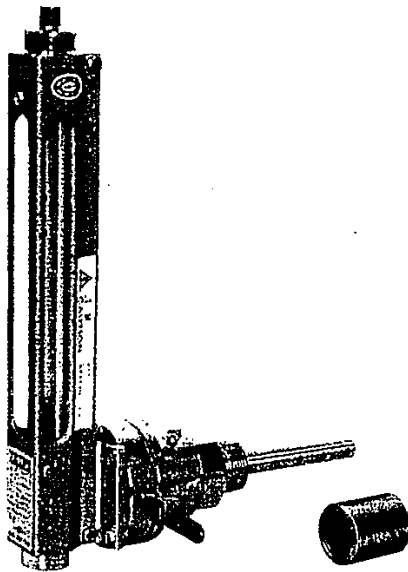


Pitot-Cell Flow Meter

FIXED INDICATOR TYPE

Instruction Manual

MODELS: PFT-A
PFT-AL
PFNT-A



Pitot-Cell Flow Meter is designed for measuring flow rate of cold and hot water for air conditioner in buildings. Due to applying pitot tube, installation is easy and pressure loss is very little.



CAUTION

- Be sure to read instruction manual.
- This Flow Meter consists of Glass Tapered Tube.
Note that Tapered Tube may be broken by contacting tool, etc. with it.
- Be sure to operate under Max. working temperature/pressure shown on sticker.
- Be careful not to open/close by solenoid valve, etc. abruptly to avoid a breakage of Tapered Tube by a shock of Float.
- Drain fluid thoroughly to avoid a freezing of fluid on no operation.
- Not applicable for strong alkaline fluid (NaOH, KOH, etc.) and fluid containing HF.



1. Installation of attached Socket and Tee

1-1. Pipe I.D.

The standard scale is engraved based on I.D. of JIS G3452 SGP pipe. If pipe I.D. is different from Table 1, an error in measurement may occur. So you are kindly requested to use SGP pipe or similar sized pipe.(See Table 1.)

Upon request on ordering, we can engrave the scale based on the specified pipe I.D.

Size	20A	25A	32A	40A	50A	65A	80A	100A	125A	150A	200A	250A	300A	350A	400A	450A
Pipe I.D.	21.6	27.6	35.7	41.6	52.9	67.9	80.7	105.3	130.8	155.2	204.7	254.2	304.7	339.8	390.6	441.4

Table 1

1-2. Caution for Installation Place

In case of the following, the flow rate may not be indicated, because to drain Air cannot be performed. In this case, do not install Flowmeter.

- (1)The place that during operation vacuum may be caused at the suction side of pump.
- (2)For the other cases, the place that vacuum may be caused.

The following straight pipes shall be considered to install Pitot-Cell Flow Meter.(See Table 2 and 3.)

Size	Upstream	Downstream
20A,25A	min 10D	min 5 D
32A and above	min 5 D	min 3 D

Table 2

Size	Upstream	Downstream
32A and below	min 20D	min 10D
40A and above	min 10D	min 5 D

Table 3

D : I.D. of Pipe

1-3. Welding of Socket(See Fig.1.)

There are two(2) kinds of Sockets according to pipe to be applied. After being sure to confirm pipe size, weld Socket to piping under the following procedure: For sizes 20A and 25A, install Flowmeter by using attached Tee.

(32A,40A,50A)

- (1)Drill $\phi 24$ hole at the installing place.
- (2)Weld attached R Socket(head:R processing) matching pipe O.D.

Be cautious about the following:

- *Match I.D. of Socket with $\phi 24$ hole.
- *Keep Socket squarely to piping.
- *Weld Socket horizontally(direction).

(65A and above)

- (1)Drill $\phi 35$ hole at the installing place.
- (2)Weld attached standard Socket.

Be cautious about the following:

- *Match head of Socket with inwall of piping.
- *Keep Socket squarely to piping.
- *Weld Socket horizontally(direction).

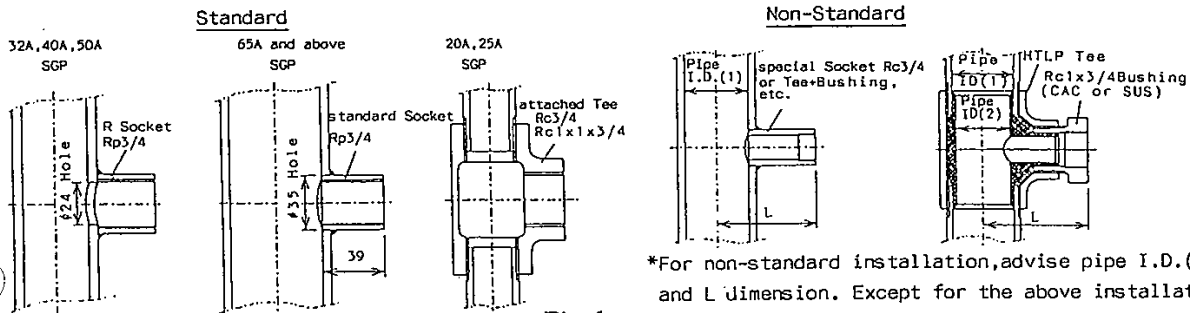


Fig.1

*For non-standard installation, advise pipe I.D.(1).(2) and L dimension. Except for the above installation, consult us.

2. Installation of Pitot Tube and Cell Block(Indicator)

(Tools, etc. to be prepared): Wrench(for 36mm opposite side), Driver(for M3), Sealing material(Sealing Tape, etc.)

*PFT-A, PFT-AL*1(brass-Fig.2) (*1: If thickness of insulation material is more than 90mm, use this model.)

- (1)Seal the screwing part of Pitot Tube with sealing Tape, etc., and screw the hexagon part(2) of Pitot Tube onto Socket(1) with Wrench tightly.(Fig.2-1)
- (2)Turn part(3) by hand toward arrow mark C(Fig.2-2), and position red line of sticker toward upstream side A.(Fig.2-3)

- (3)After confirming that red line is positioned toward upstream side, and screw 3 pcs of +screws(4) with +Driver.(Fig.2-3)

- (4)Close Cock by turning Cock Handle(5) till the Handle touches S side(SHUT:close), and install Cell Block(Indicator)(6) with attached Washer(7) and 4 pcs of Bolts(8) vertically.(Fig.2-4)

Fig.2

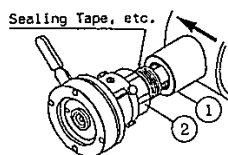


Fig.2-1

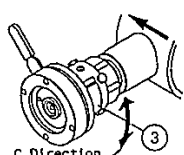


Fig.2-2

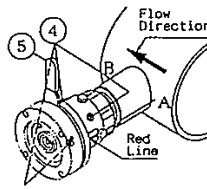


Fig.2-3

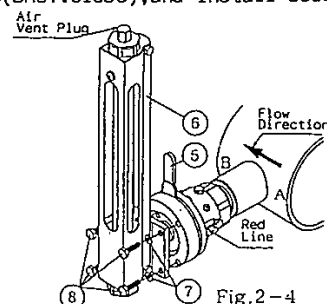


Fig.2-4

*PFNT-A(bronze-Fig.3)

- (1) Seal the screwing part of Pitot Tube with Sealing Tape, etc., and screw the hexagon part(2) onto Socket(1) with Wrench tightly.(Fig.3-1)
- (2) Turn part(3) by hand toward arrow mark C(Fig.3-2), and position red line of sticker toward upstream side.(Fig.3-3)
- (3) After confirming that red line is positioned toward upstream side, and screw 3 pcs of +screws(4) with +Driver.(Fig.3-3)
- (4) Close Cock by turning Cock Handle(5) till the Handle touches S side(SHUT:close), push Cell Block(Indicator)(6) into Pitot Tube Assy., and install Cell Block(Indicator)(6) by turning Cap Nut(7) vertically.(Fig.3-4)

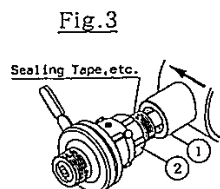


Fig.3-1

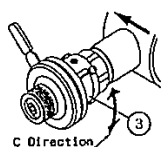


Fig.3-2

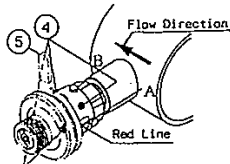


Fig.3-3

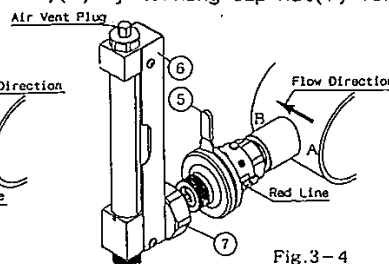


Fig.3-4

- (Caution)
1. After confirming that scale of Cell Block(Indicator) conforms to size of Pitot Tube and pipe size, install Flowmeter.
 2. When changing the setting of red line, unscrew 3 pcs of +screws(4) and do it from the procedure of the above(2).
 3. After installing Pitot Tube, make flushing thoroughly and install Cell Block.(It is possible not to enter foreign matter initially.)
 4. When Cock Handle is closed, the direction of Handle becomes square to piping, and when it is opened, the direction is positioned toward downstream.

3. Preparation and caution for operation

- (1) Upon completion of installation, put Cock Handle down and contact O side(OPEN) to open Cock.
- (2) Loosen Air Vent Plug at the top of indication part, and discharge air in indication part completely. If air remains inside, an error may be caused in the indicated value.
- (3) When there is much foreign particle in the newly established piping, put Cock down and contact S side(SHUT). If opening Cock only at the measuring, inflow of the particle to the indication part can be minimized, and dirt of Tapered Tube and Strainer can be reduced.
- (4) When freezing is liable to occur in winter, drain water in the Tapered Tube to avoid breakage of Tapered Tube under the following procedure:
(Procedure for draining water) Close Cock Handle → Remove Strainer Cap at the bottom → Loosen Air Vent Plug at the top → Drain water → Mount Strainer Cap → Tighten Air Vent Plug (completion)

4. Check for poor indication

4-1. An error is large soon after installation. Or Float does not rise.

- (1) Check if the length of straight pipes is more than necessary length.(See item 1-2.)
- (2) Check if the hole of Pitot Tube faces to upstream side.(Red line of Pitot Tube shall face to upstream side)
- (3) Check if air can be discharged completely.
- (4) Check if Cock Handle is opened(OPEN) to contact O side.
- (5) Check if scale conforms to pipe size.(Size is indicated on the lower part of scale. For installation with Tee, confirm "T" indicated on the back of pipe size of scale tube.)

4-2. An error of indication is gradually enlarged.

- (1) After discharging air, check flow rate again.
- (2) After removing Strainer Cap, check the clogging state of Strainer. When clogging is severe, wash it with tap water.
- (3) Check dirt of the inside of Tapered Tube.(When Float is not clearly seen, unscrew Disassembling Screw, remove Tapered Tube from the top, and wash it.)
- (4) Check if there is any clogging at the small hole of the Upper Stopper.(Check it at the time of washing Tapered Tube.)

*If no improvement is obtained by the above check, the other cause except for Flowmeter would be expected. In this case, after checking the pump pressure and ON-OFF state of valve, etc., contact us.

5. Specifications

*Accuracy: within ±5%(at max. flow rate)

*Scale : Cold Water 7°C(Blue), Hot Water 60°C(Red)----bouble scale

*Max. allowable pressure : 1.0MPa, or 2.0MPa(2 kinds, indicated on body)

*Max. allowable temperature: 100°C

(Note) In accordance with JIS A 4008 6.2 Fan Coil Unit, scale temperature shall be decided.

*In case of operation at ambient temperature (approx 20°C), the reading of flow rate shall be about $\frac{\text{Cold Water Scale} + \text{Hot Water Scale}}{2}$. Upon request, scale based on specified temperature is available.

6. Model, Construction, Material, Major Dimension

(1) PFT-A , PFT-AL* (*If thickness of insulation material is more than 90mm, use this model.)

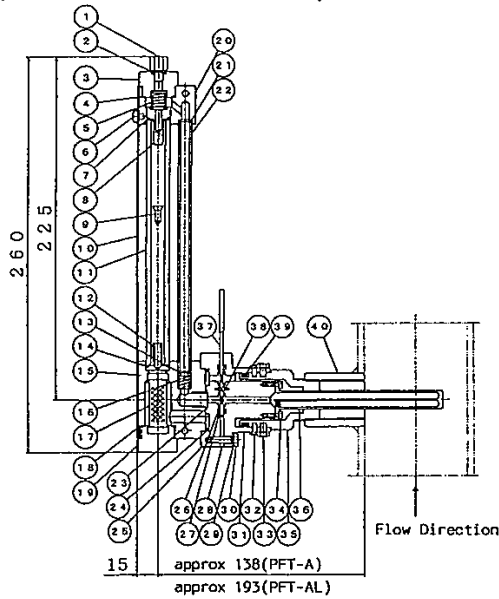


Fig.4

No.	Part Name	Materials	No.	Part Name	Materials
1	Air Vent Plug	C3604	21	O-Ring:P6	NBR
2	O-Ring:P6	NBR:hardness90	22	Return Tube	SUS304
3	Disassembling Screw	C3604	23	O-Ring:P10	NBR
4	O-Ring:P20	NBR	24	O-Ring:P35	NBR
5	Spring	SUS304	25	Dram for connecting Cell Block	C3604
6	Small Screw	SUS304	26	O-Ring:P6	PTFE
7	O-Ring:P12	NBR	27	O-Ring:O2028	NBR
8	Upper Stopper	C4641	28	Spacer	SUS304
9	Float	Titanium	29	Spring Washer	SUS304
10	Assembling Cover	SUS304	30	Hexagon Bolt:M4x16	SUS304
11	Tapered Tube (w/ Scale)	Pyrex	31	Joint Dram	C3604
12	Lower Stopper	PC	32	Bind Screw:M3x6	SUS304
13	O-Ring Clamp	C3604	33	Hexagon Bolt:M4x6	SUS304
14	O-Ring:P12	NBR	34	Bolt w/Hexagon Hole M2.6x8	SUS304
15	Lower Block	C3604	35	Joint Tube	C3604
16	Spring	SUS304	36	Pitot Tube	SUS304
17	Strainer	SUS304	37	Cock Handle	SUS304
18	O-Ring:P20	NBR	38	Parallel Pin:2x8	SUS304
19	Cap	C3604	39	O-Ring:P29.5	NBR
20	Upper Block	C3604	40	Socket:3/4B	SS400

(2) PFNT-A

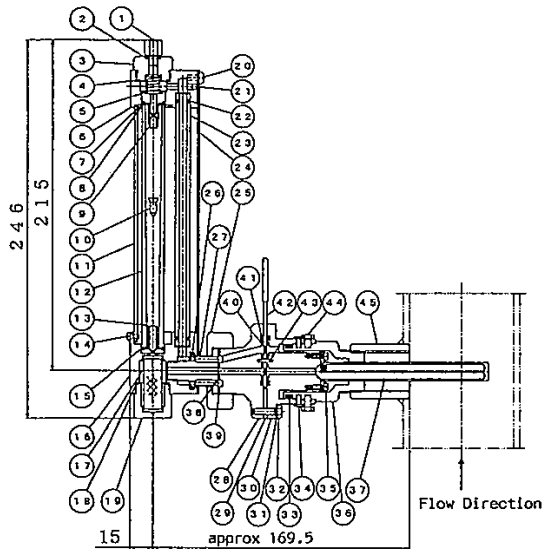


Fig.5

No.	Part Name	Materials	No.	Part Name	Materials
1	Air Vent Plug	SUS304	24	Assembling Cover	SUS304
2	O-Ring:P6	NBR:hardness90	25	Cap Nut	CAC406C
3	Disassembling Screw	SUS304	26	O-Ring:P20	NBR
4	O-Ring:P20	NBR	27	Connection Tube	CAC406C
5	Spring	SUS304	28	Connector Dram	CAC406C
6	Upper Block	CAC406C	29	Spacer	SUS304
7	Protective Cover Holder	CAC406C	30	Joint Dram	CAC406C
8	O-Ring:P12	NBR	31	Spring Washer	SUS304
9	Upper Stopper	CAC406C	32	Hexagon Bolt:M4x16	SUS304
10	Float	Titanium	33	O-Ring:P29.5	NBR
11	Protective Cover	PMMA	34	Bind Screw:M3x6	SUS304
12	Tapered Tube (w/ Scale)	Pyrex	35	Bolt w/Hexagon Hole M2.6x8	SUS304
13	Lower Stopper	PC	36	Joint Tube	CAC406C
14	Fixed Screw	SUS304	37	Pitot Tube	SUS304
15	O-Ring:P12	NBR	38	O-Ring:P6	NBR
16	Lower Block	CAC406C	39	O-Ring:P22	NBR
17	Strainer	SUS304	40	O-Ring:P6	PTFE
18	O-Ring:P20	NBR	41	O-Ring:O2028	NBR
19	Cap	CAC406C	42	Cock Handle	SUS304
20	Fixed Screw	SUS304	43	Parallel Pin:2x8	SUS304
21	Ball	SUS304	44	Hexagon Bolt:M4x6	SUS304
22	O-Ring:P7	NBR	45	Socket:3/4B	SS400
23	Return Tube	SUS304			

Messrs.

(Model) PFT-A

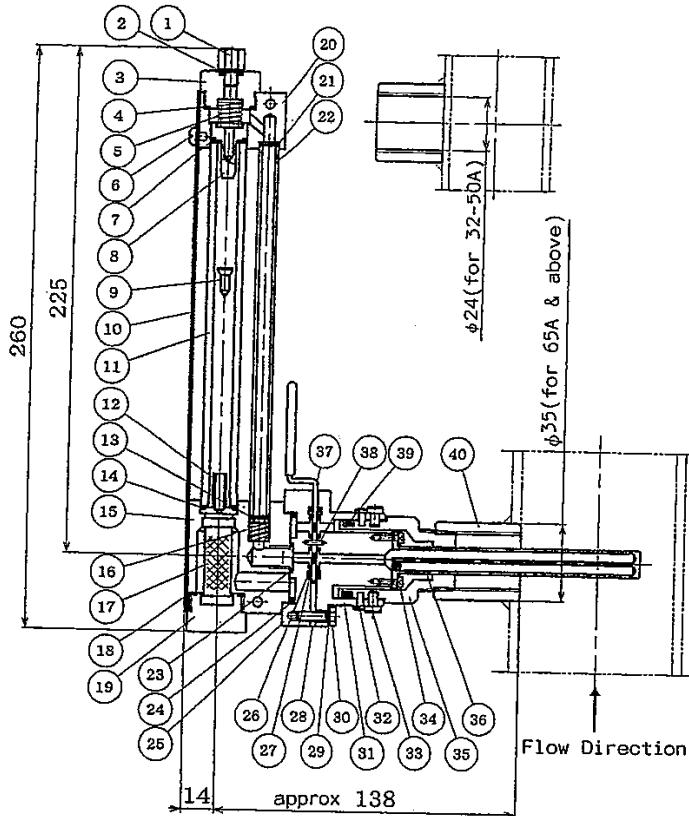
(Tag No.)

(DWG No.)

(Date)

(Qty.)

Pitot-Cell Flow Meter FIXED INDICATOR TYPE



No.	Part Name	Material
1	Air Vent Plug	C3604
2	O-Ring:P6	NBR:hardness90
3	Disassembling Screw	C3604
4	O-Ring:P20	NBR
5	Spring	SUS304
6	Small Screw	SUS304
7	O-Ring:P12	NBR
8	Upper Stopper	C4641
9	Float	Titanium
10	Assembling Cover	SUS304
11	Tapered Tube(w/ Scale)	Pyrex
12	Lower Stopper	PC
13	O-Ring: Clamp	C3604
14	O-Ring:P12	NBR
15	Lower Block	C3604
16	Spring	SUS304
17	Strainer	SUS304
18	O-Ring:P20	NBR
19	Cap	C3604
20	Upper Block	C3604
21	O-Ring:P6	NBR
22	Return Tube	SUS304
23	O-Ring:P10	NBR
24	O-Ring:P35	NBR
25	Dram for connecting Cell Block	C3604
26	O-Ring:P6	PTFE
27	O-Ring:O2028	NBR
28	Spacer	SUS304
29	Spring Washer	SUS304
30	Hexagon Bolt:M4x16	SUS304
31	Joint Dram	C3604
32	Bind Screw:M3x6	SUS304
33	Cap:M4x6	SUS304
34	Bolt w/Hexagon Hole M2.6x8	SUS304
35	Joint Tube	C3604
36	Pitot Tube	SUS304
37	Cock Handle	SUS316
38	Parallel Pin:2x8	SUS304
39	O-Ring:P29.5	NBR
40	Socket:3/4B *See 1	SS400

Size	Flow Range (L/min)		
		Standard	1 scale
3/4 B	20A	8~60	2
1 B	25A	15~100	5
1 1/4 B	32A	20~130	5
1 1/2 B	40A	30~200	10
2 B	50A	50~360	10
2 1/2 B	65A	80~580	20
3 B	80A	150~850	50
4 B	100A	200~1400	50
5 B	125A	300~2000	100
6 B	150A	400~3000	100
8 B	200A	800~5400	200
10 B	250A	1500~8000	500
12 B	300A	2000~12000	500
14 B	350A	2500~15000	500
16 B	400A	3000~20000	1000
18 B	450A	4000~25000	1000

*(Note 1) For sizes 20A, 25A, install by using attached Tee(material:FCMB) not welding Socket.

Fluid H ₂ O	Density 1.0 g/cm ³	Pressure Max. 1.0/ 1.0 MPa
Flow Range STANDARD TYPE	Viscosity 1 cP	Temperature cold water(7°C) (Double hot water(60°C) Scale)