

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Hydraulic Actuator for Valve (Not Hydraulic Motor)**with type designation(s)
hydraulic actuators

Issued to

Eltorque Automation (Xiamen) Ltd.
Xiamen City,, Fujian Province,, China

is found to comply with

DNV GL rules for classification – Ships Pt.4 Ch.6 Piping systems**DNVGL-OS-D101 – Marine and machinery systems and equipment, Edition January 2018****Application :****Product(s) approved by this certificate is/are accepted for installation on vessels classed by DNV GL.****Dsgn. press./Torque See Certificate**Issued at **Høvik** on **2021-01-06**for **DNV GL**This Certificate is valid until **2026-01-05**.DNV GL local station: **Xiamen**Approval Engineer: **Mehdi Rowshan**

Zeinab Sharifi
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.

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Form code: TA 251

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Product description

Rack and pinion hydraulic actuators in two types:

HSQ (Single acting): HSQ160, HSQ350, HSQ900, HSQ2000

HDQ (Double acting): HDQ120, HDQ350, HDQ700, HDQ1400, HDQ3000, HDQ5000, HDQ10K, HDQ20K

Design standard: GB 150-1998 chapter 9 /JIS8270-8285

Materials:

Cylinder: 45# steel medium carbon (DIN EN C45 (1.0503)/ ASTM 1045), SUS306/316/316L
End Plate: 45# steel medium carbon (DIN EN C45 (1.0503)/ ASTM 1045), SUS306/316/316L
Bolting: SUS316, DIN582
Seals: NBR/PTFE

Actuator manufacturing plant:

Eltorque Automation (Xiamen) Ltd.

2/F,1# building, No.168, Huizuo Rd, XinYang Industrial Area, Haicang District, Xiamen City, Fujian Province, China

Application/Limitation

All actuators covered by this certificate are approved for 160 bar design pressure for the design temperature between -15 °C to +65 °C.

The hydraulic actuators may be installed in the electro - hydraulic models specified in the table below:

Action Type	No	Rack and pinion series		
		Hydraulic actuator models	Bore Diameter (mm)	Installed in Electro-hydraulic actuator model
Double Acting	1	HDQ120	32	EDQ120
	2	HDQ350	40	EDQ350
	3	HDQ700	50	EDQ700
	4	HDQ1400	63	EDQ1400
	5	HDQ3000	80	EDQ3000
	6	HDQ5000	100	EDQ5000
	7	HDQ10K	125	EDQ10K
	8	HDQ20K	160	EDQ20K
Single Acting	1	HSQ160	50	ESQ160
	2	HSQ350	63	ESQ350
	3	HSQ900	90	ESQ900
	4	HSQ2000	125	ESQ2000

Type Approval documentation

Doc. ref.	Rev.	Description
821238- 821243, 821296- 821297, 826102- 826103	01	Assembly drawing and schematic diagram of Double acting hydraulic actuator(120-700N)
821244-821250, 826104-826105	01	Assembly drawing and schematic diagram of Double acting hydraulic actuator (More than 1400N)
821199, 821200- 821204, 826091-	01	HDQ10K Hydraulic cylinder drawing
		HDQ20K Hydraulic cylinder drawing
		HDQ120 Hydraulic cylinder drawing

826092		
821205-821210,	01	HDQ350 Hydraulic cylinder drawing
826094		
821211- 821216,	01	HDQ700 Hydraulic cylinder drawing
826095		
821217-821222,	01	HDQ1400 Hydraulic cylinder drawing
826097		
821224- 821229,	01	HDQ3000 Hydraulic cylinder drawing
821292- 821293,		
826099		
821231- 821236,	01	HDQ5000 Hydraulic cylinder drawing
821294- 821295,		
826100- 826101	01	Assembly drawing and schematic diagram of Single acting hydraulic actuator
HSQ160xm-001-	01	HSQ160 Hydraulic cylinder drawing
013		
HP350xm-001- 013	01	HSQ350 Hydraulic cylinder drawing
HP900xm-001- 014	01	HSQ900 Hydraulic cylinder drawing
HP2000xm-001- 014		
4 637-012	01	HDQ/HSQ Specification of hydraulic actuator
312-022	01	HSQ160 BOM (Single acting)
312-023	01	HSQ350 BOM (Single acting)
312-024	01	HSQ900 BOM (Single acting)
312-025	01	HSQ2000 BOM (Single acting)
312-011	01	HDQ20K BOM (Double acting)
312-012	01	HDQ120 BOM (Double acting)
312-013	01	312-013 HDQ350 BOM (Double acting)
312-014	01	312-014 HDQ700 BOM (Double acting)
312-015	01	312-015 HDQ1400 BOM (Double acting)
312-037	01	312-037 HDQ3000 BOM (Double acting)
312-038	01	312-038 HDQ5000 BOM (Double acting)
312-039	01	312-039 HDQ10K BOM (Double acting)
312-071	01	312-071 HDQ350 BOM (immersion) (Double acting)
323-003 V1.0	01	Wall thickness calculation of the stainless hydraulic actuator cylinder
323-004 V1.0	01	Stainless Hydraulic actuator bolt strength check
323-001 V1.0	01	Hydraulic actuator bolt strength check
323-002 V1.0	01	Wall thickness calculation of the hydraulic actuator cylinder

Production testing

Each actuator is to be hydro tested at 1.5 x the maximum allowable pressure before delivery.

Certification

Hydraulic actuator HDQ20K shall be delivered with DNVGL product certificate; no product certificate is required for other actuator models covered in this certificate.

Marking of product

For traceability to this type approval the actuators are to be marked with:

- Manufacturer's name or trademark
- Pressure rating and maximum torque
- Type designation

Periodical assessment

For retention of the Type Approval, a DNV GL Surveyor shall perform periodical assessment after two years (+/- 90 days) and after 3.5 years (+/- 90 days) to verify that the conditions for the approval are complied with. Reference is made to DNVGL-CP-0338.