DNV·GL

Certificate No:
TAA00001M5

TYPE APPROVAL CERTIFICATE

This is to certify:

That the electro-hydraulic pump

with type designation(s)
LPU version 2, LPU version 2a, LPU-Ex

Issued to
Emerson Automation Solutions, Damcos A/S
Næstved, Sjælland, Denmark

is found to comply with
DNV GL rules for classification – Ships, offshore units, and high speed and light craft

Application :

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.

Location classes:

Temperature	**D**
Humidity	**B**
Vibration	**B**
EMC	**B**
Enclosure	**D**

Issued at **Høvik** on **2018-02-23**
This Certificate is valid until **2022-12-05**.
DNV GL local station: **Copenhagen**

Approval Engineer: **Ståle Sneen**

for **DNV GL**

Odd Magne Nesvåg
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid.
The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

© DNV GL 2014. DNV GL and the Horizon Graphic are trademarks of DNV GL AS.

Product description

The LPU is an electro hydraulic power unit that fits directly on Damcos' hydraulic valve actuators. The following LPU versions are available:

ID-No.	Name	Description
160G4150	LPU-S-Power-On/Off 230 VAC 50/60 Hz v2	Spring return (fail close) actuators. On/Off position indication.
160G4152	LPU-S-Power-Cont. 230 VAC 50/60 Hz v2	Spring return (fail close) actuators. Analogue position indication.
160G4154	LPU-S-BUS V.2 230 VAC 50/60 Hz v2	Spring return (fail close) actuators. All position indication.
160G4156	LPU-S-P-NET V.2 230 VAC 50/60 Hz	Spring return (fail close) actuators. All position indication.
160G4182	LPU-D-Power-On/Off 230 VAC 50/60 Hz v2a	Double acting actuator. On/Off position indication.
160G4183	LPU-D-Power-Cont. 230 VAC 50/60 Hz v2a	Double acting actuators. Analogue position indication.
160G4187	LPU-D-P-NET 230 VAC 50/60 Hz v2a	Double acting actuators. All position indication.
160G4188	LPU-D-Power-On/Off 110 VAC 50/60 Hz v2a	Double acting actuators. On/off position indication. 110 VAC.
160G4189	LPU-D-Power-Cont. 110 VAC 50/60 Hz v2a	Double acting actuators. Analogue position indication. 110 VAC.
160G4190	LPU-S-Power-On/Off 110 VAC 50/60 Hz v2	Spring return (fail close) actuators. On/Off position indication. 110 VAC.
160G4191	LPU-S-Power-Cont. 110 VAC 50/60 Hz v2	Spring return (fail close) actuators. Analogue position indication. 110 VAC.
160G4196	LPU-S-EX-D-IIC-T6 v2 230 VAC 50/60 Hz	Spring return (fail close) actuators. All position indication. Ex-d-T6.
160G4197	LPU-D-EX-D-IIC-T6 v2a 230 VAC 50/60 Hz	Double acting actuators. All position indication. Ex-d-T6
160G4207	LPU-S-EX-D-IIC-T5 v2 230 VAC 50/60 Hz	Spring return (fail close) actuators. All position indication. Ex-d-T5.
160G4208	LPU-D-EX-D-IIC-T5 v2a 230 VAC 50/60 Hz	Double acting actuators. All position indication. Ex-d-T5
160G4214	LPU-S-EX-D[IA]-IIC-T6 v2 230 V 50/60 Hz	Spring return (fail close) actuators. All position indication. Ex-d-[ia]-T6.
160G4215	LPU-D-EX-D[IA]-IIC-T6 v2 230 V 50/60 Hz	Double acting actuators. All position indication. Ex-d-[ia]-T6.
160G4216	LPU-S-EX-D[IA]-IIC-T5 v2 230 V 50/60 Hz	Spring return (fail close) actuators. All position indication. Ex-d-[ia]-T5.
160G4217	LPU-D-EX-D[IA]-IIC-T5 v2 230 V 50/60 Hz	Double acting actuators. All position indication. Ex-d-[ia]-T5.
160G4268	LPU-S v2 Power 230V Analog F. PD527	Spring return (fail close) actuators. Analogue position indication.
160G4269	LPU-D v2 Power 230V Analog F. PD527	Double acting actuators. Analogue position indication.
160G4270	LPU-S v2 Power 110V Analog F. PD527	Spring return (fail close) actuators. Analogue position indication.
160G4271	LPU-D v2 Power 110V Analog F. PD527	Double acting actuators. Analogue position indication
160G8003	LPU-D-BUS 230 VAC 50/60 Hz v2a	Double acting actuators. All position indication.
160G8004	LPU-D-Power-On/Off 230 VAC v2a AS D	Double acting actuator. On/Off position indication.
160G8005	LPU-D-Power-Analog 230 VAC v2a AS D	Double acting actuators. Analogue position indication.

ID-No.	Name	Description
160G8022	LPU-S-Power-On/Off v2 230 + LED + Local	Spring return (fail close) actuators. On/Off position indication.
160G8023	LPU-D-Power-On/Off v2 230 + LED + Local	Double acting actuator. On/Off position indication.
160G8024	LPU-S-P-NET Special + LED + Local	Spring return (fail close) actuators. All position indication.
160G8025	LPU-D-PNET Special v2a + LED + Local	Double acting actuators. All position indication.

Place of manufacture

Emerson Automation Solutions, Damcos A/S
Aaderupvej 41
DK-4700 Næstved
Denmark

Emerson Process Management Marine Systems (Shanghai) Co., Ltd.
T3-7,128 Long Gui Road,
JinQiao Export Process Zone (South) Shanghai
Post Code: 201201

Application/Limitation

The Type Approval covers hardware listed under Product description. When the hardware is used in applications to be classed by DNV GL, documentation for the actual application is to be submitted for approval by the manufacturer of the application system in each case. Reference is made to DNV GL rules for classification of ships Pt.4 Ch.9 Control and monitoring systems.

Ex installations to be approved in each case according to the Rules and Ex-Certification/ Special Condition for Safe Use listed in valid Ex-certificate issued by a notified/recognized Certification Body.

Ex-certification is not covered by this certificate and the following paragraph, which is for information only, is based on information received from the manufacturer, but not verified by DNV GL.

Information according to Ex-certificates DEMKO 05 ATEX 139150X Rev.3 and IECEx ULD 16.0026X Iss.1: – Not verified by DNV GL:
- Items without zener barrier inside enclosure: LPU-D-Ex-d IIC-T6 230V 50/60 Hz, LPU-D-Ex-d IIC-T5 230V 50/60 Hz, LPU-S-Ex-d IIC-T6 230V 50/60 Hz and LPU-S-Ex-d IIC-T5 230V 50/60 Hz
- Items with zener barrier inside enclosure: LPU-D-Ex-d-[ia] IIC-T6 230V 50/60 Hz, LPU-D-Ex-d-[ia] IIC-T5 230V 50/60 Hz, LPU-S-Ex-d-[ia] IIC-T6 230V 50/60 Hz and LPU-S-Ex-d-[ia] IIC-T5 230V 50/60 Hz

Type Approval documentation

Tests carried out

Test according to IACS Unified Requirements E10 rev.5, December 2006.
Applicable tests according to Standard for Certification No. 2.4, April 2006.
Tests for certified safe type equipment (where applicable).

Marking of product

The products to be marked with:
- manufacturer name
- model name
- serial number
- power supply ratings

Periodical assessment

The scope of the periodical assessment is to verify that the conditions stipulated for the type are complied with, and that no alterations are made to the product design or choice of systems, software versions, components and/or materials.

The main elements of the assessment are:

- Ensure that type approved documentation is available
- Inspection of factory samples, selected at random from the production line (where practicable)
- Review of production and inspection routines, including test records from product sample tests and control routines
- Ensuring that systems, software versions, components and/or materials used comply with type approved documents and/or referenced system, software, component and material specifications
- Review of possible changes in design of systems, software versions, components, materials and/or performance, and make sure that such changes do not affect the type approval given
- Ensuring traceability between manufacturer's product type marking and the type approval certificate

Periodical assessment is to be performed after 2 years and after 3.5 years. A renewal assessment will be performed at renewal of the certificate.

END OF CERTIFICATE