

ABS Digimatic Indicator ID-SX2



Safety Precautions

To ensure operator safety, use this product in conformance with the directions, functions and specifications given in this User's Manual. Use under other conditions may compromise safety.

WARNING

- Always keep batteries out of reach of children, and if swallowed, consult a physician immediately.
- Batteries should never be short-circuited, disassembled, deformed or come in contact with extreme heat or flames.
- If battery alkaline liquid comes in contact with the eyes, flush eyes immediately with clean water and consult a physician. If battery alkaline liquid comes in contact with the skin, flush the exposed area thoroughly with clean water.

CAUTION

- Never attempt to charge the primary battery or reverse the positive-negative terminals when mounting. Improper battery handling or mounting may cause the battery to explode, cause battery leakage and/ or serious bodily injury or malfunctioning.
- Always handle the sharp measuring faces of this product with care to avoid injury.

NOTICE

- Do not disassemble or modify. This may cause damage.
- Large errors will result when used in places with significant temperature fluctuation, due to the thermal expansion of structural components and fixing jigs. Use in places with minimal temperature fluctuation whenever possible. Allow the product to adapt to the ambient temperature when using in a location with a different temperature.
- Do not store the product in a place with high humidity or a lot of dust. Also, avoid usage in places exposed to splashes of water or coolant.
- Do not apply excessive force or subject to sudden impacts such as dropping.
- Be sure to perform reference point setting before measurement.
- Remove dust, cutting chips, etc. before and after use.
- Do not write numbers, etc. with an electric pen. This may cause damage.
- Do not operate the keys with a pointed object (such as a screwdriver or ballpoint pen).
- Avoid loads in the vertical direction relative to the plunger or usage involving torsion to the plunger.
- This product is shipped without a battery. Install a battery before use.
- The battery supplied is for confirming the functions and performance of the product. Note that this battery may not fulfill the expected life.
- When disposing of batteries, follow local laws, regulations, etc.
- Malfunction or damage due to depleted batteries, etc. is not covered by the warranty.
- The dustproof type protects the plunger and bearing from dust, water, oil, etc. by attaching a rubber boot, etc. to the standard type. Note that the dustproof type is not completely waterproof. Do not immerse the product in liquid or use the product in a place where it is intensively exposed to oil or water.

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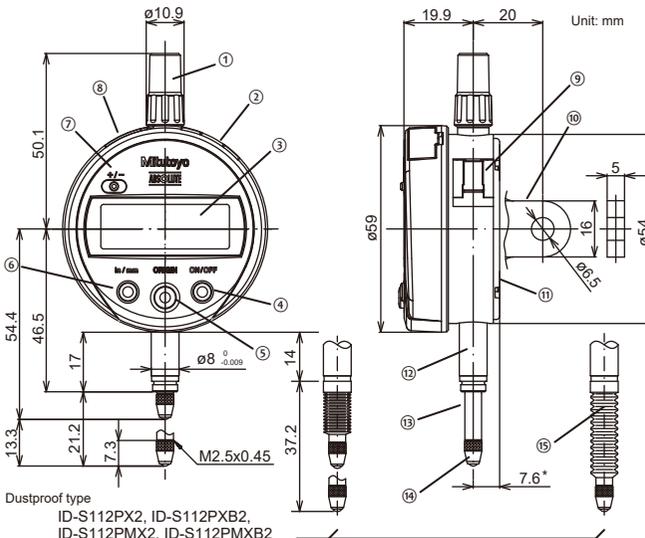
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1. Names and Dimensions of Components

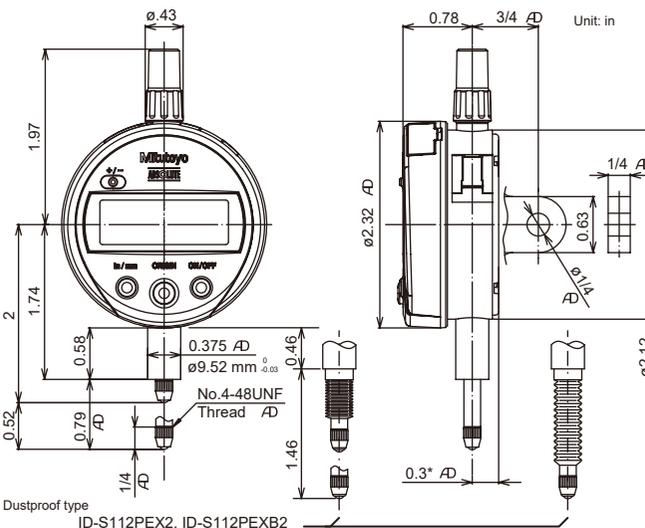
NOTICE

The product display does not rotate. Forcibly rotating the display may damage the product.

- ISO/JIS type
Back with lug type: ID-S1012X2, -S1012MX2, -S112X2, -S112MX2, -S112PX2, -S112PMX2
Flat back type*: ID-S1012XB2, -S1012MXB2, -S112XB2, -S112MXB2, -S112PXB2, -S112PMXB2



- AGD type
Back with lug type: ID-S1012EX2, -S112EX2, -S112TX2, -S112PEX2
Flat back type*: ID-S1012EXB2, -S112EXB2, -S112TXB2, -S112PEXB2



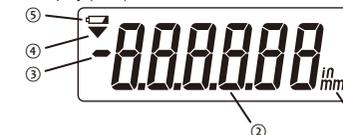
AD This is the symbol of American Gage Design (AGD). It means that this type conforms to appropriate dimensions of Dial Indicators in ASME/AGD 2 and has interchangeability.

- ① Cap
- ② Battery holder
- ③ Display (LCD)
- ④ [ON/OFF] key
- ⑤ [ORIGIN] key
- ⑥ [in/mm] key (except for ID-S1012X2, ID-S112X2, ID-S112PX2)
- ⑦ [+ / -] key
- ⑧ Output connector (with cap)
- ⑨ Lifting lever mount (left and right)
- ⑩ Back with lug
- ⑪ Flat back
- ⑫ Stem
- ⑬ Plunger
- ⑭ Contact point
- ⑮ Rubber boot (dustproof type only)

Tips

Dimensions with an asterisk (*) are for the flat back type. Dimensions without an asterisk (*) are common for the back with lug type and the flat back type.

Display (LCD)



- ① Unit display
- ② Measured value display
- ③ Sign display
- ④ Reverse count display
- ⑤ Battery voltage decrease display

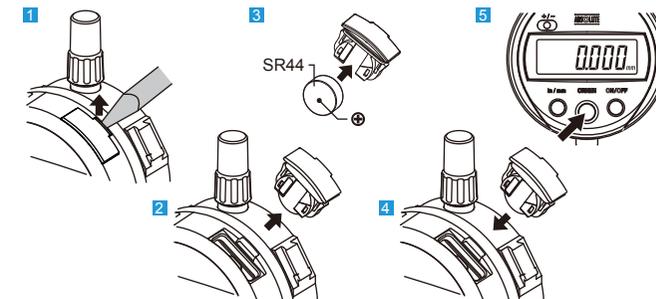
Key icon operation



2. Installing (Replacing) the Battery

NOTICE

- Be sure to use SR44 (silver oxide button battery No. 938882) for the battery.
- The product may display an error or malfunction if the battery holder is not mounted correctly.
- If the product will be out of use for 3 months or more, remove the battery and store it separately, to prevent damage to the product due to battery fluid leakage.
- Do not use a pointed object or excessive force to remove the battery holder. This may damage the battery holder.



- Use a flathead screwdriver or similar to remove the battery holder.
- If replacing an existing battery, remove the old battery.
- Insert a new battery into the battery holder with the "+" symbol facing the display (LCD).
- Attach the battery holder.
- Press the [ORIGIN] key for 1 second or more.

Tips

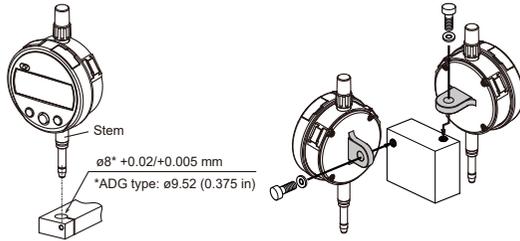
- If no value is displayed even when a battery is installed, reinstall the battery.
- Although the display may show garbled text, [E] (minimum digits) or [-----] just after installing the battery, this is not abnormal. Perform reference point setting as is (refer to "5. ORIGIN Setting (Reference Point Setting)").
- Reference point settings are cleared when the battery is removed. Perform reference point setting again after installing the battery.

3. Setup

1) Mounting to a stand, jig, etc.

NOTICE

- Whenever possible, avoid fixing the stem directly with a set screw, etc.
- The plunger may not be able to move smoothly if the screw is tightened with a tightening torque of 150 cN•m or more to secure the stem.



Tips

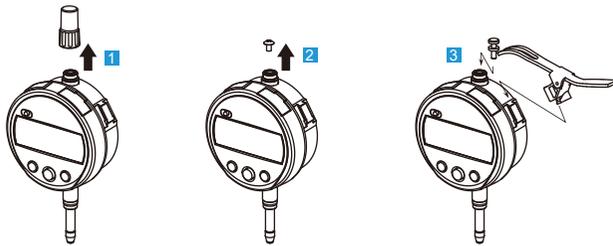
When mounting the product to a stand or jig, use the stem or lug on the back. If using the stem, use a slotted holder with a $\phi 8\text{ mm}$ or $\phi 9.52\text{ mm}$ hole with G7 (+0.005 mm to +0.02 mm).

2) Mounting the lifting lever

(Options: Part No. 21EZA198)

NOTICE

- Using the product while the stop screw is not secured firmly may damage internal components or the workpiece.
- If not mounting a stop screw, always mount the original screw on the plunger top end. Otherwise internal components or the workpiece may be damaged.



- 1 Rotate the cap counterclockwise to remove it from the product.
- 2 Fix the plunger, using pliers padded with a rag, etc., so that it does not turn, and then remove the screw (M2.5 at the top end of the plunger).
- 3 Mount the stop screw supplied with the lifting lever and, with the lever tip caught by the stop screw, mount the lifting lever on the lifting lever mount (dovetail).

Tips

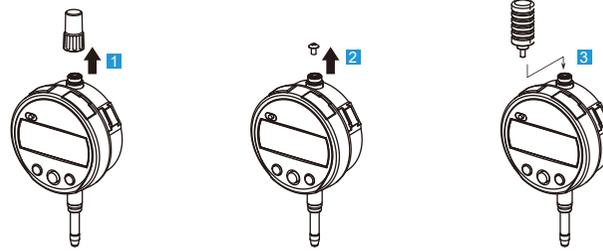
Store the removed screw and cap to prevent loss.

3) Mounting the lifting knob

(Options: Part No. 21EZA105)

NOTICE

- Using the product while the lifting knob is not secured firmly may damage internal components or the workpiece.
- If not mounting a lifting knob, always mount the original screw on the plunger top end. Otherwise internal components or the workpiece may be damaged.



- 1 Rotate the cap counterclockwise to remove it from the product.
- 2 Fix the plunger, using pliers padded with a rag, etc., so that it does not turn, and then remove the screw (M2.5) at the top end of the plunger.
- 3 Mount the lifting knob on the top end of the plunger.

Tips

Store the removed screw and cap to prevent loss.

4) Mounting the release (Optional part No. 21JZA295)



- 1 Rotate the cap counterclockwise to remove it from the product.

Tips

Store the removed screw and rubber cap to prevent loss.

- 2 Fix the plunger, using pliers padded with a rag, etc., so that it does not turn, and then remove the screw (M2.5) on top of the plunger.
- 3 Use the screw removed in step 2 to secure the mounting plate supplied with the release to the plunger.
- 4 Screw the release firmly into the hole.

5) Contact point replacement

NOTICE

When replacing the contact point, turn the contact point while fixing the plunger. Otherwise, the product may be damaged.

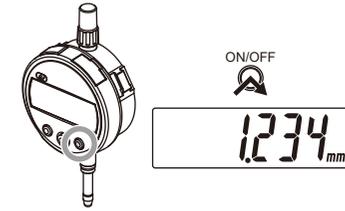


Mount and remove the contact point with a rag and 2 pairs of pliers (one for fixing the plunger) as shown in the figure.

Tips

- Changing the contact point may cause changes in external dimensions and measurement force, or restrictions on measurement directions.
- Errors due to the contact point (perpendicularity of flat contact point, center runout of roller contact point, etc.) are added to the measurement accuracy.
- Various contact points are available as options. Refer to the Mitutoyo MEASURING INSTRUMENTS CATALOG for details.

4. Power ON/OFF

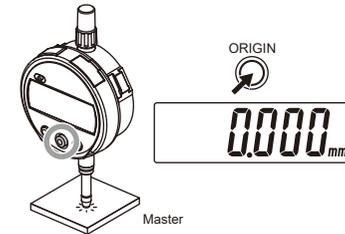


- 1 Press the [ON/OFF] key to turn the product on and off.

Tips

- If the power does not turn on even when the [ON/OFF] key is pressed, the battery may be dead. Replace the battery.
- Although the plunger may feel heavy at the bottom dead center when using for the first time, this can be resolved by pushing the plunger up once.
- Even after the power is turned off, the reference point set and counting direction will be retained.

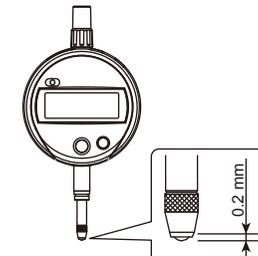
5. ORIGIN Setting (Reference Point Setting)



- 1 Move the plunger to the point to be set as the reference point, and then press the [ORIGIN] key for 1 second or more.
⇒ The indicated value becomes zero and the reference point (ORIGIN) is set.

Tips

- Place the contact point on the workpiece several times to verify that the measured value is stable.
- This product does not guarantee stable repeatability within 0.2 mm from the bottom dead center (when the plunger is completely extended). When performing reference point setting, be sure to lift the plunger at least 0.2 mm above the bottom dead center.



- A rubber damper is attached to this product to soften the plunger impact. Although the indicated value may not be stable at the bottom dead center due to the elasticity of the damper, this is not a malfunction.

6. Measurement Method

1) Measurement



- Gradually and lightly place the contact point on the workpiece in the same orientation and conditions as for reference point setting, and then read the indicated value.

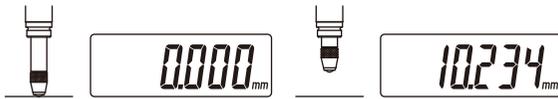
Tips

If the contact point strikes the workpiece to be measured hard, the workpiece may deform and measurement results may be affected.

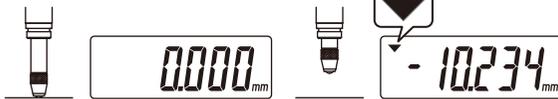
2) Switching counting direction

The counting direction can be changed by pressing the [+/-] key. If the product is set to negative counting when the plunger is pushed in, [▼] is shown on the top left of the display.

• Positive count

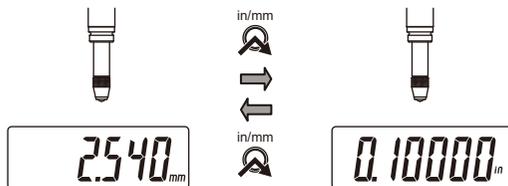


• Negative count



3) Switching units

Press the [in/mm] key to switch the unit between in (inches) and mm (millimeters).



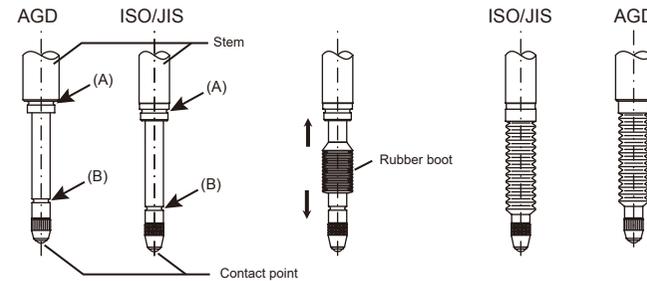
7. Precautions after Use

- When cleaning, wipe this product with a soft cloth moistened with diluted neutral detergent. Do not use an organic solvent such as thinner, which may cause the product to deform or malfunction.
- On the plunger may lead to malfunction. Clean with a cloth moistened with alcohol, etc. before use.
- Do not lubricate the plunger with lubricating oil, etc.
- If the product is to be out of use for 3 months or more, remove the battery before storage. Liquid leakage from the battery may damage the product.
- Do not store the product in a place with a high temperature or humidity, or a lot of dust or oil mist.

8. Errors and Troubleshooting

Error Display	Causes and Countermeasures
Battery voltage decrease mark  1234 mm	Battery is depleted. Replace with a new battery.
Sensor contamination detection error Err E	A sudden change in temperature may create condensation on the detector, or it may be contaminated by other sources. Turn the power off and allow the product to adapt to the temperature for about 2 hours. If it does not recover after adapting to the temperature, repair is required: consult with your dealer or agent or with our sales office.
Hardware error Err H	This error indicates a hardware abnormality. Repair is necessary when the error is generated. Please contact our sales office.
ABS synthesis error 123E mm	Although this may occur during high-speed plunger movement, there is no effect on measurement. Use the product as is. If it occurs while the plunger is not moving, the internal sensor has failed. In this case, repair is required: consult with your dealer or agent or with our sales office.

9. Rubber Boot Replacement (Dustproof Type Only)



- Remove the old rubber boot and wipe away dust or oil from the stem groove (A) and plunger groove (B) with alcohol, etc.
- Put the rubber boot on the plunger so that the rubber boot end with the larger bore is on the stem side, and then set the rubber boot in between the stem and the contact point.
- Lightly apply a small amount of room temperature curing silicone adhesive to grooves (A) and (B). At this time, be careful not to apply silicone adhesive to the plunger sliding surface.
- Pinch the top end of the rubber boot with a tool such as flat tip tweezers and fit it into stem groove (A).
- Attach the bottom end of the rubber boot to plunger groove (B) by pressing manually.
- Wipe away excess adhesive with a clean cloth.

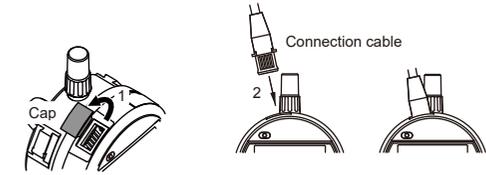
10. Output Function

NOTICE

For use with a Mitutoyo linear gage counter (EC-101D, EG-101D, EH-102D) connected, set the linear gage counter "SDP input WAIT setting" to "No WAIT" before use. If used with other settings, an error will be displayed on the linear gage counter.

1) Externally outputting the displayed value

The displayed value can be output to a device supporting Digimatic output format by connecting the product and the external device with a connection cable (option). The product can be connected to an optional external display, external printer, PC, etc.

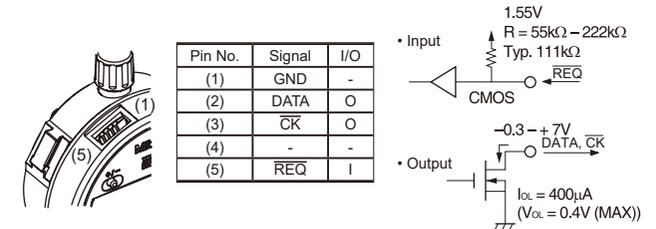


- Press the [ON/OFF] key to turn off the product.
- Connect the product and the external device.
 - Remove the cap of the output connector of the product.
 - Connect the product and the external device with a connection cable.

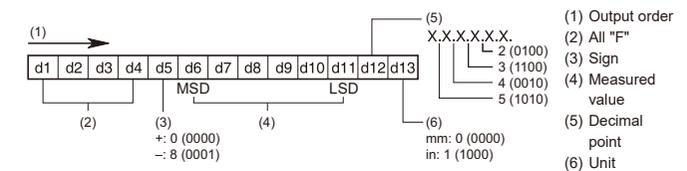
Tips

- 2 types of connection cables (options), No. 905338 (1 m) and No. 905409 (2 m), are available for this product.
- When connecting a connection cable, pay attention to the connector direction as you insert it.
- Store the removed cap to prevent loss.
- Always install the cap if a connection cable is not used.

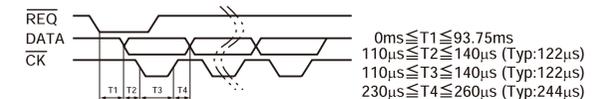
2) Output connector



3) Output data format



4) Timing chart



11. Specifications

■ Individual specifications

Model *1	ID-S1012X2, ID-S1012XB2	ID-S112X2, ID-S112XB2	ID-S112PX2, ID-S112PXB2
Code No. *1	543-781-10, 543-781B-10	543-790-10, 543-790B-10	543-794-10, 543-794B-10
Measurement range	12.7 mm		
Resolution	0.01 mm	0.001 mm	
JIS/ISO Error of indication MPE	Partial measuring range $F_{MPE} *2$	0.02 mm	0.003 mm
	Total measuring range $E_{MPE} *2$	0.02 mm	0.003 mm
	Hysteresis $H_{MPE} *2$	0.02 mm	0.002 mm
	Repeatability $R_{MPE} *2$	0.01 mm	0.002 mm
	Stem diameter	ø8 mm	
Contact point	Carbide (joint screw M2.5 x 0.45), part No. 901312 (provided as standard)		
Measurement force MPL	1.5 N or less	2.5 N or less	
Measurement direction	All directions		
Protection level *4	IP42 equivalent *5		IP53 equivalent *5
Battery life *6	Continuous operation approx. 20,000 hours	Continuous operation approx. 18,000 hours	

Model *1	ID-S1012MX2, ID-S1012MXB2	ID-S112MX2, ID-S112MXB2	ID-S112PMX2, ID-S112PMXB2
Code No. *1	543-782-10, 543-782B-10	543-791-10, 543-791B-10	543-795-10, 543-795B-10
Measurement range	12.7 mm/0.5 in		
Resolution	0.01 mm/0.0005 in	0.001 mm/0.00005 in	
JIS/ISO Error of indication MPE	Partial measuring range $F_{MPE} *2$	0.02 mm	0.003 mm
	Total measuring range $E_{MPE} *2$	0.02 mm	0.003 mm
	Hysteresis $H_{MPE} *2$	0.02 mm	0.002 mm
	Repeatability $R_{MPE} *2$	0.01 mm	0.002 mm
	Overall *2*3	±0.0010 in	±0.0001 in
ASME	Hysteresis *2	0.0010 in	0.0001 in
	Repeatability *2	0.0005 in	0.0001 in
Stem diameter	ø8 mm		
Contact point	Carbide (joint screw M2.5 x 0.45), part No. 901312 (provided as standard)		
Measurement force MPL	1.5 N or less	2.5 N or less	
Measurement direction	All directions		
Protection level *4	IP42 equivalent *5		IP53 equivalent *5
Battery life *6	Continuous operation approx. 20,000 hours	Continuous operation approx. 18,000 hours	

Model *1	ID-S1012EX2, ID-S1012EXB2	ID-S112EX2, ID-S112EXB2	ID-S112TX2, ID-S112TXB2	ID-S112PEX2, ID-S112PEXB2
Code No. *1	543-783-10, 543-783B-10	543-792-10, 543-792B-10	543-793-10, 543-793B-10	543-796-10, 543-796B-10
Measurement range	0.5 in/12.7 mm			
Resolution	0.0005 in/0.01 mm	0.00005 in/0.001 mm	0.0001 in/0.001 mm	0.00005 in/0.001 mm
JIS/ISO Error of indication MPE	Partial measuring range $F_{MPE} *2$	0.02 mm	0.003 mm	
	Total measuring range $E_{MPE} *2$	0.02 mm	0.003 mm	
	Hysteresis $H_{MPE} *2$	0.02 mm	0.002 mm	
	Repeatability $R_{MPE} *2$	0.01 mm	0.002 mm	
	Overall *2*3	±0.0010 in	±0.0001 in	
ASME	Hysteresis *2	0.0010 in	0.0001 in	
	Repeatability *2	0.0005 in	0.0001 in	
Stem diameter	ø0.375 in (9.52 mm)			
Contact point	Carbide (joint screw No. 4-48UNF), part No. 21BZB005 (provided as standard)			
Measurement force MPL	1.5 N or less	2.5 N or less		
Measurement direction	All directions			
Protection level *4	IP42 equivalent *5			IP53 equivalent *5
Battery life *6	Continuous operation approx. 20,000 hours	Continuous operation approx. 18,000 hours		

*1: Model numbers ending with "B" are flat back types without lug.

*2: During normal measurement at 20 °C.

*3: Overall magnification and linearity.

*4: The protection level (IP: International Protection) is based on IEC 60529/JIS C 0920.

*5: Values are for factory default conditions.

*6: The battery life varies depending on usage times and conditions. The above values are guidelines.

■ Common specifications

CE marking/ UKCA marking	EMC Directive/Electromagnetic Compatibility Regulations: EN IEC 61326-1 Immunity test requirement: Clause 6.2 Table 2 Emission limit: Class B RoHS Directive/The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations: EN IEC 63000
Power	Silver oxide battery SR44 x 1 (part No. 938882)
Scale type	Electrostatic capacitance type absolute linear encoder
Response speed	Unlimited (unavailable for scanning measurement)
Data output	Digimatic output
Temperature range	Operating temperature range: 0 °C to 40 °C, storage temperature range: -10 °C to 60 °C
Standard accessory	SR44 (for function verification x 1) • User's Manual warranty, inspection results

12. Accessories (Optional)

- Lifting lever: Part No. 21EZA198
- Lifting knob: Part No. 21EZA105
- Release: Part No. 21JZA295
- Connection cable: Part No. 905338 (1 m, flat straight)
- Connection cable: Part No. 905409 (2 m, flat straight)

* For accessories (optional) other than the above, refer to the Mitutoyo MEASURING INSTRUMENTS CATALOG.

13. Off-Site Repairs (Subject to Charge)

Off-site repair (subject to charge) is required in the case of the following malfunctions. Contact your nearest dealer or our sales office.

- Poor plunger operation
- Poor accuracy
- [E] is displayed as the last digit when the plunger is stationary
- Abnormal measured value or LCD trouble
- No recovery from [Err C]
- Power will not turn on

* If the fundamental structural components or multiple components need to be replaced, we reserve the right to decline the repair.