


# DTK-A Small-size Displacement Transducer INSTRUCTION MANUAL

Thank you for purchasing this KYOWA product. Before using it, please read this instruction manual carefully. Also, keep the manual within easy reach so that you can refer to whenever necessary.

Specifications and dimensions described in this manual could be changed without notice. Please visit our website for the latest version.

## 1. Calling the operator's attention

The following cautionary symbols and headlines are used to invite the operator's attention. Be sure to observe the accompanying precautions in order to safeguard the operator and preserve the performance of the instrument.

	<b>Warning</b>	Improper operation of the system may result in severe injury of the operator.
<b>Caution</b>		Cautions are given to invite the operator's attention, in order to avoid instrument failure or mal-function.

## 2. Important notice

Unless specified, strain-gage transducers must not be used under hydrogen environment.

## 3. Safety precautions



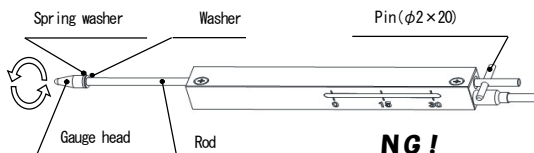
**Warning**

- As you push the rod inward, the rod returns to its initial position by reaction force. Handle the product with care to avoid eye poking.

## 4. Handling precaution

### Caution

- Do not apply excessive axial or bending force on the rod.
- When changing the gauge head or screws, be sure to insert the accessory pin ( $\phi 2 \times 20$ ) through the hole, located on the cable side of the rod, to secure the rod in place. Or, the transducer will be damaged.



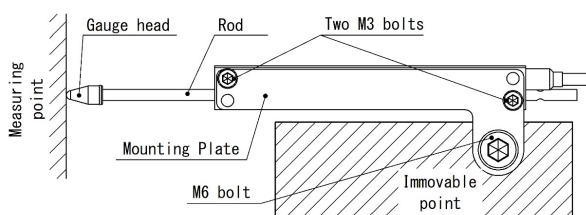
(Note)

Do not turn the gauge head while holding the body.

- Do not disassemble the product.
- Do not use the product under water and dusty environment.
- Avoid usage in vibration.
- Pay similar attentions toward the product as one gives to regular dial gages.
- Always keep the rod clean.
- Make sure that the bending radius of cable is longer than 10 times of a diameter of the cable.

## 5. Installation

- 5.1 Fix the transducer to an immovable point as illustrated, using an M6 bolt and the accessory plate, two M3 bolts. So, arrange the M6 bolt by yourself.



- 5.2 Initial unbalance with the rod fully extended is approximately -2.5 to -0.5 mV/V.

- 5.3 Make sure the displacement of about 0.3 mm is applied to the transducer.

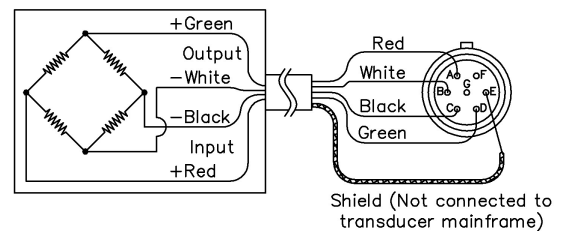
- 5.4 Same as other dial gauges, the probe is made to contact the measuring point for measuring. However, when a measuring dynamic phenomenon, that the rod may fail to respond to it on occasion. So make sure before measuring that it can respond.

- 5.5 To fix the rod to the measuring point, remove the gauge head then fix to the measuring point, using the M2.5 screw or the M2.5 screw which is on the other end of the transducer.

## 6. Connection

- 6.1 Connect the transducer to a measuring instrument.

- 6.2 When using a measuring instrument other than KYOWA, connector plug as follows.



- 6.3 After the power ON, always preheat the product for approximately 5 to 10 minutes.

## 7. Conversion

- 7.1 Use the calibration constant described on the Test Data Sheet to convert a measured value into a displacement value.

- 7.2 When a strain amplifier is in use, output reads in  $\times 10^6$  equivalent strain. Find a displacement value corresponding to  $\times 10^6$  strain. Then, obtain a displacement value through multiplication using the following equation.

$$\text{Displacement (mm)} = \text{Strain amplifier's output} (\times 10^6 \text{ strain}) \times \text{Calibration constant (mm}/1 \times 10^6 \text{ strain})$$

- 7.3 When using an amplifier of other type or a recorder, first find the exact bridge exciting voltage applied. Second, find the displacement value that corresponds to 1( $\mu$ V) output voltage against 1(V) bridge excitation voltage. Then, obtain the displacement value through multiplication using the following equation.

$$\text{Displacement (mm)} = \frac{\text{Bridge output voltage } (\mu\text{V})}{\text{Bridge excitation voltage (V)}} \times \text{Calibration constant (mm}/1\mu\text{V/V})$$

## 8. Storage precautions and inspection

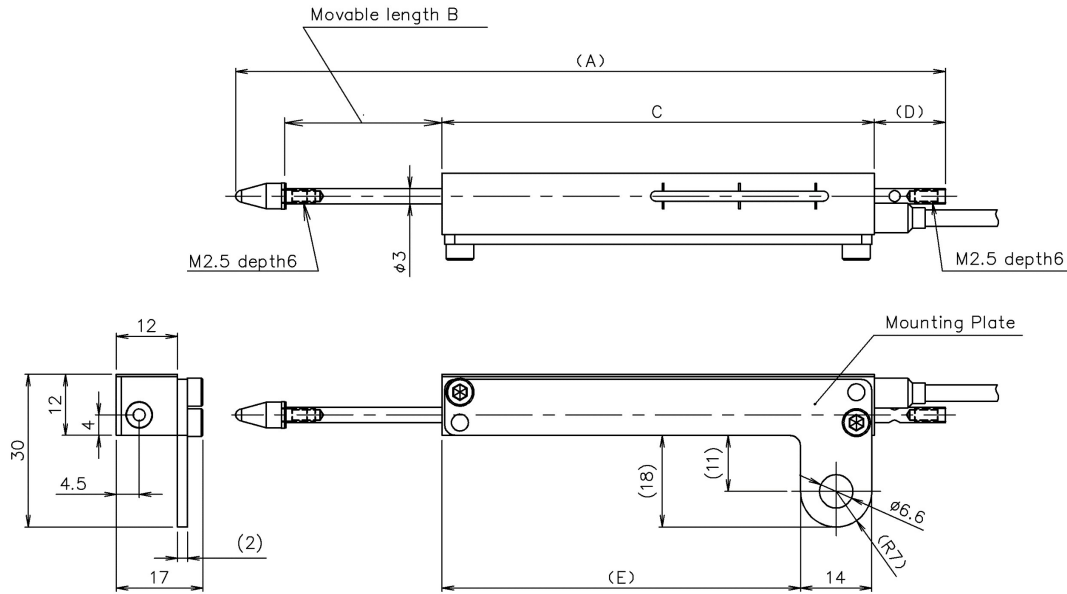
- 8.1 Avoid water, dust and oil from the product.
- 8.2 For storage, be sure to put the accessory protection tube on the rod.
- 8.3 Recommend calibrate the product once a year or so. (Contact your KYOWA representative.)
- 8.4 If an abnormal initial value or reading appears, measure input resistance, output resistance as well as insulation resistance (which should be 100M $\Omega$  or higher).  
If abnormal resistance is found, the cause may be failure of the sensing element. In this case, contact your KYOWA representative.

### Caution

- To measure insulation resistance, apply a voltage lower than 50V to the insulation resistance tester.

Note: Use XS-5-DT or XS-2-DT probes for a measuring object whose shape is spherical.

## 10. Dimensional drawing



Note: It is the size when attaching the attached mounting plate.

Models	Mounting Plate	(A)	B	C	(D)	(E)
DTK-A-30	DTK30-LP	140	31	85	14~45	71
DTK-A-50	DTK50-LP	196	51	120	14~65	106

## 11. Specifications

Models	Rated capacity	Frequency Response	Weight (Approx.)
DTK-A-30	30 mm	DC to approx. 10Hz	25 g
DTK-A-50	50 mm	DC to approx. 6Hz	34 g

## ◆ Performance

Rated Capacity	See table above.
Nonlinearity	Within $\pm 0.3\%$ RO
Hysteresis	Within $\pm 0.3\%$ RO
Repeatability	0.3%RO or less
Repeatability	2.5 mV/V or more

### ◆Environmental Characteristics

Safe Temperature	-10 to 70°C(Non-condensing)
Compensated Temperature	0 to 60°C (Non-condensing)
Temperature Effect on Zero	Within $\pm 0.05\%/^{\circ}\text{C}$
Temperature Effect on Output	Within $\pm 0.05\%/^{\circ}\text{C}$

### ◆Electrical Characteristics

Safe Excitation	6V AC or DC
Recommended Excitation	1 to 5 VDC
Input Resistance	350Ω ±3%
Output Resistance	350Ω ±3%
Cable	4-conductor (0.08mm <sup>2</sup> ) vinyl shielded cable, 3.2mm diameter by 3m long, terminated with a connector plug (PRC03-12A10-7M) (Shield wire is not connected to the case.)

### ◆ Mechanical Properties

Frequency Response	See table above.
Measuring Force	Approx. 2N
Weight	See table above. (Excluding Cable)
Compliance	Directive 2011/65/EU, (EU) 2015/863 (10 restricted substances) (RoHS)

[NOTE]

Products with CE Marking are compliant European RoHS Directive.

## ◆ Accessories

Mounting Plate (DTK30-LP)	1 (for DTK-A-30) (Note)
Mounting Plate (DTK50-LP)	1 (for DTK-A-50) (Note)

Note: One Mounting Plate(DTK-LP) includes the following parts.

Mounting Plate	1
Rounded machine screw (M3×6)	1

Pin ( $\phi 2 \times 20$ )	1
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Probe (X-1-DT)	1(Note)
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Protection tube	1 (Note)
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Note: It is attached to the product at delivery.

Test Data Sheet 1

Instruction manual	1 (This book)
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### ◆ Optional Accessories

Extension Rods	EB-50,100
Mounting Plate	DTK30,50-LP
Mounting Band	FXB-30B
Replacement Probes	X,XS,SH,H