TECHNICAL GUIDANCE

OUTLINE

CDT2000 is a new series of flowmeter which combines a multidigital indicator with a pitot tube.

CDT2000 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 15mm to 450mm dia.

The indicator is portable and removable, and it is compatible with 4 different line sizes as per customers' choice. Thus, one indicator can be used for 4 different lines, which saves the installation cost. Only self-closing installation nozzles are welded at measuring points and the indicator is inserted only when measurement is required.

CDT2000 is most suitable for the measurement of cold / hot water for the air conditioning of buildings and collective housings.

FEATURES

❏ Easy installation simply by welding 20mm(3/4") socket at measuring points of existing pipes.
❏ Indicator part portable and removable by one touch action.
❏ 4 different line sizes can be measured with one indicator unit.
❏ Low pressure loss
❏ No temperature compensation required
❏ Both horizontal and vertical lines can be measured
❏ Wide measuring range
   Measuring range selectable depending on application
❏ (Battery operated type) External power supply is not required
❏ 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
   :700kPa (Bias pressure)
   Not applicable for vacuum service
- Temperature and Relative Humidity
   Fluid temperature : -10 to 70°C
   (Use the lining or plastics pipe within its allowable temperature)
   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 with factory about details.
- Accuracy : Std. ±5% F.S. (±10% F.S. for flow rate of less than 30%)
- Turn down ratio : Flow rate from 10 to 100% of full scale

- Low cutoff : Less than 7%
- Protection class : IP65 (JIS C 0920)
   (Except for the air introduction port at the bottom of housing.)
- Mass : Indicator CDTI22 (4) □□ Approx. 1kg
   Fixing nozzle CDTN □□□ Approx. 1.2kg
- Specification and Function of indicator (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
- 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
   Indication interval : 1s (Sampling 0.5 s)
   Filter : 0, 2, 4, 8, 16, 32s (Moving average)
   LCD back light : Lighting for 10sec after operating
- 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)
- Mounting Position : Front vertical installation

TOKYO KEISO CO., LTD.

Standard full scale range (SGP, STPG pipe)

Process pipe size		Full scale range [L/min]					Inside dia. (mm)	
A	B	Code					1MPa	2MPa
		05		10		20		
20	3/4	50	30	70	50	100	70	(26)	21.4
25	1	70	50	100	70	150	100	(34)	27.2
32	1-1/4	120	90	160	120	250	160	(43)	35.5
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 (PVC lining pipe)

| Process pipe size		Full scale range [L/min]			Inside dia.
A	B	Code			(mm)
		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

1) Scaling can be selected from 4 flow ranges. The flow rate that can be selected is in the same code.

2) The inside diameter of in 1MPa specification is based on SGP (JIS G3452) Carbon steel pipe for piping, and the inside of ( ) shows the inner diameter of SGP three-way socket (JIS B 2301).

3) The inside diameter of in 2MPa specification is based on the carbon steel tube for STPG (JIS G3454 Sch40) for pressure piping, and full scale range of 20 to 32mm in 2MPa is shown in gray area.

4) Above full scale ranges are based on the flow rate when the flow runs through the inside diameter of the pipe lined with PVC. The pipe consists of a tee joint of the Eslo coat LX made by Sekisui Chemical Co.'s Eslon®. Its maximum operating pressure is 1 MPa. If you use the tee joints with the different inside diameter from above, the extra calibration is required. For further consultation inform us of the dimensions "L" and "D" in the drawing shown at the end of this instruction manual.

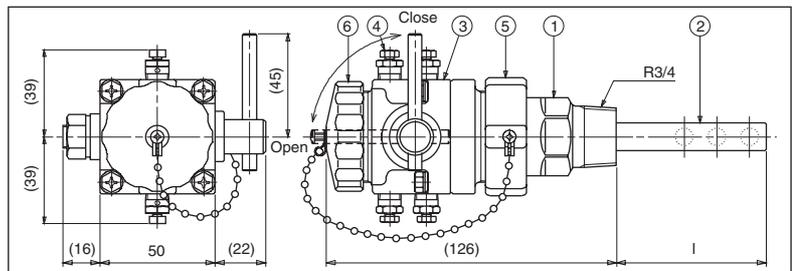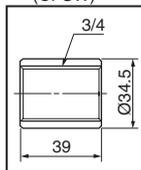## MATERIAL and OUTLINE DIMENSION

Indicator (CDTI22☐☐)

Air / Drain vent screw

Indicator (CDTI24☐☐)

Air vent screw
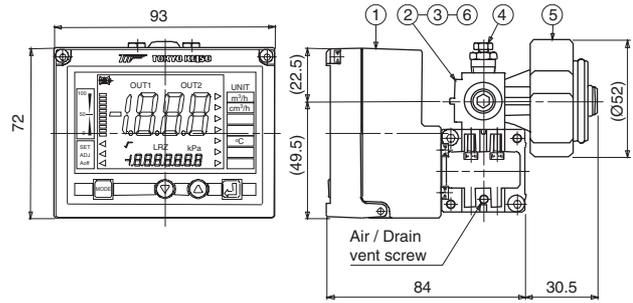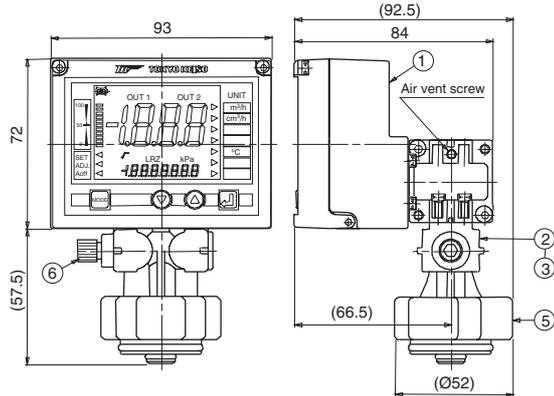
No.	Parts name	Material
①	Indicator	Aluminium alloy
②	Body	SCS 14
③	O-ring	NBR
④	Air vent valve	SUS 316*
⑤	Cap nut	SCS 13
⑥	Uniform pressure valve	SUS 316

*Air vent valve is for CDT I 22☐☐.

CDTN Fixing nozzle

Close
Open
R3/4

Refer to approval drawing for the dimension l.

No.	Parts name	Material
①	Fittings	SCS 14
②	Pitot tube	SUS 316
③	Isolation valve	SCS 14
	Valve shaft	SUS 316
	O-ring	NBR
④	Air vent valve	SUS 316
⑤	Cap nut	SCS 13
⑥	Cap cover	ABS
⑦	Socket	SS 400*1
⑧	Three-way socket	FCMB*1,2

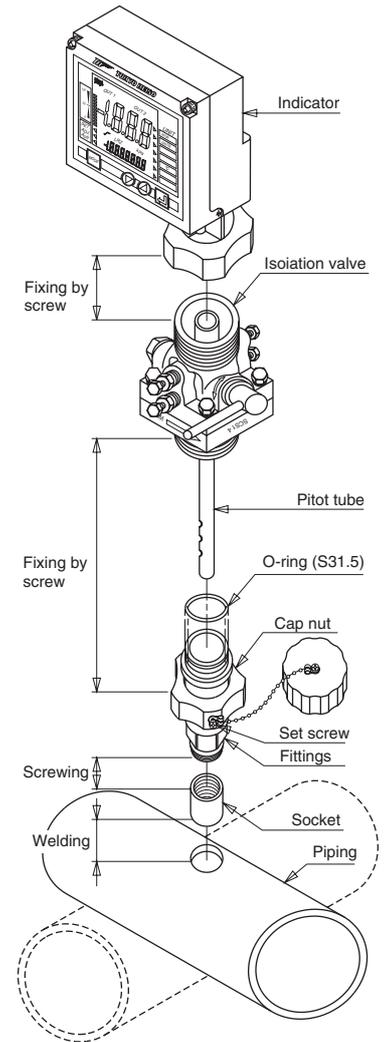*1 It is possible to attach standard material for socket (SS400 or FCMB) if requested, but material besides these materials shall be provided by customer when needed.

*2 For the 2 MPa rating, the parts made of proper material such as S25C should be selected and provided by customers considering pipe sch40.

⑦ Socket (Option)
(CFSW)

3/4
Ø34.5
39

⑧ Three-way socket (Option)
(JIS B 2301/ CFTW)
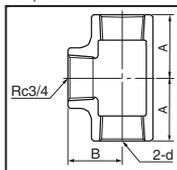
Rc3/4
A
A
B
2-d

Dimension of three-way socket

Size	d	A	B
20A	Rc3/4	33	33
25A	Rc1	35	36
32A	Rc11/4	36	41
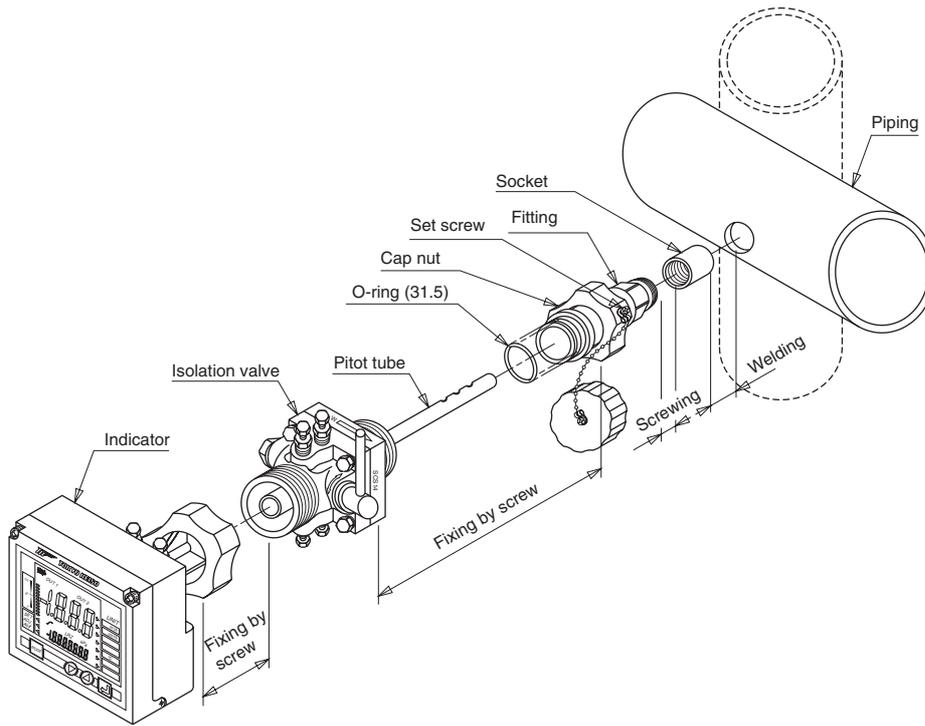
CDT22□□

CDT24□□

Piping	CDT22□□	CDT24□□
Three-way socket (20 to 32mm)	Three-way socket, Rc3/4	Rc3/4, Three-way socket
Straight piping (≧40mm)	3/4, Ø35, 39	3/4, Ø35, 39

INSTALLATION

1) Keep the upstream and downstream straight runs as required.
2) 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 less than or equal to 32 mm diameter.
3) Select and drill the hole at right place so that the final fixed posture of indicator should be horizontal.
4) Weld the socket to the drilled hole. The centerline of the socket must be in line with the one of the pipe.
5) Screw the CDTN fixing nozzle into the welded socket to complete the installation.

MEASURING METHOD

1) Open the cap of the CDTN fixing nozzle.
2) Insert the CDTI indicator to the nozzle, and fix the indicator by tightening up the cap nut. At this time, be careful that the CDTI indicator becomes horizontal correctly.
3) Carry out the air elimination and zero adjustment when installation completed.
   (Refer to the instruction manual for details about the measurement method after installation.)

MODEL CODE

CDTI Indicator

CDTI2	□	□0	-□□□□	-□□	4	L	-A	/□□□		Description
Installation type	2									Horizontal type
	4									Vertical type
Pressure rating		10								1MPa class
		20								2MPa class
Main pipe size			-1000							Scale for 20mm
			-2000							Scale for 25mm
			-3000							Scale for 32mm
			-4000							Scale for 40mm
			-5000							Scale for 50mm
			-6000							Scale for 65mm
			-7000							Scale for 80mm
			-8000							Scale for 100mm
			-9000							Scale for 125mm
			-A000							Scale for 150mm
			-B000							Scale for 200mm
			-C000							Scale for 250mm
			-D000							Scale for 300mm
			-E000							Scale for 350mm
			-F000							Scale for 400mm
			-G000							Scale for 450mm
Full scale range				-05						Refer to
				-10						
				-20						Standard full scale range
Indicator type					4					Battery type
Application						L				For liquid
Version							-A			Symbol of version
Option								/DS2		2 flow ranges
								/DS3		3 flow ranges
								/DS4		4 flow ranges
								/PL		PVC lining
Additional function									(Blank)	Not provided
									/Z	Provided

Note) Use [/] in the code to indicate of option (PVC lining etc.)

[E.g.1] (In case of 1 connection) For combined selection of Horizontal installation, Connection size 50mm, 1MPa class, Full scale flow rate code [10]
Model code : CDTI2210-5000-104L-A

[E.g.2] (In case of 3 connections) For combined selection of Vertical installation, Connection size 80mm, 100mm, and 150mm, 1MPa class, PVC lining, Full scale flow rate code [05]
Model code CDTI2410-78A0-054L-A/DS3/PL
(In case of using for piping of two or more connections, a scaling code is added like E.g. 2.)

SUGGESTIONS

- The model CDTI22(4) 10 one touch flow is calibrated based on the inside diameter of JIS G3452 SGP. For the model CDTI22(4) 20, calibrated JIS G3454 Sch.40.
  Consult TOKYO KEISO if pipes are different from above.
  Specific calibration is required.
- Straight length for upstream and downstream is required for accurate measurement as shown in the following table,

Size	Upstream	Downstream
≦32mm	≧10D	≧5D
≧40mm	≧5D	≧3D

Note) D : Inside diameter of main pipe.

- Run the fluid fully in the pipe. Otherwise it could not be measured.

CDTN Fixing nozzle

CDTN	□□□	-□	-A	/□□□		Description
Main pipe size	020					20mm
	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
Pressure rating		-1				1MPa class
		-2				2MPa class
Version			-A			Symbol of version
Option				/CFT		Three-way socket for pipe (CFTW) : (20 to 32A)
				/CFS		Welding socket (CFSW) : (40A up size)
				/PL		PVC lining
Additional function					(Blank)	Not provided
					/Z	Provided

Note) Use [/] in the code to indicate of option (PVC lining etc.)
Connection size of PVC lining is shown in gray (32 to 150mm). (Inform of L and D size in the following figure.)

[E.g.1] For combined selection of Connection size 80mm, 1MPa class, PVC lining   Model code : CDTN080-1-A/PL

[E.g.2] For combined selection of Connection size 50mm, 1MPa class with welding socket   Model code : CDTN050-1-A/CFS

LINING AND OTHER PIPING

- The full scale ranges are 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 the tee joints with the different inside diameter from above, the extra calibration is required.
  For further consultation inform us of the dimension "D" in the following drawing.
- 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:
  —tee joint with 25 mm in branch line + A bushing with 25 mm x 20 mm
  —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.
- Available for other piping. Inform of the types of piping and dimension of L and D of the following figure.
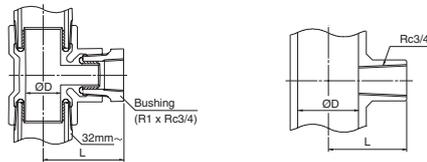
Lining piping (PVC)   Other piping

ORDERING INFORMATION

Indicator
1. Model code
2. Quantity

Fixing nozzle
3. Model code
4. Quantity

* Specification is subject to change without notice.

TOKYO KEISO CO., LTD.

ISO 9001 Certified
JQA-2172

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