SEISMIC COMPRESSOR CONTAINER SPECIFICATION

Section 1 Container Construction

1.0 General

The container is to be a standard 20' x 8' x 8' 6" high shipping container to ISO specification conforming to American Bureau of Shipping TIR and IMCO approval capable of 9 high stacking and UIC and CSC registration plate.

Container is to have a standard pair of fork lift lifting pockets totally enclosed on all sides as the floor. The underside of the container is to be fully plated with 3mm thick minimum steel plate, fully welded to container.

1.1 Floor

Mild steel open mesh tread plate with a non-slip coating to allow access to service compressors and ancillary components.

1.2 Ceiling

Roof shall be a standard corrugated construction and have 75 by 50 by 6 RSA cross members welded internally to the corrugated skin at all contact points. Cross members to be positioned at 1200mm centres maximum to support the ceiling structure.

1.3 Walls

Standard Container construction, no specific requirements. Acoustic panelling which could be removal and act as thermal insulation.

1.4 Doors

Standard container double doors on one end of the container, single access door on other end. Removable side panels needed for maintenance.

1.5 Services

Service entries are to be located at the position of, the recess is to be approx 900mm high and 500mm deep and manufactured from 3mm plate fully welded in, sitting on the top edge of the container bottom rail. The bottom of the recess is to have a fall of 25mm to the outside of the container to allow for drainage.

Lycab for electrical and air.

IP monitoring of the systems thus network Cat 7 connection required.

The recess is to have a hinged cover plate with a latch.

A 316 stainless steel earthing boss, 25mm diameter x 25mm long, drilled and tapped M12 shall be fully welded in the base of the box.

Service entry recess is to accommodate: -

Fresh water inlet supply – Connection to be a suitable size to tie in with the deck supplies from the vessel. BAS need to know what size pipework the container has and whether there is one circuit for both compressors or one each. Supplier to determine what flow rate they require. The ship is fitted with PN16 hose connections.

Air compressor line out – exact ship details not available at this time but will be added in due course.

440V three phase IP67 rated appliance inlet.

10 way socket for fire alarm and communications connection to ship.

Lycab gland assembly size approx. 120 mm x 160 mm for gas pipe/cable entries.

1.8 Painting

Container to be finished to the following specification or equivalent:-

Top and sides

Surfaces to be shot blasted to SAE. 2.5
Apply first coat of Temishield EPY 672 HB
Epoxy Micaceous Iron Oxide to 174 microns of dry film thickness.
Apply second coat of Temishield ERV series.
Apply coat white epoxy intermediate coat to 125 microns of dry film thickness.
Apply final coat of red vinyl container paint to 75 microns dry film thickness.

Underside

Surfaces to be shot blasted to SAE. 2.5
Apply first coat Temishield EPY 672 HB
Epoxy Micaceous Iron Oxide to 175 microns of dry film thickness.
Apply second coat Temishield Coal tar and epoxy to 300 microns.

1.9 Container Markings

Container is to be fully marked in accordance with ISO regulations to include the owners mark "BASU – XXX XXX X**"** (number to be confirmed). Container is to be fitted with CSC Safety approval plate. A company manages the BAS numbering of containers. Details will be provided when required.

Section 2 Interior Coatings

2.0 Floors, Walls, Ceiling and Doors

Maintenance access walkway to be provided (refer to section 1.1 for details).

Section 3 Electrical Services

3.0 Design and Installation Standard

The design and installation standard of the electrical services shall conform fully to *BS 7671: Requirements for Electrical Installation and the Regulation and Recommendations for the Electrical and Electronic Equipment of Ships* and *IEE 17th edition.*

Lighting and power circuits are to be wired in single core silicone rubber cable contained within high impact PVC conduit.

3.1 Electrical Supply

The electrical supply to the container will be 440V 60Hz 160A 3 phase and will be provided by the vessel.

The incoming supply is to be connected to the container via an appliance inlet socket arrangement located in the services compartment. The appliance inlet is to be 4 pin (3P + E), IP67, rated for 440V 60Hz 160A to IEC-EN60309-2

Double pole miniature circuit breakers are to be provided for the following circuits:-

Lighting circuit.

Fire alarm panel.

240V double socket to be provided IP67

Spare

3.2 Emergency Stop

Emergency stop buttons should be located in close proximity to each compressor, there should also be an emergency stop located at the entrance doorway.

Section 4 Electrical Installations

4.0 Lighting

The main laboratory is to be lit by corrosion resistant LED light with covers to IP56 or above.

The wattage and quantity of LED lights is to be determined to achieve an average illuminance of 500 lux.

Two emergency light units to IP56 or above are to be positioned evenly spaced over walkway. These lights are to have external battery isolation switches fitted.

Local switching is to be provided at the entrance door way either end of the container, adjacent to the doors using two way double pole light switches to IP56 or above.

4.1 Fire Alarm / Communications

A suitable junction box with terminal connections to be provided by the allow connection of the container systems to the ship. The junction box to be rated to IP66.

The following items will be wired in:

A ten way female connector fitted with dust cover to IP65 (Manufacturer – Contact Connectors type H-BE) is to be installed in the services compartment to allow connection of the container to the Ships fire alarm system and communications. This socket is to be connected to a suitable junction box in the lobby which is to have the following items wired in:-

Two smoke / heat detectors compatible with the ships fire detection system.
Two fire alarm call points.
One alarm flashing beacon.
One loud speaker compatible with the ships P.A. system.
One telephone compatible with the ships telephone system. (Option to use headset if compressor is running).

4.2 Electrical Cable

25m Long hook up cable suitable for connecting to ships supply to be supplied. Cable to be flexible braided style suitable for use on a ships' deck. Fitted IP67 plug / sockets either end.

Section 5 Seismic Compressors

5.0 Compressor details

A container comprising two compressors which can each independently compress 285m3/hr to 207 bar. There must be an option to allow both compressors to be run in series thus compressing 570m3/hr to 207 bar. The compressors need to have a proven track record both in a marine environment and also in a containerised marine environment. The compressors will be used for seismic surveys and will need to operate days at a time and located on open deck.

The compressor must conform to the following design standards.

5.1 Compressor design:

- Designed for continuous use in marine environment
- Constructed for high pressure applications up to 350bar
- Robust and long life design with a minimum of at least 10 years
- Lloyds Register design appraisal to ASME VIII design code.

Item	Specification	Document Number
1.	Safety devices for protection against excessive pressure – Part 1: Safety valves	ISO 4126-1
2.	Specification for testing of positive displacement compressors and exhausters. Methods for simplified acceptance testing for air compressors and exhausters	BS 1571-2:1975
3.	Mechanical vibration -- Evaluation of machine vibration by measurements on non-rotating parts -- Part 1: General guidelines	ISO 10816-1
4.	Metallic tube connections for fluid power and general use Part 1: 24 degree cone connectors	ISO 8434-1:2007
5.	General tolerances - Part 1: Tolerances for linear and angular dimensions without individual tolerance indications	ISO 2768-1:1989
6.	Metallic products. Types of inspection documents	BS EN 10204:2004
7.	Compressors and vacuum pumps – Safety requirements – Part 1: AIR compressors	EN 1012-1
8.	Acoustics - Noise test code for compressors and vacuum pumps: Engineering method	EN 2151:2008-08
9.	Electrical installation & control panel in accordance with the Marine Equipment Directive (MED).	2014/90/EU

5.2 Compressor operation:

- Compressor to be operated via Variable Speed Drive (VSD) allowing compressor output to be turned down to 50% of maximum operating condition.
- Soft motor start for minimum peak load current.
- Compressor to be controlled via PLC control cabinet with ability to interface with vessel monitoring systems. The system to allow for remote monitoring anywhere on the ship (via an IP based network).
- PLC control logic to enable speed reduction of compressor based on output requirements of seismic process. (to be discussed with customer)
- Seismic container suitable for storage (with power) at -35°C and operation at -20°C.

5.3 Paint specification:

- Marine grade paint spec for operation in salt water conditions
- Primer Examplar: Cromadex 2100
- Topcoat Examplar: Cromadex 222

Section 6 Documentation

6.0 Manuals

Five paper copies of a detailed operation and maintenance manual are to be supplied with the container along with a PDF version. This is to include full manufacturer's information on the compressors.

6.1 Certification

Certification is to include: Container CSC, paint finish, electrical tests and commissioning tests.

Section 7 Standards

7.1 Standards

A mix of International and British standards have been used throughout this specification, it should be noted that these do not always fully equate with equivalent European classifications. Should a Contractor utilise an alternative standard they are asked to confirm and justify that the equivalence for the particular material or procedure is either equivalent or superior to the quoted standard.