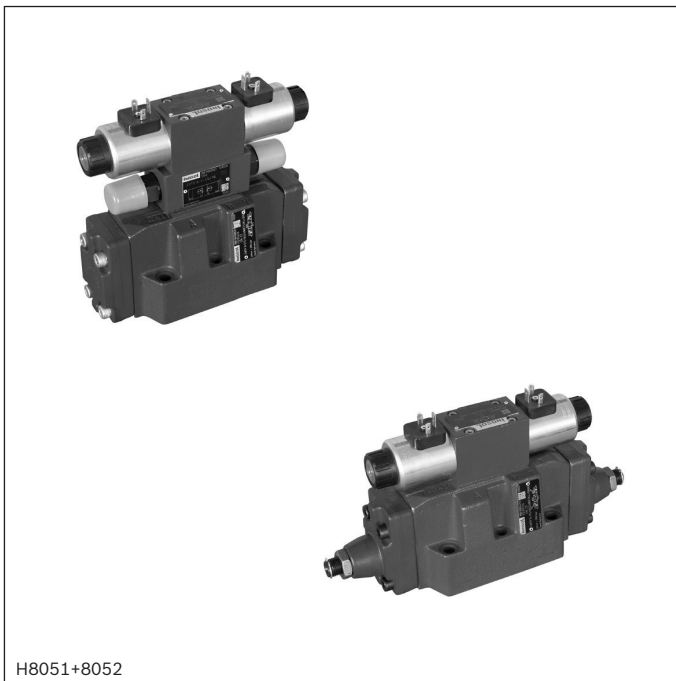


Directional spool valves, pilot-operated, with hydraulic or electro-hydraulic actuation

WEH and WH



- ▶ Size 10 ... 32
- ▶ Component series 4X; 6X; 7X
- ▶ Maximum operating pressure 350bar [5076psi]
- ▶ Maximum flow 1100 l/min [290 US gpm]

Features

- ▶ 4/3-, 4/2- or 3/2-way version
- ▶ Types of actuation (internal or external pilot control):
 - Electro-hydraulic (type WEH)
 - Hydraulic (type WH)
- ▶ For subplate mounting
- ▶ Porting pattern according to ISO 4401 and NFPA T3.5.1 R2
- ▶ Spring or pressure centering, spring end position or hydraulic end position
- ▶ Wet-pin DC or AC solenoids, optional
- ▶ Electrical connection as individual or central connection
- ▶ Optional versions:
 - Manual override
 - Switching time adjustment
 - Preload valve in channel P of the main valve
 - Stroke setting and/or spool position monitoring

Contents

Features	1
Ordering code	2 ... 4
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Dimensions	10 ... 16

Ordering code

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22
						/									/						*

01	Up to 280 bar	no code
	Up to 350 bar	H -
02	3-way version	3
	4-way version	4

Types of actuation

03	Electro-hydraulic	WEH
	Hydraulic	WH

Size

04	NG10	10
	NG16	16
	NG25 (version "W.H 22")	22
	NG25 (version "W.H 25")	25
	NG32	32

Spool return in the main valve

05	By means of springs	no code
	Hydraulic ¹⁾	H
06	For symbols, see page 5 and 6	
07	Component series 40 ... 49 (40 ... 49: unchanged installation and connection dimension) – NG10	4X
	Component series 60 ... 69 (60 ... 69: unchanged installation and connection dimension) – NG25 ("W.H 25") and NG32	6X
	Component series 70 ... 79 (70 ... 79: unchanged installation and connection dimension) – NG16 (from series 72) and NG25 ("W.H 22")	7X

Control spool return in the pilot control valve with 2 spool positions and 2 solenoids
(only possible with symbols C, D, K, Z and hydraulic control spool return in the main valve)

08	With spring return	no code
	Without spring return	O
	Without spring return with detent ²⁾	OF

Pilot control valve ⁽²⁾

09	High-power valve (data sheet 23178)	6E
10	Direct voltage 24 V ²⁾	G24
	Alternating voltage 230 V 50/60 Hz ²⁾	W230
	For other voltages, frequencies and electric data, see data sheet 23178	
11	Without manual override	no code
	With manual override	N
	With concealed manual override	N9

Pilot oil flow

12	External pilot oil supply, external pilot oil return ³⁾	no code
	Internal pilot oil supply, external pilot oil return ^{3); 4)}	E
	Internal pilot oil supply, internal pilot oil return ⁴⁾	ET
	External pilot oil supply, internal pilot oil return ³⁾	T
	(For type WH... only "no code" ; version "ET" and "T" with 3-spool position valve, pressure-centered only possible if $p_{pilot} \geq 2 \times p_{tank} + p_{pilot\ min!}$)	

Ordering code

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	
							/									/						*

Switching time adjustment

13	Without switching time adjustment	no code
	Switching time adjustment as supply control	S
	Switching time adjustment as discharge control	S2

Corrosion resistance (outside)

14	None (valve housing primed)	no code
	Improved corrosion protection (240 h salt spray test according to EN ISO 9227)	J3

Electrical connection ²⁾

15	Individual connection	
	Without mating connector; connector DIN EN 175301-803	K4 ⁶⁾
	For further electrical connections, see data sheet 23178 and 08010	

Spool position monitoring

16	Without position switch	no code
	Monitored spool position "a"	QMAG24
	Monitored spool position "b"	QMBG24
	Monitored spool position "a" and "b"	QMABG24
	Monitored rest position	QM0G24
For more information, see data sheet 24830		

Stroke setting

17	For ordering code, see page 36 and 37	
----	---------------------------------------	--

Throttle insert ²⁾

18	Without throttle insert	no code
	Throttle Ø 0.8 mm [0.0315 inch]	B08
	Throttle Ø 1.0 mm [0.0394 inch]	B10
	Throttle Ø 1.2 mm [0.0472 inch]	B12
	Throttle Ø 1.5 mm [0.0591 inch]	B15
	Throttle Ø 2.0 mm [0.0787 inch]	B20
	Throttle Ø 2.5 mm [0.0984 inch]	B25

Preload valve (not for NG10) ²⁾

19	Without preload valve	no code
	With preload valve ($p_c = 4.5 \text{ bar [65 psi]}$)	P4,5
20	Without pressure reducing valve	no code
	With pressure reducing valve	D3 ⁵⁾

Seal material

21	NBR seals	no code
	FKM seals	V
	Observe compatibility of seals with hydraulic fluid used. (other seals on request)	
22	For further information, see the plain text	*

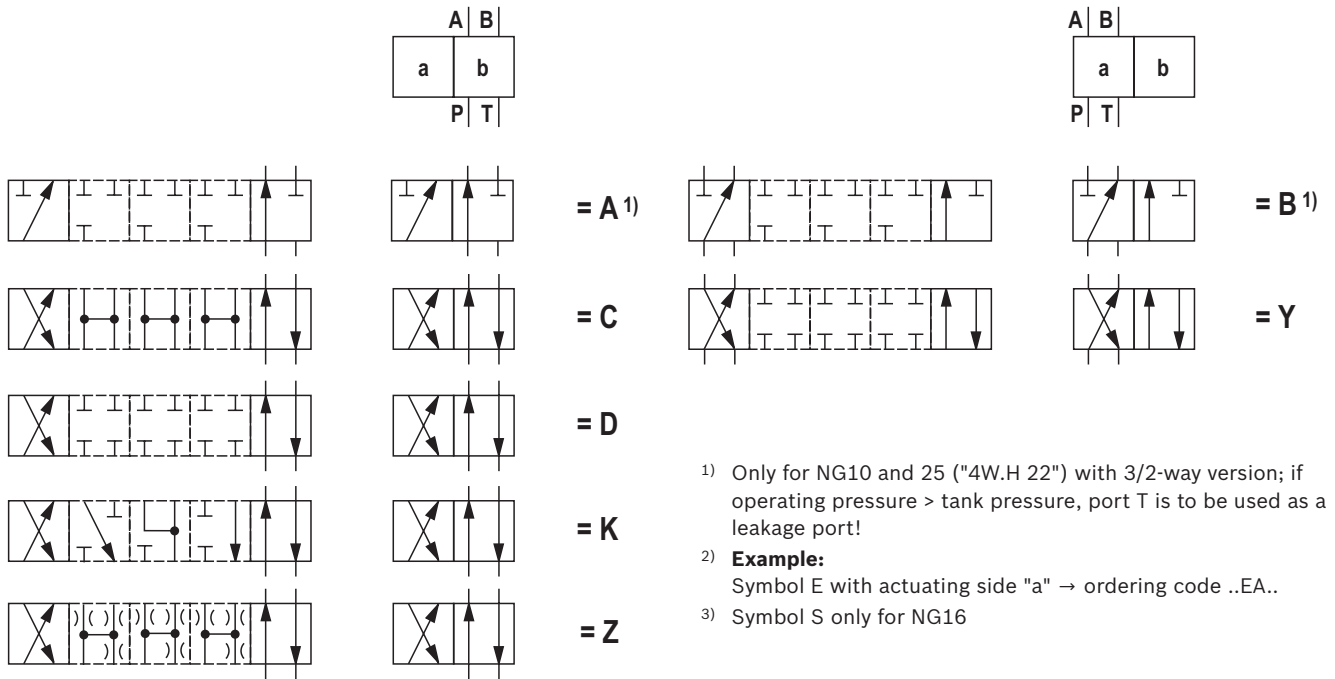
p_{pilot} = pilot pressure
 $p_{\text{pilot min}}$ = minimum pilot pressure
 p_{tank} = tank pressure
 p_c = cracking pressure

Explanation of the footnotes, see page 4.

Ordering code

- 1) ▶ 2 spool positions (hydraulic end position): only symbols C, D, K, Z, Y
 - ▶ 3 switching positions (hydraulically centered): only NG16, NG25 ("4W.H 25") and NG32
- 2) Only with electro-hydraulic actuation (type WEH)
- 3) Pilot oil supply X or return Y **external**:
 - ▶ The maximum admissible operating parameters of the pilot control valve must be observed (see data sheet 23178)!
 - ▶ Minimum pilot pressure: please observe page 16!
 - ▶ Maximum pilot pressure: please observe page 16!
- 4) Pilot oil supply **internal** (version "ET" and "E"):
 - ▶ Minimum pilot pressure: please observe page 16!
 - ▶ Maximum pilot pressure: please observe page 16!
With a higher pilot pressure, use of a **pressure reducing valve "D3"** is required (if it is not used pilot pressure = operating pressure at the port!).
 - ▶ In order to prevent inadmissibly high pressure peaks, a **"B10" throttle insert** has to be provided in port P of the pilot control valve (see page 14).
 - ▶ In connection with version "H", the **pressure reducing valve "D3"** is also required.
- 5) Only in connection with the **"B10"** throttle insert
- 6) Mating connectors, separate order, see data sheet 23178

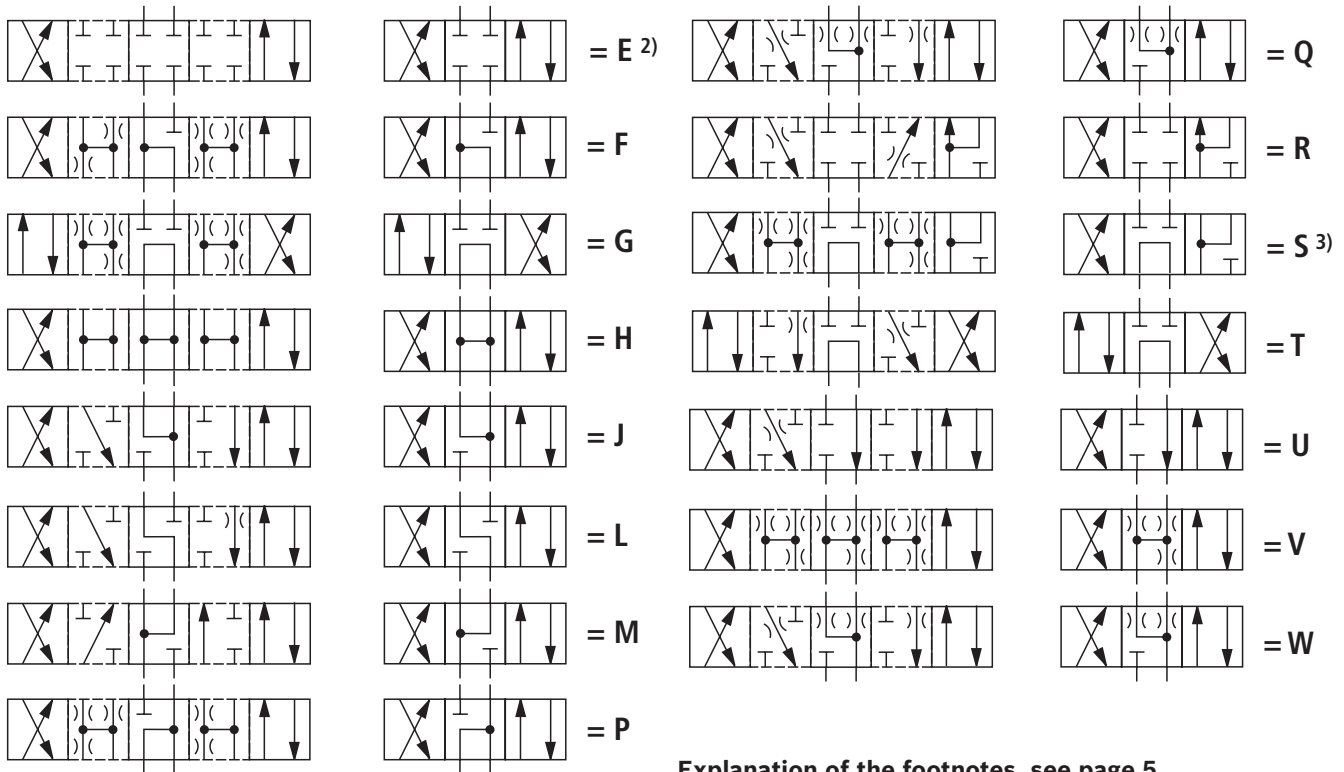
Symbols: 2 spool positions



- 1) Only for NG10 and 25 ("4W.H 22") with 3/2-way version; if operating pressure > tank pressure, port T is to be used as a leakage port!
- 2) **Example:**
Symbol E with actuating side "a" → ordering code ..EA..
- 3) Symbol S only for NG16

Ordering code		Type of actuation	
Symbol	Spool return	Type WH (hydraulic)	Type WEH (electro-hydraulic)
A ¹ , C, D, K, Z	../..		
	..H../..		
	..H../O		
	..H../OF		
B ¹ , Y	../..		
	..H../..		

Symbols: 3 spool positions



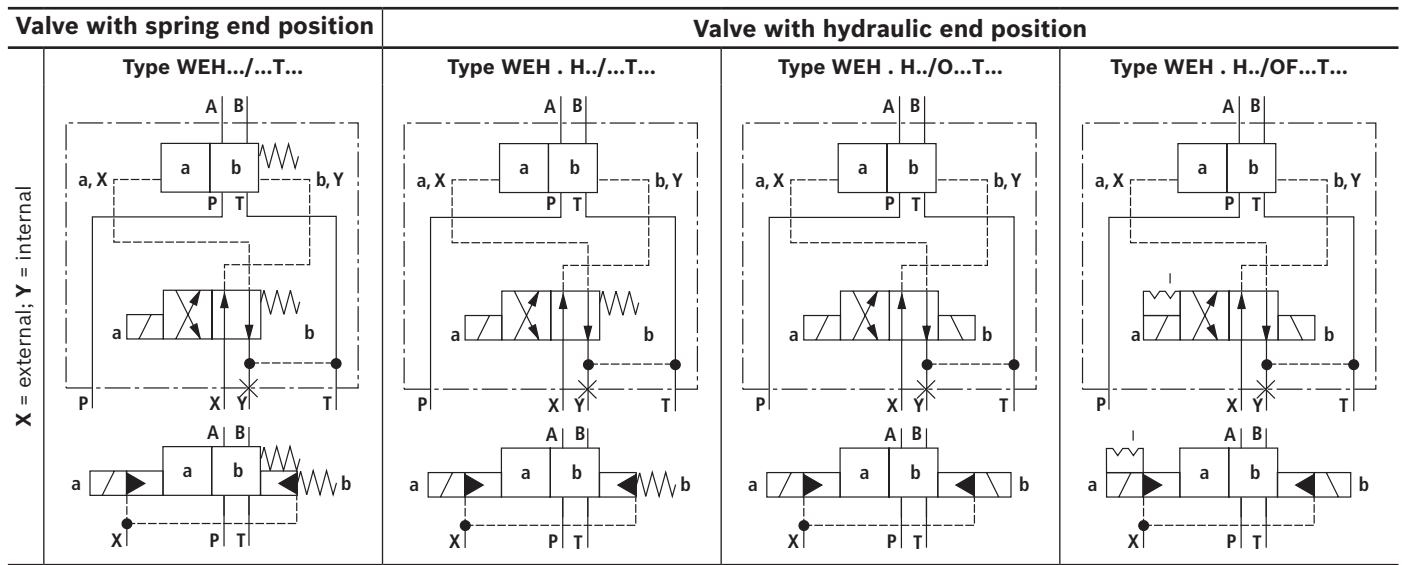
Explanation of the footnotes, see page 5.

Ordering code			Type of actuation		
Symbol	Actuating side	Spool return	Type WH (hydraulic)	Type WEH (electro-hydraulic)	
E, F, G, H, J, L, M, P, Q, R, S, T, U, V, W		../..			
	.A				
	.B				
		..H../..			
		H.A			
		H.B			

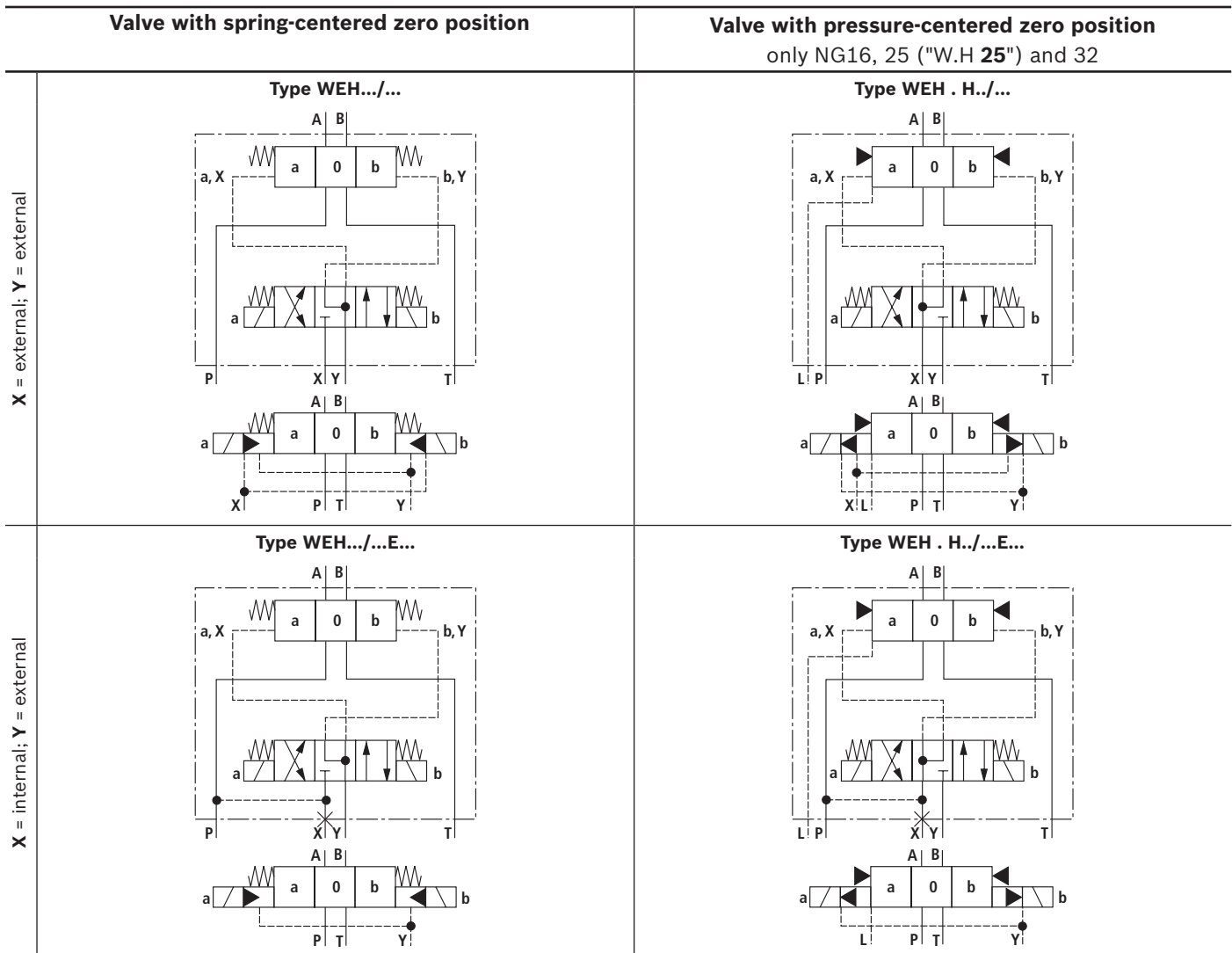
Symbols for valves with 2 spool positions

	Valve with spring end position	Valve with hydraulic end position			
<p>X = external; Y = external</p>	<p>Type WEH.../..</p>	<p>Type WEH . H../...</p>	<p>Type WEH . H../O...</p>	<p>Type WEH . H../OF...</p>	
	<p>X = internal; Y = external</p>	<p>Type WEH.../...E...</p>	<p>Type WEH . H../...E...</p>	<p>Type WEH . H../O...E...</p>	<p>Type WEH . H../OF...E...</p>
		<p>X = internal; Y = internal</p>	<p>Type WEH.../...ET...</p>	<p>Type WEH . H../...ET...</p>	<p>Type WEH . H../O...ET...</p>

Symbols for valves with 2 spool positions



Symbols for valves with 3 spool positions

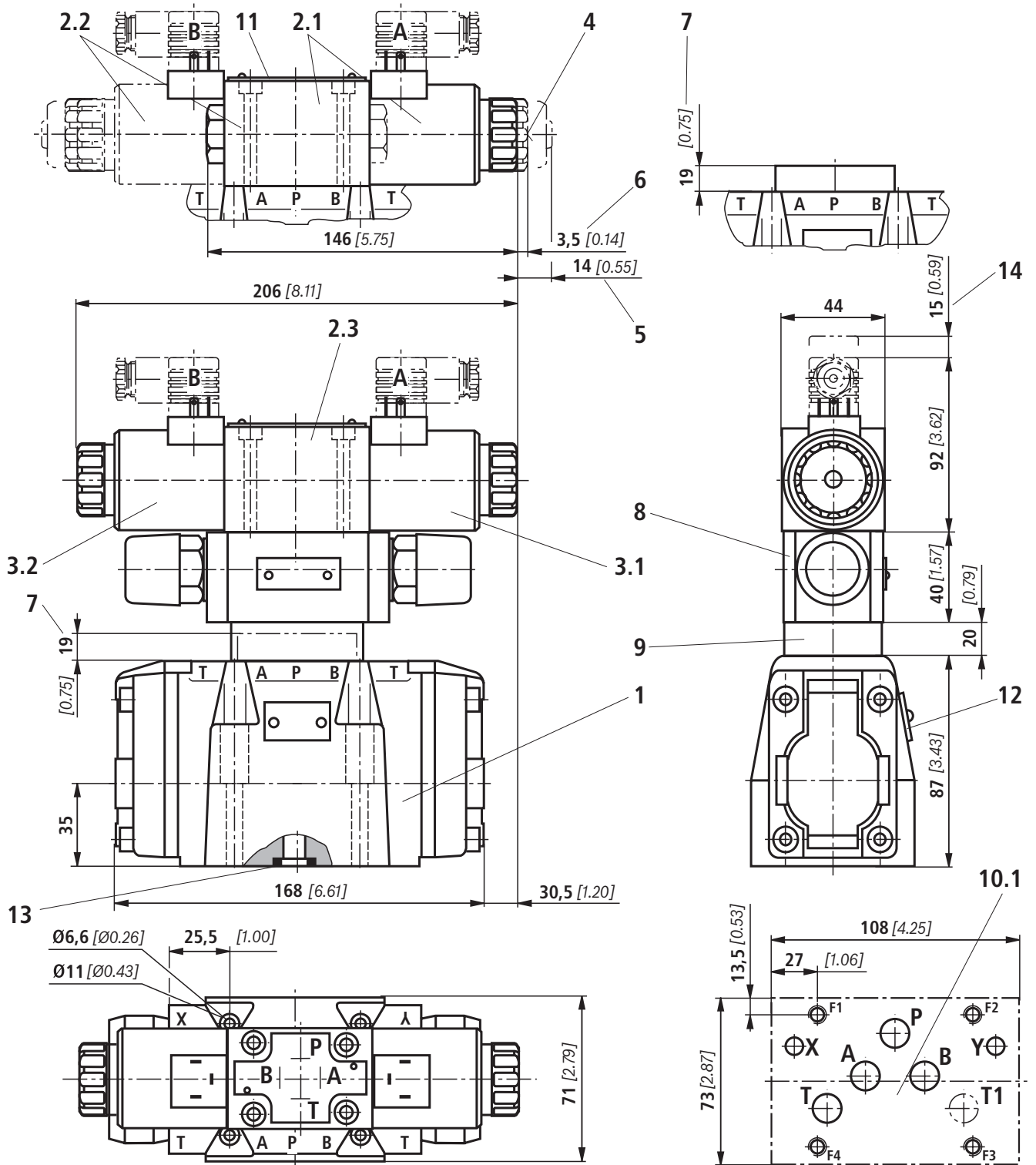


Symbols for valves with 3 spool positions

	Valve with spring-centered zero position	Valve with pressure-centered zero position only NG16, 25 ("W.H 25") and 32
X = internal; Y = internal	<p>Type WEH.../...ET...</p>	<p>Type WEH . H./...ET...</p>
X = external; Y = internal	<p>Type WEH.../...T...</p>	<p>Type WEH . H./...T...</p>

Notice:
3-spool position valves, pressure-centered, preferably with external pilot oil supply and/or return ("no code", "E")

Dimensions: NG10
(dimensions in mm [inch])



0,01/100
[0.0004/4.0]

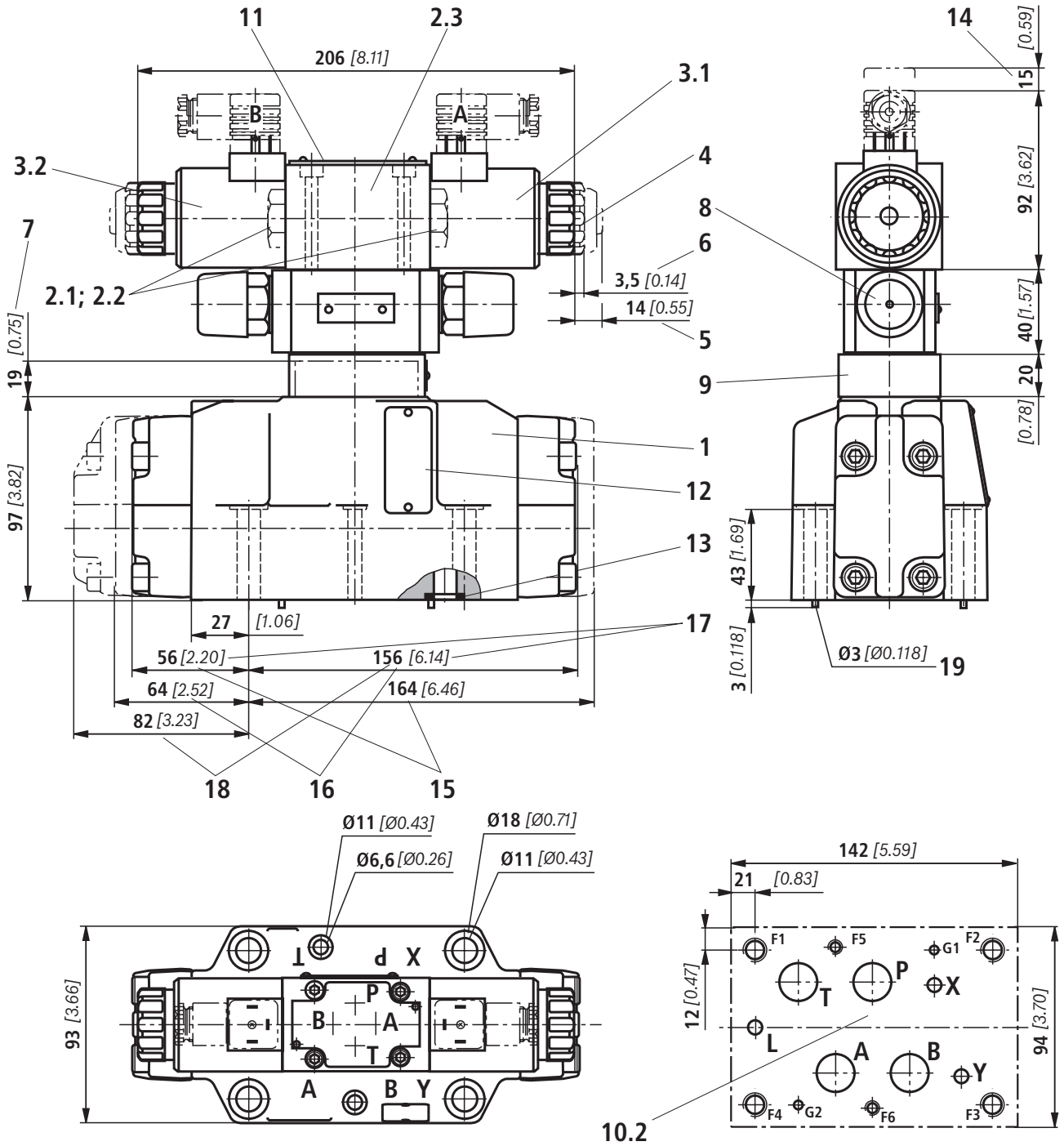
Rzmax 4

Required surface quality of the valve contact surface

Notice:

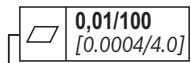
The dimensions are nominal dimensions which are subject to tolerances.

Dimensions: NG16
(dimensions in mm [inch])



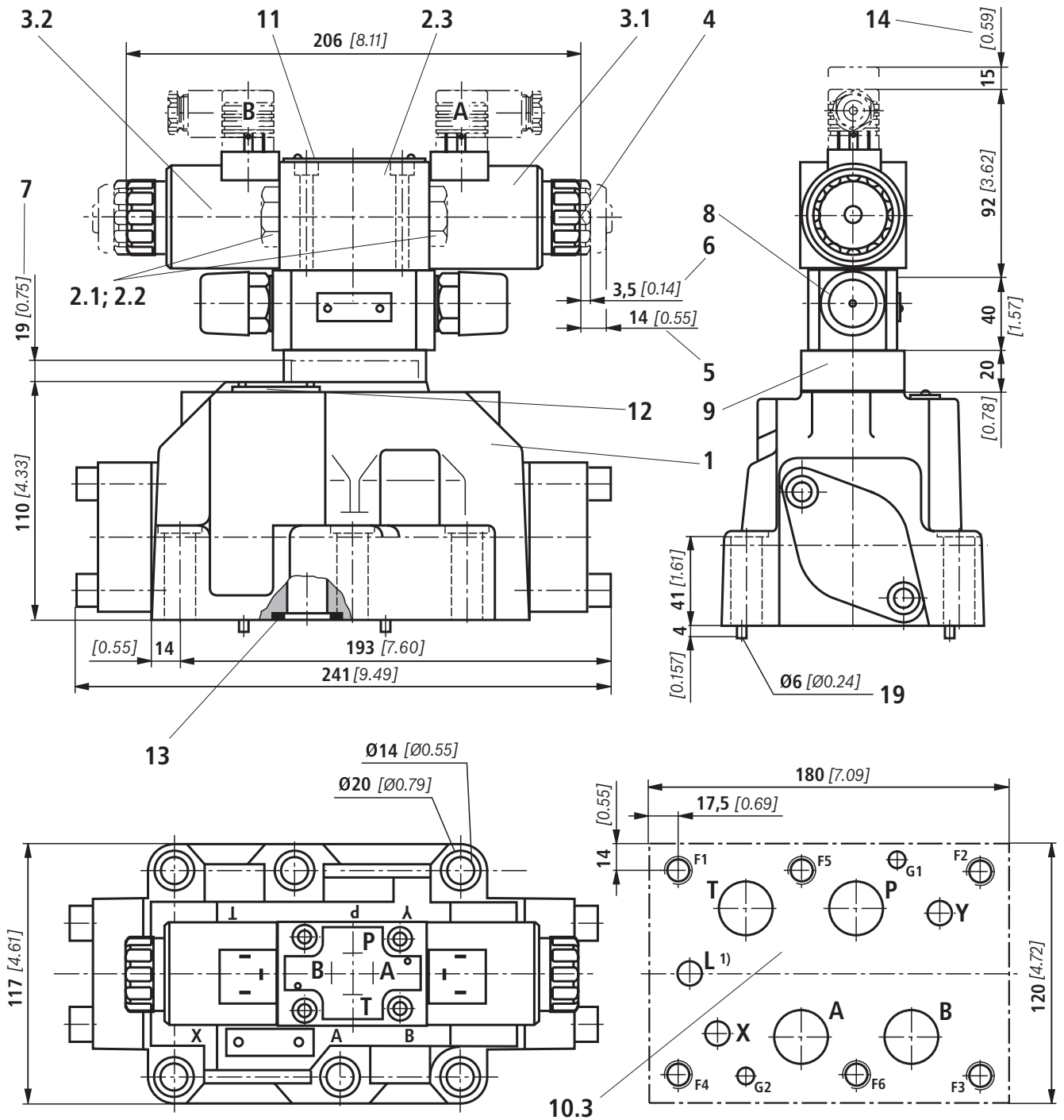
Notice:

The dimensions are nominal dimensions which are subject to tolerances.



Required surface quality of the valve contact surface

Dimensions: NG25 ("W.H 22")
(dimensions in mm [inch])



1) Port L only for valves with pressure-centered zero position

Notice:

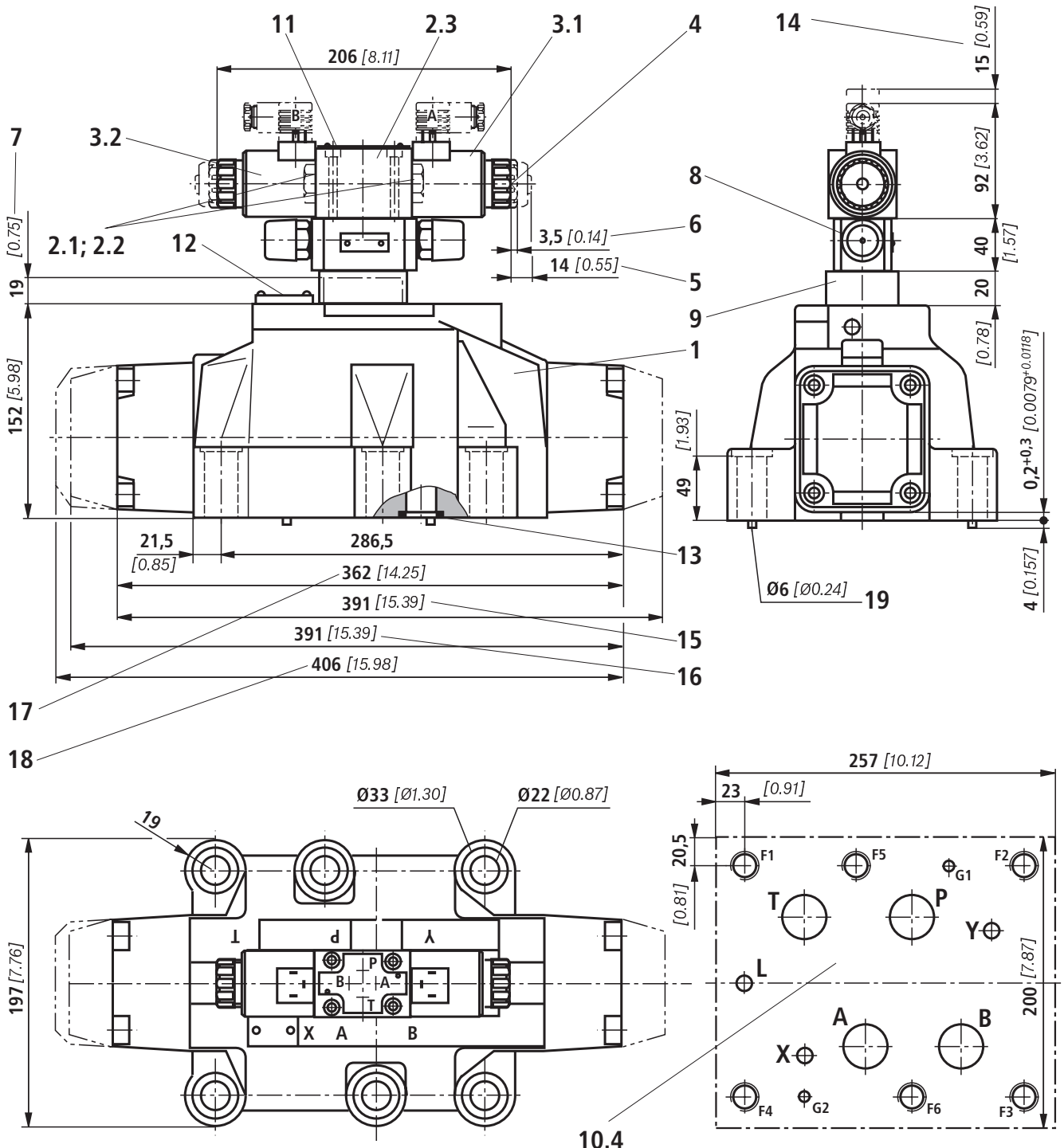
The dimensions are nominal dimensions which are subject to tolerances.

0,01/100
[0.0004/4.0]

Rzmax 4

Required surface quality of the valve contact surface

Dimensions: NG32
(dimensions in mm [inch])



Notice:

The dimensions are nominal dimensions which are subject to tolerances.

0,01/100
[0.0004/4.0]

Rzmax 4

Required surface quality of the valve contact surface

Dimensions

- 1** Main valve
 - 2** Pilot control valve type 4WE 6 ... (data sheet 23178):
 - 2.1** ▶ Pilot control valve type 4WE 6 D... (1 solenoid) for main valves with symbols C, D, K, Z
 - ▶ symbols HC, HD, HK, HZ
 - ▶ Pilot control valve type 4WE 6 JA... (1 solenoid "a") for main valves with symbols EA, FA, etc., spring return
 - ▶ Pilot control valve type 4WE 6 MA... (1 solenoid "a") for main valves with symbols HEA, HFA, etc., hydraulic spool return
 - 2.2** ▶ Pilot control valve type 4WE 6 Y... (1 solenoid) for main valves with symbol Y
 - ▶ symbol HY
 - ▶ Pilot control valve type 4WE 6 JB... (1 solenoid "b") for main valves with symbols EB, FB, etc., spring return
 - ▶ Pilot control valve type 4WE 6 MB... (1 solenoid "b") for main valves with symbols HEB, HFB, etc., hydraulic spool return
 - 2.3** ▶ Pilot control valve type 4WE 6J... (2 solenoids) for main valves with 3 spool positions, spring-centered
 - ▶ Pilot control valve type 4WE 6 M... (2 solenoids) for main valves with 3 spool positions, pressure-centered
 - 3.1** Solenoid "a"
 - 3.2** Solenoid "b"
 - 4** Manual override, "N", optional
 - ▶ Actuation of the manual override is only possible up to a tank pressure of approx. 50 bar. Avoid damage to the bore of the manual override! (Special tool for the operation, separate order, material no. **R900024943**). When the manual override is blocked, the operation of the solenoid must be prevented!
 - ▶ Simultaneous actuation of the solenoids must be prevented.
 - 5** Solenoid **without** manual override
 - 6** Solenoid **with** manual override
 - 7** Height of the diversion plate with hydraulic actuation (type WH...)
 - 8** Switching time adjustment (wrench size 6), optional
 - 9** Pressure reducing valve, optional
 - 10.1** Machined valve contact surface; porting pattern according to ISO 4401-05-05-0-05 and NFPAT3.5.1 R2-D05
 - 10.2** Machined valve contact surface; porting pattern according to ISO 4401-07-07-0-05 and NFPAT3.5.1 R2-D07
 - 10.3** Machined valve contact surface; porting pattern according to ISO 4401-08-08-0-05 and NFPAT3.5.1 R2-D08
 - 10.4** Machined valve contact surface; porting pattern according to ISO 4401-10-09-0-05 and NFPAT3.5.1 R2-D10
 - 11** Name plate pilot control valve
 - 12** Name plate complete valve
 - 13** Seal rings
 - 14** Space required for removing the mating connector
 - 15** 2-spool position valves with spring end position in the main valve (symbols A, C, D, K, Z)
 - 16** 2-spool position valves with spring end position in the main valve (symbols B, Y)
 - 17** 3-spool position valves, spring-centered; 2-spool position valves with hydraulic end position in the main valve
 - 18** 3-spool position valves, pressure-centered
 - 19** Locking pin
- Subplates** (separate order) with porting pattern according to ISO 4401 see data sheet 45100.

Dimensions

Valve mounting screws (separate order)

► NG10:

4 metric hexagon socket head cap screws

ISO 4762 - M6 x 45 - 10.9-fIZn-240h-L

(friction coefficient $\mu_{\text{total}} = 0.09 \dots 0.14$);

tightening torque $M_A = 12.5 \text{ Nm}$ [9.2 ft-lbs] $\pm 10\%$,

material no. **R913000258**

4 hexagon socket head cap screws UNC

1/4-20 UNC x 1 3/4" ASTM-A574

on request

► NG16:

4 metric hexagon socket head cap screws

ISO 4762 - M10 x 60 - 10.9-fIZn-240h-L

(friction coefficient $\mu_{\text{total}} = 0.09 \dots 0.14$);

tightening torque $M_A = 58 \text{ Nm}$ [42.8 ft-lbs] $\pm 10\%$,

material no. **R913000116**

2 metric hexagon socket head cap screws

ISO 4762 - M6 x 60 - 10.9-fIZn-240h-L

(friction coefficient $\mu_{\text{total}} = 0.09 \dots 0.14$);

tightening torque $M_A = 12.5 \text{ Nm}$ [9.2 ft-lbs] $\pm 10\%$,

material no. **R913000115**

4 hexagon socket head cap screws

UNC 3/8-16 UNC x 2 1/4" ASTM-A574 on request

2 hexagon socket head cap screws

UNC 1/4-20 UNC x 2 1/4" ASTM-A574 on request

► NG25:

6 metric hexagon socket head cap screws

ISO 4762 - M12 x 60 - 10.9-fIZn-240h-L

(friction coefficient $\mu_{\text{total}} = 0.09 \dots 0.14$);

tightening torque $M_A = 130 \text{ Nm}$ [95.9 ft-lbs] $\pm 10\%$,

material no. **R913000121**

6 hexagon socket head cap screws

UNC 1/2-13 UNC x 2 1/2" ASTM-A574 on request

► NG32:

6 metric hexagon socket head cap screws

ISO 4762 - M20 x 80 - 10.9-fIZn-240h-L

(friction coefficient $\mu_{\text{total}} = 0.09 \dots 0.14$);

tightening torque $M_A = 430 \text{ Nm}$ [317.2 ft-lbs] $\pm 10\%$,

material no. **R901035246**

6 hexagon socket head cap screws

UNC 3/4-10 UNC x 3 1/4" ASTM-A574 on request