



**THE CERAMIC
VALVE EXPERTS**



ACS KTW

壓力平衡閥

Pressure Balance Valve

(P15~P18)





混水分水閥芯 浴缸&花灑

Bath & Shower Diverter Cartridge

(P69~P71)





HAIN-YO

二合一閥芯 飲用水(RO)+自來水

2 in 1 Ceramic Cartridge(RO+Raw Water)

(P72)



Company Profile

公司簡介

翰優企業有限公司—專業的精密陶瓷閥製造廠，專業生產供給衛浴銅器單槍水龍頭之製造廠商，配合組裝。其功能是控制自來水之開啓與關閉及冷熱水調和。一般傳統式之水龍頭，是靠橡膠墊圈控制水的開與關，但近年來，精密陶瓷已經取代傳統式的方式。精密陶瓷之特性：耐磨耗、壽命長、操作順暢... 等。

翰優公司於西元1990年10月起開始致力於研究發展精密陶瓷閥，引進精密生產設備及檢測設備，以高品質、高效率之陶瓷閥系統產品服務客戶，產品行銷國內外，品質深受各界肯定。

翰優公司在1998年2月，正式導入ISO9002品質管理系統，于1999年元月通過ISO9002認證，更于1999年9月通過ISO9001品質管理與品質保證標準認證(1999年4月起升級為ISO9001)，其目的是建立翰優全體員工共識，促使全員與品質管理系統之執行與維持，藉由全員參與，確保提供客戶滿意及優良之產品。

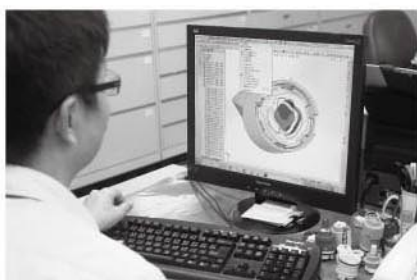


Company Profile

HAIN YO ENTERPRISES CO., LTD. is a specialized manufacturer in ceramic cartridge application in single lever faucet. The product is for water flow control and hot/cold water accommodation. The conventional faucet uses rubber washer to control the water flow, yet now precision ceramic cartridge has replaced the traditional one. Ceramic cartridge delivers long wearing, long life and easy use for character.

HAIN YO ENTERPRISES CO., LTD. has been being engaged in precision ceramic cartridge R&D, introduced precision production equipment and testing facilities to make high quality and precise ceramic cartridge to customers. The products are sold locally and abroad and earning reputation.

HAIN YO ENTERPRISES CO., LTD. was guided by ISO 9002 QC management in Feb, 1998 and completed ISO 9002 and ISO 9001 in January and September 1999 respectively (the company was up-grade to ISO 9001 certificate in April). The purpose of the striving for certificate is to build up a common view of teamwork uniforming the staff with QC management by concluding quality policy- insist on quality, strive for prominence, satisfy the customers. All staff joins in the company's strategy offering the best quality products to customers.



經營理念 Company Philosophy

「誠信，負責，積極，創新」是翰優創業至今堅持的理念。為客戶做到迅速，熱忱的服務，務必達到客戶的需要更是翰優一貫的宗旨。穩定的品質、平實的价格，是我們對客戶的承諾。

"Integrity, responsibility, positivism and innovation" is what HAIN-YO always insists on since establishment offering customers fast and cordial services. The company is sure to meet every single requirement from customers. We promise to provide stable quality product at reasonable price.

品質政策 Quality Policy

翰優以「品質」服務顧客，建立信譽；以最完善之行銷體系經營發展，拓展外銷，並以「堅持品質、力求卓越、顧客滿意」為我們的品質政策。

HAIN-YO serves customers with quality for reputation establishment. We develop our business and expand to overseas via the best marketing system based on the quality policy insistence, prominence striving and customer satisfaction.

未來展望 Prospection

在邁入新世紀領域，翰優將以「立足臺灣、胸懷大陸、放眼世界」的企業精神，全力朝向國際化、多角化的目標。

Accessing to the new era, HAIN-YO will be international-and-versatile-oriented with enterprise culture-bases in Taiwan expands to Mainland China and aims to the world.



Company Profile

製造管理流程 Production Management Flow Chart

射出成型 Injection Mould

塑膠品採電腦全自動射出機，直壓式射出一體成型，品質穩定。
Integrated-form injected by fully computerized injector.

I.Q.C品質檢驗 Incoming Quality Control

產品、配件以精密陶瓷檢驗儀器設備詳細檢驗，確保入料品質。
To assure material quality, products and components are particularly tested by precision facilities.

自動化組立 Automatic Assembly

陶瓷閥裝配採用一貫電腦自動化機器組立完成，力求生產標準化。
Normalizing production by automatic assembly machine.

電腦噴印 Computer Jet Printing

為求誠信負責及產品的可追溯性，出廠之陶瓷閥皆經電腦噴印：廠牌、型號、製造日期。
To be responsible to our production, all ceramic cartridges are jet printed with brand name, model and manufactured date.

I.P.Q.C製程巡檢 Process Inspection

通過製程巡檢的方式，發現製程中的異常及不穩定因素，及時處理改善，以保證品質。
With the process inspection to modify the problems in time.

F.Q.C.100%空壓測試 F.Q.C.100% Air Test

生產之每一陶瓷閥皆經嚴格的空壓測漏檢驗，確保出廠產品零瑕疵。
Performing the air test for every ceramic cartridge.

功能測試 Function Test

採用進口之壽命測試機、爆破測試機、溫度變動測試機、水密測試機，依照ASSE 1016-2011/ASME A112.1016-2011/CSA B125.16-11、EN817、AS NZS 3718:2005標準，對出廠之陶瓷閥做嚴格的功能測試，確認產品的可靠度。
Introduce the imported endurance test machine, burst pressure test machine, temperature variation test machine and water sealing machine. All the testing standard is in compliance with ASSE 1016-2011/ASME A112.1016-2011/CSA B125.16-11、EN 817、AS NZS 3718:2005.

包裝 Package

依本公司陶瓷閥裝配製程QC工程表之規定包裝。
Packaging standard according to QC engineering program and suit for long distance transportation.

入庫 In Stock

成品依照不同型號、批號集存於成品區域內。
Store the finished products according to the different model and lot number.

O.Q.C出貨檢驗 O.Q.C

在出貨時，產品再一次的品質確認，確保出廠產品零瑕疵。
Product quality inspection again before shipment.

出貨 Shipment

為維護公司品質、信譽，出貨程序嚴謹，以確保產品完整、迅速地、適時地送達客戶。
All delivery process is performed with strict management.

品質保證

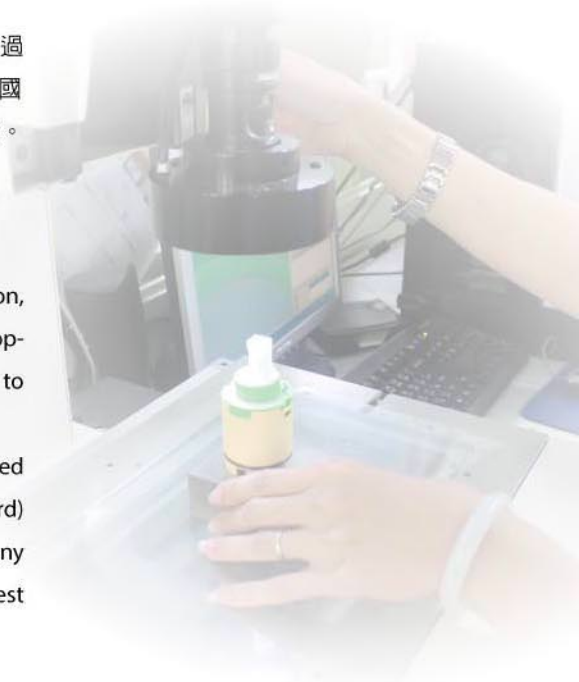
精密陶瓷閥是水龍頭(閥類製品)的關鍵性精密零組件，因此對於產品的品質，翰優要求零缺點，絕對不允許有一點點的瑕疵，從產品開發到量產，對進料檢驗、製程管制、品質功能測試到包裝出貨檢查，均執行嚴格管制，做到100%全檢。

為了徹底落實品質管制，確保每一項檢查管制動作切實執行，本公司產品已通過北美/加拿大cUPC、美國NSF、英國WRAS、澳洲Water Mark、法國ACS及德國KTW認證，並同步導入自動化組裝生產線及管理電腦化，提供客戶最佳的品質保證。

Quality Assurance

Ceramic cartridge is a crucial precision module to faucet making. For this reason, HAIN-YO requires flawless product quality, admits no mistake from product development, material inspection, production process control, product performance test to package and delivery, all products are under strict 100% inspection.

For utter practice of QC and execution of every inspection, our products have passed cUPC (North America/Canada), NSF certificate (U.S. Standard), WRAS (U.K. Standard) and Water Mark (Australia Standard), ACS (France), KTW (Germany). Also the company has guided in automatic fabrication and computerized management to offer the best quality of products to customers.

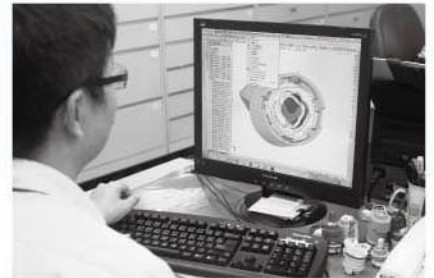


Company Profile

設計開發

翰優秉持「設計開發是企業成長的原動力，創新是創造價值的最佳方法」的理念，多年來特別重視設計開發人才之養成，從事產品外觀設計，結構與精密度之提升，不斷創造更佳耐久實用性產品，贏得國內外客戶高度信賴與肯定。

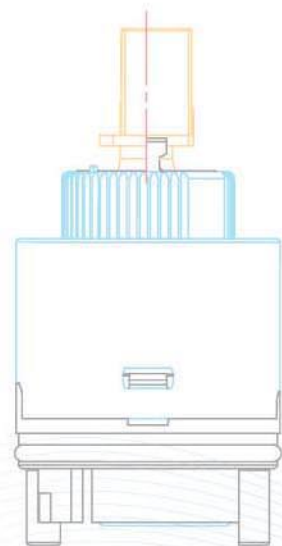
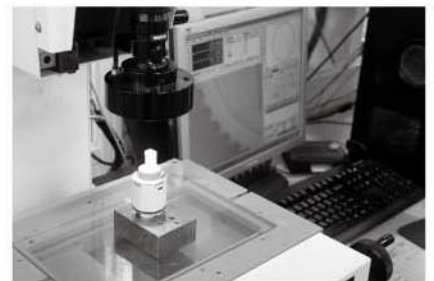
擁有一流人才與核心技術，我們堅信以翰優累積20年的設計開發經驗，配合先進電腦化自動生產線，絕對有能力為客戶設計出更創新精良的精密陶瓷閥產品，滿足客戶的需求。



Design & Development

Upholding the principle... design and development is the motivity of business, innovation is the best way to value creation-the company particularly respects the cultivation of talent to design and development. To create the most durable and useful products to customers, the company continuous to improve the product design structure and accuracy to fulfill customer's needs.

Having dedication of our staff, up-grade technology and decade experience in design and development, our guiding principle has been the desire to make innovation/evolution and orientation products to fit the market demand.



自動化設備

為確保市場品質領先的地位，本公司引進搭配電腦控制機械手臂(ROBOT)的先進直壓式自動化射出成型機械，一貫電腦自動化組立生產線與電腦噴印機等整廠的自動化生產設備，使生產完全標準化，產品達到均一化且可靠度高的目標。因此，我們深信能配合客戶需求，進行自動化彈性生產，提供客戶最優質的精密陶瓷閥產品。

Automation Equipment

To keep the leadership in the strategy market, our company has invested the equipment of hydraulic injection machine consist of robot and PLC control and computer jet printing and so forth automatic production equipment to achieve uniform product for complete standardization.

Therefore, we believe we have the ability to provide high quality ceramic cartridge to meet customers' request strictly.



Contents



★ (附定溫蓋) (With Temp. Limitor)

壓力平衡閥/Pressure Balance Valve

★ 15	JL02BJ	40mm低腳背對背	40mm Back to Back 180° Reverse Type W/O Distributor
★ 16	JH02BD	40mm高腳背對背	40mm Back to Back 180° Reverse Type W/ Distributor
★ 17	JL04BD	40mm低腳空轉式	40mm Low Torque Structure Type W/O Distributor
★ 18	JH04BD	40mm高腳空轉式	40mm Low Torque Structure Type W/ Distributor
★ 19	MH04TD	45mm高腳空轉式	45mm Low Torque Structure Type W/ Distributor

精密陶瓷閥芯/Ceramic Cartridge

01系列/齒輪式 01/Gear Type

20	BL01GD	47mm低腳齒輪式	47mm Gear Type W/O Distributor
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02系列/空轉式-標準型 02/Low Torque Structure Type - Standard

21	GL02GJ	25mm低腳空轉式	25mm Low Torque Structure Type W/O Distributor
★ 21	GL02GJ-003	25mm低腳空轉式+定溫蓋	25mm Low Torque Structure Type W/O Distributor
22	GH02GJ	25mm高腳空轉式	25mm Low Torque Structure Type W/ Distributor
★ 22	GH02GJ-003	25mm高腳空轉式+定溫蓋	25mm Low Torque Structure Type W/ Distributor
23	FL02GJ	35mm低腳空轉式	35mm Low Torque Structure Type W/O Distributor
24	FH02GJ	35mm高腳空轉式	35mm Low Torque Structure Type W/ Distributor
25	DL02GJ	40mm低腳空轉式	40mm Low Torque Structure Type W/O Distributor
26	DH02GJ	40mm高腳空轉式	40mm Low Torque Structure Type W/ Distributor

02系列/空轉式-單控閥 02/Low Torque Structure Type - Cold(Hot) Only Type

27	GL02GJ-004	25mm低腳空轉式單控閥	25mm Cold(Hot) Only Type W/O Distributor
28	GL02GJ-008	25mm低腳空轉式單控閥	25mm Cold(Hot) Only Type W/O Distributor
29	GH02GJ-008	25mm高腳空轉式單控閥	25mm Cold(Hot) Only Type W/ Distributor
30	FL02GJ-390/490	35mm低腳空轉式單控閥	35mm Cold(Hot) Only Type W/O Distributor
31	FH02GJ-390/490	35mm高腳空轉式單控閥	35mm Cold(Hot) Only Type W/ Distributor

02系列/空轉式-二段式 02/Low Torque Structure Type - Water Saving Type (2 Steps)

32	FL02GJ-380/480	35mm低腳二段式	35mm 2 Steps Type W/O Distributor
33	FH02GJ-380/480	35mm高腳二段式	35mm 2 Steps Type W/ Distributor
34	DL02GJ-380/480	40mm低腳二段式	40mm 2 Steps Type W/O Distributor
35	DH02GJ-380/480	40mm高腳二段式	40mm 2 Steps Type W/ Distributor

02系列/空轉式-節能閥 02/Low Torque Structure Type - Energy Saving Type

36	FL02GJ-535	35mm低腳節能閥	35mm Energy Saving Type W/O Distributor
37	FH02GJ-535	35mm高腳節能閥	35mm Energy Saving Type W/ Distributor
38	DL02GJ-535	40mm低腳節能閥	40mm Energy Saving Type W/O Distributor
39	DH02GJ-535	40mm高腳節能閥	40mm Energy Saving Type W/ Distributor
40	FL02GJ-555	35mm低腳節能閥(廚房用)	35mm Energy Saving Type W/ Distributor (for Kitchen Faucet)

02系列/空轉式-厚底部墊圈 02/Low Torque Structure Type - Thick Base Seal Type		
41	FL02GJ-802	35mm低腳空轉式(厚底部墊圈) 35mm Thick Base Seal Type W/O Distributor
42	DL02GJ-802	40mm低腳空轉式(厚底部墊圈) 40mm Thick Base Seal Type W/O Distributor
02系列/空轉式-反向進水 02/Low Torque Structure Type - Outlet In Front		
43	FL02GJ-850	35mm低腳反向進水 35mm Outlet In Front W/O Distributor
44	DL02GJ-850	40mm低腳反向進水 40mm Outlet In Front W/O Distributor
04系列/搖桿式 04/Joystick Type		
45	FL04BD	35mm低腳搖桿式 35mm Joystick Type W/O Distributor
46	FH04BD	35mm高腳搖桿式 35mm Joystick Type W/ Distributor
47	DL04BD	40mm低腳搖桿式 40mm Joystick Type W/O Distributor
48	DH04BD	40mm高腳搖桿式 40mm Joystick Type W/ Distributor
05系列/背對背 05/Back to Back 180° Reverse		
★ 49	DL05BJ	40mm低腳背對背 40mm Back to Back 180° Reverse Type W/O Distributor
11系列/旋轉式 11/Rotary Type		
★ 50	FL11BD	35mm旋轉式 35mm Rotary Type
★ 51	DL11BJ	40mm旋轉式 40mm Rotary Type
12系列/側出水 12/House Open Type		
52	GL12TD-009	25mm低腳側出水 25mm House Open Type W/O Distributor
53	FL12TD	35mm低腳側出水 35mm House Open Type W/O Distributor
54	FH12TD	35mm高腳側出水 35mm House Open Type W/ Distributor
55	DH12TD	40mm高腳側出水 40mm House Open Type W/ Distributor
56	EH12TD	45mm高腳側出水 45mm House Open Type W/ Distributor
16系列/上封水-標準&單控閥 16/Side-Outlet Type - Standard & Cold(Hot) Only Type		
57	WH16GJ	32mm上封水 32mm Side-Outlet Type
58	FH16GJ	35mm上封水 35mm Side-Outlet Type
59	DH16GJ	40mm上封水 40mm Side-Outlet Type
60	FH16GJ-090/190	35mm上封水單控閥 35mm Side-Outlet Type+Cold(Hot) Only Type
17系列/接管式-標準&側入側出&單控閥&節能閥 17/Connected Pipe Type - Standard & Side In Side Out & Cold(Hot) Only & Energy Saving Type		
61	FH17GJ	35mm接管式 35mm Connected Pipe Type
62	DH17GJ	40mm接管式 40mm Connected Pipe Type
63	FH17GJ-031/131	35mm接管式(側入側出) 35mm Connected Pipe Type (Side In Side Out)
64	FH17GJ-090/190	35mm接管式單控閥 35mm Connected Pipe Type+Cold(Hot) Only Type
65	FH17GJ-530	35mm接管式節能閥(0~90度) 35mm Connected Pipe Type+Energy Saving Type (0°~90°)
66	FH17GJ-540/640	35mm接管式節能閥(30/60度) 35mm Connected Pipe Type+Energy Saving Type (30°/60°)
18系列/分水器 18/Diverter Cartridge		
67	KL18GJ-001/002	33mm一分三分水閥芯(長桿/短桿) 33mm+3-Way Diverter (Long/Short Stem)
68	FL18GJ-001/002	35mm一分四分水閥芯(長桿/短桿) 35mm+4-Way Diverter (Long/Short Stem)
19系列/花灑&浴缸 混水分水閥芯(二進二出) 19/Bath & Shower Diverter Cartridge		
69	FL19GJ	35mm低腳混水分水閥 35mm Bath & Shower Diverter Cartridge W/O Distributor
70	DL19GJ	40mm低腳混水分水閥(側出底出) 40mm Bath & Shower Diverter Cartridge W/O Distributor (Side & Bottom Outlet)
71	DH19GJ	40mm高腳混水分水閥(側出頂出) 40mm Bath & Shower Diverter Cartridge W/ Distributor (Side & Top Outlet)
19系列/二合一閥芯(三進兩出) 19/2 in 1 Ceramic Cartridge (RO+Raw Water)		
72	FL19GJ-006/106	35mm低腳二合一閥芯(飲用水(RO)+自來水) 35mm 2 in 1 Ceramic Cartridge (RO+Raw Water) W/O Distributor

壓力平衡閥說明

Pressure Balance Valve Application

◎ 說明

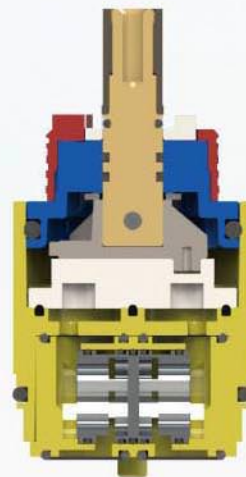
壓力平衡閥，系以感應冷熱進水口壓力，並對冷熱水變動作補償以穩定出水口溫度。本控制閥可由冷水位調節到最小溫度37.8°C(100°F)，與此同時，熱水入口溫度值域從48.9°C(120°F)到82°C(180°F)，冷水入口溫度值域為4.4°C(40°F)到26.7°C(80°F)，且設有一個可調節元件，用以限制最大出口溫度到48.9°C(120°F)。

◎ 特點

1. 通過美國反燙傷法標準ASSE#1016及ANSI/ASME A112.18.1。
2. 壓力平衡閥系列產品已通過美國、中國、台灣等國...多項功能結構之專利。
3. 平衡閥是由不銹鋼303鋼材加工製成與精密陶瓷及高級工程塑料結合為單一體之壓力平衡閥，其整體功能之特點：平行度與同心度精密度高、裝配容易、操作簡單、手感順暢、品質穩定。
4. 此壓力平衡閥可藉由定溫蓋元件調整極限設定位置，使出水口不會超過48.9°C(120°F)。
5. 當冷熱水供水壓力變化差±50%時，其出水口溫度會自動維持在設定溫度的±2°C(±3.6°F)以內，能消除在沐浴時因冷熱水壓不穩定所產生之忽冷忽熱現象，達到不被燙傷之安全性。
6. 冷水失效時，在5秒鐘內出水口溫度會自動控制在48.9°C(120°F)以內，並且出水口流量降低至1.9L/Min(0.5GPM)以下，以達到不被燙傷之安全性。
7. 熱水失效時，冷水出水口流量須在5秒鐘內降低至1.9L/Min(0.5GPM)以下，以避免使用上的不舒適感及防止不可預測的危險性。
8. 此壓力平衡閥不但可安裝在供給水管的正面，亦可不必變更供水管之方向，只要將此壓力平衡閥旋轉180°，仍可安裝在同一面牆之反面。

◎ 安裝注意事項

1. 要安裝本閥時，先確認冷熱水終端供水管道正確位置。
2. 螺帽鎖緊扭力建議：100kgf.cm~120kgf.cm(10N.m~12Nm)。
3. 使用冷熱水溫度條件建議：
熱水供水口為48.9°C(120°F)~82°C(180°F)
冷水供水口為4.4°C(40°F)~26.7°C(80°F)
4. 安裝完成後，水龍頭開啓時，應先從冷水→溫水→熱水之順序開啓。
5. 請避免在雜質過高的水質中使用此平衡閥，以防止加熱時水中鐵質、石灰質等容易附著影響平衡閥正常運作；若使用的水中含有太多的鐵質、石灰質等雜質，建議改善使其符合飲用水規範或者必須定期清潔與檢查壓力平衡閥的裝置，確保此壓力平衡閥能正常運作，以發揮其功能，而清潔與檢查的次數多寡則視水質而定。
6. 此平衡閥的裝置須由專業技工安裝，以確保安全，因為不當的裝配，都有可能使出水溫度失常，而讓使用者有被燙傷之虞。



◎ APPLICATION

A pressure balance valve was designed to be adjusted incoming hot or cold water pressure and compensates for fluctuations to keep shower temperatures constant and comfortable.

These balance valve shall be adjustable from the cold position up to a minimum of 37.8°C(100°F) with hot water inlet temperatures ranging from 48.9°C(120°F) to 82°C(180°F) and cold water inlet temperatures ranging from 4.4°C(40°F) to 26.7°C(80°F). And there is a component that can limit the maximum outlet temperature to 48.9°C(120°F).

◎ FEATURES

1. Passed the certificate of anti-scaled standard ASSE 1016 and ANSI/ASME A112.18.1 U.S.A.
2. Our balance valve have applied the patent of U.S.A., China and Taiwan. The other countries patent are pending.
3. The pressure balance valve is the integration with the piston made of #303 stainless steel , precise ceramic disc and high tech plastic material. The precision of the parallel and concentricity keeps well. This pressure balance valve is easy to install and operate, and possesses smooth operating and stable quality.
4. The outlet water temperature of the pressure balance valve can be adjusted to non-exceeded 48.9°C(120 °F) by Temp. Adjuster.
5. When the variation of the inlet cold or hot water pressure is 50%, the temperature variation of outlet water will not greater than $\pm 2^{\circ}\text{C}$ ($\pm 3.6^{\circ}\text{F}$) from the initial outlet set temperature to ensure shower safety and prevent hot burns.
6. When the cold water supply fails, the temperature of the outlet water still can be controlled under 48.9°C(120 °F) and decrease the outlet flow rate to 1.9L/Min(0.5GPM) within 5 seconds.
7. When the hot water supply fails, the outlet flow rate of cold water must decrease to 1.9L/Min(0.5GPM) within 5 seconds.
8. The pressure balance valve we designed can be said as two in one valve for installation either in the front side or in the opposite direction of the same wall and the same water supply pipes.

◎ NOTE

1. Make sure the proper position of hot/cold water supply pipes before installing the valve.
2. The torque suggest condition: 100~120 kgf.cm (10N.m~12N.m)
3. The hot/cold water supply condition :
hot water supply 48.9°C(120°F) ~ 82°C(180°F)
cold water supply 4.4°C(40°F) ~ 26.7°C(80°F)
4. After installing , make sure it is cold water, warm water, hot water incoming when you turn on the faucet.
5. Please avoid installing this valve in the high contained contaminant water, because it is easy to adhere to the valve for the contaminant after heating. If the water contains heavy contaminants, the water quality is suggested for improvement. The valve should be checked frequently to ensure normal functional and working properly. The inspection times depend on the amount of contaminants in the water.
6. The valve must be set by professional installer to ensure safety. Any in-proper installation will raise the discharge temperature and may get hot burns.

壓力平衡閥芯 Pressure Balance Valve

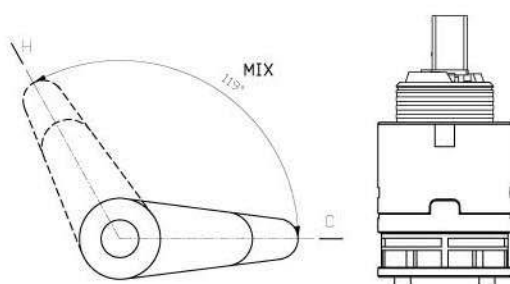
JL02BJ

低腳

Without Distributor

背對背

Back to Back 180° Reverse



★ (附定溫蓋) (With Temp. Limitor)

陶瓷片技術要求 Technical characteristics of the ceramic discs	
材質 Material	AL ₂ O ₃ 92% ~ 96%
表面粗糙度 Surface roughness	Ra 0.1 ~ Ra 0.3 μm
硬度 Hardness	>1000 HV
平面度 Flatness	<0.6 μm

技術規格 Technical characteristics of the cartridge	
最大旋轉角度 Max. rotary angle	119°
螺帽扭矩 Recommended nut tightening torque	10 ~ 12 N.m
密封測試 / 耐壓測試 Water resistance pressure	500 psi
最高使用溫度 Max. temperature	90°C (194°F)
壽命測試 Endurance test	20,000 cycles (ASSE 1016-操作元件Piston) 80,000 cycles (ASSE 1016-內部元件Disc)

流量 Flow rate	
水壓 Water pressure	混合水 Mixing (L/min)
1 bar	11.70
2 bar	15.90
3 bar	18.80
4 bar	22.00

JH02BD

高腳

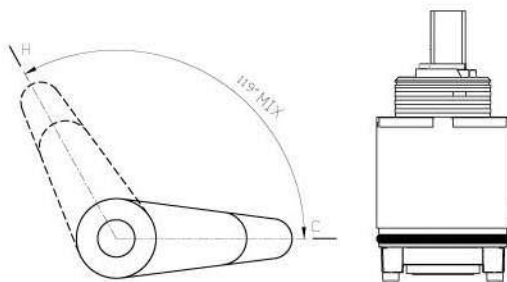
With Distributor

背對背

Back to Back 180° Reverse

選配：逆止閥組

Option : Check Valve Set



★ (附定溫蓋) (With Temp. Limitor)

陶瓷片技術要求 Technical characteristics of the ceramic discs

材質 Material	AL ₂ O ₃ 92% ~ 96%
表面粗糙度 Surface roughness	Ra 0.1 ~ Ra 0.3 μm
硬度 Hardness	>1000 HV
平面度 Flatness	<0.6 μm

技術規格 Technical characteristics of the cartridge

最大旋轉角度 Max. rotary angle	119°
螺帽扭矩 Recommended nut tightening torque	10 ~ 12 N.m
密封測試 / 耐壓測試 Water resistance pressure	500 psi
最高使用溫度 Max. temperature	90°C (194°F)
壽命測試 Endurance test	20,000 cycles (ASSE 1016-操作元件Piston) 80,000 cycles (ASSE 1016-內部元件Disc)

流量 Flow rate

水壓 Water pressure	混合水 Mixing (L/min)
1 bar	10.00
2 bar	16.00
3 bar	20.20

壓力平衡閥芯 Pressure Balance Valve

JL04BD

低腳

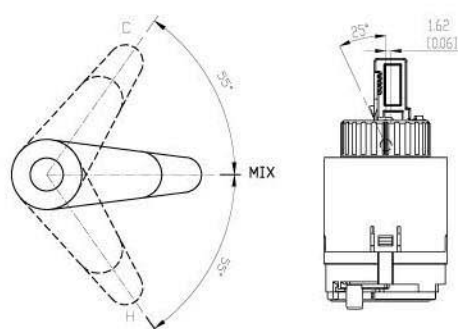
Without Distributor

空轉式

Low Torque Structure Type

選配：逆止閥組

Option : Check Valve Set



★ (附定溫蓋) (With Temp. Limitor)

陶瓷片技術要求 Technical characteristics of the ceramic discs

材質 Material	Al ₂ O ₃ 92% ~ 96%
表面粗糙度 Surface roughness	Ra 0.1 ~ Ra 0.3 μm
硬度 Hardness	>1000 HV
平面度 Flatness	<0.6 μm

技術規格 Technical characteristics of the cartridge

最大開啟角度 Max. opening angle	25°
最大旋轉角度 Max. rotary angle	110°
螺帽扭矩 Recommended nut tightening torque	10 ~ 12 N.m
密封測試 / 耐壓測試 Water resistance pressure	500 psi
最高使用溫度 Max. temperature	90°C (194°F)
壽命測試 Endurance test	20,000 cycles (ASSE 1016-操作元件Piston) 80,000 cycles (ASSE 1016-內部元件Disc)

流量 Flow rate

水壓 Water pressure	熱水 Hot (L/min)	冷水 Cold (L/min)	混合水 Mixing (L/min)
1 bar	5.40	5.50	9.50
2 bar	7.80	7.90	14.00
3 bar	9.70	9.70	17.50

JH04BD

高腳

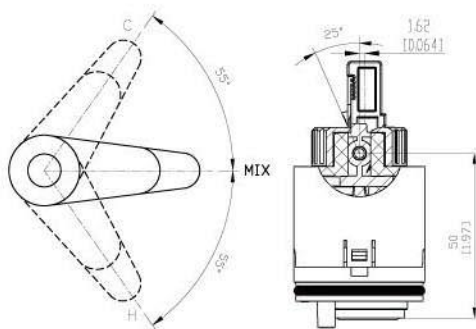
With Distributor

空轉式

Low Torque Structure Type

選配：逆止閥組

Option : Check Valve Set



★ (附定溫蓋) (With Temp. Limitor)

陶瓷片技術要求 Technical characteristics of the ceramic discs

材質 Material	AL ₂ O ₃ 92% ~ 96%
表面粗糙度 Surface roughness	Ra 0.1 ~ Ra 0.3 μm
硬度 Hardness	>1000 HV
平面度 Flatness	<0.6 μm

技術規格 Technical characteristics of the cartridge

最大開啟角度 Max.opening angle	25°
最大旋轉角度 Max. rotary angle	110°
螺帽扭矩 Recommended nut tightening torque	10 ~12 N.m
密封測試 / 耐壓測試 Water resistance pressure	500 psi
最高使用溫度 Max. temperature	90°C (194°F)
壽命測試 Endurance test	20,000 cycles (ASSE 1016-操作元件Piston) 80,000 cycles (ASSE 1016-內部元件Disc)

流量 Flow rate

水壓 Water pressure	熱水 Hot (L/min)	冷水 Cold (L/min)	混合水 Mixing (L/min)
1 bar	8.36	8.00	14.00
2 bar	11.60	10.90	19.20
3 bar	13.80	13.40	23.36
4 bar	16.20	15.70	24.84

壓力平衡閥芯 Pressure Balance Valve

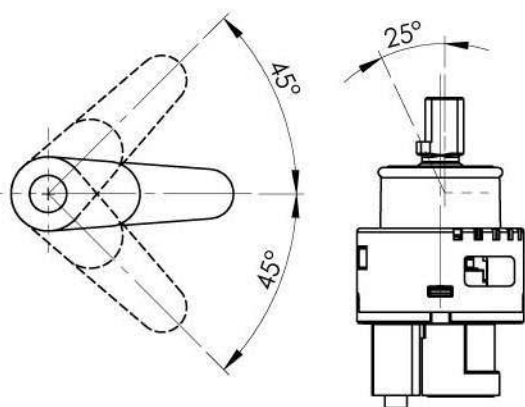
MH04TD

高腳

With Distributor

空轉式

Low Torque Structure Type



★ (附定溫蓋) (With Temp. Limitor)

陶瓷片技術要求 Technical characteristics of the ceramic discs

材質 Material	AL ₂ O ₃ 92% ~ 96%
表面粗糙度 Surface roughness	Ra 0.1~ Ra 0.3 μm
硬度 Hardness	>1000 HV
平面度 Flatness	<0.6 μm

技術規格 Technical characteristics of the cartridge

最大開啟角度 Max. opening angle	25°
最大旋轉角度 Max. rotary angle	90°
螺帽扭矩 Recommended nut tightening torque	10 ~12 N.m
密封測試 / 耐壓測試 Water resistance pressure	500 psi
最高使用溫度 Max. temperature	90°C (194°F)
壽命測試 Endurance test	20,000 cycles (ASSE 1016-操作元件Piston) 80,000 cycles (ASSE 1016-內部元件Disc)

流量 Flow rate

水壓 Water pressure	熱水 Hot (L/min)	冷水 Cold (L/min)	混合水 Mixing (L/min)
1 bar	7.80	8.08	14.92
2 bar	11.20	11.64	20.96
3 bar	14.12	14.36	26.28

精密陶瓷閥芯-01系列(齒輪式)

Ceramic Cartridge-01(Gear Type)

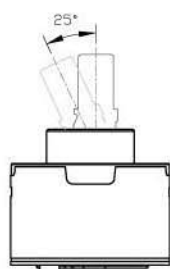
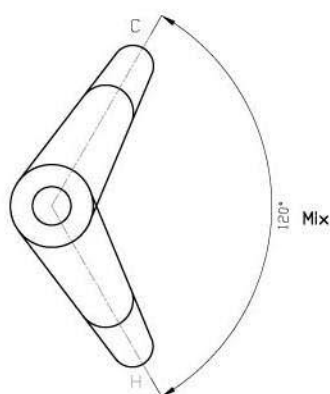
BL01GD

低腳

Without Distributor

齒輪式

Gear Type



陶瓷片技術要求 Technical characteristics of the ceramic discs

材質 Material	Al ₂ O ₃ 92% ~ 96%
表面粗糙度 Surface roughness	Ra 0.1 ~ Ra 0.3 μm
硬度 Hardness	>1000 HV
平面度 Flatness	<0.6 μm

技術規格 Technical characteristics of the cartridge

最大開啟角度 Max. opening angle	25°
最大旋轉角度 Max. rotary angle	120°
螺帽扭矩 Recommended nut tightening torque	10~12 N.m
密封測試 / 耐壓測試 Water resistance pressure	250~300 psi
最高使用溫度 Max. temperature	90°C (194°F)
壽命測試 Endurance test	500,000 cycles (ASME A112.18.1) 70,000 cycles (EN817)

流量 Flow rate

水壓 Water pressure	熱水 Hot (L/min)	冷水 Cold (L/min)	混合水 Mixing (L/min)
1 bar	11.16	11.22	13.69
2 bar	18.60	18.70	22.98
3 bar	24.02	24.04	29.66

精密陶瓷閥芯-02系列(空轉式-標準)

Ceramic Cartridge-02(Low Torque Structure Type - Standard)

GL02GJ / GL02GJ-003

低腳

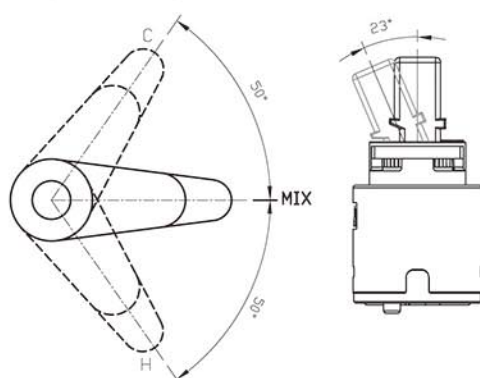
Without Distributor

空轉式

Low Torque Structure Type

選配：附定溫蓋

Option:Temp. Limitor



陶瓷片技術要求 Technical characteristics of the ceramic discs

材質 Material	AL ₂ O ₃ 92% ~ 96%
表面粗糙度 Surface roughness	Ra 0.1 ~ Ra 0.3 μm
硬度 Hardness	>1000 HV
平面度 Flatness	<0.6 μm

技術規格 Technical characteristics of the cartridge

最大開啟角度 Max. opening angle	23°
最大旋轉角度 Max. rotary angle	100°
螺帽扭矩 Recommended nut tightening torque	7 ~ 8 N.m
密封測試 / 耐壓測試 Water resistance pressure	350 ~ 500 psi
最高使用溫度 Max. temperature	90°C (194°F)
壽命測試 Endurance test	500,000 cycles (ASME A112.18.1) 70,000 cycles (EN817)

流量 Flow rate

水壓 Water pressure	熱水 Hot (L/min)	冷水 Cold (L/min)	混合水 Mixing (L/min)
1 bar	6.30	6.5	8.56
2 bar	8.80	9	11.16
3 bar	10.80	11	14.00

GH02GJ / GH02GJ-003

高腳

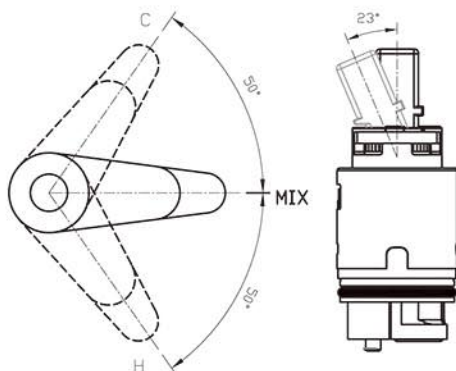
With Distributor

空轉式

Low Torque Structure Type

選配：附定溫蓋

Option:Temp. Limitor



陶瓷片技術要求 Technical characteristics of the ceramic discs

材質 Material	AL ₂ O ₃ 92% ~ 96%
表面粗糙度 Surface roughness	Ra 0.1 ~ Ra 0.3 μm
硬度 Hardness	>1000 HV
平面度 Flatness	<0.6 μm

技術規格 Technical characteristics of the cartridge

最大開啟角度 Max. opening angle	23°
最大旋轉角度 Max. rotary angle	100°
螺帽扭矩 Recommended nut tightening torque	7 ~ 8 N.m
密封測試 / 耐壓測試 Water resistance pressure	350 ~ 500 psi
最高使用溫度 Max. temperature	90°C (194°F)
壽命測試 Endurance test	500,000 cycles (ASME A112.18.1) 70,000 cycles (EN817)

流量 Flow rate

水壓 Water pressure	熱水 Hot (L/min)	冷水 Cold (L/min)	混合水 Mixing (L/min)
1 bar	7.80	7.70	9.90
2 bar	10.70	10.50	13.80
3 bar	13.00	12.80	16.60

精密陶瓷閥芯-02系列(空轉式-標準)

Ceramic Cartridge-02(Low Torque Structure Type - Standard)

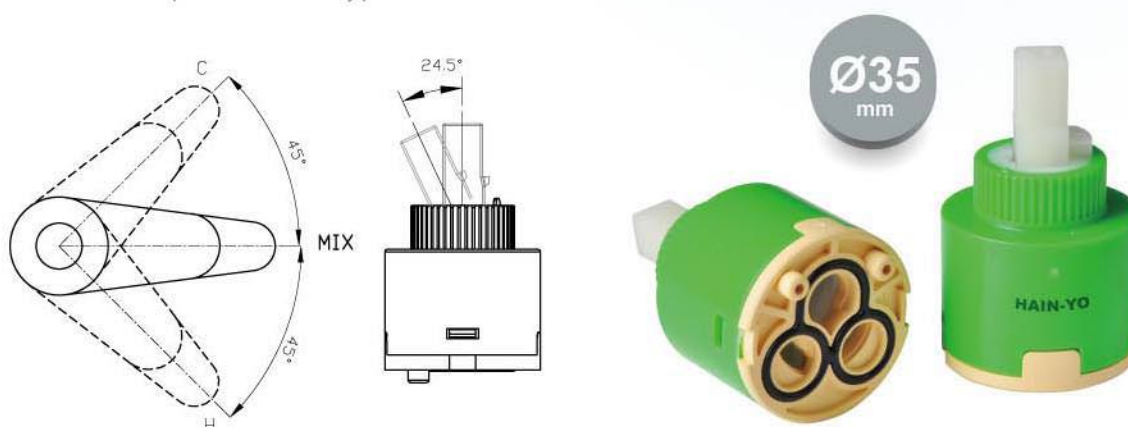
FL02GJ

低腳

Without Distributor

空轉式

Low Torque Structure Type



陶瓷片技術要求 Technical characteristics of the ceramic discs

材質 Material	AL ₂ O ₃ 92% ~ 96%
表面粗糙度 Surface roughness	Ra 0.1 ~ Ra 0.3 μm
硬度 Hardness	>1000 HV
平面度 Flatness	<0.6 μm

技術規格 Technical characteristics of the cartridge

最大開啟角度 Max. opening angle	24.5°
最大旋轉角度 Max. rotary angle	90°
螺帽扭矩 Recommended nut tightening torque	8 ~ 10 N.m
密封測試 / 耐壓測試 Water resistance pressure	350 ~ 500 psi
最高使用溫度 Max. temperature	90°C (194°F)
壽命測試 Endurance test	500,000 cycles (ASME A112.18.1) 70,000 cycles (EN817)

流量 Flow rate

水壓 Water pressure	熱水 Hot (L/min)	冷水 Cold (L/min)	混合水 Mixing (L/min)
1 bar	16.60	16.20	19.70
2 bar	23.80	22.50	27.60
3 bar	25.30	26.30	33.30

FH02GJ

高腳

With Distributor

空轉式

Low Torque Structure Type



陶瓷片技術要求 Technical characteristics of the ceramic discs

材質 Material	AL ₂ O ₃ 92% ~ 96%
表面粗糙度 Surface roughness	Ra 0.1 ~ Ra 0.3 μm
硬度 Hardness	>1000 HV
平面度 Flatness	<0.6 μm

技術規格 Technical characteristics of the cartridge

最大開啟角度 Max. opening angle	24.5°
最大旋轉角度 Max. rotary angle	90°
螺帽扭矩 Recommended nut tightening torque	8 ~ 10 N.m
密封測試 / 耐壓測試 Water resistance pressure	350 ~ 500 psi
最高使用溫度 Max. temperature	90°C (194°F)
壽命測試 Endurance test	500,000 cycles (ASME A112.18.1) 70,000 cycles (EN817)

流量 Flow rate

水壓 Water pressure	熱水 Hot (L/min)	冷水 Cold (L/min)	混合水 Mixing (L/min)
1 bar	13.80	13.00	18.10
2 bar	18.00	18.00	24.70
3 bar	21.20	21.60	29.10

精密陶瓷閥芯-02系列(空轉式-標準)

Ceramic Cartridge-02(Low Torque Structure Type - Standard)

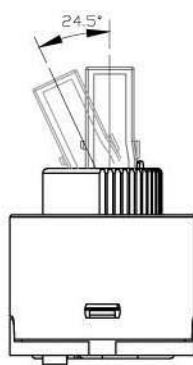
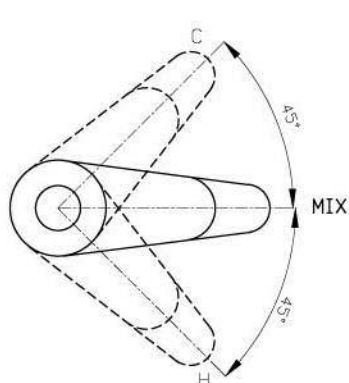
DL02GJ

低腳

Without Distributor

空轉式

Low Torque Structure Type



陶瓷片技術要求 Technical characteristics of the ceramic discs

材質 Material	Al ₂ O ₃ 92% ~ 96%
表面粗糙度 Surface roughness	Ra 0.1 ~ Ra 0.3 μm
硬度 Hardness	>1000 HV
平面度 Flatness	<0.6 μm

技術規格 Technical characteristics of the cartridge

最大開啟角度 Max. opening angle	24.5°
最大旋轉角度 Max. rotary angle	90°
螺帽扭矩 Recommended nut tightening torque	10 ~ 12 N.m
密封測試 / 耐壓測試 Water resistance pressure	350 ~ 500 psi
最高使用溫度 Max. temperature	90°C (194°F)
壽命測試 Endurance test	500,000 cycles (ASME A112.18.1) 70,000 cycles (EN817)

流量 Flow rate

水壓 Water pressure	熱水 Hot (L/min)	冷水 Cold (L/min)	混合水 Mixing (L/min)
1 bar	16.10	15.60	20.60
2 bar	22.10	21.00	28.80
3 bar	25.80	25.40	34.70

DH02GJ

高腳

With Distributor

空轉式

Low Torque Structure Type



陶瓷片技術要求 Technical characteristics of the ceramic discs

材質 Material	AL ₂ O ₃ 92% ~ 96%
表面粗糙度 Surface roughness	Ra 0.1 ~ Ra 0.3 μm
硬度 Hardness	>1000 HV
平面度 Flatness	<0.6 μm

技術規格 Technical characteristics of the cartridge

最大開啟角度 Max. opening angle	24.5°
最大旋轉角度 Max. rotary angle	90°
螺帽扭矩 Recommended nut tightening torque	10 ~ 12 N.m
密封測試 / 耐壓測試 Water resistance pressure	350 ~ 500 psi
最高使用溫度 Max. temperature	90°C (194°F)
壽命測試 Endurance test	500,000 cycles (ASME A112.18.1) 70,000 cycles (EN817)

流量 Flow rate

水壓 Water pressure	熱水 Hot (L/min)	冷水 Cold (L/min)	混合水 Mixing (L/min)
1 bar	16.20	16.60	20.80
2 bar	23.00	23.00	26.80
3 bar	27.00	27.60	33.40

精密陶瓷閥芯-02系列(空轉式-單控閥)

Ceramic Cartridge-02(Low Torque Structure Type - Cold(Hot) Only Type)

GL02GJ-004

低腳

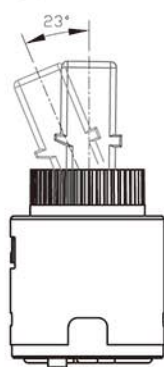
Without Distributor

空轉式

Low Torque Structure Type

單控閥

Cold (Hot) Only Type



陶瓷片技術要求 Technical characteristics of the ceramic discs

材質 Material	AL ₂ O ₃ 92% ~ 96%
表面粗糙度 Surface roughness	Ra 0.1 ~ Ra 0.3 μm
硬度 Hardness	>1000 HV
平面度 Flatness	<0.6 μm

技術規格 Technical characteristics of the cartridge

最大開啟角度 Max. opening angle	23°
螺帽扭矩 Recommended nut tightening torque	7 ~ 8 N.m
密封測試 / 耐壓測試 Water resistance pressure	350 ~ 500 psi
最高使用溫度 Max. temperature	90°C (194°F)
壽命測試 Endurance test	500,000 cycles (ASME A112.18.1) 70,000 cycles (EN817)

流量 Flow rate

水壓 Water pressure	冷/熱水 Cold/Hot (L/min)
1 bar	6.50
2 bar	8.66
3 bar	10.56

GL02GJ-008

低腳

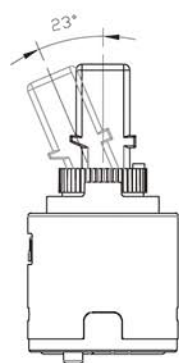
Without Distributor

空轉式

Low Torque Structure Type

單控閥

Cold (Hot) Only Type



陶瓷片技術要求 Technical characteristics of the ceramic discs

材質 Material	AL ₂ O ₃ 92% ~ 96%
表面粗糙度 Surface roughness	Ra 0.1 ~ Ra 0.3 μm
硬度 Hardness	>1000 HV
平面度 Flatness	<0.6 μm

技術規格 Technical characteristics of the cartridge

最大開啟角度 Max. opening angle	23°
螺帽扭矩 Recommended nut tightening torque	7 ~ 8 N.m
密封測試 / 耐壓測試 Water resistance pressure	350 ~ 500 psi
最高使用溫度 Max. temperature	90°C (194°F)
壽命測試 Endurance test	500,000 cycles (ASME A112.18.1) 70,000 cycles (EN817)

流量 Flow rate

水壓 Water pressure	冷/熱水 Cold/Hot (L/min)
1 bar	8.56
2 bar	11.16
3 bar	14

精密陶瓷閥芯-02系列(空轉式-單控閥)

Ceramic Cartridge-02(Low Torque Structure Type - Cold(Hot) Only Type)

GH02GJ-008

高腳

With Distributor

空轉式

Low Torque Structure Type

單控閥

Cold (Hot) Only Type



陶瓷片技術要求 Technical characteristics of the ceramic discs

材質 Material	AL ₂ O ₃ 92% ~ 96%
表面粗糙度 Surface roughness	Ra 0.1 ~ Ra 0.3 μm
硬度 Hardness	>1000 HV
平面度 Flatness	<0.6 μm

技術規格 Technical characteristics of the cartridge

最大開啟角度 Max. opening angle	23°
螺帽扭矩 Recommended nut tightening torque	7 ~ 8 N.m
密封測試 / 耐壓測試 Water resistance pressure	350 ~ 500 psi
最高使用溫度 Max. temperature	90°C (194°F)
壽命測試 Endurance test	500,000 cycles (ASME A112.18.1) 70,000 cycles (EN817)

流量 Flow rate

水壓 Water pressure	冷/熱水 Cold/Hot (L/min)
1 bar	9.90
2 bar	13.80
3 bar	16.60

FL02GJ-390/490

低腳

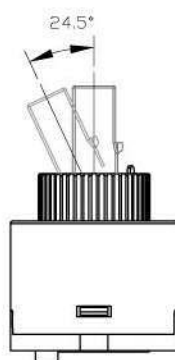
Without Distributor

空轉式

Low Torque Structure Type

單控閥

Cold (Hot) Only Type



陶瓷片技術要求 Technical characteristics of the ceramic discs

材質 Material	AL ₂ O ₃ 92% ~ 96%
表面粗糙度 Surface roughness	Ra 0.1 ~ Ra 0.3 μm
硬度 Hardness	>1000 HV
平面度 Flatness	<0.6 μm

技術規格 Technical characteristics of the cartridge

最大開啟角度 Max. opening angle	24.5°
螺帽扭矩 Recommended nut tightening torque	8 ~ 10 N.m
密封測試 / 耐壓測試 Water resistance pressure	350 ~ 500 psi
最高使用溫度 Max. temperature	90°C (194°F)
壽命測試 Endurance test	500,000 cycles (ASME A112.18.1) 70,000 cycles (EN817)

流量 Flow rate

水壓 Water pressure	冷/熱水 Cold/Hot (L/min)
1 bar	19.19
2 bar	26.40
3 bar	31.92

精密陶瓷閥芯-02系列(空轉式-單控閥)

Ceramic Cartridge-02(Low Torque Structure Type - Cold(Hot) Only Type)

FH02GJ-390/490

高腳

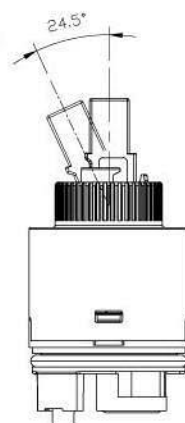
With Distributor

空轉式

Low Torque Structure Type

單控閥

Cold (Hot) Only Type



陶瓷片技術要求 Technical characteristics of the ceramic discs

材質 Material	AL ₂ O ₃ 92% ~ 96%
表面粗糙度 Surface roughness	Ra 0.1 ~ Ra 0.3 μm
硬度 Hardness	>1000 HV
平面度 Flatness	<0.6 μm

技術規格 Technical characteristics of the cartridge

最大開啟角度 Max. opening angle	24.5°
螺帽扭矩 Recommended nut tightening torque	8 ~ 10 N.m
密封測試 / 耐壓測試 Water resistance pressure	350 ~ 500 psi
最高使用溫度 Max. temperature	90°C (194°F)
壽命測試 Endurance test	500,000 cycles (ASME A112.18.1) 70,000 cycles (EN817)

流量 Flow rate

水壓 Water pressure	冷/熱水 Cold/Hot (L/min)
1 bar	18.10
2 bar	24.70
3 bar	29.10

精密陶瓷閥芯-02系列 (空轉式-二段式)

Ceramic Cartridge-02
(Low Torque Structure Type - 2 Steps Type)

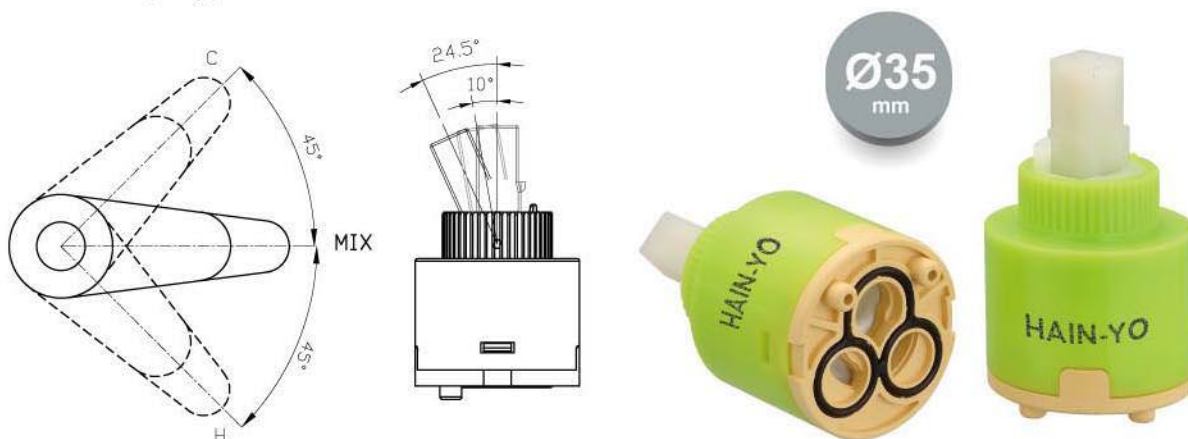
FL02GJ-380/480

低腳

Without Distributor

二段式

2 Steps Type



陶瓷片技術要求 Technical characteristics of the ceramic discs

材質 Material	AL ₂ O ₃ 92% ~ 96%
表面粗糙度 Surface roughness	Ra 0.1 ~ Ra 0.3 μm
硬度 Hardness	>1000 HV
平面度 Flatness	<0.6 μm

技術規格 Technical characteristics of the cartridge

第一段開啟角度 / 最大開啟角度 1st step opening angle / Max. opening angle	10° / 24.5°
最大旋轉角度 Max. rotary angle	90°
螺帽扭矩 Recommended nut tightening torque	8 ~ 10 N.m
密封測試 / 耐壓測試 Water resistance pressure	350 ~ 500 psi
最高使用溫度 Max. temperature	90°C (194°F)
壽命測試 Endurance test	500,000 cycles (ASME A112.18.1) 70,000 cycles (EN817)

流量-第一段開啟 (10°) Flow rate-1st step opening angle (10°)

水壓 Water pressure	熱水 Hot (L/min)	冷水 Cold (L/min)	混合水 Mixing (L/min)
1 bar	5.60	5.30	4.10
2 bar	8.60	8.30	5.30
3 bar	11.20	11.00	8.80

流量-全開 (24.5°) Flow rate-Max. opening angle (24.5°)

水壓 Water pressure	熱水 Hot (L/min)	冷水 Cold (L/min)	混合水 Mixing (L/min)
1 bar	9.00	9.30	11.20
2 bar	14.00	14.20	15.00
3 bar	16.20	17.00	19.00

精密陶瓷閥芯-02系列 (空轉式-二段式)

Ceramic Cartridge-02 (Low Torque Structure Type - 2 Steps Type)

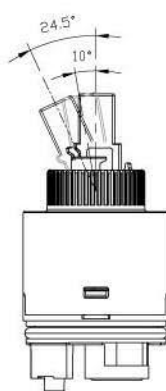
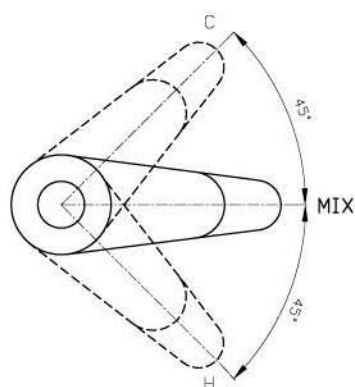
FH02GJ-380/480

高腳

With Distributor

二段式

2 Steps Type



Ø35
mm



陶瓷片技術要求 Technical characteristics of the ceramic discs

材質 Material	AL ₂ O ₃ 92% ~ 96%
表面粗糙度 Surface roughness	Ra 0.1 ~ Ra 0.3 μm
硬度 Hardness	>1000 HV
平面度 Flatness	<0.6 μm

技術規格 Technical characteristics of the cartridge

第一段開啟角度 / 最大開啟角度 1st step opening angle / Max. opening angle	10° / 24.5°
最大旋轉角度 Max. rotary angle	90°
螺帽扭矩 Recommended nut tightening torque	8 ~ 10 N.m
密封測試 / 耐壓測試 Water resistance pressure	350 ~ 500 psi
最高使用溫度 Max. temperature	90°C (194°F)
壽命測試 Endurance test	500,000 cycles (ASME A112.18.1) 70,000 cycles (EN817)

流量-第一段開啟 (10°) Flow rate-1st step opening angle (10°)

水壓 Water pressure	熱水 Hot (L/min)	冷水 Cold (L/min)	混合水 Mixing (L/min)
1 bar	6.30	6.50	4.50
2 bar	8.40	9.10	6.20
3 bar	10.50	10.90	7.50

流量-全開 (24.5°) Flow rate-Max. opening angle (24.5°)

水壓 Water pressure	熱水 Hot (L/min)	冷水 Cold (L/min)	混合水 Mixing (L/min)
1 bar	10.00	10.50	12.10
2 bar	14.00	14.70	16.70
3 bar	16.80	17.80	20.20

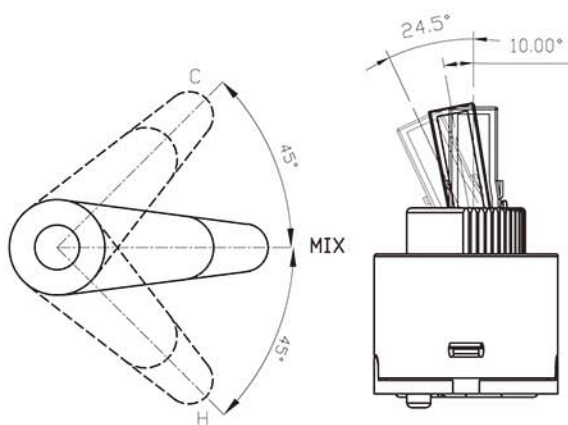
DL02GJ-380/480

低腳

Without Distributor

二段式

2 Steps Type



陶瓷片技術要求 Technical characteristics of the ceramic discs

材質 Material	AL ₂ O ₃ 92% ~ 96%
表面粗糙度 Surface roughness	Ra 0.1 ~ Ra 0.3 μm
硬度 Hardness	>1000 HV
平面度 Flatness	<0.6 μm

技術規格 Technical characteristics of the cartridge

第一段開啟角度 / 最大開啟角度 1st step opening angle / Max. opening angle	10° / 24.5°
最大旋轉角度 Max. rotary angle	90°
螺帽扭矩 Recommended nut tightening torque	10 ~ 12 N.m
密封測試 / 耐壓測試 Water resistance pressure	350 ~ 500 psi
最高使用溫度 Max. temperature	90°C (194°F)
壽命測試 Endurance test	500,000 cycles (ASME A112.18.1) 70,000 cycles (EN817)

流量-第一段開啟 (10°) Flow rate-1st step opening angle (10°)

水壓 Water pressure	熱水 Hot (L/min)	冷水 Cold (L/min)	混合水 Mixing (L/min)
1 bar	4.00	4.60	3.60
2 bar	5.70	6.30	5.10
3 bar	6.80	7.90	6.20

流量-全開 (24.5°) Flow rate-Max. opening angle (24.5°)

水壓 Water pressure	熱水 Hot (L/min)	冷水 Cold (L/min)	混合水 Mixing (L/min)
1 bar	12.00	12.20	16.40
2 bar	16.20	16.40	22.20
3 bar	20.40	20.60	27.00

精密陶瓷閥芯-02系列(空轉式-二段式)

Ceramic Cartridge-02(Low Torque Structure Type - 2 Steps Type)

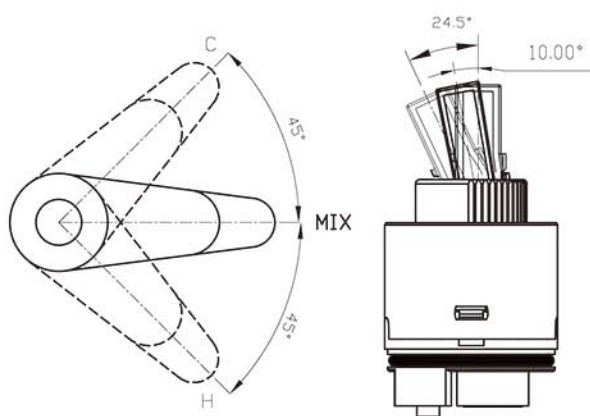
DH02GJ-380/480

高腳

With Distributor

二段式

2 Steps Type



陶瓷片技術要求 Technical characteristics of the ceramic discs

材質 Material	AL ₂ O ₃ 92% ~ 96%
表面粗糙度 Surface roughness	Ra 0.1 ~ Ra 0.3 μm
硬度 Hardness	>1000 HV
平面度 Flatness	<0.6 μm

技術規格 Technical characteristics of the cartridge

第一段開啟角度 / 最大開啟角度 1st step opening angle / Max. opening angle	10° / 24.5°
最大旋轉角度 Max. rotary angle	90°
螺帽扭矩 Recommended nut tightening torque	10 ~ 12 N.m
密封測試 / 耐壓測試 Water resistance pressure	350 ~ 500 psi
最高使用溫度 Max. temperature	90°C (194°F)
壽命測試 Endurance test	500,000 cycles (ASME A112.18.1) 70,000 cycles (EN817)

流量-第一段開啟 (10°) Flow rate-1st step opening angle (10°)

水壓 Water pressure	熱水 Hot (L/min)	冷水 Cold (L/min)	混合水 Mixing (L/min)
1 bar	4.40	4.90	3.30
2 bar	5.90	6.80	4.60
3 bar	7.20	8.20	5.50

流量-全開 (24.5°) Flow rate-Max. opening angle (24.5°)

水壓 Water pressure	熱水 Hot (L/min)	冷水 Cold (L/min)	混合水 Mixing (L/min)
1 bar	12.20	12.40	17.00
2 bar	16.60	17.60	23.20
3 bar	20.40	21.20	28.00

精密陶瓷閥芯-02系列(空轉式-節能閥)

Ceramic Cartridge-02
(Low Torque Structure Type - Energy Saving Type)

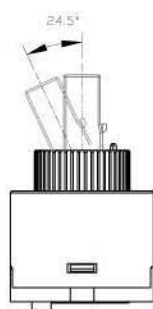
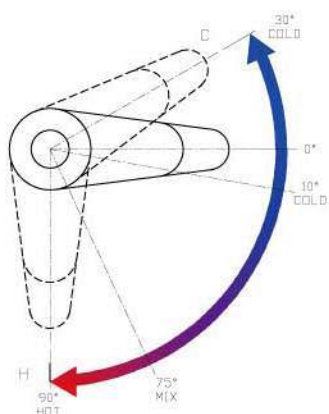
FL02GJ-535

低腳

Without Distributor

節能閥

Energy Saving Type



陶瓷片技術要求 Technical characteristics of the ceramic discs

材質 Material	AL ₂ O ₃ 92% ~ 96%
表面粗糙度 Surface roughness	Ra 0.1 ~ Ra 0.3 μm
硬度 Hardness	>1000 HV
平面度 Flatness	<0.6 μm

技術規格 Technical characteristics of the cartridge

最大開啟角度 Max. opening angle	24.5°
最大旋轉角度 Max. rotary angle	120°
螺帽扭矩 Recommended nut tightening torque	8 ~ 10 N.m
密封測試 / 耐壓測試 Water resistance pressure	350 ~ 500 psi
最高使用溫度 Max. temperature	90°C (194°F)
壽命測試 Endurance test	500,000 cycles (ASME A112.18.1) 70,000 cycles (EN817)

流量 Flow rate

水壓 Water pressure	熱水 Hot (L/min)	中間開啟 middle position 冷水 Cold (L/min)	混合水 Mixing (L/min)
1 bar	10.62	9.62	13.96
2 bar	14.35	13.42	19.40
3 bar	17.28	16.20	22.96

精密陶瓷閥芯-02系列(空轉式-節能閥)

Ceramic Cartridge-02(Low Torque Structure Type - Energy Saving Type)

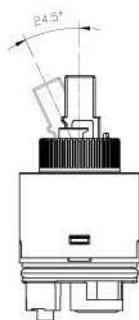
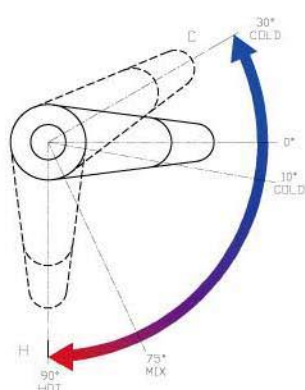
FH02GJ-535

高腳

With Distributor

節能閥

Energy Saving Type



Ø35
mm



陶瓷片技術要求 Technical characteristics of the ceramic discs

材質 Material	AL ₂ O ₃ 92% ~ 96%
表面粗糙度 Surface roughness	Ra 0.1 ~ Ra 0.3 μm
硬度 Hardness	>1000 HV
平面度 Flatness	<0.6 μm

技術規格 Technical characteristics of the cartridge

最大開啟角度 Max. opening angle	24.5°
最大旋轉角度 Max. rotary angle	120°
螺帽扭矩 Recommended nut tightening torque	8 ~ 10 N.m
密封測試 / 耐壓測試 Water resistance pressure	350 ~ 500 psi
最高使用溫度 Max. temperature	90°C (194°F)
壽命測試 Endurance test	500,000 cycles (ASME A112.18.1) 70,000 cycles (EN817)

流量 Flow rate

水壓 Water pressure	熱水 Hot (L/min)	中間開啟 middle position 冷水 Cold (L/min)	混合水 Mixing (L/min)
1 bar	10.84	9.64	14.20
2 bar	14.80	13.48	19.44
3 bar	17.48	16.16	23.60

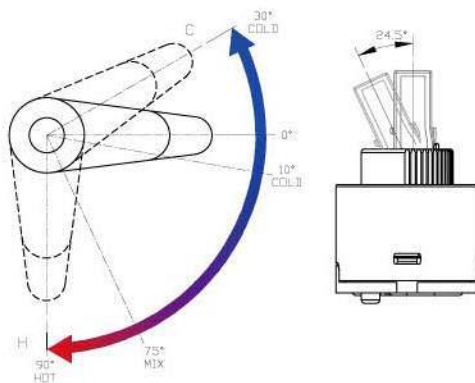
DL02GJ-535

低腳

Without Distributor

節能閥

Energy Saving Type



陶瓷片技術要求 Technical characteristics of the ceramic discs

材質 Material	AL ₂ O ₃ 92% ~ 96%
表面粗糙度 Surface roughness	Ra 0.1 ~ Ra 0.3 μm
硬度 Hardness	>1000 HV
平面度 Flatness	<0.6 μm

技術規格 Technical characteristics of the cartridge

最大開啟角度 Max. opening angle	24.5°
最大旋轉角度 Max. rotary angle	120°
螺帽扭矩 Recommended nut tightening torque	10 ~ 12 N.m
密封測試 / 耐壓測試 Water resistance pressure	350 ~ 500 psi
最高使用溫度 Max. temperature	90°C (194°F)
壽命測試 Endurance test	500,000 cycles (ASME A112.18.1) 70,000 cycles (EN817)

流量 Flow rate

水壓 Water pressure	熱水 Hot (L/min)	中間開啟 middle position 冷水 Cold (L/min)	混合水 Mixing (L/min)
1 bar	11.80	11.10	14.20
2 bar	16.20	15.60	19.60
3 bar	19.40	18.40	23.60

精密陶瓷閥芯-02系列(空轉式-節能閥)

Ceramic Cartridge-02(Low Torque Structure Type - Energy Saving Type)

DH02GJ-535

高腳

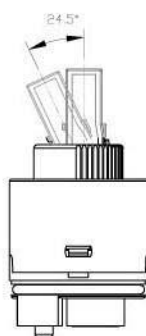
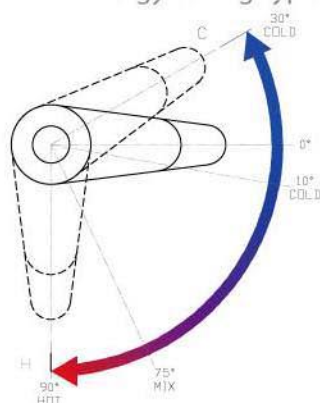
With Distributor

空轉式

Low Torque Structure

節能閥

Energy Saving Type



陶瓷片技術要求 Technical characteristics of the ceramic discs

材質 Material	AL ₂ O ₃ 92% ~ 96%
表面粗糙度 Surface roughness	Ra 0.1 ~ Ra 0.3 μm
硬度 Hardness	>1000 HV
平面度 Flatness	<0.6 μm

技術規格 Technical characteristics of the cartridge

最大開啟角度 Max. opening angle	24.5°
最大旋轉角度 Max. rotary angle	120°
螺帽扭矩 Recommended nut tightening torque	10 ~ 12 N.m
密封測試 / 耐壓測試 Water resistance pressure	350 ~ 500 psi
最高使用溫度 Max. temperature	90°C (194°F)
壽命測試 Endurance test	500,000 cycles (ASME A112.18.1) 70,000 cycles (EN817)

流量 Flow rate

水壓 Water pressure	熱水 Hot (L/min)	中間開啟 middle position 冷水 Cold (L/min)	混合水 Mixing (L/min)
1 bar	11.60	10.50	16.20
2 bar	16.20	14.40	22.00
3 bar	19.20	17.40	26.00

FL02GJ-555

低腳

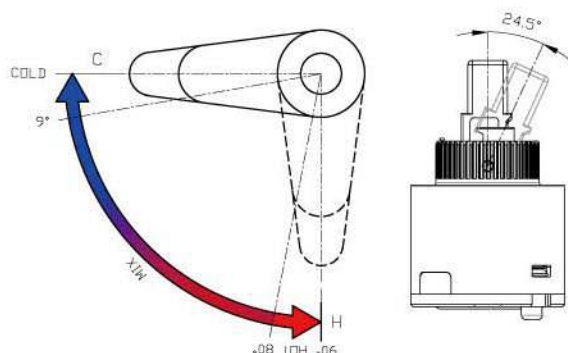
Without Distributor

空轉式

Low Torque Structure

廚房用節能閥

Energy Saving Type (for Kitchen Faucet)



陶瓷片技術要求 Technical characteristics of the ceramic discs

材質 Material	AL ₂ O ₃ 92% ~ 96%
表面粗糙度 Surface roughness	Ra 0.1 ~ Ra 0.3 μm
硬度 Hardness	>1000 HV
平面度 Flatness	<0.6 μm

技術規格 Technical characteristics of the cartridge

最大開啟角度 Max. opening angle	24.5°
最大旋轉角度 Max. rotary angle	逆時針 Anti-clockwise 90°
螺帽扭矩 Recommended nut tightening torque	8 ~ 10 N.m
密封測試 / 耐壓測試 Water resistance pressure	350 ~ 500 psi
最高使用溫度 Max. temperature	90°C (194°F)
壽命測試 Endurance test	500,000 cycles (ASME A112.18.1) 70,000 cycles (EN817)

流量 Flow rate

水壓 Water pressure	熱水 Hot (L/min)	中間開啟 middle position 冷水 Cold (L/min)	混合水 Mixing (L/min)
1 bar	10.40	10.20	13.60
2 bar	14.20	13.80	18.80
3 bar	16.80	16.20	22.50

精密陶瓷閥芯-02系列(空轉式-厚底部墊圈)

Ceramic Cartridge-02(Low Torque Structure Type - Thick Base Seal Type)

FL02GJ-802

低腳

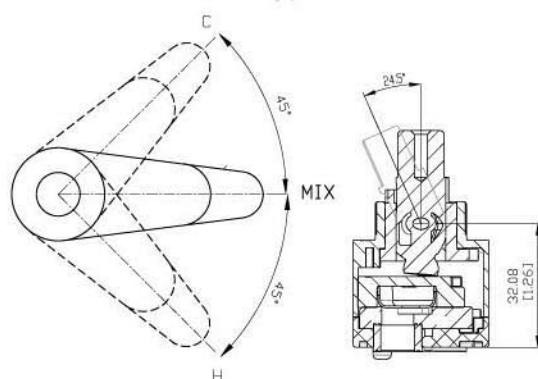
Without Distributor

空轉式

Low Torque Structure Type

厚底部墊圈

Thick Base Seal Type



陶瓷片技術要求 Technical characteristics of the ceramic discs

材質 Material	AL ₂ O ₃ 92% ~ 96%
表面粗糙度 Surface roughness	Ra 0.1 ~ Ra 0.3 μm
硬度 Hardness	>1000 HV
平面度 Flatness	<0.6 μm

技術規格 Technical characteristics of the cartridge

最大開啟角度 Max. opening angle	24.5°
最大旋轉角度 Max. rotary angle	90°
螺帽扭矩 Recommended nut tightening torque	8 ~ 10 N.m
密封測試 / 耐壓測試 Water resistance pressure	350 ~ 500 psi
最高使用溫度 Max. temperature	90°C (194°F)
壽命測試 Endurance test	500,000 cycles (ASME A112.18.1) 70,000 cycles (EN817)

流量 Flow rate

水壓 Water pressure	熱水 Hot (L/min)	冷水 Cold (L/min)	混合水 Mixing (L/min)
1 bar	13.30	13.60	16.80
2 bar	18.00	19.11	22.30
3 bar	20.30	22.90	27.80

DL02GJ-802

低腳

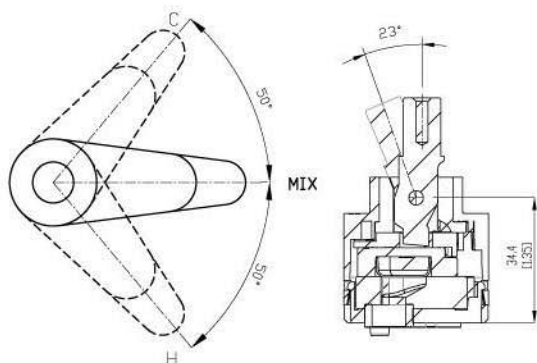
Without Distributor

空轉式

Low Torque Structure Type

厚底部墊圈

Thick Base Seal Type



陶瓷片技術要求 Technical characteristics of the ceramic discs

材質 Material	AL ₂ O ₃ 92% ~ 96%
表面粗糙度 Surface roughness	Ra 0.1 ~ Ra 0.3 μm
硬度 Hardness	>1000 HV
平面度 Flatness	<0.6 μm

技術規格 Technical characteristics of the cartridge

最大開啟角度 Max. opening angle	23°
最大旋轉角度 Max. rotary angle	100°
螺帽扭矩 Recommended nut tightening torque	10 ~ 12 N.m
密封測試 / 耐壓測試 Water resistance pressure	350 ~ 500 psi
最高使用溫度 Max. temperature	90°C (194°F)
壽命測試 Endurance test	500,000 cycles (ASME A112.18.1) 70,000 cycles (EN817)

流量 Flow rate

水壓 Water pressure	熱水 Hot (L/min)	冷水 Cold (L/min)	混合水 Mixing (L/min)
1 bar	15.10	14.90	15.80
2 bar	20.00	20.60	21.60
3 bar	21.80	24.70	25.90

精密陶瓷閥芯-02系列(空轉式-反向進水)

Ceramic Cartridge-02(Low Torque Structure Type - Outlet In Front)

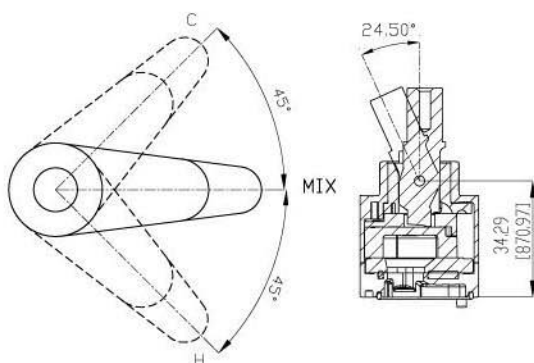
FL02GJ-850

低腳

Without Distributor

反向進水

Outlet in Front Cartridge



陶瓷片技術要求 Technical characteristics of the ceramic discs

材質 Material	AL ₂ O ₃ 92% ~ 96%
表面粗糙度 Surface roughness	Ra 0.1 ~ Ra 0.3 μm
硬度 Hardness	>1000 HV
平面度 Flatness	<0.6 μm

技術規格 Technical characteristics of the cartridge

最大開啟角度 Max. opening angle	24.5°
最大旋轉角度 Max. rotary angle	90°
螺帽扭矩 Recommended nut tightening torque	8 ~ 10 N.m
密封測試 / 耐壓測試 Water resistance pressure	350 ~ 500 psi
最高使用溫度 Max. temperature	90°C (194°F)
壽命測試 Endurance test	500,000 cycles (ASME A112.18.1) 70,000 cycles (EN817)

流量 Flow rate

水壓 Water pressure	熱水 Hot (L/min)	冷水 Cold (L/min)	混合水 Mixing (L/min)
1 bar	6.60	8.00	10.50
2 bar	9.60	11.00	15.00
3 bar	11.40	13.60	18.00

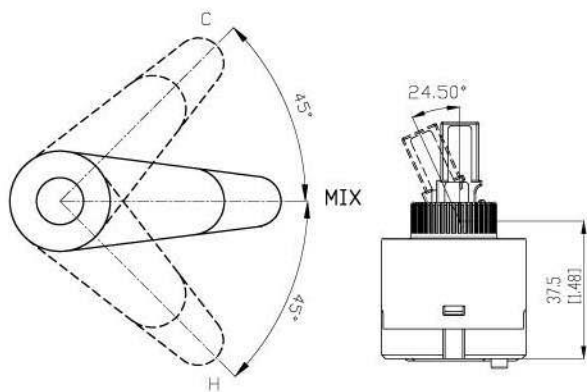
DL02GJ-850

低腳

Without Distributor

反向進水

Outlet in Front Cartridge



陶瓷片技術要求 Technical characteristics of the ceramic discs

材質 Material	AL ₂ O ₃ 92% ~ 96%
表面粗糙度 Surface roughness	Ra 0.1 ~ Ra 0.3 μm
硬度 Hardness	>1000 HV
平面度 Flatness	<0.6 μm

技術規格 Technical characteristics of the cartridge

最大開啟角度 Max. opening angle	24.5°
最大旋轉角度 Max. rotary angle	90°
螺帽扭矩 Recommended nut tightening torque	10 ~ 12 N.m
密封測試 / 耐壓測試 Water resistance pressure	350 ~ 500 psi
最高使用溫度 Max. temperature	90°C (194°F)
壽命測試 Endurance test	500,000 cycles (ASME A112.18.1) 70,000 cycles (EN817)

流量 Flow rate

水壓 Water pressure	熱水 Hot (L/min)	冷水 Cold (L/min)	混合水 Mixing (L/min)
1 bar	8.40	8.80	12.20
2 bar	11.20	12.20	16.60
3 bar	13.80	15.00	20.40

精密陶瓷閥芯-04系列(搖桿式)

Ceramic Cartridge-04(Joystick Type)

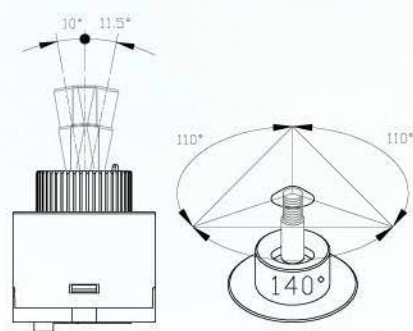
FL04BD

低腳

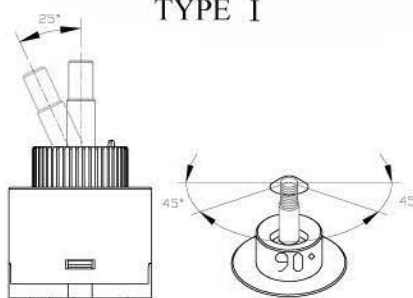
Without Distributor

搖桿式

Joystick Type



TYPE I



TYPE II

陶瓷片技術要求 Technical characteristics of the ceramic discs

材質 Material	AL ₂ O ₃ 92% ~ 96%
表面粗糙度 Surface roughness	Ra 0.1 ~ Ra 0.3 μm
硬度 Hardness	>1000 HV
平面度 Flatness	<0.6 μm

技術規格 Technical characteristics of the cartridge

最大開啟角度 Max. opening angle	21.5°/25°
最大旋轉角度 Max. rotary angle	360°/180°
螺帽扭矩 Recommended nut tightening torque	8 ~ 10 N.m
密封測試 / 耐壓測試 Water resistance pressure	350 ~ 500 psi
最高使用溫度 Max. temperature	90°C (194°F)
壽命測試 Endurance test	500,000 cycles (ASME A112.18.1) 70,000 cycles (EN817)

流量-TYPE I 開啟角度(21.5°) Flow rate-TYPE I opening angle (21.5°)

水壓 Water pressure	熱水 Hot (L/min)	冷水 Cold (L/min)	混合水 Mixing (L/min)
1 bar	5.84	6.52	14.84
2 bar	7.72	9.64	20.80
3 bar	9.32	11.40	24.72

流量-TYPE II 開啟角度(25°) Flow rate-TYPE II opening angle (25°)

水壓 Water pressure	熱水 Hot (L/min)	冷水 Cold (L/min)	混合水 Mixing (L/min)
1 bar	6.00	6.44	13.56
2 bar	7.92	9.00	19.32
3 bar	9.56	10.50	22.80

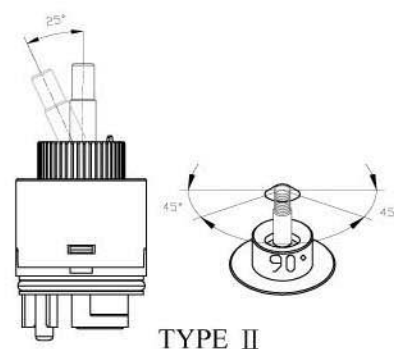
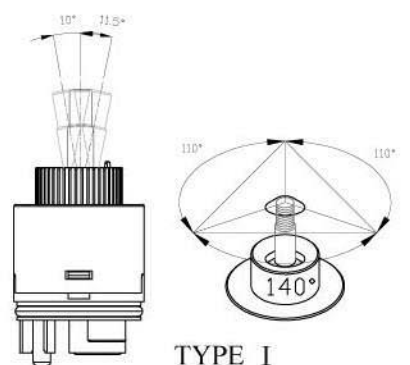
FH04BD

高腳

With Distributor

搖桿式

Joystick Type



陶瓷片技術要求 Technical characteristics of the ceramic discs

材質 Material	AL ₂ O ₃ 92% ~ 96%
表面粗糙度 Surface roughness	Ra 0.1 ~ Ra 0.3 μm
硬度 Hardness	>1000 HV
平面度 Flatness	<0.6 μm

技術規格 Technical characteristics of the cartridge

最大開啟角度 Max. opening angle	21.5°/25°
最大旋轉角度 Max. rotary angle	360°/180°
螺帽扭矩 Recommended nut tightening torque	8 ~ 10 N.m
密封測試 / 耐壓測試 Water resistance pressure	350 ~ 500 psi
最高使用溫度 Max. temperature	90°C (194°F)
壽命測試 Endurance test	500,000 cycles (ASME A112.18.1) 70,000 cycles (EN817)

流量-TYPE I 開啟角度(21.5°) Flow rate-TYPE I opening angle (21.5°)

水壓 Water pressure	熱水 Hot (L/min)	冷水 Cold (L/min)	混合水 Mixing (L/min)
1 bar	6.12	6.32	15.92
2 bar	8.56	8.76	21.00
3 bar	10.20	10.40	24.76

流量-TYPE II 開啟角度(25°) Flow rate-TYPE II opening angle (25°)

水壓 Water pressure	熱水 Hot (L/min)	冷水 Cold (L/min)	混合水 Mixing (L/min)
1 bar	6.52	6.48	15.60
2 bar	8.68	9.00	21.60
3 bar	10.40	10.50	25.40

精密陶瓷閥芯-04系列(搖桿式)

Ceramic Cartridge-04(Joystick Type)

DL04BD

低腳

Without Distributor

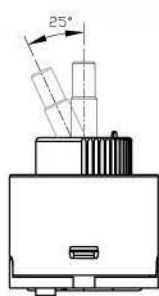
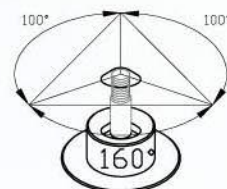
搖桿式

Joystick Type

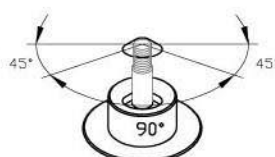
Ø40
mm



TYPE I



TYPE II



陶瓷片技術要求 Technical characteristics of the ceramic discs

材質 Material	AL ₂ O ₃ 92% ~ 96%
表面粗糙度 Surface roughness	Ra 0.1 ~ Ra 0.3 μm
硬度 Hardness	>1000 HV
平面度 Flatness	<0.6 μm

技術規格 Technical characteristics of the cartridge

最大開啟角度 Max. opening angle	21.5°/25°
最大旋轉角度 Max. rotary angle	360°/180°
螺帽扭矩 Recommended nut tightening torque	10 ~ 12 N.m
密封測試 / 耐壓測試 Water resistance pressure	350 ~ 500 psi
最高使用溫度 Max. temperature	90°C (194°F)
壽命測試 Endurance test	500,000 cycles (ASME A112.18.1) 70,000 cycles (EN817)

流量-TYPE I 開啟角度(21.5°) Flow rate-TYPE I opening angle (21.5°)

水壓 Water pressure	熱水 Hot (L/min)	冷水 Cold (L/min)	混合水 Mixing (L/min)
1 bar	6.52	5.84	14.84
2 bar	8.96	7.72	20.80
3 bar	10.76	9.32	24.72

流量-TYPE II 開啟角度(25°) Flow rate-TYPE II opening angle (25°)

水壓 Water pressure	熱水 Hot (L/min)	冷水 Cold (L/min)	混合水 Mixing (L/min)
1 bar	5.80	6.00	13.84
2 bar	8.28	8.20	19.00
3 bar	10.00	10.00	22.48

DH04BD

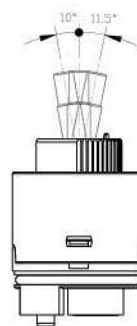
高腳

With Distributor

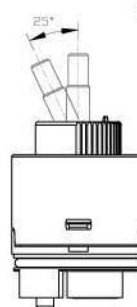
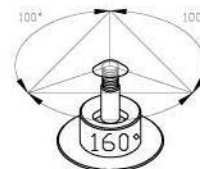
搖桿式

Joystick Type

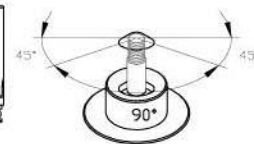
Ø40
mm



TYPE I



TYPE II



陶瓷片技術要求 Technical characteristics of the ceramic discs

材質 Material	AL ₂ O ₃ 92% ~ 96%
表面粗糙度 Surface roughness	Ra 0.1 ~ Ra 0.3 μm
硬度 Hardness	>1000 HV
平面度 Flatness	<0.6 μm

技術規格 Technical characteristics of the cartridge

最大開啟角度 Max. opening angle	21.5°/25°
最大旋轉角度 Max. rotary angle	360°/180°
螺帽扭矩 Recommended nut tightening torque	10 ~ 12 N.m
密封測試 / 耐壓測試 Water resistance pressure	350 ~ 500 psi
最高使用溫度 Max. temperature	90°C (194°F)
壽命測試 Endurance test	500,000 cycles (ASME A112.18.1) 70,000 cycles (EN817)

流量-TYPE I 開啟角度(21.5°) Flow rate-TYPE I opening angle (21.5°)

水壓 Water pressure	熱水 Hot (L/min)	冷水 Cold (L/min)	混合水 Mixing (L/min)
1 bar	6.16	7.08	14.84
2 bar	8.40	9.60	20.56
3 bar	10.08	11.56	24.52

流量-TYPE II 開啟角度(25°) Flow rate-TYPE II opening angle (25°)

水壓 Water pressure	熱水 Hot (L/min)	冷水 Cold (L/min)	混合水 Mixing (L/min)
1 bar	6.00	6.48	15.60
2 bar	8.20	9.00	21.60
3 bar	9.84	10.50	25.40

精密陶瓷閥芯-05系列(背對背) Ceramic Cartridge-05(Back to Back 180° Reverse)

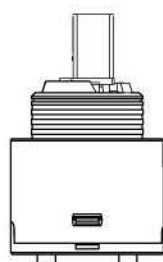
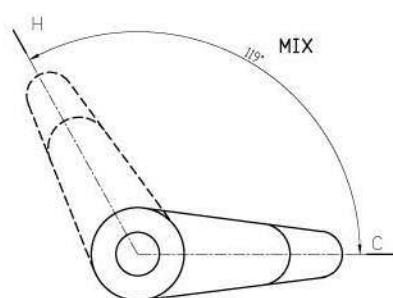
DL05BJ

低腳

Without Distributor

背對背

Back to Back 180° Reverse



陶瓷片技術要求 Technical characteristics of the ceramic discs

材質 Material	AL ₂ O ₃ 92% ~ 96%
表面粗糙度 Surface roughness	Ra 0.1 ~ Ra 0.3 μm
硬度 Hardness	>1000 HV
平面度 Flatness	<0.6 μm

技術規格 Technical characteristics of the cartridge

最大旋轉角度 Max. rotary angle	119°
螺帽扭矩 Recommended nut tightening torque	10 ~ 12 N.m
密封測試 / 耐壓測試 Water resistance pressure	350 ~ 500 psi
最高使用溫度 Max. temperature	90°C (194°F)
壽命測試 Endurance test	500,000 cycles (ASME A112.18.1) 70,000 cycles (EN817)

流量 Flow rate

水壓 Water pressure	混合水 Mixing (L/min)
1 bar	14.70
2 bar	20.50
3 bar	25.50

精密陶瓷閥芯-11系列(旋轉式)

Ceramic Cartridge-11(Rotary Type)

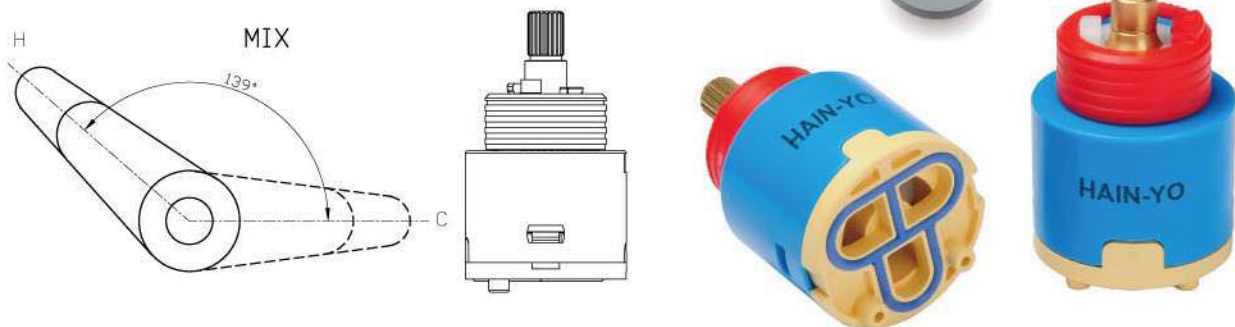
FL11BD

低腳

Without Distributor

旋轉式

Rotary Type



陶瓷片技術要求 Technical characteristics of the ceramic discs

材質 Material	AL ₂ O ₃ 92% ~ 96%
表面粗糙度 Surface roughness	Ra 0.1 ~ Ra 0.3 μm
硬度 Hardness	>1000 HV
平面度 Flatness	<0.6 μm

技術規格 Technical characteristics of the cartridge

最大旋轉角度 Max. rotary angle	139°
螺帽扭矩 Recommended nut tightening torque	8 ~ 10 N.m
密封測試 / 耐壓測試 Water resistance pressure	350 ~ 500 psi
最高使用溫度 Max. temperature	90°C (194°F)
壽命測試 Endurance test	500,000 cycles (ASME A112.18.1) 70,000 cycles (EN817)

流量 Flow rate

水壓 Water pressure	熱水 Hot (L/min)	冷水 Cold (L/min)	混合水 Mixing (L/min)
1 bar	8.16	8.00	12.32
2 bar	11.08	10.84	19.04
3 bar	13.48	13.12	23.08

精密陶瓷閥芯-11系列(旋轉式)

Ceramic Cartridge-11(Rotary Type)

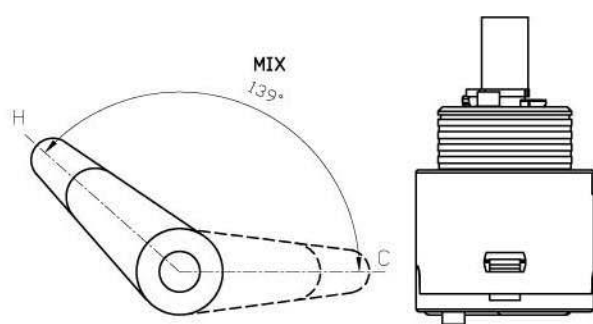
DL11BJ

低腳

Without Distributor

旋轉式

Rotary Type



陶瓷片技術要求 Technical characteristics of the ceramic discs

材質 Material	AL ₂ O ₃ 92% ~ 96%
表面粗糙度 Surface roughness	Ra 0.1 ~ Ra 0.3 μm
硬度 Hardness	>1000 HV
平面度 Flatness	<0.6 μm

技術規格 Technical characteristics of the cartridge

最大旋轉角度 Max. rotary angle	139°
螺帽扭矩 Recommended nut tightening torque	10 ~ 12 N.m
密封測試 / 耐壓測試 Water resistance pressure	350 ~ 500 psi
最高使用溫度 Max. temperature	90°C (194°F)
壽命測試 Endurance test	500,000 cycles (ASME A112.18.1) 70,000 cycles (EN817)

流量 Flow rate

水壓 Water pressure	熱水 Hot (L/min)	冷水 Cold (L/min)	混合水 Mixing (L/min)
1 bar	9.92	8.72	15.92
2 bar	13.48	12.24	21.26
3 bar	16.32	14.72	26.40

精密陶瓷閥芯-12系列(側出水)

Ceramic Cartridge-12(House Open Type)

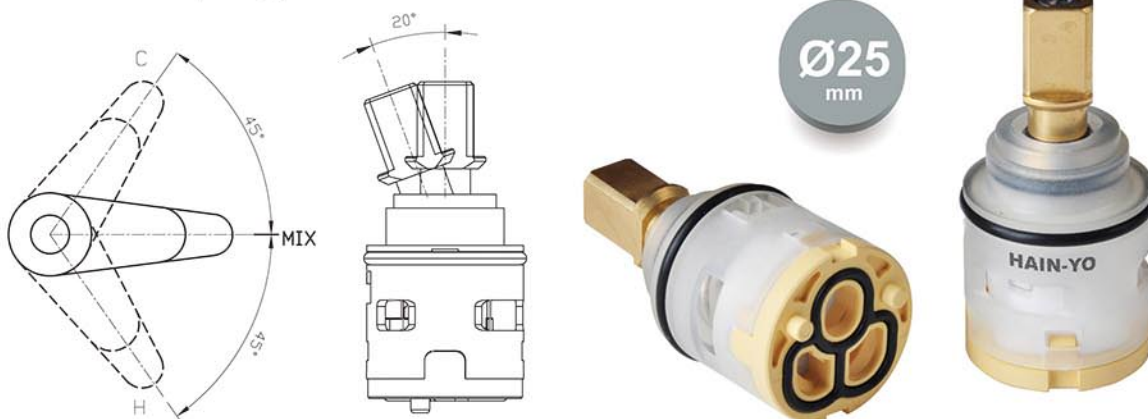
GL12TD-009

低腳

Without Distributor

側出水

House Open Type



陶瓷片技術要求 Technical characteristics of the ceramic discs

材質 Material	AL ₂ O ₃ 92% ~ 96%
表面粗糙度 Surface roughness	Ra 0.1 ~ Ra 0.3 μm
硬度 Hardness	>1000 HV
平面度 Flatness	<0.6 μm

技術規格 Technical characteristics of the cartridge

最大開啟角度 Max. opening angle	20°
最大旋轉角度 Max. rotary angle	90°
螺帽扭矩 Recommended nut tightening torque	7 ~ 8 N.m
密封測試 / 耐壓測試 Water resistance pressure	350 ~ 500 psi
最高使用溫度 Max. temperature	90°C (194°F)
壽命測試 Endurance test	500,000 cycles (ASME A112.18.1) 70,000 cycles (EN817)

流量 Flow rate

水壓 Water pressure	熱水 Hot (L/min)	冷水 Cold (L/min)	混合水 Mixing (L/min)
1 bar	8.50	8.50	9.20
2 bar	11.70	11.70	12.40
3 bar	14.10	14.10	16.30

精密陶瓷閥芯-12系列(側出水) Ceramic Cartridge-12(House Open Type)

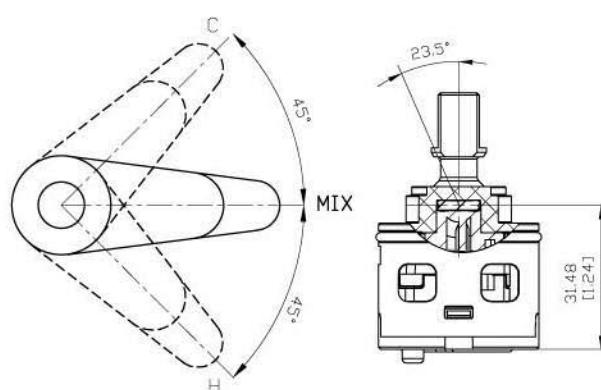
FL12TD

低腳

Without Distributor

側出水

House Open Type



陶瓷片技術要求 Technical characteristics of the ceramic discs

材質 Material	AL ₂ O ₃ 92% ~ 96%
表面粗糙度 Surface roughness	Ra 0.1 ~ Ra 0.3 μm
硬度 Hardness	>1000 HV
平面度 Flatness	<0.6 μm

技術規格 Technical characteristics of the cartridge

最大開啟角度 Max. opening angle	23.5°
最大旋轉角度 Max. rotary angle	90°
螺帽扭矩 Recommended nut tightening torque	8 ~ 10 N.m
密封測試 / 耐壓測試 Water resistance pressure	350 ~ 500 psi
最高使用溫度 Max. temperature	90°C (194°F)
壽命測試 Endurance test	500,000 cycles (ASME A112.18.1) 70,000 cycles (EN817)

流量 Flow rate

水壓 Water pressure	熱水 Hot (L/min)	冷水 Cold (L/min)	混合水 Mixing (L/min)
1 bar	15.80	15.80	21.00
2 bar	21.52	21.52	28.80
3 bar	26.40	26.40	34.60

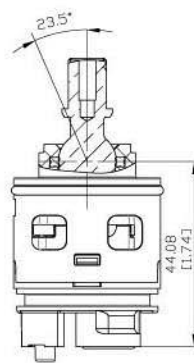
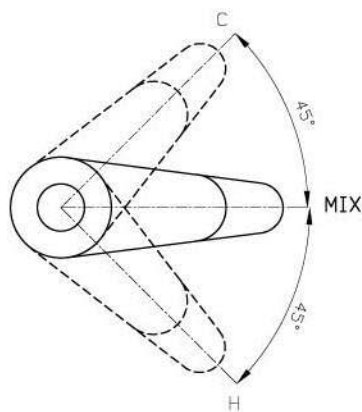
FH12TD

高腳

With Distributor

側出水

House Open Type



陶瓷片技術要求 Technical characteristics of the ceramic discs

材質 Material	AL ₂ O ₃ 92% ~ 96%
表面粗糙度 Surface roughness	Ra 0.1 ~ Ra 0.3 μm
硬度 Hardness	>1000 HV
平面度 Flatness	<0.6 μm

技術規格 Technical characteristics of the cartridge

最大開啟角度 Max. opening angle	23.5°
最大旋轉角度 Max. rotary angle	90°
螺帽扭矩 Recommended nut tightening torque	8 ~ 10 N.m
密封測試 / 耐壓測試 Water resistance pressure	350 ~ 500 psi
最高使用溫度 Max. temperature	90°C (194°F)
壽命測試 Endurance test	500,000 cycles (ASME A112.18.1) 70,000 cycles (EN817)

流量 Flow rate

水壓 Water pressure	熱水 Hot (L/min)	冷水 Cold (L/min)	混合水 Mixing (L/min)
1 bar	13.52	13.40	19.92
2 bar	17.44	17.94	27.04
3 bar	21.00	21.64	33.36

精密陶瓷閥芯-12系列(側出水) Ceramic Cartridge-12(House Open Type)

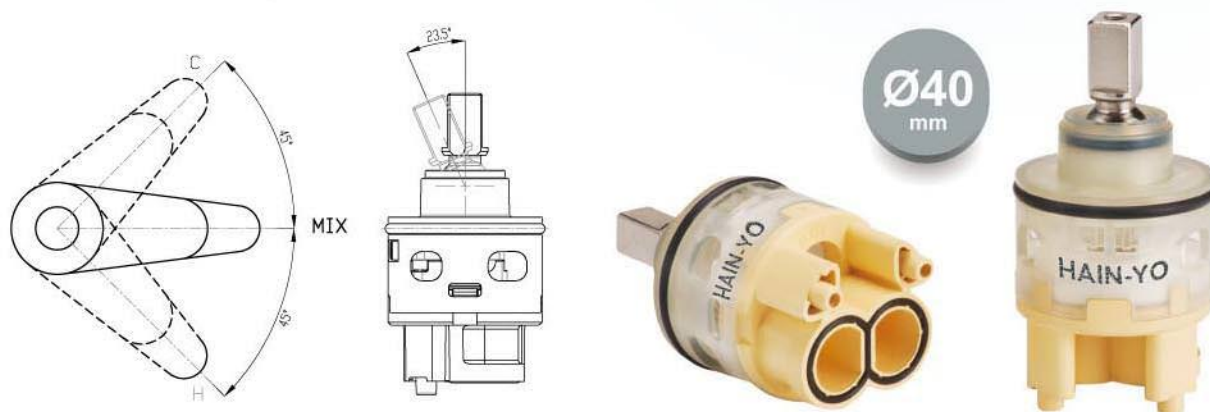
DH12TD

高腳

With Distributor

側出水

House Open Type



陶瓷片技術要求 Technical characteristics of the ceramic discs

材質 Material	AL ₂ O ₃ 92% ~ 96%
表面粗糙度 Surface roughness	Ra 0.1 ~ Ra 0.3 μm
硬度 Hardness	>1000 HV
平面度 Flatness	<0.6 μm

技術規格 Technical characteristics of the cartridge

最大開啟角度 Max. opening angle	23.5°
最大旋轉角度 Max. rotary angle	90°
螺帽扭矩 Recommended nut tightening torque	10 ~ 12 N.m
密封測試 / 耐壓測試 Water resistance pressure	350 ~ 500 psi
最高使用溫度 Max. temperature	90°C (194°F)
壽命測試 Endurance test	500,000 cycles (ASME A112.18.1) 70,000 cycles (EN817)

流量 Flow rate

水壓 Water pressure	熱水 Hot (L/min)	冷水 Cold (L/min)	混合水 Mixing (L/min)
1 bar	16.69	16.68	27.76
2 bar	22.77	22.76	38.28
3 bar	28.31	28.32	45.44

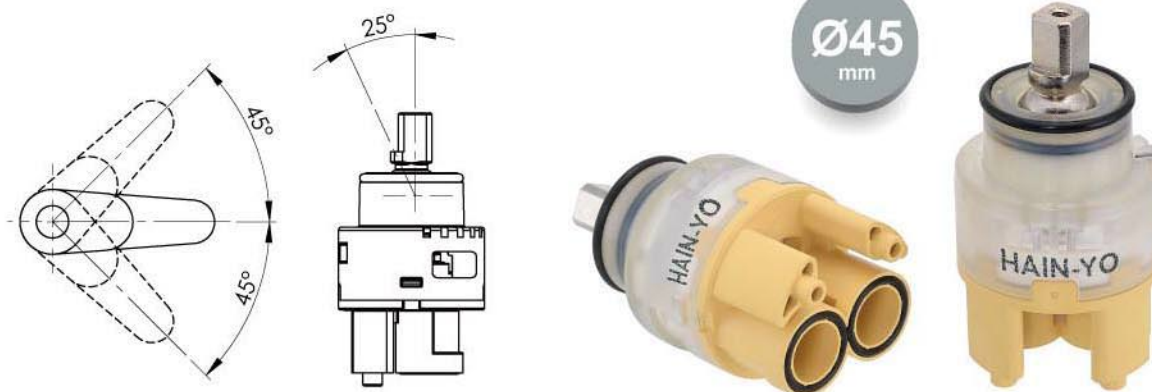
EH12TD

高腳

With Distributor

側出水

House Open Type



陶瓷片技術要求 Technical characteristics of the ceramic discs

材質 Material	AL ₂ O ₃ 92% ~ 96%
表面粗糙度 Surface roughness	Ra 0.1 ~ Ra 0.3 μm
硬度 Hardness	>1000 HV
平面度 Flatness	<0.6 μm

技術規格 Technical characteristics of the cartridge

最大開啟角度 Max. opening angle	25°
最大旋轉角度 Max. rotary angle	90°
螺帽扭矩 Recommended nut tightening torque	10 ~ 12 N.m
密封測試 / 耐壓測試 Water resistance pressure	350 ~ 500 psi
最高使用溫度 Max. temperature	90°C (194°F)
壽命測試 Endurance test	500,000 cycles (ASME A112.18.1) 70,000 cycles (EN817)

流量 Flow rate

水壓 Water pressure	熱水 Hot (L/min)	冷水 Cold (L/min)	混合水 Mixing (L/min)
1 bar	16.24	15.20	27.72
2 bar	21.84	20.70	37.88
3 bar	27.98	27.80	47.50

精密陶瓷閥芯-16系列(上封水-標準/單控閥)

Ceramic Cartridge-16 (Side-Outlet Type - Standard / Cold(Hot) Only Type)

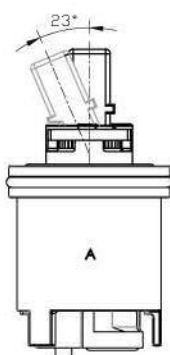
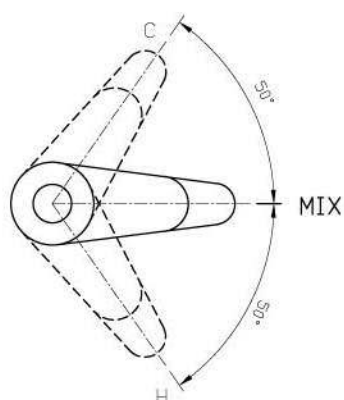
WH16GJ

高腳

With Distributor

上封水

Side-Outlet Type



陶瓷片技術要求 Technical characteristics of the ceramic discs

材質 Material	AL ₂ O ₃ 92% ~ 96%
表面粗糙度 Surface roughness	Ra 0.1 ~ Ra 0.3 μm
硬度 Hardness	>1000 HV
平面度 Flatness	<0.6 μm

技術規格 Technical characteristics of the cartridge

最大開啟角度 Max. opening angle	23°
最大旋轉角度 Max. rotary angle	100°
螺帽扭矩 Recommended nut tightening torque	6 ~ 7 N.m
密封測試 / 耐壓測試 Water resistance pressure	350 ~ 500 psi
最高使用溫度 Max. temperature	90°C (194°F)
壽命測試 Endurance test	500,000 cycles (ASME A112.18.1) 70,000 cycles (EN817)

流量 Flow rate

水壓 Water pressure	熱水 Hot (L/min)	冷水 Cold (L/min)	混合水 Mixing (L/min)
1 bar	4.80	4.89	5.40
2 bar	8.39	8.46	9.04
3 bar	10.29	10.45	11.59

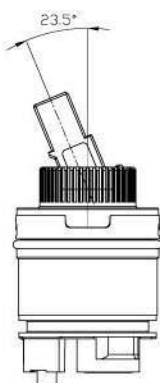
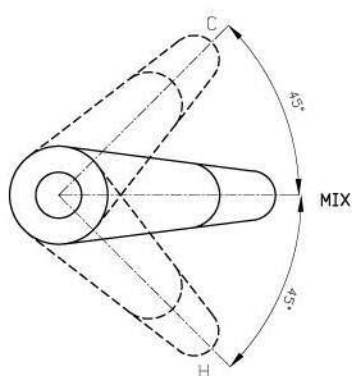
FH16GJ

高腳

With Distributor

上封水

Side-Outlet Type



陶瓷片技術要求 Technical characteristics of the ceramic discs

材質 Material	AL ₂ O ₃ 92% ~ 96%
表面粗糙度 Surface roughness	Ra 0.1 ~ Ra 0.3 μm
硬度 Hardness	>1000 HV
平面度 Flatness	<0.6 μm

技術規格 Technical characteristics of the cartridge

最大開啟角度 Max. opening angle	23.5°
最大旋轉角度 Max. rotary angle	90°
螺帽扭矩 Recommended nut tightening torque	8 ~ 10 N.m
密封測試 / 耐壓測試 Water resistance pressure	350 ~ 500 psi
最高使用溫度 Max. temperature	90°C (194°F)
壽命測試 Endurance test	500,000 cycles (ASME A112.18.1) 70,000 cycles (EN817)

流量 Flow rate

水壓 Water pressure	熱水 Hot (L/min)	冷水 Cold (L/min)	混合水 Mixing (L/min)
1 bar	13.40	12.60	18.80
2 bar	18.00	17.10	25.10
3 bar	21.00	20.30	33.10

精密陶瓷閥芯-16系列(上封水-標準/單控閥)

Ceramic Cartridge-16 (Side-Outlet Type - Standard / Cold(Hot) Only Type)

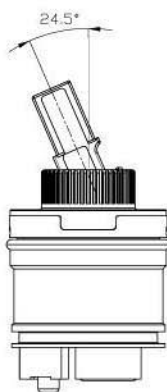
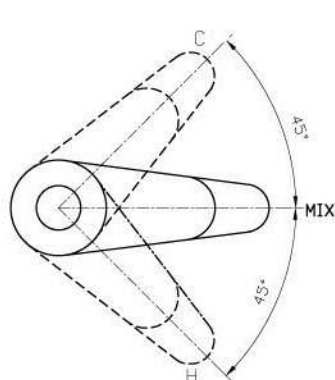
DH16GJ

高腳

With Distributor

上封水

Side-Outlet Type



陶瓷片技術要求 Technical characteristics of the ceramic discs

材質 Material	AL ₂ O ₃ 92% ~ 96%
表面粗糙度 Surface roughness	Ra 0.1 ~ Ra 0.3 μm
硬度 Hardness	>1000 HV
平面度 Flatness	<0.6 μm

技術規格 Technical characteristics of the cartridge

最大開啟角度 Max. opening angle	24.5°
最大旋轉角度 Max. rotary angle	90°
螺帽扭矩 Recommended nut tightening torque	10 ~ 12 N.m
密封測試 / 耐壓測試 Water resistance pressure	350 ~ 500 psi
最高使用溫度 Max. temperature	90°C (194°F)
壽命測試 Endurance test	500,000 cycles (ASME A112.18.1) 70,000 cycles (EN817)

流量 Flow rate

水壓 Water pressure	熱水 Hot (L/min)	冷水 Cold (L/min)	混合水 Mixing (L/min)
1 bar	15.50	15.30	20.80
2 bar	20.70	21.10	28.60
3 bar	24.20	24.90	34.90

FH16GJ-090 / 190

高腳

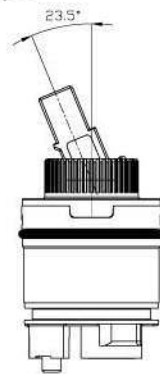
With Distributor

上封水

Side-Outlet Type

單控閥

Cold(Hot) Only Type



陶瓷片技術要求 Technical characteristics of the ceramic discs

材質 Material	AL ₂ O ₃ 92% ~ 96%
表面粗糙度 Surface roughness	Ra 0.1 ~ Ra 0.3 μm
硬度 Hardness	>1000 HV
平面度 Flatness	<0.6 μm

技術規格 Technical characteristics of the cartridge

最大開啟角度 Max. opening angle	23.5°
螺帽扭矩 Recommended nut tightening torque	8 ~ 10 N.m
密封測試 / 耐壓測試 Water resistance pressure	350 ~ 500 psi
最高使用溫度 Max. temperature	90°C (194°F)
壽命測試 Endurance test	500,000 cycles (ASME A112.18.1) 70,000 cycles (EN817)

流量 Flow rate

水壓 Water pressure	冷/熱水 Cold/Hot (L/min)
1 bar	17.36
2 bar	23.84
3 bar	28.76

精密陶瓷閥芯-17系列(接管式-標準/側入側出/單控閥/節能閥)

Ceramic Cartridge-17(Connected Pipe Type - Standard / Side In Side Out / Cold(Hot) Only / Energy Saving Type)

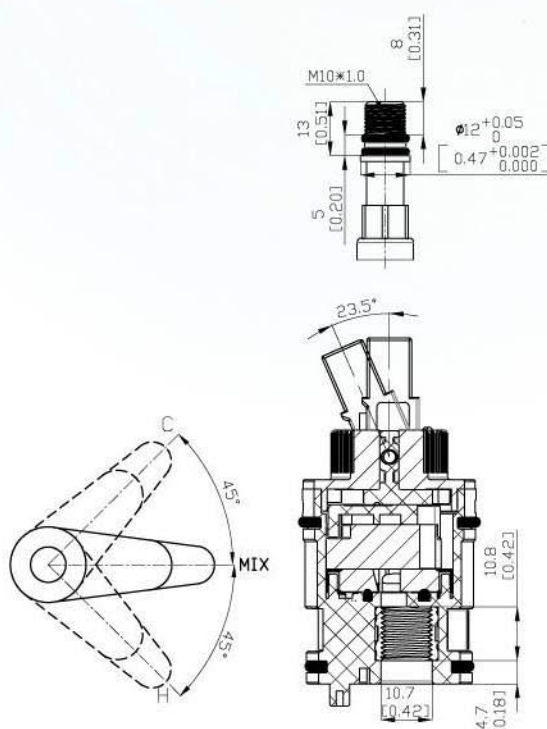
FH17GJ

高腳

With Distributor

接管式

Connected Pipe Type



陶瓷片技術要求 Technical characteristics of the ceramic discs

材質 Material	AL ₂ O ₃ 92% ~ 96%
表面粗糙度 Surface roughness	Ra 0.1 ~ Ra 0.3 μm
硬度 Hardness	>1000 HV
平面度 Flatness	<0.6 μm

技術規格 Technical characteristics of the cartridge

最大開啟角度 Max. opening angle	23.5°
最大旋轉角度 Max. rotary angle	90°
螺帽扭矩 Recommended nut tightening torque	8 ~ 10 N.m
密封測試 / 耐壓測試 Water resistance pressure	350 ~ 500 psi
最高使用溫度 Max. temperature	90°C (194°F)
壽命測試 Endurance test	500,000 cycles (ASME A112.18.1) 70,000 cycles (EN817)

流量 Flow rate

水壓 Water pressure	熱水 Hot (L/min)	冷水 Cold (L/min)	混合水 Mixing (L/min)
1 bar	11.00	11.40	16.00
2 bar	15.20	15.40	22.00
3 bar	18.60	18.80	26.60

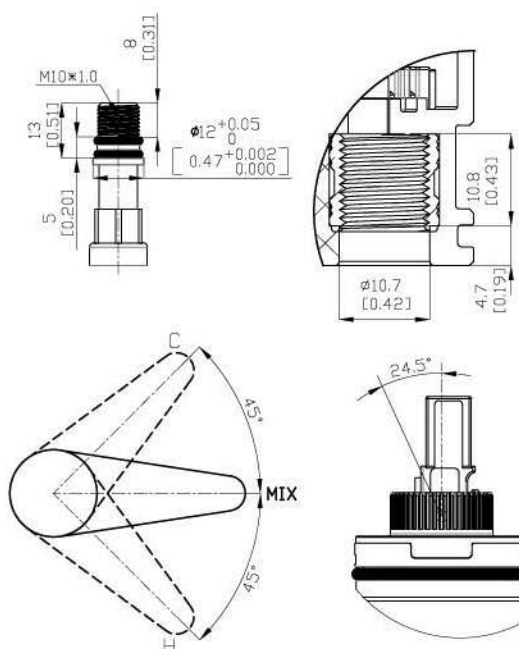
DH17GJ

高腳

With Distributor

接管式

Connected Pipe Type



陶瓷片技術要求 Technical characteristics of the ceramic discs

材質 Material	AL ₂ O ₃ 92% ~ 96%
表面粗糙度 Surface roughness	Ra 0.1 ~ Ra 0.3 μm
硬度 Hardness	>1000 HV
平面度 Flatness	<0.6 μm

技術規格 Technical characteristics of the cartridge

最大開啟角度 Max. opening angle	24.5°
最大旋轉角度 Max. rotary angle	90°
螺帽扭矩 Recommended nut tightening torque	10 ~ 12 N.m
密封測試 / 耐壓測試 Water resistance pressure	350 ~ 500 psi
最高使用溫度 Max. temperature	90°C (194°F)
壽命測試 Endurance test	500,000 cycles (ASME A112.18.1) 70,000 cycles (EN817)

流量 Flow rate

水壓 Water pressure	熱水 Hot (L/min)	冷水 Cold (L/min)	混合水 Mixing (L/min)
1 bar	13.32	13.64	15.28
2 bar	18.32	18.00	21.52
3 bar	21.44	21.60	27.20

Ceramic Cartridge-17(Connected Pipe Type - Standard / Side In Side Out / Cold(Hot) Only / Energy Saving Type)

高腳

接管式

側入側出

Side In Side Out



技術規格 Technical characteristics of the cartridge

流量 Flow rate

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FH17GJ-090 / 190

高腳

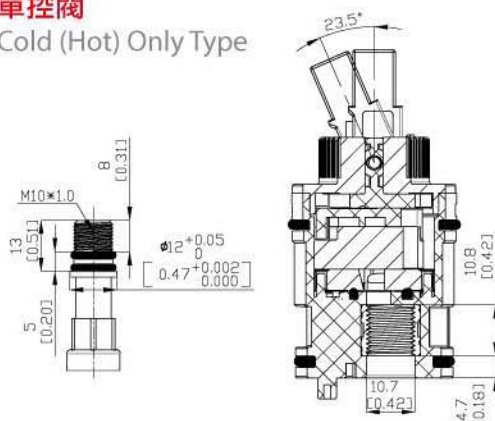
With Distributor

接管式

Connected Pipe Type

單控閥

Cold (Hot) Only Type



陶瓷片技術要求 Technical characteristics of the ceramic discs

材質 Material	AL ₂ O ₃ 92% ~ 96%
表面粗糙度 Surface roughness	Ra 0.1 ~ Ra 0.3 μm
硬度 Hardness	>1000 HV
平面度 Flatness	<0.6 μm

技術規格 Technical characteristics of the cartridge

最大開啟角度 Max. opening angle	23.5°
螺帽扭矩 Recommended nut tightening torque	8 ~ 10 N.m
密封測試 / 耐壓測試 Water resistance pressure	350 ~ 500 psi
最高使用溫度 Max. temperature	90°C (194°F)
壽命測試 Endurance test	500,000 cycles (ASME A112.18.1) 70,000 cycles (EN817)

流量 Flow rate

水壓 Water pressure	冷/熱水 Cold/Hot (L/min)
1 bar	16.00
2 bar	22.00
3 bar	26.60

精密陶瓷閥芯-17系列(接管式-標準/側入側出/單控閥/節能閥)

Ceramic Cartridge-17(Connected Pipe Type - Standard / Side In Side Out / Cold(Hot) Only / Energy Saving Type)

FH17GJ-530

高腳

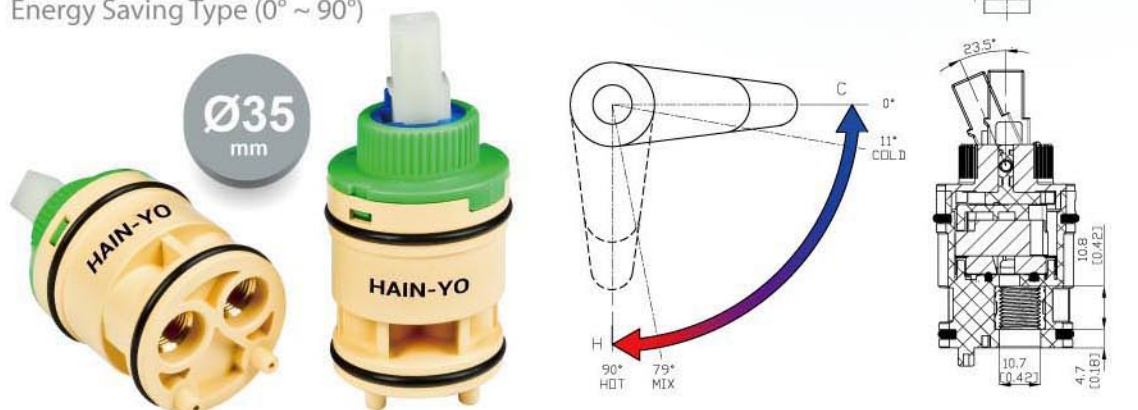
With Distributor

接管式

Connected Pipe Type

節能閥 (0 ~ 90度)

Energy Saving Type (0° ~ 90°)



陶瓷片技術要求 Technical characteristics of the ceramic discs

材質 Material	Al ₂ O ₃ 92% ~ 96%
表面粗糙度 Surface roughness	Ra 0.1 ~ Ra 0.3 μm
硬度 Hardness	>1000 HV
平面度 Flatness	<0.6 μm

技術規格 Technical characteristics of the cartridge

最大開啟角度 Max. opening angle	23.5°
最大旋轉角度 Max. rotary angle	90°
螺帽扭矩 Recommended nut tightening torque	8 ~ 10 N.m
密封測試 / 耐壓測試 Water resistance pressure	350 ~ 500 psi
最高使用溫度 Max. temperature	90°C (194°F)
壽命測試 Endurance test	500,000 cycles (ASME A112.18.1) 70,000 cycles (EN817)

流量 Flow rate

水壓 Water pressure	熱水 Hot (L/min)	冷水 Cold (L/min)	混合水 Mixing (L/min)
1 bar	11.20	10.08	15.20
2 bar	15.10	13.30	20.90
3 bar	20.60	17.00	25.40

FH17GJ-540 / 640

高腳

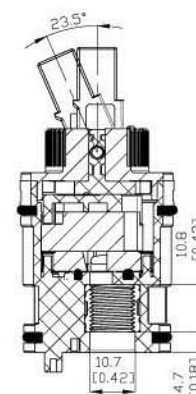
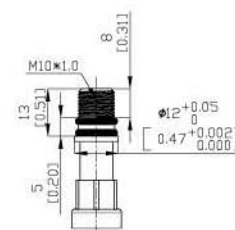
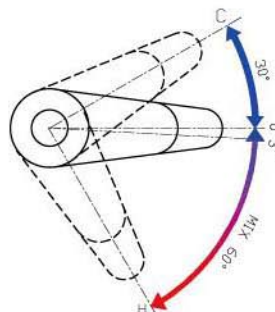
With Distributor

接管式

Connected Pipe Type

節能閥 (30度/60度)

Energy Saving Type (30°/60°)



陶瓷片技術要求 Technical characteristics of the ceramic discs

材質 Material	AL ₂ O ₃ 92% ~ 96%
表面粗糙度 Surface roughness	Ra 0.1 ~ Ra 0.3 μm
硬度 Hardness	>1000 HV
平面度 Flatness	<0.6 μm

技術規格 Technical characteristics of the cartridge

最大開啟角度 Max. opening angle	23.5°
最大旋轉角度 Max. rotary angle	90°
螺帽扭矩 Recommended nut tightening torque	8 ~ 10 N.m
密封測試 / 耐壓測試 Water resistance pressure	350 ~ 500 psi
最高使用溫度 Max. temperature	90°C (194°F)
壽命測試 Endurance test	500,000 cycles (ASME A112.18.1) 70,000 cycles (EN817)

流量 Flow rate

水壓 Water pressure	熱水 Hot (L/min)	冷水 Cold (L/min)	混合水 Mixing (L/min)
1 bar	11.60	12.00	14.60
2 bar	16.00	16.80	18.80
3 bar	18.80	20.00	22.20

精密陶瓷閥芯-18系列(分水器)

Ceramic Cartridge-18 (Diverter Cartridge)

KL18GJ-001/002

一分三

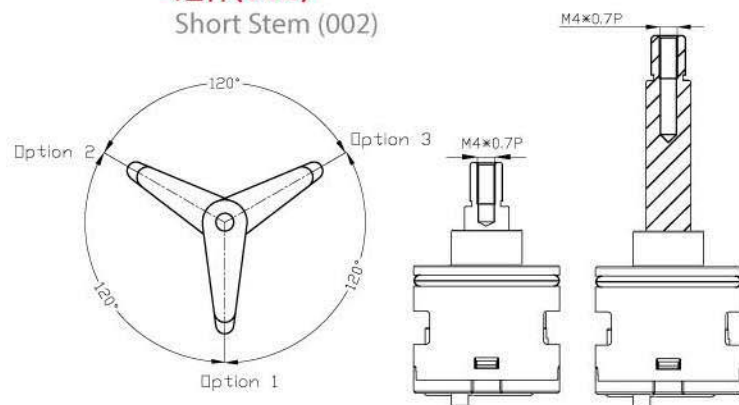
3-Way Diverter

長桿(001)

Long Stem (001)

短桿(002)

Short Stem (002)



陶瓷片技術要求 Technical characteristics of the ceramic discs

材質 Material	AL ₂ O ₃ 92% ~ 96%
表面粗糙度 Surface roughness	Ra 0.1 ~ Ra 0.3 μm
硬度 Hardness	>1000 HV
平面度 Flatness	<0.6 μm

技術規格 Technical characteristics of the cartridge

最大旋轉角度 Max. rotary angle	360°
螺帽扭矩 Recommended nut tightening torque	8 ~ 10 N.m
密封測試 / 耐壓測試 Water resistance pressure	350 ~ 500 psi
最高使用溫度 Max. temperature	90°C (194°F)
壽命測試 Endurance test	≥ 15,000 cycles (ASME A112.18.1)

流量 Flow rate

水壓 Water pressure	流量 Flow rate (L/min)
1 bar	17.00
2 bar	22.70
3 bar	25.50

FL18GJ-001/002

一分四

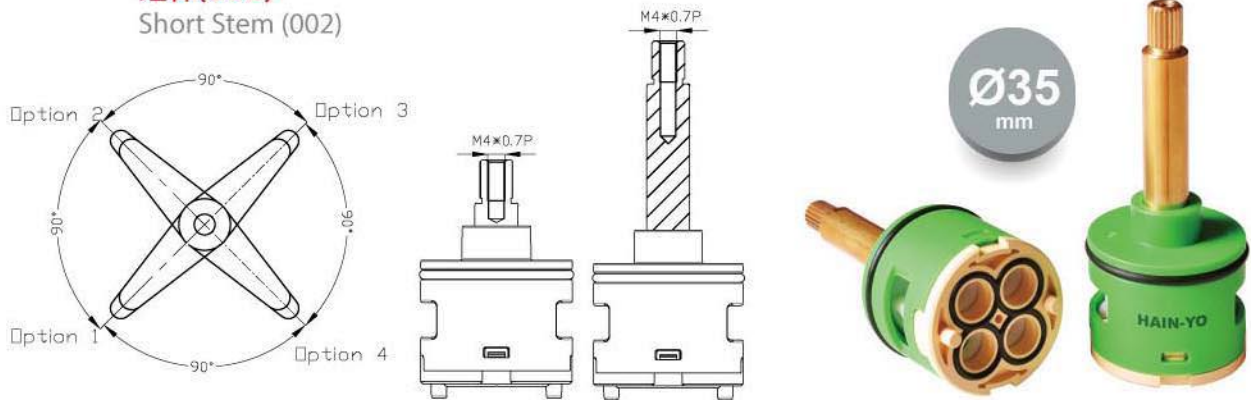
4-Way Diverter

長桿(001)

Long Stem (001)

短桿(002)

Short Stem (002)



陶瓷片技術要求 Technical characteristics of the ceramic discs

材質 Material	AL ₂ O ₃ 92% ~ 96%
表面粗糙度 Surface roughness	Ra 0.1 ~ Ra 0.3 μm
硬度 Hardness	>1000 HV
平面度 Flatness	<0.6 μm

技術規格 Technical characteristics of the cartridge

最大旋轉角度 Max. rotary angle	360°
螺帽扭矩 Recommended nut tightening torque	8 ~ 10 N.m
密封測試 / 耐壓測試 Water resistance pressure	350 ~ 500 psi
最高使用溫度 Max. temperature	90°C (194°F)
壽命測試 Endurance test	≥ 15,000 cycles (ASME A112.18.1)

流量 Flow rate

水壓 Water pressure	流量 Flow rate (L/min)
1 bar	17.00
2 bar	22.70
3 bar	25.50

精密陶瓷閥芯-19系列(花灑&浴缸 混水分水器<兩進兩出>)

Ceramic Cartridge-19(Bath & Shower Diverter Cartridge)

FL19GJ

低腳

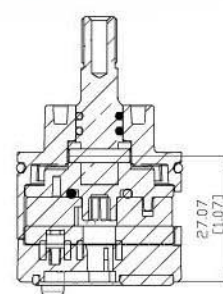
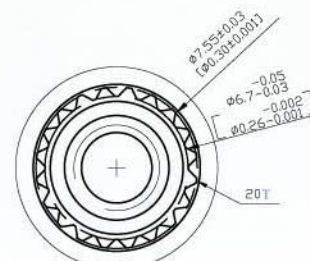
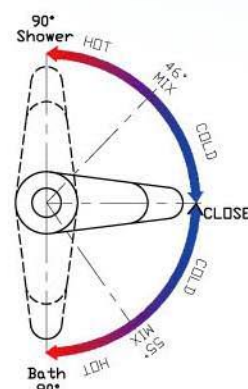
Without Distributor

兩進兩出

Bath & Shower Diverter Cartridge

側出底出

Side & Bottom outlet



陶瓷片技術要求 Technical characteristics of the ceramic discs

材質 Material	AL ₂ O ₃ 92% ~ 96%
表面粗糙度 Surface roughness	Ra 0.1 ~ Ra 0.3 μm
硬度 Hardness	>1000 HV
平面度 Flatness	<0.6 μm

技術規格 Technical characteristics of the cartridge

浴缸最大旋轉角度Max. rotary angle in bath position(clockwise)	90°
花灑最大旋轉角度Max. rotary angle in shower position(counterclockwise)	90°
螺帽扭矩 Recommended nut tightening torque	8 ~ 10 N.m
密封測試 / 耐壓測試 Water resistance pressure	350 ~ 500 psi
最高使用溫度 Max. temperature	90°C (194°F)
壽命測試 Endurance test	500,000 cycles (ASME A112.18.1) 70,000 cycles (EN817)

流量-花灑/底出 Flow rate-Shower Position/Bottom Outlet

水壓 Water pressure	熱水 Hot (L/min)	冷水 Cold (L/min)	混合水 Mixing (L/min)
1 bar	4.60	5.82	8.20
2 bar	6.02	7.88	11.36
3 bar	7.44	9.64	13.88

流量-浴缸/側出 Flow rate-Bath Position/Side Outlet

水壓 Water pressure	熱水 Hot (L/min)	冷水 Cold (L/min)	混合水 Mixing (L/min)
1 bar	9.08	9.36	12.76
2 bar	12.24	12.76	17.16
3 bar	14.64	17.48	20.80

DL19GJ

低腳

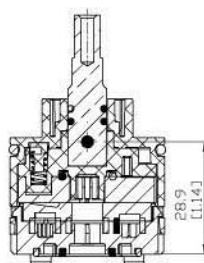
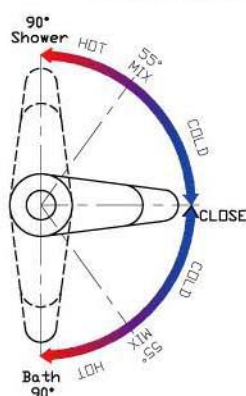
Without Distributor

兩進兩出

Bath & Shower Diverter Cartridge

側出底出

Side & Bottom outlet



陶瓷片技術要求 Technical characteristics of the ceramic discs

材質 Material	AL ₂ O ₃ 92% ~ 96%
表面粗糙度 Surface roughness	Ra 0.1 ~ Ra 0.3 μm
硬度 Hardness	>1000 HV
平面度 Flatness	<0.6 μm

技術規格 Technical characteristics of the cartridge

浴缸最大旋轉角度 Max. rotary angle in bath position (clockwise)	90°
花灑最大旋轉角度 Max. rotary angle in shower position (counterclockwise)	90°
螺帽扭矩 Recommended nut tightening torque	10 ~ 12 N.m
密封測試 / 耐壓測試 Water resistance pressure	350 ~ 500 psi
最高使用溫度 Max. temperature	90°C (194°F)
壽命測試 Endurance test	500,000 cycles (ASME A112.18.1) 70,000 cycles (EN817)

流量-花灑/底出 Flow rate-Shower Position/Bottom Outlet

水壓 Water pressure	熱水 Hot (L/min)	冷水 Cold (L/min)	混合水 Mixing (L/min)
1 bar	4.50	4.20	8.20
2 bar	8.00	5.60	11.40
3 bar	9.40	6.70	13.80

流量-浴缸/側出 Flow rate-Bath Position/Side Outlet

水壓 Water pressure	熱水 Hot (L/min)	冷水 Cold (L/min)	混合水 Mixing (L/min)
1 bar	9.20	10.20	15.80
2 bar	12.20	14.20	21.80
3 bar	15.10	16.70	26.10

精密陶瓷閥芯-19系列(花灑&浴缸 混水分水器<兩進兩出>)

Ceramic Cartridge-19(Bath & Shower Diverter Cartridge)

DH19GJ

高腳

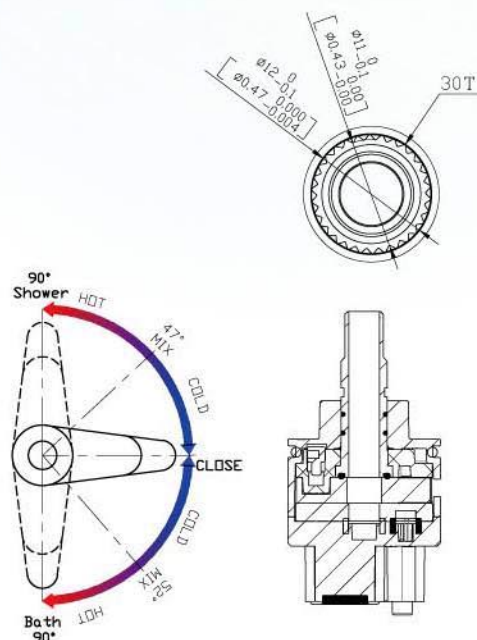
With Distributor

兩進兩出

Bath & Shower Diverter Cartridge

側出頂出

Side & Top Outlet



陶瓷片技術要求 Technical characteristics of the ceramic discs

材質 Material	AL ₂ O ₃ 92% ~ 96%
表面粗糙度 Surface roughness	Ra 0.1 ~ Ra 0.3 μm
硬度 Hardness	>1000 HV
平面度 Flatness	<0.6 μm

技術規格 Technical characteristics of the cartridge

浴缸最大旋轉角度Max. rotary angle in bath position(clockwise)	90°
花灑最大旋轉角度Max. rotary angle in shower position(counterclockwise)	90°
螺帽扭矩 Recommended nut tightening torque	10 ~ 12 N.m
密封測試 / 耐壓測試 Water resistance pressure	350 ~ 500 psi
最高使用溫度 Max. temperature	90°C (194°F)
壽命測試 Endurance test	500,000 cycles (ASME A112.18.1) 70,000 cycles (EN817)

流量-花灑/側出 Flow rate-Shower Position/Side Outlet

水壓 Water pressure	熱水 Hot (L/min)	冷水 Cold (L/min)	混合水 Mixing (L/min)
1 bar	9.28	11.80	20.64
2 bar	12.88	16.00	28.64
3 bar	15.12	19.48	33.60

流量-浴缸/頂出 Flow rate-Bath Position/Top Outlet

水壓 Water pressure	熱水 Hot (L/min)	冷水 Cold (L/min)	混合水 Mixing (L/min)
1 bar	9.18	9.60	12.52
2 bar	13.00	12.80	17.40
3 bar	15.64	15.40	21.12

精密陶瓷閥芯-19系列

(二合一閥芯(飲用水(RO)+自來水)<三進兩出>)

Ceramic Cartridge-19

(2 in 1 Ceramic Cartridge(RO+Raw Water))

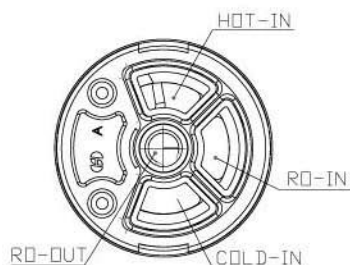
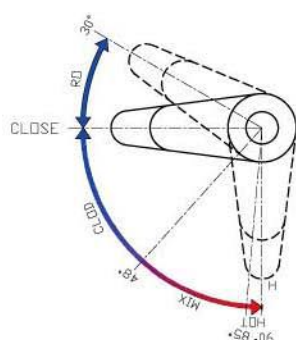
FL19GJ-006 / 106

低腳

Without Distributor

三進兩出

2 in 1 Ceramic Cartridge(RO+Raw Water)



陶瓷片技術要求 Technical characteristics of the ceramic discs

材質 Material	AL ₂ O ₃ 92% ~ 96%
表面粗糙度 Surface roughness	Ra 0.1 ~ Ra 0.3 μm
硬度 Hardness	>1000 HV
平面度 Flatness	<0.6 μm

技術規格 Technical characteristics of the cartridge

飲用水最大旋轉角度(順時針)Max. rotary angle in Drinking Water(clockwise)	30°
自來水最大旋轉角度(逆時針)Max. rotary angle in RAW Water (counterclockwise)	90°
螺帽扭矩 Recommended nut tightening torque	8 ~ 10 N.m
密封測試 / 耐壓測試 Water resistance pressure	350 ~ 500 psi
最高使用溫度 Max. temperature	90°C (194°F)
壽命測試 Endurance test	≥500,000 cycles (ASME A112.18.1)

流量-RO飲用水 Flow rate-Drinking Water

水壓 Water pressure	流量 Flow rate (L/min)
1 bar	5.80
2 bar	8.00
3 bar	9.60

流量-自來水 Flow rate-Raw Water

水壓 Water pressure	熱水 Hot (L/min)	冷水 Cold (L/min)	混合水 Mixing (L/min)
1 bar	7.10	7.20	8.80
2 bar	9.90	10.00	12.10
3 bar	11.90	12.30	14.80



翰優企業有限公司
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