

功能說明、剖面圖、圖形符號

二通插裝閥設計成插件結構，用於整體集成塊。帶油口A和B的主閥組件插入控制塊上尺寸符合DIN ISO 7368標準的插孔，並用控制蓋板封閉。在大多數情況下，蓋板的作用，就是作為主閥組件控制側與先導閥之間的連接件。採用適合的先導閥來控制主閥，主閥組件能承擔壓力、方向或者節流功能、或它們的組合功能。通過不同通徑的閥和執行器獨特的流量變化需要相匹配，可以實現特殊的經濟型結構設計。如果主閥組件能承擔一種以上的功能，特殊的經濟型結構就能達到。

方向功能

二通插裝閥的基本組成主要包括控制蓋板 (1) 和插件 (2)。控制蓋板含有控制孔、根據功能需要可選擇的行程限位器、液壓控制的方向座閥或梭閥。另外，方向滑閥或方向座閥可以安裝在控制蓋板上。插件的組成主要包括閥套 (3)、調整圈 (4) (僅適用至通徑32)、座閥 (5)、可選擇帶阻尼錐頸 (6)、或不帶阻尼錐頸 (7)、以及復位彈簧 (8)。

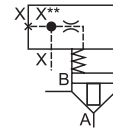
功能說明

二通插裝閥的驅動取決於壓力。因此對閥的驅動，這裡有三個重要的承壓面積： A_1 、 A_2 、 A_3 。閥座的面積 (A_1) 作為100%、根據類型，環型面積 (A_2) 為面積 (A_1) 的7%或50%。因此面積比 $A_1 : A_2$ 或是14.3 : 1 或是2 : 1。面積 (A_3) 等於 $A_1 + A_2$ 。由於 $A_1 : A_2$ 面積比不同，因此，環型面積 A_2 也不同。面積 A_3 在閥座面積 A_1 為100%時，可能是107%，也可能是150%。

下列基本應用

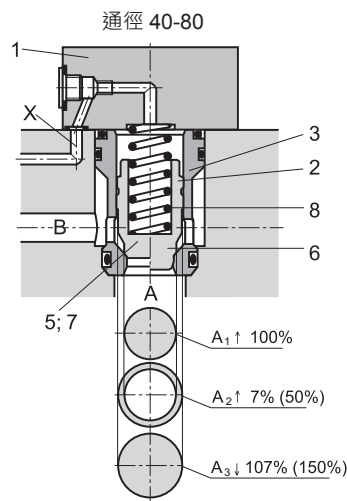
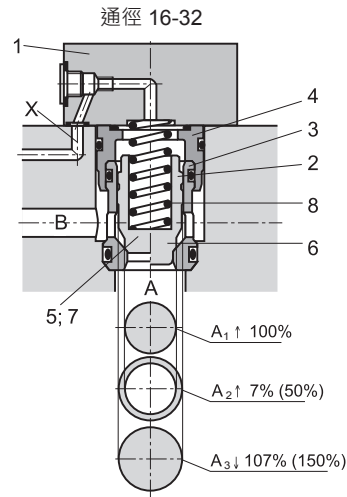
面積 A_1 和 A_2 的作用在閥開啟方向。面積 A_3 和彈簧的作用在閥關閉方向。合成力的有效方向 (開啟力或關閉力) 決定了兩通插裝閥的關閉狀態。

二通插裝閥的流動方向可以從A至B，也可以從B至A。如果作用於面積 A_3 的控制壓力來自油口B或者控制油由外部供給，油口A則關閉，且無洩漏。



型號 LFA...D../FX..

型號 LC..A..E../B..D../...



Function, sections, symbol

2-way cartridge valves are elements that have been designed for a compact block design. The power section with connections A and B is installed into the control block in a receiving hole standardized according to ISO 7368 and closed with a cover. In most cases, the cover is simultaneously the connection from the control side of the power section to the pilot control valves. By control with respective pilot control valves, the power section can be applied for pressure, directional and throttle functions or a combination of these functions. Particularly efficient solutions are realized by adjustment of the size to various flows of the individual ways of an actuator. The application of power sections of elements for multiple functions is very cost-effective.

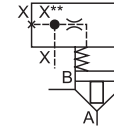
2-way cartridge valves generally consist of control cover (1) and installation kit (2). The control cover contains the control bores and optionally a stroke limitation function, a hydraulically controlled directional seat valve or a shuttle valve according to the required overall function. Additionally, electrically operated directional spool or seat valves can be installed at a control cover. The installation kit consists of a bushing (3), ring (4) (only up to NG32), valve poppet (5), optionally with damping nose (6) or without damping nose (7) as well as closing spring (8).

The function of 2-way cartridge valves is pressure-dependent.

This way, three crucial pressurized areas A_1 , A_2 , A_3 are realized for the function. The area at the valve seat A_1 is considered as 100%. Depending on the version, the annulus area A_2 realized by grading is 7% or 50% of area A_1 . The area ratio $A_1 : A_2$ is respectively either 14.3 : 1 or 2 : 1. The area A_3 is identical to the sum of areas $A_1 + A_2$. Due to the different area ratios $A_1 : A_2$ and the resulting different annulus areas (A_2), the area A_3 is one time 107% and another time 150% of the area A_1 at the seat, which is observed as 100%.

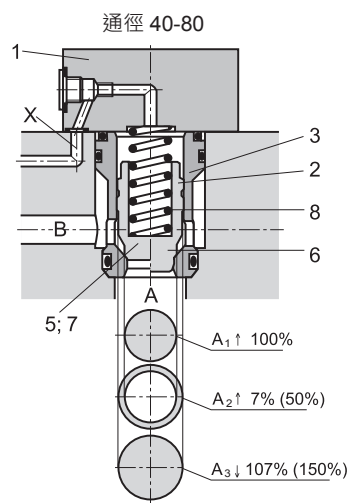
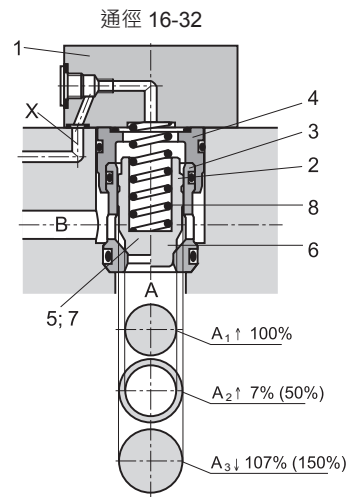
In general, the following applies:

The areas A_1 and A_2 are effective in opening direction. The area A_3 and the spring are effective in closing direction. The direction of action of the resulting force from the opening and closing forces determines the spool position of the 2-way cartridge valve. The 2-way cartridge valves can be passed from A to B or from B to A. Pressurization of area A_3 by pilot oil discharge from channel B or external pilot oil supply, channel A is blocked in a leakage-free manner.



型號 LFA...D../FX..

型號 LC...A...E../B...D../..



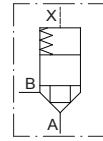
Logic valve



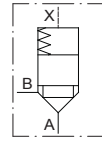
閥類型符號 SYMBOL

LC-※

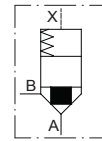
A₁: A₂ = 2:1
TYPE "A.E"



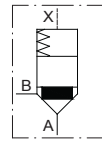
A₁: A₂ = 14.3:1
TYPE "B.E"



A₁: A₂ = 2:1
TYPE "A.D"



A₁: A₂ = 14.3:1
TYPE "B.D"



規格說明

SPECIFICATION

型式 MODEL	最高使用壓力 MAX. OPERATING PRESSURE (kgf/cm ²)	開啟壓力 CRACKING PRESSURE kgf/cm ²	重量 WEIGHT kg
LC-16	315	05 : 0.5 10 : 1.0 20 : 2.0 40 : 4.0	0.18
LC-25			0.43
LC-32			0.91
LC-40			1.61
LC-50			2.83
LC-63			6.41
LC-80			12.1

型號說明

HOW TO ORDER

LC - 25 - A - 20 - E

閥型式 VALVE TYPE

D : 帶緩沖閥芯

VALVE POPPET WITH DAMPING NOSE

E : 不帶緩沖閥芯

VALVE POPPET WITHOUT DAMPING NOSE

開啟壓力 CRACKING PRESSURE

05 : 0.5 kgf/cm² 10 : 1.0 kgf/cm²

20 : 2.0 kgf/cm² 40 : 4.0 kgf/cm²

閥型式 VALVE TYPE

A : 開閥比 2 : 1 A₁: A₂ 2 : 1 (A₂=50%)

B : 開閥比 14.3 : 1 A₁: A₂ 14.3 : 1 (A₂=7%)

閥規格 VALVE SIZE

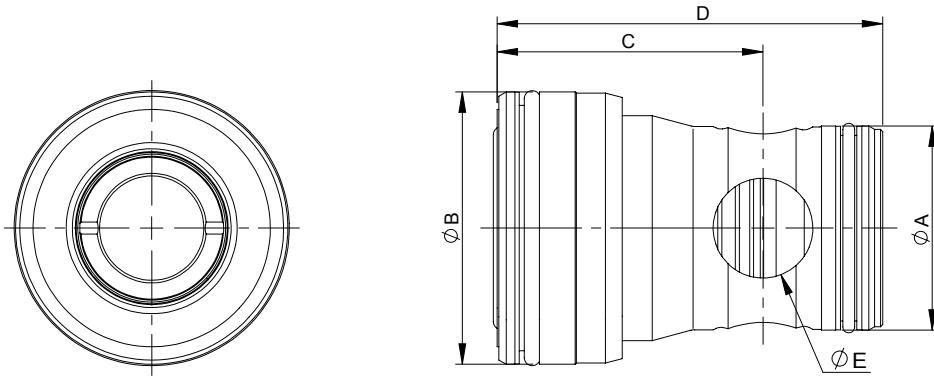
系列編號 SERIES NUMBER

單位 UNIT : mm

安裝尺寸

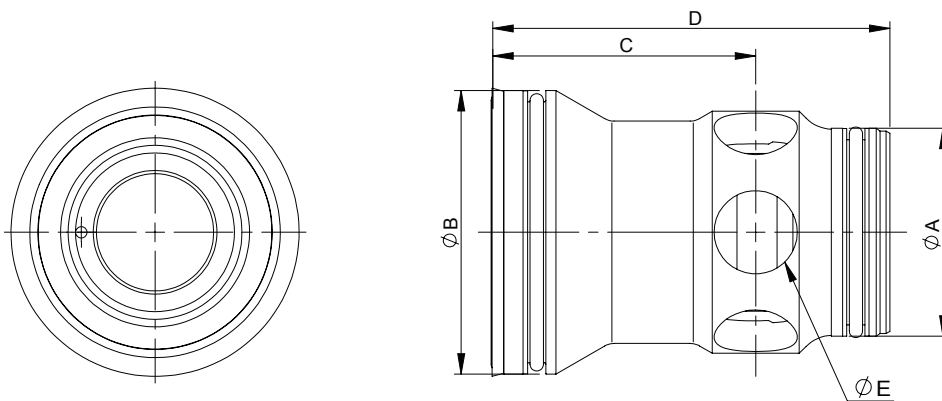
INSTALLATION DIMENSIONS

LC-16~32



CODE SIZE	ϕA	ϕB	C	D	ϕE
16	25	32	37.2	56	4-12
25	34	45	48.6	72	4-18
32	45	60	58.6	85	4-22

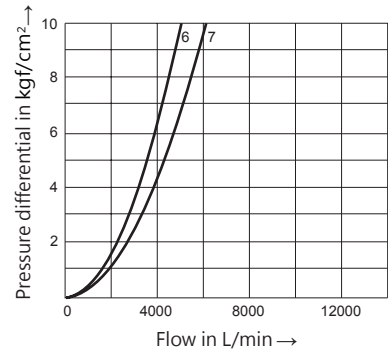
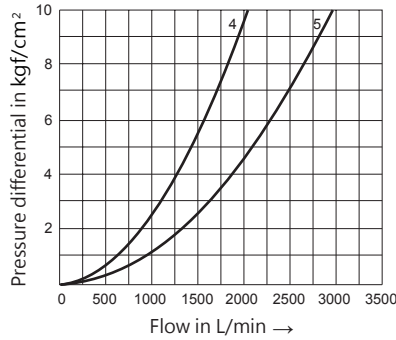
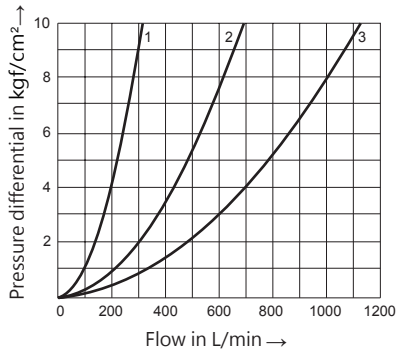
LC-40~80



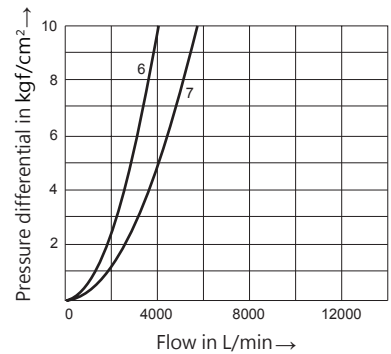
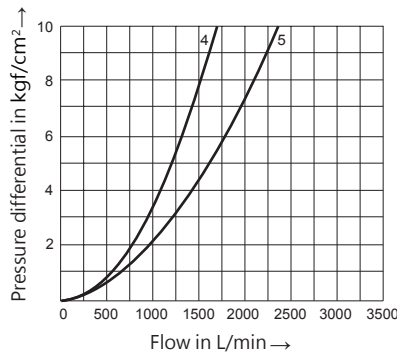
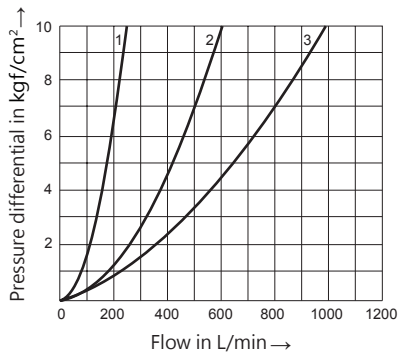
CODE SIZE	ϕA	ϕB	C	D	ϕE
40	55	75	69.5	105	6-22
50	68	90	79.5	122	6-26
63	90	120	104	155	6-32
80	110	145	136.4	205	6-35

性能曲線 PERFORMANCE CURVES

帶緩沖閥芯 "D", A→B
 (用HLP46模擬 · 油 = 40 °C±5 °C)
 With damping nose "D", A → B
 (Simulated with HLP46, \varnothing Oil = 40 °C±5 °C)



帶緩沖閥芯 "D", B→A
 (用HLP46模擬 · 油 = 40 °C±5 °C)
 With damping nose "D", B → A
 (Simulated with HLP46, \varnothing Oil = 40 °C±5 °C)



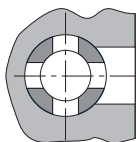
Notice:

指定的性能曲線用100%模擬線軸行程和對齊的插座（見下圖）。仿真結果通過測量結果驗證。基礎是具有 \varnothing D3*的安裝幾何結構（參見K02-20的安裝孔）和根據ISO 4411 / 2008-10-01的仿真模型。
 The specified performance curves were simulated with 100% spool stroke and an aligned socket (see sketch below). The simulation results were validated by measurement results. The basis was an installation geometry with \varnothing D3* (see installation bore page K02-20) and a simulation model according to ISO 4411/2008-10-01.

- 1 Size 16
- 2 Size 25
- 3 Size 32
- 4 Size 40
- 5 Size 50
- 6 Size 63
- 7 Size 80

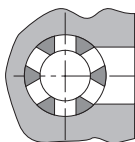
推薦的插座對齊：
 Recommended socket alignment:

NG16 ... 32



Bore on bore

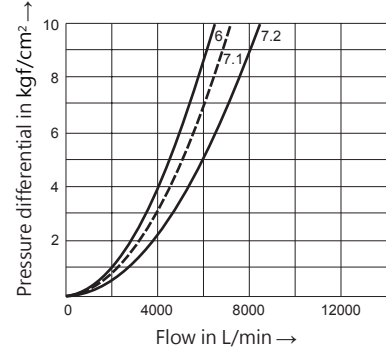
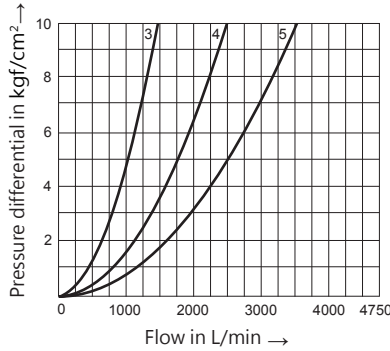
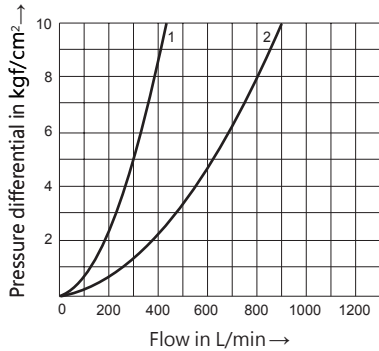
NG40 ... 80



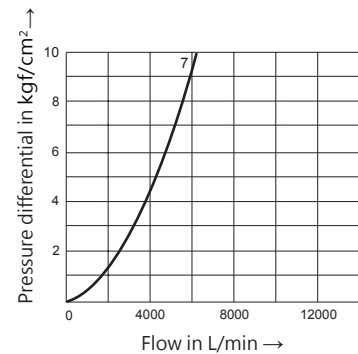
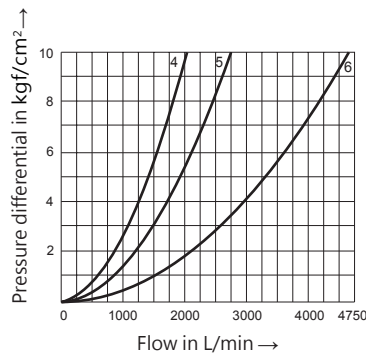
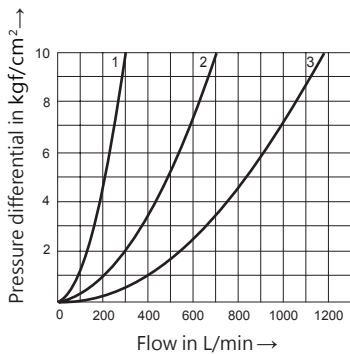
Bar on bore

性能曲線 PERFORMANCE CURVES

不帶緩沖閥芯 "E", A→B
 (用HLP46模擬 · 油 = 40 °C±5 °C)
 Without damping nose "E", A → B
 (Simulated with HLP46, Oil = 40 °C±5 °C)



不帶緩沖閥芯 "E", B→A
 (用HLP46模擬 · 油 = 40 °C±5 °C)
 Without damping nose "E", B → A
 (Simulated with HLP46, Oil = 40 °C±5 °C)



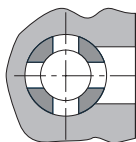
Notice:

指定的性能曲線用100%模擬線軸行程和對齊的插座 (見下圖)。
 仿真結果通過測量結果驗證。
 基礎是具有 $\varnothing D3^*$ 的安裝幾何結構 (參見K02-20的安裝孔) 和根據ISO 4411 / 2008-10-01的仿真模型。
 The specified performance curves were simulated with 100% spool stroke and an aligned socket (see sketch below). The simulation results were validated by measurement results. The basis was an installation geometry with $\varnothing D3^*$ (see installation bore page K02-20) and a simulation model according to ISO 4411/2008-10-01.

- 1 Size 16
- 2 Size 25
- 3 Size 32
- 4 Size 40
- 5 Size 50
- 6 Size 63
- 7 Size 80
- 7.1 Size 80, spool design "A"
- 7.2 Size 80, spool design "B"

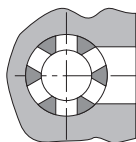
推薦的插座對齊：
 Recommended socket alignment:

NG16 ... 32



Bore on bore

NG40 ... 80



Bar on bore

功能說明、剖面圖、圖形符號 Function, section, symbols

二通插裝壓力閥是先導式錐閥或滑閥。其主閥組件，結構為插裝閥 (1)，插入符合 DIN 7368 的標準插孔，並用控制蓋板封閉。
手動或電液比例控制的先導閥 (4) 被集成於控制蓋板 (2) 中，或作為先導閥安裝在控制蓋板 (2) 上。其安裝面按 DIN 24 340 (2)。根據插裝閥和控制蓋板的組合可實現不同的壓力閥功能。

溢流閥功能

控制蓋板 LFA..DB... 型

插裝閥 LC..DB... 型

具有溢流閥功能 (LC..DB... 型) 的插裝閥 (1) 是一個面積比 1:1 的座閥 (在 B 口沒有有效面積)。作用於 A 口的壓力經提供控制油的節流孔 (5) 進入主閥彈簧腔 (6)。在壓力低於先導閥 (4) 設定的壓力時，主閥芯 (3) 上的液壓力平衡，而彈簧力使主閥保持關閉狀態。當壓力達到設定值時，主閥芯打開並根據壓力-流量特性限制 A 口的壓力。

The 2-way cartridge valves for pressure control functions are pilot operated poppet or spool valves. The main component designed as a cartridge valve (1) is inserted into a cavity which is standardised to DIN ISO 7368 and is sealed by the control cover (2). The pilot valve (4) for either manual or electrical proportional pressure control is integrated into the control cover (2) or mounted onto the control cover (2) as a pilot valve with interface connections to DIN 24 340.

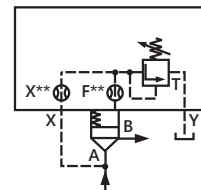
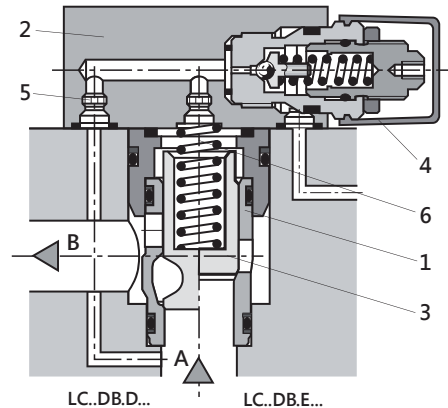
By combining the cartridge valve with the control covers different pressure functions can be realised.

Pressure relief function

Control cover type LFA..DB...

Cartridge valve type LC..DB...

The cartridge valve (1) for the pressure relief function (type LC . DB...) is a poppet valve without an area differential (no effective area at port B). The pressure acting at port A is fed via the pilot supply orifice (5) to the spring side (6) of the element. At pressures below the setting of pilot valve (4) the forces on spool (3) are balanced and the spool remains closed due to the spring force. On reaching the set pressure, spool (3) opens and limits the pressure at port A in relation to the pressure-flow characteristics.



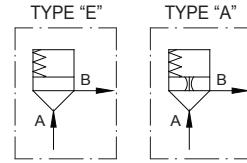
Type LFA..DB...

Type LC..DB...

Logic valve



閥類型符號 SYMBOL
LC-※-DB



規格說明

SPECIFICATION

型式 MODEL	最高使用壓力 MAX. OPERATING PRESSURE (kgf/cm ²)	開啟壓力 CRACKING PRESSURE kgf/cm ²	重量 WEIGHT kg
LC-16-DB	315	20 : 2.0 30 : 3.0 40 : 4.0 50 : 5.0	0.18
LC-25-DB			0.43
LC-32-DB			0.89
LC-40-DB			1.75
LC-50-DB			3.18
LC-63-DB			6.93

型號說明

HOW TO ORDER

LC - 25 - DB - 20 - E

閥型式 VALVE TYPE
A : 止逆閥芯帶縮流
POPPET VALVE WITH ORIFICE
E : 止逆閥芯
POPPET VALVE WITHOUT ORIFICE

開啟壓力 CRACKING PRESSURE
20 : 2.0 kgf/cm² 30 : 3.0 kgf/cm²
40 : 4.0 kgf/cm² 50 : 5.0 kgf/cm²
(30,50為LC-16,LC-25,LC-32唯一型式
30,50 ONLY FOR LC-16,LC-25,LC-32)

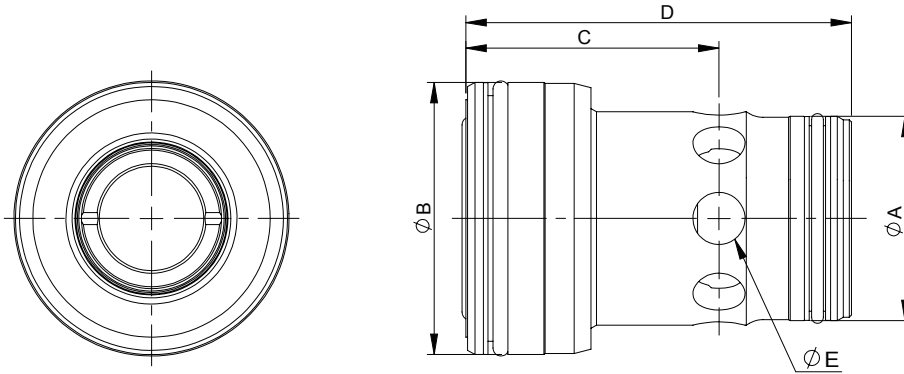
閥型式 VALVE TYPE
DB : 溢流閥 RELIEF LOGIC VALVE

閥規格 VALVE SIZE

系列編號 SERIES NUMBER

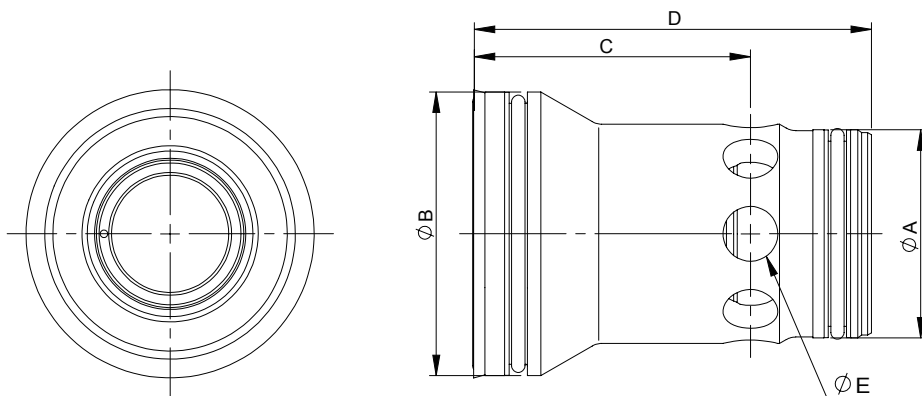
安裝尺寸 INSTALLATION DIMENSIONS

LC-16~32-DB



CODE SIZE	ØA	ØB	C	D	ØE
16	25	32	34	56	8-5.5
25	34	45	45.5	72	8-9
32	45	60	55.8	85	8-11.5

LC-40~63-DB



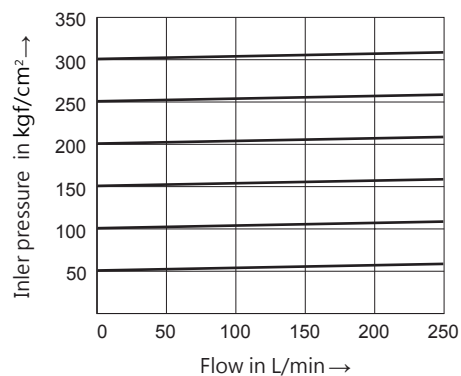
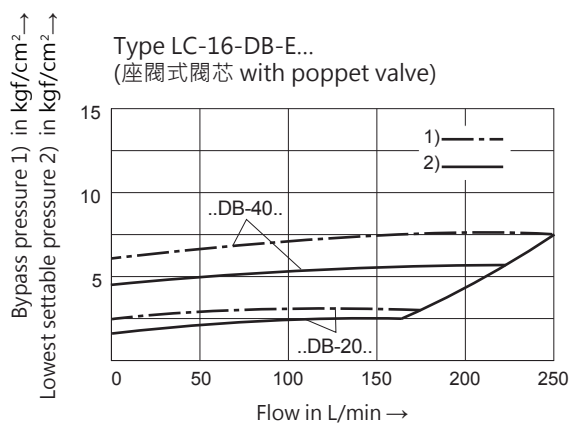
CODE SIZE	ØA	ØB	C	D	ØE
40	55	75	73	105	8-14.5
50	68	90	87.8	122	8-18
63	90	120	111	155	8-23

性能曲線 PERFORMANCE CURVES

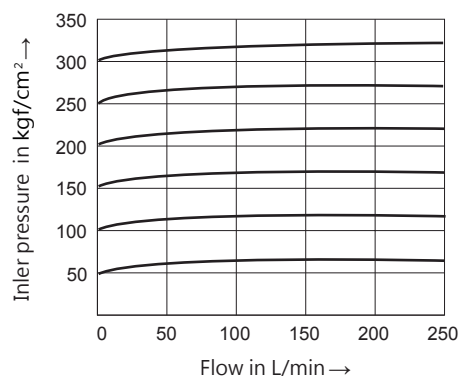
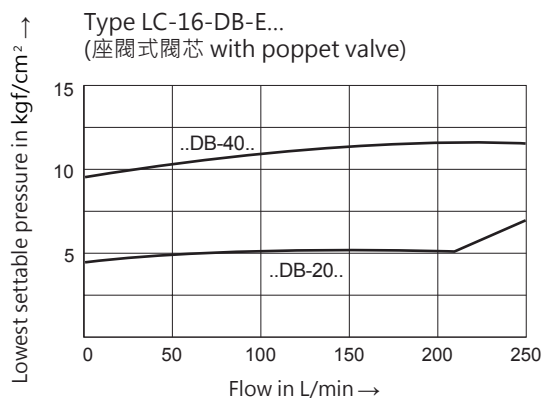
規格 16(在使用HLP46, 油=40 °C±5 °C時測得)
 NS 16(measured with HLP 46; 油= 40 °C±5 °C)

該性能曲線在先導控制油無壓外洩時測得.先導控制油內洩時,進口壓力隨著B口壓力增加.
 The performance curves were measured with an external pilot oil drain at zero pressure.
 With an internal pilot oil drain the inler pressure is increased by the pressure being applied at port B.

手調壓力閥 : LFA-16-DB...型和LFA-16-DBW...型
 Manual pressure adjustment, type LFA-16-DB...and type LFA-16-DBW...



電液比例壓力調節閥 : LFA-16-DBE...型
 Electrical proportional pressure adjustment, type LFA-16-DBE...

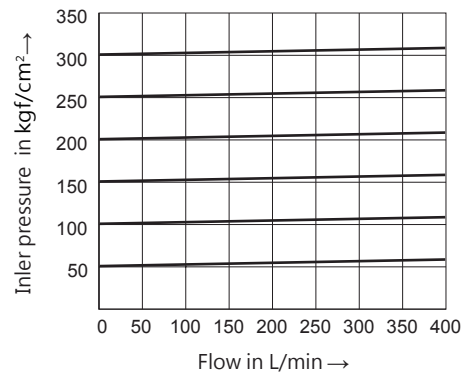
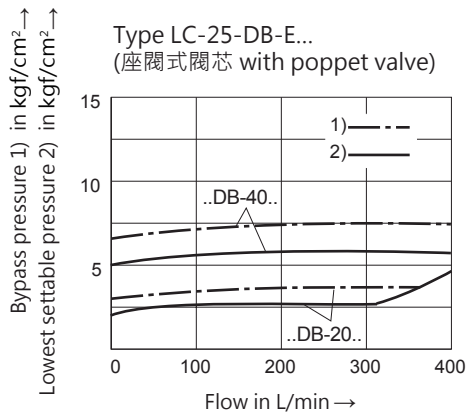


性能曲線 PERFORMANCE CURVES

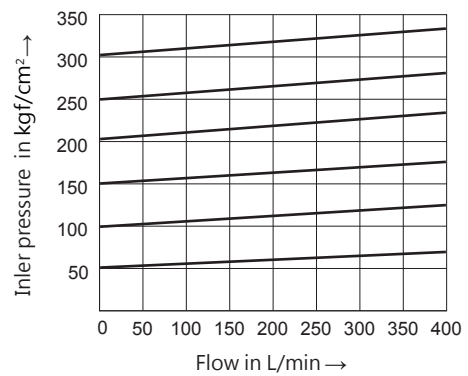
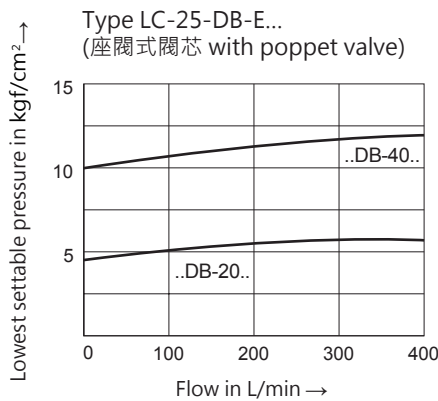
規格 25(在使用HLP46, 油=40 °C±5 °C時測得)
 NS 25(measured with HLP 46; 油= 40 °C±5 °C)

該性能曲線在先導控制油無壓外洩時測得.先導控制油內洩時,進口壓力隨著B口壓力增加.
 The performance curves were measured with an external pilot oil drain at zero pressure.
 With an internal pilot oil drain the inler pressure is increased by the pressure being applied at port B.

手調壓力閥 : LFA-25-DB...型和LFA-25-DBW...型
 Manual pressure adjustment, type LFA-25-DB...and type LFA-25-DBW...



電液比例壓力調節閥 : LFA-25-DBE...型
 Electrical proportional pressure adjustment, type LFA-25-DBE...

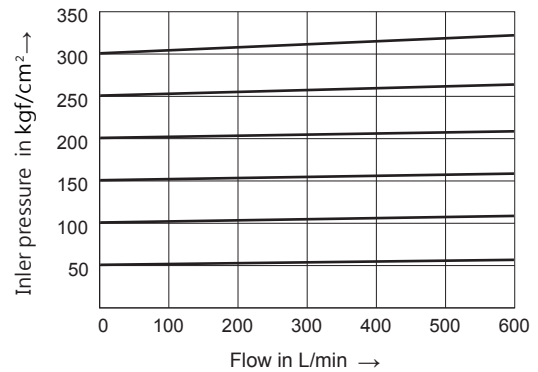
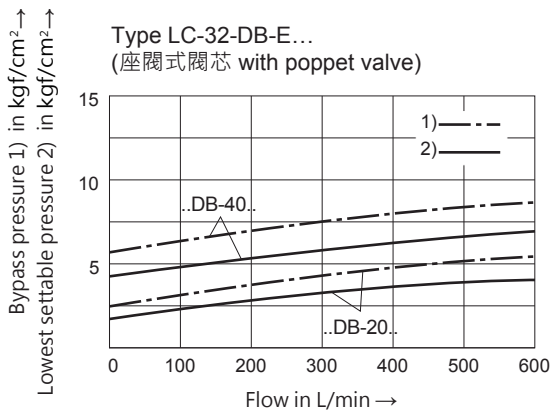


性能曲線 PERFORMANCE CURVES

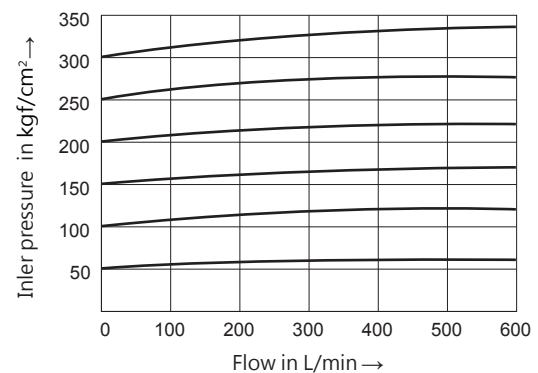
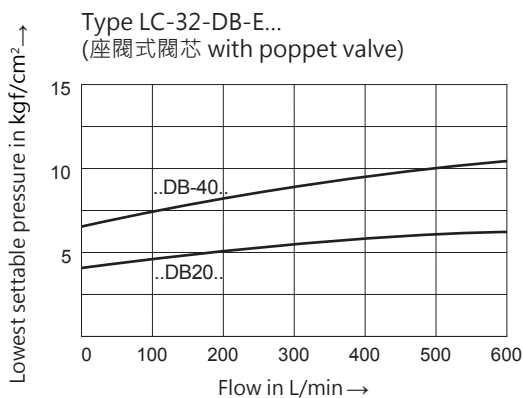
規格 32(在使用HLP46, 油溫=40 °C±5 °C時測得)
 NS 32(measured with HLP 46; 油溫= 40 °C±5 °C)

該性能曲線在先導控制油無壓外洩時測得.先導控制油內洩時,進口壓力隨著B口壓力增加.
 The performance curves were measured with an external pilot oil drain at zero pressure.
 With an internal pilot oil drain the inler pressure is increased by the pressure being applied at port B.

手調壓力閥 : LFA-32-DB...型和LFA-32-DBW...型
 Manual pressure adjustment, type LFA-32-DB...and type LFA-32-DBW...



電液比例壓力調節閥 : LFA-32-DBE...型
 Electrical proportional pressure adjustment, type LFA-32-DBE...

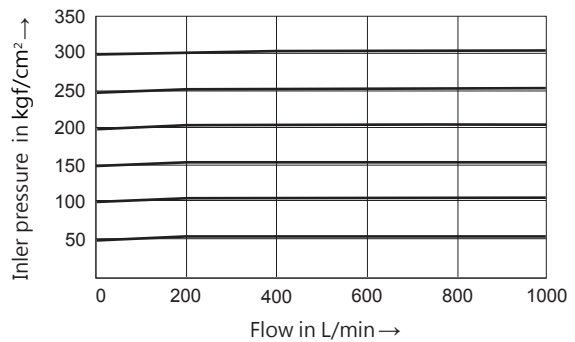
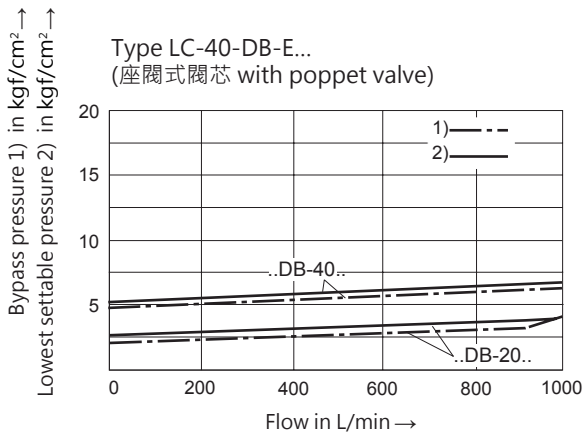


性能曲線 PERFORMANCE CURVES

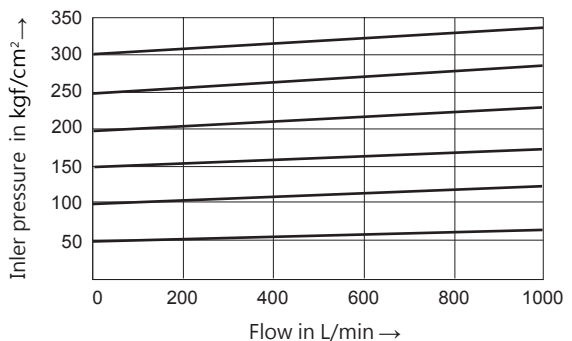
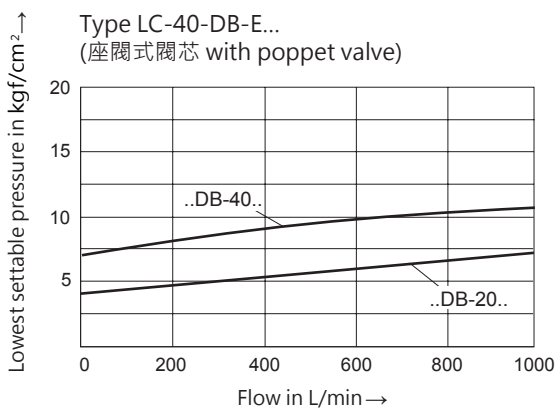
規格 40(在使用HLP46, 油溫=40 °C±5 °C時測得)
 NS 40(measured with HLP 46; 油溫= 40 °C±5 °C)

該性能曲線在先導控制油無壓外洩時測得.先導控制油內洩時,進口壓力隨著B口壓力增加.
 The performance curves were measured with an external pilot oil drain at zero pressure.
 With an internal pilot oil drain the inler pressure is increased by the pressure being applied at port B.

手調壓力閥 : LFA-40-DB...型和LFA-40-DBW...型
 Manual pressure adjustment, type LFA-40-DB...and type LFA-40-DBW...



電液比例壓力調節閥 : LFA-40-DBE...型
 Electrical proportional pressure adjustment, type LFA-40-DBE...

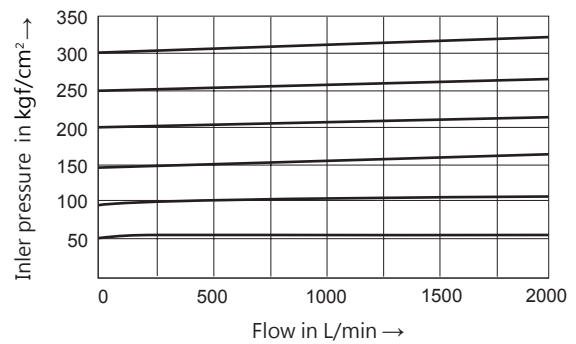
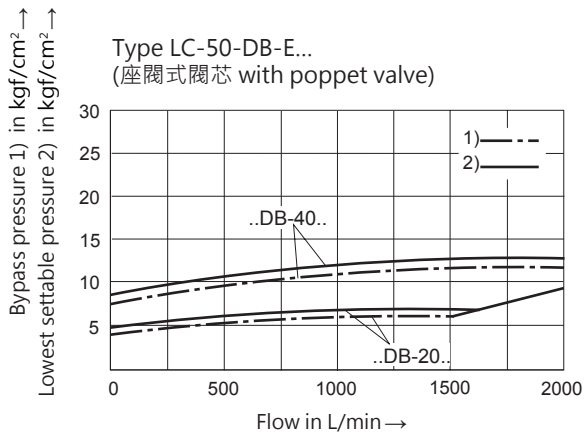


性能曲線 PERFORMANCE CURVES

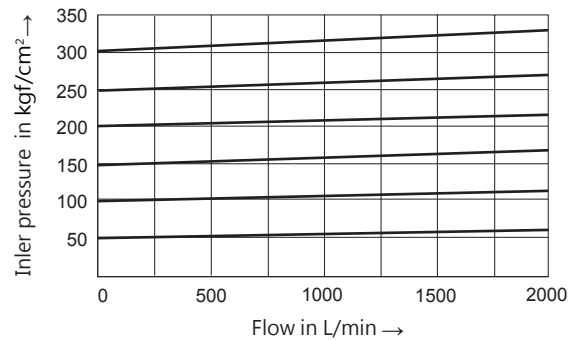
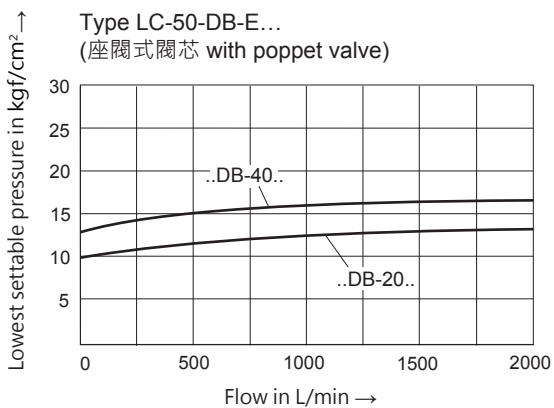
規格 50(在使用HLP46, ϑ 油=40 °C \pm 5 °C時測得)
 NS 50(measured with HLP 46; ϑ Oil= 40 °C \pm 5 °C)

該性能曲線在先導控制油無壓外洩時測得.先導控制油內洩時,進口壓力隨著B口壓力增加.
 The performance curves were measured with an external pilot oil drain at zero pressure.
 With an internal pilot oil drain the inler pressure is increased by the pressure being applied at port B.

手調壓力閥 : LFA-50-DB...型和LFA-50-DBW...型
 Manual pressure adjustment, type LFA-50-DB...and type LFA-50-DBW...



電液比例壓力調節閥 : LFA-50-DBE...型
 Electrical proportional pressure adjustment, type LFA-50-DBE...



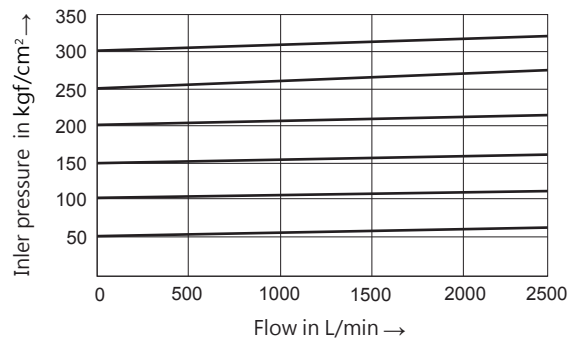
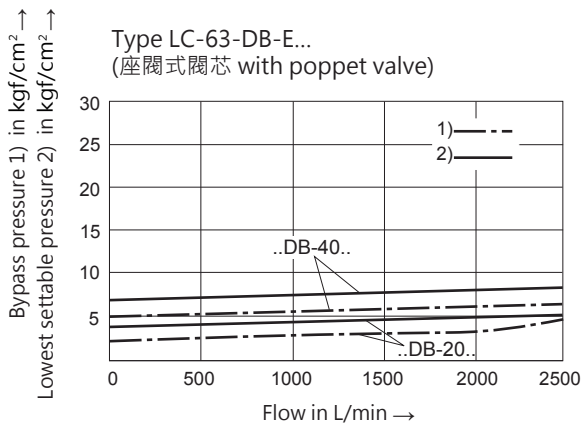
性能曲線

PERFORMANCE CURVES

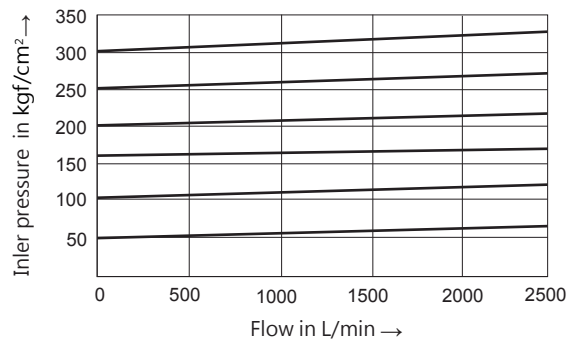
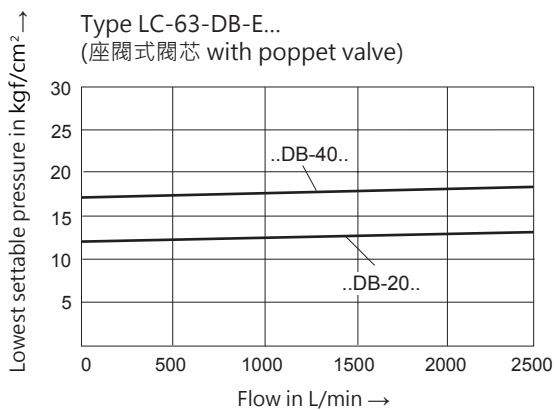
規格 63(在使用HLP46, 油溫=40 °C±5 °C時測得)
 NS 63(measured with HLP 46; Oil= 40 °C±5 °C)

該性能曲線在先導控制油無壓外洩時測得.先導控制油內洩時,進口壓力隨著B口壓力增加.
 The performance curves were measured with an external pilot oil drain at zero pressure.
 With an internal pilot oil drain the inler pressure is increased by the pressure being applied at port B.

手調壓力閥 : LFA-63-DB...型和LFA-63-DBW...型
 Manual pressure adjustment, type LFA-63-DB...and type LFA-63-DBW...



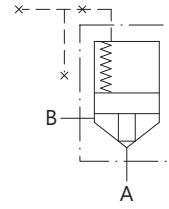
電液比例壓力調節閥 : LFA-63-DBE...型
 Electrical proportional pressure adjustment, type LFA-63-DBE...



Logic valve



閥類型符號 SYMBOL
LCV-※



規格說明

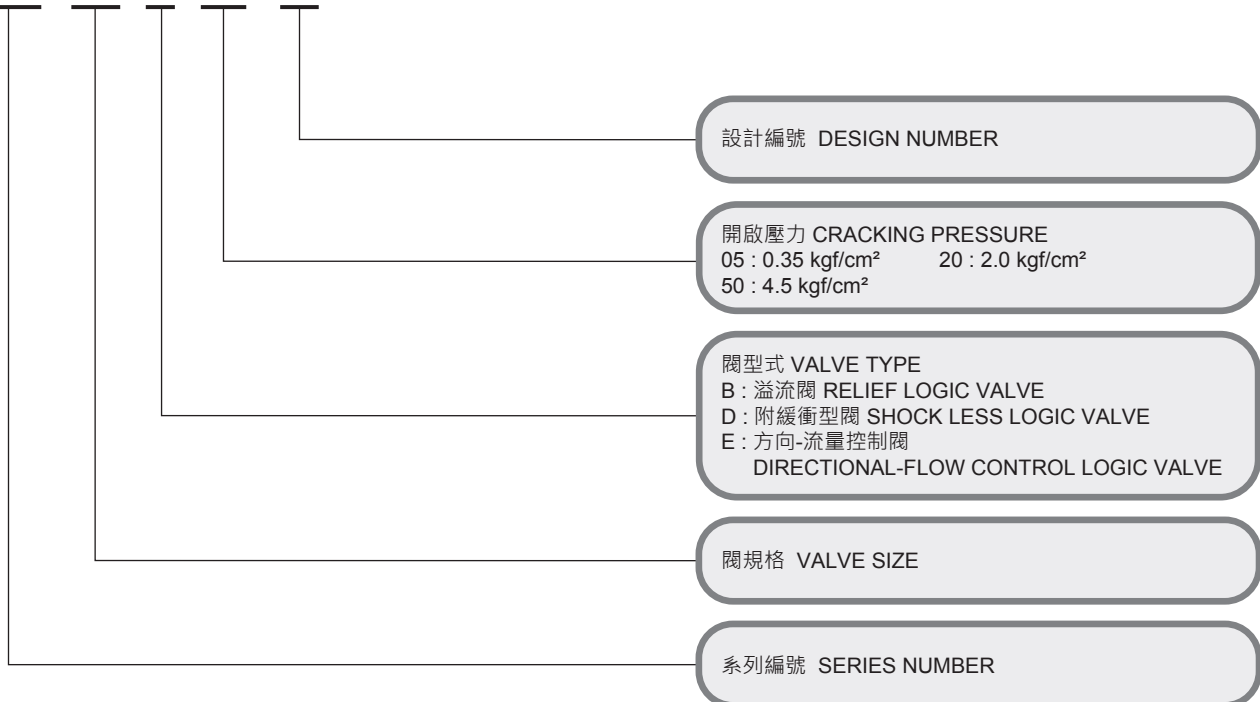
SPECIFICATION

型式 MODEL	最高使用壓力 MAX. OPERATING PRESSURE (kgf/cm ²)	開啟壓力 CRACKING PRESSURE kgf/cm ²	最大流量 MAX. FLOW L/min	重量 WEIGHT kg
LCV-16	315	05 : 0.35 20 : 2.0 50 : 4.5	130	0.18
LCV-25			350	0.43
LCV-32			500	0.87
LCV-40			850	1.59
LCV-50			1400	2.74
LCV-63			2100	5.81
LCV-80			3400	11.1
LCV-100			5500	21.2

型號說明

HOW TO ORDER

LCV - 25 - E - 05 - 10

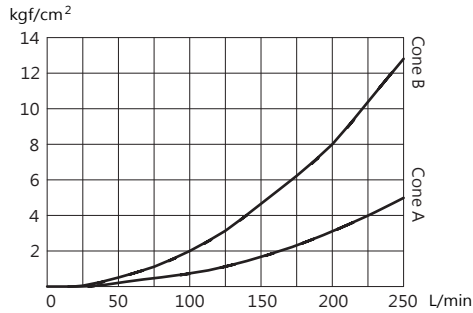


性能曲線 PERFORMANCE CURVES

流量—壓力特性 NOMINAL OVERRIDE

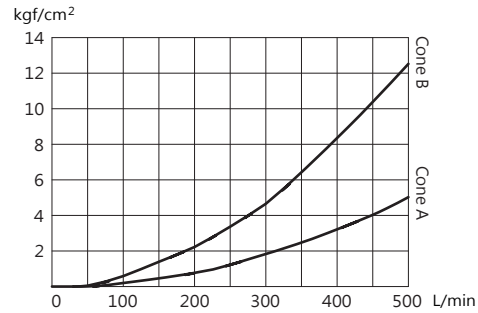
● LCV-16

Check conditions : without spring,
oil temperature 50°C / 122°F, viscosity 35 cSt



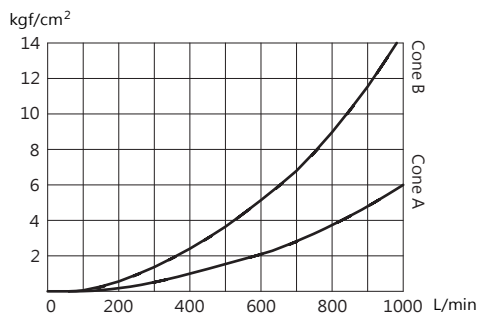
● LCV-25

Check conditions : without spring,
oil temperature 50°C / 122°F, viscosity 35 cSt



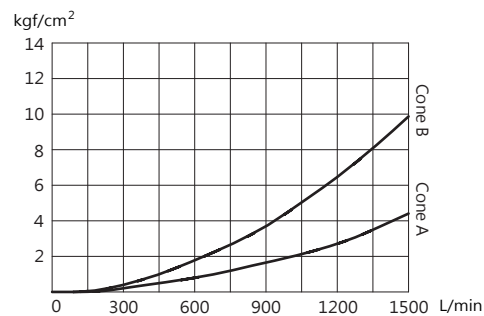
● LCV-32

Check conditions : without spring,
oil temperature 50°C / 122°F, viscosity 35 cSt



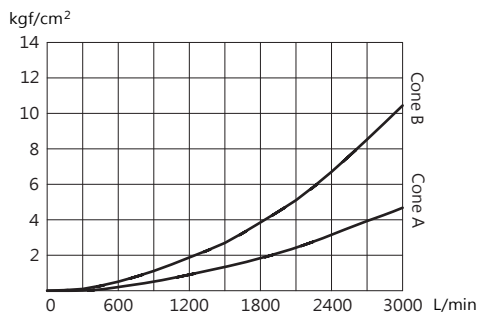
● LCV-40

Check conditions : without spring,
oil temperature 50°C / 122°F, viscosity 35 cSt



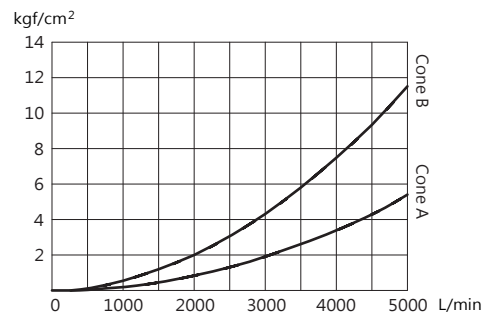
● LCV-50

Check conditions : without spring,
oil temperature 50°C / 122°F, viscosity 35 cSt



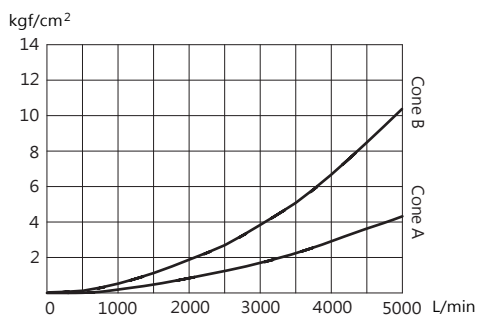
● LCV-63

Check conditions : without spring,
oil temperature 50°C / 122°F, viscosity 35 cSt



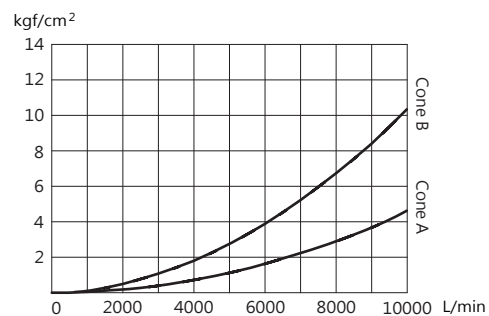
● LCV-80

Check conditions : without spring,
oil temperature 50°C / 122°F, viscosity 35 cSt



● LCV-100

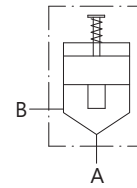
Check conditions : without spring,
oil temperature 50°C / 122°F, viscosity 35 cSt



Logic valve



閥類型符號 SYMBOL
LCV-※-OP



規格說明

SPECIFICATION

型式 MODEL	最高使用壓力 MAX. OPERATING PRESSURE (kgf/cm ²)	開啟壓力 CRACKING PRESSURE kgf/cm ²	最大流量 MAX. FLOW L/min	重量 WEIGHT kg
LCV-16-OP	315	05 : 0.35 20 : 2.0	130	0.18
LCV-25-OP			350	0.43
LCV-32-OP			500	0.99
LCV-40-OP			850	1.84
LCV-50-OP			1400	2.88
LCV-63-OP			2100	6.39

型號說明

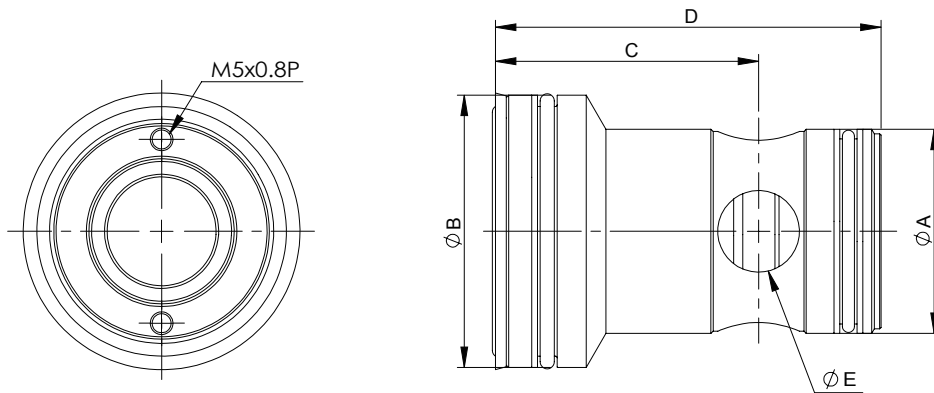
HOW TO ORDER

LCV - 25 - OP - 05



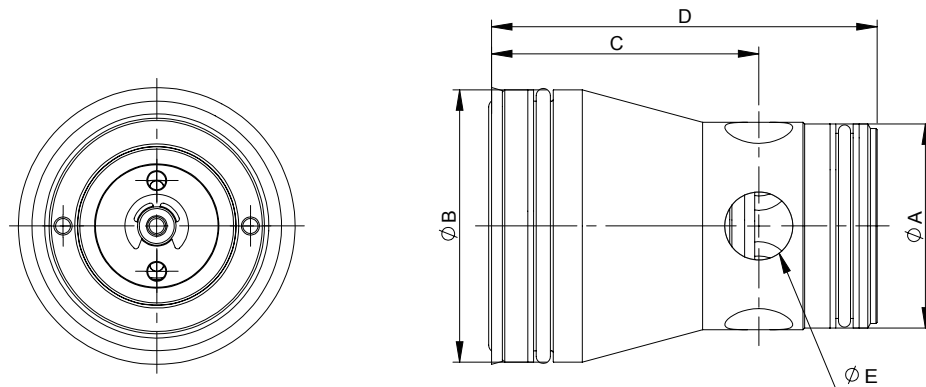
安裝尺寸 INSTALLATION DIMENSIONS

LCV-16~100



CODE SIZE	ϕA	ϕB	C	D	ϕE
16	25	32	37	56	4-10
25	34	45	43	72	4-14
32	45	60	58	85	4-18
40	55	75	66.5	105	4-23.5
50	68	90	82	122	4-28
63	90	120	112	155	6-25
80	110	145	152	205	4-34
100	135	180	174	245	4-50

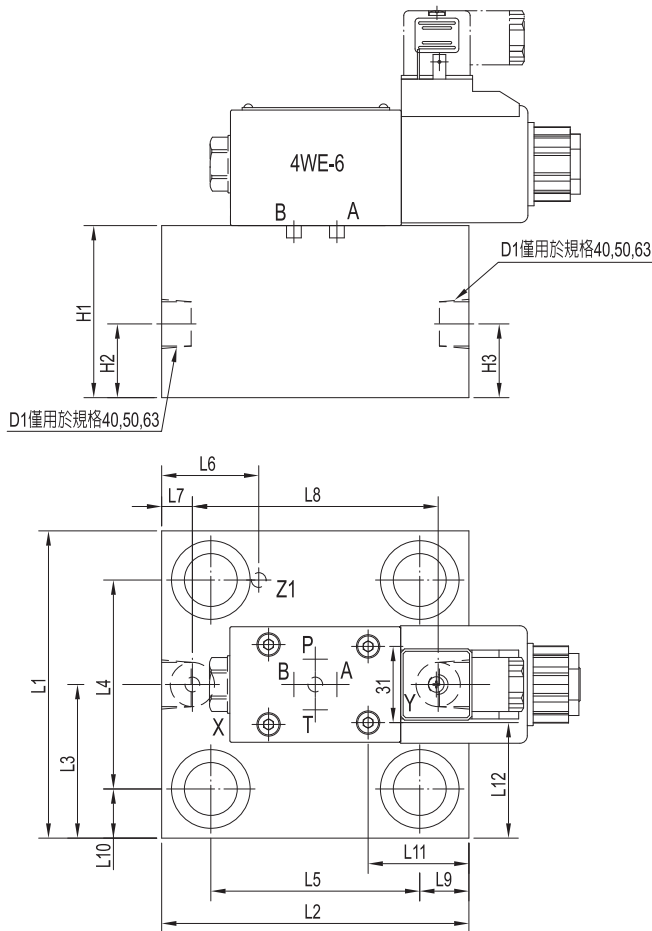
LCV-16~63-OP



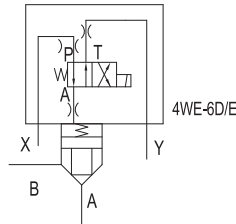
CODE SIZE	ϕA	ϕB	C	D	ϕE
16	25	32	37	56	4-10
25	34	45	50	72	4-15
32	45	60	58.9	85	5-15
40	55	75	76.5	105	6-17
50	68	90	83.5	122	4-24
63	90	120	112	155	6-25

Control Cover For Mounting A Directional Spool Or Poppet Valve

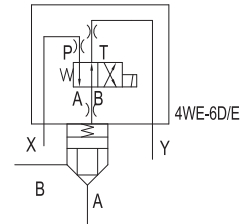
蓋板規格 CONTROL COVER SIZE : 16~63



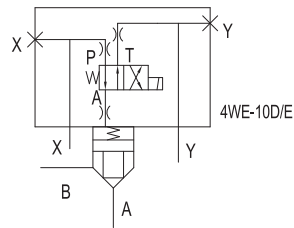
閥類型符號 SYMBOL



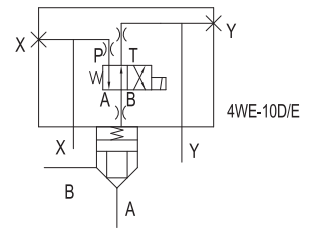
LFA-16~32-WEA



LFA-16~32-WEB



LFA-40~100-WEA



LFA-40~100-WEB

規格 SPECIFICATION	D1	H1	H2	H3	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12
16	/	40	/	/	65	80	/	46	46	29.5	15	50	17	9.5	7	17
25	/	40	/	/	85	85	/	58	58	26.5	9.5	66	13.5	13.5	21	27
32	/	50	/	/	100	100	/	70	70	33	9	82	15	15	28.5	34.5
40	G1/4	60	30	30	125	125	67.5	85	85	39.5	12.5	100	20	20	41	47
50	G1/2	68	32	32	140	140	75	100	100	40	12	116	20	20	48.5	56.5
63	G1/2	82	40	40	180	180	83	125	125	52	15	150	27.5	27.5	96	69

型號說明

HOW TO ORDER

LFA-16-WEA

型式 TYPE

WEA/WEB : 用於裝配方向滑閥或方向座閥的控制蓋板
CONTROL COVER FOR MOUNTING
A DIRECTIONAL SPOOL OR POPPET
VALVE

規格 SIZE

16 / 25 / 32 / 40 / 50 / 63 / 80 / 100

系列編號 SERIES NUMBER