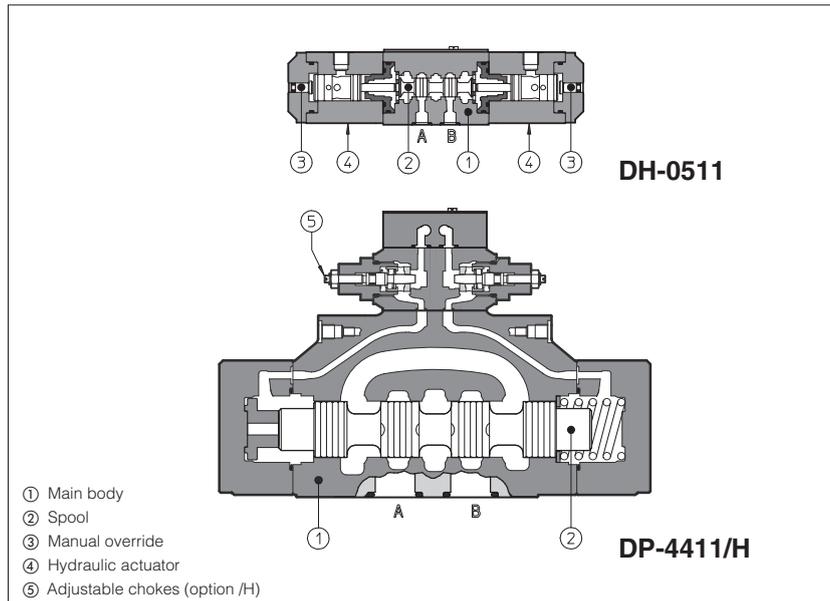




Table E225-3/E

Hydraulic operated directional valves

ISO 4401 size 06, 10, 16, 25 and 32



Hydraulic operated directional valves are spool type, three or four way, two or three position, designed to operate in oil hydraulic systems.

Available with single or double hydraulic actuator.

Valve sizes and max flow:

DH-0 = size 06, flow up to 50 l/min

DK-1 = size 10, flow up to 160 l/min

DP-1 = size 10, flow up to 160 l/min

DP-2 = size 16, flow up to 300 l/min

DP-4 = size 25, flow up to 700 l/min

DP-6 = size 32, flow up to 1000 l/min

Max pressure:

350 bar for DH-0, DP-1, DP-2, DP-4, DP-6

315 bar for DK-1

- ① Main body
- ② Spool
- ③ Manual override
- ④ Hydraulic actuator
- ⑤ Adjustable chokes (option /H)

1 MODEL CODE

| | | | | | | | | | |
|---|----------|----------|----------|---|----------|---|-----------|---|---|
| DH-0 | 4 | 1 | 3 | / | A | / | ** | / | * |
| Directional control valve, size: DH-0 = 06 DK-1 = 10 DP-1 = 10 DP-2 = 16 DP-4 = 25 DP-6 = 32 | | | | | | | | | Seals material, see section ③: - = NBR PE = FKM BT = HNBR (only for DP) |
| Type of actuator: 4 = single actuator 5 = double actuator | | | | | | | | | Series number |
| Valve configuration, see section ⑤ 0 = free, without springs 1 = spring centered, without detent 3 = spring offset external position 5 = 2 external positions, with detent (only for DH and DK) 7 = center and external positions | | | | | | | | | Options: only for DH-04 and DK-14, see section ④: /A = actuator device mounted on side of port B only for DP: /H = adjustable chokes for controlling the main spool shifting time (meter-out to the pilot chambers of the main valve) /H9 = adjustable chokes for controlling the main spool shifting time (meter-in to the pilot chambers of the main valve) /R = with check valve on port P (not available for DP-1*) /S = main spool stroke adjustment (not available for DP-1*) |
| | | | | | | | | | Spool type, see section ④ |

2 HYDRAULIC CHARACTERISTICS

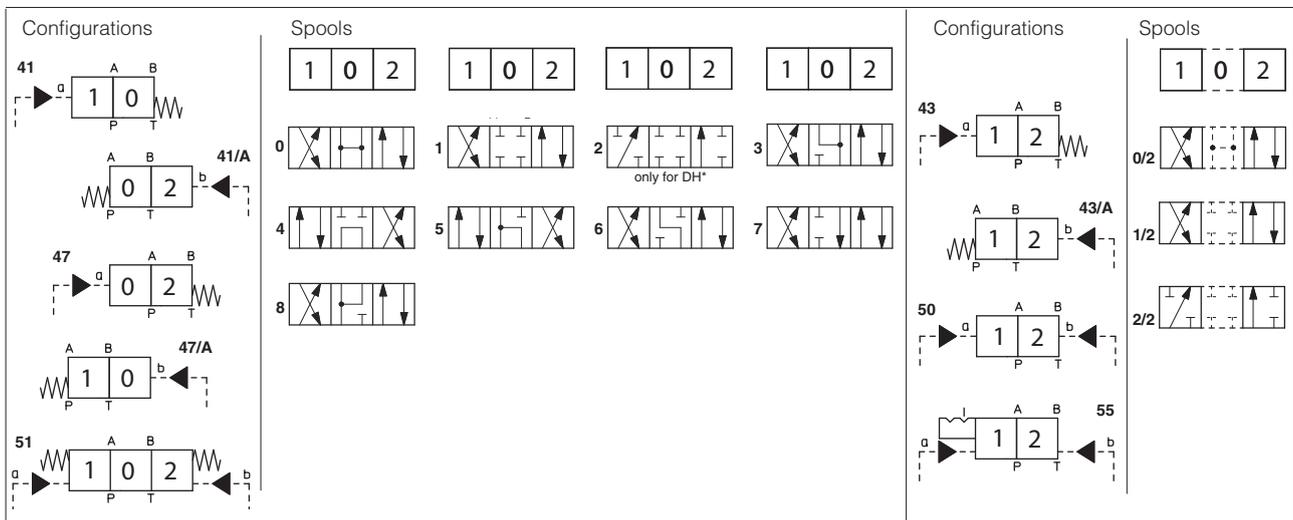
| Valve model | DH-0 | DK-1 | DP-1 | DP-2 | DP-4 | DP-6 |
|---|--------------|---------------|------|------|------|------|
| Max recommended flow [l/min] | 50 | 160 | 160 | 300 | 700 | 1000 |
| Max pressure on port P, A, B [bar] | 350 | 315 | 350 | | | |
| Max pressure on port T (also X, Y for DP) [bar] | see note (1) | | | 250 | | |
| Minimum pilot pressure [bar] | 3 (min) | 5 (suggested) | 4 | | | |
| Max recommended pressure on piloting line [bar] | 70 | | | | 250 | |

(1) The max pressure on port T has to be not over 50% of pilot pressure

3 MAIN CHARACTERISTICS, SEALS AND FLUIDS - for other fluids not included in below table, consult our technical office

| | | | |
|--|---|----------------------------|----------------------|
| Assembly position / location | any position except for valves type DH-050, DK-150, DP-*50 (without springs) that must be installed with their longitudinal axis horizontal | | |
| Subplate surface finishing | roughness index Ra 0,4 - flatness ratio 0,01/100 (ISO 1101) | | |
| MTTFd values according to EN ISO 13849 | 150 years, for further details see technical table P007 | | |
| Compliance | RoHS Directive 2011/65/EU as last update by 2015/65/EU REACH Regulation (EC) n°1907/2006 | | |
| Ambient temperature range | standard execution = -30°C ÷ +70°C; /PE option = -20°C ÷ +70°C; /BT option = -40°C ÷ +70°C | | |
| Seals, recommended fluid temperature | NBR seals (standard) = -20°C ÷ +80°C, with HFC hydraulic fluids = -20°C ÷ +50°C FKM seals (/PE option) = -20°C ÷ +80°C HNBR seals (/BT option) = -40°C ÷ +60°C, with HFC hydraulic fluids = -40°C ÷ +50°C | | |
| Recommended viscosity | 15 ÷ 100 mm ² /s - max allowed range 2,8 ÷ 500 mm ² /s | | |
| Max fluid contamination level | ISO4406 class 20/18/15 NAS1638 class 9, see also filter section at www.atos.com or KTF catalog | | |
| Hydraulic fluid | Suitable seals type | Classification | Ref. Standard |
| Mineral oils | NBR, FKM, HNBR | HL, HLP, HLPD, HVLP, HVLPD | DIN 51524 |
| Flame resistant without water | FKM | HFDU, HFDR | ISO 12922 |
| Flame resistant with water | NBR, HNBR | HFC | |

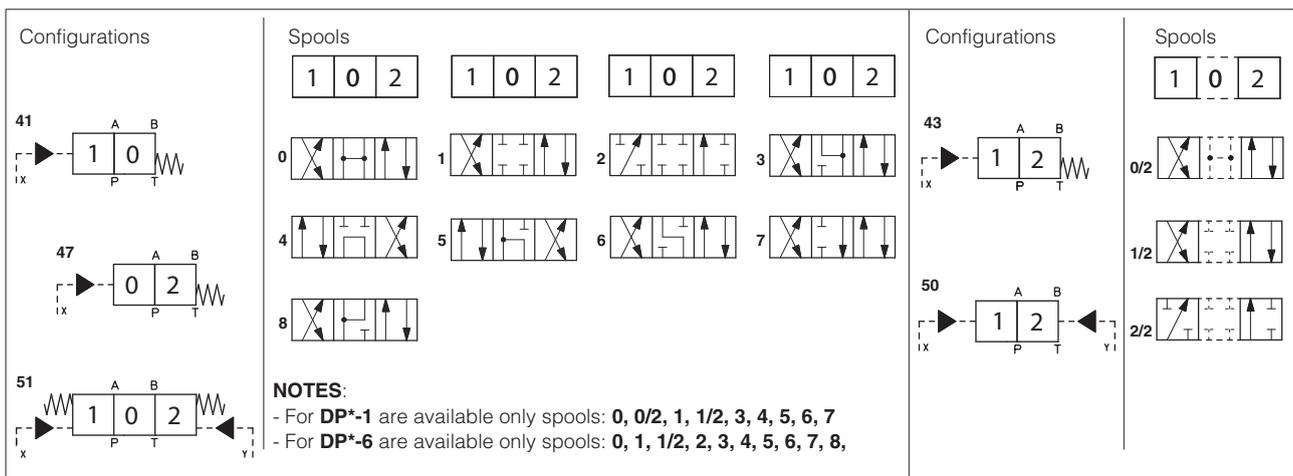
4 CONFIGURATIONS and SPOOLS valves type DH-*, DK-*



NOTES

- spools type **0** and **3** are also available as **0/1** and **3/1** with restricted oil passages in central position, from user ports to tank.
- spools type **1**, **4** and **5** are also available as **1/1**, **4/8** (only for DH), and **5/1**. They are properly shaped to reduce water-hammer shocks during the switching.
- spools type **1**, **1/2**, **3**, **8** are available as **1P**, **1/2P**, **3P**, **8P** (only for DH-0) to limit valve internal leakages.

5 CONFIGURATIONS and SPOOLS valves type DP-*



Special shaped spools

- spools type **0** and **3** are also available as **0/1** and **3/1** with restricted oil passages in central position, from user ports to tank.
- spools type **1**, **4** and **5** are also available as **1/1**, **4/8** and **5/1** are properly shaped to reduce water-hammer shocks during the switching.

6 Q/Δp DIAGRAMS

| | |
|-------------|--|
| DH-0 | See note and diagrams on table E010 relating the DH* valve from which DH-0* are derived |
| DK-1 | See note and diagrams on table E025 relating the DKE valve from which DK-1* are derived |
| DP-1 | See note and diagrams on table E085 relating the DPH*-1 valve from which DP-1* are derived |
| DP-2 | See note and diagrams on table E085 relating the DPH*-2 valve from which DP-2* are derived |
| DP-4 | See note and diagrams on table E085 relating the DPH*-4 valve from which DP-4* are derived |
| DP-6 | See note and diagrams on table E085 relating the DPH*-6 valve from which DP-6* are derived |

7 DIMENSIONS OF HYDRAULIC OPERATED VALVES ISO 4401 size 06 and 10 [mm]

ISO 4401: 2005
Mounting surface: 4401-03-02-0-05 (see table P005)
 Fastening bolts: 4 socket head screws M5x50 class 12.9
 Tightening torque = 8 Nm
 Diameter of ports A, B, P, T: Ø = 7,5 mm (max)
 Seals: 4 OR 108

① Pilot pressure port G1/8"
 ② Manual override

Mounting subplates: see tab. E010

DH-04**

Mass: 1,2 Kg

DH-05**

Mass: 1,6 Kg

ISO 4401: 2005
Mounting surface: 4401-05-05-0-05 (see table P005)
(without X port)
 Fastening bolts: 4 socket head screws M6x40 class 12.9
 Tightening torque = 15 Nm
 Diameter of ports A, B, P, T: Ø = 11,2 mm (max)
 Diameter of port Y: Ø = 5 mm
 Seals: 5 OR 2050, 1 OR 108

① Pilot pressure port G1/4"
 ② Air bleed

Mounting subplates: see tab. E025 (only version /Y)

Note: Line Y must be always present and no counter pressure are allowed on this line.

DK-14**

Mass: 3,4 Kg

DK-15**

Mass: 4,2 Kg

8 DIMENSIONS OF HYDRAULIC OPERATED VALVES ISO 4401 size 16, 25 and 32 [mm]

DP-1

ISO 4401: 2005

Mounting surface: 4401-05-05-0-05
(see table P005)

Fastening bolts:

4 socket head screws M6x40 class 12.9

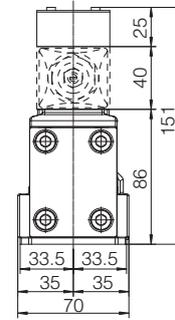
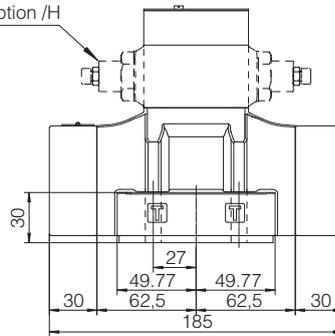
Tightening torque = 15 Nm

Diameter of ports A, B, P, T : $\varnothing = 11$

Diameter of ports X, Y: $\varnothing = 5$ mm

Seals: 5 OR 2050, 2 OR 108

Only for
option /H



Mass: 7,1 Kg

DP-2

ISO 4401: 2005

Mounting surface: 4401-07-07-0-05

Fastening bolts:

4 socket head screws M10x50 class 12.9

Tightening torque = 70 Nm

2 socket head screws M6x45 class 12.9

Tightening torque = 15 Nm

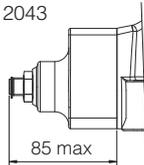
Diameter of ports A, B, P, T: $\varnothing = 20$

Diameter of ports X, Y: $\varnothing = 7$ mm

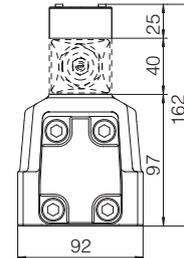
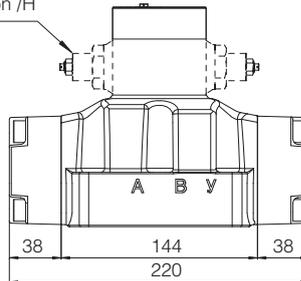
Diameter of port L: $\varnothing = 5$ mm

Seals: 4 OR 130, 2 OR 2043

**Stroke adjustment
device for option /S**



Only for
option /H



Mass: 10 Kg

DP-4

ISO 4401: 2005

Mounting surface: 4401-08-08-0-05

Fastening bolts:

6 socket head screws M12x60 class 12.9

Tightening torque = 125 Nm

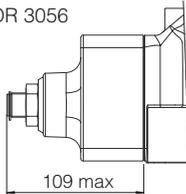
Diameter of ports A, B, P, T : $\varnothing = 24$

Diameter of ports X, Y: $\varnothing = 7$ mm

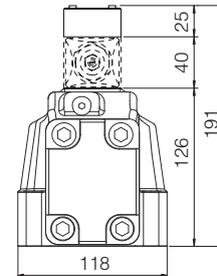
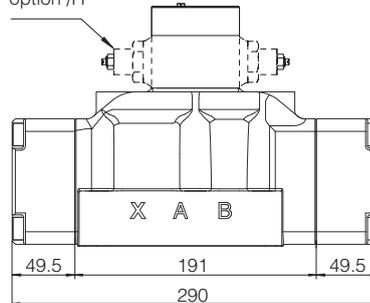
Diameter of port L: $\varnothing = 5$ mm

Seals: 4 OR 4112, 2 OR 3056

**Stroke adjustment
device for option /S**



Only for
option /H



Mass: 16,5 Kg

DP-6

ISO 4401: 2005

Mounting surface: 4401-10-09-0-05

(port L optional)

Fastening bolts:

6 socket head screws M20x80 class 12.9

Tightening torque = 600 Nm

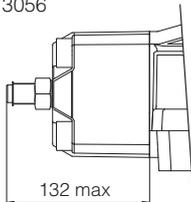
Diameter of ports A, B, P, T : $\varnothing = 34$ mm

Diameter of ports X, Y: $\varnothing = 7$ mm

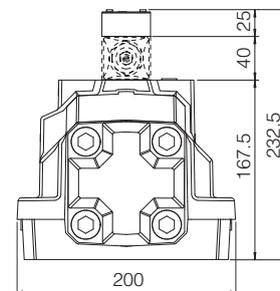
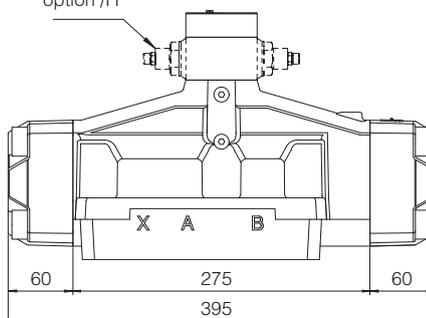
Diameter of port L: $\varnothing = 5$ mm

Seals: 4 OR 144, 2 OR 3056

**Stroke adjustment
device for option /S**



Only for
option /H



Mass: 38 Kg

Mounting subplates: see tab. K280