



## RPH Hydraulic Actuator, 90° Operation for Low-Torque, Heavy-Duty Service On-Off and Modulating

**RPHD, Double Acting Actuator**

**RPHS, Spring Return Actuator**

### Features

- Totally enclosed, weatherproof housing in nodular cast iron for maximum strength and suitable for use in hostile environments
- A vent valve on the bottom housing flange is provided to avoid accidental pressurisation
- A cast steel version is available on request
- A compact rack and pinion design provides simple construction
- External travel stops for precise angular stroke adjustment between 80° and 100°
- The double acting actuator is with 2 hydraulic cylinders mounted at each side of the housing
- Mounting of two different cylinders makes it possible to obtain different output torques in the opening and closing directions
- The single acting spring return actuator is with one cylinder mounted at one side of the housing and the spring cartridge mounted at the other side, depending on spring action (to close or to open)
- The spring cartridge execution is fully enclosed, tamperproof for full personnel safety
- Two mechanical stoppers are available for external stroke adjustment between 80° and 100° rotation
- Bushings are made of sintered bronze, charged with teflon to provide minimal friction and extended service life
- Electroless nickel plated and polished cylinder for corrosion resistance and minimal friction
- The piston seals are made by a teflon U-ring with special elastomer, centered into its sealing face and charged by underlying O-ring. This solution assures long service life, preventing sticking problems



### Technical Data

- Supply medium: hydraulic oil or fire-resistant fluid
- The design pressure of the cylinder is 220 barg (3190 psig)
- The standard design temperature is -30°C/+100°C
- Max operating torque up to 2600 Nm
- Output torques: see tables
- Execution suitable for On-Off and Modulating service

### Accessories

- Mounting brackets for valve top mounting adaptation

- Mounting brackets for limit switch boxes with electric limit switches or position transmitters
- Threaded holes for mounting of hydraulic accumulator and hydraulic control manifold
- Hydraulic control groups for On-Off operation or step-by-step control service with solenoid valves, in weatherproof or explosionproof execution
- Hydraulic control groups for modulating service, according to various specifications, with proportional control valve or servovalve
- Electric control panels in weatherproof or explosionproof enclosure

## RPH Hydraulic Actuator Coding Mode

2 2 2 M M V Y<sub>1</sub> C<sub>1</sub> C<sub>2</sub> Z

### 222: index of the series

### MMV: index of actuator model

010 = RPHD 10	01A = RPHS 10-OP	01C = RPHS 10-CL
020 = RPHD 20	02A = RPHS 20-OP	02C = RPHS 20-CL
040 = RPHD 40	04A = RPHS 40-OP	04C = RPHS 40-CL
080 = RPHD 80	08A = RPHS 80-OP	08C = RPHS 80-CL

### Y<sub>1</sub>: material index

A = Housing steel A216WBC + Seals NBR  
 B = Housing steel A216WBC + Seals Fluorosilicon  
 C = Housing steel A216WBC + Seals Viton  
 F = Housing nodular cast iron GS 400-18L +Seals Fluorosilicon  
 G = Housing nodular cast iron GS 400-18L +Seals NBR  
 H = Housing nodular cast iron GS 400-18L +Seals Viton

### C<sub>1</sub> C<sub>2</sub>: material index

32 = Cylinder D = 32 mm  
 40 = Cylinder D = 40 mm  
 45 = Cylinder D = 45 mm  
 50 = Cylinder D = 50 mm  
 55 = Cylinder D = 55 mm  
 60 = Cylinder D = 60 mm  
 65 = Cylinder D = 65 mm

### Z: available index

0 = Standard base version  
 (0 to 9 possible variables)

## RPHD Actuator Output Torques Table

Model	MOT (Nm)	Supply Pressure (bar)									
		60	80	104	120	140	160	180	200	207	220
RPHD 10-032	480	126	169	219	253	295	337	379	421	442	463
RPHD 20-040	740	197	263	342	395	461	527	592	658	691	724
RPHD 20-050	740	309	411	535	617	720	-	-	-	-	-
RPHD 40-045	1750	467	622	809	933	1089	1244	1400	1555	1633	1711
RPHD 40-055	1750	697	929	1208	1394	1626	-	-	-	-	-
RPHD 40-065	1750	973	1298	1687	-	-	-	-	-	-	-
RPHD 80-055	2600	697	929	1208	1394	1626	1859	2091	2323	2439	2556
RPHD 80-065	2600	973	1298	1687	1947	2271	2596	-	-	-	-

## RPHS Actuator Output Torques Table

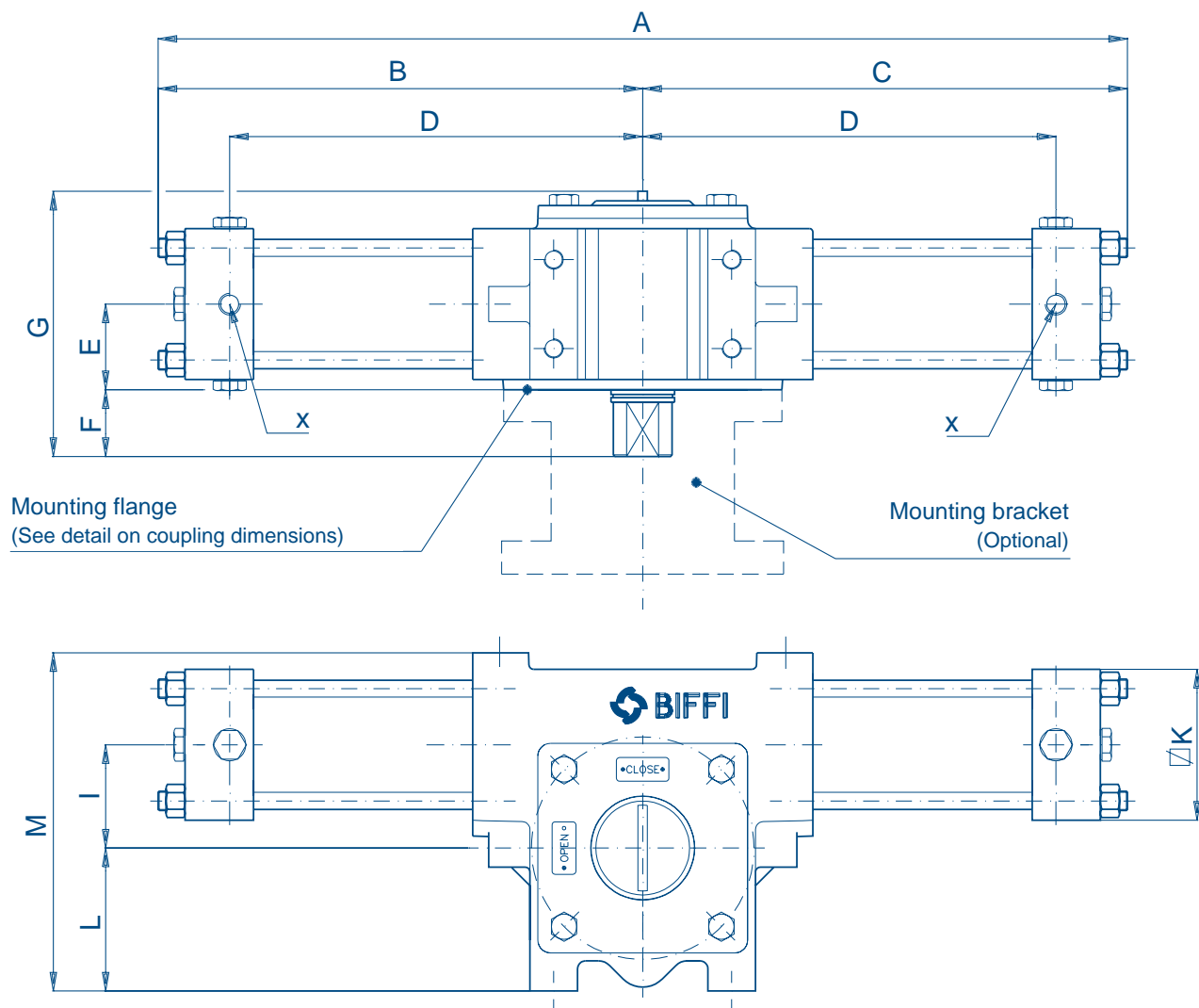
Actuator Model	MOT (Nm)	Spring Torque		Oil Torque at Supply Pressure (bar)																	
		SET	SST	80		104		120		140		160		180		200		207		220	
				OST	OET	OST	OET	OST	OET	OST	OET	OST	OET	OST	OET	OST	OET	OST	OET	OST	OET
RPHS 10-032-SS1	480	93	129	66	26	116	77	150	110	192	152	234	195	276	237	318	279	339	300	361	321
RPHS 20-040-SS2	740	223	295	-	-	96	16	148	69	214	135	280	201	346	266	412	332	444	365	477	398
RPHS 20-050-SS2	740	223	295	165	85	288	209	370	291	473	394	576	497	679	600	-	-	-	-	-	-
RPHS 40-045-SS4	1750	452	619	-	-	309	125	433	249	589	405	744	560	900	716	1055	871	1133	949	1211	1027
RPHS 40-055-SS4	1750	452	619	430	245	708	524	894	710	1126	942	1359	1175	1591	1407	-	-	-	-	-	-
RPHS 40-065-SS4	1750	452	619	798	614	1188	1003	1447	1263	-	-	-	-	-	-	-	-	-	-	-	-
RPHS 80-055-SS5	2600	940	1273	-	-	-	-	-	-	587	219	819	451	1052	683	1284	916	1400	1032	1516	1148
RPHS 80-065-SS5	2600	940	1273	-	-	648	280	908	539	1232	864	1557	1188	1881	1513	2206	1837	2368	1999	2530	2162

### Notes

MOT= Maximum Operating Torque  
 SET = Spring Ending Torque  
 SST = Spring Starting Torque  
 OST = Oil Starting Torque  
 OET = Oil Ending Torque  
 All torque values are in Nm

## Dimensional drawings

### RPHD Hydraulic Actuator (double acting)



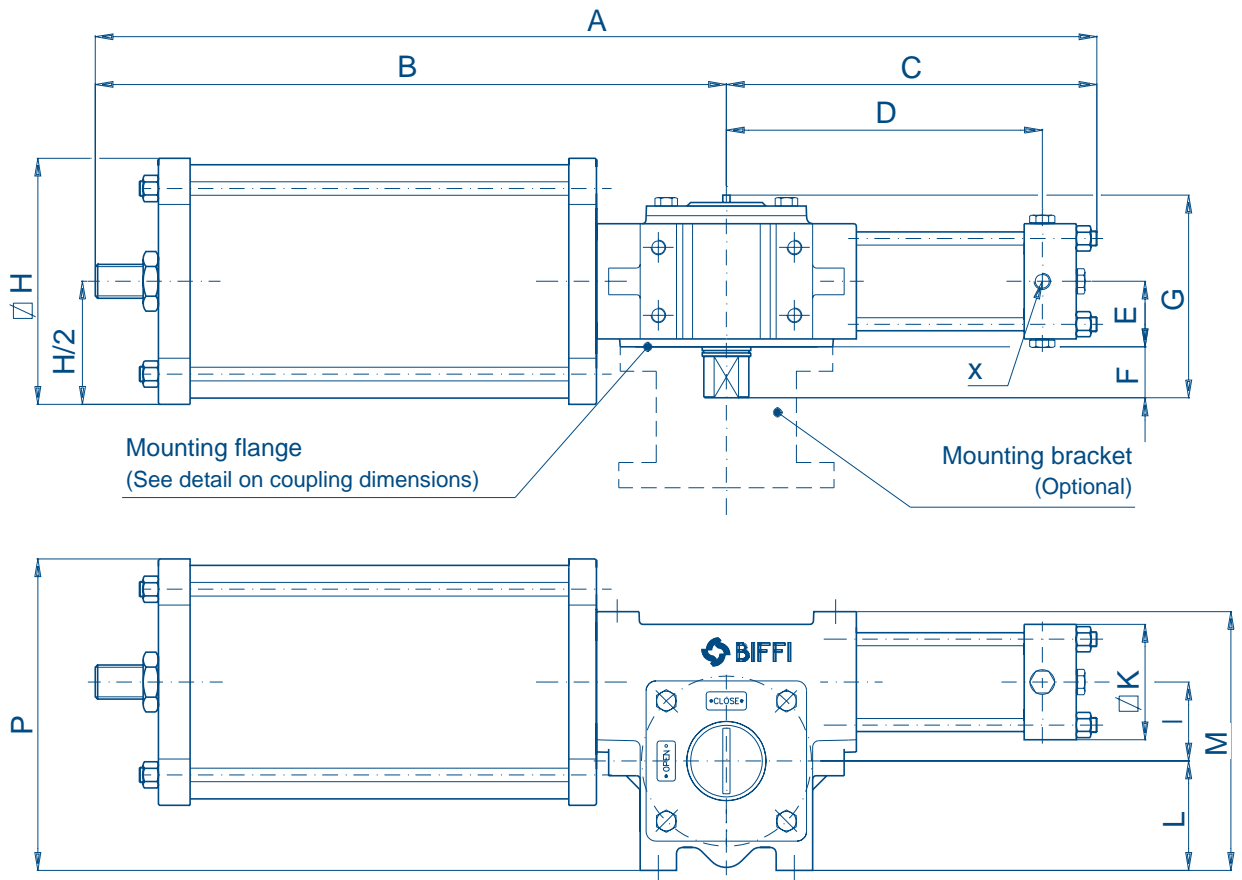
### RPHD Hydraulic Actuator

Model	A	B	C	D	E	F	G	∅K	I	L	M	X	Weight (Kg)
RPHD 10-032	458	229	229	188	50	30	143	80	36	71	161	1/4" NPT	16
RPHD 20-040	458	229	229	188	50	32	145	80	36	71	158	1/4" NPT	19
RPHD 20-050	458	229	229	188	50	32	145	80	36	71	158	1/4" NPT	20
RPHD 40-045	610	305	305	260	54	42	167	95	65	90	213	1/4" NPT	32
RPHD 40-055	610	305	305	260	54	42	167	95	65	90	213	1/4" NPT	34
RPHD 40-065	610	305	305	260	54	42	167	95	65	90	213	1/4" NPT	37
RPHD 80-055	620	310	310	260	54	55	172	95	65	71	194	1/4" NPT	37
RPHD 80-065	620	310	310	260	54	55	172	95	65	71	194	1/4" NPT	39

### Notes

- All dimensions are in mm
- Tolerances  $\pm 2\%$
- x = Hydraulic port
- Weights given are with oil and without mounting bracket and control panel

## RPHS Hydraulic Actuator - Spring to close



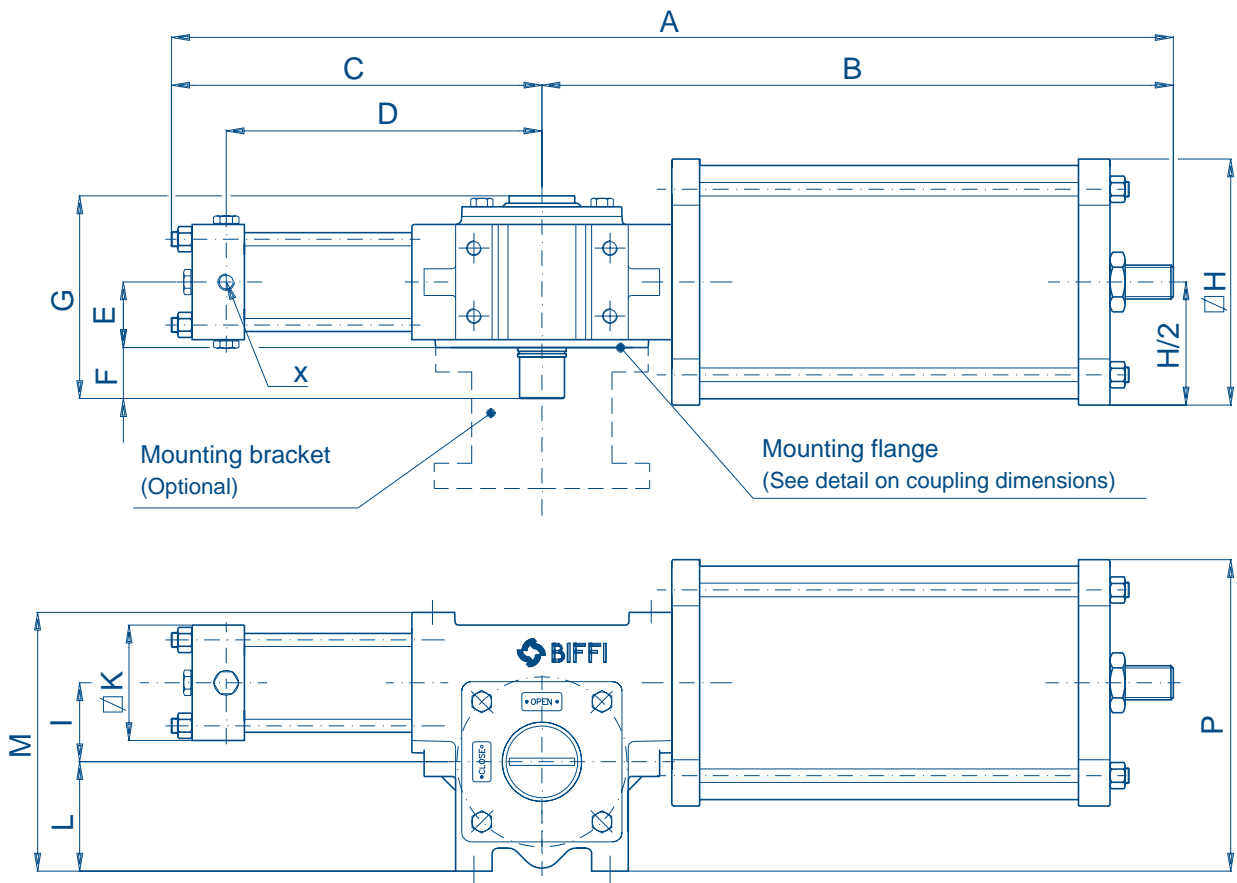
## RPHS Hydraulic Actuator - Spring to close

Model	A	B	C	D	E	F	G	H	∅K	I	L	M	P	X	Weight (Kg)
RPHS 10-032-SS1/CL	589	360	229	188	50	30	143	112	80	36	71	161	163	1/4" NPT	28
RPHS 20-040-SS2/CL	590	361	229	188	50	32	145	149	80	36	71	158	182	1/4" NPT	36
RPHS 20-050-SS2/CL	590	361	229	188	50	32	145	149	80	36	71	158	182	1/4" NPT	40
RPHS 40-045-SS4/CL	809	504	305	260	54	42	167	195	95	65	90	213	253	1/4" NPT	69
RPHS 40-055-SS4/CL	809	504	305	260	54	42	167	195	95	65	90	213	253	1/4" NPT	76
RPHS 40-065-SS4/CL	809	504	305	260	54	42	167	195	95	65	90	213	253	1/4" NPT	80
RPHS 80-055-SS5/CL	820	510	310	260	54	55	172	250	95	65	71	194	261	1/4" NPT	90
RPHS 80-065-SS5/CL	820	510	310	260	54	55	172	250	95	65	71	194	261	1/4" NPT	92

### Notes

1. All dimensions are in mm
2. Tolerances  $\pm 2\%$
3. x = Hydraulic port
4. Weights given are with oil and without mounting bracket and control panel

## RPHS Hydraulic Actuator- Spring to open



## RPHS Hydraulic Actuator- Spring to open

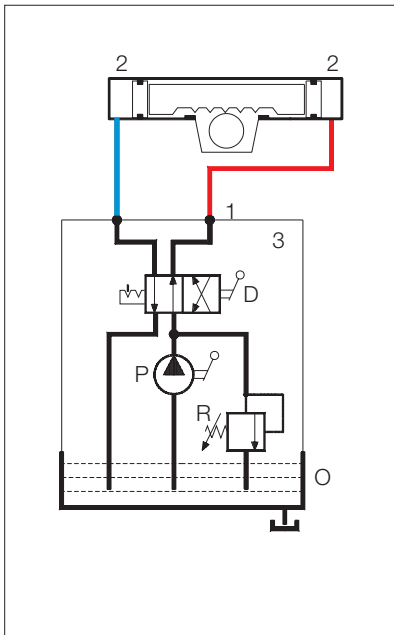
Model	A	B	C	D	E	F	G	∅H	∅K	I	L	M	P	X	Weight (Kg)
RPHS 10-032-SS1/OP	589	360	229	188	50	30	143	112	80	36	71	161	163	1/4" NPT	28
RPHS 20-040-SS2/OP	590	361	229	188	50	32	145	149	80	36	71	158	182	1/4" NPT	36
RPHS 20-050-SS2/OP	590	361	229	188	50	32	145	149	80	36	71	158	182	1/4" NPT	40
RPHS 40-045-SS4/OP	809	504	305	260	54	42	167	195	95	65	90	213	253	1/4" NPT	69
RPHS 40-055-SS4/OP	809	504	305	260	54	42	167	195	95	65	90	213	253	1/4" NPT	76
RPHS 40-065-SS4/OP	809	504	305	260	54	42	167	195	95	65	90	213	253	1/4" NPT	80
RPHS 80-055-SS5/OP	820	510	310	260	54	55	172	250	95	65	71	194	261	1/4" NPT	90
RPHS 80-065-SS5/OP	820	510	310	260	54	55	172	250	95	65	71	194	261	1/4" NPT	92

### Notes

1. All dimensions are in mm
2. Tolerances  $\pm 2\%$
3. x = Hydraulic port
4. Weights given are with oil and without mounting bracket and control panel

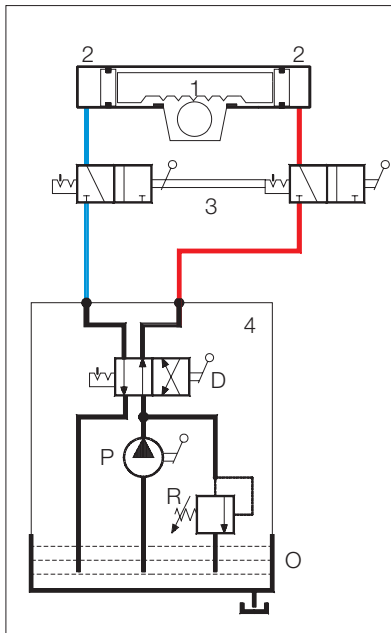
## Hydraulic Manual Overrides for RPH Actuator

### A) LOCAL CONTROL ONLY FOR DOUBLE ACTING ACTUATORS



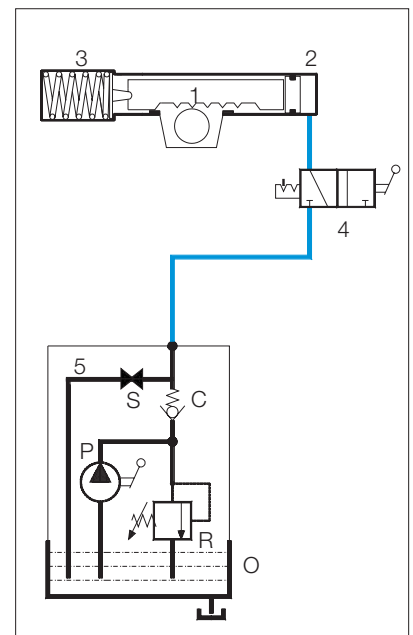
- 1. Rack & Pinion mechanism
- 2. Hydraulic cylinder
- 3. Hydraulic manual override
- D = Directional control valve
- P = Hand pump
- R = Relief valve
- O = Oil tank

### B) LOCAL CONTROL SUITABLE ALSO FOR REMOTE OIL SUPPLY FOR DOUBLE ACTING ACTUATORS



- 1. Rack & Pinion mechanism
- 2. Hydraulic cylinder
- 3. Hydraulic manual selector
- 4. Hydraulic manual override
- D = Directional control valve
- P = Hand pump
- R = Relief valve
- O = Oil tank

### C) LOCAL CONTROL SUITABLE ALSO FOR REMOTE OIL SUPPLY FOR SPRING RETURN ACTUATORS



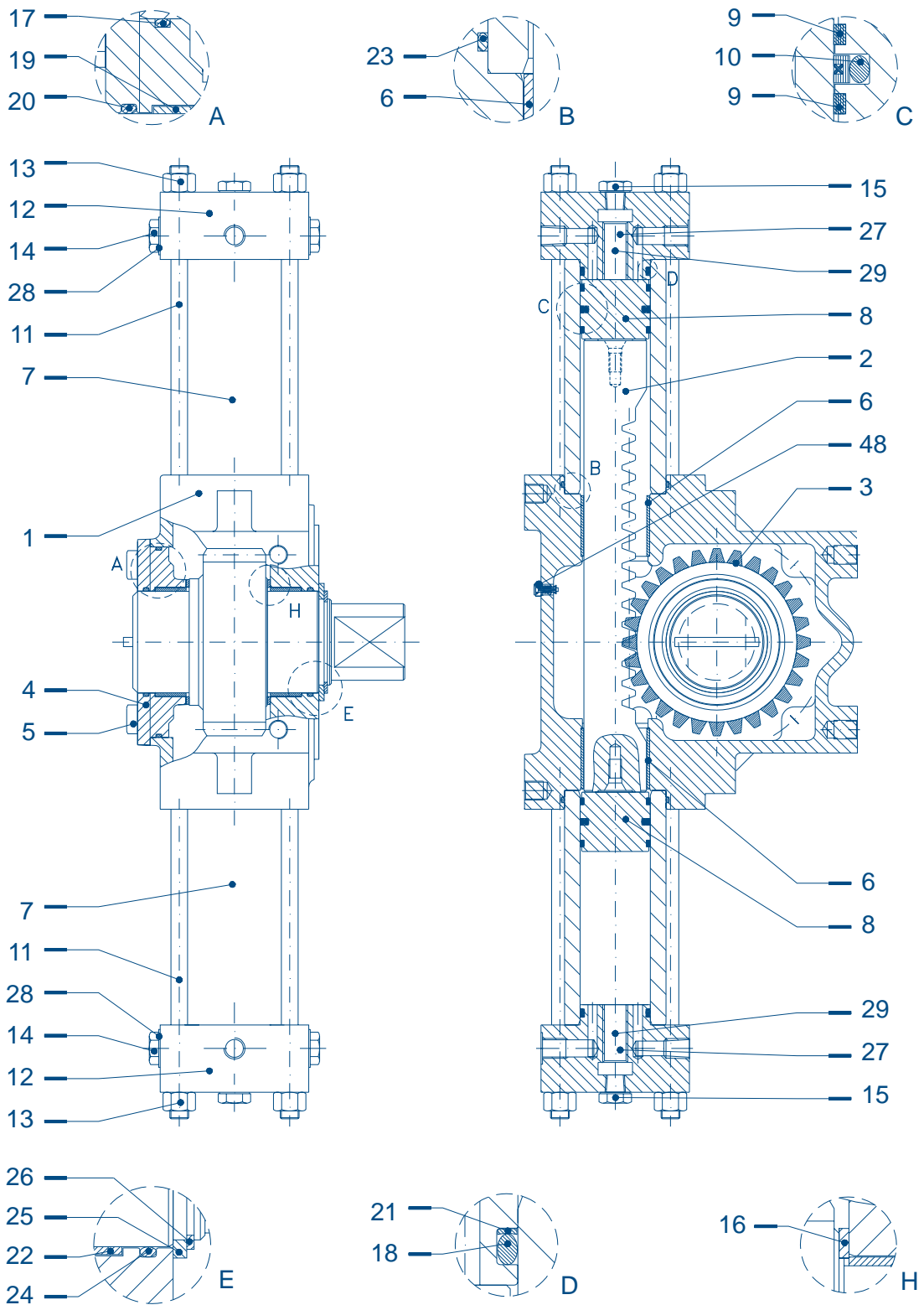
- 1. Rack & Pinion mechanism
- 2. Hydraulic cylinder
- 3. Spring cartridge
- 4. Hydraulic manual selector
- 5. Hydraulic manual override
- S = Stop valve
- C = Check valve
- P = Hand pump
- R = Relief valve
- O = Oil tank

## RPHD hydraulic actuator (double acting)

Item	Q.ty	Description	Material	• Recommended spare parts
1	1	Housing	Nodular cast iron	
2	1	Rack	Alloy steel	
3	1	Pinion	Alloy steel	
4	1	Cover	Carbon steel	
5	4	Screw	Alloy steel	
6	2	Bushing	Fe + Bz + Teflon	
7	2	Cylinder tube	Nickel-plated carbon steel	
8	2	Piston	Carbon steel	
9	4	Guide sliding piston ring	Teflon + graphite	•
10	2	Piston seal ring	Teflon + graphite + NBR	•
11	8	Tie rod	Alloy steel	
12	2	End flange	Carbon steel	
13	8	Nut	Carbon steel	
14	4	Plug	Stainless steel	
15	2	Plug	Stainless steel	
16	2	Shoulder washer	Ertacetal	•
17	1	O-ring	NBR	•
18	2	O-ring	NBR	•
19	1	Bushing	Fe + Bz + Teflon	
20	1	O-ring	NBR	•
21	2	Back-up ring	NBR	•
22	1	Bushing	Fe + Bz + Teflon	
23	2	O-ring	NBR	•
24	1	O-ring	NBR	•
25	1	Spigot ring	Nylon	
26	1	Retainer ring	Stainless steel	•
27	2	Stop setting screw	Carbon steel	
28	4	Washer	Copper	
29	2	Friction bar	Nylon	
48	1	Vent valve	Stainless steel	



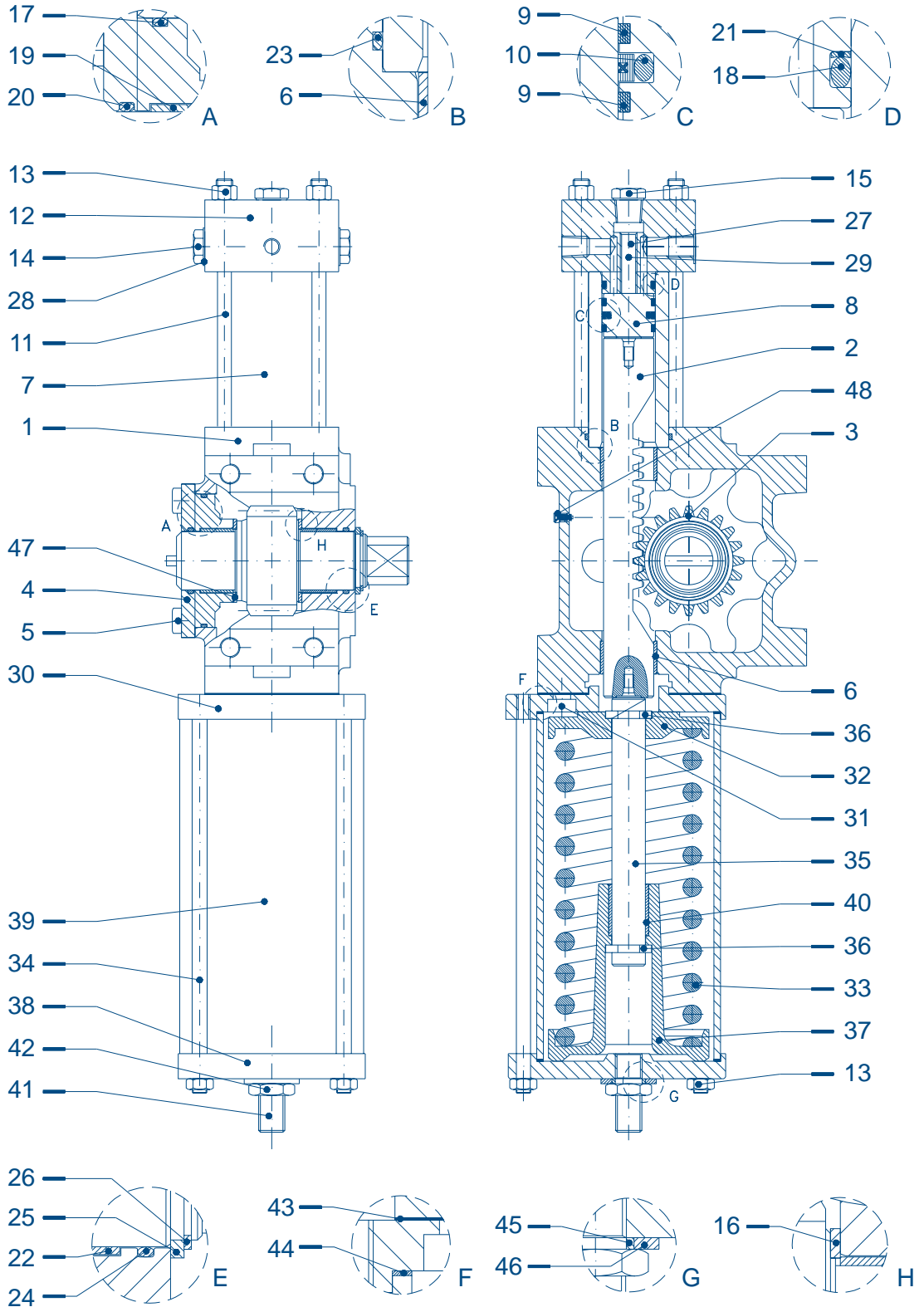
## RPHD hydraulic actuator (double acting)



## RPHS 10 hydraulic actuator (spring return)

Item	Q.ty	Description	Material	• Recommended spare parts
1	1	Housing	Nodular cast iron	
2	1	Rack	Alloy steel	
3	1	Pinion	Alloy steel	
4	1	Cover	Carbon steel	
5	4	Screw	Alloy steel	
6	2	Bushing	Fe + Bz + Teflon	
7	1	Cylinder tube	Nickel-plated carbon steel	
8	1	Piston	Carbon steel	
9	2	Guide sliding piston ring	Teflon + graphite	•
10	1	Piston seal ring	Teflon + graphite + NBR	•
11	4	Tie rod	Alloy steel	
12	1	End flange	Carbon steel	
13	8	Nut	Carbon steel	
14	2	Plug	Stainless steel	
15	1	Plug	Stainless steel	
16	1	Shoulder washer	Ertacetal	•
17	1	O-ring	NBR	•
18	1	O-ring	NBR	•
19	1	Bushing	Fe + Bz + Teflon	
20	1	O-ring	NBR	•
21	1	Back-up ring	NBR	•
22	1	Bushing	Fe + Bz + Teflon	
23	1	O-ring	NBR	•
24	1	O-ring	NBR	•
25	1	Spigot ring	Nylon	
26	1	Retainer ring	Stainless steel	•
27	1	Stop setting screw	Carbon steel	
28	1	Washer	Copper	
29	1	Friction bar	Nylon	
30	1	Head spring flange	Carbon steel	
31	4	Screw	Alloy steel	
32	1	Spring thrust flange	Carbon steel	
33	1	Spring	Alloy steel	
34	4	Tie rod	Alloy steel	
35	1	Spring guide rod	Alloy steel	
36	4	Retainer ring	Stainless steel	
37	1	Spring guide flange	Nodular cast iron	
38	1	End spring flange	Carbon steel	
39	1	Spring cartridge tube	Carbon steel	
40	1	Bushing	Fe + Bz + Teflon	
41	1	Adjusting screw	Carbon steel	
42	1	Nut	Carbon steel	
43	1	Spring cartridge gasket	NBR	•
44	1	Gasket	NBR	•
45	1	Sealing washer	PVC	•
46	1	Washer	Stainless steel	
47	1	Shoulder washer	Ertacetal	•
48	1	Vent valve	Stainless steel	

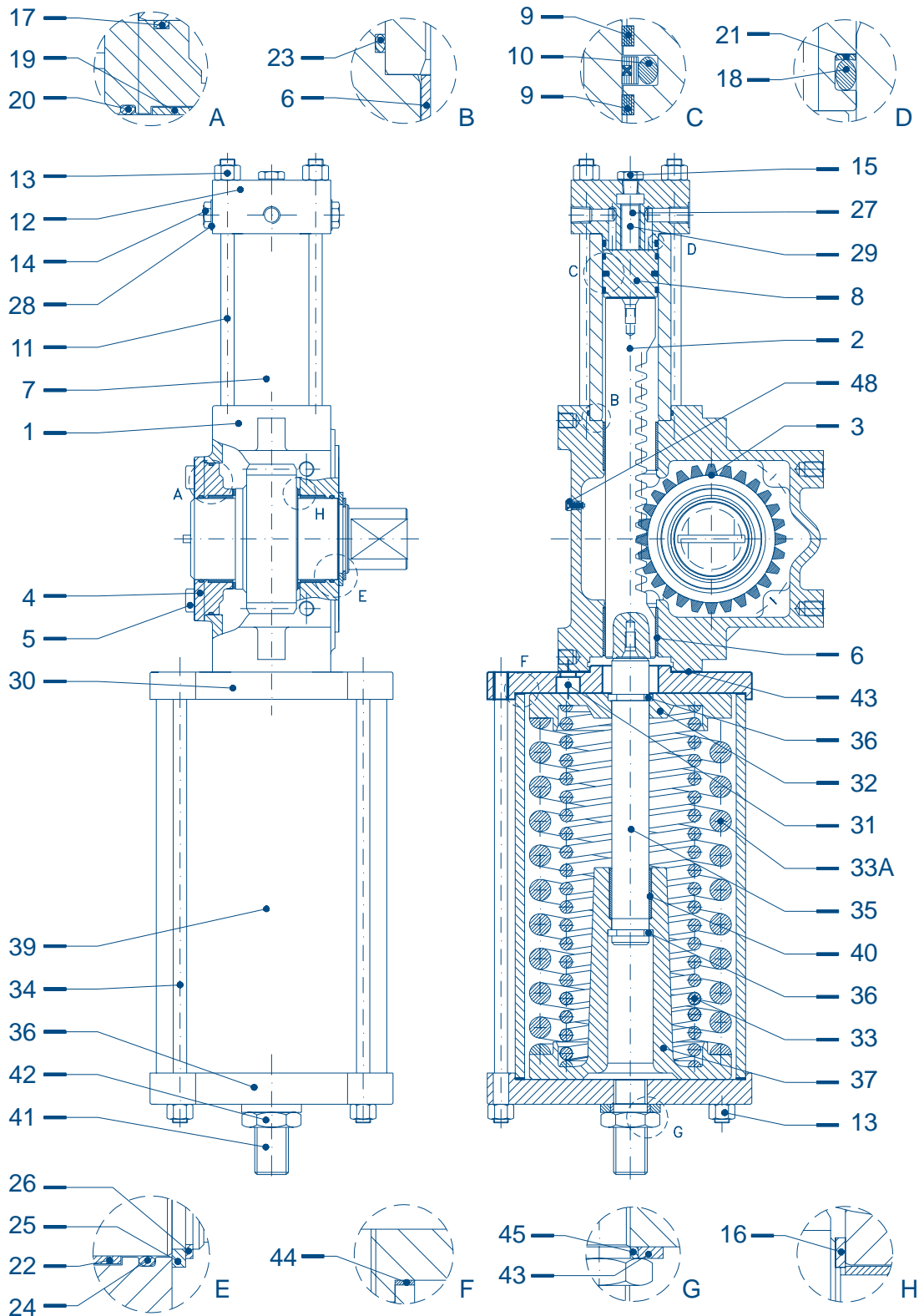
## RPHS 10 hydraulic actuator (spring return)



## RPHS 40 hydraulic actuator (spring return)

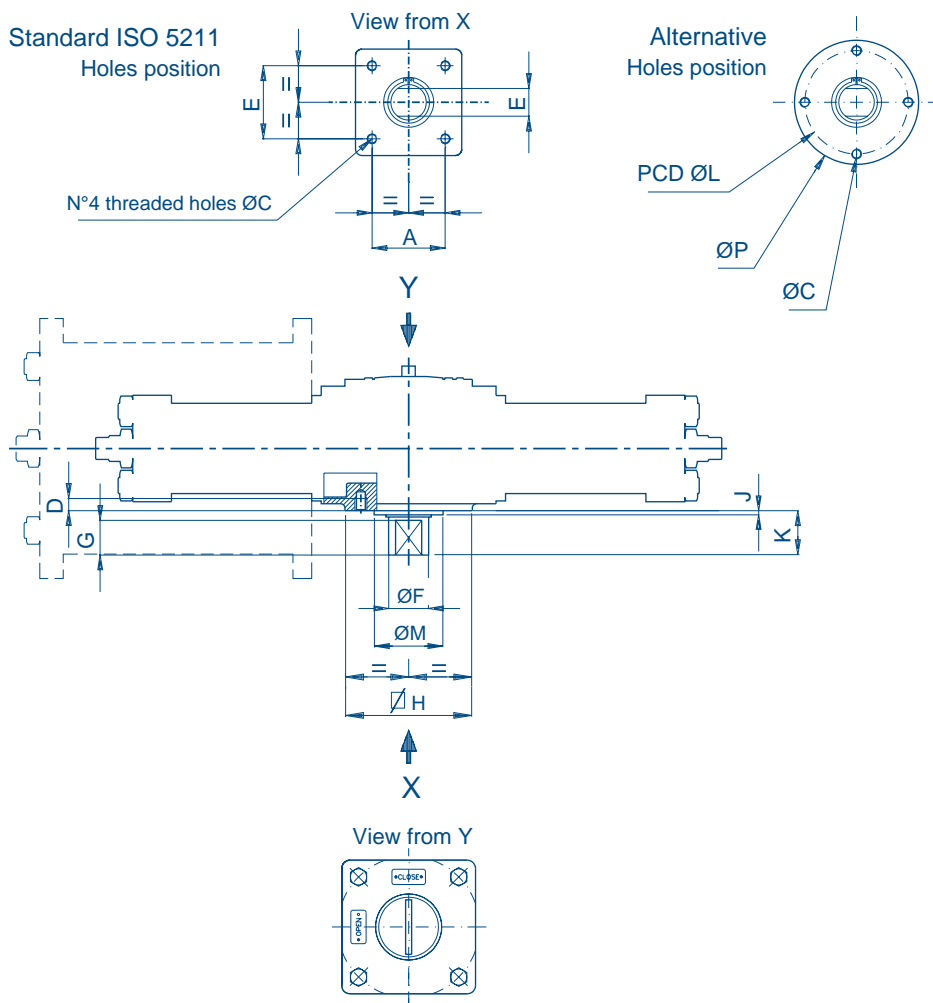
Item	Q.ty	Description	Material	• Recommended spare parts
1	1	Housing	Nodular cast iron	
2	1	Rack	Alloy steel	
3	1	Pinion	Alloy steel	
4	1	Cover	Carbon steel	
5	4	Screw	Alloy steel	
6	2	Bushing	Fe + Bz + Teflon	
7	1	Cylinder tube	Nickel-plated carbon steel	
8	1	Piston	Carbon steel	
9	2	Guide sliding piston ring	Teflon + graphite	•
10	1	Piston seal ring	Teflon + graphite + NBR	•
11	4	Tie rod	Alloy steel	
12	1	End flange	Carbon steel	
13	8	Nut	Carbon steel	
14	2	Plug	Stainless steel	
15	1	Plug	Stainless steel	
16	1	Shoulder washer	Ertacetal	•
17	1	O-ring	NBR	•
18	1	O-ring	NBR	•
19	1	Bushing	Fe + Bz + Teflon	
20	1	O-ring	NBR	•
21	1	Back-up ring	NBR	•
22	1	Bushing	Fe + Bz + Teflon	
23	1	O-ring	NBR	•
24	1	O-ring	NBR	•
25	1	Spigot ring	Nylon	
26	1	Retainer ring	Stainless steel	•
27	1	Stop setting screw	Carbon steel	
28	1	Washer	Copper	
29	1	Friction bar	Nylon	
30	1	Head spring flange	Carbon steel	
31	4	Screw	Alloy steel	
32	1	Spring thrust flange	Carbon steel	
33	1	Spring	Alloy steel	
33A	1	Spring	Alloy steel	
34	4	Tie rod	Alloy steel	
35	1	Spring guide rod	Alloy steel	
36	4	Retainer ring	Stainless steel	
37	1	Spring guide flange	Nodular cast iron	
38	1	End spring flange	Carbon steel	
39	1	Spring cartridge tube	Carbon steel	
40	1	Bushing	Fe + Bz + Teflon	
41	1	Adjusting screw	Carbon steel	
42	1	Nut	Carbon steel	
43	1	Spring cartridge gasket	NBR	•
44	1	Gasket	NBR	•
45	1	Sealing washer	PVC	•
46	1	Washer	Stainless steel	
48	1	Vent valve	Stainless steel	

## RPHS 40 hydraulic actuator (spring return)



## Coupling Dimensions

### RPHD/RPHS Hydraulic Actuator



### RPHD/RPHS Hydraulic Actuator

Model	A±0.2	B±0.2	ØC	D	<sup>0</sup> E-0.1	<sup>0</sup> ØF-0.5	G	∅H	∅K	J	ØL	<sup>0</sup> ØM-0.2	ØP
RPHD 10	49.5	49.5	M8	10	16	21	23	66	30	3	70	40	90
RPHS 10	49.5	49.5	M8	10	16	21	23	66	30	3	70	40	90
RPHD 20	72.1	72.1	M10	12	22	29	25	92	32	3	102	50	125
RPHS 20	72.1	72.1	M10	12	22	29	25	92	32	3	102	50	125
RPHD 40	88.4	88.4	M12	15	28	37	34	112	42	3	125	60	150
RPHS 40	88.4	88.4	M12	15	28	37	34	112	42	3	125	60	150
RPHD 80	99	99	M16	23	37	49	45	132	55	3	140	75	175
RPHS 80	99	99	M16	23	37	49	45	132	55	3	140	75	175

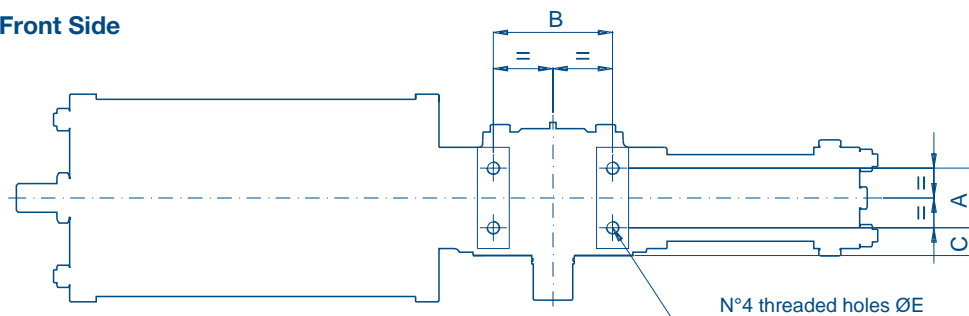
### Notes

1. All dimensions are in mm
2. Actuator shown in closed position

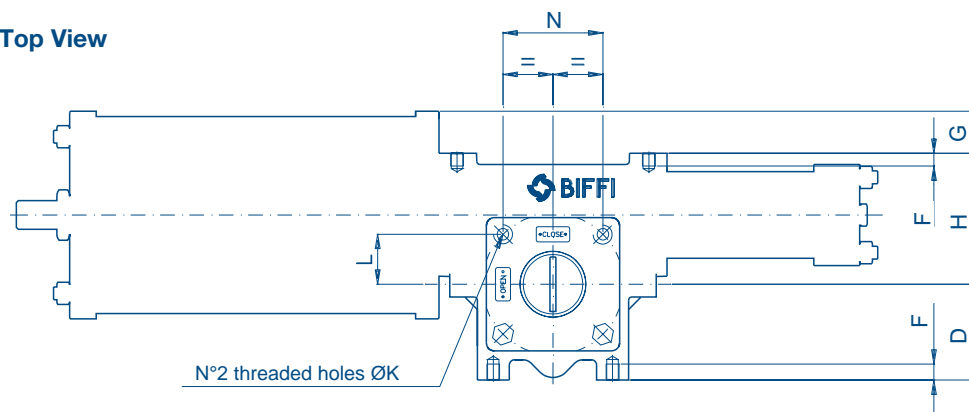
## Mounting Holes for Accessories

### RPHS Hydraulic Actuators

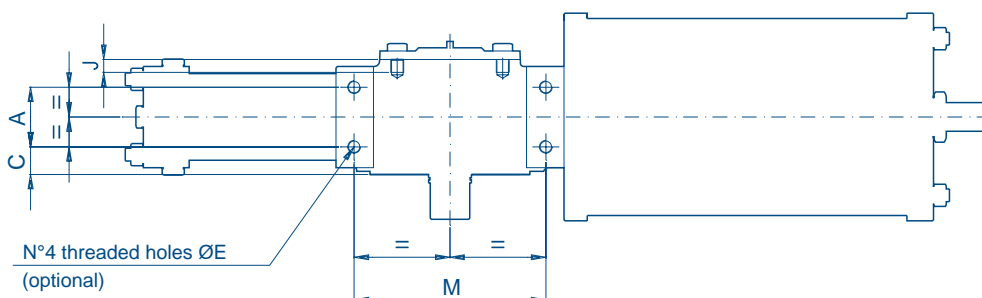
Front Side



Top View



Back Side



### RPHS Hydraulic Actuators

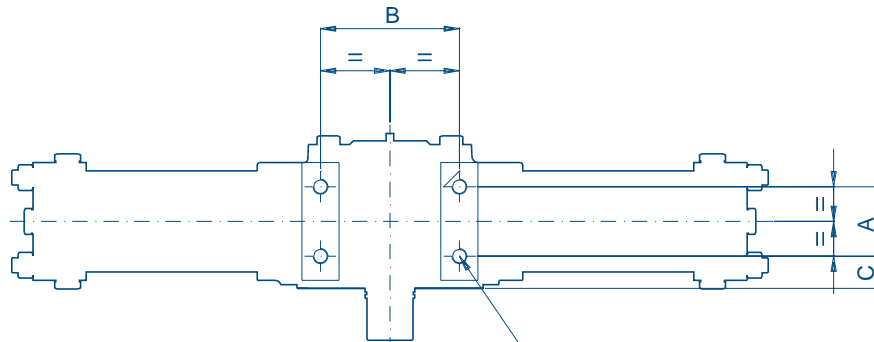
Model	A±0.2	B±0.2	C	D	ØE	F	G	H	ØK	J	L	M	N
RPHS 10	50	104	21	70.5	M12	12	2	90.5	M8	15	36	130	72
RPHS 20	50	104	21	70.5	M12	12	24	90.5	M8	15	36	130	72
RPHS 40	56	112	26	90	M12	12	40	123	M10	23	49.5	180	99
RPHS 80	56	112	26	90	M12	12	40	123	M10	23	49.5	180	99

### Notes

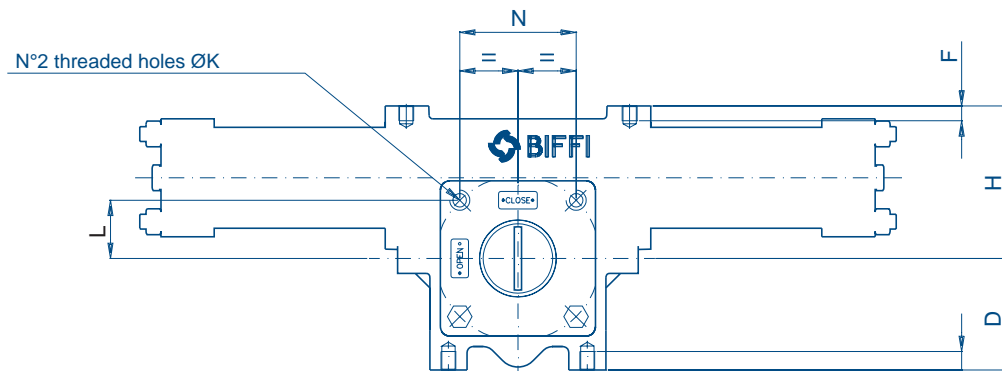
1. All dimensions are in mm
2. Actuator shown in closed position

## RPH Hydraulic Actuator

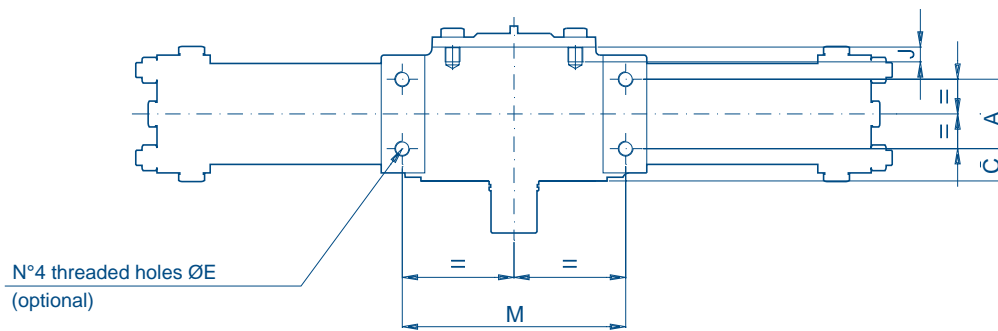
Front Side



Top View



Back Side



## RPH Hydraulic Actuator

Model	A±0.2	B±0.2	C	D	ØE	F	H	ØK	J	L	M	N
RPH 10	50	104	21	70,5	M12	12	90,5	M8	15	36	130	72
RPH 20	50	104	21	70,5	M12	12	90,5	M8	15	36	130	72
RPH 40	56	112	26	90	M12	12	123	M10	23	49,5	180	99
RPH 80	56	112	26	90	M12	12	123	M10	23	49,5	180	99

### Notes

1. All dimensions are in mm
2. Actuator shown in closed position