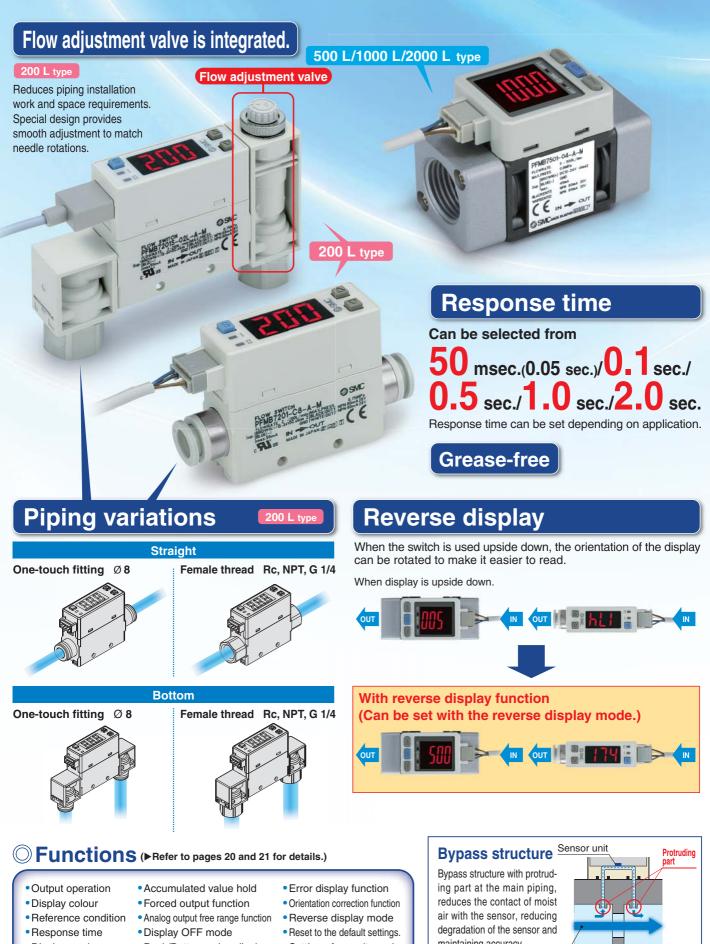


# Series **PFMB 2-Colour Display Digital Flow Switch**



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

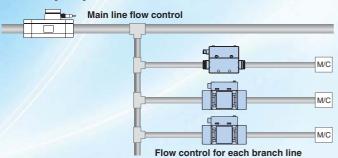


## 2-Colour Display Digital Flow Switch Series PFMB

# **Digital flow switch to save energy!**

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

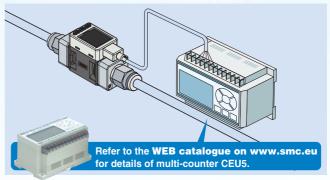
Saving energy starts from numerical control of the flow consumption of equipment and lines and clarification of the purpose and effect.



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



Remote control is possible with accumulated pulse.



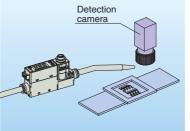
## **Applications**

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

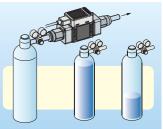
Air dryei

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.



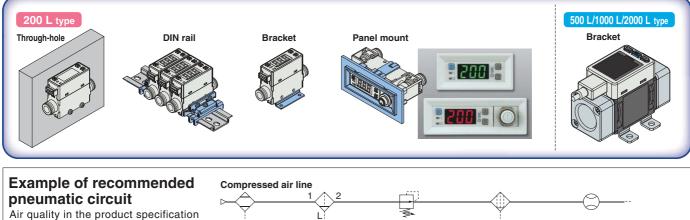
• Accumulated indication shows the operating flow rate or residual amount (of N<sub>2</sub> etc.) in a gas cylinder.



Flow switch

PFMB

**O** Mounting



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



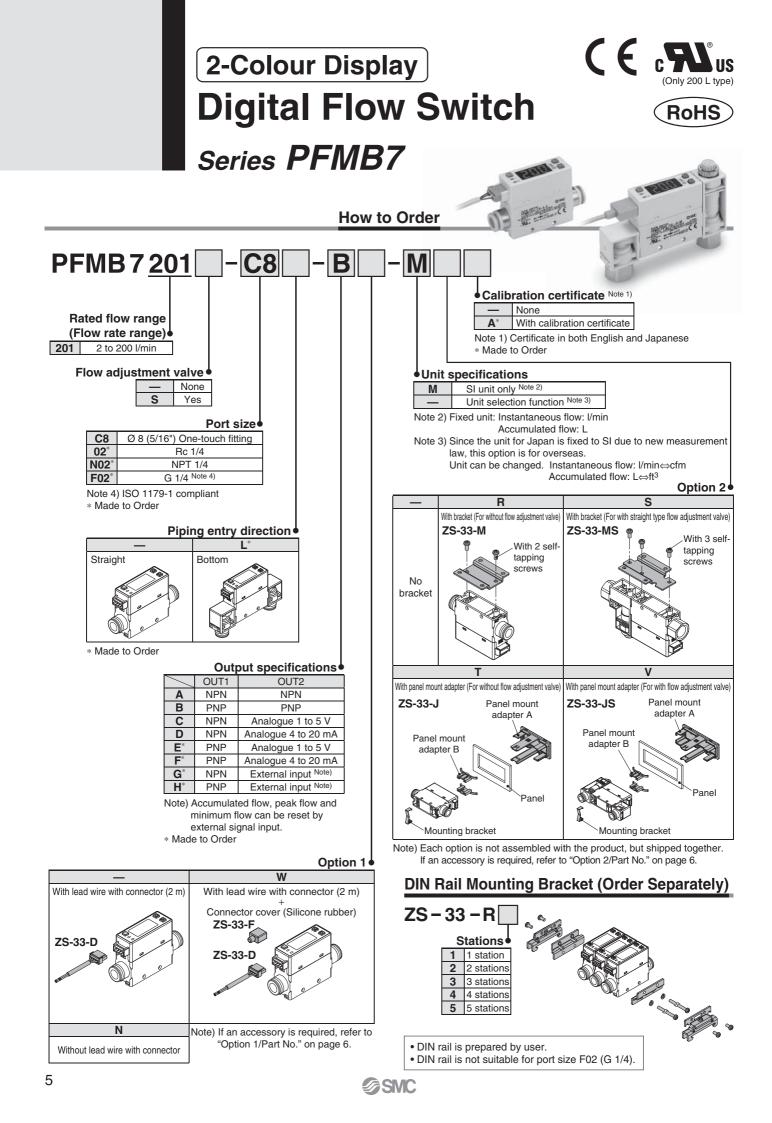
# **Flow Switch Flow Rate Variations**

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

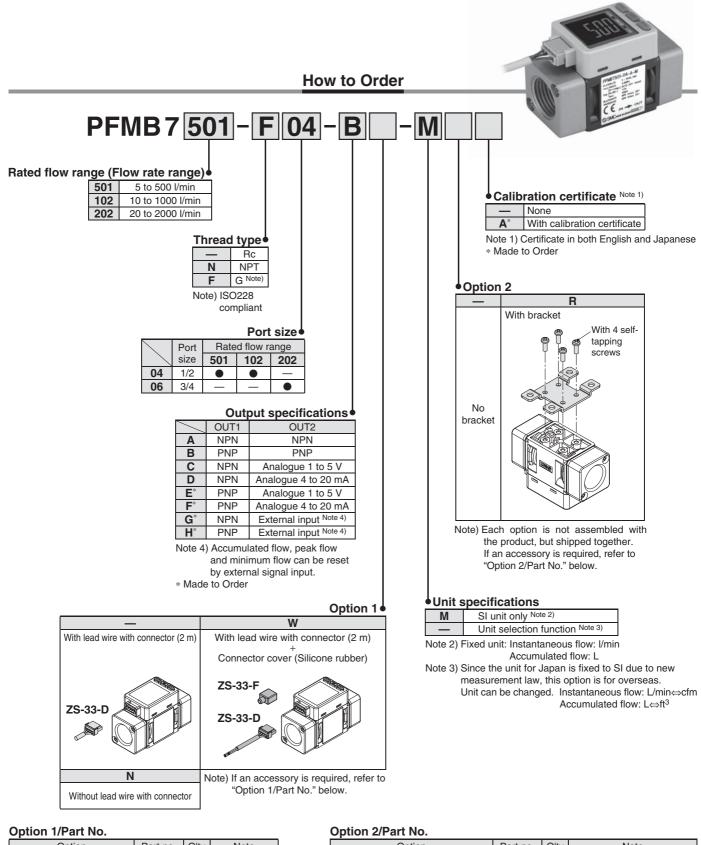


## Flow Switch Variations/Basic Performance Table

	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 <sup>Vector</sup> 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 <sup>Vector</sup> 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 <sup>Vector</sup> 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 <sup>(Non s)</sup> 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 <sup>3</sup> 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 <sup>Note 7</sup> 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 <sup>3</sup> 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 <sup>3</sup> 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 <sup>3</sup> 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 <sup>3</sup> 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 <sup>3</sup> 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 <sup>3</sup> 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 <sup>3</sup> can be selected.         L or ft <sup>3</sup> 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/ <del>1</del> , NI 1 0/ <del>1</del> , 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

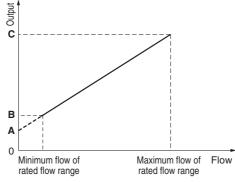
Model	Flow range								
woder	–100 l/min 0 l/min	200 l/min	500 l/min	1000 l/min	2000 l/min				
PFMB7201	2 l/min 2 l/min -10 l/min	200 l/min 210 l/min 210 l/min							
PFMB7501	5 l/min 5 l/min –25 l/min		500 l/min 525 l/min 525 l/min						
PFMB7102	10 l/min 10 l/min –50 l/min			1000 l/min 1050 l/min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

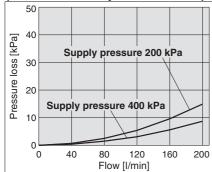
	Α	В	С
Voltage output	1 V	1.04 V	5 V
Current output	4 mA	4.16 mA	20 mA

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	

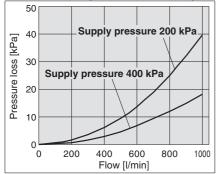


## Pressure Loss (Reference Data)

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

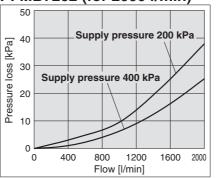


#### PFMB7102 (for 1000 l/min)



#### 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]

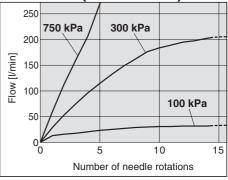
PFMB7202 (for 2000 l/min)



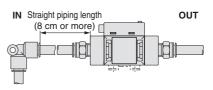
SMC

### Flow Adjustment Valve Flow-rate Characteristics

## PFMB7201 (for 200 l/min)

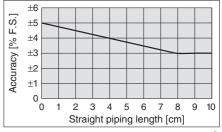


## **Straight Piping Length and Accuracy**



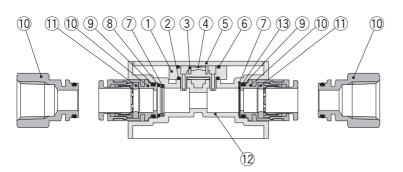
- The piping on the IN side must have a straight section of piping with a length of 8 cm or more. If a straight section of piping is not installed, the
- accuracy can vary by approximately ±2 % F.S. \* "Straight section" means a part of the piping without any bends or rapid changes in the cross sectional 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  $\pm 2$  % F.S. when such tubing is not used.

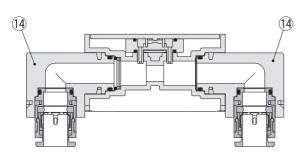
## PFMB7201/7501/7102/7202

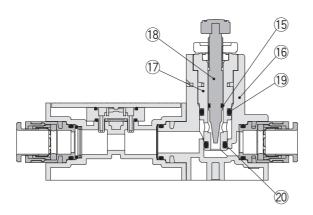


## **Construction/Fluid Contact Parts**

## PFMB7201



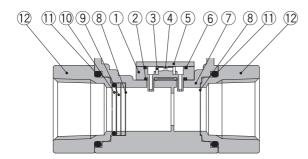




#### **Component Parts**

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						

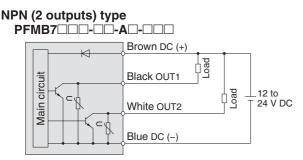
### PFMB7501/7102/7202



#### **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						

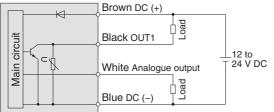
## Internal Circuits and Wiring Examples



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

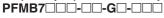
NPN (1 output) + Analogue (4 to 20 mA) output type PFMB7

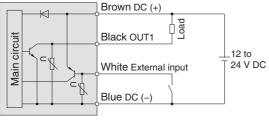


Max. applied voltage: 28 V, Max. load current: 80 mA, Internal voltage drop: 1 V or less C: Analogue output: 1 to 5 V

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

#### NPN (1 output) + External input type

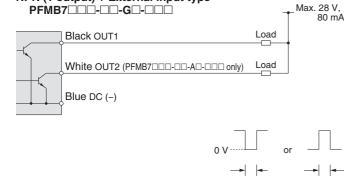


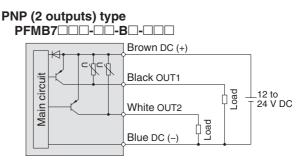


Max. applied voltage: 28 V, Max. load current: 80 mA, Internal voltage drop: 1 V or less External input: input voltage 0.4 V or less (reed or solid state input) for 30 msec. or longer

#### Accumulated pulse output wiring examples

#### 

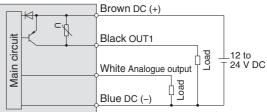






PNP (1 output) + Analogue (1 to 5 V) output type PFMB7

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



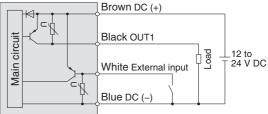
Max. load current: 80 mA, Internal voltage drop: 1.5 V or less E: Analogue output: 1 to 5 V

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

Max. load impedance: 600  $\Omega$ 

### 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

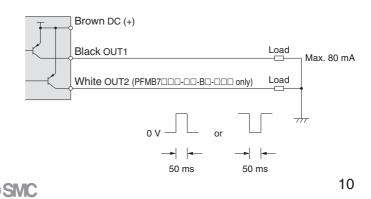
PNP (2 outputs) type PFMB7\_\_\_\_\_BB\_-\_\_\_ PNP (1 output) + Analogue output type PFMB7\_\_\_\_\_EB\_-\_\_\_

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

PFMB7

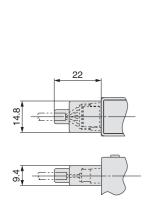
50 ms

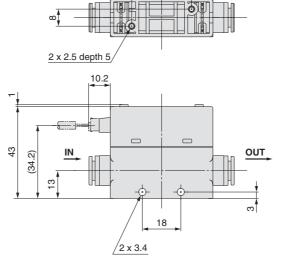
50 ms



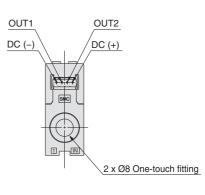
### Dimensions

## PFMB7201-C8

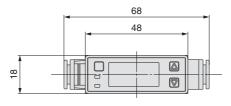




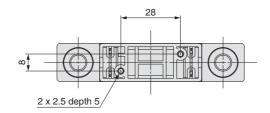
28

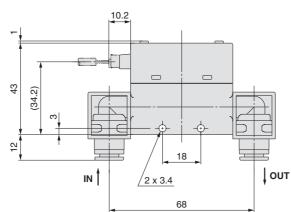


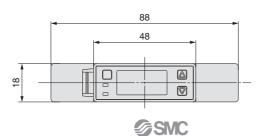
With connector cover

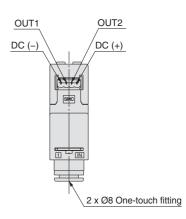


### PFMB7201-C8L

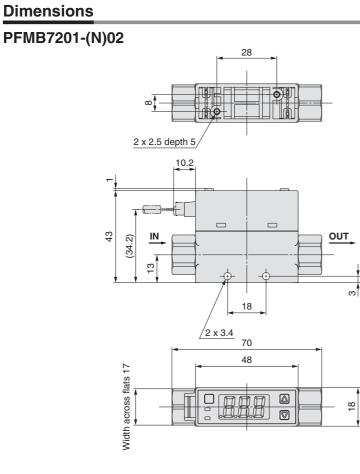


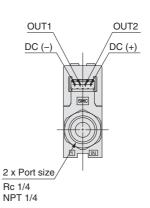




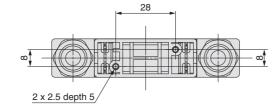


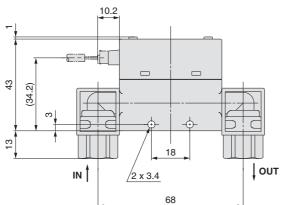
## Dimensions

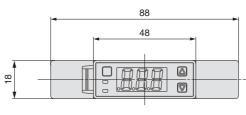


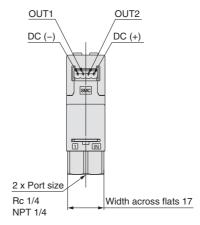


## PFMB7201-(N)02L



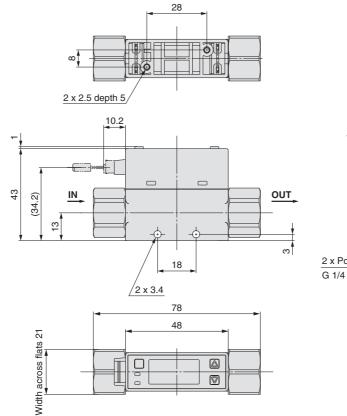


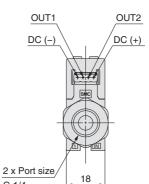




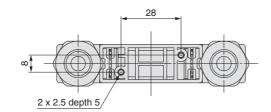
## Dimensions

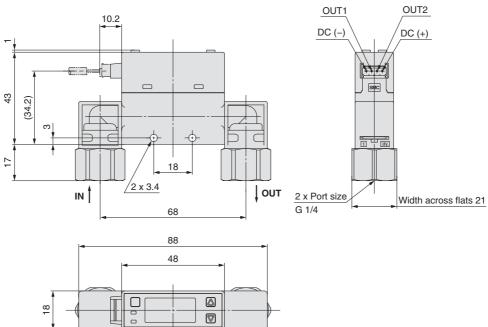
PFMB7201-F02





### PFMB7201-F02L



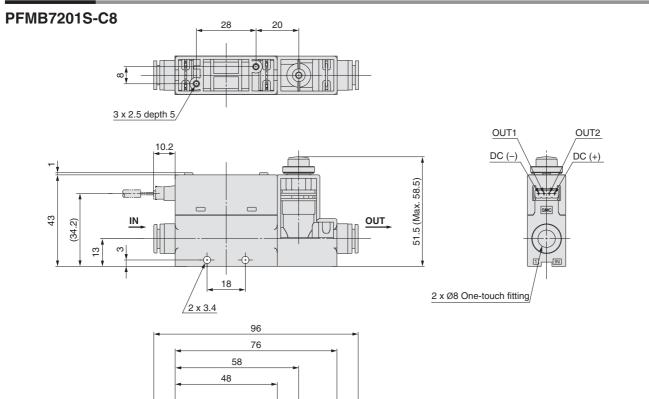


 $\square$ 

**SMC** 

8

## Dimensions

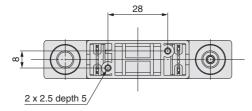


0

0

### PFMB7201S-C8L

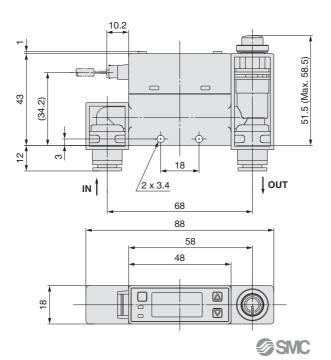
8

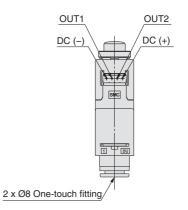


HF 

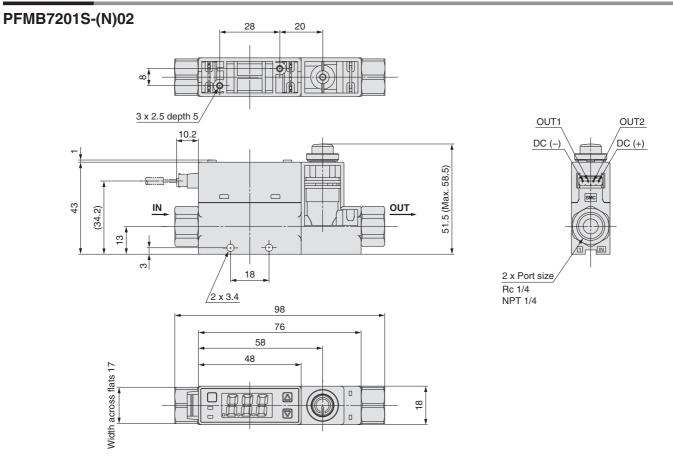
HL

 $\square$ 

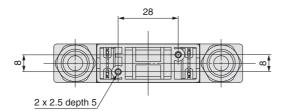


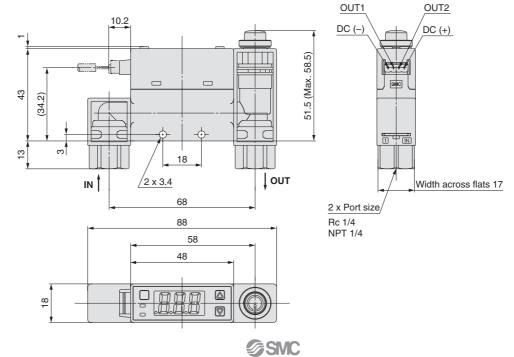


Dimensions



## 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> $\square$

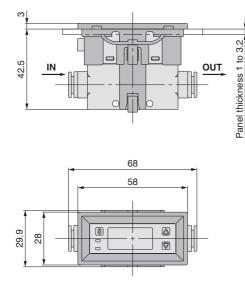
**SMC** 

### Dimensions

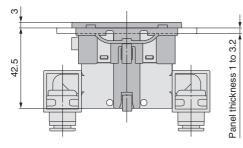
### Dimensions

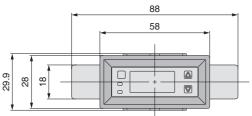
#### **PFMB7201**

Panel mount/ Without flow adjustment valve/Straight

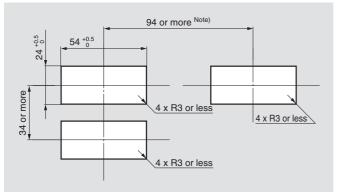


#### Panel mount/ Without flow adjustment valve/Bottom





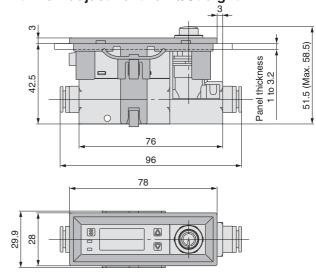
## **Panel Fitting Dimensions**



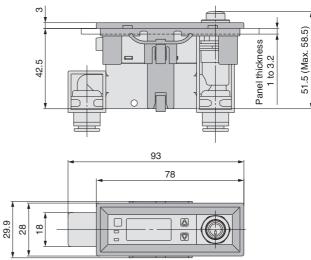
Panel thickness 1 to 3.2 mm

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.

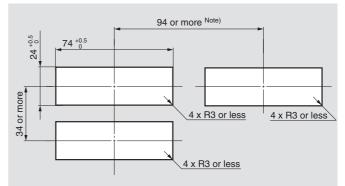
#### Panel mount/ With flow adjustment valve/Straight



## Panel mount/ With flow adjustment valve/Bottom



### **Panel Fitting Dimensions**



#### Panel thickness 1 to 3.2 mm

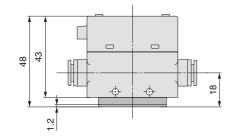
Note) Piping entry direction: Minimum dimensions for bottom piping. If using straight piping, the piping material and tubing need to be taken into consideration when designing the system. If a bend (R) is used, limit it to R3 or less.

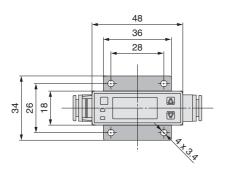


### Dimensions

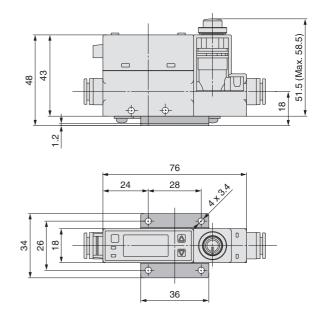
### **PFMB7201**

With bracket/Without flow adjustment valve

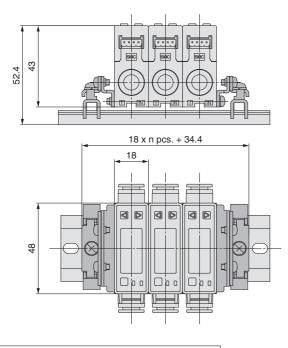




### With bracket/With flow adjustment valve



## **DIN rail mounting**

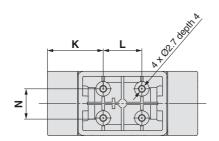


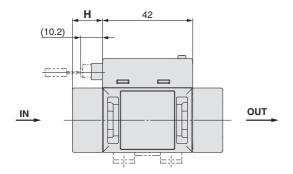
• DIN rail is prepared by user.

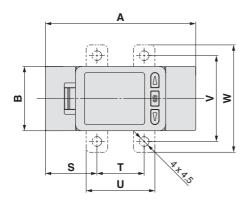
• DIN rail is not suitable for port size F02 (G 1/4).

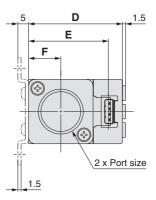
#### Dimensions

## PFMB7501/7102/7202





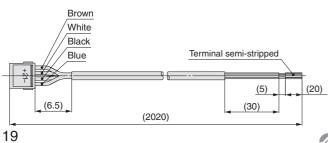




Symbol Model	Α	В	D	Е	F	Н	к	L	N
PFMB7501/7102	70	30	43.7	37.2	15	14	26	18	13.6
PFMB7202	90	35	49.2	42.7	17.5	24	31	28	16.8

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

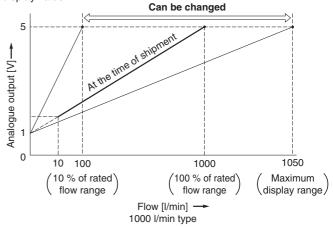
The maximum (minimum) flow rate is detected and updated from when the power supply is turned on. In peak (bottom) value display mode, this maximum (minimum) flow rate is displayed.

#### Keylock function

Prevents operation errors such as accidentally changing setting values.

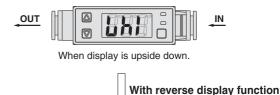
#### Analogue output free range function

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.	

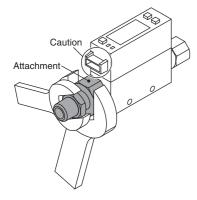
If the failure cannot be solved after the above instructions are performed, please contact SMC for investigation.

#### Precautions on piping

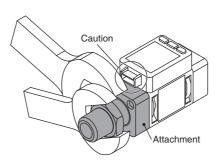
#### Piping for the metal attachment

- 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.

<b>2</b> +43 (0)2262622800	www.smc.at	office@smc.at	Lithuania	🕿 +370 5 2308118	www.smclt.lt	info@smclt.lt
<b>2</b> +32 (0)33551464	www.smcpneumatics.be	info@smcpneumatics.be	Netherlands	🕿 +31 (0)205318888	www.smcpneumatics.nl	info@smcpneumatics.nl
<b>2</b> +359 (0)2807670	www.smc.bg	office@smc.bg	Norway	<b>2</b> +47 67129020	www.smc-norge.no	post@smc-norge.no
<b>2</b> +385 (0)13707288	www.smc.hr	office@smc.hr	Poland	🕿 +48 222119600	www.smc.pl	office@smc.pl
c 🖀 +420 541424611	www.smc.cz	office@smc.cz	Portugal	🕿 +351 226166570	www.smc.eu	postpt@smc.smces.es
<b>2</b> +45 70252900	www.smcdk.com	smc@smcdk.com	Romania	🕿 +40 213205111	www.smcromania.ro	smcromania@smcromania.ro
<b>2</b> +372 6510370	www.smcpneumatics.ee	smc@smcpneumatics.ee	Russia	🕿 +7 8127185445	www.smc-pneumatik.ru	info@smc-pneumatik.ru
🕿 +358 207513513	www.smc.fi	smcfi@smc.fi	Slovakia	🕿 +421 (0)413213212	www.smc.sk	office@smc.sk
<b>2</b> +33 (0)164761000	www.smc-france.fr	promotion@smc-france.fr	Slovenia	🕿 +386 (0)73885412	www.smc.si	office@smc.si
<b>2</b> +49 (0)61034020	www.smc.de	info@smc.de	Spain	<b>2</b> +34 902184100	www.smc.eu	post@smc.smces.es
🕿 +30 210 2717265	www.smchellas.gr	sales@smchellas.gr	Sweden	<b>2</b> +46 (0)86031200	www.smc.nu	, post@smc.nu
<b>2</b> +36 23511390	www.smc.hu	office@smc.hu	Switzerland	<b>2</b> +41 (0)523963131	www.smc.ch	info@smc.ch
<b>2 +353 (0)14039000</b>	www.smcpneumatics.ie	sales@smcpneumatics.ie	Turkey	🕿 +90 212 489 0 440	www.smcpnomatik.com.tr	info@smcpnomatik.com.tr
<b>2</b> +39 0292711	www.smcitalia.it	mailbox@smcitalia.it	UK	🕿 +44 (0)845 121 5122	www.smcpneumatics.co.uk	sales@smcpneumatics.co.uk
<b>2</b> +371 67817700	www.smclv.lv	info@smclv.lv				
i	<ul> <li>☎ +32 (0)33551464</li> <li>☎ +359 (0)2807670</li> <li>☎ +385 (0)13707288</li> <li>☎ +420 541424611</li> <li>☎ +437 70252900</li> <li>☎ +372 6510370</li> <li>☎ +358 207513513</li> <li>☎ +33 (0)164761000</li> <li>☎ +49 (0)61034020</li> <li>☎ +30 210 2717265</li> <li>☎ +30 210 2717265</li> <li>☎ +353 (0)14039000</li> <li>☎ +39 0292711</li> </ul>	☎ +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	<b>1</b> +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	<b>1</b> +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