



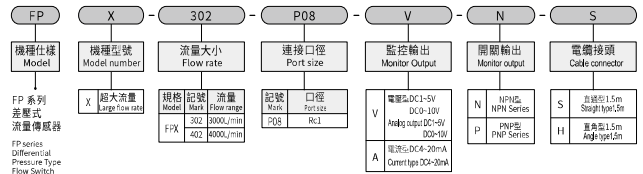
FPX 系列 數位式大型流量傳感器(差壓型) 操作說明書

FPX Series - Flow Meter User Manual

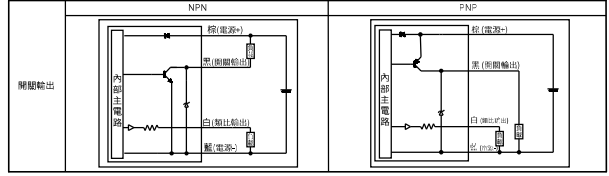
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FP 訂購稱呼代號 Code of Order



輸出選擇 Output signal selection

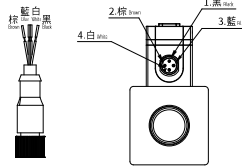


確認開關狀態NPN或PNP型,並依需求選擇

輸出訊號 Output signal selection	電壓型 Voltage type	DC1-5V / DC0-10V (Switch)
輸出阻抗 load impedance	電流型 Current type	DC4-20mA
	電壓型 Voltage type	50kΩ
	電流型 Current type	300Ω

輸出訊號具電壓及電流,請確認輸出訊號,並依需求選擇

FPX電纜線材規格表 Specification



PIN	顏色 Color	內容 Content
01 <td>黑 Black</td> <td>開關輸出 switch output: max:50mA</td>	黑 Black	開關輸出 switch output: max:50mA
02 <td>棕 Brown</td> <td>電源Power+(24V)</td>	棕 Brown	電源Power+(24V)
03 <td>藍 Blue</td> <td>電源Power-(GND)</td>	藍 Blue	電源Power-(GND)
04 <td>白 White</td> <td>電壓輸出Voltage output:1-5V or 0-10V 電流輸出Load impedance:4-20mA</td>	白 White	電壓輸出Voltage output:1-5V or 0-10V 電流輸出Load impedance:4-20mA

使用安全事項與警告

使用安全警告與注意事項分為「危險」、「警告」、「注意」。

危險: 表示如果進行操作,有可能導致死亡或重傷的危險內容並且危險發生時的緊急性(緊急程度)高的情況。
警告: 表示如果進行錯誤操作,有可能導致死亡或重傷的危險內容。
注意: 表示如果進行錯誤操作,有可能導致輕傷或財產損失的危險內容。

關於使用流體

危險

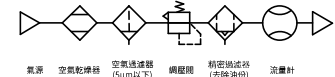
嚴禁用於易燃性氣體。

注意

- 請使用不含氯、硫磺、磷等腐蝕成分的乾燥氣體,且不含灰塵及油類的乾淨氣體。
- 使用壓力範圍,請參考規格書之額定範圍內使用,否則會影響感測器的使用壽命。
- 含大量液體的壓縮空氣會造成本產品或其他氣動元件不良的原因,請設置後冷卻器、空氣乾燥器、冷凝水收集器等對策。
- 由於空壓機產生的過多碳粉會附著在本產品內部,成為動作不良的原因。
- 各系列的前置性不同,選擇時請多加注意。
- 請遵守測定流量、使用壓力。(使用規範以外的壓力會造成產品損壞)

警告

- 不能作為商用儀表使用。
- 不適用於計量法(因此請不要用於商業交易,請做為工業用感測器使用)。
- 除使用液體之外的液體由於不能保證其精度,因此請不要使用。
- 請先確認溫度調節後,再讓液體流動。(以免施加超過額定應力的限制,導致損傷)
- 感測器的一次側使用期間,請使用禁油規格的潤滑油,否則可能因潤滑油飛濺造成感測器失靈或破裂。
- 使用破碎器等液化氣體時,請務必氣化後使用(因為液化的氣體進入本產品可能導致產品故障)。
- 液體中可能含有雜質,請將過濾器設置於前端。(建議空氣過濾)



關於佈線

危險

- 電源電壓及輸出給使用規格電壓。(如超出規格以上之電壓,則可能造成本產品受損或觸電,最嚴重可能會導致起火)

警告

- 請勿負載對錶。(本產品有加過載保護,但無法保護所有錯誤配線,所以請多加注意配線)
- 請確認配線上的絕緣性。
- 請勿把電力線與動力線合為同一配線。
- 請採用不同配線以免含開關的控制迴路產生干擾而造成錯誤動作的原因。
- 請勿在通電中進行配線。(以免造成連接器損壞或觸電風險)
- 設置本產品及配線時,請遠離電流電線等雜訊源,而加載於電源線的突波線另外採取防護對策,否則可能造成顯示或輸出變動。
- 在進行計量動作時,請勿短接端子或接座(以免觸電,產生操作錯誤或損壞感測器)。
- 不穩定的電源有超過額定電壓,或導致本產品損壞,或導致本產品精度下降。

- 請停止控制裝置、機械裝置後,在切斷電源的狀態下進行修繕。如果使裝置過快進行有時裝置會進行異常動作,這樣非常危險,請先停止裝置,機械裝置保持停止狀態進行通電試驗,並進行相關資料設定。操作前,操作中請將人員、工具、裝置所帶的靜電充分放電後進行操作。活動部請使用類似機件人員用材料,具有耐衝擊性的材料進行連接作業。
- 負荷請勿過重,因為可能導致本產品破裂或燒毀。
- 本產品之電壓接觸含有防流漏之接觸,未使用本產品之接觸,請做好接觸的防護,以防止雜質等不因素導致其回遊。
- 配線時,請確認絕緣的顏色及端子號碼。(錯誤配線會導致異常損壞,故障和錯誤動作的发生,因此,在配線前請確認說明書上的配線顏色及端子編號,並進行配線,並依說明書充分放電(消除靜電)。
- 本產品在通電後由於自身診斷需要耗時約四秒,這段時間內流量值輸出開關動作,通電後約四秒請設定為無視誤讀的程式設定。

注意

- 動作過程中如果發生異常,請立即切斷電源,停止使用本產品,並與銷售店聯繫。
- 本產品的流量值請保持在額定流量範圍內。
- 流量輸出的設定值時,控制系統可能會自動動作,因此請停止裝置進行後再變更輸出設定值。
- 請一年至少定期檢查一次本產品,確認本產品正常動作。
- 請不要拆解本產品,否則可能會造成故障。
- 外板材料為樹脂,去除污漬時請不要使用溶劑、酒精、清洗劑等。
- 請注意感測器或感測器產生的反向電流,與流量感測器相同的電壓上連接含有量感測器等,其動作時,高壓感測器會輸入裝置時,如果未關閉輸出線和電源線,極短時間或通電感測器,則可能在流量感測器的開關輸出迴路上產生反向電流,造成流量感測器損壞。

關於安裝

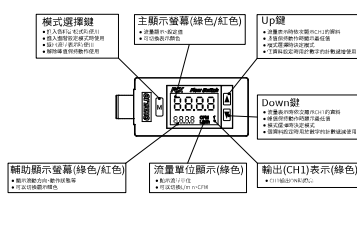
警告

- 請注意液體的流向。(請動方向請依照本體所指示的前視圖方向)
- 安裝前請用吹氣清除感測器內部的牙垢。
- 請勿碰撞、拍打。(若施加過大的撞擊,有可能導致內部損壞)
- 在安裝時,請勿拉扯電源線,以免拉力過大導致損壞。

注意

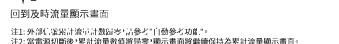
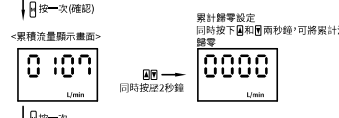
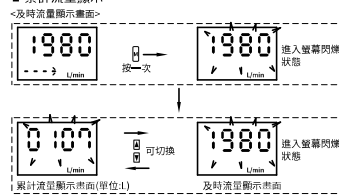
- 本產品LCD顯示器之流量,可能因為角度不同而有看不清楚的情況。
- 請使用適當的扭力來緊緊蓋至計。
- 使用本產品,請在沒有流量的情況下,先通電再通氣,以確保產品等點校正正確。
- 使用流量計時,請確保提供穩定的壓力源。
- FPX系列大流量計,在工作壓力方面建議在5bar以上,若低於5bar則可測量的流量小。
- 作業應盡可能小。
- 本產品在配線狀態由於差壓特性,流道內含有壓力是導致電氣不能瞬間斷電,建議將氣源排出可以瞬間恢復至零點。

① 螢幕顯示、操作按鍵和功能

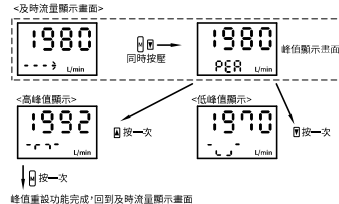


操作模式/一般模式

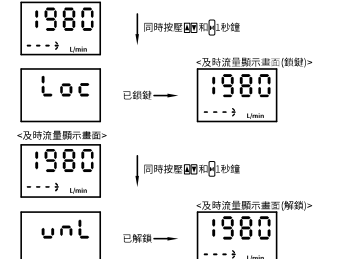
■ 累計流量顯示



■ 峰值保持功能

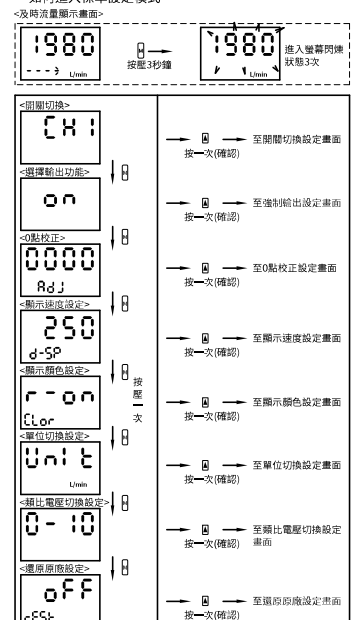


■ 鎖鍵功能

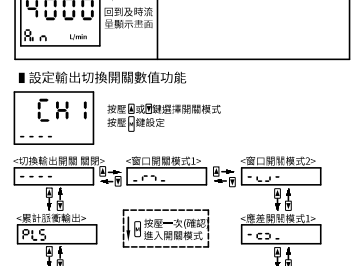


標準設定模式

如何進入標準設定模式



■ 設定輸出切換開關數值功能

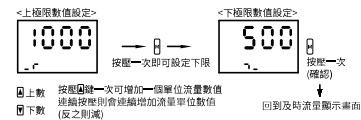


注:每次顯示(修正)之後,解鎖或鎖鍵功能都會解除!

當顯示功能及鎖鍵之後,所有的按鍵操作將不會有動作反應,除了解鎖功能。

當顯示功能,每次按鍵在某一設定值顯示"Loc"的字樣。

CH1開啟/關閉數值設定

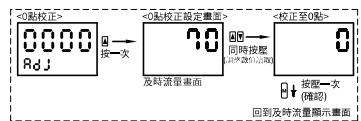


開關動作說明

名稱	LCD顯示	動作說明
窗口開關模式1	---	在指定範圍內開關輸出ON
窗口開關模式2	---	在指定範圍外開關輸出ON
應差開關模式1	---	設定一個應差範圍，達到指定流量以上時，開關輸出OFF
應差開關模式2	---	設定一個應差範圍，達到指定流量以上時，開關輸出ON (顯示:HHH倍率維持輸出)
累計輸出切換模式1	---	達到累計值以上時，開關輸出ON
累計輸出切換模式2	---	達到累計值以上時，開關輸出OFF
累計脈衝輸出1	PLS	累計每固定升輸出一定脈衝(約每40ms)
切換輸入開關OFF	---	開關動作OFF

注:1.脈衝輸出率:3000L=30L/Pulse,4000L=40L/Pulse

點校正模式-頁面設定

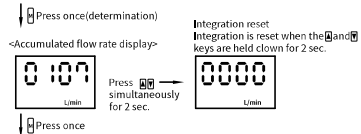
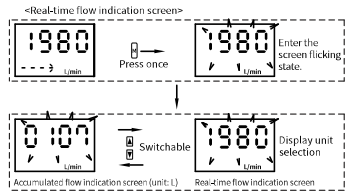


畫面顯示速度設定

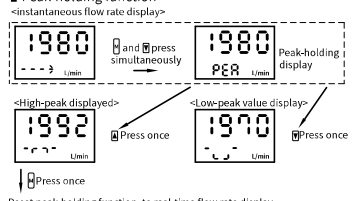


Operating mode/normal mode

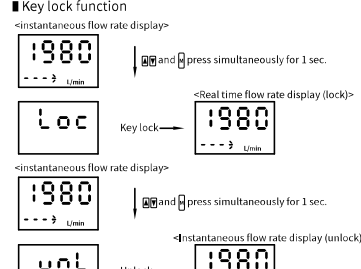
Accumulated flow indication



Peak-holding function

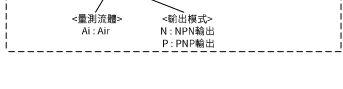
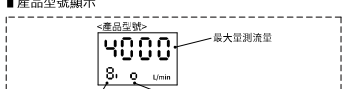
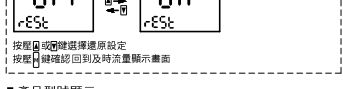
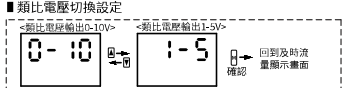
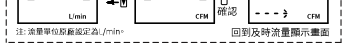
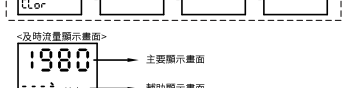
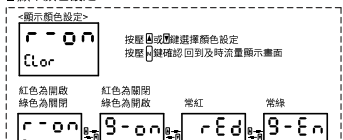


Key lock function



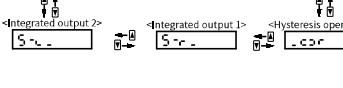
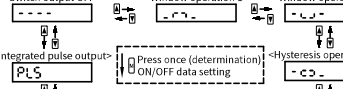
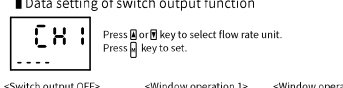
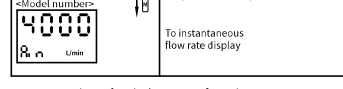
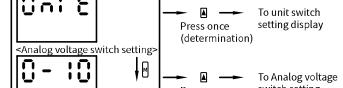
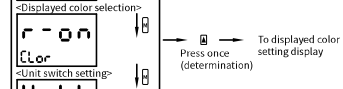
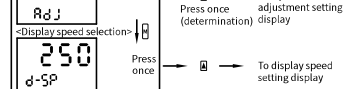
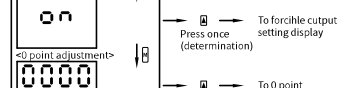
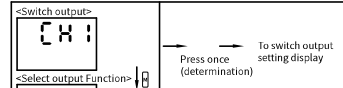
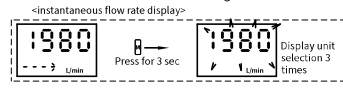
Notes: Keys are unlocked when the controller is shipped. Lock keys if necessary. The key lock/unlock state is held even if power is turned OFF. While key lock, all the operations are not accepted excluding the key lock release operation. While key lock, if the key is operated, it becomes a "Loc" display.

顯示顏色設定



Standard setting mode

How to enter to Standard setting mode



Safety precautions

The safety cautions are ranked as-DANGER->WARNING->and->CAUTION-in the section.

DANGER When a dangerous situation may occur if handling is mistaken leading to fatal or serious injuries, or when there is a high degree of emergency to a warning.

WARNING When a dangerous situation may occur if handling is mistaken leading to fatal or serious injuries.

CAUTION When a dangerous situation may occur if handling is mistaken leading to minor injuries or physical damage.

Working fluid

DANGER

Do not use this product with flammable fluids.

CAUTION

Please use dry air without chlorine, sulfur, acid and other corrosive content fluid, also clean air without dust and oil mist.

Please refer to the ambient pressure range in the operating pressure ranges specification or it will affect the life of the sensing component.

Compressed air containing condensate water will cause defects in this product or other pneumatic components. Please install the cooler machine, air dryer, condensate collector or other countermeasures.

Excessive toner generated by the air compressor will adhere to the inside of the product and cause malfunction.

Please check before purchasing, the pressure resistance of each series are different.

Please observe the measured flow rate and operating pressure.

WARNING

This product cannot be used as a business meter.

This product does not conform to measurement laws, and cannot be used for commercial purposes. Use this for factory applications.

Do not use fluids other than the applicable fluid because accuracy cannot be guaranteed.

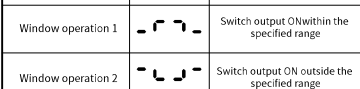
Please confirm the adjustment of the pressure regulator before allowing fluid to flow.

Don't impose a limit that exceeds the rated pressure and cause damage.

When using a valve on the primary side of this product, use only an oil-prohibited specification valve. This sensor could malfunction or fail if exposed to splattering grease, oil, etc. Also, there is a risk of abrasion dust entering the sensor depending on the valve. Install a filter to prevent the dust from entering the sensor.

Vaporize liquids/gases before use. Entry of liquids/gases into this product will result in damage.

Foreign matter may be mixed in the fluid, please install the filter at the front end. (Recommended circuit)



About Wiring

DANGER

Use power voltage and output within the specified voltage. If voltage exceeding the specified voltage is applied, the sensor could malfunction or be damaged, or electrical shock or fire could occur. Do not use a load exceeding the output rating.

Failure to observe this could result in damage to the output or fire.

WARNING

Do not short-circuit the load.

(This product is equipped with overload protection but it cannot protect all wrong wiring, so please pay more attention to wiring.)

Please confirm the insulation while wiring.

Do not mix with other circuits to cause over-current, which may cause damaged.

Do not combine electric wire and power wire together while proceeding wiring.

Please use different wiring to avoid interference caused by the control circuit containing the switch affect wiring operation.

Do not process wiring while power-on.

Avoid the damage to the connector or risk of electric shock.

Please keep away from sources of noise such as high-current wires when install and wiring this product. Take additional protective measures against surges loaded on the power line or the display or output circuit fluctuate.

Stop the control device and machine device, and turn the power off before wiring. Starting operation suddenly could result in unpredictable operation and accidents. Conduct an emergency test with control devices and machine devices stopped, and set target switch data. Discharge electrostatic accumulated in personnel or tools before and during work. Connect and wire bend-resistant material, such as robot wire material, for movable sections.

Do not short-circuit the load. This product could rupture or burn.

The cable connector of this product contains a connector with a protective sleeve. If the connector of this product is not used, please protect the connector to prevent unfavorable factors such as impurities from causing problems.

When wiring, please confirm the wiring color and terminal number. (Wrong wiring will cause damage to the switch, malfunction and errors. Therefore, before wiring, please confirm the wiring color and terminal number in the instruction manual before wiring, and use a DC power supply with sufficient capacity and small fluctuations.)

The product after power-on, it takes 4 seconds detections, within 4 seconds the switch is no movement while flow rate working and take it as no signal program setting.

CAUTION

If a problem occurs during operation, turn off power and stop using. Then contact your dealer immediately for the issue or question.

Keep this products flow switch within the rated flow range.

If the output setting value is change, control system devices could operate unintentionally. Stop devices before changing settings.

Regularly inspect the product at least once a year or more, and confirm that this is operating correctly.

Do not disassemble or modify this product. Doing so could result in faults.

This case is made of resin. Do not use solvent, alcohol or any other detergent in cleaning to remove contamination, etc.

Check backflow currents caused by broken wiring or wiring resistance. If other devices, including a flow sensor, and the switch output wire and power line's minus side are temporarily short circuited to check the operation of the control panel's input unit, or if the power line's minus side is broken, a backflow current could flow to and damage the flow sensor switch output circuit.

Installation Adjustment

WARNING

Note the direction of the fluid. (The flow direction should follow the direction of the arrow indicated by the body)

Before installation, blow off the dirt remaining in the piping.

Do not drop or beat. If an excessive impact is applied, it may cause internal damage.

During installation, please do not pull the power cord to avoid damage caused by excessive tension.

CAUTION

The flow rate of the LCD display of this product may be unclear due to different angles.

Please use proper torque to lock the flowmeter.

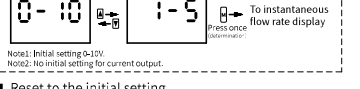
When using this product, please turn on the power and then ventilate whenever there is no flow to ensure that the zero point calibration of the product is correct.

When using a differential pressure flow meter, make sure to provide a stable pressure source.

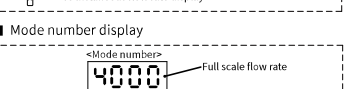
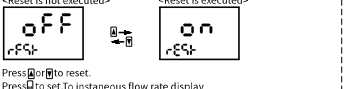
For the FFX series, the working pressure is recommended to be above 5bar. If it is lower than 5bar, the working range of the measurable flow will be reduced.

Due to the differential pressure characteristics of this product in the saturated state, the gas cannot be returned to zero instantaneously due to the pressure difference in the flow channel. It is recommended that the gas be discharged to instantly return to zero.

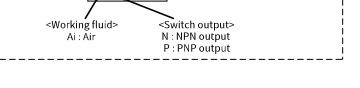
Display/operating section names and functions



Setting of display color



Unit switch setting



Analog voltage switch setting



Reset to the initial setting



Mode number display

