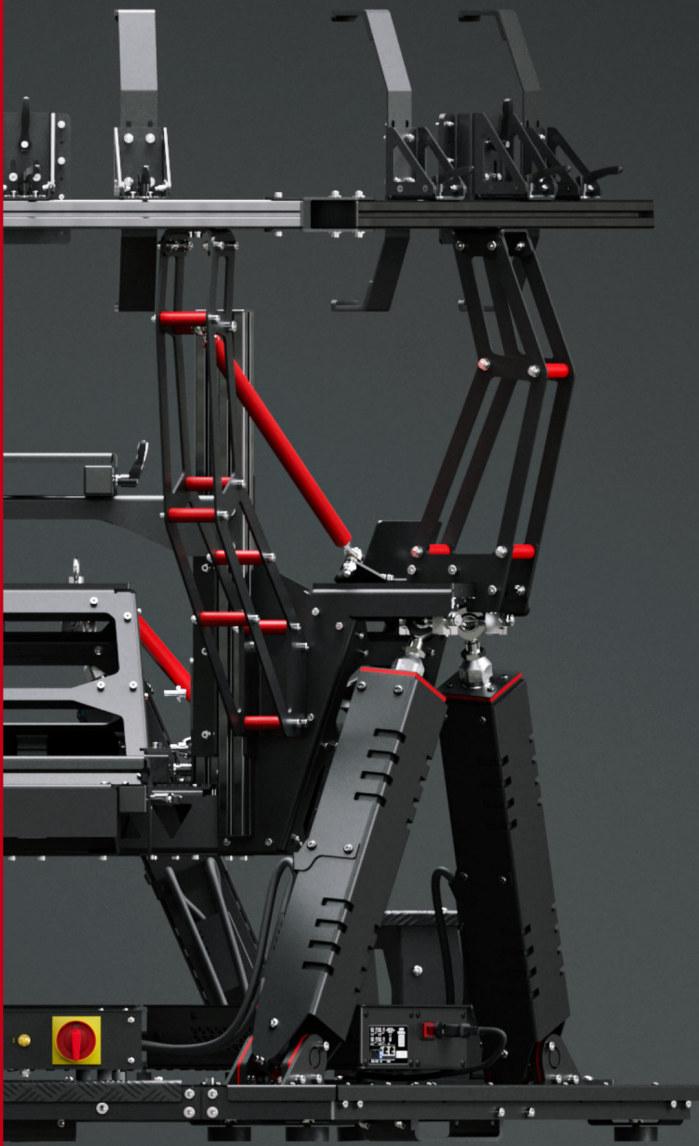# USER MANUAL

PRECISION IN MOTION **REDEFINED**

QS 525

The Motion Systems, manufacturer of Qubic System, would like to thank you for choosing the QS-S25, an innovative product that helps you to develop highly reliable training and entertainment solutions that reproduce key immersive elements, such as surface textures, acceleration, engine vibrations and vehicle dynamics for multiple types of land, air or sea vehicles. Our motion system has been designed to deliver the most realistic simulation experience. We hope you enjoy your new Qubic System!

Our experts are ready to assist you:
QubicSystem.com/contact

ASK
SUPPORT
Our experts are ready to assist you:
MotionSystems.eu/Support

SEARCH OUR
TUTORIALS
Everything you wish to know is here:
QubicSystem.com/Tutorials

SUPPORTED
GAMES
Racing games and professional simulation software:
QubicSystem.com/Supported-Games

DISCORD
YOU ASK, WE ANSWER
Join our discord server to ask questions:
Discord.com/invite/tuAtybvTRn

Contents

1. SAFETY PRECAUTIONS

WARNING

The device is intended solely for individuals **OVER THE AGE OF 16**. In case of use by individuals with limited physical, sensory, or mental capabilities, strict supervision is required. Read safety instructions before using the device.

WARNING

The device is **NOT** allowed to be used by a pregnant woman.

WARNING

DO NOT use the device around pets.

WARNING

Always ensure that cockpit attachment points can withstand forces generated by the QS-S25 (approved construction or tested for expected load). Check the cockpit for loose mounting points.

WARNING

To reduce the risk of burns, fire, electrical shock, injury or mechanical damage always **TURN OFF THE POWER SUPPLY** before plugging and unplugging the QS-S25.
Dangerous voltages level can be present in Power Cabinet for a few minutes after turning off the machine.

> **WARNING**
>
> **DO NOT** touch the actuators when the power is on.

- Use the QS-S25 only for its intended purpose, according to instructions.
- Unplug the QS-S25 from the power supply if it is not used for an extended period or when there is a need to perform hardware installation, maintenance, servicing or repairs.
- The QS-S25 was designed for indoor use only - **DO NOT** store or use the product outdoors.
- Keep the QS-S25 away from the heat sources, high humidity, water, and other liquids. **DO NOT** store in cold place where water condensation may occur.
- **DO NOT** disassemble the product. Any tampering with or altering the product will void the warranty, poses a serious risk of electric shock, and may irreparably damage the product.
- **DO NOT** cover the ventilation holes in the Power Cabinet.
- Keep the power cord plug and the socket dry, clean and dust-free.
- Protect the power cord from damage caused by being stepped on, rubbed against, or pinched.
- **DO NOT** use the QS-S25 if the ambient temperature is below 4° Celsius (39° Fahrenheit) or above 45° Celsius (113° Fahrenheit).
- **DO NOT** use the QS-S25 if it has been damaged, or any component is broken or missing. Please contact technical support.
- **DO NOT** use attachments or replacement parts not recommended or approved by the manufacturer. If you must replace a power cord, use only certified products with the same rating as the one being replaced.
- Any modifications to machine's settings and its cockpit are at the risk of the user/installer.
- Connect the QS-S25 to a properly grounded outlet only. See grounding instructions in section **2.9** on page **19**.
- If you want to increase safety level of the system, you can add external safety devices. For detailed information see section **7** on page **82**.

> **WARNING**
>
> Stop using the QS-S25 immediately and contact technical support when the machine starts to emit unusual noise, smoke or any other suspicious behavior indicating the machine is not working properly.

1.1. HEALTH AND SAFETY INSTRUCTION

The safety of Qubic System users is top priority. To protect users and bystanders from injuries caused by mechanical parts movement and electric shock, the following instructions **MUST BE** followed.

WARNING

As with any mechanical device, user is the one responsible for inspecting the condition of the machine before using it and ensuring safe working conditions.

What must be checked before turning on the device:

■ Ensure that nothing is blocking machine's movements or air vents. The minimum distance between the air vents in the Power Cabinet's and any outside part of the cockpit equipment is 10 cm (4 in).

■ Check if cables are mounted correctly – they must **NOT** be stretched or loosely connected to the socket. Placed them out of the moving range of the device components.
■ Check if all components are correctly mounted.
■ Check if there are no sharp edges near the moving range of the cockpit.

WARNING

Dangerous voltage level are present in the Power Cabinet and cables during the operation and for up to a few minutes after turning off the machine.

How to safely turn on and use the QS-S25:

- Ensure that everyone around is aware of cockpit's rapid movements.
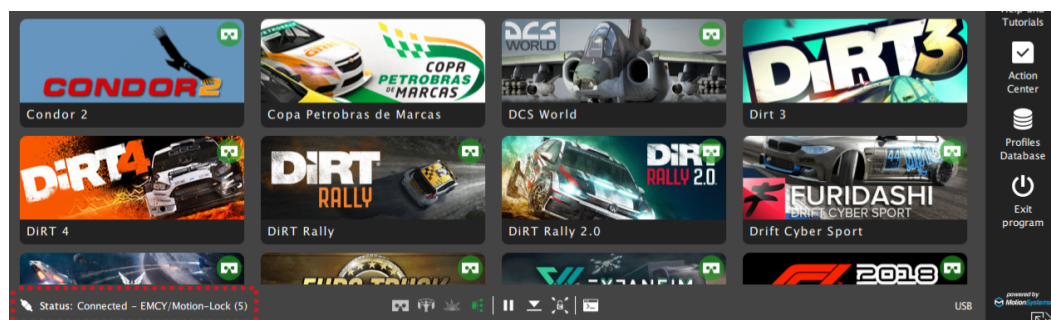- Ensure that no one stands in the range of the motion (minimum of 1.5 m [5 feet]).

> **WARNING**
>
> In order to perform a start-up calibration QS-S25 will move automatically after turning it on. **DO NOT** approach the device and **DO NOT** interfere until the procedure is over.

- **DO NOT** change the payload weight mounted to the QS-S25 during a start-up calibration.
- Motion Lock Switch should be mounted within the reach of the user – it has to be available immediately in every situation. Different seat positioning setups should be taken into account.
- Check the Motion Lock Switch **AT LEAST** once a month to reduce the possibility of unknown and unexpected failure.
- Before getting on and off the machine activate Motion Lock Switch by pressing it down.
- In case of game crash or freeze - Motion Lock Switch must be triggered (pressed down) before getting off the machine.

> **INFO**
>
> To check if the QS-S25 is in the Motion Lock mode - go to QubicManager application main window. Platform status is displayed in the lower left corner of the main application window:
>
>

Motion Lock input is not SIL/PL (safety integrity level/performance level) rated and **DOES NOT** guarantee safety. If you wish to achieve specific SIL/PL ranking, consider introducing a power cut-off device that is controlled by an external safety relay and cuts off the power to all Power Cabinets. Example application of the power cut-off contactor can be found in section **7.3.2** and **7.3.3** on pages **86** and **88**.

- For VR Headset users:
    - Remove the VR goggles before entering or exiting the rig.
    - Ensure that cables from the VR Headset are not in the movement range of the QS-S25.
    - Ensure that the whole VR setup is not in the motion range of the QS-S25.
    - Ensure that VR setup cables are protected from being crushed by the QS-S25 – **DO NOT** place them loosely under the motion rig.

It is **recommended** that the connected PC is capable of running the game at stable 90 frames per second or more when VR Headset is used. Lower values can cause VR sickness.
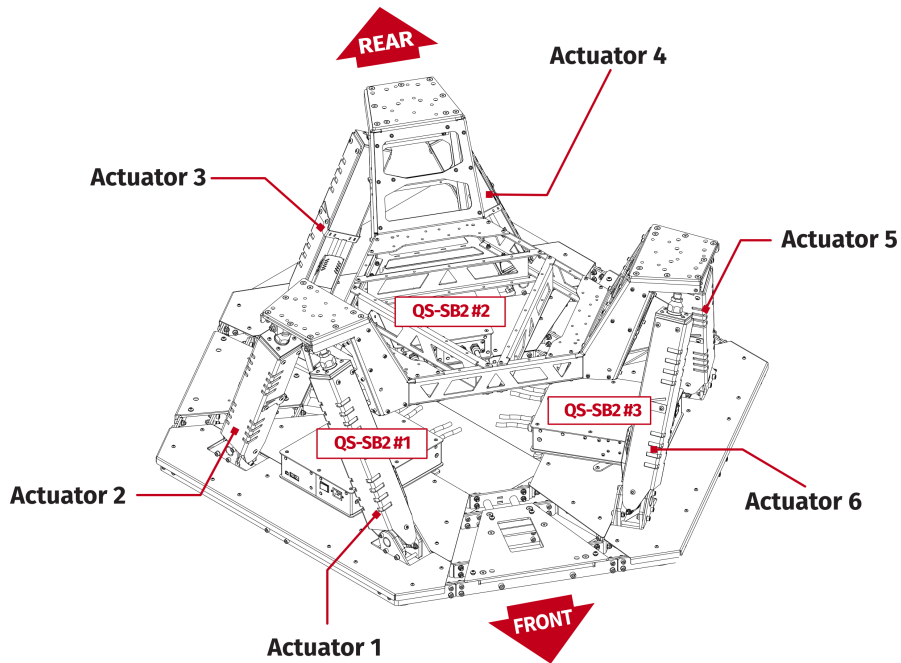
- **DO NOT** use QS-S25 if you are pregnant, tired, or under the influence of alcohol or narcotic substances.
- **STOP USING** the QS-S25 immediately if you start feeling pain, fatigue or any physical or mental discomfort.
- User **MUST** always be mentally and physically capable of operating the simulator at its full performance.
- For every two hours of playing, we recommend at least **15 MINUTES OF BREAK**.
- **DO NOT** put your hands or legs in the actuator's range of motion!
- **DO NOT** use the QS-S25 with small children or pets around.
- **DO NOT** put any items between actuators and stabilization plates.
- **DO NOT** pull the wires connecting the actuators with the Power Cabinets.
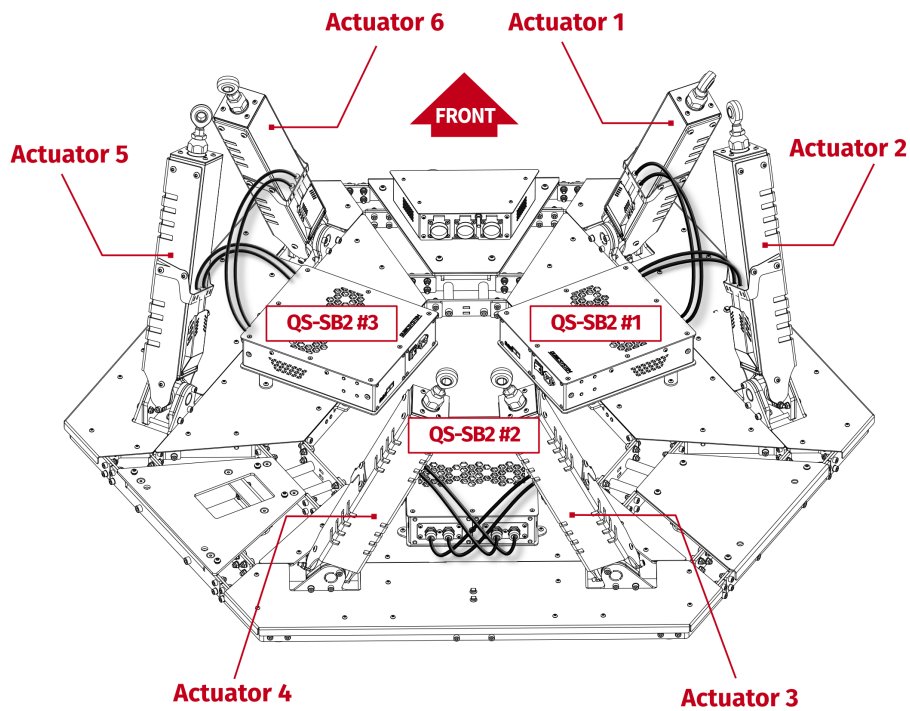- **Always** fasten the seat belt while using the QS-S25.

2. PRODUCT DESCRIPTION

2.1. COMPLETE VIEW

QS-S25 basic setup overview:

Actuators numbering and connections with power cabinets:

QS-S25 basic with all additional accessories overview:

Monitor holder

Steering wheel mounting bracket

Monitors mounting bracket

Seat mounting bracket

REAR

Pedals mounting bracket

FRONT

Shifter, handbrake mounting bracket

VR googles hanger

Power switch box

INFO

Use only monitors compatible with VESA 100 x 100 32" type mounting.

2.2.   DIMENSIONS

QS-S25 basic setup dimensions:

381.00

769.25

1603.06

1557.12

1199.12

Ø1492

Ø1850

INFO

QS-S25's maximum heave is 108.3 mm (4.26 in) - ensure that the room in which the motion platform will operate has a high enough ceiling (including accessories + monitors).

QS-S25 dimensions with accessories:

1559.25

1297.25

769.25

1701.11

1655.17

∅1850

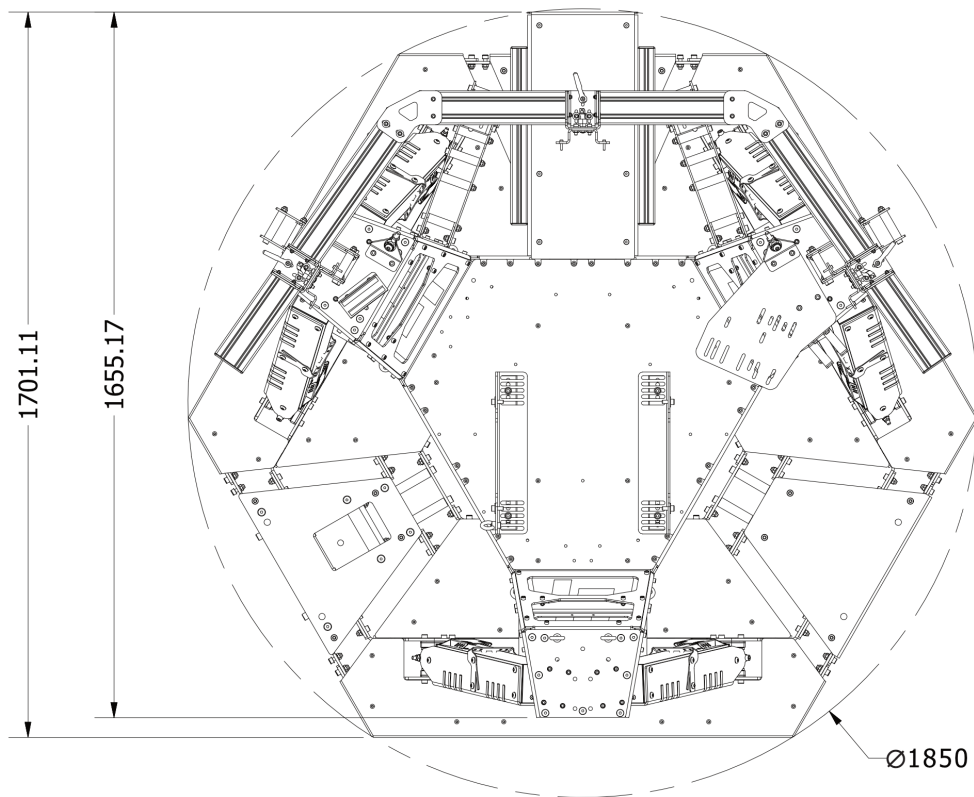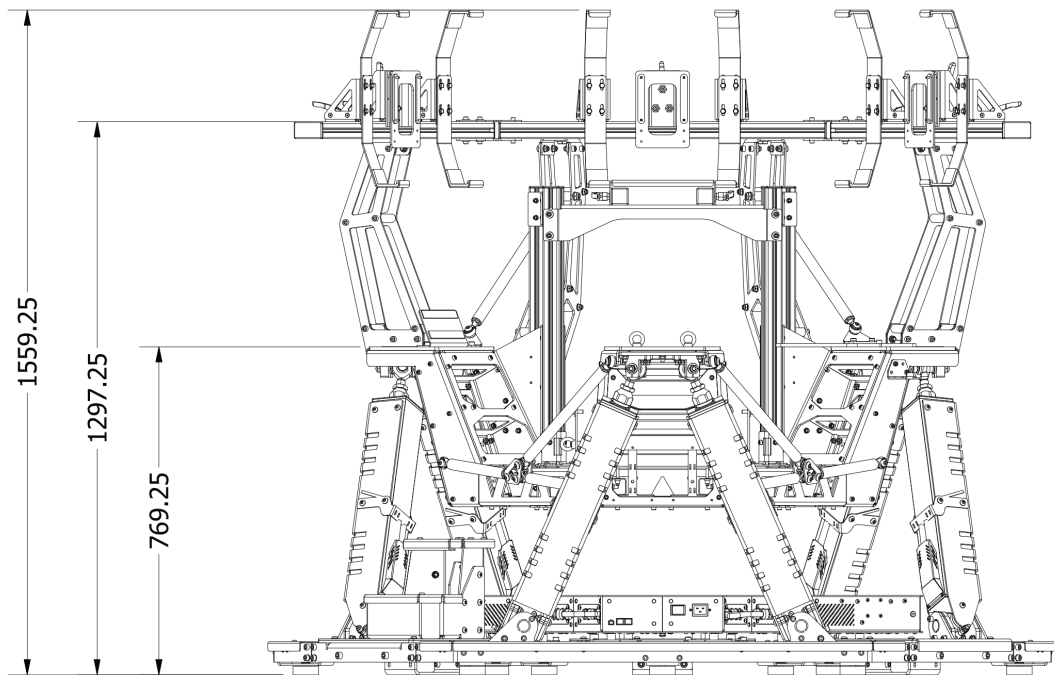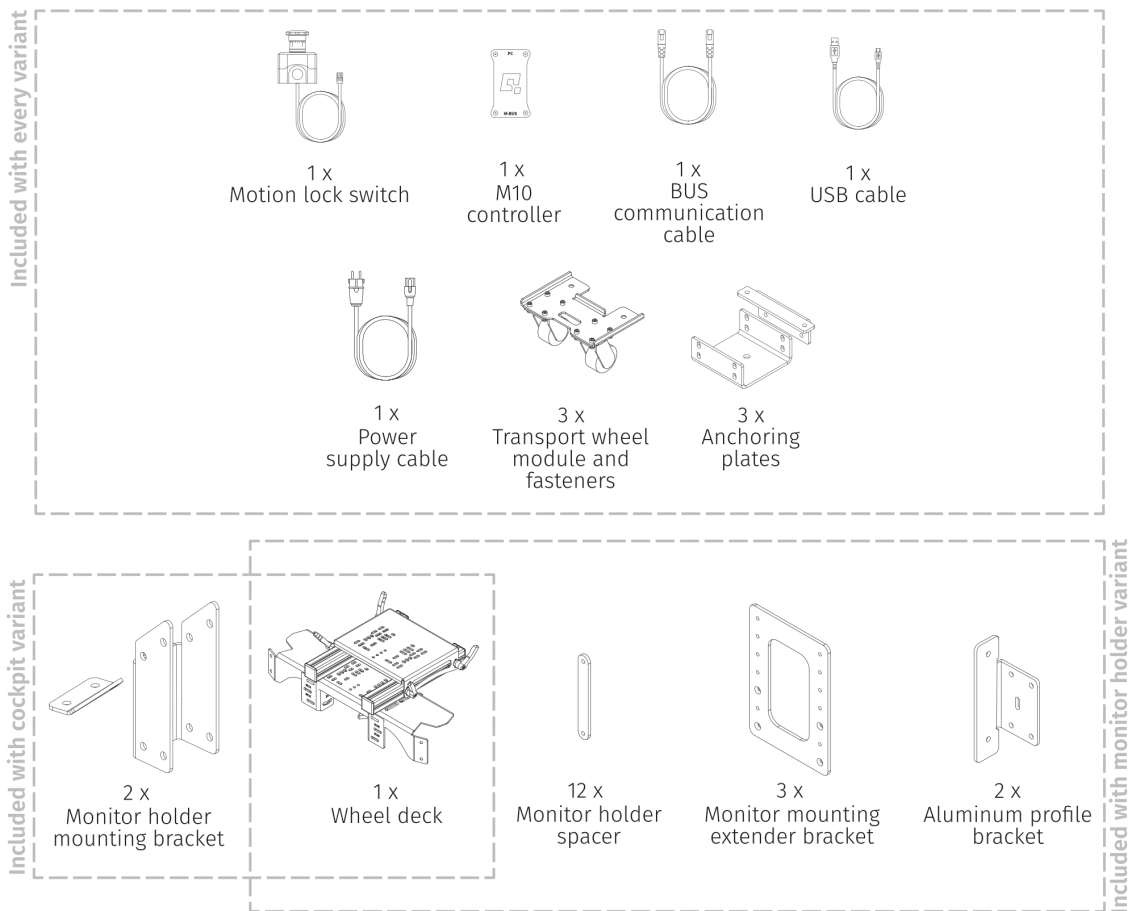## 2.3. COMPONENTS (ASSEMBLED VARIANT)

QS-S25 (assembled) components:

Included with every variant

1 x
Motion lock switch

1 x
M10
controller

1 x
BUS
communication
cable

1 x
USB cable

1 x
Power
supply cable

3 x
Transport wheel
module and
fasteners

3 x
Anchoring
plates

Included with cockpit variant

2 x
Monitor holder
mounting bracket

1 x
Wheel deck

12 x
Monitor holder
spacer

3 x
Monitor mounting
extender bracket

2 x
Aluminum profile
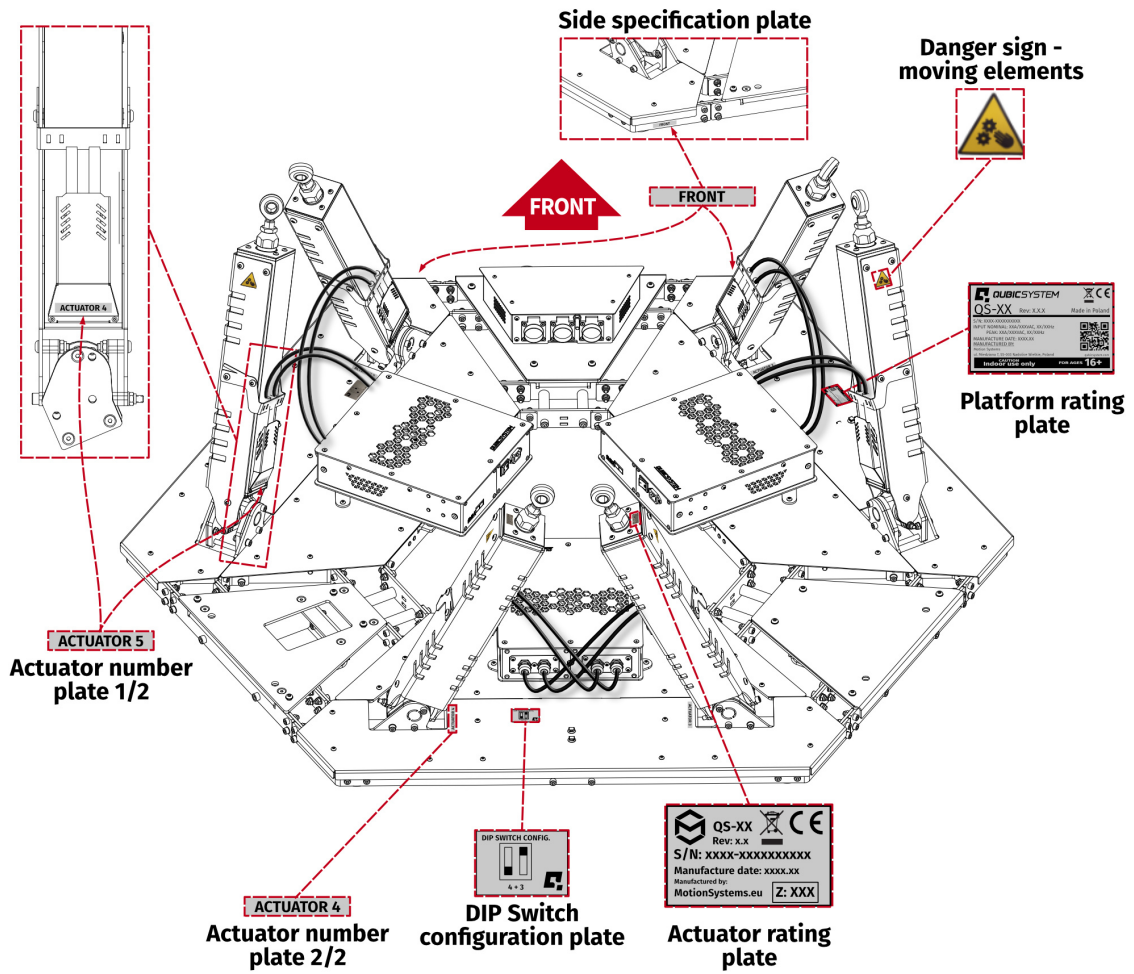bracket

Included with monitor holder variant

INFO

For information on components in modularized variant go to section **3** on page **22**.

2.4. LABELS AND WARNING PLATES PLACEMENT

Side specification plate

Danger sign - moving elements

FRONT

FRONT

Platform rating plate

ACTUATOR 4

ACTUATOR 5
Actuator number plate 1/2

ACTUATOR 4
Actuator number plate 2/2

DIP SWITCH CONFIG.
DIP Switch configuration plate

Actuator rating plate

2.5.   SAFE DISTANCES

Minimum safe distances from the QS-S25 edges are shown below:

INFO

Keep in mind that QS-S25 might move during simulation, occasionally check if the safe distances are kept to avoid damages by QS-S25 hitting for example wall or TV screen.
To ensure that safe distance is always kept - anchor the machine to the ground. For more details go to section **Anchoring** on page **63**.

2.6.   ENVIRONMENTAL CONDITIONS

QS-S25 shall be operated within ambient conditions as specified below:

- Only indoor use
- Temperature : 0° - 40° Celsius / 32° - 104° Fahrenheit
- Humidity : 0 - 70 % (without condensation)
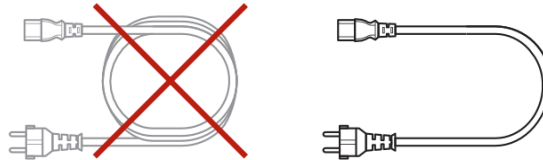- Maximum altitude : up to 2000 m / 6561 ft

2.7. POWER REQUIREMENTS

Power Cabinet (QS-SB2) contains the power supply for connected actuators. If there is no certainty if fuses or entire electrical installation can handle QS-S25, contact qualified electrician.

INFO

Ensure that the extension cord used to power the QS-S25 meets cross-section requirements:

- EU - 3 x 1.5 mm2
- USA - 3 x 14 AWG

2.8. POWER CONSUMPTION

Tables below contain power consumption data on Performance mode (Q-MODE is unavailable for QS-S25).

Voltage - 230V:

Converter specification		Breaker specification	Power consumption	
Average Power [kVA]	Peak Power [kVA]	Peak Current [A]	Average Power (stress test) [kW]	Average Power (typical game) [kW]
1,3	2,4	11	0,46	0,20

Voltage - 110V:

Converter specification		Breaker specification	Power consumption	
Average Power [kVA]	Peak Power [kVA]	Peak Current [A]	Average Power (stress test) [kW]	Average Power (typical game) [kW]
0.9	1.5	13	0.45	0.24

Be aware that with heavier payload, and/or more intensive simulation, average Power consumption may rise.

2.9. GROUNDING REQUIREMENTS

In case of a system malfunction or breakdown, grounding provides a path of the least resistance for electric current to reduce the risk of electric shock. If the location (where the QS-S25 is set up) can not provide proper grounding according to the description, please contact a qualified electrician for assistance.

DO NOT modify the plug provided with the power cord - if it does not fit the outlet, contact a qualified electrician for assistance.

WARNING

The device is **NOT** intended to be used in an IT earthing/grounding system.

INFO

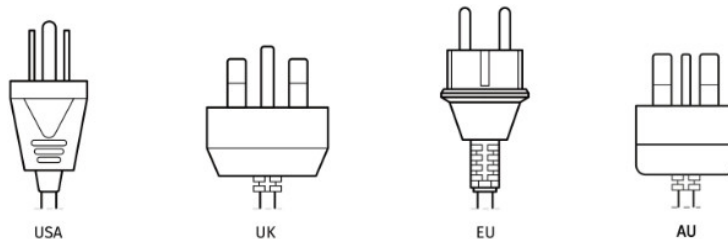Use only high-quality power plug adapters purchased from a trusted supplier.
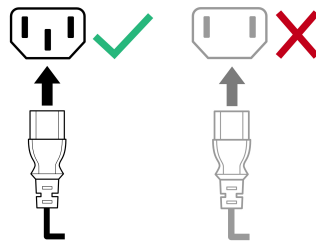
The power supply for QS-S25 includes an electric cord with an equipment-grounding conductor and a grounding plug. The plug must be plugged into a matching socket that is correctly installed and grounded in accordance with appropriate local codes and ordinances. It is recommended to use multiple, separately fused wall sockets.

If your electrical installation does not provide you with that option look into other electrical safety protection systems in section **7.3.2** on page **86**.

Applicable plugs for different regions:

Check if the power cord plug has a grounding connection (3 pins). In order to reduce risk of electric shock **DO NOT** use a plug without grounding connection (without a center pin).
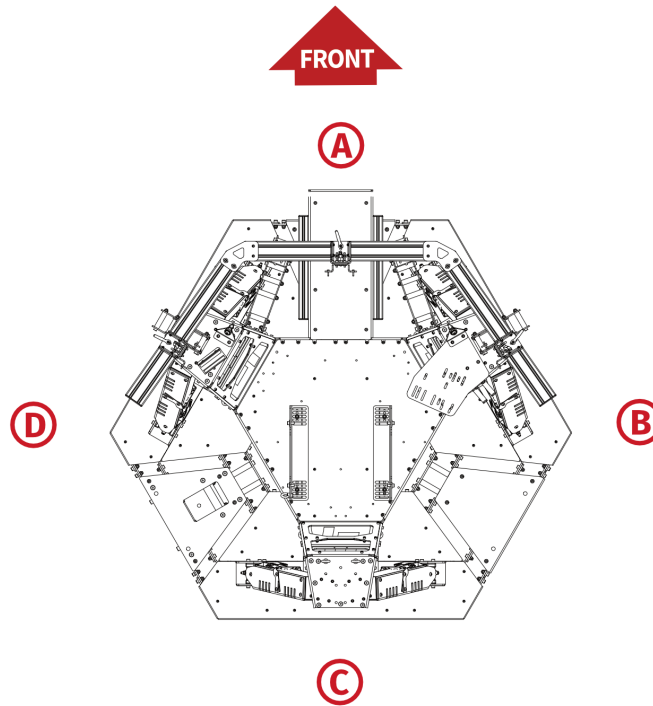

INFO

For more details on connecting Power cords and grounding wiring, see section **Connecting power cords** on page **68**.
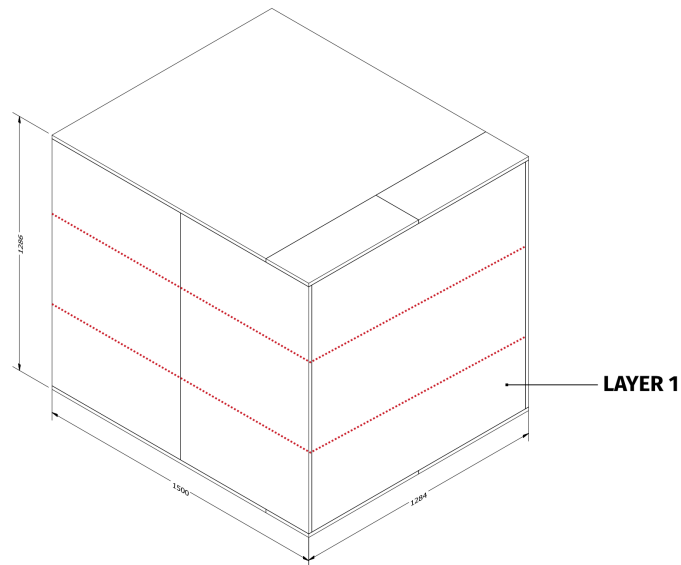
2.10.   NOISE EMISSION

The QS-S25 was checked for noise level based on actual standards. Noise level during normal work condition is not over 80 dB. Measuring method is compliant with ISO 11202. Four measuring positions as shown on the picture are placed 160 cm from the floor level and 100 cm from the edge of the device.
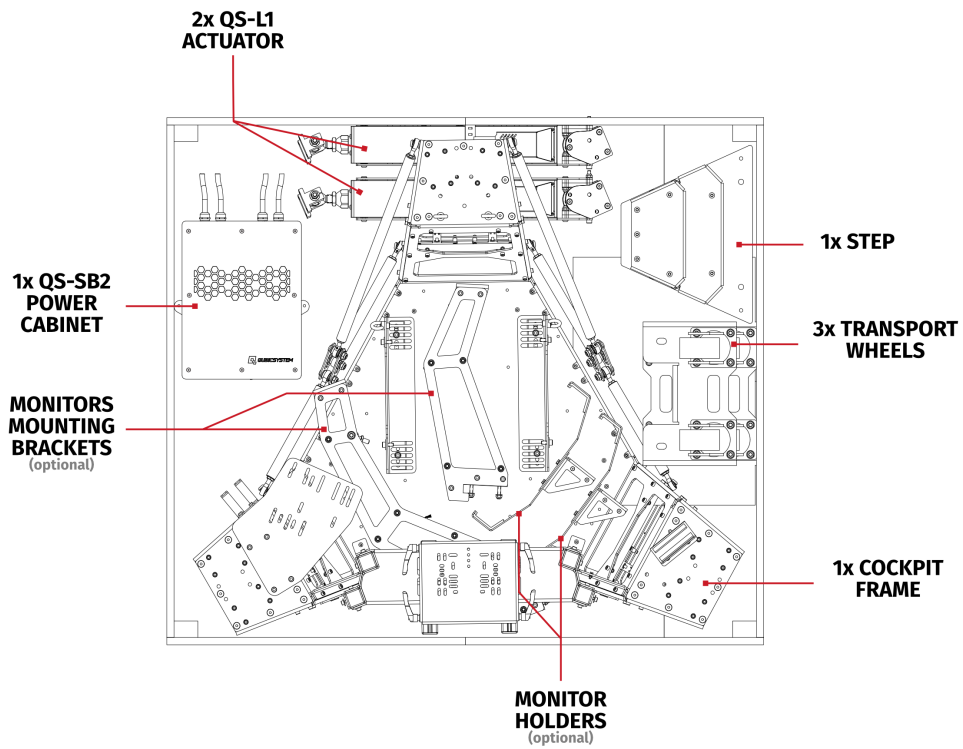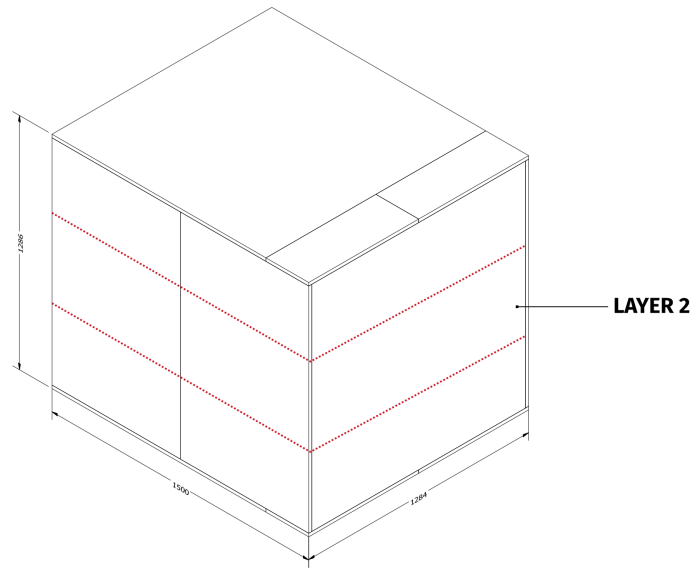

Measurement point	A	B	C	D
Measurement conditions: ■ Sinus input signal ■ Auto acceleration ■ 100% speed ■ Heave 50 mm ■ 0,9 Hz frequency ■ 250 kg ballast load	60,7 dB(A)	63,4 dB(A)	62,9 dB(A)	63,2 dB(A)
■ Typical game ■ 250 kg ballast load	53,9 dB(A)	56,8 dB(A)	57,8 dB(A)	58,6 dB(A)

3. QS-S25 MODULARIZED ASSEMBLY

LAYER 1

LAYER 1

2x QS-L1 ACTUATOR

1x QS-SB2 POWER CABINET

MONITORS MOUNTING BRACKETS
(optional)

1x STEP

3x TRANSPORT WHEELS

1x COCKPIT FRAME

MONITOR HOLDERS
(optional)

LAYER 2

LAYER 2

SWITCH BOX

SEGMENT #3

CONNECTOR #3

2x QS-L1 ACTUATOR

1x PEDALS MOUNTING BRACKET

1x QS-SB2 POWER CABINET

LAYER 3

LAYER 3

SEGMENT #2

CONNECTOR #2

2x QS-L1 ACTUATOR

1x QS-SB2 POWER CABINET

CONNECTOR #1

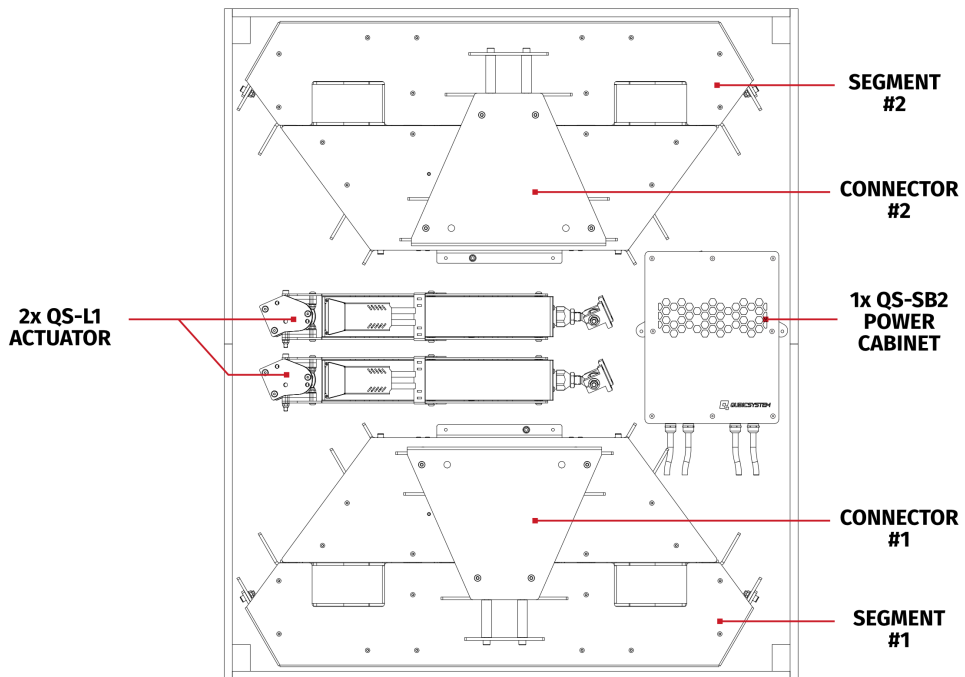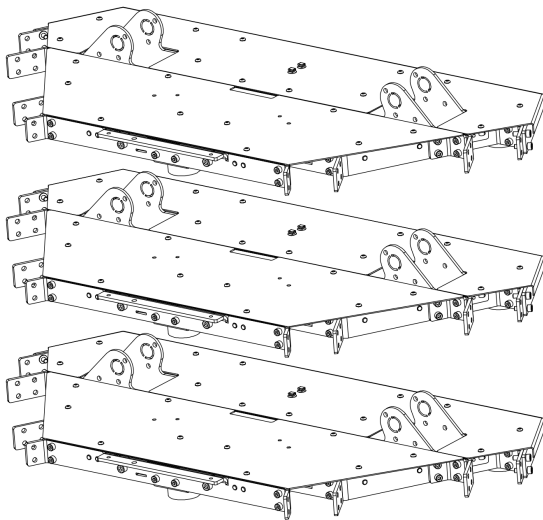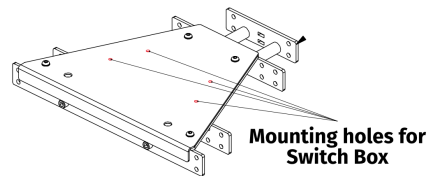SEGMENT #1

3.1. LOWER FRAME ASSEMBLY

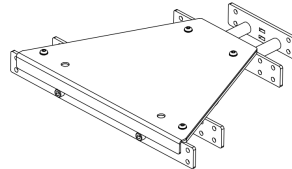| Operation	Tools
Unpack the segments and connectors. Front side connector has additional holes for mounting power switch box.	by hand

3 x Segment

1 x Front connector

Mounting holes for
Switch Box

1 x Right connector

1 x Left connector

Operation	Tools
Turn the connectors and segments upside down, connect the segments with connectors using bolts, nuts and washers as shown on the illustration.	6 mm hex key, 13 mm socket wrench

FRONT CONNECTOR

SEGMENT #3

SEGMENT #2

LEFT CONNECTOR

RIGHT CONNECTOR

SEGMENT #1

16x
DIN 6797 J 8,4
toothed
washer

16x
DIN 125
A 8,4
washer

24x
DIN 985
M8 nut

24x
DIN 912
M8x25

Operation	Tools
Lay down the braided wires (grounding connections), M-BUS cables, power supply cables as shown on the illustration. Cables will be connected to the power cabinets later on. Braided wires shall be connected to the switch box, power cabinets and cockpit frame.	by hand

FRONT

REAR

Braided wire
Power supply cable
M-BUS cable

3.2. MOUNTING ACTUATORS AND POWER CABINETS

Operation	Tools
Place the power cabinets and actuators according to the layout shown below.	by hand

Place the actuators as shown on the layout. Power supply and control cables from power cabinet to the actuator should cross each other.

Operation	Tools
Configure the CFG switches according to the actuators layout.	by hand

Operation	Tools
Bolt in the power cabinets with segments. Power cabinets has attached mounting brackets with vibro-isolators, place them on the segment and screw in using bolts and nuts for the connection.	5mm hex key, 10mm socket wrench

2x ISO 7380-1 - M6 x 16 black bolt

2x DIN 125 – A 6,4

Bolt for grounding connection

Braided wire

2x DIN 985 – M6

Operation	Tools
Unbolt the marked bolt, connect and screw in the short braided wire from the backside grounding connection bolt.	5mm hex key

Operation	Tools
Connect the actuators with the base frame segments.	6mm hex key, 13mm socket wrench

4x DIN 6797 J 8,4 toothed washer

6x DIN 912 – M8x30 bolt

6x DIN 985 – M8 nut

3.3.   MOUNTING COCKPIT FRAME
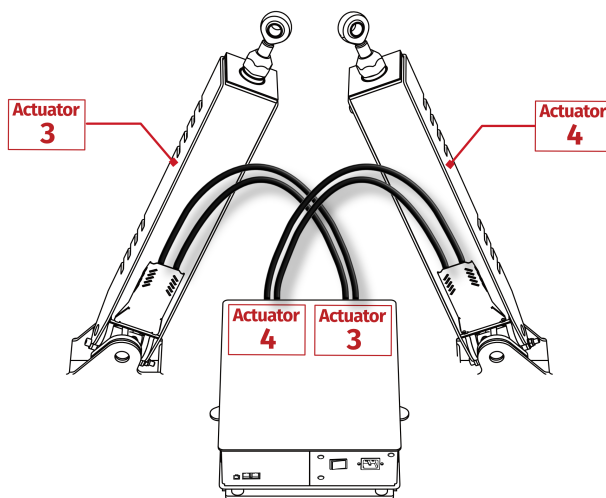
Operation	Tools
Connect the actuators with the cockpit frame.	5mm hex key, 10mm socket wrench

8x DIN 912 – M6 x 30 bolt

8x DIN 125 – A 6,4 washer

8x DIN 985 – M6 nut

QS-S25

Operation	Tools
Optional - connect the wheels to the lower frame segments in order to move the device to the designated location.	19mm socket

DIN 933 – M12 x 90 bolt

DIN 9021 – 15 (M14) washer

WARNING

Do not use the device with attached transportation wheels. Wheels shall be attached only for transportation purposes.

3.4. MOUNTING LOWER FRAME ACCESSORIES

Operation	Tools
Connect the switch box, stairs and steel plate with lower frame connectors.	5mm hex key, 10mm socket wrench

DIN 985 – M6 nut

DIN 125 – A 6,4 washer

4x ISO 7380-1 – M8 x 20

4x DIN 6797 – J 8,4 toothed washer

SWITCH BOX

FRONT

STAIRS

CORRUGATED STEEL PLATE

4x ISO 7380-1 – M8 x 20 bolt

4x DIN 6797 – J 8,4 toothed washer

3.5.   MOUNTING COCKPIT ACCESSORIES

Before mounting cockpit accessories power-up the device and check if the pitch and roll movements are correct. Run QubicManager → Tools and Diagnostic → Platform Diagnostic and check correctness of the movements. If any of the movement is incorrect then the actuators were installed in the wrong place.

Cockpit accessories overview :

3.5.1 SEAT MOVER

Operation	Tools
Connect the seat mover with cockpit. Slide in slot nuts into the seat mover railings and screw it in from below of the frame.	5mm hex key

FRONT

Hole shall be on the back

Slot Nut 8 M6

DIN 9021 – 6,4 washer

DIN 912 – M6 x 16 bolt

3.5.2 KEYBOARD HOLDER

Operation	Tools
Connect the keyboard holder with the cockpit frame.	6mm hex key, 13mm socket wrench

3.5.3 SHIFTER/HANDBRAKE PLATE

Operation	Tools
Connect the shifter/handbrake plate with the cockpit frame.	6mm hex key, 13mm socket wrench

4 x DIN 912 - M8 x 40

4 x DIN 125 - A 8,4
4 x DIN 985 - M8

FRONT

3.5.4 VR GOGGLES HANGER

Operation	Tools
Connect the VR goggles hanger with the cockpit frame.	5mm hex key

2 x DIN 912 – M6 x 20 bolt

FRONT

3.5.5 STEERING WHEEL DESK

Operation	Tools
Assemble the steering wheel desk as shown on the illustrations. Do not mount the additional bracket if you wish to install the monitor holders.	4, 5, 6mm hex key

DIN 125 – A 6,4 washer and DIN 985 – M6 Nut

from the inside

DIN 9021 – 6,4

Slot Nut 8 M6

DIN 912 – M6 x 20

FRONT

✗ Do not mount this bracket when using monitor holders (see section – mounting monitors holders)

T-Slot nut M6

DIN 912 M6 x 20

DIN 912 – M6 x 25

FRONT

**DIN 125 – A 6,4
washer
and
DIN 985 – M6 Nut
from the platform**

DIN 6798 – J 8,4

DIN 912 – M8 x 20

DIN 6798 J6,4

DIN 912 M6 x 20

FRONT

Slot Nut 8 M6

DIN 6798 – J 6,4 washer

DIN 912 – M6 x 16 Bolt

described in later steps

Slot Nut 8 M6

DIN 6798 – J 6,4
toothed
washer

DIN 912 – M6 x 16
bolt

FRONT

Slot Nut 8 M6
DIN 6798 – J 6,4
DIN 912 – M6 x 16

ISO 7380-1 – M6 x 25

Operation	Tools
Connect right side bracket the same way as the left one.	4, 5, 6mm hex key

Assemble right side brackets the same way

FRONT

Operation	Tools
Put in the plastic endings on the brackets. Connect the steering wheel desk to the side brackets.	5mm hex key

Slot Nut 8 M6
DIN 9021 – 6,4 washer
DIN 912 – M6 x 16 bolt

Plastic cover

3.5.6 STEERING WHEEL BRACKET

Operation	Tools
Optional Install the direct drive mounting bracket.	5, 6mm hex key

8x DIN 912 - M6 x 16 Bolt

8x Slot Nut 8 M6

DIN 912 - M8 x 20 bolt   **DIN 9021 - 8,4 washer**

3.5.7 PEDALS BRACKET

Operation	Tools
Put in the pedals mounting bracket as shown on illustration. Remove 6 bolts from the spacers.	4mm hex key

Operation	Tools
Attach the pedals set to the frame.	4, 5mm hex key

ISO 7380-1 M6 x 45

Spacer

DIN 985 M6

DIN 125 A6,4

DIN 912 M6 x 20

Operation	Tools
Put in the removed bolts through the holes in the cockpit frame and use them to connect the pedals bracket with cockpit frame.	4mm hex key

Pedals bracket mounting points

6 x ISO 7380-1 – M6 x 45 bolt

ISO 7380-1 – M6 x 45

FRONT

Side view

FRONT

3.5.8 MONITORS HOLDERS

Operation	Tools
Connect the monitors holder front bracket.	5mm hex key

Operation	Tools
Connect the monitors holder side bracket.	6mm hex key, 13mm socket wrench

DIN 912 – M8 x 35 bolt

Remove this bolt before mounting

DIN 125 – 8,4 washer

DIN 985 – M8 nut

Operation	Tools
Connect the monitors holder front bracket - pull rod.	6mm hex key, 13mm socket wrench

DIN 912 – M8 x 45 bolt
DIN 125 – A 8,4 washer
DIN 985 – M8 nut

DIN 912 – M6 x 20 bolt
DIN 125 – A 6,4 washer
DIN 985 – M6 nut

Operation	Tools
Connect the monitors holders top frame.	5mm hex key

Slot Nut 8 M6

DIN 9021 – 6,4 washer

DIN 912 – M6 x 16 bolt

DIN 912 – M6 x 16 bolt

DIN 9021 – 6,4 washer

Slot Nut 8 M6

Operation	Tools
Connect the monitors mounting brackets to the top frame	2.5, 3, 5mm hex key

DIN 912 - M6 x 16

DIN 912 - M4 x 20 bolt for monitor

DIN 912 - M6 x 16 bolt

Adjustable lever

DIN 9021 - 6,4 washer

Slot Nut 8 M6

DIN 985 – M4 nut

DIN 125 – A 4,3 washer

DIN 7991 – M4x16 bolt

DIN 912 – M4 x 20 bolt

Mounting bracket for adjusting monitor height, in case when monitor mounting points are not in the center

Mounting brackets for monitors with mounting niche

Operation	Tools
Connect the monitors frame to the mounting bracket	3mm hex key, 8 & 10mm socket wrench

DIN 125 – A 6,4 washer

DIN 125 – A 6,4 washer

DIN 985 – M6 nut

DIN 933 – M6 x 20 bolt

DIN 7991 – M5x16 bolt

DIN 125 – A 5,3 washer

DIN 985 – M5 nut

Operation	Tools
Connect the mounting brackets with the upper frame of the holders.	5mm hex key

DIN 912 – M6 x 16 bolt

Adjustable lever

DIN 9021 – 6,4 washer

3.5.9 SPEAKER HOLDERS

Operation	Tools
Connect the speakers mounting brackets and mount the speakers inside the cockpit frame.	3mm hex key, 7mm socket wrench

FRONT

Speakers placement

Speaker mounting bracket

DIN 6798 - J 6,4 toothed washer

ANSI B18.3 - 1/4 bolt

DIN 912 - M4 x 10

DIN 985 - M4 nut

DIN 125 - A 4,3 washer

Vibro-isolator

INFO

Dedicated set of speakers for the QS-S25 is Logitech Z906

4. INSTALLATION

Remember, even though possibilities with QS-S25 are broad, some things should be kept in mind when the place for the rig is chosen. Motion Systems **DOES NOT** approve exceeding or ignoring any of these points and **IS NOT** responsible for malfunctions or failures that are the results of these actions.

- **DO NOT** use the QS-S25 on very soft or fragile surfaces like rubber, glass, or foam.
- Ensure that all QS-S25 modules are mounted properly.
- Be aware that QS-S25 will crawl a little in every direction during operation. Those movements could damage the surface in the long term. Manufacturer, its subsidiaries, and their partners are not responsible for any floor damages. It is recommended to anchor the machine to the ground - see section **Anchoring** on page **63** for details.
- **DO NOT** mount the rig in tight or cluttered spaces – nothing should restrict QS-S25's motion range.
- Seatbelts and other harnesses should be mounted to parts of the motion rig that move in the same way as the seat. **DO NOT** attach them to any static part or ground.
- Cables must not be stretched and should be kept in a way that prevents them from getting under actuator or any part that can crush or tear them.
- If you want to use the QS-S25 in an unusual application, and you are not sure, that the desired setup is feasible, please contact the distributor/reseller.
- Only racing seats and harnesses certified by the FIA shall be installed on the QS-S25.
- The user/integrator is responsible for using a pedal set other than that provided by the manufacturer.

4.1. TRANSPORTATION

The platform can be moved using transportation wheel modules, included in the package. Attaching them to a fully assembled platform will lift it from the ground and allow to roll it into designated place. Wheel modules MUST then be unfastened. **DO NOT** use the platform while on the wheels.

The platform may also be lifted and transported using lifting straps and a lifting device.

4.1.1 ATTACHING WHEEL MODULES

To roll the platform into designated place install wheel modules (x3) using included bolts and washers. Screw them in gradually to evenly lift the platform.

Bolt M12 x 90
(DIN 933)

Washer M14
(DIN 9021)

WARNING

After rolling the platform into designated place wheel modules **MUST** then be uninstalled. **DO NOT** use the platform while on the wheels.

4.1.2 LIFTING THE PLATFORM

The platform can be moved by lifting it from the ground. **ONLY** use lifting points shown below:

4.2. ANCHORING

Depending on the floor surface, the platform may crawl in all directions during normal operation. It is recommended to anchor it to the ground.

Anchor holes pattern dimensions:

> INFO
>
> It is suggested to use M12 wedge anchor bolts.

1. Remove three triangular bottom plates from the platform using 5 mm hex key (4 bolts per plate).

2. Install anchoring plates underneath the platform using bolts, nuts and washers included in the package, as shown in the illustration:

underside view

4x Toothed Washer (DIN 933)

6x Bolt M8 x 25 (DIN 912)

4x Washer A8,4 (DIN 125)

6x Nut M8 (DIN 985)

2x Bolt M8 x 25 (DIN 7991)

Anchor hole

2 piece anchoring plate

Attach back in after anchoring

3. Once the platform is in its designated place - install anchor bolts referring strictly to manufacturer's anchor bolt manual.

4. Reattach triangular plates back to the platform using 5mm hex key.

4.3. CFG SWITCH CONFIGURATION

INFO

- All QS-SB2 Power Cabinets **must** be interconnected via Motion Lock interlink cables.
- Order of connecting the cables is not important. Keep the CFG switches setting according to the actuators numbering.

4.4. INTERCONNECTIONS

POWER CABINET – SB2#3

ACTUATOR 5-6

ML DN ML UP CFG M-BUS M-BUS

1 2
ON ↓

MOTION LOCK
INTERLINK CABLE

M-BUS CONNECTION CABLE

M-BUS
TERMINATOR

POWER CORD

POWER CABINET – SB2#2

ACTUATOR 3-4

1 2
ON ↓

ML DN ML UP CFG M-BUS M-BUS

M-BUS CONNECTION CABLE

POWER CORD

POWER CABINET – SB2#1

MOTION LOCK
INTERLINK CABLE

ACTUATOR 1-2

1 2
ON ↓

ML DN ML UP CFG M-BUS M-BUS

POWER CORD

M-BUS CONNECTION CABLE

Connected in assembled variant

MOTION
LOCK

M-BUS CONNECTION CABLE

M10 CONTROLLER

POWER
SOCKET

POWER BOX

USER's PC

Grounding
bolt

USB CABLE

POWER CORD

4.5. MOTION LOCK CONNECTION WITH OTHER QS DEVICES

If you own more QubicSystem devices, we recommend including them in the Motion Lock circuit in order to create one e-stop button setup. Refer to diagrams below.

WARNING

- All Motion Lock connections must be performed with power switched OFF.
- Motion Lock interlink cables have different ML/UP (6 pin) and ML/DN (4 pin) plugs on each end.

QS-S25 and a belt tensioner (**QS-BT1**):

Variant #1

Variant #2

QS-S25, steering wheel (**QS-DD-20**) and a belt tensioner (**QS-BT1**):

4.6. CONNECTING POWER CORDS

4.7. CONNECTING GROUNDING WIRES

INFO

Platform is equipped with a low resistance protective-earth bolt. It must be connected to the facility's solid protective earth/grounding bolt in order to increase suppression level. It is recommended to use at least 10 mm^2 copper wire.

WARNING

All operations **MUST BE** performed with the platform powered off and by a qualified electrician.

Connect to the upper frame

4.7.1 CONNECTING BUILDING EARTHING WIRE

Building earthing wire connection:
Switch Box
(frontside)

4.8.   SOFTWARE INSTALLATION

INFO

Note down the QS-S25 serial number before installation as it is needed to access software download page.

The **SERIAL NUMBER** can be found on the M10 identification label in the **XXXXXX-XXXXXX-XXXXX-XXXXXX** format. This serial number is also used for activation of FSMI (Force-SeatMI) and MT (Motion Theater) licenses - check information on page **76**.

To download the software visit: **QubicSystem.com/Download**

Once the QS-S25 is installed and connected correctly:

1. Download **Qubic Manager Software**.

2. Proceed with the installation steps and launch the application.

3. Connect power connection cord to the wall socket.

4. Turn on the system by switching on the power switch button on the Power Box.

5. Check position of Motion Lock Switch, unpress if needed.

6. The QS-S25 will perform a start-up calibration.

   WARNING

   DO NOT change the payload during the start-up calibration.

7. If Qubic Manager has recognized the QS-S25 correctly, the status of the machine visible in the lower left corner will change to **Parked/Centered**.

8. Check **Action Center** on the right side panel for a list of actions that requires attention:

9. It is possible to solve them one by one or by pressing the **Resolve All** button. Firmware update may require additional confirmation in the dialogue box.

10. Go to **Tools and Diagnostics** →**Devices** and select **Configure**.

11. Choose one of the operation modes:

INFO
Q-MODE is unavailable for QS-S25

12. Close the configuration and return to the main application window. Choose the game and check profile details by clicking on the game tile.

13. Adjust the motion effects intensity to your preferences in the game profile window, scroll down in the window to see all of the settings. You can adjust the settings during the game simulation by pressing **ALT+TAB**.

<div style="border: 2px solid red;">

WARNING

The QS-S25 is a high performance machine capable of fast and abrupt movement based on game/simulation input data. User **MUST** maintain a sensible approach when modifying the default game profile.

</div>

14. Activate profile by clicking the **Activate** button.

15. Launch the game by clicking the **Run the game** button.

If you need the serial number to activate other software licenses such as ForceSeatMI or ForceSeatDI, it can be found in the Qubic Manager. After connecting the QS-S25 go to **Tools and Diagnostics →Devices**:

Serial number is visible under the device name:

The software is provided "as is", without warranty of any kind, express or implied, including but not limited to the warranties of merchantability, fitness for a particular purpose, and non-infringement. In no event shall the authors or copyright holders be liable for any claim, damages, or other liability, whether in an action of contract, tort or otherwise, arising from, out of, or in connection with the software or the use or other dealings in the software. The software sends anonymous usage data to the Motion Systems company. The data is used to improve the software and game profiles. The data is not used for advertising purposes.

5. MAINTENANCE

Cleaning

To minimize the risk of abnormal heating that can result in system failure, keep the QS-S25 uncovered, clean and dust-free. Cleaning the unit should be performed with a soft, dry cloth. **DO NOT** use solvents or cleaners that may corrode or damage materials of parts used in the QS-S25 in any way.

Testing the Motion Lock button

At least once a month check if Motion Lock switch is working correctly – turn on the QS-S25 (with no one using the rig) and push the red button. If the machine turns off, lowers and does not react to any signal (turn on simulation or game to verify that) then the Motion Lock switch works correctly. If the machine reacts in any different way - **DO NOT** use it and contact technical support.

Checking actuator seals

To minimize the risk of QS-S25 failure, check the condition of the linear actuator's rubber seals **once a month**. If necessary, lubricate them externally, using silicone grease.

Manufacturer tested silicon grease specifications:

- Working conditions (°C): -40 do +200
- Density (g/cm3): 1,02
- NLGI class: 2
- Worked penetration: 220-270
- Dielectric constant (100 Hz): 2,9
- Breakdown voltage (kV/mm): 30
- pH of water lift: 4 to 6

Actuator rubber seal

6. TROUBLESHOOTING

<div style="border: 2px solid red;">

WARNING

DO NOT attempt to do any repairs by yourself. It could be dangerous and will result in loss of warranty! Repairs should be consulted with technical support and then performed by a qualified technician.

</div>

Before contacting technical support, try this:
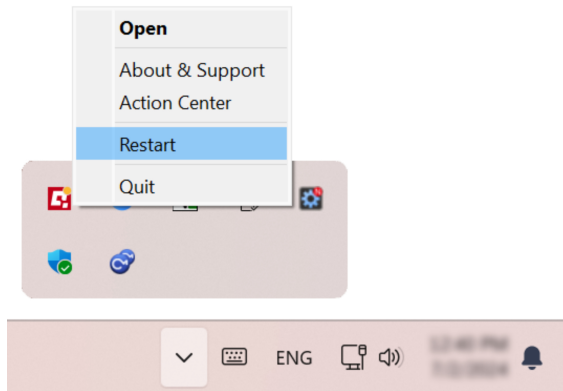
- Check Action Center in QubicManager.
- Check all cable connections in the device.
- Restart QubicManager application by right-click on the application icon in the system tray and selecting **Restart**:

- Check Motion Lock Switch position (should be unpressed to activate the motion) :

- Try different USB ports (also try bypassing the USB hub by a direct PC connection).
- If a problem occurred abruptly, it could be caused by a thermal protection. Turn off the QS-S25, disconnect it from power outlets and wait at least 15 minutes to let it cool down. Try turning it on again later.
- In case of any unclear electrical issues or strange behavior, contact technical support.
- If the device suffers from abnormal work conditions, please immediately contact the distributor/reseller for technical support.

6.1. CREATING A SNAPSHOT

A snapshot is the easiest and fastest way to diagnose a problem. If you send in the zip file generated in the snapshot menu along with a description of the problem, technical support receives the necessary information about the product and its configuration. It can be then analyzed to provide the best solution.

> **WARNING**
>
> The QS-S25 and all interconnected Power Cabinets **MUST BE** be powered up when creating the snapshot.

1. Open the main window of the QubicManager application.
2. Go to **Tools and Diagnostic** → **About / Support**.

3. Open the **Snapshot** window:

4. Select data that will be included in the snapshot.

5. Scroll down, consent to the technical support terms and conditions and select **Create & Show**:

6. The snapshot has been created, click the **OK** button - the folder with the snapshot ZIP file will open.

7. Attach the snapshot ZIP file to your support request.

6.2. DISCORD CHANNEL

We strongly recommend joining our discord channel, where our growing community is sharing amazing tips and ideas of how to set up, use and tune the Qubic System products. You can also send questions for technical support or get answers directly from the community.

Join our discord channel by following the invitation link:

https://discord.com/invite/tuAtybvTRn

7. ADVANCED APPLICATIONS

Examples shown in this section describe optional application of external safety and power cut-off devices. If you wish to expand the functionality of your motion system, read the whole section to have a good understanding of how to apply and what functionality to expect. Apply at your own discretion.

WARNING

Motion Lock input is not a SIL/PL (safety integrity level/performance level) rated and **DOES NOT** guarantee safety. If you wish to achieve specific SIL/PL ranking, consider introducing a power cut-off device that is controlled by an external safety relay and cuts off the power to all QS-SB2. Example application of the power cut-off contactor can be found in section **7.3.2** and **7.3.3**.

INFO

When applying safety relay to the Motion Lock :

- Use input cables according to your safety relay manual.
- Use output cables according to your safety relay manual and cross section no less than 0,75 mm^2

7.1. ADDING ADDITIONAL DEVICES TO THE MOTION LOCK CIRCUIT

If there is necessity to stop other devices, apart from the QS-S25, ML (Motion Lock) and additional user devices can be controlled by safety relay outputs. In the example application, the E-STOP button is connected to the external safety relay. When the E-STOP is triggered, the safety relay will activate the Motion Lock function, which will stop motion of the platform and additional devices.

Example application of single-channel safety relay that controls ML and additional devices:

Example wiring diagram of application of one-channel safety relay with E-STOP button:

7.2.   IMPLEMENTING THE WORKING ZONE PROTECTION

To protect bystanders from accidental hit from moving parts of the platform, safety gate with opening sensor***** can be connected to safety relay input for activating ML function. When the gate opens, the safety relay output activates the ML (Motion Lock) function and stops the motion of the platform.

Example application of safety gate opening sensor:

*Check your safety relay manual for list of applicable sensors

7.3. INCREASING SAFETY LEVEL

WARNING

Modifications of the safety system, involving application of the power line contactors, shall be performed only by somebody competent. A competent person is a qualified and knowledgeable person, who because of their training and experience has the knowledge required to apply those changes. It is user responsibility to commission modification of the safety system to a competent person, experienced with industrial wiring practices, which will be required to undertak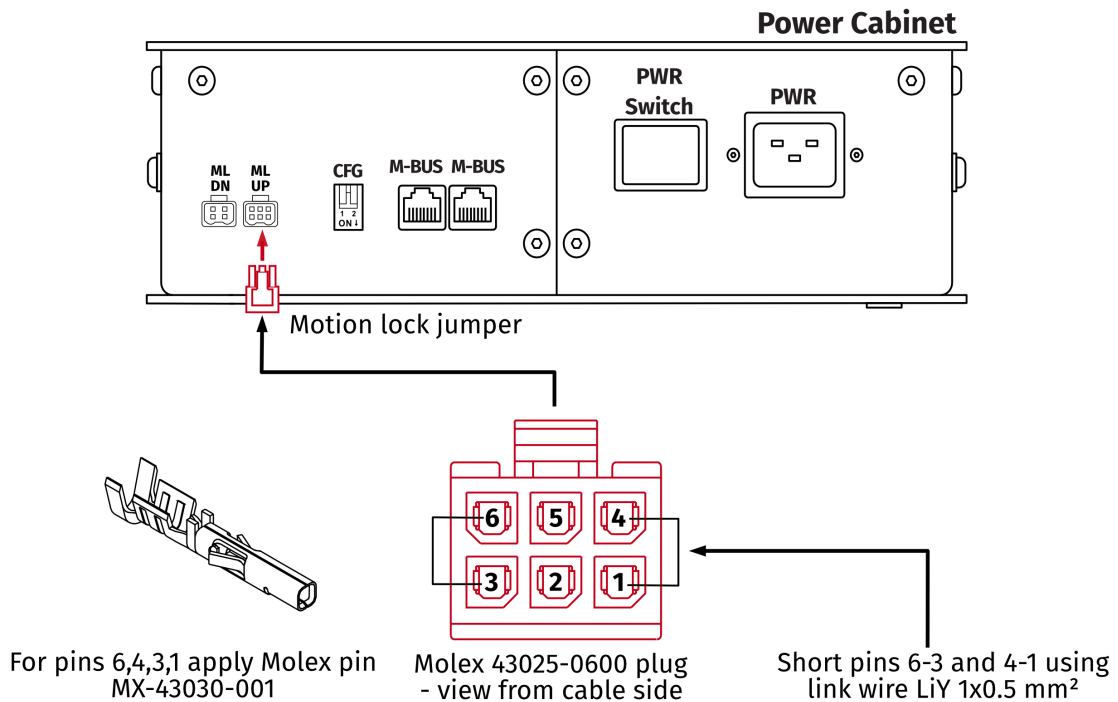e the installation. Commissioning shall be undertaken by a trained electrical technician experienced in safety installations.

7.3.1 ASSEMBLING MOTION LOCK JUMPER

To apply solutions which require using power line contactors, Motion Lock connection cables in the QS-SB2 power cabinet needs to be replaced with jumpers. To prepare a jumper, you need to assemble recommended connector as shown below:

For pins 6,4,3,1 apply Molex pin MX-43030-001

Molex 43025-0600 plug – view from cable side

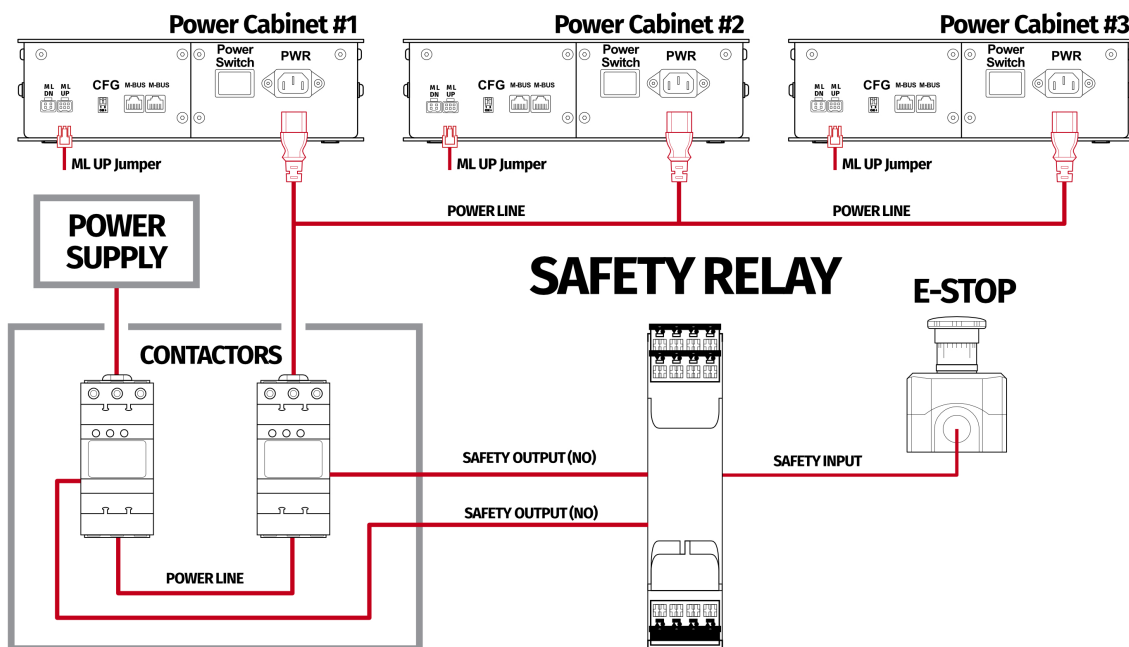Short pins 6-3 and 4-1 using link wire LiY 1x0.5 mm²

7.3.2 ADDING POWER-CUT CIRCUIT WITH E-STOP BUTTON

If specific SIL/PL rated level needs to be achieved, it might be necessary to install a power cut-off device. Two contactors connected in series and controlled by safety relay can be used to provide or cut-off power line to QS-SB2 power cabinets. When safety function on safety relay input is triggered, a safety relay will switch off the contactors, thus cutting-off the power to the platform. To apply this solution, ML UP connection cables needs to be replaced with prepared jumper as described in section **7.3.1**.

> **INFO**
>
> To achieve required safety performance level it is necessary to perform safety risk assessment at user site.

Example application of power line contactors and E-STOP button:

> **INFO**
>
> In order to increase SIL/PL level it's a good practice to apply well-known contactors of two different manufacturers in order to decrease probability of failure resulting from serial production.

Example wiring diagram of application of power line contactors and one-channel safety relay with E-STOP:

INFO

PE (protective grounding/earthing) connection is omitted for better transparency

7.3.3 IMPLEMENTING THE WORKING ZONE PROTECTION WITH POWER-CUT CIRCUIT

In example application contactors connected in series provide power line to the QS-SB2 power cabinets. When safety function on safety relay input is triggered, a safety relay will switch off the power contactors, thus cutting-off the power to the platform.
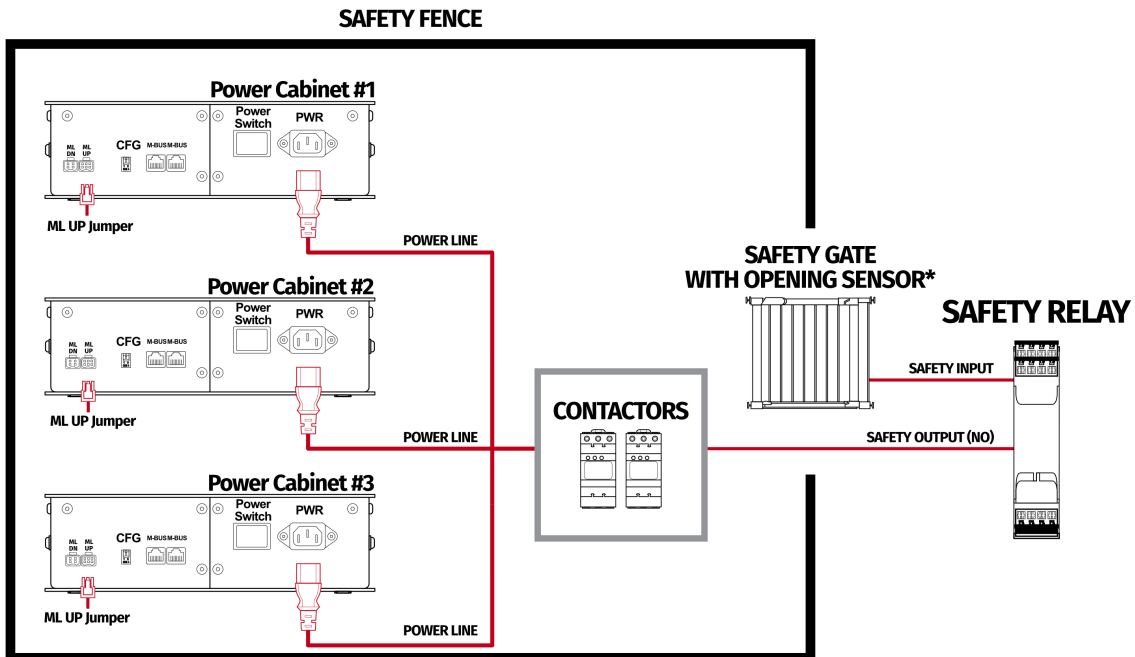
Example application of power line contactors with safety gate opening sensor:

*Check your safety relay manual for list of applicable opening sensors

---

INFO

When applying safety relay and contactors to the power line remember to:

- Use control cables according to your safety relay manual
- Power line cables shall be chosen accordingly to power requirements of motion system. See power requirements of specific motion system.

7.4. IMPLEMENTING NON-FACTORY MOTION LOCK SWITCH

If you want to assemble custom Motion Lock switch or a button box setup (only Double Pole Single Throw switch compatible) using QubicSystem Motion Lock interlink cable, follow the diagrams below:

For non-factory Motion Lock plug setup, you must assemble plug and connectors as shown below:

8. ENVIRONMENTAL IMPACT AND DISPOSAL

DO NOT dispose of this product with standard household waste but drop it off at a collection point for the disposal of Waste Electrical and Electronic Equipment for recycling.

QS-S25 is shipped with wooden cases/cardboard boxes. If the packaging is no longer needed, it can be fully recycled.

QS-S25 is an advanced device and if stored or disposed of incorrectly it could harm the environment or/and other people. When the device is no longer in use it should be disposed in environmental safe manner in compliance with applicable local work and environmental protection regulations. If no other agreement of disposal was concluded, the device shall be dismantled for disposal as follows:

- Metal parts should be scrapped.
- Electric and electronic components should be disposed of in the specialized disposal center.
- Other materials should be sorted and disposed of accordingly to the local law and regulations.

9. LIABILITY DISCLAIMER

If permitted under applicable law, Motion Systems and its subsidiaries disclaim all liability for any damages caused by one or more of the following:

- The product has been modified, opened, or altered.
- Failure to comply with assembly instructions.
- Inappropriate or abusive use, negligence, an accident (an impact - for example).
- Normal wear.

INFO

If permitted under applicable law, Motion Systems and its subsidiaries disclaim all liability for any damages unrelated to the material or manufacturing defect with respect to the product (including, but not limited to, any damages caused directly or indirectly by any software, or by combining the QS-S25 with any unsuitable element or other elements not supplied or not approved by Motion Systems for this product).

10. WARRANTY

Motion Systems warrants to the consumer that this product shall be free from defects in materials and workmanship, for a warranty period which corresponds to the time limit to bring an action for concerning this product.

For commercial customers, there is a one (1) year limited warranty, starting on the original date of purchase.

Within the warranty period, the product will be repaired or replaced free of charge, excluding shipping charges.

This warranty shall not apply:

- If the product has been modified, opened, altered, or has suffered damage as a result of inappropriate or abusive use, negligence, an accident, normal wear, or any other cause unrelated to a material or manufacturing defect (including, but not limited to, combining the QS-S25 with any unsuitable element, including in particular power supplies, chargers, or any other elements not supplied or approved by Motion Systems for this product).

- In the event of failure to comply with the instructions provided by technical support.

- To software (said software being subject to a specific warranty).

- To accessories (cables, cases, for example).

- If the product was sold at public auction or if the product has suffered damage as a result of force majeure: flood, fire, earthquake, storm.

This warranty is non-transferable. No new warranty period commences if the product is repaired or replaced. Your statutory rights towards the seller are not affected or restricted by this warranty. Motion Systems, and their partners are not liable for any indirect, incidental, or punitive damages from use of this product. In case of malfunction during the warranty period immediately contact technical support.

11. COPYRIGHT

Qubic System is a trademark of Motion Systems. All rights reserved.

All the contents in this user manual are the intellectual property of Motion Systems. No part of this manual, including the products and software described in it, shall be modified or translated into any language without the prior written permission of Motion Systems. Specifications and information in this manual are subject to change at any time without obligation to notify any person of such revision or changes. Illustrations are not binding.

12. MANUFACTURER INFORMATION

Qubic System is a brand
that belongs to **Motion Systems**

HQ address:
Miedziana 7 Street
55-003 Nadolice Wielkie
Poland

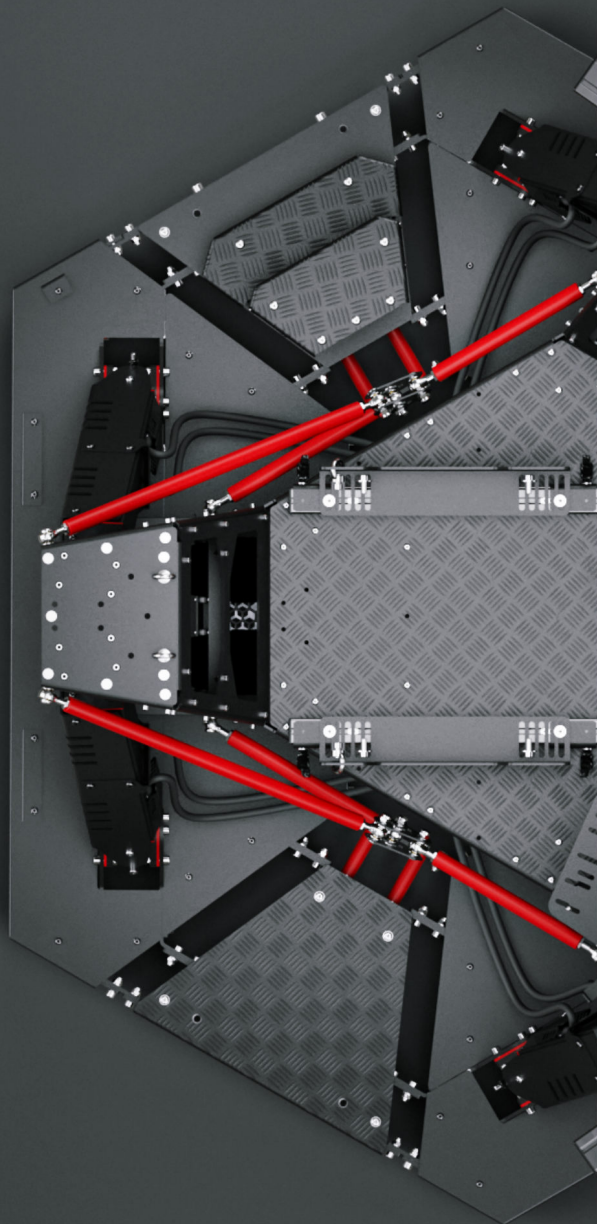**Motion Systems homepage**   **QubicSystem homepage**

INFO

In support queries please contact your reseller.

QUBICSYSTEM

QS 525