

### 特點 CHARACTERISTICS

- 直動式方向滑閥。
- 液壓操作。
- 安裝面按DIN 24 340 A型 · ISO 4401 和 CETOP-RP 121 H。
- 彈簧或壓力對中，彈簧或壓力復位。
  
- Direct operated directional spool valve.
- Operating methods: Hydraulic
- Porting pattern according to DIN 24340 form A, ISO 4401 and CETOP-RP 121H
- Spring or pressure-centred, spring or pressure return.

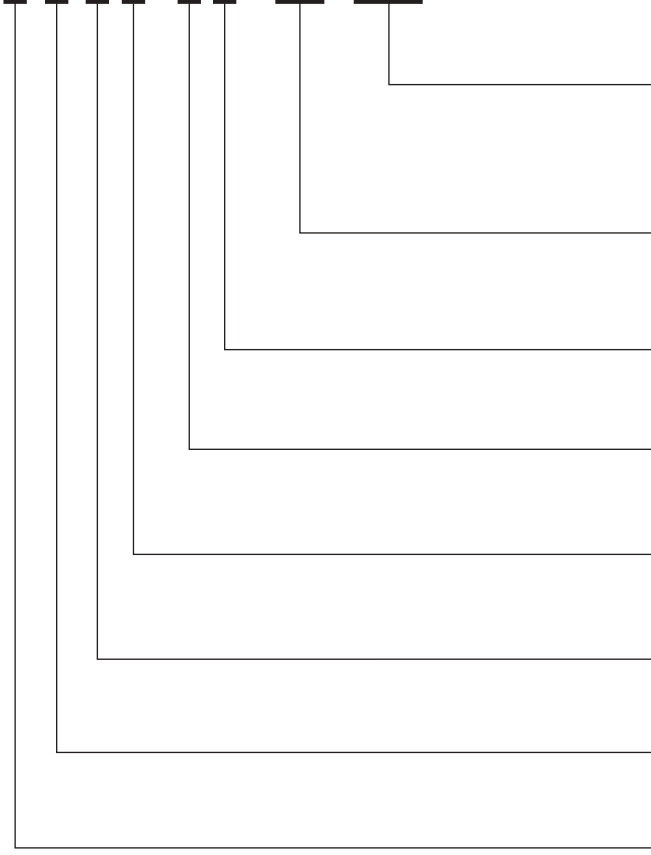


### 規格說明 SPECIFICATION

型式 MODEL	最高使用壓力 MAX. OPERATING PRESSURE kgf/cm <sup>2</sup>	最大流量 MAX. FLOW L/min	重量 WEIGHT kg
4WH-6	315	60	2.2
4WHZ-6			2.4

### 型號說明 HOW TO ORDER

## 4 W H Z - 6 D / O F - B12



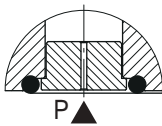
- 無代號：無節流塞頭  
**NO CODE** : WITHOUT THROTTLE PLUG  
**B08** : 節流 0.8 mm THROTTLING 0.8 mm  
**B10** : 節流 1.0 mm THROTTLING 1.0 mm  
**B12** : 節流 1.2 mm THROTTLING 1.2 mm
  
- 無代號：彈簧復位 **NO CODE** : SPRING RETURN  
**O** : 無彈簧復位 WITHOUT SPRING RETURN  
**OF** : 無彈簧復位，帶定位機構  
 WITHOUT SPRING RETURN BUT WITH DETENT
  
- 主軸型式 · 見C08-03頁  
SPOOL TYPE (AS C08-03)
  
- 閥規格 VALVE SIZE  
**6** : 通徑6mm SIZE 6mm
  
- 控制方向 CONTROL DIRECTION  
無代號：徑向連接 **NO CODE** : RADIAL CONNECTIONS  
**Z** : 徑向或軸向連接 **Z** : RADIAL OR AXIAL CONNECTIONS
  
- 操作方式 TYPES OF OPERATION  
**H** : 液壓 HYDRAULC
  
- 閥類型 VALVE TYPE  
**W** : 方向閥 DIRECTIONAL VALVE
  
- 工作口數量 NUMBER OF MAIN PORTS  
**4** : 四個工作口 4 MAIN PORTS

## 功能說明

## FUNCTIONAL DESCRIPTION

- WH型閥門是具有流體邏輯啓動的方向滑閥；這些閥控制流體的啓動、停止和方向。
- 這種方向控制閥主要包括閥體(1)、一個或兩個啓動元件(2) (液壓啓動液壓缸)、控制閥芯(3)和一個或兩個復位彈簧(4)。用於控制連接以徑向(型號“WH”) (5)或軸向(型號“WHZ”) (6)方式排列。
- 在斷電的狀態下，控制閥芯(3)由復位彈簧(4)保持在中間或初始位置(脈衝閥芯除外)。控制閥芯(3)借助啓動元件移動到所需的閥芯位置。
- 不帶帶有制動器的彈簧復位，型號..OF/..  
帶液壓啓動的方向閥還可作為帶制動器的2閥芯位置閥(7)提供。如果使用帶制動器的啓動元件，則每個閥芯位置均可鎖定。
- 不帶彈簧復位，型號..O/..  
如果使用不帶復位彈簧且不帶制動器的啓動元件，在未通電的情況下將不會給出一個定義的閥芯位置。

- Valve of type WH are directional spool valves with fluid logics actuation.They control the start, stop and direction of a flow.
- The directional valves basically consist of housing (1), one or two actuation elements (2) (hydraulic actuation cylinder), control piston (3), and one or two return springs (4). The connections for control are arranged in a radial (model “WH”) (5) or axial(model “WHZ”) (6) way.
- In the de-energized condition, control piston (3) is held in the central position or in the initial position by the return springs (4) (except for impulse spool). The control spool (3) is moved to the required spool position by means of the actuation elements.
- Without spring return with detent, model ..OF/..  
Directional valves with hydraulic or pneumatic actuation are also available as 2-spool position valve with detent (7). If using actuation elements with detent, every spool position can be locked.
- Without spring return, model ..O/..  
If using actuation elements without return springs and without detent, a defined spool position is not given in the de-energized condition.



### 節流插件

根據主要工作條件，如果在切換過程中可能出現流量超過閥的性能限制情形，就需要使用節流插件。安裝位置在方向閥的通道P中。

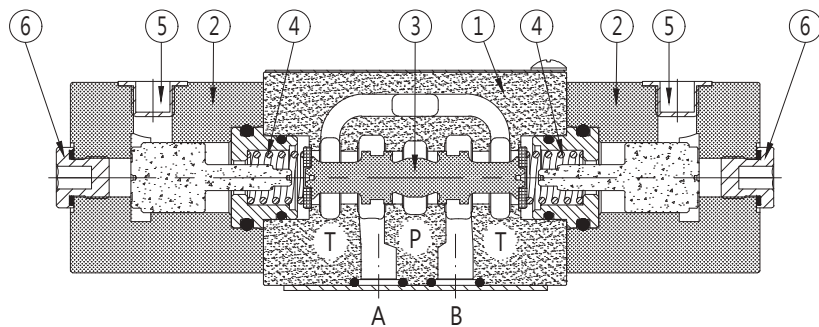
### Throttle insert

The use of a throttle insert is required when due to prevailing operating conditions, flows can occur during the switching processes, which exceed the performance limit of the valve. It is inserted in channel P of the directional valve.

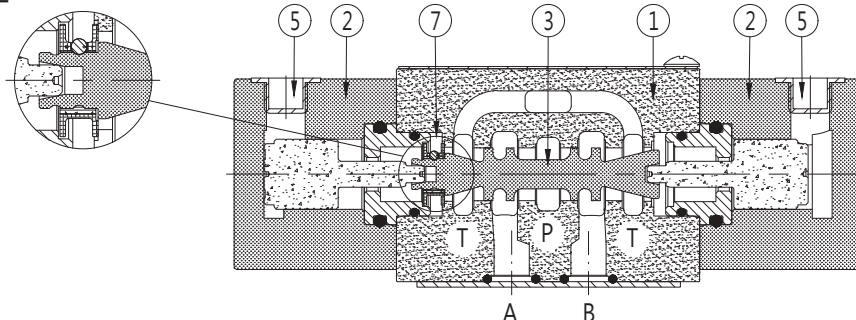
## 剖面圖

## SECTION

型號：4WHZ-6J  
TYPE:4WHZ-6J



型號：4WH-6D/OF  
TYPE:4WH-6D/OF



一般數據 General			
安裝位置 Installation Position		可選擇 optional <sup>1)</sup>	
最高周圍溫度範圍 Ambient temperature, max.		°C -30~+80 (NBR seals) -20~+80 (FPM seals)	
重量 Weight		WH	WHZ
帶1個啓動液壓缸的閥 One actuation cylinder		kg	2.0
帶2個啓動液壓缸的閥 Two actuation cylinder		kg	2.2
液壓數據 Hydraulic			
最高工作壓力 Operating pressure	油口A, B, P Port A, B, P	kgf/cm <sup>2</sup>	至315 315
	油口T Port T	kgf/cm <sup>2</sup>	至160 如果工作壓力超過油箱允許壓力·對於閥芯A和B的 閥門·油口T須用作洩油口。 up to 160 With symbols A and B, port T must be used as a drain port if the operating pressure is above the permitted tank pressure.
最大流量 Flow, max.		L/min	至60 up to 60
流通截面 ( 閥芯位置 0 ) Flow cross-section ( spool position 0 )		mm <sup>2</sup>	符號 Q Symbol Q
			約為額定截面的 6% Approx. 6 % of nominal cross-section
最小先導壓力 Minimum pilot pressure		kgf/cm <sup>2</sup>	4 (參閱 C10-05 特性曲線) (see characteristic curve C10-05)
最大先導壓力 Maximum pilot pressure		kgf/cm <sup>2</sup>	10
先導流量 Pilot volume		cm <sup>3</sup>	4.24
液壓油 Hydraulic fluid		見表 (參閱 C10-04 ) See table (C10-04)	
溫度範圍 Temperature range		°C	-30~+80 (NBR seals) -20~+80 (FPM seals)
粘度範圍 Viscosity range		mm <sup>2</sup> /s	2.8至500 2.8 to 500
油液清潔度 Degree of fluid contamination		等級 20/18/15 Class 20/18/15 <sup>3)</sup>	
最大切換頻率 Maximum switching frequency		1/h	7200

液壓油 Hydraulic fluid		分類 Classification	適合的密封材料 Suitable sealing materials	標準 Standards
礦物油 Mineral oils		HL, HLP, HLPD, HVLP, HVLPD	NBR, FPM	DIN 51524
生物降解 Bio-degradable	不溶於水 insoluble in water	HETG (菜籽油) HEES (合成脂)	NBR, FPM FPM	VDMA 24568
	可溶於水 soluble in water	HEPG (聚乙二醇)	FPM	
耐火 Flame-resistant	無水 water-free	HFDU, HFDR	FPM	ISO 12922
	含水 containing water	HFC ( Fuchs Hydrotherm 46M, Petrofer Ultra Safe 620 )	NBR	ISO 12922

- 1) 用於型號 .. /O.. (A, C和D) : 水平。  
For models .. /O.. (A, C, and D): Horizontal.
- 2) 取決於最小先導壓力的性能極限。請參閱C09-07。  
Performance limit depending on the minimum pilot pressure, see C09-07.
- 3) 在液壓系統中必須遵守規定的組件清潔度等級；有效的過濾可防止發生故障。同時還可增加組件的使用壽命。  
The cleanliness classes specified for the components must be adhered to in hydraulic systems. Effective filtration prevents faults and at the same time increases the life cycle of the components.

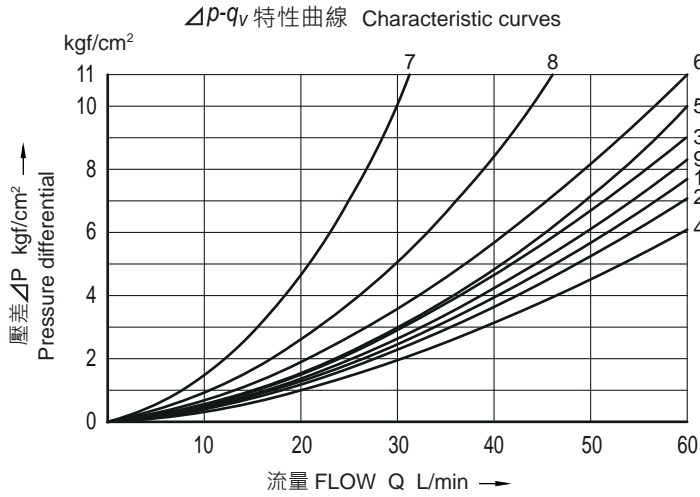
## 啓動類型 ACTUATION TYPES

閥芯符號 Spool symbol	型號定義 Codification		啓動類型 Type of actuation
	啓動側 Actuation side	閥芯復位 Spool return	H (液壓) H (Hydraulic)
A, C, D			
		.../O...	
		.../OF...	
B, X, Y			
C9, C9S E, E1 F, G H, J L, M P, Q R, U	"a" <sup>1)</sup> = .A		
	"b" <sup>1)</sup> = .B		

<sup>1)</sup> 請參照C08-03頁符號 See symbols AS C08-03.

## 特性曲線 (使用 HLP46 及 9 油 = 40 ± 5 °C 測得)

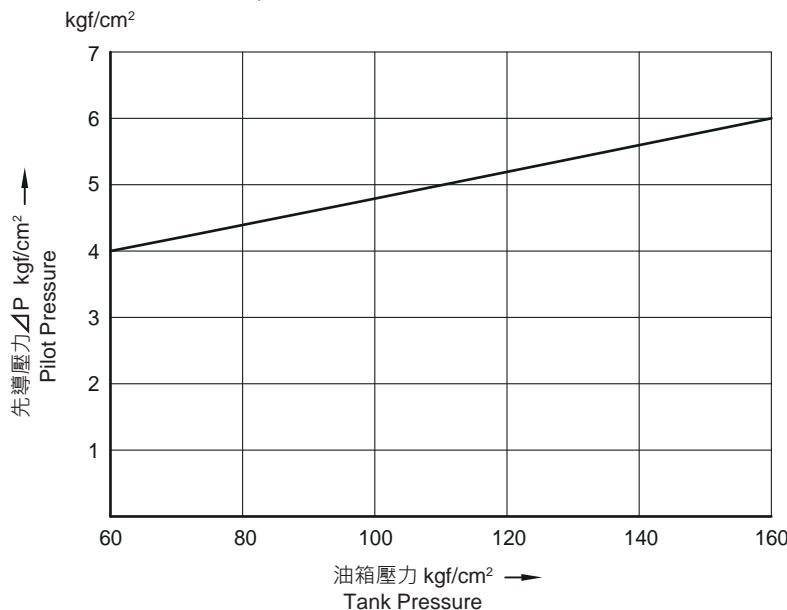
### Characteristic Curves (measured with HLP46, 9oil = 40 ± 5 °C)



- 7 符號 "R" · 閥芯位置為 B → A  
Symbol "R" in spool position B → A
- 8 符號 "G" 及 "T" · 中央位置為 P → T  
Symbol "G" and "T" in central position P → T
- 9 符號 "H" · 中央位置為 P → T  
Symbol "H" in central position P → T

符號 Symbol	流動方向 Flow direction			
	P → A	P → B	A → T	B → T
A, B	3	3	-	-
C, X	1	1	3	1
D, Y	5	5	3	3
E	3	3	1	1
F	1	3	1	1
G	6	6	9	9
H	2	4	2	2
J, Q	1	1	2	1
L	3	3	4	9
M	2	4	3	3
P	3	1	1	1
R	5	5	4	-
U	3	3	9	4
C9				
C9S				

最小先導壓力隨油箱壓力變化曲線  
Minimum pilot pressure depending on tank pressure

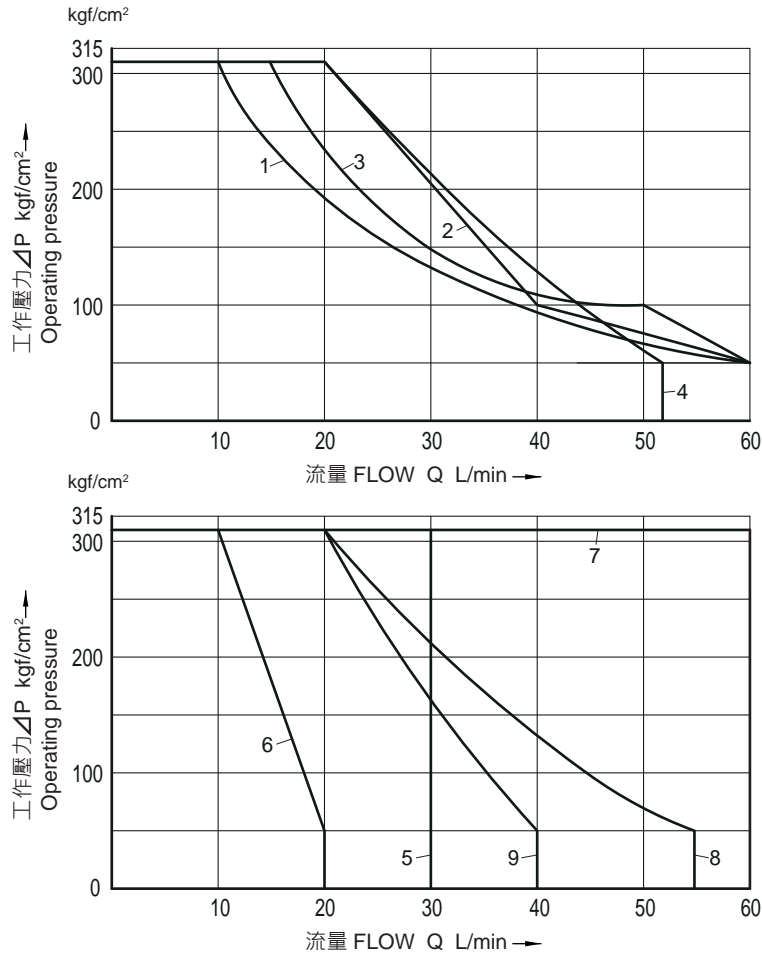


如果油箱壓力更高，則必須依照此圖增加最小先導壓力。  
In case of a higher tank pressure, the minimum pilot pressure has to be increased according to this diagram.



性能極限：(使用 HLP46 及 9 油 = 40 ± 5 °C 測得)

Switching power limits (measured with HLP46, 9<sub>oil</sub> = 40 ± 5 °C)



彈簧復位 Spring return	曲線 Curve	先導壓力 6kgf/cm <sup>2</sup> > 油箱壓力 Pilot pressure 6 kgf/cm <sup>2</sup> > tank pressure	
		符號	Symbol
"無代號" (帶彈簧復位) "No code" (with spring return)	1	A, B	
	2	C, D, Y	
	3	C9, C9S, E, E1, J, L, U, M, Q	
	4	F, P	
	5	G, H	
	6	R	
../O.. ../OF..	7	A, C, D	

彈簧復位 Spring return	曲線 Curve	先導壓力 10kgf/cm <sup>2</sup> > 油箱壓力 Pilot pressure 10 kgf/cm <sup>2</sup> > tank pressure	
		符號	Symbol
"無代號" (帶彈簧復位) "No code" (with spring return)	1	A, B	
	7	C, C9, C9S, D, Y, E, E1, G, H, J,	
	8	L, U, M, Q	
	9	F, P	
			R
../O.. ../OF..	7	A, C, D	

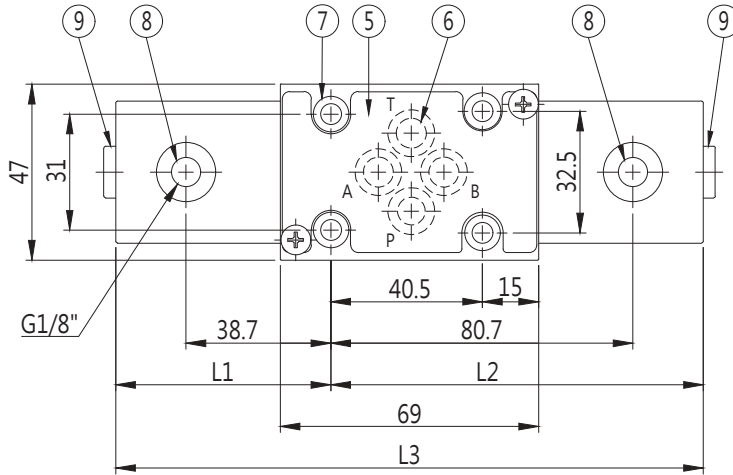
注意！Noties！

- 由於黏性效應，閥的切換功能取決於過濾過程，為實現指定的允許流量值，我們建議使用 25 μm 的全流過濾，作用於閥內的液動力同樣會影響流量性能。  
Because of the adhesive effect, the switching function of the valves depends on the filtration. In order to achieve the specified admissible flow values, we recommend full flow filtration with 25 μm. The flow forces acting within the valves also affect the flow performance.
- 使用四通閥，指定的流量數據適用於具有 2 個流動方向的正常運行（例如：從 P 至 A 並同時從 B 至 T 回流）（請參見表格）。如果在臨界情況下僅有一個流動方向可用，允許的流量會顯著降低（例如：由於連接 A 或 B 堵塞，將四通閥作為三通閥使用時）。  
With 4 way valves the specified flow data thus apply to normal operation with 2 volume flow directions (e.g. from P to A and at the same time return flow from B to T) (see table). If only one flow direction is available, in critical cases, the admissible flow can be significantly smaller (e.g. when using a 4 way valve as 3 way valve, due to blocked connection A or B).

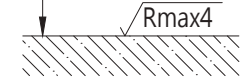
單位 UNIT : mm

### 安裝尺寸 INSTALLATION DIMENSIONS

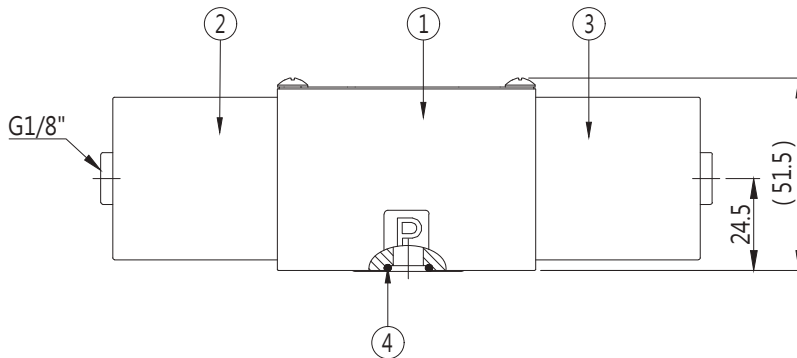
通用底板尺寸  
 APPLICATIVE SUB-PLATE DIMENSIONS  
**MC - 02 - 1**  
 (詳見 E01-09 Page E01-09)



0.01/100mm



要求配合件表面精加工  
 Required surface finish  
 of the mating piece



類型	L1	L2	L3
WH	50.5	92.5	143
WHZ	57.5	99.5	157

1. 帶2個閥芯位置和2個啓動液壓缸的閥  
帶3個閥芯位置和2個啓動液壓缸的閥
2. 啓動液壓缸 "a"
3. 啓動液壓缸 "b"
4. O型環AS-568-012
5. 銘牌
6. 安裝面按DIN 24 340 A型  
ISO 4401和CETOP-RP 121 H
7. 閥固定螺釘 M5x50L ISO 4762-12.9  
安裝扭矩 8~9 N·m
8. 與型號 "WH" 的連接
9. 與型號 "WHZ" 的連接

1. With 2 spool positions and 2 start hydraulic cylinders  
With 3 spool positions and 2 start hydraulic cylinders
2. Start hydraulic cylinder "a"
3. Start hydraulic cylinder "b"
4. O-ring AS-568-012
5. Name plate
6. Mounting face according to DIN 24 340 type A  
ISO 4401 and CETOP-RP 121 H
7. Valve fixing screw M5x50L ISO 4762-12.9  
Mounting torque 8~9 N·m
8. Connection to model "WH"
9. Connection to model "WHZ"