



CURVETECH COMPENSATOR

1 Pint – EV 4002-1

TECHNICAL MANUAL

SMD Reference: EV 4002-1-1 pint

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1. INTRODUCTION

This document is the technical manual for SMD's Curvetech 1 pint compensator.

This document describes the specification, installation, operation and maintenance of this compensator.



SAFETY

2.1 SMD Statement on Product Safety

SMD view system safety as a critical property of all equipment that they manufacture.

SMD strive to:

- Remove or minimise hazards inherent in a system to the greatest practical extent.
- Provide control measures for residual hazards.
- Provide the users with the required information and warnings to avoid, or take precautions against, residual hazards.

Client Responsibilities

- Ensure that all personnel have read the required documentation to ensure they are operating safely.
- Equipment supplied by SMD is as safe as practicality permits regarding standard operation, maintenance and direct access to equipment, however due to the variations in installation SMD cannot foresee all hazards once installed on the clients vessel, therefore SMD shall not be liable for safety in the area where the equipment is installed, or for any deviations from standard operations or installation.
- During standard operations, it is unnecessary for personnel to be in close proximity to the machinery apart from when routine operational maintenance is carried out.
- It is the client's responsibility to provide adequate safety measures and procedures for the protection of personnel, including guards or other means to prevent unauthorised access to equipment.
- As the equipment is normally operated in a marine environment, safety measures pertaining to this must be taken into account and incorporated in the client's safety procedures.
- Training on the equipment and compliance with safety procedures are the responsibility of the client.
- All personnel must observe established safety procedures

2.2 Recommended Safety Precautions

Safety guidelines for handling, installing, operating and maintaining SMD equipment are given below. Specific precautions for protection of personnel and equipment are also provided.

The client is urged to incorporate these safety guidelines into their own safety procedures and make sure that all personnel are fully aware of these.



2.3 General Precautions

Safety devices provided by SMD are primarily intended for the protection of personnel and secondarily for the protection of the equipment.

Only suitably qualified and competent personnel should install, operate or maintain this equipment.

Personnel must fully understand and follow safe operating procedures at all times during the operation and maintenance of the equipment covered by these manuals.

The person in charge of operations must always have a clear view of the deck equipment.

When operations are conducted at night or in poor visibility, ensure that the equipment and immediate area around it are adequately illuminated.

Ensure that the work area is easily accessible without obstruction.

Route cables and hoses through separate protection channels or conduits wherever possible.

Ensure that all guard, guardrails and other protective devices are in position before commencing any operation.

Never wear loose clothing when working with moving machinery.

When there is uncertainty that a circuit is de-energised, it must be considered “live” at all times. This may be taken to mean electric or hydraulic circuits.

Isolate, lock-off and tag all electrical power sources before making any connections or disconnections or working on circuits.

Many critical components of the equipment may be subject to wear or damage and other deterioration, which reduces their normal useful life.

The equipment design provides safety margins taking into account normal wear and tear, however, in the case of extreme wear duty or known overload; the appropriate steps should be taken to rectify any problem and return the system to within its original specification.

If replacement is neglected, components can reach a point where they constitute a safety hazard; similarly, failure to maintain mechanisms necessary to assure correct and proper operation may also constitute a safety hazard.

Safety guidance may also be found in the relevant proprietary information manuals.



2.4 Specific Precautions

The equipment is manufactured from various grades of steel and aluminium.

On no account should welding be undertaken on any of the equipment without implementing approved weld procedures appropriate to the materials involved; failure to do this could endanger life and invalidate the certification of manufacture.

Hydraulic relief valves are one of the most important safety features and must never exceed manufacturer's recommended settings.

Only suitably qualified and competent personnel may perform any testing and re-adjustment of pressure relief devices.

Under no circumstances must anyone undo the main tie bar fixings without restraining the end plate as the unit contains stored energy in a large spring. Failure to take necessary precautions could result in a high risk accident due to the consequences of the uncontrolled energy.

Written records of inspection and maintenance activities should be maintained and regularly updated.

2.5 Warnings and Cautions



WARNING

- Statements outline minimum safety requirements to be observed when operating the equipment and during maintenance procedures.

Ignoring these warnings could result in serious injury or death of personnel.



CAUTION

- Statements call particular attention to a step in a procedure that, if not followed, could result in damage to, or destruction of, equipment.



2. SPECIFICATIONS

Type	
Rolling Diaphragm with internal spring	
Pressure at Max. volume	
0.7 bar (10 psi)	
Total Volume	
0.57 litres (1 imp. Pint)	
Hydraulic connections	
2 x 9/16" UNF SAE J475	
Materials	
Body	Acetal
Spring	316 Stainless steel
Diaphragm	Fabric reinforced nitrile rubber
Mounting method	
4 x M8 bolts in base	
Dimensions	
Diameter	114mm
Length (Empty)	258mm
Length (Full)	378mm
Weight	
In air (Empty)	1.75kg
In air (Oil filled)	2.5kg
In seawater (Oil filled)	0.75kg



3. 1 PINT COMPENSATOR EV 4002-1 ASSEMBLY PROCEDURE

- Degrease compensator piston (Item 12) and piston position indicator (Item 11). Place narrow end of position indicator inside compensator piston and align hole. Push piston indicator home until shoulder comes into contact with piston.
- Degrease compensator thrust bearing (Item 9) and compression spring (Item 8). Slide thrust bearing inside spring until shoulder is flush with base of spring.
- Slide thrust bearing end of spring over position indicator and into piston.
- Place securing cap (Item 4) over end of diaphragm and align holes. Secure in place using M5 x 12mm socket head cap screw (Item 5) and one M5 sealing washer (Item 6).

Note: - Do not exceed maximum torque of 5Nm.

- Degrease pressure housing (Item 3) and spring housing (Item 10). Place diaphragm end of piston assembly inside pressure housing and align holes. Place spring housing over spring and push down whilst aligning holes.
- Use eight M5 x 30mm socket head cap screws (Item 13) with Aqualube grease on threads (or equivalent), eight M5 self locking nuts (Item 15), and 16 x M5 flat washers (Item 14) to fasten pressure housing and spring housing together, ensuring that all eight bolts pass through holes in compressor diaphragm.

Note: - Do not exceed the maximum torque of 5Nm.

- To dismantle the compensator perform the above steps but in the reverse order. It should be noted that although the spring is not very powerful, care should be taken when separating the compensator spring housing (Item 10) from the compensator pressure housing (Item 3). Loosen the nuts in small increments alternatively.



4. PARTS LISTS

5.1 PARTS LIST EV 4002-1 – 1 PINT COMPENSATOR

See parts list (page 14)



5. SERVICE AND SPARE PARTS

6.1 SERVICE RETURNS PROCEDURE

- The compensator should be suitably packaged and returned to SMD freight paid after advising SMD of the required service work.
- A maintenance/failure report by the customer is required.
- A quotation for service/repair will be provided by SMD.
- An order to service/repair the unit is required before work can commence.

6.2 SPARE PARTS

Refer to the attached parts list and general assembly drawing. Ordering by SMD part number reduces the risk of wrong parts being provided.



6. DISTRIBUTORS

Contact SMD Limited for a current list of distributors:-

- Telephone :- ++44 (0) 191 234 2222.
- Fax :- ++44 (0) 191 234 8599.
- E-mail :- info@smd.co.uk
- Web Site :- <http://www.smd.co.uk>
- Address :- Soil Machine Dynamics Limited.
Turbinia Works
Davy Bank
Wallsend,
Tyne and Wear,
United Kingdom.
NE28 6UZ.

SMD have a network of distributors that can provide in-field support for Curvetech Products in their relative areas.



7. GENERAL ARRANGEMENT DRAWINGS

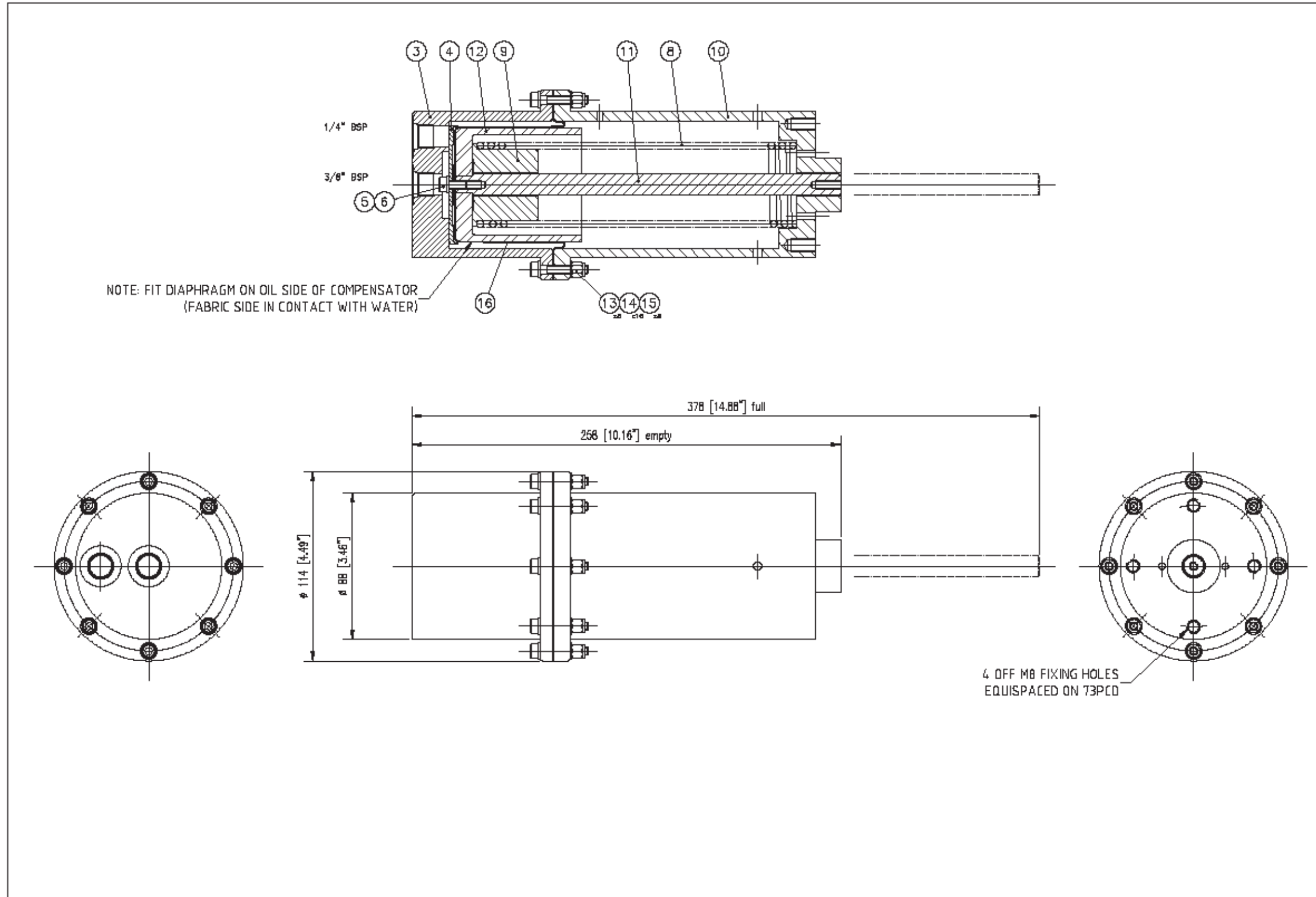


Figure 1 – General Arrangement 1 PINT PRESS COMP 10PSI - EV4002-1 – 1/2



No.	Part	Description / Size	Qty
3	OV 4180-2	COMPENSATOR-248 PRESS.HOUSING / 6000M	1
4	OV 4181-2	COMPENSATOR-248 SECURING CAP / 6000M	1
5	OB 1028	BOLT M5 x 12 SHCS A4 SS / M5 x 12	1
6	OW 1013	WASHER M5 SEALING / M5	1
8	OV 4167-3	1 PINT SPRING 0.060 / 0.15KGF/CM2	1
9	OV 4182-2	COMPENSATOR-248 THRUST BEARING / 6000M	1
10	OV 4183-2	COMPENSATOR-248 SPRING HOUSING / 6000M	1
11	OV 4184-1	Compensator-248 Piston Pos Indicator SS	1
12	OV 4185-2	COMPENSATOR-248 PISTON / 6000M	1
13	OB 1026	BOLT M5 X 30 SHCS A4 SS	8
14	OW 1011	WASHER M5 FLAT FORM A	16
15	ON 1018	NUT NYLOC M5	8

Figure 1 – General Arrangement 1 PINT PRESS COMP 10PSI - EV4002-1 – 2/2



