



Marine & Offshore

Certificate number: 31727/B0 BV

File number: ACM 101/0096/03

Product code: 1406I

This certificate is not valid when presented without the full attached schedule composed of 7 sections

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TYPE APPROVAL CERTIFICATE

This certificate is issued to

DESMI Pumping Technology A/S

Nørresundby - DENMARK

for the type of product

DEEPWELL LUBE OIL PUMP

DESMI Centrifugal Pumps Type DL

Requirements:

- BUREAU VERITAS Rules for the Classification of Steel Ships

This certificate is issued to attest that Bureau Veritas Marine & Offshore did undertake the relevant approval procedures for the product identified above which was found to comply with the relevant requirements mentioned above.

This certificate will expire on: 26 Apr 2023

For Bureau Veritas Marine & Offshore,

At BV FREDERICIA, on 26 Apr 2018,

Jesper Jensen



This certificate remains valid until the date stated above, unless cancelled or revoked, provided the conditions indicated in the subsequent page(s) are complied with and the product remains satisfactory in service. This certificate will not be valid if the applicant makes any changes or modifications to the approved product, which have not been notified to, and agreed in writing with Bureau Veritas Marine & Offshore. Should the specified regulations or standards be amended during the validity of this certificate, the product(s) is/are to be re-approved prior to it/they being placed on board vessels to which the amended regulations or standards apply. This certificate is issued within the scope of the General Conditions of Bureau Veritas Marine & Offshore available on the internet site www.veristar.com. Any Person not a party to the contract pursuant to which this document is delivered may not assert a claim against Bureau Veritas Marine & Offshore for any liability arising out of errors or omissions which may be contained in said document, or for errors of judgement, fault or negligence committed by personnel of the Society or of its Agents in establishment or issuance of this document, and in connection with any activities for which it may provide.

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BV Mod. Ad.E 530 June 2017

This certificate consists of 4 page(s)

THE SCHEDULE OF APPROVAL

1. PRODUCT DESCRIPTION

DESMI Centrifugal Pumps Type DL

Type : DL300 / DL300B / DL400 / DL400B / DL500

1.1 DL300-4stg product description

Multistage centrifugal pump with thrust bearing unit and equipped with a closed impeller

| Speed (r/min) | Dia.(mm) | Flow (m3/h) | Head (m) | Efficiency (%) | Power (kW) | NPSHr (m) |
|---------------|----------|-------------|----------|----------------|------------|-----------|
| 1450 | 229 | 205 | 37 | 72 | 29 | 3.7 |
| | 198 | 164 | 25 | 69 | 28 | 3.4 |
| 1780 | 229 | 251 | 56 | 72 | 53 | 4.6 |
| | 198 | 200 | 38 | 69 | 30 | 4.1 |

Note: to meet different performance requirements by cut the impeller dia. Max. Dia.229mm Min. Dia.198mm.and/or the number of stages can be changed

1.2 DL300-7stg product description

Multistage centrifugal pump with thrust bearing unit and equipped with a closed impeller

| Speed (r/min) | Dia.(mm) | Flow (m3/h) | Head (m) | Efficiency (%) | Power (kW) | NPSHr (m) |
|---------------|----------|-------------|----------|----------------|------------|-----------|
| 1450 | 229 | 205 | 65 | 72 | 50 | 3.7 |
| | 198 | 164 | 44 | 69 | 28 | 3.4 |
| 1780 | 229 | 251 | 98 | 72 | 93 | 4.6 |
| | 198 | 200 | 66 | 69 | 52 | 4.1 |

Note: to meet different performance requirements by cut the impeller dia. Max. Dia.229mm Min. Dia.198mm.and/or the number of stages can be changed

1.3 DL300B-5stg product description

Multistage centrifugal pump with thrust bearing unit and equipped with a closed impeller

| Speed (r/min) | Dia.(mm) | Flow (m3/h) | Head (m) | Efficiency (%) | Power (kW) | NPSHr (m) |
|---------------|----------|-------------|----------|----------------|------------|-----------|
| 1450 | 229 | 220 | 52 | 79 | 50 | 3.9 |
| | 198 | 181 | 36 | 71 | 25 | 3.5 |
| 1780 | 229 | 269 | 78 | 79 | 73 | 5.9 |
| | 198 | 223 | 54 | 71 | 47 | 5.3 |

Note: to meet different performance requirements by cut the impeller dia. Max. Dia.229mm Min. Dia.198mm.and/or the number of stages can be changed

1.4 DL400-4stg product description

Multistage centrifugal pump with thrust bearing unit and equipped with a closed impeller

| Speed (r/min) | Dia.(mm) | Flow (m3/h) | Head (m) | Efficiency (%) | Power (kW) | NPSHr (m) |
|---------------|----------|-------------|----------|----------------|------------|-----------|
| 1450 | 316 | 505 | 85 | 78 | 150 | 5.0 |
| | 279 | 419 | 63 | 77 | 94 | 4.1 |
| 1780 | 316 | 620 | 128 | 78 | 277 | 6.1 |
| | 279 | 514 | 95 | 77 | 173 | 5.1 |

Note: to meet different performance requirements by cut the impeller dia. Max. Dia.316mm Min. Dia.279mm.and/or the number of stages can be changed

1.5 DL400-6stg product description

Multistage centrifugal pump with thrust bearing unit and equipped with a closed impeller

| Speed (r/min) | Dia.(mm) | Flow (m3/h) | Head (m) | Efficiency (%) | Power (kW) | NPSHr (m) |
|---------------|----------|-------------|----------|----------------|------------|-----------|
| 1450 | 316 | 505 | 128 | 78.2 | 226 | 5.0 |
| | 279 | 419 | 95 | 77.3 | 140 | 4.1 |
| 1780 | 316 | 620 | 192 | 78.2 | 416 | 6.1 |
| | 279 | 514 | 143 | 77.3 | 260 | 5.1 |

Note: to meet different performance requirements by cut the impeller dia. Max. Dia.316mm Min. Dia.279mm.and/or the number of stages can be changed

1.6 DL400B-4stg product description

Multistage centrifugal pump with thrust bearing unit and equipped with a closed impeller

| Speed (r/min) | Dia.(mm) | Flow (m3/h) | Head (m) | Efficiency (%) | Power (kW) | NPSHr (m) |
|---------------|----------|-------------|----------|----------------|------------|-----------|
| 1450 | 319 | 630 | 83 | 83 | 172 | 4.9 |
| | 279 | 600 | 55 | 83 | 109 | 4.6 |
| 1780 | 319 | 773 | 125 | 83 | 318 | 6.0 |
| | 279 | 736 | 83 | 83 | 202 | 5.6 |

Note: to meet different performance requirements by cut the impeller dia. Max. Dia.319mm Min. Dia.279mm and/or the number of stages can be changed

1.7 DL500-4stg product description

Multistage centrifugal pump with thrust bearing unit and equipped with a closed impeller

| Speed (r/min) | Dia.(mm) | Flow (m3/h) | Head (m) | Efficiency (%) | Power (kW) | NPSHr (m) |
|---------------|----------|-------------|----------|----------------|------------|-----------|
| 1185 | 400 | 900 | 81 | 80 | 248 | 4.9 |
| | 360 | 800 | 60 | 75.6 | 173 | 4.8 |

Note: to meet different performance requirements by cut the impeller dia. Max. Dia.400mm Min. Dia.360mm and/or the number of stages can be changed

1.8 Materials and/or components

Material combination depending on pump series:

| | |
|----------------|--------------------------------|
| Head | Cast iron |
| Top shaft | Stainless Steel / Carbon Steel |
| Discharge case | Cast iron |
| Bowl | Cast iron |
| Bell | Cast iron |
| Impeller | Copper alloy / Stainless Steel |
| Pump shaft | Stainless Steel / Carbon Steel |

When other choices of materials are used per manufacturer's recommendations, the BV agreement is to be obtained.

2. DOCUMENTS AND DRAWINGS

- Installation, Operation and maintenance Instruction Manual N°T1518 rev B dated 11/16

- DL pump drawing list as reviewed on 14/02/2018:

| Model | DL300-7stg | DL300B-5stg | DL400-2stg | DL400-4stg | DL400B-4stg | DL500-4stg |
|----------------------|------------|-------------|------------|------------|-------------|------------|
| Head Column Assembly | 415136 | 415136 | 415136 | 415136 | 416171 | 415381 |
| Head | 523450 | 523450 | 524000 | 524000 | 524030 | 523550 |
| Top Shaft | 114051-35 | 114051 | 114051 | 114051 | 112671 | 114066 |
| Bowl Assembly | 414675 | 413740 | 413200 | 414697 | 414164 | 407349 |
| Bowl | 520660 | 520660 | 520420 | 520420 | 521930 | 523620 |
| Bell | 520680 | 520680 | 520440 | 520440 | 522010 | 523640 |
| Impeller | 520640 | 522960 | 520400 | 520400 | 521950 | 523600 |
| Pump Shaft | 112979 | 114057 | 114064 | 114532 | 114065 | 114686 |
| Discharge Case | / | / | 520460 | / | / | / |

No departure from the above documents shall be made without the prior consent of the Society. The manufacturer must inform the Society of any modification or changes to these documents and drawings.

3. TEST REPORTS

The performance curves of pumps are shown on the manufacturer's composite selection charts:

- DL300B-5stg pump curves 1450 rpm
- DL300B-5 stg pump curves 1780 rpm
- DL300-7stg pump curves 1450 rpm
- DL300-7 stg pump curves 1780 rpm
- DL400-4 stg pump curves 1450 rpm
- DL400-4 stg pump curves 1780 rpm
- DL400B-4 stg pump curves 1450 rpm
- DL400B-4 stg pump curves 1780 rpm
- DL500-4 stg pump curves 1185 rpm

4. APPLICATION / LIMITATION

- 4.1 Pumps may be used as deepwell lube oil pumps for Main Engine Lubrication oil supply.
- 4.2 The approval does not include the prime mover of the pump.
- 4.3 The pump is to be installed according to manufacturer's instructions and Bureau Veritas Rules requirements.

5. PRODUCTION SURVEY REQUIREMENTS

- 5.1 The products are to be supplied by **DESMI Pumping Technology A/S** in compliance with the type and the requirements described in this certificate.
- 5.2 This type of product is within the category IBV of Bureau Veritas Rule Note NR320.
- 5.3 BV product certificate is required.
- 5.4 The pumps are to be hydrostatically and performance tested and delivered with a BV certificate when required in BV Rules NR 467, Pt C, Ch 1, Sec 10 table 39.

For information, **DESMI Pumping Technology A/S** has declared to Bureau Veritas the following production sites:

- **DESMI Pumping Technology A/S: P. O. Box 226, Tagholm 1, 9400 Nørresundby, DENMARK**
- **DESMI Pumping Technology (Suzhou) Co, Ltd, N°740 Fengting avenue, Weiting Sub District, 215122 SIP, SUZHOU CHINA**

6. MARKING OF PRODUCT

Each pump is to be at least permanently marked with:

- Manufacturer's name or logo
- Pump size
- Serial number
- Society's brand as relevant

7. OTHERS

It is **DESMI Pumping Technology A/S's** responsibility to inform shipbuilders or their sub-contractors of the proper methods of fitting, use and general maintenance of the approved equipment and the conditions of this approval.

This certificate supersedes the Type Approval Certificate N° 31727/A0 BV issued by the Society.

***** END OF CERTIFICATE *****