



CURVETECH RESERVOIR

18 Litre – AB5673

TECHNICAL MANUAL

SMD Reference : 18 Litre reservoir

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INTRODUCTION

This document is the technical manual for SMD's Curvtech 18 litre compensator.

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

All 18 litre compensators are fitted with linear transducers to regulate the voltage. The linear transducers regulate the voltage by keeping it proportional to the amount of oil that is in the compensators.



SAFETY

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

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.



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.

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.

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



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.



SPECIFICATIONS

Type	
Rolling Diaphragm with nested external spring.	
Pressure at Min. volume	
0.5 bar (7 psi).	
Pressure at Max. volume	
0.9 bar (14 psi).	
Total Volume	
18 litres (Variable volume = 6.3 litres).	
Hydraulic connections	
7 x 9/16" UNF SAE J475. 2 x 7/16" UNF SAE J475. 1 x 1½" SAE 3000. 1 x 2½" SAE 3000 suction port.	
Materials	
Body	Polycarbonate, Acetal.
Ends	Aluminium Alloy/Nylon.
Diaphragm	Fabric reinforced nitrile rubber.
Mounting method	
M10 fixing holes.	
Dimensions	
Diameter	255mm
Length (Excl. transducer)	630mm
Weight	
In air (Empty)	21 kg
In air (Oil filled)	36kg
In seawater (Oil filled)	9.5kg



18 LITRE RESERVOIR MAINTENANCE

Replacing the Suction Strainer

- Ensure the reservoir is fully drained of oil.
- Remove 12 off M6 bolts (items 14, 19 and 20) to detach the suction housing (item 1) from the reservoir block (item 9).
- Remove the suction strainer (item 10) from within the suction housing.
- Remove any residue from inside the suction housing (item 1 and the reservoir block (item 9).
- Fit the new suction strainer onto the fitting (item 21) - tighten the strainer up by hand.
- Fit the suction housing (item 1) onto the reservoir block (item 9) using the M6 bolts and washers (items 14, 19 and 20).

Replacing the Rolling Diaphragm

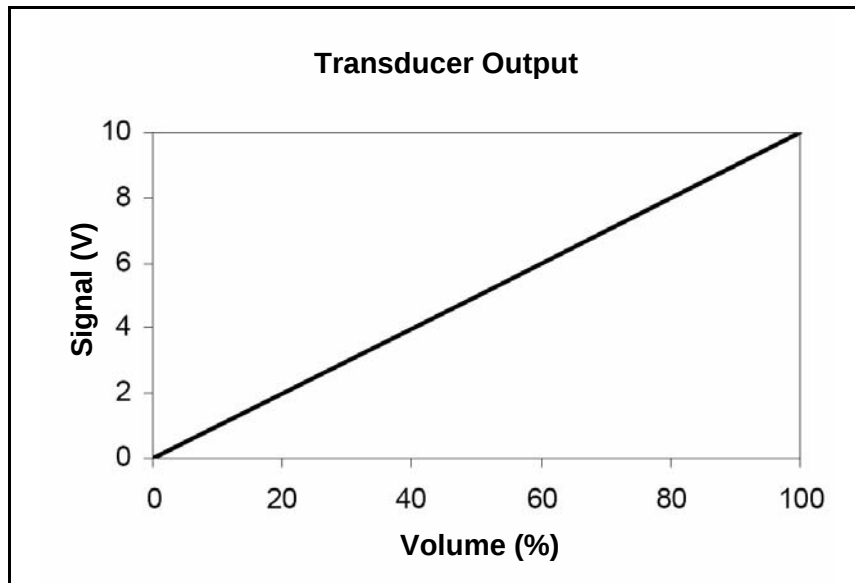
- Remove the linear transducer (item 12).
- Carefully remove 12 off M6 nuts and bolts (items 17, 19 and 20) to detach the base plate (item 2) from the body (item 4). **Take Care** - this will release the spring (item 8).
- Remove the spring (item 8 and the piston (item 5)
- Undo the 12 off M6 nuts and bolts (items 16, 18 and 19) and remove the clear plastic body (item 4) and diaphragm (item 6).
- Clean any residue from inside the piston housing (item 3 before fitting the new diaphragm.
- Apply a light coat of Molykote 111 to the fabric side of the diaphragm.
- Place the diaphragm (item 6) inside the piston housing (item 3) so that the sealing lip fits into the groove (coat the groove with molykote 111).
- Clamp the main body (item 4 ensuring that the 4 magnets are aligned with the linear sensor mounting.
- Place the piston (item 5) inside the main body (item 4) ensuring that the 4 magnets are aligned with the linear sensor mounting.
- Fit the spring (item 8) and the base plate (item 2), ensuring that the base plate is the correct way round (the spring locates on the raised boss)
- Using a press, or an assistant, clamp the base plate (item 2) to the main body (item 4) with 12 off M6 bolts (17, 19 and 20).



LINEAR TRANSDUCER EV 4016-2 FOR 6.3L COMPENSATOR

The linear transducer supplied for fitting to the 18 litre reservoir outputs a voltage proportional to the the volume of oil within the reservoir. The transducer detects the position of the magnets mounted on the reservoir piston, which in turn controls a variable resistance.

The transducer output signal is linear, as shown below:



Specification

Supply Voltage
24 volts
Accuracy
$\pm 1.5\%$ of Full Scale
Depth Rating
3000m
Connector
Impulse MCBH-3-MP
Pin1
Common
Pin 2
Signal 0-10v
Pin 3
Supply voltage



Other connectors and wiring configurations are available to suit customer requirements.



SERVICE AND SPARE PARTS

Service Returns Procedure

- The reservoir 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.

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.



DISTRIBUTORS

Contact SMD Limited, for a current list of distributors:-

- Telephone :- ++44 (0) 191 234 2222.
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SMD has a network of distributors that are in-field support for Curvetech Products in their relative areas.



