TECHNICAL INFORMATION

M3 SONAR® - 500M

P/N 922-20010000
P/N 922-20050000 (WITH SYNC)
P/N 922-20100000 (WITH VDSL)
P/N 922-20130000 (WITH SYNC + VDSL)

* Specifications subject to change without notice

Tel: (604) 464 8144
Fax: (604) 941 5423

922-20017902
KONGSBERG MESOTECH LTD.
1598 Kebet Way, Port Coquitlam B.C. Canada
V3C 5M5
KONGSBERG MESOTECH LTD.

WARRANTY STATEMENT
Effective January 1, 2006

Kongsberg Mesotech Ltd. warrants that its products are free from defective materials and/or workmanship for a period of 24 months from the date of receipt of goods by the end user, or 30 months from date of product shipment from the manufacturing facility (whichever occurs first). Kongsberg Mesotech Ltd. will - at no charge - repair or replace (at its option) any part(s) determined to be defective of workmanship or materials, provided the warranty claim is made to either the manufacturing facility or its authorized repair centres within the warranty period.

The purchaser is responsible for the examination of the product upon receipt. The purchaser is required to report any irregularity to received Kongsberg Mesotech Ltd. goods to either the manufacturer, its Sister companies or its Agents, within 15 days of receipt of goods. Proof of date received may be required.

The warranty is void if warranty labels are broken; Kongsberg Mesotech Ltd. will not warrant any product which is physically damaged, abused, altered, subjected to accident or negligence or misuse, or is incorrectly installed or used by the purchaser - or purchaser's representative.

Consumable items (including lamps, fuses, and worn O rings or shaft-seals) are excluded by the warranty.

All Product/Equipment being returned for warranty, repair/replacement shall have freight costs “prepaid”. All warranty Product/Equipment being returned to the customer will be freight charges “prepaid” by Kongsberg Mesotech Ltd.

NOTE: Shipping method and carrier for warranty returned items will be at the discretion of Kongsberg Mesotech Ltd.
A Kongsberg Mesotech Ltd. Warranty Claim form must be completed and submitted to KML Service Department prior to warranty claim acceptance.

Kongsberg Mesotech Ltd. cannot warrant that its products are suitable for any particular or intended purpose. No other warranty is expressed or implied; Kongsberg Mesotech Ltd. accepts no liability on consequential damages – these include, but are not limited to: loss of profit, property damage and personal injury.

The maximum liability shall not, in any case, exceed the price of the product claimed to be defective.
THE MULTIMODE MULTIBEAM FOR MULTIPLE APPLICATIONS

- Imaging and profiling capabilities
- GeoTIFF output for image mosaics
- Multiple true-zoom windows
- CHIRP and Doppler modes of operations
- User-friendly interface
- Significant time savings
- Integrated tilt and pan/tilt control

The Kongsberg Mesotech M3 Sonar® is a multibeam system with both imaging and profiling capabilities. The M3 Sonar® provides high-resolution and easy to interpret images by combining the rapid refresh rate of a conventional multibeam sonar with image quality comparable to a single-beam sonar.

Detection of small objects out to 150 meters combined with a 120° to 140° field of view allows the operator to see the complete underwater picture in real-time.

APPLICATIONS

- Marine Engineering
- Shallow Water Bathymetric Surveying
- Site Inspection
- Environmental Monitoring
- Site Clearance
- Defense and Security

MODELS WITH VDSL TELEMETRY

- Alternative to Ethernet which is limited to <100m
- Longer cable connection to sonar head (up to 1000m)

INSTALLATION OPTIONS

- Pole mount on a surface vessel
- Suitable for a wide range of vehicles from large work-class ROVs to small observation class ROVs
- Tripod mounted

M3 SOFTWARE

The M3 Software was developed specifically for the M3 Sonar® to manage communications with the head and operate all beamforming and imaging processing.

Four Pre-Defined Operating Modes:

1. **Imaging**: long range navigation with high speed update rate
2. **Enhanced Image Quality (eIQ)**: greatest image quality (0.95° angular resolution) from a short range with a slower update
3. **ROV Navigation**: selects eIQ or imaging based on range
4. **Profiling**: narrow 3° beam used to generate a 3D point cloud
**Sonar Specifications**

Range: 0.2m to 150m  
Range Resolution: 1cm  
Frequency: 500 kHz  
Pulse Types: CW, CHIRP  
Modes: Imaging, eIQ Imaging and Profiling

**Imaging Mode**
Horizontal Field of View: 120°  
Vertical Beamwidth: 3°, 7°, 15°, 30°  
Angular Resolution: 1.6°  
Update Rate: up to 40 Hz

**eIQ Imaging Mode**
Horizontal Field of View: 140°  
Vertical Beamwidth: 30°  
Angular Resolution: 0.95°  
Update Rate: up to 10 Hz

**Profiling Mode**
Horizontal Field of View: 120°  
Vertical Beamwidth: 3°  
Number of Beams: 256  
Update Rate: up to 40 Hz

**Interface Specifications**

Communication: Ethernet, or Ethernet and VDSL  
Data Rates: 10/100/1000 Mbps (Ethernet only)  
10/100 Mbps (Ethernet and VDSL)  
Input Voltage: 12 to 36 VDC  
Input Power: 22W (avg.), peak power < 60W, mode dependant  
Operating System: Windows® 10 Professional  
Windows® 7 Professional  
Synchronization: PRI Sync (for models with sync)

**Environmental Specifications**

Temperature  
Operation: -2°C to +38°C  
Storage: -40°C to +55°C  
Shock and Vibration  
Shock Qualified: +/-50gs, 3 Axes, 6 shocks per axis  
Vibration Qualified: 4g, 30Hz 3 Axes, 2 hours per axis.  
No resonance below 800Hz

**Mechanical Specifications**

Dimensions: (see diagrams below)  
Weight in Air: 4.6kg  
Weight in Water: 1.7kg  
Depth Rating: 500m  
Connector Type: SEA CON®  
Connector Model: MINK-10-FCRL  
MIND-4-FCR (for models with sync)  
Materials: Hard Anodized Aluminum, Stainless Steel 316, Elastomeric Polyurethane

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**SPECIFICATIONS**

**PART NUMBER** | **COMMUNICATIONS** | **DATA RATES** | **SYNCHRONIZATION** | **CONNECTOR MODELS**
--- | --- | --- | --- | ---
922-2001000 | ETHERNET | 10/100/1000 MBPS | NONE | MINK-10-FCRL
922-2005000 | ETHERNET | 10/100/1000 MBPS | PRI SYNC | MINK-10-FCRL, MIND-4-FCR
922-2010000 | ETHERNET & VDSL | 10/100 MBPS | NONE | MINK-10-FCRL
922-2013000 | ETHERNET & VDSL | 10/100 MBPS | PRI SYNC | MINK-10-FCRL, MIND-4-FCR

SPECIFICATIONS subject to change without notice
922-20017902
KONGSBERG MESOTECH LTD.
1598 Kelet Way, Port Coquitlam B.C. Canada
V3C 5M5

Tel: (604) 464 8144  
Fax: (604) 941 5423
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<td>922-20050000</td>
<td>M3 Sonar Head 500m with synchronization, SEA CON – Outline Drawing</td>
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<td>M3 Sonar Head 500m with VDSL and synchronization, SEA CON – Outline Drawing</td>
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<td>421-21820000</td>
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<td>421-21980000</td>
<td>M3 Sonar Head, Power and Telemetry Connector SEANET – Drawing</td>
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<td>M3 Cable Assembly, Ethernet / Power – Drawing</td>
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<td>436-03130000-0015</td>
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<td>422-44060000</td>
<td>Bracket, Pole Mount to Rotator (OE10-103) – Assembly Drawing</td>
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<td>Adapter Plate, Pole Mount to Rotator (OE10-102) – Assembly Drawing</td>
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<td>M3 Sonar Head with Rotator (OE10-102) – Outline Drawing</td>
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<td>Adapter Plate, M3 Sonar and Rotator (OE10-102) to Pole Mount – Assembly Dwg</td>
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<td>422-44170000</td>
<td>Adapter Plate, M3 Sonar and Rotator (OE10-102) to Pole Mount – Outline Drawing</td>
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</tbody>
</table>
NOTES:
1. MAXIMUM OPERATING DEPTH: 500msw / 1640fsw.
2. WEIGHT IN AIR: 4.6kg [10.1lbs] ESTIMATED
3. WEIGHT IN SEA WATER: 1.7kg [3.7lbs] ESTIMATED
4. STANDARD CONNECTOR: SEACON MINK-10-FCRL (2 #14, 8 #20).
5. WETTED MATERIALS: 6061-T6 ALUMINIUM, 300 SERIES STAINLESS STEEL, ELASTOMERIC POLYURETHANE
6. DIMENSIONS ARE NOMINAL, IN INCHES. DO NOT SCALE.

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OUTLINE AND INSTALLATION DRAWING-
M3 SONAR C/W SYNC OPTION
500m VERSION

NOTES:
1. MAXIMUM OPERATING DEPTH: 500msw / 1640fsw.
2. WEIGHT IN AIR: 4.7kg [10.4lbs] ESTIMATED
3. WEIGHT IN SEA WATER: 1.8kg [4.0lbs] ESTIMATED
4. POWER/TEL CONNECTOR: SEACON MINK-10-FCRL (2 #14, 8 #20)
5. SYNC CONNECTOR: SEACON MIND-4-FCR (4 #22)
6. WETTED MATERIALS: 6061-T6 ALUMINUM, 300 SERIES STAINLESS STEEL,
   ELASTOMERIC POLYURETHANE.
7. DIMENSIONS ARE NOMINAL, IN INCHES. DO NOT SCALE.

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Kongsberg Mesotech Ltd.

ISSUE DESCRIPTION DATE

DRAWN
BMS 13/06/30

REVISIONS

APPROVALS

NAME

DATE

ISS

DESCRIPTION

DATE

REVISED

CHECKED

ENGRI

ISSUED

B 1C965 MD
922-20051001

1.0

SCALE 12

W.O. NO.

SHEET 1 OF 1
NOTES:
1. ALL PARTS AND PROCESSES USED IN THIS ASSEMBLY MUST COMPLY WITH THE RMS DIRECTIVE.
2. ADD R/A5 AND MOLEX CONNECTORS BEFORE SOLDERING.
3. MAKE WIRE TO THE CENTER (PIN 2) 1/8" LONGER THAN THE OTHER ONES.
4. HEATSHRINK DRAIN WIRE.
5. ADD R/A5 CONNECTOR, CRIMPS, AND MOLEX HOUSING.
6. MAXIMUM 1/2" UNTWISTED.
7. SOLDER AND HEATSHRINK WIRES.

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M3
POWER/TELEMETRY HEAD CONNECTOR WIRING ASSEMBLY

1.1 ECO 5071 2012/12/10
ISS DESCRIPTION DATE

REVISIONS

1/00 B 1C965 MD 421-21981000 ISS 11 SCAL W.O. NO. SHEET 1 OF 1
NOTES:
1. ALL PARTS AND PROCESSES USED IN THIS ASSEMBLY MUST COMPLY WITH THE ROHS DIRECTIVE.
2. CABLE MINIMUM BEND RADIUS = 5".
3. LENGTH (IN FT. ± 2%) = XXXX IN PART # 436-OPPP0000-XXXX.
4. STRIP CABLE BY 1.5" +/- 0.10", MAXIMUM 0.5" UNTWISTED.
5. STRIP CABLE BY 3.5" +/- 0.25", MAXIMUM 0.5" UNTWISTED.
6. SPLICE 2x20AWG WIRES TO 1x18AWG WIRE, COVER SPLICE WITH HEAT SHRINK.
7. INSTALL CAP (SUPPLIED WITH CONNECTOR).
8. INSTALL CABLE CLAMP.
   a. INSTALL RJ45 JACK PLUG FROM RJ45 JACK.
   b. INSTALL OUTER PIECE AND HAND-TIGHTEN WITH 24MM SOCKET (COVER BEND ON TOP).
   c. INSTALL WIRES AS PER T568B ETHERNET STANDARD.
8. INSTALL POWER JACK CONNECTOR:
   a. INSTALL O-RING, THEN INSTALL CONNECTOR THRU THE HOLE IN THE BOX.
   b. INSTALL COVER (WITH THE BEND ON TOP), WASHER, THEN THE NUT.
   c. INSTALL WIRES AS PER WIRING DIAGRAM.
9. INSTALL A STICKER WITH CABLE P/N ON ENCLOSURE LID.
   LABEL SIZE 45mm x 10mm, BROTHER LABEL MAKER SETTINGS;
   FONT: HEL, WIDTH x1, SIZE: 12PT, STYLE: BOLD
10. INSTALL WIRES AS PER T568B ETHERNET STANDARD.

SUPPLIED AS PRE-FABRICATED PART - SEE ENGINEERING MASTER

Kongsberg Mesotech Ltd.

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APPROVALS

DRAWN BH 2015 SEP 26
REVISED BH 2015 JUL 13
CHECKED J.B. 3/15/2015
ENGRAVING 3/15/2015
ISSUED 2015/07/13

Kongsberg Mesotech Ltd.
DWG ASSY M3 TEST CABLE SEACDN MINK

REFERENCE SHEET 1 OF 1

ISS 1.8

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SCALE: NTS
W.O. NO.
SHEET 1 OF 1

1.8

SEE ECO 5537
2015/07/13

SEE ECO 5465
2015/03/09

1.6

ECO 5395/5431 AFTER ENG. CHANGES
2014/12/02

1.5

SEE ECO 5312
2014/06/11

1.4

SEE ECO 5127
2013/05/15

1.8

SEE ECO 5537
2015/07/13

SEE ECO 5465
2015/03/09

1.6

ECO 5395/5431 AFTER ENG. CHANGES
2014/12/02

1.5

SEE ECO 5312
2014/06/11

1.4

SEE ECO 5127
2013/05/15
NOTES:
1. ALL PARTS AND PROCESSES USED IN THIS ASSEMBLY MUST COMPLY WITH THE RoHS DIRECTIVE.
2. CABLE MINIMUM BEND RADIUS = 5".
3. INSTALL PUSH-ON PROTECTIVE CAP (SUPPLIED WITH CONNECTOR).
4. REFER TO BILL OF MATERIALS FOR LENGTH (IN FT. ÷ 0.1 FT.)
5. SPLICE CABLE BY 3.5" ÷ 0.25". MAXIMUM 0.5" Untwisted.
6. CRIMP FERRULES
7. INSTALL A STICKER WITH CABLE P/N ON ENCLOSURE LID.
   LABEL SIZE 56mm x 10mm, BROTHER LABEL MAKER SETTINGS:
   FONT: HEL, SIZE: 12PT, WIDTH: x1, STYLE: BOLD
8. REMOVE LABEL THAT IS ON THE CABLE WHIP.
9. INSERT EXTRA PIN INTO LOCATION MARKED AS "E".

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Do not scale drawing.
## MINK-10-CCP TO M3 BOX CONNECTION

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<tr>
<td>2</td>
<td>BI_DA+</td>
<td>N/C</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>BI_DC-</td>
<td>N/C</td>
<td>5</td>
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<tr>
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<td>N/C</td>
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</tr>
<tr>
<td>7</td>
<td>BI_DD+</td>
<td>N/C</td>
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### FRONT VIEW

#### NOTES:

ALL PARTS AND PROCESSES USED ON THIS ASSEMBLY MUST COMPLY WITH THE RoHS DIRECTIVE.

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### APPROVALS

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### ISS

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<td>ASSEMBLY PINOUT MINK-10-CCPL TO POWER/ETHERNET BREAKOUT BOX</td>
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### REVISIONS

Kongsberg Mesotech Ltd.

Size: 1C965 Type: MD

Create Date: 18/Jan/17

Scale: NTS W.O. No.: SHEET 1 OF 1

DWG NO. 436-00001210 ISS 1.0
NOTES:
1. ALL PARTS AND PROCESSES USED IN THIS ASSEMBLY MUST COMPLY WITH THE ROHS DIRECTIVE.
2. REFER TO THE TABLE FOR TOLERANCES.
3. STRIP CABLE BY 3.5" (+1" - 0").
4. INSTALL CABLE GLAND.
5. INSTALL RJ45 JACK.
6. INSTALL RJ45 COUPLER:
   a. REMOVE JACK PLUG FROM RJ45 COUPLER (5).
   b. TEST WITH ETHERNET TESTER (FLUKE CABLE IQ TESTER OR EQUIVALENT).
7. SPlice CABLE BY 3.5" (+1" - 0"). HEATSHRINK OVERLAPS THE WIRE INSULATION ON BOTH ENDS OF THE SPICED AREA BY A MINIMUM OF 1 WIRE GROUP (LARGEST GROUP) DIAMETER.
8. CRIMP FERRULES.
9. INSTALL POWER JACK CONNECTOR:
   a. INSTALL CONNECTOR, WASHER, THEN THE NUT.
   b. INSTALL PINS WITH SOLDERED WIRES TO THE CONNECTOR.
   c. INSTALL CAP (SUPPLIED WITH CONNECTOR).
10. INSTALL A STICKER WITH CABLE P/N ON ENCLOSURE LID.
    LABEL SIZE 45mm x 10mm, BROTHE LABEL MAKER SETTINGS;
    FONT: HEL, WIDTH x1, SIZE: 12PT, STYLE: BOLD.
11. REMOVE LABEL THAT IS ON THE CABLE WHIP.
ANODE MUST BE MOUNTED ONLY AT THIS LOCATION AND ONLY FOR ALUMINUM HEADS
NOTE: EXTRA HOLE MARKING ANODE LOCATION FOR TITANIUM HEADS ITEMS 6, 7 & 8 ARE NOT REQUIRED USE INSTEAD ONE MORE EACH OF ITEMS 4 & 5

NOTE:
- LUBRICATE FASTENERS WITH ANTI-SEIZE LUBRICANT
- LUBRICATE BASE OF ANODE WITH WATER RESISTANT GREASE

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Kongsberg Mesotech Ltd.
NOTE:
- LUBRICATE FASTENERS WITH ANTI-SEIZE LUBRICANT
NOTES:

1. LUBRICATE FASTENERS WITH ANTI-SEIZE LUBRICANT
NOTES:
1. ANODE TO BE USED ONLY WITH ALUMINUM HEAD
   AT LOCATION MARKED WITH NOTCH - SEE DETAIL
2. FOR TITANIUM HEAD, ITEMS 2, 5 AND 6 NOT USED;
   USE INSTEAD ONE MORE EACH OF ITEM 3 AND 4
3. LUBRICATE FASTENERS WITH ANTI-SEIZE LUBRICANT
4. LUBRICATE BASE OF ANODE WITH WATER RESISTANT GREASE
NOTES:
1. ANODE TO BE USED ONLY WITH ALUMINUM HEAD
   AT LOCATION MARKED WITH NOTCH - SEE DETAIL
2. FOR TITANIUM HEAD, ITEMS 2, 5, 6 AND 9 NOT USED;
   USE INSTEAD ONE MORE EACH OF ITEM 3 AND 4
3. HEAD, FLANGE AND MRU NOT INCLUDED; SHOWN ONLY FOR CLARITY
4. IF NOT USING MRU DO NOT USE ITEMS 8 AND 9 AND USE CENTER HOLE
   OF ITEM 2 FOR INSTALLATION
5. LUBRICATE FASTENERS WITH ANTI-SEIZE LUBRICANT
6. LUBRICATE BASE OF ANODE WITH WATER RESISTANT GREASE

ANODE LOCATION
NOTCH MARK
ANODE LOCATION

DETAIL A
SCALE 1:2

Kongsberg Mesotech Ltd.

ASSEMBLY DRAWING
DOWNLOOKING BRACKET
POLE MOUNT TO M3 SONAR

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NOTES:
1. FLANGE, ROTATOR, AND SONAR HEAD NOT INCLUDED; SHOWN ONLY FOR CLARITY
2. LUBRICATE FASTENERS WITH ANTI-SEIZE LUBRICANT
3. BRACKET AND ADAPTOR CAN BE ASSEMBLED AS SHOWN ON EITHER PAGE

Kongsberg Mesotech Ltd.

ASSEMBLY DRAWING
ADAPTOR PLATE AND BRACKET - M3 SONAR AND ROTATOR (OE10-102) TO POLE MOUNT

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE DECIMALS [FRACTIONAL] ANGULAR X.XX +0.005 -0.012 MACH +0.003 BEND +1° SURFACE FINISH 125 Ra, DE-BURR HOLES BREAK SHARP EDGES 0.010

DO NOT SCALE DRAWING

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APPROVALS
NAME DATE
DRAWN ORC 13/08/15
REVISED ORC 15/07/15
CHECKED ENGR
ISSUED ENGINEER

Kongsberg Mesotech Ltd.

1.1 ECO 5549 2015-07-31
ISS DESCRIPTION DATE
1.1

SIZE NSCM NO TYPE DWG. NO. ISS SCALE: W.O. NO. SHEET
B 1C965 MD 422-44171000 1.1 3:18 281-1150 2 OF 2
NOTES:
1. FLANGE, ROTATOR, AND SONAR HEAD NOT INCLUDED; SHOWN ONLY FOR CLARITY

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DO NOT SCALE DRAWING

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES.
TOLERANCES ARE:
DECIMALS: 0
FRACTIONAL: ±0.006
ANGULAR: ±0.5°
X XXX: ±0.003
MACH = 30
BEND = ±1°
SURFACE FINISH 125 Ra.
DE-BURR HOLES
BREAK SHARP EDGES 0.010

OUTLINE AND INSTALLATION DRAWING
ADAPTOR PLATE AND BRACKET - M3 SONAR AND ROTATOR (OE10-102) TO POLE MOUNT

Kongsberg Mesotech Ltd.

ECO 1549

1.1

ISS
DESCRIPTION
DATE

REVISIONS

1.1

ECO 1549
2015/08/24

ISS
DESCRIPTION
DATE

REVISIONS

Kongsberg Mesotech Ltd.

OUTLINE AND INSTALLATION DRAWING
ADAPTOR PLATE AND BRACKET - M3 SONAR AND ROTATOR (OE10-102) TO POLE MOUNT

Kongsberg Mesotech Ltd.
NOTES:
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OUTLINE AND INSTALLATION DRAWING
ADAPTOR PLATE AND BRACKET - M3 SONAR AND ROTATOR (OE10-102) TO POLE MOUNT

Kongsberg Mesotech Ltd.

1.1 ECO 5549 2015/08/24
ISS DESCRIPTION DATE

REVISIONS

DRAWN: DRC 2013/08/15
REvised: 08/24/2015
CHECKED: 08/24/2015
ENG: 08/24/2015
ISSUED: 08/24/2015

SCALE: 1:4
DRAWN/W.O. NO. 281-1150 SHEET 2 OF 2