolt through the previously drilled clearance hole in the door running guide and into the lock body. While the bolt is engaged, mark the positions of the fixing holes on the door.	Drill the marked fixing holes in the door. Secure the assembly using the supplied bolts, washers and nuts. Tighten all fixings securely and trim any excess bolt length if necessary.
		

6. PRODUCT LIFETIME CARE

6.1. Maintenance and Repair

Routine inspection and maintenance shall be carried out in accordance with the Salvo Health Check Guide (**MM-EN-Castell-Salvo-SCP-0426**), including the inspection intervals, functional test procedures, visual health checks, pass / monitor / fail criteria, and removal-from-service requirements stated in that guide.

If any defect, damage, or concerns are identified, stop use immediately and isolate the equipment.

The system must not be operated until it has been inspected and deemed safe by a competent and authorised person or the manufacturer. All maintenance and repair activities must be performed by authorised personnel who fully understand the system's operation and technical functions.

For detailed maintenance procedures, inspection intervals, and component specific health checks, refer to the individual product user guides.

6.2. Dismantling and Decommissioning

Before dismantling or decommissioning the system, ensure all electrical power sources are safely isolated. Components should be removed in a controlled manner to prevent damage or injury.

All parts must be disposed of in accordance with local regulations and environmental requirements.

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

6.3. Support and Fault Reporting

In the event of a fault, damage, or abnormal operation, do not attempt unauthorised repair. Contact the original installer or Castell Safety International Ltd. for technical support and guidance.

Provide relevant system details and a description of the issue to enable efficient resolution.

6.4. Manufacturer Contact Information

Castell Safety International Ltd.
The Castell Building, 217 Kingsbury Road, London, NW9 9PQ, UK.

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