

Telescopic Boom & Robotic Nozzle

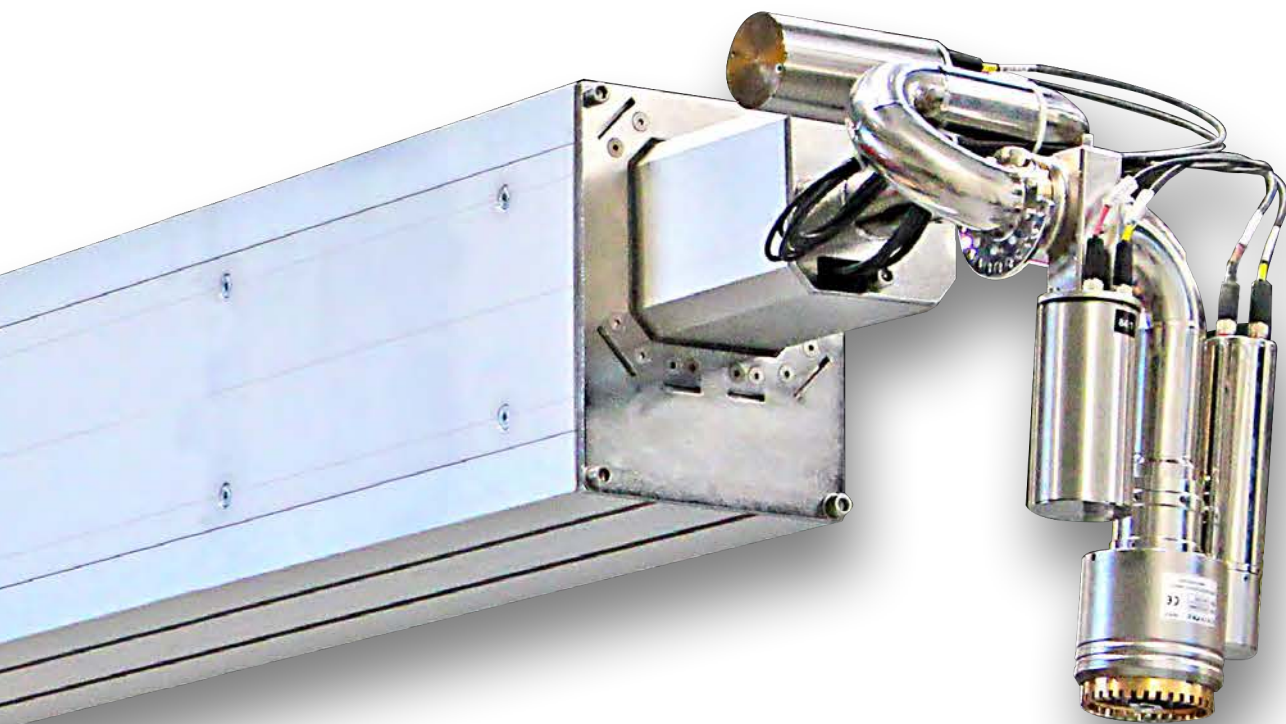
UNIFIRE

This document is not intended as a technical manual. Please consult the technical manual for complete details prior to shipping, installing, or working with any of the products or components contained in this document.

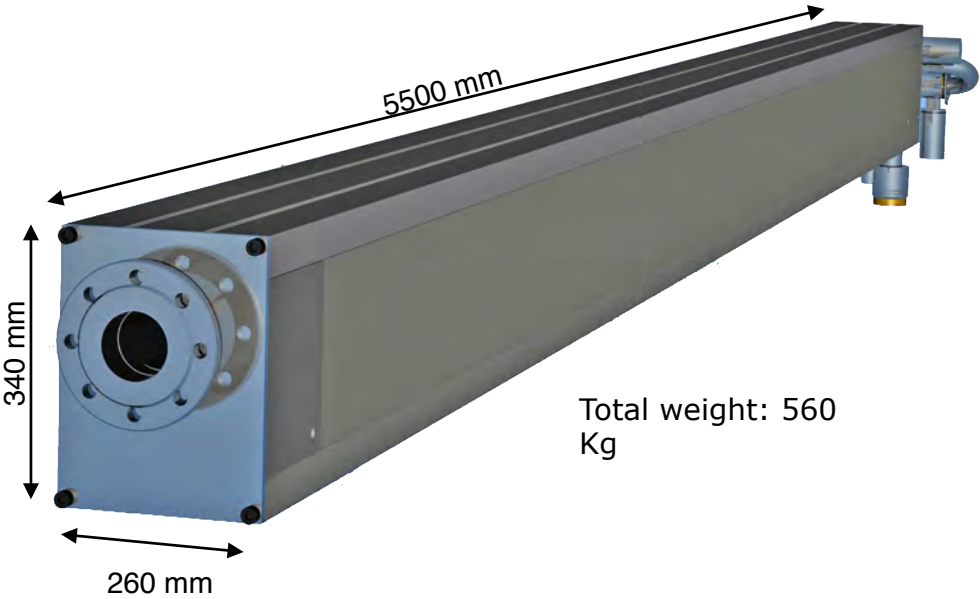
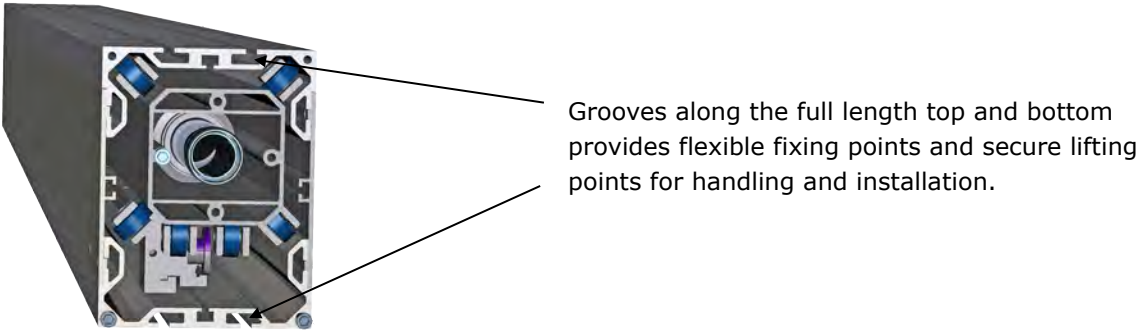
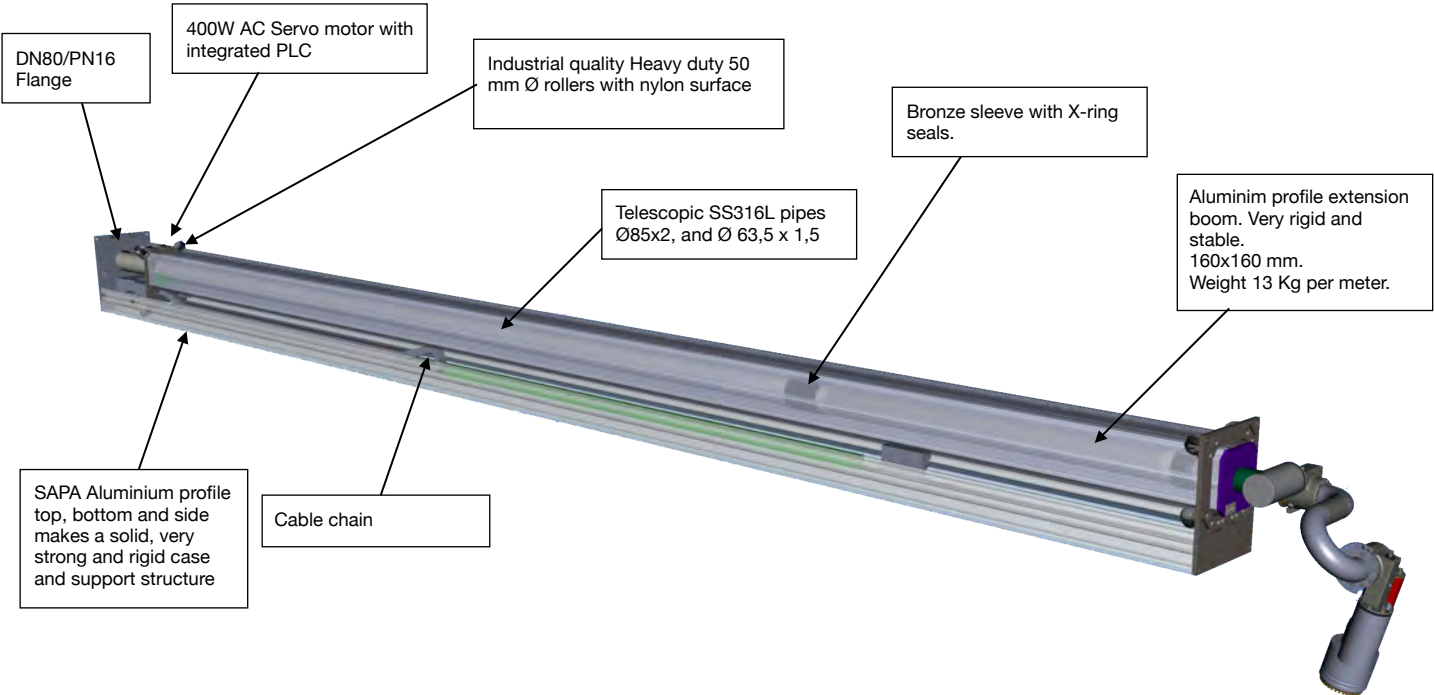
Unifire Articulating Boom



- Extends 4 meters from the façade to provide optimal trajectory
- Extends in 6 seconds
- Boom made of high strength, heavy duty extruded aluminium profile
- Telescopic pipes and monitor made of 316L marine grade stainless steel
- Mechanics, transmission and motors are protected from dust (IP55)
- Electromechanical transmission with 400W AC Servo motor provides smooth and quiet operation
- Simple, quick installation with multi-connector cables to control cabinet
- Shipping dimension (excluding monitor): 550x340x260 cm
- Total weight (including monitor): 560 Kg
- Simple installation with adjustable fixing points - install standing on supports, or hanging DN80/PN16 connection flange
- 2" internal Ø of telescopic pipe
- Supports flow of up to 1600 lit/min at 10 bar



Telescopic Boom & Robotic Nozzle
Introduction



SAFETY Information

⚠ DANGER

Shut off the power and isolate the system before carrying out any installation, repair, or maintenance steps. Electrical parts may cause injury or death.

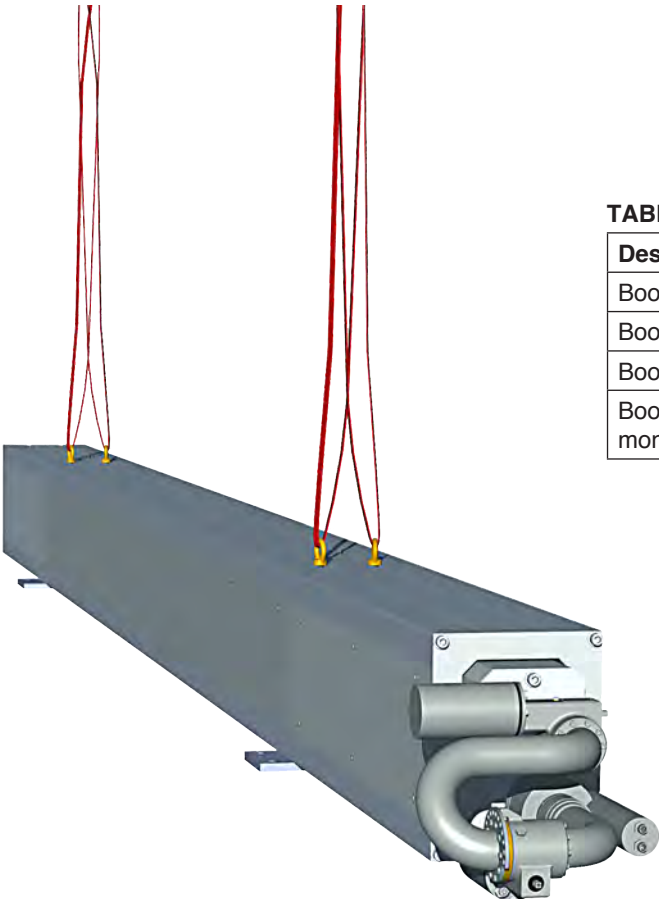
Before installing the system, follow this safety information:

- Qualified personnel must carry out all installation steps.
- Follow the directions given in this manual.
- Safely secure the monitor and its components during installation.
- Use lifting gear, equipment, and procedures fit for purpose.

Inspecting the System

Before installing the system, complete the following inspection checks:

- Inspect the system components for damage or other deviations that might occur during transport. If damage is evident, note the extent of damage on the carrier's freight bill. A separate request for inspection by the carrier's agent should be made in writing. Damaged equipment shall not be installed.
- Check the marking and identification labels on the equipment against the material specification and order confirmation.



Rigging and Handling

⚠ CAUTION

All panels must be secured in place when lifting the unit. The front end of the boom must be secured to prevent it from extending if the boom is unbalanced once lifted.

⚠ WARNING

Units may be located on upper floor levels providing the floor is capable of supporting the total unit operating weight.

- Do not transport the extension boom vertically. The extension boom shall be transported in the horizontal position.
- A level floor or foundation must be provided by others, capable of supporting the operating weight of the unit.
- Use the provided eye hooks and straps (Figure 4-1) for lifting with a minimum working load of 1,000 kg (2,204 lbs.), or as required by local safety regulations. See Figure 4-2 for weight, center of gravity, and eye hook location depending on boom configuration.
- Rig the unit to its location with an overhead lift and lower the unit slowly to its required position.
- If installing components in the field in the lift position, ensure the unit is properly supported.

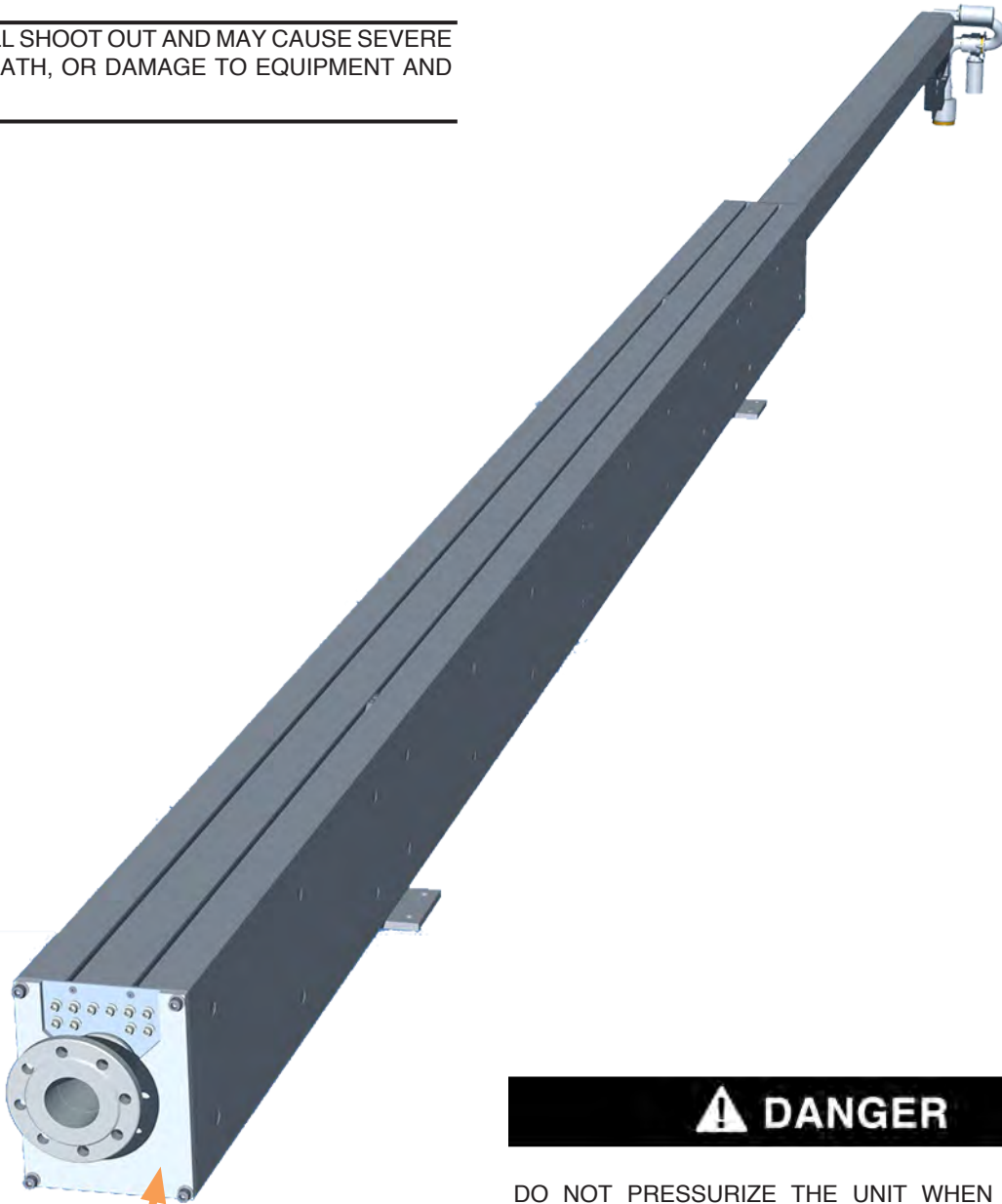
TABLE 4-1: BOOM RIGGING CONFIGURATION

Description	Approximate weight
Boom	560 kg (1,200 lb)
Boom extended	
Boom with monitor	
Boom extended with monitor	

⚠ DANGER

DO NOT PRESSURIZE THE UNIT WHEN NOT FULLY EXTENDED!!!

THE BOOM WILL SHOOT OUT AND MAY CAUSE SEVERE INJURY OR DEATH, OR DAMAGE TO EQUIPMENT AND PROPERTY

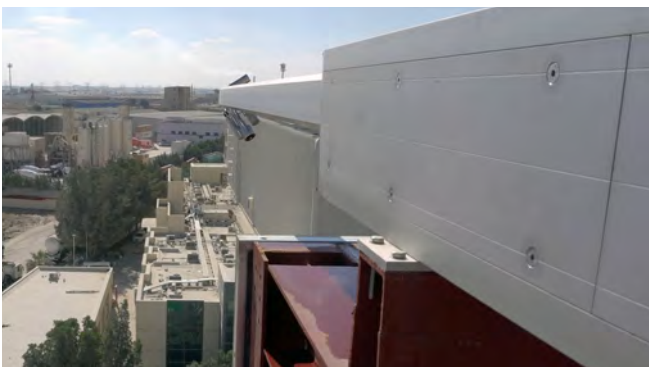
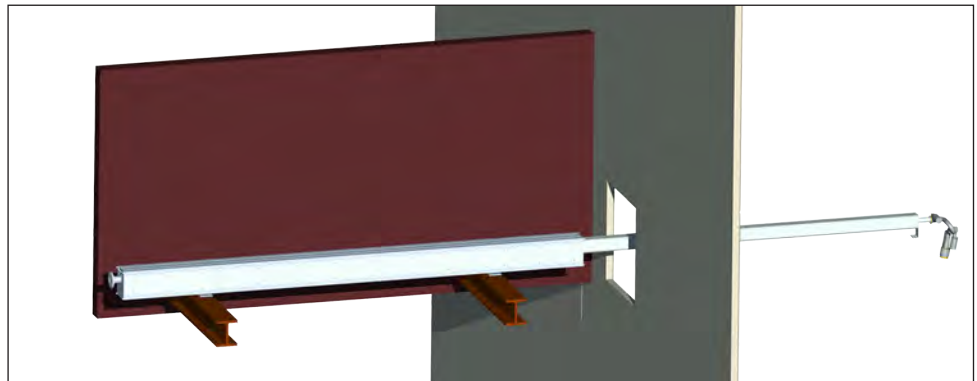
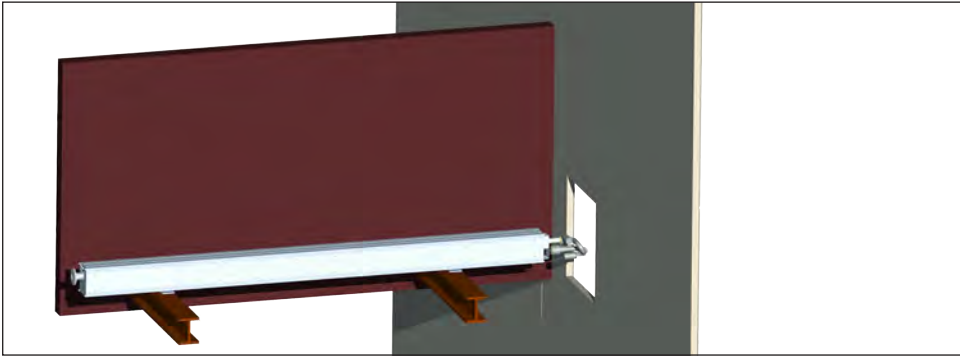
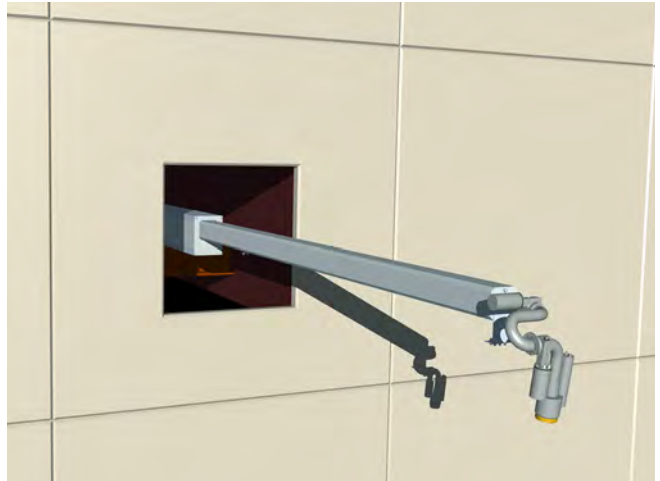


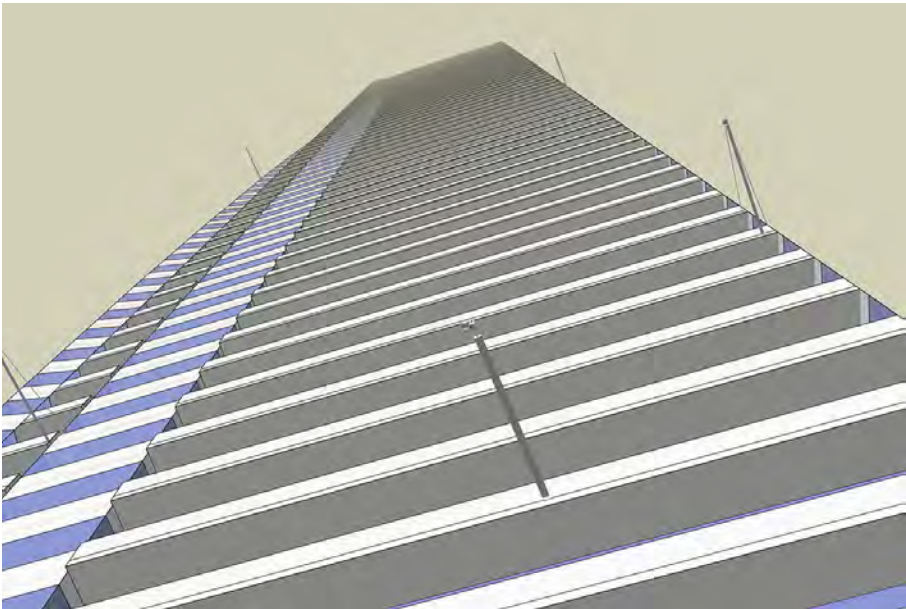
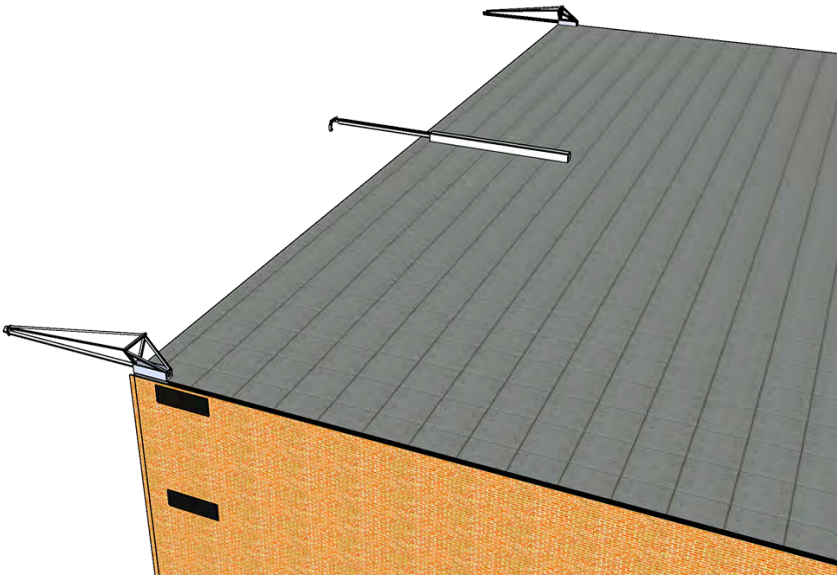
**THE REAR PANEL MUST
BE INSTALLED BEFORE
APPLYING WATER
PRESSURE**

⚠ DANGER

DO NOT PRESSURIZE THE UNIT WHEN THE REAR PANEL IS NOT PROPERLY INSTALLED AND ALL 4 M12 BOLTS ARE TIGHTENED.

THE REAR PIPE MAY SHOOT OUT AND MAY CAUSE SEVERE INJURY OR DEATH, OR DAMAGE TO EQUIPMENT AND PROPERTY





1+

Attaching the Monitor to the Boom**⚠ CAUTION**

Ensure that the system is powered off before installing the monitor to the boom. The boom and monitor are provided disassembled and require field installation.

⚠ CAUTION

Install the monitor only after the boom is placed near its final destination. Take precaution to avoid damaging the monitor.

⚠ WARNING

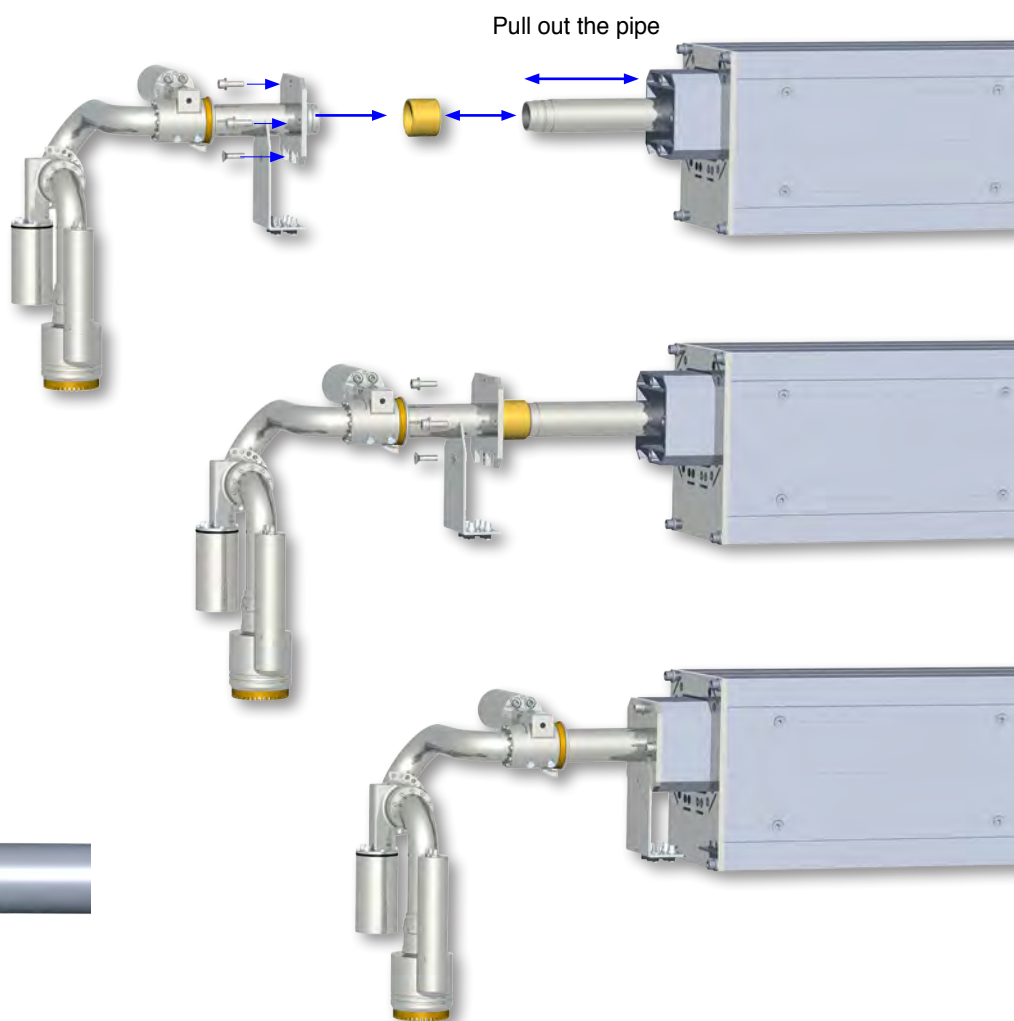
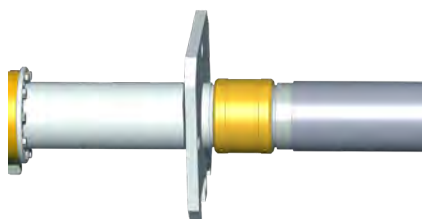
The monitor is heavy and when installed at heights, safety extreme caution must be taken and must meet all local safety regulations to prevent injury to the installer or accidental drops of equipment during the installation process.

To attach the boom to the monitor, complete the following steps:

1. Place the boom at ground level.
2. Connect the monitor to the telescopic pipe with the threaded sleeve.
3. Attach the sleeve to the monitor. Rotate the pipe until the threads are not visible and **only** the grooves are visible (see Figure 4-3)..
4. Install and tighten the four M12 bolts to the specified torque value (see Figure 4-4).
5. See electrical installation section for connecting the cables.

**FIGURE 4-4
MONITOR CONNECTIONS**

**FIGURE 4-3
SLEEVE GROOVES**



Rigging and Handling

⚠ CAUTION

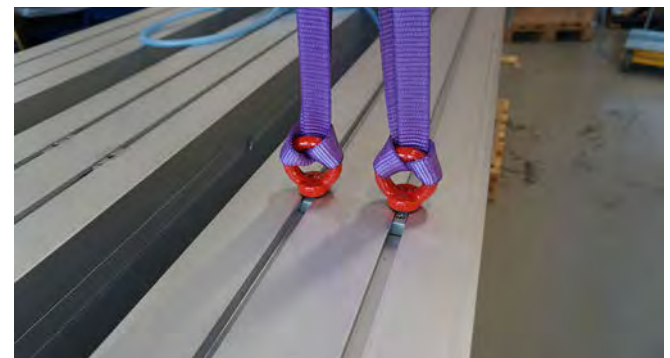
All panels must be secured in place when lifting the unit. The front end of the boom must be secured to prevent it from extending if the boom is unbalanced once lifted.

⚠ WARNING

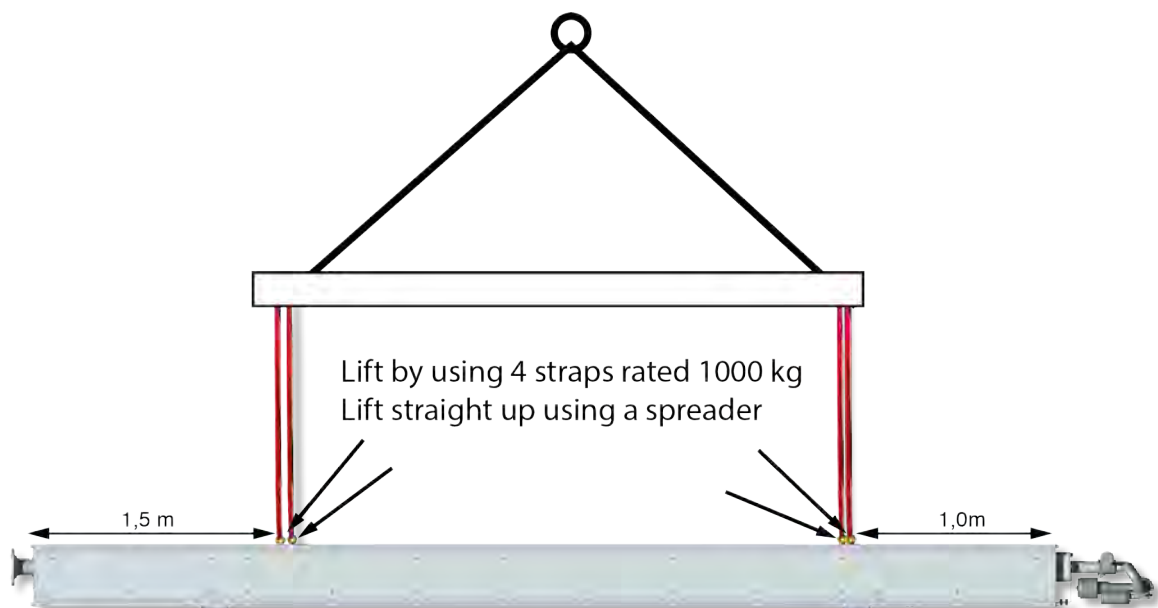
- Units may be located on upper floor levels, provided that the floor is capable of supporting the total unit operating weight.
- Do not transport the extension boom vertically. The extension boom shall be transported in the horizontal position.
- A level floor or foundation must be provided by others, capable of supporting the operating weight of the unit.
- Use the provided eye hooks and straps (Figure 4-1) for lifting with a minimum working load of 1,000 kg (2,204 lb), or as required by local safety regulations. See Figure 4-2 for weight, center of gravity, and eye hook location depending on boom configuration.
- The eye hook bracket plate can be slid to the correct lifting positions for a balanced load. The brackets must be fixed with the hex-screw before lifting.
- Rig the unit to its location with an overhead lift and lower the unit slowly to its required position.
- Rig the unit to its location with an overhead lift and lower the unit slowly to its required position.
- If installing components in the field in the lift position, ensure that the unit is properly supported.



The eye-hook bracket can be loosened and adjusted to the correct lifting position. Make absolutely sure the bracket is firmly locked in place before lifting the boom.



Correctly attached lifting straps.

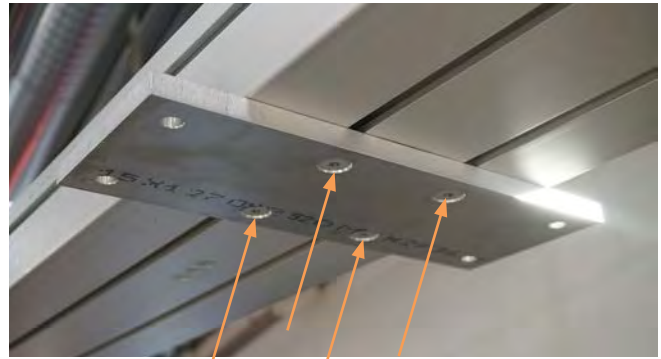


Mechanical Installation of Telescopic Boom

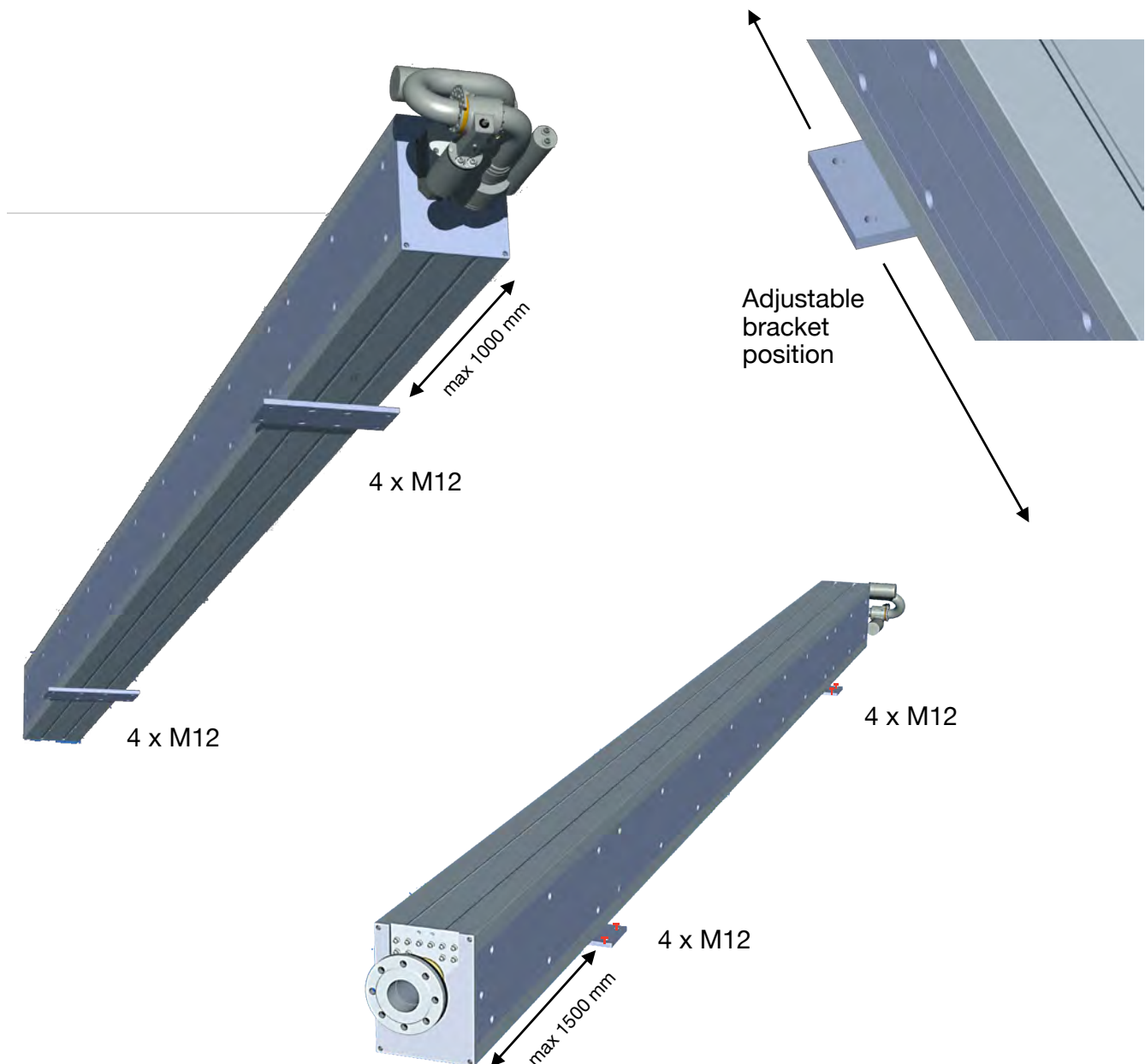
The telescopic boom has been designed with easily adjustable brackets to accommodate the most convenient support points in the building.

The boom has a slim profile (260x340 mm).

The top and bottom of the enclosure provide T-grooves that run along the full length of the boom enclosure. Along the groove slides two mounting plates that provide 4 x 13 mm Ø holes for 4 x M12 bolts. Adjust the position of the mounting plates to match with the most convenient fixation points.



Loosen the 4 bolts to adjust bracket position



Installing the Boom

⚠ WARNING

The unit is extremely heavy and must be handled with extreme caution. Use only heavy lifting machines to handle the unit.

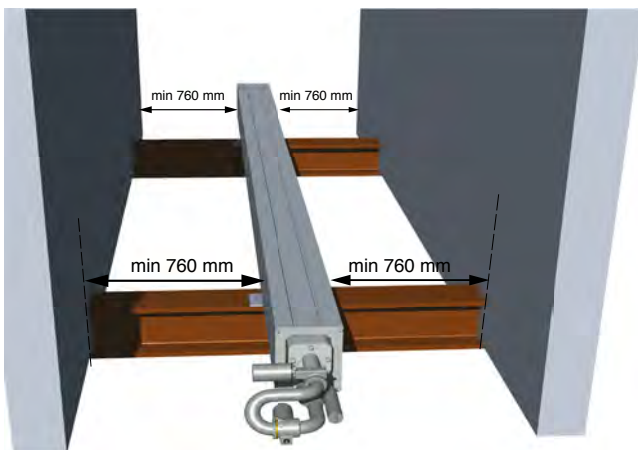
⚠ WARNING

Make sure any temporary supports being used to hold the boom are in compliance with local safety regulations.

Creating a clearance area around the boom

- The boom and its components must be installed to provide access for inspection, servicing, repair, and maintenance activities. A minimum of 760 mm (2.5 ft) space on both sides of the boom is required to complete these tasks (see Figure 4-5).
- Alternatively, if the boom requires installation adjacent to a wall, keep the left side of the boom accessible (see Figure 4-6).
- The monitor requires additional clearance once mounted on the boom in order to rotate freely without obstruction. Take this into account when installing the boom adjacent to a wall (see Figure 4-7).

**FIGURE 4-5
INSTALLATION CLEARANCE**



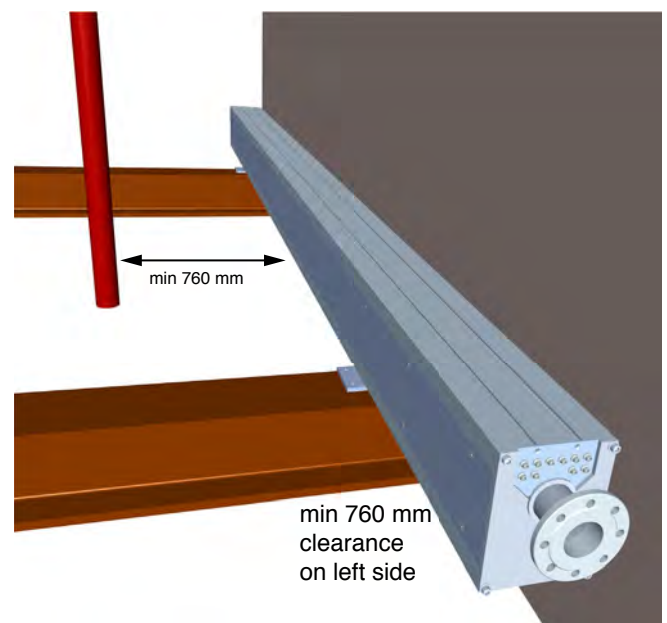
Securing the boom to the structure

CAUTION

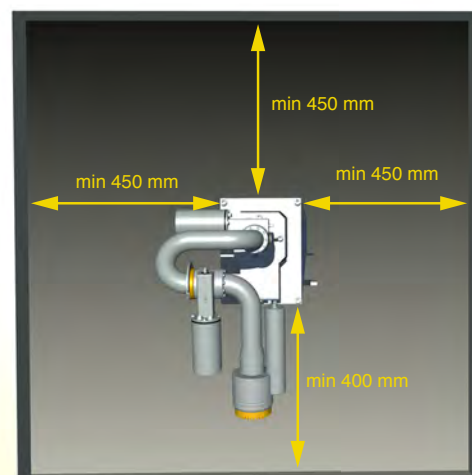
Before attaching the boom to the building structure, consult with a structural engineer to ensure the system can be safely mounted without affecting the structural integrity of the building.

The extension boom, with attached robotic monitor, shall be firmly secured to a sturdy structure of the building using the provided mounting plates or adequate supports.

**FIGURE 4-6
INSTALLATION ADJACENT TO WALL**



**FIGURE 4-7
MONITOR CLEARANCE AREA**



Connecting the monitor to the boom

The SPRAYSAFE AFS Boom is delivered with the monitor cables pre-installed internally, running to the tip of the boom.

Start by connecting the short (1,4 meter) M12 cables at the tip of the boom.

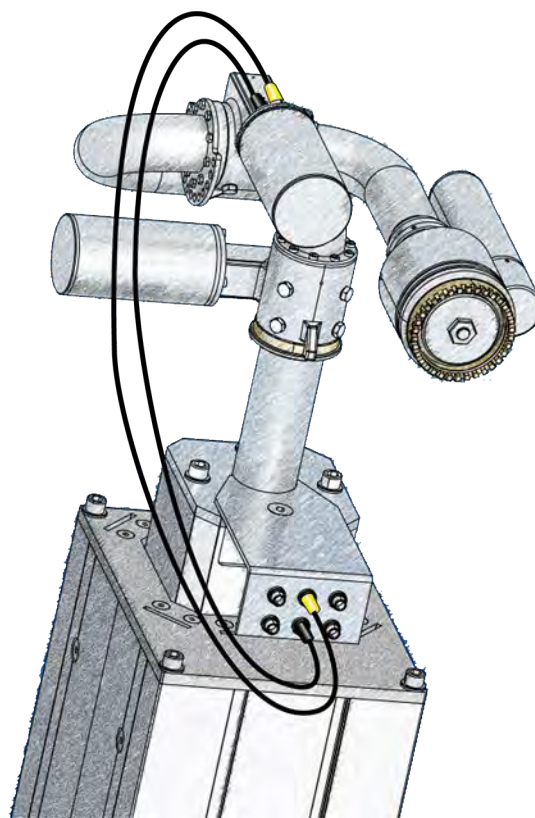
From left to right: Rotation, Vertical, Nozzle



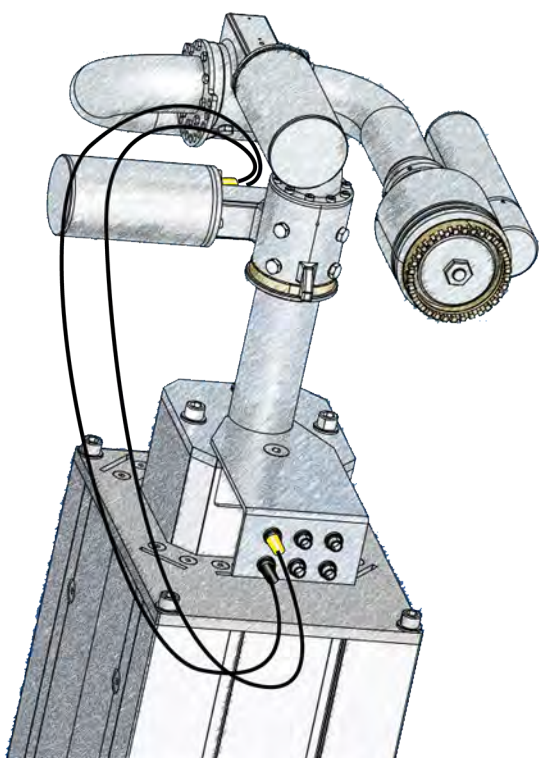
Yellow connectors are for the BLDC Motor Phases.

Black connectors are for the BLDC Motor Sensors.

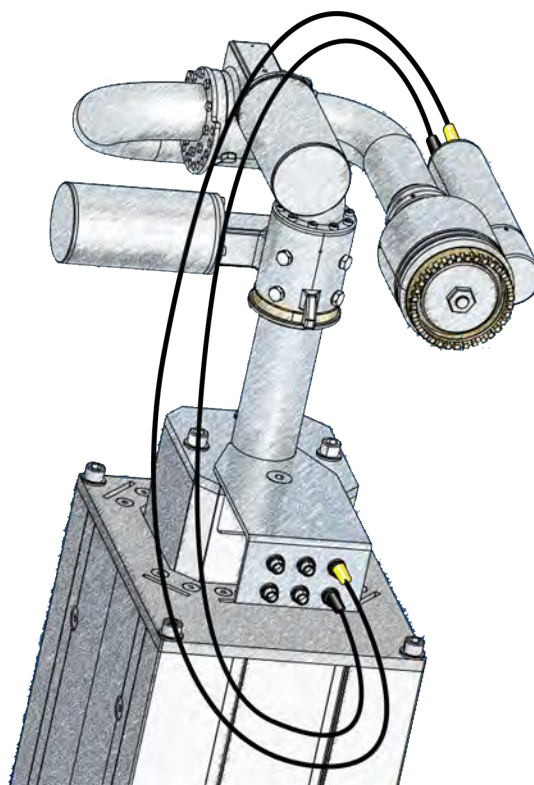
Yellow is A-coded, Black is B-coded, hence it is not possible to accidentally cross the cables.



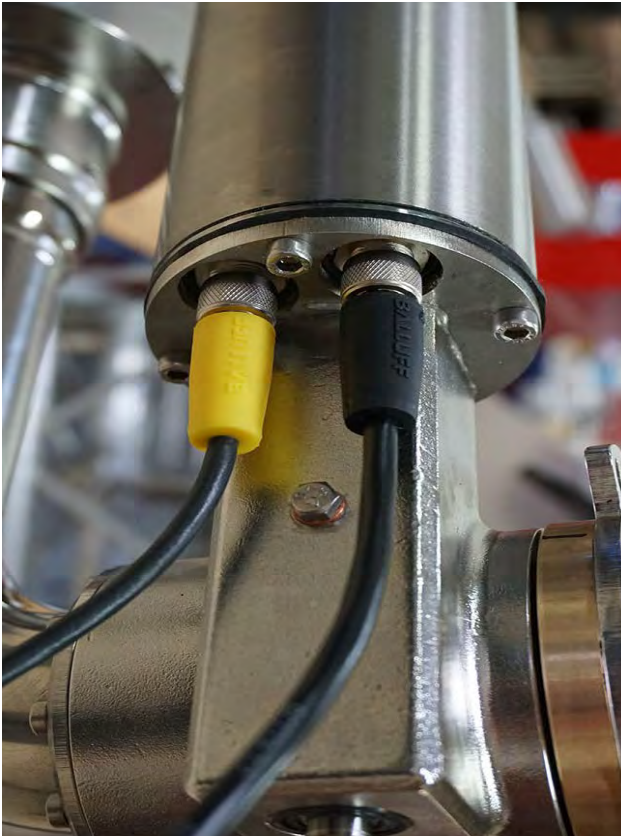
Cables to Vertical (MK5)



Cables to Rotation (MK4)



Cables to Nozzle (MK6)



Phases and Sensor cable to vertical motor

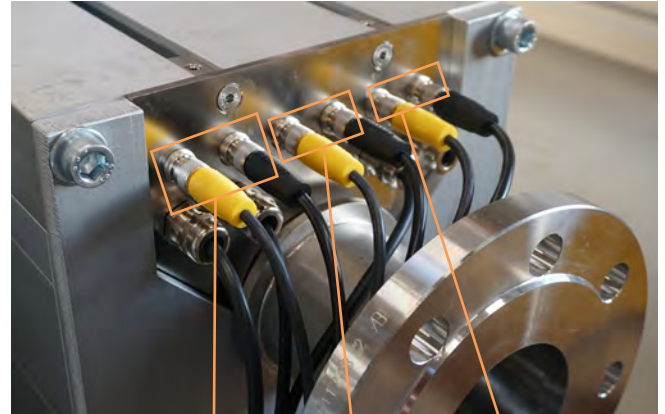


Monitor and Nozzle connected

Connecting the boom to the PLC

At the rear of the boom you will find the corresponding pairs of connectors - Rotation, Vertical, Nozzle.

Always in that order, from left to right.



Connect the Boom to the PLC using short (1,4 meter) M12 cables.

Connecting the boom servo motor to the PLC

The boom has its own built-in 400W “MAC400” servo motor.

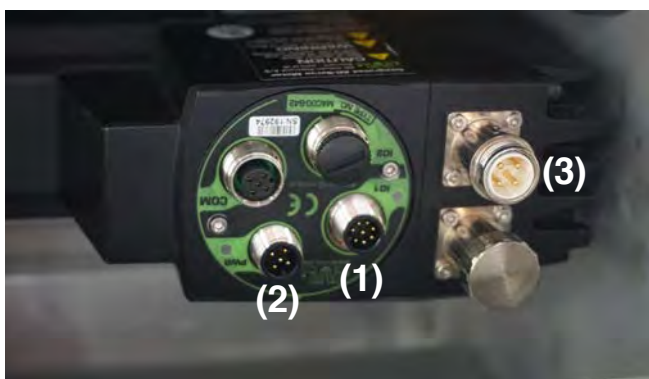
The MAC400 motor has a fully integrated controller that keeps track of the boom’s position, controls speed and ramping.

The MAC400 communicates with the **TARGA** PLC via a set of 4 simple digital I/O’s.

Command: Go to position Extend or Retract

Feedback: At position Extended or Retracted.

3 cables connect to the MAC 400

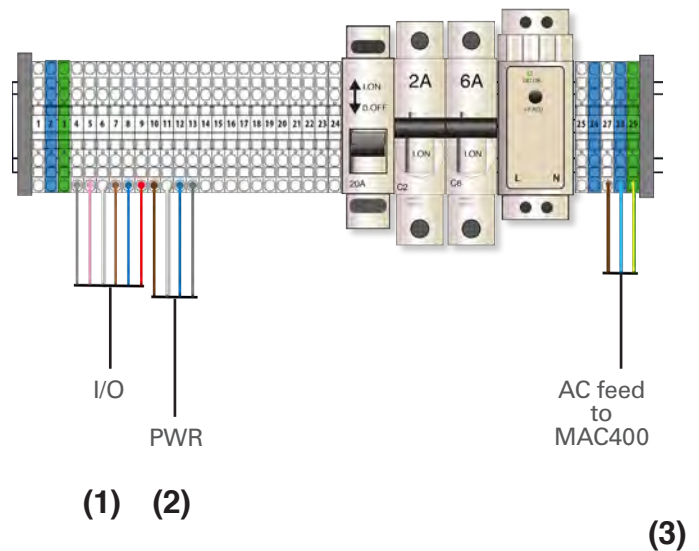


(1) I/O Signals

(2) Power to MAC400 electronics: 24VDC

(3) Power to motor: AC 115-230V 50/60 Hz

- (1) I/O to sockets 4,5,6,7,8,9
- (2) 24VDC electronics feed from sockets 10,11,12 and 13
- (3) AC Power to MAC400 from sockets 27, 28, and 29



⚠ CAUTION

Note: The COM port is used for programming and configuring the MAC400 only. The MAC400 motor is pre-programmed to run with the *Telescopic Boom*. **Never connect anything to COM.** This is for authorized technicians and high-level maintenance only.



Remove the rear left side panel to access the MAC400 motor

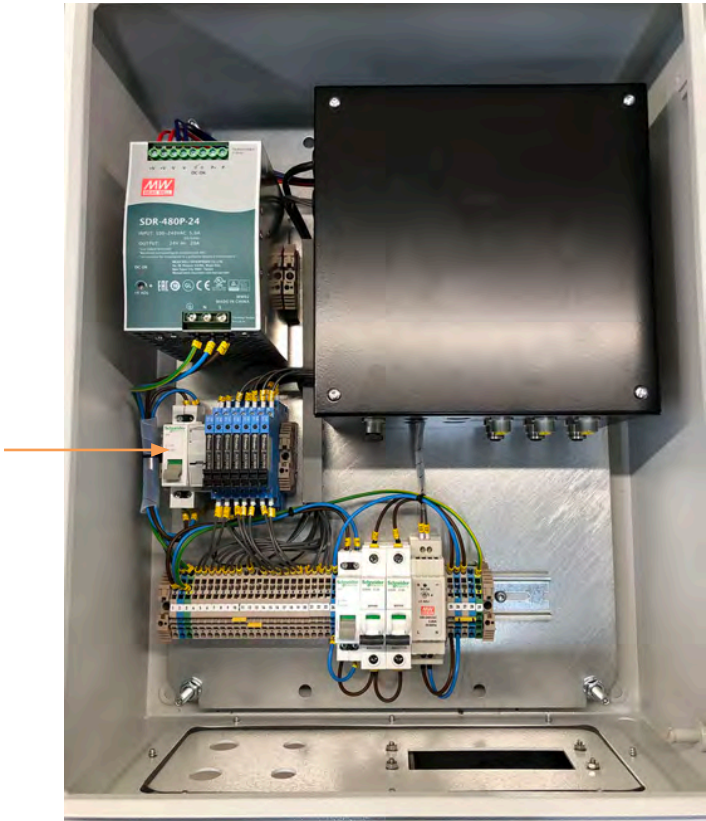
⚠ DANGER

The Boom motor initiates calibration every time power is turned on! This means that the boom will extend automatically when power is turned on. Take extreme caution before turning on power to be sure it is safe for the boom to extend for the automatic calibration process.

Read the section on calibrating the boom motor before turning power on.

TARGA PLC TERMINAL SOCKETS

TARGA PLC ON/
OFF breaker



Terminal	Function	Internal connection	External connection	External Function	Cable mark	Cable dim.	Colour marking Motor	IO1 PIN	Motor Description	
1	PSU	L	Power	Power	1	1,5 mm²				
2	PSU	N	Power	Power	2	1,5 mm²				
3	PSU	GND	Power	Power	3	1,5 mm²				
4	Signal	Relâ 1 -> DI1	Ext. Motor Signals	Signal (Dig. Input)	4	0,75 mm²	Grey	5	Digital Output 1	Boom extended signal
5	Signal	Relâ 2 -> DI2	Ext. Motor Signals	Signal (Dig. Input)	5	0,75 mm²	Pink	6	Digital Output 2	Boom retracted signal
6	Signal	J13:2 (DO1)	Ext. Motor Signals	Signal (Dig. Out)	6	0,75 mm²	White	1	Digital input 1	Retracts boom
7	Signal	J13:3 (DO2)	Ext. Motor Signals	Signal (Dig. Out)	7	0,75 mm²	Brown	2	Digital input 2	Extends boom
8	Signal	J10:1 (VCC)	Ext. Motor Signals	Signal (24V VCC)	8	0,75 mm²	Blue	7	VCC	
9	Signal	J10:4 (GND)	Ext. Motor Signals	Signal	9	0,75 mm²	Red	8	GND	
10	VCC	J42:1 24V (2A)	Ext. Motor Elec. Power	Power	10	0,75 mm²	Brown	1	P+	
11	VCC		Ext. Motor Elec. Power	Power	->10		White	2	P+	
12	GND	J42:2 GND	Ext. Motor Elec. Power	Power	12	0,75 mm²	Blue	3	P-	
13	GND		Ext. Motor Elec. Power	Power	->12		Grey	5	P-	
14	COM, all relays	COM	Ext. Motor Elec. Power	Power		0,75 mm²				
15	NO, Relay 1	J14:2 (DO3)		Supervisory	15	0,75 mm²				
16	NO, Relay 2	J14:3 (DO4)		Trouble	16	0,75 mm²				
17	NO, Relay 3	J15:2 (DO5)		Alarm	17	0,75 mm²				
18	NO, Relay 4	J15:3 (DO6)		Valve control	18	0,75 mm²				
19	NO, Relay 5	J16:2 (DO7)		System failure	19	0,75 mm²				
20	24V	J1:1 (24V)	FV300 24V		20	0,75 mm²				
21	RS485	J1:2 (B-)	FV300 FB-		21	0,75 mm²				
22	RS485	J1:3 (A+)	FV300 FB+		22	0,75 mm²				
23	GND	J1:4 (GND)	FV300 0V		23	0,75 mm²				
24	N	Term. 25			26	1,5 mm²				
25	L	AC/DC Supply			25	1,5 mm²				
26	N	AC/DC Supply			26	1,5 mm²				
27	L		Ext. Motor Main Supply		27	1,5 mm²	Brown		L2	
28	N		Ext. Motor Main Supply				Blue		N	
29	⏏		Ext. Motor Main Supply		29	1,5 mm²	Green/Yellow		Earth	

Calibrating the boom's linear movement

As mentioned in the previous section, the boom is fitted with a high-end 400W servo motor, the MAC400.

The motor has its own built-in micro controller.

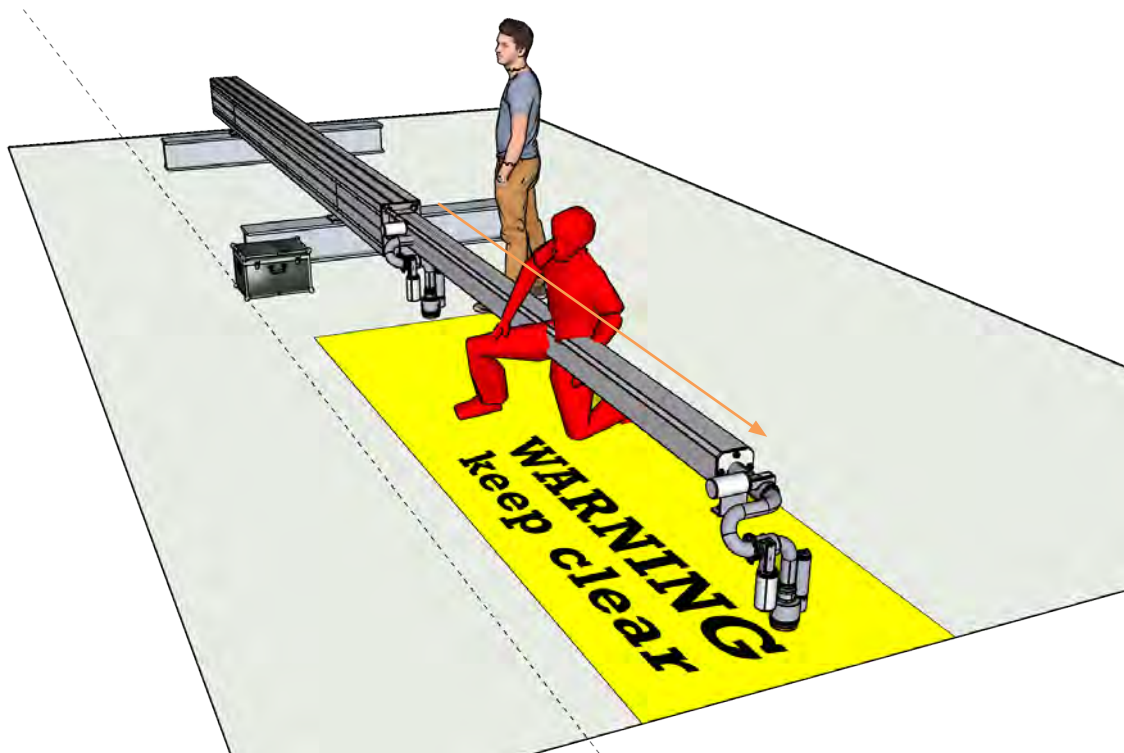
The MAC400 has been programmed to run a calibration as soon as the motor is powered up. This means that when connected to power, the boom will automatically begin to extend slowly, at 10% speed, and with reduced power, until it reaches the mechanical stop.

It will stop when the boom is fully extended. Set the outer mechanical stop as its Zero position, and return - still slowly and at reduced power, exactly 3900 mm, to its home position.

! DANGER

Make sure it is safe to extend the boom before activating the boom!!!

Damage to property and equipment, severe injury or death may occur.



The MAC400 motor gets its power from the PLC cabinet. It is connected over one master breaker, and 2 automatic fuses.

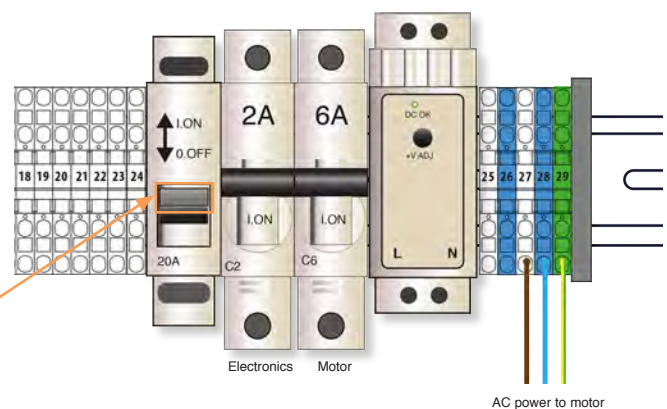
The 2A fuse covers 24V DC to the electronics.
The 6A fuse covers the 115/230 VAC to the motor power.

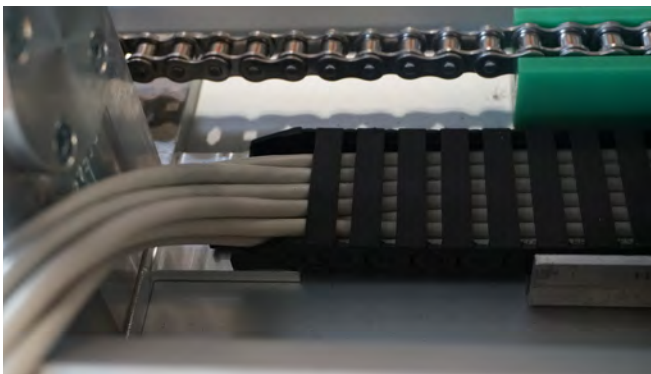
Confirm that both fuses are engaged (switched in the upper position).

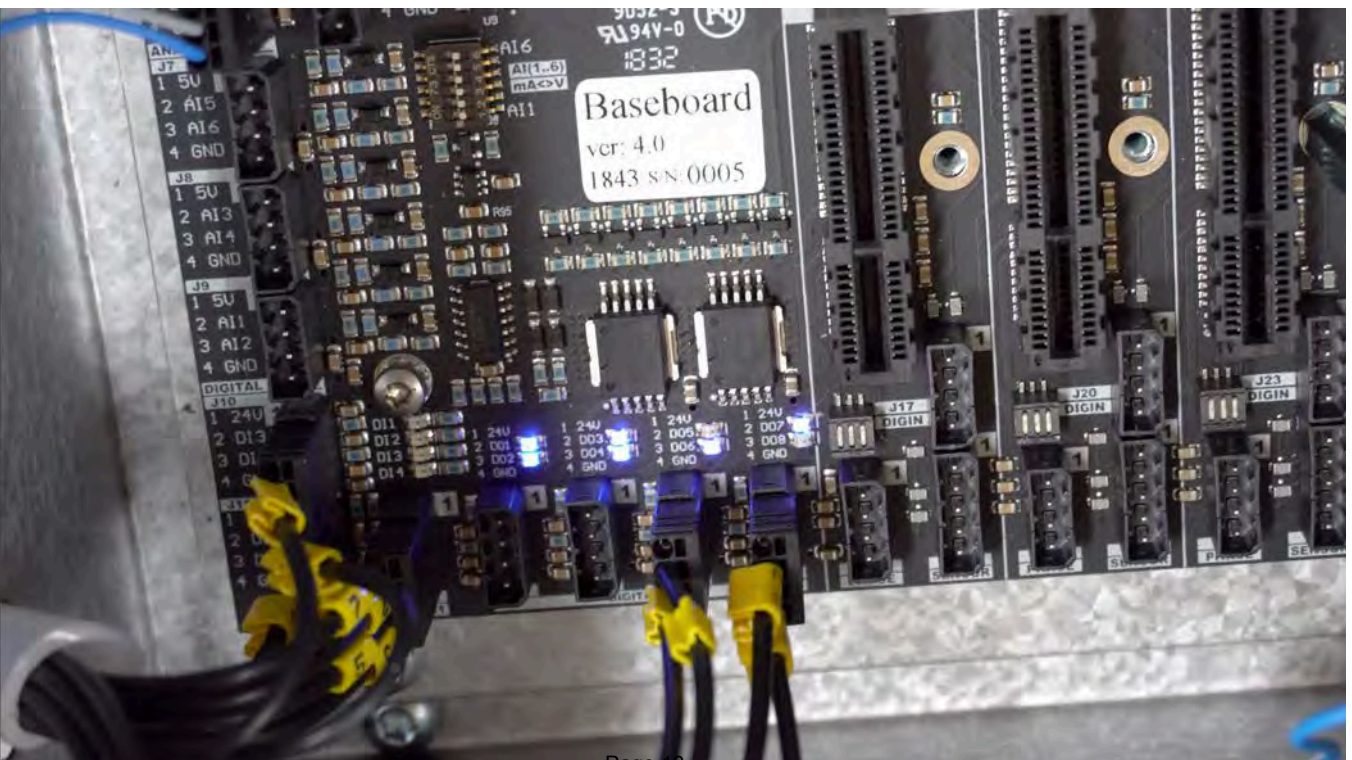
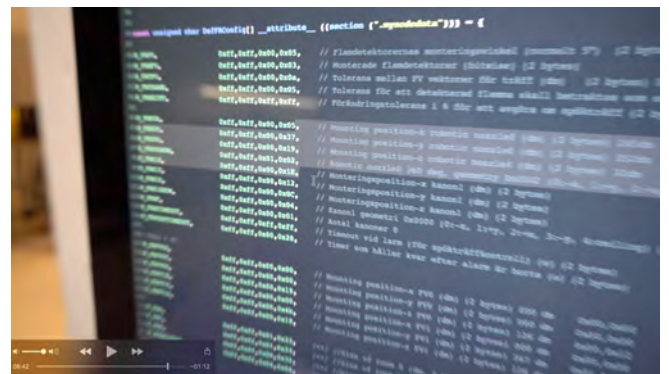
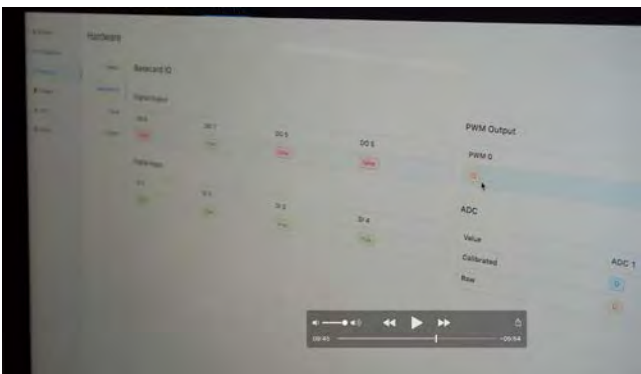
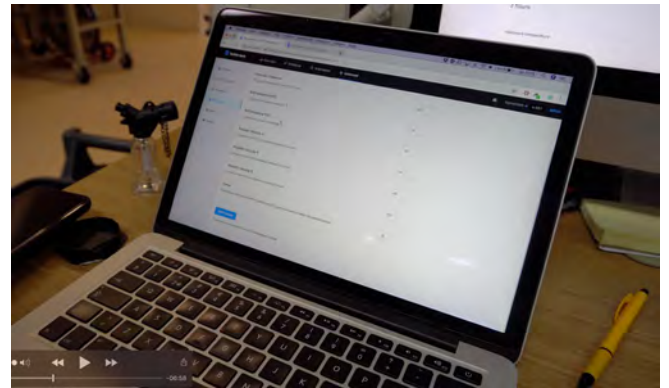
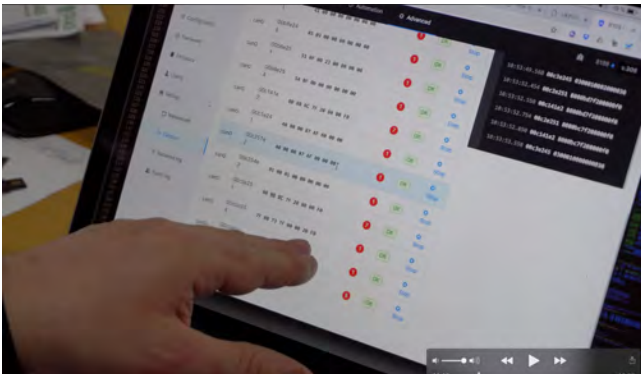
Be sure that it is safe for the boom to extend (ensuring that the boom is fully secured and there are no obstacles or obstructions in the way or other dangers). Then, flip the power to ON (move to upper position).

DANGER: This will initiate the boom calibration and it will slowly extend the boom out and back in.

Note: The boom will run calibration also if the **TARGA** PLC breaker is OFF.







Shipping the Unifire water cannon boom

The UNIFIRE water cannon boom has been designed with optimized logistics in mind. The booms fit in a 20ft container, allowing up to 36 booms to be stacked (4 layers of 9), and putting crates with the water cannons and electronics on top.

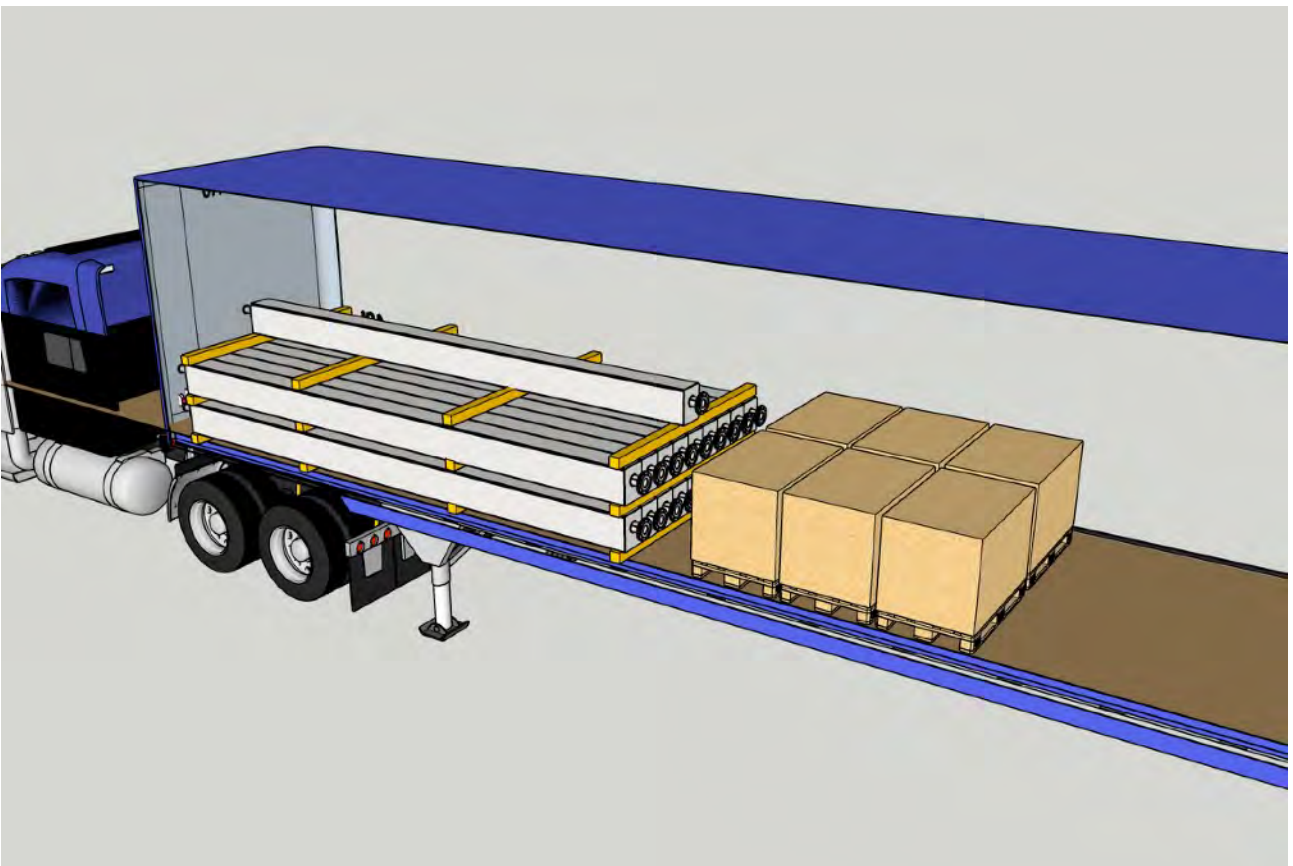
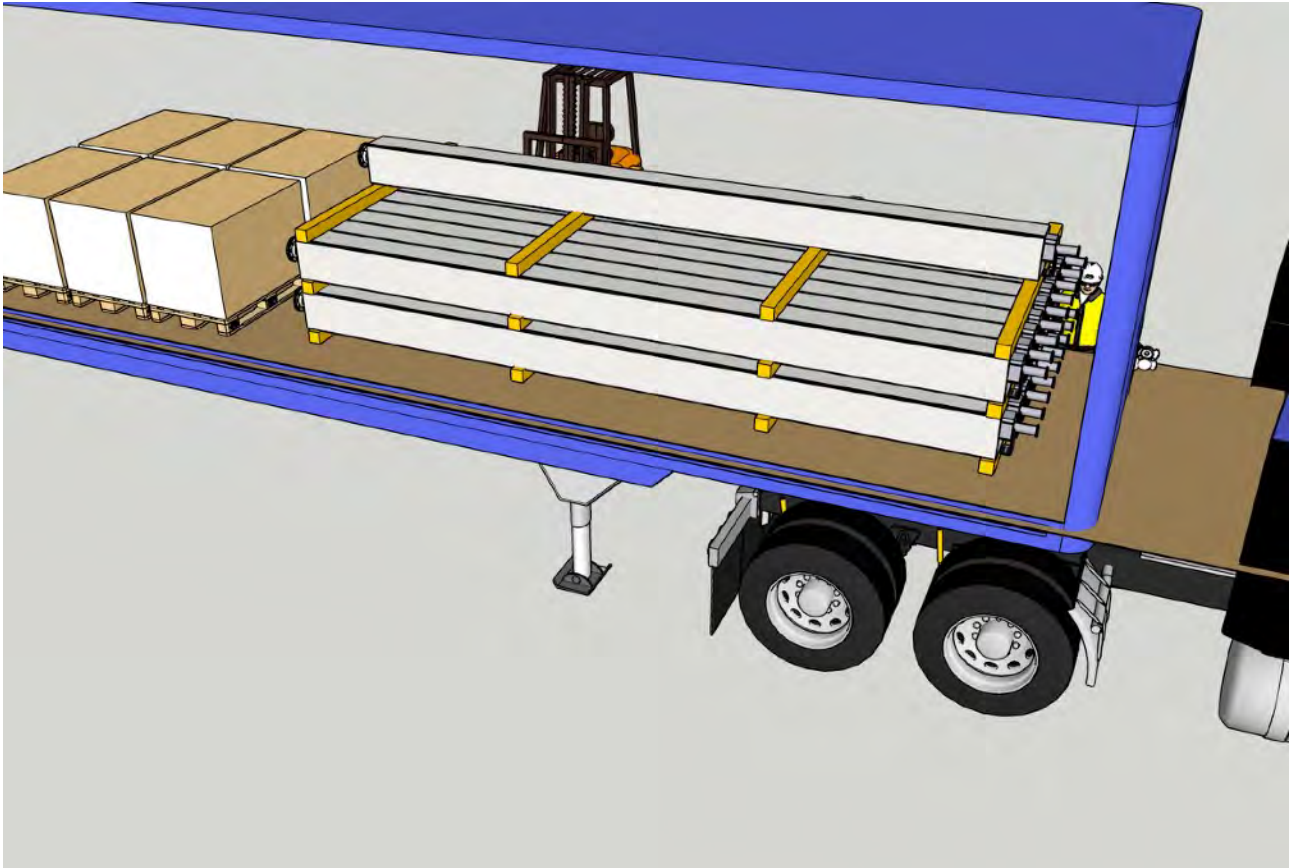


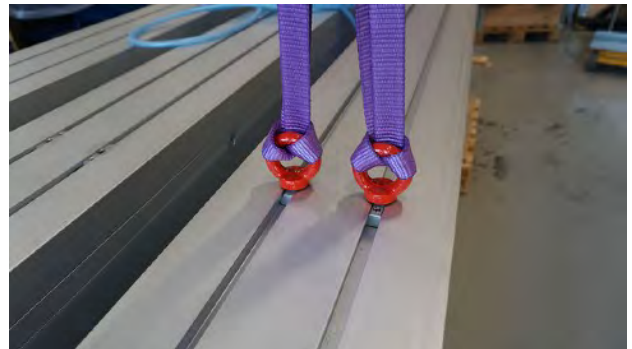
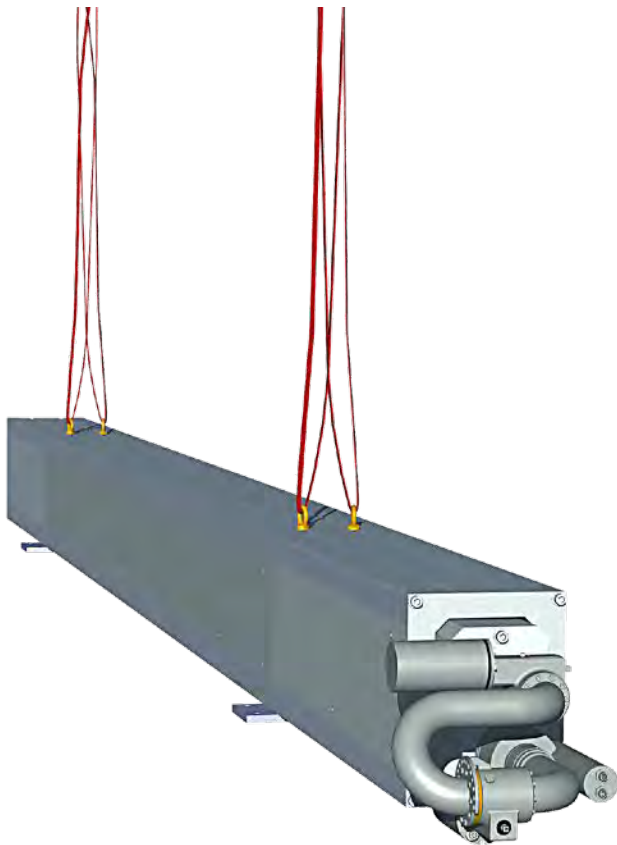
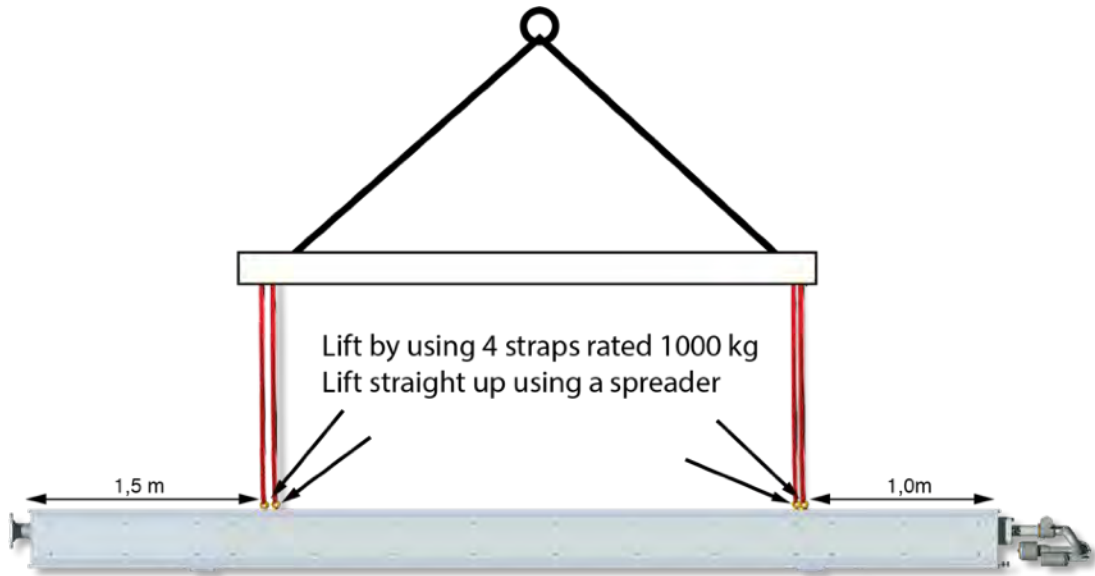
Ship up to 36 complete system in one 20ft container

The lifting eyes can be attached and removed, to allow for efficient stacking on a flat-bed trailer.

The installation bracket plates are also removed during transport to allow for effective and simple packaging and transport.







Remove the lifting eyes for transport



Remove the bracket / installation plate for transport