

### OUTLINE

CDT1000 is a new series of flowmeter which combines a multi-digital indicator with a pitot tube.  
 CDT1000 detects the differential pressure exerted by flow velocity in the pitot tube inserted in the pipe and outputs flow rate with digital indication.  
 Applicable sizes range from 20mm to 450mm dia.  
 The principal applications are for hot and cooling water lines for air conditioning in apartment and office buildings and other facilities.

### FEATURES

- ❑ Easy installation
- ❑ Installation simply by making a 35mm dia. hole and welding 20mm (3/4") socket at measuring point of existing pipes. This is most convenient for renewal use when additional flow sensor is required on the line.
- ❑ Low pressure drop
- ❑ Wide measuring range  
 Measuring range selectable depending on application
- ❑ Applicable for both horizontal and vertical pipes.
- ❑ Various indicator functions selectable from the following:  
 Battery type, Current Output type (2-wire 4 to 20mA), Alarm Output type, Temperature Sensor Input type and LonWorks type
- ❑ Indicator parts are interchangeable.
- ❑ Easy to see because of large LCD display
- ❑ Compact size and lightweight
- ❑ Quick delivery

### STANDARD SPECIFICATION

- **Measuring Fluid** : Water, Cold water, Hot water
- **Max. Pressure** : 2MPa
- Max. Allowable Differential Pressure : 200kPa (Bias pressure)
- Temperature and Relative Humidity  
 Fluid temperature : -10 to 70°C  
 Ambient Temp. : -10 to 50°C < 85%RH  
 Storage Temp. : -20 to 60°C < 85%RH  
 (Without icing, without condensation)
- Process pipe size : 20mm(3/4") to 450mm(18")
- Adaptation pipe : Carbon steel pipe for piping (JIS G 3452) [1MPa class]  
 Carbon steel pipe for pressure piping (JIS G 3454 Sch40) [2MPa class]  
 Note : If pipe other than above is required, special calibration may be necessary.  
 Consult factory for details.
- Accuracy : ±5% F.S. [std.]  
 Accuracy is guaranteed for fluid temperature range 7 to 60°C
- Measuring range : Flow rate from 10 to 100% of full scale
- Protection class : IP65 (JIS C 0920)  
 (Except for the air introduction port at the bottom of housing.)
- Mass : Approx. 2kg



- Indicator type function (All types with indicator)

Type	Function
Battery type	Battery drive, Indication only
<b>Current output type</b>	<b>4-20mA DC (2-wire)</b>
Alarm output A type	2 points + 4-20mA DC
Alarm output B type	2 points + Temp. Indication
Temp. sensor input type	Temp. Indication, Battery drive
LonWorks Type	Applicable to LON communication network

- Indication function  
**Flow rate indication**  
**3-1/2 digits LCD (Height 18mm) : 0 to 1999**  
 (FFF appears in case of out of range)  
 11 segment bar graph  
**Totalizer indication**  
**7-1/2 digits LCD (Height 5mm): 0 to 19999999**  
 Indication interval : 1s (Sampling 0.5 sec)  
 Filter : 0,2,4,8,16,32s (Moving average)  
 LCD back light : Continue 10s after operation  
 (Except current output type)
- Material of Pitot tube parts :  
 Refer to [OUTLINE DIMENSION] and [MATERIAL]
- **Material of wetted parts of indicator**  
**Diaphragm** : 316L SS  
**Body** : 316SS  
 O-ring : Fluorine rubber (JIS Class4-D)  
 Drain hole sealing : Alumina ceramics
- Material of indicator body: Aluminium alloy
- Painting : Melamine resin painting (Indicator housing)
- Painting color  
 Front : Wine red (Munsell 10RP3/8)  
 Rear : Light gray (Munsell N7.5)
- Process connection : R3/4" (M)
- Installation posture : Front vertical installation

● Standard full scale range [SGP,STPG(40~450mm)pipe]

Process pipe size		Full scale range [L/min]			Inside dia. (mm)		
mm	inch	Code			1MPa	2MPa	
		05	10	20			
20	3/4	50	70	100	(26)	Refer to following table	
25	1	70	100	150	(34)		
32	1-1/4	120	160	250	(43)		
40	1-1/2	130	200	300	41.6		41.2
50	2	200	300	450	52.9		52.7
65	2-1/2	400	500	700	67.9		65.9
80	3	500	700	1000	80.7		78.1
100	4	900	1300	1800	105.3		102.3
125	5	1300	2000	2800	130.8		126.6
150	6	2000	3000	4000	155.2		151.0
200	8	3500	5000	7000	204.7	199.9	
250	10	5000	7000	10000	254.2	248.8	
300	12	8000	10000	16000	304.7	297.9	
350	14	10000	13000	20000	339.8	333.4	
400	16	13000	18000	25000	390.6	381.0	
450	18	16000	20000	30000	441.4	428.6	

● Standard full scale range [2MPa version = 20~32mm]

Process pipe size		Full scale range [L/min]			Inside dia. (mm)
mm	inch	Code			
		10	20	50	
20	3/4	50	70	100	21.4
25	1	70	100	150	27.2
32	1-1/4	120	160	250	35.5

● Standard full scale range [PVC lined pipe]

Process pipe size		Full scale range [L/min]			Inside dia. (mm)
mm	inch	Code			
		05	10	20	
32	1-1/4	75	100	150	29.5
40	1-1/2	100	130	200	34.7
50	2	170	250	350	46.2
65	2-1/2	300	400	600	59.7
80	3	450	650	900	70.9
100	4	800	1000	1600	95.2
125	5	1200	1800	2500	119.7
150	6	1700	2500	3500	142

Note

- The inside diameter of pipe size 20 to 32mm in 1MPa is based on three-way socket (JIS B 2301).  
(It is possible to attach three-way socket as option.)
- The inside diameter of pipe size 20 to 32mm in 2MPa is based on three-way socket (Sch.40). (Supplied by customer.)
- 40mm or more, the inside diameter of in 1MPa specification is based on Carbon steel tube for ordinary piping SGP (JIS G3452), and the inside diameter of in 2MPa specification is based on Carbon steel pipes for pressure piping STPG (JIS G 3454 Sch40).
- Scale range of PVC lining is based on the inside diameter of the upper table. In the case of inside diameter other than the upper table, special calibration is required. Consult after checking L and D size of the figure in page 6.

● Specification and function of each type

1) Battery type

- Battery : Alkali battery (LR6) x 2 pcs.
- Battery life : Approx. 2 years at 23°C
- Auto power off mode selectable
- Low Battery monitor as standard

2) Current output type

- Power supply : 24V DC ±10%
- Output : 4-20mA DC (2-wire)
- Max. load : 600Ω
- Output accuracy : ±0.5% F.S. at 23°C
- Response : Less than 2 s (At filter setting 0)

3) Alarm output A type

- Power Supply : 24V DC ±10%
- Power Consumption : Less than 25mA
- Alarm Output : Open Collector x 2 (Independent)
- Load : Less than 30V DC / 80mA
- Response : Less than 2 s (At Filter setting 0)
- Alarm setting : Selectable (high / Low),  
Reset Span: Adjustable / Min. 1digit
- Output : 4-20mA DC
- Max. load : 600Ω
- Output Accuracy : ±0.5%F.S.at 23°C

4) Alarm output B type

- Power Supply : 24V DC ±10%
- Power Consumption : Less than 25mA
- Alarm Output : Open Collector x 2 (Independent)
- Load : Less than 30V DC / 80mA
- Response : Less than 2 s (At Filter setting 0)
- Alarm setting : Selectable (high / Low),  
Reset Span: Adjustable / Min. 1digit
- Connecting Temp. Sensor: Pt100Ω (3-wire) (JIS C 1604)
- Temp. Indication : -10 to 80°C
- Indication Interval : 60 s
- Temp. Ind. Accuracy : ±2°C (Excluding sensor error)

5) Temperature sensor input type

- Following function is added to battery type
- Connecting temp. sensor : Pt100Ω (3-wire) (JIS C 1604)
- Temp. Indication : -10 to 80°C
- Indication interval : 60 s
- Temp. indication accuracy: ±2°C (Excluding sensor error)

6) LonWorks type

- Applicable to Lon communication network.
- Communication with network devices by FTT-10A Transceiver.
- Power Supply : 24V AC ±10% / 50, 60Hz
- Power Consumption : Less than 80mA
- Transmission LON Value : Flowrate and differential pressure  
(Convert the Indication value to LON value)
- Response : Less than 2 s (At Filter setting 0)
- The communication of each device is in accordance with definite procedure related to its LON value. FTT-10A can be connected by free topology and multi drop connection. Refer to [Function Profile] for detailed information

● Cable entry

Type	Cable entry L	Cable entry R
Battery type	—	—
Current output type	○	—
Alarm output A type	○	—
Alarm output B type	○	○
Temperature sensor input type	—	○
LonWorks type	○	○
Acceptable cable outside diameter	Ø 3-8mm	

○ : Yes — : No

OPTION (Factory set)

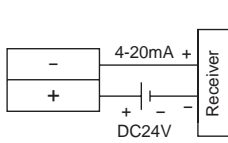
- Totalizing indication  
Selection of totalizer function CODE : /TLZ
- Selection of Temp. indication unit : °F (Export Model)  
Temp. sensor input type only (Standard unit : °C)  
CODE : /TPF

OPTION (Others)

- Refer to "MODEL CODE"

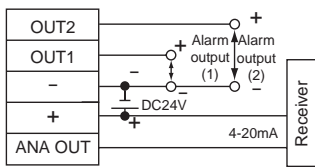
WIRING DIAGRAM

[Current output type]



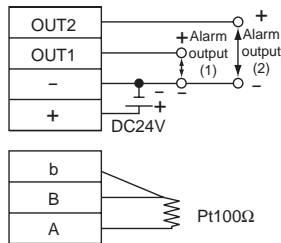
[Alarm output A type]

Alarm output (1)/(2) : Open collector  
Load: Less than 30V DC/80mA (each)

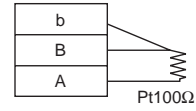


[Alarm output B type]

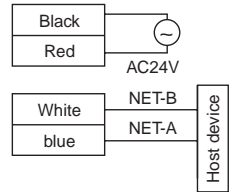
Alarm output (1)/(2) : Open collector  
Load: Less than 30V DC/80mA (each)



[Temp. sensor input type]

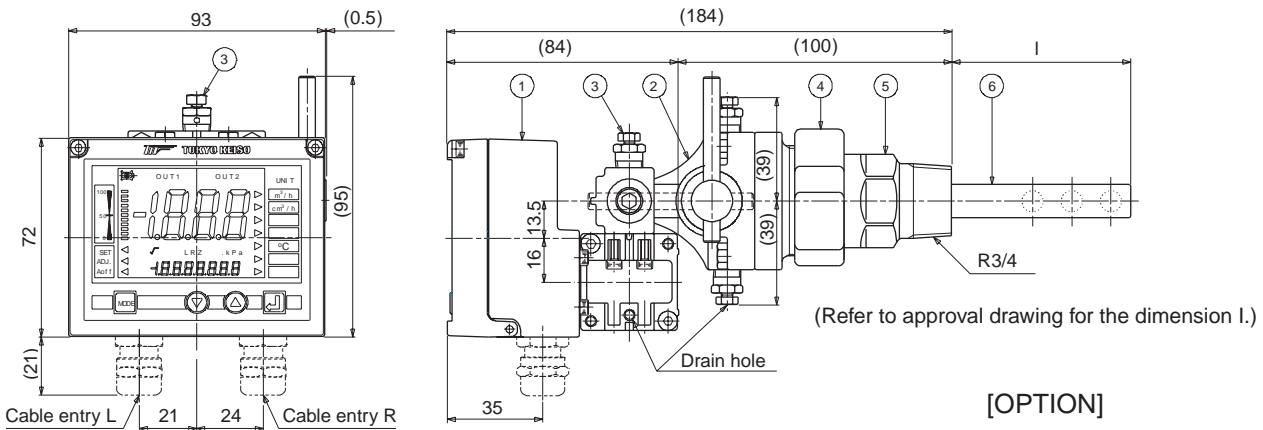


[LonWorks Type]



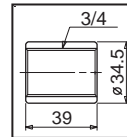
MATERIAL and OUTLINE DIMENSION

CDT12□□

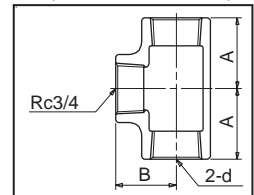


[OPTION]

⑦ Socket (CFSW)



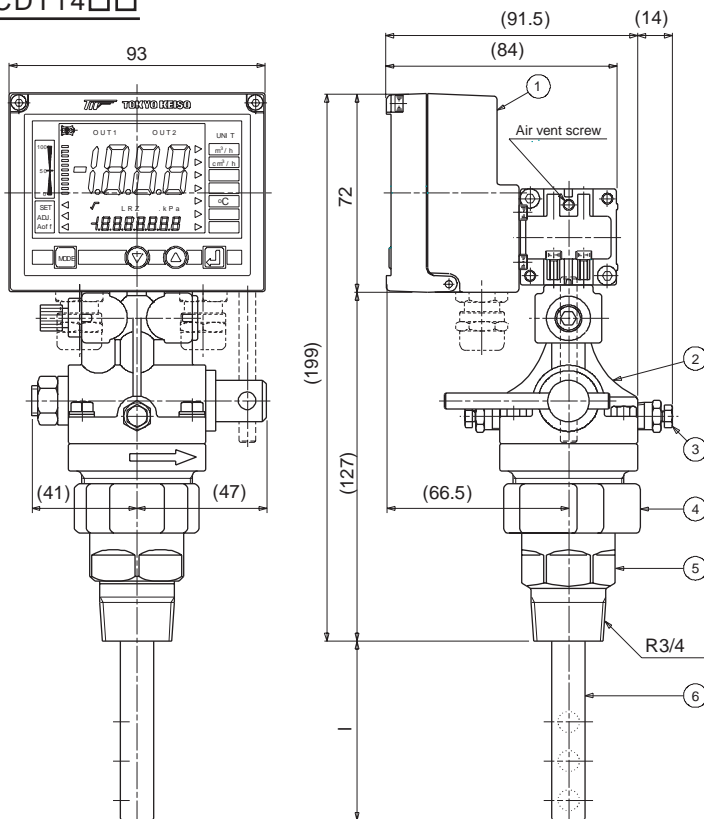
⑧ SGP three-way socket (JIS B 2301/CFTW)



Dimension of three-way socket

Size	d	A	B
20mm	Rc3/4	33	33
25mm	Rc1	35	36
32mm	Rc11/4	36	41

CDT14□□



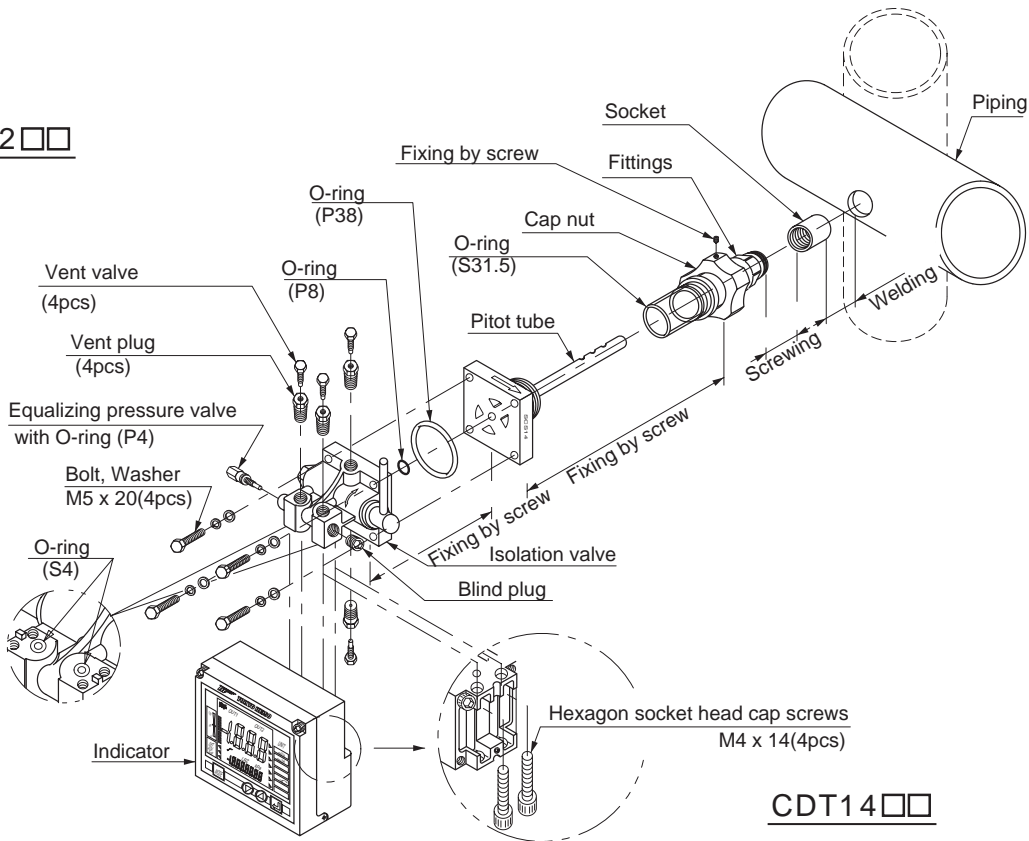
No.	Part Description	Material
①	Indicator body	Aluminum alloy
	Isolation valve	SCS 14
②	Valve Shaft	SUS 316
	O-ring	NBR
③	Vent valve	SUS 316
④	Cap nut	SCS13
⑤	Fittings	BC6
⑥	Pitot tube	SUS 316
⑦	Socket	SS 400*1
⑧	Three-way socket	FCMB*1,2

\*1 It is possible to attach standard material for socket (SS400 or FCMB) if requested, but material besides these materials shall be provided by customer when needed.

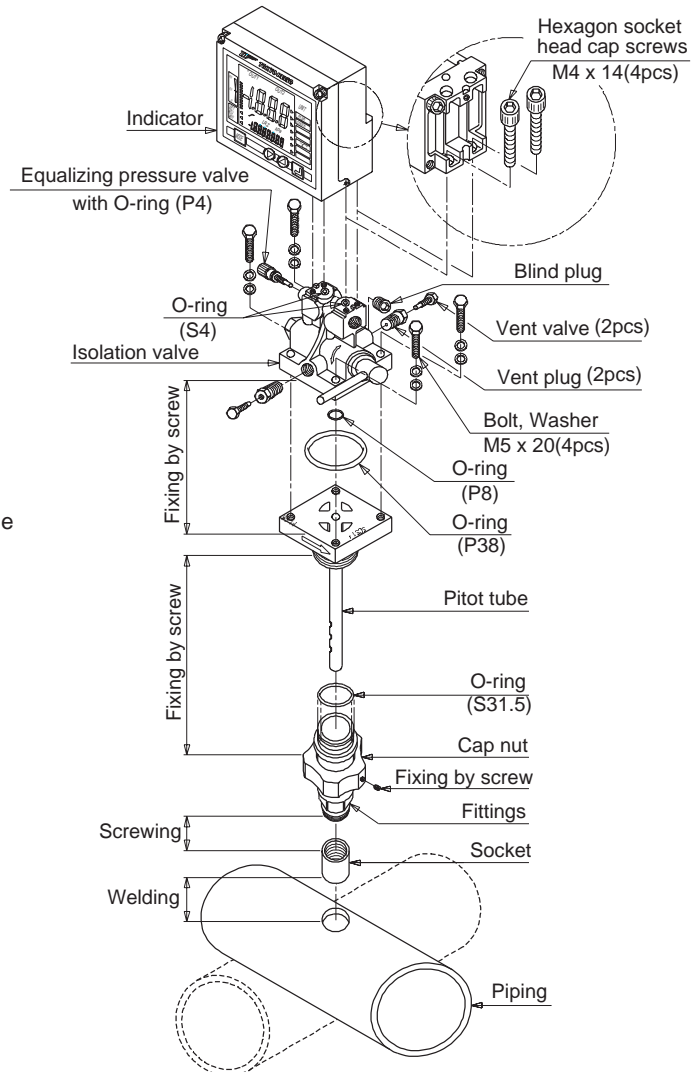
\*1,2 In the 2MPa specification, material is equivalent to S25C. Supplied by customer. (Note: Sch40 specification)

CONSTRUCTION

CDT12□□



CDT14□□

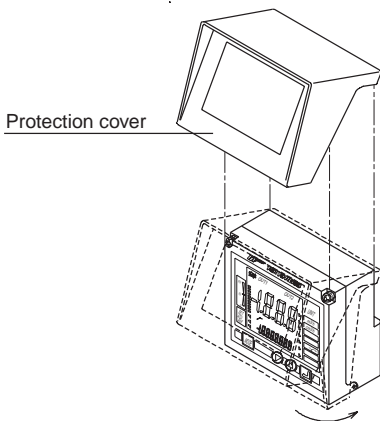


[Option]

- Protection cover (For indicator protection)  
CODE : /HGC

CAUTIONS ON INSTALLATION

- Avoid direct rays and equip with a protection cover or install in the place which a direct rainstorm does not splash.  
(If protection cover is used, it may be difficult to read the display.)



MODEL CODE

CDT1	□	□0	-□□□	-□□	□	L	-A	/□□□	Description	Note
Installation type	2								Horizontal type	Standard type
	4								Perpendicular type	Vertical type
Pressure rating	10								1MPa class	Carbon steel pipe for piping (JIS G 3452)
	20								2MPa class	Carbon steel pipe for pressure piping (JIS G 3454 Sch40)
Main pipe size			- 020						20mm	Nominal diameter for installation pipe
			- 025						25mm	
			- 032						32mm	
			- 040						40mm	
			- 050						50mm	
			- 065						65mm	
			- 080						80mm	
			- 100						100mm	
			- 125						125mm	
			- 150						150mm	
			- 200						200mm	
			- 250						250mm	
			- 300						300mm	
			- 350						350mm	
		- 400						400mm		
		- 450						450mm		
Full scale range			- 05						Flow rate range	Select for the code of Standard full scale range
			- 10							
			- 20							
			- 50							
Indicator type						4			Battery type	Battery drive
						5			Current output type	4-20mA DC (2-wire)
						6			Alarm output A type	2 points + 4-20mA DC
						7			Alarm output B type	2 points + Temp. input · Indication
						8			Temp.sensor input type	Temp. input · Indication, Battery drive
					9				LonWorks type	LonWorks available
Application						L			For liquid	
Version							- A		Version code	
Option*								/TLZ	Totalization indicator	
								/TPF	Indication Temp. °F	Indication type and incase of export are available
								/HGC	With protection cover at display part	
								/CFT	Three-way socket for piping (CFTW)	Attachment is possible in case of the quality of the material FCMB and 1MPa specification
								/CFS	Welding sockt (CFSW)	Available only for SS400
								/PL	PVC lined pipe specification	Inform us L and D dimension of figure in page 6.
Additional function								Blank	Not provided	Not necessary if above-mentioned code is available.
								/Z	Provided	Consult about the details of the pipe material or Pitot-tube length.

\*Note) Insert "/" between each code when the plural codes are selected.

Code example 1: [In case optional code is not selected]

Horizontal installation, Connection size 50mm, 1MPa class, Full scale flow rate code[10], Battery drive type  
 Model code: CDT1210-050-104L-A

Code example 2: [In case all of the possible optional codes are selected]

Vertical installation, Connection size 100mm, 1MPa class, Full scale flow rate code[05], Temp. sensor input type, Totalization indicator, indication, With protection cover at display part, With welding socket  
 Model code: CDT1410-100-058L-A/TLZ/TPF/HGC/CFS

Code example 3: [In case piping type specification]

Horizontal installation, Connection size 80mm, Pipe material SUS304TPD, 1MPa class, Full scale flow rate code[20], Current output type, Totalization indicator, With welding socket  
 Model code: CDT1210-080-205L-A/TLZ/CFS/Z

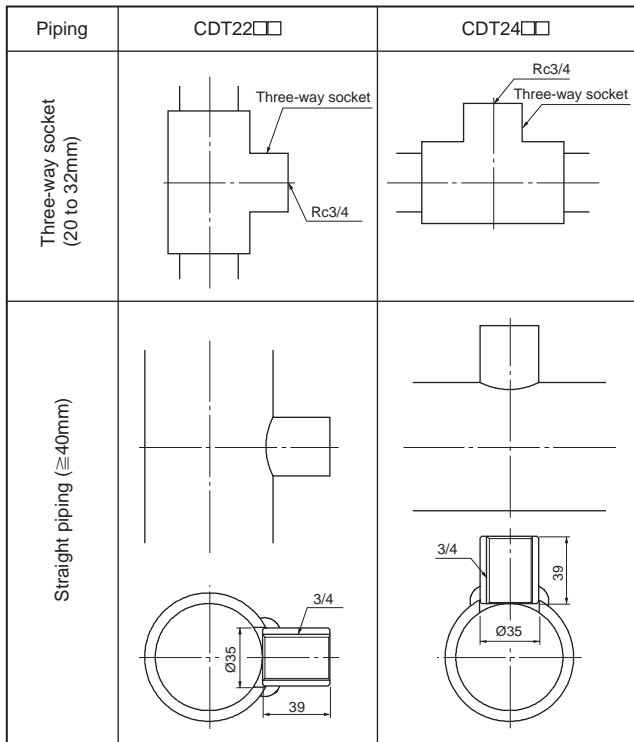
When the piping type is specified as seen in the above Code example 3, it will be additional function.

Moreover, in case socket and three-way socket are prepared by customer, Pitot tube length may be changed by installation dimension. This will be an additional function.

Accordingly the last letter of model code will be "Z" in case of such special specification as not mentioned in the above mode code.

## INSTALLATION

- 1) Select the installation place in consideration of the required straight length.
- 2) Make the hole of  $\varnothing 35$  in place of the pipe for more than 40mm.  
 $\leq 32$ mm process piping : Install three-way socket.
- 3) Select the position of the hole prudently so as the indicator would become vertical after the fixing has been made.
- 4) Weld the socket to the drilled hole. At this time the center line of the socket and the center line of the piping shall be crossed.
- 5) It is over completed when CDT1000 is installed in the socket welded.



## SUGGESTIONS

- CDT12(4)10 flowmeter is calibrated for use with standard steel pipe lines. In case the pipe material is different from standard steel pipe, special calibration is required. Consult factory for details.
- Straight length for upstream and downstream is required for accurate measurement as shown in the following table,

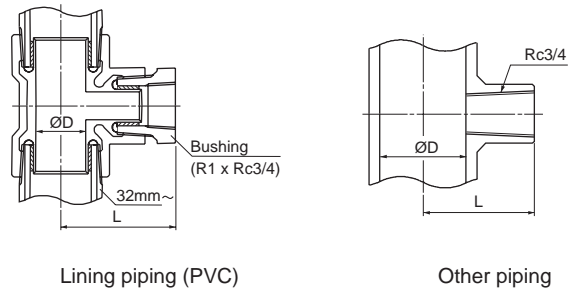
Size	Upstream	Downstream
$\leq 32A$	$\geq 10D$	$\geq 5D$
$\geq 40A$	$\geq 5D$	$\geq 3D$

Note) D : Inside diameter of main pipe.

- Use this flowmeter, filling with water in the pipe.
- In case the fluid is liquid, eliminate the air in according to the CDT1000 Instruction manual.

## LINING AND OTHER PIPING

- In case of PVC lining piping, prepare bushing (25mm x 20mm) for the main pipe in more than 32mm and for branch tube in 25mm.
- Available for other piping. Inform of the types of piping and dimension of L and D of the following figure.
- Refer to the table for full scale flow rate.



## ORDERING INFORMATION

Indicator

1. Model code
2. Quantity

\* Specification subject to change without notice

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