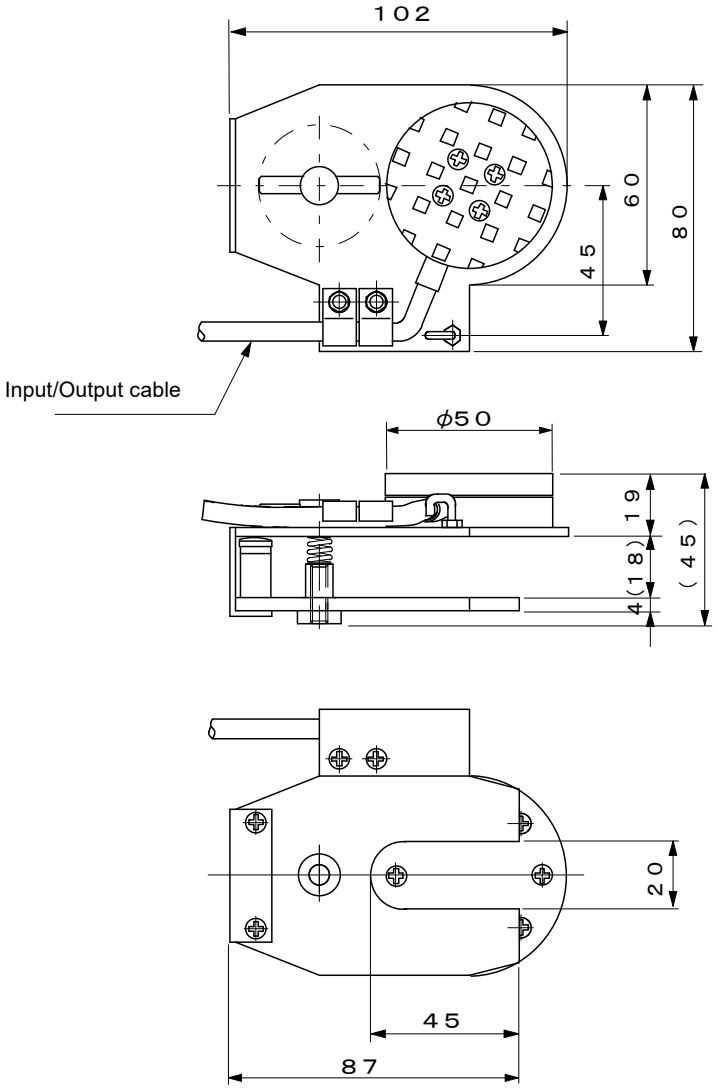
Operation Manual of TML Pedal Force Transducer

This operation manual applies to the following products:

MLA-1KNA

Products with special specifications are partly out of this manual.

1. DIMENSIONS



2. INSTALLATION

Please use the pedal force transducer with taking safety into consideration.
If the transducer is not installed correctly, precise measurement may not be achieved. Furthermore, the transducer may be deformed and/or broken.

1. Place the transducer so as to hold the pedal between the upper plate and the lower plate, and securely fasten the fixing screw. Installation is easily done by this procedure. Place the sensing area as close as possible to the central part of the pedal.

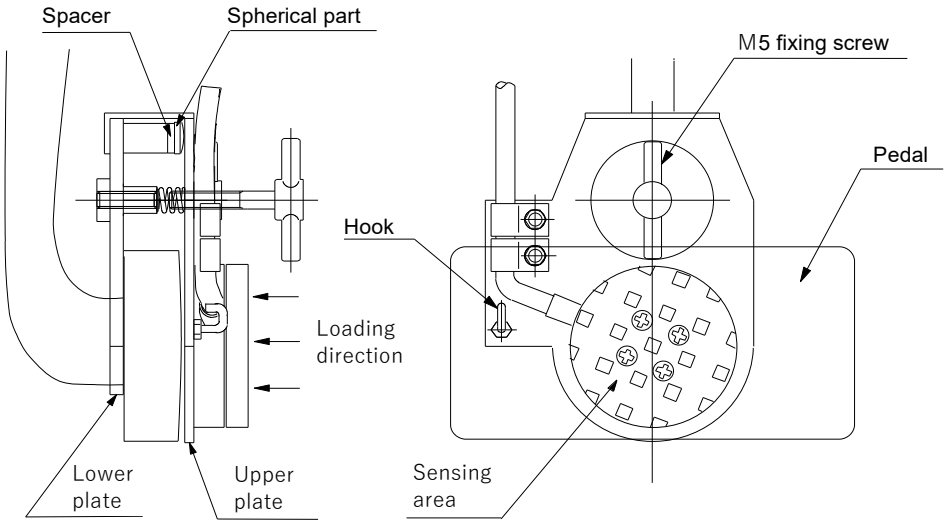
2. Be careful not to apply extreme load to the cable in order to avoid disconnection.

3. The hook is useful in installing a displacement transducer when displacement measurement is required.

4. The transducer is adjusted at the time of delivery supposing the pedal thickness to be 18mm. If necessary, it can be adjusted within the range of ±2mm using the spacer.
   When adjusting, remove the spherical parts and interchange the spacer with suitable ones.
   The spacers must be supplied by the customer. Washers on the market may also be used.

5. Ideally, it should be loaded straightly along the axis of the transducer.
   Output fluctuation may occur in the order of 3% at maximum when an eccentric load is applied depending on the pedaling point.

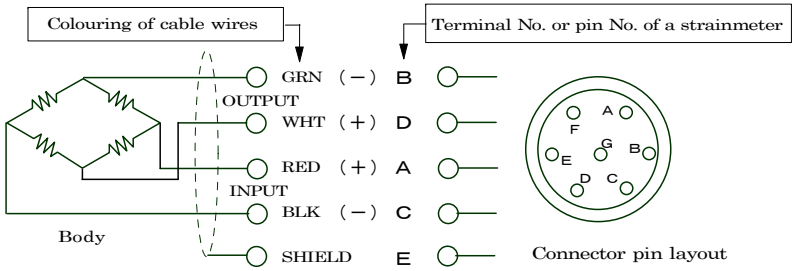
6. Never disassemble or modify the transducer in order to maintain its measurement accuracy.



3. MEASUREMENT

1. This transducer is calibrated with a constant voltage excitation type strain meter by using the supplied input/output cable.
   The rated output, calibration coefficient and zero balance shown on the test data are found with an instrument gauge factor of 2.00. (In case of TML data logger, its coefficient should be set to 1.000.)

2. The end of input/output cable usually has a connector plug in standard.
   The connector plug is connected to a strain meter.
   Please refer to the connecting layout.



・N.B. The shield wire of the cable is not connected to the transducer unit itself.

3. Set necessary measuring parameters to a strain meter, recorder, computer, etc.
   (for strain meter, for instance, initial balancing, sensitivity adjustment, setting of unit, coefficient and measure mode, initial value measurement, etc.)

4. The measured value changes in "+" polarity with increase in load. .

5. In ordinary measurement, it is recommended that a strain meter is previously set to direct measure mode in kN.
   In case of strain reading, load can be calculated by using the following equation:

Load	=	Measured value	×	Calibration coefficient
[kN]		[$\times 10^{-6}$]		[kN ／1×10^{-6}]

6. In case the length of cable is extended, you must correct the lowering of sensitivity by using the following equation:
   (N.B. only when bridge excitation is constant voltage.)

$$\text{Equation : } \varepsilon_o = \left\{1 + \frac{r}{R}\right\} \varepsilon$$

ε_o =	Real value after correction	[kN]	[$\times 10^{-6}$]
ε =	Measured value	[kN]	[$\times 10^{-6}$]
R =	Input resistance of transducer		[Ω]
r =	Resistance value of extended cable (Total resistance at input)		[Ω]

Sectional area of wire of extended cable (mm^2)	0.05	0.08	0.3	0.35	0.5
Total resistance value per meter (Ω)	0.63	0.44	0.12	0.11	0.071

4. CHECK and STORAGE

1. Measure initial unbalance value [$\times 10^{-6}$] in DIRECT mode of the strain meter.
   The initial unbalance value means strain output [$\times 10^{-6}$] at no load.

2. Using an insulation resistance tester with an excitation voltage of less than DC 50V, measure insulation resistance [MΩ] between input/output wires of the cable (4 pieces of red, green, black and white) and transducer unit itself.

3. Using a digital voltmeter or tester, measure terminal resistance [Ω] between output wires and/or input wires.

   Make sure that measured values in the above 1, 2 and 3 are not largely different from the values shown on the test data sheet.

4. For storage, avoid a high or low temperature, high humid place, dust, water drop, vibration, shock, etc.

5. STANDARD ACCESSORIES

Test data	1 copy
Operation manual	1 copy

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URL : www.tml.jp/e