

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Pneumatic Actuator

with type designation(s)

PAV, PAW, PAWC, PA00, PA05, PA10, PA15, PA20, PA25, PA30, P40, P50,, PA60, PA70 (double acting (-DE) and spring return (-S))., P40T, P50T (double acting (-DE) and spring return (-S))., PI00, PI10, PI20, PI30, PI40 (double acting (-DE) and spring return (-S)), PPW, PP00, PP10, PP20 (double acting (-DE) and spring return (-S)), 180° PAGW, PAG00, PAG10, PAG20, PAG30 (double acting (-DE) and spring return (-S))

Issued to

MECANICA PRISMA, S.L.
Montmeló BARCELONA, Spain

is found to comply with

Det Norske Veritas' Rules for Classification of Ships
Det Norske Veritas' Rules for Classification of High Speed and Light Craft.
Offshore Standard DNV-OS-D101, Marine and Machinery Systems and Equipment

Application :

The actuators are approved for use on valves in ships and machinery piping systems as accepted/limited by the DNV Rules.

Type	Dsgn. press./Torque
PAV, PAW, PAWC, PA00, PA05, PA10, PA15, PA20, PA25, PA30, P40, P50, PA60, PA70 (double acting (-DE) and spring return (-S)).	8 bar
P40T, P50T (double acting (-DE) and spring return (-S)).	8 bar
PI00, PI10, PI20, PI30, PI40 (double acting (-DE) and spring return (-S))	8 bar
PPW, PP00, PP10, PP20 (double acting (-DE) and spring return (-S))	8 bar
180° PAGW, PAG00, PAG10, PAG20, PAG30 (double acting (-DE) and spring return (-S))	8 bar

This Certificate is valid until **2018-12-31**.

Issued at **Høvik** on **2014-11-17**

for **DNV GL**

DNV GL local station: **Barcelona**

Approval Engineer: **Tom Berg-Nielsen**

.....
Marianne Spæren Marveng
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. If any person suffers loss or damage which is proven to have been caused by any negligent act or omission of the Society, then the Society shall pay compensation to such person for his proven direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question. The maximum compensation shall never exceed USD 2 million. In this provision the "Society" shall mean DNV GL AS as well as all its direct and indirect owners, affiliates, subsidiaries, directors, officers, employees, agents and any other person or entity acting on behalf of DNV GL AS.

Certificate No: **P-15076**
File No: **777.91**
Job Id: **262.1-004269-2**

Product description

Rack and pinion pneumatic actuators for ball-, plug- and butterfly valves.

Type:

PAV, PAW, PAWC, PA00, PA05, PA10, PA15, PA20, PA25, PA30, P40, P50, PA60, PA70 (double acting (-DE) and spring return (-S)).
P40T, P50T (double acting (-DE) and spring return (-S)).
PI00, PI10, PI20, PI30, PI40 (double acting (-DE) and spring return (-S))
PPW, PP00, PP10, PP20 (double acting (-DE) and spring return (-S))
180° PAGW, PAG00, PAG10, PAG20, PAG30 (double acting (-DE) and spring return (-

Max operating working pressure: 8 bar

Output torque: see manufacturers technical datasheets size and pressure related.

Cylinder body material:

PAV, PAW, PAWC, PA00, PA05, PA10, PA15, PA20, PA25, PA30: Aluminium Alloy EN-573-3 , Grade EN-AW-6063-T6

P40-P50-PA60-PA70-PA40T-P50T: Aluminium Alloy EN-1706 , Grade EN-AC-42200-T6

PPW(S), PP00-10-20(S): Polyamide, Grade PA6.6 (xxxxxxxxxxxxx)Black (internal info)

PI00-10-20-30(S): Stainless steel ASTM A351 Grade CF8M. (EN 10213-4. 1.4408)

- Temperature range: -32 to 90 °C for all the above listed or -50 to 80 °C for PP / PI / PAG when fitted with O-rings N7 for low temperature (Cryogenic Services).

Application/Limitation

- The actuators may only be used in compliance with the DNV Rules and restrictions and limitations therein.
- Actuators on valves in piping systems required to operate under fire conditions must be fire safe. This shall be documented and approved by DNV GL
- The maximum output torque from actuators used on butterfly valves must not exceed the limit at which the valve spindle or disc can be damaged if the disc is restrained in any position.
- The Actuators shall be Corrosion resistant for marine applications
- Actuators used on ship side valves located in dry compartments, bilge valves and valves on the fuel oil and lubricating oil tanks which are situated higher than the double bottom tanks, shall be arranged for local manual operation. For ship side valves a portable hand pump is not accepted as equivalent to manual operation.

Type Approval documentation

Manufacturer's product catalogue

Manufacturer's document "Technical Expedient of Prisma Pneumatic Actuators Rev. 0, dated 2014-06-06, PA-PP-PI-PAG Double Acting and Spring Return.

Instruction Operation Manual PI-PIE Family, 2012-09-27

Instruction Operation Manual P-PA Family, 2013-03-01

Instruction Operation Manual PP Family, 2013-04-01

Instruction Operation Manual PAG Family, 2014-07-15

DNV survey report, Burst testing dated 2004-09-29 and 2004-10-06.

DNV survey report, Burst testing PI30 dated 2005-04-05.

DNV survey report No: 44001239, burst testing dated 2007-10-16

DNV survey report, Burst testing PA70 dated 2008-11-05.

DNV Survey Report, Burst Test PA10-PI10-PP10, dated 2014.07-22

Product catalogue

Certificate No: **P-15076**
File No: **777.91**
Job Id: **262.1-004269-2**

Customer's calculations.
Dimensional drawings
Type Approval Assessment Report dated 2014-07-22-

Type Tests carried out

- Burst test

Delivery conditions/ Marking of product

Production testing:

- Each actuator body is to be subjected to a pressure test at minimum **1,3 times** the design pressure at room temp, or in combination with test of actuator assembly.
- Each actuator shall be subjected to an operability test.

Marking:

For traceability to this type approval, the products are at least to be marked with:

- Manufacturers name or trade mark
- Type designation
- Maximum working pressure
- Serial number

Periodical assessment

Periodical assessment after 2 years:

For retention of the Type Approval, DNV-GL Surveyor shall perform an assessment 2 years after issue of the Type Approval Certificate, according to DNV Standard for Certification No. 2.9 – 5-794.40, "Type Approval of Valves" to verify that the conditions for the type approval are complied with.

Renewal assessment after 4 years:

Application for renewal shall be submitted to DNV not later than 3 months before expiry date of the certificate. Upon receipt of the application a periodical assessment will be carried out to verify the conditions for the type approval is still complied with. Any changes to the design are to be handled as for initial Type Approval, with regards to additional documentation and testing requirements.

END OF CERTIFICATE