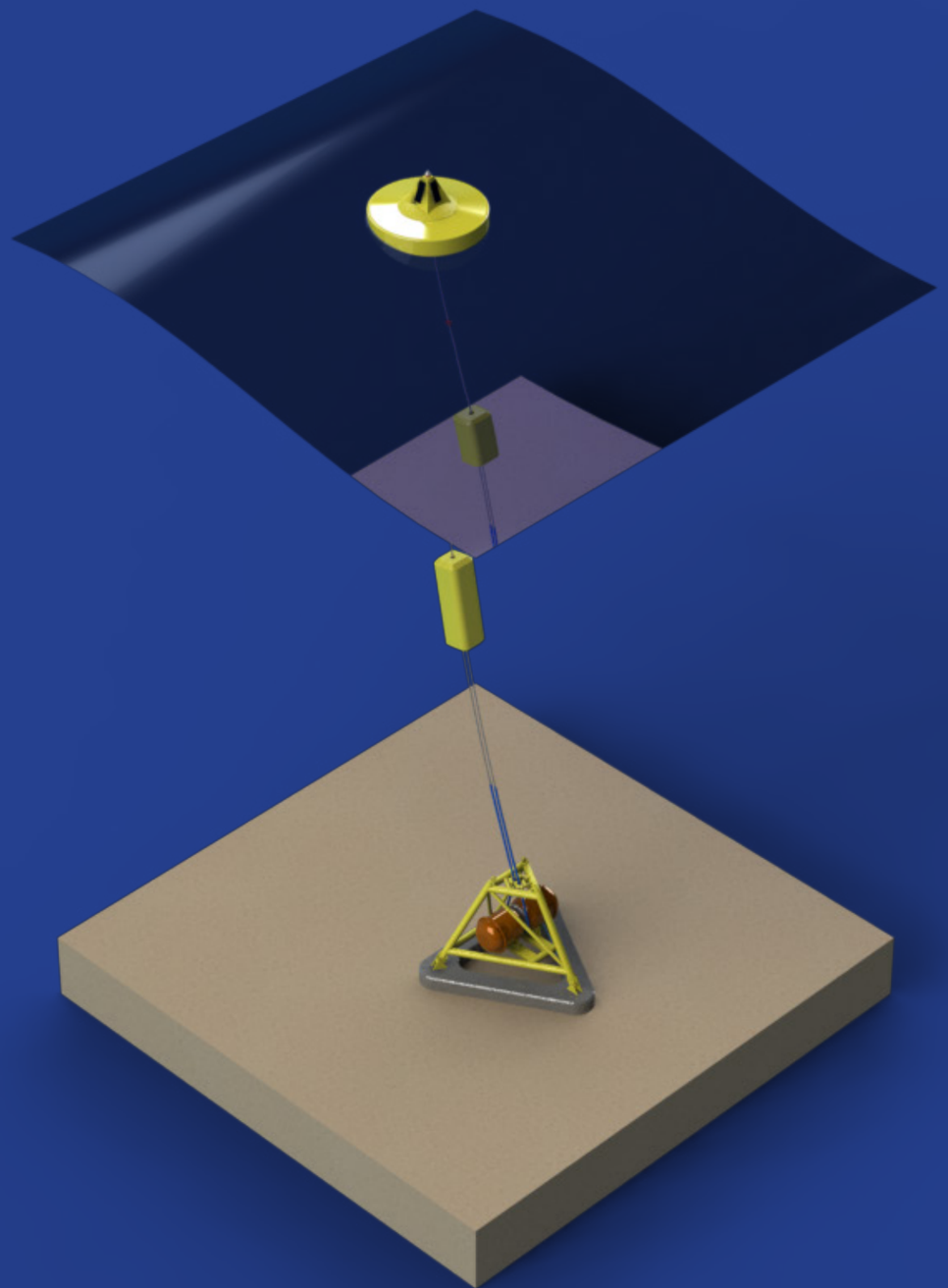
Ocean Energy AS



BALANCED WAVE ENERGY CONVERTER

BWEC® - Presentation of system principles

December, 2018

BWEC®
particulars

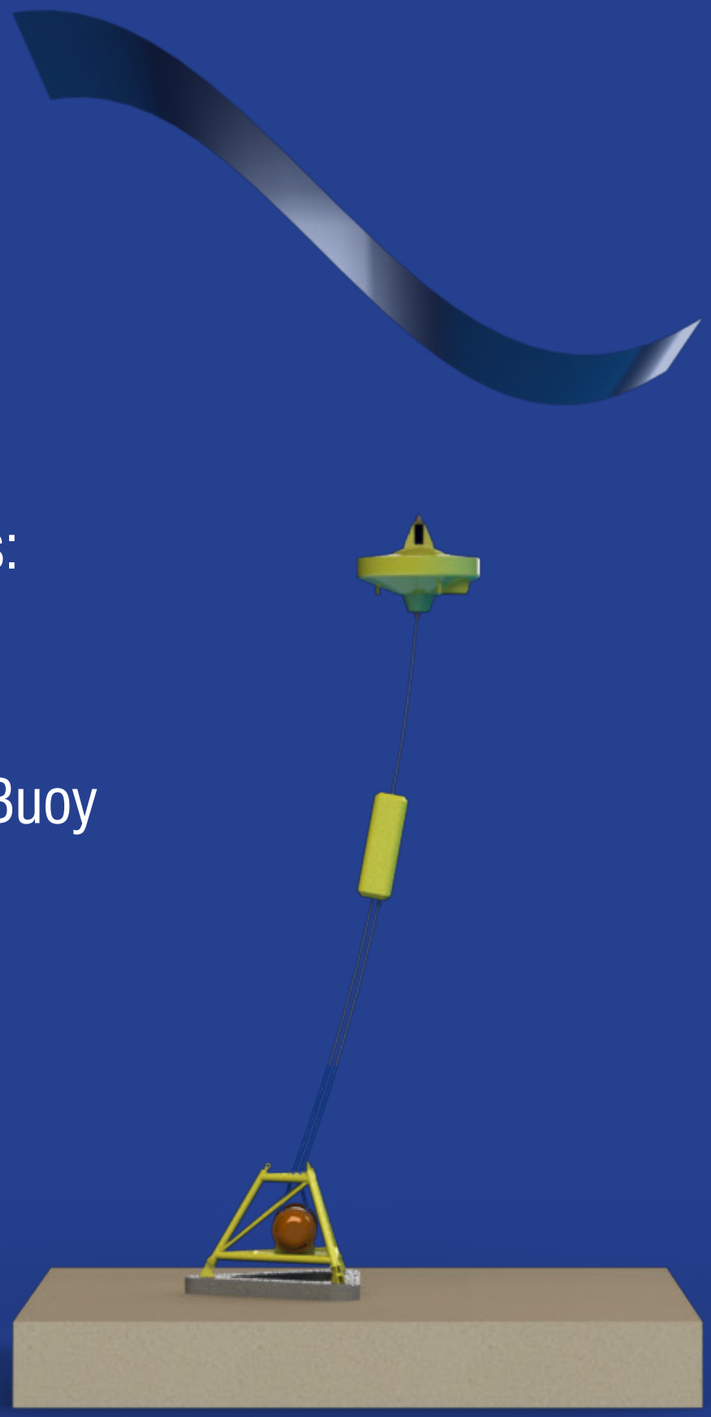
Sea depth
20m – 40m.

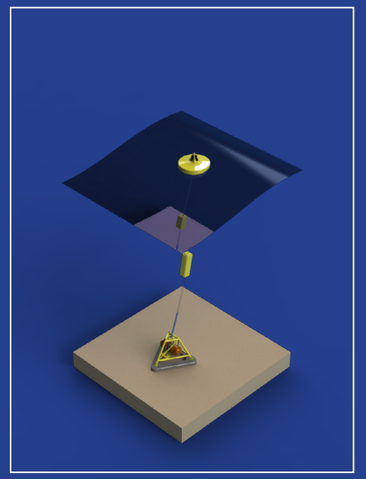
Power production
50 kVA per buoy.

Designed to ensure reliable
operation.

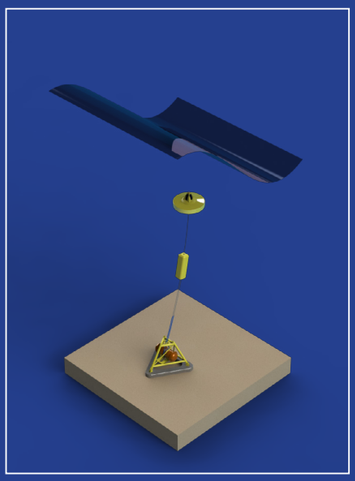
Three main parts:

- Storm Buoy
- Submerged Buoy
- Seabed Unit



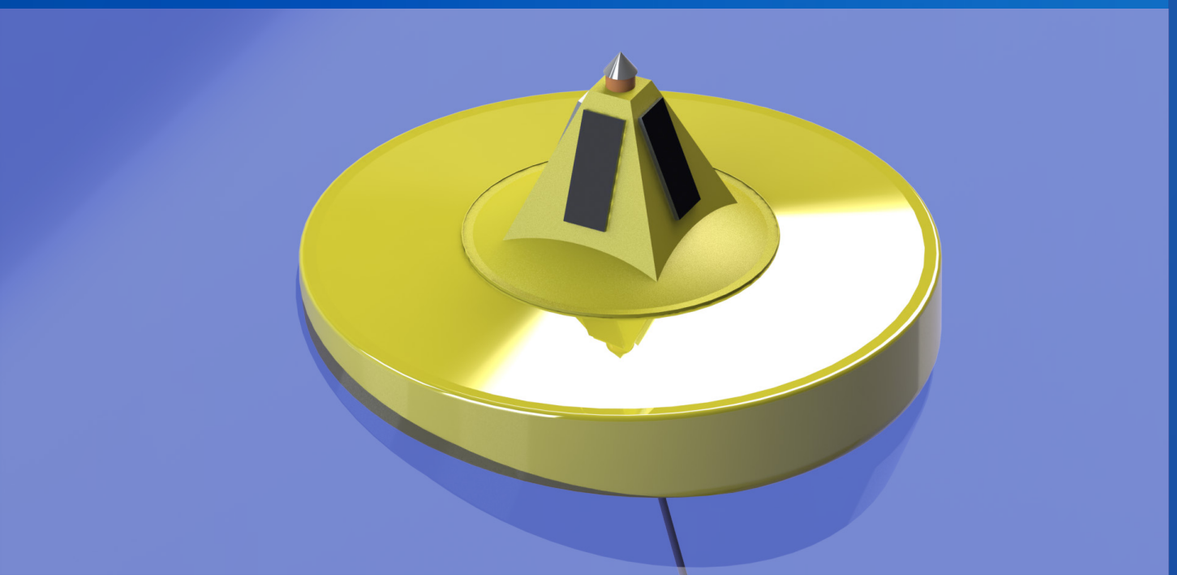


Standard weather.
Normal operation.
Storm Buoy deployed.



Extreme weather.
Emergency operation.
Storm Buoy retracted.

Storm Buoy



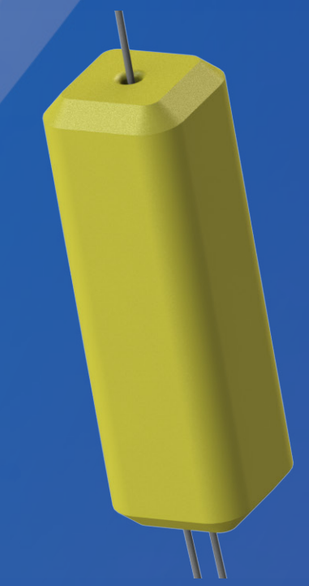
Main parts:

- Compartment of strong GRP
- Winch
- Water ballast system
- Storm Buoy Control system
- Power system for the control system and winch.

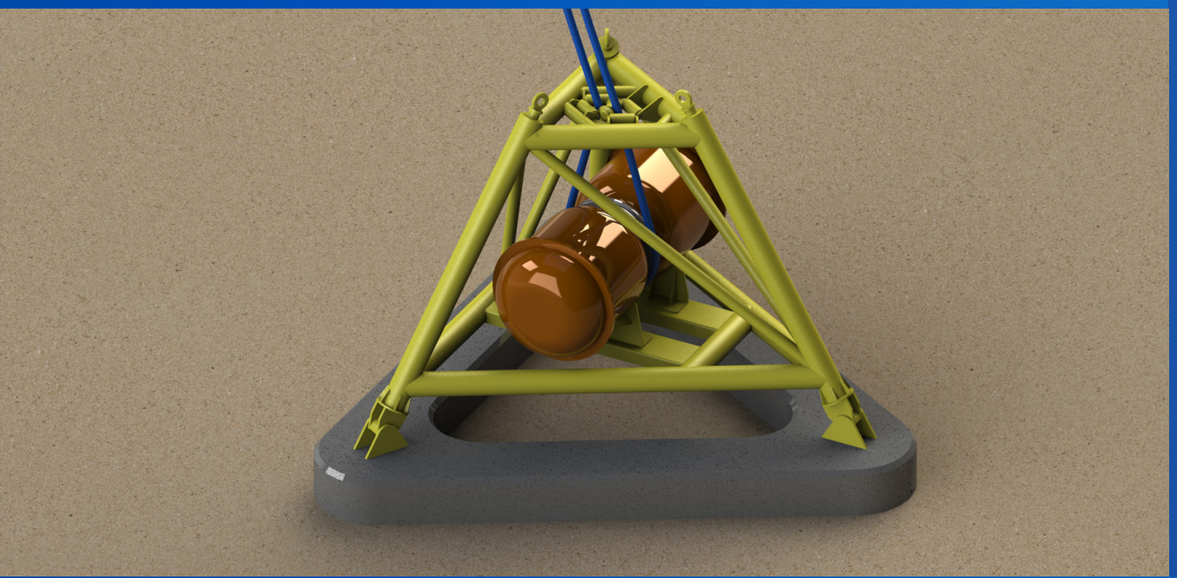
Submerged Buoy

Main parts:

- Standard buoy approx. $3m^3$
- Modified to the concept



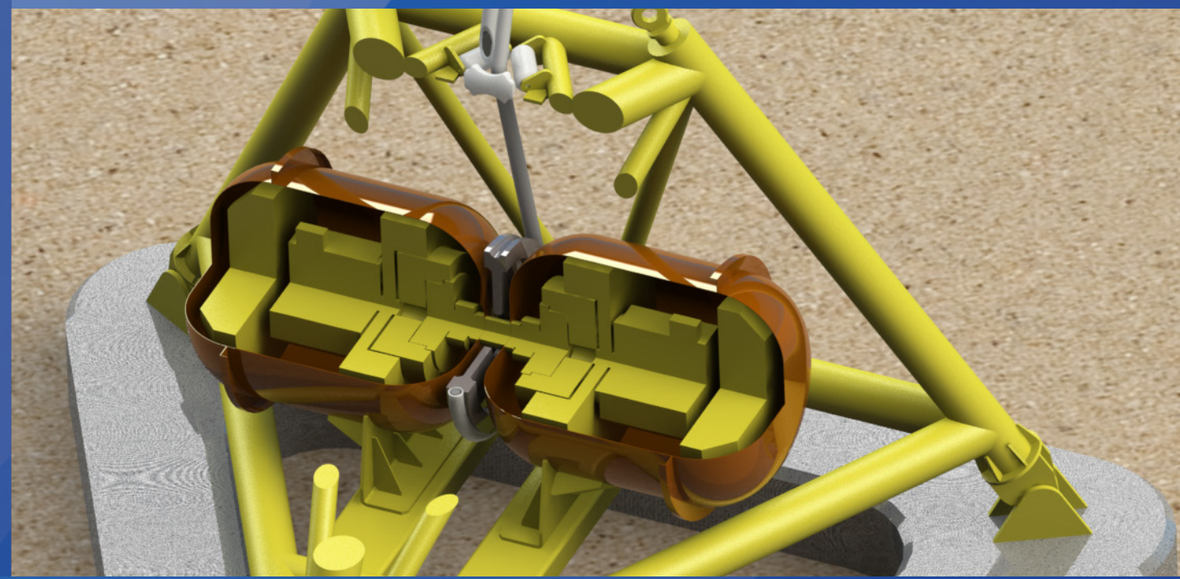
Seabed Unit



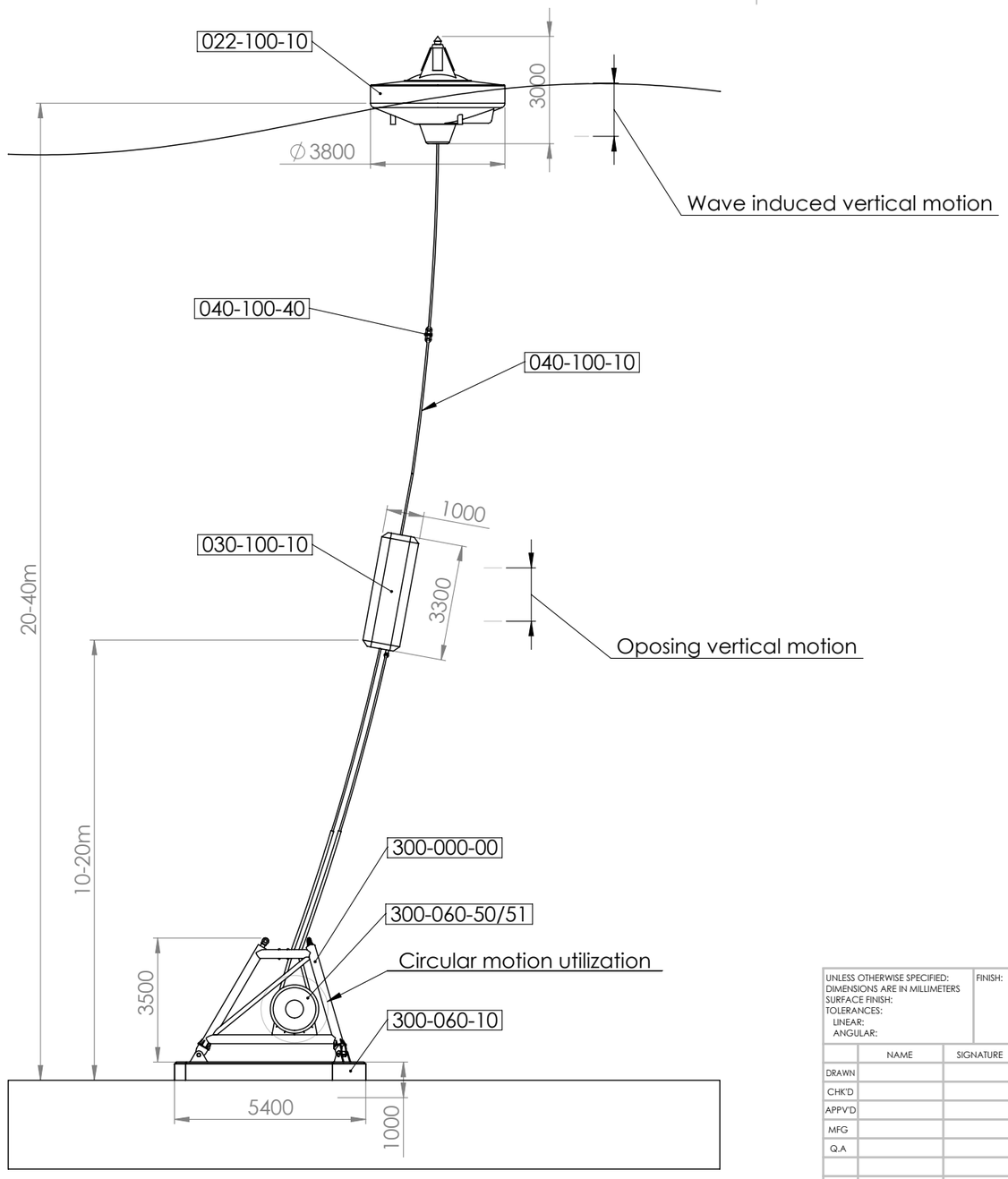
Main parts:

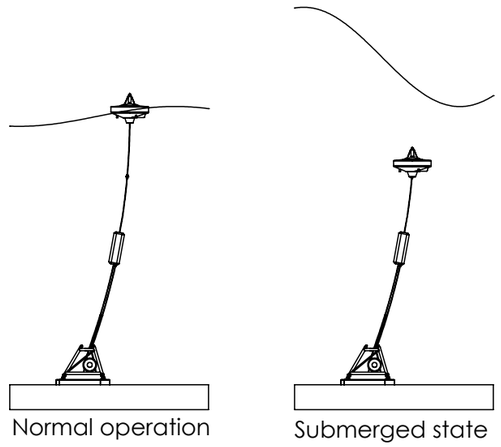
- Strong steel structure with quick release maintenance system.
- Concrete base foundation aprox. 30 tons.

- Two pressure compartments, each with a 25 kVA generator connected to a sheeve by a shaft.



BWEC® system principal sketch





ITEM NO.	DESCRIPTION
300-000-00	Seabed unit
300-060-10	Seabed concrete base
300-060-50	Pressure compartment 1
300-060-51	Pressure compartment 2
040-100-10	Spectra rope
040-100-40	Swivel
022-100-10	Stormbuoy
030-100-10	Submerged buoy

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN MILLIMETERS
SURFACE FINISH:
TOLERANCES:
LINEAR:
ANGULAR:

FINISH:

DEBURR AND BREAK SHARP EDGES

DO NOT SCALE DRAWING

REVISION P1

	NAME	SIGNATURE	DATE
DRAWN			
CHK'D			
APPV'D			
MFG			
Q.A			

MATERIAL:

WEIGHT:

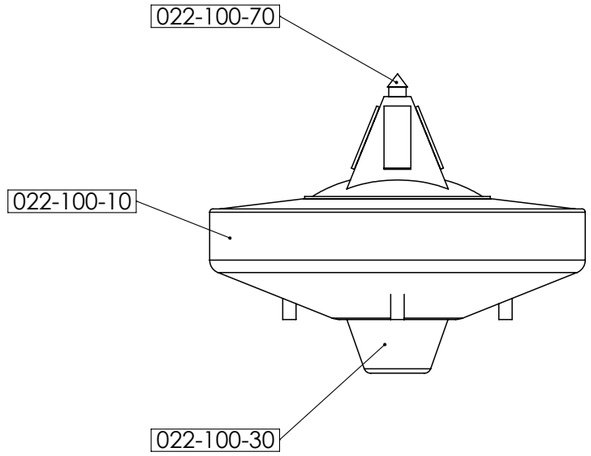
TITLE:
Balanced Wave Energy Converter - Principal Sketch

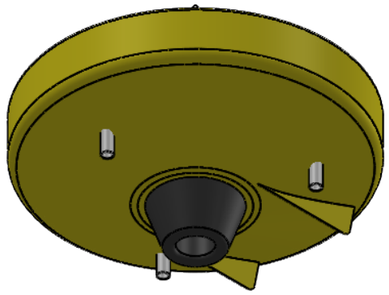
DWG NO. P101-CL903-000-00D

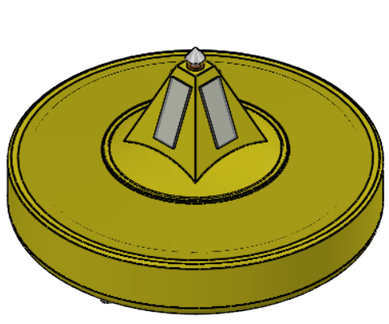
A3

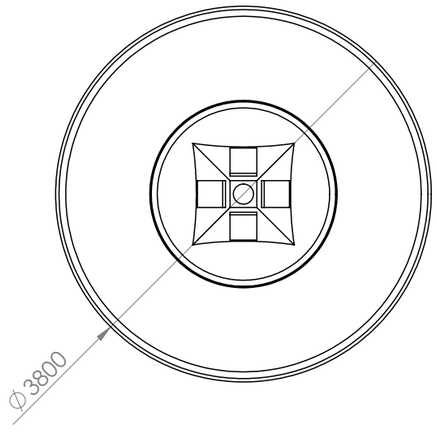
SCALE:1:500

SHEET 1 OF 1









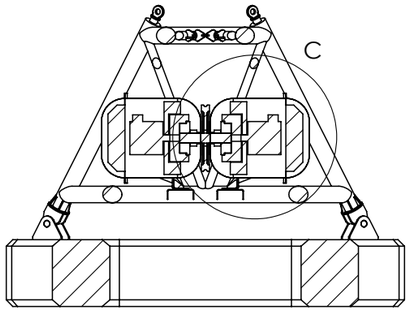
ITEM NO.	DESCRIPTION
022-100-10	Stormbuoy
022-100-20	Winch
022-100-30	Rope guide
022-100-40	Control system
022-100-50	Ballast system
022-100-60	Battery power system
022-100-70	Lantern

NOTE: Some parts listed are internal

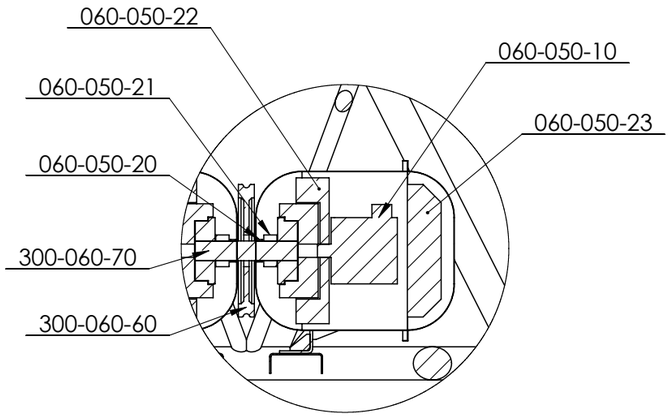
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS SURFACE FINISH: TOLERANCES: LINEAR: ANGULAR:		FINISH:		DEBURR AND BREAK SHARP EDGES		DO NOT SCALE DRAWING	REVISION P1
	NAME	SIGNATURE	DATE			TITLE: Storm Buoy	
DRAWN							
CHK'D							
APPV'D							
MFG							
Q.A				MATERIAL:		DWG NO. P101-CL903-022-01D	A3
				WEIGHT:		SCALE:1:50	SHEET 1 OF 1

Storm Buoy outlines and systems

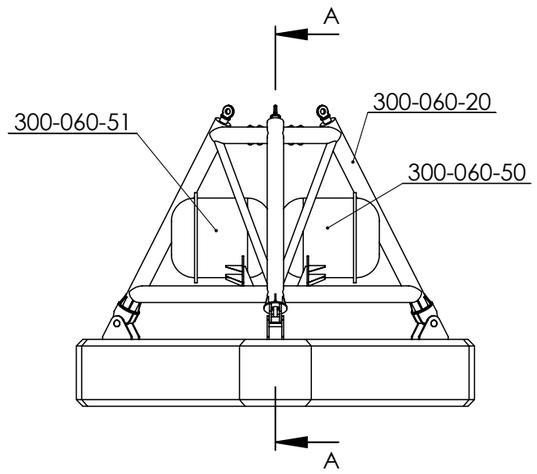
Seabed Unit system components

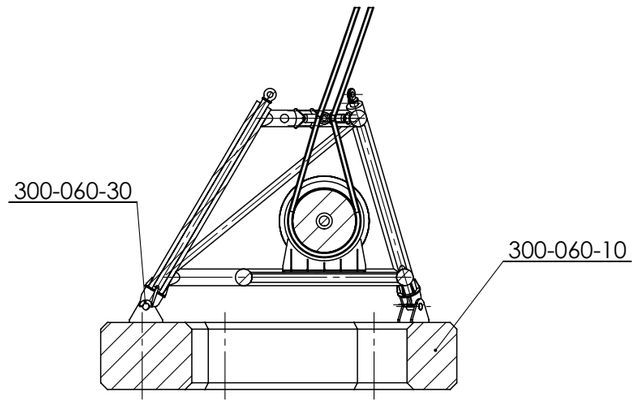


SECTION B-B

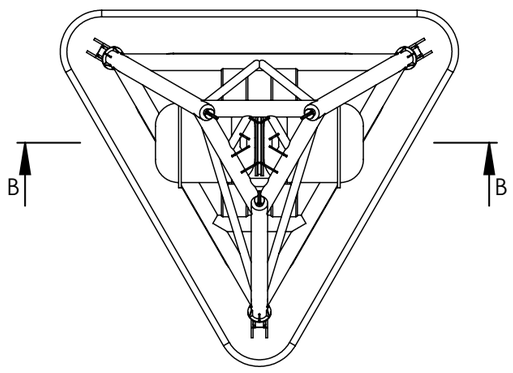


DETAIL C - Typ. pressure compartment
SCALE 2 : 75

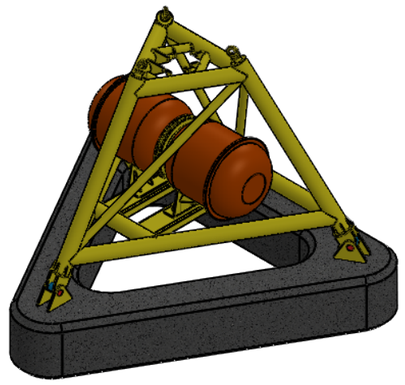




SECTION A-A



ITEM NO.	DESCRIPTION
300-060-10	Seabed concrete base
300-060-20	Seabed main steel structure
300-060-30	Maintenace release device
300-060-50	Pressure compartment 1
060-050-10	Generator 1
060-050-20	Shaft seal 1
060-050-21	Shaft bearing 1
060-050-22	Flywheel 1
060-050-23	Power Electronics 1
300-060-51	Pressure compartment 2
060-051-10	Generator 2
060-051-20	Shaft seal 2
060-051-21	Shaft bearing 2
060-051-22	Flywheel 2
060-051-23	Power Electronics 2
300-060-60	Sheeve
300-060-70	Generator shaft
300-060-80	Power cable connection chamber



NOTE: Pressure compartments similar in components

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS SURFACE FINISH: TOLERANCES: LINEAR: ANGULAR:		FINISH:				DEBURR AND BREAK SHARP EDGES	DO NOT SCALE DRAWING REVISION P1
	NAME	SIGNATURE	DATE				TITLE: Seabed Unit
DRAWN							
CHK'D							
APPV'D							
MFG							
Q.A				MATERIAL:			DWG NO. P101-CL903-300-01D A3
				WEIGHT:			SCALE:1:75 SHEET 1 OF 1

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Presentation prepaired by West Maritime AS in cooperation with MetalCad d.o.o.