

### GENERAL

The CFW2000 is the liquid flowmeter mainly designed for air conditioner. The flow rate is detected by the differential pressure which is created by a Pitot tube inserted into the pipe.

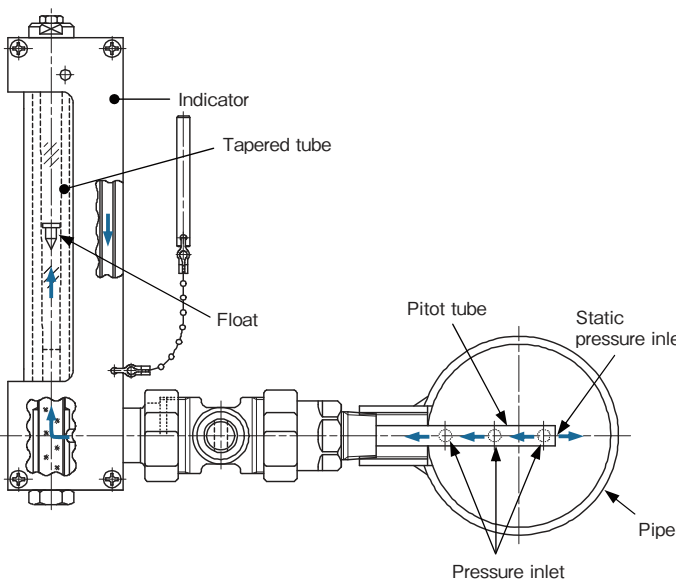
As the indicator is compatible with 4 different line sizes as per customers' choice, one indicator can be commonly used for 4 different pipes by just installing the fixing nozzles on them. It saves space and cost for the services where no continuous monitoring is required. Thus, the portable and detachable indicator, "ONE-TOUCH FLOW" is most suitable for the measurement of cold and hot water for the air conditioning system in collective housings, office buildings and other facilities.

### FEATURES

- ❑ Portable indicator is detachable with one touch action
- ❑ Just weld a 20 mm (3/4 inch) socket in the existing pipe and screw the flowmeter into the socket
- ❑ Minimum pressure loss  
60°C hot water in red and 7°C cold water in blue with double scales
- ❑ For both horizontal and vertical pipes
- ❑ One indicator can be commonly used for 4 different pipes.
- ❑ Light weight, cost effective and quick delivery

### MEASURING PRINCIPLE

The Pitot tube inserted into the pipe which have two pressure inlets, one for the total pressure (dynamic + static pressure) and the other one for static pressure only. The liquid is introduced into the flowmeter as a bypass line by the pressure difference of the total and static pressure as shown by an arrow ← in the following schematics. The flow going through the tapered tube makes the float stay at a position on the scale corresponding to the total flow rate in the pipe.



Dew prevention cover (option)



The dew prevention cover is detachable with one touch action.

### STANDARD SPECIFICATIONS

- Measuring liquid : Water, Cold water, Hot water
- Main pipe size : 20 mm (3/4") to 450 mm (18")
- Indication accuracy :  $\pm 5\%$  (F.S.)
- Max. operating pressure  
CFIW2 □ □ - □ □ □ □ -10 1.0 MPa  
CFIW2 □ □ - □ □ □ □ -20 2.2 MPa
- Operating temperature : 0 to 80°C  
The operating temperature is typical one which may change according to operating or environment conditions. (Use the lining or plastics pipe within its allowable temperature).
- Mass Indicator : CFIW2 □ □ 2 □ Approx.1.3 kg  
Fixing nozzle CFNW □ □ □ Approx.1.0 kg

## MODEL CODE

The CFW2000 "ONE-TOUCH FLOW" is composed of :

- A CFIW indicator
- A CFNW fixing nozzle
- A three-way socket (for main pipe size 20 to 32 mm) or a socket for welding piping (for main pipe size 40 mm or larger)

### ● CFIW Indicator

| CFIW2                                                              | □ 2 □ | -□□□□ | -□□ | -B    | /□□□ | Description                      |
|--------------------------------------------------------------------|-------|-------|-----|-------|------|----------------------------------|
| Installation type                                                  | 2     |       |     |       |      | Horizontal                       |
|                                                                    | 4     |       |     |       |      | Vertical                         |
| Indicator calibration                                              | 2     |       |     |       |      | 7°C and 60°C water, double scale |
| Scale range                                                        | 1     |       |     |       |      | Scale range 1 See right table    |
|                                                                    | 2     |       |     |       |      | Scale range 2 See right table    |
| Note 1<br>Main pipe size and combination of 4 measuring pipe sizes | -1000 |       |     |       |      | Scale for 20 mm                  |
|                                                                    | -2000 |       |     |       |      | Scale for 25 mm                  |
|                                                                    | -3000 |       |     |       |      | Scale for 32 mm                  |
|                                                                    | -4000 |       |     |       |      | Scale for 40 mm                  |
|                                                                    | -5000 |       |     |       |      | Scale for 50 mm                  |
|                                                                    | -6000 |       |     |       |      | Scale for 65 mm                  |
|                                                                    | -7000 |       |     |       |      | Scale for 80 mm                  |
|                                                                    | -8000 |       |     |       |      | Scale for 100 mm                 |
|                                                                    | -9000 |       |     |       |      | Scale for 125 mm                 |
|                                                                    | -A000 |       |     |       |      | Scale for 150 mm                 |
|                                                                    | -B000 |       |     |       |      | Scale for 200 mm                 |
|                                                                    | -C000 |       |     |       |      | Scale for 250 mm                 |
|                                                                    | -D000 |       |     |       |      | Scale for 300 mm                 |
|                                                                    | -E000 |       |     |       |      | Scale for 350 mm                 |
|                                                                    | -F000 |       |     |       |      | Scale for 400 mm                 |
|                                                                    | -G000 |       |     |       |      | Scale for 450 mm                 |
| Pressure rating                                                    | -10   |       |     |       |      | 1 MPa class                      |
|                                                                    | -20   |       |     |       |      | 2 MPa class                      |
| Version                                                            |       |       |     | -B    |      | Version code                     |
| Option                                                             |       |       |     | /DEG  |      | Degreasing treatment             |
|                                                                    |       |       |     | /PL   |      | For the PVC lining pipe          |
| Additional function                                                |       |       |     | blank |      | Not provided                     |
|                                                                    |       |       |     | /Z    |      | Provided                         |

### Note1

Example ① The combination of 4 measuring pipes:

The combined code of 4 measuring pipes for 25, 50, 200, 300 mm is "-25BD".

The whole model code becomes "CFIW2□□-25BD-□□-B".

Example ② The combination of 3 measuring pipes or less:

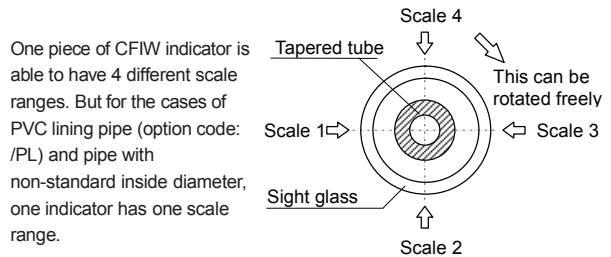
The combined code of 3 measuring pipes for 100, 125, 150 mm is "-89A0".

The whole model code becomes "CFIW2□□-89A0-□□-B".

### ● CFNW Fixing nozzle

| CFNW                | □□□ | -□ | -B | /□□□  | Description                                                                   |
|---------------------|-----|----|----|-------|-------------------------------------------------------------------------------|
| Main pipe size      | 020 |    |    |       | 20 mm                                                                         |
|                     | 025 |    |    |       | 25 mm                                                                         |
|                     | 032 |    |    |       | 32 mm                                                                         |
|                     | 040 |    |    |       | 40 mm                                                                         |
|                     | 050 |    |    |       | 50 mm                                                                         |
|                     | 065 |    |    |       | 65 mm                                                                         |
|                     | 080 |    |    |       | 80 mm                                                                         |
|                     | 100 |    |    |       | 100 mm                                                                        |
|                     | 125 |    |    |       | 125 mm                                                                        |
|                     | 150 |    |    |       | 150 mm                                                                        |
|                     | 200 |    |    |       | 200 mm                                                                        |
|                     | 250 |    |    |       | 250 mm                                                                        |
|                     | 300 |    |    |       | 300 mm                                                                        |
|                     | 350 |    |    |       | 350 mm                                                                        |
|                     | 400 |    |    |       | 400 mm                                                                        |
|                     | 450 |    |    |       | 450 mm                                                                        |
| Pressure rating     | -2  |    |    |       | Pressure rating code                                                          |
| Version             |     |    |    | -B    | Version code                                                                  |
| Option              |     |    |    | /CFT  | Three-way socket for 20 to 32 mm<br>Applied to only Indicator CFIW 1MPa class |
|                     |     |    |    | /CFS  | Socket of welding for 40 mm or larger pipes                                   |
|                     |     |    |    | /DEG  | Degreasing treatment                                                          |
|                     |     |    |    | /COV  | Dew prevention cover                                                          |
|                     |     |    |    | /BC6  | Material of fitting is CAC406                                                 |
|                     |     |    |    | /PL   | For PVC lining pipe                                                           |
| Additional function |     |    |    | blank | Not provided                                                                  |
|                     |     |    |    | /Z    | Provided                                                                      |

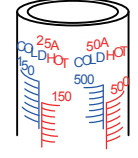
## STANDARD SCALE RANGE



### ● The example of standard specification

[example 1] Code number of CFIW2221 indicator with Scale range 1 for 25, 50, 200, 300mm sizes has [CFIW2221-25BD-□□-B].

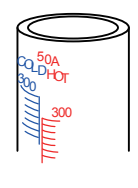
Scales can be chosen. The graduation example is shown in right drawing.



### ● The example of PVC lining pipe or non-standard pipes

[example 2] Code number of CFIW2222 indicator with scale range for 50 mm of PVC lining pipe has [CFIW2222-5000-10-B/PL] and likewise with scale range for 50mm of non-standard pipes has [CFIW2222-5000-10-B/Z].

It has one graduation (for one size of pipe) as shown at the right drawing.



## STANDARD SCALE RANGE TABLE

| CFIW2□□□ |       |                       |                       | Inside diameter of pipe mm |             |                    |
|----------|-------|-----------------------|-----------------------|----------------------------|-------------|--------------------|
| Size     |       | Scale range L/min     |                       | 1 MPa class                | 2 MPa class | PVC lining pipe *1 |
| mm       | inch  | Scale range 1 *2      | Scale range 2 *1, *2  | *3, *5                     | *4, *5      |                    |
| 20       | 3/4   | 12 to 100 [8 to 75]   | 10 to 60 [6 to 45]    | (26)                       | (21.4)      |                    |
| 25       | 1     | 18 to 150 [13 to 120] | 15 to 100 [10 to 75]  | (34)                       | (27.2)      |                    |
| 32       | 1 1/4 | 35 to 280 [25 to 220] | 25 to 180 [20 to 140] | (43)                       | (35.5)      | 29.5               |
| 40       | 1 1/2 | 35 to 300             | 30 to 180             | 41.6                       | 41.2        | 34.7               |
| 50       | 2     | 60 to 500             | 50 to 300             | 52.9                       | 52.7        | 46.2               |
| 65       | 2 1/2 | 100 to 800            | 80 to 500             | 67.9                       | 65.9        | 59.7               |
| 80       | 3     | 150 to 1200           | 120 to 700            | 80.7                       | 78.1        | 70.9               |
| 100      | 4     | 250 to 2000           | 200 to 1200           | 105.3                      | 102.3       | 95.2               |
| 125      | 5     | 400 to 3000           | 300 to 2000           | 130.8                      | 126.6       | 119.7              |
| 150      | 6     | 600 to 4500           | 400 to 2800           | 155.2                      | 151.0       | 142.0              |
| 200      | 8     | 1000 to 8000          | 700 to 4800           | 204.7                      | 199.9       |                    |
| 250      | 10    | 1500 to 12000         | 1200 to 7500          | 254.2                      | 248.8       |                    |
| 300      | 12    | 2000 to 17000         | 1600 to 10000         | 304.7                      | 297.9       |                    |
| 350      | 14    | 2500 to 22000         | 2000 to 13000         | 339.8                      | 333.4       |                    |
| 400      | 16    | 3500 to 28000         | 2800 to 17000         | 390.6                      | 381.0       |                    |
| 450      | 18    | 4500 to 35000         | 3500 to 22000         | 441.4                      | 428.6       |                    |

\*1 PVC lining type is available for the size 32 mm to 150 mm as marked gray. Its scale range is shown in the column Scale range 2 as marked gray. Full-scale flow rates for the PVC lining pipe are calculated based on the inner diameter of ESILON® ESLOCOAT LX tee fittings (Sekisui Chemical Co., Ltd). The maximum rating is 1 MPa. If you use other fittings, additional calibration is needed. Please check "D" and "L" in the figure at the end of this document and the kind of pipe, and then contact us.

\*2 Scale ranges of 20, 25, 32 mm size for 2 MPa class are shown in the brackets in above table.

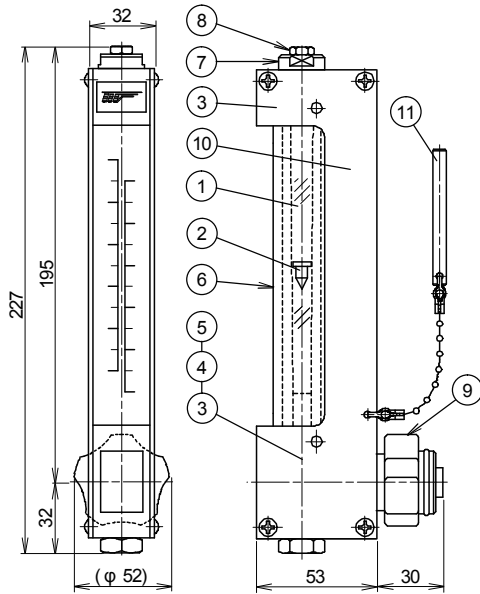
\*3 The inside diameter of main pipe of 20 to 32mm in 1MPa class is based on the three-way socket (JIS B 2301).(The three-way socket shall be attached upon request.)

\*4 The inside diameter of main pipe of 20 to 32mm in 2 MPa class is based on three-way socket (Sch 40). The three-way socket is supplied by customer.

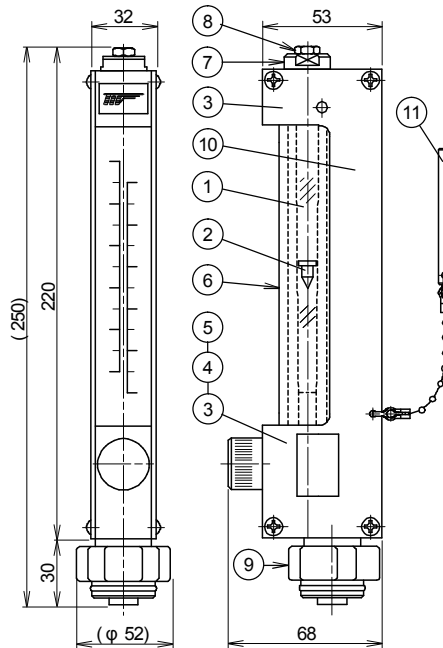
\*5 The inside diameter of main pipe more than 40mm in 1 MPa class is based on SGP (JIS G3452) Carbon steel pipe for piping, and the inside diameter in 2 MPa class is based on the carbon steel pipe for STPG (JIS G 3454 Sch 40) for pressure piping.

**DIMENSION AND MATERIAL**

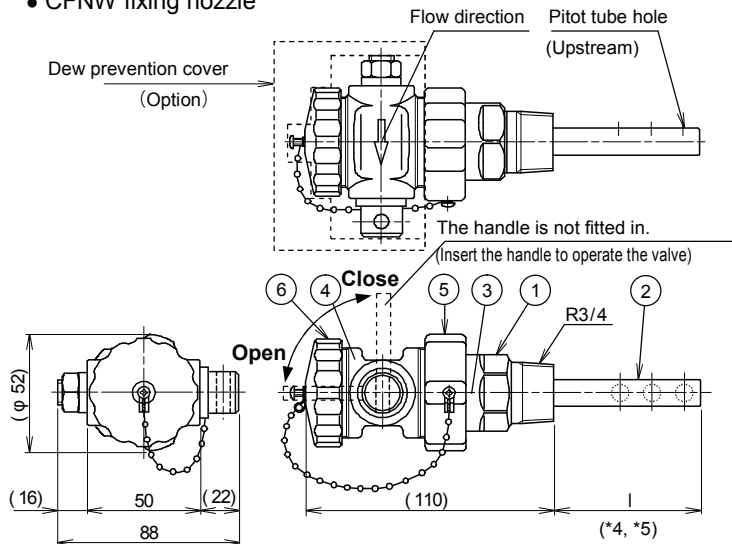
• Indicator (CFIW222□)



• Indicator (CFIW242□)



• CFNW fixing nozzle



Length of Pitot tube "l"

| Size   | *4  | *5  |
|--------|-----|-----|
| 20 mm  | 30  | 30  |
| 25 mm  | 32  | 32  |
| 32 mm  | 42  | 65  |
| 40 mm  | 63  | 70  |
| 50 mm  | 69  | 76  |
| 65 mm  | 79  | 88  |
| 80 mm  | 88  | 98  |
| 100 mm | 102 | 115 |
| 125 mm | 117 | 131 |
| 150 mm | 133 | 148 |
| 200 mm | 98  | —   |
| 250 mm | 113 | —   |
| 300 mm | 128 | —   |
| 350 mm | 135 | —   |
| 400 mm | 151 | —   |
| 450 mm | 166 | —   |

\*6 The dimension of "l" in Pitot tube is typical one which is our standard. The dimension may change depending on your pipes or sockets. In such case please check "D" and "L" in the figure at the end of this document and the kind of pipe, and then contact us.

\*1 CAC406 is available as the material of fitting on request. Optional code :/BC6

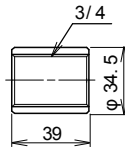
\*2 The socket made of SS400 is supplied as an accessory upon request. The socket made of other than SS400 is supplied by the customers.

\*3 For the Indicator CFIW 1MPa class, three-way socket is supplied upon request. Its material other than FCMB is provided by customers. For the Indicator CFIW 2MPa class, the part made of proper material such as S25C is selected and provided by customers considering pipe sch40.

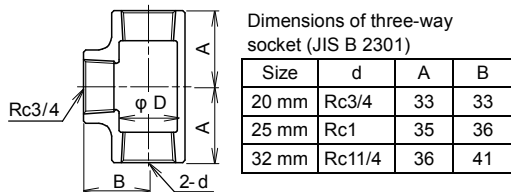
\*4 For SGP and STPG pipes

\*5 For PVC lining pipes

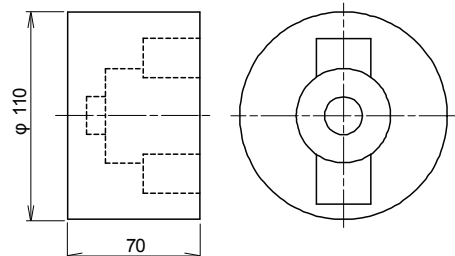
⑦ Socket (Model code : /CFS)  
40 mm or more, common to Indicator CFIW 1 and 2MPa classes



⑧ Three-way socket (Model code : /CFT)  
20 to 32 mm, only for Indicator CFIW 1MPa class

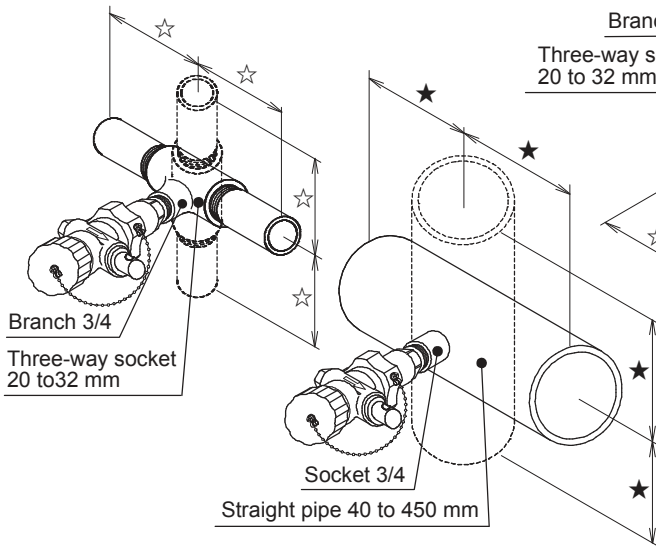


⑨ Dew prevention cover (Model code : /COV)

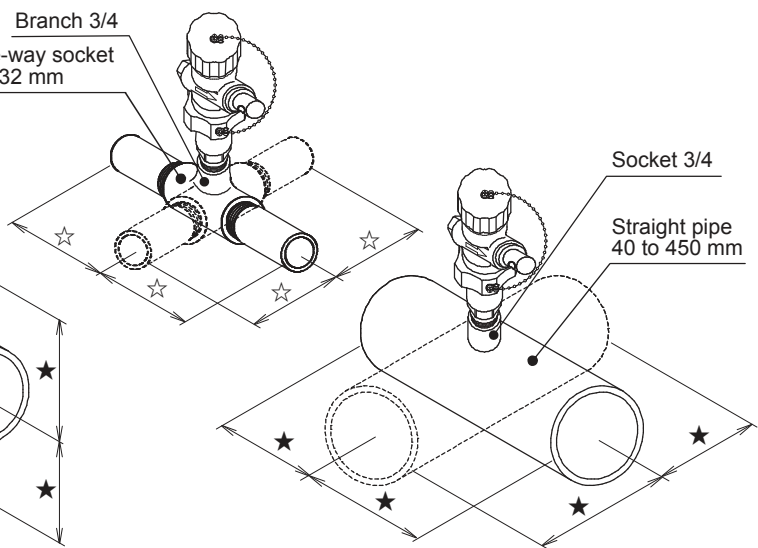


INSTALLATION, STRAIGHT RUNS AND ASSEMBLY DRAWING

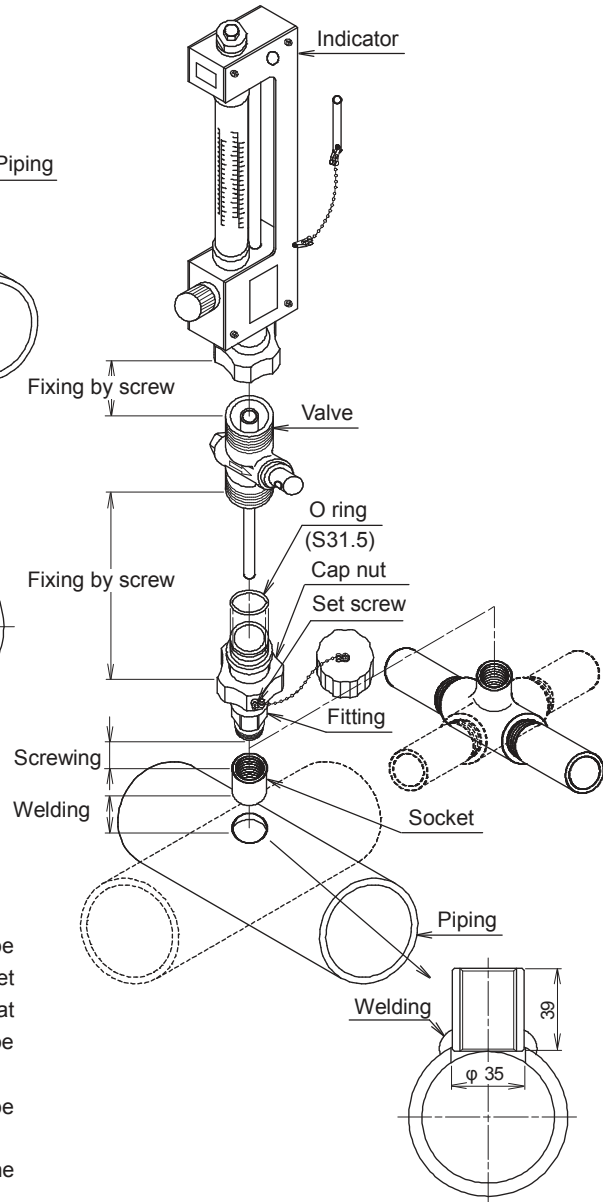
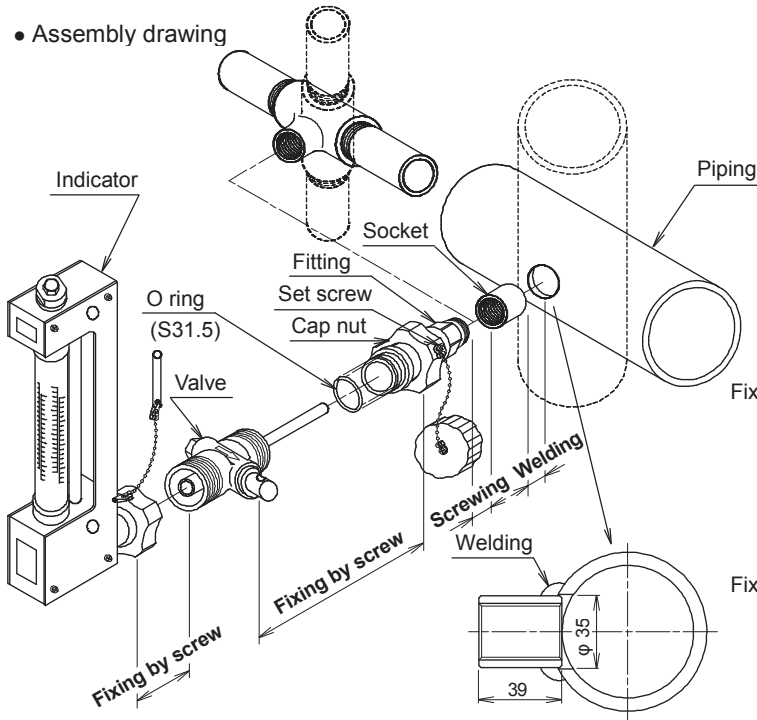
• Horizontal installation (CFW2200 series)



• Vertical installation (CFW2400 series)



• Assembly drawing



• Installation

1) Keep the upstream and downstream straight runs as follows.

| Pipe size         | Upstream    | Downstream |
|-------------------|-------------|------------|
| 32 mm or less (☆) | 10D or more | 5D or more |
| 40 mm or more (★) | 5D or more  | 3D or more |

Note : D is the inside diameter of main pipe.

- To install the flowmeters, drill a hole of 35mm diameter into the pipe having more than or equal to 40mm diameter. Use the three-way socket for the pipe having 20 to 32 mm diameter. Select and drill the hole at right place so that the final fixed posture of tapered tube should be vertical.
- Weld the socket to the drilled hole. The centerline of the socket must be perpendicular to the one of the pipe.
- Screw the CFNW fixing nozzle into the welded socket to complete the installation.

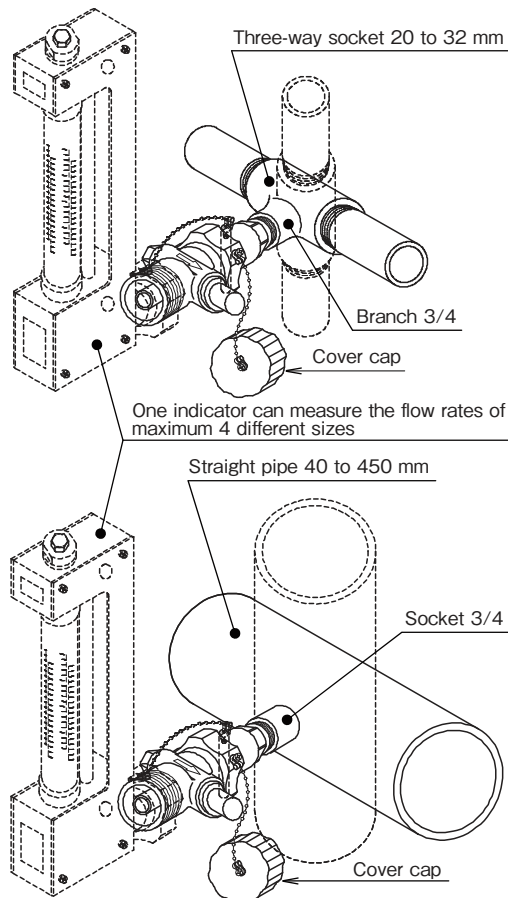
## SUGGESTIONS

- ❑ Install the fixing nozzles on the main pipes in advance. Measure the flow rate by fixing the indicator on them when required. One indicator can measure the flow rates of maximum 4 different sizes of the standard pipe. However it measures one flow rate of one size of non-standard pipe.

Following table shows the indicator commonly used for the combination of measuring pipes.

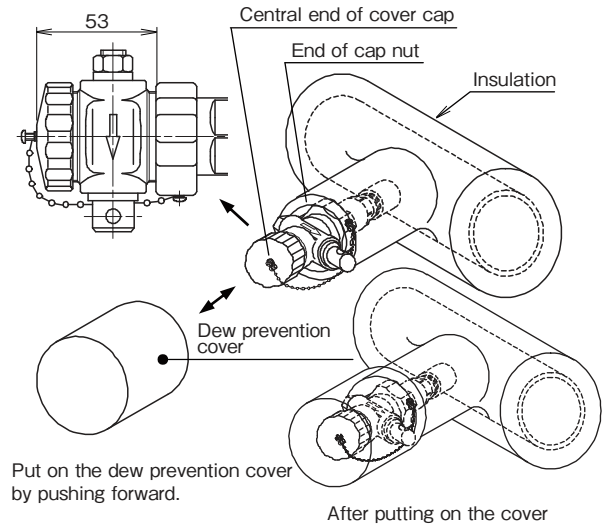
| Kinds of measuring pipes                                                                                                                                                                                                                                 | Can an indicator be used commonly?    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| A combination of three-way sockets 20 to 32mm (JIS B2301) and 40 to 450 mm SGP pipes (JIS G3452)*6                                                                                                                                                       | Yes<br>For 4 different sizes of pipes |
| A combination of three-way sockets 20 to 32mm (for Sch.40 pipes) and 40 to 450 mm STPG pipes (JIS G3454 Sch 40)*7                                                                                                                                        | Yes<br>For 4 different sizes of pipes |
| <ul style="list-style-type: none"> <li>• A mixed combination of above *6 and *7</li> <li>• Three-way sockets with 40 mm or larger</li> <li>• Non-standard pipes in inside diameters</li> <li>• Resin pipes</li> <li>• Lining pipes in general</li> </ul> | No<br>An indicator per one pipe size  |

- ❑ The model CFIW2 □ □ - □ □ □ □ -10 flowmeter is calibrated based on the inside diameter of JIS G3452 SGP. The model CFIW2 □ □ □ - □ □ □ □ -20 flowmeter is calibrated on JIS G3454 STPG Sch.40. If pipes are different from above, consult TOKYO KEISO. Specific calibration is required.
- ❑ Run the fluid fully in the pipe. Otherwise it could not be measured.



## HOT AND COLD INSULATION

- ❑ When the fixing nozzle is insulated up to the end of the cap nut as shown in the drawing below, the fixing nozzle may get a dew condensation due to the fluid temperature. To prevent a dew condensation the dew prevention cover can be provided on request. See page 3. The distance between the end of cap nut and the central end of the cover cap is 53 mm. Do not insulate this part. If this part is insulated, the dew prevention cover cannot be put on.



Put on the dew prevention cover by pushing forward.

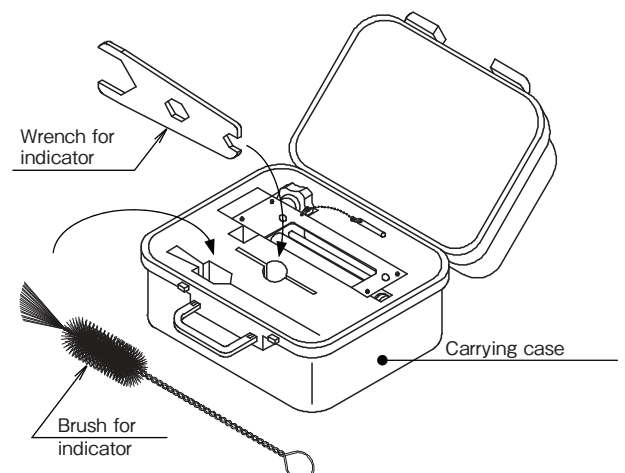
After putting on the cover

## HOW TO MEASURE

- 1) Open the cap of the CFNW fixing nozzle.
- 2) Insert the CFIW indicator into the CFNW nozzle, and fix the CFIW indicator by tightening up the cap nut. At this time, be careful that the tapered tube of CFIW indicator must be vertical. Confirm that the scale range corresponds to the size of the main pipe.
- 3) Move a valve handle to "Open" when installation is completed. Liquids run through indicator and it starts to measure the flow rate.
- 4) Conduct this in reverse procedure to finish measurement

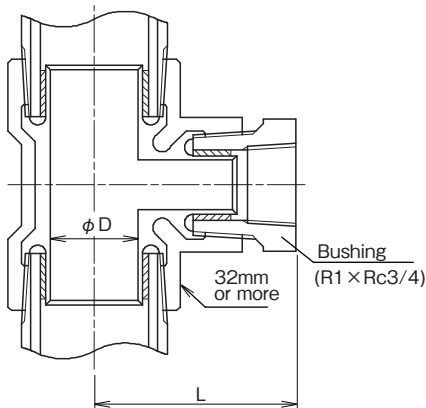
## HOW TO STORE AFTER MEASURING

The CFIW indicator has been delivered with the carrying case as shown below. Store the indicator in it after measuring the flow rate. An air elimination plug, a wrench used for opening and closing caps on the top and bottom of indicator, a brush for cleaning the tapered tube are contained in the case. Use them for the maintenance.



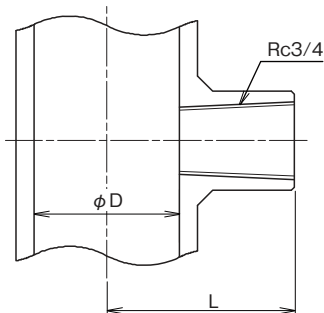
## LINING PIPING

- Only scale range 2 is available for the pipe lined with PVC. The flow rate is based on when the flow runs through the inside diameter of the pipe which consists of a tee joint of the Eslo coat LX made by Sekisui Chemical Co.'s Eslon®. If you use other fittings, additional calibration is needed. Please check "D" and "L" in the drawing below and contact us.
- When the main pipe size is between 32 mm and 150 mm, provide either one of the following tee joint and bushing assembly to make the connection size 20 mm:
  - A tee joint with 25 mm in branch line + A bushing with 25 mm x 20 mm
  - A tee joint with larger than 25 mm in branch line + One or more bushings in series to make the final connection size 20 mm
 For further consultation inform us of the dimension "L" in the following drawing



## OTHER PIPING

- Available for other piping. Consult factory for details. Inform of the type of piping and dimension of "L" and "D" of the following figure.



## ORDERING INFORMATION

- Inform us the kind of your pipe and installation method when inquiring or ordering the flowmeter.

## CAUTIONS ON USING CFW2000 SERIES



This flowmeter has a glass tube which is subject to the pressure from the piping. Avoid the use of CFW2000 Series for the following services.

1. Liquid services subject to impulse pressure in the process.
2. Secondary accidents might occur due to the breakage of glass in such services :
  - Toxic fluids such as poisons, stimulant and narcotics
  - Flammable fluids
  - Explosive fluids
3. Any services where scattering of glass fragments might cause a serious injury.
4. The installation places of the flowmeters where breakage of glass might be caused by the accidents from the surrounding piping or equipment.
5. On-off operation where breakage of glass might be caused by the collision of the float inside meter due to the abrupt change of flow.
6. Services where the heat shock by abrupt change of temperature.

\* Specification is subject to change without notice.

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