Digital Tachometer

Speedmeter·Elapsed timecounter·Time wide meter·Flowmeter

Standard input series   Differential input series

DT−5TXR / DT−5TFR

INSTRUCTION MANUAL

FEATURES:

●Multiple purpose digital tachometer measures optional, liner, andflowratespeeds. Ifdesired, this unit can also function as an elapse time counter or ratiometer.

●An insertion of new cassette type adapter increases functions.(CASSETTE TYPE OPTIONAL UNIT)

●All functions are easily set via front panel keys.

●Easy mounting, no brackets or screws are required.

●Any AC voltage between 85 and 264V will power to DT-5TXAR.(DC powered DT-5TXDR: DC9 to 35V)

Introduction

Thank you for purchasing SHIMPO's Digital Tachometer DT-5TXR/ DT-5TFR. For instructions to use this product properly and optimally for a long period of time, please be sure to read this manual thoroughly before use.
After reading, please store this manual in a safe place for future reference.

＊ When you purchase the product with optional equipment:
   Please refer to the optional equipment's operation manual.

Safety Requirements

The following requirements are very important for this product's correct and safe use.

After reading, be sure to store this manual in a safe, convenient place where operators can always refer to it easily.

Caution	
Electric Shock Be sure to turn the power OFF when wiring as well as inspecting the unit. Otherwise, an electric shock can be caused.	DO NOT block the unit's ventilation holes located on the sides of the unit. Also, DO NOT put any foreign matters inside the unit through these holes. Otherwise, abnormal heat generation or equipment malfunction can be caused.
DO NOT touch the unit with wet (or sweaty) hands for wiring and inspection. Otherwise, an electric shock can be caused.	In case of assembling the first option to DT-5TXR unit body after purchasing, please note that only the options with "R" at the foot of model name can be connected to the unit.

Operating Environment

■**POWER**
Make sure AC voltage is between 85 and 264V.(DC powered DT-5TXDR:DC9 to 35V)
When installing unit,keep power and sensor wires separate.
■**INPUT SIGNAL WIRE**
Connection wiring from sensors shall not be kept in the same or parallel conduit or cable as the power source, power or high voltage cables to avoid noise which may cause mulfunction.
Use shielded wire for input power connections in the shortest possible metal conduit.
■**TERMINAL**
After inserting wires tighten terminals securely.
■**OPERATING ENVIRONMENT**
DO NOT install this unit in the following locations:
Where the unit is exposed to direct sunlight, or where the ambient temperature exceeds a range of 0 - 45℃ .
Where the relative humidity exceeds a range of 35 - 85% and where the temperature changes quickly causing condensation.
Where corrosive and/ or flammable gases are present.
Where levels of dust, salinity, and/ or ferric substance presence are high.
Where direct vibration or impacts can be applied to the unit.
Where the unit can easily be influenced by noises (including static electricity).

Unit Model

Please check your unit's model, as follows.

```
DT ─┬─ 5TX ─┐ ┌─┐ R ─ ┌──┐ ─ ┌──┐
    └─ 5TF ─┘ └─┘     └──┘   └──┘
```
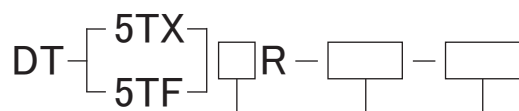
The 2nd Option

Symbol	Output	Function
FVC	Analog signal output	Outputs voltage and current related to the displayed value.
BCD	BCD output	Open collector and BCD output. Provides a convenient interface between the unit and a sequencer.

The 1st Option

Symbol	Output	Function
FVTR	Analog signal output	Outputs voltage and current related to the displayed value.
CPTR	Relay output	Relay's C contact output. Outputs H, L, and GO related to the set value.
TRTR	Transistor output	Open collector output. Outputs HH, H, LL, L, GO, and ZERO data.

Power Requirement

Symbol	Power Requirement
A	AC power (85 to 264V AC)
D	DC power(9 to 35V DC)

Input Type

Symbol	Input Type	
5TX	Standard input	Elated to sensor input such as of rotary encoder and magnetic sensor.
5TF	Differential input	Related to line driver output such as of AC servo motor.

* HH: High set point 2 output
    H: High set point 1 output
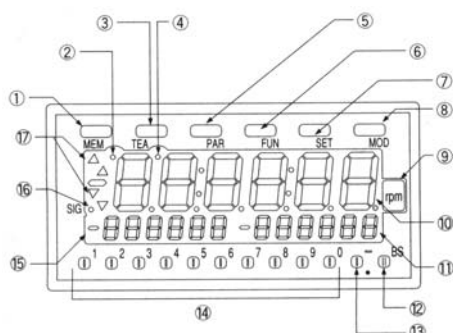   L: Low set point 1 output
    LL: Low set point 2 output
* For combinations of the above-mentioned output levels, refer to DT-5TXR/DT-5TFR Series List; page 15.

Specifications

| Model		DT-5TXR/ DT-5TFR			
Display	Operation Model	Tachometer	Flowmeter	Elapsed timecounter	Time width meter
	Display 1	0 to 999999 Six digits		0:00:00 to 9:59:59 (Hour:Minute: Second Base 60 display)	0:00:00 to 9:59:59 (Hour: Minute:Second Base 60 display)
	Display 2	–		0:00 to 999.99 (Second:1/100 Second decimal display)	
		With zero suppress			
Decimal point location		10^{-1} to 10^{-5}		–	
Display area		Main display: 7 red segment LED,Font height: 15mm,6 digits Two sub-displays: 7 green segment LED,Font height: 6.5mm,6 digits + 6 digits ″– (minus)″ Display available			
Input range		0.0067Hz to 100kHz			10ms to 3600s
Accuracy		± 0.008%± 1digit			± 0.1%± 1digit
Filter		100kHz, 30kHz, 10kHz, and 0.02kHz are switched via parameters. However, only 10kHz and 0.02kHz can be used for the magnetic sensor,and only 0.02kHz for the contact(s).			
Display cycle		0.2, 0.5, 1, 2, 5, 10, 15, 30, and 60 seconds (Can be switched via parameter settings) Optional equipment's output data is also updated in these cycles, except for analog and BCD output Optional equipment's analog output data is updated every 10ms or in a display cycle.			Depends on input signals
Pre-scale function		Parameter setting type via the front panel keys Teaching (combination) function of display value(s) is also available.			–
Memory function		Stores and displays the maximum and minimum measuring values in the sub-displays via the green LED.			
High and low set point 1 values		High and low set point 1 values can be displayed in the sub-display via the green LED.			
Auto-zero time		0.1 to 150 seconds		0.1 to 3600 seconds	
Pre-arithmetic function		Updates display values according to the elapsed time after pulse stop.			–
Insulation resistance		10M Ω or more (at 500V DC megger)			
Voltage proof		1500V AC or more 1 min			
Noise proof		Power terminal normal/common mode ±1500V			
Vibration proof		Conforms to JIS C-0911 Vibration frequency: 10 to 55Hz, Half amplitude: 0.5mm 10 minutes in X, Y, and Z directions			
Operating temperature		0 to 45℃ (no condensation)			
Operating humidity		35 to 85% RH(no condensation)			
Operating atmosphere		No corrosive gases			
Protective function		Front panel: IP66 (or similar level) Rear terminal block: IP20			
Casing material		ABS resin			
External dimensions		W96 × H48 × D134mm(DIN)			
Weight		300g (350 with output)			

Component Part Names and Functions

●Front

| No.	Name	Function
1	Memory key	Used to display the maximum and minimum values.
2	Memory mode lamp	Blinks when the memory key is pressed.
3	Teach key	Used when performing field adjustment settings.
4	Teach mode lamp	Lights up when the teach key is pressed.
5	Parameter key	Used when performing parameter settings.
6	Function key	Used when performing function settings.
7	Set key	Used when parameter settings are completed, etc.
8	Mode key	Used to select a mode.
9	Unit label attachment area	A proper unit label (from attached labels) is attached here.
10	Main display	Displays the measuring values.
11	Sub-B display	Displays the low set point 1 and minimum values.
12	Back space key	Used for parameter settings and to alter a number for each digit.
13	Minus/Dot key	Used to display "− (minus)," to designate the decimal point, and to switch the "Hour:Minute:Second" and "Second" display systems between each other.
14	Numeric keys	Used for parameter and high/low set point 1 value settings.
15	Sub-display A	Displays the high set point 1 and maximum values.
16	Signal lamp	Lights up at sensor signal input.
17	High and low set point 1 output indicators	Indicates output comparison status of the high set point 2, high set point 1, low set point 2, and low set point 1 values.

●Rear
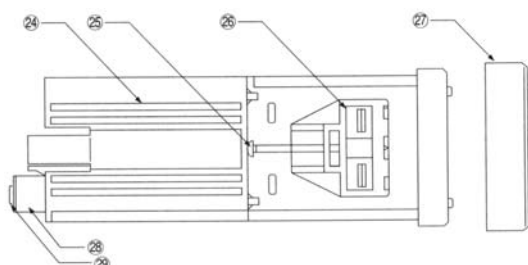
| No.	Name
18	Rear panel removal lever
19	Rear panel removal lever
20	Output connector (when the 2nd optional equipment is installed) ＊
21	Input/output optional terminal block (when the 1st optional equipment is installed) ＊
22	Rear panel
23	Standard terminal block

＊ Since, for both DT-5TXR and DT-5TFR series, the optional board(s) are internally equipped, only terminal block (for the 1st optional equipment) or connector (for the 2nd optional equipment) can be viewed from outside of this unit.

●Side
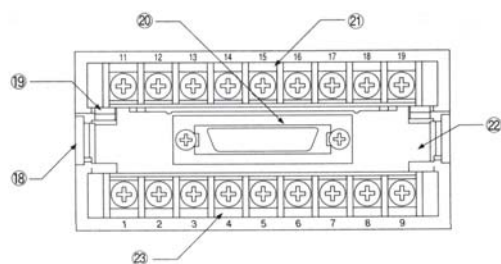
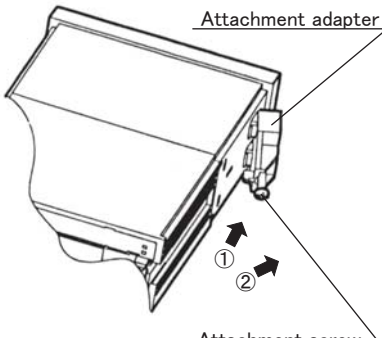| No.	Name
24	Vent
25	Attachment screw
26	Attachment adapter
27	Front panel protective cover
28	Terminal block
29	Terminal block cover

External Dimensions

＊ Attachment adapter width

Dimensions with the front panel protective cover attached
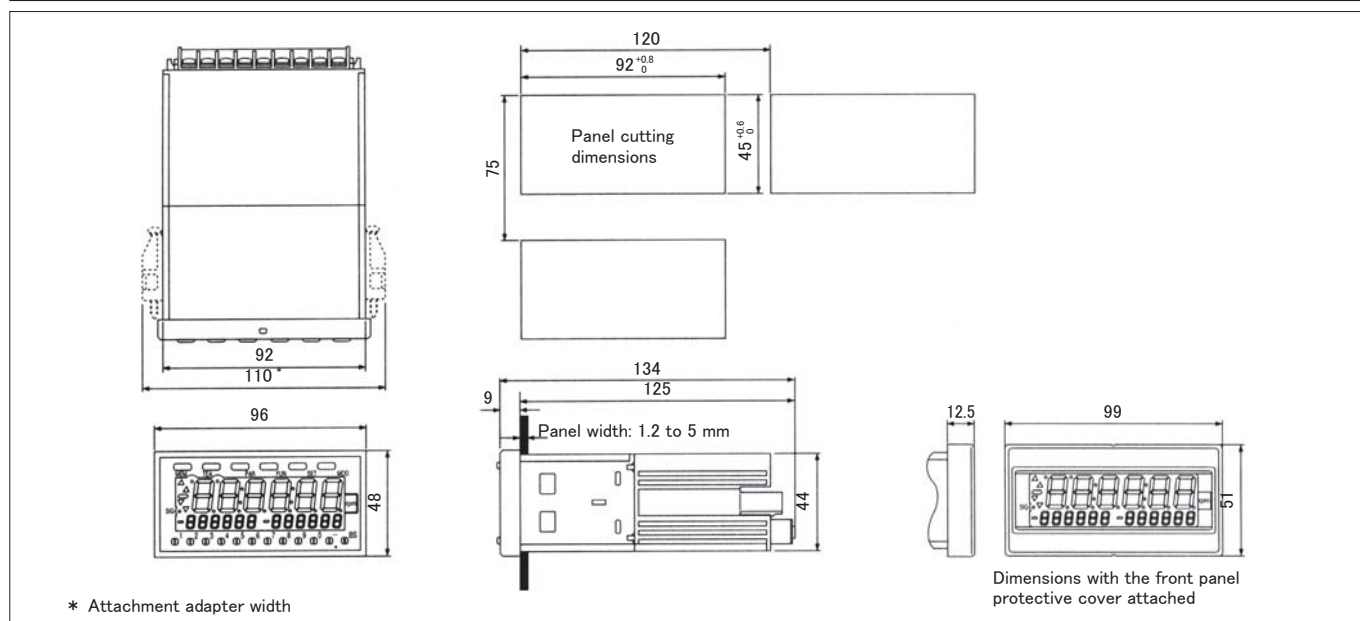
Note) When the connector is attached, a 30 mm or more space is required to lay its cable.

Unit Attachment to Attachment Panel

Refer to the following procedure to attach the unit to the attachment panel. Prior to starting attachment work, be sure to confirm that the attachment panel thickness is 1.2 to 5 mm.

1 Remove the attachment adapter from the unit.

While pushing the attachment screw, open the attachment adapter outward and remove it.
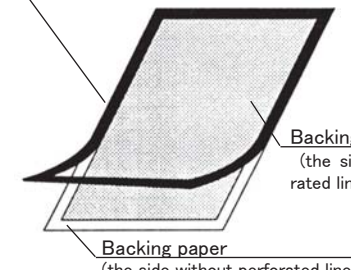
Attachment adapter

Attachment screw

2 Attach the provided water-proof packing to the panel surface.
* When the water-proof feature is unnecessary, this step can be skipped.

① Peel the perforated outer frame (backing paper + Water-proof packing) (The surface of both sides of the water-proof packing is adhesive.)
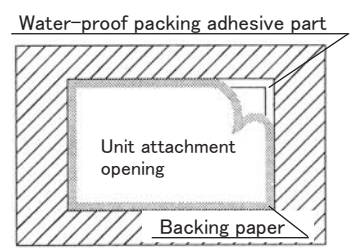
Outer frame (Backing paper + Water-proof packing)

Backing paper (the side with perforated lines)

Backing paper (the side without perforated lines)

② Attach the provided water-proof packing to the edges of the unit attachment panel and opening, aligning with its left and right sides, and then peel off the backing paper.
* At this time, be sure not to make the water-proof packing displaced or wrinkled. Also, DO NOT elongate the water-proof packing in any directions (i.e. upper, lower, left and right).
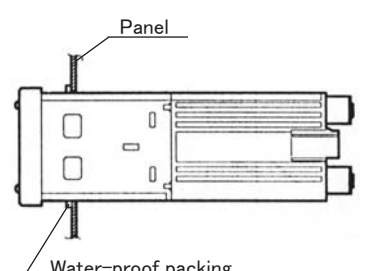
Water-proof packing adhesive part

Unit attachment opening

Backing paper

5 Ecure the unit to the panel with the attachment screws.

The specified torque to fasten the screws is 6.5kgf·cm or less.

Panel

Attachment screw

* If these screws are fastened excessively, the attachment adapter can be deformed.

4 Attach the attachment adapter to the unit.

Attach the attachment adapter to the attachment hole from the side.

Adapter attachment holes
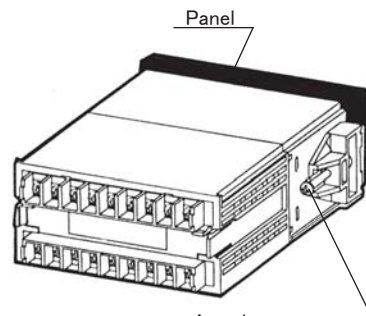
Panel

Attachment adapter

* Rear view after the unit is attached to the panel.

3 Place the unit horizontally and then insert it into the panel's attachment opening.

Push the unit into the opening so that the water-proof packing's adhesive part is securely attached to both unit and panel surfaces.

Panel

Water-proof packing

* Panel thickness: 1.2 to 5 mm

Note:Water-proof requirements
・Front panel:IP66 (or similar level)
・Rear terminal block:IP20 (non-water-proof)

DO NOT install the unit in the following areas:
① Where water can come into direct contact with the unit always.
② Where oil or chemicals can come into direct contact with the unit.
③ Where water can be splashed on the unit's rear or side face(s).
* The front panel is water-proofed with IP66 (or similar level). However, if water is splashed on the unit, be sure to wipe it off the unit as soon as possible.

Wiring to Power Source and Sensors (DT-5TXR)

Note:
To prevent an electric shock, prior to performing wiring, be sure to turn the unit's power OFF. Be sure to use the rated voltage (AC power specifications: 85 to 264V AC, DC power specification: 9 to 35V DC). Inverter output (to connect a motor) cannot be used as the power source.
DO NOT install the sensor's connection wires together with strong electric cables (power cable, high-voltage cable, etc.) via bundling, wiring in parallel, or installing them in one conduit. Otherwise, noise is sent via a signal line causing the unit malfunction.
Be sure to use sealed wires for input connection or install them in a metal conduit, as well as to keep the wires as short as possible.

DT-5TXR

●Terminal block connection diagram

∗ Models
AC power specifications: DT-5TXAR
DC power specifications: DT-5TXDR

Note) When using an NPN open collector, Nos. 5 and 6 are not short-circuited.

◎ Wiring requirements
・Use M3 crimp-style terminals with a width of 7 mm or less to connect wires to the terminal block.
・After wire connection to the terminal block is completed, be sure to attach the provided terminal block cover.

●Input Specifications

Item	Description	
Power	AC (5TXAR)	85 to 264V AC(50/60Hz)
	DC (5TXDR)	9 to 35V DC Starting current: 2A or less
Power consumption	12W	
Sensor power output	+12V DC Max. 150mA	
	(When installing ratio input optional RMT, up to 150mA can be used.)	
Open collector input	Open collector (NPN) input	
	LO input	Load capacity: 10mA or more
		0 to 3V
	HI input	Leakage current: 0.5mA or less
	Maximum frequency	100Hz
Contact input (Pull up + Open collector input)	Used for non-voltage contact with Nos. 5 and 6 short-circuited.	
	Contact capacity	Voltage: 12V Current: 15mA or more
	Maximum frequency	20Hz
Voltage input	LO input	0 to 1.5V
	HI input	4.0 to 30V
	Input resistance	10k Ω
	Maximum frequency	30kHz
Magnetic sensor input[Note]	Input voltage	Up to 100Hz	0.3Vp-p or more
		Up to 1kHz	1.5Vp-p or more
		Up to 10kHz	6 to 30Vp-p or more
	Maximum frequency	10kHz	

Note) Magnetic sensor cannot be used in the time width mode (mode 3).

●Magnetic sensor output voltage

Frequency	Output voltage
10Hz	0.3Vp-p or more is required
100Hz	0.3Vp-p or more is required
1kHz	1.5Vp-p or more is required
10kHz	6.0Vp-p or more is required

●Input circuit

Open collector sensor
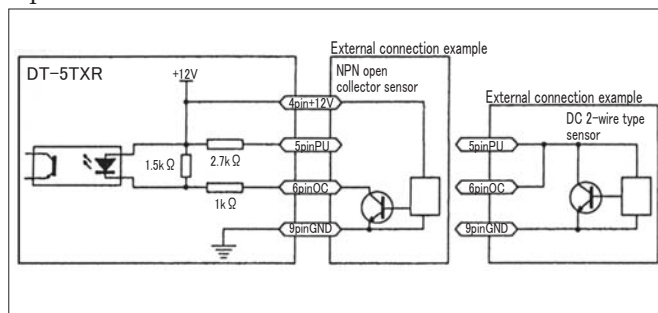
Relay & switch
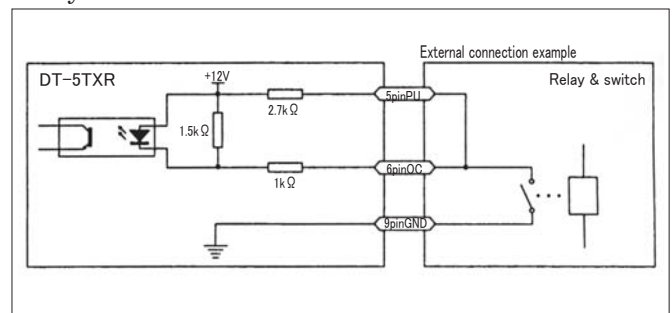
Voltage output sensor
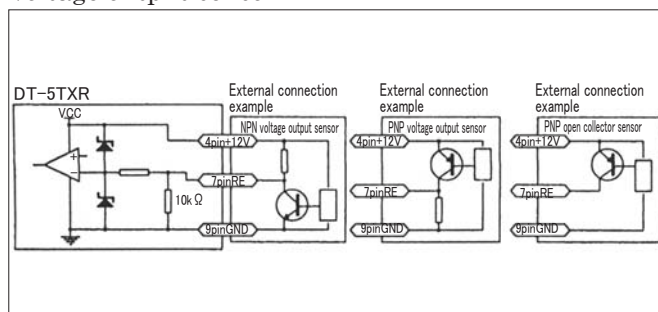
Magnetic sensor
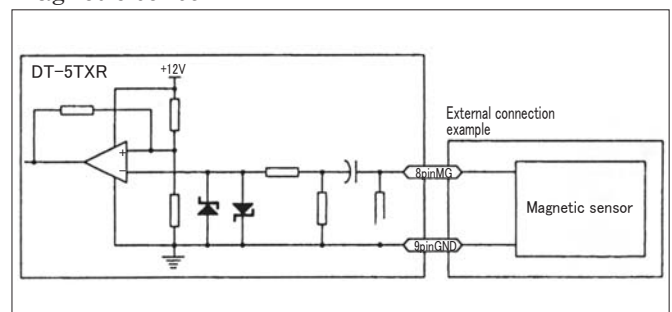
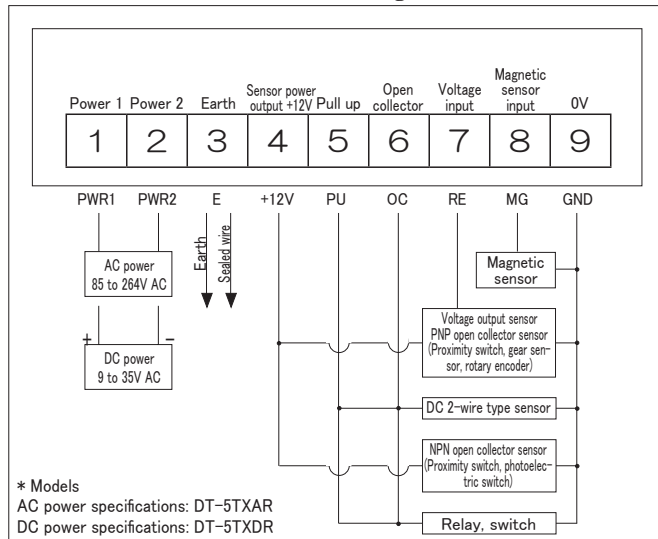## Wiring to Power Source and Sensors (DT-5TFR)

Note:
To prevent an electric shock, prior to performing wiring, be sure to turn the unit's power OFF. Be sure to use the rated voltage (AC power specifications: 85 to 264V AC, DC power specification: 9 to 35V DC). Inverter output (to connect a motor) cannot be used as the power source.

DO NOT install the sensor's connection wires together with strong electric cables (power cable, high-voltage cable, etc.) via bundling, wiring in parallel, or installing them in one conduit. Otherwise, noise is sent via a signal line causing the unit malfunction.

Be sure to use sealed wires for input connection or install them in a metal conduit, as well as to keep the wires as short as possible.

DT-5TFR

●Terminal block connection diagram

*Models
AC power specifications: DT-5TFAR
DC power specifications: DT-5TFDR
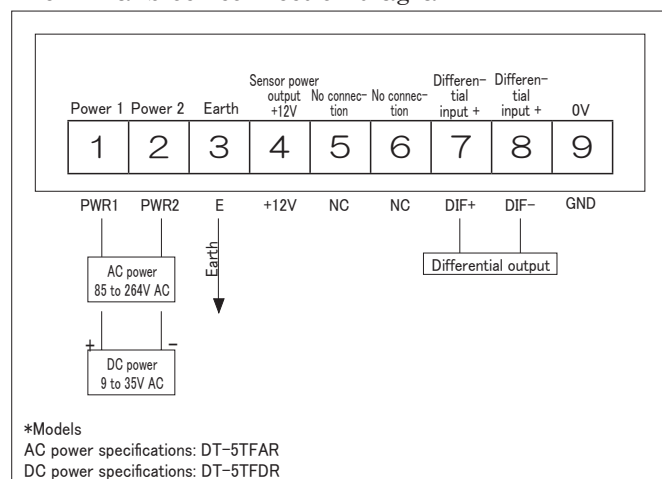
●Line driver input circuit
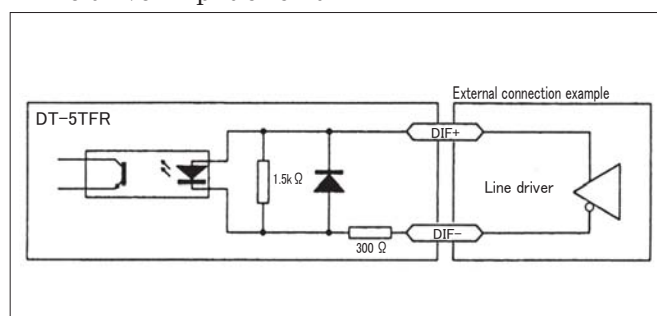
●Input circuit

Item	Description	
Power	AC (5TFAR)	85 to 264V AC(50/60Hz)
	DC (5TFDR)	9 to 35V DC Starting current: 2A or less
Power consumption	12W	
Sensor power output	+12V DC Max. 150mA (When installing ratio input optional RMT, up to 150mA can be used.)	
Differential input	Connected to	Differential line driver AM26LS31 or the similar one
	Differential input voltage	DIF+ / DIF− / V$_{DIF}$
	V$_{DIF}$	Maximum voltage / 5.5V(15mA)
		Minimum voltage / 3.0V
	Maximum frequency	100kHz

6

Basic Setting Procedure

According to each operation mode and application, perform the settings as follows:

1 Mode Settings	→	**2** Parameter Settings	→	**3** Function Settings	→	Measurement start
Refer to pages 8 to 12		Refer to pages 8 to 12		Refer to pages 8 to 12		
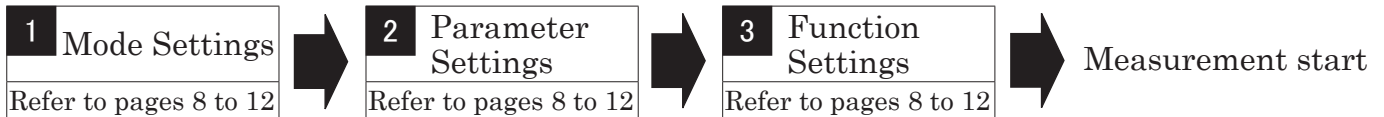
Perform high and low set point 1 value settings (see page 13) or memory function settings (see page 14), whenever required.
Also, this unit does not require complicated parameter calculations. The equipped combination feature enables display value alteration and error correction.

Setting Keys and Application

To perform mode, parameter, function, and other features (field adjustment/high and low set point 1 values setup/memory function) settings, use the front panel keys, as follows:

Parameter key
Used for parameter settings.

Teach key
Used for field adjustment settings.

Memory key
Used for memory function (maximum and minimum value display) settings.

Main display
Displays each setting's set value, etc.

Sub-display A
Displays parameter and function numbers as well as high set point 1 and high set point 2 values.

Numeric Keys
Used to enter or select set values.

Function key
Used for function settings.

Set key
Used when mode, parameter, and function settings are completed.

Mode key
Used for mode settings.

Sub-display B
Displays low set point 1 and low set point 2 values.

Backspace key
Used to correct parameter and function set values.

Minus/dot key
Used to display "- (minus)", decimal point and to switch "Hour:Minute:Second" and "Second" display system between each other.

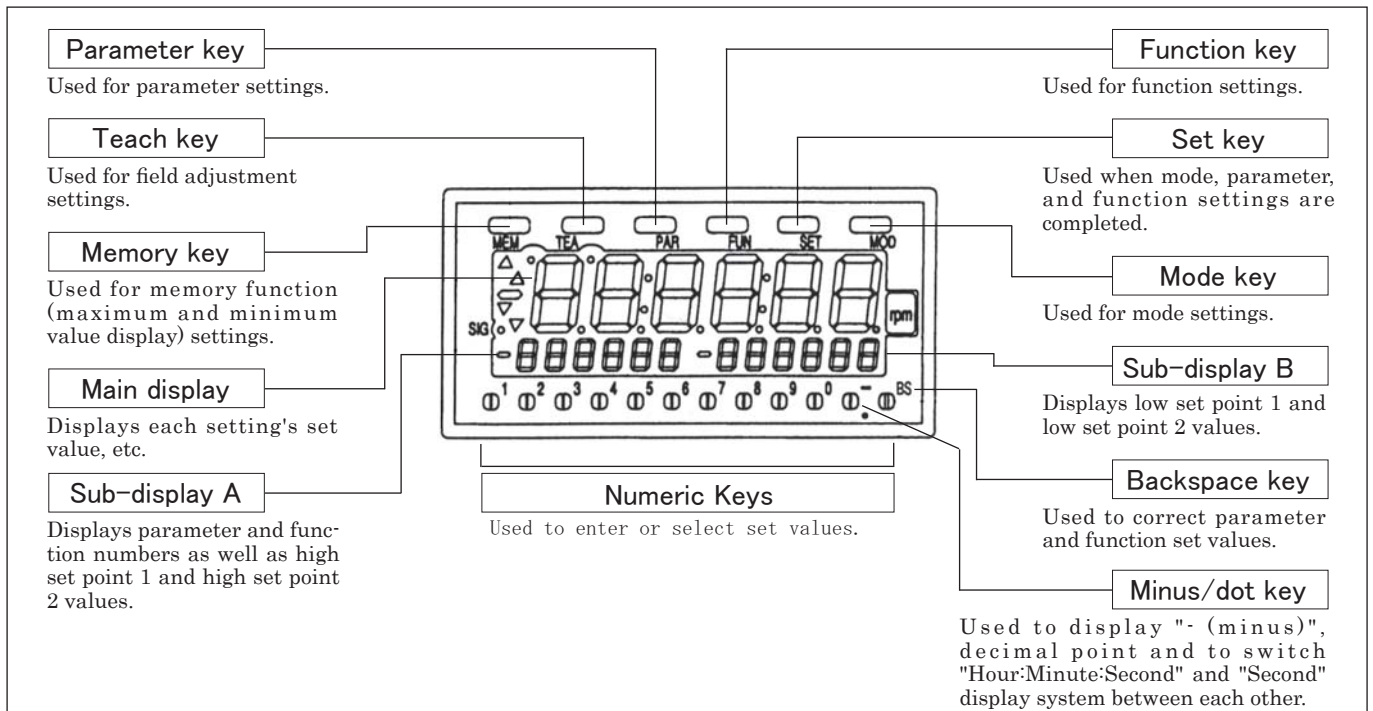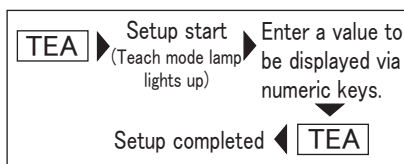## Field Adjustment Settings

When the actual rpm can be checked (measured), the following easy method (field adjustment) can be used for the settings.

The field adjustment does not require complicated calculations. Via this function, the display values can be altered and errors can be corrected, using the front panel keys.

■Setting method

TEA ▶ Setup start (Teach mode lamp lights up) ▶ Enter a value to be displayed via numeric keys.
Setup completed ◀ TEA

Press the [TEA] key, to start the field adjustment. After numeric key entry is completed, press the [TEA] key again, and setup is now completed.

◎ Setup range
When input rpm is either 99999 or more, or 0, settings cannot be performed since these numbers exceed the field adjustment's setting range.
In such a case, "EE-2"* is displayed in the main display.
When input rpm is 99999 or more, lower and set it again. When input rpm is 0, raise it until the input rpm is displayed. If these two methods are not desired, change the parameter settings.

* For detailed information about error display, refer to page 12.

E.g. "12345rpm" is currently displayed. However, the number of sensor pulses, deceleration ratio, etc have not been identified. In such a case, use a hand-held type tachometer to measure rpm. Assuming this measuring value is 1000rpm, enter this number as the set rpm. Then, from the next measurement, data on these items will be displayed without performing parameter settings.

[Settings of above-mentioned example]

Regular display
"12345" is displayed on the main display, "700," on the sub-display A, and "500," on the sub-B display.
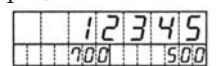
Press the [TEA] key to start the field adjustment settings.
(At this time, the LED below the [TEA] key lights up.)

Use numeric keys to enter a set value "1000."
From the highest digit of the number, enter as follows:
[1] → [0] → [0] → [0]
Press the [TEA] key.

Settings completed

Mode, Parameter, and Function

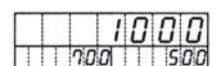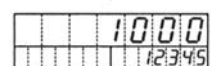DT-5TXR/ DT-5TFR has the following five modes. Select an appropriate one according to your measurement purpose.

Mode No.	Mode Name	Application
1	Tachometer mode	Measuring the number of input pulses and the pulse cycle, calculates and display rpm.
2	Elapsed timecounter mode	Displays processing time based on the process length and speed.
3	Time width mode	Displays input ON time.
4	Flow rate mode	Measures flow rate per unit time.
99	Test mode	Self-diagnoses the internal circuit.

The following parameters and functions have been set up in mode 1 (tachometer mode) upon shipping.

●Parameters (Upon shipping)

No.	Setting Item	Default Value Display	Default Value Set value	Functions
P1	Number of pulses per rpm	_ _0001	1p/r	Enters the number of pulses that are output per rpm in the sensor section. For example, for the rotary encoder, the number of its pulses,or for the gear sensor, the number of gears is entered.
P2	rpm in detection section	_01000	1000rpm	Enters rpm in the sensor section. Usually enters the maximum rpm.
P3	Values to be displayed (with decimal point)	001000.	1000	Enters desired values to be displayed under conditions of P1 and P2. Enter the decimal point, if required. The pre-scale values are automatically calculated based on P1, P2, and P3's set values.
P4	Display cycle	_1.0_	1 second	Select the optimum value, being 1 second as standard. The selected display cycle becomes measurement time. For example, with 1 second selected, when the input pulse cycle is 1 second or more,that pulse cycle becomes the display cycle. If no pulse is input, pulse input is held for auto-zero time (P5).
P5	Auto-zero time	_ _006.0	6.0 second	Designates the time until the display becomes 0 when no pulse is input. The shorter this time is set, the faster the display becomes "0."Regardless of display cycle (P4) setup, pulse input is held for the auto-zero time.
P6	Input filter	_ 10_	10kHz	Selects the smallest frequency that is larger than the input signal's maximum frequency, from 10, 30, 100, 0.02kHz. When using contact input, select 0.02kHz.

* When parameter settings are not necessary, the default values (values shown above, designated upon shipping) can be used as is.

●Function (Upon shipping)

| No.	Setting Item	Default Value Display	Default Value Set value	Functions
F1	High set point 2 and low set point 2 values[Note 1)]	000000	0	Designates the high set point 2 and low set point 2 values. These values are displayed on the sub-display without the decimal point.
F2	High and low set point 1 value hysteresis	_ _ _ _ 00	0	Designates high set point 1, low set point 1, high set point 2, and low set point 2 values' hysteresis values (i.e. difference between output ON and OFF). Use this function when rpm drastically fluctuates. (Refer to the following section "About Hysteresis.")
F3	High set point 1 and low set point 1 value setting prohibit	_ 0_	Enable	Selects prohibit/enable status for the operation of high set point 1 and low set point 1 values setting key. To prevent incorrect settings, select 1 (prohibit).
F4	Comparator output timer at start	_ _ _ _ 00	0second	Designates the time until the comparator's determination is output at the operation start.
F5	Display selection of sub-display	_ 0_	High and low set point 1 values	Select the data to be displayed on the sub-display.
F6	Minimum rpm	000000	0	Designates an rpm (display value for mode 4) at which zero is displayed. When the rpm is smaller than this value, zero is displayed.
F7	Frequency of moving average	_ 0_	None	Used when the display is deviated due to rpm fluctuation.
F8	Pre-arithmetic function function	_ 0_	None	Used to quickly perform deceleration display when no signal is input. When using the pre-arithmetic function function, select "1."
-	-	-	-	-
F10	BCD output logic[Note 2)]	_ 0_	Negative logic	For the negative logic, designate as "0," and for the positive logic, "1."
F11	Maximum analog signal output display value [Note 3)]	001000	1000	Designates a display value equivalent to each output's maximum value (10V, 5V, 1V, 20mA).
F12	Minimum analog signal output display value[Note 3)]	000010	10	Each output value becomes forcefully minimum (0V, 1V, 4mA) when the value becomes smaller than this display value. Usually designate as "0."
F13	Analog signal output cycle[Note 3)]	_ 0_	Maximum speed	When this cycle is "0," output is updated at the maximum speed (approximately 10msec), and when it is "1," in display cycle.
F14	Analog signal output offset[Note 3)]	_ 000.0	0%	With the maximum output (10V, 1V) denoted as 100% , the analog signal is output after adding the set value (in %). For 4-20mA and 1-5V output, 16mA and 4V are denoted as 100%, respectively. The added values should not become larger than the maximum values (10V, 5V, 1V, 20mA). Usually designate as "0."

Note 1) The high set point 2 value is displayed on the sub-display A, and the low set point 2 value, on the sub-B display.
Note 2) Function 10 can be set up only when the second optional equipment, DOP-BCD has been installed.
Note 3) Functions 11 to 14 can be set up when the first optional equipment, DOP-FVTR or the second optional DOP-FVC has been installed.

◎ About Hysteresis

The output values for the same input differ when input is increased and decreased. This phenomenon or the difference between these two amounts is called hysteresis.
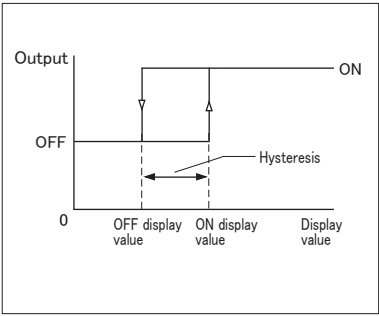
[Example]

For high set point 1 value (also applicable to low set point 1, high set point 2, and low set point 2 values), assuming the high set point 1 value is 1000 and hysteresis is 10:
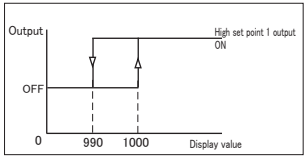
When the displayed value is 1000, output is turned ON, and when it is 990, OFF.

◎ About Display

Use Function 5 (Sub-display's display pattern selection) to select the desired display pattern from the following three:

・Display pattern (1)
(Set value: 0)

Main display
Measuring value

High set point 1 value	Low set point 1 value
Sub-display A	Sub-display B

* When the high and low set point 1 values have not been designated, "0" is displayed.
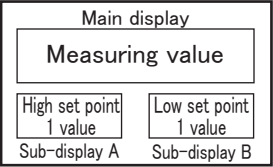
・Display pattern (2)
(Set value: 1)

Main display
Measuring value

Blank	Blank
Sub-display A	Sub-display B
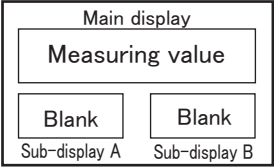
・Display pattern (3)
(Set value: 2)

Main display
Measuring value

rpm	Blank
Sub-display A	Sub-display B

◎ Time of Moving Average

The frequency of moving average can be selected via function 7. Measurement is performed using the cycle designated via parameter 4 (display cycle) and averaging the data via function 7's set value (frequency).

F7	0	1	2
Times of moving average	None	Three times	Ten times

Each mode's parameter and function setting items are as follows:

■Mode 1 (Tachometer mode)

●Parameter

No.	Setting Item	Setting Range	Default Value Display	Default Value Set value
P1	Number of pulses per rpm	1 to 9999p/r	_ _0001	1p/r
P2	rpm in detection section	1000 to 99999rpm	_01000	1000rpm
P3	Values to be displayed (with decimal point)	0.00001 to 999999	001000.	1000
P4	Display cycle	0.2/0.5/1.0/2.0/5.0/ 10/15/30/60 second	_1.0_	1second
P5	Auto-zero time	0.1 to 150 second	_ _006.0	6.0second
P6	Input filter	10/30/100/0.02kHz	_ 10_	10kHz

* For detailed information about the parameter function, refer to page 8.

●Function

No.	Setting Item	Setting Range	Default Value Display	Default Value Set value
F1	High set point 2 and low set point 2 values [Note 1)]	000000 to 999999	000000	0
F2	High and low set point 1 value hysteresis	0 to 99	_ _ _ _00	0
F3	High set point 1 and low set point 1 value setting prohibit	0 (enable)/1 (prohibit)	_ 0_	Enable
F4	Comparator output timer at start	0 to 99 second	_ _ _ _00	0 second
F5	Display selection of sub-display	0 (high and low set point 1 values)/1 (none)/2 (rpm)	_ 0_	High and low set point 1 values
F6	Minimum rpm	000000 to 999999	000000	0
F7	Frequency of moving average	0 (none)/1 (3 times)/ 2 (10 times)	_ 0_	None
F8	Pre-arithmetic function function	0 (not used)/1 (used)	_ 0_	None
-	-	-	-	-
F10	BCD output logic [Note 2)]	0 (negative logic)/ 1 (positive logic)	_ 0_	Negative logic
F11	Maximum analog signal output display value [Note 3)]	0 to 999999	_0100.0	1000
F12	Minimum analog signal output display value [Note 3)]	0 to 999999	000010.	10
F13	Analog signal output cycle [Note 3)]	0 (maximum speed)/1 (synchronizes with the display cycle)	_ 0_	Maximum speed
F14	Analog signal output offset [Note 3)]	−100 to 100%	_ 000.0	0%

* For detailed information about the function, refer to page 8.
Note 1) The high set point 2 value is displayed on the sub-display A, and the low set point 2 value, on the sub-B display.
Note 2) Function 10 can be set up only when the second optional equipment, DOP-BCD has been installed.
Note 3) Functions 11 to 14 can be set up when the first optional equipment, DOP-FVTR or the second optional equipment, DOP-FVC has been installed.

■Mode 2 (Elapsed timecounter mode)

●Parameter

No.	Setting Item		Setting Range	Default Value Display	Default Value Set value
P1	Number of pulses per rpm		1 to 9999p/r	_ _0001	1p/r
P2	rpm in detection section		1000 to 99999rpm	_01001	1000rpm
P3	Values to be displayed (with decimal point)	Hour:Minute: Second display system	0:00:00 to 9:59:59	_010:00	10:00 second
		Second display system	0:00 to 999:99		
P4	Display cycle		0.2/0.5/1.0/2.0/5.0/ 10/15/30/60 second	_1.0_	1 second
P5	Auto-zero time		0.1 to 150 second	_ _006.0	6.0 second
P6	Input filter		10/30/100/0.02kHz	_ 10_	10kHz

* For detailed information about the parameter function, refer to page 8.

●Function

No.	Setting Item		Setting Range	Default Value Display	Default Value Set value
F1	High set point 2 and low set point 2 values [Note 1)]	Hour:Minute: Second display system	0:00:00 to 9:59:59	_ 00000	Second display system 0 second
		Second display system	0:00 to 999:99		
F2	High and low set point 1 value hysteresis		0 to 99	_ _ _ _00	0
F3	High set point 1 and low set point 1 value setting prohibit		0 (enable)/1 (prohibit)	_ 0_	Enable
F4	Comparator output timer at start		0 to 99 second	_ _ _ _00	0 second
F5	Display selection of sub-display		0 (high and low set point 1 values)/ 1 (none)/2 (rpm)	_ 0_	High and low set point 1 values
F6	Minimum rpm		000000 to 999999	000000	0
F7	Frequency of moving average		0 (none)/1 (3 times)/ 2 (10 times)	_ 0_	None
F8	Pre-arithmetic function function		0 (not used)/1 (used)	_ 0_	None
-	-		-	-	-
F10	BCD output logic [Note 2)]		0 (negative logic)/ 1 (positive logic)	_ 0_	Negative logic
F11	Maximum analog signal output display value [Note 3)]	Hour:Minute: Second display system	0:00:00 to 9:59:59	_010:00	10:00
		Second display system	0:00 to 999:99		
F12	Minimum analog signal output display value [Note 3)]	Hour:Minute: Second display system	0:00:00 to 9:59:59	_000:10	00:10
		Second display system	0:00 to 999:99		
F13	Analog signal output cycle [Note 3)]		0 (maximum speed)/ 1 (synchronizes with the display cycle)	_ 0_	Maximum speed
F14	Analog signal output offset [Note 3)]		−100 to 100%	_ 000.0	0%

* For detailed information about the function, refer to page 8.
Note 1) The high set point 2 value is displayed on the sub-display A, and the low set point 2 value, on the sub-B display.
The display system is designated via parameter 3 (value to be displayed).
The sub-displays do not display the colon.
Note 2) Function 10 can be set up only when the second optional equipment, DOP-BCD has been installed.
Note 3) Functions 11 to 14 can be set up when the first optional equipment, DOP-FVTR or the second optional equipment, DOP-FVC has been installed.

Note) When input signal stops in the elapsed timecounter mode, the display changes into overflow indication after the auto-zero time elapses.
"-.-.-.-.:-.-." means overflow indication, not an error. When the input signal enters the specified display range, normal display appears.

Parameters and Functions of Each Mode - 2

Each mode's parameter and function setting items are as follows:

■Mode 3 (Time width mode)

●Parameter

No.	Setting Item	Setting Range	Default Value Display	Default Value Set value	Functions
P1	Switch between "Hour:Minute: Second" and "1/100 Second" display systems	0:00:00/0:00	0:00	1/100 second	Designates the time display unit.
P2	Measurement section	0 (OFF)/1 (ON)	_ 1_	ON	Designates measurement time, i.e. during input signal OFF or ON.
P3	Auto-zero time	0.1 to 3600 second	_3600.0	3600 second	Refer to page 8.
P4	Input filter	10/0.02kHz	_ 10_	10kHz	Refer to page 8.

●Function

No.	Setting Item		Setting Range	Default Value Display	Default Value Set value
F1	High set point 2 and low set point 2 values Note 1)	Hour:Minute: Second display system	0:00:00 to 9:59:59	_ 00000	Second display system 0 second
		Second display system	0:00 to 999:99		
F2	High and low set point 1 value hysteresis		0 to 99	_ _ _ _ 00	0
F3	High set point 1 and low set point 1 value setting prohibit		0 (enable)/1 (prohibit)	_ 0_	Enable
F4	Comparator output timer at start		0 to 99 second	_ _ _ _ 00	0 second
F5	Display selection of sub-display		0 (high and low set point 1 values)/ 1 (none)/2 (rpm)	_ 0_	High and low set point 1 values
-	-		-	-	-
-	-		-	-	-
-	-		-	-	-
-	-		-	-	-
F10	BCD output logic Note 2)		0 (negative logic)/ 1 (positive logic)	_ 0_	Negative logic
F11	Maximum analog signal output display value Note 3)	Hour:Minute: Second display system	0:00:00 to 9:59:59	_010:00	10 second
		Second display system	0:00 to 999:99		
F12	Minimum analog signal output display value Note 3)	Hour:Minute: Second display system	0:00:00 to 9:59:59	_000:10	0.1 second
		Second display system	0:00 to 999:99		
F13	Analog signal output cycle Note 3)		0 (maximum speed)/ 1 (synchronizes with the display cycle)	_ 0_	Maximum speed
F14	Analog signal output offset Note 3)		−100 to 100%	_ 000.0	0%

* For detailed information about the function, refer to page 8.
Note 1) The high set point 2 value is displayed on the sub-display A, and the low set point 2 value, on the sub-B display.
The display system is designated via parameter 3 (value to be displayed).
The sub-displays do not display the colon.
Note 2) Function 10 can be set up only when the second optional equipment, DOP-BCD has been installed.
Note 3) Functions 11 to 14 can be set up when the first optional equipment, DOP-FVTR or the second optional equipment, DOP-FVC has been installed.

Each mode's parameter and function setting items are as follows:

■Mode 4 (Flow rate mode)
●Parameter

No.	Setting Item	Setting Range	Default Value Display	Default Value Set value	Functions
P1	Number of blades per rpm	1 to 99	_ _ _ _ 01	1	Enters the flowmeter's number of blades. When this information is not identified, enter "1."
P2	Capacity per blade of sensor (cc, l, etc.)	0.0001 to 99999	_ 0001.0	1.0	Enters the sensor (flowmeter)'s pulse rate.
P3	Scaling	0.00000 to 999999	00001.0	1	Sets the scaling factor to designate the display unit. When using the unit designated via parameter 2 and displaying a value every second, enter "1." (Refer to the scaling section below.)
P4	Decimal point display	0.00000 to 00000.0	00000.0	Displays until one digit after the decimal point.	Refer to page 8.
P5	Display cycle	0.2/0.5/1.0/2.0/5.0/ 10/15/30/60 second	_ 1.0 _	1 second	
P6	Auto-zero time	0.1 to 150 second	_ _ 006.0	6.0 second	
P7	Input filter	10/30/100/0.02kHz	_ 10 _	10kHz	

●Function

No.	Setting Item	Setting Range	Default Value Display	Default Value Set value
F1	High set point 2 and low set point 2 values[Note 1)]	0:00:00 to 9:59:59	000000	0
F2	High and low set point 1 value hysteresis	0 to 99	_ _ _ _ 00	0
F3	High set point 1 and low set point 1 value setting prohibit	0 (enable)/1 (prohibit)	_ 0 _	Enable
F4	Comparator output timer at start	0 to 99 second	_ _ _ _ 00	0 second
F5	Display selection of sub-display	0 (high and low set point 1 values)/ 1 (none)/2 (rpm)	_ 0 _	High and low set point 1 values
F6	Minimum rpm	0.0 to 999999	00000.0	0
F7	Frequency of moving average	0 (none)/1 (3 times)/ 2 (10 times)	_ 0 _	None
F8	Pre-arithmetic function function	0 (not used)/1 (used)	_ 0 _	None
-	-	-	-	-
F10	BCD output logic[Note 2)]	0 (negative logic)/ 1 (positive logic)	_ 0 _	Negative logic
F11	Maximum analog signal output display value [Note 3)]	0.0 to 999999	00100.0	100.0
F12	Minimum analog signal output display value [Note 3)]	0.0 to 999999	00001.0	1.0
F13	Analog signal output cycle [Note 3)]	0 (maximum speed)/ 1 (synchronizes with the display cycle)	_ 0 _	Maximum speed
F14	Analog signal output offset[Note 3)]	−100 to 100%	_ 000.0	0%

* For detailed information about the function, refer to page 8.
Note 1) The high set point 2 value is displayed on the sub-display A, and the low set point 2 value, on the sub-B display.
Note 2) Function 10 can be set up only when the second optional equipment, DOP-BCD has been installed.
Note 3) Functions 11 to 14 can be set up when the first optional equipment, DOP-FVTR or the second optional equipment, DOP-FVC has been installed.

◎ bout Scaling (Parameter 3)

"Scaling factor" is a value obtained when a flow rate per second is designated as "1" in the same unit used for parameter 2.
For example, to designate the display data unit to "l/min" when the flowmeter reads 2.5cc/p, scaling is calculated as follows:

$$1 \times \underline{60} \div \underline{1000} = 0.06$$

Since the unit used for parameter 2 has been designated as "cc," divide by "1000."
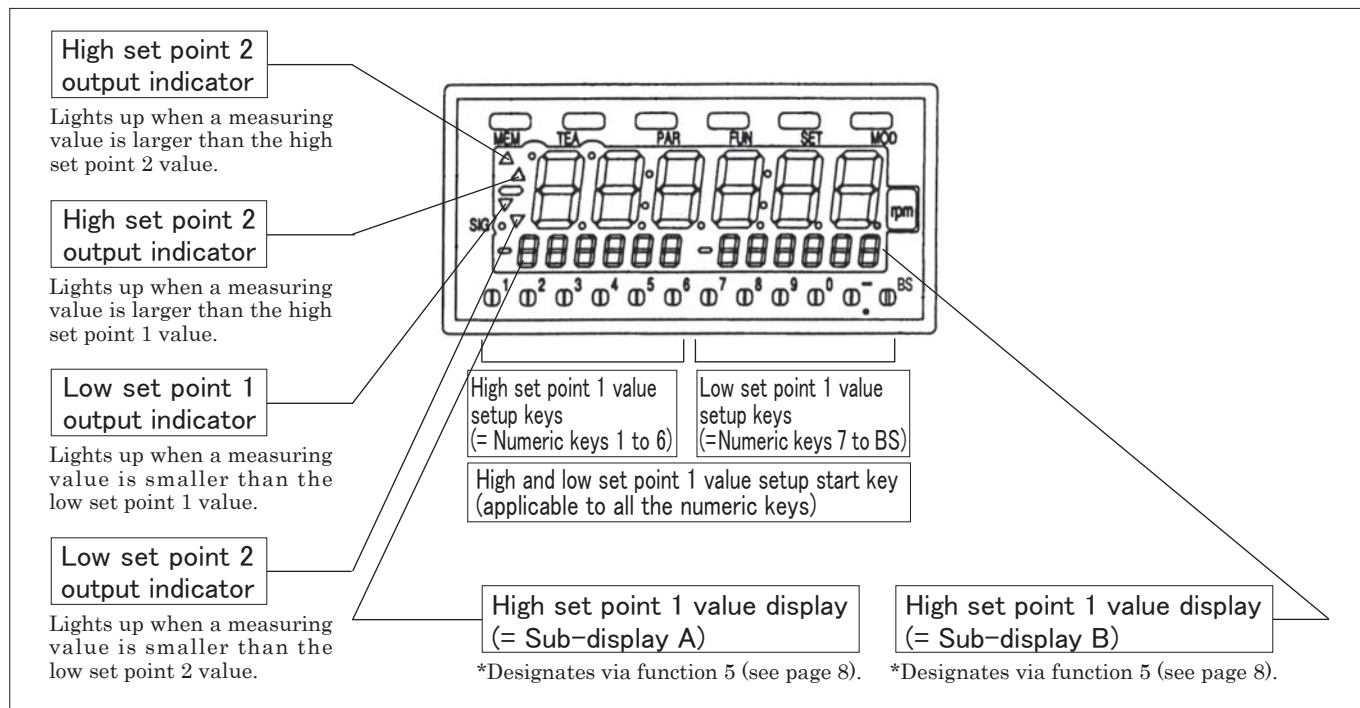Since the flow rate per second is obtained, multiple by 60.

High and Low Set Point 1 Values Setup

When an output value is larger than the set high set point 1 value, or smaller than the set low set point 1 value, each output display section (see below) lights up. Also, combining with optional equipment, signals can be output*.
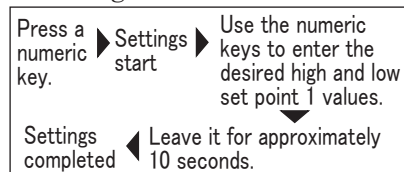
* High and low set point 1 value evaluation is only displayed. When signal output is required, please purchase the following
   optional equipment.
・Relay signal output:　　　　1st optional equipment DOP-CPTR
・Transistor signal output:　　1st optional equipment DOP-TRTR

●Keys used for high and low set point 1 value settings and their functions

High set point 2 output indicator
Lights up when a measuring value is larger than the high set point 2 value.

High set point 2 output indicator
Lights up when a measuring value is larger than the high set point 1 value.

Low set point 1 output indicator
Lights up when a measuring value is smaller than the low set point 1 value.

Low set point 2 output indicator
Lights up when a measuring value is smaller than the low set point 2 value.

High set point 1 value setup keys (= Numeric keys 1 to 6)

Low set point 1 value setup keys (=Numeric keys 7 to BS)

High and low set point 1 value setup start key (applicable to all the numeric keys)

High set point 1 value display (= Sub-display A)
*Designates via function 5 (see page 8).

High set point 1 value display (= Sub-display B)
*Designates via function 5 (see page 8).

■Setting Procedure

Press a numeric key. ▶ Settings start ▶ Use the numeric keys to enter the desired high and low set point 1 values.

Settings completed ◀ Leave it for approximately 10 seconds.

Press a numeric key to start high and low set point 1 value settings.
After entering the desired values via the numeric keys*, either wait for approximately 10 seconds or press the [SET] key. Then, settings are completed.

*High and low set point 1 values setup key (= Numeric keys)

When entering the desired high and low set point 1 values (up to 6 digits), each numeric key relates to each digit for high and low set point 1 values as follows:

・High set point 1 value setup keys

Desired high set point 1 value digits	6	5	4	3	2	1
Numeric keys	1	2	3	4	5	6

・Low set point 1 value setup keys

Desired low set point 1 value digits	6	5	4	3	2	1
Numeric keys	7	8	9	0	–.	BS

Every time a numeric key is pressed, the display changes as
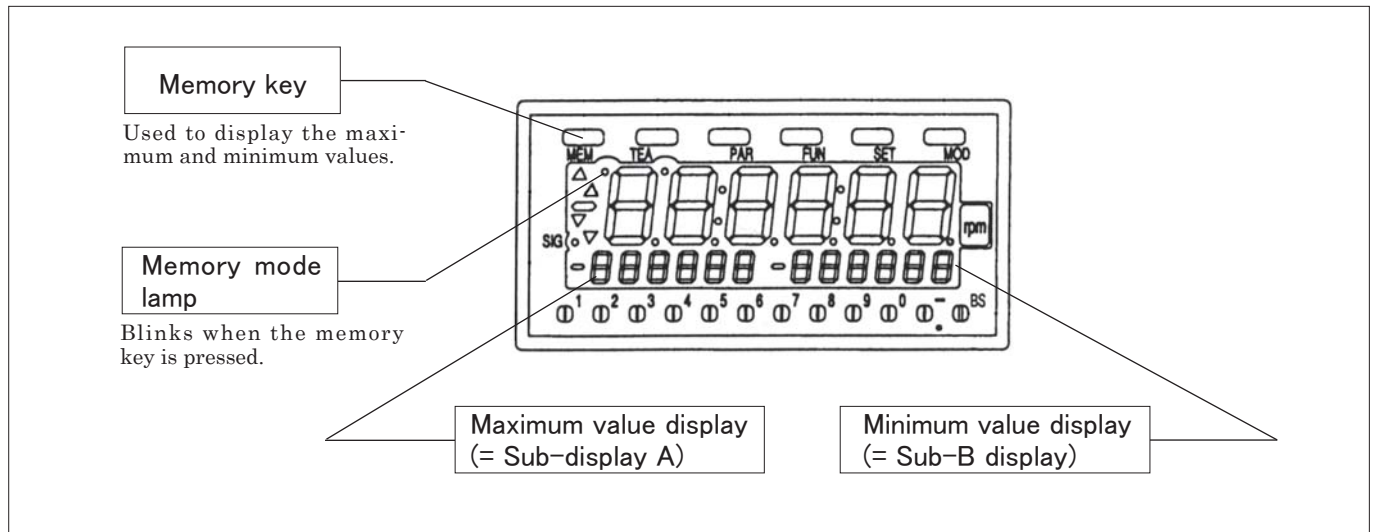" 0 → 1 → 2 → 3 "
     ↑————— 9 ←——┘
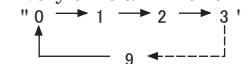
Note) The sub-displays do not display the decimal point.
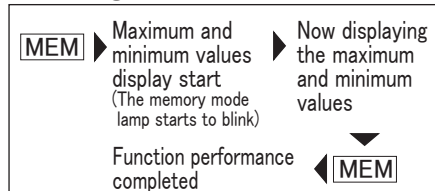When setting "100.0," enter "1000."

Memory Function (Maximum and Minimum Value Display) Settings

With this function, while performing regular measurement, the maximum (displayed on sub-display A) and minimum (displayed on sub-B display) values can simultaneously be checked.

●Keys used for memory function settings and their functions

Memory key

Used to display the maximum and minimum values.

Memory mode lamp

Blinks when the memory key is pressed.

Maximum value display (= Sub−display A)

Minimum value display (= Sub−B display)

■Setting Procedure

| MEM | ▶ | Maximum and minimum values display start (The memory mode lamp starts to blink) | ▶ | Now displaying the maximum and minimum values |

Function performance completed ◀ MEM

Press the [MEM] key to start maximum and minimum value display.
Until the [MEM] key is pressed again, these values remain displayed.

Note) The sub-displays do not display the decimal point.
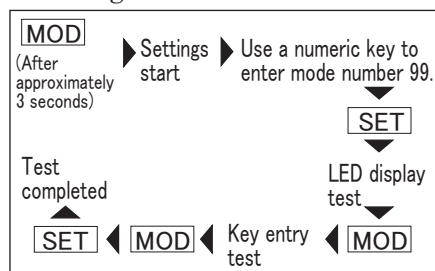
Test Mode Setting (Function to check the unit is operating correctly)

The test mode is a function to check the unit is operating correctly. For both DT-5TXR and DT-5TFR, this mode is used to perform self-diagnosis of the internal circuit (LED display test/key entry test). The mode number is 99.

■Test Type

LED display test   Checks if the main display's LED is functioning correctly, via its lighting.

Key entry test   Checks if each key entry is performed correctly via the display related to each key.

■Setting Procedure

MOD (After approximately 3 seconds) ▶ Settings start ▶ Use a numeric key to enter mode number 99.

SET

LED display test

Key entry test ◀ MOD

Test completed

SET ◀ MOD ◀

Press the [MOD] key to start the test mode.
Press the [SET] key to start the test. First, perform the LED display test and when this test is completed, press the [MOD] key to start the key entry test. When both tests are completed, press the [MOD] key again, and the display returns to the LED display test mode. Then press the [SET] key, and the tests are completely finished.

14

●Test mode (mode 99) is set up here.

Regular display
"500.0" is displayed on the main display,
"7000," on the sub-display A, and "4000,"
on the sub-B display.

```
    500.0
 7000    4000
```

↓

Hold down the [MOD] key for approxi-
mately 3 seconds. "500.0" displayed on
the main display blinks and the currently
selected mode's number appears.
* When this is the first time to set up the
mode after purchasing this unit, default
mode "1 (tachometer mode)" that has been
selected upon shipping is displayed.

```
  -01-
```

⋮

Every time a numeric key is pressed, the
display changes to the next mode.

```
1 → 2 → 3 → 4
↑              ↓
     99 ←
```

At this time, select mode 99 (test mode).

```
  -99-
```

Press the [SET] key to start the LED display
test.

↓

[LED display test]

The main display's LED
lights up. When numbers
from 111111 to 000000 are dis-
played repeatedly, the display
is operating correctly. Also,
the decimal point is displayed
in order.

```
 111111
111111 111111
```
⋮
```
 999999
999999 999999
```
↓
```
 000000
000000 000000
```

Press the [MOD] key to start the key entry
test.

[Key entry test]

"-99-F01" is displayed on the
main display, and "003," on
the sub-display A.

```
 -99-F01
  003
```

↓

Press the [MEM] key and "1" is
displayed on the main display's
first digit.
In the same manner, press each
key and "1" is displayed on the
related display digit (LED)*

*There is no entry test for the
[SET] and [MOD] keys.

Keys related to the main display
MEM TEA PAR FUN SET MOD
```
 1000
000000 000000
```
①②③④⑤⑥ ⑦⑧⑨⓪⊖⊗
Keys related to the   Keys related to the
sub-display A   sub-display B

Press the [MOD] key, and the display returns
to the LED display test mode.

[LED display test]

↓

* LED related to each key is as follows:
MEM Main display's 6th digit
TEA Main display's 5th digit
PAR Main display's 4th digit
FUN Main display's 3rd digit

① Sub-display A's 6th digit
② Sub-display A's 5th digit
③ Sub-display A's 4th digit
④ Sub-display A's 3rd digit
⑤ Sub-display A's 2nd digit
⑥ Sub-display A's 1st digit
⑦ Sub-display B's 6th digit
⑧ Sub-display B's 5th digit
⑨ Sub-display B's 4th digit
⓪ Sub-display B's 3rd digit
⊖ Sub-display B's 2nd digit
⊗ Sub-display B's 1st digit

Press the [SET] key, and the display returns
to the regular display mode.

```
    500.0
 7000    4000
```

↓

Test mode completed

Error Display

For both DT-5TXR and DT-5TFR, when any operation problem occurs, it is displayed to notify you. Refer to the
following table to locate the error and take appropriate countermeasures.

Display Area	Display	Error	Measure
Main display	–.–.–.–.–	Displayed when overflow indication (the number of display value digits exceeds that of the display's digits) occurs.	When input signal enters the measurement range (display digit range), the measuring value is displayed.
Main display	EE-1	Displayed when input half amplitude is 10msec or less in mode 3 (time width mode).	Adjust the input half amplitude to the measurement range.
Main display	EE-2	Displayed when a value to be entered exceeds the field adjustment range (input rpm is 99,999 or more).	Reduce the input rpm and perform the field adjustment.
Main display	EE-3	Internal memory calling error	Press the [SET] key to recover the error display. Note)

* When problems other than the above-mentioned occur, please contact us.
Note) When parameters return to the default values, set them up again. Also, if "EE-3" cannot be recovered, please contact us.

Optional Equipment (Commonly Used for DT-5TXR/ DT-5TFR)

For both DT-5TXR and DT-5TFR, if you purchase a model with optional equipment, be sure to check its model, specifications, and wiring method for the correct use.

1st option (terminal block output)	**DOP−FVTR**	Analog signal	Caution
2nd option (connector output)	**DOP−FVC**	(voltage/current) output	

Caution
In case of assembling the first option to DT-5TXR unit body after purchasing,
please note that only the options with "R" at the foot of model name can be connected to the unit.

● Specifications
(Commonly Used for DOP-FVTR and DOP-FVC)

Model	DOP−FVTR/DOP−FVC		
Output	Current output	4 to 20mA	
	Voltage output	0 to 10V ± 10V when displaying "−" on the ratio meter.	Only one output can be used among these three.
		1 to 5V	
		0 to 1V ± 1V when displaying "−" on the ratio meter.	
Load	Current output	500 Ω or less	
	Voltage output	1k Ω or less	
Connector used (DOP−FVC)	[On DT−5TXR/DT−5TFR side] PCS−E36LMD [On the plug side] Plug: PCS−E36SF,Cover: PCS−E36LA (both manufactured by Honda Communication)		

* The user must perform cable connection (only for DOP-FVC).

● Setting(For DOP-FVTR/DOP-FVC)

Please refer "Function" in the Instruction Manual of Digital Tachometer or Ratio meter at same time.

・When DOP-FVTR or FVC is installed,the following function shall be available.

Function No.	Setting item	Explanation
F11	Display value at Maximum Analog	Setting display value for the maximum value of each output signal (10V, 5V, 1V & 20mA).
F12	Display value at Minimum Analog output	Below this display value, each output shall clip to minimum value (0V, 1V & 4mA). Normally Zero "0" is selected.
F13	Update time of Analog output signal	Setting "0" :Fastest (Prox. 10msec), Setting "1" :Same as display cycle
F14	Offset of Analog output signal	The value sated by % of maximum output signal (10V, 1V) as 100% 4 ~ 20mA:16mA is 100% 1 ~ 5V :4V is 100% Normally Zero "0" is selected.

* Digital ratio meter is only available to install DOP-FVC.
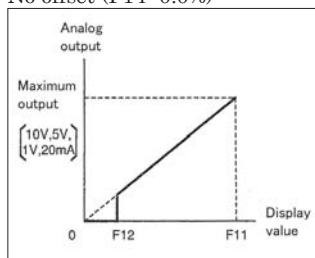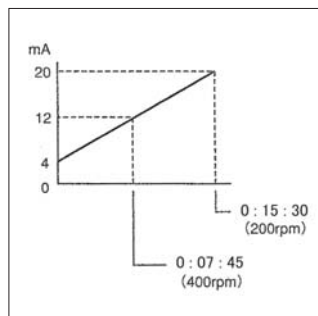
No offset (F14=0.0%)　　　Offset is used (F14=20.0%)
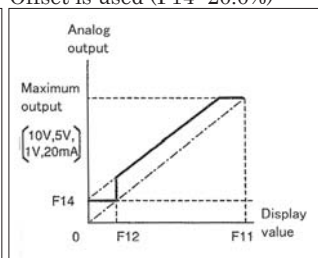
[Setting example 3]

Number of pulses is one per revolution.When elapse time(display value) is 0:15:30 at 250rpm,analog output signal is 20mA.Update time is the same as display cycle.
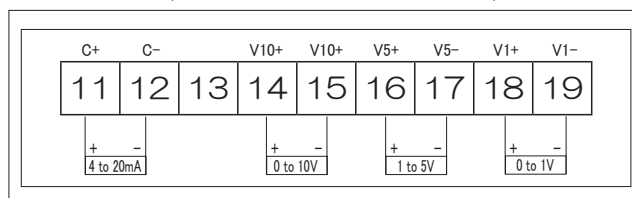

Parameter		
P1	P2	P3
100	200	0:15:30

Function			
F11	F12	F13	F14
0:15:30	0	1	0.0

* Other Parameters and Functions shall be initial value.

● Wiring
DOP-FVTR (Terminal block connection)

C+	C−		V10+	V10+	V5+	V5−	V1+	V1−
11	12	13	14	15	16	17	18	19

4 to 20mA　　0 to 10V　　1 to 5V　　0 to 1V

* Use one output among these.

DOP-FVC (Connector connection)

| Symbol	Pin Number		Symbol
C+ 4 to 20mA+	1	19	C− 4 to 20mA−
	2	20	
No connection	3	21	No connection
No connection	4	22	No connection
No connection	5	23	No connection
No connection	6	24	No connection
No connection	7	25	No connection
No connection	8	26	No connection
V10+ 0 to 10V+	9	27	V10− 0 to 10V−
	10	28	
No connection	11	29	No connection
No connection	12	30	No connection
V5+ 1 to 5V+	13	31	V5− 1 to 5V−
	14	32	
No connection	15	33	No connection
No connection	16	34	No connection
V1+ 0 to 1V+	17	35	V1− 0 to 1V−
	18	36	

* Use one output among these.

[Setting example 1]

Number of pulse is one per revolution.When display value is 46.8m/min at 1200rpm,analog output signal is 10V.Minimum output signal is 0V and update time is same as display cycle.

Parameter		
P1	P2	P3
1	1200	46.8

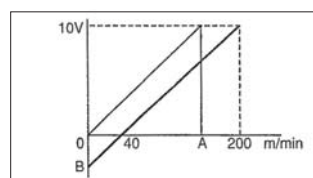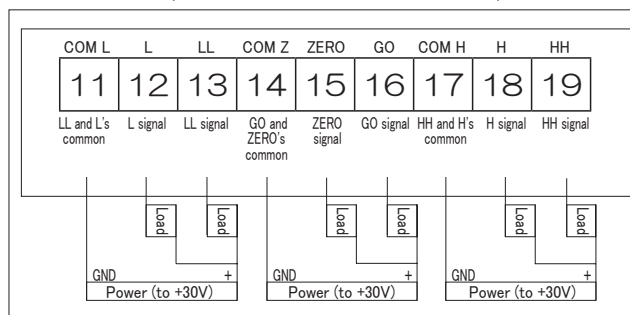| Function			
F11	F12	F13	F14
46.8	0.0	1	0.0
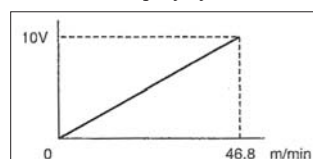
* Other Parameter and Functions shall be initial value.

[Setting example 2]

Number of pulses are sixty per revolution.When display value is 200m/min at 1000rpm,analog output signalis 10V.At 40m/min,analog output signal is 0V.Update time is fastest as 10msec.
・step 1 : On the chart,pull the line between 0V at 40m/min and 10V at 200m/min.
・step 2 : Pull the parallel line against above line. Calculate the speed(A=F11)at 10V. A=200-40=160m/min
・step 3 : Calculate offset voltage(B) at 30m/min. B=-40÷160×10=-2.5V
・step 4 : Calculate B value as %(C). C=-2.5÷10×100=-25.0%

Parameter		
P1	P2	P3
60	1000	200

Function			
F11	F12	F13	F14
160	0	0	−25.0

* Other Parameters and Functions shall be initial value.
* Below 40m/min,output signal shall be negative.

Optional Equipment (Commonly Used for DT-5TXR/ DT-5TFR)

For both DT-5TXR and DT-5TFR, if you purchase a model with optional equipment, be sure to check its model, specifications, and wiring method for the correct use.

1st option (terminal block output)	DOP−TRTR	Transistor output

Caution
In case of assembling the first option to DT-5TXR unit body after purchasing,
please note that only the options with "R" at the foot of model name can be connected to the unit.

●Specifications
（Commonly Used for DOP-TRTR ）

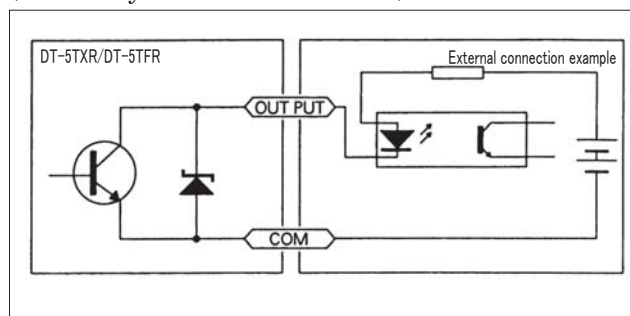| Model	DOP−TRTR	
Output capacity	DC30V 20mA Open collector	
Residual voltage	VOL = 1.5V or less	
Output signal	Measuring value < LL set value	LL signal ON
	Measuring value < L set value	L signal ON
	L set value ≦ Measuring value ≦ H set value	GO signal ON
	H set value < Measuring value	H signal ON
	HH set value < Measuring value	HH signal ON
	Measuring value = 0	ZERO signal ON
Connector used	[On DT−5TXR/DT−5TFR side] PCS−E36LMD [On the plug side] Plug: PCS−E36SF,Cover: PCS−E36LA (both manufactured by Honda Communication)	
Output is insulated from the internal circuit.		
Transistor ON at output		

●Wiring
DOP-TRTR (Terminal block connection)

COM L	L	LL	COM Z	ZERO	GO	COM H	H	HH
11	12	13	14	15	16	17	18	19
LL and L's common	L signal	LL signal	GO and ZERO's common	ZERO signal	GO signal	HH and H's common	H signal	HH signal

Load Load   Load Load   Load Load

GND   +   GND   +   GND   +
Power (to +30V)   Power (to +30V)   Power (to +30V)

* Use one output among these.

Output circuit
(commonly used for DOP-TRTR)

DT−5TXR/DT−5TFR

External connection example

OUT PUT

COM

Optional Equipment (Commonly Used for DT-5TXR/ DT-5TFR)

For both DT-5TXR and DT-5TFR, if you purchase a model with optional equipment, be sure to check its model, specifications, and wiring method for the correct use.

2nd option（connector output）　**DOP-BCD** BCD output

●Specifications

| Model		DOP-BCD
NPN open collector output	Output capacity	DC30V 20mA
Open collector input	Open collector (NPN) input	
	LO input	Load capacity: 5mA or more 0 to 1.5V
	HI input	Leakage current: 0.1mA or less
Data output	6-digit BCD code	
Decimal point output	DP 1 to 4 (10^{-1} to 10^{-4} digits)	
Control output	PLUS	This signal changes into LO when data output is positive.
	DT OUT	Output signal is defined when this signal is HI.
	OVR	When the display value changes into overflow indication, this signal changes into LO.
Control input	HOLD	Data is not updated while this signal is LO.
	ENABLE	Output becomes all at high impedance while this signal is LO.
Connector used*		[On DT-5TXR/DT-5TFR side] PCS-E36LMD [On the plug side] Plug: PCS-E36SF, Cover: PCS-E36LA (both manufactured by Honda Communication)
BCD output and decimal point output can be set to either negative or positive logic.(Use function 10 to select either one.)		

* The user must perform cable connection.

●Wiring（Connector connection）

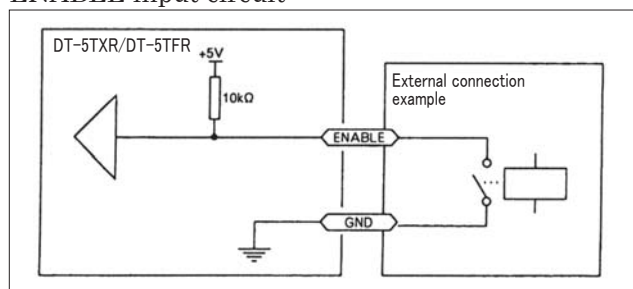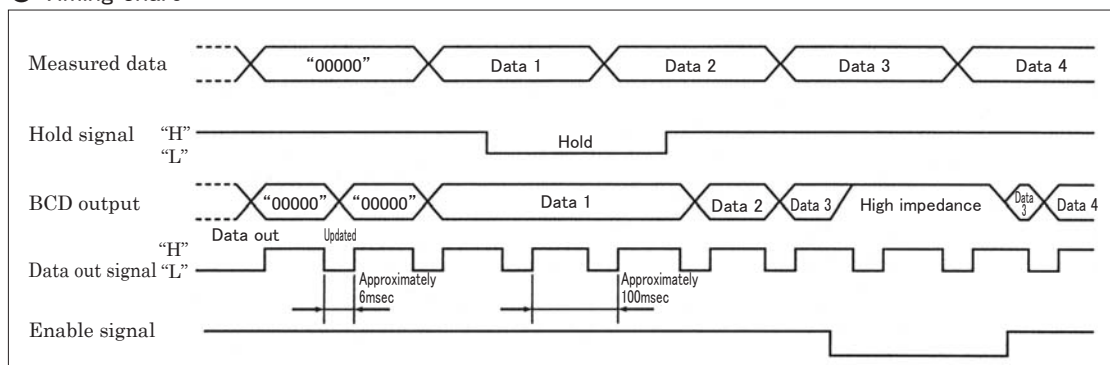| Input/ Output	Symbol		Pin Number		Symbol		Input/ Output
Output	$\times 10^0$	1	1	19	1	$\times 10^3$	Output
		2	2	20	2		
		4	3	21	4		
		8	4	22	8		
	$\times 10^1$	1	5	23	1	$\times 10^4$	
		2	6	24	2		
		4	7	25	4		
		8	8	26	8		
	$\times 10^2$	1	9	27	1	$\times 10^5$	
		2	10	28	2		
		4	11	29	4		
		8	12	30	8		
	PLUS		13	31	DP1		
	DT OUT		14	32	DP2		
	OVR		15	33	DP3		
Input	HOLD		16	34	DP4		
	ENABLE		17	35	GND		
	GND		18	36	GND		

Output circuit
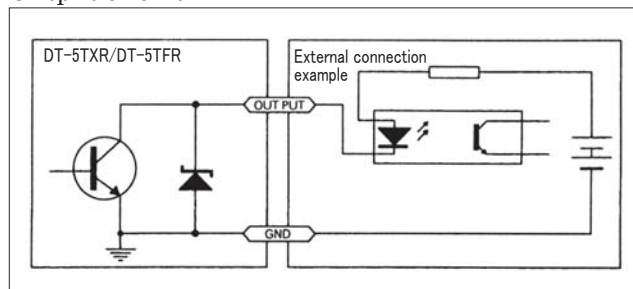
HOLD input circuit
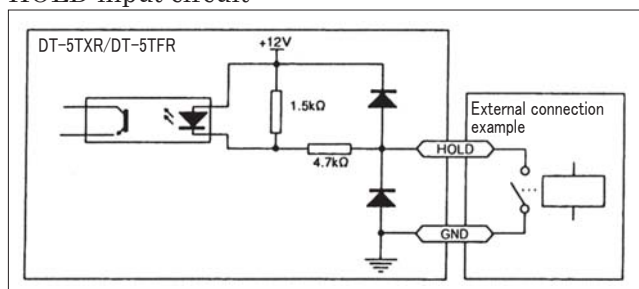
ENABLE input circuit

● Timing chart

# Optional Equipment (Commonly Used for DT-5TXR/ DT-5TFR)

For both DT-5TXR and DT-5TFR, if you purchase a model with optional equipment, be sure to check its model, specifications, and wiring method for the correct use.

| 1st option (terminal block output) | DOP−CPTR | Relay output |

●Specifications

Model		DOP−CPTR	
Output contact		1C	
Rated load	Resistant load	AC250V 5A 100,000 times	
	Inductive load cos φ =0.4	DC30V 5A 100,000 times	
		DC30V 5A 100,000 times	
		DC30V 2.5A 100,000 times	
Output signal	Measuring value < L set value		L signal ON
	L set value ≦ Measuring value ≦ H set value		GO signal ON
	H set value < Measuring value		H signal ON

●Wiring (Terminal block connection)
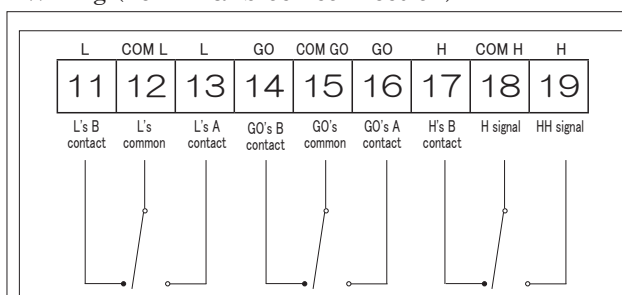
Output circuit
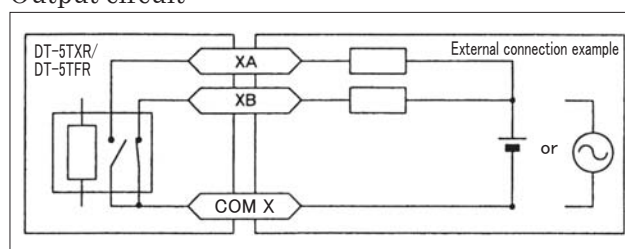
DT-5TXR/ DT-5TFR Series List

This operation manual is applicable to the following models:

	Model		1st Optional Equipment (Terminal Block Output)		2nd Optional Equipment (Connector Output)	
	AC power specifications	DC power specifications				
Standard Input Series	DT−5TXAR	DT−5TXDR	–		–	
	DT−5TXAR−FVC	DT−5TXDR−FVC			DOP−FVC	Analog signal (voltage/current) output
	DT−5TXAR−BCD	DT−5TXDR−BCD			DOP−BCD	BCD output
	DT−5TXAR−FVTR	DT−5TXDR−FVTR	DOP−FVTR	Analog signal (voltage/current) output	–	
	DT−5TXAR−FVTR−BCD	DT−5TXDR−FVTR−BCD			DOP−BCD	BCD output
	DT−5TXAR−CPTR	DT−5TXDR−CPTR	DOP−CPTR	Relay output	–	
	DT−5TXAR−CPTR−FVC	DT−5TXDR−CPTR−FVC			DOP−FVC	Analog signal (voltage/current) output
	DT−5TXAR−CPTR−BCD	DT−5TXDR−CPTR−BCD			DOP−BCD	BCD output
	DT−5TXAR−TRTR	DT−5TXDR−TRTR	DOP−TRTR	Transistor output	–	
	DT−5TXAR−TRTR−FVC	DT−5TXDR−TRTR−FVC			DOP−FVC	Analog signal (voltage/current) output
	DT−5TXAR−TRTR−BCD	DT−5TXDR−TRTR−BCD			DOP−BCD	BCD output
Differential Input Series	DT−5TFAR	DT−5TFD	–		–	
	DT−5TFAR−FVC	DT−5TFD−FVC			DOP−FVC	Analog signal (voltage/current) output
	DT−5TFAR−BCD	DT−5TFD−BCD			DOP−BCD	BCD output
	DT−5TFAR−FVT	DT−5TFD−FVTR	DOP−FVTR	Analog signal (voltage/current) output	–	
	DT−5TFAR−FVT−BCD	DT−5TFD−FVTR−BCD			DOP−BCD	BCD output
	DT−5TFAR−CPT	DT−5TFD−CPTR	DOP−CPTR	Relay output	–	
	DT−5TFAR−CPT−FVC	DT−5TFD−CPTR−FVC			DOP−FVC	Analog signal (voltage/current) output
	DT−5TFAR−CPT−BCD	DT−5TFD−CPTR−BCD			DOP−BCD	BCD output
	DT−5TFAR−TRT	DT−5TFD−TRTR	DOP−TRTR	Transistor output	–	
	DT−5TFAR−TRT−FVC	DT−5TFD−TRTR−FVC			DOP−FVC	Analog signal (voltage/current) output
	DT−5TFAR−TRT−BCD	DT−5TFD−TRT−RBCD			DOP−BCD	BCD output

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