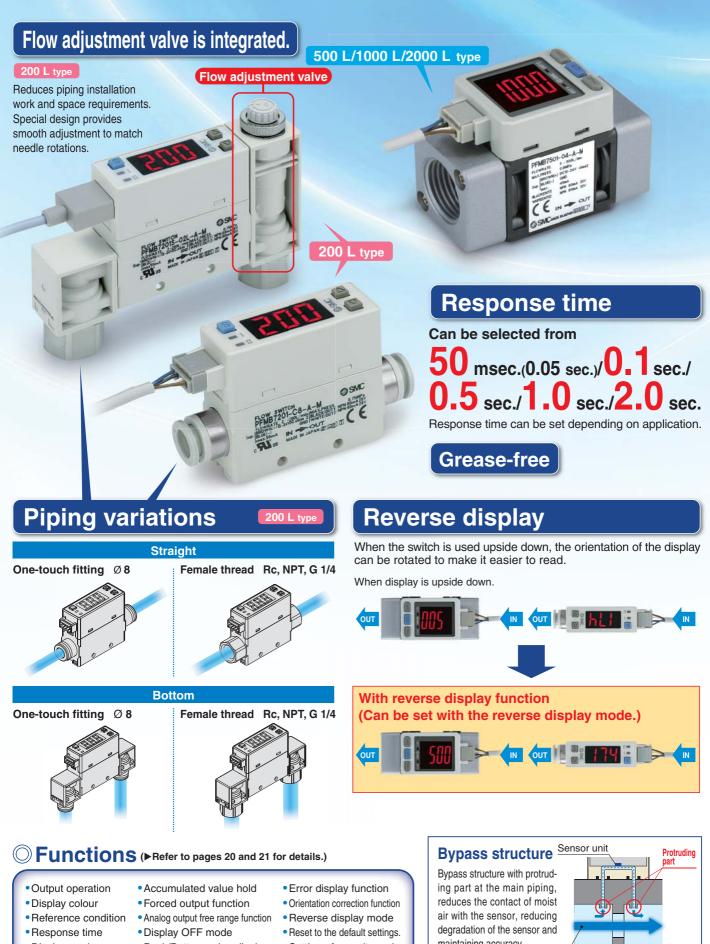


Series **PFMB 2-Colour Display Digital Flow Switch**



- Display mode
- External input function
- Peak/Bottom value display
 - Keylock function
- · Setting of security code
- maintaining accuracy. Moist air

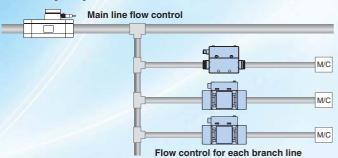


2-Colour Display Digital Flow Switch Series PFMB

Digital flow switch to save energy!

Flow control is necessary for promoting energy saving in any application.

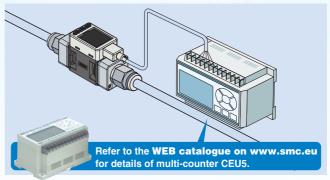
Saving energy starts from numerical control of the flow consumption of equipment and lines and clarification of the purpose and effect.



- Digital display allows visualisation of flow rate.
- 2-colour display, Improved visibility



Remote control is possible with accumulated pulse.



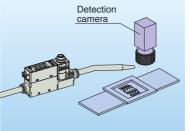
Applications

Note) The product is not designed to be explosion proof.

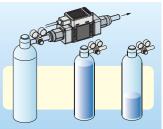
Air dryei

IDF

Control of purge air flow of ionizer
 • Flow control of the air for spray painting
 • N₂ blow prevents distortion of camera image due to air turbulence.



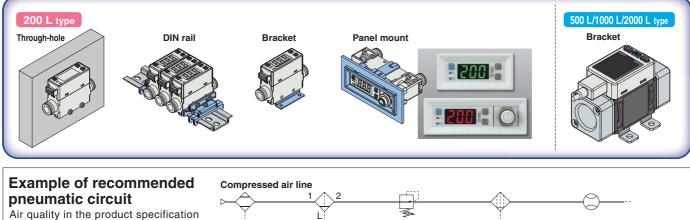
• Accumulated indication shows the operating flow rate or residual amount (of N₂ etc.) in a gas cylinder.



Flow switch

PFMB

O Mounting



Air quality in the product specification can be satisfied by using this pneumatic circuit.



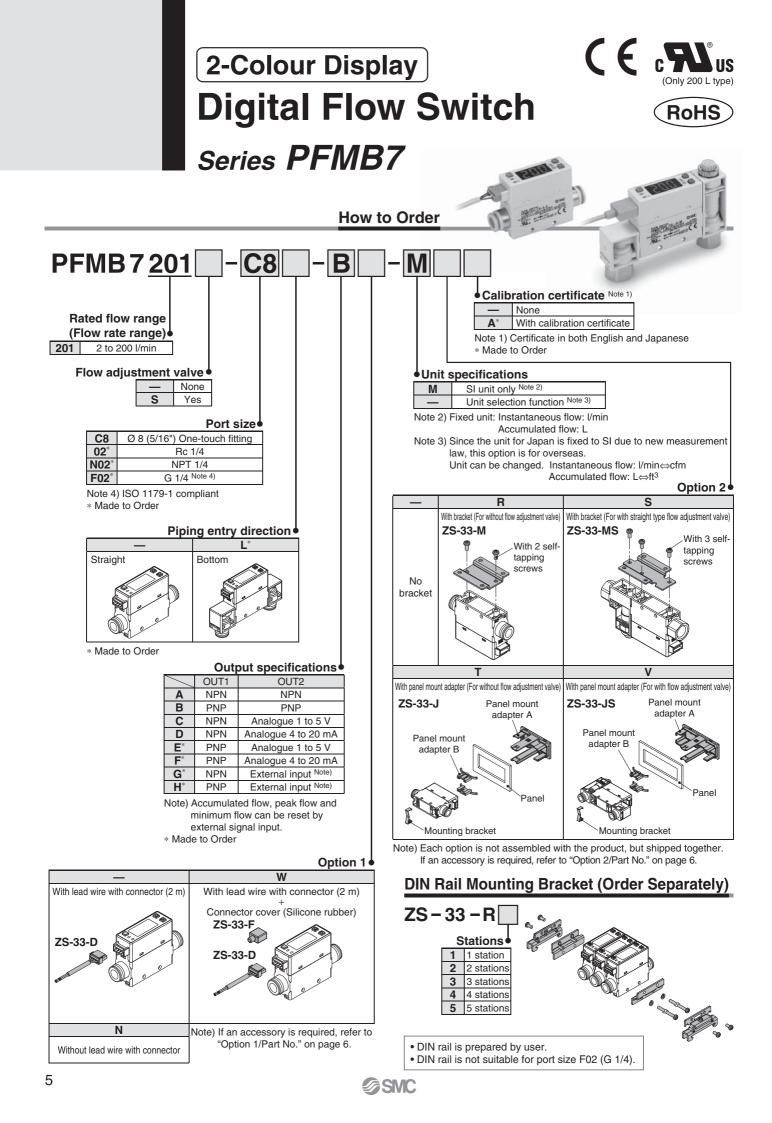
Flow Switch Flow Rate Variations

| Series | Applicable | Detection | Minimum | Rated flow range [l/min] | |
|--|---------------|---------------------|--------------|--------------------------|----------------------------|
| PFMV | fluid | method | setting unit | | |
| | | | | 0 0.5 | |
| | | | | 0 | |
| ~ | | Thermal | | 0 3 | |
| and the second s | Air N2 | type (MEMS) | | -0.5 0.5 | |
| | | | | | |
| | | | | | |
| | | | | 3 | |
| | Applicable | Detection | Minimum | Rated flow range [I/min] | |
| Series | fluid | method | setting unit | | 0 1200 |
| PFM | | | 0.01 l/min | 10 | |
| 1000 5 | Air N2 | Thermal | | 0.5 25 | |
| O THER | Argon CO2 | type (MEMS) | 0.1 l/min | 50 | |
| | | | | | |
| DEMD | 0 | | | | 1 |
| PFMB | en il | | | 200 | |
| Na air | Drucoir | | | 5 500 | 1 |
| | Dry air N2 | | 1 l/min | 10 1000 | 1 |
| | | flow type | | | |
| | | | | 2000 | |
| PFMC | | Thermal | | 5 500 | |
| The second se | Dry air N2 | type (MEMS) | 1 l/min | 10 1000 | |
| C Estation | 142 | Bypass flow type | | 20 2000 | |
| PF2A | | | | | |
| FFZA | | | 0.1 l/min | 1 10 | |
| | | | 0.5 l/min | 5 | |
| | | | 1 l/min | 10 100 | |
| | | | 2 l/min | 20 200 | |
| | Air N2 | Thermal type | | | - - - - - - |
| | | (Thermistor) | 5 l/min | 50 500 | |
| | | | 5 l/min | 150 3000 | |
| A' E | | | | 300 | 6000 |
| 5 A. | | | 10 l/min | | 1200 |
| | | | | | |

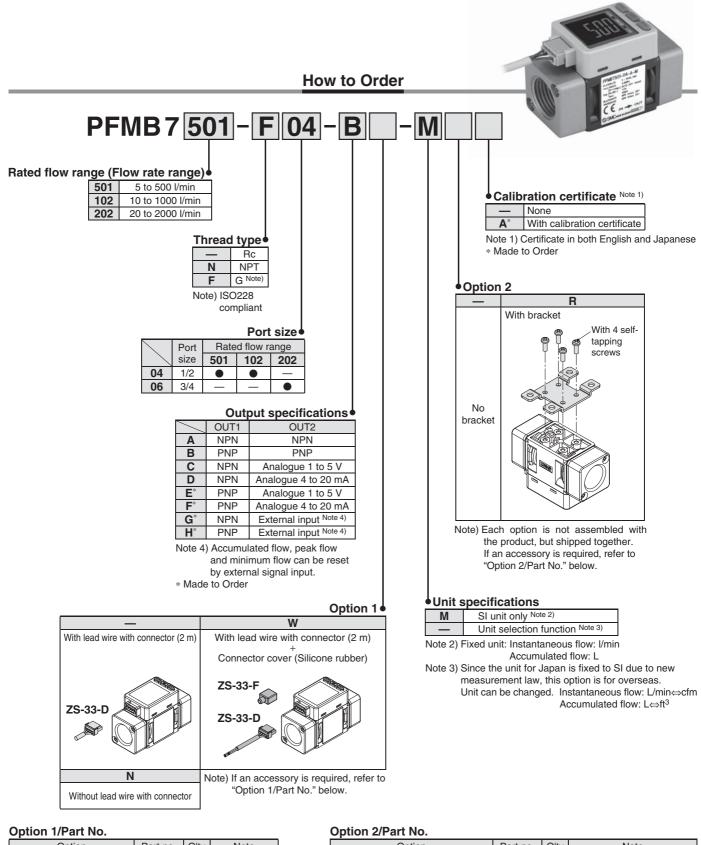


Flow Switch Variations/Basic Performance Table

| | PFMV | PFM | PFMB | PFMC | PF2A |
|---|---|--|--|--|---|
| Series | | e and a | | Careton Careton | |
| Enclosure | IP40 | IP40 | IP40 | IP65 | IP65 |
| Fluid | Air, N2 | Air, N2, Ar, CO2 | Dry air, № | Dry air, № | Air, N2 |
| Setting | Digital | Digital | Digital | Digital | Digital |
| Rated flow range | 0 to 0.5 l/min –0.5 to 0.5 l/min 0 to 1 l/min –1 to 1 l/min 0 to 3 l/min –3 to 3 l/min | 0.2 to 10 l/min 0.5 to 25 l/min 1 to 50 l/min 2 to 100 l/min | 2 to 200 1/min 10 to 1000 l/min 20 to 2000 l/min | 5 to 500 l/min 10 to 1000 l/min 20 to 2000 l/min | 1 to 10 l/min 50 to 500 l/min 5 to 50 l/min 150 to 3000 l/min 10 to 100 l/min 300 to 6000 l/min 20 to 200 l/min 600 to 12000 l/min |
| Power supply voltage | 24 V DC ±10 % | 24 V DC ±10 % | 12 to 24 V DC ±10 % | 12 to 24 V DC ±10 % | 12 to 24 V DC ±10 % |
| Temperature characteristics (25 °C reference) | ±2 % F.S. (15 to 35 °C) ±5 % F.S. (0 to 50 °C) | ±2 % F.S. (15 to 35 ℃) ±5 % F.S. (0 to 50 ℃) | ±2 % F.S. (15 to 35 °C) ±5 % F.S. (0 to 50 °C) | ±2 % F.S. (15 to 35 °C) ±5 % F.S. (0 to 50 °C) | ±3 % F.S. (15 to 35 °C) ±5 % F.S. (0 to 50 °C) ±2 % F.S. (PF2A7□□H: 0 to 50 °C) |
| Repeatability | ±1 % F.S. (Fluid: Dry air) Analogue output: ±5 % F.S. Maalogue output: ±0.1 % F.S. | ±1 % F.S. (Fluid: Dry air) Analogue output: ±3 % F.S. | ±1 % F.S. (Fluid: Dry air) | ±1 % F.S. (Fluid: Dry air) | ±1 % F.S. (PF2A7⊡0, PF2A7⊡□H) ±2 % F.S. (PF2A7⊡1) |
| Hysteresis | Hysteresis mode: Variable Window comparator mode: Variable | Hysteresis mode: Variable Window comparator mode: Variable | Hysteresis mode: Variable Window comparator mode: Variable | Hysteresis mode: Variable Window comparator mode: Variable | Hysteresis mode: Variable Window comparator mode: Fixed (3 digits) |
| Output | NPN/PNP open collector Analogue voltage output Analogue current output | NPN/PNP open collector Accumulated pulse output Analogue voltage output Analogue current output | NPN/PNP open collector Accumulated pulse output Analogue voltage output Analogue current output | NPN/PNP open collector Accumulated pulse output Analogue voltage output Analogue current output | NPN/PNP open collector Accumulated pulse output |
| Display | 2-colour LCD display | 2-colour LED display | 2-colour 2-colour LED display LCD display | 3-colour LCD display | LED display |



2-Colour Display Digital Flow Switch Series PFMB7



| Option | Part no. | Q'ty | Note |
|-----------------------------------|----------|------|----------------|
| Lead wire with connector | ZS-33-D | 1 | Lead wire: 2 m |
| Connector cover (Silicone rubber) | ZS-33-F | 1 | For connector |

| Part no. | Q'ty | Note |
|----------|---|---|
| ZS-33-M | | With 2 self-tapping screws (3 x 6) |
| ZS-33-MS | 1 | With 3 self-tapping screws (3 x 6) |
| ZS-33-J | 1 | |
| ZS-33-JS | 1 | |
| ZS-42-C | 1 | With 4 self-tapping screws (3 x 6) |
| ZS-42-D | 1 | With 4 self-tapping screws (3 x 6) |
| | ZS-33-M ZS-33-MS ZS-33-J ZS-33-JS ZS-42-C | ZS-33-M 1 ZS-33-MS 1 ZS-33-J 1 ZS-33-JS 1 ZS-33-JS 1 ZS-42-C 1 |

Specifications

For Flow Switch Precautions, refer to "Handling Precautions for SMC Products" on SMC website. For Specific Product Precautions, refer to the Operation Manual on SMC website.

| Minimum Impact Note 1 Umin esting unit Accountable for control response to the second secon | | | | | | | | | | | |
|--|---------------|----------------------|------------------------|---|-----------------------------------|------------------------------------|--|--|--|--|--|
| Fluid Applicable fluid were to the product of the transmission of thetrasmission of the transmission of the transmission of t | | Model | | DEMB7201 | DEMB7501 | DEMR7102 | PEMB7202 | | | | |
| Field Event Event Program Field temperature range Detection Protection method 10 to 200 (min 10 to 1000 (min 20 to 2000 (min Set flow 20 to 200 (min 10 to 1000 (min 20 to 2000 (min Set flow 20 to 2100 (min 10 to 1000 (min 20 to 2000 (min Set flow 20 to 2100 (min 10 to 1000 (min 20 to 2000 (min Set flow 11 L 11 (min 10 L 10 L Annality with theme 1 1 L 10 to 0.0 Min 20 to 2000 (min Rest flow range 0 to 0.75 MPa 0 to 0.8 MPa 10 to 0.8 MPa Protection 1.0 MPa Refer to "Pressure Load" (min to 0.0 Kin to 0.8 MPa Protection 1.0 MPa Refer to "Pressure Load" (min to 0.6 Kin to | | | Iuid Note 1) | | | | | | | | |
| Detection method Thermal type Flow Rated flow range 2 to 20 Urnin 5 to 500 Urnin 10 to 1000 Urnin 20 to 2000 Urnin Set Tow Internance Inte | Fluid | | | | | | | | | | |
| Fated flow range 2 to 200 kmin 5 to 600 kmin 10 to 1000 kmin 20 to 2000 kmin Flow Attendinge 2 to 200 kmin 10 to 1000 kmin 20 to 2000 kmin 20 to 2000 kmin Flow Minimum bildetacout 1 to 1000 kmin 20 to 2000 kmin 20 to 2000 kmin Setting Unit 1 to 1000 kmin 20 to 2000 kmin 20 to 2000 kmin Setting Unit 1 to 2000 kmin 10 to 200 kmin 20 to 2000 kmin Setting Unit 1 to 2000 kmin 10 to 200 kmin 20 to 2000 kmin Researce marge: 0 to 0.75 MPa 0 to 0.8 MPa 0 to 0.8 MPa Pressure loss Processore 1.0 MPa 1.2 kMPa Processore 1.2 kMPa Pressore 1.2 kMPa Processore 1.2 kMPa 1.2 kMPa 1.2 kMPa Processore 1.2 kMPa 1.2 kMPa | | | | | | | | | | | |
| Set flow Set flow 10 to 1000 ltmm 20 to 2100 ltmm 20 to 210 ltmm 20 | | | | 2 to 200 l/min | | | 20 to 2000 l/min | | | | |
| Flow mite intege Resultance of the second | | | | | | | | | | | |
| Flow Itimina Itimina Itimina Itimina Itimina extractive pripriou Linewal of 2 or 5 minutes can be selected. 10 Lipulse Accentrative pripriou 0 to 0.75 MPa 0 to 0.8 MPa Pressure Procentrative pripriou 0 to 0.75 MPa 0 to 0.8 MPa Pressure Procentrative pripriou 0 to 0.75 MPa 0 to 0.8 MPa 0 to 0.8 MPa Pressure Procentrative pripriou 1.5 MPa Relet to "Pressure to cancer any pripriou 1.5 MPa 0 to 0.8 MPa 0.6 MPa Relet to "Pressure to cancer any pripriou 1.5 MPa 1.5 MPa 1.6 MPa Relet to "Pressure to cancer any pripriou 1.5 MPa 1.6 MPa <td< th=""><th></th><th></th><th></th><th></th><th>5 to 525 l/11</th><th></th><th>2010/2100 1/11111</th></td<> | | | | | 5 to 525 l/11 | | 2010/2100 1/11111 | | | | |
| setting unit lacemate for IL ID Interval of 2 of 5 minutes can be selected. Interval of 2 of 5 minutes can be selected. Id Rated pressure range Oto 0.75 MPa Oto 0.75 MPa Oto 0.75 MPa Oto 0.75 MPa Oto 0.8 MPa To 0.9 MPa Pressure loss Pr | Flow | - | | 0 10 999,999,999 L | 11/ | , , , | | | | | |
| Instrume Interval of 2 or Smither 10 Lipulse Rated pressure range 0 to 0.75 MPa 0 to 0.8 MPa Pressure 0 to 0.75 MPa 0 to 0.8 MPa Pressure loss Refer to Pressure Loss" graph. 1.2 MPa Pressure loss Pressure loss Refer to Pressure Loss" graph. Pressure loss Pressure loss Refer to Pressure Loss" graph. Pressure loss Production 55 m K or less Production S m K or loss MPa, to 0.0 8 MPa, do the Pa derence) Production S m K or loss S m K or loss Mainti Mainted consumption 55 m K or less S m K or loss Production Production 3 % F S. S m K or loss Mainti Mainted consumption 55 m K or loss S m K or loss S m K or loss Repeatability ±1 % F S. (2 % F S. mean resonance S m K or loss S m K or loss Switch operation Select from Hystersity (Indow comparatics, Accumutated output or loss S m K or loss S m K or loss Mainting loss (Indow Comparatics, Accumutated and D m A) P or loss (Indow Comparatics, Accumated and unput or loss S m K or loss (Indow Comparatics, Acc | | | | 11 | I 1/I | | | | | | |
| Nomitable statutions Note 30 Interval of 2 or 5 minutes can be selected. Pressure loss 0 to 0.75 MPa 0 to 0.8 MPa Pressure loss 1.0 MPa 1.2 MPa Pressure loss 1.0 MPa 1.2 MPa Pressure loss 1.5 K M to 0.8 MPa 1.2 MPa Pressure loss 1.5 K M to 0.8 MPa 1.2 MPa Pressure loss 1.5 K M to 0.8 MPa 1.5 K M to 0.8 MPa Pressure loss 1.5 K M to 0.8 MPa 1.5 K M to 0.8 MPa Pressure loss 1.5 K M to 0.8 MPa 1.5 K M to 0.8 MPa Upply obscursey 2.8 K M 1.5 K M to 0.8 MPa Vision 1.5 K M to 0.8 MPa 1.5 K M to 0.8 MPa Vision Antopase output accuracy 1.5 K S (0 to 0.7 C, 25 C reference) Vision Select from Hysteresis, Windew comparator, Accumulated output modes. Select from Mail output type Output mode Select from Mail output type. 1.5 V or less (al load current 80 mA) Maximum load current 0 MPA Beber from Mail output type. 1.5 V or less (al load current 80 mA) Maximum load current 0 MPA Select from Mail output type. 1.5 V or less (al load curent 80 mA) | | | | | | | | | | | |
| Bated pressure range 0 to 0.75 MPa 0 to 0.75 MPa Pressure loss 1.0 MPa Refer to Pressure Loss" graph. Pressure loss 1.2 MPa Refer to Pressure Loss" graph. Pressure loss 1.5 KF.3 (to 0.8 MPa, 0.5 MPa reference) 1.5 VF.3 (to 0.8 MPa, 0.5 MPa reference) Prote supply voltage 1.2 to 24 V DC :10 % 0.5 0.8 MPa reference) Protection Polating bare corracy 2.5 VF.5 (to 0.8 MPa reference) Minitigges output accuracy 2.5 VF.5 (to 0.8 MPa reference) 2.5 VF.5 (to 0.8 MPa reference) Manages output accuracy 2.1 % F.5 (to 2% F.5 when 3% /5.6 is then 10.05 seconds) 1.6 MPA reference) Manages output accuracy 1.1 % F.5 (to 2% F.5 (to 1.6 MPA reference) 0.0 Seconds) Output type NPN output systems; Mindow comparator, Accumulated output or Accumulated pulse output modes. Switch operation 80 nA Basime applies rating with output type.1 V or less (at load current 80 mA) NPN output type.1 V or less (at load current 80 mA) Histeine Intermed and the system is interma and the system is interma and the system supply voltage 12 V: 300 D NPN output type.1 V or less (at load current 80 mA) Histeine Intermed and the system is interma and th | | | | 1 L/p | | | | | | | |
| Processor Proof pressure 1.0 MPa 1.2 MPa Pressure loss Pressure loss Refer to Pressure loss' graph. Pressure loss Pressure loss Refer to Pressure loss' graph. Pressure loss Pressure loss Refer to Pressure loss' graph. Pressure loss Product Pressure loss' graph. Refer to Pressure loss' graph. Pressure loss Product Pressure loss Refer to Pressure loss graph. Pressure loss Product Pressure loss Refer to Pressure loss graph. Pressure loss Product Pressure loss graph. Pressure loss graph. Pressure loss Pressure loss graph. Pressure loss graph. Pressure loss Pressure loss graph. Pressure loss graph. Pressure loss Pressure loss graph. Pressure loss graph. Product loss graph. Pressure loss graph. Pressure loss graph. Product loss graph. Pressure loss graph. Pressure loss graph. Product loss graph. Pressure loss graph. Pressure loss graph. Product loss graph. Pressure loss graph. Pressure loss graph. Product loss graph. Pressure loss | | Accumulated value n | iold function (Note 2) | | Interval of 2 or 5 mini | | | | | | |
| Pressure Pressure Description Pressure Loss* characteristics with providinge 15 % F.S. (bio 0.8 MPa, 0.5 MPa reference) Prover supply voltage 12 to 24 V DC ±10 %. Prover supply voltage 13 % F.S. Electrical Prover supply voltage Output accuracy 13 % F.S. Analogue output accuracy 13 % F.S. Output mode 55 % S.C. to 0.8 MPa, 0.5 MPa reference) Output mode 13 % F.S. Output mode Select from Hysteresis. Window comparator, Accumulated output Accumales Switch Maninger output type Maninger output type NPN output type. 1 V or less (at load current 80 MA) Maninger output type NPN output type. 1 V or less (at load current 80 MA) Maninger output type NPN output type. 1 V or less (at load current 80 MA) Maninger output type NPN output type. 1 V or less (at load current 80 MA) Maninger output type NPN output type. 1 V or less (at load current 80 MA) Maninger output type NPN output type. 1 V or less (at load current 80 MA) Maninger output type NPN output type. 1 V or less (at load current 80 MA) Maninger output type NPN output type. 1 V | | | | | | | | | | | |
| Pressure toss There for the result to toss or graph. Pressure class detactification wherein is \$15.15.00.075 MPa.0.33 MPa element 12.10.24 V DC .110 % Presser capping on the class of the c | Pressure | | | 1.0 MPa | | | | | | | |
| Power supply voltage 12 to 24 V DC ±10 % Heiner Loosumption 55 m A or less Protection Polarity protection Natague output accuracy 13 % F.S. Analogue output accuracy 13 % F.S. Vector Repetability 13 % F.S. Vector Network Select from Hysteresis, Window comparator, Accumulated output accuracy Switch Maximum load current 80 mA Maximum load current 80 mA 80 mA Response time ^{Vector} Select from 0.55 sec. 1 sec. 52 sec. Proteresis NPN output type: 1 V or less (at load current 80 mA) manalogue output 10 5 V or less (at load current 80 mA) Response time ^{Vector} Vector Select from 0.55 sec. 15 sec. 15 sec. Note Output type: Voltes output 10 to Vor less (at load current 80 mA) 10 Power supply voltage 12 V: 300 D Response time ^{Vector} Vector Vectorent 0.5 secc. 10 sec. 10 sec. | | Pressure los | SS | | Refer to "Pressu | | | | | | |
| Electrical Current consumption S5 mA or less Protection Display accuracy 13 % F.S. Note IT Answer Answer 13 % F.S. Repetatbility 11 % F.S. (12 % F.S. when response time is to 0.05 seconds.) Temperature characteristics 11 % F.S. (12 % F.S. when response time is to 0.05 seconds.) Temperature characteristics 11 % F.S. (12 % F.S. when response time is to 0.05 seconds.) Switch operature characteristics 11 % F.S. (12 % F.S. when response time is to 0.05 seconds.) Switch operature characteristics 11 % F.S. (12 % F.S. when response time is to 0.05 seconds.) Switch operation Select from Nomal output or Reversed output. Bailman agaid values (MR values) NPN output or Reversed output. Hainim agaid values (MR values) NPN output type. 1.5 V or less (at load current 80 mA) Response time Non 0 Frequence Current output 4 to 20 mA Hout tageting (RM values) NPN output type 10 Voltage output 1 for SV. Current output 4 to 20 mA Current output 4 to 20 mA Current output 4 to 20 mA Hout tageting (RM values) Current output 4 to 20 mA Response time Non 7 Linked with the response time of the solind stato 0 rol 0.1 T | | | | ±5 % F.S. (0 to 0.75 MPa, 0.35 MPa reference) | | | rence) | | | | |
| Protection Protection Note 11 Analogue output accuracy 13 % F.S. Analogue output accuracy 13 % F.S. Current Parenture Characteristics 15 % F.S. (10 50 °C. 28 °C reference). Output type NPN open collector Output type NPN open collector Output mode Select from Hysteresis, Window comparator, Accumulated output or Accumulated output accurrent 80 mA Not of the average inten ^(Non s) Select from Accumulated for ACCUP or Accumulated output to Accumulated output to Accumulated output to Accumulated output accumated output accumated output accumated on Accumulated output to Accumulated output accumate Accumulated output to Accumulated Accumote Accumulated Accumulated Accurent Base Adv Accumul | | | | | | | | | | | |
| Display accuracy 13 % F.S. Net 11 Accuracy 13 % F.S. Repeatability 11 % F.S. (±2 % F.S. when response time is set to 0.05 seconds.) Temperature characteristics 11 % F.S. (±2 % F.S. when response time is set to 0.05 seconds.) Output type NPN open collector NPN open collector Output mode Select from Hysteresik, Window comparator, Accumulated pulse output modes. Switch operation Select from Hysteresik, Window comparator, Accumulated pulse output modes. Switch operation Select from Normal output of Pereversed output. Maximum load current 80 mA Maximum apple dyalloging MPR obj/ PPN output type: 1.5 V or less (at load current 80 mA) Response time Non 4 Select from 0.05 sec., 0.1 sec., 0.7 2 sec. Hysteresis Non 6/9 Vocinator output: 1 to 20 mA Protection Select from 0.05 were supply load table from 0. Current output 1 to 20 mA Output timped fames. A power supply load table from 0. Imped meal Output type: Voltage output: 1 to 20 mA Imped meal Output type: Output type: 1 V or less (at load current 80 mA) Response time Non 7 Linked with the response time of the switch output. Respo | Electrical | | sumption | | | | | | | | |
| Network Analogue output accuracy 13 % F.S. Securation Repeatability 11 % F.S. (2% F.S. when response time is set to 0.05 seconds.) Temperature characteristics 11 % F.S. (2% F.S. when response time is set to 0.05 seconds.) Output type NPN open collector Output type NPN output or response time is set to 0.05 second type. Switch Maximum load current 80 mA Maximum load current 80 mA Maximum load current 80 mA Response time lives in the set to 0.05 second type. 1.5 V or less (at load current 80 mA) Response time lives in the set to 0.05 second type. 1.5 V or less (at load current 80 mA) Response time lives in the set to 0.05 second type. 1.5 V or less (at load current 80 mA) Nantogue Output type Voltage output: 1 to 5 V. Current output 40 to 20 mA Nantogue Output type Voltage output: 1 to 5 V. Current output: 4 to 20 mA Nantogue Output type Voltage output: 1 to 5 V. Current output: 4 to 20 mA Nantogue Current output Maximum load impedance at power supply voltage 24 V: c00 Q. at power supply voltage 12 V: 30 Q. Unit Wess Imput mode Select from Istantancous flow on | | | | | | | | | | | |
| Accurate Program Accurate Program< | | | | | | | | | | | |
| Hepstability 1:1 % F.S. (£2 % F.S. when response time is set to U.0s seconds.) Temperature characteristics 1:5 % F.S. (10:5 % C.2) % F.S. (10:5 % C.2) Circutut type Output type NPN open collector NPN open collector NPN open collector Switch Switch operation Select from Hysteresis, Window comparator, Accumulated output or Accumulated pulse output modes. Switch Switch operation Select from Hysteresis, Window comparator, Accumulated output or Accumulated output hype. Note Maximum page dove (Basida output hype: 1 V or less (at load ourners 00 mA) Hepsteresis Note 5 Select from 0.05 sec., 0.1 sec., 0.7 2 sec. Hysteresis Note 5 Voltage output : 1 to V or less (Response time of the switch output. Impedance Woltage output impedance: Approx. 1 k0 Response time Note 7 Neximum load impedance: Approx. 1 k0 Imput mode Select from Accumulated flow acternal response time of the switch output. Imput mode Select from Standard output on Accumulated flow. Unit Wole 10 Imput mode Select from Standard output or Accumulated flow. | | | | | | | | | | | |
| Output type NPN open collector PNP open collector Output mode Select from Hysteresis, Window comparator, Accumulated output or Accumulated puise output modes. Switch Switch operation Sole of from Hysteresis, Window comparator, Accumulated output or Accumulated puise output modes. Maximum load current Born A Sole of from Hysteresis, Window Comparator, Accumulated puise output type: 1.5 V or less (at load current 80 mA). Note 60 NPN output type: 1.5 V or less (at load current 80 mA). Sole of from 0.5 sec. 1 sec., or 2 sec. Hysteresis Switch operation Sole of from 0.5 sec. 1 sec., or 2 sec. Protection Short circuit protection Variable from 0. Note 60 Output type Voltage output: 1 to 20 mA Note 60 Output type Voltage output: 1 to 20 mA Note 60 Output type Voltage form Sole of the switch output. Input type Voltage form fistantaneous flow or Accumulated flow external input Input voltage 7 Voltage form fistantaneous flow or Accumulated flow. Input two 01 Input voltage 7 Sole of table tion form fistantaneous flow or Accumulated flow. -100 to 210 Imin Input node Select from Accumulated flow external input -100 to 210 Imin -100 to 2100 Imin< | Accuracy | | | ± | | |) | | | | |
| Output mode Select from Hysteresis, Window comparator, Accumulated output or Accumulated pulse output modes. Switch output Maximum load current 80 mA 80 mA <t< th=""><th></th><th></th><th></th><th></th><th></th><th></th><th></th></t<> | | | | | | | | | | | |
| Switch Select from Normal output or Reversed output. Switch Bon A Baiman apple voltage internet. 80 mA Maiman apple voltage internet. 80 mA Baiman apple voltage internet. 80 mA Maiman apple voltage internet. 80 mA Maiman apple voltage internet. 80 mA Mainana apple voltage internet. 80 mA Mainana apple voltage internet. 80 mA Mainana apple voltage internet. 80 mA Note 0 Voltage output: 1 to 5 V. Corrent output: 4 to 2 mA Mainana apple voltage output. Cutput impedance: Approx. 1 KQ Output type Voltage output: 1 to 5 V. Corrent output. Response time Vine Vine Vine Vine Vine Vine Vine Vin | | | | | | | | | | | |
| Switch output Maximum load current me Non 4 80 mA 28 V DC Besponse time Non 4/ Hysteresis Non 5/ Protection NPN output type: 1 V or less (at load current 80 mA) PNP output type: 1.5 V or less (at load current 80 mA) Non 6/ Hysteresis Non 5/ Protection Select from 0.05 sec., 0.1 sec., 0.5 sec., 1 sec., or 2 sec. Protection Non 6/ Hysteresis Non 5/ Protection Short circuit protection Short circuit protection Non 6/ Analogue Voltage output: 1 to 5 V, Current output: 4 to 20 mA Response time Non 7/ Input | | | | Select from Hystere | | | ulse output modes. | | | | |
| SWItch Watimum applied voltage (MPM only) 28 V DC Not the second se | | Switch oper | ation | | Select from Normal out | out or Reversed output. | | | | | |
| Maximum applied voltage (MM* only) Description Haximum applied voltage (MM* only) NPN output type: 1 V or less (at load current 80 mA) PNP output type: 1.5 V or less (at load current 80 mA) Response time Note 4) Select from 0.05 sec., 0.5 sec., 1 sec., or 2 sec. Hysteresis Note 5) Variable from 0.0 Protection Select from 0.05 sec., 0.1 sec., 0.7 sec., 1 sec., or 2 sec. Analogue Upput type: Voltage output: 1 to 5 V. Current output: 4 to 20 mA Hysteresis Note 5) Output type: Voltage output: 1 to 5 V. Current output: 4 to 20 mA Hesponse time Note 7) Linked with the response time of the switch output. External input Input voltage: 0.4 V or less (Reed or Solid state) for 30 msec. or longer Input Note 10 Input voltage: 0.4 V or less (Reed or Solid state) for 30 msec. Display mode Select from Accumulated flow external reset or Peak/Bottom reset. Reference condition Note 9 Select from Standard condition or Normia condition. Displayable Instantaneous 1000 Lor ft ³ can be selected. Vinin Accumulated flow in the wine with new interval Log of the anale selected. Displayable Instantaneous 1000 Displayable Instantaneous 100 | Curitah | Maximum Io | ad current | | 80 | mA | | | | | |
| Internal wordsprogenes time Note 3: First Output type: 1 S v Oriess (at load current so mA) Response time Note 3: Select from 0.5 sec., 0.1 sec., 0.2 sec., 1 sec., 0.2 sec. Note 5: Variable from 0 Protection Voltage output: 1 to 5 V. Current output: 4 to 20 mA Response time Note 7: Current output: 4 to 20 mA Response time Note 7: Current output: 4 to 20 mA Response time Note 7: Current output: 4 to 20 mA Response time Note 7: Current output: 4 to 20 mA Response time Note 7: Current output: 4 to 20 mA Response time Note 7: Current output: 4 to 20 mA Response time Note 7: Current output: 4 to 20 mA Input Mode Select from Accumulated flow setmal response time of the switch output: 7 voltage setmal response time of the switch output: 7 voltage setmal response time Note 7: Response time Note 7: External input Mode Select from Accumulated flow setmal response time of the switch output: 7 voltage setmal response time Note 7: Input mode Select from Accumulated flow setmal response time of the switch output: 7 voltage setmal response time of the switch output: 7 voltage setmal response time of the switch output: 7 voltage setmal response time of the switch output: 7 voltage setmal response time of the switch output: 7 voltage setmal resetmal response time of the switch output: 7 voltage | | Maximum applied | voltage (NPN only) | | 28 V | DC | | | | | |
| Hysteresis Water Variable from 0 Protection Short circuit protection Output type Output type Voltage output: 1 to 5 V, Current output: 4 to 20 mA Analogue Migedance Voltage output: 1 to 5 V, Current output: 4 to 20 mA Response time Note 7) Current output: 7 to 20 maintering to 1 the switch output. Response time Note 7) Linked with the response time of the switch output. Input Mode Response time Note 7) Select from Accumulated flow external reset or Peak/Bottom reset. Reference condition Note 9 Select from Standard condition or Normal condition. Input Mode Display mode Select from Standard condition or Normal condition. Input Note 1 to 210 Umin -100 to 2100 Umin Displayable Instantaneous flow -100 to 210 Umin -25 to 525 Umin -100 to 2100 Umin Minimum Ibstantaneous flow -10 to 210 Umin -25 to 525 Umin -100 to 2100 Umin Mistantaneous flow -10 to 210 Umin -25 to 525 Umin -100 to 2100 Umin -100 to 2100 Umin Mistantaneous flow -10 to 210 Umin -25 to 525 Umin -100 to 2100 Umin -100 to 2100 Umin Display | output | Internal voltage dro | p (Residual voltage) | NPN output type: 1 V o | | | | | | | |
| Hysteresis Water Variable from 0 Protection Short circuit protection Output type Output type Voltage output: 1 to 5 V, Current output: 4 to 20 mA Analogue Migedance Voltage output: 1 to 5 V, Current output: 4 to 20 mA Response time Note 7) Current output: 7 to 20 maintering to 1 the switch output. Response time Note 7) Linked with the response time of the switch output. Input Mode Response time Note 7) Select from Accumulated flow external reset or Peak/Bottom reset. Reference condition Note 9 Select from Standard condition or Normal condition. Input Mode Display mode Select from Standard condition or Normal condition. Input Note 1 to 210 Umin -100 to 2100 Umin Displayable Instantaneous flow -100 to 210 Umin -25 to 525 Umin -100 to 2100 Umin Minimum Ibstantaneous flow -10 to 210 Umin -25 to 525 Umin -100 to 2100 Umin Mistantaneous flow -10 to 210 Umin -25 to 525 Umin -100 to 2100 Umin -100 to 2100 Umin Mistantaneous flow -10 to 210 Umin -25 to 525 Umin -100 to 2100 Umin -100 to 2100 Umin Display | | | | | | | | | | | |
| Protection Short of circuit protection Note 0 Analogue output Output type Voltage output: 1 to 5 V, Current output: 4 to 20 mA Analogue output Current output Maximum load impedance at power supply voltage 24 Y: 800 0, at power supply voltage 12 V: 300 0 Response time (Note) External input Input mode Select from Accumulated flow external input mode Reternee condition Note 9 Select from Accumulated flow external input mode Select from Accumulated flow external input mode Nit Note 10 Instantaneous flow information or Normal condition. -0 to 2100 l/min Jisplay mode Select from Instantaneous flow or Accumulated flow. Unit Note 10 Instantaneous flow information instantaneous flow or Accumulated flow. Initiananeous flow information instantaneous flow informatina instantaneous flow information instantaneous flow | | | | | | | | | | | |
| Note 0 Analogue Output Output type Voltage output: 1 b 5 V, Current output: 4 to 20 mA Manadouptut Output Voltage output: 1 b 5 V, Current output: 4 to 20 mA Output impedance: Approx. 1 kΩ Response time ^{Note 7} Linked with the response time of the switch output. External input Input Note 8 Input Notage: 0.4 V or less (Reed or 50 olid state) for 30 msec. or longer Input Note 8 Reference condition Note 9 Select from Standard condition or Normal condition. Display mode Select from Standard condition or Normal condition. -0.0 to 2100 l/min Display mode L or ft ³ can be selected. -10 to 2100 l/min -10 to 2100 l/min -25 to 525 l/min -50 to 1050 l/min -100 to 2100 l/min -25 to 525 l/min Impart Note 9 Display mode -10 to 2100 l/min -25 to 525 l/min -100 to 2100 l/min Minimum Instantaneous flow L or ft ³ can be selected. -10 to 2100 l/min -10 to 2 | | | | | | | | | | | |
| Note of Managoge Output Voltage output Output impedance: Approx 1 kΩ Response time Note 7 Linked with the response time of the switch output. External input Mode Input woltage 24 V: 600 Ω, at power supply voltage 12 V: 300 Ω External input Input woltage 24 V: 600 Ω, at power supply voltage 12 V: 300 Ω Input Mode External input Input woltage 24 V: 600 Ω, at power supply voltage 12 V: 300 Ω Input Mode Select from Accumulated flow schemal reset or Pack/Bottom reset. Reference condition Note 9 Select from Standard condition or Normal condition. Display mode 1/min or cfm can be selected. Unit Note 10 Instantaneous flow 1/min or cfm can be selected. Note 10 Instantaneous flow -10 to 210 l/min Display mode 1/min or cfm can be selected. -10 to 2100 l/min Minimum Instantaneous flow 1 -10 to 2100 l/min Minimum Instantaneous flow 1 -10 to 2100 l/min Display ED. Colour. Red/Green, 3 digls, 7 segment LCD, Colour. Red/Green, 4 diglts, 7 segment Indicator LED ED. Olour. Red/Green, 3 digls, 7 segment LCD, Colour. Red/Green, 4 diglts, 7 segment | | | | | | | | | | | |
| Manage Impedance Current output Maximum load impedance at power supply voltage 24 V: 600 Ω, at power supply voltage 12 V: 300 Ω External input Method External input Input mode Select from Accumulated flow sternal reset or Peak/Bottom reset. External Input mode Select from Accumulated flow sternal reset or Peak/Bottom reset. Display Instantaneous flow or Accumulated flow. Unin or fm can be selected. Unit Note 10 Instantaneous flow or Accumulated flow. I on to 10 to 210 V/min -25 to 525 V/min -50 to 1050 V/min -100 to 2100 V/min Display mode Instantaneous flow Ot opsige gl wher value is with -10 to 10 to 210 V/min -25 to 525 V/min -50 to 1050 V/min -100 to 2100 V/min Mathemeous flow LED. Colour: Red/Green, 3 digls, 7 segment LCD. Colour: Red/Green, 4 digits, 7 segment 10 L Display unit Accumulated flow 1 LED. Colour: Red/Green, 3 digls, 7 segment LED. ON When switch output is ON. (OUT1/OUT2: Orange) Enclosure IE20 Whet wide SWID: 40 to 00 V AC for 1 minute between terminals and housing Operating humidity range Operati | | | | | | | | | | | |
| Note of the syntax Response time Note?) Linked with the response time of the switch output. External input twoels Input Notess (Reed or Solid state) for 30 msec. or longer input twoels Input mode Select from Accumulated flow external reset or Peak/Bottom reset. Reference condition Note 00 Select from Instantaneous flow or Normal condition. Display mode Select from Instantaneous flow or Normal condition. Display mode Instantaneous flow interval Display mode -10 to 210 l/min Display mode -25 to 525 l/min Display mode -10 to 210 l/min range Accumulated flow -10 to 210 l/min (bigging [0] when value is with -19 to 11m range] -25 to 525 l/min Display mode 10 to 059 0.999.999 L Minimum Instantaneous flow 1 L Display LED, Colour: Red/Green, 3 digits, 7 segment LCD, Colour: Red/Green, 4 digits, 7 segment Indicator LED LED, With Work 00, IOUT //OUT2: Orange) IP40 Withstand voltage 1000 V AC for 1 minute between terminals and housing Operating temperature range Operation: 0 to 50° C, Norage: -10 to 60° C, No condenesation or freezing) < | | Impedance | Current output | Maximum load imp | | | oltage 12 V: 300 Ω | | | | |
| External input External input Input voltage: 0.4 V or tess (Reed or Solid state) for 30 msec. or longer input Note 10 Reference condition Note 9) Select from Standard condition or Normal condition. Display mote Select from Standard condition or Normal condition. Display mote Instantaneous flow or Accumulated flow. Unit Note 10 Instantaneous flow or Accumulated flow. Accumulated flow L or fl ³ can be selected. - 0 to 210 Umin -25 to 525 Umin Accumulated flow Obsplay [0] when value is with-19 to 190 min range. Display unt Instantaneous flow Accumulated flow 1 Umin range. Display unt Instantaneous flow Accumulated flow 1 L Display unt Instantaneous flow Accumulated flow 1 L Display unt Instantaneous flow Indicator LED LED. Colour: Red/Green, 3 digits, 7 segment Indicator LED LED Olivies state) 60 volt 00 V AC for 1 minute between terminals and housing Instantaneous flow IP40 Withstand voltage Operation: 0 to 50 °C, Storage: -10 to 60 °C (No condensation or freezing) Ope | output | Response ti | me Note 7) | Linked with the response time of the switch output. | | | | | | | |
| Input Nete 5 Input mode Select from Accumulated flow external reset or Peak/Bottom reset. Plagtary mode Select from Standard condition or Normal condition. Select from Standard condition or Normal condition. Display mode Inistantaneous flow or Accumulated flow. Umin or cfm can be selected. Unit Note 10, range Inistantaneous flow or Accumulated flow. -10 to 210 l/min Accumulated flow L or fl ³ can be selected. -10 to 210 l/min Accumulated flow -10 to 210 l/min -25 to 525 l/min -50 to 1050 l/min -100 to 2100 l/min Accumulated flow L or fl ³ can be selected. -10 to 299,999,999 L -100 to 2100 l/min -100 to 2100 l/min -100 to 2100 l/min -100 to 2100 l/min -100 to 299,999,999 L -100 to 2100 l/min -100 to 200 c/min -100 to 2100 l/min -100 to 200 c/min -100 l -100 | External | | | Inp | ut voltage: 0.4 V or less (Reed o | r Solid state) for 30 msec. or lon | aer | | | | |
| Reference condition Note 9) Select from Standard condition or Normal condition. Display mode Select from Instantaneous flow or Accumulated flow. Unit Note 10) Instantaneous flow or Accumulated flow. Display prote Accumulated flow Display prote -10 to 210 l/min Accumulated flow -10 to 210 l/min Accumulated flow -10 to 210 l/min Accumulated flow 0 to 999,999.99 L Minimum Instantaneous flow Instantaneous flow 1 l/min Accumulated flow 0 to 999,999.99.9 Minimum Instantaneous flow Indicator LED ED/O when white is with -10 to 1/min range. Display unit Accumulated flow Accumulated flow 1 L Display unit Accumulated flow Indicator LED ED/O when white whit only 50 (00 P/C colour: Red/Green, 4 digits, 7 segment Indicator LED ED/O when white only 00 P/C colour: Red/Green, 4 digits, 7 segment Indicator LED ED/O when white only 00 P/C colour: Red/Green, 4 digits, 7 segment Indicator LED ED/O when white only 00 P/C colour: Red/Green, 4 digits, 7 segment Indicator | | | | | | | | | | | |
| Display mode Select from Instantaneous flow or Accumulated flow. Unit Note 10) Instantaneous flow Urnin or cfm can be selected. Displayable range Instantaneous flow L or ft ³ can be selected. -10 to 210 l/min Minimum Instantaneous flow -10 to 210 l/min -25 to 525 l/min -50 to 1050 l/min -100 to 2100 l/min Minimum Instantaneous flow -10 to 210 l/min range. [Display [0] when value is with -10 to 11/min range. 0 to 999, 999 go 1 -100 to 2100 l/min -100 to 299, 999 go 1 -100 to 2100 l/min -100 to 299, 999 go 1 -100 to 299, 999 go 1 -100 to 200 l/min -100 to 200 l/min -100 to 2100 l/min -100 to 2100 l/min -100 to 2100 l/min -100 to 2100 l/min -100 to 200 l/min -10 to 200 l/min | | Reference co | ondition Note 9) | | | | · | | | | |
| Unit Note 10) Instantaneous flow Accumulated flow L or ft ³ can be selected. L or ft ³ can be selected. Displayable range Instantaneous flow Accumulated flow -10 to 210 U/min -25 to 525 U/min -50 to 1050 U/min -100 to 2100 U/min Minimum display unit Instantaneous flow Accumulated flow 0 to 999, 999, 999 L 0 to 999, 999, 999 L 0 to 999, 999, 999 L Minimum display unit Accumulated flow 1 L 0 L 0 to 999, 999, 999 L Instantaneous flow display unit LED, Colour: Red/Green, 3 digits, 7 segment LCD, Colour: Red/Green, 4 digits, 7 segment Indicator LED LED ON when switch output is ON. (OUT1/OUT2: Orange) IP40 Withstand voltage 1000 V AC for 1 minute between terminals and housing Insulation resistance 50 MQ or more (500 V DC measured via megohmmeter) between terminals and housing Operating temperature range Operation: 0 to 50 °C, Storage: -10 to 60 °C (No condensation or freezing) Operating temperature range Operation: 0 to 50 °C, Storage: -31 to 60 °C (No condensation or freezing) Operating temperature range CE, UL (CSA), ROHS CE, ROHS Piping Piping specifications Rc 1/4, NPT 1/4, 6 1/4, 0 8 One-touch fitting Rc 1/2, NPT 1/ | | | | | | | | | | | |
| Unit Note 10 Accumulated flow L or ff3 can be selected. Displayable range Instantaneous flow Accumulated flow -10 to 210 l/min -25 to 525 l/min -50 to 1050 l/min -100 to 2100 l/min Minimum Instantaneous flow Accumulated flow -10 to 2100 l/min -25 to 525 l/min -50 to 1050 l/min -100 to 2100 l/min Minimum Instantaneous flow Instantaneous flow 1 l/min range. [Display [0] when value is within -19 to 19 l/min range.] [Display [0] when value is within -19 to 19 l/min range.] [Display [0] when value is within -19 to 19 l/min range.] [Display [0] when value is within -19 to 19 l/min range.] [Display [0] when value is within -19 to 19 l/min range.] [Display [0] when value is within -19 to 19 l/min range.] [Display [0] when value is within -19 to 19 l/min range.] [Display [0] when value is within -19 to 19 l/min range.] [Display [0] when value is within -19 to 19 l/min range.] [Display [0] when value is within -19 to 19 l/min range.] [Display [0] when value is within -19 to 19 l/min range.] [Display [0] when value is within -19 to 19 l/min range.] [Display [0] when value is within -19 to 19 l/min range.] [Display [0] when value is within -19 to 19 l/min range.] [Display [0] when value is within -19 to 19 l/min range.] [Display [0] when value is within -19 to 19 l/min range.] [Display [0] when value is within -19 to 19 l/min range.] [Display [0] when value is | | | | | | | | | | | |
| Displayable range Instantaneous flow Accumulated flow -10 to 210 l/min (Dsplays [0] when value is within -1 to 1 l/min range]. -25 to 525 l/min (Dsplays [0] when value is within -19 to 100 l/min ange]. -100 to 2100 l/min (Dsplays [0] when value is within -19 to 100 l/min ange]. Minimum display unit Accumulated flow 1 L 10 L Display lindicator LED LED, Colour: Red/Green, 3 digits, 7 segment LCD, Colour: Red/Green, 4 digits, 7 segment Indicator LED ED (When switch output is 0N. (DUT): Geen, 0JI2; Red/ UD (D) VAC for 1 minute between terminals and housing IP40 Environmental Environmental Insulation resistance 50 MΩ or more (500 V DC measured via megohrmmeter) between terminals and housing Operating temperature range Operating temperature range Operation: 0 to 50 °C, Storage: -10 to 60 °C (No condensation or freezing) CE, RoHS Piping Piping specifications Piping Rc 1/4, NPT 1/4, G 1/4, 0 8 0n-touch fitting Rc 1/4, NPT 1/4, G 1/4, 0 8 0n-touch fitting Rc 1/4, NPT 1/4, G 1/4, 0 8 0n-touch fitting Rc 1/4, NPT 1/4, G 1/4, D 8 0n-touch fitting Rc 1/4, NPT 1/4, G 1/4, D 8 0n-touch fitting Rc 1/4, NPT 1/4, G 1/4, D 8 0n-touch fitting Rc 1/4, NPT 1/4, G 1/4, D 8 0n-touch fitting Rc 1/4, NPT 1/4, G 1/4, D 8 0n-touch fitting Rc 1/4, NPT 1/4, G 1/4, D 8 0n-touch fitting Rc 1/4, NPT 1/4, G 1/4, D 8 0n-touch fitting Rc 1/4, NPT 1/4, G 1/4, D 8 0n-touch fitting Rc 1/4, NPT 1/4, G 1/4, D 8 0n-touch fitting Rc 1/4, NPT 1/4, G 1/4, D 8 0n-touch fitting Rc 1/4, NPT 1/4, G 1/4, D 8 0n-touch fitting Rc 1/4, NPT 1/4, | | Unit Note 10) | | | | | | | | | |
| Displayable range Instantaneous flow Accumulated flow Displays [0] when value is within -1 to 1 lmin range.] | | | | | | | | | | | |
| Variage Accumulated flow 0 to 999,999,999 L Minimum Instantaneous flow 1 l/min display unit Accumulated flow 1 L Display LED, Colour: Red/Green, 3 digits, 7 segment LCD, Colour: Red/Green, 4 digits, 7 segment Indicator LED LED (Volume switch output is ON. (OUT1/OUT2: Orange) IP40 Withstand voltage 1000 V AC for 1 minute between terminals and housing Insulation resistance 50 MΩ or more (500 V DC measured via megohmmeter) between terminals and housing Operating temperature range Operation: 0 to 50 °C, Storage: -10 to 60 °C (No condensation or freezing) Operating temperature range Operation: 0 to 50 °C, Storage: -10 to 60 °C (No condensation or freezing) Operating temperature range Operation: 0 to 50 °C, Storage: -10 to 60 °C (No condensation or freezing) Operating temperature range Operation: 0 to 50 °C, Storage: -10 to 60 °C (No condensation or freezing) Standard CE, UL (CSA), RoHS CE, RoHS Piping Piping specifications Rc 1/4, NPT 1/4, G 1/4, 0 8 0ne-touch fitting Rc 1/2, NPT 1/2, G 1/2 Rc 3/4, NPT 3/4, G 3/4 Weight Body Rc 1/4, NPT 1/4/5 rdight, 70 g, Botom: 85 g 100 g 155 g 155 g Weight Flow adjustme | Display | Displayable | Instantaneous flow | | | | | | | | |
| Minimum display unit Instantaneous flow Accumulated flow 1 L 10 L Display LED, Colour: Red/Green, 3 digits, 7 segment LCD, Colour: Red/Green, 4 digits, 7 segment Indicator LED LED, Olour: Red/Green, 3 digits, 7 segment LCD, Colour: Red/Green, 4 digits, 7 segment Indicator LED LED, Olour: Red/Green, 3 digits, 7 segment LP40 Withstand voltage 1000 V AC for 1 minute between terminals and housing Insulation resistance 50 MΩ or more (500 V DC measured via megohmmeter) between terminals and housing Operating temperature range Operation: 0 to 50 °C, Storage: -10 to 60 °C (No condensation or freezing) Operating humidity range Operation, Storage: 35 to 85 % RH (No condensation or freezing) Operating temperature range CE, UL (CSA), RoHS CE, RoHS Piping specifications Rc 1/4, NPT 1/4, G 1/4, 0 8 0ne-touch fitting Rc 1/2, NPT 1/2, G 1/2 Rc 3/4, NPT 3/4, G 3/4 Piping ontry direction Straight, Bottom Straight, Bottom Note 12) Brask [Electroless nickel plaing), HNBR, Si, Au, GE4F Weight Flow adjustment valve +45 g — — Lead wire +220 g +25 g +30 g Panel mount ad | | range | Accumulated flow | | | | | | | | |
| display unit Accumulated flow 1 L 10 L Display LED, Colour: Red/Green, 3 digits, 7 segment LCD, Colour: Red/Green, 4 digits, 7 segment Indicator LED LED ON when switch output is ON. (OUT1/OUT2: Orange) IP40 Withstand voltage 1000 V AC for 1 minute between terminals and housing Insulation resistance 50 MΩ or more (500 V DC measured via megohmmeter) between terminals and housing Operating temperature range Operation: 0 to 50 °C, Storage: -10 to 60 °C (No condensation or freezing) Operating temperature range Operation: 0 to 50 °C, Storage: -10 to 60 °C (No condensation or freezing) Operating temperature range Operation: 0 to 50 °C, Storage: -10 to 60 °C (No condensation or freezing) Operating temperature range Operation: 0 to 50 °C, Storage: -10 to 60 °C (No condensation or freezing) Operating temperature range Operation: 0 to 50 °C, Storage: -10 to 60 °C (No condensation or freezing) Operating temperature range Operation: 0 to 50 °C, Storage: -10 to 60 °C (No condensation or freezing) Biping Piping specifications Rc 1/4, NPT 1/4, G 1/4, 0 8 One-touch fitting Piping entry direction Straight, Bottom Straight, Bottom Weight Body R 14, MPT 1/4/Straight 70 g, Bottom: 130 g | | Minimum | | | | | | | | | |
| Display LED, Colour: Red/Green, 3 digits, 7 segment LCD, Colour: Red/Green, 4 digits, 7 segment Indicator LED LED Wither switch output is ON. (OUT1/OUT2: Orange) IP40 Enclosure IP40 Withstand voltage 1000 V AC for 1 minute between terminals and housing Insulation resistance 50 MΩ or more (500 V DC measured via megohmmeter) between terminals and housing Operating temperature range Operation: 0 to 50 °C, Storage: -10 to 60 °C (No condensation or freezing) Operating humidity range Operation, Storage: 35 to 85 % RH (No condensation or freezing) Standard CE, UL (CSA), RoHS CE, RoHS Piping Piping specifications Rc 1/4, NPT 1/4, G 1/4, 0 8 One-touch fitting Rc 1/2, NPT 1/2, G 1/2 Rc 3/4, NPT 3/4, G 3/4 Main materials of parts in contact with fluid FKM, Staintess stel 304, PS, PBT, Brass (Electroles nickel plating), HNBR, Si, Au, GE4F ADC, PPS, Stainless steel 304, Au, HNBR, Si, GE4F Weight Flow adjustment valve +45 g Lead wire +45 g Head wire +20 g +25 g +30 g Panel mount adapter +15 g - | | | | | | | | | | | |
| Indicator LED LED 0N when switch output is ON. (0UT1: Green, OUT2: Red) LED ON when switch output is ON. (OUT1/OUT2: Orange) Final Cosure IP40 With stand voltage 1000 V AC for 1 minute between terminals and housing Insulation resistance 50 MΩ or more (500 V DC measured via megohmmeter) between terminals and housing Operating temperature range Operation: 0 to 50 °C, Storage: -10 to 60 °C (No condensation or freezing) Operating temperature range Operation: 0 to 50 °C, Storage: -10 to 60 °C (No condensation or freezing) Operating temperature range Operation: 0 to 50 °C, Storage: -10 to 60 °C (No condensation or freezing) Operating temperature range Operation: 0 to 50 °C, Storage: -10 to 60 °C (No condensation or freezing) Operating temperature range CE, UL (CSA), RoHS CE, RoHS Piping Piping specifications Rc 1/4, NPT 1/4, 6 1/4, 0 8 0ne-touch fitting Rc 1/2, NPT 1/2, G 1/2 Rc 3/4, NPT 3/4, G 3/4 Note 12) Bass (Electrotes nickel plating), HNBR, Si, Au, GE4F ADC, PPS, Stainless steel 304, Au, HNBR, Si, GE4F Weight Rc 1/4, NPT 1/4/Straight: 70 g, Bottom: 85 g 100 g 155 g Flow adjustment valve +45 g +35 g Bracket +20 g | | | | | | | ament | | | | |
| Enclosure IP40 Withstand voltage 1000 V AC for 1 minute between terminals and housing Insulation resistance 50 MΩ or more (500 V DC measured via megohmmeter) between terminals and housing Operating temperature range Operation: 0 to 50 °C, Storage: -10 to 60 °C (No condensation or freezing) Operating temperature range Operation: 0 to 50 °C, Storage: 35 to 85 % RH (No condensation or freezing) Operating humidity range Operation: 0 to 50 °C, Storage: 35 to 85 % RH (No condensation or freezing) Standard CE, UL (CSA), RoHS Piping Piping specifications Ptiping entry direction Rc 1/4, NPT 1/4, G 1/4, Ø 8 One-touch fitting Note 12) Rc 3/4, NPT 3/4, G 3/4 Weight Body Rc 1/4, NPT 1/4, Staight: 50, Bottom: 130 g 100 g Ø 8 One-touch fitting/Straight: 50 g, Bottom: 65 g 100 g Bracket +45 g Lead wire +35 g Bracket +20 g +25 g Panel mount adapter +15 g | | | D | | | switch output is $ON (OUT1/O$ | JT2: Orange) | | | | |
| Withstand voltage 1000 V AC for 1 minute between terminals and housing Insulation resistance 50 MΩ or more (500 V DC measured via megohmmeter) between terminals and housing Operating temperature range Operation: 0 to 50 °C, Storage: -10 to 60 °C (No condensation or freezing) Operating humidity range Operation, Storage: 35 to 85 % RH (No condensation or freezing) Standard CE, UL (CSA), RoHS Piping Piping specifications R c 1/4, NPT 1/4, G 1/4, 08 0ne-touch fitting Rc 1/2, NPT 1/2, G 1/2 R c 3/4, NPT 3/4, G 3/4 CE, RoHS Piping entry direction Straight, Bottom Main materials of parts in contact with fluid FKM, Stainless stel 304, PS, PBT, Brass (Electroless nickel plating), HNBR, Si, Au, GE4F Body R c 1/4, NPT 1/4/Straight: 70 g, Bottom: 85 g (G 1/4/Straight: 15 g, Bottom: 130 g (0 8 0ne-touch fitting/Straight: 50 g, Bottom: 65 g Weight Flow adjustment valve +45 g Lead wire +45 g Bracket +20 g +25 g Panel mount adapter +15 g — | | - | - | | | | | | | | |
| Insulation resistance 50 MΩ or more (500 V DC measured via megohmmeter) between terminals and housing Operating temperature range Operation: 0 to 50 °C, Storage: -10 to 60 °C (No condensation or freezing) Operating humidity range Operation, Storage: 35 to 85 % RH (No condensation or freezing) Standard CE, UL (CSA), RoHS CE, RoHS Piping Piping specifications Rc 1/4, NPT 1/4, G 1/4, 08 0ne-touch fitting Rc 1/2, NPT 1/2, G 1/2 Rc 3/4, NPT 3/4, G 3/4 Main materials of parts in contact with fluid FKM, Stailess stel 304, PS, PBT, Brass (Electroless nickel plating), HNBR, Si, Au, GE4F ADC, PPS, Stainless steel 304, Au, HNBR, Si, GE4F Body Rc 1/4, NPT 1/4/Straight: 70 g, Bottom: 85 g 100 g 155 g Flow adjustment valve +45 g | | | oltage | | | | | | | | |
| Operating temperature range Operation: 0 to 50 °C, Storage: -10 to 60 °C (No condensation or freezing) Operating humidity range Operation, Storage: 35 to 85 % RH (No condensation or freezing) Standard CE, UL (CSA), RoHS CE, RoHS Piping Piping specifications Rc 1/4, NPT 1/4, G 1/4, 0 8 0ne-touch fitting Rc 1/2, NPT 1/2, G 1/2 Rc 3/4, NPT 3/4, G 3/4 Main materials of parts in contact with fluid Note 12) FKM Saines steel 304, PSP, PBT, Brass (Electroless nickel plating), HNBR, Si, Au, GE4F ADC, PPS, Stainless steel 304, Au, HNBR, Si, GE4F Body R 1/4, NPT 1/4/Straight: 70 g, Bottom: 85 g 100 g 155 g Flow adjustment valve +45 g | Environmental | | | 50 MO or m | | | and housing | | | | |
| Operating humidity range Operation, Storage: 35 to 85 % RH (No condensation or freezing) Standard CE, UL (CSA), RoHS CE, RoHS Piping Piping specifications Piping entry direction Rc 1/4, NPT 1/4, G 1/4, 0 8 One-touch fitting Rc 1/2, NPT 1/2, G 1/2 Rc 3/4, NPT 3/4, G 3/4 Main materials of parts in contact with fluid Note 12) FKM Stailess steel 304, PR, PBT, Brass (Electroles nickel plating), HNBR, Si, Au, GE4F ADC, PPS, Stainless steel 304, Au, HNBR, Si, GE4F Weight Ro 1/4, NPT 1/4/Straight: 70 g, Bottom: 85 g 0 8 One-touch fitting/Straight: 50 g, Bottom: 65 g 100 g 155 g Flow adjustment valve +45 g — Head wire +35 g 425 g +30 g Bracket +20 g +25 g +30 g | Environmental | | | | | | | | | | |
| Standard CE, UL (CSA), RoHS CE, RoHS Piping Piping specifications Piping entry direction Rc 1/4, NPT 1/4, G 1/4, Ø 8 One-touch fitting Rc 1/2, NPT 1/2, G 1/2 Rc 3/4, NPT 3/4, G 3/4 Main materials of parts in contact with fluid Note 12) FKM, Stainless steel 304, PS, PBT, Brass (Electroles nickel plating), HNBR, SA, GE4F ADC, PPS, Stainless steel 304, Au, HNBR, Si, GE4F Meight Rc 1/4, NPT 1/4/Straight: 70 g, Bottom: 85 g 0 8 One-touch fitting/Straight: 50 g, Bottom: 65 g 100 g 155 g Weight Flow adjustment valve +45 g — Lead wire +35 g | | | | | | | | | | | |
| Piping Piping specifications Rc 1/4, NPT 1/4, G 1/4, Ø 8 One-touch fitting Rc 1/2, NPT 1/2, G 1/2 Rc 3/4, NPT 3/4, G 3/4 Main materials of parts in contact with fluid FKM, Stainless steel 304, PS, PBT, Brass (Electroless nickel plating), HNBR, Si, Au, GE4F ADC, PPS, Stainless steel 304, Au, HNBR, Si, GE4F Weight Body Rc 1/4, NPT 1/4/Straight 70 g, Bottom: 85 g 0 8 One-touch fitting/Straight: 50 g, Bottom: 65 g 100 g 155 g Flow adjustment valve +45 g — Lead wire +35 g Hard Straight Pase (Panel mount adapter +15 g | Standard | | innuty runge | | | |) | | | | |
| Piping Piping entry direction Straight, Bottom Main materials of parts in contact with fluid FKM, Stainless steel 304, PS, PBT, Brass (Electroless nickel plating), HNBR, Si, Au, GE4F ADC, PPS, Stainless steel 304, Au, HNBR, Si, GE4F Body Rc 1/4, NPT 1/4/Straight: 70 g, Bottom: 85 g G 1/4/Straight: 15 g, Bottom: 65 g 100 g 155 g Flow adjustment valve +45 g — Lead wire +35 g Bracket +20 g +25 g Panel mount adapter +15 g — | | | ifications | , | Ro 1/2 ND | | Bc 3/4 NPT 3/4 G 3/4 | | | | |
| Main materials of parts in contact with fluid FKM, Stainless steel 304, PPS, PBT, Brass (Electroless nickel plating), HNBR, Si, Au, GE4F ADC, PPS, Stainless steel 304, Au, HNBR, Si, GE4F Weight Rc 1/4, NPT 1/4/Straight: 70 g, Bottom: 85 g G 1/4/Straight: 15 g, Bottom: 130 g Ø 8 One-touch fitting/Straight: 50 g, Bottom: 65 g 100 g 155 g Flow adjustment valve +45 g — Lead wire +35 g Bracket +20 g +25 g Panel mount adapter +15 g — | Piping | | | | nc 1/2, NF | , V 1/L | 110 0/ 1 , NI 1 0/ 1 , O 0/4 | | | | |
| Weight Rody Rc 1/4, NPT 1/4/Straight: 70 g, Bottom: 85 g G 1/4/Straight: 115 g, Bottom: 130 g 0 8 One-touch fitting/Straight: 50 g, Bottom: 65 g ADC, PPS, Statiniess steel 304, AU, HINBH, Si, GE4F Height Rc 1/4, NPT 1/4/Straight: 70 g, Bottom: 65 g 100 g 155 g Flow adjustment valve +45 g — Lead wire +45 g — Bracket +20 g +25 g Panel mount adapter +15 g — | Main met | | | | | | | | | | |
| Body Rc 1/4, NPT 1/4/Straight: 70 g, Bottom: 85 g G 1/4/Straight: 15 g, Bottom: 130 g 0 8 One-touch fitting/Straight: 50 g, Bottom: 65 g 100 g 155 g Weight Flow adjustment valve +45 g | | | | | ADC, PPS | , Stainless steel 304, Au, HNBR | , Si, GE4F | | | | |
| Body G 1/4/Straight: 115 g, Bottom: 130 g Ø 8 One-touch fitting/Straight: 50 g, Bottom: 65 g 100 g 155 g Weight Flow adjustment valve +45 g | uu | - · | | | | | | | | | |
| Image: Weight Ø 8 One-touch fitting/Straight: 50 g, Bottom: 65 g — Head wire +45 g — Lead wire +35 g Bracket +20 g +25 g Panel mount adapter +15 g — | | Body | | | 10/ |) a | 155 a | | | | |
| Flow adjustment valve +45 g — Lead wire +35 g Bracket +20 g +25 g +30 g Panel mount adapter +15 g — — | | Bouy | | | 100 | 9 | 155 g | | | | |
| Lead wire +35 g Bracket +20 g +25 g +30 g Panel mount adapter +15 g — | | Elow edited | mont volvo | | | | | | | | |
| Lead wire +30 g Bracket +20 g +25 g +30 g Panel mount adapter +15 g — | Weight | | ment valve | +++9 y | | | | | | | |
| Panel mount adapter +15 g — | - | | | .00 - | | | .00 | | | | |
| | | | t adapt | | +2 | o y | +30 g | | | | |
| | | | | | | | | | | | |
| | | | nung pracket | g co+ | | | | | | | |

Note 1) Refer to "Example of recommended pneumatic circuit" on page 2. Note 2) When using the accumulated value hold function, use the operating conditions to calculate the product life, and do not exceed it. The maximum access limit of the memory device is 1 million cycles. If the product is operated 24 hours per day, the product life will be as follows: • 5 min interval: life is calculated as 5 min x 1 million = 5 million min = 9.5 years • 2 min interval: life is calculated as 2 min x 1 million = 2 million min = 3.8 years If the accumulated flow external reset is repeatedly used, the product life will be shorter than calculated life.

Note 3) Do not release the OUT side piping port of the product directly to the atmosphere without connecting piping. If the product is used with the piping port released to atmosphere, accuracy may vary.

Note 4) The time from when the flow is changed by a step input (when the flow rate changes from 0 to the maximum flow instantaneously) until the switch output turns ON (or OFF) when set at 90 % of the rated flow rate.

- Note 5) If the flow fluctuates around the set value, the width for setting more than the fluctuating width needs to be set. Otherwise, chattering will occur.
- Note 6) When using a product with an analogue output
- Note 7) The time from when the flow is changed as a step input (when the flow Note 9) The time non-when the now is changed as a step input (when the now rate changes from 0 to the maximum flow instantaneously) until the analogue output reaches 90 % of the rated flow rate.
 Note 8) When using a product with an external input
 Note 9) The flow rate given in the specification is the value at standard condition.

- Note 10) Setting is only possible for models with the unit selection function.
- Note 11) Refer to "Straight Piping Length and Accuracy" on page 8 for details.
- Note 12) Refer to "Construction/Fluid Contact Parts" on page 9 for details.



Flow Range

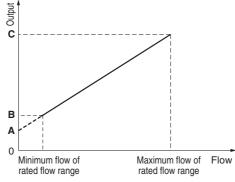
| Model | Flow range | | | | | | | | |
|----------|------------------------------------|-------------------------------------|-------------------------------------|--|--|--|--|--|--|
| woder | –100 l/min 0 l/min | 200 l/min | 500 l/min | 1000 l/min | 2000 l/min | | | | |
| PFMB7201 | 2 l/min 2 l/min -10 l/min | 200 l/min 210 l/min 210 l/min | | | | | | | |
| PFMB7501 | 5 l/min 5 l/min –25 l/min | | 500 l/min 525 l/min 525 l/min | | | | | | |
| PFMB7102 | 10 l/min 10 l/min –50 l/min | | | 1000 l/min 1050 l/min 1050 l/min | | | | | |
| PFMB7202 | 20 l/min 20 l/min -100 l/min | | | | 2000 l/min 2100 l/min 2100 l/min | | | | |

Analogue Output

Flow/Analogue Output

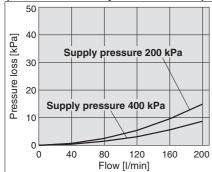
| | Α | В | С |
|----------------|------|---------|-------|
| Voltage output | 1 V | 1.04 V | 5 V |
| Current output | 4 mA | 4.16 mA | 20 mA |

| Model | Minimum flow of rated flow range | | |
|----------|-------------------------------------|------------|--|
| PFMB7201 | 2 l/min | 200 l/min | |
| PFMB7501 | 5 l/min | 500 l/min | |
| PFMB7102 | 10 l/min | 1000 l/min | |
| PFMB7202 | 20 l/min | 2000 l/min | |

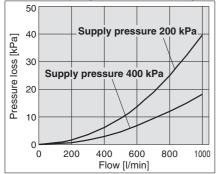


Pressure Loss (Reference Data)

PFMB7201 (for 200 I/min) (Without flow adjustment valve)

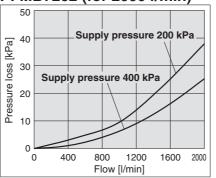


PFMB7102 (for 1000 l/min)



PFMB7501 (for 500 l/min) 50 40 Pressure loss [kPa] Supply pressure 200 kPa 30 20 Supply pressure 400 kPa 10 0 0 100 200 300 400 500 Flow [l/min]

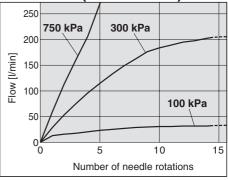
PFMB7202 (for 2000 l/min)



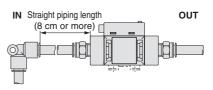
SMC

Flow Adjustment Valve Flow-rate Characteristics

PFMB7201 (for 200 l/min)

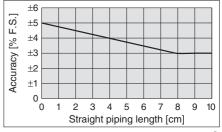


Straight Piping Length and Accuracy



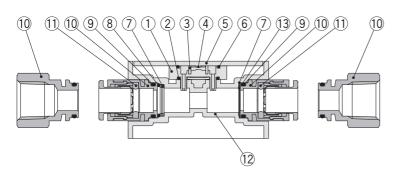
- The piping on the IN side must have a straight section of piping with a length of 8 cm or more. If a straight section of piping is not installed, the
- accuracy can vary by approximately ±2 % F.S. * "Straight section" means a part of the piping without any bends or rapid changes in the cross sectional area.
- When the PFMB7201 is connected to tubing, use a tube I.D. 5 mm just before the product.
- When the PFMB7501 or 7102 is connected to tubing, use a tube I.D. 9 mm or more just before the product.
- The accuracy can vary by approximately ± 2 % F.S. when such tubing is not used.

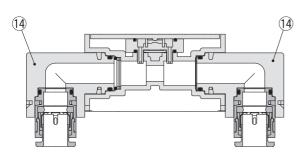
PFMB7201/7501/7102/7202

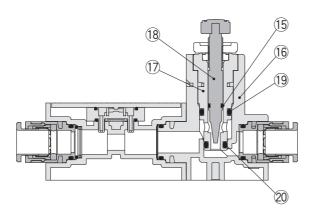


Construction/Fluid Contact Parts

PFMB7201



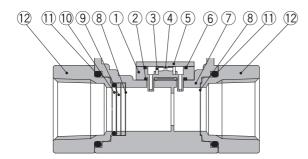




Component Parts

| COI | | | | | | | | | |
|-----|----------------------------|---------------------|----------------------------|--|--|--|--|--|--|
| No. | Description | Material | Note | | | | | | |
| 1 | Sensor body | PPS | | | | | | | |
| 2 | Gasket | HNBR | | | | | | | |
| 3 | Flow rectifier | Stainless steel 304 | | | | | | | |
| 4 | Sensor chip | Silicon | | | | | | | |
| 5 | Printed circuit board | GE4F | | | | | | | |
| 6 | Gasket | HNBR | | | | | | | |
| 7 | Flow rectifier | Stainless steel 304 | | | | | | | |
| 8 | O-ring | FKM | Fluoro coating | | | | | | |
| 9 | O-ring | FKM | Fluoro coating | | | | | | |
| 10 | Fitting for piping | Brass | Electroless nickel plating | | | | | | |
| 11 | O-ring | FKM | Fluoro coating | | | | | | |
| 12 | Body | PBT | | | | | | | |
| 13 | Gasket | HNBR | | | | | | | |
| 14 | Bottom piping adapter | PBT | | | | | | | |
| 15 | O-ring | HNBR | Fluoro coating | | | | | | |
| 16 | Flow adjustment valve body | PBT | | | | | | | |
| 17 | Body | Brass | Electroless nickel plating | | | | | | |
| 18 | Needle | Brass | Electroless nickel plating | | | | | | |
| 19 | O-ring | HNBR | Fluoro coating | | | | | | |
| 20 | O-ring | HNBR | Fluoro coating | | | | | | |
| | | | | | | | | | |

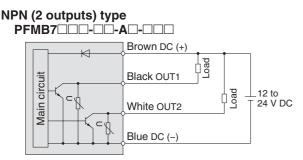
PFMB7501/7102/7202



Component Parts

| No. | Description | Material | Note | | | | | | |
|-----|-----------------------|---------------------|---------|--|--|--|--|--|--|
| 1 | Sensor body | PPS | | | | | | | |
| 2 | Gasket | HNBR | | | | | | | |
| 3 | Flow rectifier | Stainless steel 304 | | | | | | | |
| 4 | Sensor chip | Silicon | | | | | | | |
| 5 | Printed circuit board | GE4F | | | | | | | |
| 6 | Gasket | HNBR | | | | | | | |
| 7 | Body | PPS | | | | | | | |
| 8 | Mesh | Stainless steel 304 | | | | | | | |
| 9 | Spacer | PPS | | | | | | | |
| 10 | O-ring | HNBR | | | | | | | |
| 11 | O-ring | HNBR | | | | | | | |
| 12 | Attachment | ADC | Coating | | | | | | |

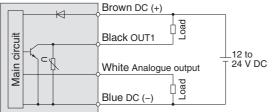
Internal Circuits and Wiring Examples



Max. applied voltage: 28 V, Max. load current: 80 mA, Internal voltage drop: 1 V or less

NPN (1 output) + Analogue (1 to 5 V) output type PFMB7

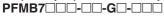
NPN (1 output) + Analogue (4 to 20 mA) output type PFMB7

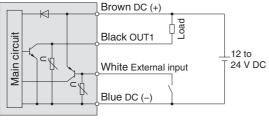


Max. applied voltage: 28 V, Max. load current: 80 mA, Internal voltage drop: 1 V or less C: Analogue output: 1 to 5 V

- Output impedance: 1 k Ω
- D: Analogue output: 4 to 20 mA
- Max. load impedance: 600 Ω

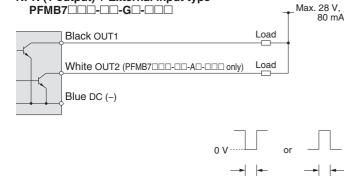
NPN (1 output) + External input type

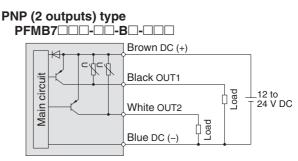




Max. applied voltage: 28 V, Max. load current: 80 mA, Internal voltage drop: 1 V or less External input: input voltage 0.4 V or less (reed or solid state input) for 30 msec. or longer

Accumulated pulse output wiring examples

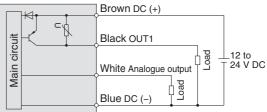






PNP (1 output) + Analogue (1 to 5 V) output type PFMB7

PNP (1 output) + Analogue (4 to 20 mA) output type PFMB7



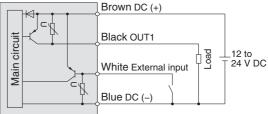
Max. load current: 80 mA, Internal voltage drop: 1.5 V or less E: Analogue output: 1 to 5 V

- Output impedance: 1 kΩ
- F: Analogue output: 4 to 20 mA

Max. load impedance: 600 Ω

PNP (1 output) + External input type





Max. load current: 80 mA, Internal voltage drop: 1.5 V or less External input: input voltage 0.4 V or less (reed or solid state input) for 30 msec. or longer

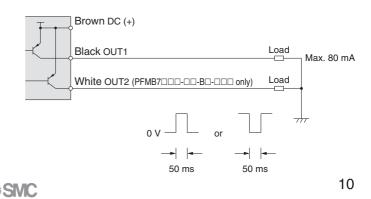
PNP (2 outputs) type PFMB7_____BB_-___ PNP (1 output) + Analogue output type PFMB7_____EB_-___

PFMB700-0-F0-00 PFMB700-0-F0-00 PNP (1 output) + External input type

PFMB7

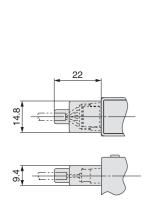
50 ms

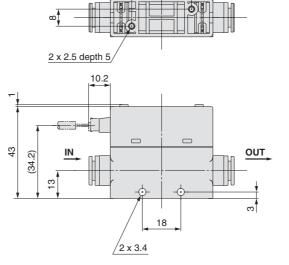
50 ms



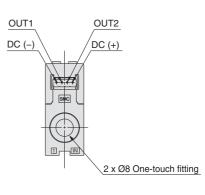
Dimensions

PFMB7201-C8

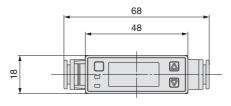




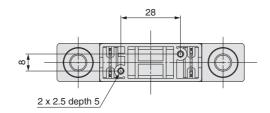
28

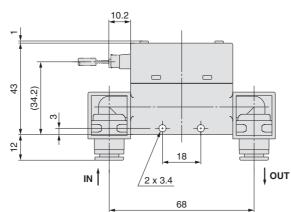


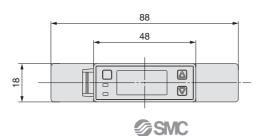
With connector cover

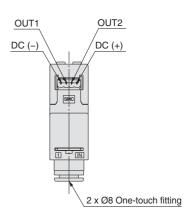


PFMB7201-C8L

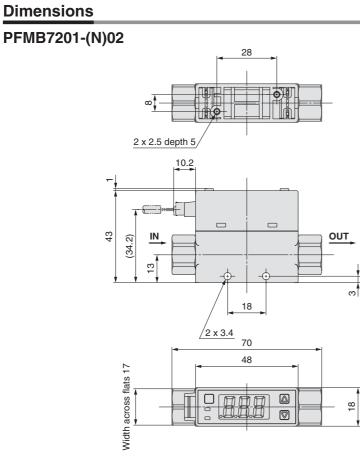


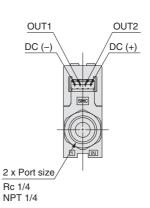




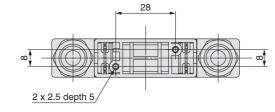


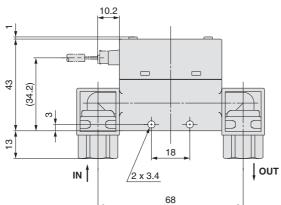
Dimensions

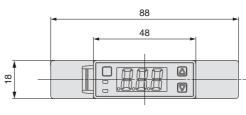


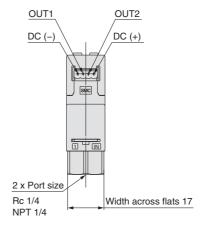


PFMB7201-(N)02L



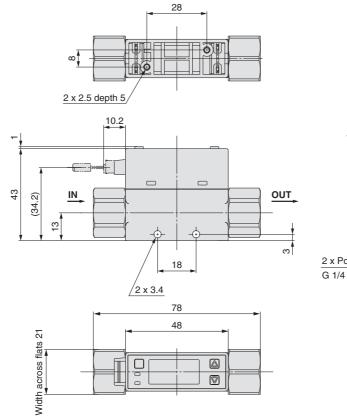


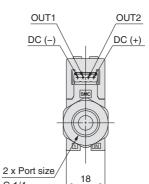




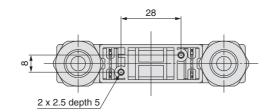
Dimensions

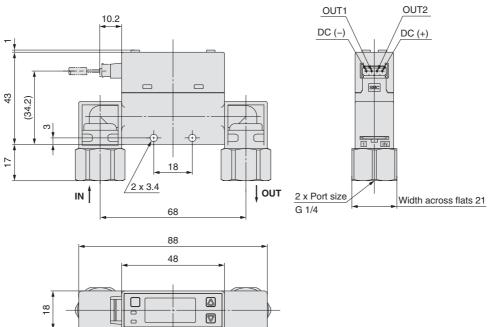
PFMB7201-F02





PFMB7201-F02L



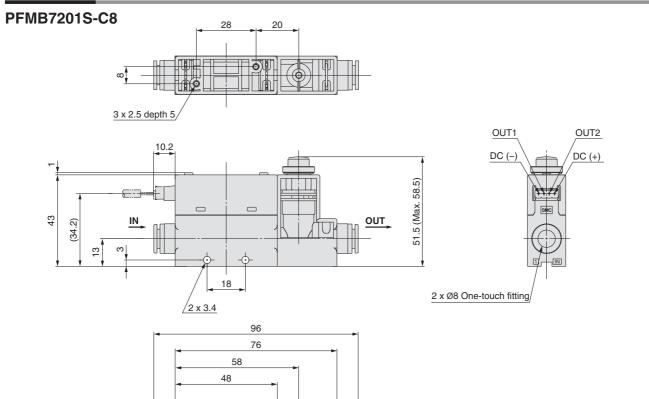


 \square

SMC

8

Dimensions

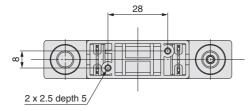


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PFMB7201S-C8L

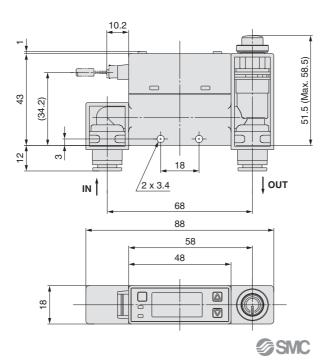
8

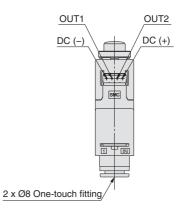


HF

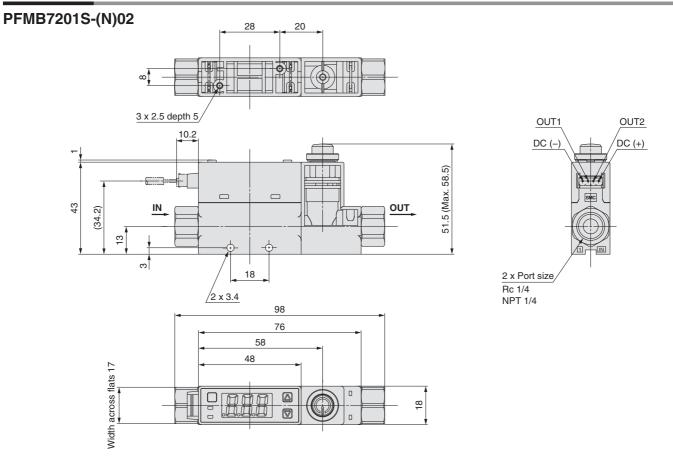
HL

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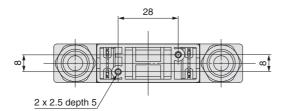


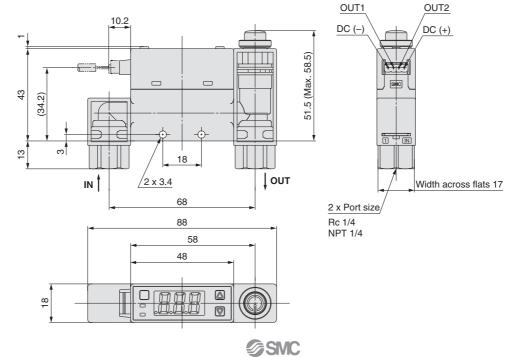


Dimensions



PFMB7201S-(N)02L





PFMB7201S-F02 28 20 TET ðЮ H ω 3 x 2.5 depth 5 OUT2 OUT1 10.2 D<u>C (+)</u> DC (-) 51.5 (Max. 58.5) ÷-43 OUT IN . (34.2) ო 13 2 x Port size 18 G 1/4 2 x 3.4 106 76 58 48 Width across flats 21 0 \square 18 \square 0 PFMB7201S-F02L 28 0 α Ć 112 2 x 2.5 depth 5 OUT1 OUT2 10.2 ______ DC (+)____ DC (-51.5 (Max. 58.5) 111 SMC 43 (34.2) c ¢ C 17 18 <u>/2 x 3.4</u> ļ ουτ IN T 2 x Port size Width across flats 21 68 G 1/4 88 58 48 \square <u>8</u> \square

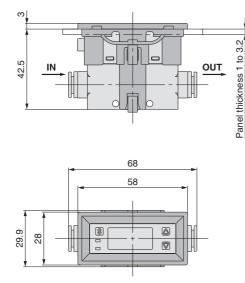
SMC

Dimensions

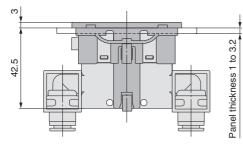
Dimensions

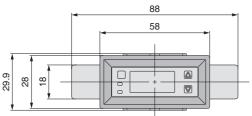
PFMB7201

Panel mount/ Without flow adjustment valve/Straight

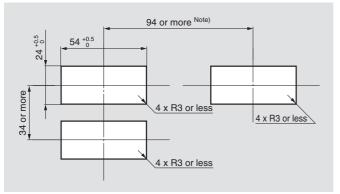


Panel mount/ Without flow adjustment valve/Bottom





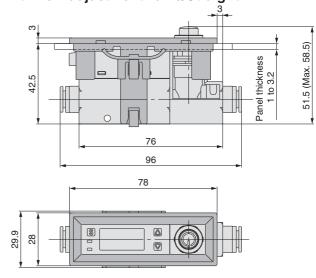
Panel Fitting Dimensions



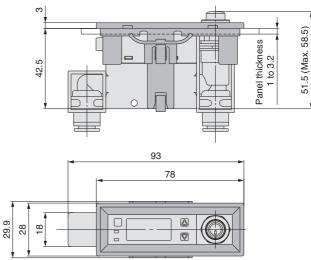
Panel thickness 1 to 3.2 mm

Note) Piping entry direction: Minimum dimensions for bottom piping. If using straight piping, the piping material and tubing need to be taken into consideration when designing the system. If a bend (R) is used, limit it to R3 or less.

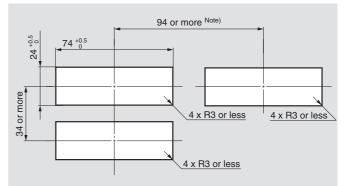
Panel mount/ With flow adjustment valve/Straight



Panel mount/ With flow adjustment valve/Bottom



Panel Fitting Dimensions



Panel thickness 1 to 3.2 mm

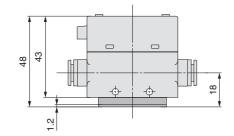
Note) Piping entry direction: Minimum dimensions for bottom piping. If using straight piping, the piping material and tubing need to be taken into consideration when designing the system. If a bend (R) is used, limit it to R3 or less.

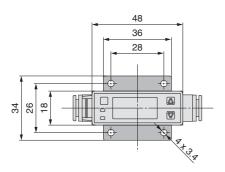


Dimensions

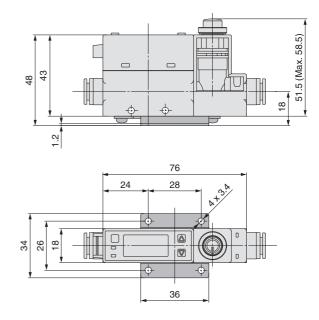
PFMB7201

With bracket/Without flow adjustment valve

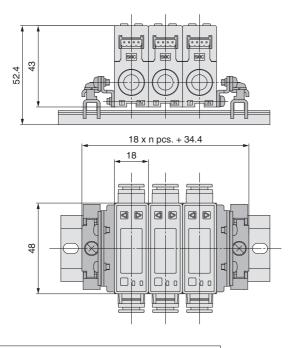




With bracket/With flow adjustment valve



DIN rail mounting

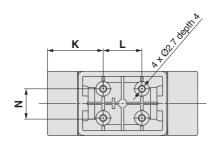


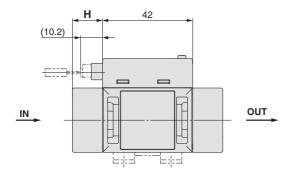
• DIN rail is prepared by user.

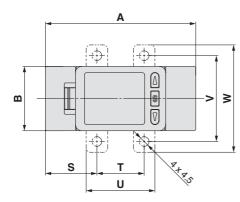
• DIN rail is not suitable for port size F02 (G 1/4).

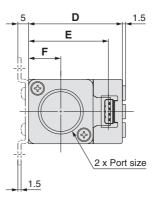
Dimensions

PFMB7501/7102/7202





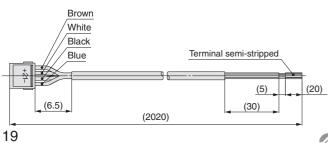




| Symbol Model | Α | В | D | Е | F | Н | к | L | N |
|-----------------|----|----|------|------|------|----|----|----|------|
| PFMB7501/7102 | 70 | 30 | 43.7 | 37.2 | 15 | 14 | 26 | 18 | 13.6 |
| PFMB7202 | 90 | 35 | 49.2 | 42.7 | 17.5 | 24 | 31 | 28 | 16.8 |

| Symbol | Bracket dimensions | | | | | |
|---------------|--------------------|----|----|----|----|--|
| Model | S | Т | U | V | W | |
| PFMB7501/7102 | 24 | 22 | 32 | 40 | 50 | |
| PFMB7202 | 30 | 30 | 42 | 48 | 58 | |

Lead wire with connector ZS-33-D



Cable Specifications

| Conductor | Nominal cross section | AWG26 | |
|-------------|-----------------------|---------------------------|--|
| | Outside diameter | Approx. 0.50 mm | |
| Insulator | Outside diameter | Approx. 1.00 mm | |
| | Colour | Brown, White, Black, Blue | |
| Sheath | Material | Oil resistant PVC | |
| Finished ou | tside diameter | Ø 3.5 | |

Note) Refer to the Operation Manual on www.smc.eu for wiring.

Series PFMB Function Details

Output operation

The output operation can be selected from the following:

Output (hysteresis mode and window comparator mode) corresponding to instantaneous flow, or output (accumulated output and pulse output) corresponding to accumulated flow.

Note) At the time of shipment from the factory, it is set to hysteresis mode and normal output.

Display colour—

The display colour can be selected for each output condition. The selection of the display colour provides visual identification of abnormal values. (The display colour depends on OUT1 setting.)

Reference condition

The display unit can be selected from standard condition or normal condition.

Standard condition: Flow rate converted to a volume at 20 °C and 1 atm (atmosphere) Normal condition: Flow rate converted to a volume at 0 °C and 1 atm (atmosphere)

Display mode

| The display mode can be selected from | Instantaneous flow display | | |
|---|----------------------------|--|--|
| instantaneous flow or accumulated flow. | Accumulated flow display | | |

Response time

| The response time can be selected to suit the application. | 0.05 sec. |
|--|-----------|
| | 0.1 sec. |
| Abnormalities can be detected more quickly by setting | 0.5 sec. |

the response time to 0.05 seconds. The effect of fluctuation and flickering of the display can

be reduced by setting the response time to 2 seconds.

Display OFF mode

This function will turn the display OFF. In this mode, decimal points flash on the main screen. If any button is pressed during this mode, the display reverts to normal for 30 seconds to allow checking of the flow etc.

Setting of security code

The user can select whether a security code must be entered to release key lock. At the time of shipment from the factory, it is set such that the security code is not required.

External input function

This function can be used only when the optional external input is present. The accumulated flow, peak value and bottom value can be reset remotely.

Accumulated flow external reset: A function to reset the accumulated flow value when an external input signal is applied.

In accumulated increment mode, the accumulated value will reset to, and increase from zero. In accumulated decrement mode, the accumulated

value will reset to, and decrease from the set value.

- * When the accumulated value is memorised, every time the accumulated flow external reset is activated, the memory device (EEPROM) will be accessed. Take into consideration the maximum number of times the memory device can be accessed, 1 million times. The total of external input times and accumulated value memorising time interval should not exceed 1 million times.
- Peak/Bottom reset: Peak and bottom value are reset.

Forced output function

The output is turned on/off in a fixed state when starting the system or during maintenance. This enables confirmation of the wiring and prevents system errors due to unexpected output.

For the analogue output type, when ON the output will be 5 V or 20 mA, and when OFF, it will be 1 V or 4 mA.

* Also, the increase or decrease of the flow and temperature will not change the on/off status of the output while the forced output function is activated.

Accumulated value hold

Accumulated value is not cleared even when the power supply is turned off.

The accumulated value is memorised every 2 or 5 minutes during measurement, and continues from the last memorised value when the power supply is turned on again.

The life time of the memory element is 1 million access cycles. Take this into consideration before using this function.

Peak/Bottom value display

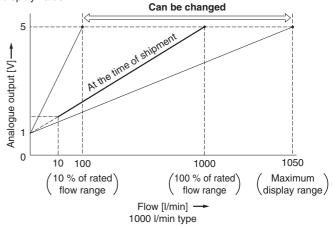
The maximum (minimum) flow rate is detected and updated from when the power supply is turned on. In peak (bottom) value display mode, this maximum (minimum) flow rate is displayed.

Keylock function

Prevents operation errors such as accidentally changing setting values.

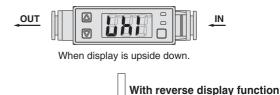
Analogue output free range function

Allows the flow that generates an output of 5 V or 20 mA to be changed. The value can be changed 10 % of maximum rated flow to maximum display value.



Reverse display mode

When the switch is used upside down, the orientation of the display can be rotated to make it easier to read by using the reverse display function.





Reset to the default settings. -

The product can be returned to its factory default settings.



1 sec

2 sec.

Error display function

When an error or abnormality arises, the location and contents are displayed.

| Display | | Description | Contents | Action | |
|--|----------------------------------|-----------------------------|---|---|--|
| Er l | | OUT1 over current error | Load current of 80 mA or more is applied to the switch output (OUT1). | Eliminate the cause of the over current b turning off the power supply and then turn | |
| Er2 | | OUT2 over current error | Load current of 80 mA or more is applied to the switch output (OUT2). | on it again. | |
| ннн | | Instantaneous flow error | The flow rate exceeds the upper limit of indicated flow rate range. | Decrease the flow rate. | |
| LLL | | Reverse flow error | There is a reverse flow equivalent to $-5\ \%$ or more. | Turn the flow to correct direction. | |
| ("999" will flash in any of upper,) (middle, lower 3-digit displays.) | PFMB7201 PFMB7501 PFMB7102 | Accumulated flow error | The flow rate exceeds the accumulated flow rate range. | Clear the accumulated flow rate. | |
| Er0 Er4 Er6 Er8 | | System error | Displayed if an internal error has occurred. | Turn the power off and on again. | |

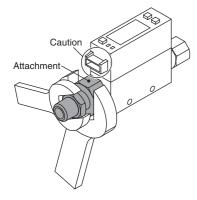
If the failure cannot be solved after the above instructions are performed, please contact SMC for investigation.

Precautions on piping

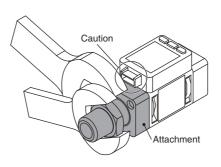
Piping for the metal attachment

- Tighten to the specified torque. Refer to the table below for the required torque values.
- Use a wrench suited for the required torque. Do not use an extremely large wrench (Total length of 40 cm or more).
- If the tightening torque is exceeded, the product can be broken.
- If the tightening torque is insufficient, the fitting may become loose.
- Avoid any sealant tape getting inside the flow path.
- Ensure there is no leakage after piping.
- When mounting the fitting, a wrench should be used on the metal part (attachment) of the fitting only. Holding other parts of the product with a wrench may damage the product.

Specifically, make sure that the wrench does not damage the connector.



| Model | Required torque | | |
|----------|-----------------|--|--|
| PFMB7201 | 12 to 14 N·m | | |
| PFMB7501 | | | |
| PFMB7102 | 28 to 30 N·m | | |
| PFMB7202 | | | |



| Model | Nominal thread size | Width across flats of attachmen | | |
|------------|---------------------|---------------------------------|--|--|
| PFMB7201 | Rc 1/4, NPT 1/4 | 17 mm | | |
| Privid/201 | G 1/4 | 21 mm | | |
| PFMB7501 | 1/2 | 00 | | |
| PFMB7102 | 1/2 | 30 mm | | |
| PFMB7202 | 3/4 | 35 mm | | |

▲ Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of "Caution," "Warning" or "Danger." They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)*1), and other safety regulations.

I

etc.

Caution indicates a hazard with a low level of risk **▲** Caution: which, if not avoided, could result in minor or moderate injury.

Warning indicates a hazard with a medium level of risk \triangle Warning: which, if not avoided, could result in death or serious injury.

Danger indicates a hazard with a high level of risk A Danger : Which, if not avoided, will result in death or serious injury. ------

🗥 Warning

1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.

Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalogue information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

2. Only personnel with appropriate training should operate machinery and equipment.

The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

- 3.Do not service or attempt to remove product and machinery/equipment until safety is confirmed.
 - 1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
 - 2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
 - 3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.
- 4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.
 - 1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
 - 2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalogue.
 - 3. An application which could have negative effects on people, property, or animals requiring special safety analysis.
 - 4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation

∧ Caution

1. The product is provided for use in manufacturing industries. The product herein described is basically provided for peaceful use in manufacturing industries

If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary

If anything is unclear, contact your nearest sales branch.

*1) ISO 4414: Pneumatic fluid power - General rules relating to systems. ISO 4413: Hydraulic fluid power - General rules relating to systems. IEC 60204-1: Safety of machinery - Electrical equipment of machines. (Part 1: General requirements) ISO 10218-1: Manipulating industrial robots - Safety.

Limited warranty and Disclaimer/ Compliance Requirements

The product used is subject to the following "Limited warranty and Disclaimer" and "Compliance Requirements". Read and accept them before using the product.

Limited warranty and Disclaimer

- 1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, wichever is first.*2)
- Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
- 2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided. This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
- 3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalogue for the particular products

*2) Vacuum pads are excluded from this 1 year warranty. A vacuum pad is a consumable part, so it is warranted for a year after it is delivered. Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

Compliance Requirements

- 1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
- 2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed

∧Caution

SMC products are not intended for use as instruments for legal metrology.

Measurement instruments that SMC manufactures or sells have not been qualified by type approval tests relevant to the metrology (measurement) laws of each country. Therefore, SMC products cannot be used for business or certification ordained by the metrology (measurement) laws of each country.

✓ Safety Instructions Be sure to read "Handling Precautions for SMC Products" (M-E03-3) before using.

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| i | ☎ +32 (0)33551464 ☎ +359 (0)2807670 ☎ +385 (0)13707288 ☎ +420 541424611 ☎ +437 70252900 ☎ +372 6510370 ☎ +358 207513513 ☎ +33 (0)164761000 ☎ +49 (0)61034020 ☎ +30 210 2717265 ☎ +30 210 2717265 ☎ +353 (0)14039000 ☎ +39 0292711 | ☎ +32 (0)33551464 www.smcpneumatics.be ☎ +359 (0)2807670 www.smc.bg ☎ +385 (0)13707288 www.smc.hr ☎ +420 541424611 www.smc.cz ☎ +477 0252900 www.smcdk.com ☎ +372 6510370 www.smcdk.com ☎ +378 (0)164761000 www.smc.fi ☎ +33 (0)164761000 www.smc.fi ☎ +43 (0)61034020 www.smc.cde ☎ +30 210 2717265 www.smc.hu ☎ +33 (0)14039000 www.smc.hu ☎ +33 (0)14039000 www.smc.hu | | ☎ +32 (0)33551464 www.smcpneumatics.be info@smcpneumatics.be Norway ☎ +359 (0)2807670 www.smc.bg office@smc.bg Norway ☎ +358 (0)13707288 www.smc.hr office@smc.bg Poland ☎ +420 541424611 www.smc.cz office@smc.cz Portugal ☎ +437 70252900 www.smc.cca smc@smc@smcdk.com Portugal ☎ +437 02510370 www.smcncfi smc@smcdk.com smc@smc.fi ☎ +338 207513513 www.smc.fi smc@smc.fi Slovenia ☎ +33 (0)164761000 www.smc.de info@smc.ce Slovenia ☎ +30 210 2717265 www.smc.hu office@smc.hu sales@smchellas.gr ☎ +333 (0)14039000 www.smc.hu office@smc.hu Sweden ☎ +330 0)14039000 www.smc.taiia.it sales@smcpneumatics.ie gain ☎ +39 0292711 www.smc.taiia.it mailbox@smcitaia.it UK | 1 +32 (0)33551464 www.smcpneumatics.be info@smcpneumatics.be office@smc.bg office@smc.bg office@smc.hr office@smc.hr office@smc.cz smc@smcdk.com smcdsmcde smsds smcdsmcdk shat slovakia Stovakia Stovakia Stat stat stat stat sales@smchellas.gr sales@smchellas.gr sweden swtzerland Turkey Swt2205131 www.smc.hu www.smc.hu | 1 +32 (0)33551464 www.smcpneumatics.be info@smcpneumatics.be office@smc.bg office@smc.bg office@smc.hr office@smc.hr office@smc.cz smc@smcpneumatics.ee www.smc.hr office@smc.cz smc@smcpneumatics.ee www.smc.fi www.smc.he www.smc.fi www.smc.he www.smc.fi www.smc.he www.smc.he www.smc.fi www.smc.he www.smc.fi www.smc.he www.smc.fi www.smc.he www.smc.hu office@smc.hu |