

DSH*

LEVER-OPERATED DIRECTIONAL CONTROL VALVE

MOUNTING SURFACES

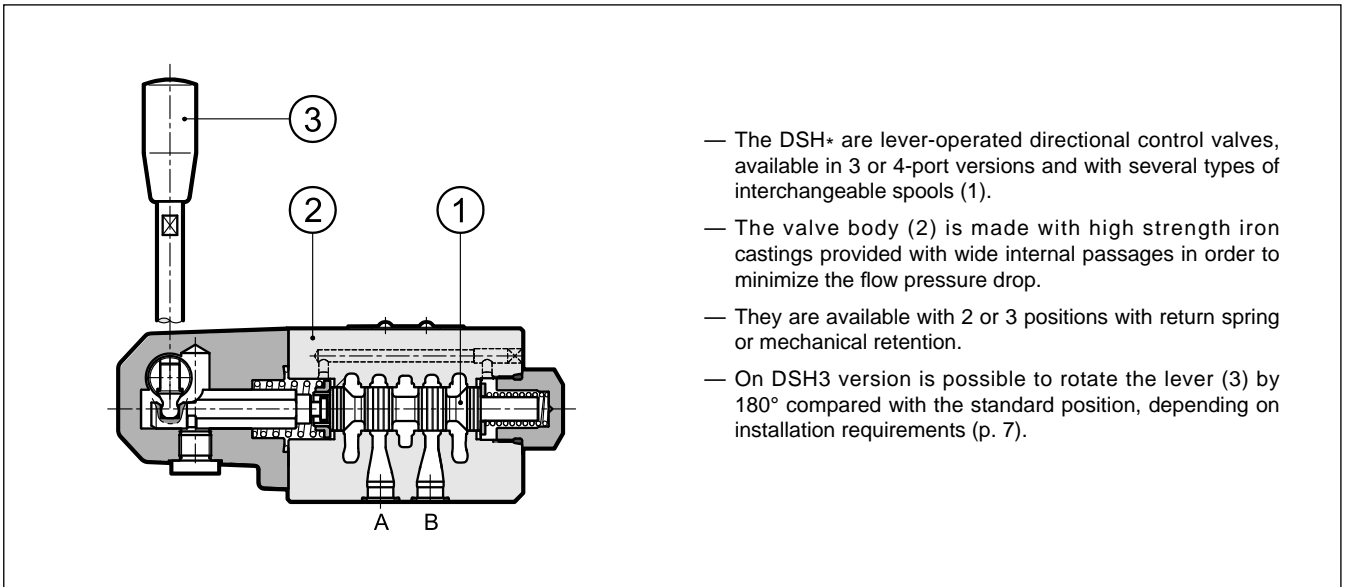
DSH3 ISO 4401-03

DSH5 ISO 4401-05

p max (see performances table)

Q nom (see performances table)

OPERATING PRINCIPLE



- The DSH* are lever-operated directional control valves, available in 3 or 4-port versions and with several types of interchangeable spools (1).
- The valve body (2) is made with high strength iron castings provided with wide internal passages in order to minimize the flow pressure drop.
- They are available with 2 or 3 positions with return spring or mechanical retention.
- On DSH3 version is possible to rotate the lever (3) by 180° compared with the standard position, depending on installation requirements (p. 7).

PERFORMANCES (with mineral oil of viscosity of 36 cSt at 50°C)

		DSH3	DSH5
Maximum working pressure:	- P - A - B ports	350	320
	- T port	210	160
Nominal flow rate	l/min	75	150
Ambient temperature range	°C	-20 / +60	
Fluid temperature range	°C	-20 / +80	
Fluid viscosity range	cSt	10 ÷ 400	
Fluid contamination degree		according to ISO 4406:1999 class 20/18/15	
Recommended viscosity	cSt	25	
Mass	kg	1.3	4.2

1 - IDENTIFICATION CODE

	<div style="display: flex; justify-content: space-around; font-weight: bold; font-size: 1.2em;"> DSH - / </div>	
Directional control valve with spool		Option: / W7 = Zinc-nickel surface treatment (see NOTE 2). Omit if not required.
Lever-operated (see NOTE 1)		Seals: N = NBR seals for mineral oil (standard) V = FPM seals for special fluids
Size: 3 = ISO 4401-03 5 = ISO 4401-05		Series No.: 11 for DSH3 (the overall and mounting dimensions remain unchanged from 10 to 19) 31 for DSH5 (the overall and mounting dimensions remain unchanged from 30 to 39)
Spool type (see p. 2)		

NOTE 1: On request it is possible to have the lever mounted in different positions from those in the catalogue. Please consult our Technical Department.

NOTE 2: Standard surface treatment: phosphating. The zinc-nickel finishing makes the valve suitable to ensure a salt spray resistance up to 600 hours.

2 - SPOOL TYPE

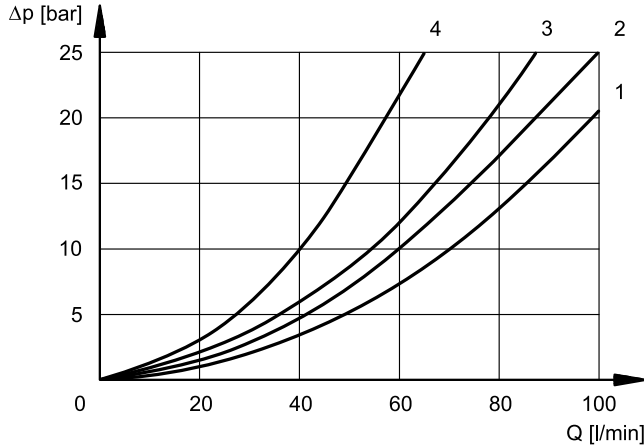
<p>Type S*: 3 positions with spring centering</p> <p>S1 S2 S3 S4</p>	<p>Type SK*: 3 positions with mechanical retention</p> <p>SK1 SK2 SK3 SK4</p>	<p>Type SA*: 2 positions (central + external) with spring centering</p> <p>SA1 SA2 SA3 SA4</p>	<p>Type SAK*: 2 positions (central + external) with mechanical retention</p> <p>SAK1 SAK2 SAK3 SAK4</p>
<p>Type TA: 2 external positions with return spring</p> <p>TA TA02 TA23</p>	<p>Type TAK: 2 external positions with mechanical retention</p> <p>TAK TAK02 TAK23</p>	<p>Besides the diagrams shown, which are the most frequently used, other special versions are available: consult our Technical Department for their identification and operating limits.</p> <p>NOTE: TA02, TA23, TAK02 and TAK23 spools are available only for DSH3.</p>	

3 - HYDRAULIC FLUIDS

Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals (code N). For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other fluid types such as HFA, HFB, HFC, please consult our technical department. Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics. The fluid must be preserved in its physical and chemical characteristics.

4 - PRESSURE DROPS Δp -Q (values obtained with viscosity 36 cSt at 50 °C)

4.1 - DSH3



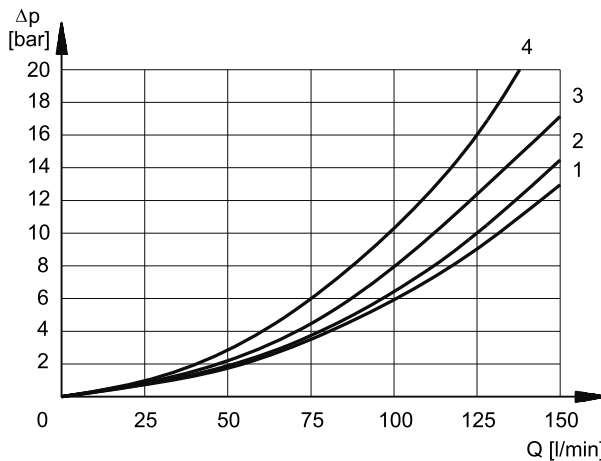
VALVE IN ACTUATED POSITION

SPOOL TYPE	FLOW DIRECTION			
	P→A	P→B	A→T	B→T
	CURVES ON GRAPH			
S1, SA1, SAK1	2	2	3	3
S2, SA2, SAK2	1	1	3	3
S3, SA3, SAK3	3	3	1	1
S4, SA4, SAK4	4	4	4	4
TA, TAK	3	3	3	3
TA02, TAK02	2	2	2	2
TA23, TAK23	3	3		

VALVE IN NORMAL POSITION

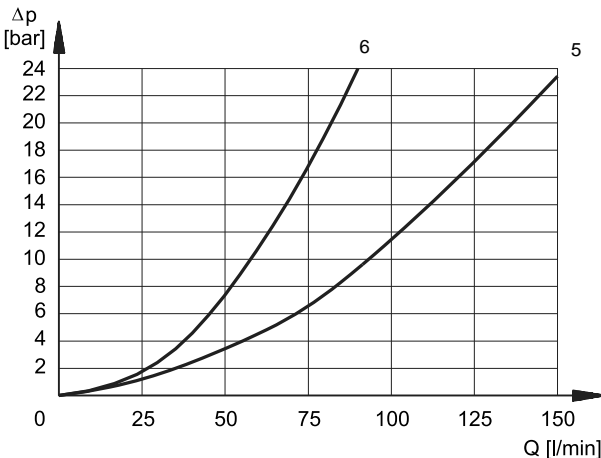
SPOOL TYPE	FLOW DIRECTION				
	P→A	P→B	A→T	B→T	P→T
	CURVES ON GRAPH				
S2, SA2, SAK2					2
S3, SA3, SAK3			3	3	
S4, SA4, SAK4					3

4.2 - DSH5



VALVE IN ACTUATED POSITION

SPOOL TYPE	FLOW DIRECTION			
	P→A	P→B	A→T	B→T
	CURVES ON GRAPH			
S1, SK1	2	2	1	1
S2, SK2	3	3	1	1
S3, SK3	3	3	2	2
S4, SK4	1	1	2	2
TA, TAK	3	3	2	2



VALVE IN NORMAL POSITION

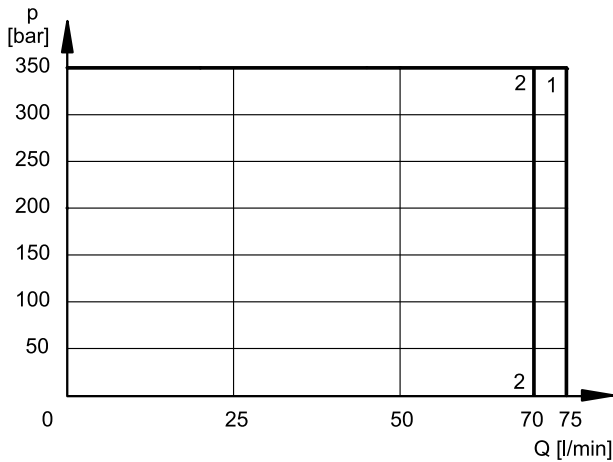
SPOOL TYPE	FLOW DIRECTION				
	P→A	P→B	A→T	B→T	P→T
	CURVES ON GRAPH				
S2, SK2					5
S3, SK3			6	6	
S4, SK4					5

5 - OPERATING LIMITS

The curves define the flow rate operating fields according to the valve pressure of the different versions.

The values have been obtained according to ISO 6403 norm, with mineral oil viscosity 36 cSt at 50 °C and filtration ISO 4406:1999 class 18/16/13.

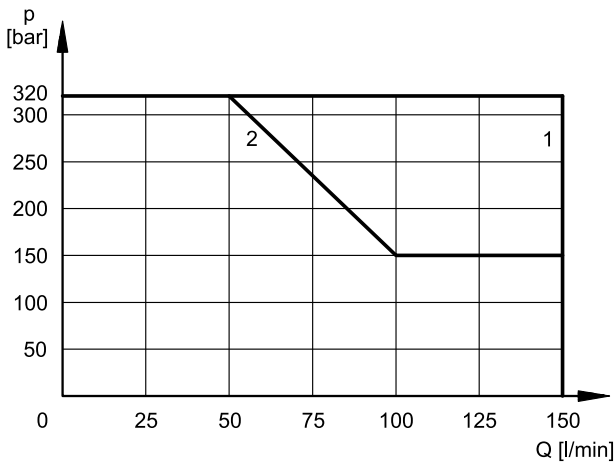
5.1 - DSH3



SPOOL TYPE	CURVE	
	P→A	P→B
S1, SK1, SA1, SAK1	1	1
S2, SK2, SA2, SAK2	1	1
S3, SK3, SA3, SAK3	1	1
S4, SK4, SA4, SAK4	2	2

SPOOL TYPE	CURVE	
	P→A	P→B
TA, TAK	1	1
TA02, TAK02	1	1
TA23, TAK23	1	1

5.2 - DSH5



SPOOL TYPE	CURVE	
	P→A	P→B
S1, SK1, SA1, SAK1	1	1
S2, SK2, SA2, SAK2	1	1
S3, SK3, SA3, SAK3	1	1
S4, SK4, SA4, SAK4	2	2

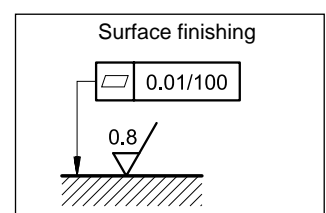
SPOOL TYPE	CURVE	
	P→A	P→B
TA, TAK	1	1

NOTE: Values in the graphs are relevant to the standard valve. The operating limits can be considerably reduced if a 4-port valve is used with port A or B plugged.

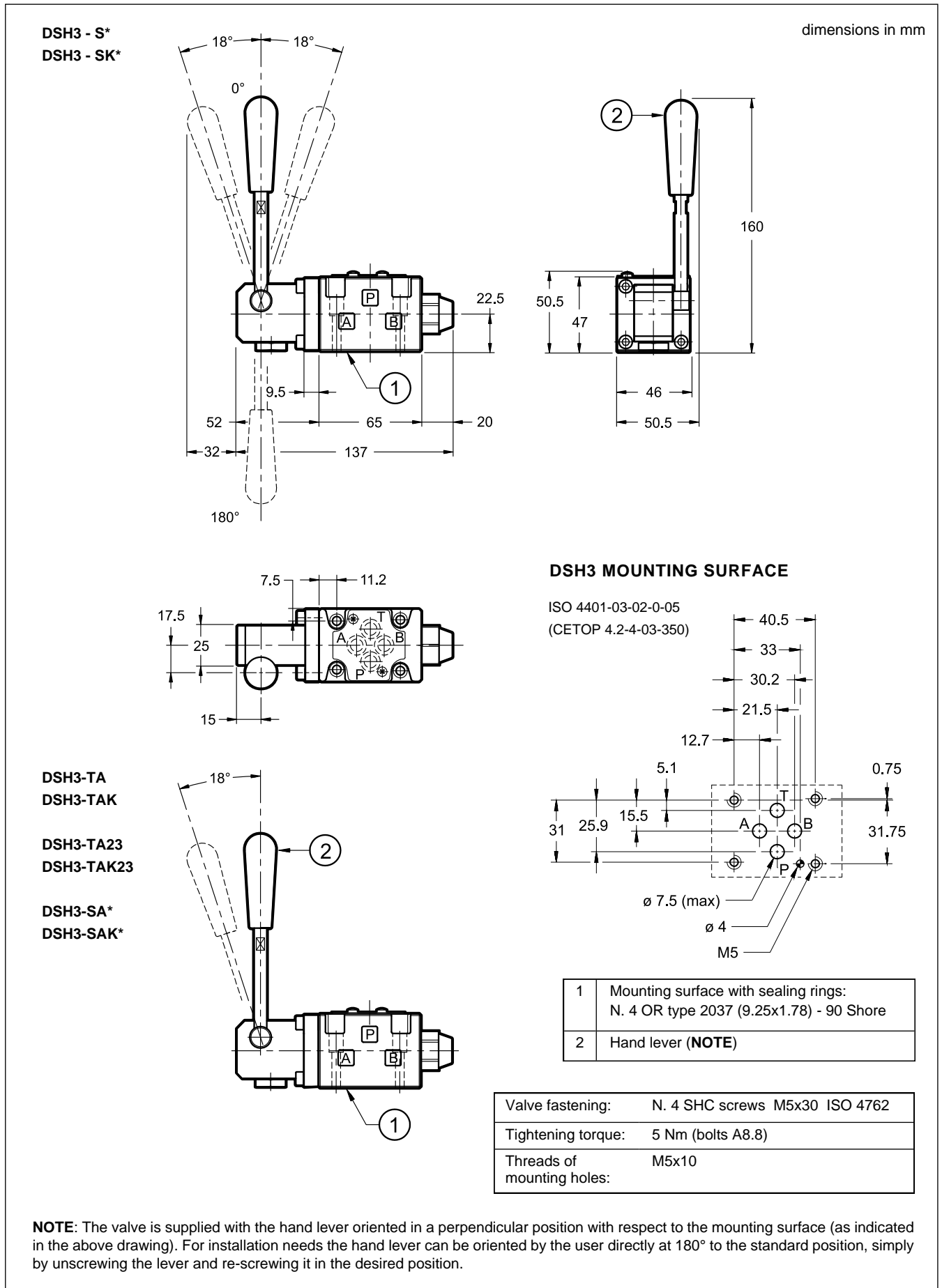
6 - INSTALLATION

Configurations with centering and return springs can be mounted in any position; valves with mechanical detent must be mounted with the longitudinal axis horizontal.

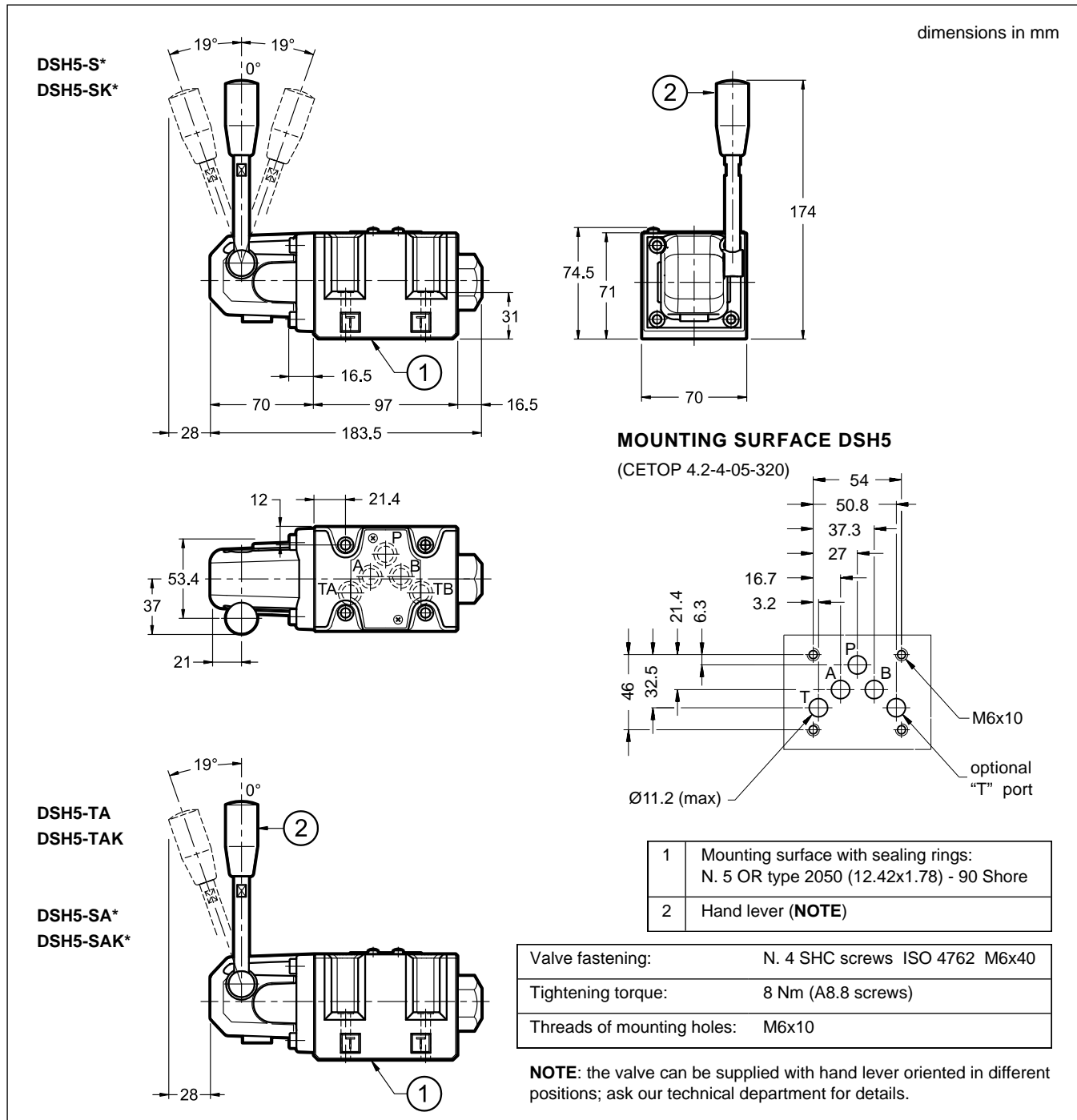
Valve fixing is by means of screws or tie rods, with the valve mounted on a lapped surface, with values of planarity and smoothness that are equal to or better than those indicated in the drawing. If the minimum values of planarity and/or smoothness are not met, fluid leakage between valve and mounting surface can easily occur.



7 - OVERALL AND MOUNTING DIMENSIONS DSH3



8 - OVERALL AND MOUNTING DIMENSIONS DSH5



9 - SUBPLATES (See catalogue 51 000)

	DSH3	DSH5
Type with rear ports	PMMD-AI3G	PMD4-AI4G - 3/4" BSP threaded
Type with side ports	PMMD-AL3G	PMD4-AL4G - 1/2" BSP threaded
P, T, A and B threads	3/8" BSP	