

TOKYO KEISO

TECHNICAL GUIDANCE

DT Series

Multi-function
Digital Differential Pressure
Indicator / Transmitter

OUTLINE

TOKYO KEISO offers you the differential pressure instrument based on new concept, namely, DT Series multi-function digital differential indicator and transmitter.

In combination with the differential pressure devices such as orifice plates, Pitot tubes, the instrument has various functions including local indication, transmitting and signal processing like square root extraction and scaling of flow measurement. Naturally, it can be used as the differential pressure type level meter.

The large LEDs and bargraph indicator serve for easy reading from a distance.

Various types are available, such as battery driven type requiring no power supply, 2-wire 4 to 20 mA output and open collector alarm type.



FEATURES

- Compact size and Lightweight
With easy-to-read large LED display, it weighs only 775g thanks to the lightweight design utilizing small semiconductor element fabricated with the latest micro machining technology.
- High-grade material as standard
All wetted parts made of 316LSS, 316SS, Fluorine Rubber and aluminum oxide.
- A wide variety of measuring ranges
The best range can be chosen from 6 measuring ranges to suit your application.
D.P. range : 1kPa, 2kPa, 5kPa, 10kPa, 20kPa, 50kPa
- Multi Functions
Wide variety of functions including square root extraction, scaling, linearization and totalization are available for your applications such as linearized level indication for horizontal cylindrical vessel.
- Large size LCD display
LCD characters 18 mm high make your reading easier even at dark with back lighting which switches off automatically (except current output type).
- Variety of Line-ups
 - i. Battery type : LCR6 2pcs.
 - ii. Current output type : 2-wire, 4-20mA (External 24 VDC power is required.)
 - iii. Alarm output type : Open collector 2 points plus 4 to 20 mA output (External 24 VDC power is required.)

STANDARD SPECIFICATION

- Measuring Fluid : Liquid or Gas
(Non corrosive fluid for wetted parts)
- Measuring Differential Pressure Range

CODE	D.P. Range		Operating pressure range
	Minimum	Maximum	
DT01□□	0~0.4	0~1	-0.09~2MPa with both sides pressurized
DT02□□	0~0.8	0~2	
DT05□□	0~2	0~5	
DT10□□	0~4	0~10	
DT20□□	0~8	0~20	
DT50□□	0~20	0~50	

- Minimum D.P. range shows recommended value.
- Allowable diff. press. : 200kPa (Single side)
(700kPa: When D.P. range is higher than or equal to 5kPa)
- Temperature and Relative Humidity
Fluid temperature : -10 to 70 °C
Ambient Temp. / Humidity : -10 to 50 °C, < 85%RH
Storage Temp. / Humidity : -20 to 60 °C, < 85%RH
(Without icing, without condensation)
- Type and Function (All types have LCD displays.)

CODE	TYPE	FUNCTION
DT□□4□□	Battery	LCD display only
DT□□5□□	Current output	2-wire, 4-20mA
DT□□6□□	Alarm output	2 Alarm+4-20mA
		1 Alarm+Pulse output +4-20mA

● INDICATION FUNCTION

Differential Pressure and Scale Indication :
 3-1/2 digits LCD (Height 18mm) : -1999 to 1999
 11 segment Bar graph
 Totalizer Indication :
 7-1/2 digits LCD (Height 5mm) : 0 to 19999999
 Indication Interval : 1 s (Sampling 0.5 sec)
 Filter : 0, 2, 4, 8, 16, 32 s (Moving average)
 LCD Back Light :
 Continue 10 s during operation (Except Current type)
 Scale Indication : Square root extraction available (option)
 Differential Pressure and Scale Indication Range :
 -5 to 110% of D.P. range or maximum -1999 to 1999
 (FFF or - FFF appears in case of out of range)
 Flowrate or Velocity Indication Range :
 -5 to 110% of D.P. range or maximum 0 to 1999
 (FFF or - FFF appears in case of out of range,
 -5 to 0% enforced to 0 indication)

● PERFORMANCE

Actual D.P. Indication Accuracy: $\pm(1.0\% \text{ F.S.} + 1 \text{ digit})$ at 23°C
 Scale indication Accuracy : $\pm(1.0\% \text{ F.S.} + 1 \text{ digit})$ at 23°C
 Square Root extraction : $\pm 0.1\% \text{ F.S.}$ (D.P. range from 5 to 100%)
 Temp. Effect : $\pm 0.1\% \text{ F.S.} / ^\circ\text{C}$ (Both zero and span)
 Inclination Effect
 Front and rear 90° : $\pm(0.1\% \text{ F.S.} + 1 \text{ digit})$ at 23°C
 Left and right direction 90° : $\pm 150 \text{ Pa Max.}$ at 23°C

Static Pressure Effect

DT01□□ : $\pm 2\% \text{ F.S.} / 1 \text{ MPa}$
 DT02□□/ DT05□□ : $\pm 1\% \text{ F.S.} / 1 \text{ MPa}$
 DT10□□/ DT20□□/ DT50□□ : $\pm 0.5\% \text{ F.S.} / 1 \text{ MPa}$

- Insulation resistance : 100 MW or more, 50 VDC, between case and terminals except battery driven type
- Withstand voltage : more than 1 min. 500 VAC, between case and terminals except battery driven type
- Protection Class : IP65 (equivalent to NEMA 4)
(Except for the air introduction port at the bottom of housing)
- Material of Wetted Parts
 - Diaphragm : 316L SS
 - Body : 316 SS
 - O-Ring : Fluorine rubber
 - Drain hole sealing : Aluminum oxide (Al₂O₃)
- Housing Material : Aluminum alloy
- Painting : Melamin resin painting
- Colour : Front / Wine red (Munsel 10RP 3/8)
Rear / Light gray (Munsel N7.5)
- Process connection : Rc1/4 (with built-in equalizing press. valve) [Standard]
- Mounting Position : Vertical direction for diaphragm face
- Specification and Function of Each Type
 - 1) Battery Type (DT□□4□)
 - Battery : Alkali battery (LR6) x 2 pcs.
 - Battery Life : Approx. 2 years at 23°C
Auto Power Off Mode selectable
Low Battery Monitor attached as standard
 - Mass : Approx. 765 g (With battery)
 - 2) Current Output Type (DT□□5□)
 - Power Supply : 24V DC $\pm 10\%$
 - Output : 4-20mA (2-wire)

Max. Load : 600 Ω
 Output Accuracy : $\pm 0.5\% \text{ F.S.}$ at 23°C
 Response : Less than 2 s (At Filter setting 0)
 Mass : Approx. 715 g

3) Alarm Output Type (DT□□6□)
 Power Supply : 24V DC $\pm 10\%$
 Power Consumption : Less than 25mA
 Alarm Output : Open Collector x 2 (Independent)
 (When the totalized pulse output option is added, the alarm output can be set only at either a high or low limit.)
 Totalized pulse output : Pulth width: 200 to 300ms
 Frequency: Less than 1Hz
 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
 Current Output : 4 to 20 mA DC
 Load resistance : Max. 600 Ω
 Current output accuracy: $\pm 0.5\% \text{ F.S.}$ at 23°C
 Mass : Approx. 725 g

OPTION

1. Process connection

- 1/4 NPT connection (with built-in equalizing valves)
CODE : /DTN
- 54 mm port connection
CODE : /VFF

2. Indication/Output

- Square Root extraction
CODE : / DS1
- Totalizing indication
Selection of Totalizer Function (Not for options DS2...DS4)
CODE : / TLZ
- Totalizing indication + Pulse output
CODE : / PUL

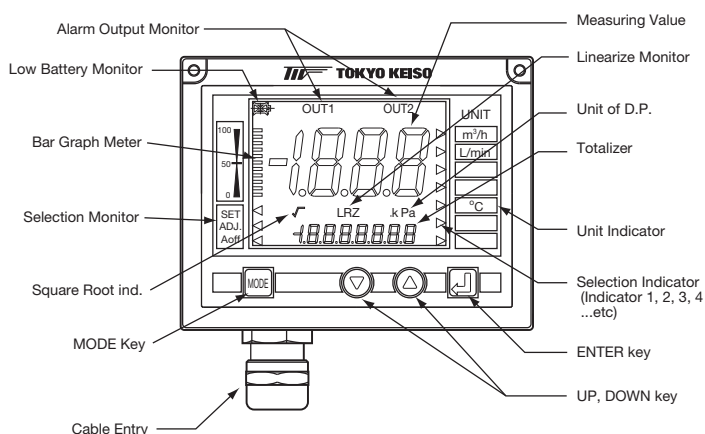
3. Special options

- Selection for number of Scale indication
Standard configuration has one scale indication [Scale 1] only.
Up to four different Scale indications are selectable options and changeable by a single operation.
CODE : / DS2, / DS3, / DS4
This option is selectable for the battery driven type only.
(Last digit denotes number of available indications)
- Linearization Correction
In case of non-linear measurement, Max. 10 points linearization correction can be made within Scale range. (Applied only one scale indication type)
The linearization correction is applied for the indication, current output and alarm output in each function.
CODE : / LRZ

4. Other options

- Protection cover provided
CODE : / HGC

FRONT PANEL



INSTALLATION

When installing the instrument, select the proper location. Avoid the exposure to direct sunshine and rainstorm. Provide with the protection cover if required as an option. (Check the easiness of meter reading before cover installation. The cover might affect meter reading)

Cable entry availability

Type	Cable Entry
Battery type	—
Current output type	○
Alarm output type	○
Applicable cable dia.	∅3-8mm

○ : Yes — : No

MODEL CODE

MODEL CODE						Description	Note
DT	□□	□	□	-A	/□□□		
Differential Pressure Range	01					1 kPa	Maximum differential pressure range
	02					2 kPa	
	05					5 kPa	
	10					10 kPa	
	20					20 kPa	
	50					50 kPa	
Type		4				Battery type	Battery drive
		5				Current Output type	2-wire 4-20mA
		6				Alarm Output type	2-points Alarm+4-20mA.
Position of process Connection		L				Upper side	Pressure connection inlets are changeable
		G				Bottom side	
Version				-A		Symbol of version	
Option 1 [Process conn.] *1					/DTN	NPT1/4 (with built-in equalizing press. valve)	Select one of two
					/VFF	54 mm port connection	
Option 2 [Display/output] *2					/DS1	Differential press. (kPa) and Flow rate	Select one of two
					/TLZ	Differential press. (kPa), Flow rate and Totalizer	
					/PUL	Totalized indication + Pulse output *5	
Option 3 [Special option] *3					/DS2	Differential press. (kPa) and two scaling value	Select one of three
					/DS3	Differential press. (kPa) and three scaling value	
					/DS4	Differential press. (kPa) and four scaling value	
					/LRZ	Linearization correction for display and output	
Option 4 [Other]					/HGC		
Special Specification					(Blank)	None	
					/Z	Yes	

*1 : When "Option 1 [Process conn.]" is not selected, process connection is Rc1/4 (with built-in equalizing press. valve) as standard .

*2 : When "Option 2 [Display]" is not selected, LCD displays differential press.(kPa) and one linear scaling value to the differential pressure. (Designate scaling value)

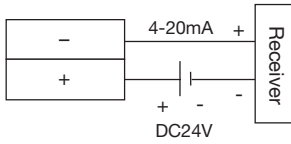
*3 : When "Option DS2 ...DS4" is selected, specify the scaling value of each display. When "Option LRZ" is selected, specify the linearizing data.

*4 : When selecting options, divide code by "/". ([E.g.] DT104L-A / DTN /DS1 / LRZ)

*5 : Applicable for Alarm output only.

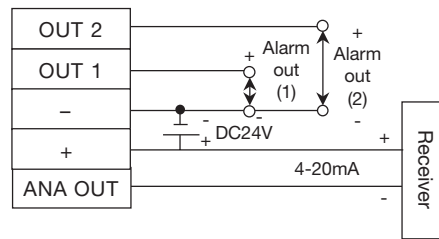
WIRING DIAGRAM

- Current output type (DT□□5□)



- Alarm output type (DT□□6□)

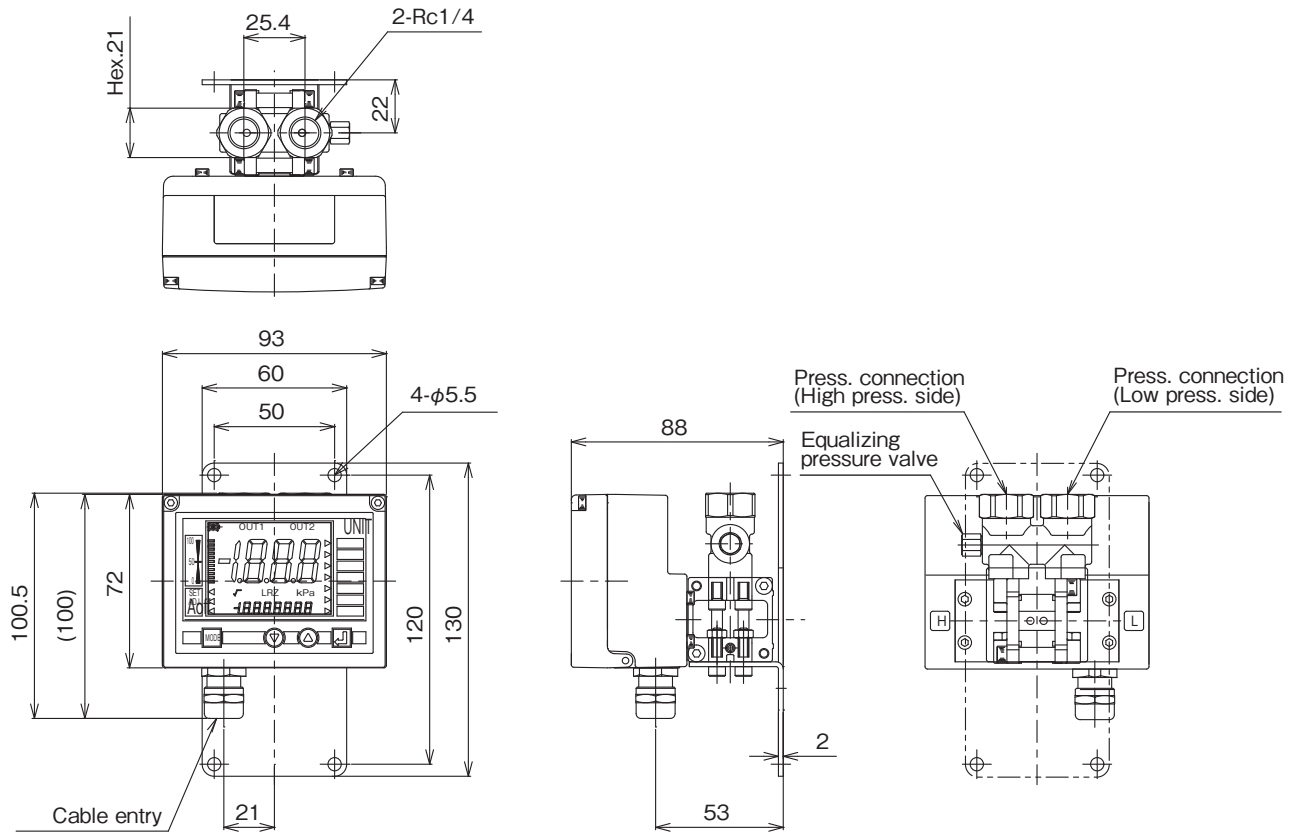
Alarm output (1)/(2) : Open collector
Max. 30V DC/80mA



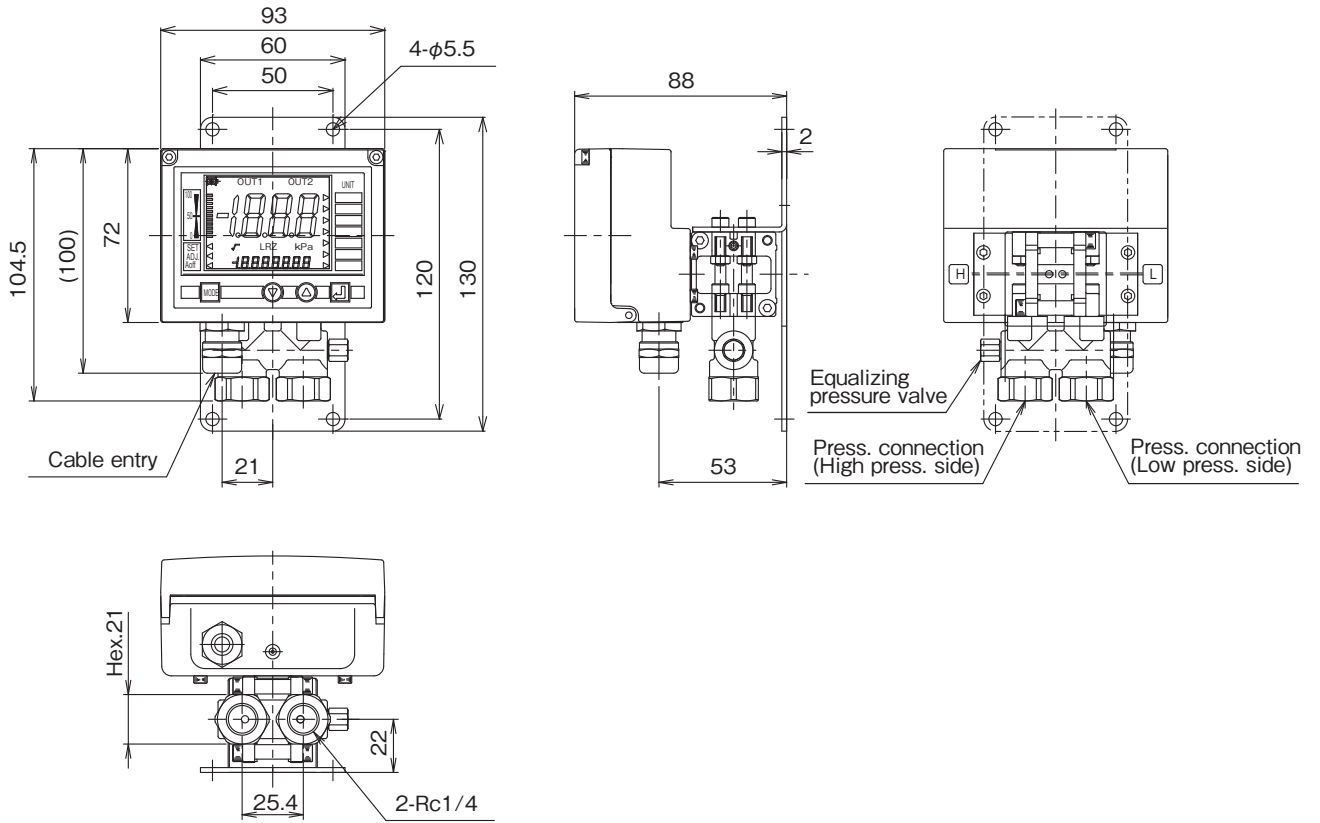
(OUT1 is used for the pulse output when the totalized pulse output option is added)

OUTLINE DIMENSION

Process Connection : Upper side (Code : L)



Process Connection : Bottom side (Code : G)



* Specification is subject to change without notice.

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