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User Manual

Including Installation Guide for Control Panels
PJC421 & PJC422



SLEIPNER AS

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Products

PJC421-PVREL - Single joystick, twist detent, thruster control and S-link Color LCD touch screen
 PJC421-PVREL-DNV - Single joystick, twist detent, thruster control and S-link Color LCD touch screen
 PJC421-LE90 - Single lever, detent, thruster control and S-link Color LCD touch screen
 PJC421-LE90-DNV - Single lever, detent, thruster control and S-link Color LCD touch screen
 PJC421-LF90 - Single lever, detent, thruster control and S-link Color LCD touch screen
 PJC421-LF90-DNV - Single lever, detent, thruster control and S-link Color LCD touch screen
 PJC421-LF90X - Single lever, detent, thruster control and S-link Color LCD touch screen
 PJC421-LF90X-DNV - Single lever, detent, thruster control and S-link Color LCD touch screen

 PJC422-PVREL - Dual joystick, twist detent, thruster control and S-link Color LCD touch screen
 PJC422-PVREL-DNV - Dual joystick, twist detent, thruster control and S-link Color LCD touch screen
 PJC422-LE90 - Dual lever, detent, thruster control and S-link Color LCD touch screen
 PJC422-LE90-DNV - Dual lever, detent, thruster control and S-link Color LCD touch screen
 PJC422-LF90 - Dual lever, detent, thruster control and S-link Color LCD touch screen
 PJC422-LF90-DNV - Dual lever, detent, thruster control and S-link Color LCD touch screen
 PJC422-LF90X - Dual lever, detent, thruster control and S-link Color LCD touch screen
 PJC422-LF90X-DNV - Dual lever, detent, thruster control and S-link Color LCD touch screen



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MC_0020

Failure to follow the considerations and precautions can cause serious injury, damage and will render all warranties given by Sleipner Motor as VOID.

MC_0411

Responsibility of the User Operating Thrusters

MC_0418

Never use thrusters when close to objects, persons or animals in the water. The thruster will draw objects into the tunnel and the rotating propellers. This will cause serious injuries and damage the thruster.

Always turn the main power switch off before touching any part of the thruster. An incidental start while touching moving parts can cause serious injuries.

It is the owner, captains or other responsible parties full responsibility to assess the risk of any unexpected incidents on the vessel. If the thruster stops giving thrust for some reason while manoeuvring you must have considered a plan on how to avoid damage to persons or other objects.

- Always turn the control device off when the thruster is not in use or when leaving the boat.
- When leaving the boat always turn off the main power switch for the thruster.
- Never use thrusters out of water.
- If the thruster stops giving thrust while running, there is possibly a problem in the drive system. You must immediately stop running the thruster and turn it off. Running the thruster for more than a few seconds without resistance from the propeller can cause serious damage to the thruster.
- If two panels are operated with conflicting directions at the same time the thruster will not run. If both are operated in the same direction, the thruster will run in this direction.
- If you notice any faults with the thruster switch it off to avoid further damage.
- The primary purpose of the thruster is to manoeuvre or dock the vessel. Forward or reverse speed must not exceed 4 knots when operated.

Products

MC_0397

PJC4 series

Control your thrusters with the new PJC4 – joystick and control panel. The bright 3.5" daylight touch screen offers an easy day-to-day operation.

Proportional thruster control for S-Link™ thruster systems

- Back-lit touch colour LCD
 - System status and diagnostics
 - Indication of power and direction of thrust
 - Interactive multi-language menus
- IPX7 water ingress rated control panel
- Flush or top mount control panel (HxW: 149x112mm)
- Built-in Wi-Fi module
- S-Link™ CAN-bus communication
- Built-in alarm buzzer
- Plug & Play cables, waterproof and compact connectors
- Dedicated connector for IO signals
- Supports various joystick designs

Environmental testing

- DNVGL-CG-0339:2019
- IACS E10:2018
- IEC 60945
- IEC 60092-504:2016

DNV Design Approved product variants available

- Power supply fault monitoring
- Display of propeller RPM
- Gear leg low oil level monitoring
- Select station, command transfer between multiple operator stations



PJC421-LE90
PJC421-LE90-DNV*



PJC421-LF90
PJC421-LF90-DNV*



PJC421-LF90X
PJC421-LF90X-DNV*



PJC421-PVREL
PJC421-PVREL-DNV*



PJC422-LE90
PJC422-LE90-DNV*



PJC422-LF90
PJC422-LF90-DNV*



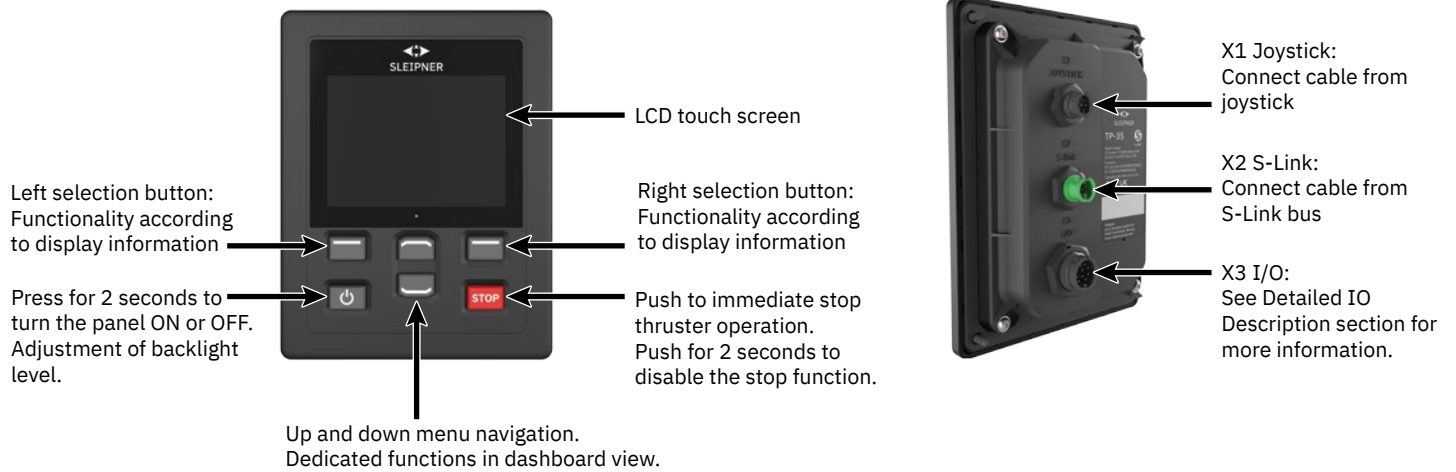
PJC422-LF90X
PJC422-LF90X-DNV*



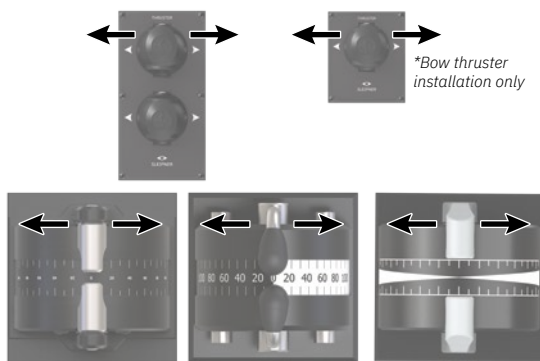
PJC422-PVREL
PJC422-PVREL-DNV*

*DNV Design Approved product variant

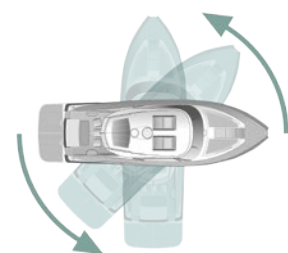
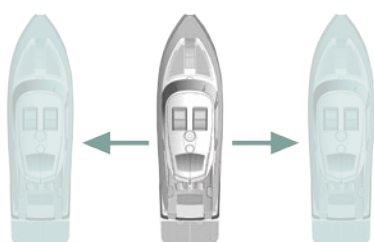
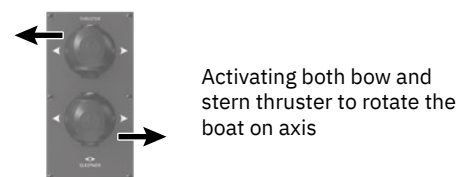
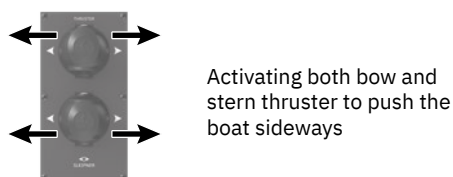
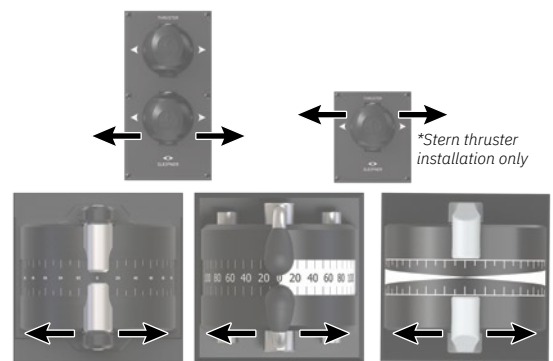
Panel Layout & Functions



Activating the bow thruster



Activating the stern thruster



Description	Value		
Supply Voltage	Min +9 VDC	Typical +24VDC	Max +31VDC
Rated max input power X2 S-Link	4.5W		
Rated max input power X3 I/O	1.3W		
Environmental testing	DNVGL-CG-0339:2019 IACS E10:2018 IEC 60945 IEC 60092-504:2016 ABYC S-31		
Operating temperature	-25°C to + 70°C IEC 60068-2-1:2007 Cold test IEC 60068-2-2:2007 Dry heat test		
IP rating	IP x7 IEC 60529		
EMC tested	IEC 60945:2002 IEC 60533:2015		
Vibration	IEC 60068-2-6		
Damp heat	IEC 60068-2-30		
Salt mist	IEC 60068-2-52, Kb		
Compass Safe Distance	0.2m IEC 61000-4-8:2010 ISO 25862: 2009		
Internal buzzer sound level	IEC 60945:2002		
External buzzer sound level	IEC 60945:2002		
Display weight	260g		
Display size	3.5 inch		

Dashboard view detailed information

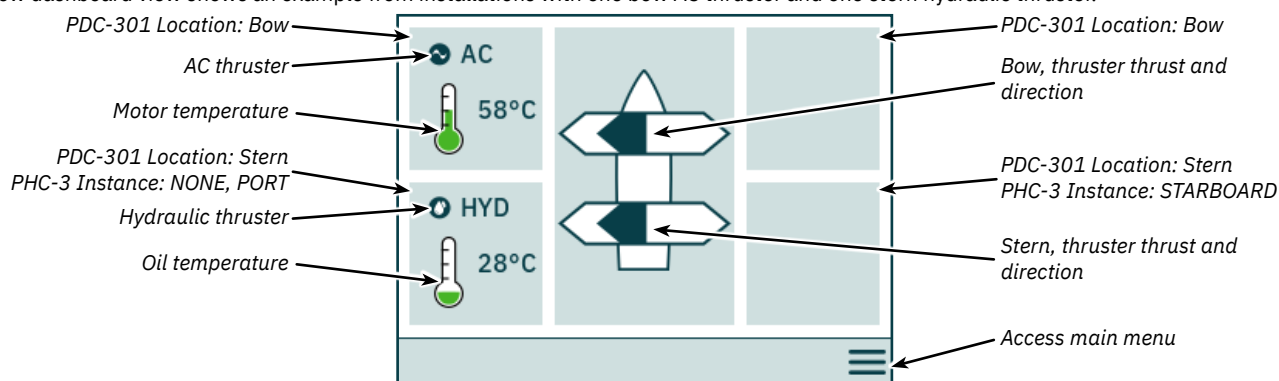
It is only possible to operate the thrusters when the dashboard view is active. The thruster dashboard view shows status information from up to four thruster controllers.

Installations with AC thrusters require one PDC-301 controller for each AC thruster. For hydraulic thrusters, the PHC-3 hydraulic controller can be used to control up to two hydraulic thrusters.

The location configuration of PDC-301 and the instance configuration of PHC-3 define where the thruster information is displayed in the dashboard view. Refer to the image below for detailed information. Information for configuring the PDC-301 and PHC-3 is in the System Devices chapter of this manual.

Dark blue arrows in the thruster dashboard represent the amount and direction of thrust from connected joysticks. For installations with both bow and stern thrusters, two arrows display the individual thrust indication of each location.

The below dashboard view shows an example from installations with one bow AC thruster and one stern hydraulic thruster.



The dashboard displays only one hydraulic oil temperature symbol for installations where one PHC-3 hydraulic controller is used to control two thrusters.

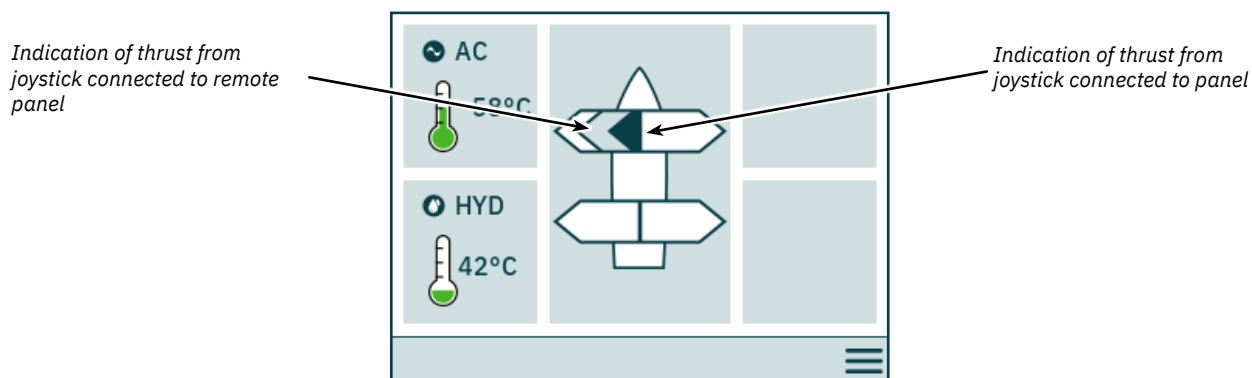
The temperature icon has five levels.

Green signifies normal temperature - Yellow signifies high temperature - Red signifies alarm stated due to too high temperature.

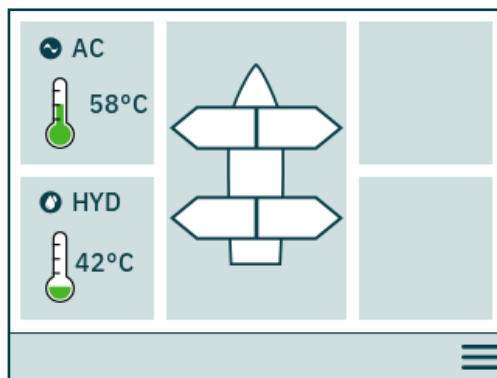
**Operation with more than one control panel**

Several control panels can be connected to the same S-Link bus and configured to control the same thruster. One example could be bridge and deck installation on the same vessel.

If joysticks are moved in the same direction on different control panels with different thrusts, the thruster will respond to the highest level. The panel will indicate thrust from the joystick connected to the panel with a dark blue coloured bar. If thrust from a remote panel is higher, it will be indicated with a light blue coloured bar.



If joysticks are moved in the opposing direction on different control panels, the thruster will not respond. In such situations the panel will indicate no thrust, refer to image below. The thruster will not respond before one of the joysticks has returned to zero position.



PJC4 part numbers that end with -DNV has additional functionality to ensure that only one control panel at the time can operate the thrusters. See chapter *Functionality of DNV models* for more information.

Control Panel - System Setup

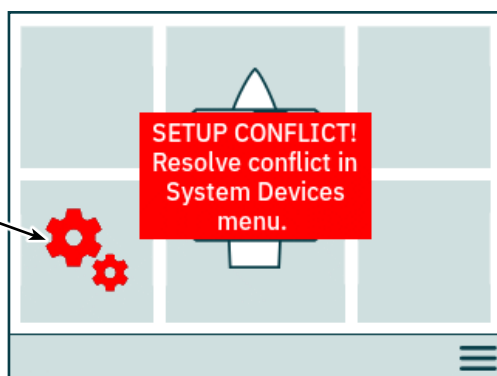
Device configuration

To enable operation of a thruster from the control panel the thruster must be associated to the control panel. Additionally, the thruster must be configured to ensure correct location in the thruster dashboard view and correct response when operating the joystick. For detailed information on how to associate and configure devices see System Devices chapter.

Configuring more than one associated device to be in the same location will result in a setup conflict. Thruster operation is suspended in the case of a setup conflict and a notice is displayed in the thruster dashboard view. Enter the System Devices menu to resolve such conflicts.

The image below shows an example of a setup conflict where more than one thruster controller has been configured to the port stern location.

Indication of a setup conflict in the port stern location

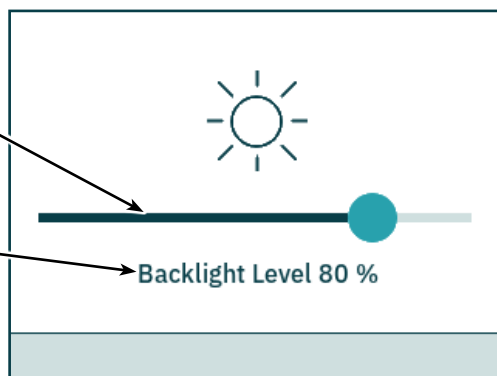


Adjustment of back light level

Press and release the ON/OFF button to activate the backlight level adjustment menu. Pressing the ON/OFF button for more than 2 seconds will turn the panel OFF. Pushing the ON/OFF button when the backlight menu is active steps the backlight level between 20% - 50% - 80%. The backlight menu automatically closes after 3 seconds of inactivity. When turning on TP-35 the backlight level is always set to 80%.

Sliding bar for adjustment and indication of configured backlight level

Indication of configured backlight level in %

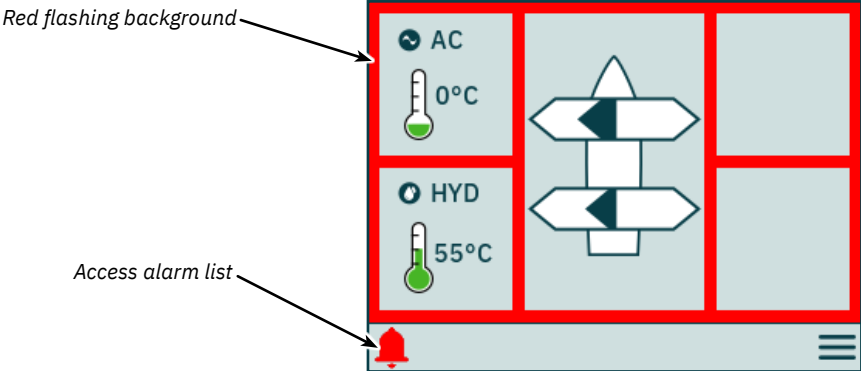


The backlight level can be adjusted with 1% resolution using the slide bar on the touch screen.

Active alarm

All TP-35 that are turned on and connected to the S-Link bus enters alarm state if it receives an alarm code or if communication with associated devices is lost. The alarm state is indicated by a blinking red background, an audible alarm signal, and the *Access alarm list* icon displayed in the lower-left corner.

It is not possible to operate thrusters with active alarms. Exceptions are *Oil over temperature alarm*, *Low oil level alarm* generated by PHC3, and *auxiliary power supply alarm* on DNV product variants.

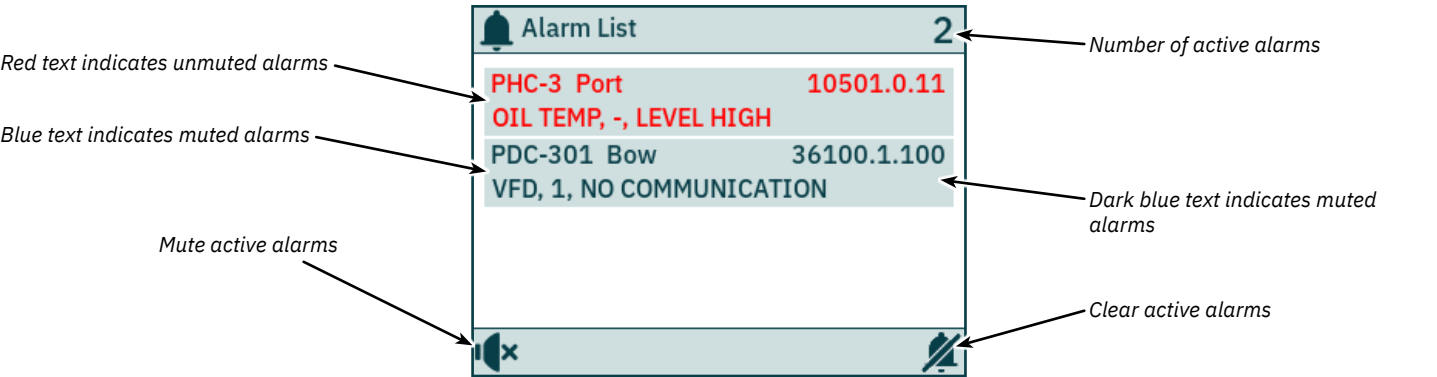


Access alarm list	Show list of active alarms.
-------------------	-----------------------------

Alarm list, audible alarm signal active

Push *Mute active alarms* on one TP-35 to mute the audible alarm signals on all Sleipner control panels that are turned on and connected to the S-Link bus.

Unmuted alarms are listed in red, and muted alarms are listed in dark blue. Active alarms are not automatically cleared, even if the alarm state is no longer present in the device. Active alarms must always be cleared by the user to be removed from the alarm list.

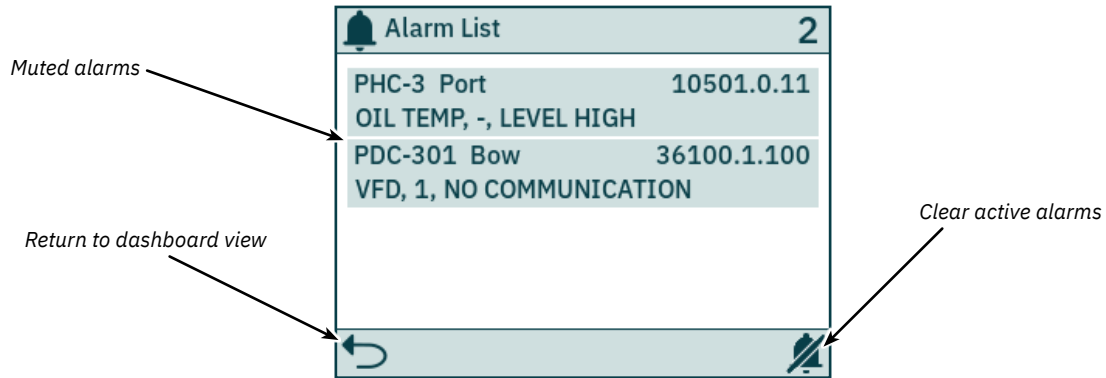


	Mute audible alarm signal.
	Clear all active alarms and mute audible alarm signals. A command to clear active alarms is sent to all devices connected to the S-Link bus. If an alarm state is still present in a device, a new alarm will be triggered in TP-35, and the audible alarm signal will be reactivated.

Alarm list, muted audible alarm signal

All active alarms are still listed after the audible alarm signal is muted.

Clear active alarms have the same functionality as when the audible alarm signal is not muted.



	Return to the dashboard view
	Clear all active alarms. A command is sent to all devices connected to the S-Link bus to clear active alarms. If the alarm state is still present in a device, a new alarm will be triggered in TP-35 and the audible alarm signal will be reactivated.

Immediate Stop alarm

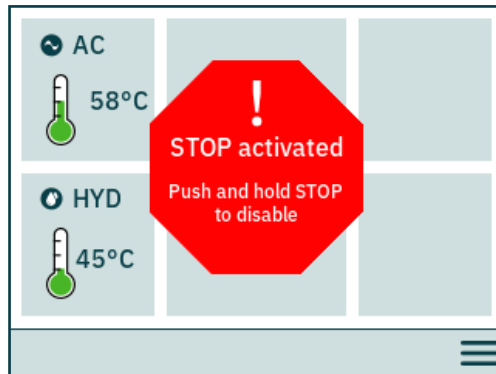
If the STOP button on TP-35 is pushed, a *STOP* message will be sent to all thrusters connected to the S-Link bus. An audible alarm signal will be given, and a notice will be displayed on the screen. The thrusters will immediately stop after receiving the *STOP* message and then broadcast the *STOP* Activated message.

If the *STOP* Activated message is not received by TP-35 within 1 second after the *STOP* button is pushed, the *STOP* notice will be closed.

The *STOP* button must be pushed for 2 seconds to disable the stop function.

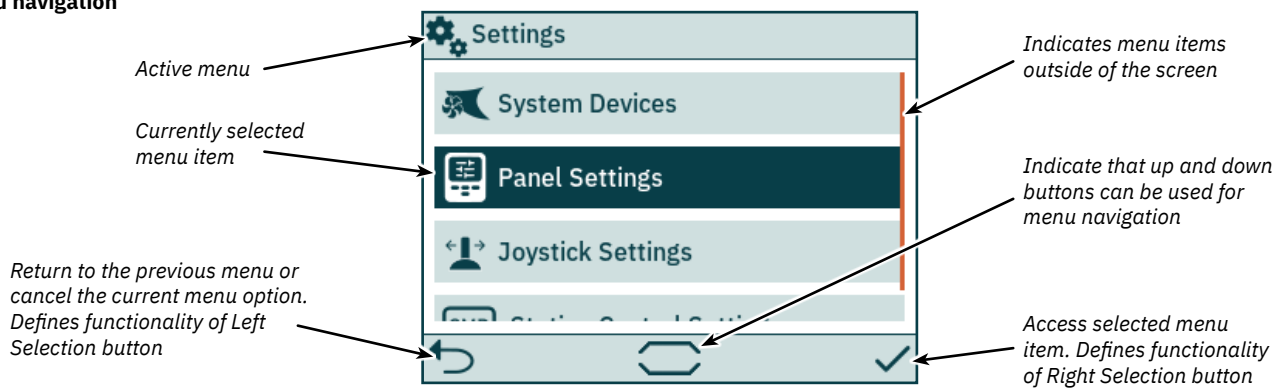
Pressing the *STOP* button with a hydraulic controller connected to the S-Link bus will activate the dump valve and all hydraulic consumers will be disabled.

The *STOP* Activated message will be displayed on all Sleipner control panels that are turned on.

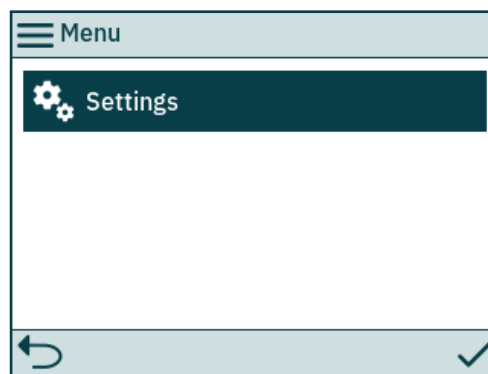


Panel buttons and touch screen functionality can be both used to operate the TP-35 control panel. The functionalities of the Selection buttons are defined by different icons located in the lower left and lower right corners of the screen. Use the up and down buttons to navigate between menu items when the  icon is displayed.

Menu navigation



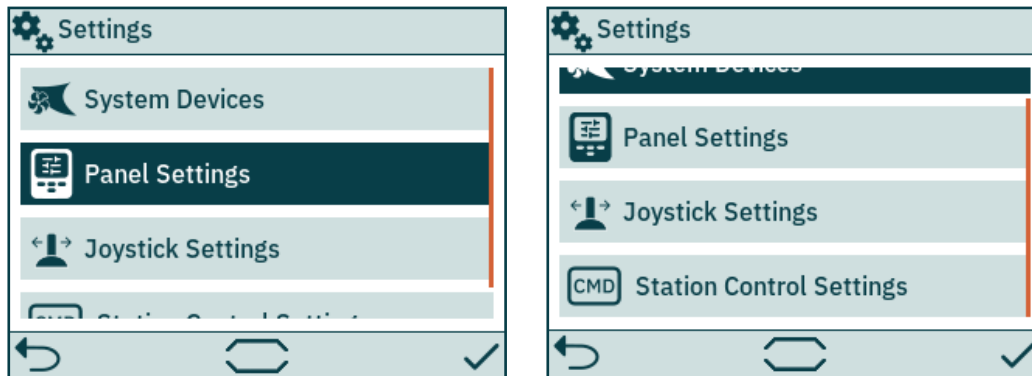
Main Menu



Settings

Configure connected S-Link devices, panel behavior and joysticks. For DNV product variants Station Control Settings can be configured.

Settings menu



System Devices

Lists and configure devices connected to the S-Link bus.

Panel Settings

Lists TP-35 serial number and firmware version.

Joystick Settings

Select joystick type and perform calibration.

Station Control Settings

Only available on DNV product variants. Activate and configure the transfer of command functionality.

System Devices

All units connected to the S-Link bus is listed in the System Devices menu. A device must be associated to the control panel to enable communication with the device.

When exiting the System Devices menu all listed devices are associated to the control panel. Once a device is associated the device type and unique serial number is stored in the control panel.

To disassociate a device that is disconnected from the S-Link bus the System Devices menu must be accessed. The disconnected device will no longer be present in the list, and when exiting the System Devices menu it will be automatically disassociated from the control panel.

To ease the installation and configuration of connected devices it is recommended to fill out the list found in chapter *List of installed S-Link devices* of this manual.

List of devices connected to the S-Link bus

System Devices

1

PDC-301 Bow
 Serial Number: 12

↶
⏏
✓

Number of devices connected to the S-Link bus.

↶	Exit the System Devices menu and associate all listed devices to the control panel.
✓	Select desired device for configuration.

PDC-301 Configuration

The proportional drive controller PDC-301 for AC thrusters has several parameters that can be configured.

Serial number and firmware version of selected device.

PDC-301

Serial Number: 12
FW Version: 1.015

Location

Bow

Thrust Direction

Normal

Function

SAC

Max Output

100 %

Load Share Limit

100 %

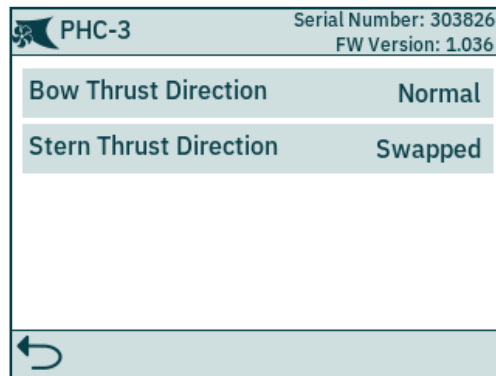
↶

Parameters that can be configured.

Location	Set the location for selected device. • Bow (default) • Stern • Bow Starboard • Stern Starboard Use Bow or Stern in conventional thruster system. In a system with two bow or two stern thrusters, for example, a catamaran. Use Bow or Stern for the port thruster. For starboard thrusters, use Bow Starboard or Stern Starboard.
Thrust Direction	Set the running direction for the thruster. • Normal (default) • Swapped
Function	Configure thruster type. • SAC - Tunnel thruster (default) • SRAC – Reserved for future functionality
Max Output	Set the maximum thrust of the thruster. Value between 50% and 100% can be chosen (default 100%). PDC-301 will scale the joystick signal to this value.
Load Share Limit	Set the maximum thrust if both bow and stern thrusters are operated at the same time. Value between 0% and 100% can be chosen (default 100%). The Load Sharing limitation allows the system to limit the combined load on the generator when bow and stern thrusters are operated at the same time. The load sharing will dynamically limit the thrust request for each thruster depending on the joystick position and limit settings. For a detailed explanation and setup guide, see AC series thruster user manual, document ID 6054.

PHC-3 Configuration

The proportional hydraulic controller PHC-3 has several parameters that can be configured. All these parameters are available for configuration on the PHC-3 controller's display. See PHC-3 User Manual for more information, document ID 5267. Only the direction of thrust for PHC-3 can be configured from TP-35.

**Bow Thrust Direction**

Set the running direction for the bow thruster.

- Normal (default)
- Swapped

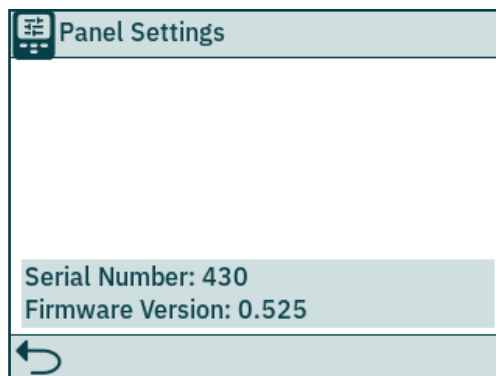
Stern Thrust Direction

Set the running direction for the stern thruster.

- Normal (default)
- Swapped

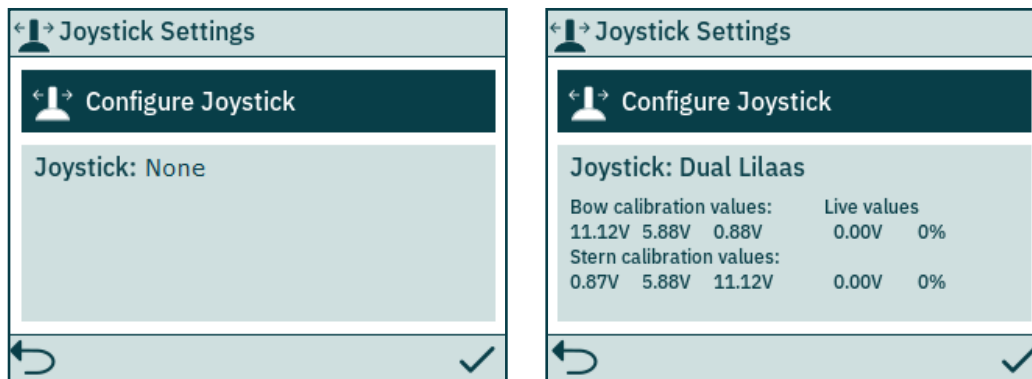
Panel settings

Lists TP-35 serial number and firmware version.



Joystick settings

The Joystick Setting menu is used to calibrate the joystick. *None* will be displayed if no calibration has been done. If a calibration has been done, the selected joystick type, calibration values, and live values will be shown.

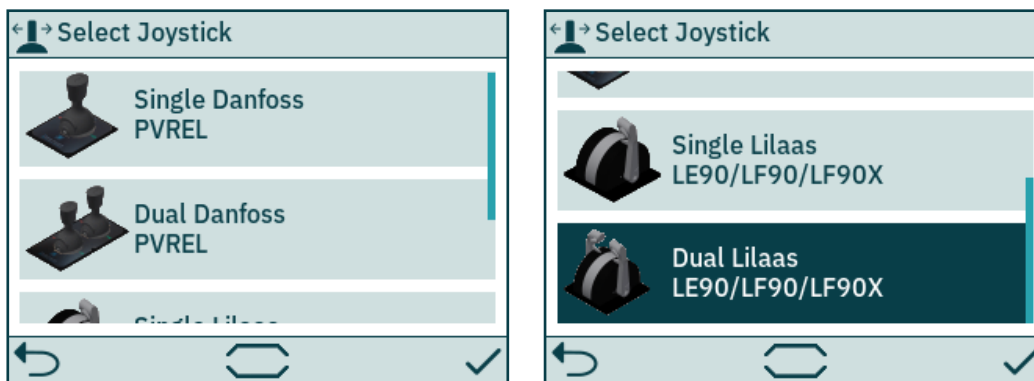


Calibration values show the measured voltage from the joystick potentiometer for full port, centred and full starboard position of the joystick.

Live values show the measured voltage from the joystick potentiometer and percentage of thrust according to the current joystick position.

Configure Joystick

A new calibration is initiated.

**Single Danfoss PVREL**

Calibrate a connected single Danfoss PVREL joystick.

Dual Danfoss PVREL

Calibrate a connected dual Danfoss PVREL joystick.

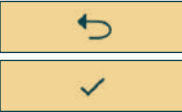
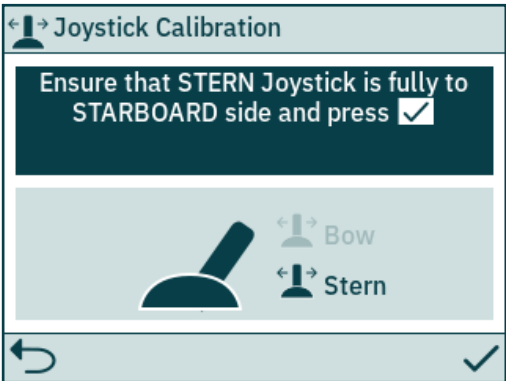
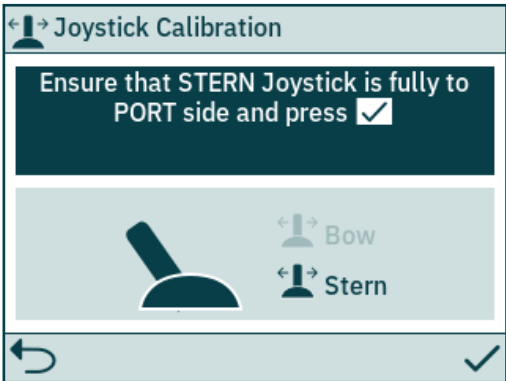
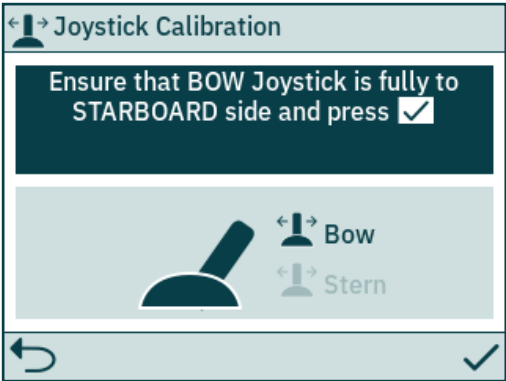
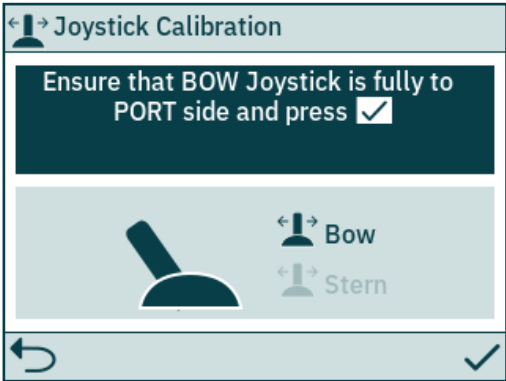
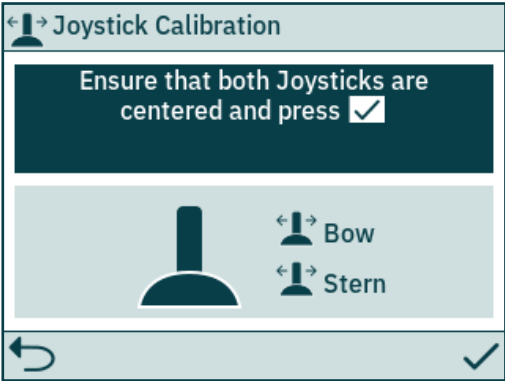
Single Lilaas LE90/LF90/LF90X

Calibrate a connected single Lilaas LE90/LF90/LF90X joystick.

Dual Lilaas LE90/LF90/LF90X

Calibrate a connected dual Lilaas LE90/LF90/LF90X joystick.

Follow the on-screen instructions to calibrate the joystick. It is important to keep the joystick in the specified position while pressing ✓. Below is an example of the steps for calibrating a dual joystick.



Abort joystick calibration and return to *Joystick Setting* menu.

Confirm current calibration step.

Station Control Settings

The Station Control Settings menu is only available on control panels with part numbers that end with *-DNV*. See detailed description in the *Functionality of DNV models* chapter.

CMD Station Control Settings	
Station Control	Activated
Workstation	Main
Location	Engine
	

Station Control	Enables or disables the Select station functionality. • Activated • Deactivated
Workstation	Defines the type of workstation. • Main • Remote
Location	Defines the location of the control panel. Only used in systems with Voyage Data Recorder Interface, VDRI-1. • Bridge • Port Wing • Starboard Wing • Engine Control Room • Engine • Wing

Functionality of DNV models

All PJC4xx part numbers that end with *-DNV* has additional functionality for compliance with DNV-RU-SHIP-Pt4Ch9 - Control and monitoring systems.

The following features are available with part numbers that end with *-DNV*:

- Power supply failure alarm display of motor RPM
- Gear leg low oil level alarm
- Select station

For compliance with DNV-RU-SHIP-Pt4Ch9 independent emergency stop must be installed.

Power supply failure alarm

An auxiliary power supply input is available on the X3 I/O connector. When powering TP-35 from both the S-Link interface and the I/O connector, an alarm will be triggered if one of the power supplies falls outside the rated input voltage range. See Detailed *IO Description* chapter for information on auxiliary power supply connection.

A failure on the S-Link power supply will suspend thruster operation from the control panel. If the auxiliary power supply falls outside rated voltage ratings, an alarm will be triggered, but thruster operation will be allowed.

Display of motor RPM and gear leg low oil level alarm

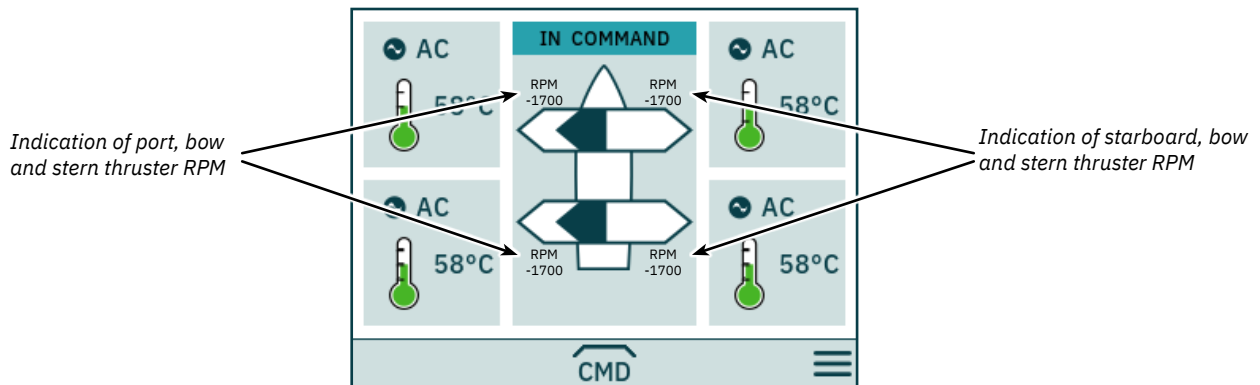
Sleipner's *Thruster Monitoring Unit-1 (TMU-1)* must be installed and connected to the S-Link bus to display motor RPM and gear leg low oil level alarm on TP-35.

The thruster motor must be equipped with an RPM sensor connected to TMU-1. An oil tank with a level switch must be installed and connected to TMU-1. RPM sensor signal and oil tank level switch signal from one thruster shall be connected to the same TMU-1, and there must be one TMU-1 for each thruster. See TMU-1 user manual for more information.

The RPM of the thruster is positive for starboard direction and negative for port.

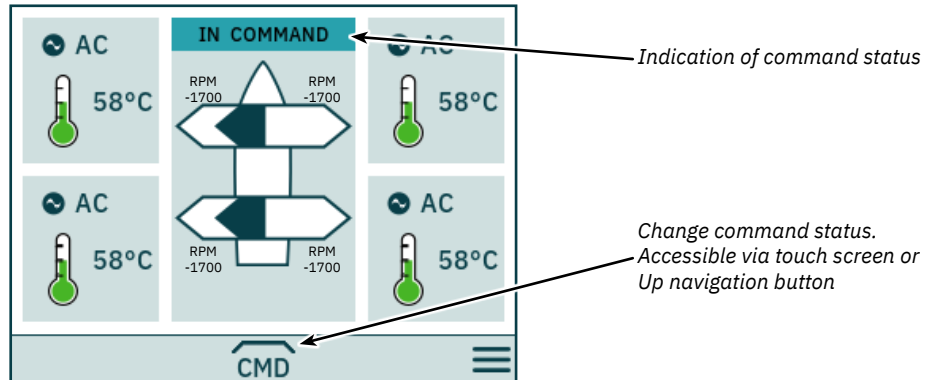
When configuring the TMU-1 Location parameter, it is important to select the option that matches the physical installation of the thruster to ensure that the read RPM value is displayed at the correct location in the thruster dashboard view. See the *System Devices* chapter for more information on configuring the TMU-1

The thruster dashboard view example below shows an installation with four AC thrusters with an RPM sensor.

**Select station**

Configuration of the select station functionality is described in the *Station Control Settings* chapter.

This functionality ensures that the thrusters can only be operated by one control panel at a time. The control panels installed on a vessel must be defined to be either Main Workstation or Remote Workstation. The type of workstation determines how the transfer of command can be conducted. It is only the workstation that is in the state IN COMMAND that can operate the thrusters. When turning on a control panel, it will automatically be IN COMMAND if none of the control panels connected to the S-Link bus is IN COMMAND.



Transfer of command

Main Workstation can obtain command from other Main Workstations and Remote Workstations.

Remote Workstation cannot obtain command from any other Workstation.

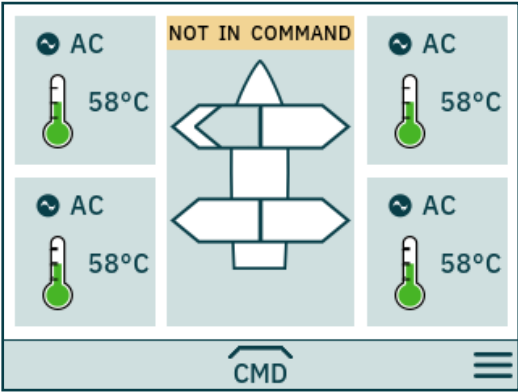
Remote Workstation and Main Workstation can obtain command when no other station is in command.

The control panel must be IN COMMAND to operate thrusters.

When the control panel is NOT IN COMMAND, thruster operation is suspended. If the connected joysticks are adjusted, no joystick signal is shown in the thruster dashboard view.

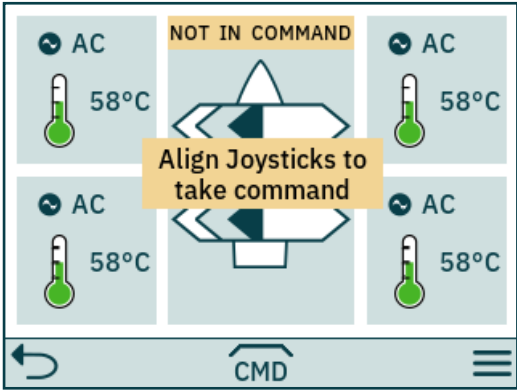
Operation of joysticks connected to a remote control panel being IN COMMAND will be shown with light blue arrows on the thruster dashboard view.

The measured RPM of the thruster motor is always displayed even if the control panel is NOT IN COMMAND.



	Take command, when not IN COMMAND.
---	------------------------------------

Joysticks must be aligned before a workstation can take command. If joysticks are not aligned when command is requested, a notice is displayed for 10 seconds. If the operator aligns the joysticks while this notice is displayed, command is taken, and an audible signal is given. If the joysticks are not aligned during the time the notice is displayed or the notice is manually closed, the workstation continues to be NOT IN COMMAND.

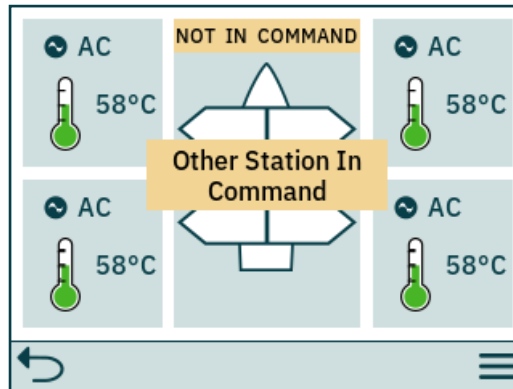


	Closes the notice.
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Joysticks aligned	Command is transferred.
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If a Remote Workstation request command when another Main or Remote Workstation is in command, a notice is displayed informing that another workstation is in command. The notice disappears after 3 seconds, or it can be manually closed.

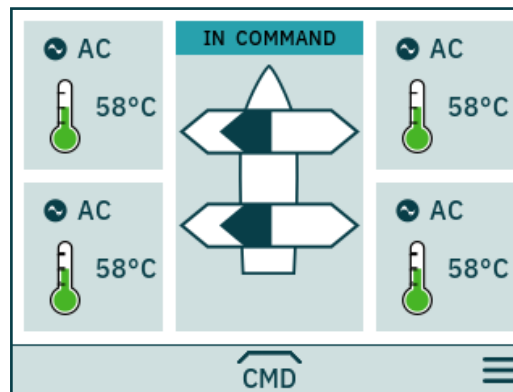
In such a situation, the other workstation must release the command before the command can be transferred.



Closes the notice.

Release command

When the control panel is IN COMMAND, Main Workstations and Remote Workstations can release command to allow for other workstations to take command. When command is released, an audible signal will be given to indicate that the state of the control panel has changed from IN COMMAND to NOT IN COMMAND. If command is released when thrusters are running, the thrusters will stop.



Release command.

PHC-3 Fault Codes

MC_0117

Fault Code	Description	Cause	Action
10500.0.10	PHC Oil Level - Level Low	Hydraulic oil level is low	"-Limit use of thruster -Inspect hydraulic oil level -Check system for leaks and refill hydraulic oil"
10500.0.13	PHC Oil Level - Open Circuit	Analog oil level sensor open circuit	"-Sensor not connected or wire break. -Verify sensor type in parameter 0201 -Disconnect sensor and measure that sensor resistance value is in range 0-180ohm."
10501.0.11	PHC Oil Temp - Level High	Oil temperature higher than 75°C (167°F)	"-Limit use of thruster to prevent temperature to rise. -Check if cooling pump is running and there is cooling water flow. -Inspect seawater filter -Verify that cooling pump is enabled in parameter 0301"
10501.0.13	PHC Oil Temp - Open Circuit	Analog oil temp sensor open circuit	"-Sensor not connected or wire break. - Disconnect sensor and measure that sensor resistance value is in range 104ohm-147Kohm -Wrong sensor is defined in parameter 0201"
10501.0.16	PHC Oil Temp - Short Circuit	Analog oil temp input short circuit	"-Input shorted to GND, check wiring/sensor -Disconnect sensor and measure that sensor resistance value is in range 104ohm-147Kohm"
10502.0.13	PHC Stabilizer Pressure - Open Circuit	Stabilizer pressure sensor open circuit	"-Sensor not connected or wire break. -System incorrectly configured with stabilizer, parameter 1001 -Replace sensor"
10502.0.16	PHC Stabilizer Pressure - Short Circuit	Stabilizer pressure sensor short circuit	"-Wires shorted or sensor defective, check wiring/sensor -Replace sensor"
10502.0.19	PHC Stabilizer Pressure - Under Limit	Stabilizer pressure has dropped below 20bar.	"-Check accumulator charge pressure -Check PTO pressure (if PTO powered) -Check system for oil leaks -Check generator power supply to the VFD (is VFD motor speed maximum when pressure alarming low)"
10502.0.20	PHC Stabilizer Pressure - Over Limit	"Stabilizer pressure is higher than: parameter 1013 PTO OVER-PRESSURE FAULT LEVEL running from PTO (FW V1.029 an older, set point + 30bar running from PTO) or set point + 15bar running from AC motor"	"-Check Parameter 1013 PTO OVER-PRESSURE FAULT LEVEL -Check PTO pressure setting -Check accumulator charge pressure -Check unload valve operation"
10502.0.26	PHC Stabilizer Pressure - VALUE MAX	Stabilizer pressure reached sensor max value.	"-Check that correct sensor is fitted -Check that sensor range parameter 1010 match the sensor -Check PTO pressure setting"
10502.0.200	PHC Stabilizer Pressure - Timeout	Stabilizer pressure has not reached 60% of set point parameter 1003 after 30sec.	"-Check pump feed shutoff valve. -Check PTO pressure (if PTO powered) -Check system for oil leaks"
10503.0.13	PHC System Pressure - Open Circuit	System pressure sensor open circuit	"-Sensor not connected or wire break. -Verify system pressure, parameter 0104"
10503.0.16	PHC System Pressure - Short Circuit	System pressure sensor short circuit	"-Wires shorted or sensor defective, check wiring/sensor -Replace sensor"
10504.0.13	PHC AI 1 - Open Circuit	Analog Input 1 (4-20mA) sensor open circuit	-Sensor not connected or wire break.
10504.0.16	PHC AI 1 - Short Circuit	Analog Input 1 (4-20mA) sensor short circuit	"-Wires shorted or sensor defective, check wiring/sensor -Replace sensor"
10505.0.13	PHC AI 2 - Open Circuit	Analog Input 2 (4-20mA) sensor open circuit	-Sensor not connected or wire break.
10505.0.16	PHC AI 2 - Short Circuit	Analog Input 2 (4-20mA) sensor short circuit	"-Wires shorted or sensor defective, check wiring/sensor -Replace sensor"
10508.0.13	PHC DOUT AC PUMP UNLOAD - Open Circuit	AC Pump Unload valve open circuit	"-Check for open circuit, power consumption < 5.0 Watt -System incorrectly configured with stabilizer, parameter 1001"
10508.0.51	PHC DOUT AC PUMP UNLOAD - Current High	AC Pump Unload valve current higher than 4.0A	-Check wires and connections for short circuit
10509.0.13	PHC DOUT ACCUMULATOR DUMP - Open Circuit	Accumulator Dump valve open circuit	"-Check for open circuit, power < 5.0 Watt -System incorrectly configured with stabilizer, parameter 1001"
10509.0.51	PHC DOUT ACCUMULATOR DUMP - Current High	Accumulator Dump valve current higher than 4.0A	-Check wires and connections for short circuit
10510.0.13	PHC DOUT STABILIZER - Open Circuit	Stabilizer valve open circuit	"-Check for open circuit, power consumption < 5.0 Watt -System incorrectly configured with stabilizer, parameter 1001"
10510.0.51	PHC DOUT STABILIZER - Current High	Stabilizer valve current higher than 4.0A	-Check wires and connections for short circuit
10511.0.13	PHC DOUT COOLING PUMP HYDRAULIC - Open Circuit	Hydraulic Cooling Pump valve open circuit	"-Check for open circuit, power consumption < 5.0 Watt -Wrong cooling pump configured, parameter 0301"
10511.0.51	PHC DOUT COOLING PUMP HYDRAULIC - Current High	Hydraulic Cooling Pump valve current higher than 4.0A	-Check wires and connections for short circuit
10512.0.13	PHC DOUT LS DUMP - Open Circuit	LS-Dump valve open circuit	"-Check for open circuit, power consumption < 5.0 Watt -System wrong configured with thrusters, parameter 2001 or 2101"
10512.0.51	PHC DOUT LS DUMP - Current High	LS-Dump valve current higher than 4.0A	-Check wires and connections for short circuit
10513.0.51	PHC DOUT PUMP #2 - Current High	Pump #2 valve current higher than 4.0A	-Check wires and connections for short circuit
10514.0.13	PHC DOUT 5 - Open Circuit	Digital Output 5 is configured as crossover and output is open circuit	"-Check for open circuit, power consumption < 5.0 Watt -Output configured wrong, parameter 0505"
10514.0.51	PHC DOUT 5 - Current High	Digital Output 5 current higher than 4.0A	-Check wires and connections for short circuit
10515.0.13	PHC DOUT 6 - Open Circuit	Digital Output 6 is configured as crossover and output is open circuit	"-Check for open circuit, power consumption < 5.0 Watt -Output configured wrong, parameter 0506"

Fault Code	Description	Cause	Action
10515.0.51	PHC DOUT 6 - Current High	Digital Output 6 current higher than 4.0A	-Check wires and connections for short circuit
10516.0.13	PHC DOUT 3 - Open Circuit	Digital Output 3 is configured as crossover and output is open circuit	"-Check for open circuit, power consumption < 5.0 Watt -Output configured wrong, parameter 0503"
10516.0.51	PHC DOUT 3 - Current High	Digital Output 3 current higher than 4.0A	-Check wires and connections for short circuit
10517.0.13	PHC DOUT 2 - Open Circuit	Digital Output 2 is configured as crossover and output is open circuit	"-Check for open circuit, power consumption < 5.0 Watt -Output configured wrong, parameter 0502"
10517.0.51	PHC DOUT 2 - Current High	Digital Output 2 current higher than 4.0A	-Check wires and connections for short circuit
10518.0.13	PHC DOUT 1 - Open Circuit	Digital Output 1 is configured as crossover and output is open circuit	"-Check for open circuit, power consumption < 5.0 Watt -Output configured wrong, parameter 0501"
10518.0.51	PHC DOUT 1 - Current High	Digital Output 1 current higher than 4.0A	-Check wires and connections for short circuit
10519.0.13	PHC DOUT 4 - Open Circuit	Digital Output 4 is configured as crossover and output is open circuit	"-Check for open circuit, power consumption < 5.0 Watt -Output configured wrong, parameter 0504"
10519.0.51	PHC DOUT 4 - Current High	Digital Output 4 current higher than 4.0A	-Check wires and connections for short circuit
10520.0.51	PHC ECI PUMP POWER FEED - Current High	ECI cooling pump power current higher than 8.0A	"-Check that the pump housing and impeller are clean, free from debris or marine growth, and that the impeller can rotate easily. -Check pump cable for damage and short circuits -Make sure the connector on the cooling pump is correct inserted. -Replace cooling pump"
10521.0.51	PHC Bow Thruster Power - Current High	Bow thruster PVG feed current higher than 3.0A	-Check PVG wires and connections for short circuit
10522.0.51	PHC Stern Thruster Power - Current High	Stern thruster PVG feed current higher than 3.0A	-Check PVG wires and connections for short circuit
10523.0.51	PHC Thruster Power - Current High	Bow or Stern PVG feed current higher than 3.3A	Check all bow and stern PVG signal wires for short circuits
10524.0.51	PHC ECI Cooling Pump - Current High	ECI cooling pump current higher than 13.0A	"-Check ECI cooling pump cable for damage and short circuits -Replace ECI cooling pump"
10524.0.53	PHC ECI Cooling Pump - Overvoltage	ECI cooling pump overvoltage, voltage higher than 33.0V	"-Check PHC-3 input voltage is below 33.0V -Replace ECI cooling pump"
10524.0.54	PHC ECI Cooling Pump - Undervoltage	ECI cooling pump under voltage, voltage is lower than 18.0V	"-Check PHC-3 input voltage is higher than 18.0V -Replace ECI cooling pump"
10524.0.55	PHC ECI Cooling Pump - Overtemp	ECI cooling pump temperature higher than 100°C (212°F)	"-Check ECI cooling pump for damages -Replace ECI cooling pump"
10524.0.100	PHC ECI Cooling Pump - No Communication	No communication with ECI cooling pump	"-Check if ECI pump is connected -Check wires to ECI pump for open circuits -Check power supply cooling pump -Wrong cooling pump configured, parameter 0301"
10524.0.205	PHC ECI Cooling Pump - HW FAULT	ECI cooling pump hardware fault	-Replace ECI cooling pump
10526.0.0	PHC ECI Cooling Pump Blocked - -	ECI cooling pump is blocked	"-Reset fault and if fault reappears, cooling pump need service or replacement. -Check pump inlet for obstacles"
10527.1.0	PHC VFD Not Ready Instance 1 -	VFD not ready	-VFD external run enable/power available signal is lost.
10528.1.10	PHC VFD ABB Parameter Instance 1 Level Low	ABB ACS550 parameter values 2001 or 2002 cannot be a negative value.	-Check ABB ACS550 parameter 2001 and 2002.
10529.0.19	PHC ECI Cooling Pump Speed - Under Limit	ECI pump motor speed under limit. Motor speed is below 100 rpm, or not getting minimum 750 rpm with in 3 seconds.	"-Check hose for dirt -Check pump inlet for obstacles"
10530.0.201	PHC PTO ENGINE INSTANCE - INIT FAIL	Parameter 1011-PTO ENGINE INSTANCE is not defined	-Set parameter 1011-PTO ENGINE INSTANCE
36000.1.24	ABB ACS550 Instance 1 Fault	ABB ACS550 fault	Se ABB ACS550 drive for more details
36002.1.24	VACON Instance 1 Fault	VACON VFD Fault	Se VACON drive for more details
36003.1.24	ABB ACS580 Instance 1 Fault	ABB ACS580 fault	Se ABB ACS580 drive for more details
36100.1.100	VFD Instance 1 No Communication	Lost communication with VFD	"-VFD not powered up -VFD communication cable not connected or incorrectly wired -On the VFD make sure the RS485 BUS TERMINATION is in ON position"
36103.1.0	VFD IN LOCAL Instance 1 -	VFD in local mode	-Switch VFD to remote mode

Fault Code	Description	Cause	Action
10600.0.208	SR150000 Fault - INTERLOCK	Retract Interlock	-Check if retract is deployed. -No communication with Retract Controller, check Retract Controller has power. -Check PDC-301 and Retract Controller setup.
36100.1.24	VFD Instance 1 Fault	VFD faulted	-See VFD for more information
36100.1.100	VFD Instance 1 No Communication	PDC-301 has no MODBUS communication with VFD.	-Check communication cable with VFD -Check if VFD has power
36101.1.200	VFD PMS Instance 1 Timeout	VFD is not ready within 60 after power request.	-Check if VFD has power
36101.1.204	VFD PMS Instance 1 SIGNAL LOST	Lost Power Management signal from VFD, VFD not available anymore.	-Check VFD for more information.
36103.1.0	VFD IN LOCAL Instance 1 -	VFD in Local or Hand Mode	-Change mode in VFD panel.

Installation Guide

Responsibility of the Installer

MC_0038

The installer must read this document to ensure necessary familiarity with the product before installation.

Instructions in this document cannot be guaranteed to comply with all international and national regulations. It is the responsibility of the installer to follow all applicable international and national regulations when installing Sleipner products.

The recommendations given in this document are guidelines ONLY, and Sleipner strongly recommends that advice is obtained from a person familiar with the particular vessel and applicable regulations.

This document contains general installation instructions intended to support experienced installers. If you are not skilled in this type of work, please contact professional installers for assistance.

If required by local regulation, electrical work must be done by a licensed professional.

Appropriate health and safety procedures must be followed during installation.

Faulty installation of Sleipner products will render all warranties given by Sleipner Motor AS.

Considerations and Precautions for S-Link Systems

MC_0105

When installing an S-Link™ system DO NOT connect any other control equipment directly to the S-Link™ bus except original Sleipner S-Link™ products.

In case of connecting third-party equipment, it must always be connected through a Sleipner-supplied interface product.

Any attempt to directly control or connect into the S-Link™ control system without a designated and approved interface will render all warranties and responsibilities of all of the connected Sleipner products.

If you are interfacing the S-Link™ bus by agreement with Sleipner through a designated Sleipner supplied interface, you are still required to install at least one original Sleipner control panel to enable efficient troubleshooting if necessary.

The TP-35 has two mounting options.

Top Mount

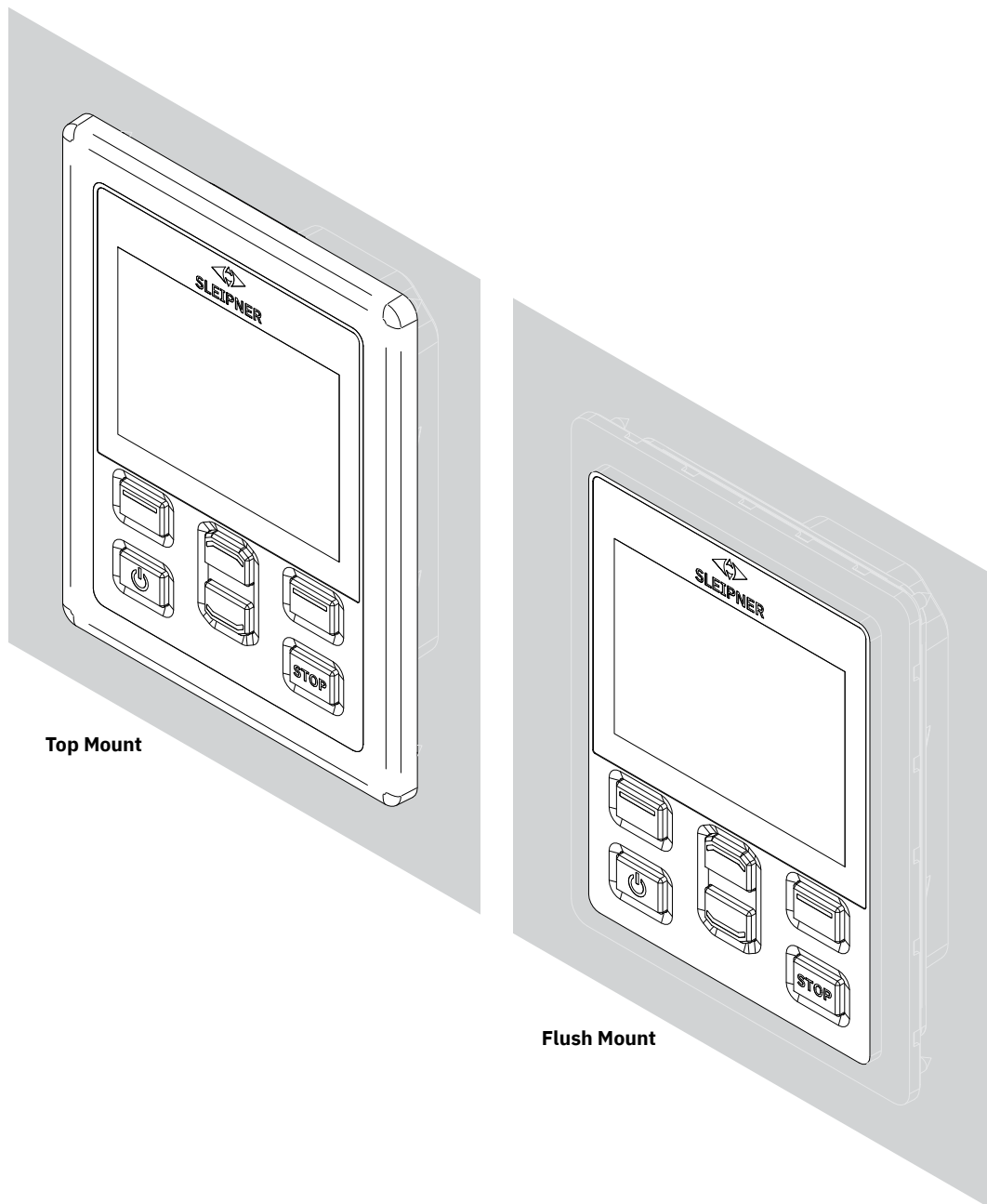
For the simplest installation the top mount design sits on the console board.

Flush Mount

The flush mount allows for a sleek and seamless display option exposing only the main screen, operation buttons and minimised panel surface.
(NB: For flush installations you must have adequate access to the back surface of the dash board to allow for the installation process)

When deciding your installation preference ensure to.

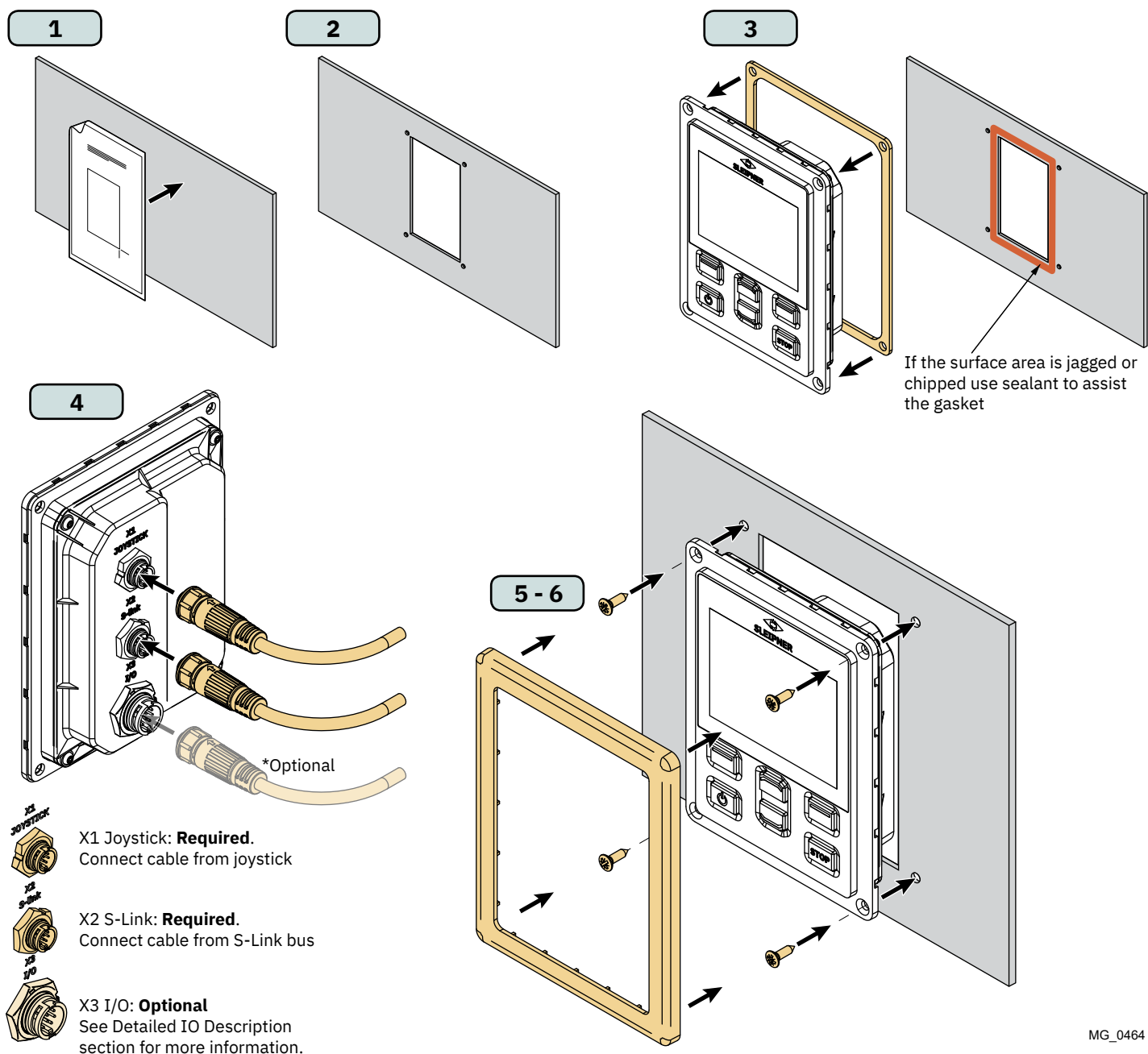
1. Find a suitable location for the control panel where it does not obstruct or is obstructed by other devices. Install the control panel on a flat surface where it is easy to use.
2. Ensure the panel should be mounted 20 cm away from any compass to ensure that the accuracy of the compass is not affected.
3. If the panel is mounted in an weather exposed location mounting the covering is recommended when the panel is not used.



MG_0463

TP-35 **Top Mount** installation.

1. Place the supplied cut-out template on the desired installation location.
2. Cut out the area according to the template.
3. Place the gasket to the back face of the panel. If the front surface around your cut out is jagged or chipped, use a sealant to assist the gasket.
4. Plug cables into the connectors at the rear of the control panel. (**NB: Access to the back of the panel may be impossible after installation.**)
5. Insert the control panel in place and fasten screws.
6. Mount cover frame



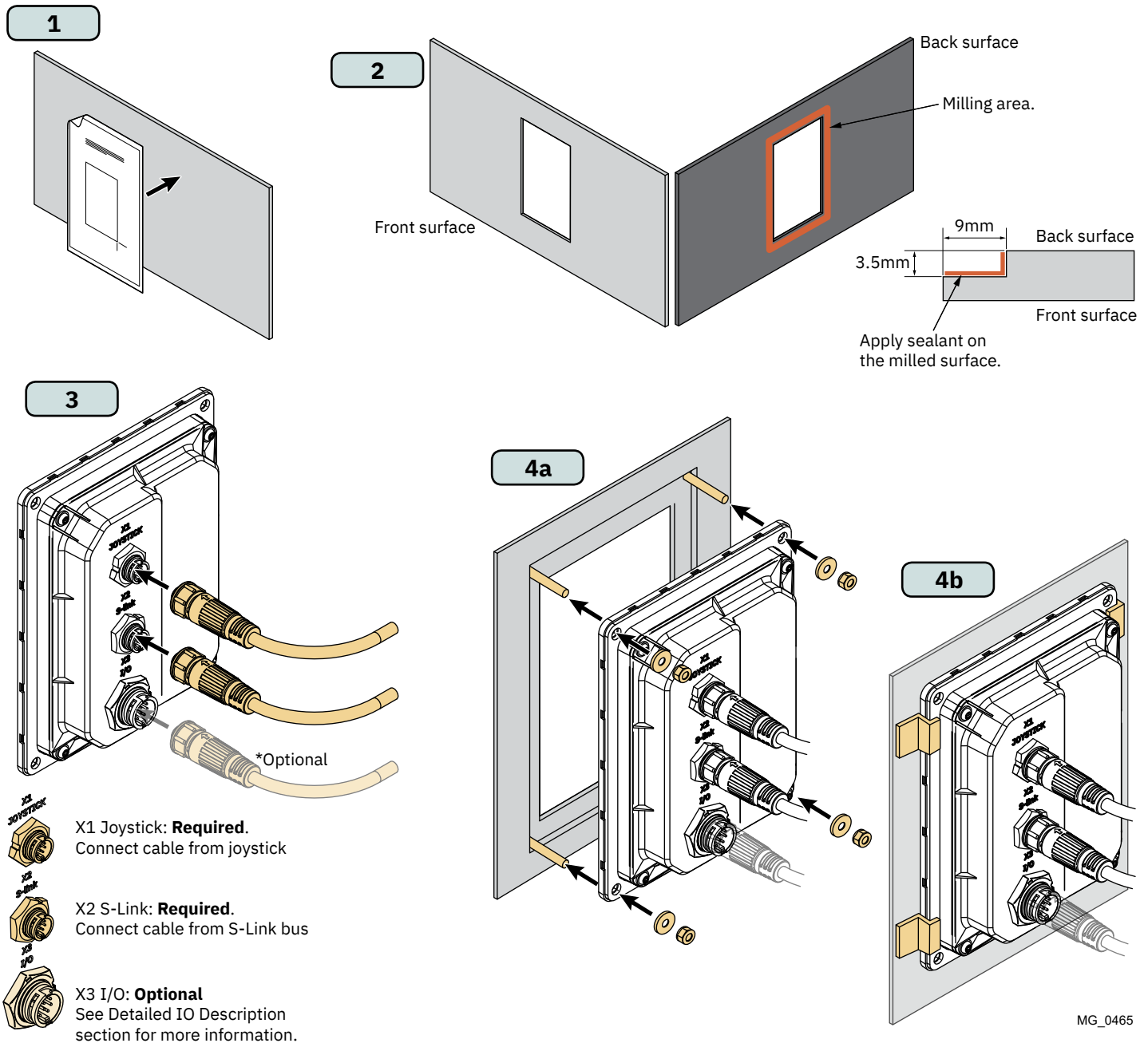
MG_0464

TP-35 **Flush Mount** installation.

1. Place the supplied cut-out template on the desired location.
2. Cut out and mill the marked area on the template. Use a sealant on the milled surface to protect against water ingress around the panel.
3. Plug cables into the connectors at the rear of the control panel.

Flush mount installations can be installed in multipliable ways. Two options are using fastening bolts or with a rear harness to hold the TP-35 in place.

- 4a. On the rear face secure four studs in the milled area using the template as a guide. **(NB: How to secure these studs will depend on the material of the dashboard.)** Insert the control panel in place and fasten with a washer/ nut. **(NB: Fastening bolts, washers or nuts are not included.)**
- 4b. Insert the control panel in place. Create fastening brackets to secure the TP-35 in place on the rear face of the dashboard. **(NB: Fastening brackets is not included and must be customized by the installer.)**



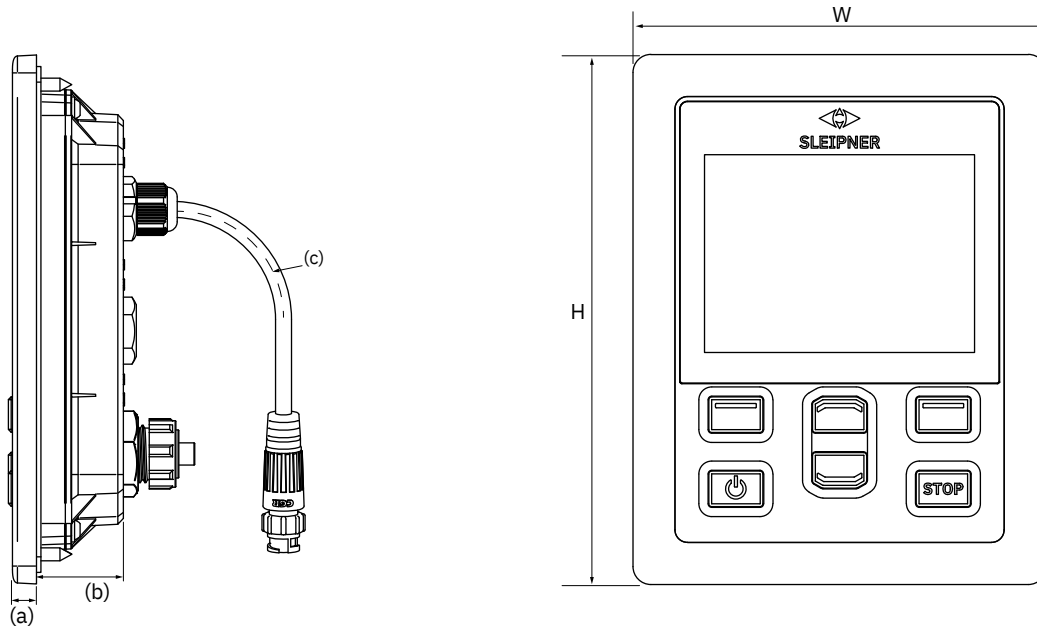
MG_0465

Measurements TP-35 Top Mount

MC_0392

Measurement code	Measurement description	TP-35 Top Mount	
		mm	inch
H	Panel Height	143.1	5.6
W	Panel width	111.6	4.4
(a)	Raised height above the dashboard	6.5	0.26
(b)	Depth behind the dashboard (not inc. cables)	23.5	0.9
(c)	Cable bend radius	35	1.4

Top mount



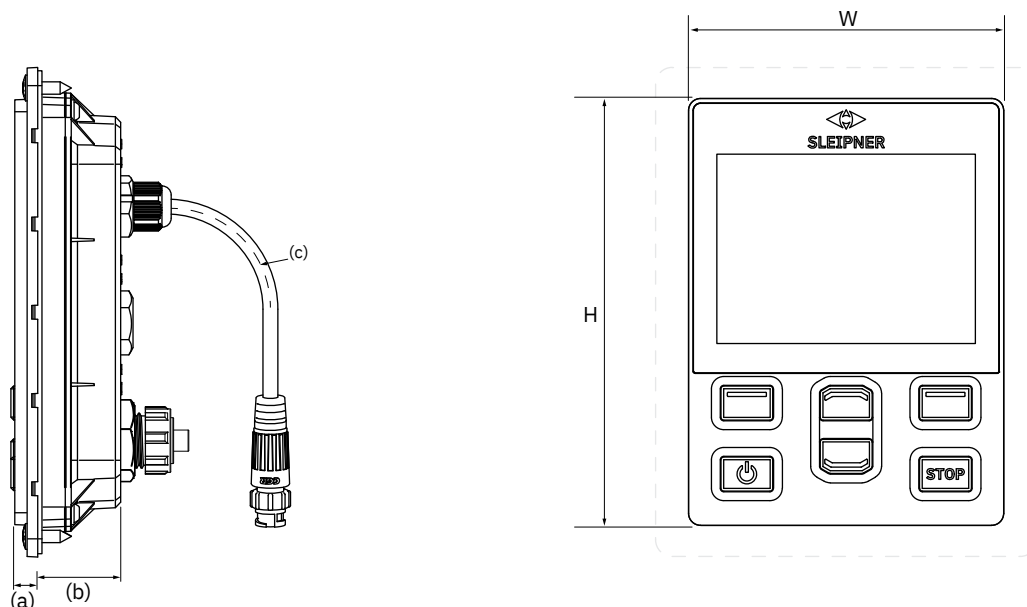
MG_0455

Measurements TP-35 Flush Mount

MC_0392

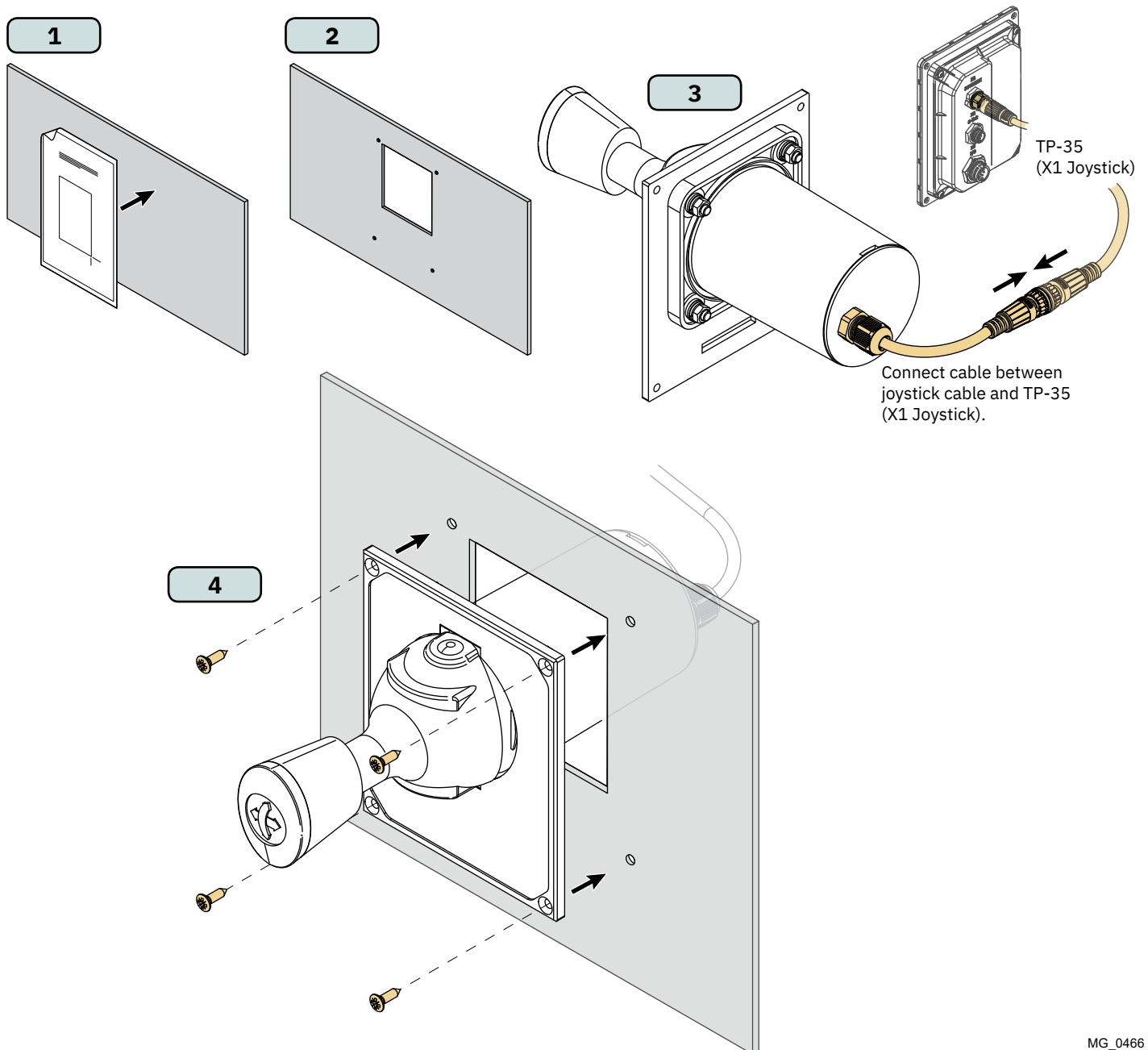
Measurement code	Measurement description	TP-35 Flush Mount	
		mm	inch
H	Panel Height	120.5	4.7
W	Panel width	89	3.5
(a)	Raised height above the dashboard	6.5	0.26
(b)	Depth behind the dashboard (not inc. cables)	23.5	0.9
(c)	Cable bend radius	35	1.4

Flush mount



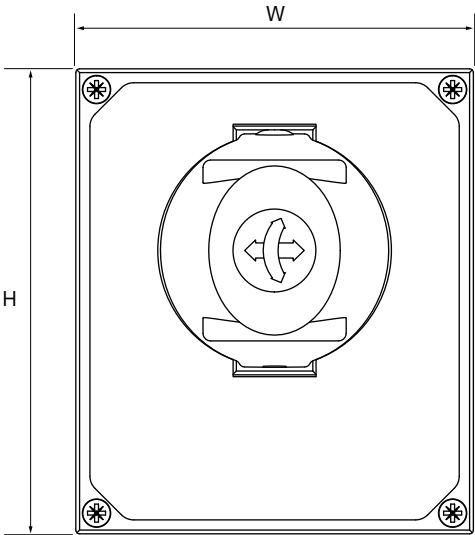
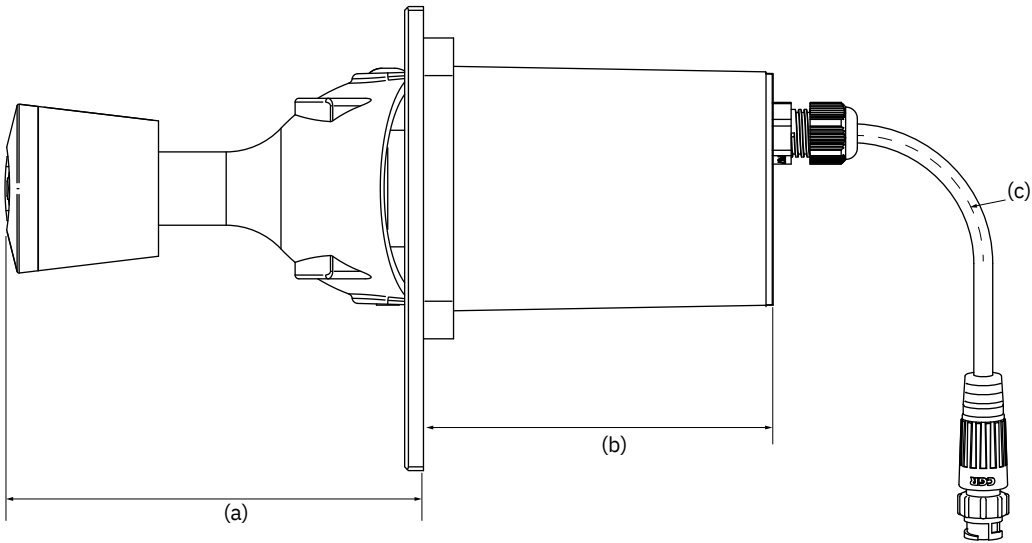
MG_0475

1. Place the supplied cut-out template on the desired installation location.
2. Cut out the area according to the template.
3. Plug cable into the cable/ connector at the rear of the TP-35 control panel. **(NB: During the TP-35 panel installation this cable may already be attached if access to the back side of the control panels is impossible.)**
4. Insert the control panel in place and fasten screws.

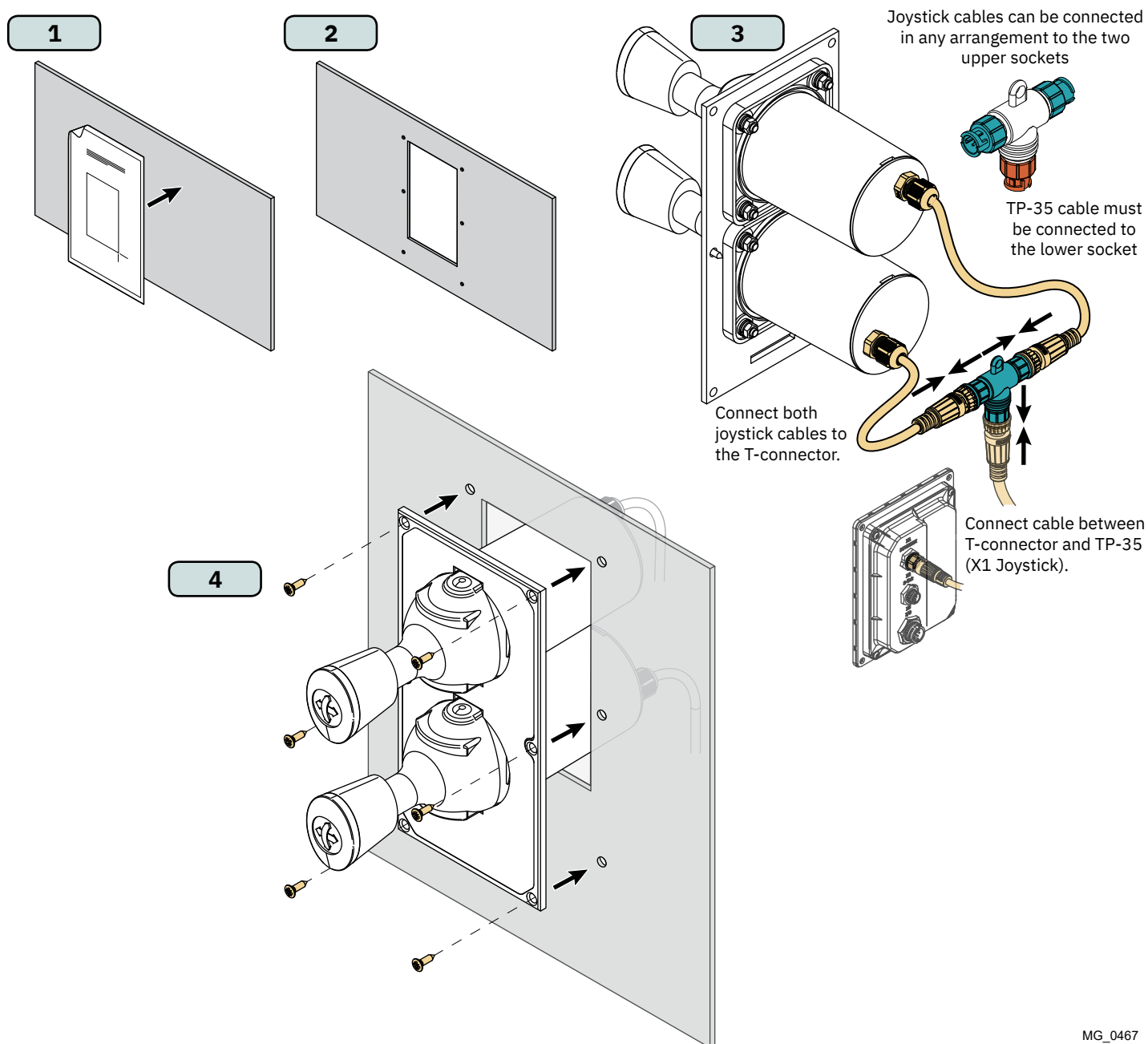


MG_0466

Measurement code	Measurement description	PJC421	
		mm	inch
H	Panel Height	123.4	4.9
W	Panel width	105.5	4.1
(a)	Raised height above the dashboard	111.3	4.4
(b)	Depth behind the dashboard (not inc. cables)	94.7	3.7
(c)	Cable bend radius	35	1.4

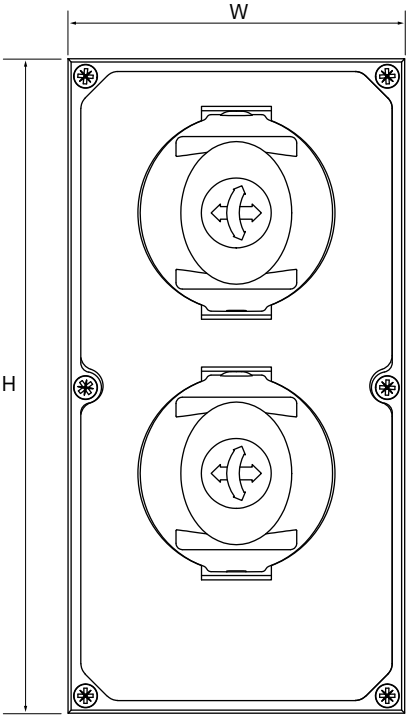
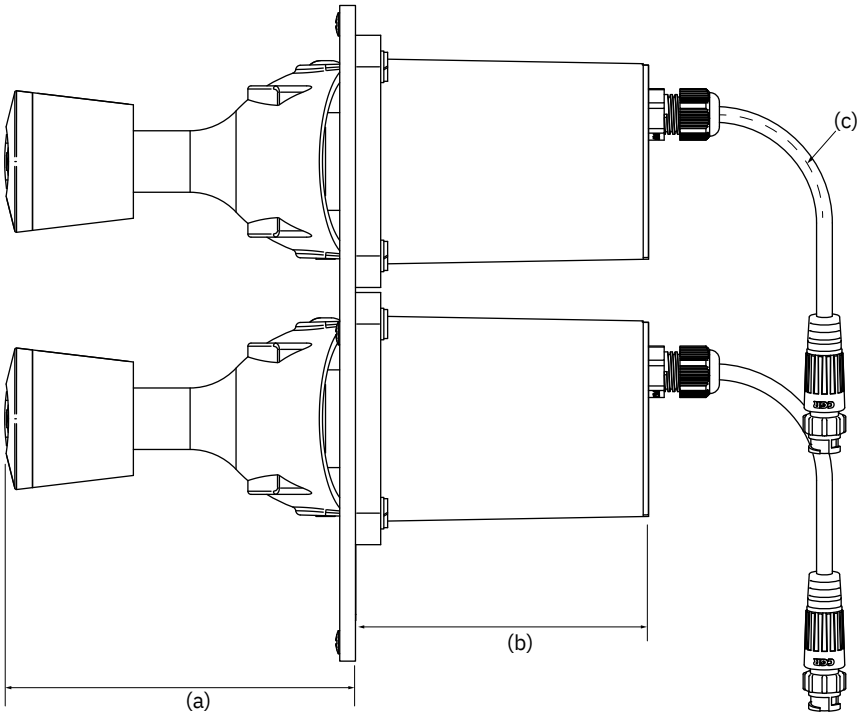


1. Place the supplied cut-out template on the desired installation location.
2. Cut out the area according to the template.
3. Plug both cables from the control panel into a S-Link T-connector. Connect the T-connector cable into the cable/ connector at the rear of the TP-35 control panel. **(NB: During the TP-35 panel installation this cable may already be attached if access to the back side of the control panels is impossible.)**
4. Insert the control panel in place and fasten screws.

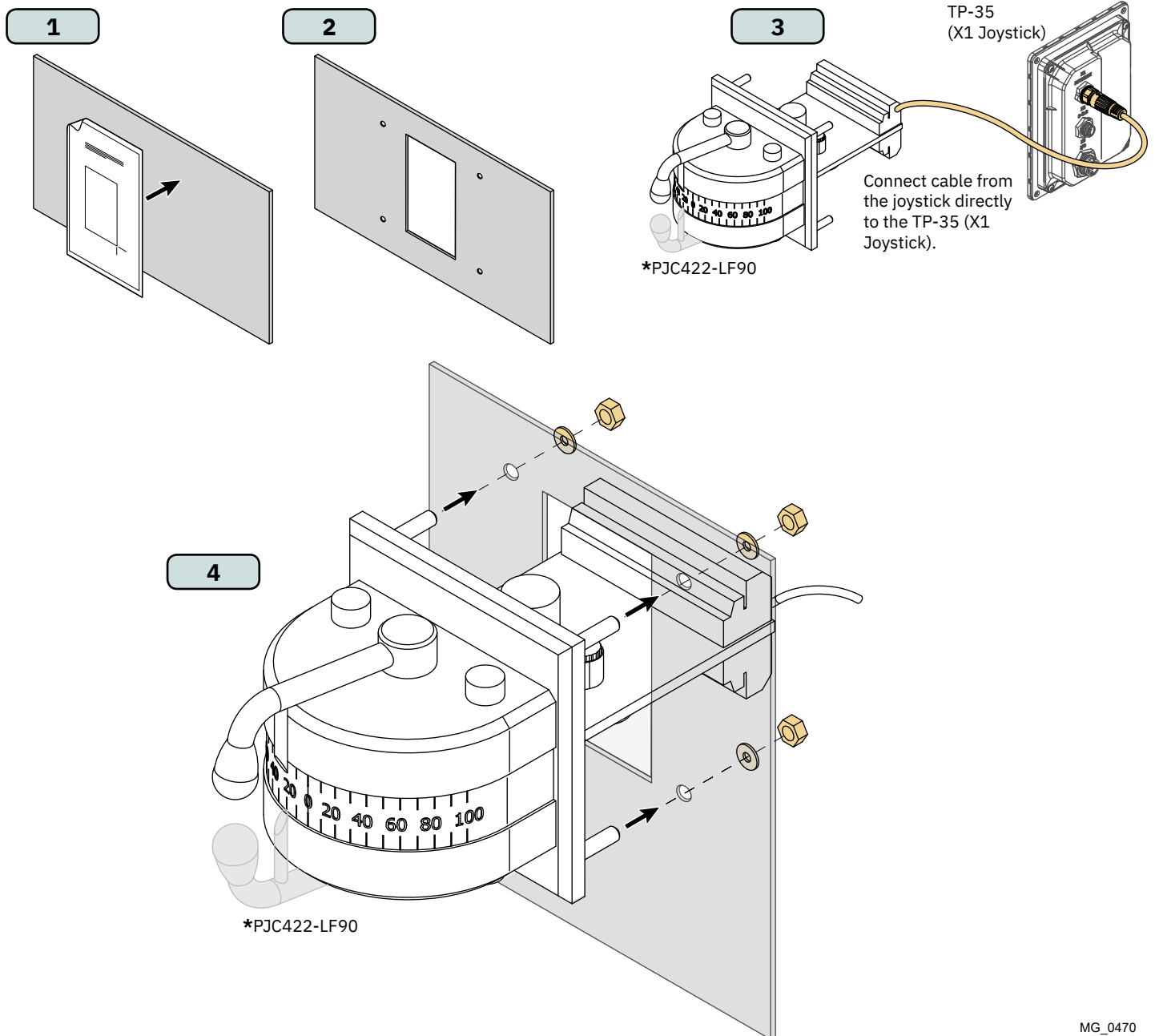


MG_0467

Measurement code	Measurement description	PJC422	
		mm	inch
H	Panel Height	206	8.1
W	Panel width	106	4.2
(a)	Raised height above the dashboard	111.3	4.4
(b)	Depth behind the dashboard (not inc. cables)	94.7	3.7
(c)	Cable bend radius	35	1.4

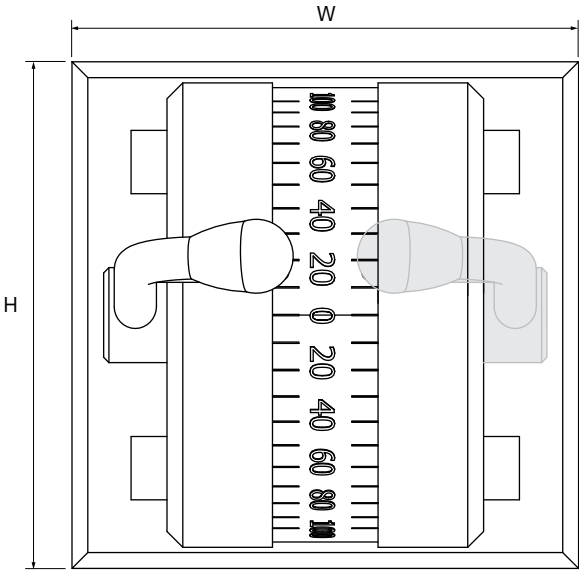
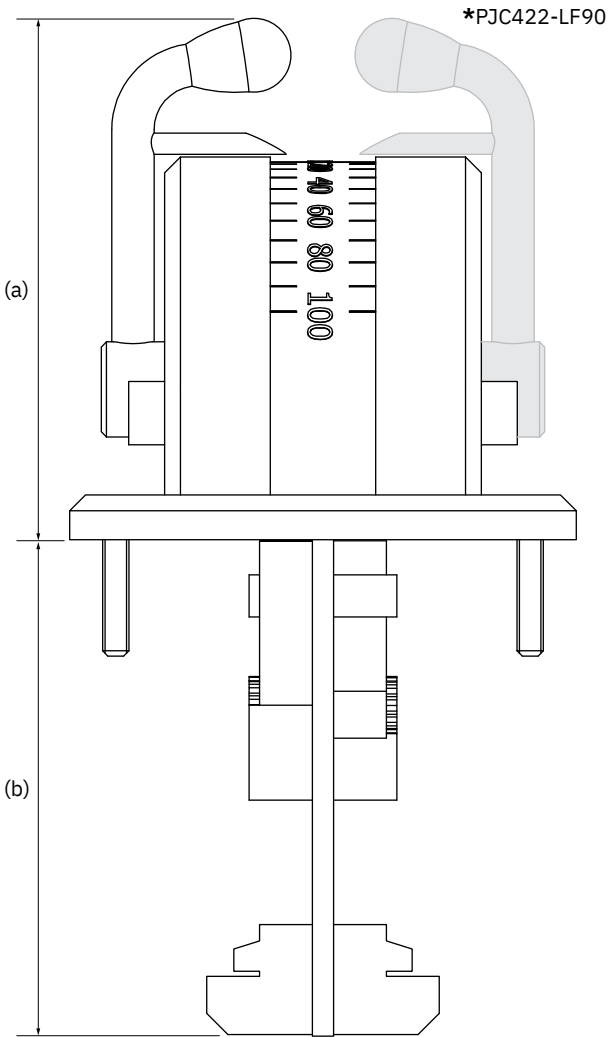


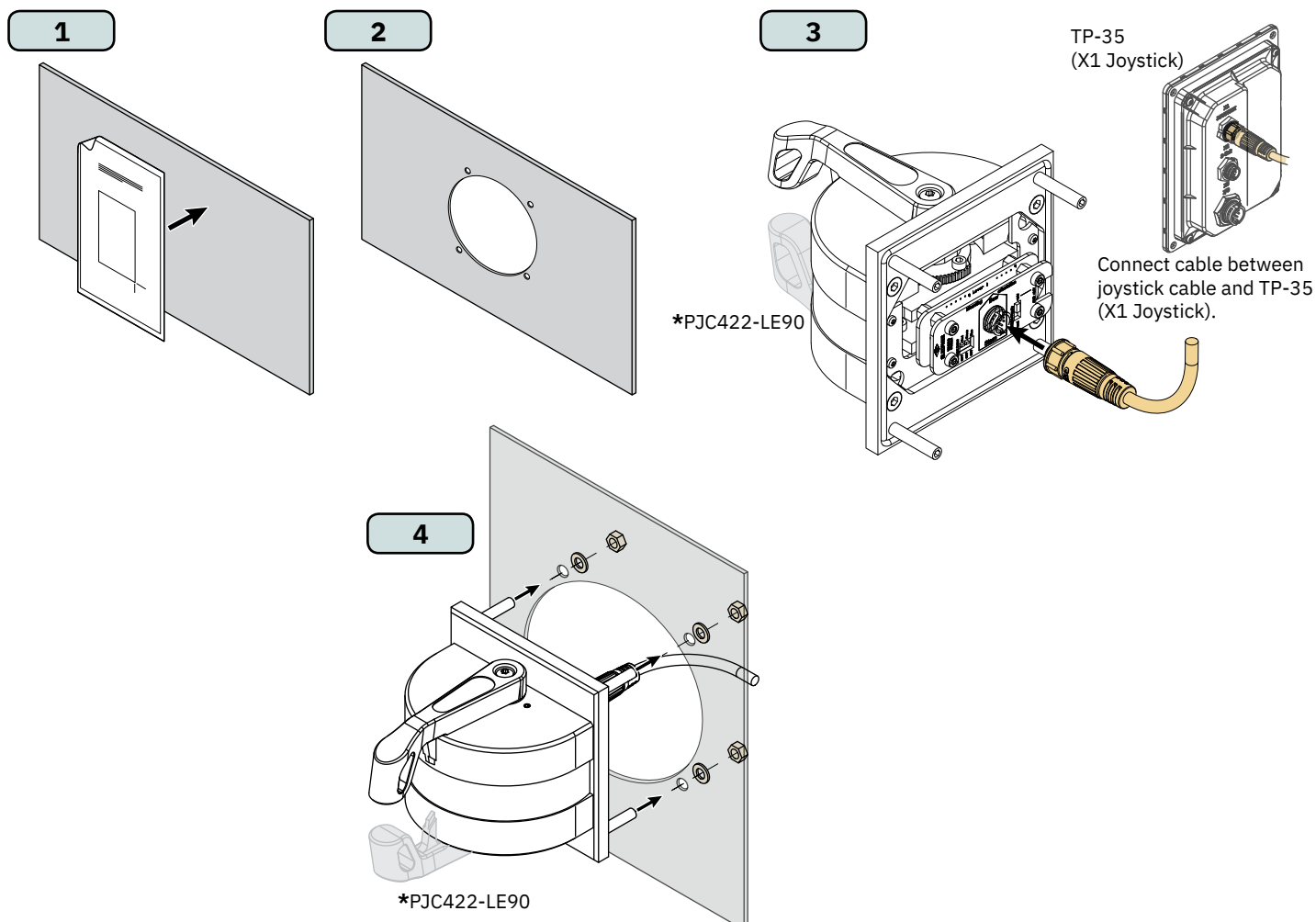
1. Place the supplied cut-out template on the desired installation location.
2. Cut out the area according to the template.
3. Place the gasket to the back face of the panel. If the front surface around your cut out is jagged or chipped, use a sealant to assist the gasket.
4. Plug cables into the connectors at the rear of the control panel.
5. Insert the control panel in place and fasten screws.
6. Mount cover frame



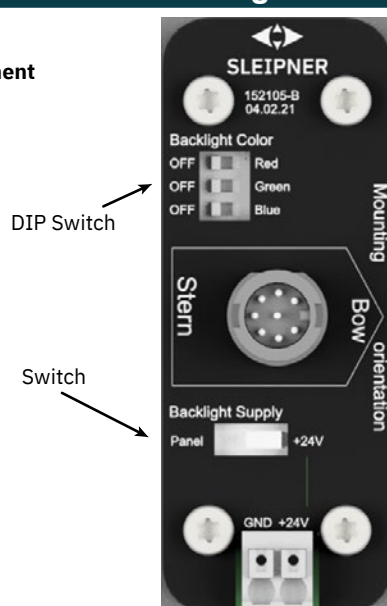
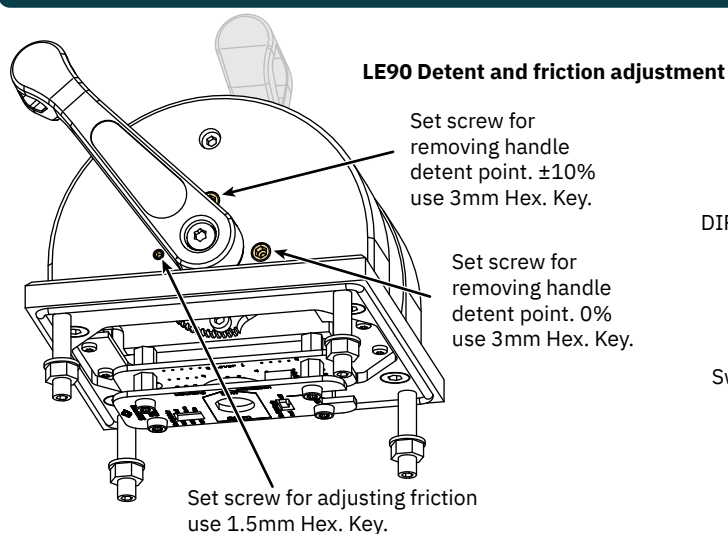
MG_0470

Measurement code	Measurement description	PJC421 LF90/-DNV		PJC422 LF90/-DNV	
		mm	inch	mm	inch
H	Panel Height	96	3.8	96	3.8
W	Panel width	96	3.8	96	3.8
(a)	Raised height above the dashboard	98.8	3.9	98.8	3.9
(b)	Depth behind the dashboard (not inc. cables)	94	3.7	94	3.7





PJC421-LE90 and PJC422-LE90 Configuration

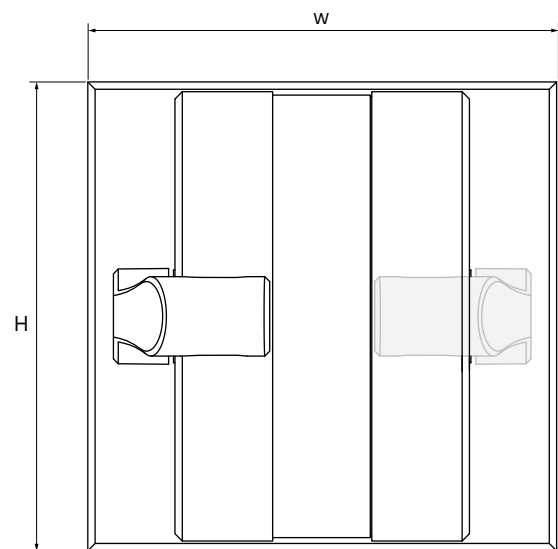
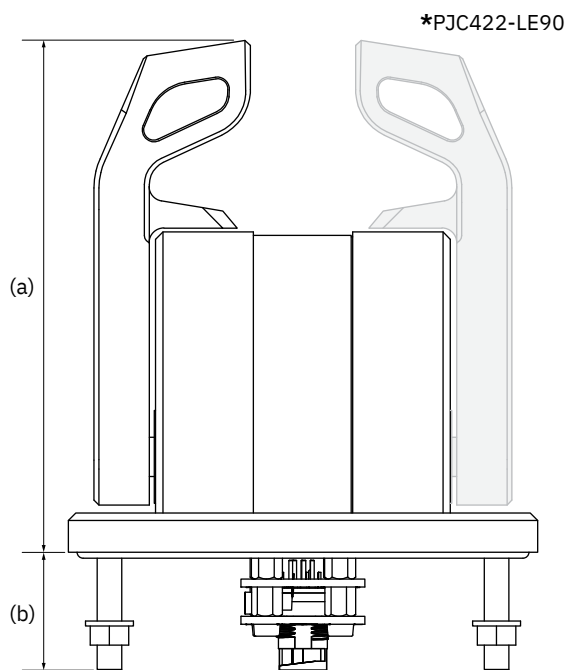


LE90 Backlight configuration

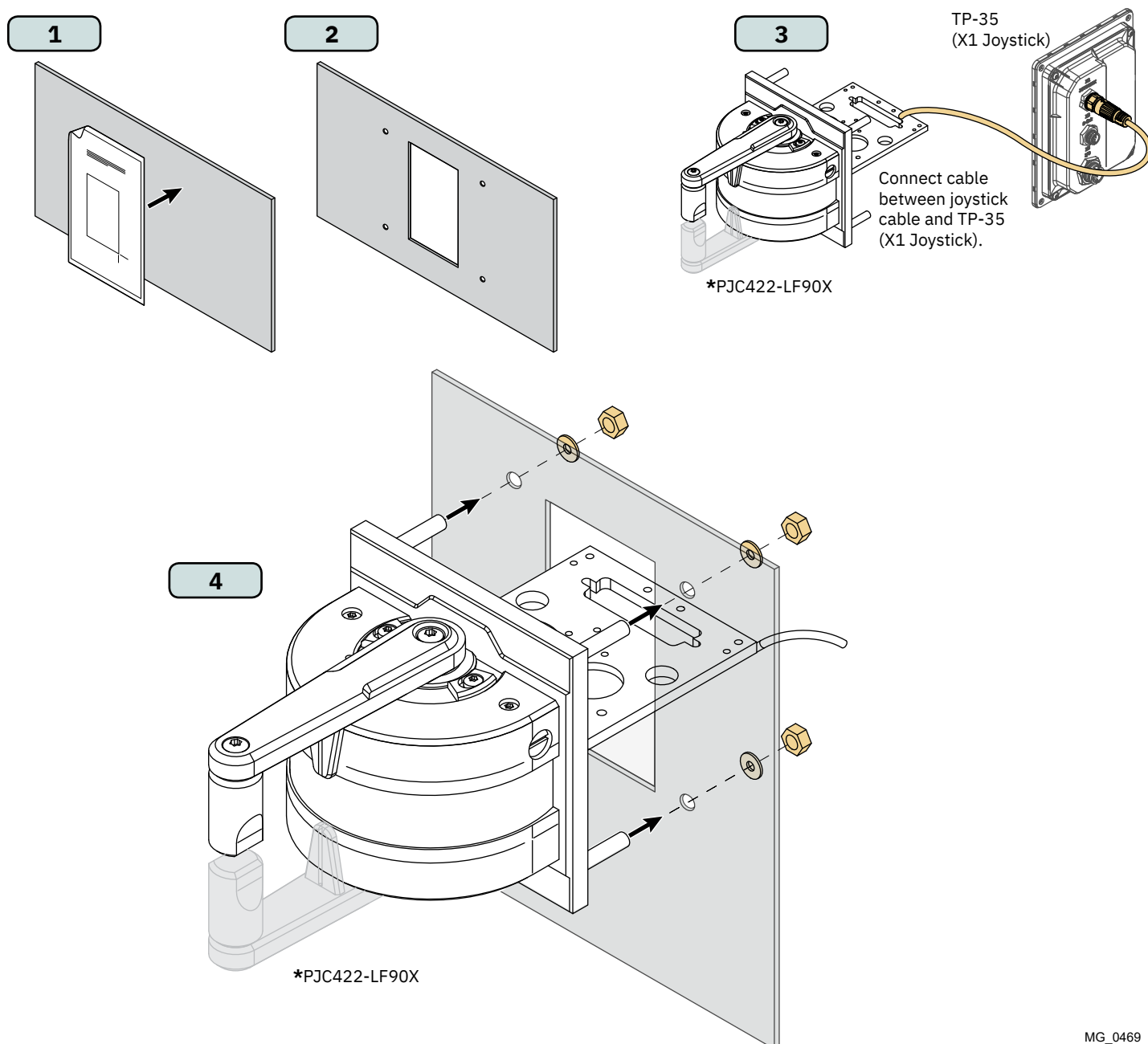
Use DIP switch to set back light color of LE90. Turning ON all three colors enables white light.

Use switch to configure power source for LE90 backlight. Choose "Panel" to power backlight from TP-35. The backlight intensity can then be controlled from TP-35. Choose +24V to power backlight from terminal block connection. This is typically used on installation with a common bridges backlight control.

Measurement code	Measurement description	PJC421 LE90/-DNV		PJC422 LE90/-DNV	
		mm	inch	mm	inch
H	Panel Height	96	3.8	96	3.8
W	Panel width	96	3.8	96	3.8
(a)	Raised height above the dashboard	104.7	4.1	104.7	4.1
(b)	Depth behind the dashboard (not inc. cables)	17.2	0.7	17.2	0.7

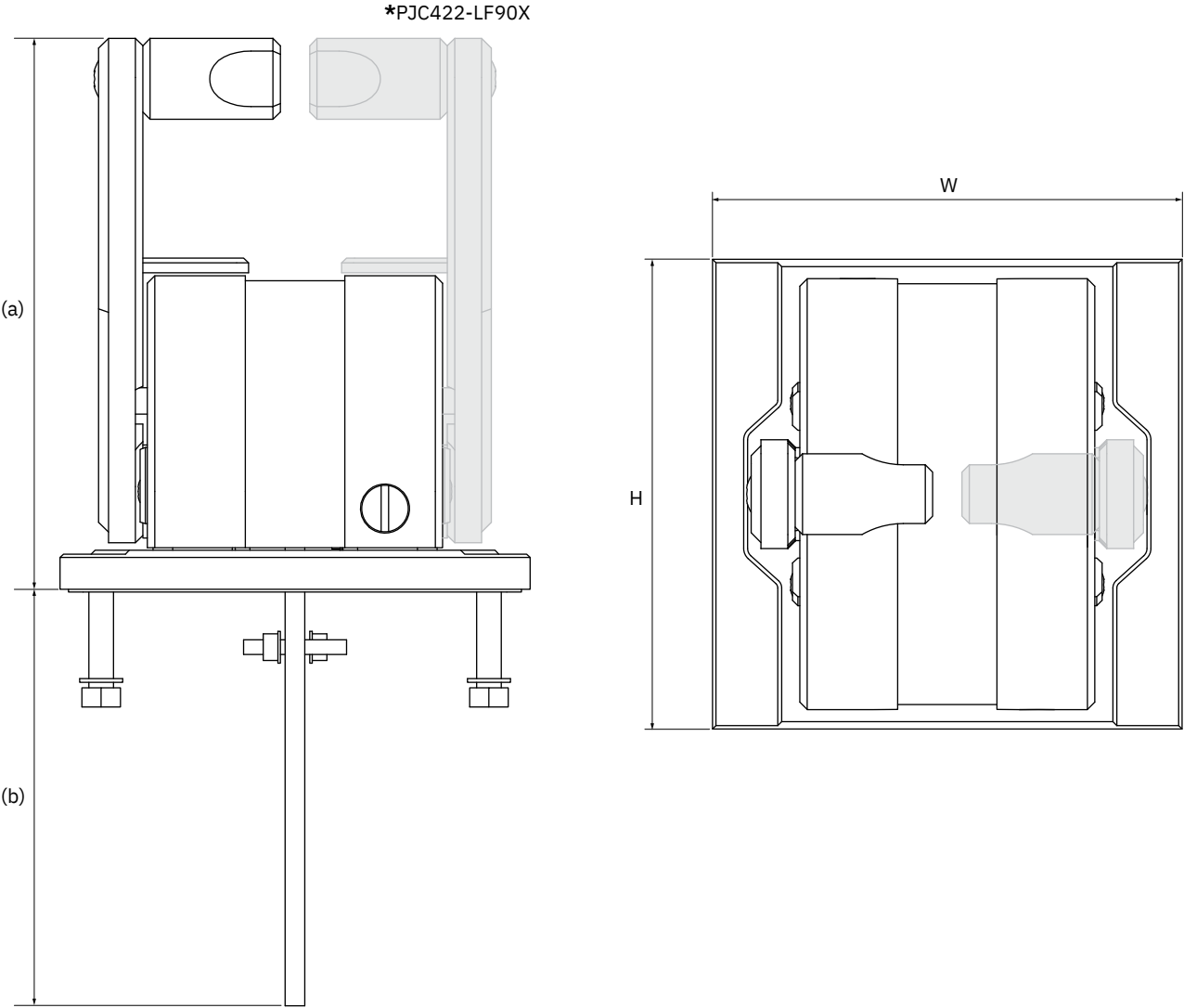


1. Place the supplied cut-out template on the desired installation location.
2. Cut out the area according to the template.
3. Plug cable into the cable/ connector at the rear of the TP-35 control panel. *(NB: During the TP-35 panel installation this cable may already be attached if access to the back side of the control panels is impossible.)*
4. Insert the control panel in place and fasten screws.



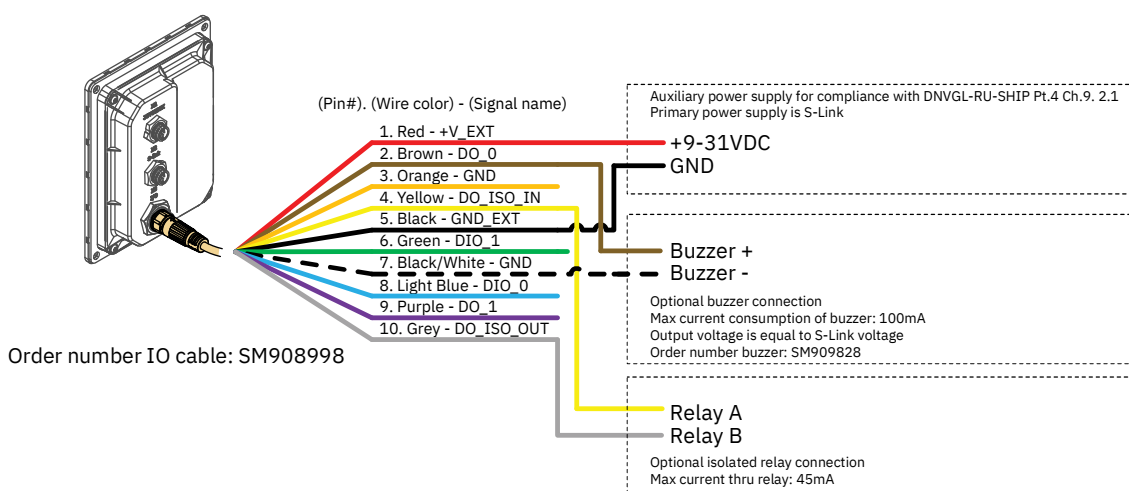
MG_0469

Measurement code	Measurement description	PJC421 LF90X/-DNV		PJC422 LF90X/-DNV	
		mm	inch	mm	inch
H	Panel Height	96	3.8	96	3.8
W	Panel width	96	3.8	96	3.8
(a)	Raised height above the dashboard	112.5	4.4	112.5	4.4
(b)	Depth behind the dashboard (not inc. cables)	85	3.3	85	3.3



MG_0458

Description	Value	
Available interfaces	X1 Joystick -1x +12V/+5V to joystick -1x AGND -2x analog inputs -2x digital input -1x +5V to LED -1x LIN data	8 pin male connector
	X2 S-Link -Vin -GND -CANH -CANL	5 pin S-Link male connector
	X3 IO -2x digital output -2x digital IO -2x GND -1x DO_ISO_IN -1x DO_ISO_OUT -1x Vin Ext -1x GND Ext	10 pin male connector Digital out signals on DO_0, DO_1, DIO_0 and DIO_1 are only available when TP-35 is powered through the S-Link interface.
Output voltage on I/O pins	Same as supply voltage	
Max total output current on I/O pins	100mA	
Max output current on one I/O pin	100mA	
Max current thru isolated digital output	45mA	
Max current on +12V to joystick	40mA	Intended for joystick potentiometers
Max current on +5V to joystick	40mA	Intended for joystick potentiometers
Max current on +5V to joystick LED	80mA	Intended for joystick backlight
IO protection	+31VDC and 0VDC	All accessible IOs tolerate connection to GND and the same voltage as the used supply voltage, Maximum +31V.
Voltage level digital input	High = >4.5 VDC Low = <0.5 VDC	



MG_0481

S-Link is a CAN-based control system used for communication between Sleipner products installed on a vessel. The system uses BACKBONE Cables as a common power and communication bus with separate SPUR Cables to each connected unit. Units with low power consumption are powered directly from the S-Link bus therefore one power cable must be connected to the BACKBONE Cable through a T-Connector. The S-Link cables should be installed such that sharp bend radius is avoided. Locking mechanism of connectors must be fully closed. Cables, T-Connectors and Extenders should not be located such that they are permanently immersed in water or other fluids.

Main advantages of S-Link system:

- Compact and waterproof plugs.
- BACKBONE and SPUR Cables have different colour coding and keying to ensure correct and easy installation. BACKBONE Cables have blue connectors and SPUR Cables have green connectors.
- Different cable lengths and BACKBONE Extenders makes the system scalable and flexible to install.

Installation of S-Link cables:

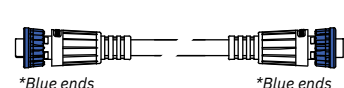
Select appropriate cables to keep the length of BACKBONE- and SPUR Cables to a minimum.

The S-Link cables should be installed to ensure sharp bend radius's is avoided. The locking mechanism on connectors must be fully closed. Cables, T-Connectors and Extenders should not be located so that they are permanently immersed in water or other fluids.

The POWER Cable should ideally be connected around the middle of the BACKBONE Cable to ensure an equal voltage drop at each end of the BACKBONE Cable. The yellow and black wire in the POWER Cable shall be connected to GND and the red wire connected to +12VDC or +24VDC.

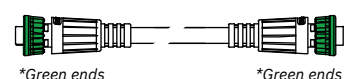
To reduce the risk of interference, avoid routing the S-Link cables close to equipment such as radio transmitters, antennas or high voltage cables. The backbone must be terminated at each end with the END Terminator.

Spur cables can be left unterminated to prepare for the installation of future additional equipment. In such cases, ensure to protect open connectors from water and moisture to avoid corrosion in the connectors.



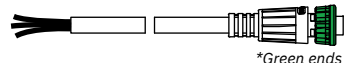
BACKBONE Cable

Forms the communication and power bus throughout a vessel. Available in different standard lengths.



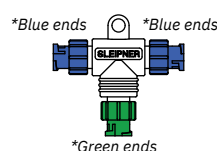
SPUR Cable

Used to connect S-Link compliant products to the backbone cable. One SPUR Cable must be used for each connected component, with no exceptions. Recommended to be as short as practically possible. Available in different standard lengths.



POWER Cable

Must be one in each system. Connects BACKBONE Cable to the power supply.



T-Connector

Used for connection of SPUR or POWER Cable to the BACKBONE Cable. One T-Connector for each connected cable.



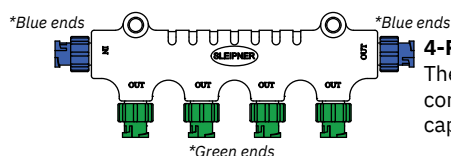
BACKBONE Extender

Connects two BACKBONE Cables to extend the length.



END Terminator

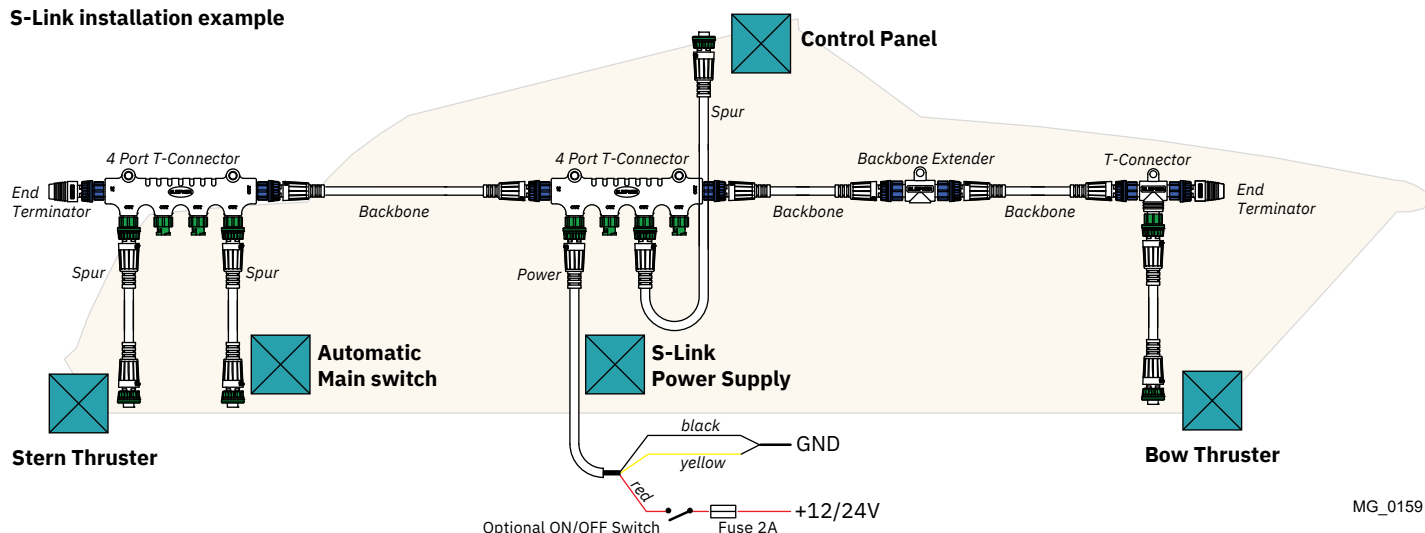
Must be one at each end of the BACKBONE bus.



4-Port T-Connector

The 4-PORT T-connector allows multiple SPUR Cables to be connected. The 4-PORT T-connector comes with two sealing caps to protect unused ports.

S-Link installation example



Fill in the type, location and serial numbers of the S-link devices installed. Keeping this as a reference will make the setup procedure easier!

[illegible]

Find your local professional dealer from our certified worldwide network for expert service and support.

visit our website www.sleipnergrouper.com/support

Product Spare Parts and Additional Resources

For additional supporting documentation, we advise you to visit our website www.sleipnergrouper.com and find your Sleipner product.

Warranty statement

- Sleipner Motor AS (The “Warrantor”) warrants that the equipment (parts, materials and embedded software of products) manufactured by the Warrantor is free from defects in workmanship and materials for the purpose for which the equipment is intended and under normal use and service (the “Warranty”).
- This Warranty is in effect for two years (Leisure Use) or one year (Commercial and other Non-leisure Use) from the date of purchase by the end user (for demonstration vessels, the dealer is deemed as end user).
- This Warranty is transferable and covers the equipment for the specified warranty period.
- The warranty does not apply to defects or damages caused by faulty installation or hook-up, abuse or misuse of the equipment including exposure to excessive heat, salt or fresh water spray, or water immersion except for equipment specifically designed as waterproof.
- In case the equipment seems to be defective, the warranty holder (the “Claimant”) must do the following to make a claim:
 - Contact the dealer or service centre where the equipment was purchased and make the claim. Alternatively, the Claimant can make the claim to a dealer or service centre found at www.sleipnergrouper.com. The Claimant must present a detailed written statement of the nature and circumstances of the defect, to the best of the Claimant’s knowledge, including product identification and serial nbr., the date and place of purchase and the name and address of the installer. Proof of purchase date should be included with the claim, to verify that the warranty period has not expired;
 - Make the equipment available for troubleshooting and repair, with direct and workable access, including dismantling of furnishings or similar, if any, either at the premises of the Warrantor or an authorised service representative approved by the Warrantor. Equipment can only be returned to the Warrantor or an authorised service representative for repair following a pre-approval by the Warrantor’s Help Desk and if so, with the Return Authorisation Number visible postage/shipping prepaid and at the expense of the Claimant.
- Examination and handling of the warranty claim:
 - If upon the Warrantor’s or authorised service Representative’s examination, the defect is determined to result from defective material or workmanship in the warranty period, the equipment will be repaired or replaced at the Warrantor’s option without charge, and returned to the Purchaser at the Warrantor’s expense. If, on the other hand, the claim is determined to result from circumstances such as described in section 4 above or a result of wear and tear exceeding that for which the equipment is intended (e.g. commercial use of equipment intended for leisure use), the costs for the troubleshooting and repair shall be borne by the Claimant;
 - No refund of the purchase price will be granted to the Claimant, unless the Warrantor is unable to remedy the defect after having a reasonable number of opportunities to do so. In the event that attempts to remedy the defect have failed, the Claimant may claim a refund of the purchase price, provided that the Claimant submits a statement in writing from a professional boating equipment supplier that the installation instructions of the Installation and Operation Manual have been complied with and that the defect remains.
- Warranty service shall be performed only by the Warrantor, or an authorised service representative, and any attempt to remedy the defect by anyone else shall render this warranty void.
- No other warranty is given beyond those described above, implied or otherwise, including any implied warranty of merchantability, fitness for a particular purpose other than the purpose for which the equipment is intended, and any other obligations on the part of the Warrantor or its employees and representatives.
- There shall be no responsibility or liability whatsoever on the part of the Warrantor or its employees and representatives based on this Warranty for injury to any person or persons, or damage to property, loss of income or profit, or any other incidental, consequential or resulting damage or cost claimed to have been incurred through the use or sale of the equipment, including any possible failure or malfunction of the equipment or damages arising from collision with other vessels or objects.
- This warranty gives you specific legal rights, and you may also have other rights which vary from country to country.

Patents

At Sleipner we continually reinvest to develop and offer the latest technology in marine advancements. To see the many unique designs we have patented visit our website www.sleipnergrouper.com/patents

Cut Out Template

(ISO) Print on paper:

A4

(US) Print on paper:

Letter 8" x 10.5"

Scale:

(1:1)



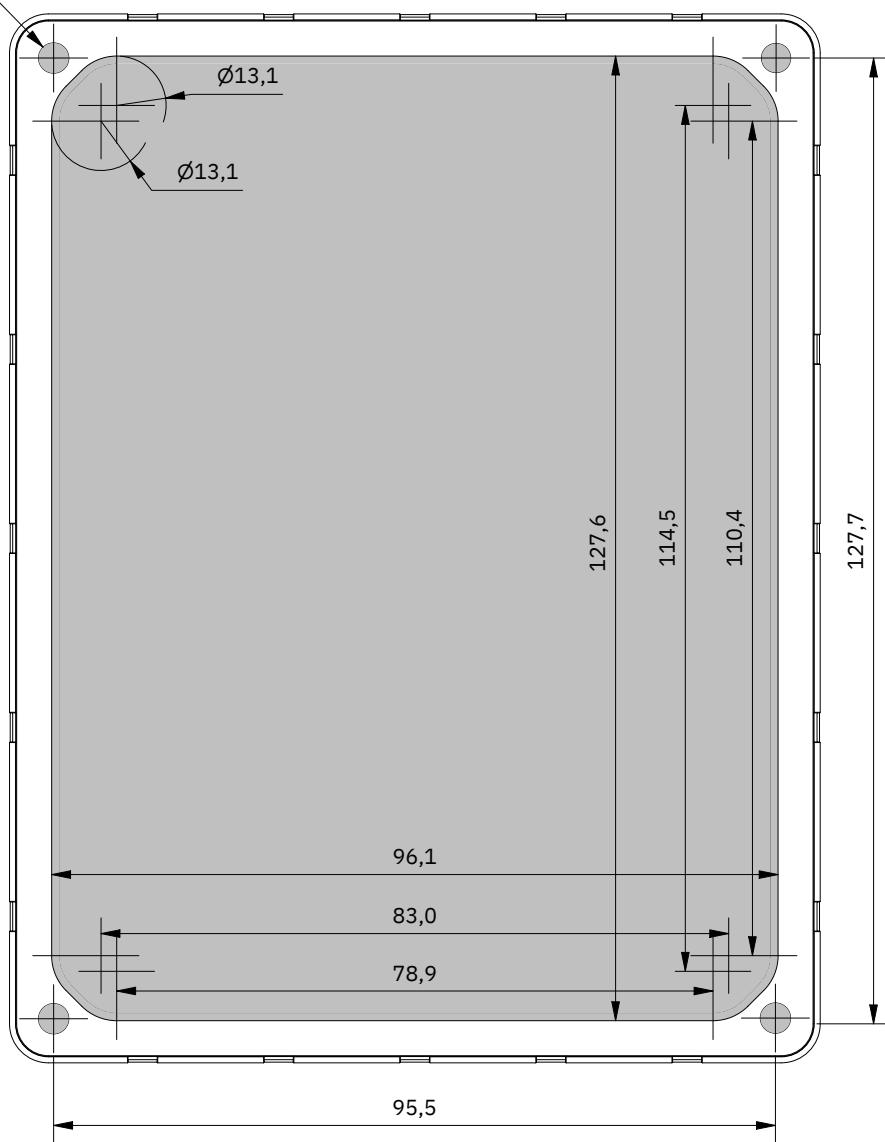
Ensure **NO** scaling has occurred from printing. Check ruler measurements on the drawing are to scale.

To download Cut Out Templates visit www.sleipnergroup.com and find your product



TP-35 Top Mount

4xØ4,0

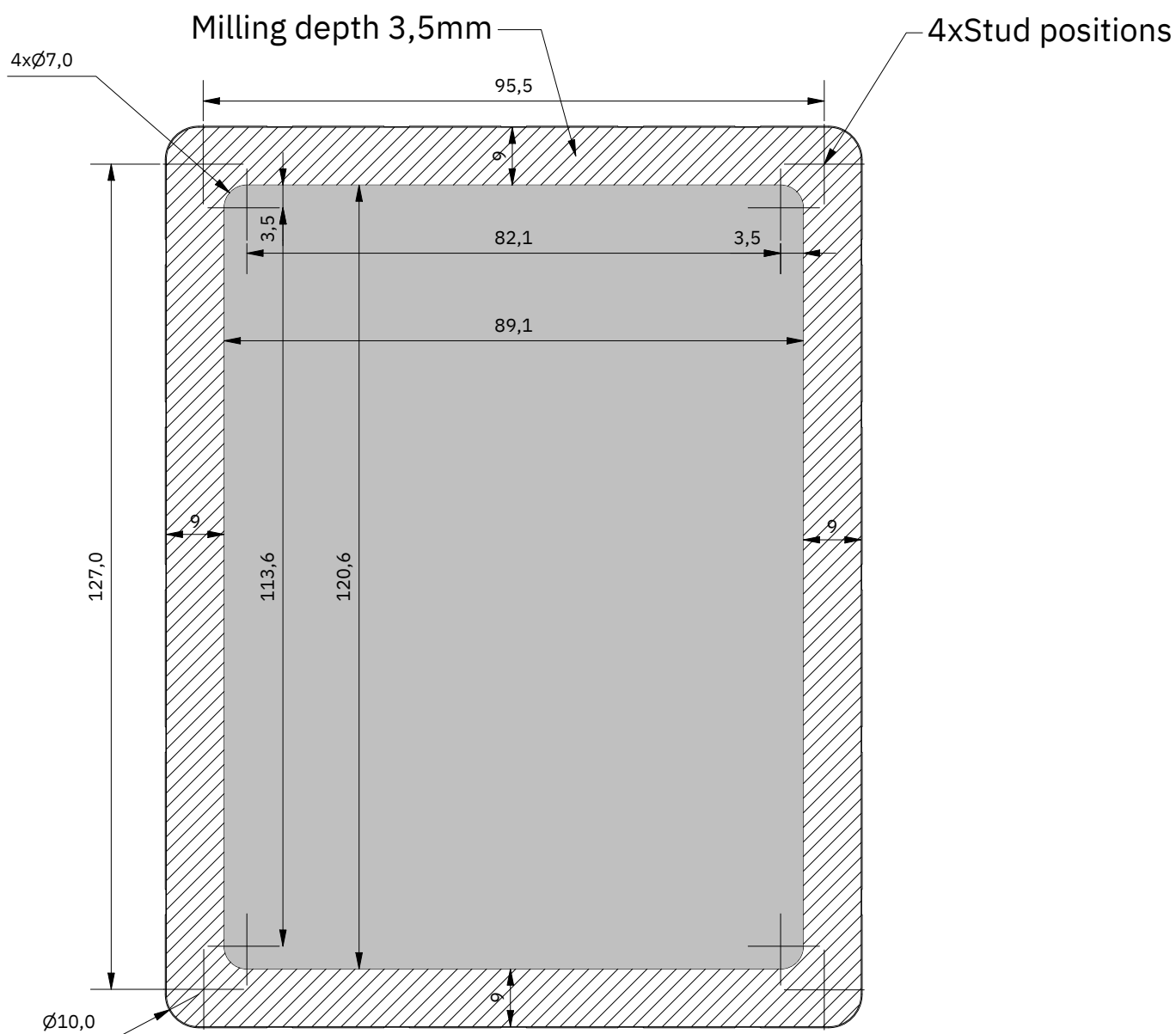




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TP-35 Flush Mount



Cut Out Template

(ISO) Print on paper:

(US) Print on paper:

Scale:

A4

Letter 8" x 10.5"

(1:1)

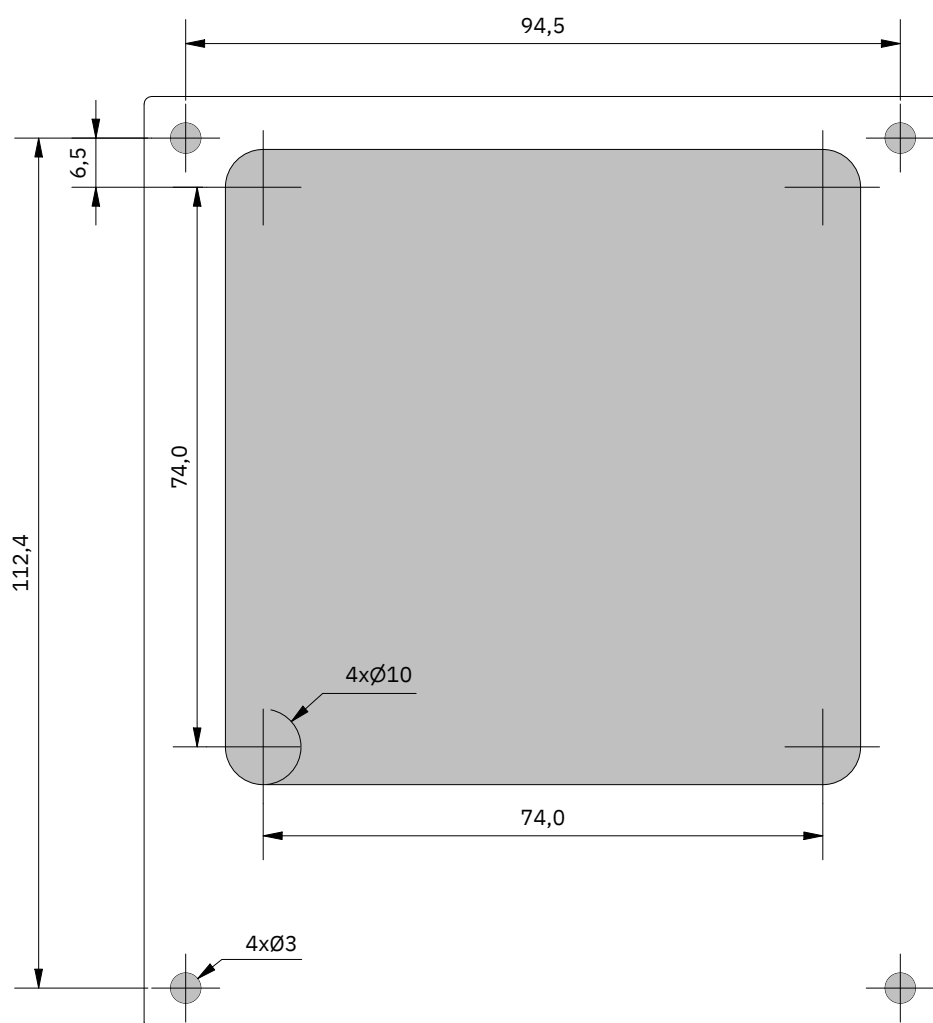


Ensure **NO** scaling has occurred from printing. Check ruler measurements on the drawing are to scale.

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PJC421-PVREL



Cut Out Template

(ISO) Print on paper:

(US) Print on paper:

Scale:

A4

Letter 8" x 10.5"

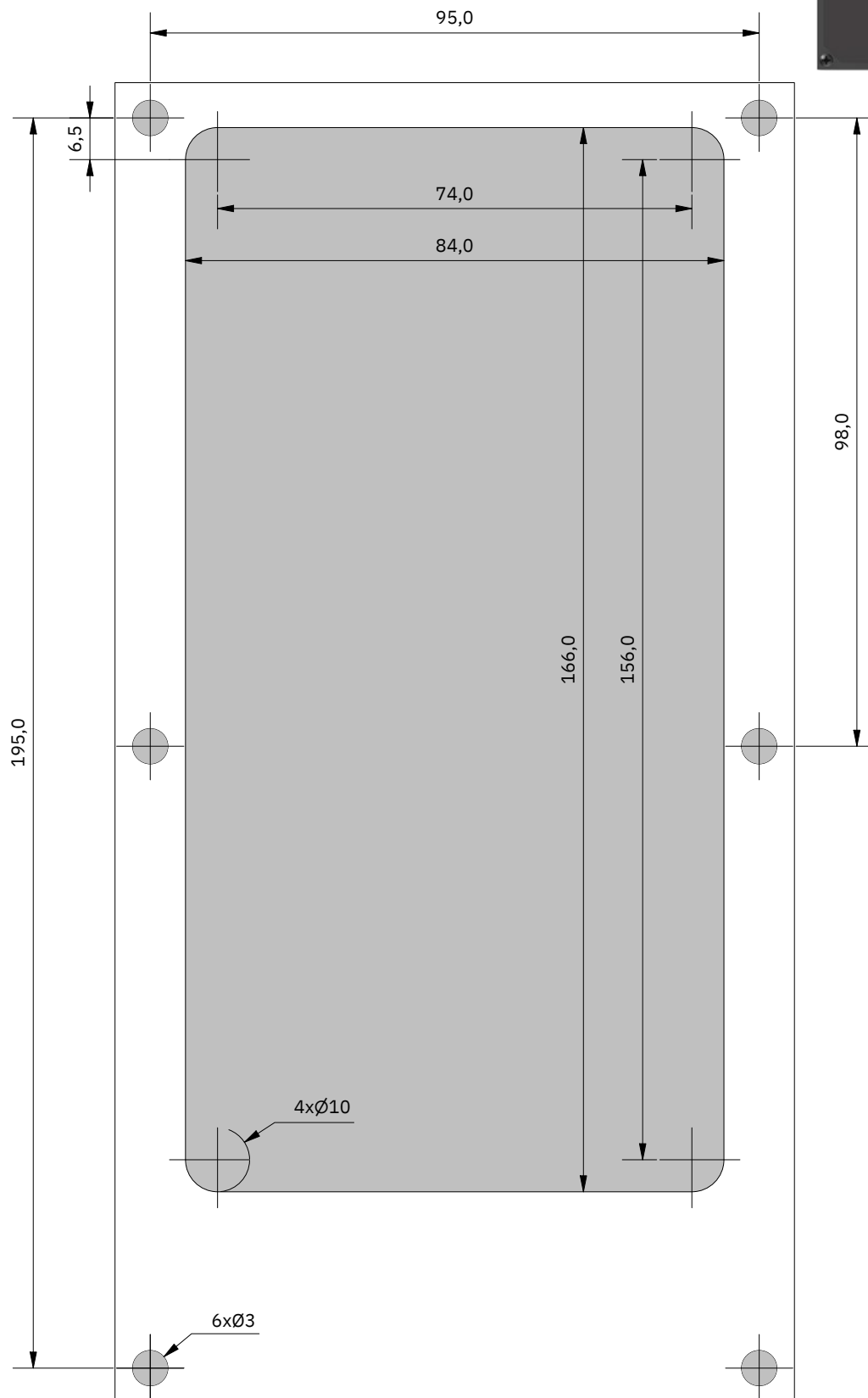
(1:1)



Ensure NO scaling has occurred from printing. Check ruler measurements on the drawing are to scale.

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PJC422-PVREL



Cut Out Template

(ISO) Print on paper:

(US) Print on paper:

Scale:

A4

Letter 8" x 10.5"

(1:1)



Ensure **NO** scaling has occurred from printing. Check ruler measurements on the drawing are to scale.

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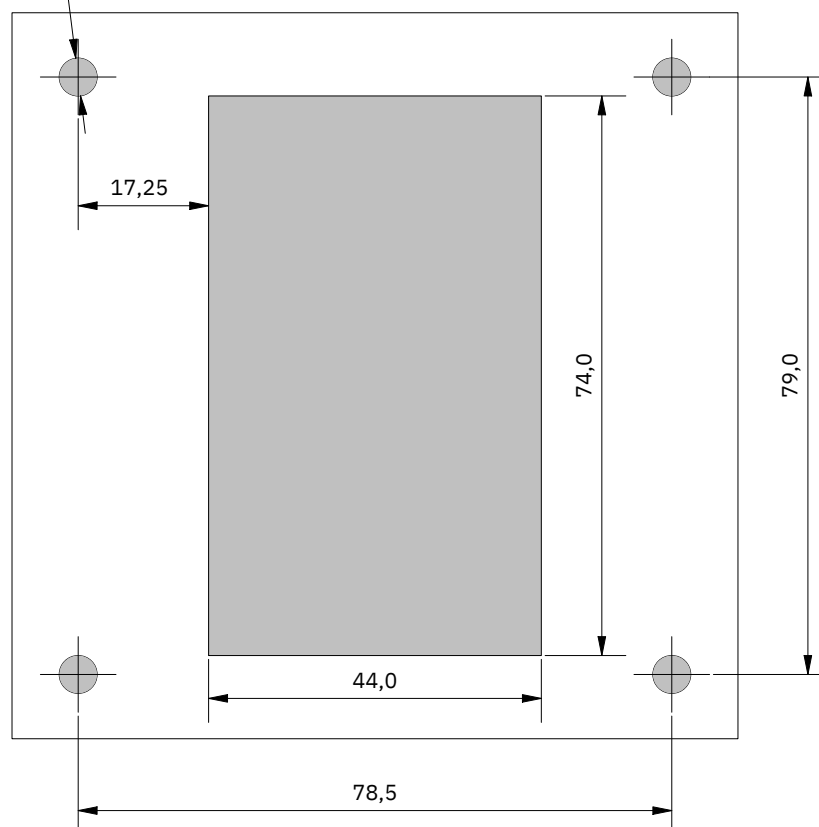


PJC421-LF90



PJC422-LF90

4 x Ø5,5mm



Cut Out Template

(ISO) Print on paper:

A4

(US) Print on paper:

Letter 8" x 10.5"

Scale:

(1:1)



Ensure **NO** scaling has occurred from printing. Check ruler measurements on the drawing are to scale.

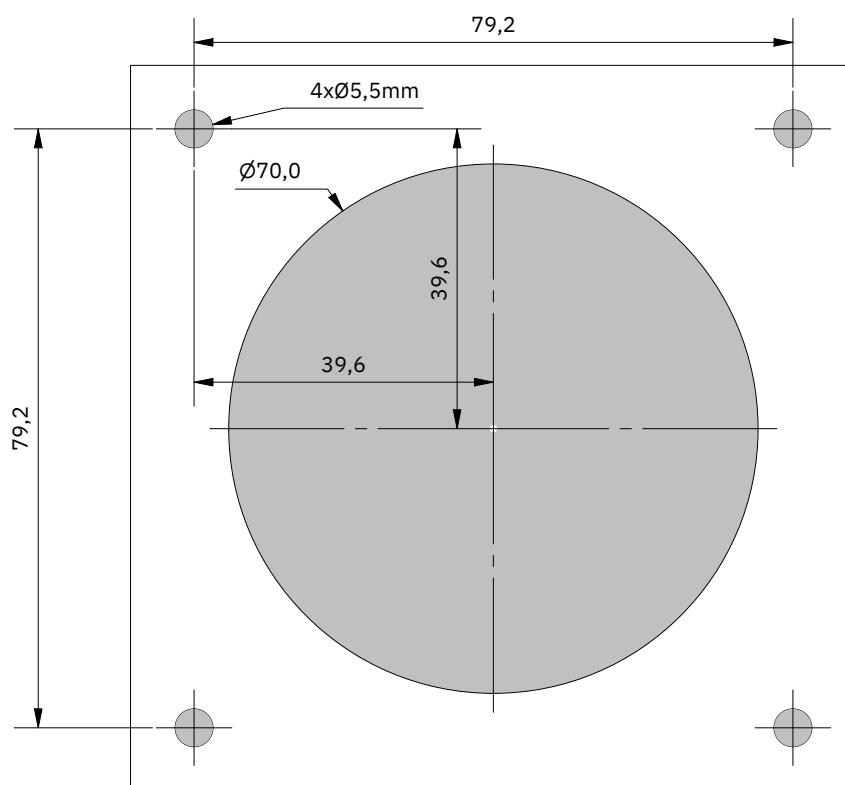
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PJC421-LE90



PJC422-LE90



Cut Out Template

(ISO) Print on paper:

A4

(US) Print on paper:

Letter 8" x 10.5"

Scale:

(1:1)



Ensure **NO** scaling has occurred from printing. Check ruler measurements on the drawing are to scale.

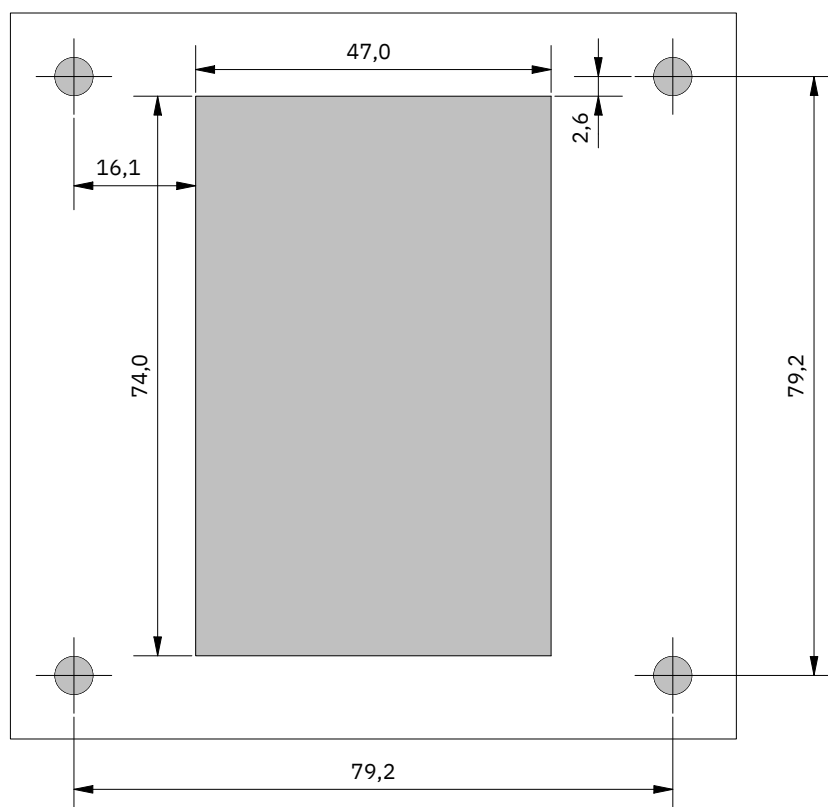
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PJC421-LF90X



PJC422-LF90X



CE Declaration of conformity (DoC)

We, The Manufacturer:	Sleipner Motor AS Arne Svendsens gate 6-8, NO 1612 Fredrikstad, Norway																		
With ISO 9001 certificate:	1484-2007-AQ-NOR-NA, issued by DNV-GL																		
Declare that the product: Product Description: Thruster Proportional Joystick Control Model Numbers: <table border="0"> <tr> <td>PJC421-PVREL</td> <td>PJC421-LE90</td> <td>PJC421-LF90X</td> <td>PJC421-LF90</td> </tr> <tr> <td>PJC421-PVREL-DNV</td> <td>PJC421-LE90-DNV</td> <td>PJC421-LF90X-DNV</td> <td>PJC421-LF90-DNV</td> </tr> <tr> <td>PJC422-PVREL</td> <td>PJC422-LE90</td> <td>PJC422-LF90X</td> <td>PJC422-LF90</td> </tr> <tr> <td>PJC422-PVREL-DNV</td> <td>PJC422-LE90-DNV</td> <td>PJC422-LF90X-DNV</td> <td>PJC422-LF90-DNV</td> </tr> </table>				PJC421-PVREL	PJC421-LE90	PJC421-LF90X	PJC421-LF90	PJC421-PVREL-DNV	PJC421-LE90-DNV	PJC421-LF90X-DNV	PJC421-LF90-DNV	PJC422-PVREL	PJC422-LE90	PJC422-LF90X	PJC422-LF90	PJC422-PVREL-DNV	PJC422-LE90-DNV	PJC422-LF90X-DNV	PJC422-LF90-DNV
PJC421-PVREL	PJC421-LE90	PJC421-LF90X	PJC421-LF90																
PJC421-PVREL-DNV	PJC421-LE90-DNV	PJC421-LF90X-DNV	PJC421-LF90-DNV																
PJC422-PVREL	PJC422-LE90	PJC422-LF90X	PJC422-LF90																
PJC422-PVREL-DNV	PJC422-LE90-DNV	PJC422-LF90X-DNV	PJC422-LF90-DNV																
Subject to installation, maintenance and use conforming to their intended purpose, is in conformity with the provisions of the following EU Directives: • Radio equipment - Directive 2014/53/EU • Restriction of the Use of certain Hazardous Substances in Electrical and Electronic Equipment (RoHS) - Directive 2002/95/EC																			
The product is tested to meet the standards and criteria outlined in:	Radio	EN 300328 V2.1.1																	
	EMC	EN 60945:2002 IEC 60533:2015 EN 301489-1 V2.2.0 EN301489-17 V3.2.0																	
	Safety	EN609501:2006 /A11:2009/A1:2010/A12:2011/A2:2013 EN 62311:2008 EN 62368-1 2020																	
	RoHS	EN 50581:2012																	

This declaration of conformity is issued under the exclusive responsibility of the manufacturer.

Fredrikstad, 20th of April 2021

Ronny Skauen, President and CEO



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UK Declaration of conformity (DoC)

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PJC421-PVREL	PJC421-LE90	PJC421-LF90X	PJC421-LF90																
PJC421-PVREL-DNV	PJC421-LE90-DNV	PJC421-LF90X-DNV	PJC421-LF90-DNV																
PJC422-PVREL	PJC422-LE90	PJC422-LF90X	PJC422-LF90																
PJC422-PVREL-DNV	PJC422-LE90-DNV	PJC422-LF90X-DNV	PJC422-LF90-DNV																
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The product is tested to meet the standards and criteria outlined in:	Radio EN 300328 V2.1.1 EMC EN 60945:2002 IEC 60533:2015 EN 301489-1 V2.2.0 EN301489-17 V3.2.0 Safety EN609501:2006 /A11:2009/A1:2010/A12:2011/A2:2013 EN 62311:2008 EN 62368-1 2020 RoHS EN 50581:2012																		

This declaration of conformity is issued under the exclusive responsibility of the manufacturer.

Fredrikstad, 20th of April 2021

Ronny Skauen, President and CEO



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This image shows a full page of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page, providing a template for handwriting practice. There are no margins, text, or other markings on the page.

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Norway

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