

TECHNICAL INFORMATION



KONGSBERG

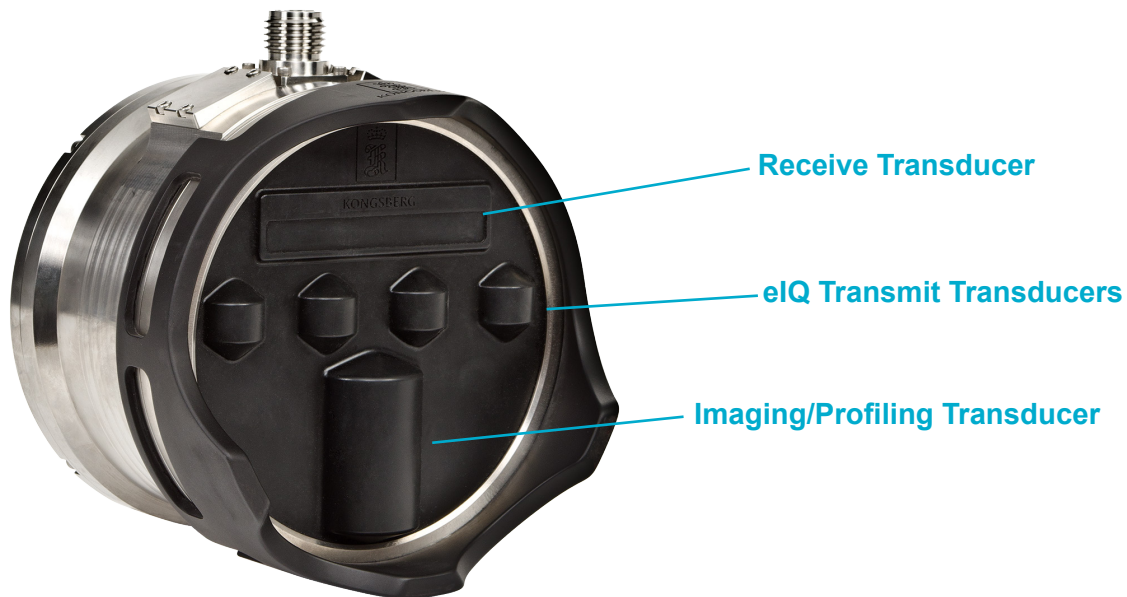
M3 SONAR[®] - 4000M

P/N 922-20020000

P/N 922-20060000 (WITH SYNC)

P/N 922-20110000 (WITH VDSL)

P/N 922-20140000 (WITH SYNC + VDSL)



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

Specifications subject to change without notice
922-20027902
KONGSBERG MESOTECH LTD.
1598 Kebet Way, Port Coquitlam B.C. Canada
V3C 5M5



KONGSBERG

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.

DESCRIPTION



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M3 SONAR® - 4000M

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

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SPECIFICATIONS



KONGSBERG

PART NUMBER	COMMUNICATIONS	DATA RATES	SYNCHRONIZATION	CONNECTOR MODELS
922-2002000	ETHERNET	10/100/1000 MBPS	NONE	MINK-10-FCRL
922-2006000	ETHERNET	10/100/1000 MBPS	PRI SYNC	MINK-10-FCRL MIND-4-FCR
922-2011000	ETHERNET & VDSL	10/100 MBPS	NONE	MINK-10-FCRL
922-2014000	ETHERNET & VDSL	10/100 MBPS	PRI SYNC	MINK-10-FCRL MIND-4-FCR

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:	8.4 kg
Weight in Water:	5.2 kg
Depth Rating:	4000 m
Connector Type:	SEA CON®
Connector Model:	MINK-10-FCRL MIND-4-FCR (for models with sync)
Materials:	Titanium, Stainless Steel 316, Elastomeric Polyurethane

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DRAWING LIST

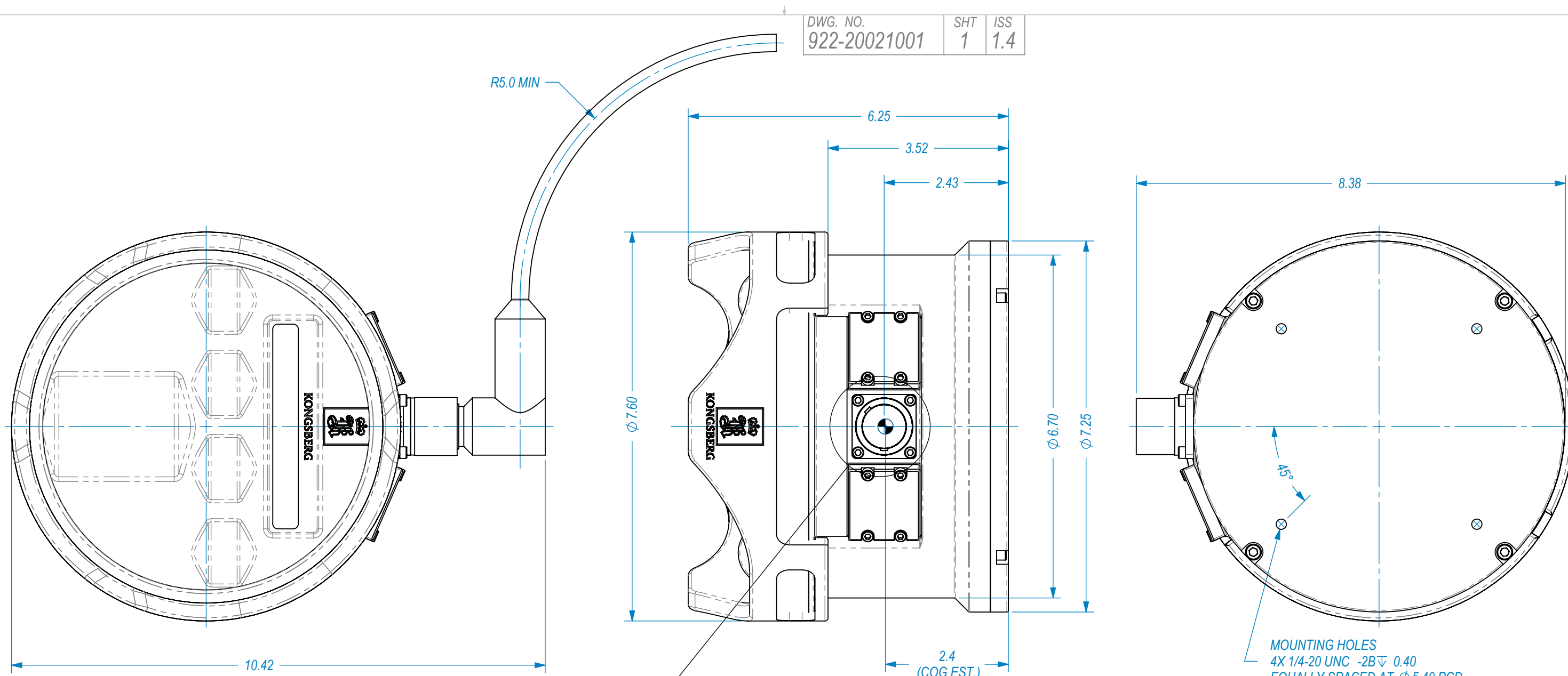
DRAWING NUMBER	PART NUMBER	DESCRIPTION
922-20021001	922-20020000	M3 Sonar Head 4000m, SEA CON – Outline Drawing
922-20061001	922-20060000	M3 Sonar Head 4000m with synchronization, SEA CON – Outline Drawing
922-20141001	922-20140000	M3 Sonar Head 4000m with VDSL and sync, SEA CON – Outline Drawing
421-21821000	421-21820000	M3 Sonar Head, Power and Telemetry Connector SEA CON – Drawing
421-21981000	421-21980000	M3 Sonar Head, Power and Telemetry Connector SEANET – Drawing
436-02381000	436-02380000	M3 Cable Whip, Ethernet / Power – Drawing
436-02391000	436-02390000-0050	M3 Cable Assembly, Ethernet / Power – Drawing
436-02811000	436-02810000-0004	M3 Cable, Synchronization, SEA CON MIND-4-CCP – Drawing
436-02831000	436-02830000-0020	M3 Cable Whip, Synchronization, SEA CON MIND-4-CCP – Drawing
436-03131000	436-03130000-0015	M3 Cable Assembly, VDSL / Power – Drawing
436-00001210	436-03350000 436-03360000	M3 Cable Connector, MINK-10-CCPL to P/E Breakout Box – Assembly Pinout
436-00001302	436-03350000 436-03360000 436-03370000	M3 Cable Connector, M3 Power/Ethernet Breakout Box – Assembly Drawing
422-44051000	422-44050000	Bracket, M3 Sonar Head to Rotator (OE10-102 / OE10-013) – Assembly Drawing
422-44061000	422-44060000	Bracket, Pole Mount to Rotator (OE10-103) – Assembly Drawing
422-44061001	422-44060000	M3 Sonar Head, SEA CON, with Rotator (OE10-103) – Outline Drawing
422-44071000	422-44070000	Adapter Plate, Pole Mount to Rotator (OE10-102) – Assembly Drawing
422-44071001	422-44070000	M3 Sonar Head with Rotator (OE10-102) – Outline Drawing
422-44121000	422-44120000	Bracket, M3 Sonar Head to Pole Mount – Assembly Drawing
422-44121001	422-44120000	Bracket, M3 Sonar Head to Pole Mount – Outline Drawing
422-44131000	422-44130000	Bracket, M3 Sonar Head to Pole Mount, Downlooking – Assembly Drawing
422-44131001	422-44130000	Bracket, M3 Sonar Head to Pole Mount, Downlooking – Outline Drawing
422-44171000	422-44170000	Adapter Plate, M3 Sonar and Rotator (OE10-102) to Pole Mount – Assembly Dwg
422-44171001	422-44170000	Adapter Plate, M3 Sonar and Rotator (OE10-102) to Pole Mount – Outline Drawing

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V3C 5M5



KONGSBERG



DWG. NO.
922-20021001

SHT	ISS
1	1.4

CONNECTOR
ORIENTATION KEYING

DETAIL A
SCALE 1:1

MOUNTING HOLES
4X 1/4-20 UNC -2B ∇ 0.40
EQUALLY SPACED AT ϕ 5.40 PCD

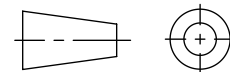
NOTES:

1. MAXIMUM OPERATING DEPTH: 4000msw / 13123fsw.
2. WEIGHT IN AIR: 8.4kg [18.5 lbs]
3. WEIGHT IN SEA WATER: 5.2kg [11.4 lbs]
4. STANDARD CONNECTOR: SEACON MINK-10-FCRL (2 #14, 8 #20)
5. WETTED MATERIALS: TITANIUM (CP AND ALLOY), 300 SERIES STAINLESS STEEL, ELASTOMERIC POLYURETHANE.
6. DIMENSIONS ARE NOMINAL, IN INCHES. DO NOT SCALE.

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APPROVALS	NAME	DATE
DRAWN	DL	11/02/16
REVISED	BMS	12/10/04
CHECKED		
ENGR		
ISSUED		



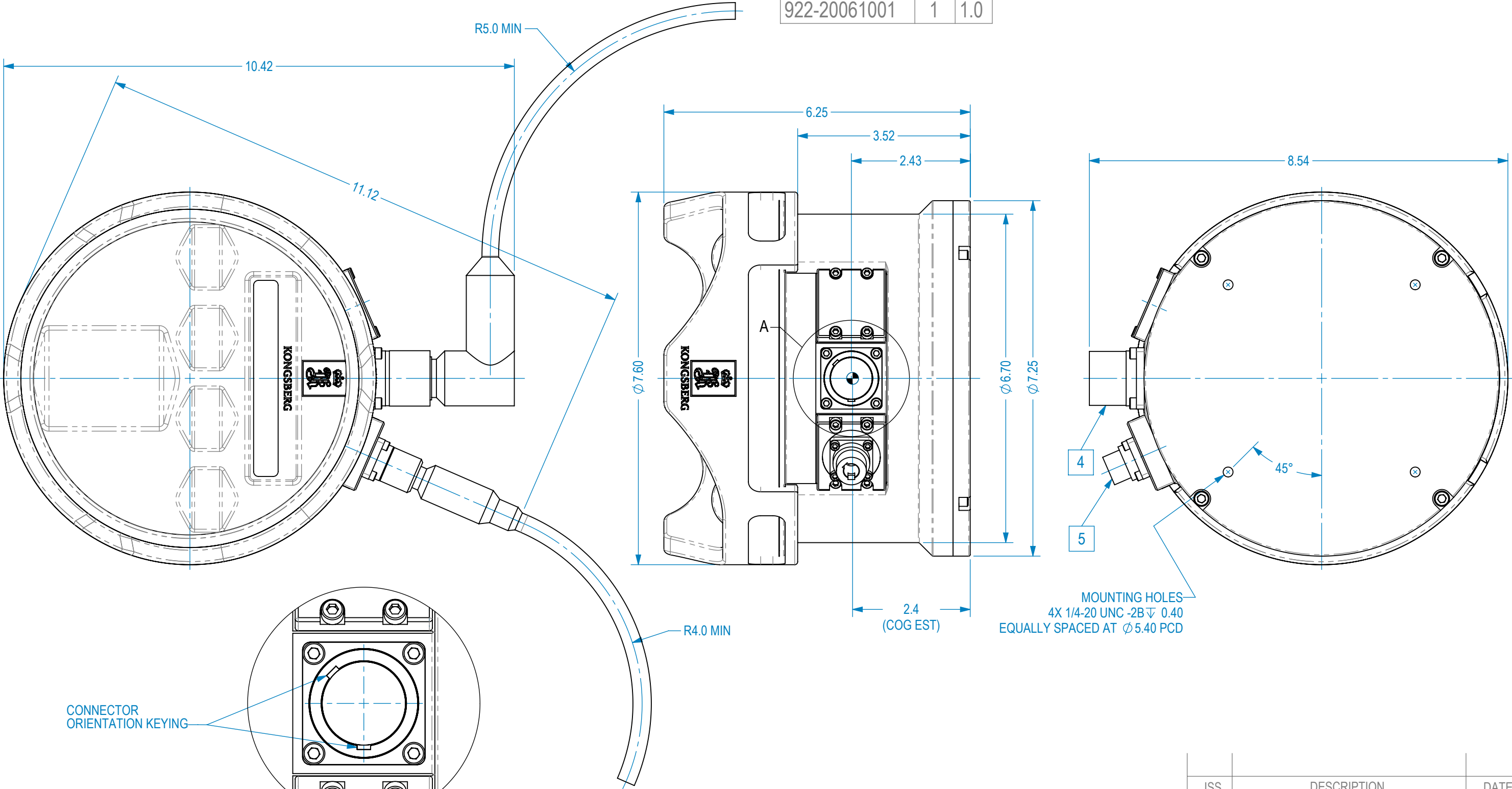
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1.3	ECO 4974	12/05/02
1.2	ECO 4809	11/08/02
1.1	ECO 4788	11/05/12

ISS	DESCRIPTION	DATE
REVISIONS		

Kongsberg Mesotech Ltd.

OUTLINE AND INSTALLATION DRAWING
M3 SONAR
4000m VERSION

SIZE	NSCM NO	TYPE	DWG. NO.	ISS
B	1C965	MD	922-20021001	1.4
SCALE: 1:2		W.O. NO.		SHEET 1 OF 1



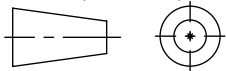
- NOTES:
1. MAXIMUM OPERATING DEPTH: 4000msw / 13123fsw.
 2. WEIGHT IN AIR: 8.5kg [18.8lbs] ESTIMATED
 3. WEIGHT IN SEA WATER: 5.3kg [11.7lbs] ESTIMATED
 4. POWER/TEL CONNECTOR: SEACON MINK-10-FCRL (2 #14, 8 #20)
 5. SYNC CONNECTOR: SEACON MIND-4-FCR (4 #22)
 6. WETTED MATERIALS: TITANIUM (CP AND ALLOY), 300 SERIES STAINLESS STEEL, ELASTOMERIC POLYURETHANE.
 7. DIMENSIONS ARE NOMINAL, IN INCHES. DO NOT SCALE.

DETAIL A
POWER/TEL CONNECTOR

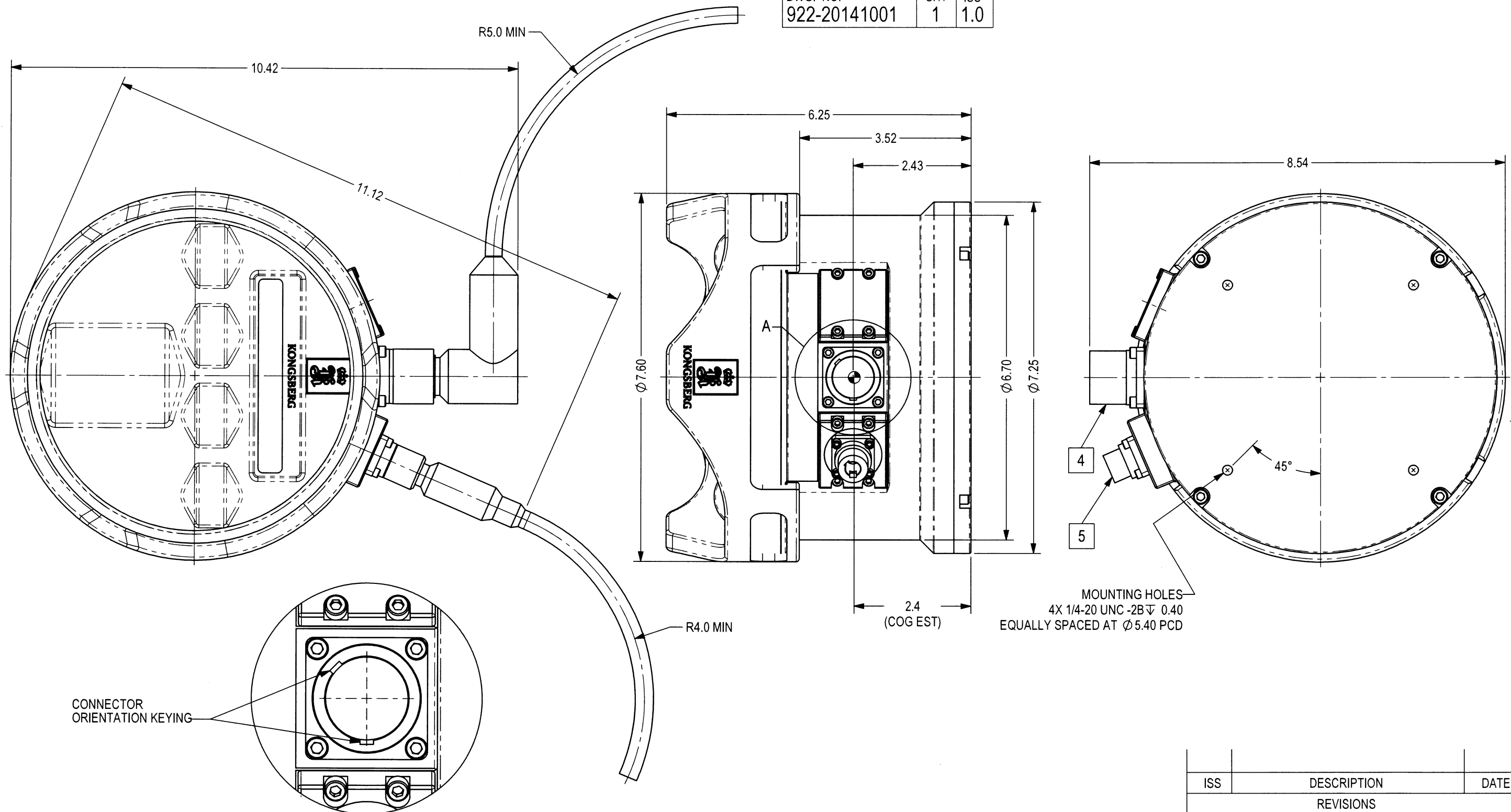
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APPROVALS	NAME	DATE
DRAWN	BMS	13/08/30
REVISED	--	--
CHECKED		
ENGR		
ISSUED		



ISS	DESCRIPTION		DATE
REVISIONS			
Kongsberg Mesotech Ltd.			
OUTLINE AND INSTALLATION DRAWING- M3 SONAR C/W SYNC OPTION 4000m VERSION			
SIZE	NSCM NO	TYPE	DWG. NO.
B	1C965	MD	922-20061001
SCALE: 1:2		W.O. NO.	ISS
			1.0
			SHEET 1 OF 1



MOUNTING HOLES
4X 1/4-20 UNC -2B ∇ 0.40
EQUALLY SPACED AT $\varnothing$ 5.40 PCD

CONNECTOR
ORIENTATION KEYING

DETAIL A
POWER/TEL (VDSL/ETHERNET) CONNECTOR

NOTES:

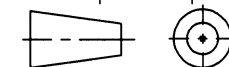
1. MAXIMUM OPERATING DEPTH: 4000msw / 13123fsw.
2. WEIGHT IN AIR: 8.5kg [18.8lbs] ESTIMATED
3. WEIGHT IN SEA WATER: 5.3kg [11.7lbs] ESTIMATED
4. POWER/TEL (VDSL/ETHERNET) CONNECTOR: SEACON MINK-10-FCRL (2 #14, 8 #20)
5. SYNC CONNECTOR: SEACON MIND-4-FCR (4 #22)
6. WETTED MATERIALS: TITANIUM (CP AND ALLOY), 300 SERIES STAINLESS STEEL, ELASTOMERIC POLYURETHANE.
7. DIMENSIONS ARE NOMINAL, IN INCHES. DO NOT SCALE.

PROPRIETARY NOTICE

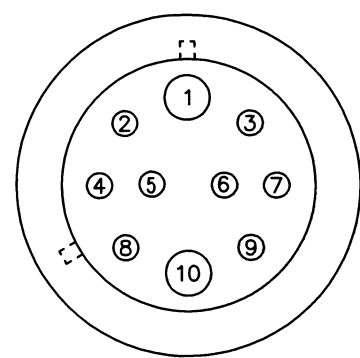
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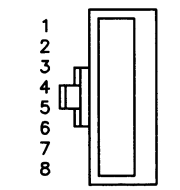
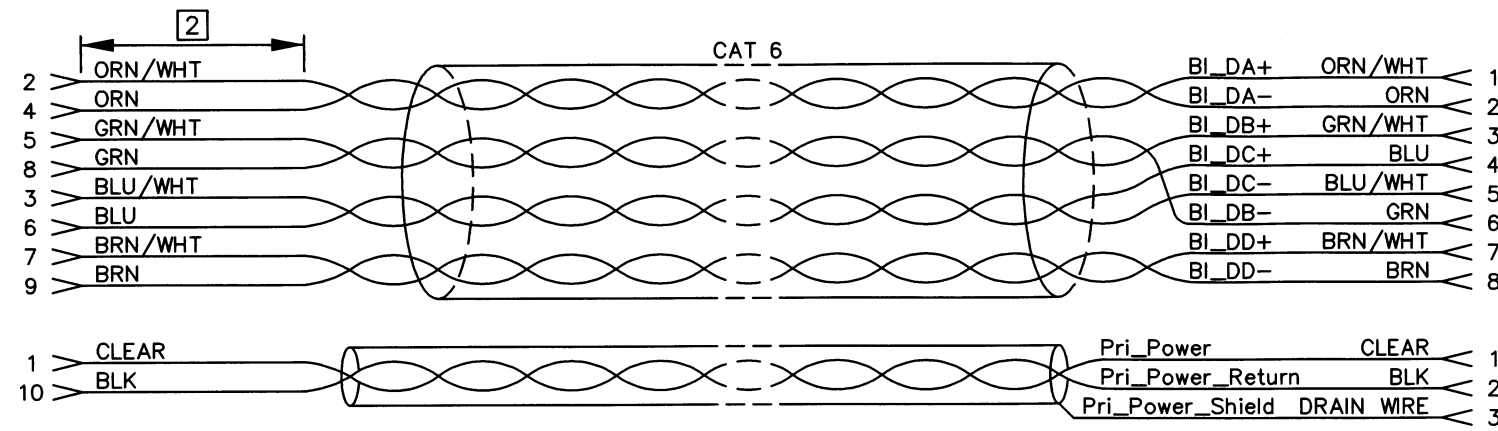
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ENGR	ES	15/06/04
ISSUED	R.A.	15/06/09



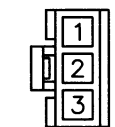
ISS	DESCRIPTION	DATE
REVISIONS		
Kongsberg Mesotech Ltd.		
OUTLINE & INSTALLATION DRAWING-M3 SONAR HEAD 4000M SEACON C/W VDSL/ETH TEL & SYNC OPTION		
SIZE	NSCM NO	TYPE
B	1C965	MD
DWG. NO.	922-20141001	ISS
SCALE: 1:2	W.O. NO.	SHEET 1 OF 1



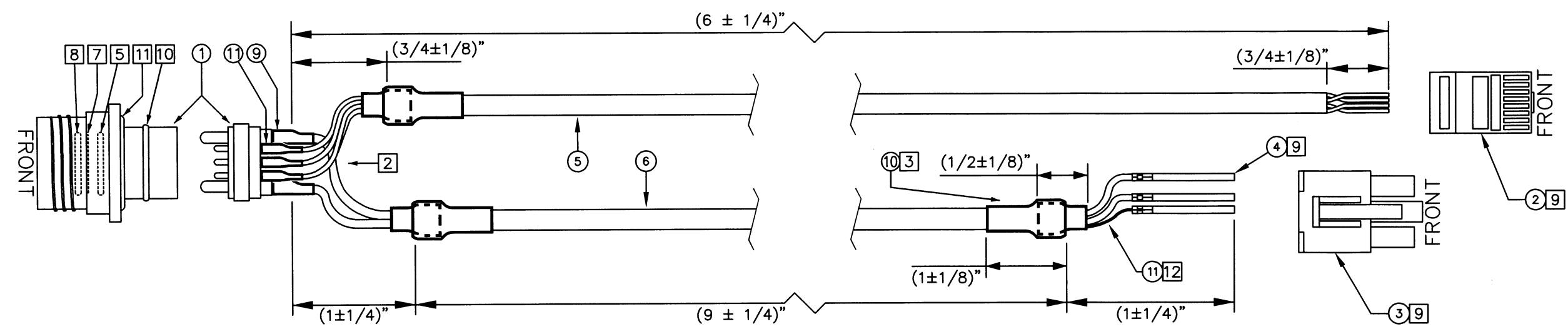
REAR VIEW



REAR VIEW



REAR VIEW

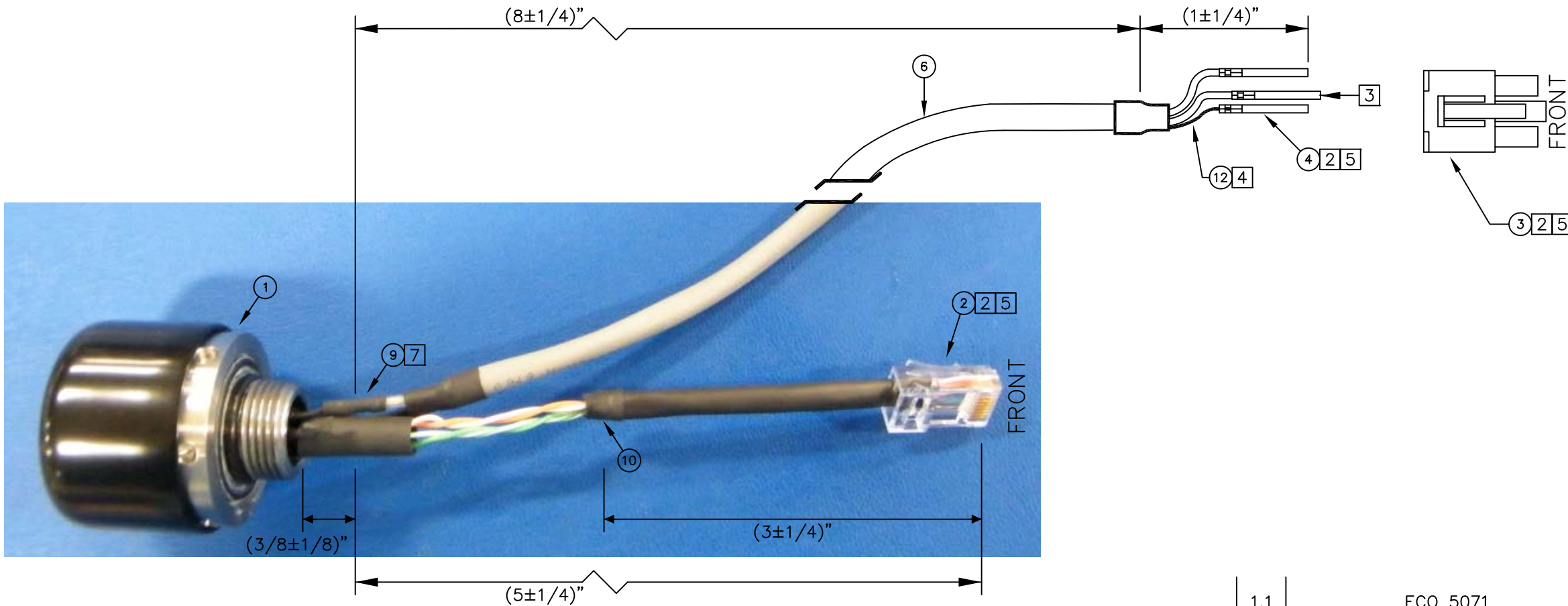
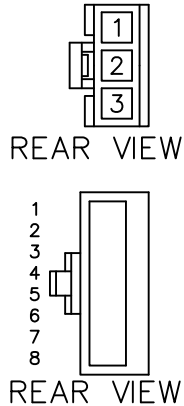
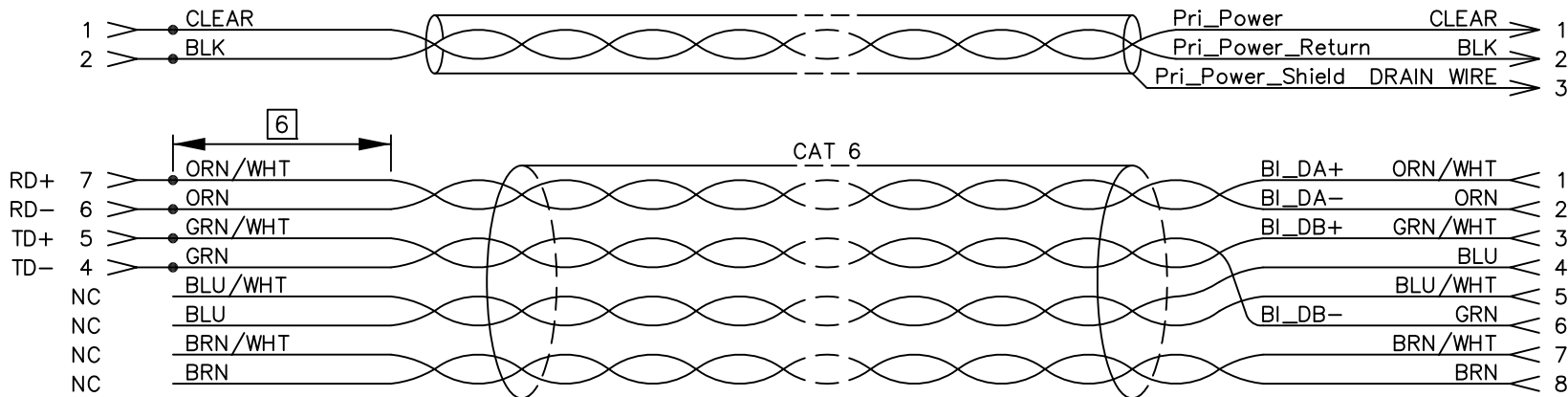
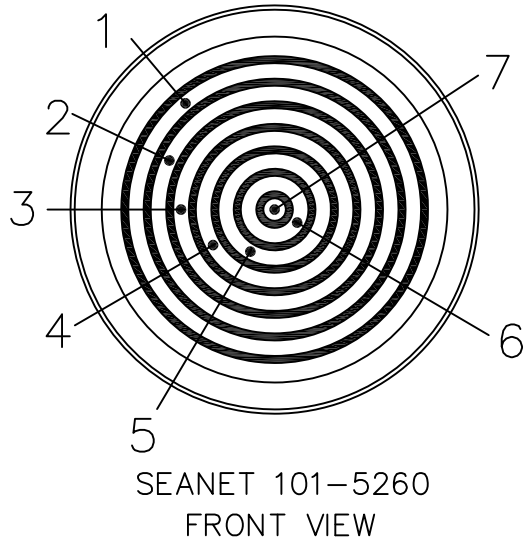


NOTES:

- 1 ALL PARTS AND PROCESSES USED IN THIS ASSEMBLY MUST COMPLY WITH THE RoHS DIRECTIVE.
- 2 MAXIMUM 1/2" UNTWISTED.
- 3 3PLACES: INSTALL HEATSHRINK AS SHOWN (OVERLAPPING).
- 4 SOLDER AND HEATSHRINK WIRES.
- 5 INSTALL 1st O-RING.
- 6 INSERT CONNECTOR INTO HOUSING FROM FRONT.
- 7 INSTALL SPRING CLIP.
- 8 INSTALL 2nd O-RING.
- 9 ADD RJ45 CONNECTOR, CRIMPS, AND MOLEX HOUSING.
- 10 INSTALL 3rd O-RING.
- 11 PUT 4th O-RING IN A PLASTIC BAG AND KEEP WITH ASSEMBLY.
- 12 HEATSHRINK DRAIN WIRE.

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		DRAWN	BH 2011/06/29	M3			
		REVISED	BH 2015/02/27	POWER/TELEMETRY HEAD CONNECTOR			
		CHECKED	<i>Lm</i> 2015/3/5	WIRING ASSEMBLY			
		ENGR	<i>I.B</i> 2015/03/05	SIZE	NSCM NO	TYPE	DWG NO.
		ISSUED	<i>R.C.H.</i> 2015/03/05	B	1C965	MD	421-21821000
		CONFIDENTIAL DO NOT COPY		SCALE: -	W.O. NO.		ISS 1.2
							SHEET 1 OF 1

1.2	SEE ECO 5407	2015 FEB 27
1.1	SEE ECO 4934	2012 MAR 02
ISS	DESCRIPTION	DATE
	REVISIONS	

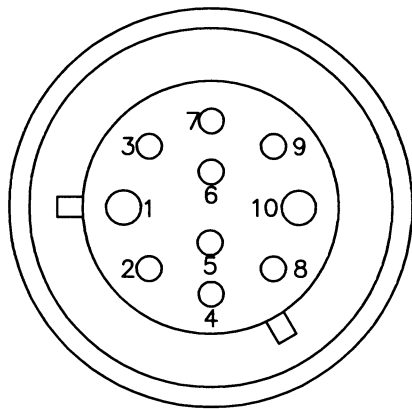


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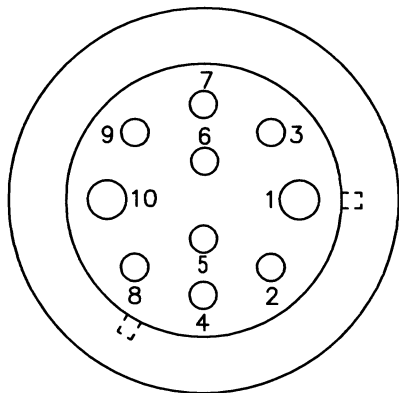
- 1 ALL PARTS AND PROCESSES USED IN THIS ASSEMBLY MUST COMPLY WITH THE RoHS DIRECTIVE.
- 2 ADD RJ45 AND MOLEX CONNECTORS BEFORE SOLDERING.
- 3 MAKE WIRE TO THE CENTER (PIN 2) 1/8" LONGER THAN THE OTHER ONES.
- 4 HEATSHRINK DRAIN WIRE.
- 5 ADD RJ45 CONNECTOR, CRIMPS, AND MOLEX HOUSING.
- 6 MAXIMUM 1/2" UNTWISTED.
- 7 SOLDER AND HEATSHRINK WIRES.

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		DRAWN	BH 2012/11/22
		REVISED	BH 2012/12/10
		CHECKED	
		ENGR	
		ISSUED	
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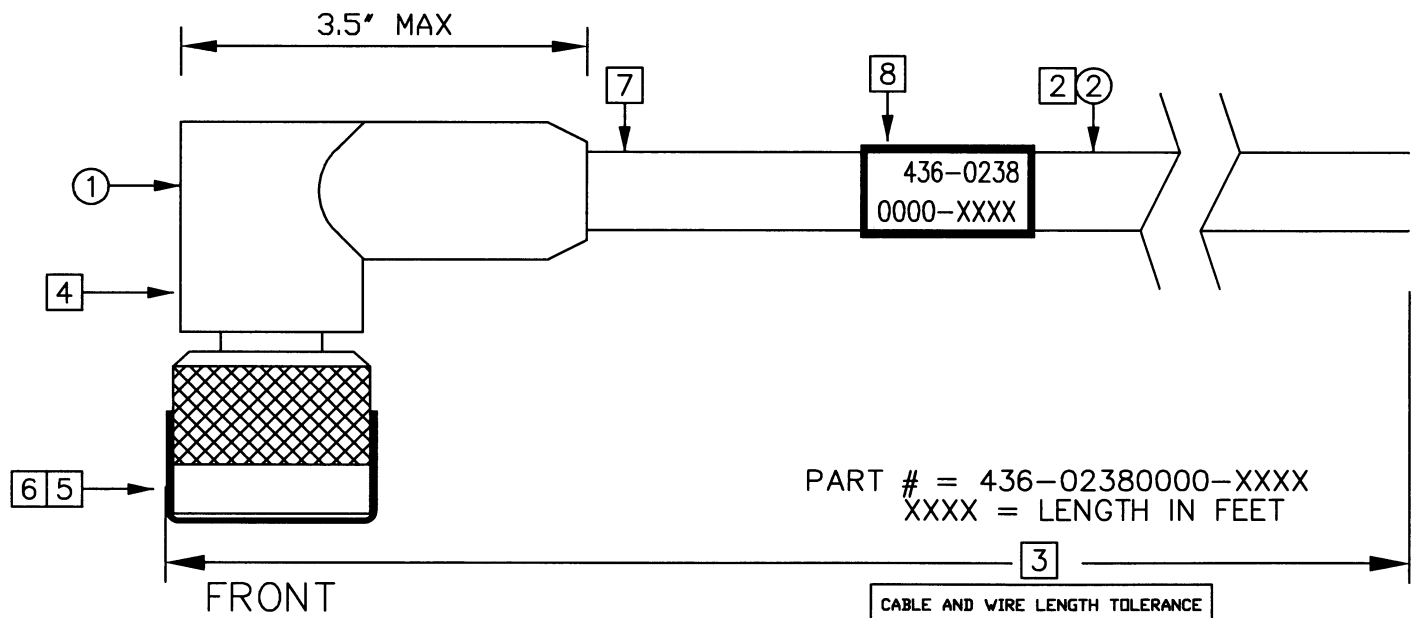
1.1	ECO 5071	2012/12/10
ISS	DESCRIPTION	DATE
REVISIONS		
Kongsberg Mesotech Ltd.		
M3 POWER/TELEMETRY HEAD CONNECTOR WIRING ASSEMBLY		
SIZE	NSCM NO	TYPE
B	1C965	MD
DWG NO.	421-21981000	ISS 1.1
SCALE: -	W.O. NO.	SHEET 1 OF 1



PIN VIEW/
FACE VIEW



SOLDER LUG/
REAR VIEW



PART # = 436-02380000-XXXX
XXXX = LENGTH IN FEET

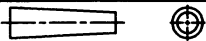
CABLE AND WIRE LENGTH TOLERANCE	
≤1 FT	+1 IN -0 IN
>1 FT-5 FT	+2 IN -0 IN
>5 FT-10 FT	+4 IN -0 IN
>10 FT- 25 FT	+6 IN -0 IN
>25 FT	+5% -0%

NOTES:

- ALL PARTS AND PROCESSES USED IN THIS ASSEMBLY MUST COMPLY WITH THE RoHS DIRECTIVE.
- CABLE MINIMUM BEND RADIUS = 5".
- THE LAST 4 DIGITS OF THE PART NUMBER STATES THE LENGTH OF THE CABLE IN FEET.
- MINK-10-CCPL MOLDED R/A.
- INSTALL PUSH-ON PROTECTIVE CAP (SUPPLIED WITH CONNECTOR).
- O-RINGS MUST BE INSTALLED ON CONNECTOR IF APPLICABLE.
- MAXIMUM 1/2" UNTWISTED FOR ALL TP.
- PRINT PART NUMBER USING 1/8" BLACK TEXT ON WHITE, THEN INSTALL CLEAR HEATSHRINK OVER.

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DO NOT SCALE DRAWING



MINK-10-CCP R/A WHIP		
FALMAT FM022208-10		
PIN NUMBER	COLOR	DESC
1	RED	18AWG
	WHT	19AWG
10	BLK	18AWG
	GRN	18AWG
2	WHT/ORG	TWISTED PAIR
4	WHT	
5	WHT/GRN	TWISTED PAIR
8	WHT	
3	WHT/BLU	TWISTED PAIR
6	WHT	
7	WHT/BRN	TWISTED PAIR
9	WHT	

1.5	ECO 6036	2016 NOV 28
1.4	ECO 5189	2013 OCT 3
1.3	ECO 5020	2012 AUG 14
1.2	ECO 4870	2011 OCT 4
1.1	ECO 4829	2011 AUG 10
1.0	ECO 4796	2011 MAY 31

ISS	DESCRIPTION	DATE
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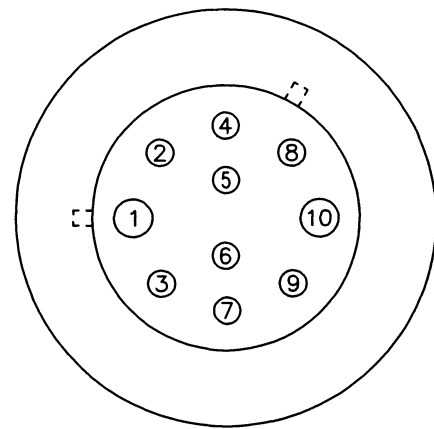
REVISIONS

Kongsberg Mesotech Ltd.

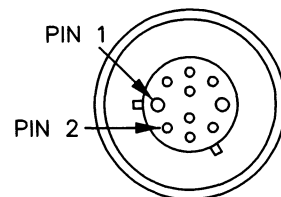
M3 SONAR
CABLE POWER/TELEMETRY WHIP
SEACON MINK-10-CCPL MOLDED R/A

SIZE	NSCM NO	TYPE	DWG NO.	ISS
B	1C965	MD	436-02381000	1.5

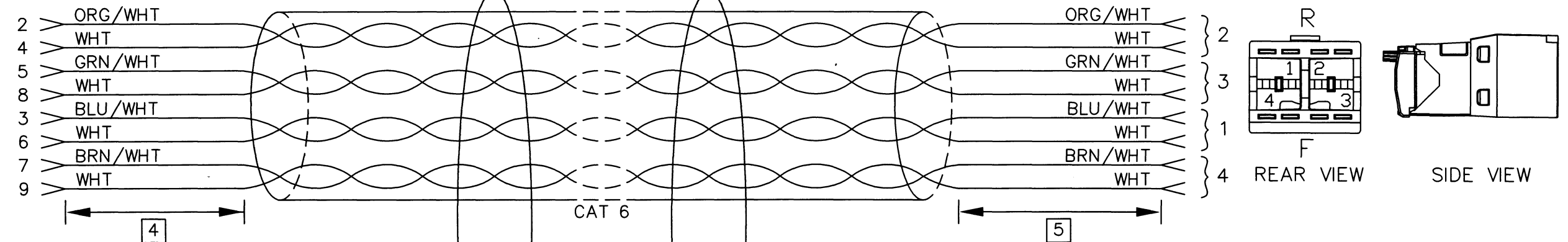
SCALE: NTS	W.O. NO.	SHEET 1 OF 1
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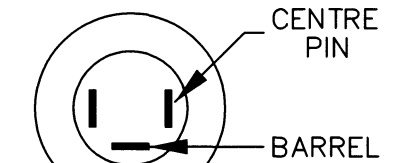
PIN VIEW



FRONT VIEW



TERMINAL BLOCK

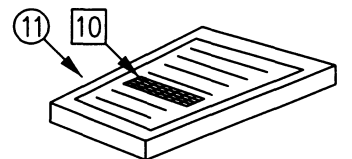
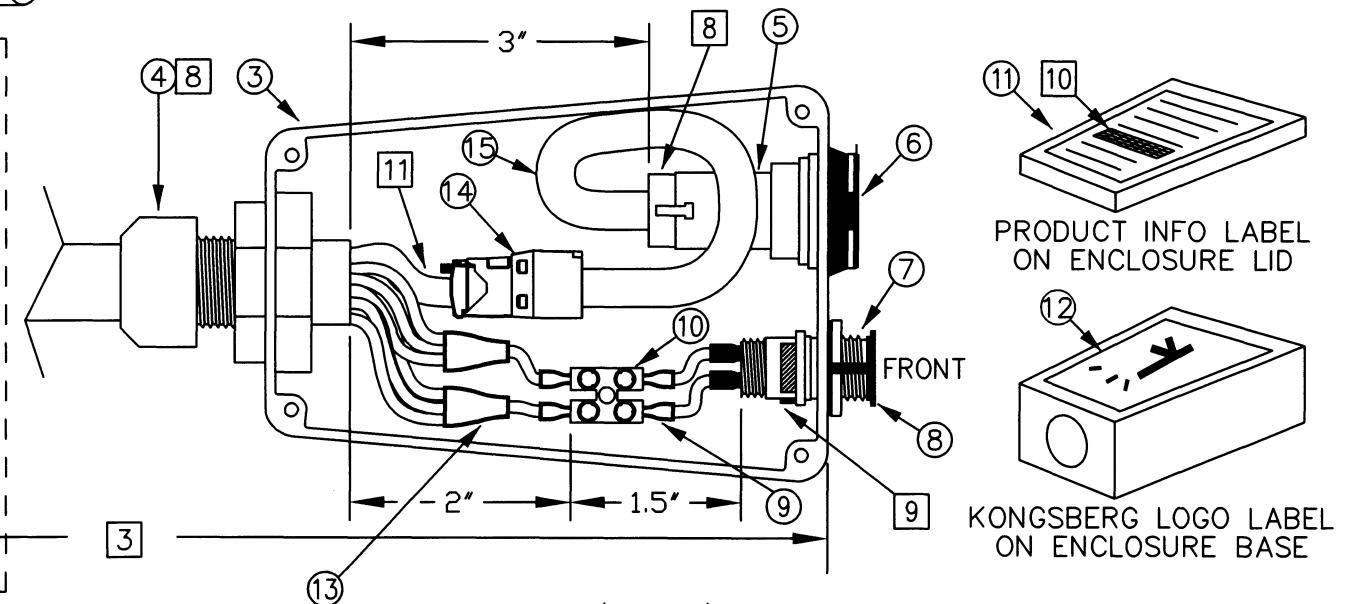


REAR VIEW

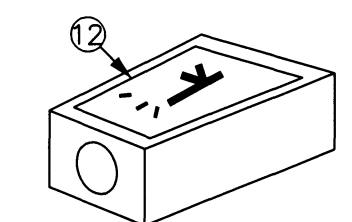
NOTES:

- 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., $\pm 2\%$) = XXXX IN PART# 436-0PPP0000-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 HEATSHRINK.
- 7 INSTALL CAP (SUPPLIED WITH CONNECTOR).
- 8 INSTALL CABLE GLAND.
INSTALL RJ45 JACK:
a - REMOVE JACK PLUG FROM RJ45 JACK (5), THEN INSTALL OUTER PIECE AND HAND-TIGHTEN WITH 24MM SOCKET (COVER BEND ON TOP).
b - INSTALL WIRES AS PER T568B ETHERNET STANDARD.
c - TEST WITH 1 Gbps ETHERNET TESTER (FLUKE CABLE IQ TESTER OR EQUIVALENT).
- 9 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.
- 10 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
- 11 INSTALL WIRES AS PER T568B ETHERNET STANDARD
INSTALL RJ45 JACK

SUPPLIED AS PRE-FABRICATED PART - SEE ENGINEERING MASTER



PRODUCT INFO LABEL ON ENCLOSURE LID



KONGSBERG LOGO LABEL ON ENCLOSURE BASE

1.8	SEE ECO 5537	2015/07/13
1.7	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

ISS	DESCRIPTION	DATE
REVISIONS		

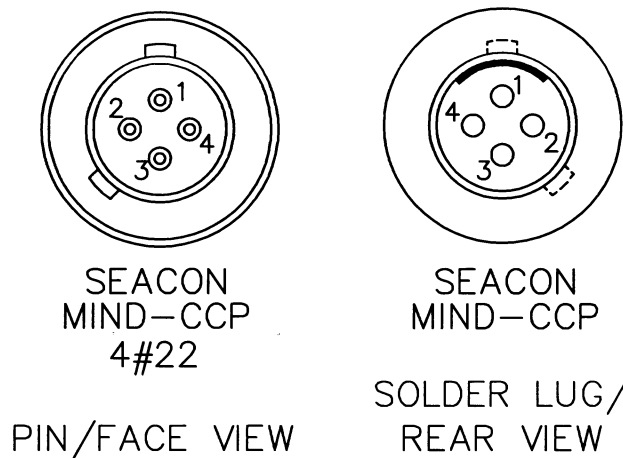
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DO NOT SCALE DRAWING

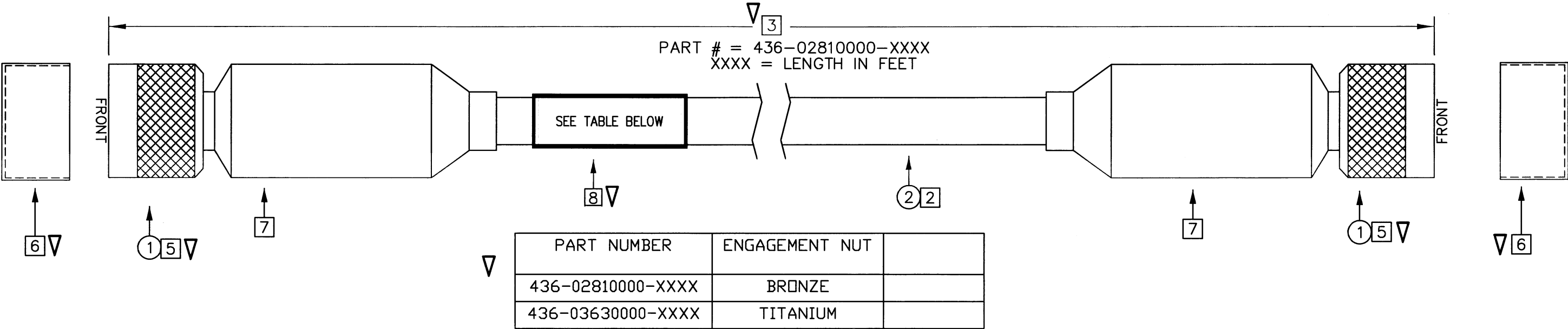
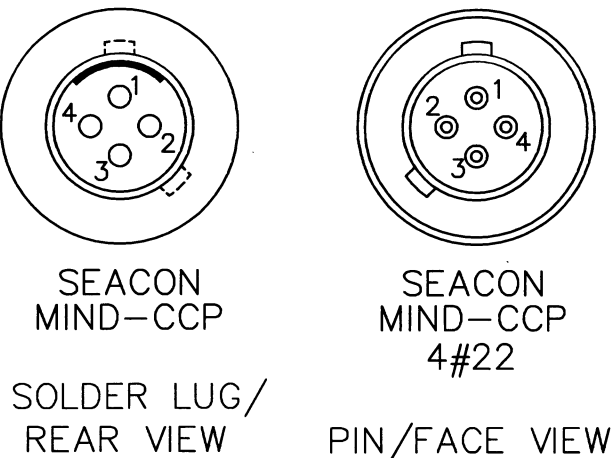
APPROVALS	DATE
DRAWN BH	2014 SEP 26
REVISED BH	2015 JUL 13
CHECKED J.B.	7/13/2015
ENGR DM	July 13/2015
ISSUED R.H.	2015 JUL 13
CONFIDENTIAL DO NOT COPY	

Kongsberg Mesotech Ltd.			
DWG ASSY M3 TEST CABLE SEACON MINK			
SIZE B	NSCM NO 1C965	TYPE MD	DWG NO. 436-02391000
SCALE: NTS			ISS 1.8

W.O. NO.	SHEET 1 OF 1
----------	--------------



MIND-4-CCP TO MIND-4-CCP CABLE ASSEMBLY					
MIND-4-CCP	FALMAT FM022208-3				MIND-4-CCP
PIN NUMBER	COLOR	DESC	DESC	SIGNAL	PIN NUMBER
1	WHT	24AWG	TWISTED PAIR	DGND	1
2	GRN	24AWG		PRI_SYNC	2
1	WHT	24AWG	TWISTED PAIR	DGND	1
4	GRN	24AWG		1PPS_SYNC	4
3	BLK	24AWG	DRAIN WIRE	DRAIN	3
NC	WHT	24AWG	TWISTED PAIR	NC	NC
NC	BLK	24AWG		NC	NC



NOTES:

- ALL PARTS AND PROCESSES USED IN THIS ASSEMBLY MUST COMPLY WITH THE RoHS DIRECTIVE.
- CABLE MINIMUM BEND RADIUS = 5".
- THE LAST 4 DIGITS OF THE PART NUMBER STATES THE LENGTH OF THE CABLE IN FEET.
- REFER TO THE TABLE FOR TOLERANCES
- LUBRICATE O-RINGS AND INSTALL ON CONNECTOR IF APPLICABLE USE MOLYKOTE 55 O-RING GREASE OR EQUIVALENT TO LUBRICATE
- INSTALL PUSH-ON PROTECTIVE CAP (SUPPLIED WITH CONNECTOR).
- MAXIMUM 1/2" UNTWISTED FOR ALL TP.
- PRINT PART NUMBER USING 1/8" BLACK TEXT ON WHITE, THEN INSTALL CLEAR HEATSHRINK OVER.

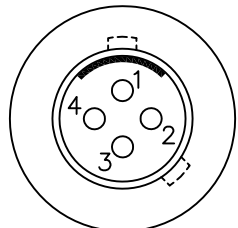
CABLE AND WIRE LENGTH TOLERANCE		
≤1 FT	+1 IN -0 IN	
>1 FT-5 FT	+2 IN -0 IN	
>5 FT-10 FT	+4 IN -0 IN	
>10 FT- 25 FT	+6 IN -0 IN	
>25 FT	+5% -0%	

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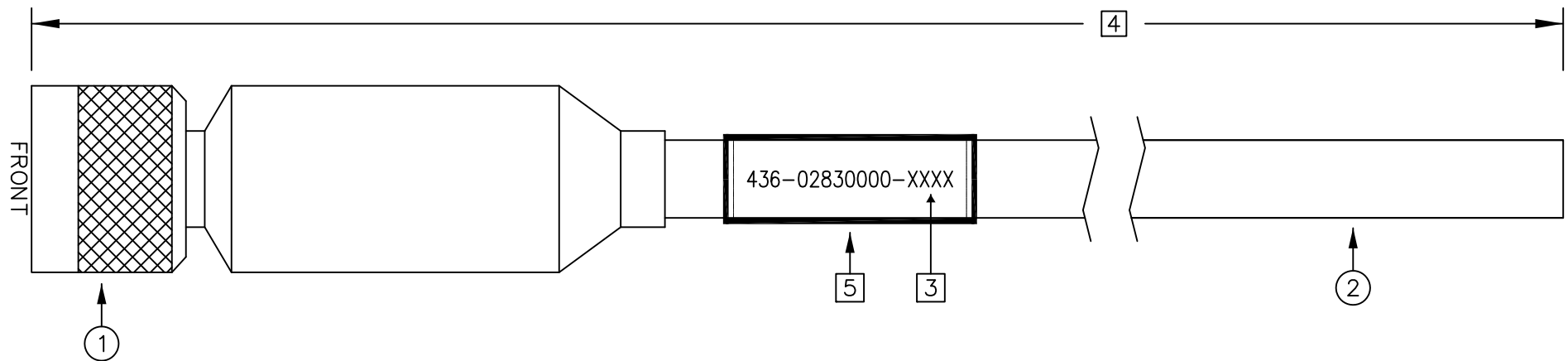
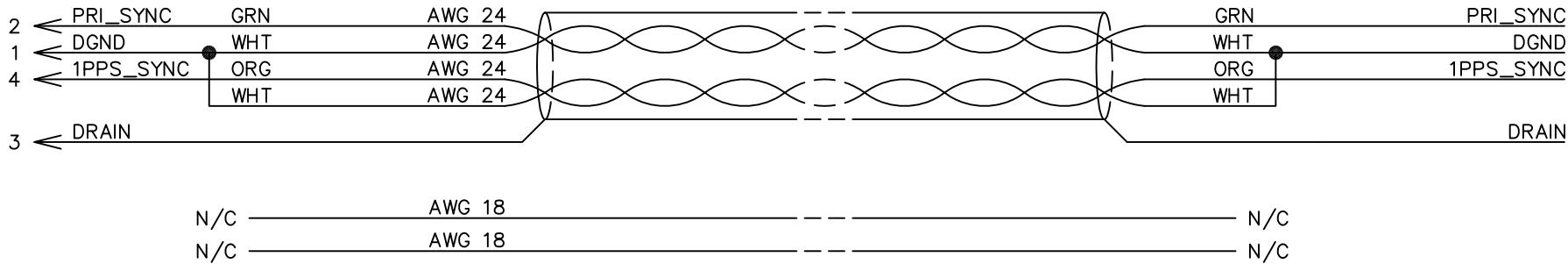
DO NOT SCALE DRAWING

APPROVALS		DATE
DRAWN	IB	2013-AUG-15
REVISED	DM	2018-APR-11
ENGR		
CHECKED	JH	Apr 16/2018
PROD	JK	Apr 16/2018
QA	JK	16-APR-18
ISSUED	am	Apr 16/18

1.2	ECO 6160	2018-APR-11
1.1	ECO 5174	2013-AUG-8
ISS	DESCRIPTION	DATE
REVISIONS		
Kongsberg Mesotech Ltd.		
M3 DUAL HEAD SYNC CABLE ASSEMBLY		
SIZE	NSCM NO	TYPE
B	1C965	MD
DWG NO.	436-02811000	
ISS	1.2	
SCALE: NTS	W.O. NO.	SHEET 1 OF 1



4#22
REAR VIEW



NOTES:

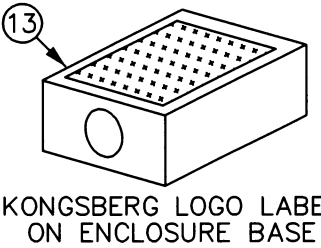
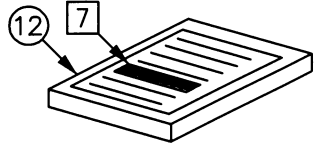
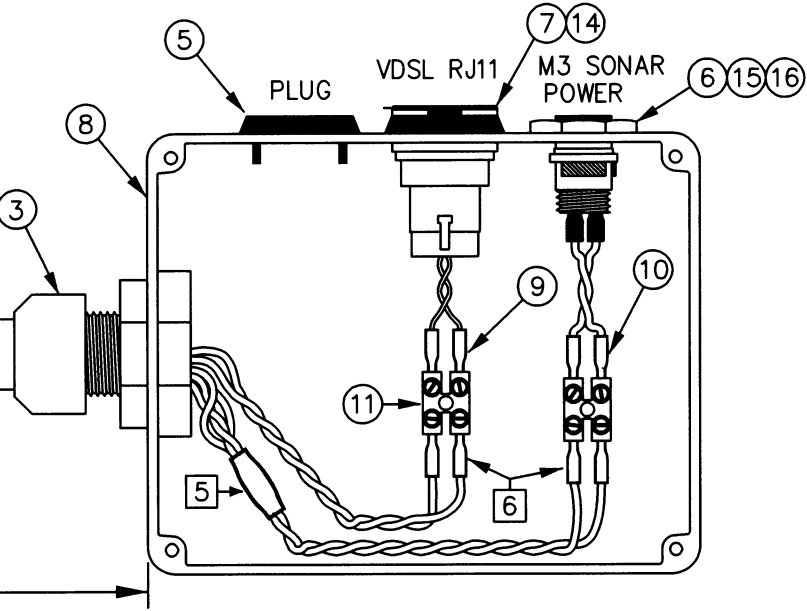
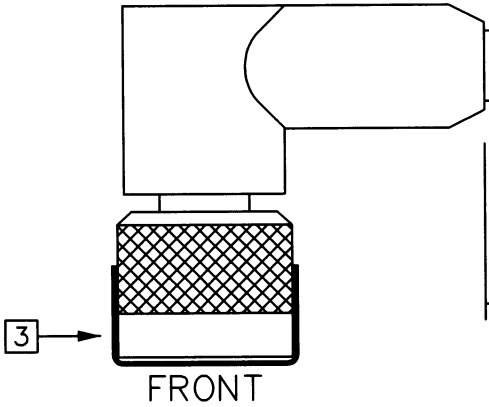
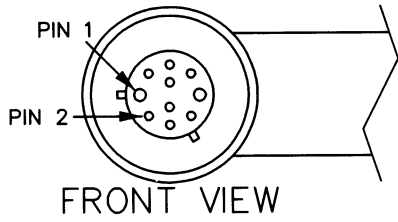
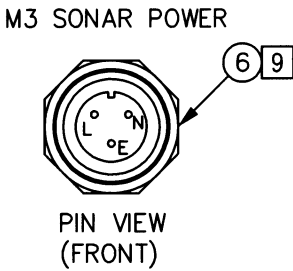
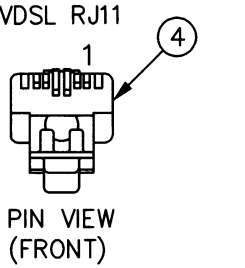
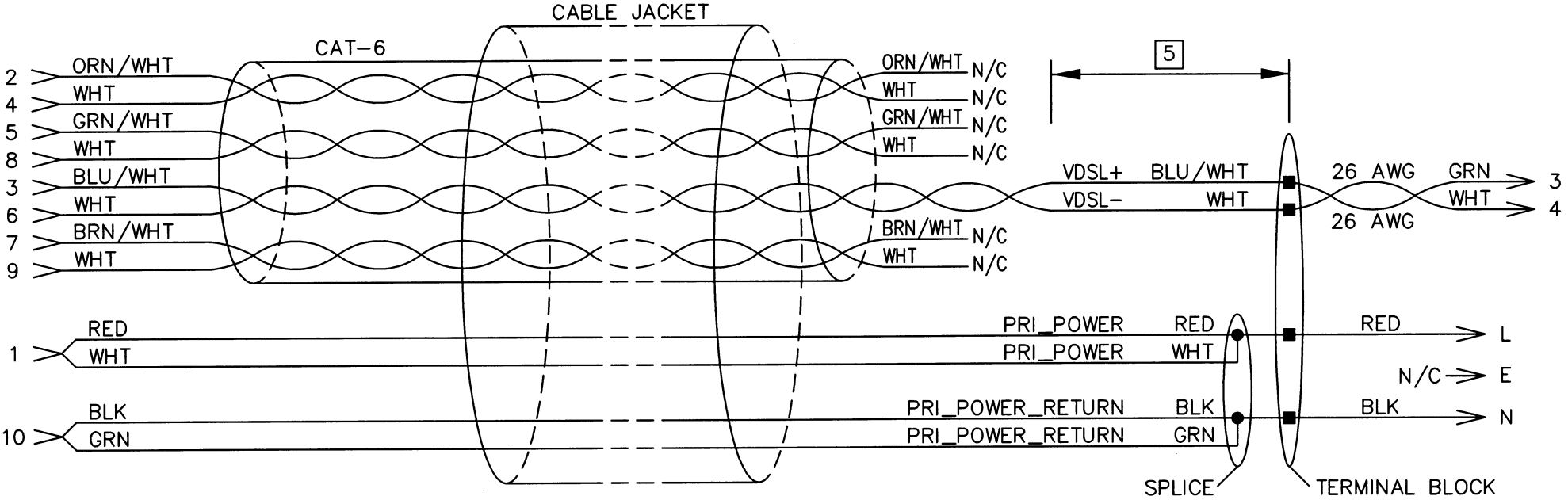
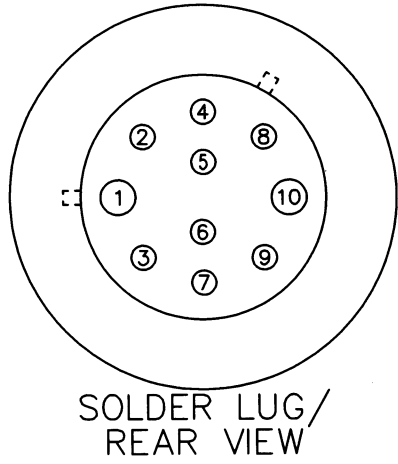
- 1 ALL PARTS AND PROCESSES USED IN THIS ASSEMBLY MUST COMPLY WITH THE RoHS DIRECTIVE.
- 2 SOLDER AND HEATSHRINK WIRES.
- 3 XXXX INDICATES LENGTH + COMPLETE PART NUMBER.
- 4 LENGTH (IN FT, ± 0.1 FT.).
- 5 PRINT PART# USING 1/8" BLACK TEXT ON WHITE, THEN COVER WITH CLEAR HEATSHRINK.

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DO NOT SCALE DRAWING

APPROVALS		DATE
DRAWN	BH	2013 JUL 20
REVISED	BH	2014 MAY 13
CHECKED		
ENGR		
ISSUED		
CONFIDENTIAL DO NOT COPY		

1.1	ECO 5289	2014 MAY 13
ISS	DESCRIPTION	DATE
REVISIONS		
Kongsberg Mesotech Ltd.		
DWG CABLE WHIP M3 HEAD SYNC		
SIZE	NSCM NO	TYPE
B	1C965	MD
DWG NO.		ISS
436-02831000		1.1
SCALE: -		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 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".

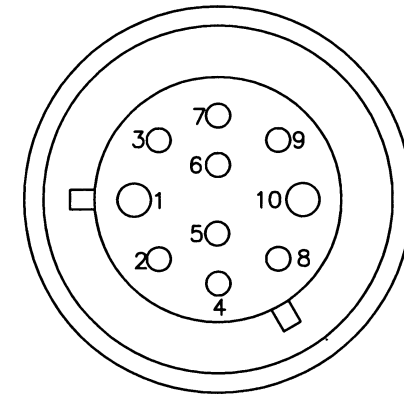
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DO NOT SCALE DRAWING

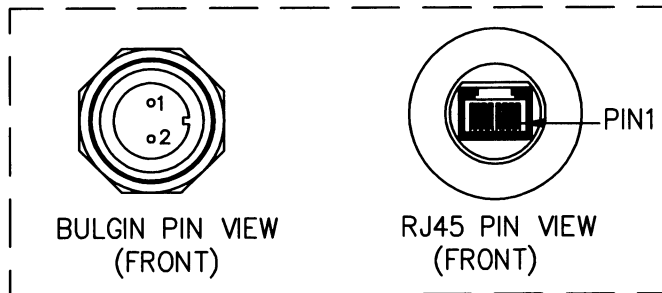
APPROVALS		DATE
DRAWN	BH	2015 APR 2
REVISED		
CHECKED	<i>[Signature]</i>	June 26/15
ENGR	<i>I.B.</i>	June 26/15
ISSUED	<i>R.C.H.</i>	JUNE 26/15
CONFIDENTIAL DO NOT COPY		

ISS	DESCRIPTION	DATE
REVISIONS		
Kongsberg Mesotech Ltd.		
CABLE ASSY M3 VDSL/POWER SEACON MINK-10-CCPL TO VDSL BREAKOUT BOX FALMAT FM022208-10 (R/A MOLDED)		
SIZE	NCSM NO	TYPE
B	1C965	MD
DWG NO.		ISS
436-03131000		1.0
SCALE: NTS		W.O. NO.
		SHEET 1 OF 1

MINK-10-CCP TO M3 BOX CONNECTION			
MINK-10		BULGIN	RJ45(T568B)
PIN NUMBER	SIGNAL	PIN NUMBER	PIN NUMBER
1	V+	1	N/A
2	BI_DA+	N/C	1
3	BI_DC-	N/C	5
4	BI_DA-	N/C	2
5	BI_DB+	N/C	3
6	BI_DC+	N/C	4
7	BI_DD+	N/C	7
8	BI_DB-	N/C	6
9	BI_DD-	N/C	8
10	V-	2	N/A



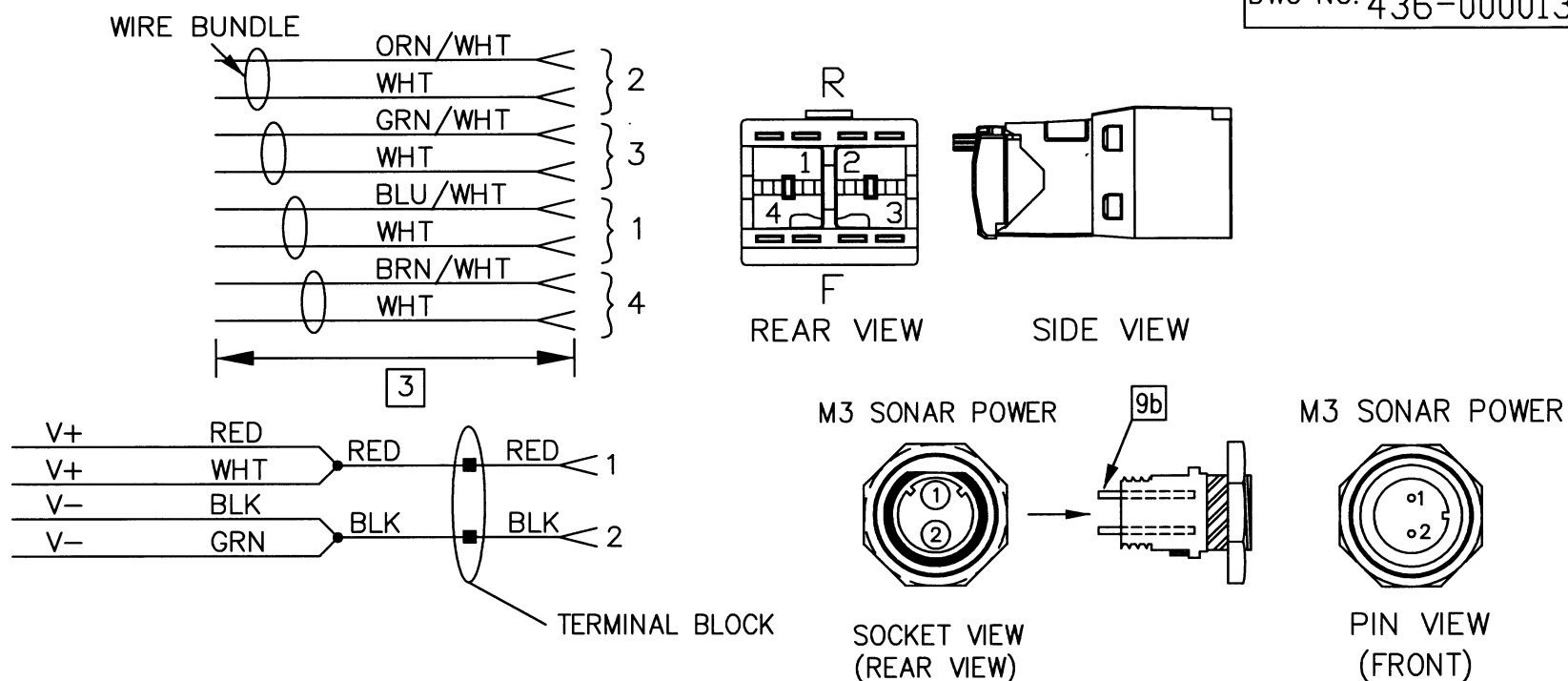
FRONT VIEW



NOTES:

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

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		DRAWN	DM 2016-DEC-08			
		REVISED		ASSEMBLY PINOUT MINK-10-CCPL TO POWER/ETHERNET BREAKOUT BOX		
		ENGR	J.M. Jan 18/2017			
DO NOT SCALE DRAWING		CHECKED	J.H. Jan 18/2017	SIZE	NSCM NO	TYPE
		PROD	P.C. Jan 18/2017	A	1C965	MD
		QA	K.H. 18 JAN 17	DWG NO. 436-00001210		ISS 1.0
		ISSUED	R.H. 18 JAN 17	SCALE: NTS		W.O. NO.
				SHEET 1 OF 1		



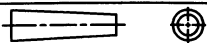
NOTES:

- 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"). MAXIMUM 0.5" UNTWISTED.
- 4 INSTALL CABLE GLAND.
- 5 INSTALL RJ45 JACK
- 6 INSTALL RJ45 COUPLER
a- REMOVE JACK PLUG FROM RJ45 COUPLER ⑤,
THEN INSTALL OUTER PIECE AND HAND-TIGHTEN WITH 24MM SOCKET (COVER BEND ON TOP).
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 SPLICED 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, BROTHER LABEL MAKER SETTINGS;
FONT: HEL, WIDTH x1, SIZE: 12PT, STYLE: BOLD
- 11 REMOVE LABEL THAT IS ON THE CABLE WHIP.

CABLE AND WIRE LENGTH TOLERANCE	
≤1 FT	+1 IN -0 IN
>1 FT-5 FT	+2 IN -0 IN
>5 FT-10 FT	+4 IN -0 IN
>10 FT- 25 FT	+6 IN -0 IN
>25 FT	+5% -0%

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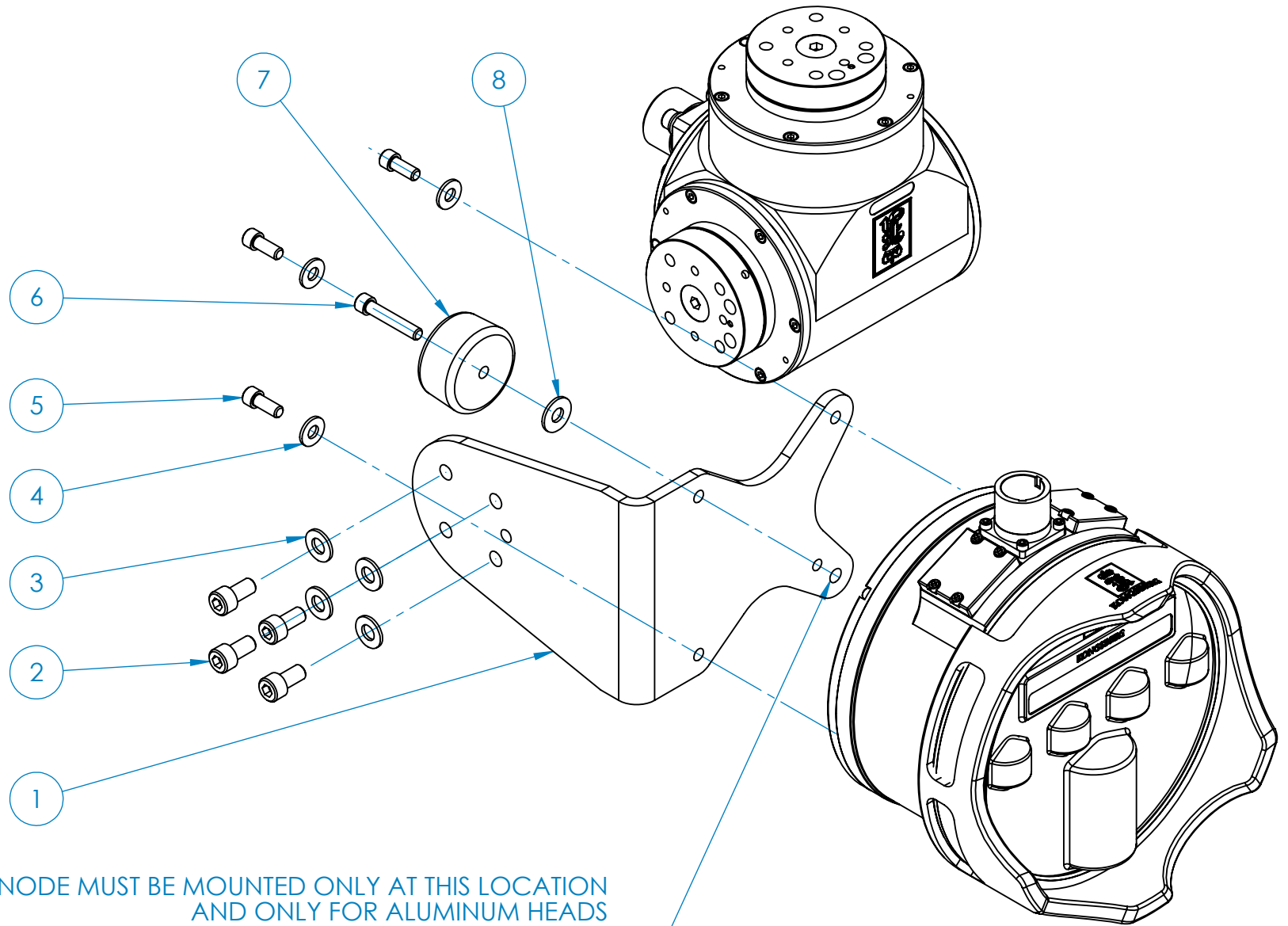
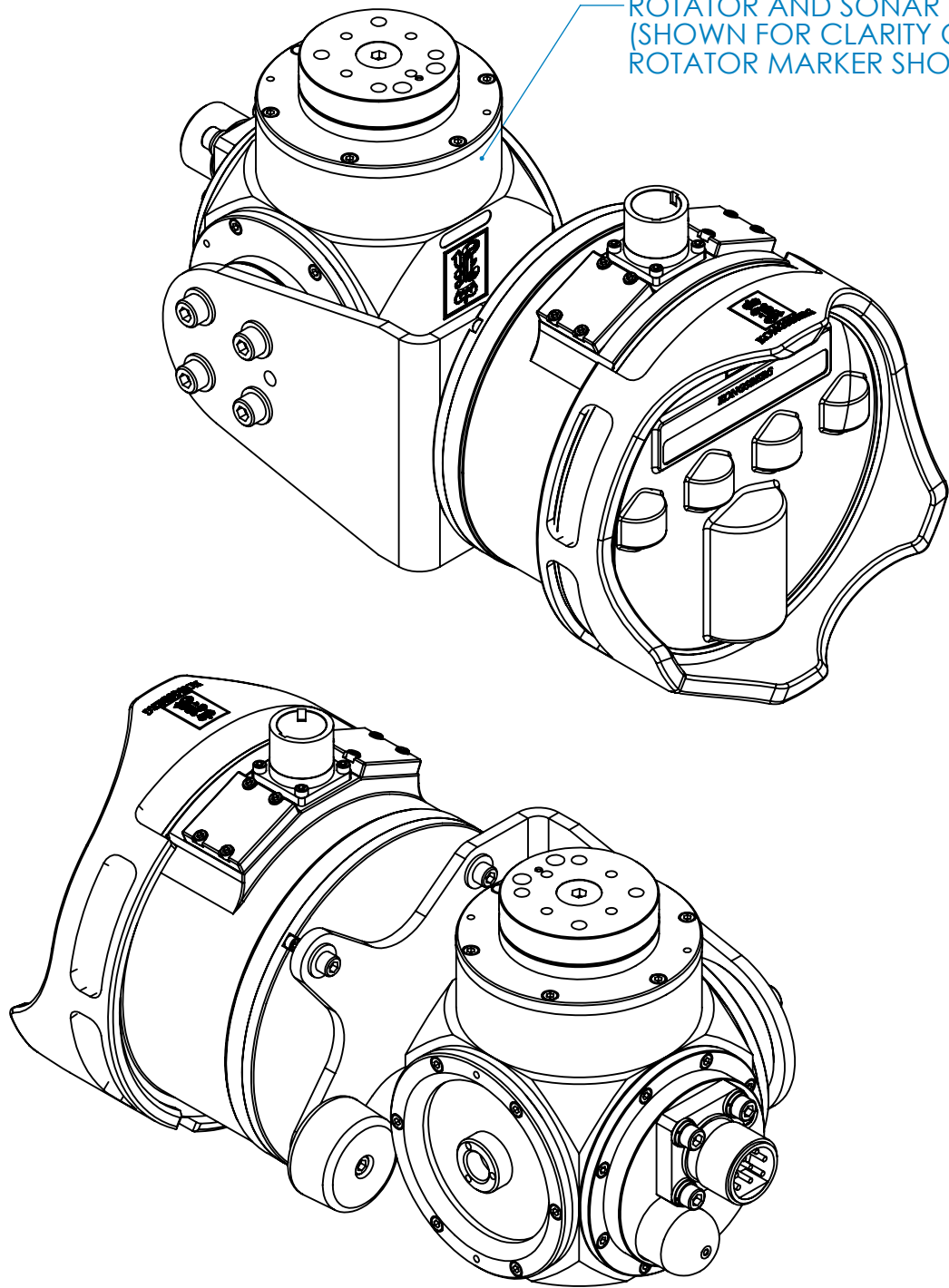
DO NOT SCALE DRAWING



APPROVALS		DATE
DRAWN	DM	2016-DEC-08
REVISED		
ENGR	dm	Jan 18/2017
CHECKED	JH	Jan 18/2017
PROD	lc	Jan 18/2017
QA	KA	18-Jan-17
ISSUED	RCH	14 JAN 17

ISS	DESCRIPTION	DATE
REVISIONS		
Kongsberg Mesotech Ltd.		
ASSY DWG M3 POWER/ETHERNET BREAKOUT BOX		
SIZE	NSCM NO	TYPE
B	1C965	MD
DWG NO.	436-00001302	
ISS	1.0	
SCALE: NTS		W.O. NO.
SHEET 1 OF 1		

ROTATOR AND SONAR HEAD NOT INCLUDED
(SHOWN FOR CLARITY ONLY)
ROTATOR MARKER SHOWN AT 180 DEG

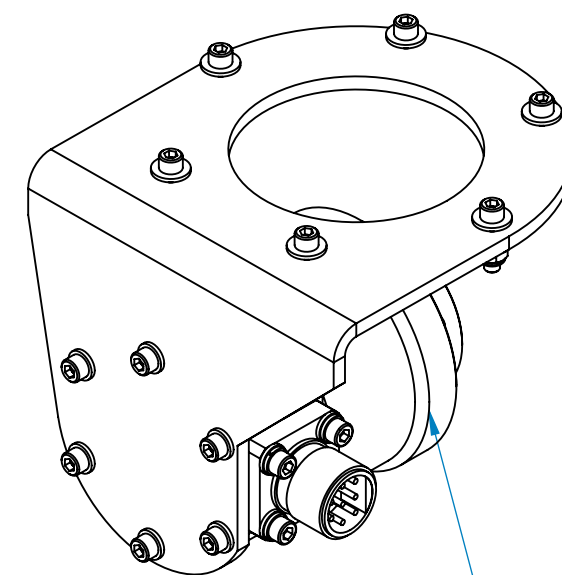
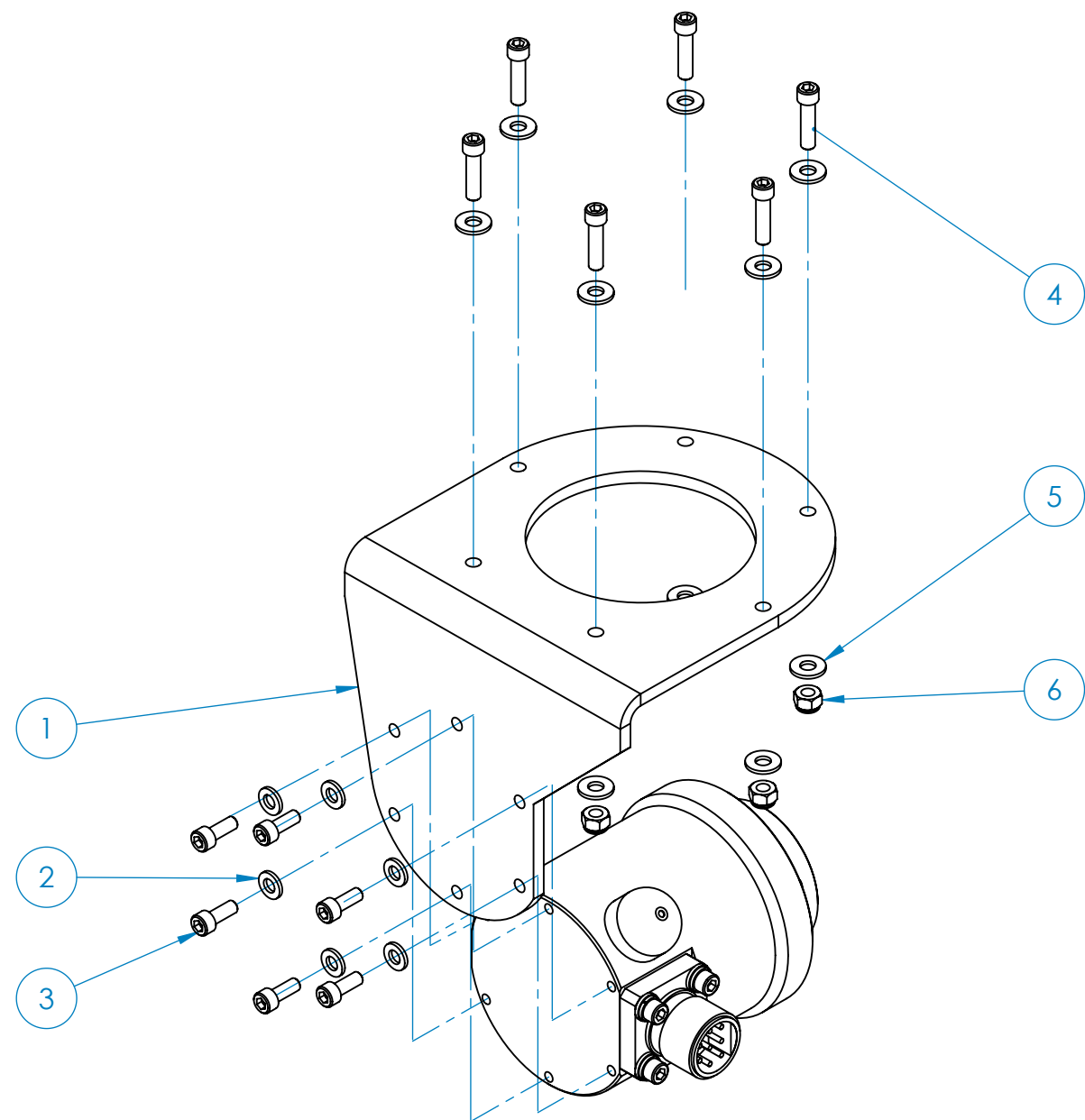


ANODE MUST BE MOUNTED ONLY AT THIS LOCATION
AND ONLY FOR ALUMINUM HEADS
NOTE EXTRA HOLE MARKING ANODE LOCATION

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

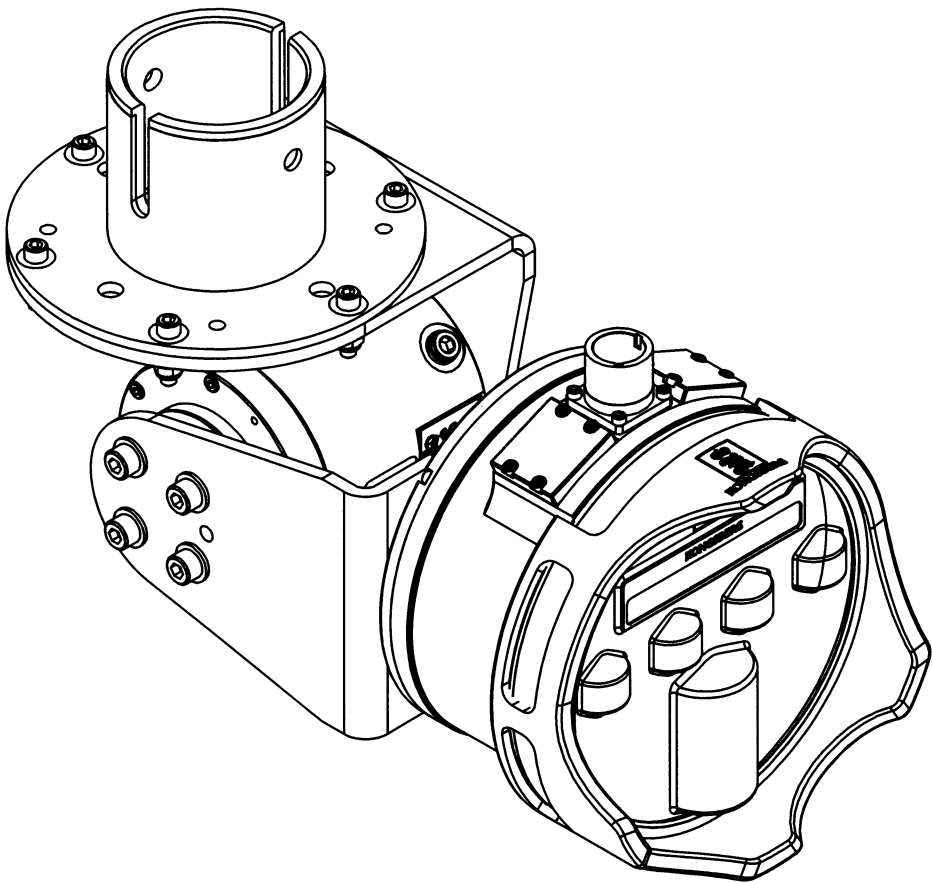
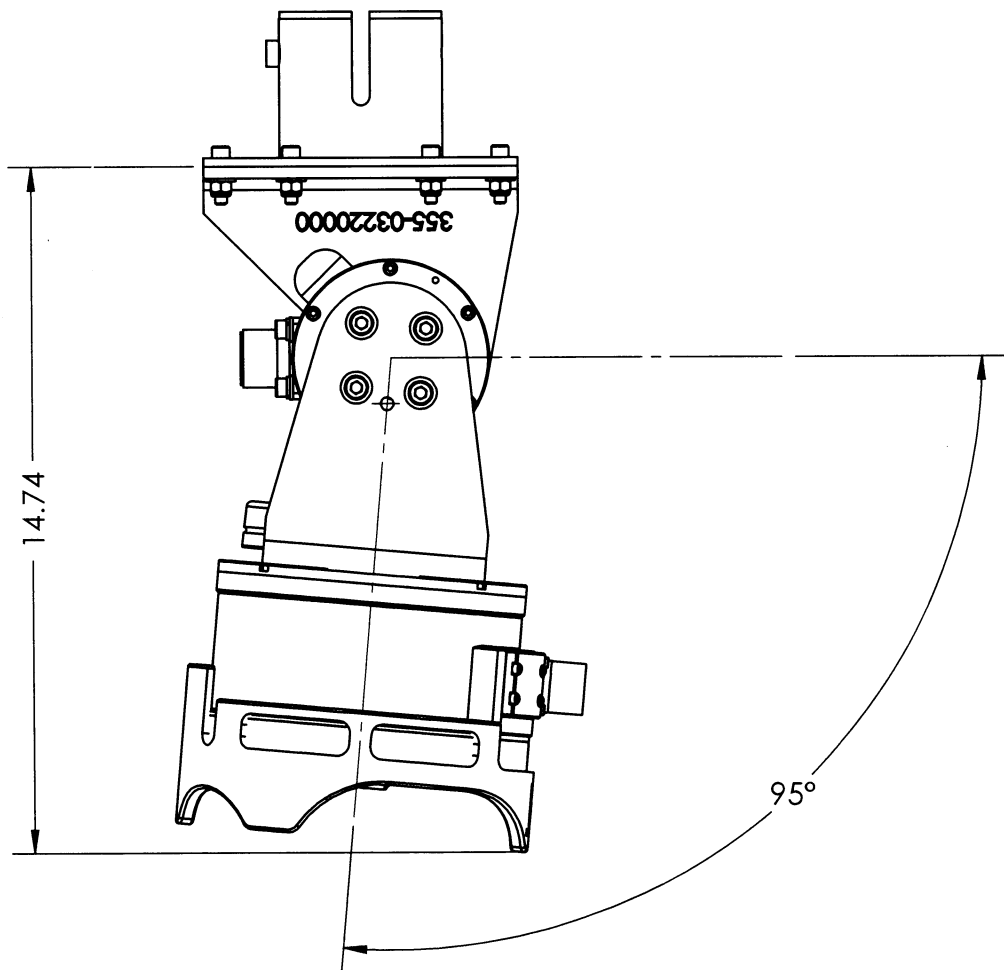
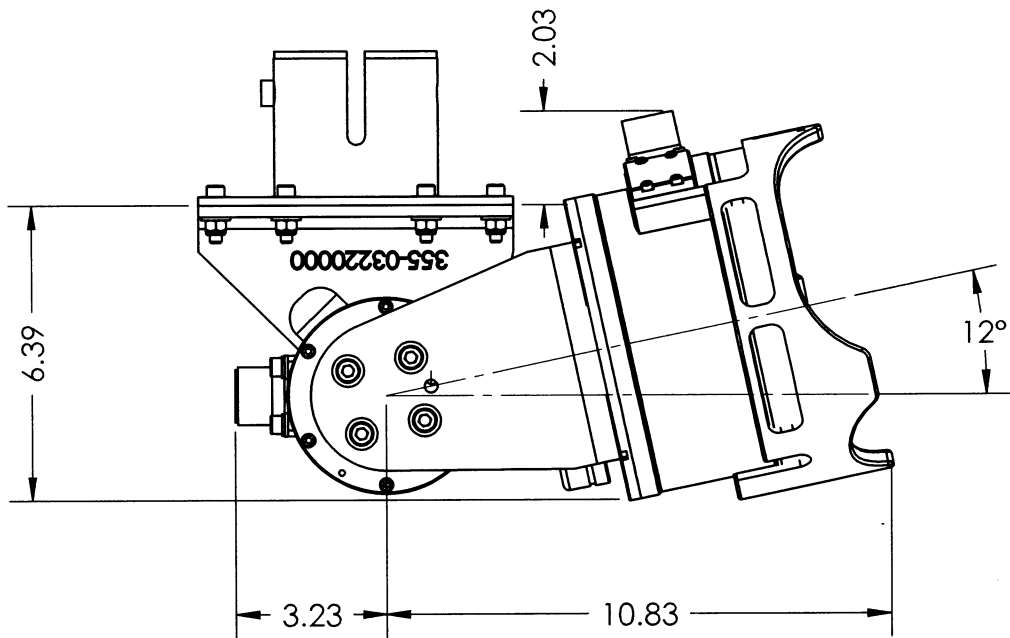
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	DRAWN	DV	2012-05-30		
	REVISED	--	--		
	CHECKED				
	ENGR				
DO NOT SCALE DRAWING. CONFIDENTIAL. DO NOT COPY.	ISSUED			ASSEMBLY DRAWING BRACKET - M3 SONAR TO ROTATOR (OE10-102 / OE10-103)	
				SIZE B	NSCM NO 1C965
				TYPE MD	DWG. NO. 422-44051000
				SCALE: 1:3	ISS 1.0
				W.O. NO.	SHEET 1 OF 1



ROTATOR NOT INCLUDED
SHOWN FOR CLARITY ONLY

NOTE:
- LUBRICATE FASTENERS WITH ANTI-SEIZE LUBRICANT

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	DRAWN	DV	2012-05-30	ISS	DESCRIPTION	DATE
	REVISED	BMS	2013-07-03	REVISIONS		
	CHECKED			Kongsberg Mesotech Ltd.		
DO NOT SCALE DRAWING. CONFIDENTIAL. DO NOT COPY.	ENGR					
	ISSUED			ASSEMBLY DRAWING BRACKET - POLE MOUNT TO ROTATOR (OE10-103)		
				SIZE B 1C965	TYPE MD	DWG. NO. 422-44061000
				SCALE: 1:3	W.O. NO.	ISS 1.1
				SHEET 1 OF 1		

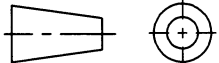


NOTE: DIMENSIONS IN INCHES

PROPRIETARY NOTICE
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CONFIDENTIAL. DO NOT COPY.

APPROVALS	NAME	DATE
DRAWN	DV	2012-07-24
REVISED	DRC	2015-07-31
CHECKED	<i>DV</i>	<i>2015/08/13</i>
ENGR	<i>W</i>	<i>2015 ALX 28</i>
ISSUED	<i>R.C.H.</i>	<i>2015 SEP 2</i>

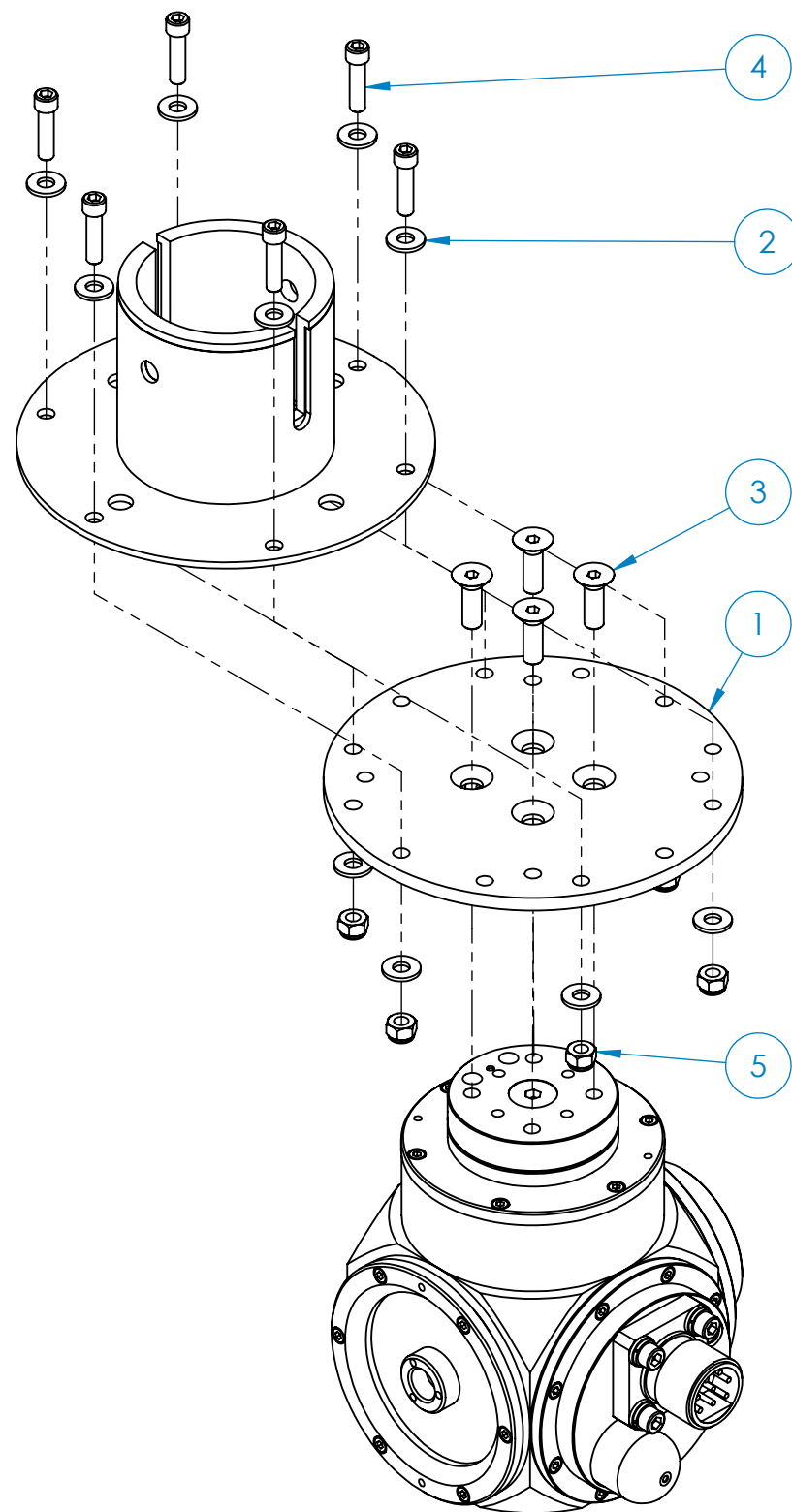


1.2	ECO 5549	2015/07/31
1.1	ECO 5401	2014/12/04
ISS	DESCRIPTION	DATE
REVISIONS		

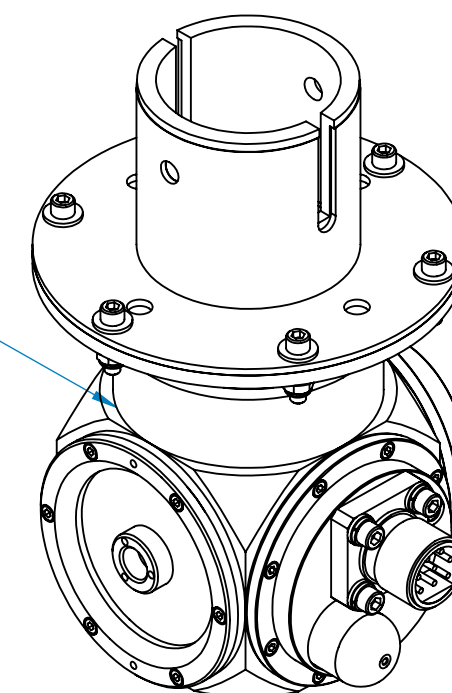
Kongsberg Mesotech Ltd.

OUTLINE AND INSTALLATION DRAWING
M3 SONAR 500M
WITH ROTATOR (OE10-103)

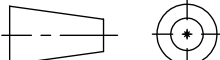
SIZE	NSCM NO	TYPE	DWG. NO.	ISS
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SCALE: 1:3		W.O. NO. 281-1150		SHEET 1 OF 2

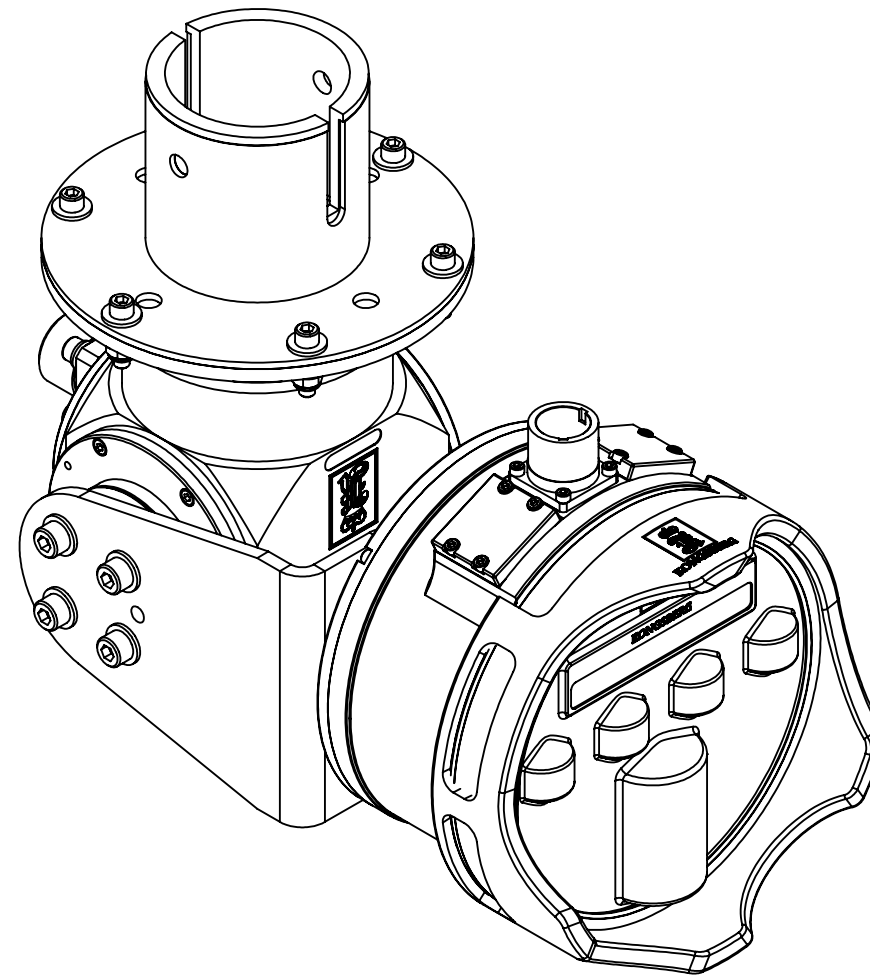
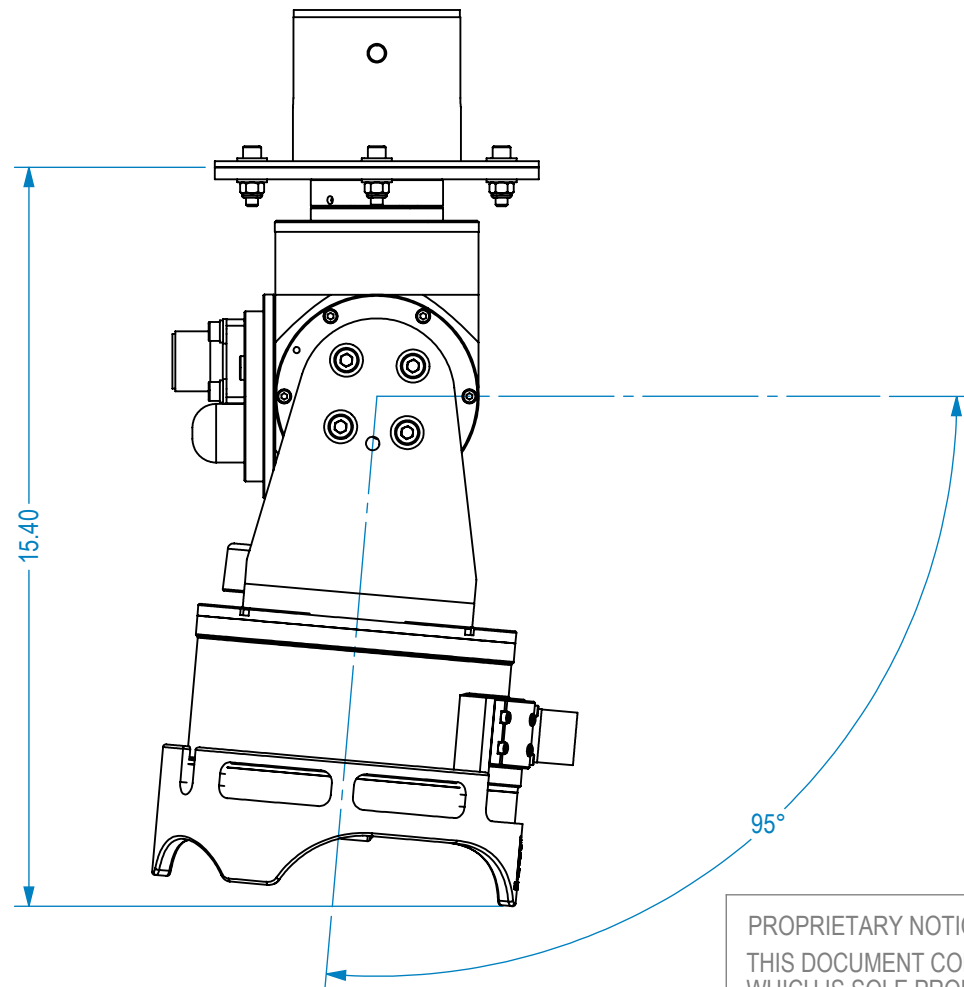
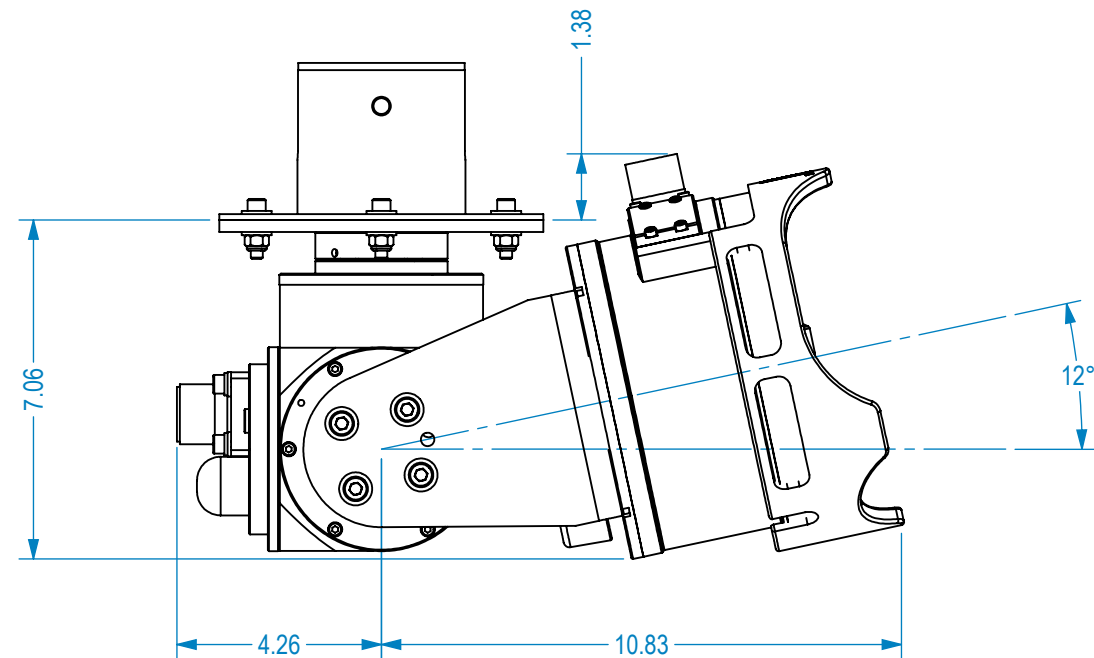


ROTATOR AND POLE MOUNT FLANGE
NOT INCLUDED
SHOWN FOR CLARITY ONLY



NOTES:
1. LUBRICATE FASTENERS WITH ANTI-SEIZE LUBRICANT

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		DRAWN	DV	2012-07-24					
		REVISED	DRC	2013-08-21	ASSEMBLY DRAWING ADAPTER PLATE - POLE MOUNT TO ROTATOR (OE10-102)				
		CHECKED							
		ENGR							
		ISSUED							
CONFIDENTIAL. DO NOT COPY.	DO NOT SCALE DRAWING				SIZE	NSCM NO	TYPE	DWG. NO.	ISS
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					SCALE: 1:3		W.O. NO.		SHEET 1 OF 1



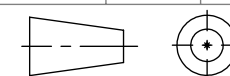
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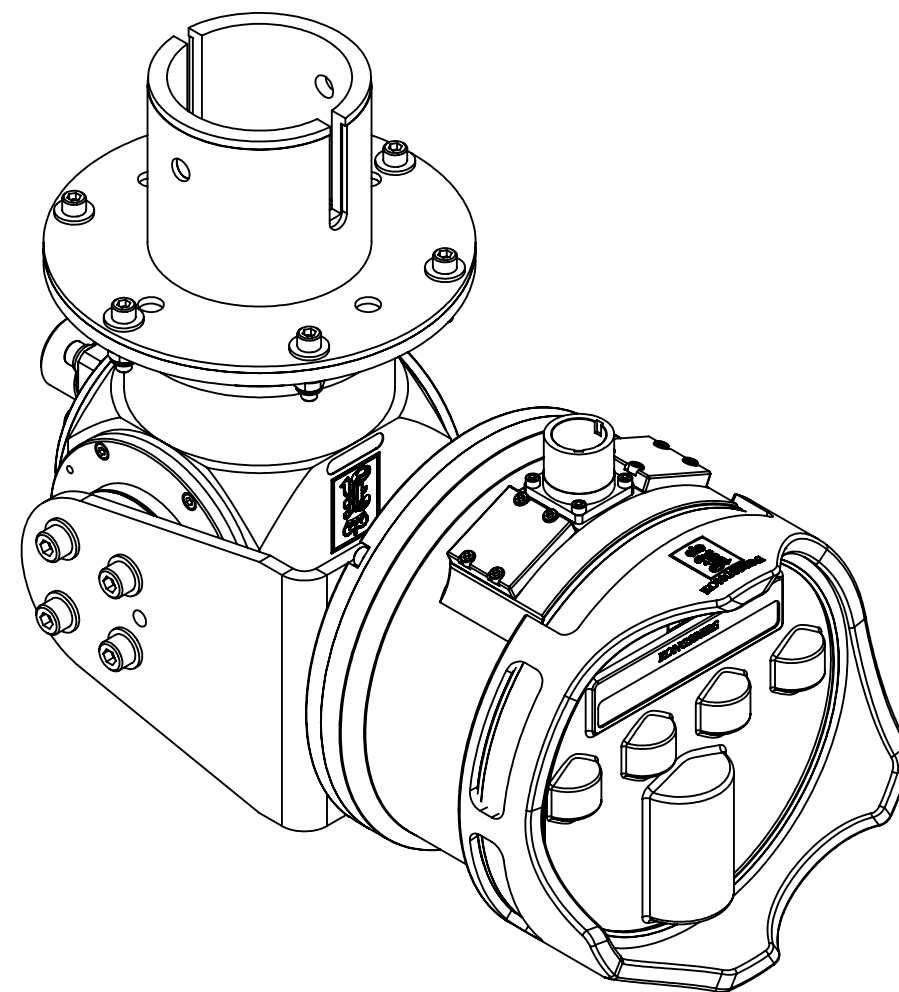
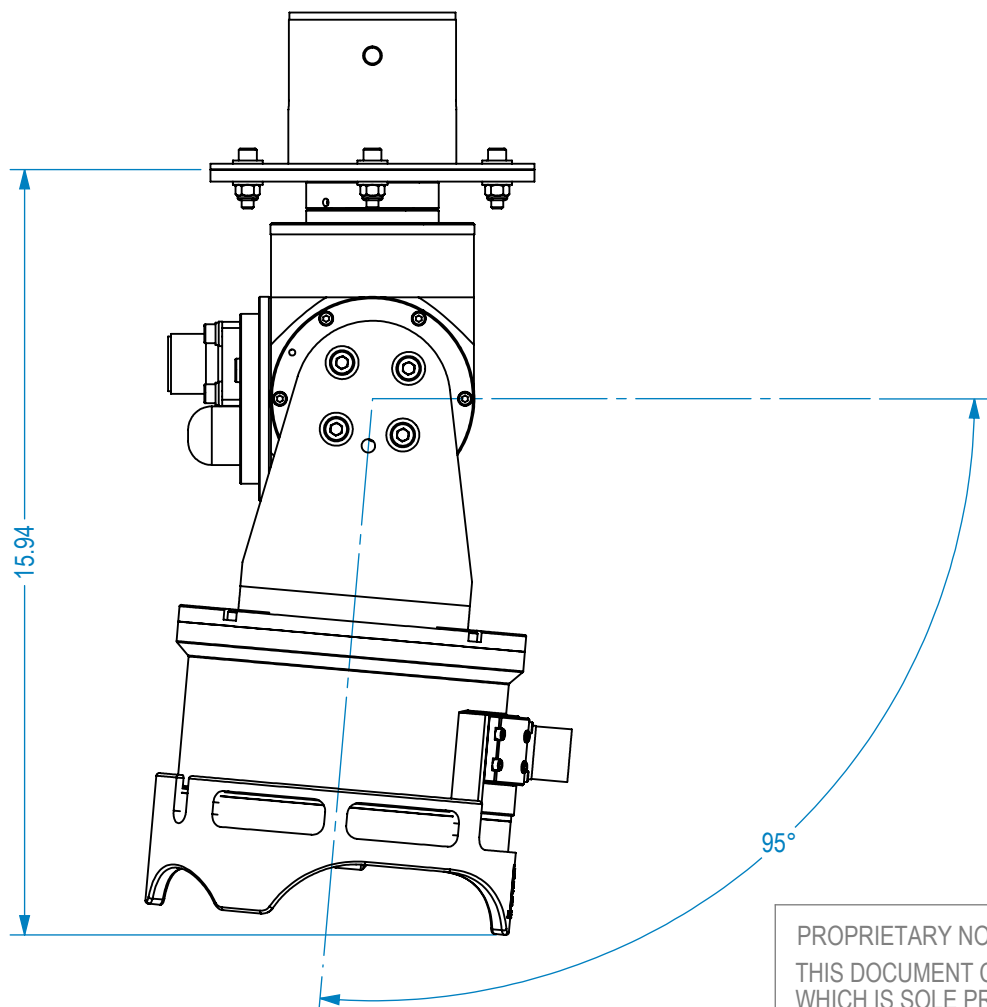
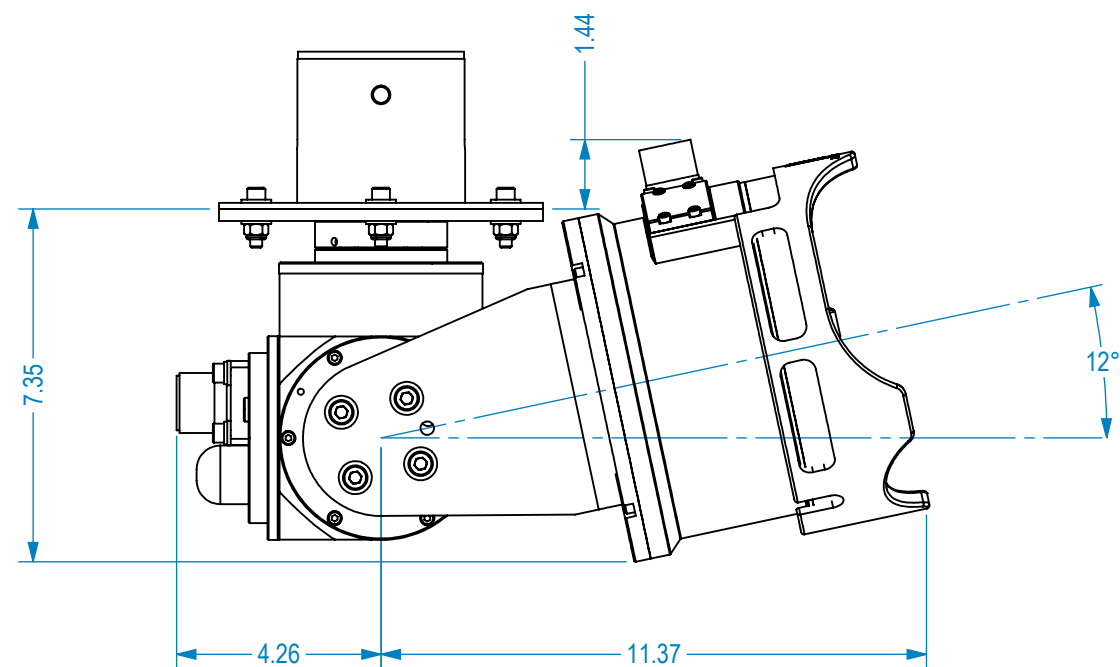
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
DECIMALS FRACTIONAL ANGULAR
X.XX ±0.006 ±1/32 MACH ±30'
X.XXX ±0.003 BEND ±1°
SURFACE FINISH 125 Ra, DE-BURR HOLES
BREAK SHARP EDGES 0.010

DO NOT SCALE DRAWING

APPROVALS	NAME	DATE
DRAWN	DV	2012-07-24
REVISED	DRC	2013-08-21
CHECKED		
ENGR		
ISSUED		



ISS	DESCRIPTION	DATE
REVISIONS		
Kongsberg Mesotech Ltd.		
OUTLINE AND INSTALLATION DRAWING M3 SONAR 500M WITH ROTATOR (OE10-102)		
SIZE B	NSCM NO 1C965	TYPE MD
DWG. NO. 422-44071001	ISS 1.0	
SCALE: 1:4	W.O. NO.	SHEET 1 OF 2



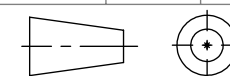
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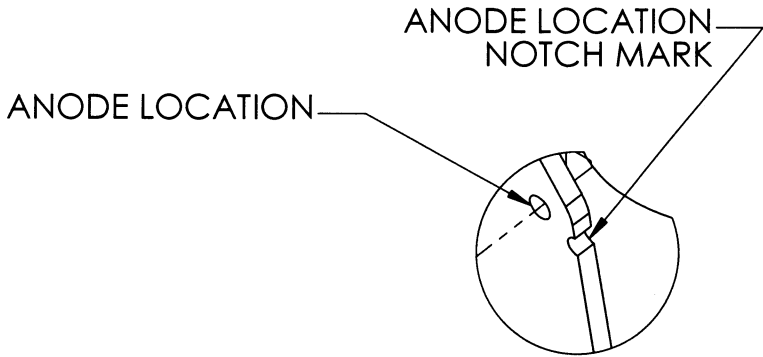
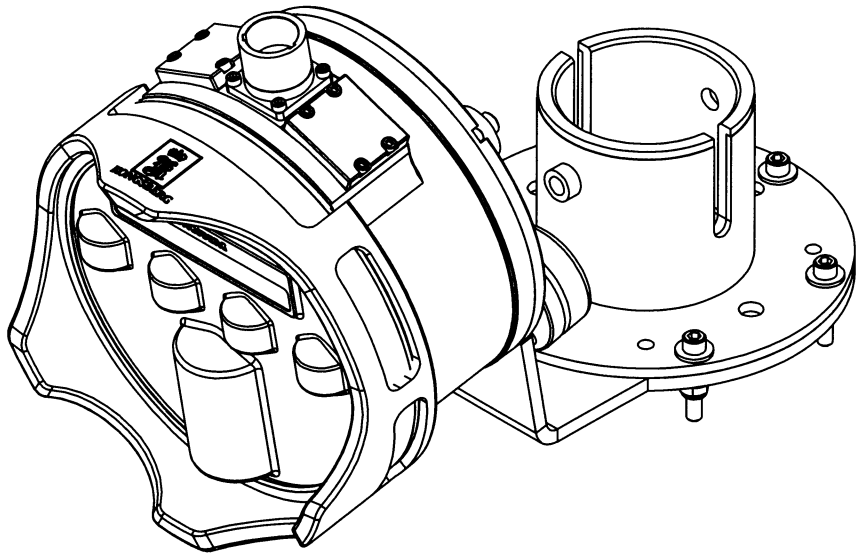
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
DECIMALS FRACTIONAL ANGULAR
X.XX ±0.006 ±1/32 MACH ±30'
X.XXX ±0.003 BEND ±1°
SURFACE FINISH 125 Ra, DE-BURR HOLES
BREAK SHARP EDGES 0.010

DO NOT SCALE DRAWING

APPROVALS	NAME	DATE
DRAWN	DV	2012-07-24
REVISED	DRC	2013-08-21
CHECKED		
ENGR		
ISSUED		

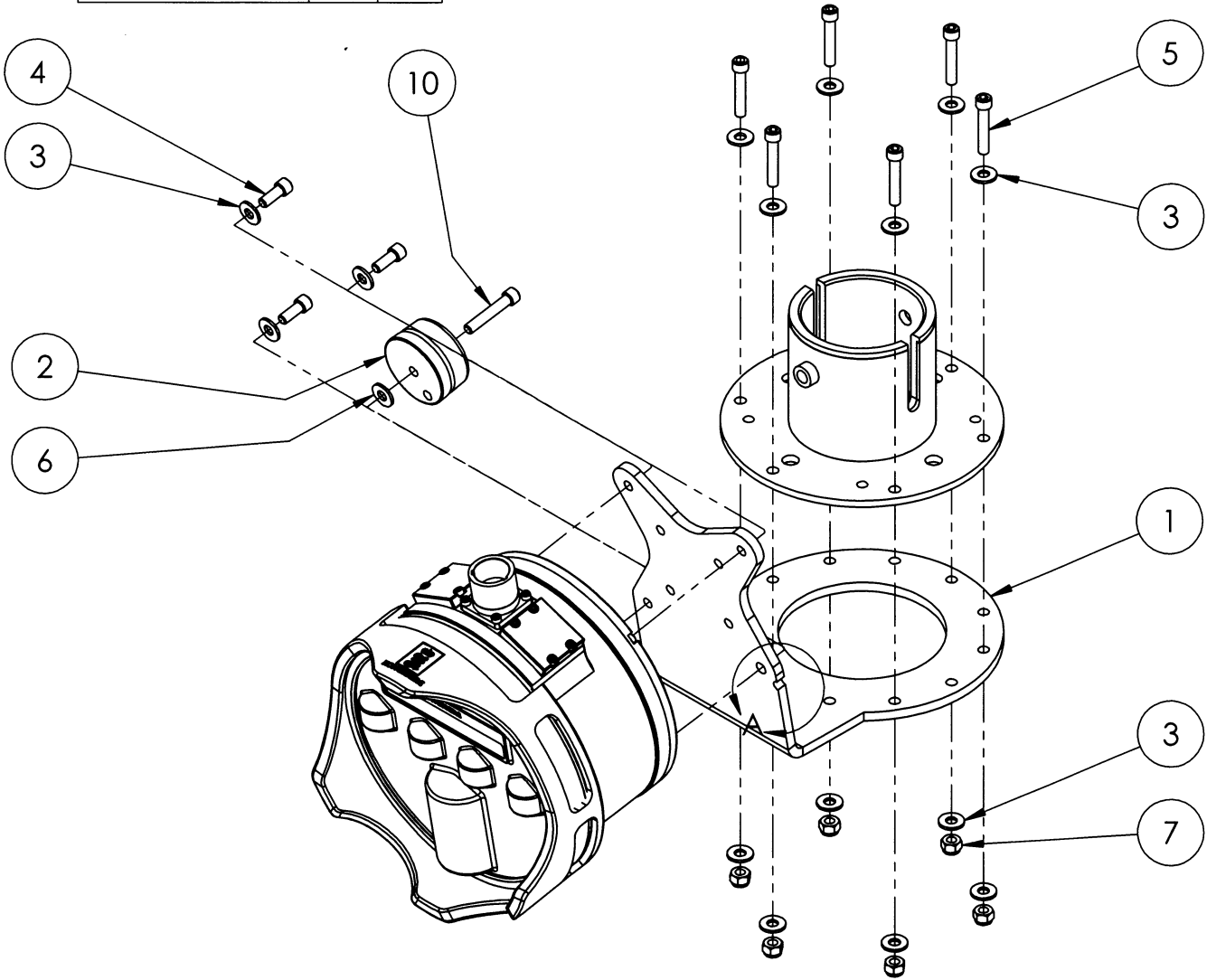


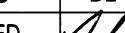
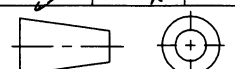
ISS	DESCRIPTION	DATE
REVISIONS		
Kongsberg Mesotech Ltd.		
OUTLINE AND INSTALLATION DRAWING M3 SONAR 4000M WITH ROTATOR (OE10-102)		
SIZE B	NSCM NO 1C965	TYPE MD
DWG. NO. 422-44071001	ISS 1.0	
SCALE: 1:4	W.O. NO.	SHEET 2 OF 2

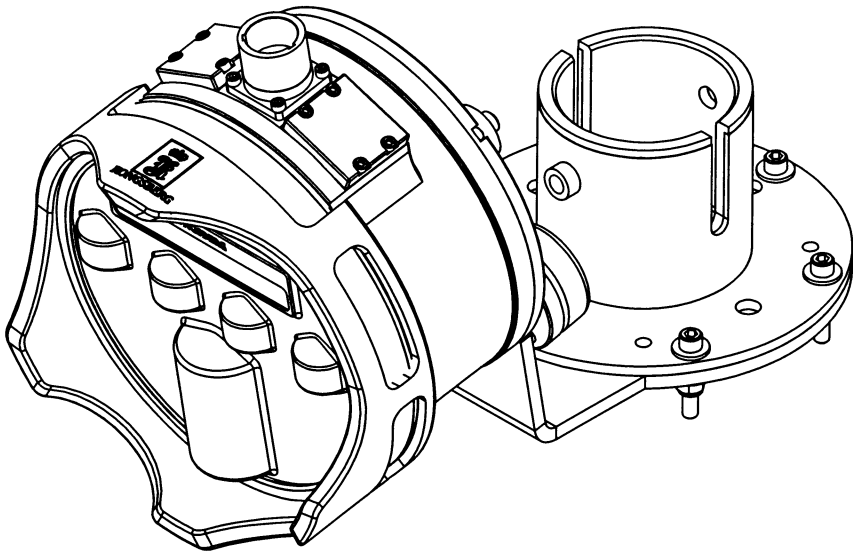
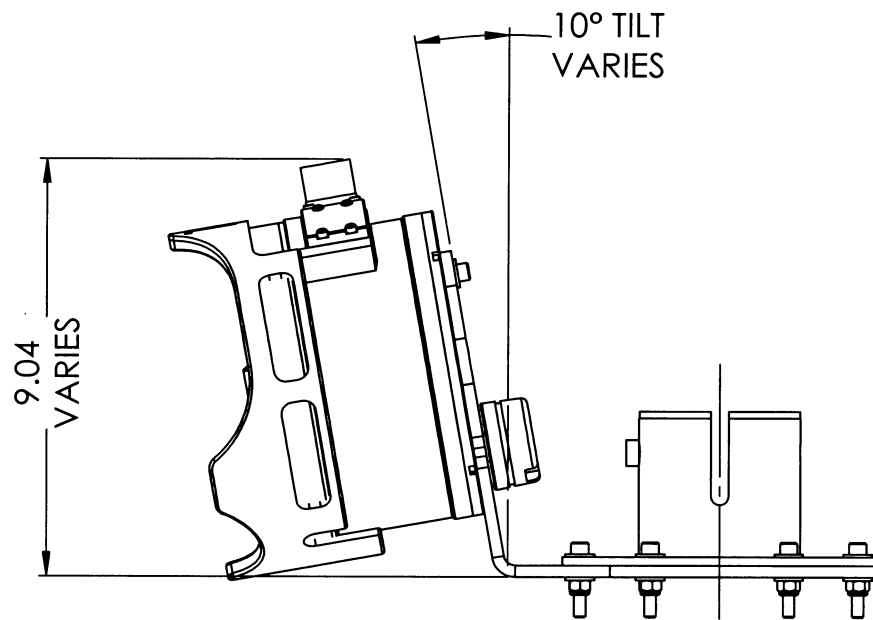
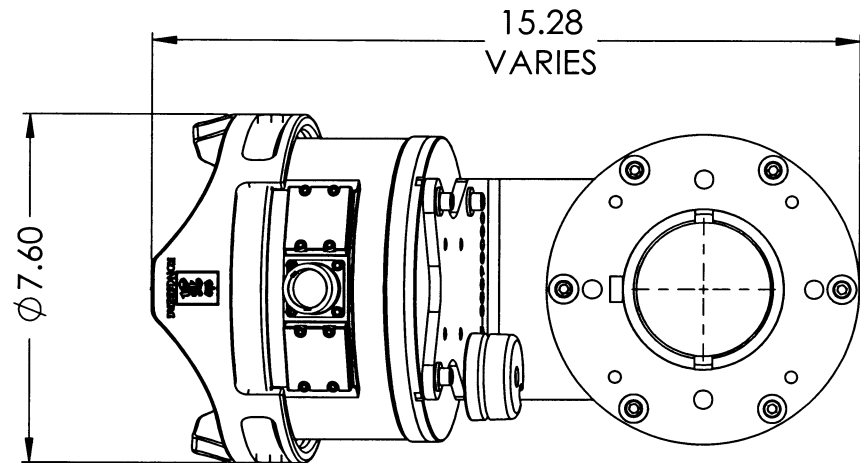


DETAIL A
SCALE 1 : 2

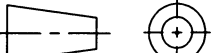
- NOTES:**
- 1. ANODE TO BE USED ONLY WITH ALUMINUM HEAD AT LOCATION MARKED WITH NOTCH - SEE DETAIL
 - 2. FOR TITANIUM HEAD, ITEMS 2, 5 AND 6 NOT USED; USE INSTEAD ONE MORE EACH OF ITEM 3 AND 4
 - 3. LUBRICATE FASTENERS WITH ANTI-SEIZE LUBRICANT
 - 4. LUBRICATE BASE OF ANODE WITH WATER RESISTANT GREASE

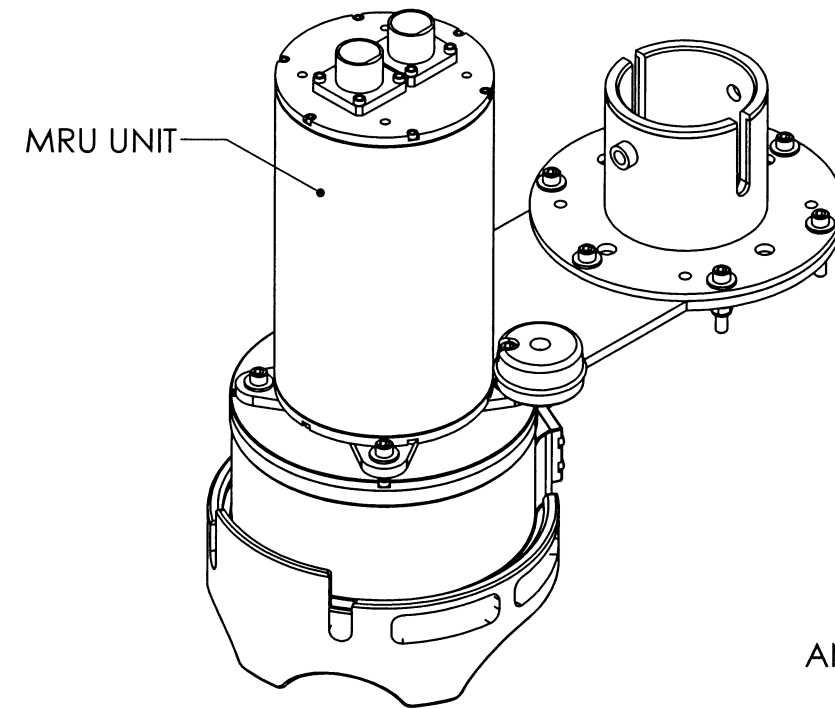


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	DRAWN	DRC	2013-08-07					
	REVISED	DL	2015-08-24	ASSEMBLY DRAWING TILT BRACKET POLE MOUNT TO M3 SONAR				
	CHECKED		2015 AUG 31					
	ENGR		2015 AUG 31					
	ISSUED	R.C.H.	2015 SEP 2					
DO NOT SCALE DRAWING. CONFIDENTIAL. DO NOT COPY.				SIZE	NSCM NO	TYPE	DWG. NO.	ISS
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				SCALE: 1:4		W.O. NO.		SHEET 1 OF 1

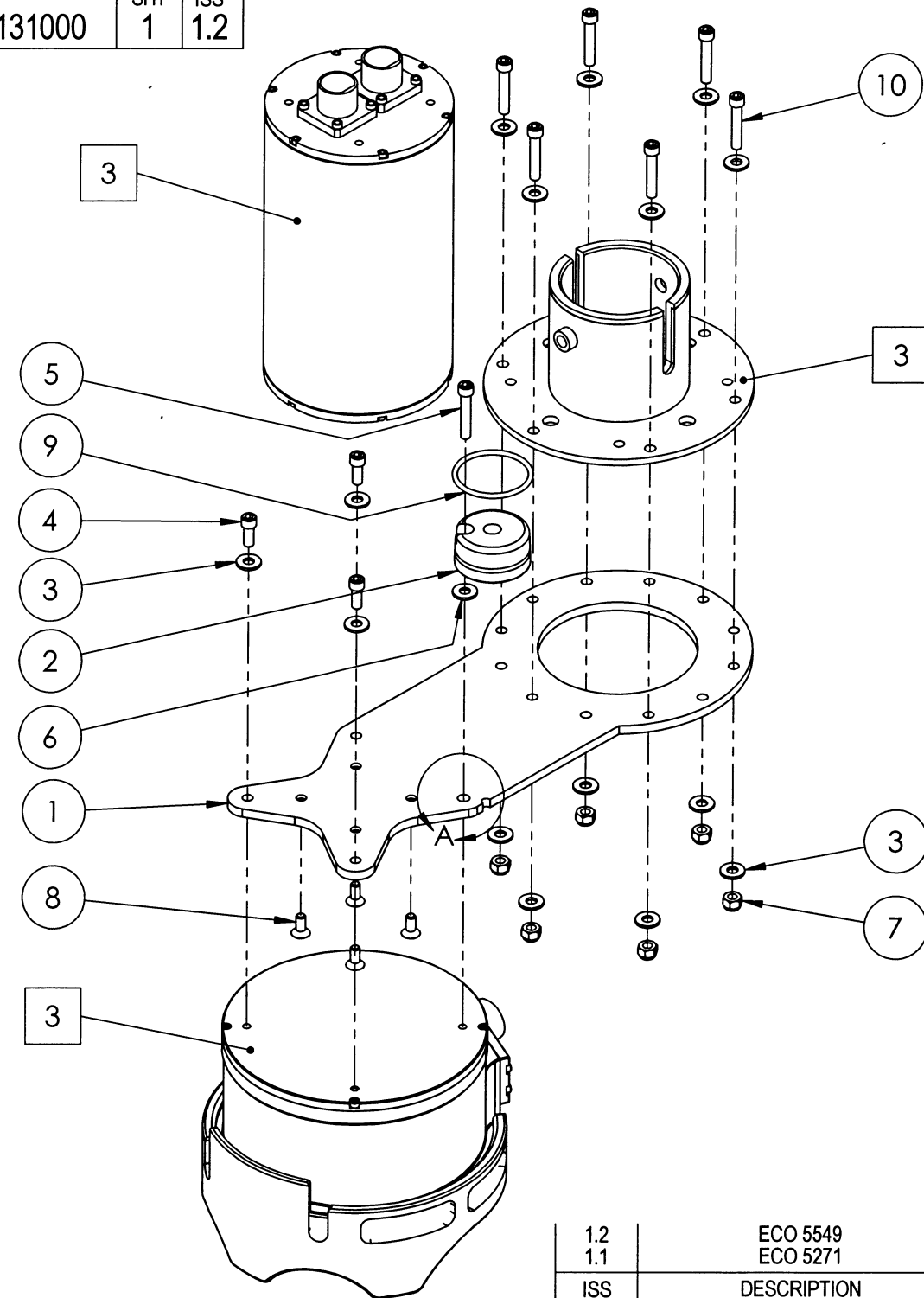
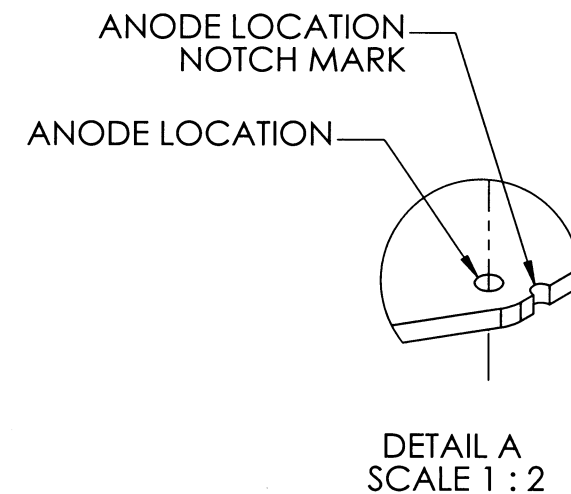


NOTE:
SONAR HEAD, FLANGE AND MRU NOT INCLUDED;
SHOWN ONLY FOR CLARITY

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		DECIMALS	FRACTIONAL	ANGULAR														
		X.XX ±0.006	± 1/32	MACH ±30°														
		X.XXX ±0.003		BEND ±1°														
		DRAWN	DRC	2013-08-07														
REVISED	DL	2015-08-24	OUTLINE AND INSTALLATION DRAWING M3 SONAR 500M WITH TILT BRACKET															
CHECKED		2015 AUG 31																
ENGR		2015 AUG 31																
ISSUED		2015 SEP 2	SIZE	NSCM NO	TYPE	DWG. NO.	ISS											
CONFIDENTIAL. DO NOT COPY.	DO NOT SCALE DRAWING		B	1C965	MD	422-44121001	1.2											
			SCALE: 1:4		W.O. NO.		SHEET 1 OF 1											



SHOWN WITH BOTH HEAD AND
MRU UNIT INSTALLED



NOTES:

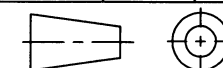
1. ANODE TO BE USED ONLY WITH ALUMINUM HEAD AT LOCATION MARKED WITH NOTCH - SEE DETAIL
2. FOR TITANIUM HEAD, ITEMS 2, 5, 6 AND 9 NOT USED; USE INSTEAD ONE MORE EACH OF ITEM 3 AND 4
3. HEAD, FLANGE AND MRU NOT INCLUDED; SHOWN ONLY FOR CLARITY
4. IF NOT USING MRU DO NOT USE ITEMS 8 AND 9 AND USE CENTER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

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APPROVALS	NAME	DATE
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REVISED	DL	2014-07-31
CHECKED		2015 AUG 31
ENGR		2015 AUG 31
ISSUED	R.C.H.	2015 SEP 2



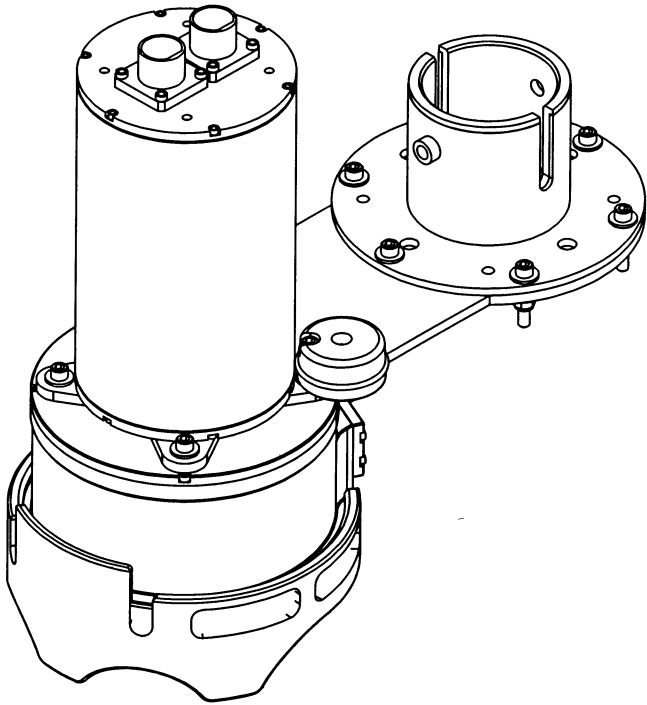
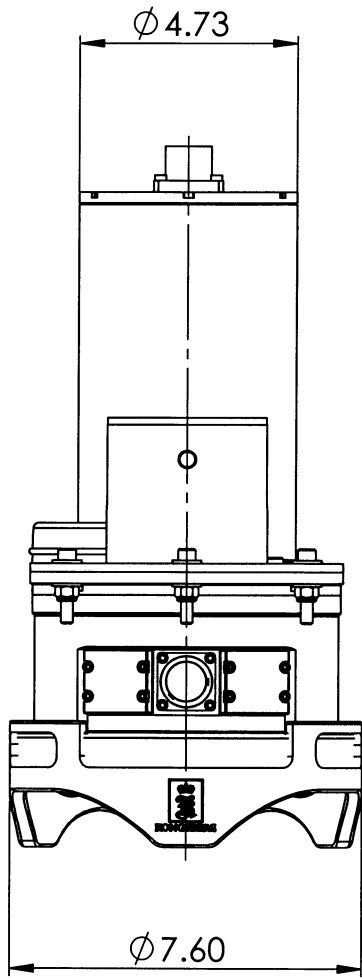
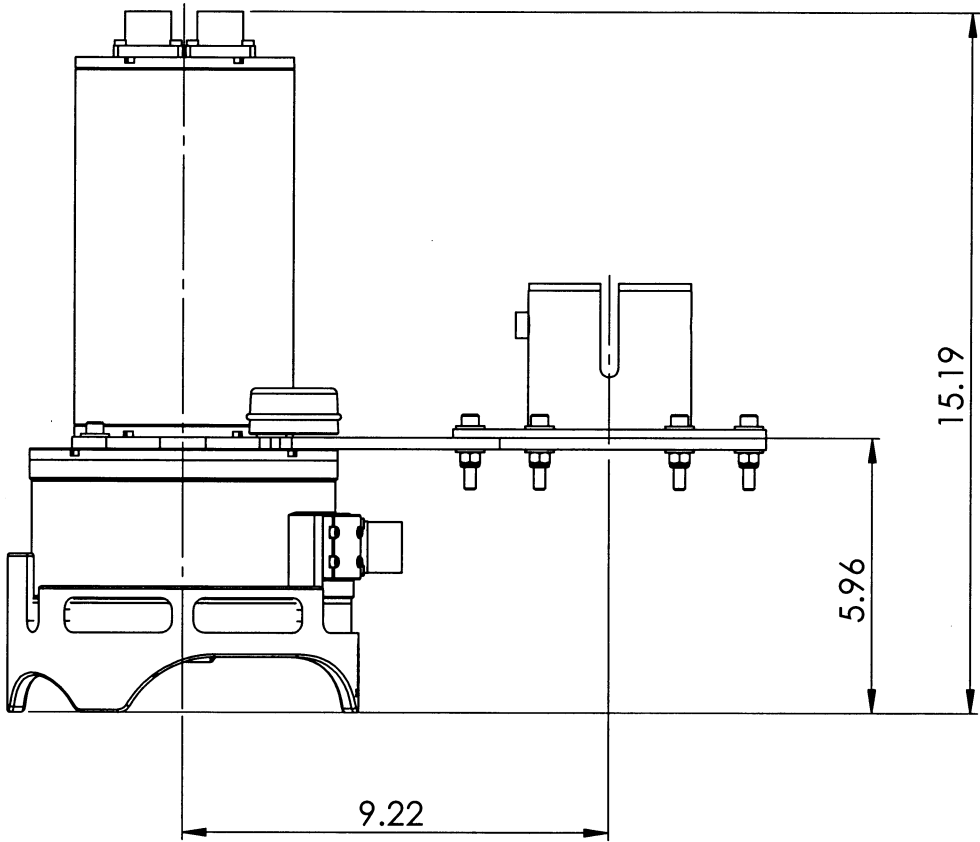
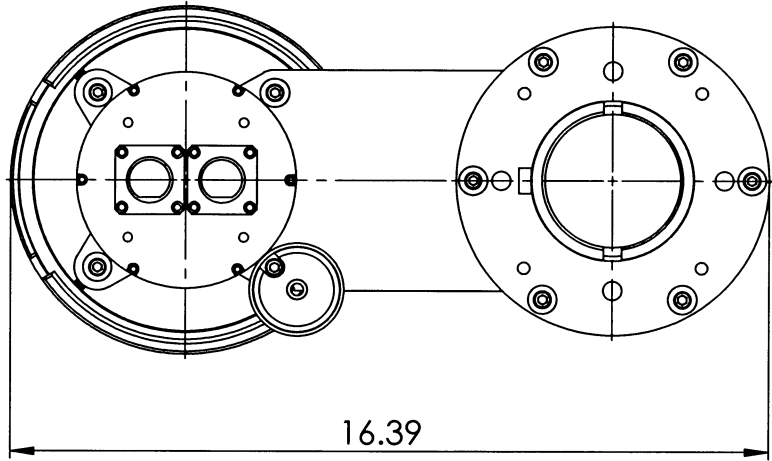
1.2	ECO 5549	2014-07-31
1.1	ECO 5271	2014-03-14
ISS	DESCRIPTION	DATE

REVISIONS

Kongsberg Mesotech Ltd.

ASSEMBLY DRAWING
DOWNLOOKING BRACKET
POLE MOUNT TO M3 SONAR

SIZE	NSCM NO	TYPE	DWG. NO.	ISS
B	1C965	MD	422-44131000	1.2
SCALE: 1:4		W.O. NO.		SHEET 1 OF 1



SHOWN WITH BOTH HEAD AND MRU UNIT INSTALLED

1.2	ECO 5549	2014-07-31
1.1	ECO 5271	2014-03-14
ISS	DESCRIPTION	DATE

REVISIONS

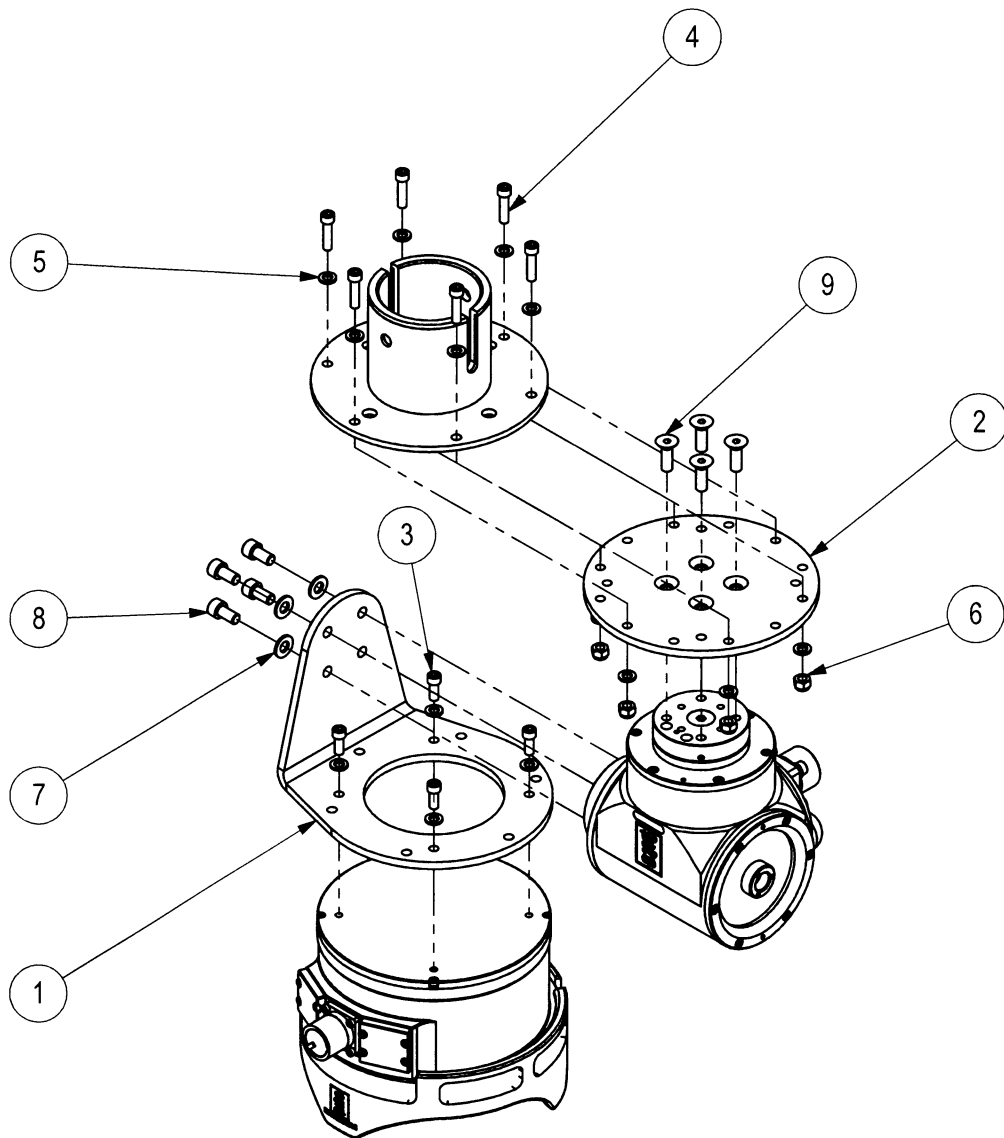
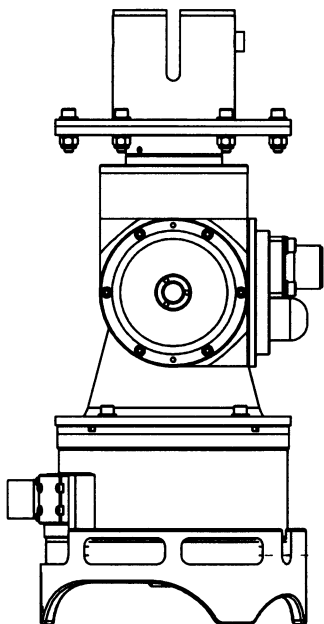
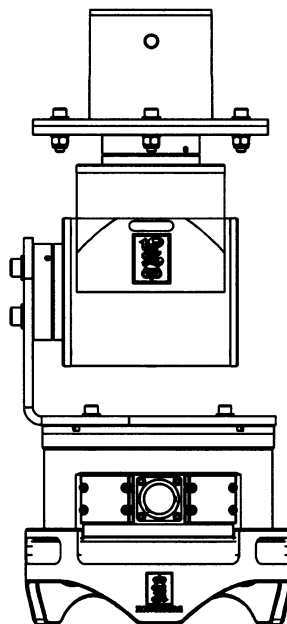
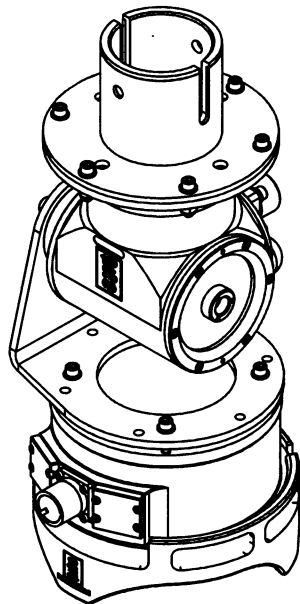
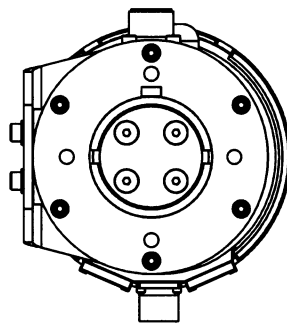
Kongsberg Mesotech Ltd.

OUTLINE AND INSTALLATION DRAWING
M3 SONAR 500M
WITH DOWNLOOKING BRACKET

SIZE	NSCM NO	TYPE	DWG. NO.	ISS
B	1C965	MD	422-44131001	1.2
SCALE: 1:4		W.O. NO.		SHEET 1 OF 1

NOTE:
SONAR HEAD, FLANGE AND MRU NOT INCLUDED;
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<u>DECIMALS</u>	<u>FRACTIONAL</u>	<u>ANGULAR</u>								
X.XX ±0.006	±1/32	MACH ±30'								
X.XXX ±0.003		BEND ±1°								
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- NOTES:
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 2. LUBRICATE FASTENERS WITH ANTI-SEIZE LUBRICANT
 3. BRACKET AND ADAPTOR CAN BE ASSEMBLED AS SHOWN ON EITHER PAGE

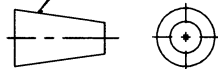
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X.XXX ±0.003 BEND ±1°
SURFACE FINISH 125 Ra, DE-BURR HOLES
BREAK SHARP EDGES 0.010

DO NOT SCALE DRAWING

APPROVALS	NAME	DATE
DRAWN	DRC	13/08/15
REVISED	DRC	15/07/31
CHECKED		2015 AUG 28
ENGR		2015 AUG 28
ISSUED	R.C.H.	2015 SEP 2

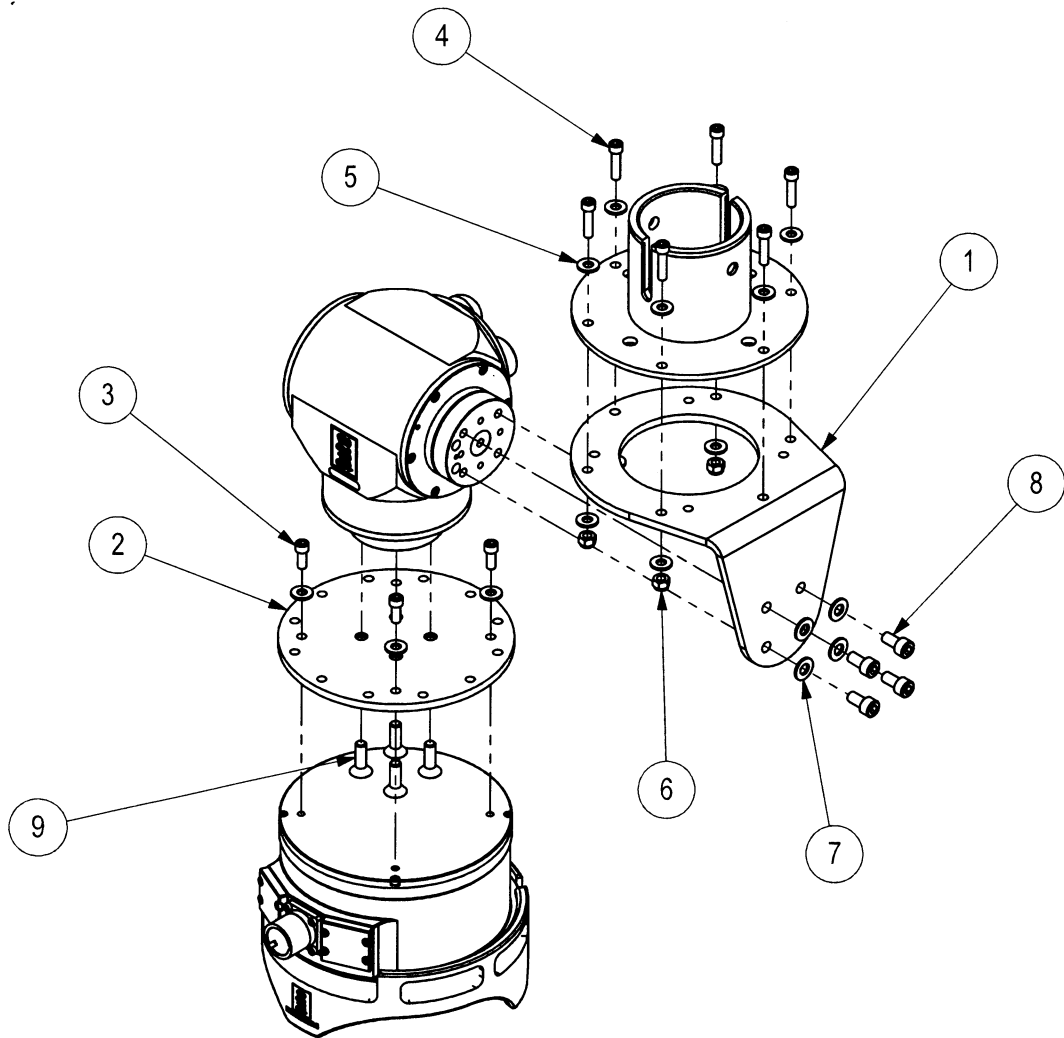
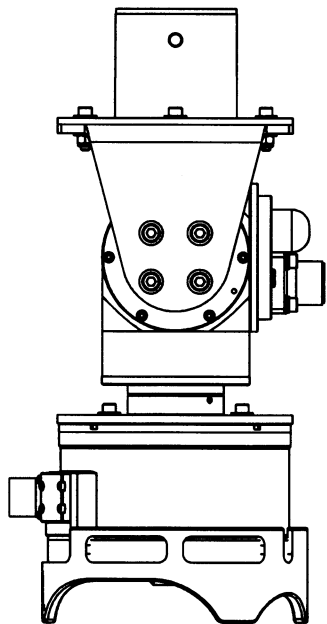
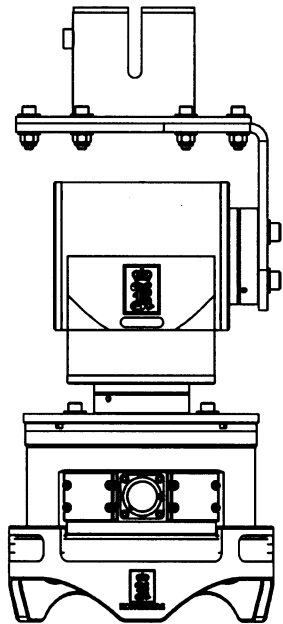
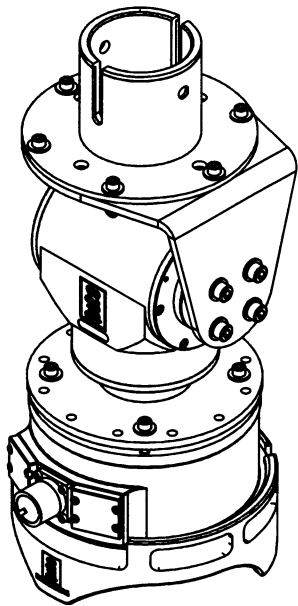
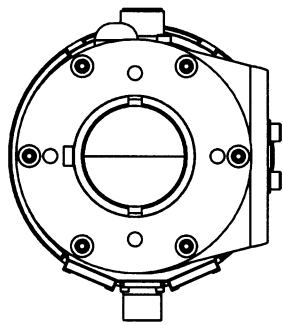


1.1	ECO 5549	2015-07-31
ISS	DESCRIPTION	DATE
REVISIONS		

Kongsberg Mesotech Ltd.

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

SIZE	NSCM NO	TYPE	DWG. NO.	ISS
B	1C965	MD	422-44171000	1.1
SCALE: 3:16		W.O. NO. 281-1150		SHEET 1 OF 2



- 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

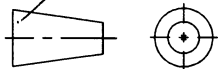
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X.XX ±0.006 ±1/32 MACH ±30°
X.XXX ±0.003 BEND ±1°
SURFACE FINISH 125 Ra, DE-BURR HOLES
BREAK SHARP EDGES 0.010

DO NOT SCALE DRAWING

APPROVALS	NAME	DATE
DRAWN	DRC	13/08/15
REVISED	DRC	15/07/31
CHECKED	<i>[Signature]</i>	2015 AUG 28
ENGR	<i>[Signature]</i>	2015 AUG 28
ISSUED	R.C.H.	2015 SEP 2

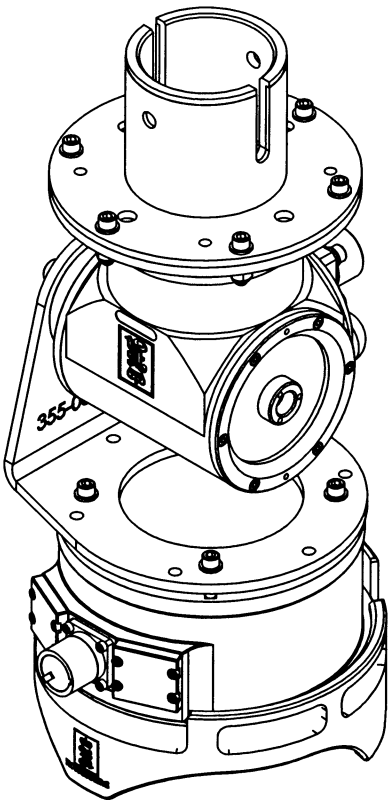
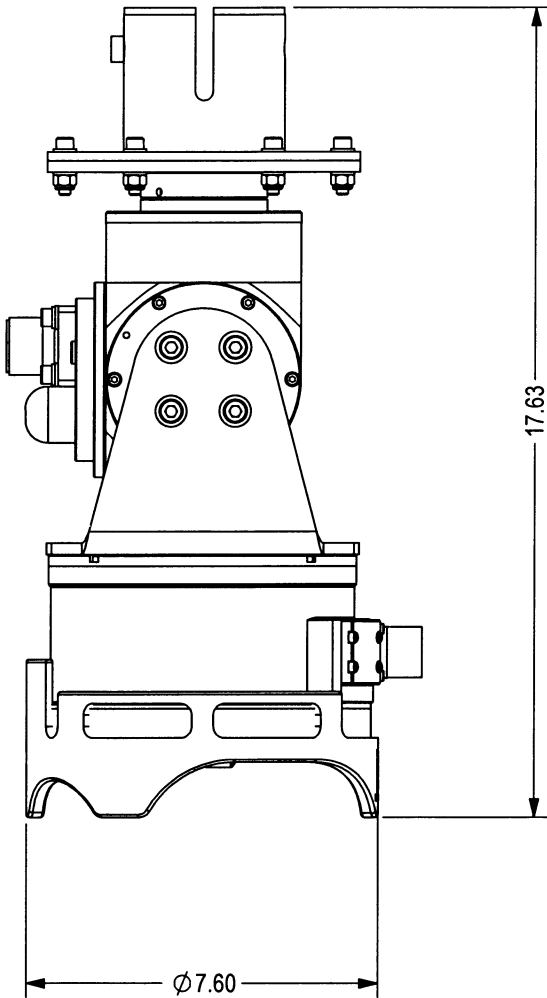
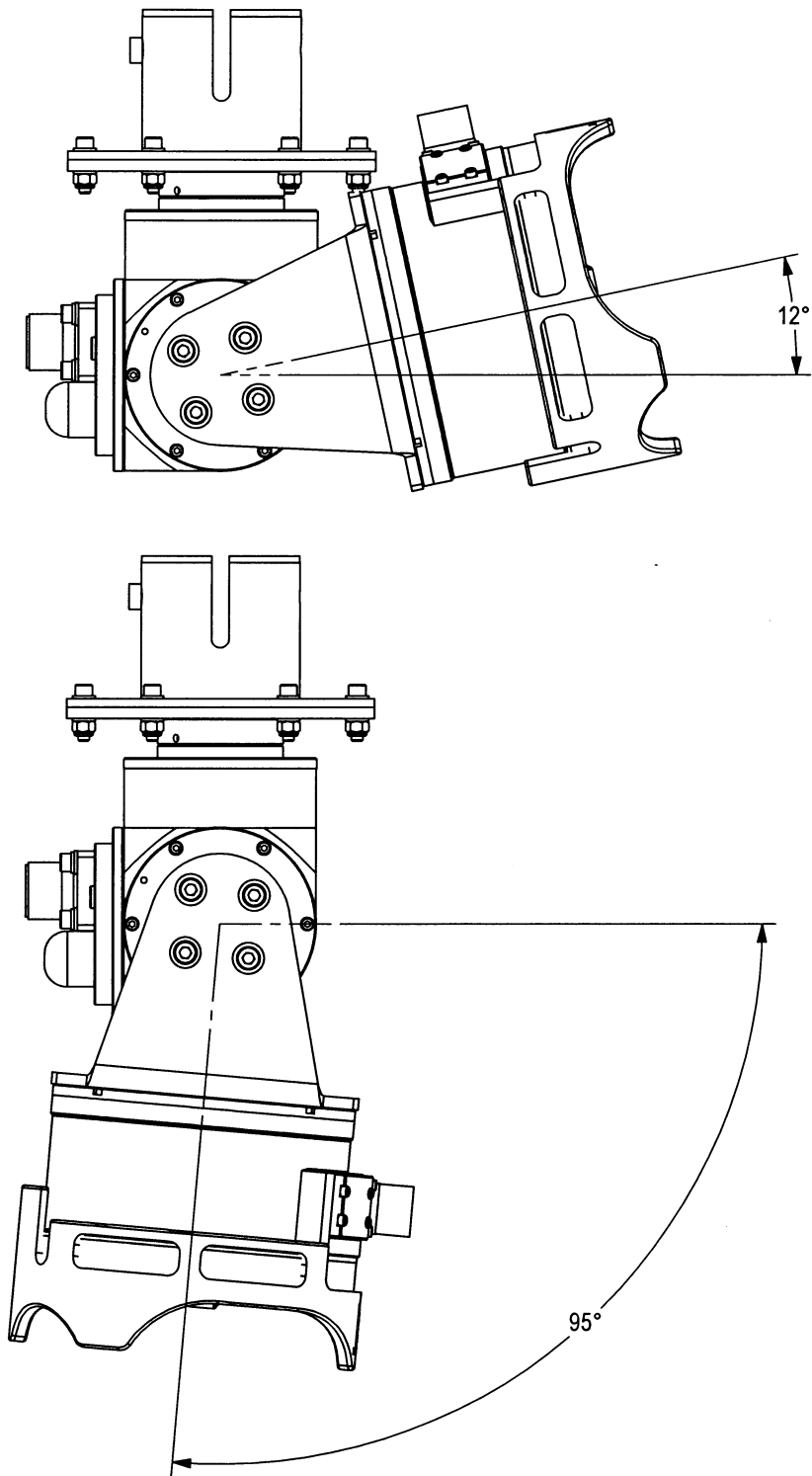


1.1	ECO 5549	2015-07-31
ISS	DESCRIPTION	DATE
REVISIONS		

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

SIZE	NSCM NO	TYPE	DWG. NO.	ISS
B	1C965	MD	422-44171000	1.1
SCALE: 3:16		W.O. NO. 281-1150		SHEET 2 OF 2

DWG. NO.	SHT	ISS
422-44171001	1	1.1



1.1	ECO 5549	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

SIZE	NSCM NO	TYPE	DWG. NO.	ISS
B	1C965	MD	422-44171001	1.1
SCALE: 1:4	W.O. NO. 281-1150	SHEET 1 OF 2		

NOTES:
1. FLANGE, ROTATOR, AND SONAR HEAD NOT INCLUDED;
SHOWN ONLY FOR CLARITY

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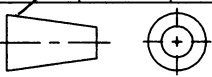
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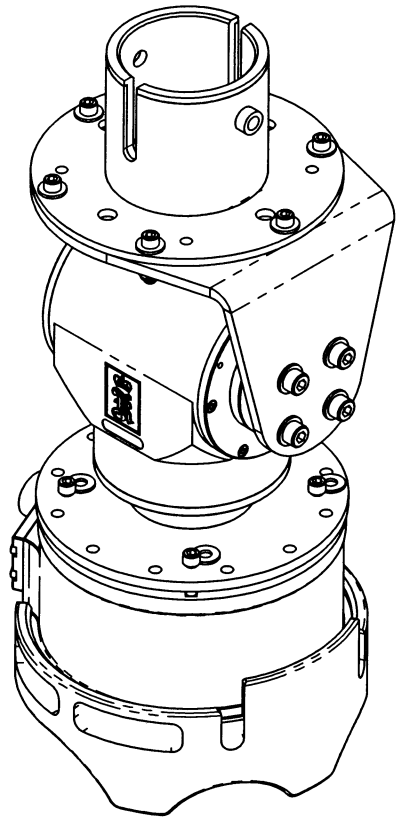
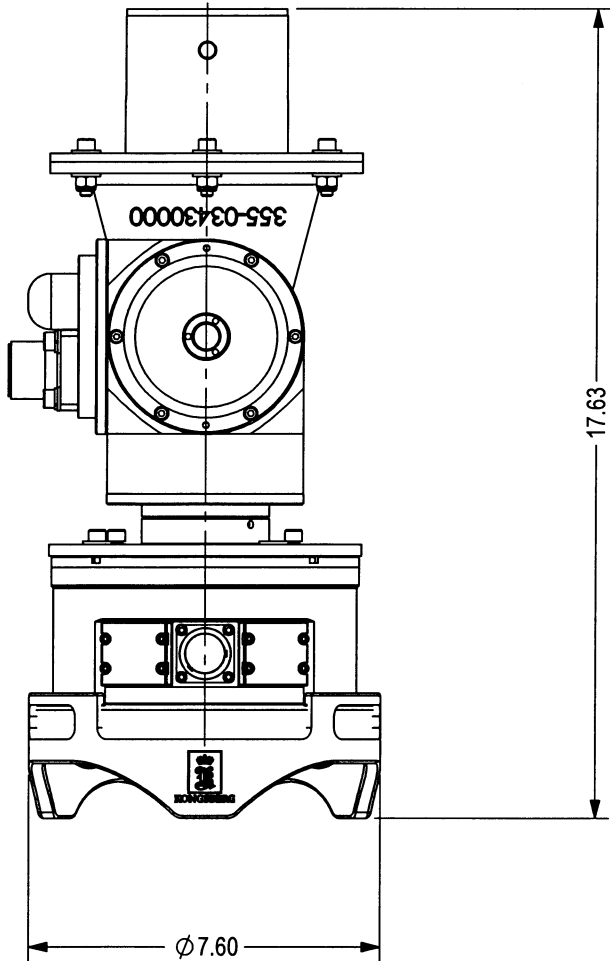
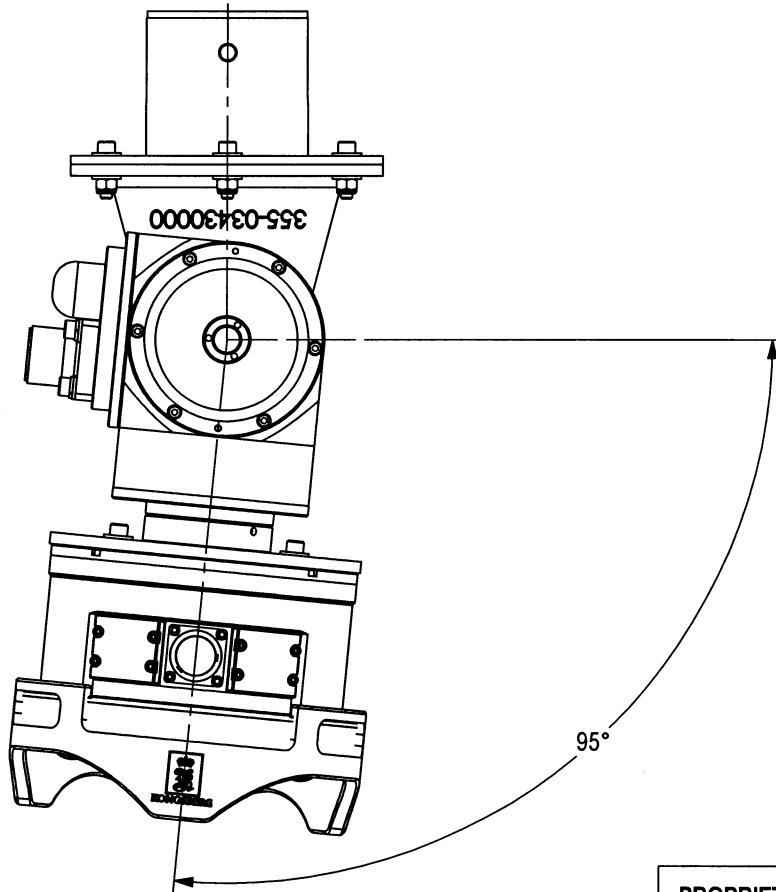
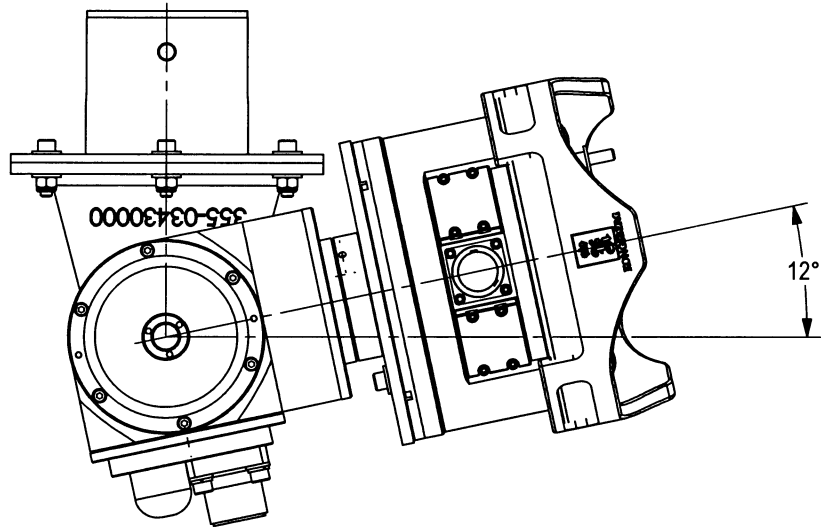
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ARE:

DECIMALS	FRACTIONAL	ANGULAR
X.XX ±0.006	±1/32	MACH ±30'
X.XXX ±0.003		BEND ±1°
SURFACE FINISH 125 Ra, DE-BURR HOLES BREAK SHARP EDGES 0.010		

DO NOT SCALE DRAWING

APPROVALS	NAME	DATE
DRAWN	DRC	2013/08/15
REVISED	DL	2015/08/24
CHECKED		2015 AUG 28
ENGR		2015 AUG 28
ISSUED	R.C.H.	2015 SEP 2





NOTES:
1. FLANGE, ROTATOR, AND SONAR HEAD NOT INCLUDED;
SHOWN ONLY FOR CLARITY

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		DECIMALS	FRACTIONAL	ANGULAR											
		X.XX ±0.006	± 1/32	MACH ±30°											
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CHECKED	<i>[Signature]</i>	2015 AUG 28													
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CONFIDENTIAL. DO NOT COPY.	DO NOT SCALE DRAWING	ISSUED	<i>R.C.H.</i>	2015 SEP 2	<table><tr><td>SIZE</td><td>NSCM NO</td><td>TYPE</td><td>DWG. NO.</td><td>ISS</td></tr><tr><td>B</td><td>1C965</td><td>MD</td><td>422-44171001</td><td>1.1</td></tr></table>	SIZE	NSCM NO	TYPE	DWG. NO.	ISS	B	1C965	MD	422-44171001	1.1
		SIZE	NSCM NO	TYPE	DWG. NO.	ISS									
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				<table><tr><td>SCALE: 1:4</td><td>W.O. NO. 281-1150</td><td>SHEET 2 OF 2</td></tr></table>	SCALE: 1:4	W.O. NO. 281-1150	SHEET 2 OF 2								
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