CHELIC

CVFR 系列
流量電控比例閥
操作說明書

CVFR Series - Flow Controller User Manual

繁 En

CVFR 訂購稱呼代號 How to Order

CVFR 101 - C08 - V - NN - B - S

機種仕樣 Model	流量大小 Flow rate	連接口徑 Port size	輸入訊號 Monitor Input	輸出訊號 Monitor Output	附件 Bracket	電纜接頭 Cable connector

流量電控比例閥
CVFR Series Flow Controller User Manual

流量大小	
500	50L/min
101	100L/min

記號 Mark	口徑 Port size	FPS 500	FPS 101
C08	Φ4	●	●
P02	PT1/4	●	●

輸入訊號	
V	類比電壓型DC0~5V Voltage type DC0~5V
	類比電壓型DC0~10V Voltage type DC0~10V
A	電流型DC4~20mA Current type DC4~20mA

註2

輸出訊號	
N	類比1~5V、異常輸出(NPN)
P	類比1~5V、異常輸出(PNP)
NN	開關(NPN)、異常輸出(NPN)
PP	開關(PNP)、異常輸出(PNP)

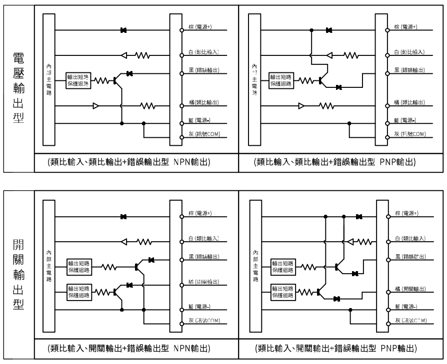
註3

記號 Mark	形式 Type
無記號 None	—
B	鎖板 Flat bracket
L	平托板 L type bracket

電纜接頭	
N	無電纜 None
S	直通型2m Straight type
H	直角型2m Angle type

註1：CVFR-101為特規品，購買前請洽業務
註2：電壓輸出(V)可從選單自行選擇兩種電壓(出廠設定為0-10V)
註3：錯誤輸出 = 異常輸出 (當發生error時會觸發信號)

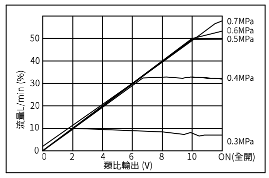
輸出選擇 Output



※注意請勿配錯線!

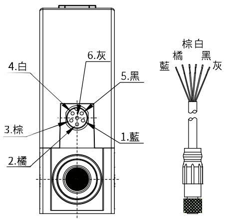
作動壓差

CVFR-500系列
■ 標準壓差0.6MPa，作動壓差0.4~0.7MPa



註1：一般標準作動壓差為5~6bar之間，5bar以下依然可以控制，但流量會被限縮。
註2：標準壓差6bar條件下，洩漏量5~10ccm。
註3：流量隨產品個別差及配管條件會有差異。請參考流量特性圖，對於需要流量請考慮安全值來選定機種。

CVFR電纜線材規格表 Specification



類比輸出型(VN、VP)

PIN	線色 Wire color	內容 Content
01	藍 (Blue)	電源－(GND)
02	白 (White)	電壓輸入：0-5V/0-10V (可切換) 電流輸入：4-20mA
03	棕 (Brown)	電源＋(24V)
04	橘 (Orange)	電壓輸出：1-5V
05	黑 (Black)	CH2(錯誤輸出：max50mA)
06	灰 (grey)	輸出訊號(GND)

開關輸出型(NN、PP)

PIN	線色 Wire color	內容 Content
01	藍 (Blue)	電源－(GND)
02	白 (White)	電壓輸入：0-5V/0-10V (可切換) 電流輸入：4-20mA
03	棕 (Brown)	電源＋(24V)
04	橘 (Orange)	CH1(開關輸出：max50mA)
05	黑 (Black)	CH2(錯誤輸出：max50mA)
06	灰 (grey)	輸出訊號(GND)

※電纜接頭也有直角型，直角型的接頭為向下引出(OUT)
※電纜接頭無法旋轉，若強硬旋轉，則會造成接頭連接部破損

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，有能導致輕傷或財物損失的危險內容。

關於使用流體

危險

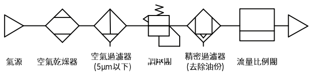
- 嚴禁用於易燃性氣體

注意

- 請使用不含氯、硫磺、酸等腐蝕成分的乾燥氣體，且不含灰塵及油霧的乾淨氣體。
- 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。
- 含大量冷凝水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。
- 各系列的耐壓性不同，選擇時請多加注意。
- 請遵守測定流量、使用壓力。(使用規範以上的壓力會造成產品損壞)。
- 請勿讓異物(配管內的垃圾、水滴、油霧等)流入本產品中，可能會導致精度與控制性降低還有可能造成故障。
- 本產品標不可長時間控制流量最大值，時間久了可能會因為熱衰退導致流量下降，需要停止控制一段時間後再開啟則會回復原來的最大流量。

警告

- 本產品在飽壓狀態，可容許一定程度的洩漏，因此不可當作需要零洩漏的截止閥來使用。
- 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。
- 除適用流體之外的流體由於不能保證其精度，因此請不要使用。
- 請先確認調壓閥調整後，再讓流體流動。
- 請確認流體供應線的壓力處於使用差壓範圍內。若壓力源偏低，或2次側的壓力偏高，則無法形成差壓，造成流體無法流動。
- 感測器的一次端使用閥時，請使用禁油規格的閥。否則，可能因潤滑油飛濺造成感測器失靈或破損。
- 根據一次側調壓閥的流量特性，當流量通過時壓力可能不穩定，進而使CVFR的輸出波動。
- 使用碳酸器等液化氣體時，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。
- 流體中可能參雜異物，請將過濾器設置於前端。 (建議空氣迴路)



關於佈線

危險

- 電源電壓及輸出請使用規格電壓。
  (如施加規格以上之電壓，則可能造成本產品受損或觸電，最嚴重可能會釀成火災)

警告

- 請勿負載短路。
  (本產品有加設過載保護，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。(勿和其他迴路混雜接觸，導致產生過電流，而有損壞的可能)
- 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包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，請遠離強電流電線等雜訊源，而加載於電源線的突波請另外採取防護對策。否則可能造成顯示或輸出變動。
- 在流量計作動過程中，請勿碰觸端子或接座。(以免觸電、產生運作錯誤或損壞開關)
- 不穩定的電源有時超過額定電源，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佈線。如果使裝置過快運行有時裝置會進行異常動作，這樣非常危險。請先使控制裝置、機械裝置保持停止狀態進行通電試驗，並進行開關資料設定。操作前、操作中請將人體、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器人用線材的具有耐屈曲性能的線材進行連接佈線。
- 負荷請不要短路。因為可能導致本產品破裂或燒毀。
- 本產品之電纜接頭含有防護套之接頭，未使用本產品之接頭，請做好接頭之防護，以防止雜質等不良因素導致其問題。
- 配線時，請確認配線的顏色及端子號碼。(錯誤配線會導致開關損壞、故障與錯誤動作的發生。因此，在配線前請確認使用說明書上的配線顏色及端子編號後再進行配線，並請使用容量充足且波動小的DC電源)

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。
- 本產品的流量請保持在額定流量量程內。
- 變更輸出的設定值時，控制系裝置可能會自動動作，因此請停止裝置運行後再變更輸出設定值。
- 請一年至少定期檢查一次本產品，確認本產品正常作動。
- 請不要拆解本產品，否則可能會造成故障。
- 外殼材質為樹脂。去除污漬時請不要使用溶劑、酒精、清洗劑等。
- 請注意斷線或配線電阻產生的逆向電流。與流量感測器相同的電源上連接含流量感測器的其他元件時，為確認控制盤的輸入裝置作動，如果使開關輸出線和電源線一極短路或切斷電源線一側，可能會在流量感測器的開關輸出迴路上產生逆向電流，造成流量感測器損壞。

關於安裝

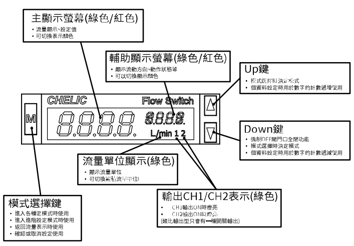
警告

- 請注意流體的方向。(流動方向請依照本體所指示的箭頭方向)
- 安裝前請用吹氣清除配管內殘留的汙垢。
- 請勿把本產品設置在可動部，以及會振動的場所。振動、撞擊可能會產生運作錯誤。
- 在安裝時，請勿拉扯電源線，以免拉力過大導致損壞。

注意

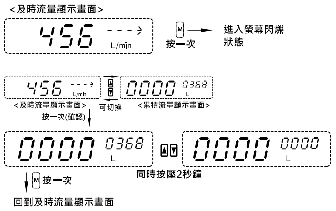
- 本產品LCD顯示器之流量，可能因為角度不同會有看不清的情況。
- 請使用適當的扭矩來鎖緊流量計。
- 使用本產品，請在沒有流量的情況下，先通電再通氣，以確保產品零點校正正確。
- 本產品內部的電磁閥並沒有完全關閉的功能。如果需要完全關閉的功能，請在外部另外設置遮斷閥。外部的遮斷閥關閉時，請讓本產品在閥全關(設定流量零)的狀態下待命。縱使外部遮斷閥原本處於遮斷的狀態，但如果讓本產品在通常控制的的狀態下，打開外部遮斷閥時，還是會在瞬間產生大流量。此外，如果頻繁使用ON/OFF動作，則在某些使用條件下，比例閥的壽

① 螢幕顯示、操作按鍵和功能

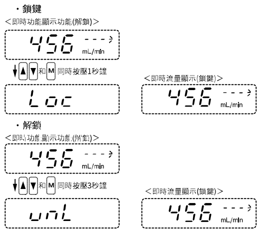


操作模式/一般模式

■ 累計流量顯示

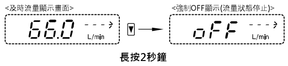


■ 鎖鍵功能



注：電源切斷再復歸之後，鎖鍵或解鎖功能都會保持。
當鎖鍵之後，如果按壓任何一個按鍵，螢幕將顯示"Loc"的字樣。

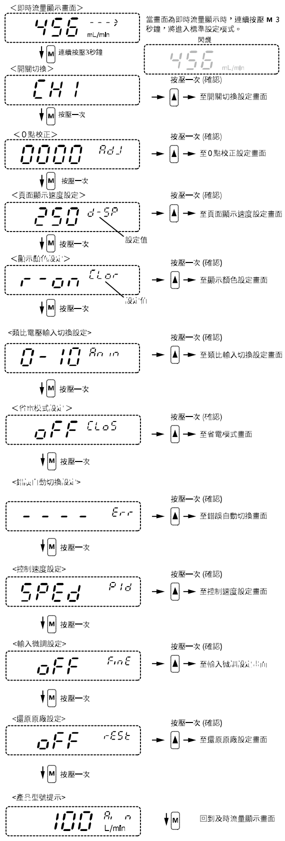
■ 強制OFF(零流量)功能



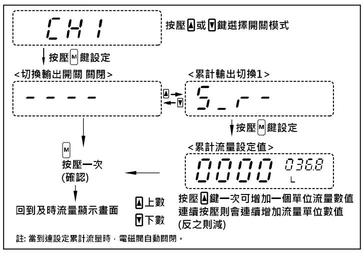
註1: 在流量控制狀態中，長按 ▼ 鍵2秒鐘，可強制停止流量控制。
註2: OFF狀態時，再次按下 ▼ 鍵2秒鐘，即可恢復原始流量。
註3: 強制電磁閥OFF狀態，即使有輸入訊號，也可強制停止控制。

標準設定模式

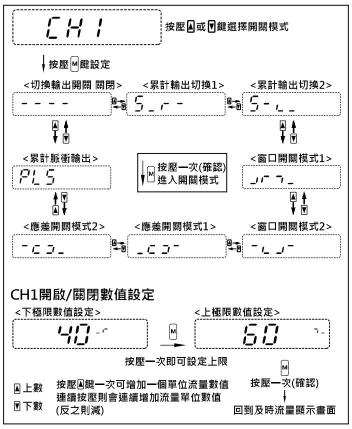
■ 如何進入標準設定模式



設定輸出切換開關數值功能 (僅限類比輸出機種)



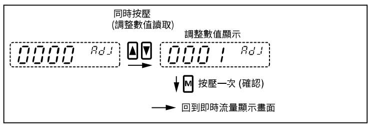
設定輸出切換開關數值功能 (僅限開關輸出機種)



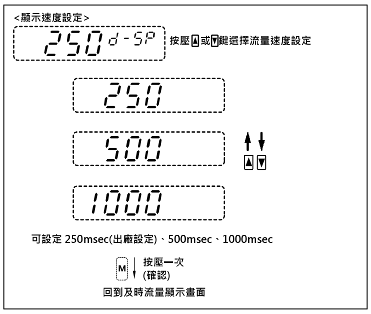
開關動作說明

名稱	LCD顯示	動作說明	下極限表示	上極限表示
窗口開關模式1	_r7_	在指定範圍內開關輸出ON	_r	7_
窗口開關模式2	-L J-	在指定範圍外開關輸出ON	-L	J-
應差開關模式1	-c3_	設定一個應差範圍，達到指定流量以上時，開關輸出OFF	_c	3-
應差開關模式2	_c3-	設定一個應差範圍，達到指定流量以上時，開關輸出ON (顯示[illegible])	-c	3_
累計輸出切換模式1	S_r-	達到累計值以上時，開關輸出ON		
累計輸出切換模式2	S-7_	達到累計值以上時，開關輸出OFF		
累計脈衝輸出	PLS	設定一個固定累計值，當到達累計值時，輸出一個脈衝訊號 (脈衝訊號時間為40ms)		
切換輸入開關OFF	- - - -	開關動作OFF		

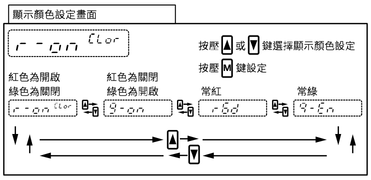
0 點校正模式 - 頁面設定



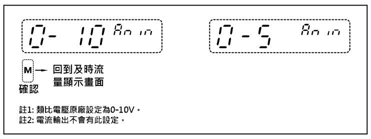
畫面顯示速度設定



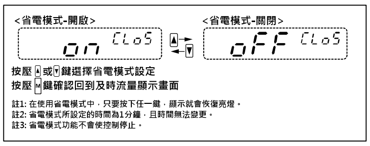
顯示顏色設定



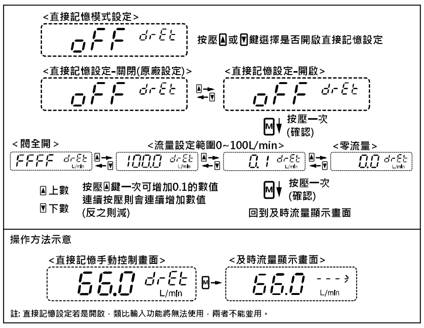
類比電壓輸入切換設定



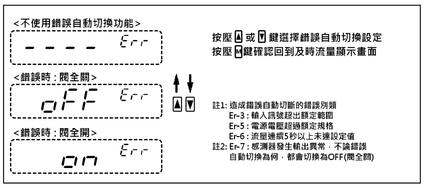
省電模式設定



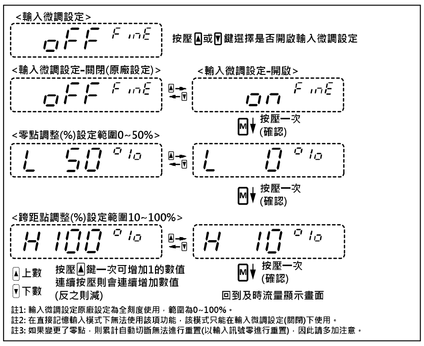
直接記憶手動控制



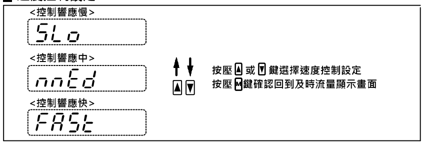
錯誤自動切換設定



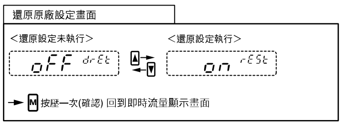
輸入微調設定



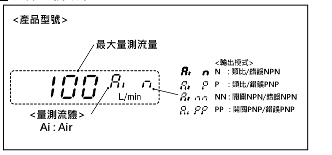
速度控制設定



還原原廠設定



產品型號顯示



錯誤碼說明與處理

過電流異常

<開關輸出過電流異常>

Er - 1

<流量開關輸出1，負載超過125mA>

顯示值歸零異常

<輸入訊號超過額定範圍>

Er - 3

<輸入達到110%F.S.以上時檢出，檢測精度±1%F.S.>

系統錯誤

<系統異常>

Er - 4

<系統錯誤(記憶體、資料存取、系統參數)異常>

額定電壓錯誤

<電源電壓異常>

Er - 5

<電源電壓超過額定規格(DC19.5V以下時檢出，檢測精度±10%F.S.)>

流量控制異常

<流量控制異常>

Er - 6

<流量連續5秒以上未達設定值(設定值與控制相差達±20%以上時，檢測精度±6%F.S.)>

感測錯誤

<感測器異常>

Er - 7

<感測器發生輸出異常>

<瞬間流量範圍超過上限>

Hi Err

<請調整流量到產品顯示範圍>

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

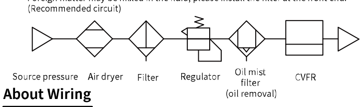
- Do not use this product with flammable fluids.

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 range 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 malfunctions.
- Please check before purchasing, the pressure resistance of each series are different.
- Please observe the measured flow rate and operating pressure. (Using pressure above the specification will cause product damage)
- Do not allow foreign materials (piping debris, water drops, oil mist, etc.) to enter the product, or else it may cause deterioration of precision as well as faults.
- Do not run the product at its maximum flow for a prolonged duration or thermal fatigue may cause decreased flow; in such case, it will need to stop running for a while in order to restore the maximum flow.

WARNING

- The product allows a certain degree of leakage under full pressure conditions; do not use this product as a check valve to achieve zero leakage.
- 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.
- When using a value 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.
- Based on flow properties of the primary side pressure regulation valve, pressure of the flow may become unstable thereby causing output fluctuation of CVFR.
- Vaporize liquidities gas before use. Entry of liquidities gas 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 wrong 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 could fluctuate.
- Do not touch the connectors or sockets during the operation of the flowmeter. (To avoid electric shock, operation error or switch damage)
- If power is not stabilized, the peak value could be exceeded. This could damage the product or impair accuracy.
- Stop the control device and machine device, and turn the power off before wiring. Starting operation suddenly could result in unpredictable operation and hazards. Conduct an energized test with control devices and machine devices stopped, and set target switch data. Discharge electrostatic accumulated in personnel or tools before and darning 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, malfunctions 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.)

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 otherdevices, including a flow sensor, and the switch output wire and power line'sminus 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

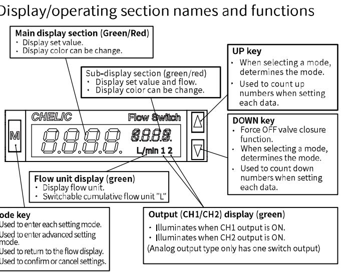
WARNING

- 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 install the product on a moving object or in a vibrating location. Vibration or impact may cause faulty operation.
- During installation, please do not pull the power cord to avoid damage caused by excessive tension.

CAUTION

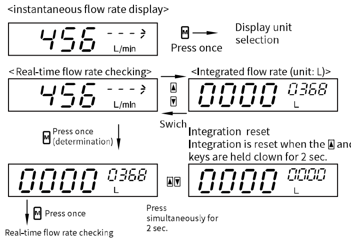
- The flow rate of the LCD display of this product may be unclear due to different angles
- Please use proper torque to lock the flowmeter
- When using this product, please turn on the power and then ventilate when there is no flow to ensure that the zero point calibration of the product is correct.
- The internal solenoid valve of the product has no full closure function. If full closure is required, an external block valve is needed. When the external block valve is closed, always set the product in a valve fully closed condition (set to ZERO flow) for standby. Even with the external block valve in its blocked condition, a transient large flow may occur if the external block valve is opened when the product is under its normal control condition. Furthermore, the service life of a proportional valve may be shortened under certain operation conditions if ON/OFF operation is frequent.

① Display/operating section names and functions



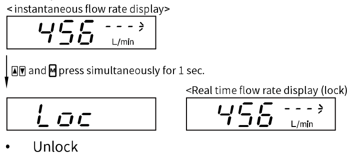
How to operate/ Normal mode

Displaying the integrated flow

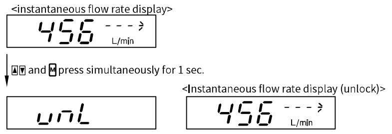


Key lock function

- Key lock

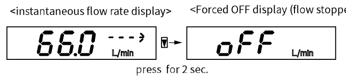


- Unlock



Note: 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.

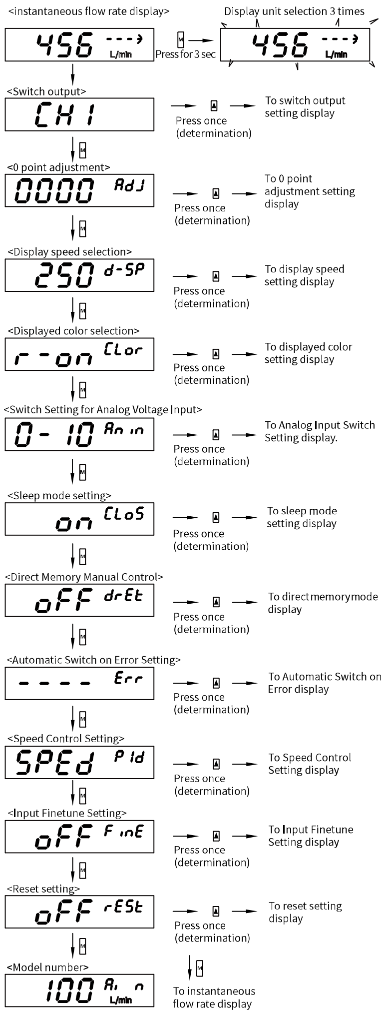
Force OFF valve closure fuction



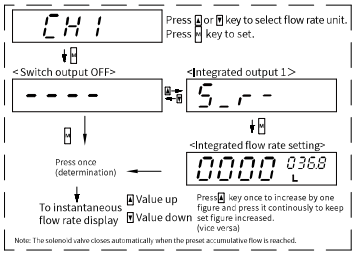
Note 1: Pressing and holding ▼ key for 2s may force close the flow control.
Note 2: Pressing and holding ▼ key for 2s again may restore the original flow.
Note 3: When the solenoid valve is in force OFF condition, the stop control is mandatory even if there is an input signal.

Standard setting mode

How to enter to Standard setting mode

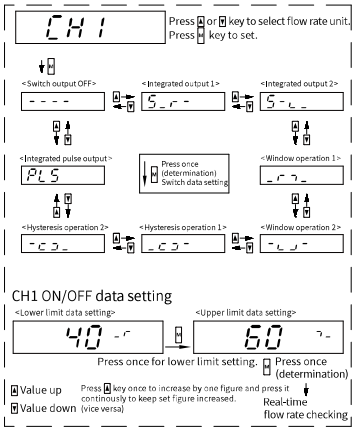


Data setting of switch output function (analog type only)



Note: The solenoid valve closes automatically when the preset accumulative flow is reached.

Data setting of switch output function (switch type only)

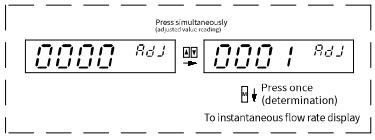


CH1 ON/OFF data setting

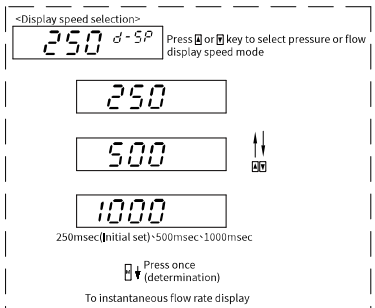
Switch action description

Mode	LCD display	Action description	Lower limit	Upper limit
Window operation 1	-r7-	Switch output ONwithin the specified range	-r	7-
Window operation 2	-cJ-	Switch output ONoutside the specified range	-c	J-
Hysteresis operation 1	-c3-	Set a hysteresis range, when it reaches the specified flow rate or more, the switch output is ON.	-c	3-
Hysteresis operation 2	-c3-	Set a hysteresis range, when it reaches the specified flow rate or more, the switch output is ON. Display example of hysteresis type	-c	3-
Integrated output 1	S-r-	When reaches the specified flow rate or more, the switch output is ON.		
Integrated output 2	S-c-	When reaches the specified flow rate or more, the switch output is OFF.		
Integrated pulse output	PLS	Set up an upper limit and trigger a pulse signal for 40ms when the count gets over it.		
Switch output to OFF	----	Switch to OFF		

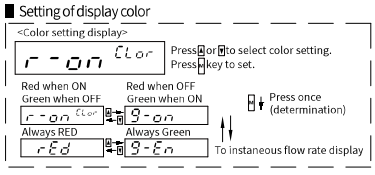
0 point adjustment mode- display setting



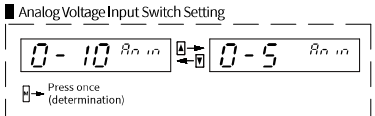
Setting of display speed



Setting of display color

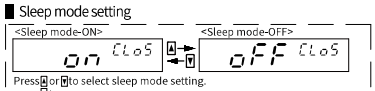


Analog Voltage Input Switch Setting



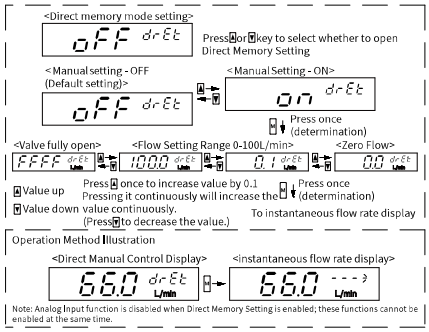
Note 1: Default setting of Analog Voltage is 0-10V.
Note 2: No such setting for Current Input.

Sleep mode setting



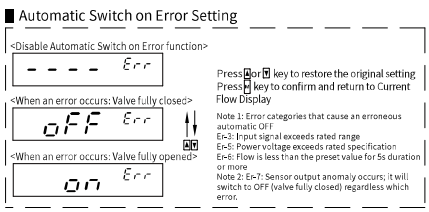
Note1: Press any key in power saving mode and the display resume lighting up.
Note2: The power saving mode will last for 1 minute each time.
Note3: The control functions remains intact in power saving mode.

Direct Memory Manual Control



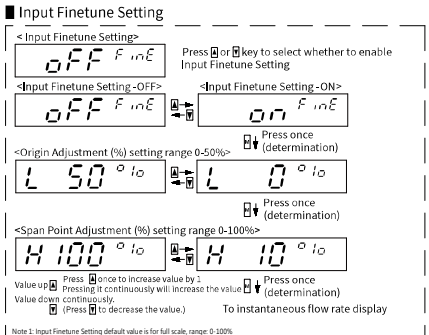
Note: Analog Input function is disabled when Direct Memory Setting is enabled; these functions cannot be enabled at the same time.

Automatic Switch on Error Setting



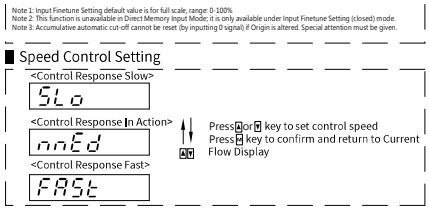
Note 1: Error categories that cause an erroneous automatic OFF
Er-3: Input signal exceeds rated range
Er-5: Power voltage exceeds rated specification
Er-6: Flow is less than the preset value for 5s duration or more
Note 2: Er-7: Sensor output anomaly occurs; it will switch to OFF (valve fully closed) regardless which error.

Input Finetune Setting

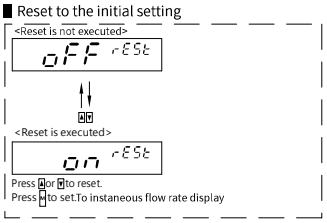


Note 1: Input Finetune Setting default value is for full scale, range: 0-100%
Note 2: This function is unavailable in Direct Memory Input Mode; it is only available under Input Finetune Setting (closed) mode.
Note 3: Accumulative automatic cut-off cannot be reset (by inputting 0 signal) if Origin is altered. Special attention must be given.

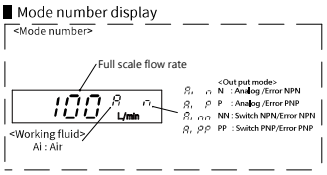
Speed Control Setting



Reset to the initial setting



Mode number display

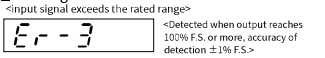


Error code messages and troubleshooting

Overcurrent error

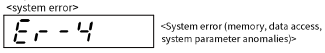
<Load of flow switch output channel 1 goes over 125mA>

Readings reset error



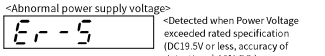
<Detected when output reaches 100% F.S. or more, accuracy of detection ±1% F.S.>

System error



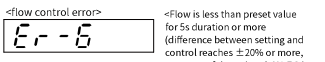
<System error (memory, data access, system parameter anomalies)>

Rated voltage error



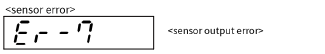
<Detected when Power Voltage exceeded rated specification (DC19.5V or less, accuracy of detection ±10% F.S.)>

Flow control error

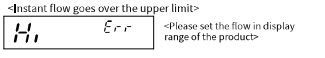


<Flow is less than preset value for 5s duration or more (difference between setting and control reaches ±20% or more, accuracy of detection ±6% F.S.)>

Measurement error



<sensor output error>



<Please set the flow in display range of the product>

＜省電模式設定＞