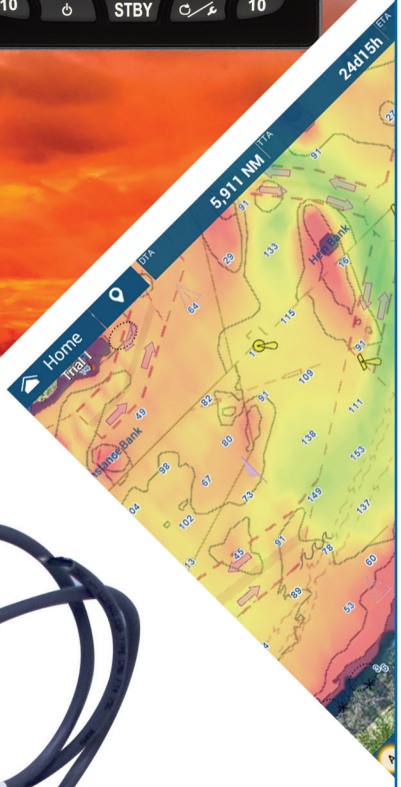
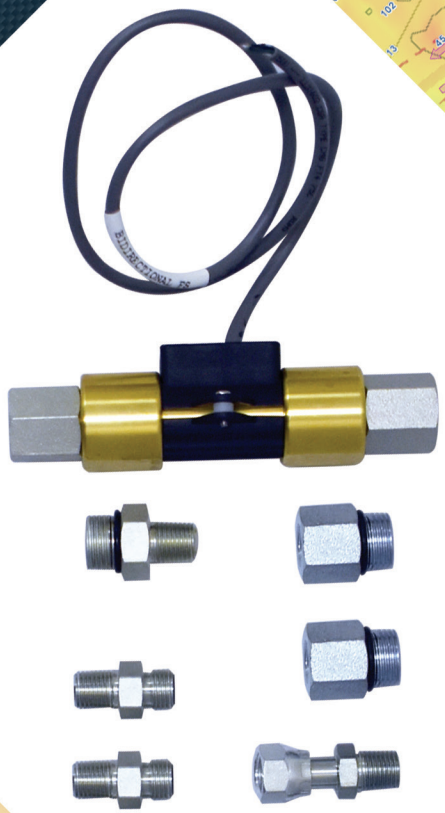
SAFEHELM2 Installation Guide





FURUNO

SafeHelm2 Installation Instructions

The SafeHelm2 Sensor Package consists of a bi-directional helm flow sensor and includes several different hydraulic fitting adapters. These adapters allow direct installation on any hydraulic helm vessel in North America that has already been plumbed for an autopilot with reversing pump control. SafeHelm2 and Furuno NAVpilots are flexible and can be added to **ANY** new or existing reversing pump steering system from any manufacturer on any boat where a NAVpilot 300 or 700 series autopilot is planned or already exists. No software or hardware upgrade of the NAVpilot system is required. Once plumbed, simply wire SafeHelm2 to the NAVpilot's Processor Unit and re-configure the software for SafeHelm. SafeHelm2 allows the full SafeHelm experience of both Helm Movement Autopilot Control and/or Furuno Power-Assist Steering (FPS).

1. Features

- Compact and rugged Brass Billet Bi-Directional Hydraulic Flow Sensor
- Reversing Pump Independent – SafeHelm2 works with any existing or new hydraulic reversing pump from any manufacturer.
- No specified physical mounting orientation (horizontal orientation recommended for high speed vessels).

- No perceptible feeling of hydraulic drag or increased helm effort when in operation.
- Low installation cost
- Included hydraulic adapters allow installation on different vessel sizes and fitting configurations. Other adapters can be used allowing installation on European and Asian vessels.
- Included adapters provide possibility for "Gender Matched" installations where no additional fittings or hoses are required.
- SafeHelm 2's unique isolated flow sensing electronics module can be easily tested, removed, and replaced without opening or disturbing the vessel's hydraulic system.
- Works with any existing Furuno NAVpilot300 or NAVpilot700/711C series autopilot with no software or hardware updates required.

2. System Components

1 each – SAF-HM2-SEN SafeHelm2 Bi-Directional Flow Switch Sensor
2 each – ORB-NPT-F14 1/4" NPT Female to ORB #8 Male Adapters
1 each – ORB-NPT-M14 1/4" NPT Male to ORB #8 Male Adapter
2 each – ORF-NPT-M14 1/4" NPT Male to ORFS #4 Male Adapters
1 each – ORF-NPT-F14 1/4" NPT Male to ORFS #4 Female Adapter

3. Mounting Considerations

(The complete reversing pump sizing and installation instructions for a Furuno NAVpilot are beyond the scope of these instructions. Please refer to the appropriate Furuno Octopus or Accu-steer reversing pump installation guides for further information on reversing pump configuration and installation.)

Once a reversing pump is installed and the hydraulic, mounting, and connection considerations for your specific installation are in place, you can begin mounting and connecting the SafeHelm2 sensor.

- Use the provided components to mount SafeHelm2 to a variety of different vessels and steering systems. In some cases, addition fittings will be required to correctly plumb SafeHelm2 into the hydraulic steering system.
- SafeHelm2 can be mounted in any orientation on the vessel but, a horizontal orientation is preferable and may improve performance on high speed vessels and vessels with more than one helm. The SafeHelm2 sensor should be installed as close as possible to the helm (or lowest helm on the vessel) and physically below the helm to help prevent air accumulation inside the SafeHelm2 sensor.
- It is also recommended that SafeHelm2 be installed with flexible hoses at each end of the sensor to prevent vibration and false activation, especially on high speed vessels.
- Never use any type of thread sealant or Teflon tape on the provided SafeHelm2 adapters that have 0-ring seals. Thread sealant or Teflon Tape MUST be used for any provided tapered fittings.
- SafeHelm2 must be mounted at least 12 inches (300 mm) away from magnetic material such as speakers.
- In single helm vessels, there should not be a "T" fitting installed between the SafeHelm2 sensor and the helm.
- There is an "Arrow" stamped into one side of SafeHelm2 labeled "Direction 1". Note that this arrow has no meaning and can be ignored during SafeHelm2 installation. The SafeHelm configuration

software will automatically determine and assign the correct directional switching during configuration.

- In multi-helm vessels, SafeHelm2 should be installed between the pump and the hydraulic "T"s that link the helms together. The sensor is to be installed as close to the helm as possible.
- SafeHelm2 must never be installed in the reversing pump return line.
- SafeHelm2 may be installed in either the starboard steering line or the port steering line. The NAVpilot SafeHelm's configuration software will automatically determine and assign the correct directional switching during configuration.
- SafeHelm activation sensitivity and "Return to Auto/Nav Mode" delay time can be customized by the installer and/or the vessel operator at any time after installation.
- Furuno Power Assist Steering (FPS) rudder speed can be customized by the customer and also may be enabled in Standby Mode.
- Upgrading from an existing FPS8 SafeHelm Sensor to SafeHelm2 is possible by removing the FPS8 module while still retaining the original Accu-Steer Reversing Pump. Some additional ORB (O-Ring Boss) fitting adapters may be required. Once the FPS8 is removed, SafeHelm2 installation is the same as any other reversing pump.
- Mercury Verado Hydraulic power steering systems operate with high back pressure. It is very important that the SafeHelm2 sensor is mounted as close to the helm as possible and in a horizontal orientation to provide best performance. This is especially true with Dual Helm Mercury Verado power steering systems.

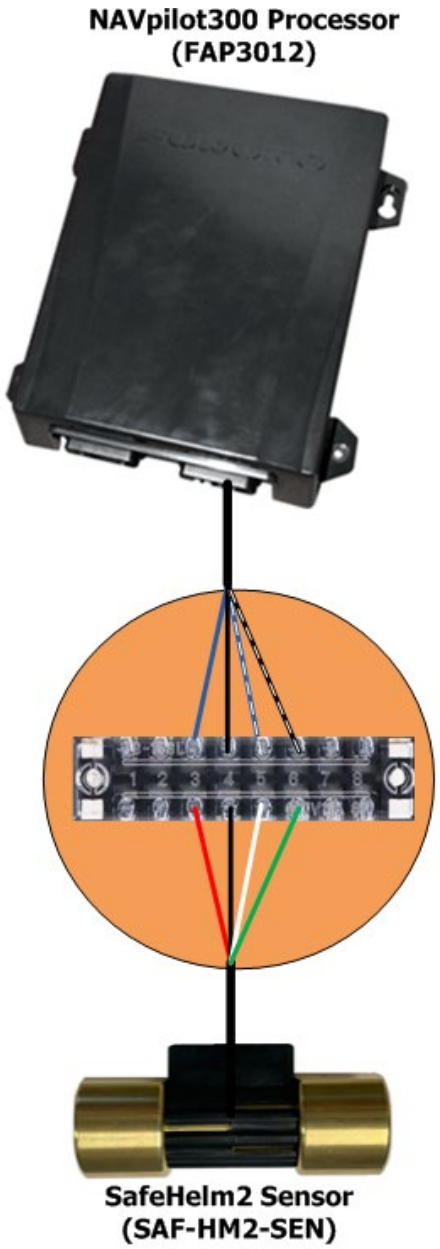
4. Wiring Considerations

SafeHelm2 has a pigtail cable which is epoxy potted to an electronic module that contains two Normally Open passive directional flow switches. These switches are designed to connect directly to the NAVpilot300 Processor via a pigtail on the processor and by the TB5 "Universal Input" Port Connector on the NAVpilot700/711C Processor.

- The original SafeHelm FPS8 utilized active sensors which required additional individual 12V power wires from the NAVpilot Processor for each sensor. Both, the NAVpilot300 Processor and the NAVpilot 700/711C Processor provide 12V for each of the original FPS8 sensors. SafeHelm2 utilizes passive contact closure switches that do not utilize these power wires. You must ensure that each power wire is taped back and permanently isolated when installing SafeHelm2.
- SafeHelm2's pigtail cable may be lengthened as necessary to reach the NAVpilot Processor Unit. Two twisted pair cable of 22 Ga. (0.8 sq. mm) or larger is recommended. Shielded or unshielded twisted wire cable is recommended.

5. NAVpilot 300 Wiring Instructions

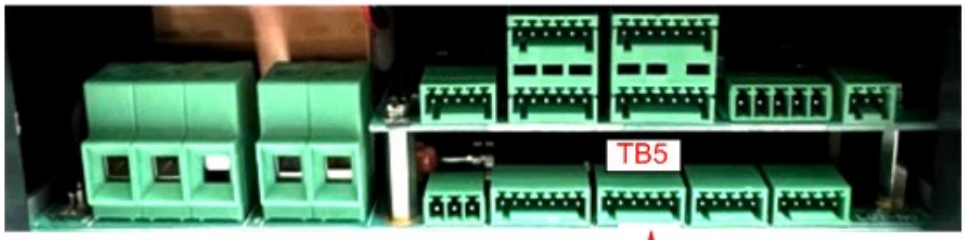
General In Multi-Cable		SafeHelm2
Blue (SW1 SIG)	⟷	Red
Black (SW1 PWR)	⟷	Black
Blue/White (SW2 SIG)	⟷	White
Black/White (SW2 PWR)	⟷	Green

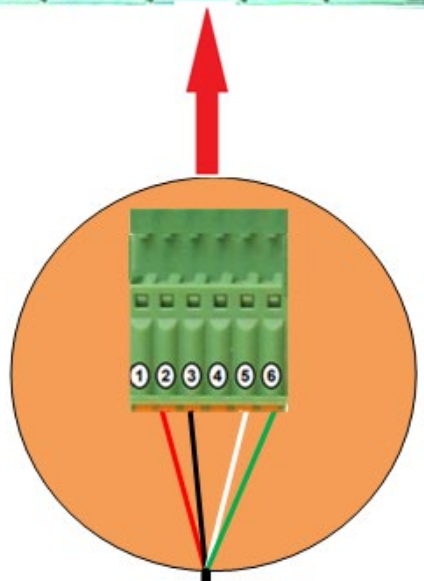


6. NAVpilot 700/711C Wiring Instructions

General In Port (TB5)		SafeHelm2
Pin2 (SW1 IN)	⟷	Red
Pin3 (SW1 GRD)	⟷	Black
Pin5 (SW2 IN)	⟷	White
Pin6 (SW2 GRD)	⟷	Green

NAVpilot700 Series Processor
(FAP7002)





SafeHelm2 Sensor
(SAF-HM2-SEN)

End – Document Rev 1.01 (Spring 2021)