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Гидроприводы KSB. Техническое описание

Hydraulic Actuator

HQ

HQ 10/10GS/10S - 200/200GS/200S:

Force Transmission via Rack-and-pinion Kinematics

HQ 400/400GS/400S - 1600/1600GS/1600S:

Force Transmission via Toggle-lever kinematics

Output Torques up to 55,000 Nm

Pressure up to 160 bar

Type Series Booklet



Hydraulic Actuators

Single-acting and Double-acting Hydraulic Actuators

HQ 10 - 1600



Main applications

- Shipbuilding
- Water
- Waste water
- Energy
- Industry

Operating data

Operating properties

Characteristic	Value
HQ	HQ 10/10GS/10S HQ 25/25GS/25S HQ 50/50GS/50S HQ 100/100GS/100S HQ 200/200GS/200S HQ 400/400GS/400S HQ 800/800GS/800S HQ 1600/1600GS/1600S
Max. permissible pressure	160 bar
Max. permissible temperature	Standard: HQ 10/10GS/10S - 1600/1600GS/1600S: -20 to +100 °C Variant: HQ 10/10GS/10S - 1600/1600GS/1600S: -45 °C to +100 °C
Output torque	HQ 10 - 1600: up to 55,000 Nm HQ 10GS - 1600GS: up to 28,000 Nm

Characteristic	Value
	HQ 10S - 1600S: up to 17,000 Nm
Enclosure	IP68

Design details

Design

The HQ type series comprises actuator types HQ, HQ GS and HQ S:

- Double-acting hydraulic actuators HQ 10, HQ 25, HQ 50, HQ 100 and HQ 200 with rack-and-pinion kinematics providing a constant output torque throughout the stroke
- Double-acting hydraulic actuators HQ 400, HQ 800 and HQ 1600 with toggle-lever kinematics providing a variable output torque that is ideally suited for actuating quarter-turn valves with a hydrodynamic torque
- Single-acting hydraulic actuators with gas cartridge, types HQ 10GS, HQ 25GS, HQ 50GS, HQ 100GS and HQ 200GS, with rack-and-pinion kinematics providing a constant output torque throughout the stroke
- Single-acting hydraulic actuators with gas cartridge, types HQ 400GS, HQ 800GS and HQ 1600GS, with toggle-lever kinematics providing a variable output torque that is ideally suited for actuating quarter-turn valves with a hydrodynamic torque
- Single-acting hydraulic actuators with spring cartridge, types HQ 10S, HQ 25S, HQ 50S, HQ 100S and HQ 200S, with rack-and-pinion kinematics providing a constant output torque throughout the stroke
- Single-acting hydraulic actuators with spring cartridge, types HQ 400S, HQ 800S and HQ 1600S, with toggle-lever kinematics providing a variable output torque that is ideally suited for actuating quarter-turn valves with a hydrodynamic torque
- They are suitable for all fields of application and all types of quarter-turn valves (centred-disc or offset-disc butterfly valves, ball valves, etc.).
- Actuator/valve interface to ISO 5211
- Used with a biodegradable, non-flammable oil
- The actuators are equipped with adapters allowing them to be mounted on valves with different types of stem end (square or flat ends).

The standard model of these actuators is suitable for immersion in up to 40 metres of (fresh or salt) water, unrefined petroleum products or other products (enclosure IP68 in continuous operation) if the valve/actuator interface is sealed tightly.

A special model with a special coating system is available for immersion in light petroleum products.

They are equipped with two assemblies consisting of adjustable travel stops and drain valve, and also feature an emergency connection valve and position indicator.

Coating

- **Standard model:**
 - Anti-corrosive primer coat applied by cathodic electrocoating, colour: black, thickness: 25 - 39 µm
 - Three-coat anti-corrosive coating consisting of a 150-µm epoxy primer coat, a 50-µm epoxy coat and a 50-µm polyurethane coat (green). Total thickness = 250 µm.

This protective coating has been tested in our laboratories and qualified for operation in salt spray environments in accordance with the NFX 41-002 standards.

- Customer-specific coatings can be applied on request.

- **Submerged actuators:**

- Anti-corrosive primer coat applied by cathodic electrocoating, colour: black, thickness: 25 - 39 μm
- Two-coat anti-corrosive coating consisting of a bituminous epoxy coat, thickness 150 μm , and a grey epoxy coat, thickness 150 μm , total thickness = 300 μm .

This protective coating has been tested in our laboratories and qualified for operation in salt spray environments in accordance with the NFX 41-002 standards.

- Customer-specific coatings can be applied on request.

Technical data

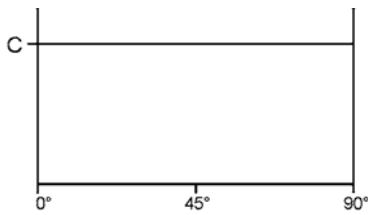
Function

Standard HQ actuators are designed for valve closure in clockwise direction.

HQ 10 - 200: force transmission via rack-and-pinion kinematics

The rack-and-pinion kinematics provide a constant torque throughout the stroke. The translatory movement of the piston/rack assembly generated by the control pressure causes a clockwise quarter rotation of the pinion and, consequently, a quarter rotation of the valve stem connected to the pinion.

Curve of rack-and-pinion kinematics



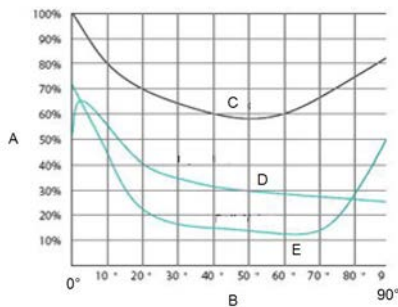
C:	Output torque
0° to 90°:	Angle of rotation
0°:	Closed
90°:	Open

HQ 400 - 1600: force transmission via toggle-lever kinematics

The toggle-lever kinematics develop a variable torque that is ideally suited for actuating quarter-turn valves with a hydrodynamic torque.

These kinematics are particularly suited for actuating ball valves as demonstrated by the torque curve below.

Curve of toggle-lever kinematics



A:	Output torque
B:	Cylinder rotation
0° to 90°:	Angle of rotation
0°:	Closed
90°:	Open
C:	Cylinder
D:	Butterfly valve
E:	Ball valve

Double-acting hydraulic actuators HQ 10 to HQ 1600

Max. pressure of control medium: 160 bar. Please contact us for higher pressures. Being symmetrically designed, the opening chamber and the closing chamber have the same capacity.

Characteristics

HQ size	Max. permissible output torque at a pressure of			Capacity in cm ³
	80 bar	135 bar	160 bar	
10	110	185	219	23
25	298	503	597	62
50	558	942	1117	115
100	1074	1812	2148	222
200	2416	4077	4832	499
400	8480	14310	16961	1276
800	15188	25630	30377	2285
1600	27626	46618	55251	4156

Type series

Thanks to an ISO 5211 interface, the actuators can be mounted directly on all valves that comply with this standard. An installation kit is available for also mounting them on all other quarter-turn valves. The actuators are equipped with removable adapters allowing them to be mounted on valves with different types of stem end (square, flat, etc.). The actuator can be mounted onto the valve in 4 different positions, offset by 90°.

HQ size	Interface standardised to ISO	Max. permissible stem dimensions		
		Square end	Flat end	Height
10	F05 and F07	19	19	50
25	F07 and F10	28	28	65
50	F10 and F12	27	36	75
100	F12, F14 and KSB1	36	46	90
200	F14, F16 and KSB2	55	75	120
400	F16 and F25	60	85	120
800	F16, F25 and F30	77	105	165
1600	F30 and F35	90	120	210

Properties of the cathoretic primer

The cathoretic coating process is based on a coating material in an aqueous solution which acts like an electrolyte. The coating particles migrate onto the part to be coated and are deposited to form a protective coating of uniform thickness.

The organic EPOXY coating (EYC-648/EYP-648), which is 25 to 39 µm thick, provides the components with an extraordinary level of corrosion resistance and

- excellent resistance to chemicals as well as excellent corrosion behaviour (salt spray testing to ASTM B 117-73),
- good resistance to solvents and insulating characteristics,
- good mechanical properties, etc.

This elastic coating is insensitive to scratches and impacts.

Control medium

- Mineral oil, biodegradable, non-flammable (HFA - HFB - HFC)
- Viscosity: 10 cst (mm²/sec) to 400 (mm²/sec)
- Cleanliness class: Class 9 to NAS 1638, equivalent to Class 18/15 to ISO 4408. Filtration recommended.
- Variant: hydraulic fluid type HFD: Contact KSB.

Single-acting hydraulic actuators with gas cartridge, types HQ 10GS - HQ 1600GS

These single-acting hydraulic actuators are designed for actuating all types of quarter-turn valves. They develop output torques of up to 27,762 Nm (2832.8 kgf.m).

The maximum operating pressure is 160 bar (16 MPa) and the maximum gas pressure is 150 bar (15 MPa).

The gas cartridge of these single-acting hydraulic actuators has the following advantages:

- Easy field maintenance
- Straightforward setting of the torque via pressure N2
- Monitoring of the torque, taking into account the pressure gauge reading

The rack-and-pinion kinematics have the following advantages:

- Precise and reliable function
- Constant output torque
- High performance achieved with space-saving design
- Reliability and long service life
- Submerged operation possible

The toggle-lever kinematics have the following advantages:

- Precise and reliable function
- Suited for the torque
- Develops a variable output torque that is ideally suited for actuating quarter-turn valves with a hydrodynamic torque.
- Reliability and long service life
- Submerged operation possible

Characteristics

HQ size	Max. permissible output torque with 150-bar gas cartridge (15 MPa) (Nm)	Max. permissible oil pressure (bar) (MPa)	Capacity (cm ³)	Actuator flange, standardised to ISO
10GS - TU250-038	41	160 (16)	23	F05, F07
10GS - TU500-038	73			
25GS - TU500-050	95		62	F07, F10
25GS - TU750-050	152			
50GS - TU750-064	201		115	F10, F12
50GS - TB750-064	193			
50GS - TU1500-064	405			
100GS - TB1500-080	495		222	F10, F12, F14
100GS - TU3000-080	485			
100GS - TU3000-125	991			
200GS - TU3000-125	1529		499	F14, F16
200GS - TB3000-125	1770			
400GS - TU3000-250	4744		1276	F14, F16 / F25
400GS - TB3000-250	4700			
800GS - TU50000-300	9844		2285	F16, F25, F30
800GS - TB5000-300	9698			
1600GS - TU7500-300	17667		4156	F30, F35
1600GS - TU10000-300	29444			

Example: TU 250 corresponds to a value of 250 kgF (kilogram force) at a pressure of 150 bar and an ambient temperature of 20 °C.

Single-acting hydraulic actuators with spring cartridge, types HQ 10S - HQ 1600S

These single-acting hydraulic actuators are designed for actuating all types of quarter-turn valves. They develop output torques of up to 17,351 Nm (1770.5 kgf.m).

The maximum operating pressure is 160 bar (16 MPa) and the maximum gas pressure is 150 bar (15 MPa).

The spring cartridge of these single-acting hydraulic actuators has the following advantages:

- Spring cartridge easy to replace at the site
- Stroke set between two limit positions by adjustable travel stops
- Welded design for optimum size and added safety

The rack-and-pinion kinematics have the following advantages:

- Precise and reliable function
- Constant output torque
- High performance achieved with space-saving design
- Reliability and long service life

The toggle-lever kinematics have the following advantages:

- Precise and reliable function
- Suited for the torque
- Develops a variable output torque that is ideally suited for actuating quarter-turn valves with a hydrodynamic torque.
- Reliability and long service life
- Submerged operation possible

Characteristics

HQ size	Max. permissible output torque with spring cartridge (Nm)	Max. permissible oil pressure (bar) (MPa)	Capacity (cm ³)	Actuator flange, standardised to ISO
10S	183	160 (16)	23	F05, F07
25S	597		62	F07, F10
50S	1117		115	F10, F12
100S	2148		222	F10, F12, F14
200S	4310		499	F14, F16
400S	16961		1276	F14, F16 / F25
800S	27793		2285	F16, F25, F30
1600S	55251		4156	F30, F35

Hydraulic connection

Standard version: direct connection

The control fluid supply is connected directly at the actuator:

- HQ 10 - 1600: All sizes of the HQ models available come with three types of threaded ports for hydraulic connection: 1/4" gas-threaded, 3/8" gas-threaded and 1/2" gas-threaded.
- Up to HQ 400 we recommend using the 1/4" and 3/8" threaded ports.

Caution: If connected directly, the actuator will only maintain its stroke position as long as control pressure is applied. If this cannot be warranted by the control system, we recommend fitting a distributor plate with piloted check valves (safety block BL0020). See schematic below.

Optional version with distributor plate: HQ 10 - 1600

The control medium supply is connected via a hydraulic distributor plate:

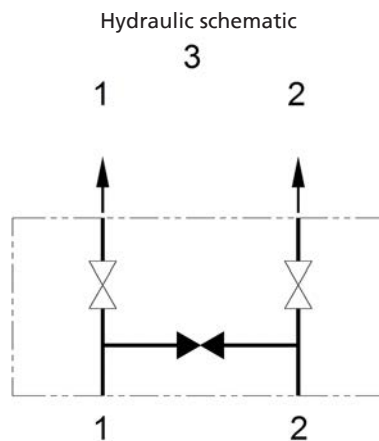
- HQ 10 - 200: mounted directly on the actuator housing
- HQ 400 - 1600: mounted on the actuator with a sub-block (BL0004) via the two 3/8" gas-threaded ports
- 3 distributor plate variants are available, see schematics below.

Shut-off function: BL0032, BL0033 and BL0034

General description:

The shut-off valve block is mounted on the side of the hydraulic actuator and can be combined with other blocks. It is used for interrupting the hydraulic oil supply to the hydraulic actuator using shut-off valves; a bypass valve can be used for flushing the hydraulic line.

- Max. permissible pressure: 160 bar (16 MPa)
- Hydraulic connection: 1/4" gas-threaded port
 - BL0032 = 1/4" G
 - BL0033 = 3/8" G
 - BL0034 = 1/2" G
- Application temperature: -30 °C to +100 °C (other temperatures on request)
- 30 l/min at 120 bar (12 MPa)



- 1: Open
- 2: Closed
- 3: To actuator

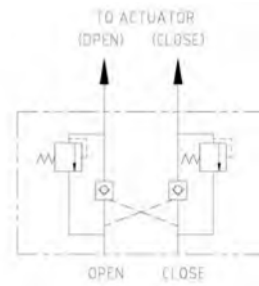
Safety block BL0020

General description:

The safety block is mounted on the side of the hydraulic actuator and can be combined with other blocks. It consists of a spool actuating two piloted check valves. It is used for interrupting the hydraulic oil supply to the hydraulic actuator; a bypass valve can be used for flushing the hydraulic line.

- Max. permissible pressure: 160 bar (16 MPa)
- Hydraulic connection: 1/4" gas-threaded port
- Application temperature: -30 °C to +100 °C (other temperatures on request)
- 25 l/min at 120 bar (12 MPa)

Hydraulic schematic



- 1: Open
- 2: Closed
- 3: To actuator

ESD block (BL 0012)

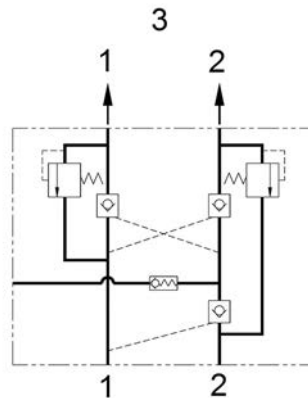
General description:

The ESD block is mounted on the side of the hydraulic actuator and can be combined with other blocks. It consists of 3 piloted check valves and 2 emergency valves.

In an emergency, the actuator is operated (opening/closing) from an external source acting like an accumulator (ESD block).

- Max. permissible pressure: 160 bar (16 MPa)
- Max. pressure in an emergency: 177 bar (17.7 MPa)
- Application temperature: -30 °C to +100 °C (other temperatures on request)
- 39 l/min at 120 bar (12 MPa)

Hydraulic schematic



- 1: Open
- 2: Closed
- 3: To actuator

Variants

Note: The ESD system must always be controlled by a central hydraulic power unit located at a distance from the valve's/ actuator's place of installation. Quick-connect coupling with integrated dust filter

Applications

The quick-connect coupling is used for hydraulic actuators, solenoid valves and other hydraulic equipment.

- Connection of emergency hand pump
- Venting and flushing of hydraulic cylinder
- Pressure verification of hydraulic equipment

Hydraulic symbol:



Quick-action coupling

Applications

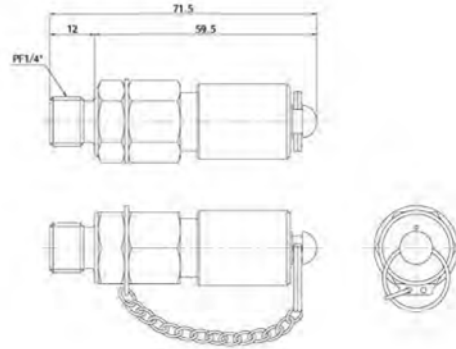
The quick-action coupling (SUS316) meets the requirements of ISO 7241-1, Series B, size 6.3. It is used for hydraulic actuators, solenoid valves and other hydraulic equipment.

- Connection of emergency hand pump
- Venting and flushing of hydraulic cylinder
- Pressure verification of hydraulic equipment

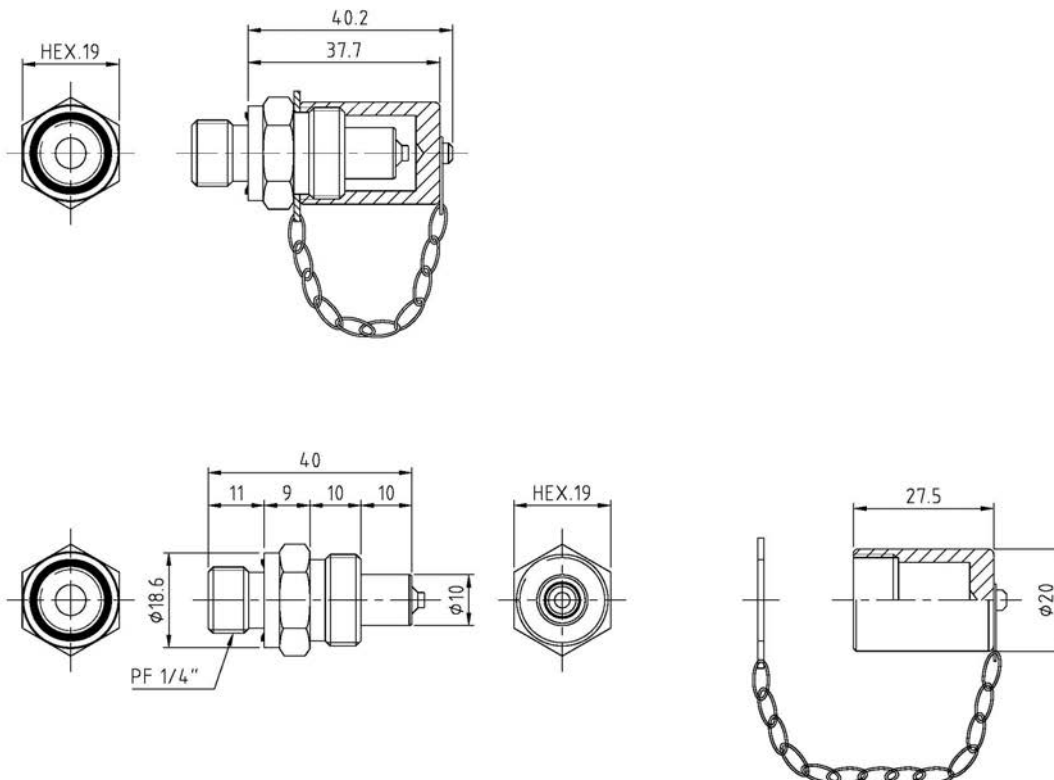
Hydraulic symbol:



Drawing



Drawings

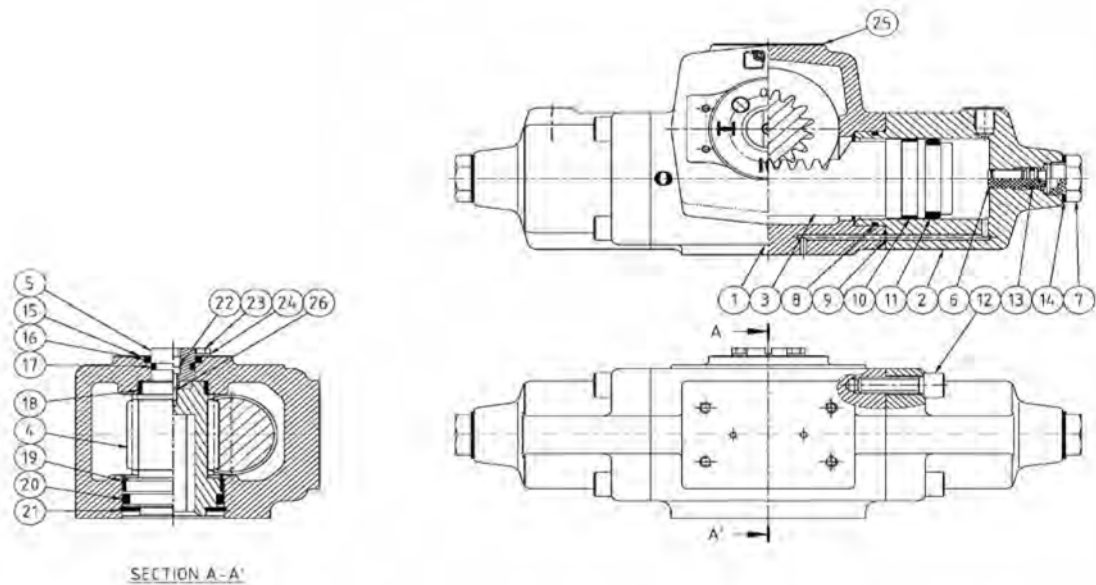


With the exception of the chain, which is made of stainless steel 304, the quick-action coupling is made of stainless steel 316.

Materials

Sectional drawing of HQ 10 - 200

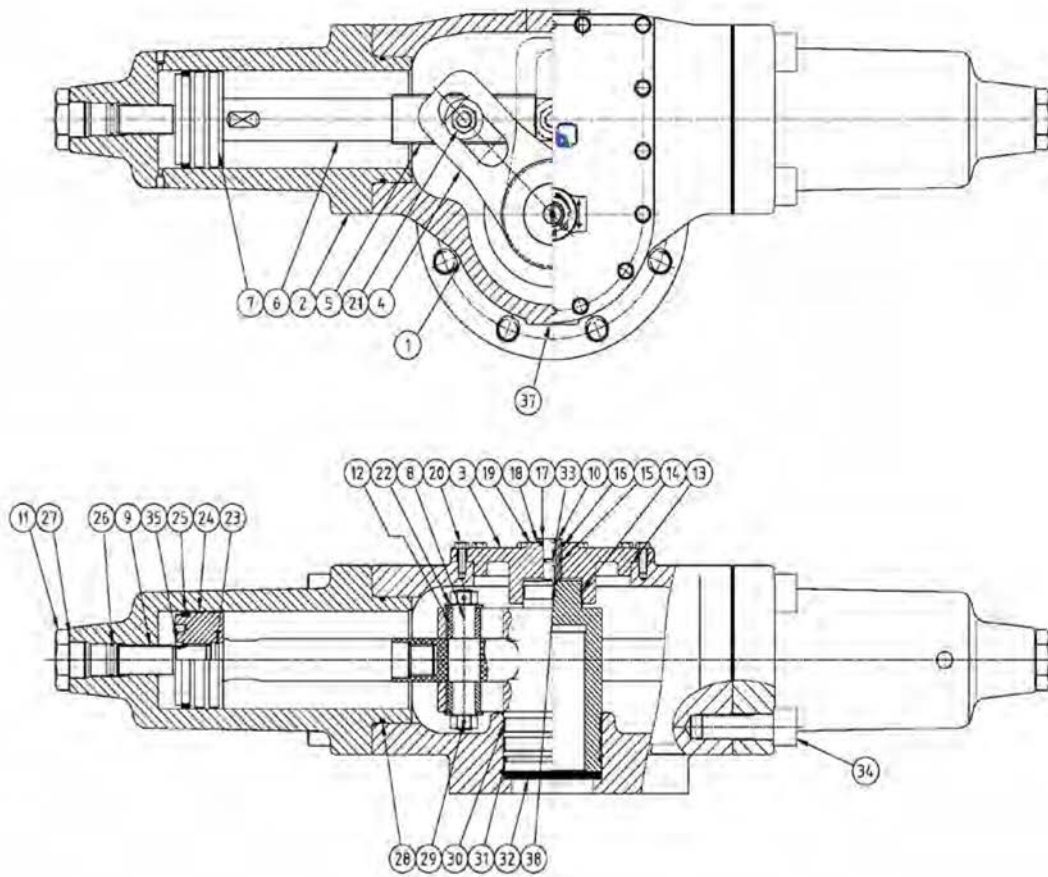
Section A-A



List of components of HQ 10 - 200

Item	Description	Materials
01	Housing	Nodular cast iron JS 1030 (EN-GJS-450-10)
02	Cylinder	Nodular cast iron JS 1030 (EN-GJS-450-10)
03	Rack	Steel SCM 440
04	Pinion	Steel SCM 440
05	Position indicator	Stainless steel 304
06	Travel stop	Steel
07	Plug	Carbon steel 545C (1.1191)
08	O-ring	Nitrile
09	O-ring	Nitrile
10	Wear ring	Plastic (phenol)
11	Ring	Plastic (urethane)
12	Fastening screws/bolts	Steel
13	O-ring	Nitrile
14	Joint ring	Copper
15	Information label	Stainless steel 316
16	Dust seal	Plastic (urethane)
17	O-ring	Nitrile
18	Strap	Plastic (phenol)
19	Strap	Plastic (phenol)
20	O-ring	Nitrile
21	Circlip	Steel SWP-A (ASTM A-228)
22	Fastening nut	Steel
23	Hexagon nut	Stainless steel 316
24	Washer	Stainless steel 316
25	Name plate	Stainless steel 316
26	O-ring	Nitrile

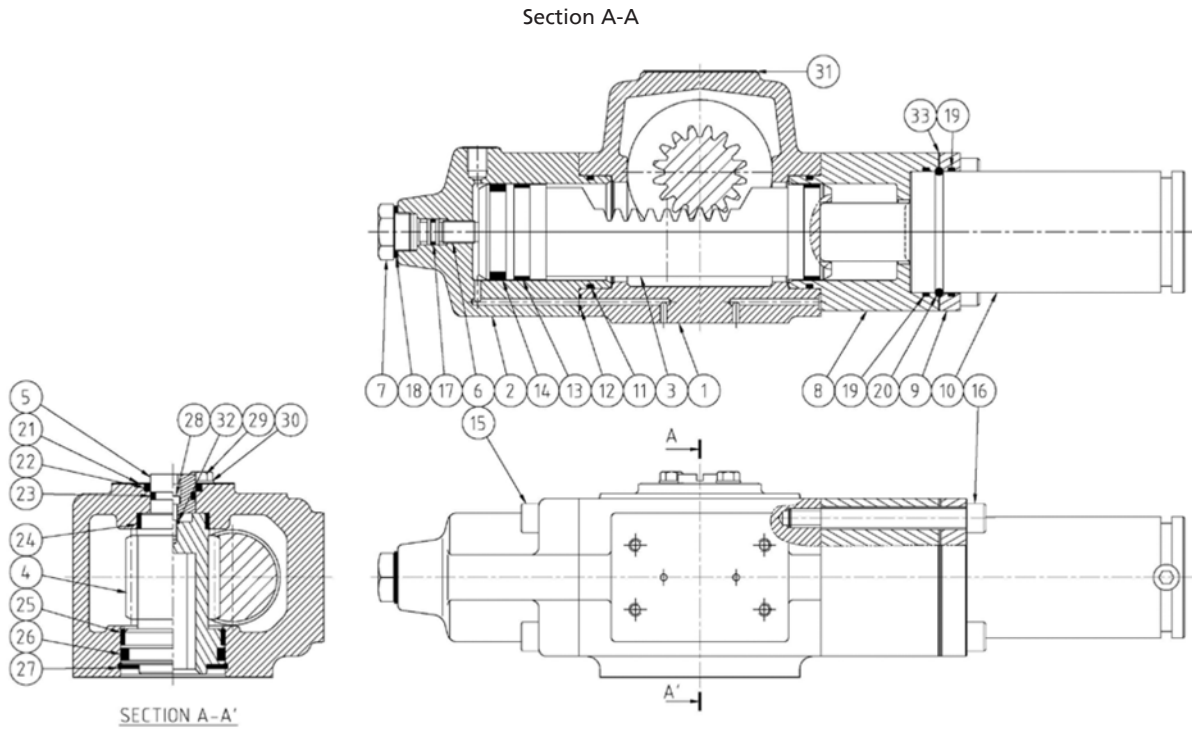
Sectional drawing of HQ 400 - 1600



List of components of HQ 400 - 1600

Item	Description	Materials
01	Housing	Nodular cast iron JS 1030 (EN-GJS-450-10)
02	Cylinder	Nodular cast iron JS 1030 (EN-GJS-450-10)
03	Housing cover	Nodular cast iron JS 1030 (EN-GJS-450-10)
04	Fork	Nodular cast iron JS 1030 (EN-GJS-600-3)
05	Connection stem	Carbon steel 545C (1.1191)
06	Rod	Steel SCM 440
07	Piston	Carbon steel 545C (1.1191)
08	Lever hinge pin	Steel SCM 440
09	Travel stop	Steel SCM 440
10	Position indicator	Stainless steel 304
11	Plug	Carbon steel 545C (1.1191)
12	Strap	Steel SCM 440
13	O-ring	Nitrile
14	Wear ring	Plastic (phenol)
15	O-ring	Nitrile
16	Dust seal	Plastic (urethane)
17	Hexagon nut	Stainless steel 316
18	Washer	Stainless steel 316
19	Information label	Stainless steel 316
20	Hexagon nut	Stainless steel 316
21	Nut	Carbon steel 545C (1.1191)
22	Washer	Bronze (BC3)
23	O-ring	Nitrile
24	Wear ring	Plastic (phenol)
25	Ring	Plastic (urethane)
26	O-ring	Nitrile
27	Joint ring	Copper
28	O-ring	Nitrile
29	Adjusting screw	Nitrile
30	Strap	Steel SCM 440
31	O-ring	Plastic (phenol)
32	Circlip	Nitrile
33	Fastening nut	Steel SWP-A (ASTM A-228)
34	Fastening nut	Steel SCM 440
35	Adjusting screw	Steel SCM 440
36	-	
37	Name plate	Stainless steel 316
38	O-ring	Nitrile

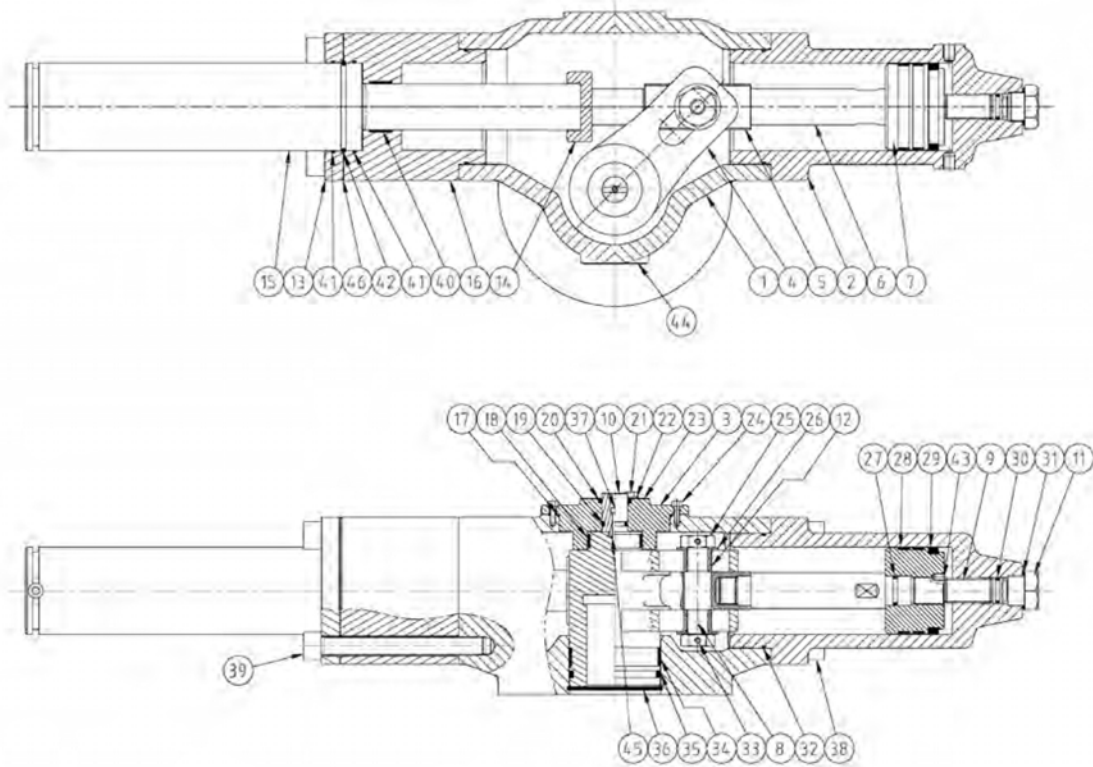
Sectional drawing of HQ 10GS - 200GS



List of components of HQ 10GS - 200GS

Item	Description	Materials
01	Housing	Nodular cast iron JS 1030 (EN-GJS-450-10)
02	Cylinder	Nodular cast iron JS 1030 (EN-GJS-450-10)
03	Rack	Steel SCM 440
04	Pinion	Steel SCM 440
05	Position indicator	Stainless steel 304
06	Travel stop	Steel SCM 440
07	Plug	Carbon steel 545C (1.1191)
08	Cylinder, gas cartridge	Carbon steel 545C (1.1191)
09	Cylinder, gas cartridge	Carbon steel 545C (1.1191)
10	Gas cartridge	-
11	O-ring	Nitrile
12	O-ring	Nitrile
13	Wear ring	Plastic (phenol)
14	Ring	Plastic (urethane)
15	Fastening screws/bolts	Steel SCM 440
16	Fastening screws/bolts	Steel SCM 440
17	O-ring	Nitrile
18	Joint ring	Copper
19	O-ring	Nitrile
20	Ring	Steel SWP-A (ASTM A-228)
21	Name plate	Stainless steel 316
22	Dust seal	Plastic (urethane)
23	O-ring	Nitrile
24	Strap	Plastic (phenol)
25	Strap	Plastic (phenol)
26	O-ring	Nitrile
27	Circlip	Steel SWP-A (ASTM A-228)
28	Fastening nut	Steel SCM 440
29	Hexagon nut	Stainless steel 316
30	Washer	Stainless steel 316
31	Name plate	Stainless steel 316
32	O-ring	Nitrile
33	Joint ring, gas cartridge	Asbestos-free

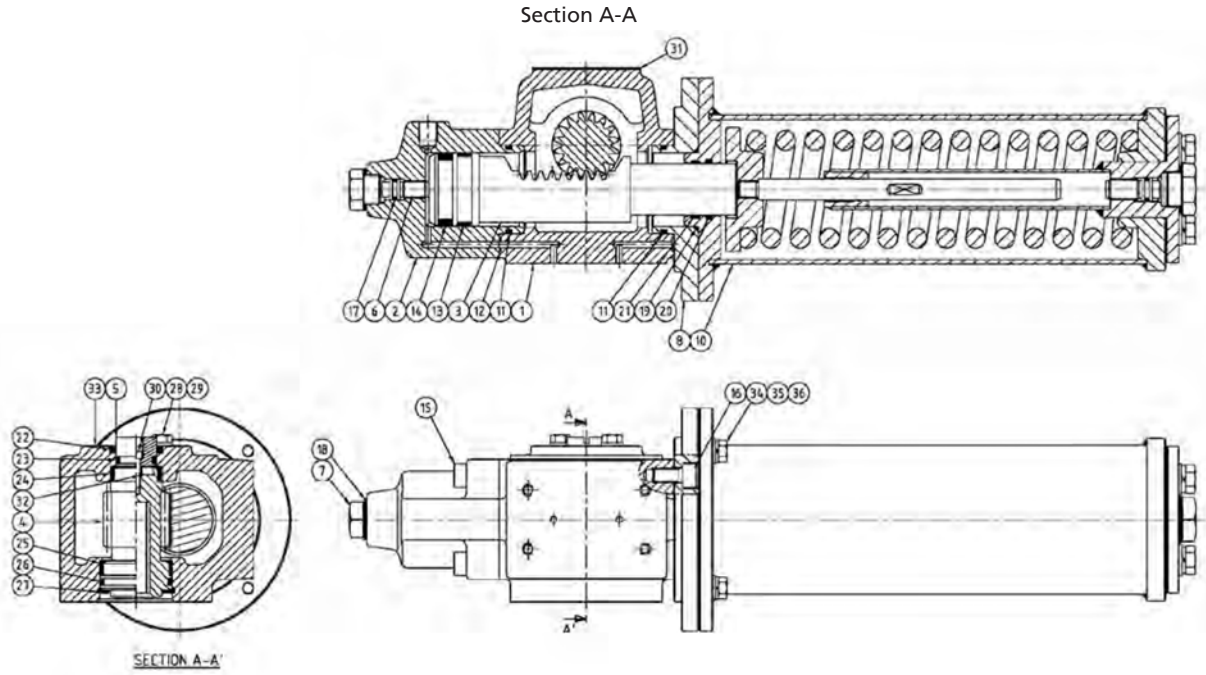
Sectional drawing of HQ 400GS - 1600GS



List of components of HQ 400GS - 1600GS

Item	Description	Materials
01	Housing	Nodular cast iron JS 1030 (EN-GJS-450-10)
02	Cylinder	Nodular cast iron JS 1030 (EN-GJS-450-10)
03	Housing cover	Nodular cast iron JS 1030 (EN-GJS-450-10)
04	Fork	Nodular cast iron JS 1030 (EN-GJS-600-3)
05	Connection stem	Carbon steel 545C (1.1191)
06	Rod	Steel SCM 440
07	Piston	Carbon steel 545C (1.1191)
08	Fork hinge pin	Steel SCM 440
09	Travel stop	Steel SCM 440
10	Position indicator	Stainless steel 304
11	Plug	Carbon steel 545C (1.1191)
12	Strap	Steel SCM 440
13	Flange, gas cartridge	Carbon steel 545C (1.1191)
14	Rod assembly, gas cartridge	Steel SCM 440
15	Gas cartridge	-
16	Cylinder, gas cartridge	Carbon steel 545C (1.1191)
17	O-ring	Nitrile
18	Wear ring	Plastic (phenol)
19	O-ring	Nitrile
20	Dust seal	Plastic (urethane)
21	Hexagon nut	Stainless steel 316
22	Washer	Stainless steel 316
23	Information label	Stainless steel 316
24	Hexagon nut	Stainless steel 316
25	Nut	Carbon steel 545C (1.1191)
26	Washer	Bronze (BC3)
27	O-ring	Nitrile
28	Wear ring	Plastic (phenol)
29	Ring	Plastic (urethane)
30	O-ring	Nitrile
31	Joint ring	Copper
32	O-ring	Nitrile
33	Adjusting screw	Steel SCM 440
34	Strap	Plastic (phenol)
35	O-ring	Nitrile
36	Circlip	Steel SWP-A (ASTM A-228)
37	Fastening nut	Steel SCM 440
38	Fastening screws/bolts	Steel SCM 440
39	Fastening screws/bolts	Steel SCM 440
40	Wear ring	Plastic (phenol)
41	O-ring	Nitrile
42	Ring	Steel SWP-A (ASTM A-228)
43	Adjusting screw	Steel SCM 440
44	Name plate	Stainless steel 316
45	O-ring	Nitrile
46	Joint ring, gas cartridge	Asbestos-free

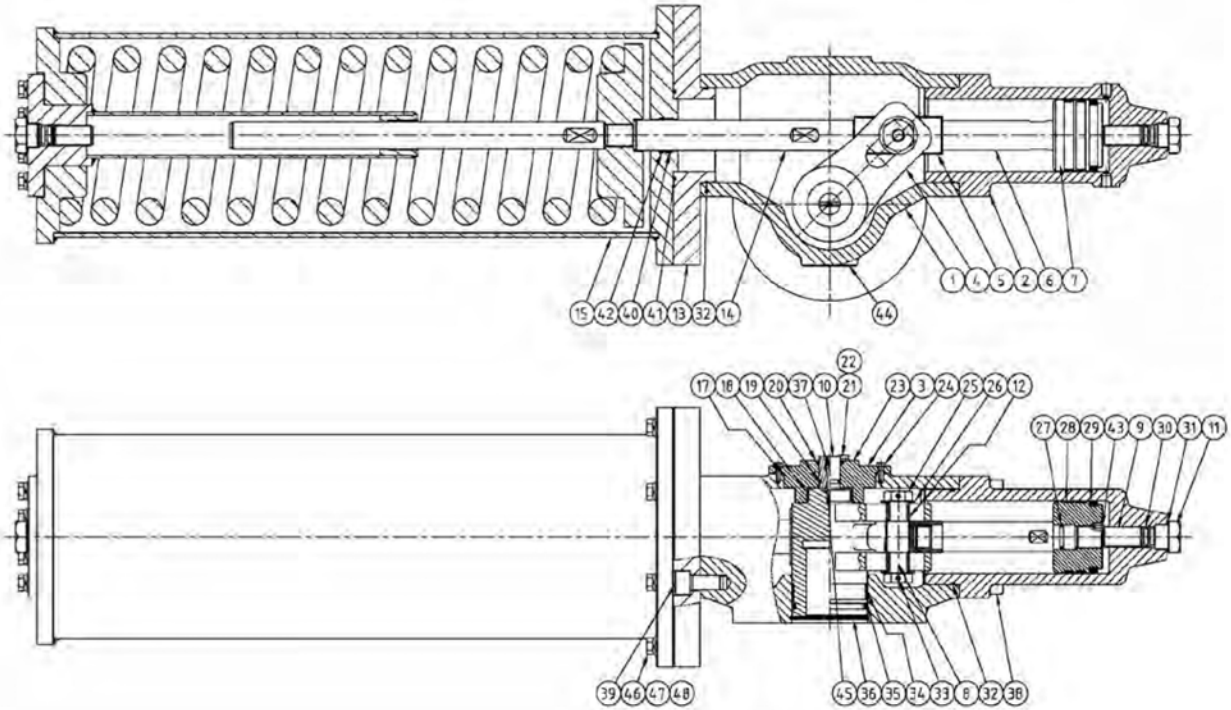
Sectional drawing of HQ 10S - 200S



List of components of HQ 10S - 200S

Item	Description	Materials
01	Housing	Nodular cast iron JS 1030 (EN-GJS-450-10)
02	Cylinder	Nodular cast iron JS 1030 (EN-GJS-450-10)
03	Rack	Steel SCM 440
04	Pinion	Steel SCM 440
05	Position indicator	Stainless steel 304
06	Travel stop	Steel SCM 440
07	Plug	Carbon steel 545C (1.1191)
08	Flange, spring cartridge	Carbon steel 545C (1.1191)
09	-	
10	Spring cartridge assembly	-
11	O-ring	Nitrile
12	O-ring	Nitrile
13	Wear ring	Plastic (phenol)
14	Ring	Plastic (urethane)
15	Fastening screws/bolts	Steel SCM 440
16	Fastening screws/bolts	Steel SCM 440
17	O-ring	Nitrile
18	Joint ring	Copper
19	O-ring	Nitrile
20	O-ring	Nitrile
21	Name plate	PTFE (Teflon 8500)
22	Dust seal	Plastic (urethane)
23	O-ring	Nitrile
24	Strap	Plastic (phenol)
25	Strap	Plastic (phenol)
26	O-ring	Nitrile
27	Circlip	Steel SWP-A (ASTM A-228)
28	Fastening nut	Stainless steel 316
29	Hexagon nut	Stainless steel 316
30	Washer	Steel SCM 440
31	Fastening nut	Stainless steel 316
32	Name plate	Stainless steel 316
33	O-ring	Nitrile
34	Hexagon nut	Stainless steel 316
35	Washer, spring cartridge	Carbon steel 545C (1.1191)
36	Washer	Carbon steel 545C (1.1191)

Sectional drawing of HQ 400S - 1600S

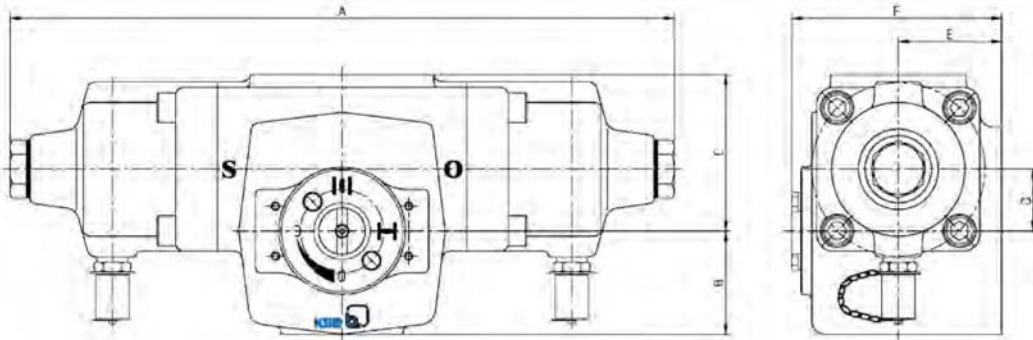


List of components of HQ 400S - 1600S

Item	Description	Materials
01	Housing	Nodular cast iron JS 1030 (EN-GJS-450-10)
02	Cylinder	Nodular cast iron JS 1030 (EN-GJS-450-10)
03	Housing cover	Nodular cast iron JS 1030 (EN-GJS-450-10)
04	Fork	Nodular cast iron JS 1030 (EN-GJS-600-3)
05	Connection stem	Carbon steel 545C (1.1191)
06	Rod	Steel SCM 440
07	End cap	Carbon steel 545C (1.1191)
08	Fork hinge pin	Steel SCM 440
09	Travel stop	Steel SCM 440
10	Position indicator	Stainless steel 304
11	Plug	Carbon steel 545C (1.1191)
12	Strap	Steel SCM 440
13	Flange, spring cartridge	Carbon steel 545C (1.1191)
14	Rod assembly, spring cartridge	Steel SCM 440
15	Spring cartridge	-
16		
17	O-ring	Nitrile
18	Wear ring	Plastic (phenol)
19	O-ring	Nitrile
20	Dust seal	Plastic (urethane)
21	Hexagon nut	Stainless steel 316
22	Washer	Stainless steel 316
23	Information label	Stainless steel 316
24	Hexagon nut	Stainless steel 316
25	Nut	Carbon steel 545C (1.1191)
26	Washer	Bronze (BC3)
27	O-ring	Nitrile
28	Wear ring	Plastic (phenol)
29	Ring	Plastic (urethane)
30	O-ring	Nitrile
31	Joint ring	Copper
32	O-ring	Nitrile
33	Adjusting screw	Steel SCM 440
34	Strap	Plastic (phenol)
35	O-ring	Nitrile
36	Circlip	Steel SWP-A (ASTM A-228)
37	Fastening nut	Steel SCM 440
38	Fastening screws/bolts	Steel SCM 440
39	Fastening screws/bolts	Steel SCM 440
40	Wear ring	PTFE (Teflon 8500)
41	O-ring	Nitrile
42	O-ring	Nitrile
43	Adjusting screw	Steel SCM 440
44	Name plate	Stainless steel 316
45	O-ring	Nitrile
46	Hexagon nut	Carbon steel 545C (1.1191)
47	Disc spring	Carbon steel 545C (1.1191)
48	Washer	Carbon steel 545C (1.1191)

Dimensions

Drawings of HQ 10 - 200

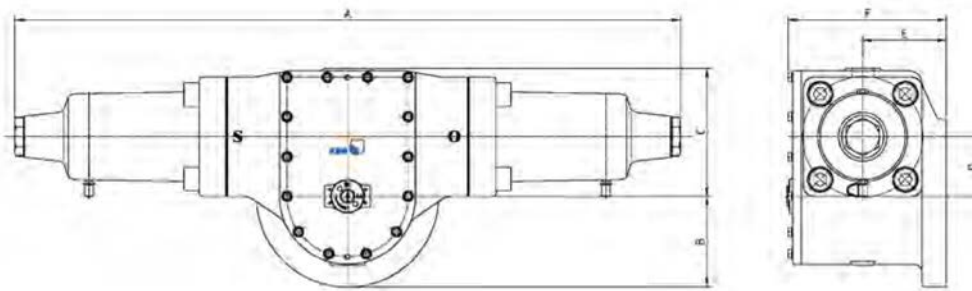


Dimensions of HQ 10 - 200

[mm]

HQ Type	A	B	C	D	E	F	ISO 5211 interface			Weight [kg]
							Ref.	Ø d1	Ø d2	
10	290	42,5	64,5	22	47	97	F05	50	M6	8
							F07	70	M8	
25	325	52	80,5	30	56	112	F07	70	M8	14
							F10	102	M10	
50	399	62	93,5	37	62	126	F10	102	M10	23
							F12	125	M12	
100	479	73	115,5	48	78	154	F12	125	M12	39
							F14	140	M16	
200	635	91	145	69	93,5	183,5	F14	140	M16	76
							F16	165	M20	

Drawings of HQ 400 - 1600

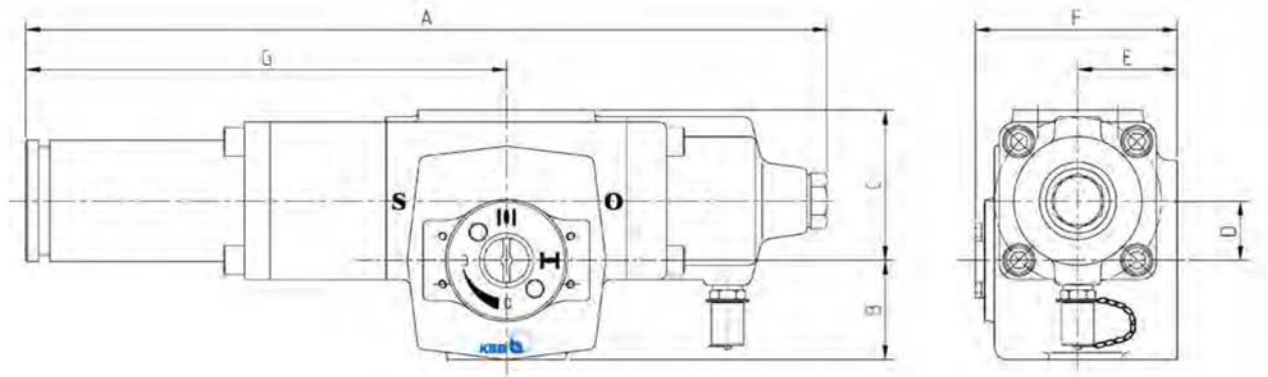


Dimensions of HQ 400 - 1600

[mm]

HQ Type	A	B	C	D	E	F	ISO 5211 interface				Weight [kg]
							Ref.	Ø d1	Ø d2	n	
400	920	127	193	90	113	219	F16	165	M20	4	100
		150					F25	254	M16	8	104
800	1278	158	233,5	110	150	282	F16	165	M20	4	160
		167					F25	254	M16	8	184
		175					F30	298	M20	8	209
1600	1516	190	290	135	190	363	F30	298	M16	8	328
		207,5					F35	298	M20	8	343

Drawings of HQ 10GS - 200GS

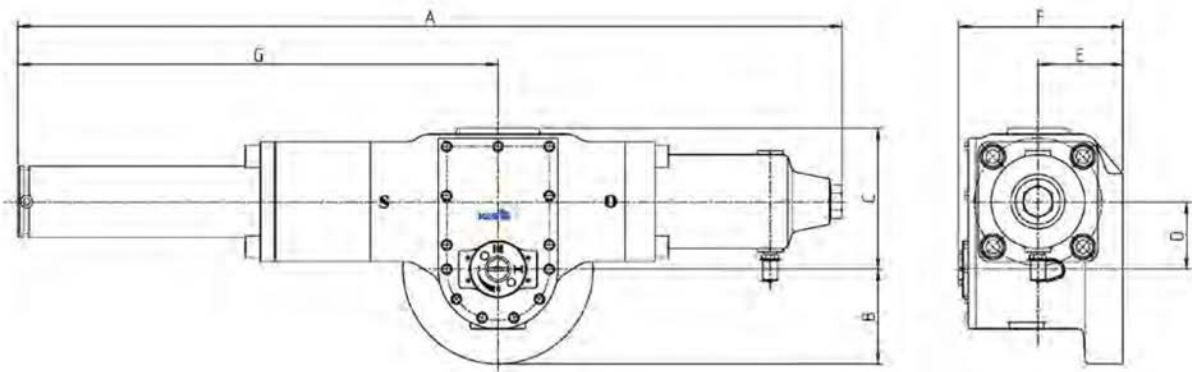


Dimensions of HQ 10GS - 200GS

[mm]

HQ Type	A	B	C	D	E	F	G	ISO 5211 interface			Weight [kg]
								Ref.	Ø d1	Ø d2	
10GS-TU250	311,6	42,5	64,5	22	47	97	166,6	F05	50	M6	9
								F07	70	M8	
10GS-TU500	346,7	42,5	64,5	22	47	97	201,7	F05	50	M6	10
								F07	70	M8	
25GS-TU500	399	52	80,5	30	56	112	236,5	F07	70	M8	17
								F10	102	M10	
25GS-TU750	408	52	80,5	30	56	112	245,5	F07	70	M8	18
								F10	102	M10	
50GS-TU750	486,5	62	93,5	37	62	126	287	F10	102	M10	28
								F12	125	M12	
50GS-TU1500	500,5	62	93,5	37	62	126	301	F10	102	M10	30
								F12	125	M12	
100GS-TU1500	586,7	73	115,5	48	78	154	344,2	F12	125	M12	46
								F14	140	M16	
100GSTU3000	596,7	73	115,5	48	78	154	354,2	F12	125	M12	48
								F14	140	M16	
200GS-TU3000	801	91	145	69	93,5	183,5	482,5	F14	140	M16	86
								F16	165	M20	

Drawings of HQ 400GS - 1600GS

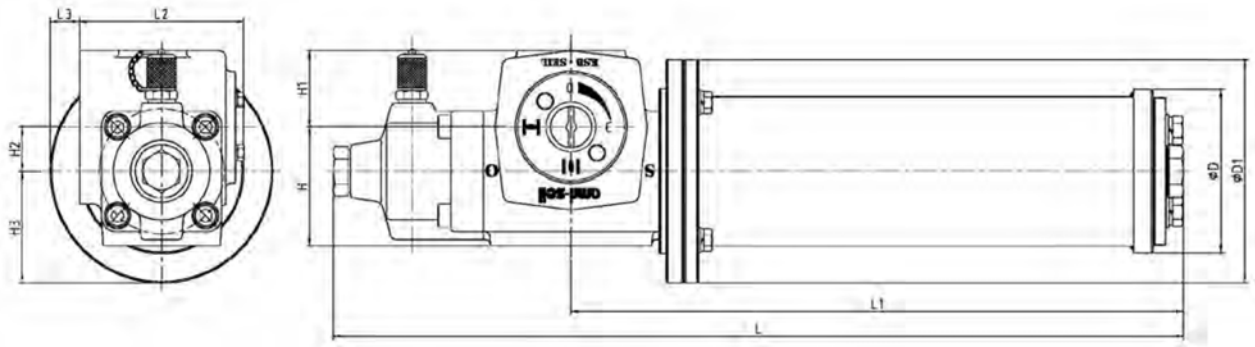


Dimensions of HQ 400GS - 1600GS

[mm]

HQ Type	A	B	C	D	E	F	G	ISO 5211 interface				Weight [kg]
								Ref.	Ø d1	Ø d2	n	
400GS-TU3000	963,5	127	193	90	113	219	641	F16	165	M20	4	138
		150						F25	254	M16	8	142
800GS-TU5000	1408	158	233,5	110	150	282	769	F16	165	M20	4	282
		167						F25	254	M16	8	290
		175						F30	298	M20	8	297
1600GS-TU7500	1595	190	290	135	190	363	837	F30	298	M16	8	535
		207,5						F35	298	M20	8	552
1600GS-TU10000	1597	190	290	135	190	363	839	F30	298	M16	8	570
		207,5						F35	298	M20	8	591

Drawings of HQ 10S - 200S

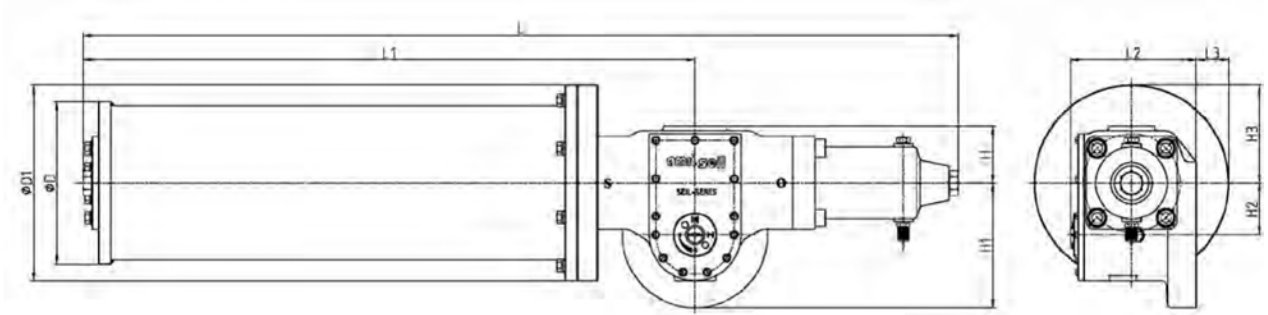


Dimensions of HQ 10S - 200S

[mm]

HQ Type	L	L1	L2	L3	H	H1	H2	H3	D	D1	ISO 5211 interface			Weight [kg]
											Ref.	Ø d1	Ø d2	
10S	468	323	97	21	64,5	42,5	22	67	96	136	F05	50	M6	15
											F07	70	M8	
25S	580	418	112	20	80,5	52	30	76	111	152	F07	70	M8	28
											F10	102	M10	
50S	696,5	497	126	36,5	93,5	63	37	98,5	149	197	F10	102	M10	50
											F12	125	M12	
100sS	896,5	654	154	52	115,5	73	48	130	202	260	F12	125	M12	65
											F14	140	M16	
200S	1150,5	832	183,5	50,5	145	91	69	144	240	288	F14	140	M16	120
											F16	165	M20	

Drawings of HQ 400S - 1600S



Dimensions of HQ 400S - 1600S

[mm]

HQ Type	L	L1	L2	L3	H	H1	H2	H3	D	D1	ISO 5211 interface				Weight [kg]
											Ref.	Ø d1	Ø d2	n	
400S	1529	1069	219	57	103	217	90	170	282	340	F16	165	M20	4	203
						240					F25	254	M16	8	205
800S	2024	1385	282	106	123,5	259	110	256	424	512	F16	165	M20	4	389
						272					F25	254	M16	8	397
						285					F30	298	M20	8	403
1600S	2411	1653	363	92	155	342,5	135	282	474	564	F30	298	M16	8	740
											F35	298	M20	8	752

Variants

Manual override option

Dec clutchable manual override HQ 10 - 1600

A manual override via declutchable manual gearbox with handwheel can be mounted between the valve and the actuator. It overrides the hydraulic actuator and can be used in either clutched (engaged) or declutched (disengaged) position. In this case, the hydraulic actuator is always fitted with a bypass connecting the two chambers and enabling safe use of the declutchable override.

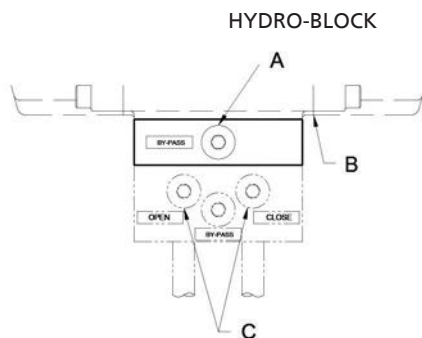
Note: The override must not be used when the actuator is pressurised. Do not declutch the manual override as long as the actuator is pressurised.

Using the manual override:

- Close the shut-off valves (Open/Close) in the HYDRO-BLOCK.
- Open bypass valve No. 1 in the bypass valve block.
- Pull the locking device to set the lever to "manual" position.
- Turn the handwheel to actuate the valve.
 - Clockwise to close the valve
 - Anti-clockwise to open the valve.

Note:

- After the manual override has been used, the lever must be in the "Remote" position to enable remote control of the valve.
- Always take the shut-off valves to the open position and the bypass valve to the closed position.



- A: Bypass valve
- B: Hydraulic actuator
- C: Shut-off valves
- D: Locking device

Open/closed position signalling: HQ 10 - 1600

AMTROBOX R limit switch box

This limit switch box is made of grey cast iron with anti-corrosive coating. Open/closed position signalling function:

- open/closed position signalling via electrical microswitches or inductive proximity sensors (1 for Open and 1 for Closed, 1 for one intermediate position on request)
- proportional signalling via angle sensor (voltage signal or 4-20 mA signal)

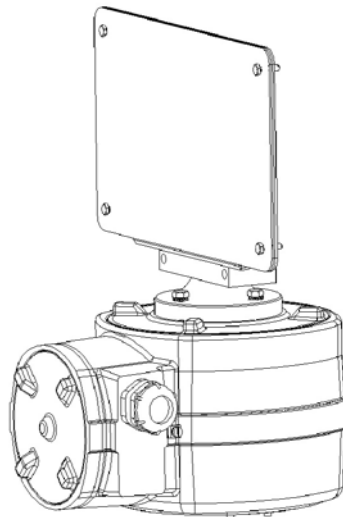
Housing: IP67

Options:

- intrinsically safe version EEx ia IIC T4



Position signalling function: visual signalling by flag

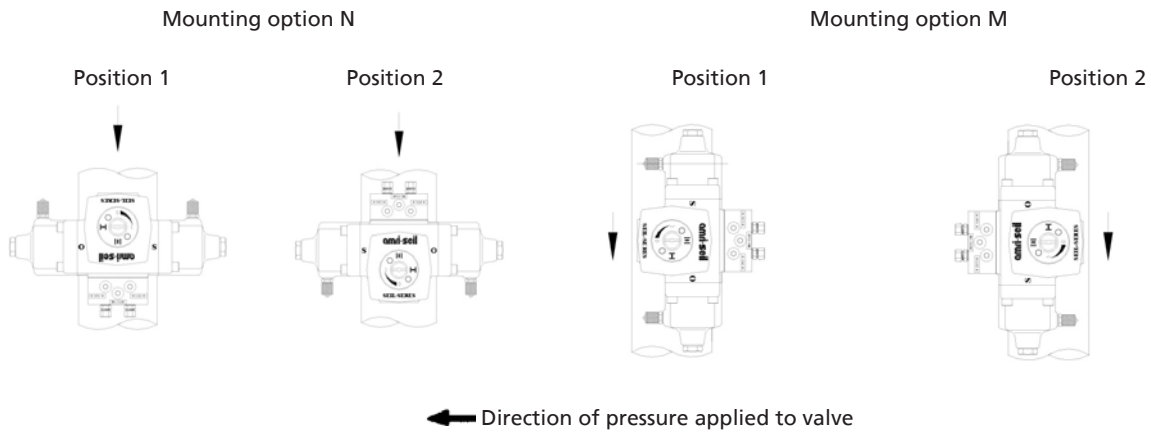


Mounting onto the valve

HQ hydraulic actuators can be mounted onto the valve in 4 different positions, offset by 90°.

If the valve is supplied with the actuator mounted, and unless otherwise specified in the purchase order, the actuator is mounted onto the valve according to mounting option N, position 1.

If the actuator is equipped with a declutchable override, it is mounted onto the valve according to mounting option M, position 2.



The mounting position can be modified at the site; proceed as described above. Also adhere to the instructions given in the maintenance manual.

По вопросам продаж и поддержки обращайтесь:

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