


USER MANUAL FOR SUBSEA GAS SAMPLING UNIT 1 liter

Document title : *Subsea Gas Sampling Unit 1 liter*
IKM TECHNOLOGY AS ref. : *IKM-1048564-U-MA-001*
Customer ref. : *Subsea Tool*




IKM Technology AS

Rev.	Date	Reason For Issue	Prepared	Checked	Approved
01	11.10.2017	Issued for Construction	OG	SB	JHR

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Author:	Gabrielsen Trine (Technology)	Owner:	IKM Administrator	
Approved by:	Gabrielsen Trine (Technology)	Company:	IKM Technology AS	

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1 GENERAL INFORMATION

This manual describes how to handle, operate and maintain the Subsea Gas Sample Unit. It is intended to be used and handled by a diver.

The unit can easily be adapted for use by any typical WROV.

The unit may also with minor modifications be adapted to collect gas from areas with very restricted access.


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1.1 Abbreviations

Req.	Requirement
WROV	Work Remotely Operated Vehicle
BSP	British standard pipe
JIC	Joint industry council
Nm	Newton meter
LPM	Liter per minute
CCM	Cubic centimeter
Mm	Millimeter
Kg	Kilogram
Ø	Diameter
Cc	Cubic centimeter


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1.2 References

Doc. no.	Description	Rev.	Issued	Can be found
IKM-1048564	Overview Subsea Gas Sample Unit 1 liter	02	05.10.17	Appendix A
IKM-1048564	Drawing Subsea Gas Sample Unit 1 liter	03	11.10.17	Appendix A
IKM-1048787	Drawing Gas Sample Storage Tank 0,5 liter	02	11.10.17	Appendix A

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2 TECHNICAL SPESIFICATION

The Gas Sample Unit 1 liter is designed to be a small and light weight tool in order to be diver-friendly.

Main components are frame, gas sampling bowl, valves and sample tank.

The unit is depth rated to 1000 MSW.

Dimensions:

Length: 665 mm.

Width: Ø207 mm.

Weight:


In air: 5,65 kg.

In water: 4,32 kg.

Sampling volume: 1 liter.

Max pressure: 100 bar.

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3 SAFETY

3.1 General - Operations

Only authorised people and qualified personnel should work on the system, and take suitable precautions to prevent any potential injuries. Always adhere to authorised working practices, and use the correct tools for the job. To facilitate this, make sure that these are available before commencing the test.


Ensure that the working area is kept clear and uncluttered.

3.2 General - Mechanical

In order to keep the sampler diver-friendly and light weighted, the sample bowl, framework and piping is kept as small/light as possible.

Hence, do handle the tool with a reasonable amount of care not to damage tool parts.

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4 OPERATIONAL DESCRIPTION

- Dive with both valves closed and empty tank.
- At sampling location; open both valves and let unit fill with water.
- Place sampling bowl over the gas leak.
- When gas evacuates from the bottom of the sampler tank, the sampler is full.
- Close bottom valve first, then upper valve. Gas sample is now secure.
- Return sampling unit to surface.

To measure leaking rate, do the following:

- Have a stopwatch available and ready.
- Both valves to be in open position, and all air evacuated from sampler.
- Place the sampler bowl over the leaking area which it is meant to measure. Make sure to have the Gas Sampling Unit in an upwards position for the most accurate reading.
- Start clocking the time at the very moment the sampler bowl of the Gas Sampling Unit is placed over the leaking gas.
- Observe closely the bottom valve of the sampler tank, and stop clocking the time as soon as gas appears/escapes from the bottom valve.
- Divide sampler tank and pipe volume 1,1 liters by elapsed time to find flow rate.

NB! This is a rough estimate of the leaking rate.

The sampler volume is 1,1 liter.

Exampel:

If it takes 45 seconds until the sampler is full. This equals 0,75 minutes.


Then: $1,1 \text{ L} / 0,75 \text{ min} = 1,4667 \text{ L/min}$.

Meaning that the leaking rate is $\approx 1,5$ liter per minute.

To Transfer collected gas sample to 500 cc test sample tank, IKM-1048787:

- Connect the sampler tank at the bottom valve and the 500 cc test sample tank by means of the supplied ¼" hose. Ensure both ends of hose are tightened.
- Open the sampler bottom valve and the 500 cc test sample tank valve.
- Close both valves and disconnect hose.
- Secure 500 cc test sample bottle by installing and tightening the blind cap provided with the sampler.

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5 MAINTENANCE


- Clean the whole tool with fresh water, remember to clean inside of tank.
- Dry tool and apply a light layer with corrosion protective coating.
- Place tool in a proper storage box or room.

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6 SPARE PART LIST

- Tank.
- Valves.
- Sampler bowl.
- Brackets/Framework.
- Nuts and bolts.

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7 REVISION CHANGES

Revision	Procedure change	Author
01	<i>Original version</i>	OG

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8 CONTACT INFORMATION

All enquiries relating to the tooling should be addressed to:

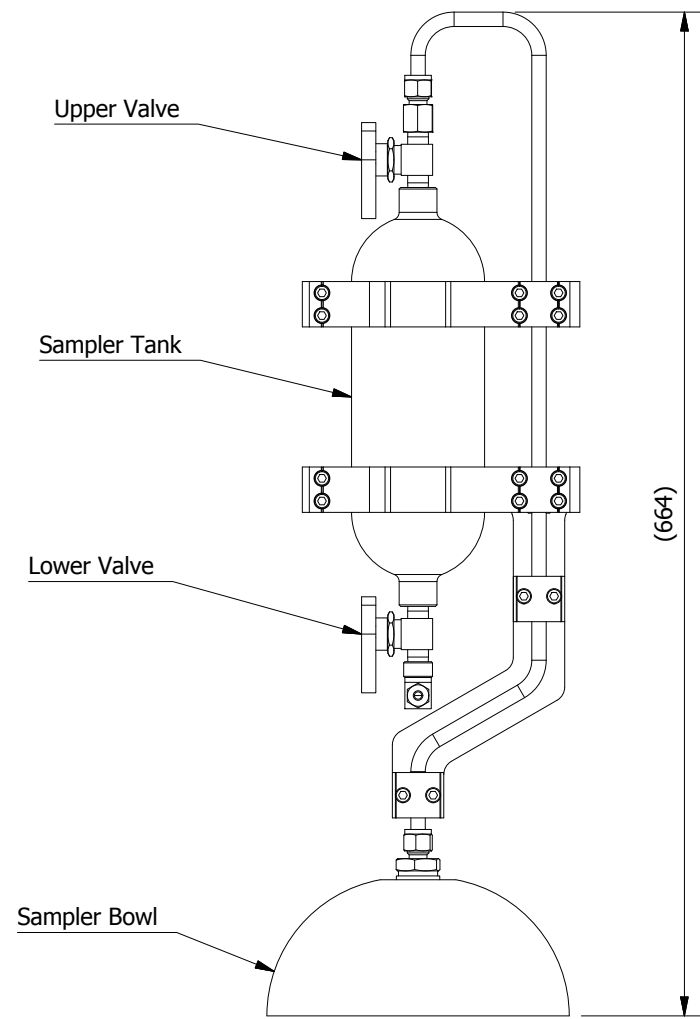
IKM Technology AS,
 Nordlysvegen 7,
 N-4340 Bryne,
 Norway

Phone, 24/7 : +47 51 80 05 20
 Mail : IKMtechnology@IKM.no

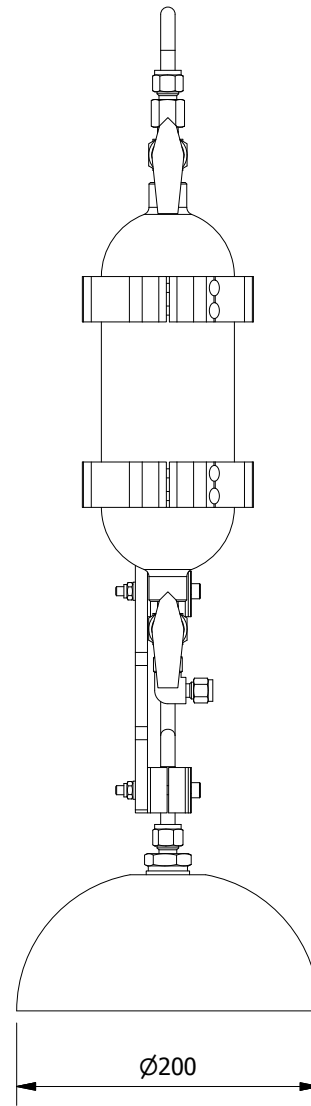
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9 APPENDIX

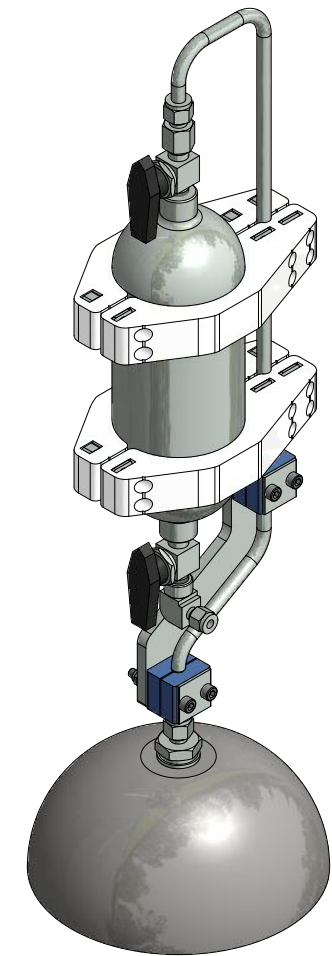
	Doc. number	Description	Rev
<i>Appendix A</i>	<i>IKM1048564</i>	<i>Overview of Gas Sampling Unit 1 liter</i>	<i>02</i>
<i>Appendix A</i>	<i>IKM1048564</i>	<i>Drawings of Gas Sampling Unit 1 liter</i>	<i>03</i>
<i>Appendix A</i>	<i>IKM-1048787</i>	<i>Drawing Gas Sample Storage Tank 0,5 liter</i>	<i>02</i>



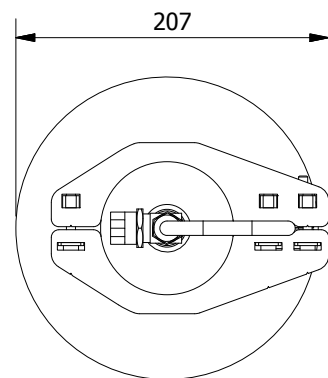
SIDE VIEW
(1 : 5)



FRONT VIEW
(1 : 5)



ISO VIEW
(1 : 5)



TOP VIEW
(1 : 5)

WEIGHT:
IN AIR: 5,56 kg
IN WATER: 4,36 kg
SURFACE AREA: 5145 cm²

UNLESS OTHERWISE SPECIFIED:
ALL DIMENSIONS ARE
IN MILLIMETRES

TOLERANCES:
LINEAR: ISO 2768-1 m
ANGULAR: ISO 2768-1 m
EDGES: ISO 2768-1 m

REMOVE ALL BURRS
BREAK ALL SHARP EDGES

FIRST ANGLE
PROJECTION



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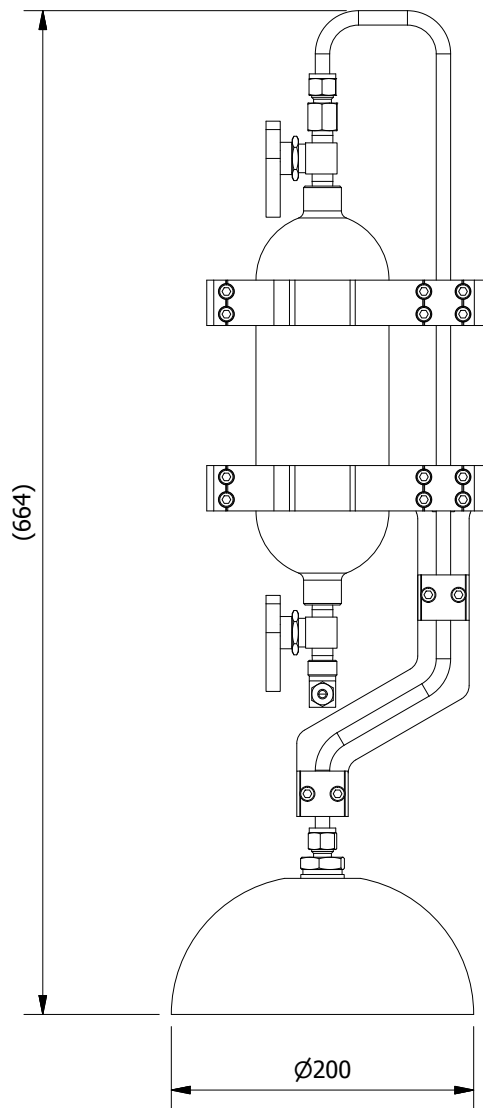
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Tel.: 51 80 05 20
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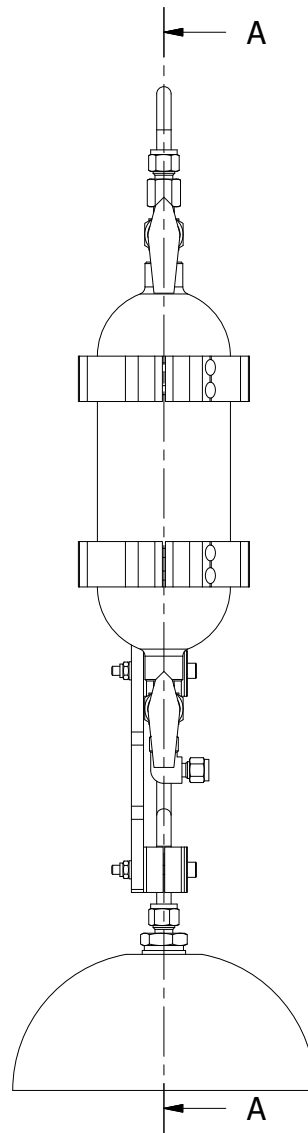
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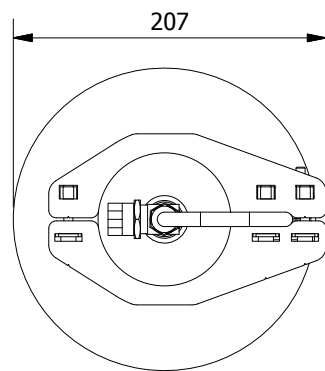
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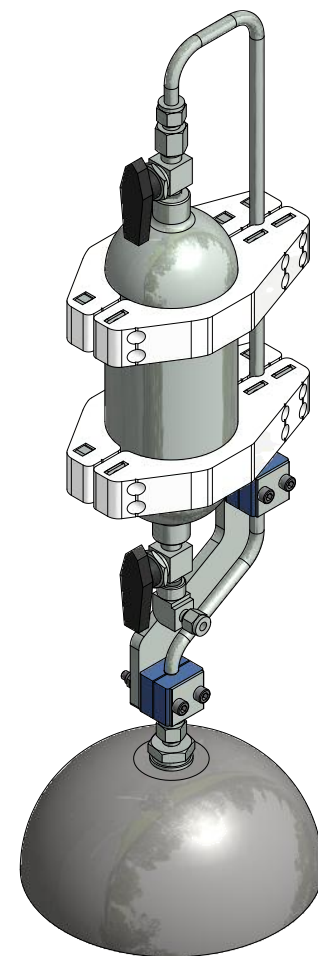
FRONT VIEW
(1 : 5)



SIDE VIEW
(1 : 5)



TOP VIEW
(1 : 5)



ISO VIEW
(1 : 5)



PARTS LIST

ITEM	QTY	PART NUMBER	TITLE	MATERIAL	MASS
1	1	IKM-1048551	Double-Ended Sample Cylinders - 1 LITER 1/4" NPT	Stainless Steel, AISI 304	2.9 kg
2	2	IKM-1048552	1/4" On-Off Valves - Straight Pattern - 1/4" NPT	Stainless Steel, AISI 316L	0.22 kg
3	1	IKM-1048554	Female Connector - Tube OD x NPT Size 3/8 x 1/4	Stainless Steel, AISI 316L	0.06 kg
4	1	IKM-1048558	TUBE - 3/8" x 0,049" - PN: SS-T6-S-049-20	Stainless Steel, AISI 316L	0.18 kg
5	6	IKM-1048566	CLAMP BOLT WASHER	Stainless Steel, AISI 316L	0.01 kg
6	4	IKM-1048567	CLAMP THREAD INSERT	Stainless Steel, AISI 316L	0.02 kg
7	2	IKM-1048568	CLAMP 1/2	PEHD 1000 (natural / white)	0.12 kg
8	1	IKM-1048574	SAMPLER BOWL	Stainless Steel, AISI 316L	0.33 kg
9	1	IKM-1048584	Male Connector Tube OD x ISO Thread Size 3/8 x 1/2	Stainless Steel, AISI 316L	0.11 kg
10	1	IKM-1048585	1/2" RS Fitting Gasket	Stainless Steel, AISI 316L	0.01 kg
11	1	IKM-1048594	TUBE / BOWL SUPPORT	Stainless Steel, AISI 316L	0.57 kg
12	2	IKM-1048654	SWAGelok TUBE CLAMP - 3/8"	PP (Polypropylene)	0.02 kg
13	1	IKM-1048657	Female Elbow - Tube OD x NPT Size 1/4 x 1/4	Stainless Steel, AISI 316L	0.08 kg
14	1	IKM-1048660	BOWL SUPPORT WASHER	Stainless Steel, AISI 316L	0.02 kg
15	2	IKM-1048679	CLAMP 2/2	PEHD 1000 (natural / white)	0.13 kg
16	1	IKM-1048789	KONTRAMUTTER - BSP - 1/2"	Stainless Steel, AISI 316L	0.01 kg
17	4	IKM-7000010	WASHER - DIN 125 - A 6,4 A4	A4	0 kg
18	12	IKM-7000503	CYLINDER HEAD CAP SCREW - DIN 912 - M6 x 35	A4	0.01 kg
19	4	IKM-7000506	CYLINDER HEAD CAP SCREW - DIN 912 - M6 x 50	A4	0.01 kg
20	4	IKM-7003023	HEX NUT FLANGED - DIN 985 - M6	A4	0 kg

NOTES:

1. TANK VOLUM: 1 LITER / 0.264 US GALLONS
2. MAX DEPTH 1000 METER

REV	DATE	DESCRIPTION	BY	CHKD	REW	APPD
3	11.10.2017	RE-ISSUED FOR CONSTRUCTION	RH	EN	-	RH
2	05.10.2017	RE-ISSUED FOR CONSTRUCTION	RH	EN	-	RH
1	04.10.2017	ISSUED FOR CONSTRUCTION	RH	EN	-	RH

WEIGHT:
IN AIR: 5,56 kg
IN WATER: 4,36 kg


SURFACE AREA:
5145 cm²

UNLESS OTHERWISE SPECIFIED:
ALL DIMENSIONS ARE
IN MILLIMETRES

TOLERANCES:
LINEAR: ISO 2768-1 m
ANGULAR: ISO 2768-1 m
EDGES: ISO 2768-1 m

REMOVE ALL BURRS
BREAK ALL SHARP EDGES

FIRST ANGLE
PROJECTION



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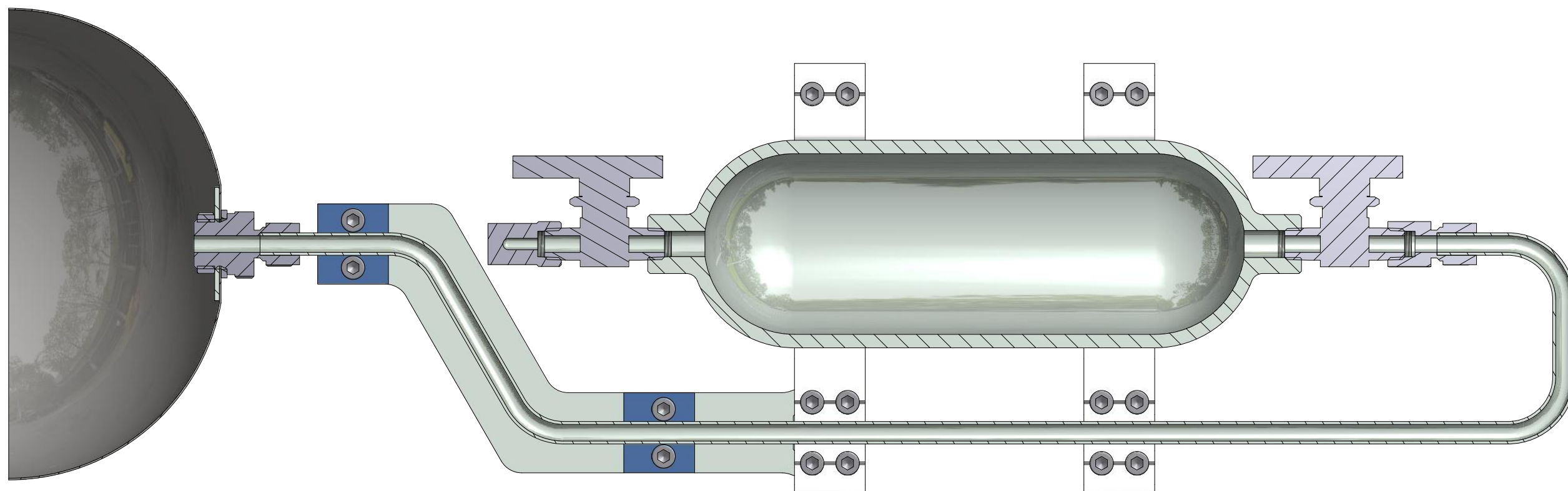
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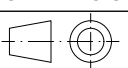
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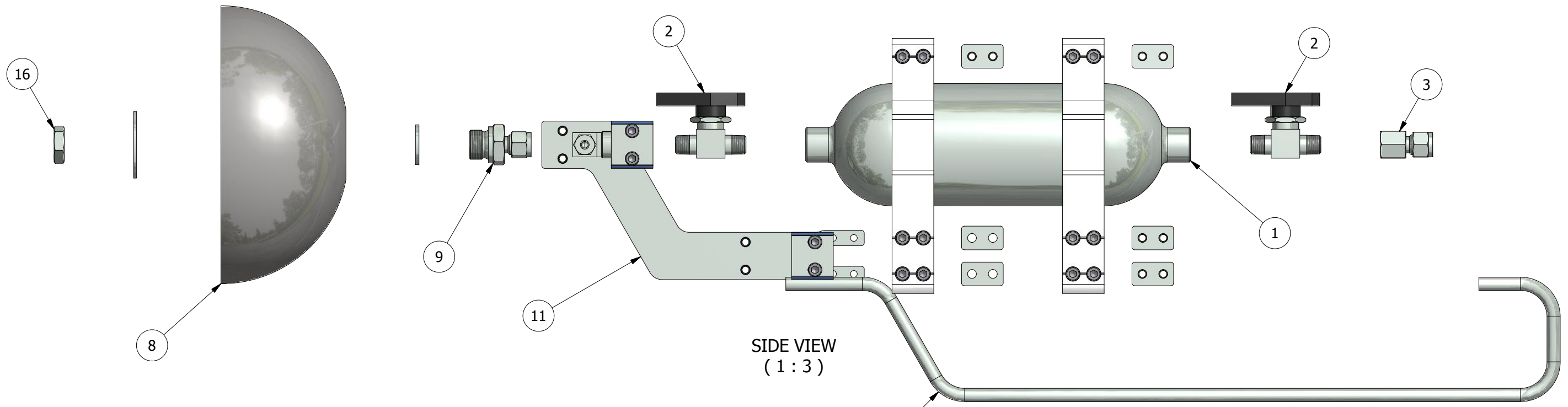
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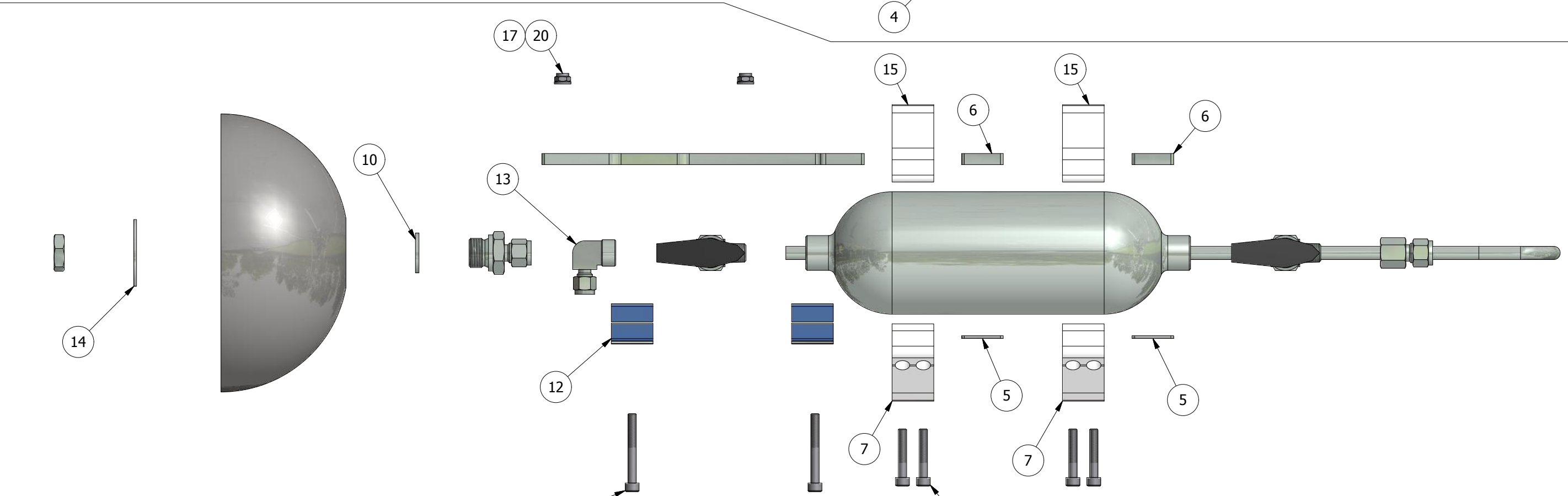


A-A
(1:2)

WEIGHT: IN AIR: 5,56 kg IN WATER: 4,36 kg SURFACE AREA: 5145 cm ²	 IKM TECHNOLOGY AS Nordlysvegen 7, 4340 BRYNE Tel.: 51 80 05 20 E-mail: ikmtechnology@IKM.no Web: www.IKM.no
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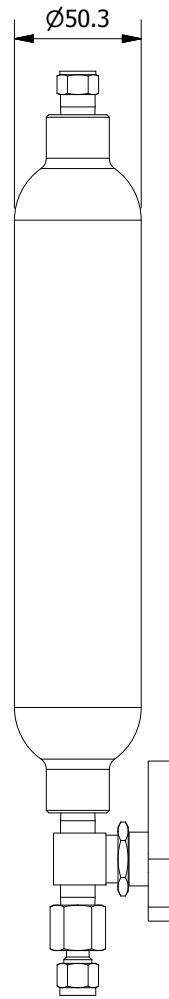
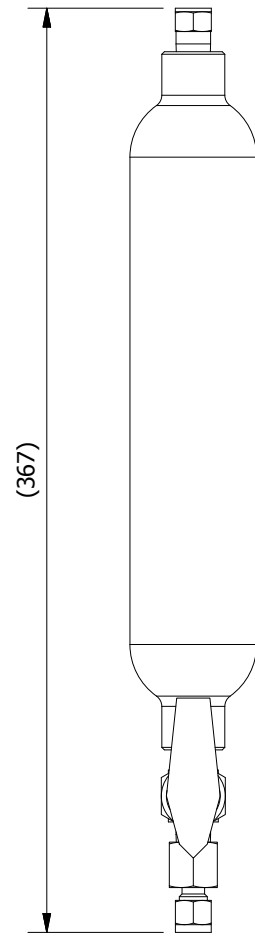
SIDE VIEW
(1 : 3)



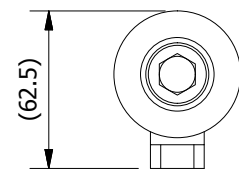
FRONT VIEW
(1 : 3)

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SURFACE AREA:	5145 cm ²
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EDGES:	ISO 2768-1 m
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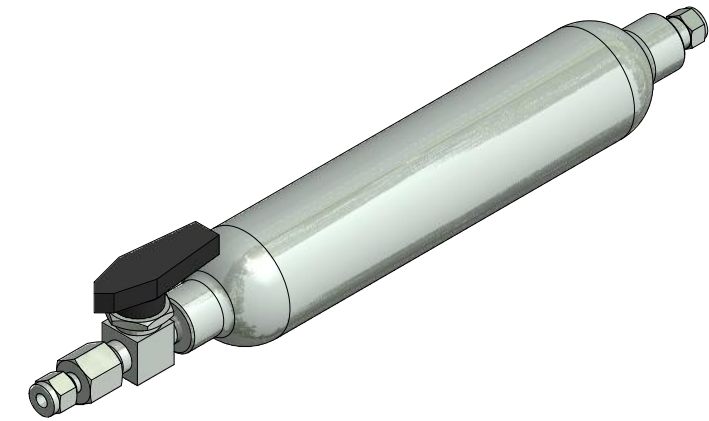
VIEW3
(1 : 3)



VIEW2
(1 : 3)



PARTS LIST					
ITEM	QTY	PART NUMBER	TITLE	MATERIAL	MASS
1	1	IKM-1048552	1/4" On-Off Valves - Straight Pattern - 1/4" NPT	Stainless Steel, AISI 316L	0.22 kg
2	1	IKM-1048782	Double-Ended Sample Cylinders - 0.5 LITER 1/4" NPT	Stainless Steel, AISI 304	0.77 kg
3	1	IKM-1048783	Female Connector Tube OD x NPT Size - 1/4 x 1/4	Stainless Steel, AISI 316L	0.05 kg
4	1	IKM-1048785	Pipe Plug NPT Size - 1/4	Stainless Steel, AISI 316L	0.03 kg




ISO VIEW
(1 : 3)

NOTES:

- TANK VOLUM: 0.5 LITER / 0.132 US GALLONS
- MAX DEPTH 1000 METER





REV	DATE	DESCRIPTION	BY	CHKD	REW	APPD
2	11.10.2017	RE-ISSUED FOR CONSTRUCTION	RH	EN	-	RH
1	05.10.2017	ISSUED FOR CONSTRUCTION	RH	EN	-	RH

WEIGHT: IN AIR: 1,07 kg IN WATER: 0,934 kg SURFACE AREA: 906,1 cm ²	 IKM TECHNOLOGY AS Nordlysvegen 7, 4340 BRYNE Tel.: 51 80 05 20 E-mail: ikmtechnology@IKM.no Web: www.IKM.no	
UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONS ARE IN MILLIMETRES TOLERANCES: LINEAR: ISO 2768-1 m ANGULAR: ISO 2768-1 m EDGES: ISO 2768-1 m REMOVE ALL BURRS BREAK ALL SHARP EDGES		
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SHEET SIZE: A3	SHEET NO.: 1 OF 2	SCALE: 1 : 3
DRAWING NO.: IKM-1048787	LATEST REV.: 2	



WEIGHT:	
IN AIR:	1,07 kg
IN WATER:	0,934 kg
SURFACE AREA:	906,1 cm ²
UNLESS OTHERWISE SPECIFIED:	
ALL DIMENSIONS ARE IN MILLIMETRES	
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LINEAR: ISO 2768-1 m	
ANGULAR: ISO 2768-1 m	
EDGES: ISO 2768-1 m	
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FIRST ANGLE PROJECTION	

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DRAWING TITLE: GAS SAMPLE STORAGE TANK 0.5 LITER		
SHEET SIZE: A3	SHEET NO.: 2 OF 2	SCALE: 1 : 3
DRAWING NO.: IKM-1048787		LATEST REV.: 2