GRAVINER

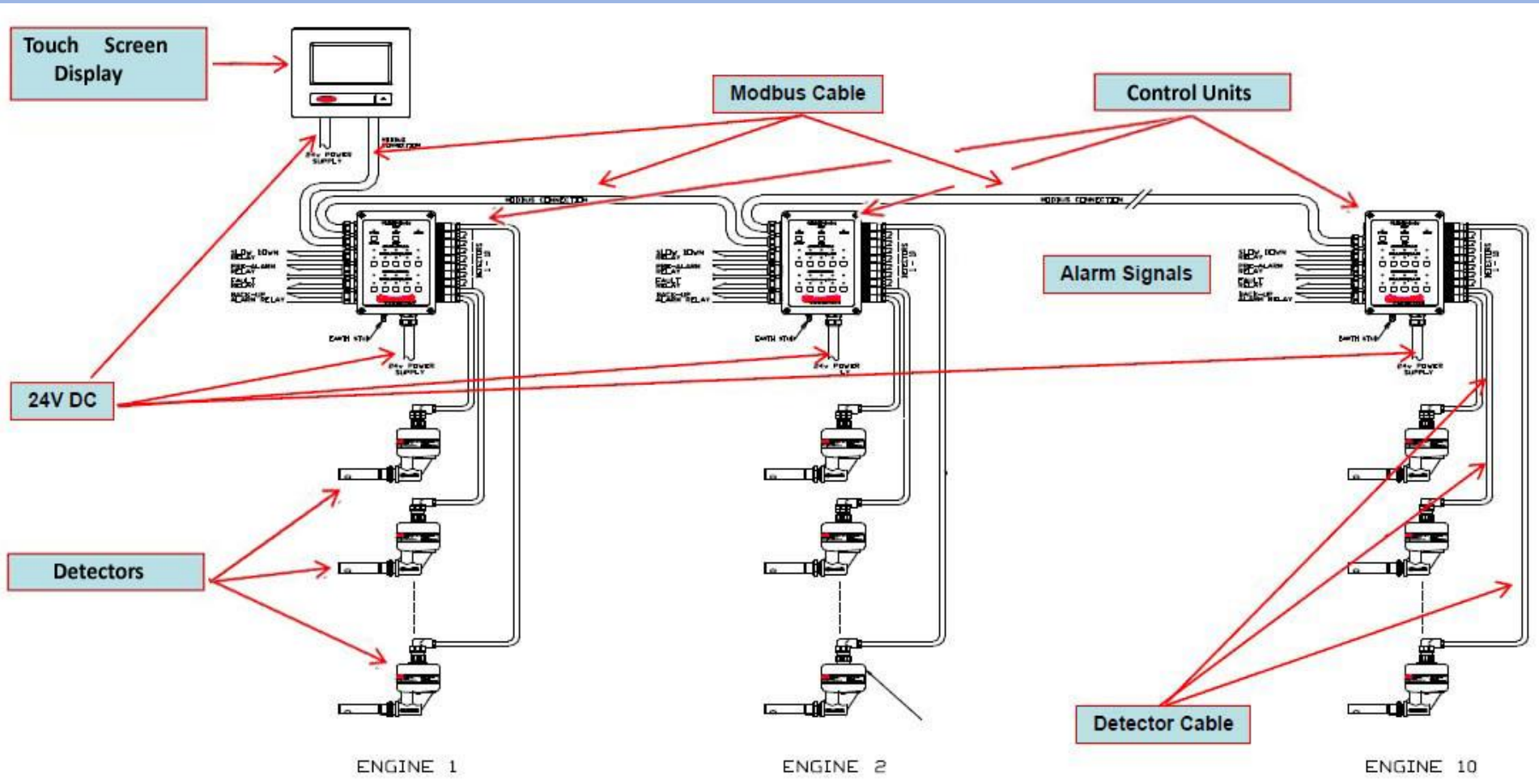
The MK7 Oil Mist Detector Presentation

ALPHA MARINE TECH (S) PTE LTD
alphamarinetech@gmail.com

United Technologies
Climate | Controls | Security

GRAVINER

Typical Installation



ALPHA MARINE TECH (S) PTE LTD alphamarinetech@gmail.com

United Technologies
Climate | Controls | Security

GRAVINER

Main System components for Graviner MK7

Remote display unit 1-53836-K271

Normally located in the engine control room the Display may be flush or surface mounted.

Powered by 24VDC supply and connected by Modbus Comms to up to 10 Control units for a maximum 100 sample points.

Facilitates safe monitoring of the system and alarm state without the need to enter the engine space.

United Technologies
Climate | Controls | Security

GRAVINER

Main System components for Graviner MK7

Control Unit 1-53836-K270

The Control Unit is mounted on the engine and has connections for 10 sampling points. Engines with a higher number utilise additional units.

Continuous Monitoring of the detectors via cables shown on slide 7.

The Control unit is powered by a 24VDC supply and connects to the Remote Display Unit using Modbus cable.

Each unit has relays for pre alarm, slow down, backup alarm and fault conditions.

United Technologies
Climate | Controls | Security

GRAVINER

Main System components for Graviner MK7

Detector head 1-53836-K269 OR K269-01

The Detector uses optical sensing (light scatter) for continuous, direct, rapid measurement of Oil Mist levels within the Crankcase.

Auto addresses each detector.

Communicates with Control Unit via bi-directional Canbus protocol.

Status automatically checked every 24 hours.

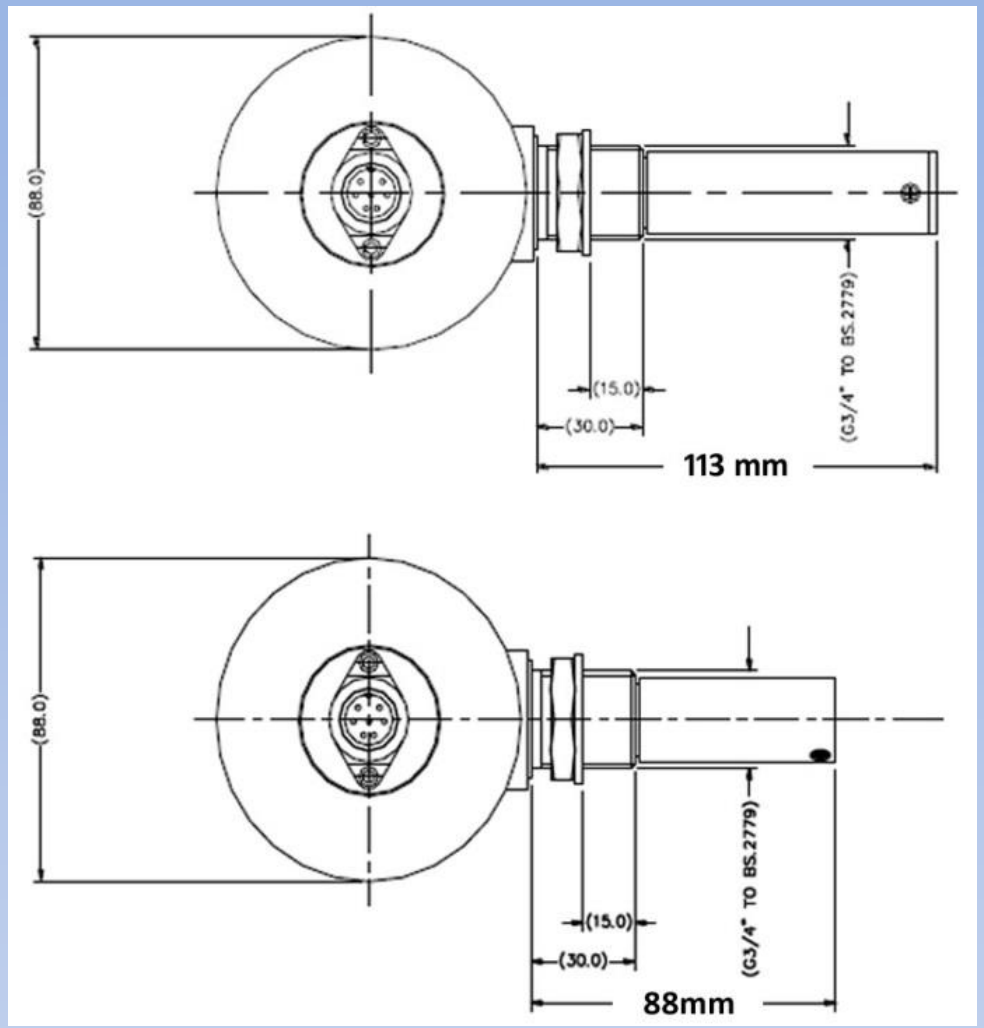
Test port to check correct function of detector.

Available in two lengths as detailed on the following slide.

United Technologies
Climate | Controls | Security

GRAVINER

Detector head with standard or short sample pipe



Detector standard length sample pipe
1-53836-K269

Detector short length sample pipe
1-53836-K269-01

United Technologies
Climate | Controls | Security

GRAVINER

Main System components for Graviner MK7

Detector cable (See slide 9 For available lengths.)

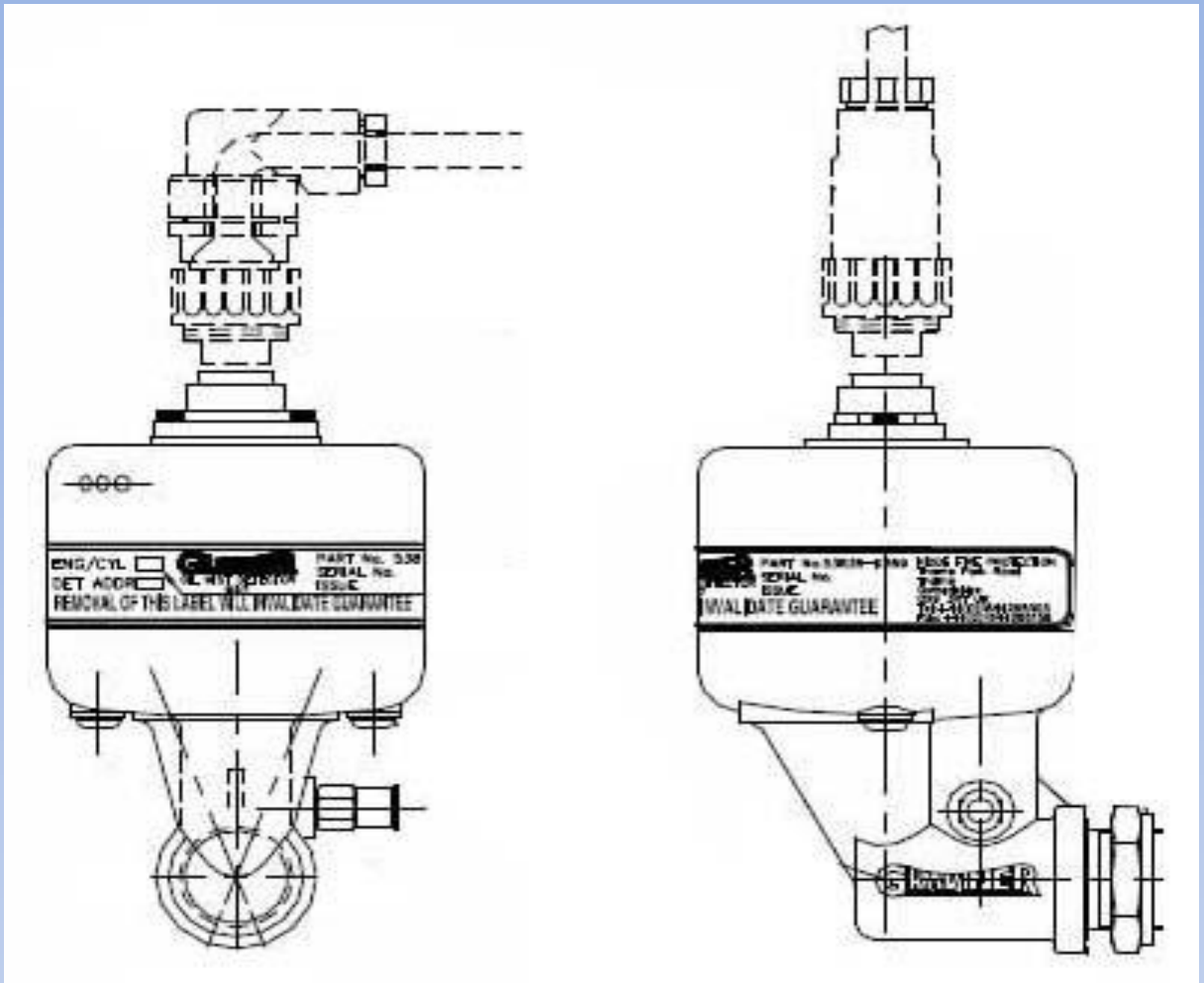
These cables connect the Detector heads to the control unit. They are available in various lengths and have either straight or 90 degree angle hard wired connectors as shown on the following slide.

United Technologies
Climate | Controls | Security

GRAVINER

Angled connector

Straight connector



United Technologies

Climate | Controls | Security

GRAVINER

Detector cables. 1 required for each sampling point. Select part numbers by choosing connector type and cable length.

Cable length M	Cable with 90° Connector	Cable with Straight Connector	Cable length M	Cable with 90° Connector	Cable with Straight Connector
1	1-43682-K285-1.0	1-43682-K286-1.0	9.5	1-43682-K285-9.5	1-43682-K286-9.5
1.5	1-43682-K285-1.5	1-43682-K286-1.5	10	1-43682-K285-10.0	1-43682-K286-10.0
2	1-43682-K285-2.0	1-43682-K286-2.0	10.5	1-43682-K285-10.5	1-43682-K286-10.5
2.5	1-43682-K285-2.5	1-43682-K286-2.5	11	1-43682-K285-11.0	1-43682-K286-11.0
3	1-43682-K285-3.0	1-43682-K286-3.0	11.5	1-43682-K285-11.5	1-43682-K286-11.5
3.5	1-43682-K285-3.5	1-43682-K286-3.5	12	1-43682-K285-12.0	1-43682-K286-12.0
4	1-43682-K285-4.0	1-43682-K286-4.0	12.5	1-43682-K285-12.5	1-43682-K286-12.5
4.5	1-43682-K285-4.5	1-43682-K286-4.5	15	1-43682-K285-15.0	1-43682-K286-15.0
5	1-43682-K285-5.0	1-43682-K286-5.0	17.5	1-43682-K285-17.5	1-43682-K286-17.5
5.5	1-43682-K285-5.5	1-43682-K286-5.5	20	1-43682-K285-20.0	1-43682-K286-20.0
6	1-43682-K285-6.0	1-43682-K286-6.0	22.5	1-43682-K285-22.5	1-43682-K286-22.5
6.5	1-43682-K285-6.5	1-43682-K286-6.5	25	1-43682-K285-25.0	1-43682-K286-25.0
7	1-43682-K285-7.0	1-43682-K286-7.0	27.5	1-43682-K285-27.5	1-43682-K286-27.5
7.5	1-43682-K285-7.5	1-43682-K286-7.5	30	1-43682-K285-30.0	1-43682-K286-30.0
8	1-43682-K285-8.0	1-43682-K286-8.0	32.5	1-43682-K285-32.5	1-43682-K286-32.5
8.5	1-43682-K285-8.5	1-43682-K286-8.5	35	1-43682-K285-35.0	1-43682-K286-35.0
9	1-43682-K285-9.0	1-43682-K286-9.0			

United Technologies

Climate | Controls | Security

GRAVINER

- Mitigates against possibility of crank case explosions.

- Fully compliant with IACS .
  - M67/M10 functional testing
  - E10 environmental specifications.

- Mandatory for marine diesel engines if:
  - Engine output greater than 2,250kW
  - Engines above 300 mm bore
  - Engine room unmanned

- Class Society approval:

American Bureau of Shipping	Lloyd's Register
Bureau Veritas	Nippon Kaiji Kyokai
China Classification Society	Polish Register of Shipping
DNV/Germanischer	Lloyds Register
Registro Italiano Navale	Korean Register of Shipping
Russian Maritime Register of Shipping	Indian Register of Shipping

United Technologies
Climate | Controls | Security

GRAVINER

GRAVINER

The MK7 Oil Mist Detector

Installation requirements and notes

United Technologies
Climate | Controls | Security

GRAVINER

Main system requirements:

Remote display unit (Monitors up to 100 Detectors)	1-53836-K271
Power socket 24VDC for above with 5m cable	1-43682-K296
Modbus connector for above with 5m cable	1-43682-K297
Control Unit (Inputs for up to 10 detectors)	1-53836-K270

Detectors, 1 per cylinder plus any other sampling points.
(Crankcase mounted via a ¾" BSP threaded hole.)

Standard sample pipe	1-53836-K269
Short sample pipe	1-53836-K269-01

See slide 6 for sample pipe lengths

Cables from the detectors to the control unit. Refer to slides 8 and 9 to select connector type and length.

United Technologies
Climate | Controls | Security

GRAVINER

Cabling requirements

There will be a requirement to run some new cables as follows:

24v DC supply cable to supply the Control Unit.

24v DC supply cable to supply the Remote Display Unit.

Modbus cable to run between the Control unit and either the ships AMS system or the Remote Display Unit if fitted. If multiple control units are fitted extra Modbus cable will be required, please see slide 2.

If retrofitting from an MK5 system existing alarm output cables can be utilized by either re-routing them into the Mk7 control unit or leaving them in the Mk5 OMD Junction Box and running cables from the Junction Box to the Mk7 OMD Control Unit. If the 4th alarm is required a new cable will need to be installed.

Cable specifications and connection details are in the Mk7 Manual (Section 2).

Mounting the Control Unit 1

The Control Unit 53836-K270 (53836-K270-01 Caterpillar only) or 53836-K276 is designed for on-engine mounting. it is recommended that it is installed as near to the centre of the engine as possible to minimise detector cable lengths.

Mounting is via the four M6 locating holes in the box. Sufficient space must be left around the Control Unit to allow access to the cable glands and the routing of the cables and to facilitate easy access to all aspects of the Control Unit.

If upgrading from an MK5 system a retrofit mounting plate 1-35100-K274 is available.

Mounting the Control Unit 2

When multiple Control Units are connected on a system the Modbus address needs to be set up in each one to ensure correct operation.

Each Control Unit must have its own address and they must be sequential, i.e. 01. 02. 03 …..10. All Control Units are shipped as Modbus address 01 (1st Control Unit).

There are 2 methods to change the Modbus address:

1. Via the Control Unit Membrane.

2. Utilizing Oil Mist Manager Software PN 1-53836-K279. This is supplied on a dongle for use on a Laptop or other suitable device. Using a USB cable It connects to the socket located on the PCB inside the Control Unit.

Full instructions for installation and set up are supplied with each control unit.

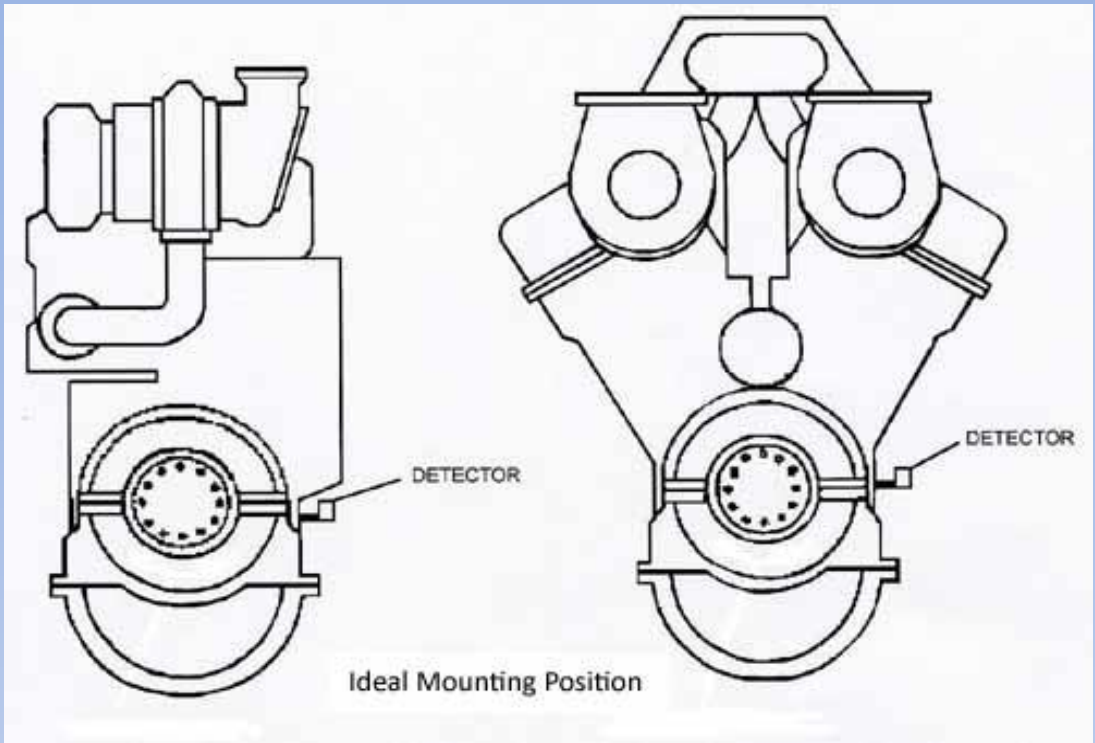
Mounting the Detectors 1

Each detector is mounted to the crankcase via a ¾ inch BSP threaded hole.

Ensure all detectors are secured tightly in place by means of the lock nut supplied.

It is recommended that detectors are located at the upper part of the crankcase wall, not in the direct line of the oil throw. On smaller engines it is permissible to mount the detectors on crankcase doors if desired or as installation dictates, subject to vibration levels.

Mounting the Detectors 2



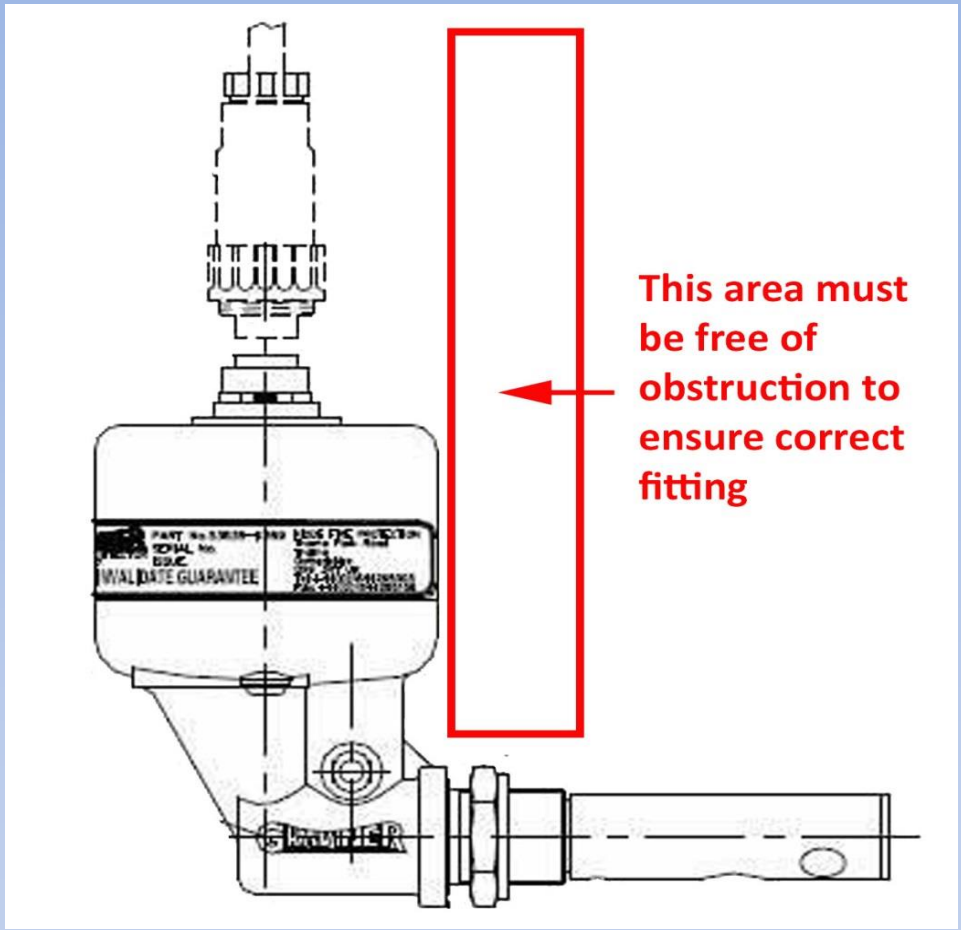
The detector must be fitted at a maximum of plus or minus 20 degrees from the vertical. Horizontally the detector must be mounted level or with the detector body inclined towards the engine to ensure oil drainage.

United Technologies
Climate | Controls | Security

GRAVINER

Mounting the Detectors 3

Check detector head installation point is free of obstruction…



United Technologies
Climate | Controls | Security

GRAVINER

Mounting the Detectors 4

… to avoid incorrect fitting

United Technologies
Climate | Controls | Security

GRAVINER

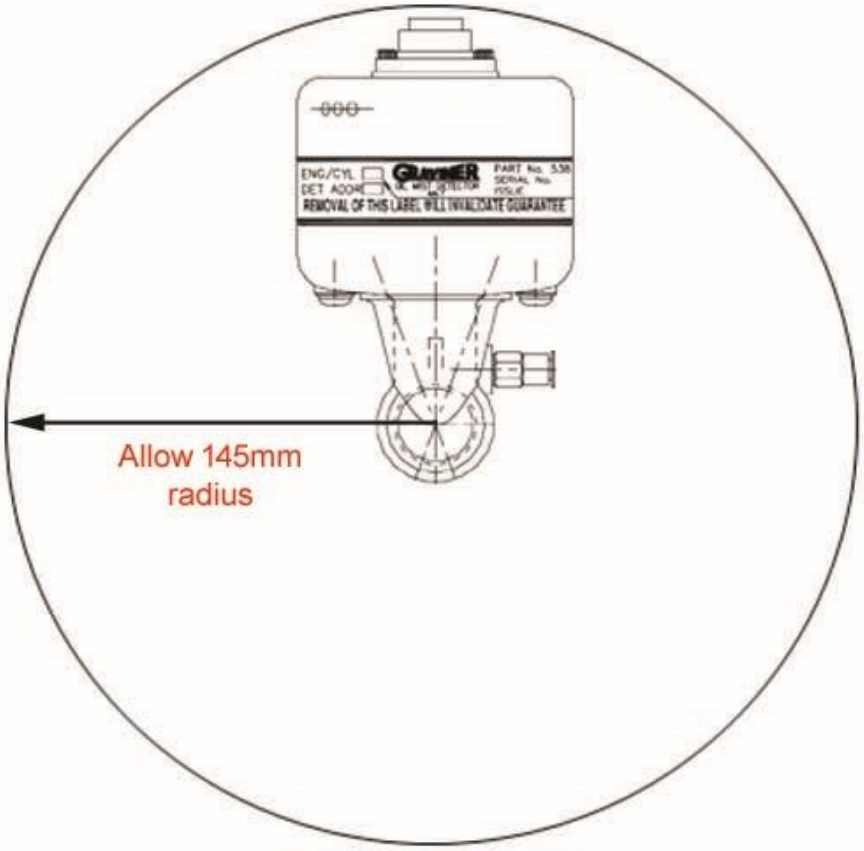
Mounting the Detectors 5

Check insertion depth to ensure oil drain hole is clear of obstruction

United Technologies
Climate | Controls | Security

GRAVINER

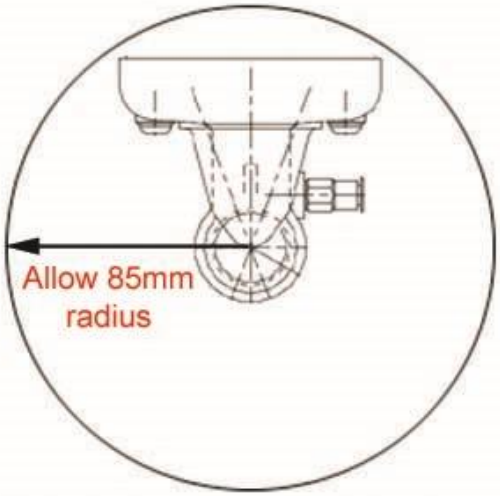
Mounting the Detectors 6



Complete Detector

When fitting the heads, the radius around the centreline of the detector sample pipe, as shown, must be clear of obstruction to screw the detector into the crankcase wall.

If there is not enough space to rotate the complete detector, the head can be detached and reassembled after the base is fitted.



Detector base only with head removed

United Technologies
Climate | Controls | Security

GRAVINER

Optional Extras

These items are available as extras for a new MK7 system;

Recommended	
Spare detector head	1-53836-K272
(includes 1 each Fan assembly and base moulding O ring)	
Commissioning kit	1-D9221-026
Service Kit	1-D9221-027
Optional	
Oil Mist Manager Software and dongle	1-53836-K279
Retrofit plate	1-35100-K274
(Used if upgrading from MK5 system. 1 required for each control unit)	

United Technologies

Climate | Controls | Security

GRAVINER

Summary of system requirements

Remote Touchscreen Display Unit	1-53836-K271
24VDC Power Socket (with 5mtr cable)	1-43682-K296
Modbus Connector (with 5mtr Cable)	1-43682-K297
Control Unit for up to 10 Detector Heads	1-53836-K270
Detector Head Assembly, standard length sample pipe	1-53836-K269
or:	
Detector Head Assembly, short length sample pipe	1-53836-K269 -01

Detector Cables. Select part numbers from lengths and connector type listed on slide 9.

Recommended extras:	
Spare Detector Head Assembly (Electronics Only)	1-53836-K272
Commissioning Kit	1-D9221-026
Service Kit	1-D9221-027

Optional extras:	
Mk7 OMD Engine Manager Software Dongle	1-53836-K279
MK5 - MK7 Retrofit Plate (1 for each control unit)	1-35100-K274

Modbus cable per metre
24VDC Power cable per metre

United Technologies
Climate | Controls | Security

GRAVINER

Important notes, please pay special attention:

MAN Diesel recommendation.

For crew safety MAN Diesel recommend that both new-build and retrofit Oil Mist Detection Systems should be mounted away from the blast vents / pressure release valves on the manoeuvring side of the engine.

Installations should be carried out in line with Class Society and Engine Designer/Maker specifications.

USA and EU Sanction Compliance.

Graviner products are supplied subject to compliance with USA and EU trade regulations. To comply with these regulations the Vessel name and IMO number or other such end user detail, if in an other installation, will be required prior to supply.

ALPHA MARINE TECH (S) PTE LTD
EMAIL : alphamarinetech@gmail.com