

**Servomex 1800MV**  
**Marine Oxygen Analyser**

**Supplementary Manual**

Ref: 01800/099B/2  
Order as part No. 01800099B



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## **1800MV Installation Tips**

When upgrading from another oxygen analyser to a Servomex 1800MV Marine Oxygen Analyser, modifications must be made to your calibration panel to reduce the risk of damaging the measuring cell by accidentally over-pressurising the cell or allowing moisture to enter it.

It is important to note that damaged measuring cells are not covered by the Servomex warranty. If required Servomex, or an approved agent can supply a simple calibration panel or modify your existing calibration panel for use with the 1800MV Marine Oxygen Analyser.

The following tips may assist technicians in installing and operating the Servomex 1800MV Marine Oxygen Analyser.

### **CAUTION**

The maximum sample pressure and flow rate for the Servomex 1800MV analyser is 5 psig and 250 ml/min. If the analyser is exposed to a higher pressure or flow rate the measuring cell may be damaged and unable to function properly!

### **WHEN INSTALLING THE 1800MV UNIT, FOLLOW THESE PRECAUTIONS:**

1. All gases including sample and zero and span calibration gases must be regulated to 3 psig upstream of the 1800MV analyser.

It is recommended to install an in-line pressure regulator before the wet gas bubbler to regulate the delivery of all gases to 3 psig. See diagram.

2. Without the installation of the pressure regulator, extreme care must be taken when switching from the sample to a calibration gas.

Before switching to the calibration gas, the flow controller on the wet gas bubbler must to be adjusted downward to prevent the calibration gas from being introduced at higher pressure. If the flow controller is not adjusted, the bubbler may blow moisture up into the cell resulting in cell contamination and possible irreversible cell damage. See overleaf for more details.

For further assistance and information please call your nearest Servomex office.

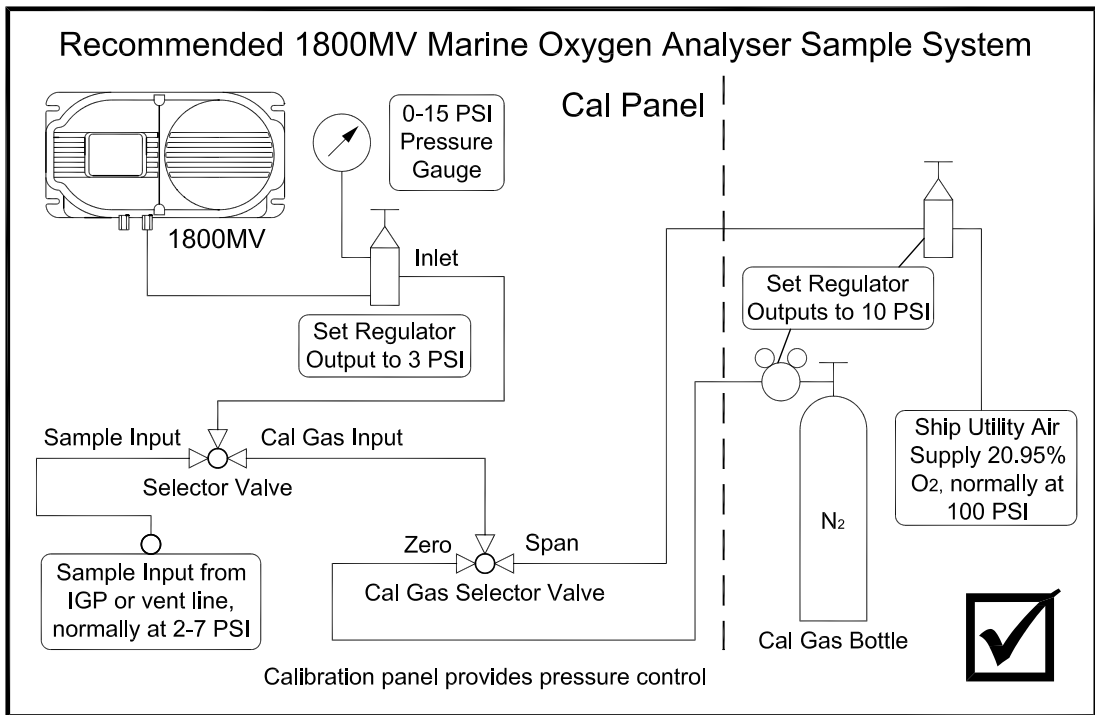
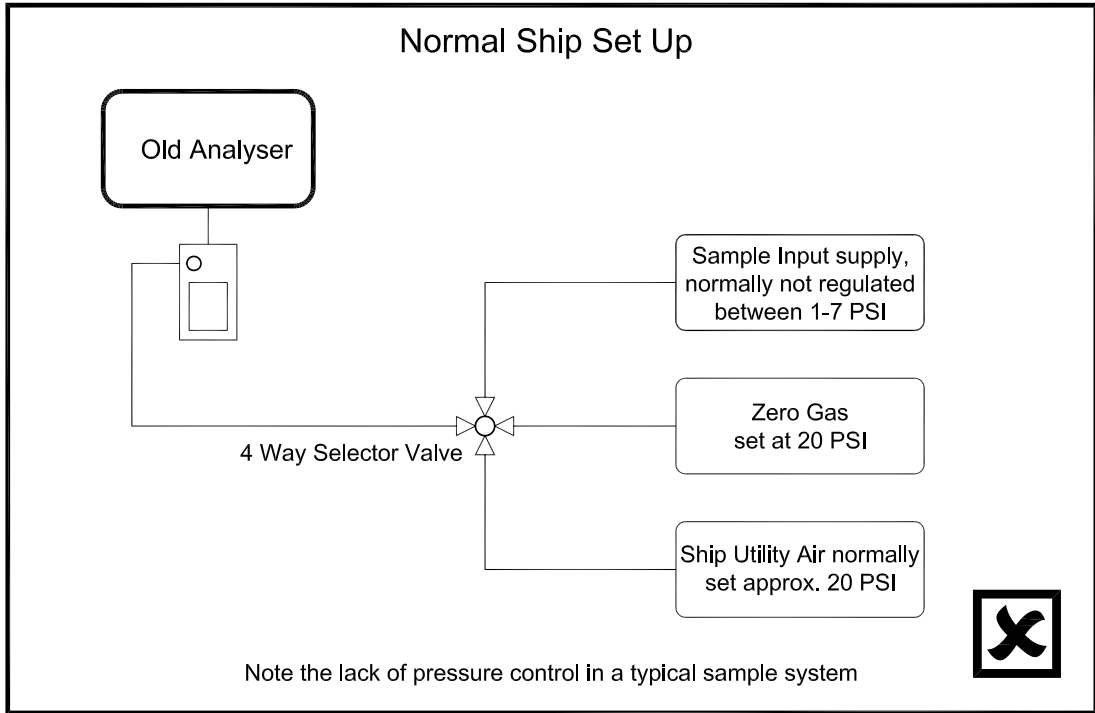


Figure 1 Installation Schematic

## 1800MV Start-Up and Shut-Down Procedure

The following tips may assist technicians in the start-up and shut-down of the 1800MV Marine Oxygen Analyser. These instructions are for the Servomex 1800MV complete with the wet gas bubbler unit.

### 1800MV MARINE OXYGEN ANALYSER SUGGESTED START-UP PROCEDURE

1. Check to see **ALL** gas valves to unit are closed!
2. Open bubbler fill opening. Fill bubbler bowl approximately 2/3rd's full with clean water. Close fill opening.
3. **Make sure bubbler flow control valve is closed!**
4. Apply power to analyser. Let unit warm up for at least two hours.\*
5. Carefully open zero gas.
6. **Set input sample / cal gas regulator to 3 PSI.**
7. Again check to see gas regulator is set at 3 PSI!
8. **Slowly** open bubbler flow control valve and set a low to medium gas bubble flow in the bubbler.
9. Let zero gas flow for approximately five minutes
10. Unit is now ready for calibration. (Refer to manual)
11. After a successful calibration, selector valve can be put to sample.

\* This is recommended to avoid problems with condensation. Note that because the measuring technology is different to electrochemical or zirconia type analysers, once switched on the unit can be left powered up without reducing cell lifetime.

### 1800MV MARINE OXYGEN ANALYSER SUGGESTED SHUT-DOWN PROCEDURE

As the Servomex 1800MV oxygen analyser uses a non-depleting "paramagnetic" measurement cell, it is not necessary to shut the analyser down between usage in order to preserve cell life. Leaving the unit switched on ensures it is always ready for use

1. Close off sample input valve to system.
2. Check and make sure ALL gas lines to unit are closed.
3. Open zero gas and set a medium flow on gas bubbler.
4. **Close off zero gas at supply. Do not adjust bubbler flow valve.**
5. Drain ALL water contents from bubbler bowl. Close drain outlet.
6. Open zero gas supply.
7. Let zero gas flow for approximately 5 minutes.
8. Close zero gas at source. Analyser reading should be at 0% depending on the concentration of the zero gas.
9. Remove power from unit.
10. Unit is now shutdown and cell is dry.

For restart, **FOLLOW START UP PROCEDURES**

## **1800MV Supplementary Notes - English**

The 1800MV is a specific model of the Servomex 1800 analyser range and is intended for use in the monitoring and control of inert gas systems, inert gas generators and membrane type nitrogen generators on board ships. The unit meets the requirements set out in the International Maritime Organisation's Guide, "Inert Gas Systems, 1990", Canadian standard TP 4295 E and the Marine Equipment Directive 96/98/EC, A.1/3.30, or "Wheelmark".

The 1800MV features the Servomex magnetodynamic paramagnetic measuring cell, which unlike electrochemical or zirconia based sensors, will not deplete over time, and unlike thermomagnetic paramagnetic sensors, will not be adversely affected by changing thermal conductivities of background gases. All Servomex cells incorporate a suspension arrangement that is precisely balanced to reduce the effects of tilt, thus making them suitable for marine use. As a result, if the unit is properly cared for, operated in accordance with the manual and the cell protected from ingress of liquids, we expect that the unit will provide users with an extremely reliable and long life measurement solution.

When installing the unit in a marine environment we recommend reviewing the Marine Tips sheet attached. Attention should also be paid to the ambient temperature limits in which the unit will operate properly (-10°C to +50°C) and protecting the unit from excessive vibration.

The 1800MV features concentration and fault alarm relays and mA outputs to facilitate easy integration to most control systems. In the event that the unit is being used to replace an existing analyser that utilises a logarithmic output, Servomex can offer a linear to logarithmic output converter for the 1800MV, reducing modifications to the existing control system.

Servomex are also able to supply a bubbler flow control system that reduces the amount of sample preparation needed and the effect of flow variations on the oxygen reading reported. This unit may also be incorporated into a full panel that includes calibration connections and Servomex can provide details of this upon request.

Finally, Servomex has a global network of service centres and appointed servicing agents and distributors. Should you require assistance a list of contacts is provided on our website, [www.servomex.com](http://www.servomex.com) or our regional headquarters will be able to put you in touch with a local engineer.



Regional Headquarters:	Contact:	Telephone:
Europe Business Centre	Customer Services	+31 (0)79 330 1581
Americas (USA)	Customer Services	+1 281 295 5800
Asia-Pacific (Shanghai)	Customer Services	+86 (0)21 6489 7570



## EUROPEAN COMMUNITY DECLARATION OF CONFORMITY

### Issued in accordance with the MARINE EQUIPMENT DIRECTIVE (MED)

This is to certify that in compliance with the Council Directive 96/98/EC of 20 December 1996 on marine equipment, as amended by Commission Directives 98/85/EC, 2001/53/EC, 2002/75/EC and 2002/84/EC of the European Parliament and of the Council:

Servomex Group Ltd  
Jarvis Brook, Crowborough  
East Sussex, England.  
TN6 3DU

declares that the

#### 1800MV OXYGEN ANALYSER FOR SAFE AREAS

conforms to type as required by the above Directives as evidenced by the Conformity Route below:

EC Type Examination (Module B) Certificate No MED 0400028/M2, expiry date, 08 July 2009, issued by Notified Body EC Registration No. 0038 (Lloyd's Register)

plus

EC (Module D) Certificate No MED 0750189, expiry date 17 August 2010, issued by Notified Body EC Registration No. 0038 (Lloyd's Register)

MED Annex A.1	Item No:	A.1/3.30
	Item description:	Oxygen Analysis and Gas Detection Equipment

#### Standards Applicable:

EN 50104: 1999	Electrical apparatus for the detection and measurement of oxygen - Performance requirements and test methods
EN 61010-1:1993	Safety requirements for electrical equipment for measurement, control, and laboratory use. Part 1 General requirements
EN 50081-1: 1992	Electromagnetic compatibility – Generic emission standard Part 1. Residential, commercial and light industry
EN 50082-2: 1995	Electromagnetic compatibility – Generic Immunity standard Part 2. Industrial environment.
EN 60529: 1992	Degrees of protection provided by enclosures (IP Code)

Dated: 24<sup>th</sup> June 2008

  
J. Hobby, Chief Scientific Officer

Note:- This document must be retained by the user for the life of the product.

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Figure 2 Marine Equipment Directive - Declaration of Conformity



### EC TYPE EXAMINATION (MODULE B) CERTIFICATE

This is to certify that :

LLOYD'S REGISTER VERIFICATION LIMITED (LRV), specified as a "notified body" under the terms of The Merchant Shipping (Marine Equipment) Regulations S.I. 1999 No. 1957, did undertake the relevant type approval procedures for the equipment identified below which was found to be in compliance with the essential Fire protection requirements of Marine Equipment Directive (MED) 96/98/EC as modified by Commission Directives 98/85/EC, 2001/53/EC, 2002/75/EC and 2002/84/EC subject to any conditions in the Design Appraisal Document attached hereto.

<b>Manufacturer</b>	Servomex Group Limited			
<b>Address</b>	Jarvis Brook, Crowborough East Sussex, TN6 3DU United Kingdom (UK)			
<b>Annex A1 Item</b>	OXYGEN ANALYSIS AND GAS DETECTION EQUIPMENT (A.1/3.30)			
<b>Product Type</b>	1800 MV			
<b>Product Description</b>	Oxygen analyser for safe areas			
<b>Specified Standard</b>	EN 50104	EN 61010-1: 1993	EN 50081-1: 1992	EN 50082-2: 1995
	EN 60529: 1992 -	IP 66 when fitted with either a blanking plug or a snubber type SS-4-SA-EA, EH or EW		
	EN 60529: 1992 -	IP 65 when fitted with snubber type SS-4-SA-EL		

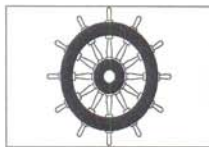
The attached Design Appraisal Document (schedule) forms part of this certificate. This certificate remains valid unless cancelled or revoked, provided the conditions in the attached schedule are complied with and the equipment remains satisfactory in service.

Date of issue	15 June 2008	Expiry date	8 July 2009
Certificate No.	MED 0400028/M2	Signed	<i>M. H. A. Rufaie</i>
Sheet No	1 of 1	Name	M.H.A. Rufaie For and on behalf of Lloyd's Register Verification LRV EC Distinguishing No. 0038



Note:

This certificate is not valid for equipment; the design or manufacture of which has been varied or modified from the specimen tested. The manufacturer should notify the notified body named on this certificate of any modification or changes to the equipment in order to obtain a valid Certificate.



0038/yy

Subject to compliance with the conditions in the attached Design Appraisal Document (schedule), which forms part of this certificate, and those of Articles 10.1(i) and 11 of the Directive, the Manufacturer is allowed to affix the "Mark of Conformity" to the Product described herein. yy Last two digits of year mark affixed.

**This certificate is issued under the authority of the MCA.**

"Lloyd's Register Verification is the business name of Lloyd's Register Verification Limited, a member of the Lloyd's Register Group. Registration number 4929226. Registered office 71 Fenchurch Street, London EC3M 4BS, England

\*Lloyd's Register, its affiliates and subsidiaries and their respective officers, employees or agents are, individually and collectively, referred to in this clause as the 'Lloyd's Register Group'. The Lloyd's Register Group assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or howsoever provided, unless that person has signed a contract with the relevant Lloyd's Register Group entity for the provision of this information or advice and in that case any responsibility or liability is exclusively on the terms and conditions set out in that contract.\*

Figure 3 Lloyd's Register Verification Certificate

**DESIGN APPRAISAL DOCUMENT**

Date 15 June 2008	Quote this reference on all future communications LDSS/PAS/TAE/W01495156/MHR/O- 91929
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**ATTACHMENT TO EC TYPE EXAMINATION (MODULE B) CERTIFICATE No. MED 0400028/M2**

The undermoted documents have been appraised for compliance with the relevant requirements of International Conventions and European Union legislation for the EC Type Examination of Marine Equipment for use on Merchant Ships Registered in the European Economic Area.

This Design Appraisal Document (schedule) forms part of the Certificate.

**ADDITIONAL APPROVAL DOCUMENTATION**

Request form	28.04.2008
Servomex letter	09.02.2007
Servomex letter	28.04.2008
Section 3 Appendix B (Technical Drawings)	Undated
Document No. 01800-P-014-5	09.02.2007
Section 2 Appendix A (Installation and Operator Manual, Part No. 01800/003B/2, issue 2)	Undated
Supplementary Manual No. 01800/099B/1	Undated
Section 10 Appendix J (Servomex Technical Data Sheets - 1800)	Undated
Section 7 Appendix F (Servomex Change Note Procedure)	28.04.2004
Section 12 Appendix L (Manufacturer's Declarations)	Undated
Servomex 1800MV (technical Construction File) No. 01800-P-014-6	28.03.2008

**Data Sheets**

(1800 MV) No. PB01800, Rev. 5 (02/07 E)	02.2007
Artesyn NFS40 Series (Power Supply) No. NFS40.PDF Rev. 19	19.11.2001

**Drawings**

No. 01158/851/1 (issue 1)	29.09.1999
No. 01158/101/4 (issue 4)	13.07.2007
No. 01800/111A/2 (issue 2)	16.03.2006
No. 01800/113D/3 (issue 3)	16.05.2006
No. 01800/124/1 (issue 1)	12.02.2007
No. 01800/124/2 (issue 2)	28.04.2008
No. 01800/911/1 (issue 1)	12.07.2007
No. 01800/911A/3 (issue 3)	18.04.2006
No. 01800/911A/4 (issue 4)	12.07.2007
No. 01800/913C/2 (issue 2)	28.11.2007
No. 01800/913D/3 (2 sheets, issue 3)	16.05.2006
No. 01800/913D/4 (2 sheets, issue 4)	29.11.2007
No. 01800/993B/2 (issue 2)	30.02.2007
No. 01800/999C/1 (2 sheets, issue 1)	16.05.2005

**TEST REPORTS**

BSI Certificate No. Q05166	22.11.2002
Servomex MED Declaration	28.02.2008

Also all the documentation listed on Design Appraisal Documents associated with MED Certificates 0400028 and MED 0400028/M1.

**DESIGN APPRAISAL DOCUMENT**

Date	15 June 2008	Quote this reference on all future communications	LDSS/PAS/TAE/W01495156/MHR/O- 91929
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**CONDITIONS OF CERTIFICATION**

1. Production items of the subject equipment are to be manufactured in accordance with either an approved Production Quality Assurance system (Module D), a Product-Quality assurance system (Module E), a Product Verification Process (Module F) or Unit Verification (Module G). The wheelmark cannot be affixed to the product until a conformity assessment module is in place.
2. Each item, batch or lot of the equipment is to be issued with a "Declaration of Conformity" and have the "Mark of Conformity" affixed after a conformity assessment module is in place.

**PLACE OF PRODUCTION**

Servomex Group Limited  
Jarvis Brook, Crowborough  
East Sussex, TN6 3DU  
United Kingdom (UK)

For and on behalf of Lloyd's Register Verification

M.H.A. RUFAlE  
Lead Specialist  
Product Approval / London Design Support Services  
Tel: +44 (0) 20 7423 1849 (Direct line)  
Email: [product-approval@lr.org](mailto:product-approval@lr.org)  
Web: [www.lr.org](http://www.lr.org)

Part 13  
 Subject: Fire protection  
 Product: OXYGEN ANALYSIS AND GAS DETECTION EQUIPMENT (A.1/3.30)

Producer	Product and Type	Details of Approval	Specified Standard	Remarks	Cert. No.
Servomex Group Limited, Jarvis Brook, Crowborough, East Sussex, TN6 3DU, United Kingdom (UK).	1800 MV	Oxygen analyser for safe areas	EN 50104 EN 61010-1: 1993 EN 50081-1: 1992 EN 50082-2: 1995  EN 60529: 1992 - IP 66 when fitted with either a blanking plug or a scrubber type SS-4-SA-EA, EI1 or IW  EN 60529: 1992 - IP 65 when fitted with scrubber type SS-4-SA-EL	Expires: 08 July 2009	MED 0400028/M2

1.5.100.2008  
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**DESIGN APPRAISAL DOCUMENT**

Date 25 March 2006	Quote this reference on all future communications LPA/ECE/TA/W00997446/MHR/O- 69550
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**ATTACHMENT TO EC TYPE EXAMINATION (MODULE B) CERTIFICATE No.MED 0400028/M1**

The undernoted documents have been appraised for compliance with the relevant requirements of International Conventions and European Union legislation for the EC Type Examination of Marine Equipment for use on Merchant Ships Registered in the European Economic Area.

This Design Appraisal Document (schedule) forms part of the Certificate.

**ADDITIONAL APPROVAL DOCUMENTATION**

Request form	12.12.2005
Servomex letter	12.12.2005
Servomex letter	01.12.2005
Servomex letter	01.08.2005
Servomex letter	29.12.2005
Servomex letter	15.11.2004

**Technical Construction Files**

1800 MV (Marine Variant) No. 01800-P-014-2 (issue 2)	11.08.2005
1800 MV (Marine Variant) No. 01800-P-014-3 (issue 3)	01.08.2005
1800 MV (Marine Variant) No. 01800-P-014-4 (issue 4)	09.12.2005

**Data Sheets**

No. TDS1800MV (Rev. 5)	04.2005
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**Drawings**

No. 01800/263/0	02.08.2004
No. 01158/000/6 (4 sheets) Rev. 6	22.04.2005
No. 01800/113C/1 (Rev. 1)	28.07.2005
No. 01800/913C/1 (Rev. 1)	25.07.2005
No. 01800/993B/1 (Rev. 1)	13.10.2005

**TEST REPORTS**

BSI Certificate No. Q05166	22.11.2002
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Also all the documentation listed on Design Appraisal Document associated with MED Certificate No. MED 0400028

**CONDITIONS**

1. Production items of the subject equipment are to be manufactured in accordance with either an approved Production Quality Assurance system (Module D), a Product-Quality assurance system (Module E) or a Product Verification Process (Module F). The wheelmark cannot be affixed to the product until a conformity assessment module is in place.
2. Each item, batch or lot of the equipment is to be issued with a "Declaration of Conformity" and have the "Mark of Conformity" affixed after a conformity assessment module is in place.

**PLACE OF PRODUCTION**

Servomex Group Limited, Crowborough, East Sussex, TN6 3DU, United Kingdom (UK)

For and on behalf of Lloyd's Register Verification

*M. A. Rufaie*  
 M.H.A. RUFAlE  
 Senior Electrical Engineer  
 Electrical and Control Engineering/Type Approval  
 London Plan Approval / Lloyd's Register EMEA  
 Tel. +44 (0) 20 7423 1849 *Direct line*

Part 13

Subject: Fire protection

Product: OXYGEN ANALYSIS AND GAS DETECTION EQUIPMENT (A.1/3.30)

Producer	Product and Type	Details of Approval	Specified Standard	Remarks	Cert. No.
Servomex Group Limited, Crowborough, East Sussex, TN6 3DU, United Kingdom (UK).	1800 MV	Oxygen analyser for safe areas	EN 50104 EN 61010-1: 1993 EN 50081-1: 1992 EN 50082-2: 1995  EN 60529: 1992 - IP 66 when fitted with either a blanking plug or a snubber type: SS-4-SA-EA, EH or EW  EN 60529: 1992 - IP 65 when fitted with snubber type SS-4-SA-EL.	Expires: 08 July 2009	MED 0400028/M1

25 MAR 2009  
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Page	1 of 2
Document number	MED 0400028
Issue number	1

**DESIGN APPRAISAL DOCUMENT**

Date 9 July 2004	Quote this reference on all future communications DAPP/ECE/TA/W00511313/MHR/O- 48782
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**ATTACHMENT TO EC TYPE EXAMINATION (MODULE B) CERTIFICATE No.MED 0400028**

The undernoted documents have been appraised for compliance with the relevant requirements of International Conventions and European Union legislation for the EC Type Examination of Marine Equipment for use on Merchant Ships Registered in the European Economic Area.

This Design Appraisal Document (schedule) forms part of the Certificate.

**APPROVAL DOCUMENTATION**

Request form	19.02.2004
Servomex letter	02.2004
Servomex 1800 MV (Marine Variant) document No. 01800-P-014-1 (Technical Construction File)	18.05.2004
Table of Contents	18.05.2004
Section 2 (Appendix A) 'Quick -Start' - Installation and Operation manual (issue 2)	Undated
Section 3 (Appendix B) Technical Drawings	Undated
Section 4 (Appendix C) Power supply data	Undated
Section 5 (Appendix D) Type Test report to EN 50104	Undated
Section 6 (Appendix E) EMC Certificates and Test Reports	Undated
Section 7 (Appendix F) Change Note Procedure (Servomex Standard)	Undated
Section 8 (Appendix G) Product Change Notes since KEMA type testing	Undated
Section 9 (Appendix H) Type test Report and Certificates - safety	Undated
Section 10 (Appendix J) Servomex Technical Data Sheets	Undated
Section 11 (Appendix K) Quality Management System	Undated
Section 12 (Appendix L) Manufacturer's Declaration	Undated
Servomex brochure (Ts Rev. 2)	11.2002

**Data Sheets**

ARTESYN (NFS25 Series) No. NFS25.PDF Rev. 01	01.2000
Chang Notes (Product) EQT02 (8 pages)	30.12.2003
1800 Marine Oxygen Analyser (TD Swgb Rev. 1)	10.2002
1800 Marine Oxygen Analyser (TDS 1800 Rev. 2)	04.2003
Servomex Marine Gas Analyser Technology Note 1: Inert Gas Production (MGA/1 Rev. 0)	06.2003
Servomex Measurement of Oxygen in Gas Mixtures (TN01 Rev. 1)	02.2002

**Drawings**

01158/000/5 (Rev. 5) 5 sheets	01.05.2003
01158/101/3 (Rev. 3)	28.07.2003
01800/102A/2 (Rev. 2)	08.08.2000
01800/111/0 (Rev. 0)	20.09.1996
01800/113C/0 (Rev. 0)	02.05.2000
01800/124/0 (Rev. 0)	05.05.2004
01800/902A/3 (Rev. 3)	26.07.2002
01800/911/0 (Rev. 0)	16.09.1996
01800/913C/0 (Rev. 0)	02.05.2000
01800/992A/2 (Rev. 2)	26.07.2000

**DESIGN APPRAISAL DOCUMENT**

Date	Quote this reference on all future communications
9 July 2004	DAPP/ECE/TA/W00511313/MHR/O- 48782

<b>Drawings (cont.)</b>	
01800/993B/0 (Rev. 0)	21.03.2000
01800/999C/0 (Rev. 0) 2 sheets	21.03.2000
01800/994D/0 (Rev. 0)	17.04.2001
<b>TEST REPORTS</b>	
Test Specification (No. 01800/001S/0)	07.03.2000
KEMA 50050760-KPS/TCM 00-2143 Rev. 1	26.04.2004
KEMA Certificate of Compliance No. KPS 01-355 (Revision 1)	26.04.2004
KEMA Certificate of Compliance No. KPS 01-356 (Revision 1)	26.04.2004
ERA Certificate of Compliance No. 5044-96-293	24.05.1996
ERA Certificate of Compliance No. 5044-96-294	24.05.1996
ERA Certificate of Compliance No. 5046/C446A	03.04.1996
ERA Certificate of Compliance No. 5046/C446B	03.04.1996
ERA Certificate of Compliance No. 4146/871/8124	07.06.1996
KEMA (Annex B) Operating Instructions Xendos Model 1800	26.04.2004
ERA No. 5044/11L3/1	05.1996
ERA No. 4473/1M3/1	02.1998
ERA No. 96-0554	06.1996
ERA No. 96-0555	06.1996
BSI Certificate No. Q05166	17.09.1986
BSI Certificate No. Q05166	22.11.2002
Servomex EC Declaration of Conformity Generic Emission and Immunity	09.05.2000
<b>CONDITIONS</b>	
Production items of the subject equipment are to be manufactured in accordance with an approved Production Quality Assurance system (Module D). The wheelmark cannot be affixed to the product until a conformity assessment module is in place.	
<b>PLACE OF PRODUCTION</b>	
Servomex Group Limited Crowborough, East Sussex, TN6 3DU United Kingdom (UK)	
 <i>M. A. Rufaie</i>	
M.H.A. Rufaie Senior Electrical Engineer For and on behalf of Lloyd's Register Verification	

Part 13

Subject: Fire protection

Product: OXYGEN ANALYSIS AND GAS DETECTION EQUIPMENT (A.1/3.30)

Producer	Product and Type	Details of Approval	Specified Standard	Remarks	Cert. No.
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