



APPLICATION GUIDE

MetalSCAN ONLINE OIL DEBRIS MONITORING FOR AZIMUTH POD PROPULSOR

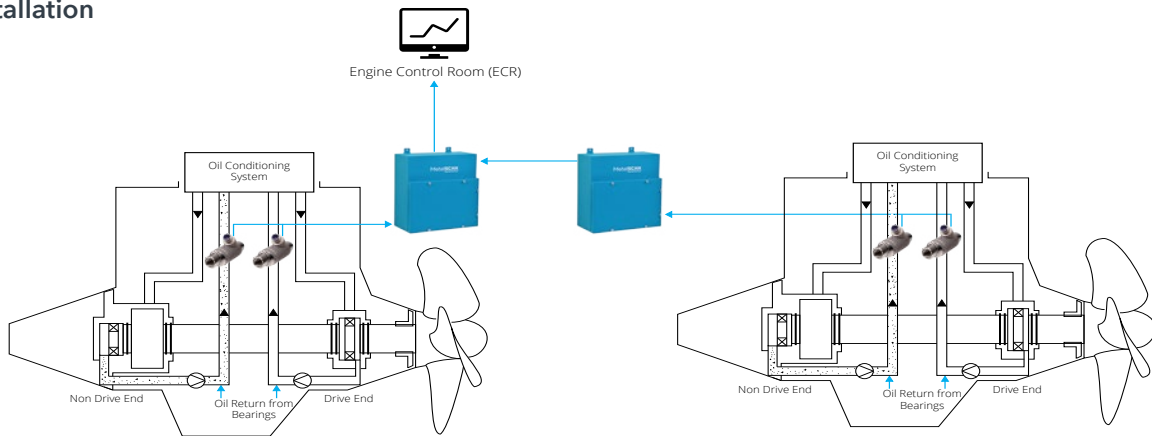
Unequalled protection for aerospace, marine and energy equipment applications. Thousands of MetalSCAN units already installed are protecting high-value, mission-critical and process-critical rotating equipment.



The MetalSCAN oil debris monitoring system for fixed and azimuthing podded propulsors consists of two MetalSCAN sensors per pod, one for the drive end and one for the non-drive end bearings. MetalSCAN is a full-flow, non-obstructive, online debris detection system designed to detect the onset of surface fatigue of bearings and gear teeth. It is used as a condition monitoring device to determine the condition of the pod bearings. The pods are monitored continuously, allowing the maintainer to track the progressive deterioration of any damaged bearings in real time. The sensors are installed in the lubrication scavenge oil lines, before the lubrication system oil filters with standard flanges or fittings depending on the type of lube oil piping.

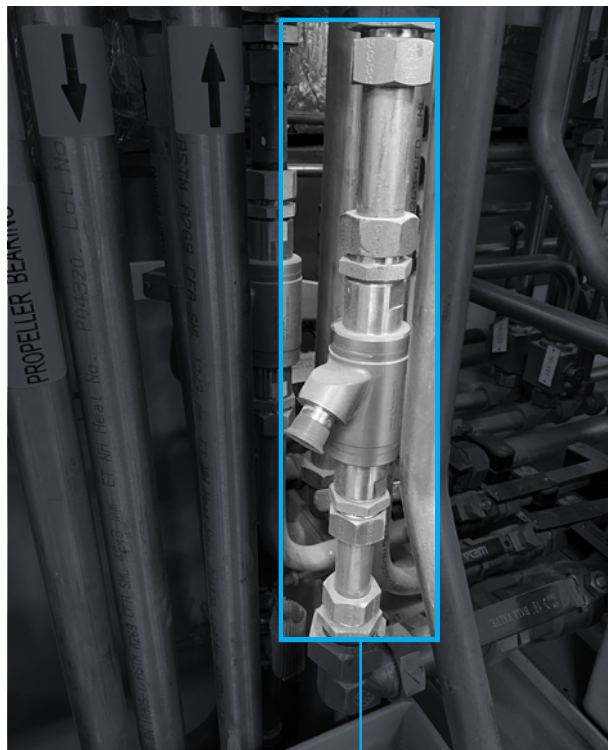
Each sensor connects to the MetalSCAN Electronic Control Unit (ECU) normally mounted in the pod room via a 20-ft. (6m) sensor cable. The ECU is connected via RS485 Modbus protocol serial communication to a host PC computer or directly to the facility control system.

Installation

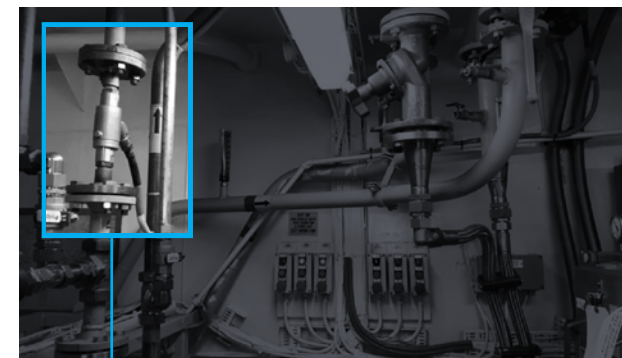
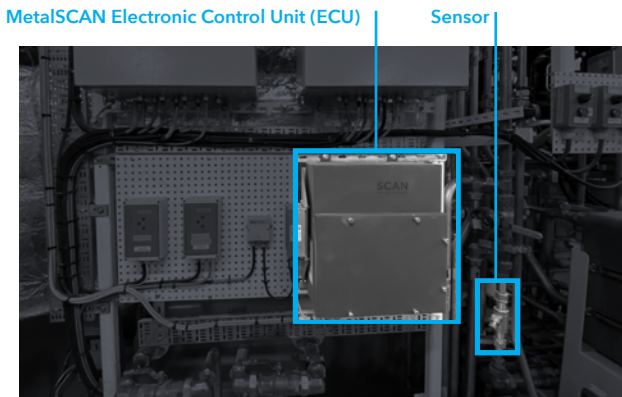


Two sensors and one MetalSCAN Electronic Control Unit (ECU) per pod are required. The sensors and ECU are installed in the pod compartment where the lubrication lines are available. The ECU's from each pod room will then be connected to a dedicated PC located in the Engine Control Room (ECR).

Note two different sensor installations below, one with compression fittings, the other with flanges.



Sensor installed with
Compression Fittings



Sensor installed
with Flange Fittings

MetalSCAN Installation Onboard Podded Ships

A MetalSCAN installation consists of three major components:

1. The MetalSCAN Electronic Control Unit (ECU) is a splash-proof ruggedized metal box that will require a 24 VDC power source. The ECU must be mounted on a flat surface in the pod room within 20-ft. (6m) of the sensor locations. The sensors are connected to the ECU via fixed-length cables.
2. MetalSCAN sensors are to be installed before the filter, cooler etc., of both return lube oil lines from the propeller and thrust bearings of each pod. The sensors can either be installed with flanges or fittings depending on the type of lube oil piping.
3. A dedicated PC (running Windows), optionally supplied by Gastops, is usually installed in the Engine Control Room (ECR).

Considerations

1. All the MetalSCAN equipment supplied by Gastops is assembled in-house prior to shipment. The equipment is tested and calibrated as a system. The equipment is shipped pre-configured for a specific pod, indicated on the outside of each carton. Contained in each carton is a MetalSCAN User's Manual and in the back of the manual is a Configuration sheet that lists (by serial number) all the components that must be assembled together. This sheet should be used to verify the correct location and installation of the specific components. This is important to maintain the system calibration.
2. MetalSCAN sensors are installed after the bearing and before the lube oil filter for each bearing. Flanges/fittings appropriate for the

type of lube oil piping must be used. The size and type of thread for the sensors is found in the MetalSCAN User's Manual under sensor specifications. MetalSCAN sensors should be installed in an area of minimal vibration and/or electrical wiring. Gastops Application Engineering can advise on optimal placement of sensors and ECU.

3. When selecting the location and installing the ECU, some points to consider are:
 - Location of the box must be within 20 cable ft. (6m) of the sensors;
 - 24 VDC Supply is required for each controller, Current draw is maximum 0.8 Amps;
 - A separate external ground from the box to the hull must be installed;
 - A communication cable consisting of 2 twisted pair cabling (1 pair plus a ground), 24 AWG with an overall foil shield and a single drain wire is required to be installed between each controller. Then one cable from either ECU to the Engine Control Room (ECR) is required to connect to the MetalSCAN PC.
4. The location of the PC within the ECR must be easily accessible by those responsible for the maintenance of the pods.

Commissioning and Training

Once the MetalSCAN System is installed, a Gastops Service Representative will verify correct location and installation as well as testing and commissioning the system onboard. Training for ship personnel on maintenance and operation is also provided at this time.

Impact on Vessel

Installation can be done alongside and does not require a dry-docking. It typically only requires the pod to be offline for a day. Additional resources will be required to install the sensor and MetalSCAN Electronic Control Unit (ECU) and pull the communication cable to the Engine Control Room (ECR).

Training requirements are minimal and often take place when the commissioning engineer is on-site for the commissioning. An additional day may be used to train if it is felt necessary.

Regular monitoring activities are minimal and take only minutes. Alarm and warning limits, when exceeded, are clearly visible on the MetalSCAN monitor screen. All results and data are available on the ship and do not require shoreside support. Shoreside support and monitoring services are available if requested from Gastops.

Most cruise lines are supported with regular monitoring services. The sensor has no moving parts and does not require calibration. The electronics require minimal maintenance and is consistent with standard maintenance requirements of all electronics.

Increased insight or visibility into the health of the pod bearings will allow for proactive health assessment, effective onboard maintenance planning, and allow the equipment operators to operate the pods with the real-time knowledge of bearing health.



Head Office

1011 Polytek Street
Ottawa, ON K1J 9J3
Canada

Nova Scotia

10-109 Williams Ave.
Dartmouth, NS B3B 2E3
Canada

Newfoundland

146A Glencoe Dr.
Mount Pearl, NL A1N 4S9
Canada

Europe

Info.eu@gastops.com

Asia

Info.ch@gastops.com

sales@gastops.com | +1 613 744 3530

gastops.com

C006084_002