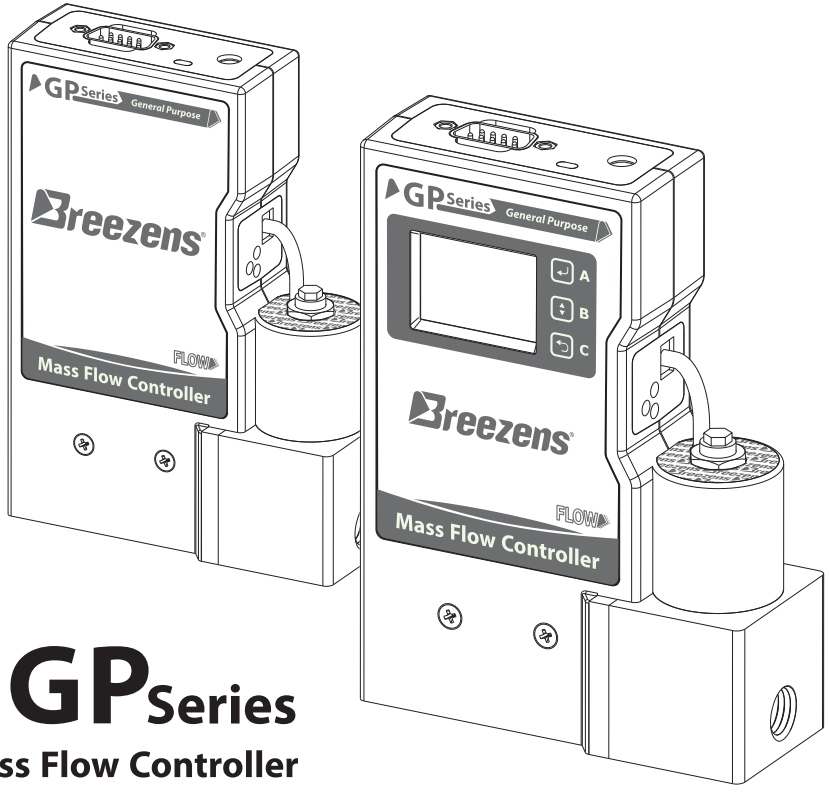




Breezens®

Accurate, Fast and Reliable



GP Series Mass Flow Controller

Visual Instruction & User Guide



March 2023









In The Name of The Most Merciful

Index

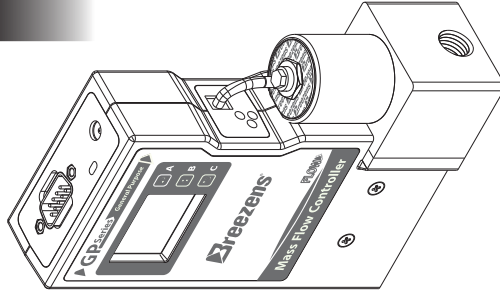
- 1 Dimensions
- 2 ATEX Requierments
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Via Display Panel (Auto)
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 - * External Port
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- 17 Setpoint Adjustment II
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 - * Voltage [0-5 V]
 - * Current [4-20 mA]

- 18 Valve Condition I
Via Display Panel
 - * Control Status [Vc:N]
 - * Close Status [Vc:C]
 - * Open Status [Vc:O]
- 19 Valve Condition II
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 - * Close Status
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- 23 Alarm Reset I
Via Display Panel
- 24 Error / Alarm Reset II
Via DB9 Port (Error Reset Pin-8)
- 24 LED Status
- 24 For Skilled Technical Expert
- 25 Factory Set

Symbols

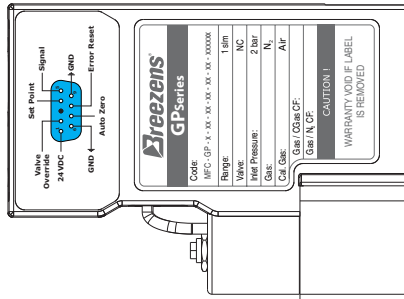
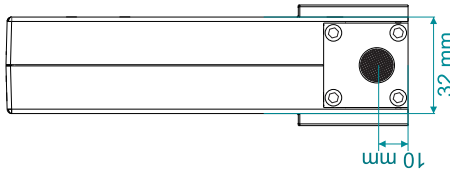
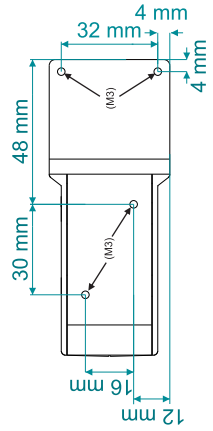
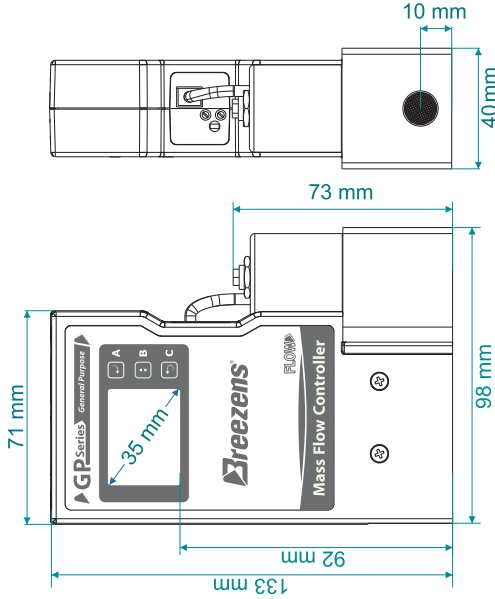
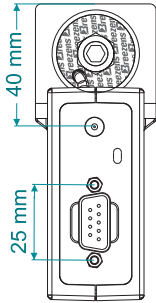
-  Hold for 3 Sec.
-  Press n Times
-  Next Step
-  Few Steps Later
-  Internal Mode
-  External Mode
-  Attention
-  Skilled Technical Expert

Dimensions



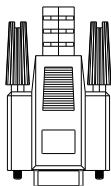
~ 800 g

 (w/o package)

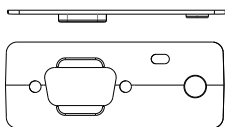


ATEX Requirements

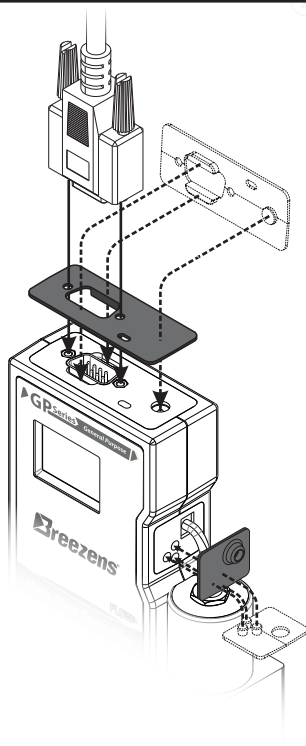
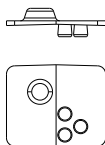
* Standard
1 x 9 - pin
Female Sub-D
(DB9)



* Electrical Port
Shield

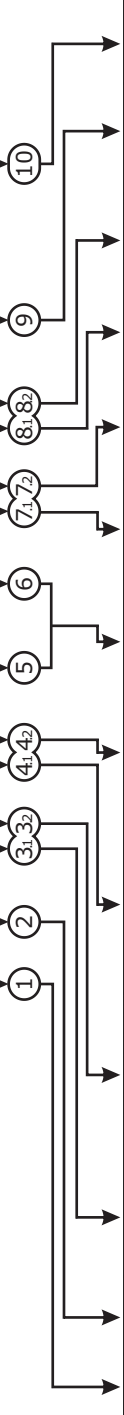


* Setting panel
Shield



Part Number Guide

GP-X - XX - XX - XX - XX - XX - XX - XX - XXXXXX



| Class | Device | Max. Inlet Pressure | ΔP Range | Wet Parts | Sealant | In/Outlet Ports | Elec. Port 1 | Elec. Port 2 | Analog port | Digital Port | Flow Range | ID |
|-------|--------|---------------------|----------|-----------|---------|-----------------|--------------|--------------|-------------|--------------|------------|----|
|-------|--------|---------------------|----------|-----------|---------|-----------------|--------------|--------------|-------------|--------------|------------|----|

| | | | | | | | | | | | |
|----|---|-----|---|---|--|--|-------|--|------------------------------|--|--------|
| GP | C | MFC | 1 0.05 to 0.2 bar 2 0.2 to 0.5 bar 3 0.5 to 1 bar 4 1 to 3 bar 5 3 to 6 bar 6 6 to 15 bar 7 100 bar 0 By Order | 1 SS 304/SS 420/Al 2 SS 304/SS 420/Al/Br. 3 SS 304/SS 420*/Al* 4 SS 316 / SS 420 5 SS 316 / SS 420* *: Coated Part | 1 NBR 2 VITON 3 EPDM 4 PVMQ 5 Kalrez | 11 BSP 1/8" 12 BSP 1/4" 13 BSP 3/8" 00 By Order | 1 Db9 | 0 Non 8 Display 1 0-5 V 4 4-20 mA | 0 Non 1 RX&TX 2 Modbus | 05 10sccm 06 20sccm 07 50sccm 08 100sccm 09 200sccm 0A 500sccm 0B 1slm 0C 2slm 0D 5slm 0E 10slm 0F 20slm 10 50slm | XXXXXX |
|----|---|-----|---|---|--|--|-------|--|------------------------------|--|--------|

Code: GP - C - 24 - 11 - 12 - 12 - 18 - 10 - 08 - 7E7101

Range: 100 sccm

Valve: NC

Max Inlet Pressure: 5 bar

Max ΔP: 3 bar

Min ΔP: 1 bar

Gas: N₂

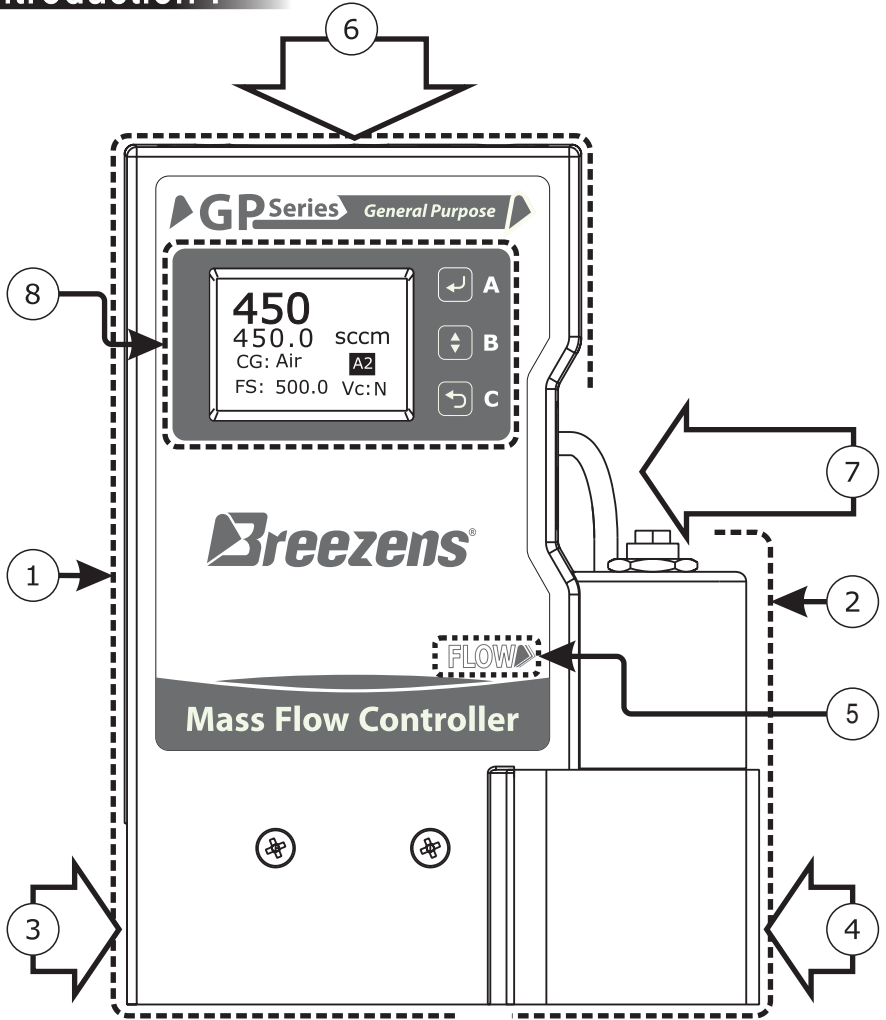
Cal. Gas: Air

CAUTION !

WARRANTY VOID IF LABEL IS REMOVED

| | |
|---|---|
| <p>① Class _____</p> <p>② Device _____</p> <p>③① Maximum Allowable Inlet Pressure _____</p> <p>③② Operating Pressure _____</p> <p>④① Wet Part _____</p> <p>④② Sealant _____</p> | <p>⑤ Mechanical Gas Inlet Port _____</p> <p>⑥ Mechanical Gas Outlet Port _____</p> <p>⑦① Electronic Port 1 _____</p> <p>⑦② Electronic Port 2 _____</p> <p>⑧① Analog port _____</p> <p>⑧② Digital Port _____</p> |
|---|---|

Introduction I



① Flow Meter Unit

② Solenoid Valve

③ Input Fitting
(BSP 1/4" Female)

④ Output Fitting
(BSP 1/4" Female)

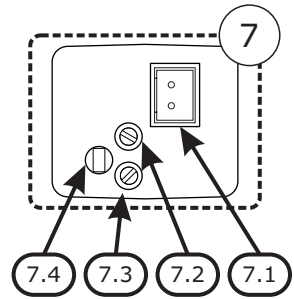
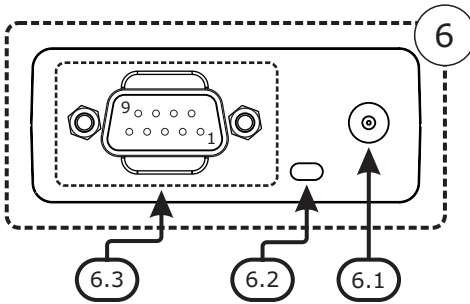
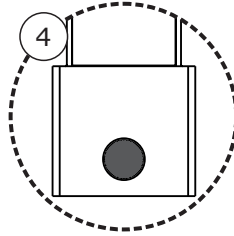
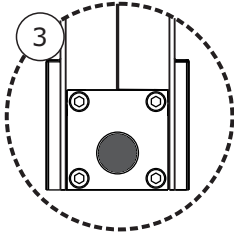
⑤ Attitude Indicator

⑥ Electrical Port

⑦ Setting panel

⑧ Display & Control panel

Introduction II

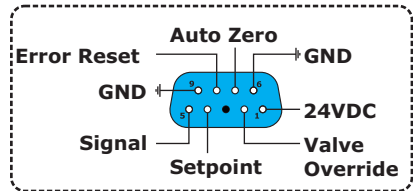


6

6.1 DC Power Jack (005)
(5.5x2.1mm)

6.2 3 Colors LED

6.3 1 x 9 - pin Male Sub-D (DB9)



7

7.1 Valve Command Port

7.2 Zero Adjustment Potentiometer

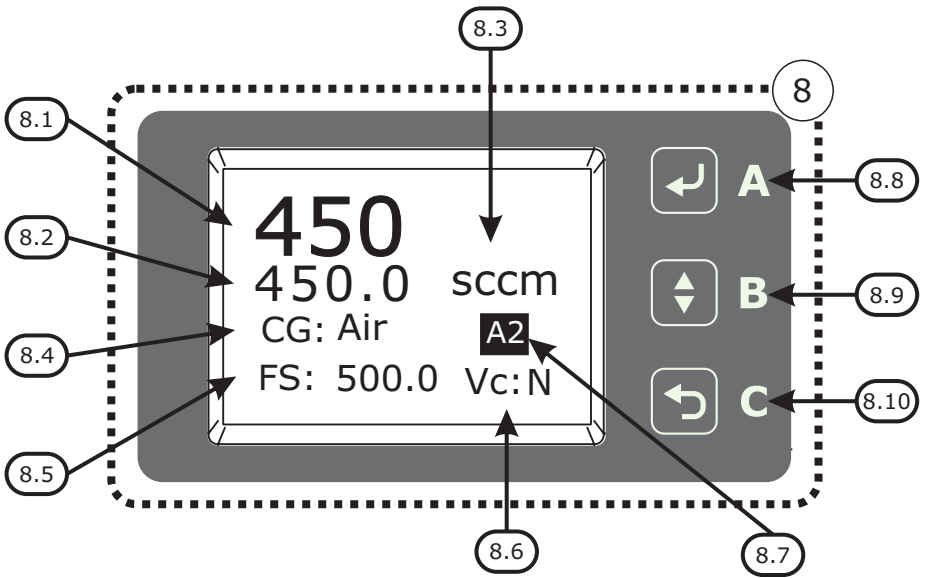
7.3 Span Adjustment Potentiometer



7.4 Auto Span Adjustment



Display Panel



8

8.1 Flow Value

8.2 Flow Setpoint

8.3 Flow Unit

8.4 Current Gas

8.5 Fullscale

8.6 Valve Condition

8.7 Error / Alarm

8.8 Key (A)
Select / Confirm

8.9 Key (B)
Scroll/ VC Shortcut

8.10 Key (C)
Cancel / SP Shortcut

VC* : Valve Condition
SP* : Setpoint

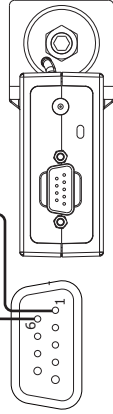
Arrangement

20 ...25 VDC
< 7.2 Watt

+24 V



P1- 24 VDC
P6- GND



3 Way Hand Valve

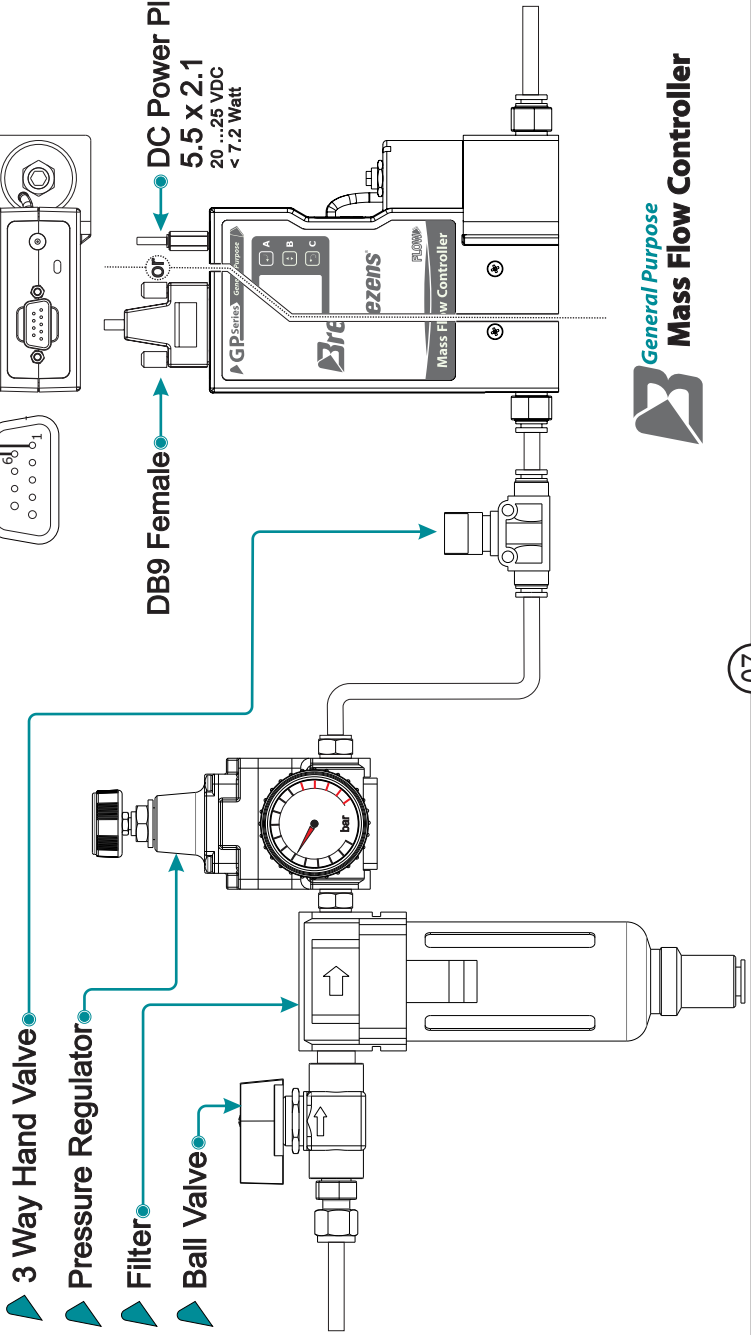
Pressure Regulator

Filter

Ball Valve

DB9 Female

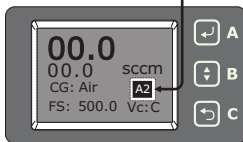
DC Power Plug
5.5 x 2.1
20 ...25 VDC
< 7.2 Watt



WarmUp Process

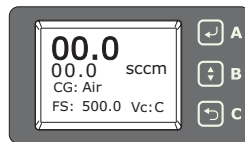


~12 sec



WarmUp Process Alarm Symbol

~5 min

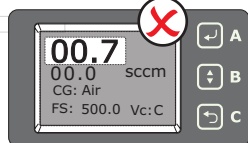
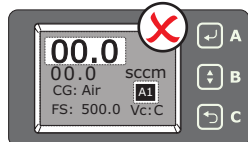
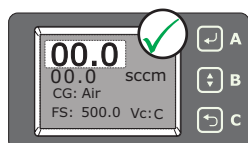
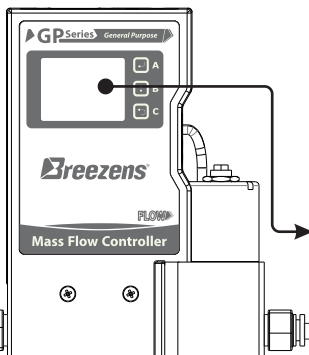
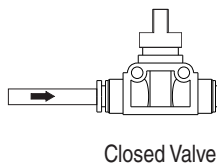


5 (min) for Acc ± 2.0 (FS)

45 (min) for Acc ± 1.5 (FS)

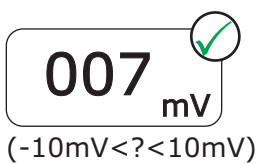
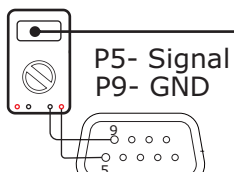
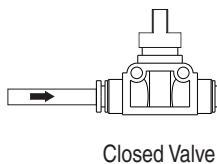
Zero Check I

Via Display



Zero Check II

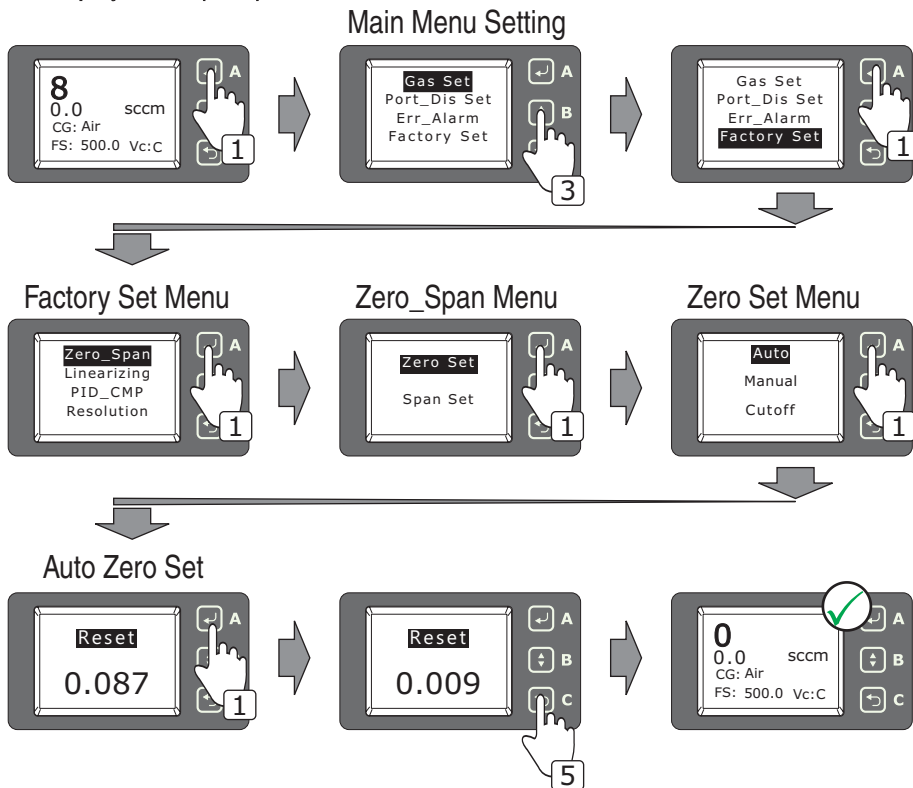
Via DB9 Port (Signal Pin-5)



Zero Adjustment I



Via Display Panel (Auto)



For Fine tune,

Temporarily reduce the Cutoff [P 11] value to 0.1% and after adjusting the Zero, return it to previous value



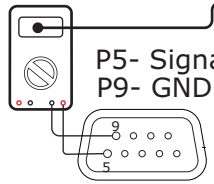
Note

Auto Zero Set is not very accurate, it is better to use the Manual Zero Set for more accurate adjustment



Zero Adjustment II

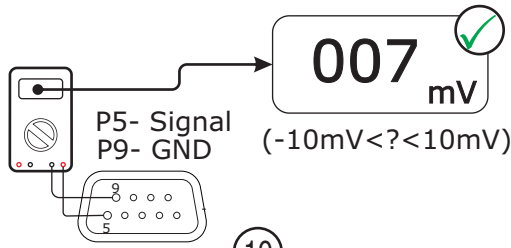
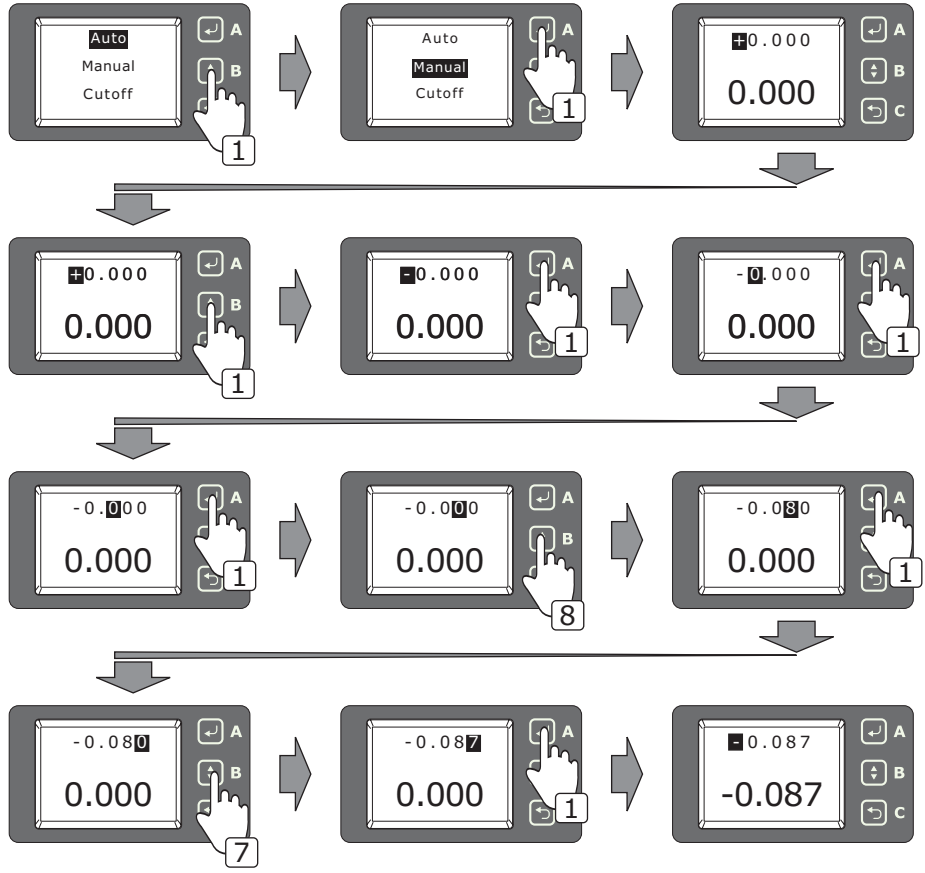
Via Display Panel (Manual)



-87 mV

Example:
(-87 mV) Or (-0.087 V) Zero Offset

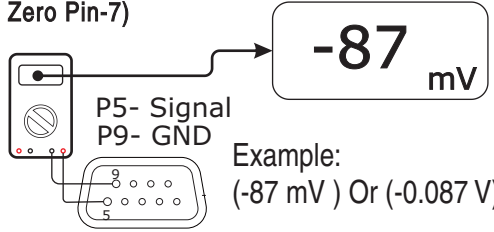
Zero Set Menu



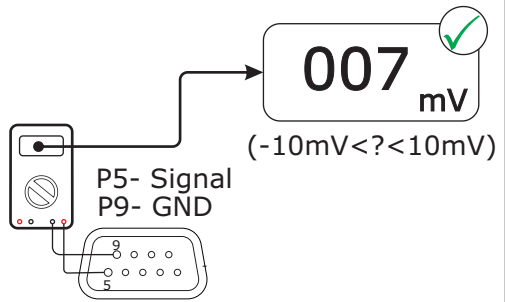
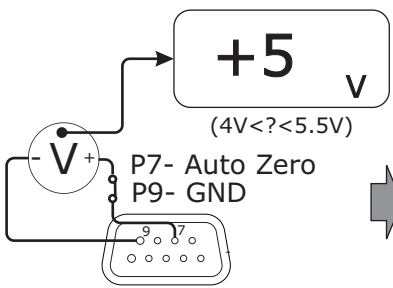


Zero Adjustment III

Via DB9 Port (Auto Zero Pin-7)

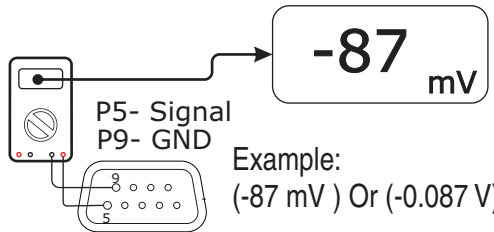


Example:
(-87 mV) Or (-0.087 V) Zero Offset

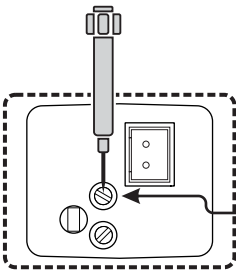


Zero Adjustment IV

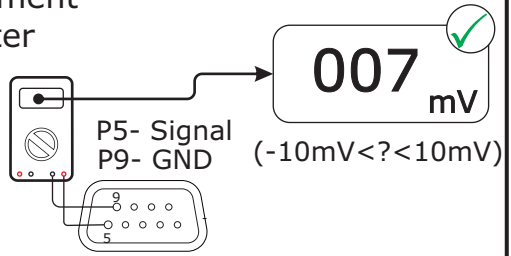
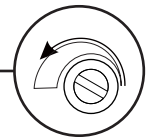
Via Potentiometer (Zero Adj. Potentiometer)



Example:
(-87 mV) Or (-0.087 V) Zero Offset



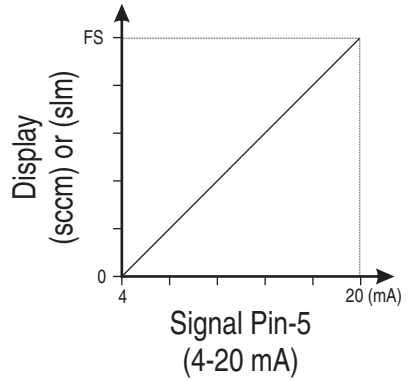
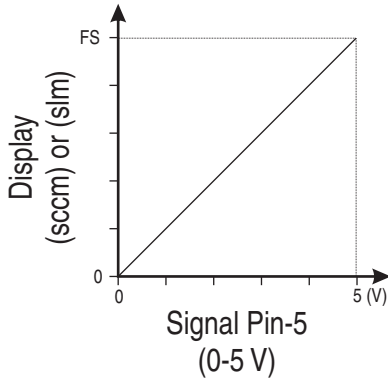
Zero Adjustment Potentiometer



Signal

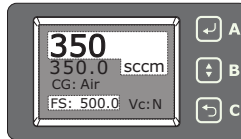



The DB9 Port (Signal Pin-5) VS Display



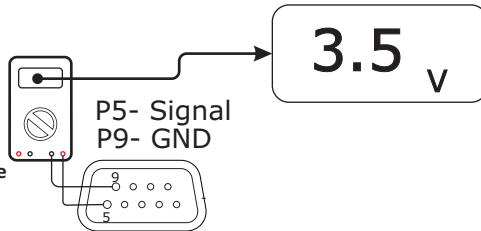
* Display [sccm]


Example:
Flow is 350 sccm
of 500 sccm FS



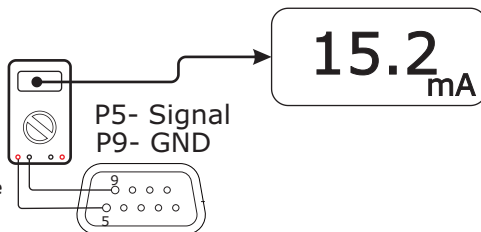
 **Minimum value in accordance with Turn Down Ratio**
2% (FS)
1% (FS)(By Order)


* Voltage Signal
[0-5 V]



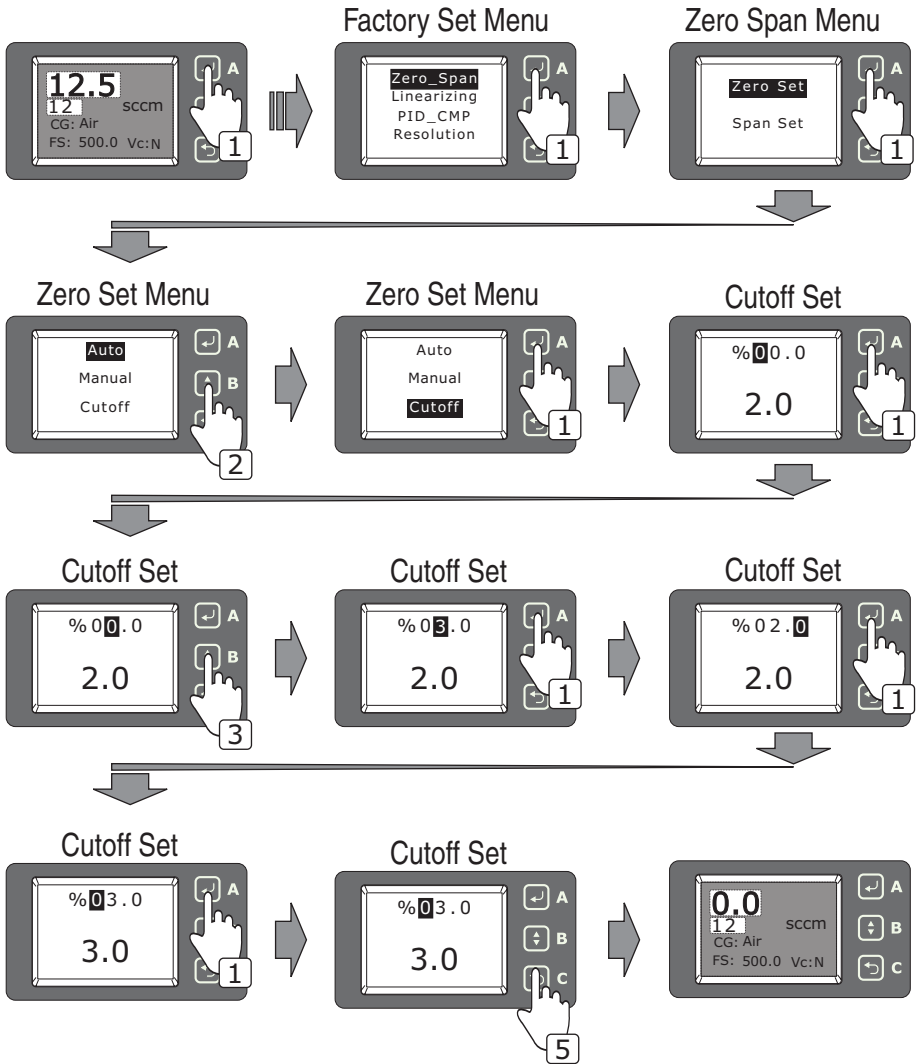
 **Minimum value in accordance with Turn Down Ratio**
100 (mV)
50 (mV)(By Order)

* Current Signal
[4-20 mA]



 **Minimum value in accordance with Turn Down Ratio**
0.32(mA)
0.16 (mA)(By Order)

Cutoff Adjustment



* For 500 sccm Fullscale
Change The Cutoff
from 2.0 to 3.0 % of FS

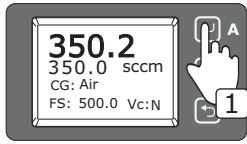
* For 500 sccm Fullscale
the minimum display Changes
from 10 sccm to 15 sccm



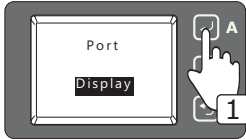
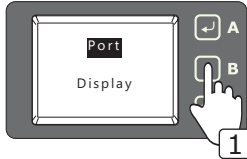
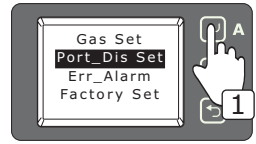
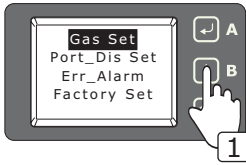
The Allowed Cut Off $\geq 2\%$ (FS)

Flow Display Option

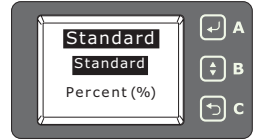
Example:
Flow is 350 sccm
of 500 sccm FS



Main Menu Setting

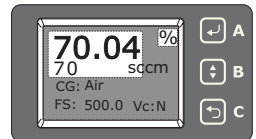
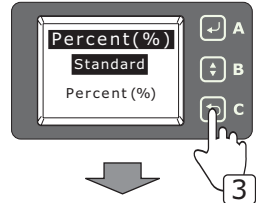
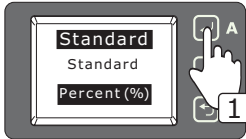
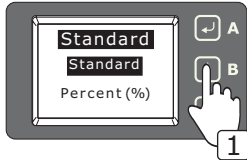


Display Show Set



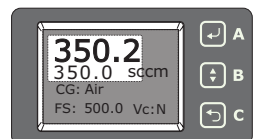
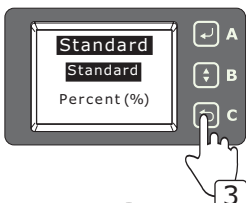
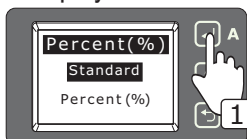
* Flow Percentage

Display Show Set

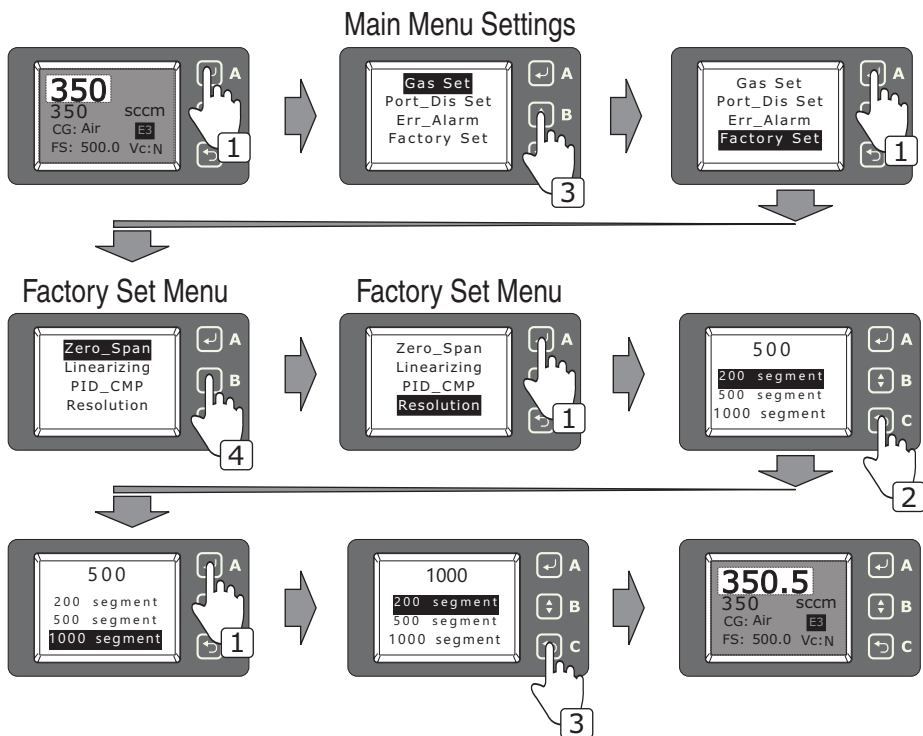


* Standard Flow

Display Show Set



Resolution Adjustment



* For 500 sccm fullscale
change the resolution
from 500 to 1000

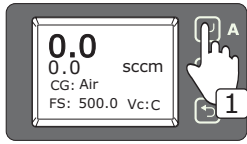


* For 500 sccm fullscale
the measurement resolution
changes from 1 sccm to 0.5 sccm

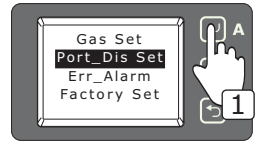
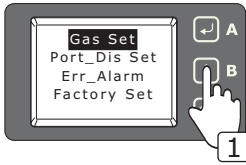


The Allowed Resolution ≤ 500
Resolution > 500 By Order

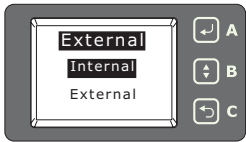
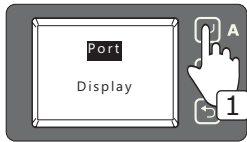
Port Selection



Setting Main Menu



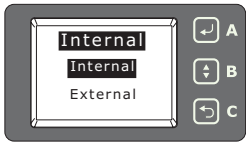
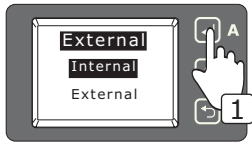
Port Selection Menu



* Internal Port



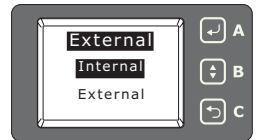
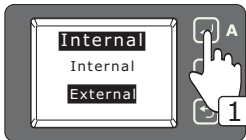
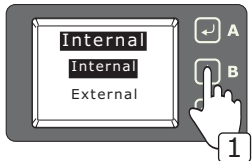
Port Selection Menu



* External Port



Port Selection Menu



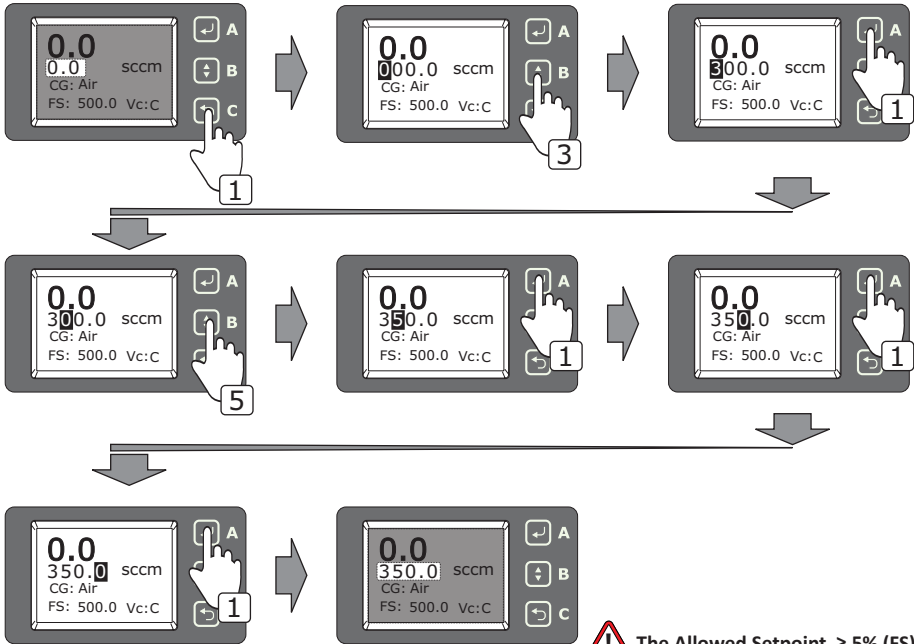
Setpoint Adjustment I



Example:

Set Point is 350 sccm
of 500 sccm FS

Display Panel



The Allowed Setpoint \geq 5% (FS)

Setpoint Adjustment II

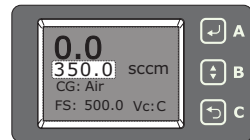
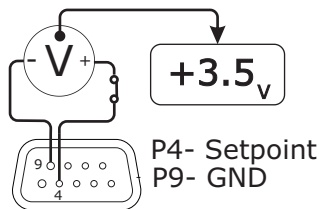


Example:

Set Point is 350 sccm
of 500 sccm FS

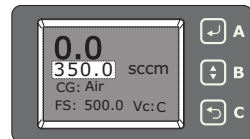
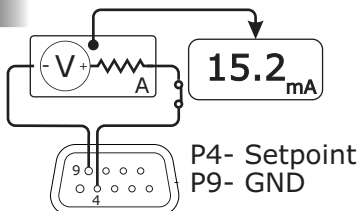
Db9 Port (Setpoint Pin-4)

* Voltage [0-5 V]



The Allowed Setpoint \geq 250 (mV)

* Current [4-20 mA]



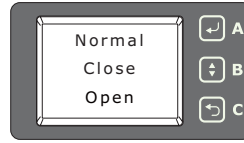
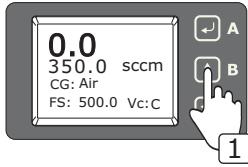
The Allowed Setpoint \geq 4.8 (mA)

Valve Condition I



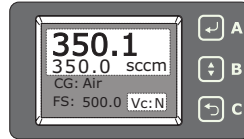
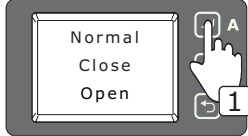
Via Display Panel

Valve Condition Menu



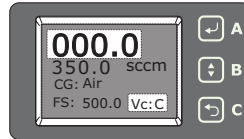
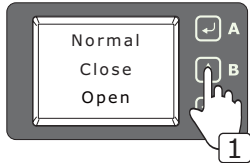
* Control Status [Vc:N]

Valve Condition Menu



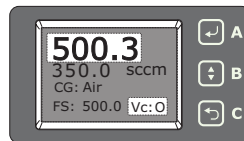
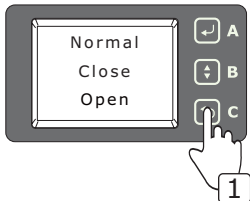
* Close Status [Vc:C]

Valve Condition Menu



* Open Status [Vc:O]

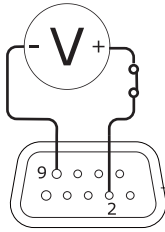
Valve Condition Menu



Valve Condition II

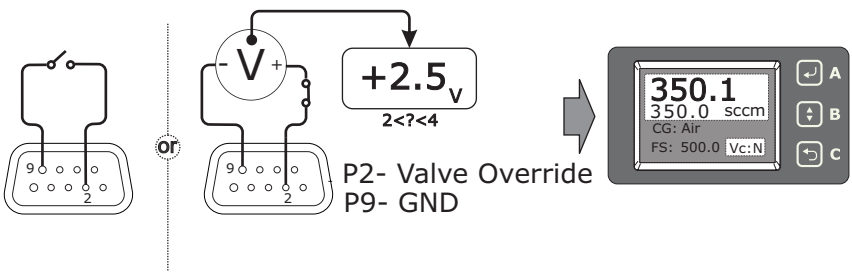


Via DB9 Port (Valve Override Pin-2)

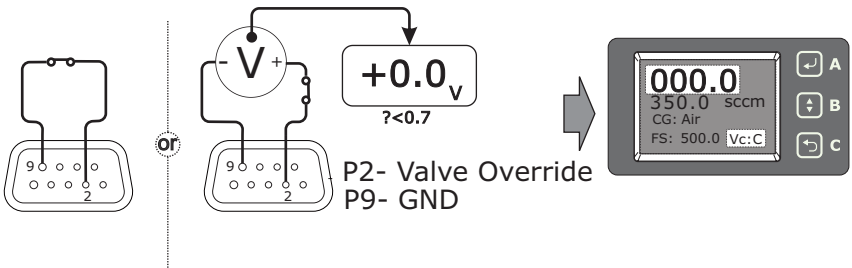


P2- Valve Override
P9- GND

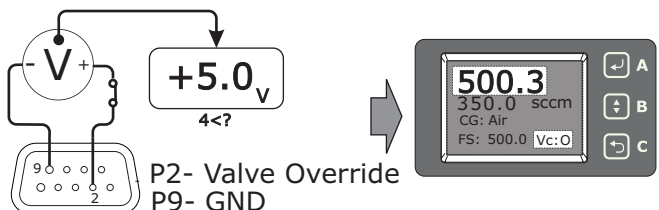
* Control Status



* Close Status



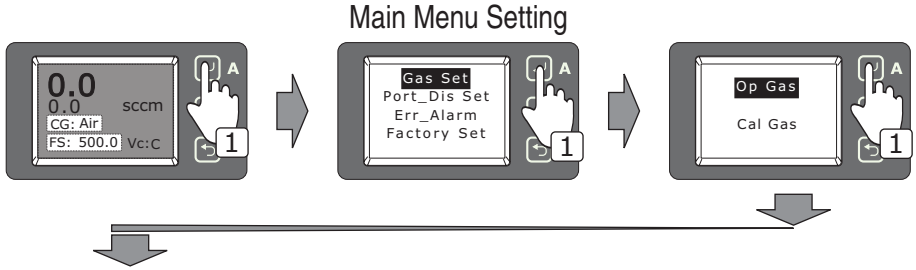
* Open Status



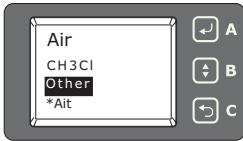
Adjust The Operation(Current) Gas I



Via The List



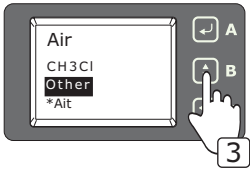
Gas Selection List



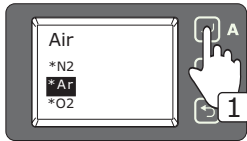
Example:

Operating (Current) Gas Changed to Argon (Ar)

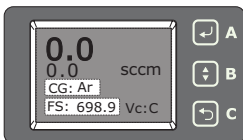
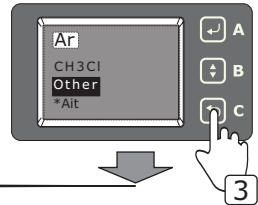
Gas Selection List



Gas Selection List



Gas Selection List



Allowed Operating Gases have an Asterisk (*)

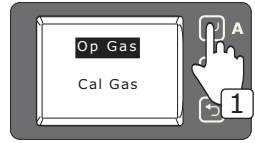
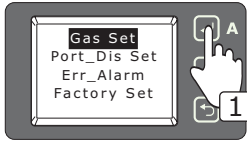
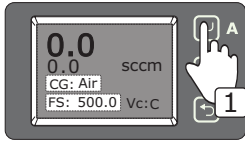
Other Operating Gases By Order

Adjust The Operation (Current) Gas II



Other gases Adjustment

Main Menu Setting



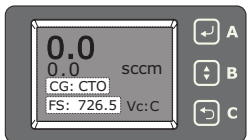
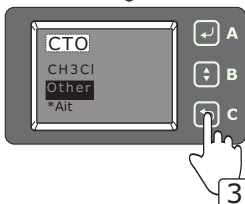
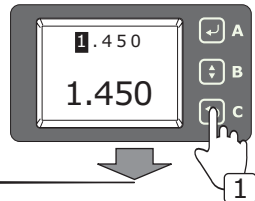
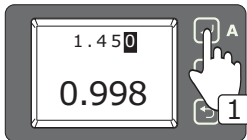
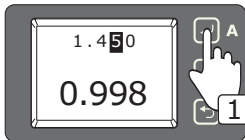
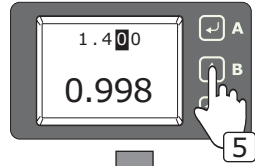
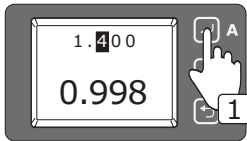
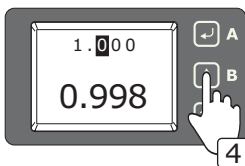
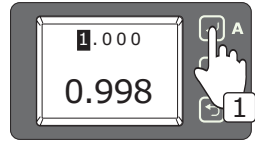
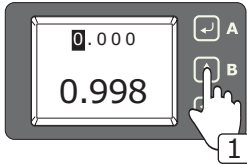
Gas Selection List



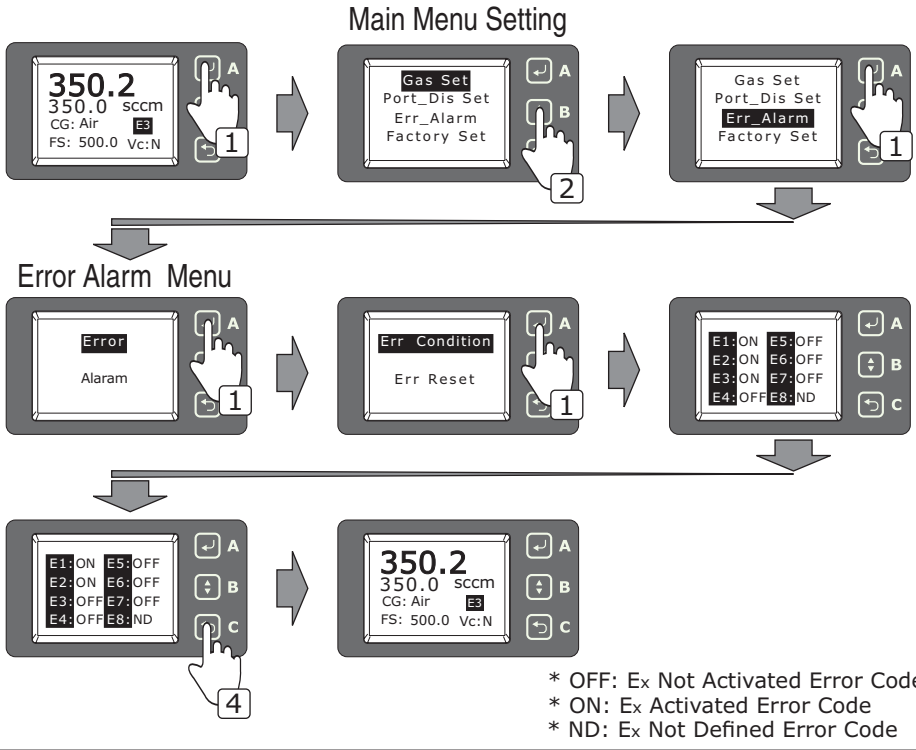
Example:

Operating (Current) Gas changed to an undefined Gas
Gas Correction Factor : 1.45

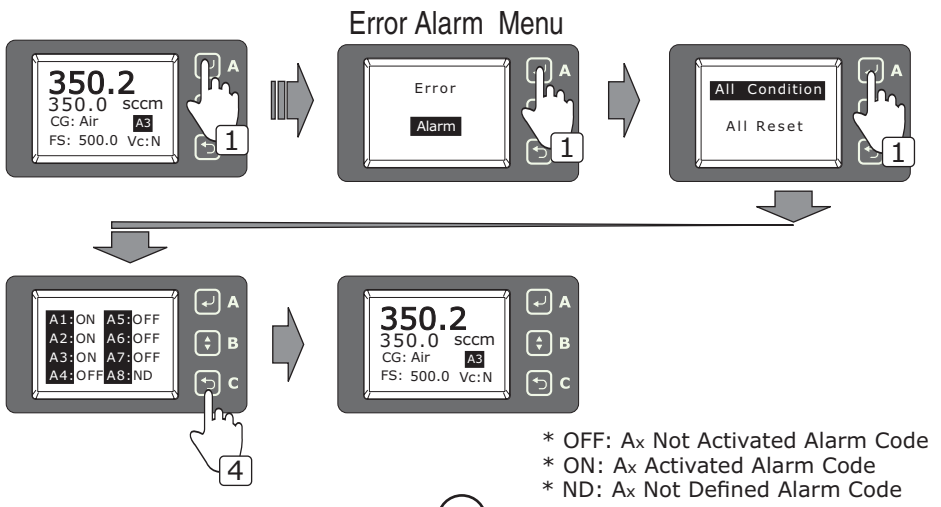
Gas Selection List



Error Status



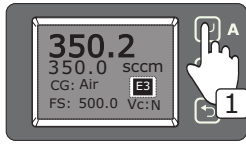
Alarm Status



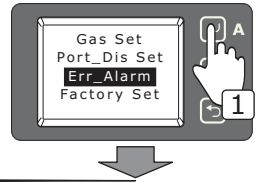
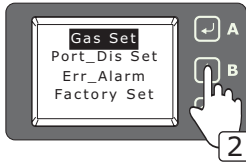
Error Reset I



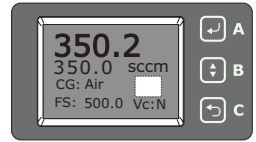
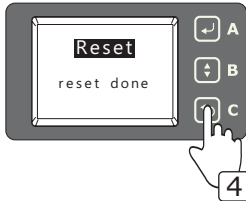
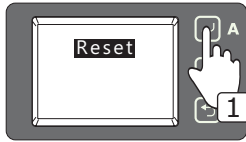
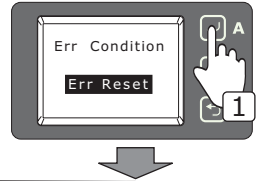
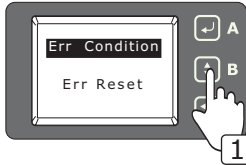
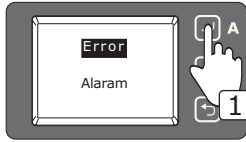
Via Display Panel



Main Menu Setting



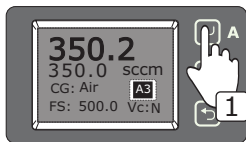
Error Alarm Menu



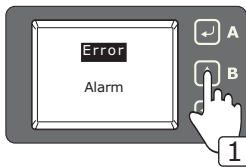
Alarm Reset I



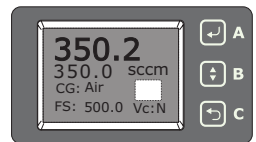
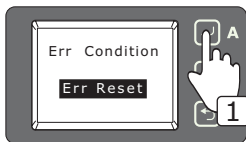
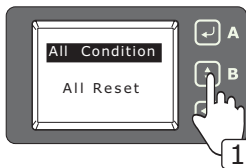
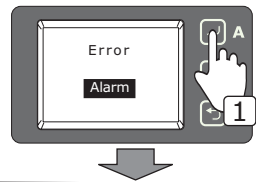
Via Display Panel



Error Alarm Menu



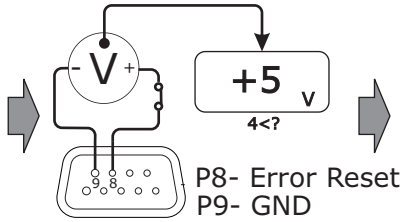
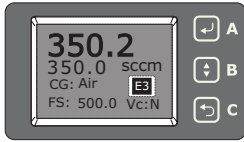
Error Alarm Menu



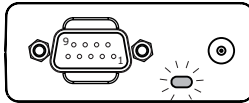
Error / Alarm Reset II



Via DB9 Port (Error Reset Pin-8)



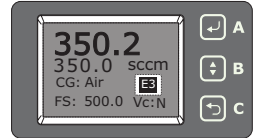
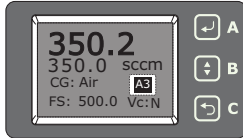
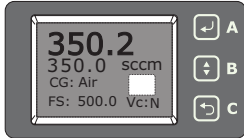
LED Status



Green: ON/Normal

Yellow : Alarm

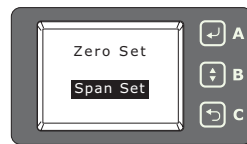
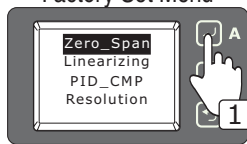
Red : Error



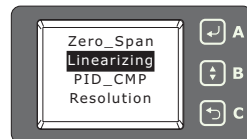
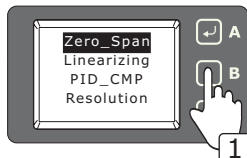
For Skilled Technical Expert

Factory Set Menu

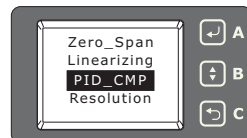
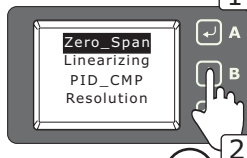
Only the authorized technical expert of the company is allowed to set SPAN



Only the authorized technical expert of the company is allowed to set LINEARIZING



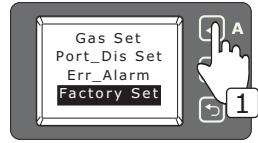
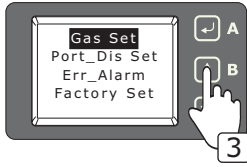
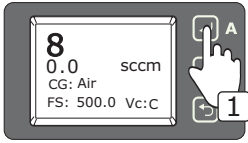
Only the authorized technical expert of the company is allowed to set PID-CMP



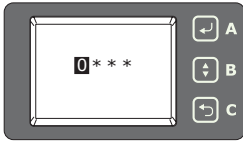
Factory Set



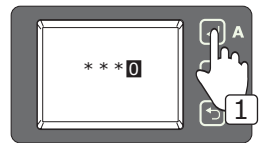
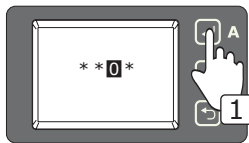
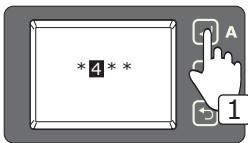
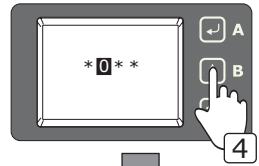
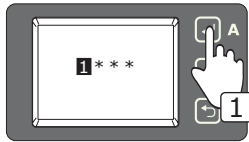
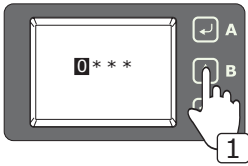
Main Menu Settings



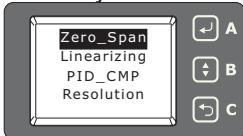
Password



Password Example: 1400



Factory Set Menu



Note:

A series of 20 horizontal dotted lines for writing notes.

Note:

A series of 20 horizontal dashed lines for writing notes.

