



TRIDENT-3000-HEX

**3000mm dia. Ocean Buoy
with hexagonal aluminium tower
Installation & Service Manual**

Technical Specifications

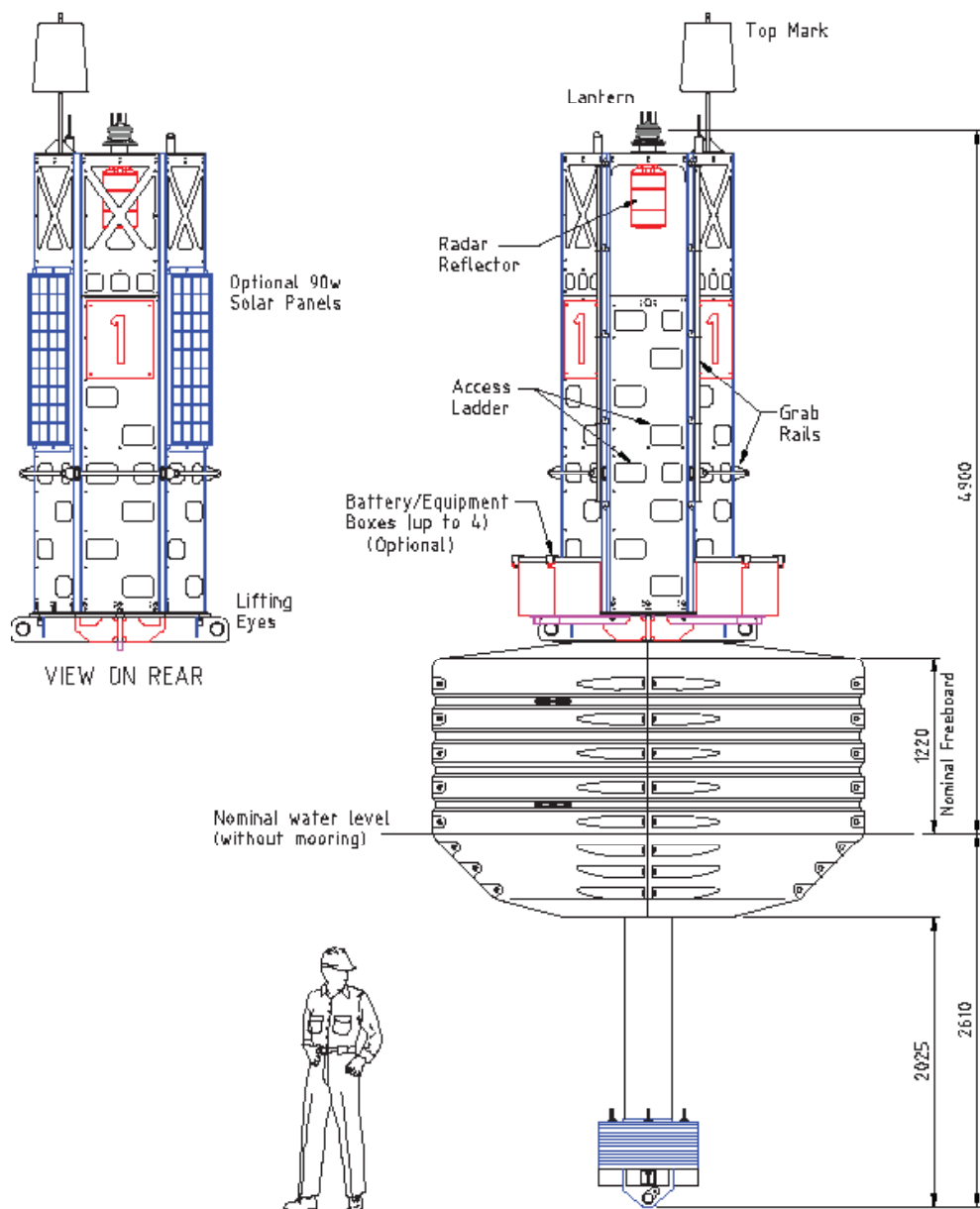


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1.0	Manual Launch	Dec 2014	G. Percy



Introduction

Congratulations! By choosing to purchase a Sealite Buoy, you have become the owner of one of the most advanced rotationally-moulded polyethylene marine buoys in the world.

Sealite Pty Ltd has been manufacturing buoys for over 25 years, and particular care has been taken to ensure your buoy gives years of service.

As a commitment to producing the highest quality products for our customers, Sealite has been independently certified as complying with the requirements of ISO 9001:2015 quality management system.

By taking a few moments to browse through this booklet, you will become familiar with the versatility of your buoy, and be able to maximise its operating function.

Sealite Buoy Division

Sealite marine buoys are manufactured on-site from rotationally-moulded UV-stabilised polyethylene, and are designed to offer a low-maintenance, high visibility solution to marine navigation.

The Sealite buoy division provides turn-key production of navigation buoys. From tooling development, raw materials selection, and production, to final testing and inspection, Sealite guarantees superior quality and fast turn-around times.

Sealite's buoy products are available in a wide range of configurations and sizes, and can be economically shipped worldwide.

Why Choose Polyethylene Buoys?

- No painting
- Inhibits growth
- Increased interval between servicing
- Routine maintenance on location
- Easily repaired in the unlikely event of damage
- Lightweight for ease of deployment and maintenance
- Environmentally friendly – no use of toxic antifouling paint

Mooring Requirements & Regulations

Please contact your local authority for any specific requirements regarding the deployment of buoys. IALA also has guidelines and recommendations that should be followed.

All information given in this manual is advisory only. Please consult with your local authority before deploying your buoy products.

Local conditions that need to be considered include:-

- Water depth
- Maximum currents
- Maximum wind speeds
- Sinker size and weight



TRIDENT-3000-HEX Ocean Buoy

The TRIDENT-3000 is one of the largest rotationally moulded buoys available, with a float diameter of 3 meters and lantern focal height of up to 5 meters.

The float section of the Trident-3000 is built from four (4) roto-moulded quadrants, which fasten together to form an incredibly robust 3 meter wide float section standing 1.8m tall. Each quadrant is moulded from UV-stabilised virgin polyethylene, and has an 18mm wall thickness.

The hexagonal tower design provides a large, robust superstructure and is built from marine grade aluminium subject to powder-coating in high visibility colours. The tower is capable of supporting additional payload.

Number of Lifting Points = 4

Visual area = 7.1m² (with daymark)

Estimated roll period (bare) = 2.2sec

SWL for 2 or more lifting points = 8630kg (mooring point)

SWL for 1 point lifting = 6000kg (deck and primary structure)

Estimated roll period (moored) = 1.6sec

SPECIFICATIONS

Refer to website www.sealite.com

ASSEMBLY INSTRUCTIONS



Please read all steps before commencing

Check Components

Unpack all components from container. Inspect all components for any damage. Please alert Sealite if any component is missing or damaged.

Float Assembly

Parts required for float assembly:

Float Section and Mooring Post	
Description	Qty
Float Sections	4
Mooring Post	1
M16 x 80mm Long S/S Bolt	*32 (24)
Ø16 S/S Flat Washer	64
Ø16 S/S Spring Washer	40
M16 S/S Plain Nut	48
M16 x 250mm S/S Tie Rod	4
Float Strap	4
* Quantity reduced by 8 when Moon Pool is fitted	

Moon Pool (Optional)	
Description	Qty
Moon Pool Mount	1
M16 x 90mm Long S/S Bolt	8
Ø16 S/S Flat Washer (3 stacks of 3)	9

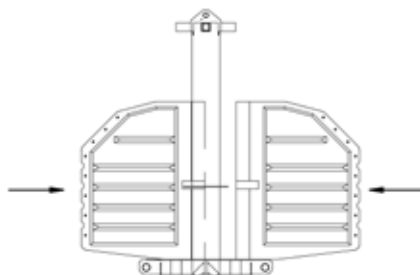
STEP 1

Position the Mooring Post upside down on flat level ground.

STEP 2

Turn the 4 x Float Sections upside down, to match the mooring post. Position the 4 x Float Sections around the Mooring Post and start securing 2 x float sections together using M16 x 80 Bolts, washers and nuts.

Coat each bolt in Anti-Seize or molybdenum disulphide Grease before fitting Nuts.



STEP 3

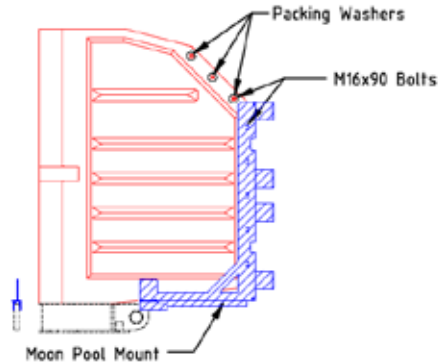
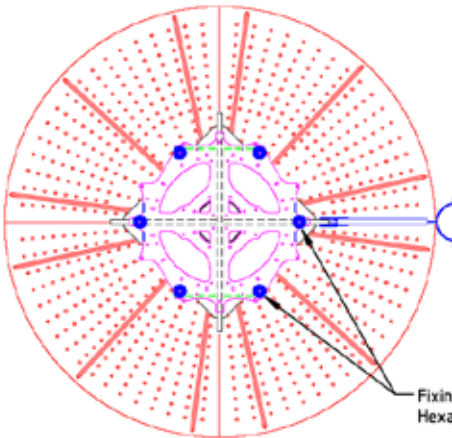
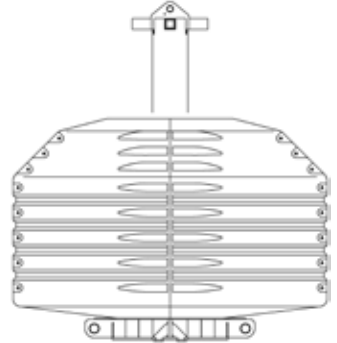
If an external moon pool is to be fitted then locate the moon pool mount between two of the float sections as shown. Align the moon pool mount and float section junction with any one of the mooring post lifting eyes. It is recommended for ease of wiring that the mount be aligned with one of the lifting eye beams which also carries one of the hex tower mounting points (see top view). The lifting eye should be trapped by the channel at the inner most end of the moon pool mount (this prevents the mooring post from spinning in the float during service).

Place a flat washer on the bolt before sliding it through the hole in the Float Section, then fit a second flat washer and a Spring washer on to the bolt before securing with a nut.

Hand tighten 2 – 4 bolts (M16 x 80) per side until all four Float sections are secured around the mooring post. *When a moon pool is to be fitted, 8 longer connecting bolts (M16 x 90) and 9 packing washers are supplied for incorporation with the float assembly as shown.*

Secure 8 x bolts down each joint on the Float Sections.

Leave the Mooring post and Float to settle for 4 hours or overnight before tightening each bolt a second time. *Giving the buoy time to relax in the fitted position will create a better joint.*



STEP 4

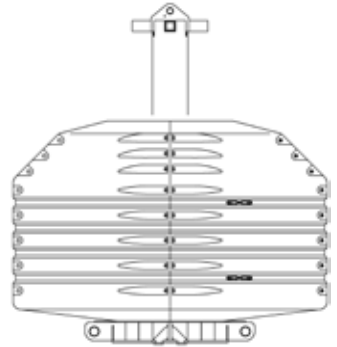
Fit and secure 2 of the 4 Float Straps around the top, and 2 of the 4 Float Straps around the bottom of the Float.

Position 2 x Float Straps on the ground and join the two Straps together by placing 1 x Tie Rod through the holes and 1 x M16 Nut on each side.

Repeat this for the second set of Straps.

Wrap the Float Straps around the Float Section and join the loose side using a Tie Rod and 2 x nuts. Repeat for the second Float Strap

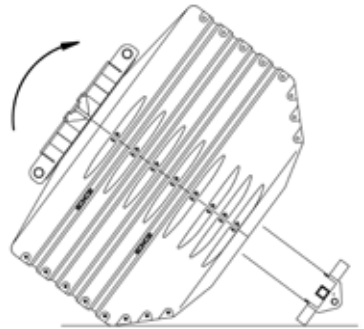
When the Float Straps are fitted in position tighten the nuts on the Tie Rods and add a Spring Washer and second nut to each side. Tighten all nuts securely.



STEP 5

Use a crane to turn the Float and Mooring Post upright.

Please Note: *The buoy weighs around 3 tonnes when fully assembled. Please be careful when rotating or otherwise lifting the Buoy.*



The buoy will be unstable after turning upright. Secure with heavy chocks and tie in place where possible. Assembly staff must be careful when working in proximity to the buoy and particularly if standing on any part of the buoy.

Hexagonal Tower Assembly

Parts required for tower assembly:

Hexagonal Tower	
Description	Qty
Hexagonal Tower with vertical grab-rails, lantern spacer, insulating spacers (on base) & optional passive radar reflector	1
Horizontal Grab Rail	5
M8 x 40mm Long S/S Cap Screw	12
Ø8 S/S Flat Washer	12
Ø8 S/S Spring Washer	12
M8 S/S Plain Nut	12

Hexagonal Tower Options	
Description	Qty
Top Mark	1
M8 x 40mm Long S/S Cap Screw	4
Ø8 S/S Flat Washer	8
Ø8 S/S Spring Washer	4
M8 S/S Plain Nut	4
Sensor Post	1
M8 x 40mm Long S/S Cap Screw	4
Ø8 S/S Flat Washer	8
Ø8 S/S Spring Washer	4
M8 S/S Plain Nut	4
Number Plate (Number or Letter per order)	3
Backing Plate	3
M6 x 25mm Long S/S Bolt	12
Ø6 S/S Flat Washer	24
M6 S/S Self-Locking Nut	12

STEP 6

Stand the hexagonal tower upright on a level surface (take care not to damage insulating spacers fitted to base of tower). Install standard and optional mechanical hardware:-

- 5 x Horizontal grab rails with M8 Socket Head Cap Screw, flat and spring washers and plain nut (12 places)
- 1 x Top Mark assembly with M8 Socket Head Cap Screw, 2 x flat washers, a spring washer and plain nut (4 places)
- 1 x Wind Sensor Post with M8 Socket Head Cap Screw, 2 x flat washers, a spring washer and plain nut (4 places)
- 3 x Number Plates and backing plates with M6 Socket Head Cap Screw, 2 x flat washers and self-locking nut (12 places)

Solar Panel Assembly

Parts required for solar panel assembly:

Solar Panels (2 x 90W)	
Description	Qty
Solar Panel (90W) fitted with mounting plates.	2
M8 x 40mm Long S/S Cap Screw	12
Ø8 S/S Flat Washer	24
Ø8 S/S Spring Washer	12
M8 S/S Plain Nut	12

STEP 7

Insert UV-stabilized cable ties in locations which are to be covered by a solar panel. Install solar panels using M10 Socket Head Cap Screw, 2 x flat washers, a spring washer and plain nut (6 places each panel). Route cables towards base of tower (or planned location of battery regulator) and tie in position using supplied cable ties. Loop surplus cable and secure somewhere inside tower and out of harm's way.

Optional Tower Mounted Electronic Equipment Assembly

Parts required for assembly:

Hexagonal Tower Lantern	
Description	Qty
Navigation Lantern	1
M10 x 30mm Long S/S Cap Screw	4
Ø10 S/S Flat Washer	8
Ø10 S/S Spring Washer	4
M10 S/S Plain Nut	4
UV-Stabilized Cable Tie	90

Hexagonal Tower Electronics (Optional)	
Description	Qty
Antenna +	Per Order
Antenna Hardware Kit	
Sensor +	Per Order
Sensor Hardware Kit	

STEP 8

Install all tower mounted electronic equipment as optional.

- Navigation Lantern with M8 Socket Head Cap Screw, 2 x flat washers, a spring washer and plain nut (4 places)
- All antennae using individually kitted fasteners
- All sensors using individually kitted fasteners

Route all cables as required and secure using UV-stabilized cable ties. Loop surplus cable and secure somewhere inside tower and out of harm's way.

Attaching Hexagonal Tower to Mooring Post

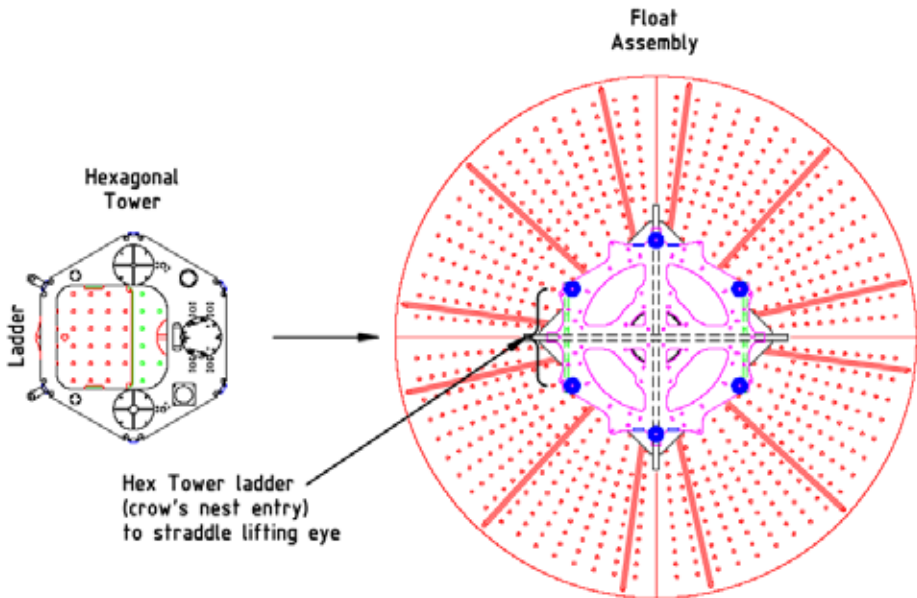
STEP 9

The hexagonal tower is to be located on the mooring post deck with the ladder centred across one of the deck lifting eyes.



Look for a pre-determined location for the tower ladder which is sometimes indicated on the mooring post

Position the float assembly so that the required location for the ladder/lifting-eye is pointing up.



STEP 10

Parts required to attach tower to mooring post:

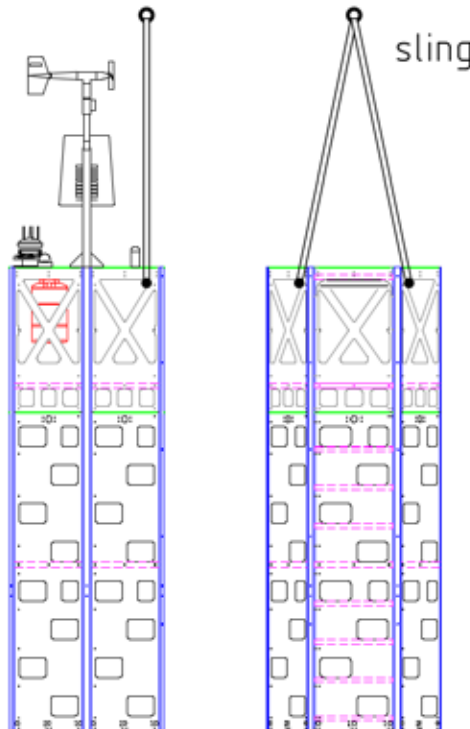
Hexagonal Tower to Mooring Post	
Description	Qty
* M16 x 120mm Long S/S Bolt, Shanked	6
Ø16 x 30mm OD S/S Flat Washer	6
Ø16 S/S Spring Washer	6
M16 S/S Plain Nut	6
* Length may vary depending on configuration	

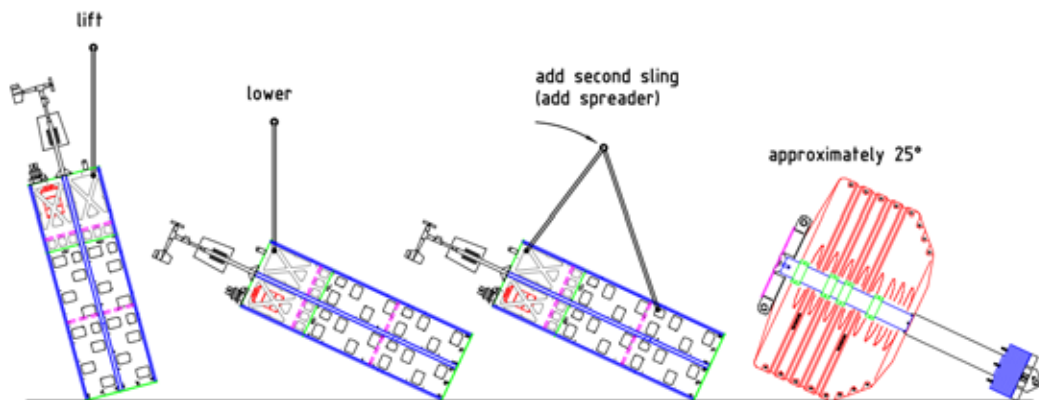
Pre-fitted to Hexagonal Tower Base	
Description	Qty
Insulating Spacer	6
M5 x 25mm Long S/S Counter-Sunk Socket Head Screw	18
M5 S/S Self Locking Nut	18

Use a sling and crane to lift the tower as shown. Tilt if necessary to match position of mooring post deck and add a second sling with optional spreader, length to suit.



- Do not use grab rails as lifting points.
- Do not use the top mark or equipment posts as lifting points.

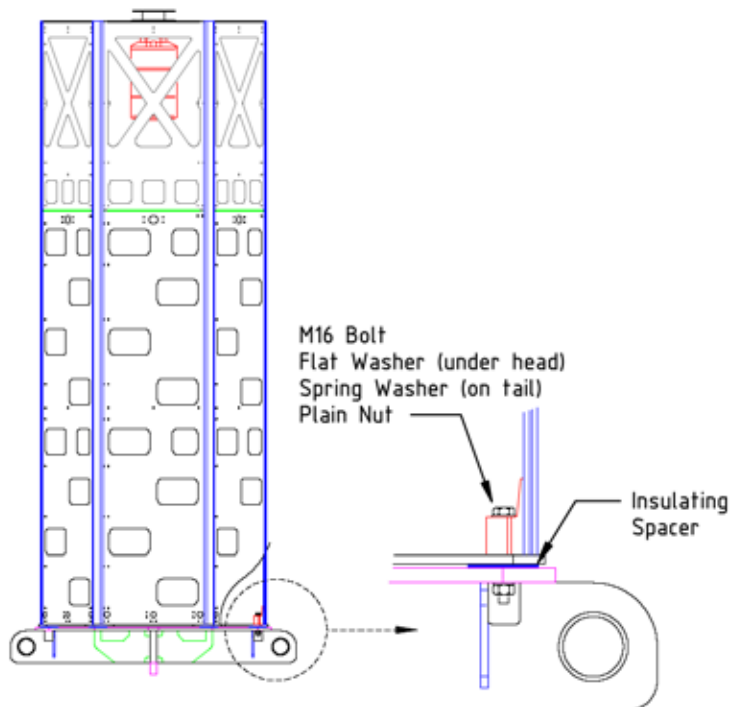




Raise the hexagonal tower into position and fix to the mooring post using M16 bolt, plain washer, spring washer and plain nut (6 places). Tighten to 152Nm (112 ft.lb).

Coat each bolt and nut with an anti-seize compound before fitting.

Check that all M16 bolts, nuts and washers have been secured correctly.



Battery/Equipment Box Assembly

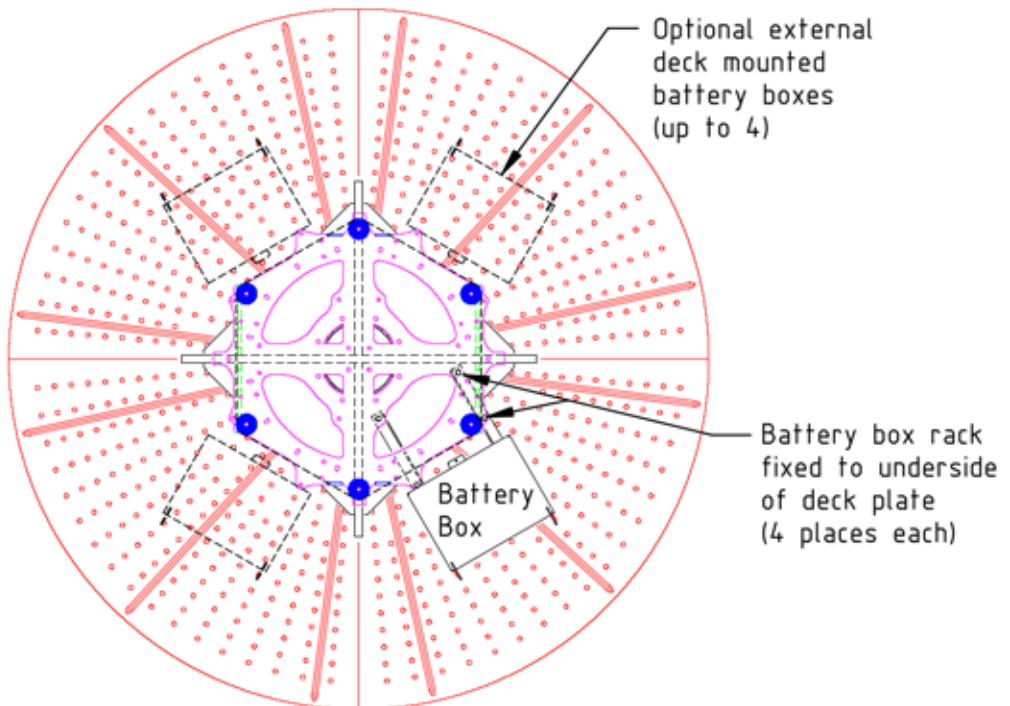
Parts required for battery/equipment box assembly:

Battery/Equipment Boxes	
Description	Qty
External Battery Box with Lid and Mounting Rack	Per Order
M12 x 50mm Long S/S Bolt	4 per Battery Box
Ø12 S/S Spring Washer	4 per Battery Box
M12 S/S Plain Nut	4 per Battery Box

STEP 11

Fix battery boxes to the underside of the mooring post deck with M12 Bolt, spring washer and plain nut (4 places ea.), tighten to 61.2Nm (45 ft.lb).

Coat each bolt and nut with an anti-seize compound before fitting.



External Moon Pool Option

Parts required for optional moon pool assembly:

External Moon Pool (Option)	
Description	Qty
Saddle	4
M12 x 60mm Long S/S Bolt	8
Ø12 S/S Spring Washer	8
M12 S/S Plain Nut	8
Sensor Cage	1
Cage Link	1
Tube Cap	1
M10 x 45mm Long S/S Bolt	4
Ø10 S/S Spring Washer	4
M10 S/S Self Locking Nut	4
UV-Stabilized Cable Tie	10

Moon Pool Equipment	
Description	Qty
Sensor +	Per Order
Sensor Mounting Hardware	

STEP 12 (EXTERNAL MOON POOL OPTION)

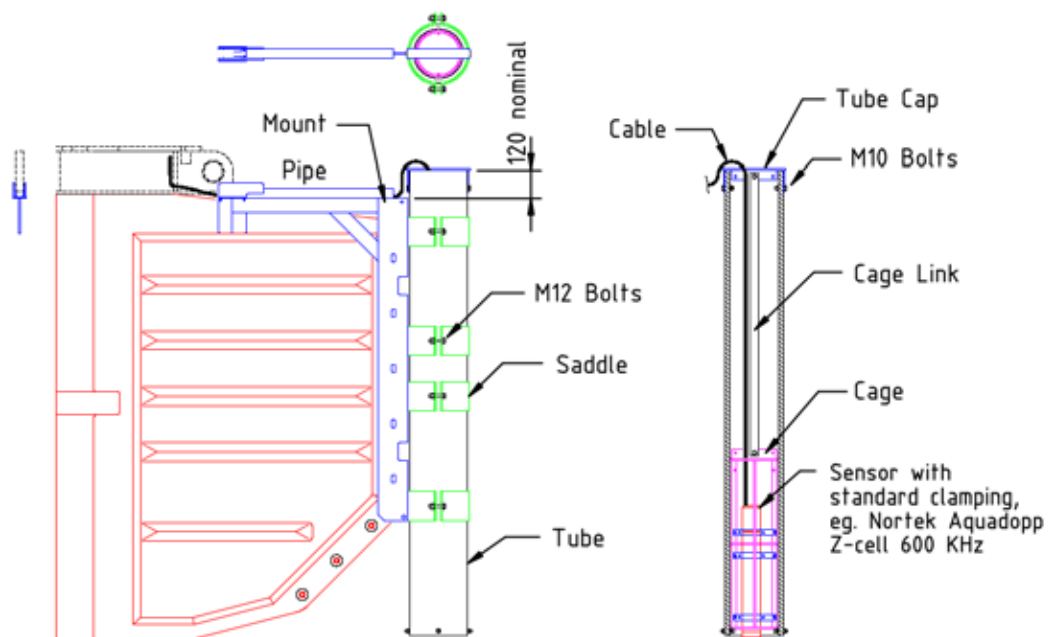
If an external moon pool is being fitted then clamp the moon pool tube against the moon pool mount using saddles as supplied. Fix using M12 bolt, spring washer and plain nut (8 places).

Install the sensor in the moon pool cage using standard sensor clamps.

Connect the cage link to the top end of the cage and to the middle mounting point on the pipe cap using M10 bolt, spring washer and self-locking nut (2 places). Run sensor cable through cage and along the cage link. Tie the cable in place using UV-stabilized cable ties.

Insert the cage and link into the top of the moon pool tube and secure the cap in place using M10 bolt, spring washer and self-locking nut (2 places). Run sensor cable through the mount pipe, under the deck beam and past the deck beam to the data logger. Tie in place as before.

Coat each bolt and nut with an anti-seize compound before fitting.





Installation of Outstanding Electronic Equipment

STEP 13

Install any outstanding electronic equipment (eg. solar regulator, data logger, terminal box) in the battery boxes and install associated wiring. Tie all cables in place using UV-stabilized cable ties.

STEP 14

Install and secure batteries in place using supplied battery clamps.

STEP 15

Connect all negative (-) and positive (+) leads to the battery terminals.

Cover the terminals with a protective grease after connection and testing is finalised.

STEP 16

Test the lantern by covering it with a dark cloth or jacket and wait 1 minute for activation.

Refer to the lantern manual for information on setting flashing codes, intensity or other variables and for troubleshooting.

Mooring Post Ballast Assembly

STEP 17

Parts required:

Mooring Post Ballast Collars	
Description	Qty
Mooring Post Ballast Collar (Half-Doughnut)	*24
Rubber Insulator Mat, Large	1
Rubber Insulator Square, small	4
Ballast Rod, M20 x 600mm Long (Standard)	4
Ø20 x 60mm OD S/S Flat Washer	8
Ø20 S/S Spring Washer	8
M20 S/S Plain Nut	8
* Quantity depends on thickness of collars and on buoy application. Nominal overall height of collar stack is 325mm ± 25mm (see diagram below).	

Lift the Buoy, **ONLY** using the Lifting Eyes on the Mooring Post.

- Position the Rubber Collar Insulator around the base of the mooring post. Secure it in position.
- Position 4 x Rubber Ballast Mounting Squares on the legs of the Mooring Post.
- Fit 2 x Ballast Plates on to the base of the Mooring Post.
- Position a second set of 2 x Ballast plates on top of the first set with the joint perpendicular to the first pair, ie. criss-cross the joints.
- Secure the plates to the mooring post using 4 x 20mm Ballast Rods, Nuts, Flat and Spring Washers.
- Weld the nuts to the Ballast Rod when the assembly is complete.

Coat each bolt and nut with an anti-seize compound before fitting.

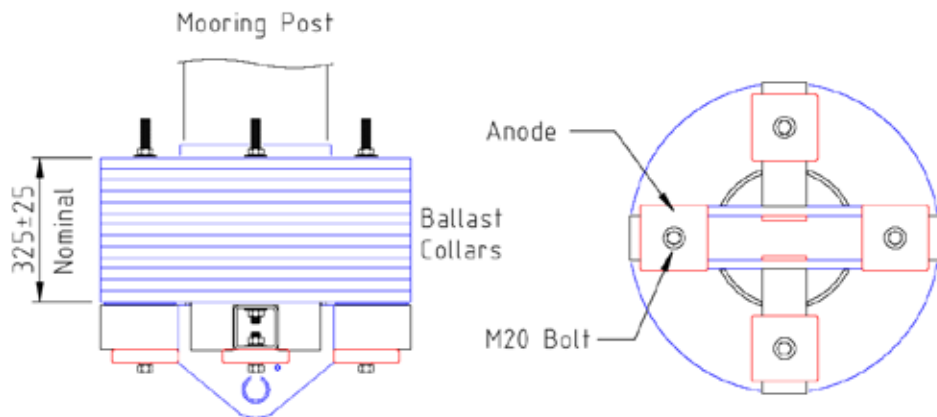
STEP 18

Parts required:

Anodes	
Description	Qty
Anode (150x150x25, NW11B1)	4
M20 x 70mm Long S/S Bolt	4
¾" S/S Flat Washer	4
Ø20 S/S Spring Washer	4
M20 S/S Plain Nut	4

Fit sacrificial anodes to the base of the mooring post using M20 bolt (tail-up), penny washer, spring washer and plain nut (4 places).

Coat each bolt and nut with an anti-seize compound before fitting



STEP 19

Parts required:

Mooring Pin	
Description	Qty
Mooring Pin	1
Mooring Pin Sleeve	1
M48 S/S Plain Nut	1
M10 x 30mm Long S/S Bolt	1
Ø10 S/S Spring Washer	1
Ø5/16" x 3" Long S/S Roll Pin	1

Fit and secure the Mooring Pin in the base of the Mooring Post.

Position and Secure the Mooring Pin to the base of the Mooring Post using the M10 Bolt and Spring Washer.

Tighten the M48 Nut on to the Mooring Pin and secure it by drilling and fitting a 5/16" Roll Pin.



Please do not leave the Buoy lying on the Float Sections which may deform while in this position if left for more than 1 hour

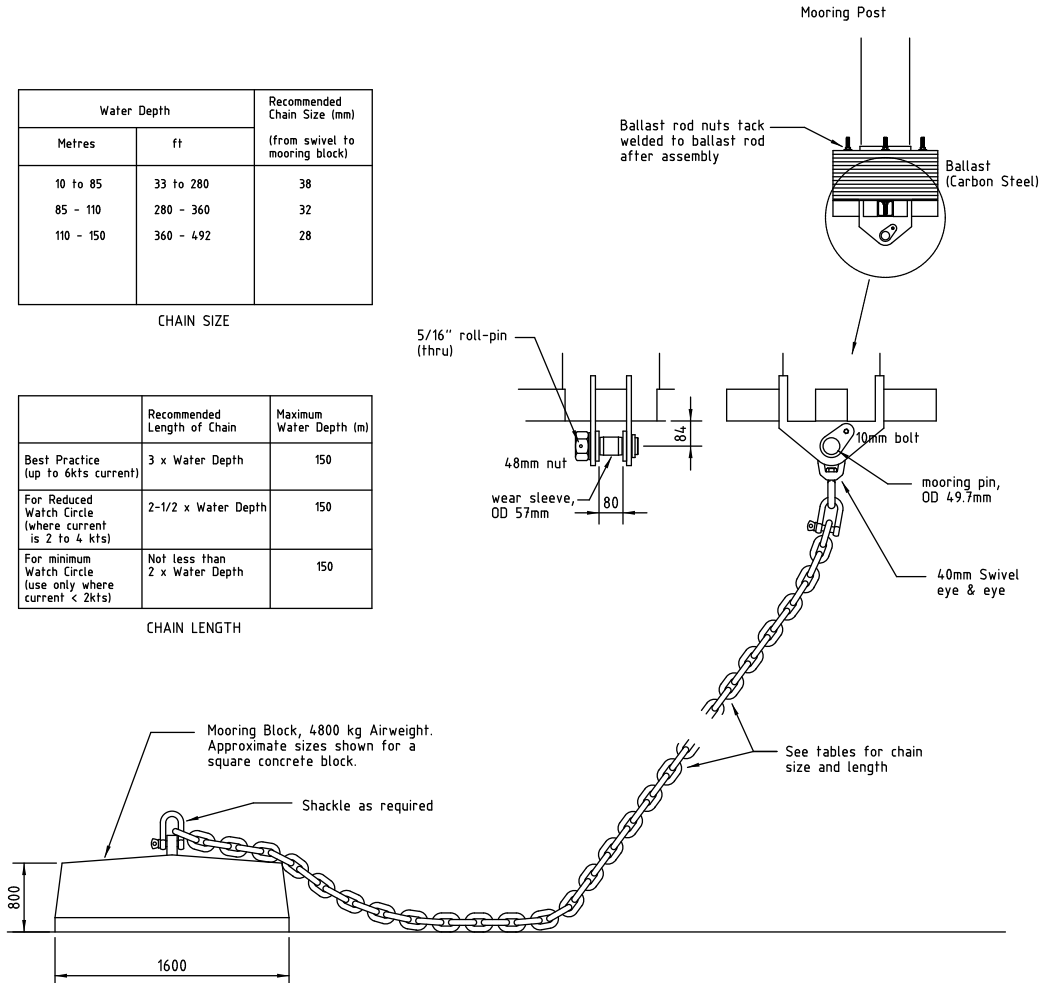
Trident-3000 Mooring Diagram

Water Depth		Recommended Chain Size (mm) (from swivel to mooring block)
Metres	ft	
10 to 85	33 to 280	38
85 - 110	280 - 360	32
110 - 150	360 - 492	28

CHAIN SIZE

	Recommended Length of Chain	Maximum Water Depth (m)
Best Practice (up to 6kts current)	3 x Water Depth	150
For Reduced Watch Circle (where current is 2 to 4 kts)	2-1/2 x Water Depth	150
For minimum Watch Circle (use only where current < 2kts)	Not less than 2 x Water Depth	150

CHAIN LENGTH



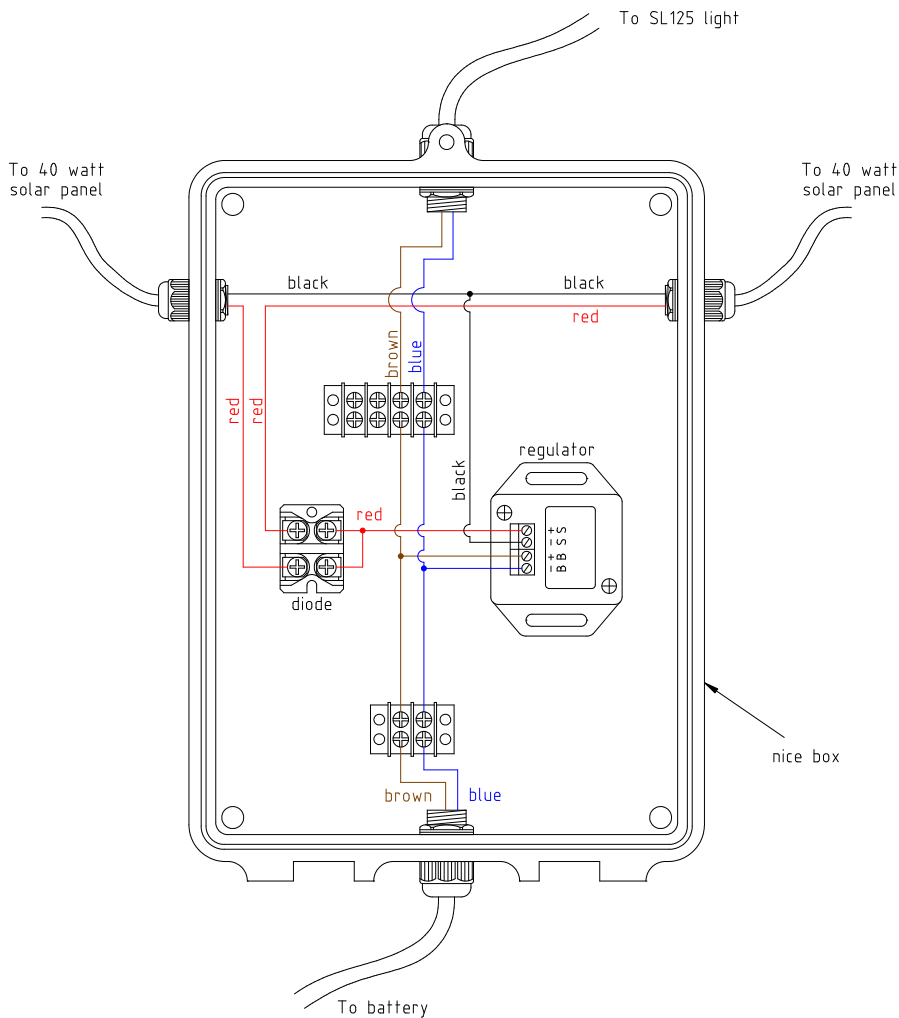
General Note

Recommendations given herein are advisory only. As each buoy installation varies, the buoy operator should establish fitness for purpose prior to installation.

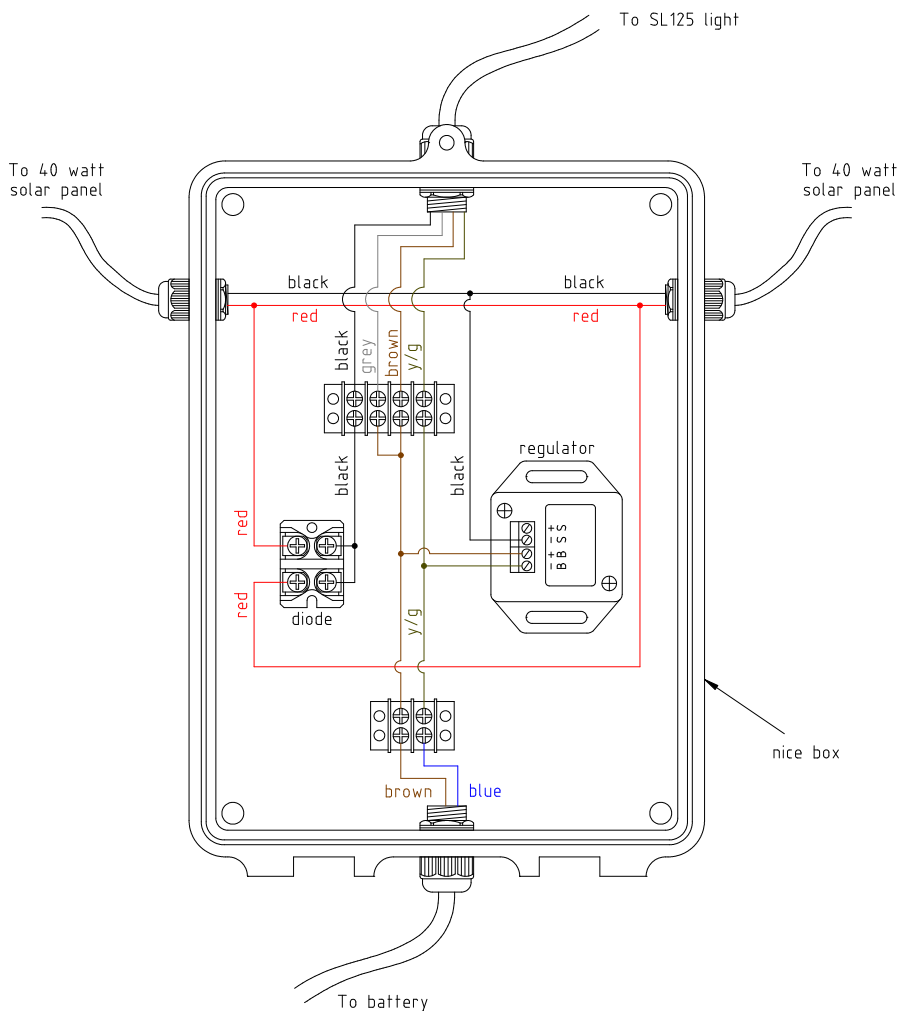
NOTES:-

- 1/ Shackles, swivel and chain are load rated products.
- 2/ All shackle pins are to be positively locked, eg using 3mm S.S. wire to lock pin eye, or use shackle pin with nut and split-pin.

Standard Wiring Diagram



GSM Wiring Diagram





Marine Buoy Maintenance

Sealite Marine Buoys are designed to require very little maintenance. We recommend the buoy be inspected annually. Inspection may need to increase depending on the local conditions and the position of the buoy.

IALA Recommendation AISM E-107 suggests moorings are inspected annually.

Marine Buoy – Annual Maintenance

- Visually inspect buoy for damage
- Inspect the top mark for any damage. Repair any broken or damaged section.
- Clean buoy of animal debris

Mooring – Annual Maintenance

- Check and clear the tail and ride chains from shells and algae.
- Check for wear on any swivel and shackle axis and check the tapered pins on the mooring pin. Any worn swivels and shackles must be replaced.
- Check the free movement of each swivel around its head. If any swivel head sticks it must be replaced.
- Check every link of the thrash length of the chain. Check the diameter of the nips and sides and also inspect the welds on every link.
- If depth allows, a worn riding chain may be reversed.
- Change a chain when any link shows excessive wear. Chain must be replaced if any link wears to less than 3/5 of the original diameter.

Mooring – Biannual Maintenance

- Inspect the ground chain and sinker.

Lanterns – Maintenance

- Please refer to the Installation Manual for the specific Marine Lantern fitted to the Buoy.



Notes

Sealite Buoy Warranty

Refer to website www.sealite.com



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