



# Energy - Downstream, Power and Manufacturing Design Appraisal Document

Lloyd's Register North America, Inc.  
Operations Office, Houston  
1330, Enclave Pkwy,  
Suite 200, Houston TX 77077 USA  
Ph: 281-675-3131/ 713-557-6390  
E-mail : s.rana@lr.org / EC-Directives.Houston@lr.org

Date  
**13 August 2013**  
Quote this reference on all future communications  
**NAO 0102524/001/SMR**

<b>Manufacturer</b>	:	Emerson Process Management 19200, NW Frwy, Houston TX 77065 USA
<b>Authorized Representative</b>	:	El-O-Matic B.V. Asveldweg II 7556 BR, Hengelo, Netherlands
<b>Product Description</b>	:	G and GC Series Pneumatic Actuators - G01, G2, G3, G4, G5, G7, G8, G10, G13 - GC01, GC2, GC3, GC4, GC5, GC7, GC8
<b>Product Type</b>	:	Pressure Vessel
<b>Size</b>	:	8" (DN 200) through 52" (DN 1300)
<b>Max pressure</b>	:	13.8 Barg
<b>Temperature Range</b>	:	- 29°C to 177°C (as permitted by material specification)
<b>Design Code</b>	:	ASME Section VIII Div 1: Edition 2007 Addenda 2009
<b>Category</b>	:	II to IV
<b>Module</b>	:	B+D (Lloyd's Register Verification is notified body for module B only)

The documents listed below have been examined to the requirements of the above Code, and the Essential Safety Requirements of the Pressure Equipment Directive (97/23/EC) supported by the above Code, including the global conformity assessment procedure of the Directive and are found in order. The proposed arrangement is considered to comply with the requirements of the Directive subject to the following:-

- (A) Construction and testing should be carried out to the requirements of the Code and to the satisfaction of the Surveyors.

Lloyd's Register North America, Inc.  
Is a subsidiary of Lloyd's Register Group Limited

Lloyd's Register Group Limited, its affiliates and subsidiaries and their respective officers, employees or agents are, individually and collectively, referred to in this clause as 'Lloyd's Register'. Lloyd's Register 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 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.

- (B) The drawings / document marked # have been received with the present submission and the drawing showing "Document Status" as "BQ" should be revised or the comments contained in the paragraphs to follow should otherwise be resolved
- (C) All materials used for the fabrication must comply with the requirements of Annex I of the directive.
- (D) In respect of Module B of the PED (97/23/EC) / PER (SI 1999: 2001 & SI 2002:1267), this appraisal is limited to:
  - i) examination of technical documentation listed above,
  - ii) identify parts designed in accordance with relevant standards,
  - iii) assessment of materials,
 Module B EC certificate would be issued subject to
  - i) Witness of type testing, records and procedures
  - ii) Review of tests and records
  - iii) Issue of test certificates
- (E) Reference Document: DF112 Rev G  
 Contents

1.0 Introduction

- 1.1 General Equipment description
- 1.2 Applicable construction code and materials
- 1.3 Manufacturing location QA approv
- 1.4 Product approval
- 1.5 Conformity assessment table and modules
- 1.6 Final product testing
- 1.7 Conclusion
- 1.8 Reference documents

2.0 Drawing register

3.0 Technical documentation

4.0 Bill of materials

5.0 Essential safety requirements: checklist

6.0 Risk assessment

7.0 Particular material appraisal

8.0 Declaration of conformity

9.0 Installation, operations and maintenance manual

10.0 Welding and Joining procedure

**COMMENTS:**

- 1. EC Declaration of conformity should reference the latest (valid) EC certificate number for module B. BQS
- 2. Approval is limited to the material appraised below in the PMA BQS

**PARTICULAR MATERIAL APPRAISAL:**

Under the provisions of the directive, particular material appraisal of materials listed below has been carried and are acceptable.

Material Specification	ASME Sec VIII Div. 1	Temp. °C Max / Min	Notes
ASTM A53 Gr B type S or E		177 / - 29	
ASTM A513 type 5 Gr MT1026 Tensile, yield, elongation to meet ASTM A53 requirements; Restricted to 6mm, max 14" dia. size, straight pipe only	Not listed. Limited to 13.8 bar	177 / - 29	Stress level less than 6000 psi, impact test exempted, considering UCS 66 curve A material with lower stresses.

Material Specification	ASME Sec VIII Div. 1	Temp. °C Max / Min	Notes
ASTM A395 60-40-18		177 / - 29	Also refer ASME B31.3
ASTM A516 Gr 70		177 / - 29	
DIN 1629 St 52.0 (UTS 500, YS 355 N/mm <sup>2</sup> , Elong 19% transverse) Thk 7.6 mm	Not listed	177 / - 29	Material accepted based on comparison with ASTM A 53 UCS-66 curve B.
ASTM A194 2H, 2		177 / - 29	
ASTM A105		177 / - 29	
ASTM A193-B7		177 / - 29	

**Drawing/ Documents**

#	Document No.	Revision	Title	Status	Date
	Technical Construction File DF 112	G	TCF for G Series	B	13 August 2013

***Lloyd's Register Verification Ltd.: Notified Body No. 0038***



Sanjeev M. Rana  
 Lloyd's Register North America, Inc.  
 Phone +1 281 675 3131

**Appraisal Status Key**

- B Examined
- BM Examined and amended in red
- BQ Examined subject to matters identified within the Design Appraisal Document which require resolution
- BQP Details to be submitted by the client to Plan Appraisal Office.
- BQS Details to be submitted by the client to the local surveyor's office responsible for the building and the arrangements verified in accordance with the Code requirements by the attending surveyor
- RI Used for information only

**Distribution:**

EC Directives Houston + TCF and DAD  
 Emerson + 1 DAD

Lloyd's Register North America, Inc.  
 Is a subsidiary of Lloyd's Register Group Limited

Document no  
Issue number  
Page 4 of 4

**NAO 0102524/001/SMR  
0**