

# CAPACITANCE TYPE LEVEL INDICATOR

## Model **KLI/KLT/KLG** SERIES



**NO MOVING PART,  
EASY TO HANDLE!!**

Distributor: Sider Electronic Industries Ltd.  
 Tel: 852-23892522 Fax: 852-23574546  
 Email: info@sider.com.hk URL: www.sider.com.hk

Wide measuring span

Cement or the like



Unaffected by dust on pneumatic conveyor

Cement or the like

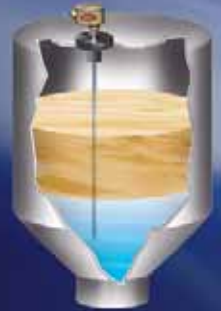


Unaffected by fouling

Flour or the like



Interfacial detection of two liquids



# KLI/KLT/KLG SERIES

## CAPACITANCE TYPE LEVEL INDICATOR

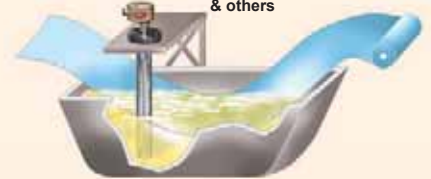
**THERE BEING NO MOVING PART, IT RELIABLY OPERATES FOR A LONG PERIOD OF TIME AND ITS MAINTENANCE IS EASY. BEST SELLING LINE IN CONTINUOUS MEASUREMENT**

### FEATURES

- Reliable detection even when objects are being fed.
- It can be applied to anything including powder, granules and liquid.
- Not affected by dust, it can accurately indicate.
- It is possible to select one of the most suitable sensors out of a wide range of products, depending upon the applicable conditions. (high temperature, high pressure, strong acid/ alkali, conductivity, insulation property and others)
- Safely measure a wide span with electrodes designed to be strong enough.
- The intrinsically safe explosion-proof model is also available for use at an explosive area.

Accurate detection of minimal capacitance

Adhesives, Lard (Food oil), Liquefied gas & others



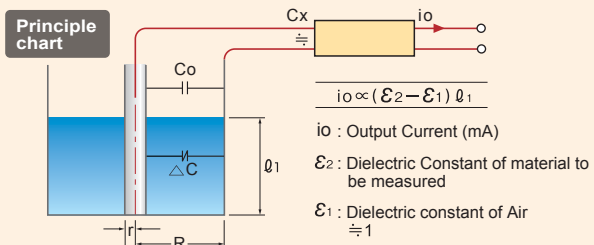
### Operating Principle

When an electrode is set in a tank so as to be coaxial with its wall as shown below, there forms a capacitance  $C_x$  between the tank and the electrode. By offsetting the stray capacitance of  $C_o$ , when the tank is empty, with a high frequency impedance bridge, it is possible to obtain  $\Delta C$ , namely the output electric signal which is proportional to the height (level)  $l_1$  of the material to be measured.

$$C_x = C_o + \Delta C$$

$$\Delta C = \frac{K(\epsilon_2 - \epsilon_1) l_1}{\log_{10}(R/r)}$$

( Increment of capacitance when the tank is filled with materials to be measured. )  
 (  $C_o$ : Capacitance when the tank is empty,  $K$  = Constant )



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**model KLI**

**Electrode · Amplifier Remote Type**  
 (Outdoor wall mount)

- Length of Exclusive Cable: Max.50m (Sensitivity Class1 =Max.25m)
- 24VDC model can be available
- Electrostatic protective model can be manufactured.

**model KLG**

Intrinsically safe explosion-proof model  
 (I)2G4 RIIS No.44622



- Attached safety barrier
- Exclusive cable : Max.25m

**model KLT**

**Electrode · Amplifier Built-in Type**

- No exclusive cable is required.
- 24VDC model can be available.

**Agitating vessel**

Liquid, dirt or the like



**Unaffected by static electricity**

Resin pellet

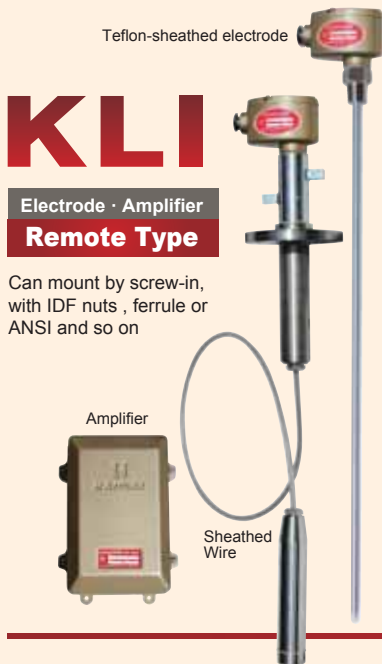


**APPLICATIONS**

- |                   |                 |              |             |
|-------------------|-----------------|--------------|-------------|
| Molten resin      | Organic solvent |              |             |
| Flour             | Food oil        | Heavy oil    |             |
| Sludge            | Sulphuric acid  | Caustic soda |             |
| Industrial water  | Fruit juice     | Sea water    | Waste water |
| Cement            | Grain           | Resin pellet |             |
| Calcium carbonate | Powdered coal   |              |             |
| Metal powder      |                 |              |             |



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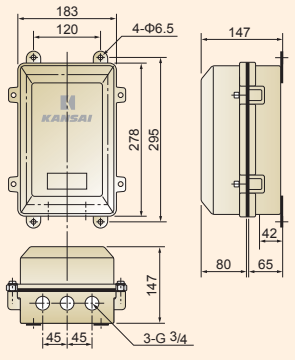
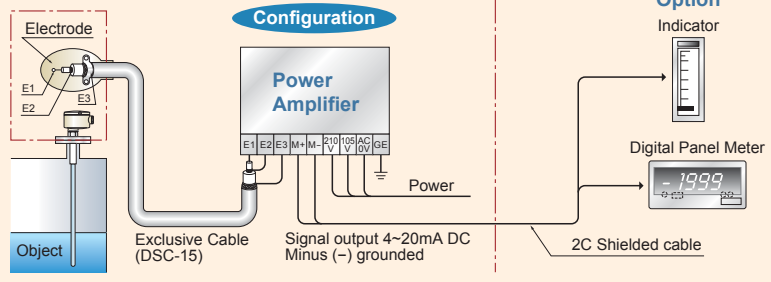


**KLI**  
**Electrode · Amplifier**  
**Remote Type**

Can mount by screw-in, with IDF nuts, ferrule or ANSI and so on

**ELECTRODE**

**Permissibly Distributed Capacitance** : 0~400pF (Depending on shape)  
**Operating Temperature** : -25~+80°C (Standard Specification)  
 -200~+500°C (Option)  
**Maximum Pressure** : 980KPa (10kgf/cm<sup>2</sup>) (Standard)  
**Housing** : IP-66  
**Color** : Hammer-net gold



**POWER · AMPLIFIER (Outdoor wall mounting)**

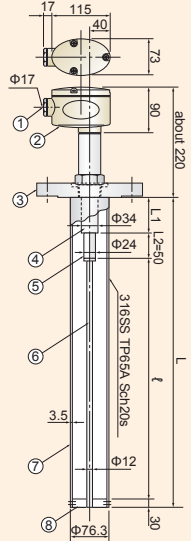
**Input Power Source** : 105/210VAC ±15% 50/60Hz (24VDC OK)  
**Power Consumption** : 4VA  
**Output Signal** : 4~20mA DC, (500Ω Max) (-) grounded  
**Measuring Sensitivity** : 10pF, 30pF, 300pF, 3000pF (F-S)  
**Accuracy** : (Amplifier) 1%  
**Weight** : 6.5Kg (Outdoor use)  
**Box Type** : Outdoor Wall mounting or Panel built-in  
**Length of Exclusive Cable** : Max. 50m (Sensitivity Class1=Max.25m)  
**Operating Temperature** : -20~+70°C  
**Housing** : IP-55 equivalent  
**Color** : Hammer-net gold

\*Compact amplifier (panel mounting) is optionally available.

**OUTLINE DRAWING**

**KLI-1 □ 3 Special**  
**B31-Z-SP-65**

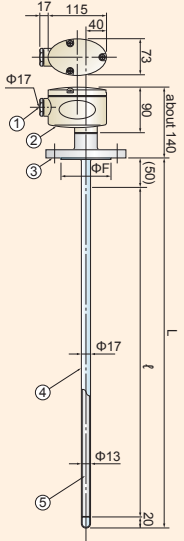
Mounting : JPI300#3B  
 Temperature : -20~+80°C  
 Pressure : 980KPa  
 Length of L : Max 4m



- 1 Cable Gland C3604
- 2 Housing Flange AC4B
- 3 Earth electrode 316SS
- 4 Insulator 316SS
- 5 Main electrode Ceramic
- 6 Auxiliary electrode 316SS
- 7 Insulator supporter 316SS
- 8 Teflon

**KLI-2 □ 3**  
**K·P·2·17**

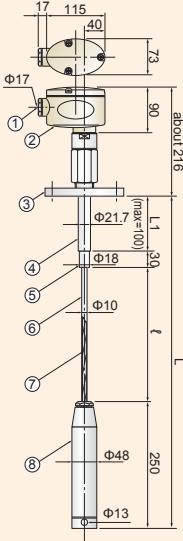
Mounting : JIS10K50A  
 Temperature : -20~+80°C  
 Pressure : 980KPa  
 Length of L : Max 4m



- 1 Cable gland C3604
- 2 Housing AC4B
- 3 Flanage 304SS
- 4 Sheath Teflon
- 5 Main electrode 304SS

**KLI-4 □ 3**  
**K·W·10P· (G)**

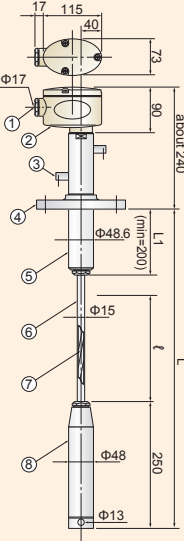
Mounting : JIS10K65A  
 Temperature : -20~+80°C  
 Pressure : 980KPa  
 Length of L : Max 15mm



- 1 Cable gland C3604
- 2 Housing AC4B
- 3 Flanage 304SS
- 4 Earth electrode 304SS
- 5 Insulator Polyacetal
- 6 Sheathed Teflon
- 7 Main electrode wire 304SS
- 8 Weight 304SS

**KLI-4 □ 3**  
**K·W·15P·3**

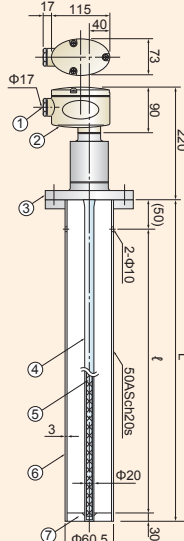
Mounting : JIS10K65A  
 Temperature : -20~+80°C  
 Pressure : 980KPa  
 Length of L : Max 30m



- 1 Cable gland C3604
- 2 Housing AC4B
- 3 Vent SS400
- 4 Flanage 304SS
- 5 Earth electrode 304SS
- 6 Sheath Teflon
- 7 Main electrode wire 304SS
- 8 Weight 304SS

**KLI-6 □ 3 Pyrex**  
**K·P·1·20·SP (50A)**

Mounting : JIS10K65A  
 Temperature : -20~+200°C  
 Pressure : 1960KPa  
 Length of L : Max 1m



- 1 Cable gland4 C3604
- 2 Housing AC4B
- 3 Flanage 304SS
- 4 Sheath Pyrex
- 5 Main electrode 304SS
- 6 Auxiliary electrode 304SS
- 7 Main electrode supporter 304SS

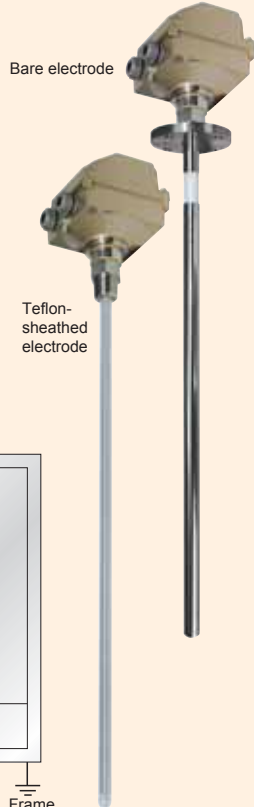
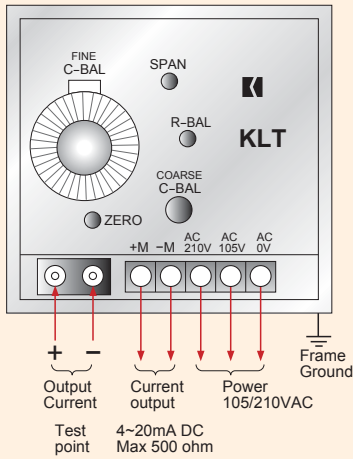
Distributor: Sider Electronic Industries Ltd.  
 Tel: 852-23892522 Fax: 852-23574546  
 Email: info@sider.com.hk URL: www.sider.com.hk

# KLT

Electrode · Amplifier  
**Built-in Type**

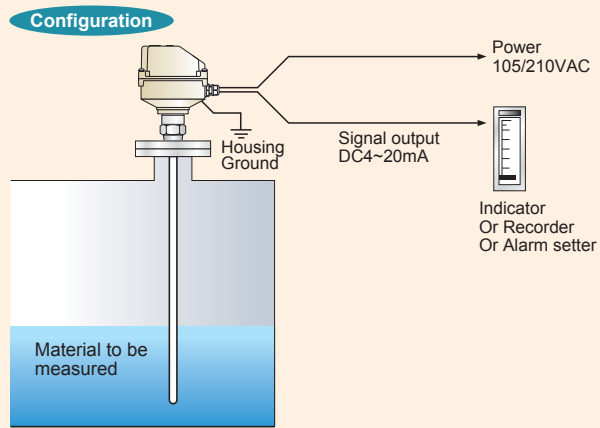
Can mount by screw-in,  
 with IDF nuts, ferrule or  
 ANSI and so on

## WIRING DIAGRAM



## STANDARD SPECIFICATION

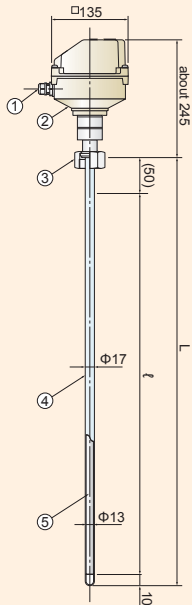
- Input Power Source : 105 /210VAC ±15% 50/60Hz (24VDC OK)
- Power Consumption : 4VA
- Output Signal : 4~20mA DC, (500Ω Max) Minus (-) grounded
- Measuring Sensitivity : 10pF, 30pF, 300pF, 3000pF (F, S)
- Accuracy : 1%
- Permissibly Distributed Capacitance : 0~400pF (Depending on shape)
- Operating temperature : -25~+80°C (Standard)  
 -200~+500°C (Special)
- Maximum Pressure : 980KPa (10kgf /cm<sup>2</sup>) (Standard Specification)
- Housing : IP-66 equivalent
- Color : Hammer-net gold



## OUTLINE DRAWING

### KLT-2 T·P1·17·IN2S

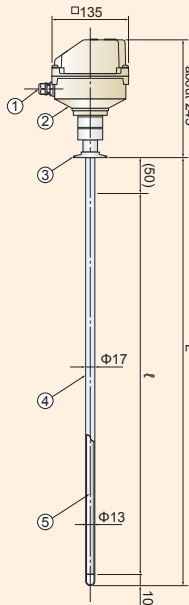
Mounting : IDF2s  
 Temperature : -20~+50°C  
 Pressure : 980KPa  
 Length of L : Max 4m



- |                  |            |
|------------------|------------|
| 1 Cable gland    | Polyacetal |
| 2 Housing        | ADC        |
| 3 IDF union nut  | 304SS      |
| 4 Sheath         | Teflon     |
| 5 Main electrode | 304SS      |

### KLT-2 □ 0 T·P1·17·IF2S

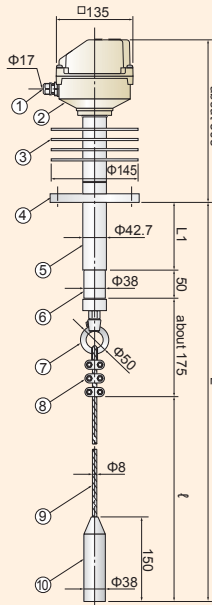
Mounting : Ferrule  
 Temperature : -20~+50°C  
 Pressure : 980KPa  
 Length of L : Max 4m



- |                  |            |
|------------------|------------|
| 1 Cable gland    | Polyacetal |
| 2 Housing        | ADC        |
| 3 Ferrule        | 304SS      |
| 4 Sheath         | Teflon     |
| 5 Main electrode | 304SS      |

### KLT-3 □ 0-H Special T·W·8·B3·H3

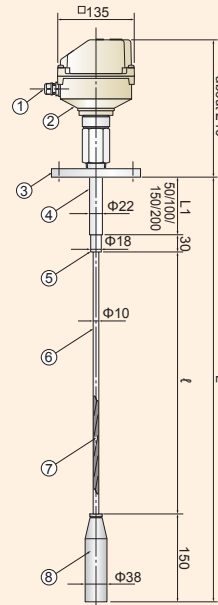
Mounting : JIS10K50A  
 Temperature : -20~+400°C  
 Pressure : 980KPa  
 Length of L : Max15m



- |                   |            |
|-------------------|------------|
| 1 Cable gland     | Polyacetal |
| 2 Housing         | ADC        |
| 3 Fin             | AC         |
| 4 Flange          | 304SS      |
| 5 Earth electrode | 304SS      |
| 6 Insulator       | Ceramic    |
| 7 Eyenut          | 304SS      |
| 8 Wire clip       | 304SS      |
| 9 Main electrode  | 304SS      |
| 10 Weight         | 304SS      |

### KLT-4 □ 0 T·W·10P·L

Mounting : JIS10K50A  
 Temperature : -20~+50°C  
 Pressure : 980KPa  
 Length of L : Max15m



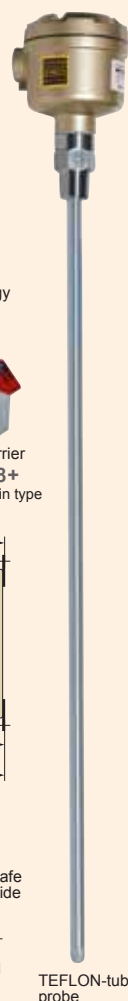
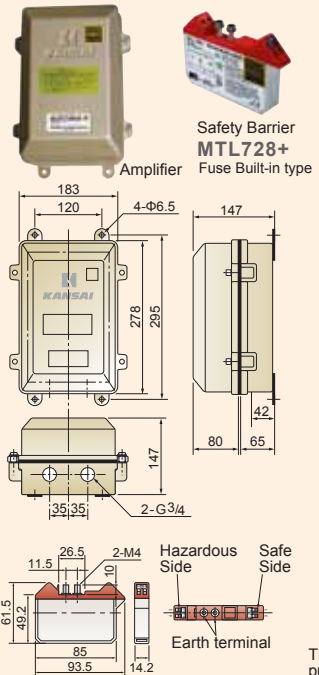
- |                       |            |
|-----------------------|------------|
| 1 Cable gland         | Polyacetal |
| 2 Housing             | ADC        |
| 3 Flange              | 304SS      |
| 4 Earth electrode     | 304SS      |
| 5 Insulator           | Polyacetal |
| 6 Sheath              | Teflon     |
| 7 Main electrode wire | 304SS      |
| 8 Weight              | 304SS      |

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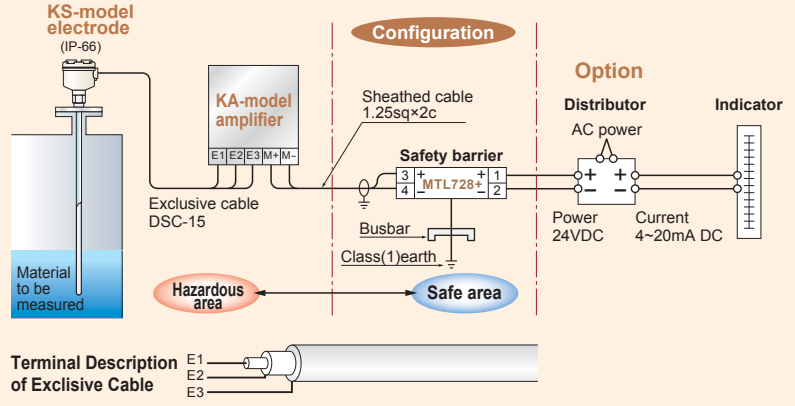
# KLG

**Intrinsically safe explosion-proof model (i)2G4 RIIS No.44622**

**FOR HAZARDOUS GAS ENVIRONMENT**  
 Explosion-proof available  
 Certified by Industry Safety-Technology Association, Labor Ministry.



Can safely be used at any explosive environment.

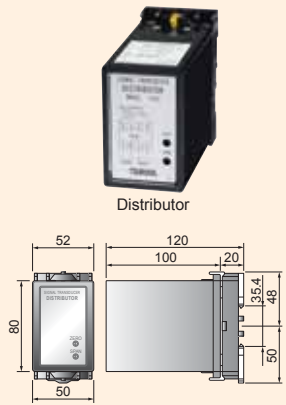


### POWER

- Power Consumption :** 4 VA
- Output Signal :** 4~20mA DC (100Ω Max)
- Measuring Sensitivity :** 130pF, 300pF, 3000pF
- Accuracy :** (Amplifier) 1%
- Weight :** 6.0 kg
- Housing :** Outdoor Wall mounting
- Length of Exclusive Cable :** Max.25 m
- Housing :** IP-66
- Painting Color :** Hammer-net gold

### STANDARD SPECIFICATION (Option)

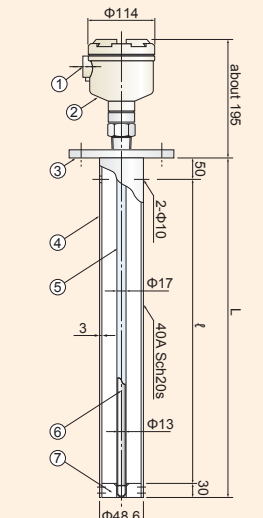
- Distributor:** 100 /110VAC or 200 /220V
- Allowable load resistance** 600Ω Max
- (Using Model7552 made by Tsuruga Electric Corp.)**



## OUTLINE DRAWING

### KLG-2□3 G·P1·17·SP(40A)

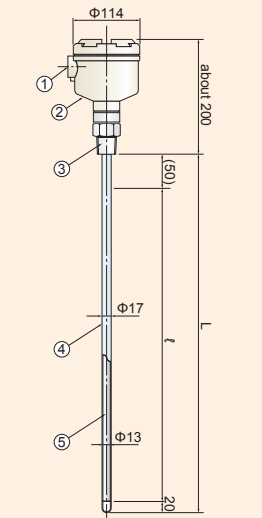
Mounting : JIS10K50A  
 Temperature : -20~+80°C  
 Pressure : 980KPa  
 Length of L : Max 4m



- |                            |        |
|----------------------------|--------|
| 1 Cable gland              | G 3/4  |
| 2 Housing                  | ADC    |
| 3 Flanage                  | 304SS  |
| 4 Auxiliary electrode      | 304SS  |
| 5 Sheath                   | Teflon |
| 6 Main electrode           | 304SS  |
| 7 Main electrode supporter | Teflon |

### KLG-2□3 G·P1·17

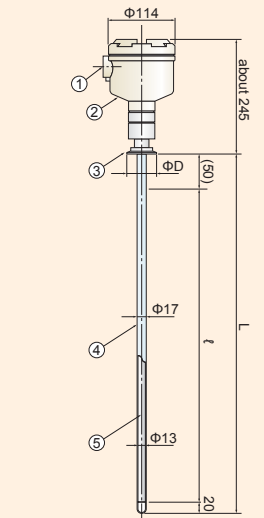
Mounting : R1  
 Temperature : -20~+80°C  
 Pressure : 980KPa  
 Length of L : Max 4m



- |                  |        |
|------------------|--------|
| 1 Cable gland    | G 3/4  |
| 2 Housing        | ADC    |
| 3 Screw          | 304SS  |
| 4 Sheath         | Teflon |
| 5 Main electrode | 304SS  |

### KLG-2□3 G·P1·17·IF·1S

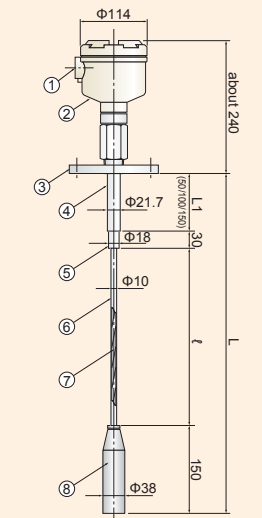
Mounting : IDF ferrule 1S  
 Temperature : -20~+80°C  
 Pressure : 980KPa  
 Length of L : Max 4m



- |                  |        |
|------------------|--------|
| 1 Cable gland    | G 3/4  |
| 2 Housing        | ADC    |
| 3 Ferrule        | 304SS  |
| 4 Sheath         | Teflon |
| 5 Main electrode | 304SS  |

### KLG-4□3 G·W·10P·L

Mounting : JIS10K50A  
 Temperature : -20~+80°C  
 Pressure : 980KPa  
 Length of L : Max 15m



- |                       |            |
|-----------------------|------------|
| 1 Cable gland         | G 3/4      |
| 2 Housing             | ADC        |
| 3 Flanage             | SUS304     |
| 4 Earth electrode     | SUS304     |
| 5 Insulator           | Polyacetal |
| 6 Sheath              | Teflon     |
| 7 Main electrode wire | SUS304     |
| 8 Weight              | SUS304     |

**OPTIONAL UNITS**

**DIGITAL METER RELAY MR-B51D5**



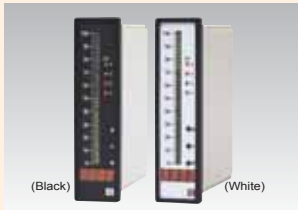
**Size:** 1/8DIN W48×H96mm  
**Power:** 85~265VAC / 95~370VDC  
 (Common power source for AC/DC)  
**Consumption:** 5W  
**Indication:** Digital (5 digit LED display)  
 Bargraph (51 segment LED)  
**Output contact:** 2SPDT (C contact)  
 2SPST (A contact), can be added  
**Remarks:** LED with brightness control  
 Output contact can be expanded up to 6 at the maximum.  
 (A contact only)

**BARGRAPH METER M-B101**



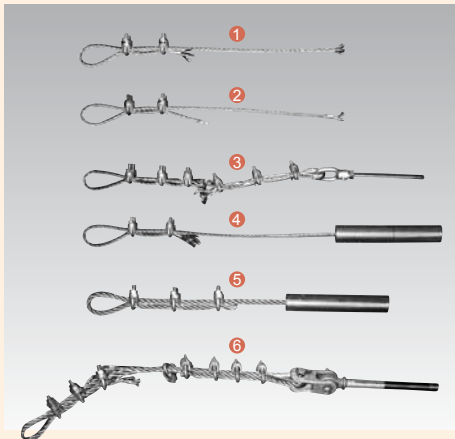
**Size:** 9/64DIN W36×H144mm  
**Power:** 85~265VAC / 95~370VDC  
 (Common power source for AC/DC)  
**Consumption:** 5W  
**Indication:** Bargraph (101 segment LED)  
**Output contact:** nil  
**Remarks:** LED with brightness control

**BARGRAPH METER RELAY MR-B101D4**



**Size:** 9/64DIN W38×H144mm  
**Power:** 85~265VAC / 95~370VDC  
 (Common power source for AC/DC)  
**Consumption:** 5W  
**Indication:** Digital (4 digit LED display)  
 Bargraph (101 segment LED)  
**Output contact:** 2SPDT (C contact)  
 2SPST (A contact), can be added  
**Remarks:** LED with brightness control  
 Output contact can be expanded up to 6 point at the maximum.  
 (A contact only)

**TENSION TEST** Osaka Prefectural Industry Technology Research, 2/24/84



**NAME OF PARTS FOR TENSION TEST**

- ① Φ8 wire rope at lead brazing
- ② Φ8 wire rope/ prevent falling
- ③ Φ8 wire rope/ eyenut
- ④ Φ8 wire rope/ bob base
- ⑤ Φ12 wire rope/ bob base
- ⑥ Φ12 wire rope/ eyebolt



**③ Description of Deformed Part**  
 The eyenut ring ovalizes but does not crack. No exception is noted on the screw-thread part of stainless steel bar.

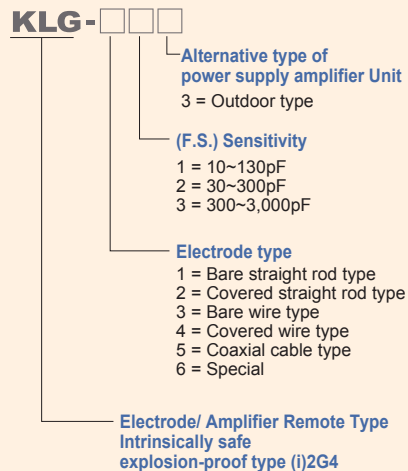
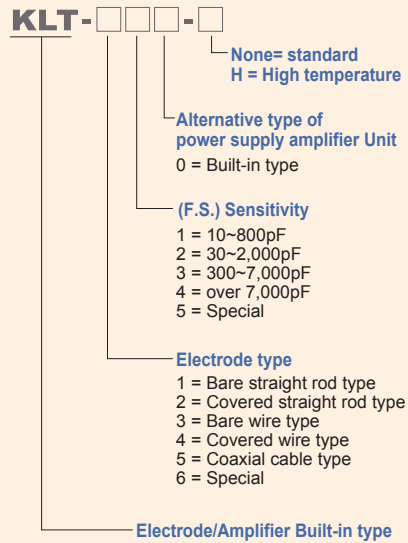
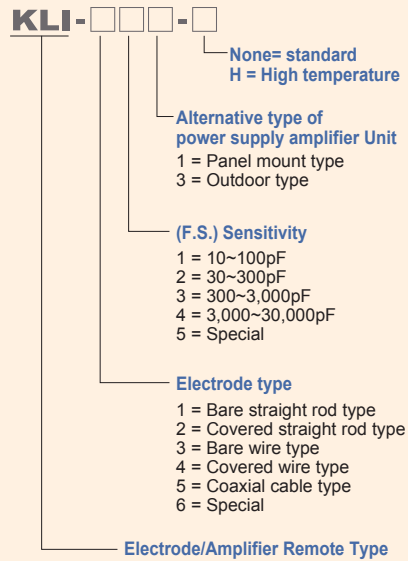
**③ Φ8 Wire**  
 Eyenut Method  
 An eyenut and a heart thimble deform but withstand any breakage. The withstanding weight is 4.345 tons. The official tension shear weight of the wire is 4.13 tons.



**⑥ Eyebolt Portion of Φ12 Wire**  
 A right-angled crevice and a heart thimble deform but withstand any breakage. The withstanding weight is 9.5 tons. The official tension shear weight of the wire is 9.48 tons.

**⑥ Description of Deformed Part**  
 Two pins of right-angled crevice, the lower half of the crevice and a pin-hole of the eyebolt as well as a heart thimble were metamorphosed. The left pin and the lower half of the crevice were severely damaged. The right pin and the eyebolt hole were metamorphosed by about 1mm.

**OUTLINE DRAWING**

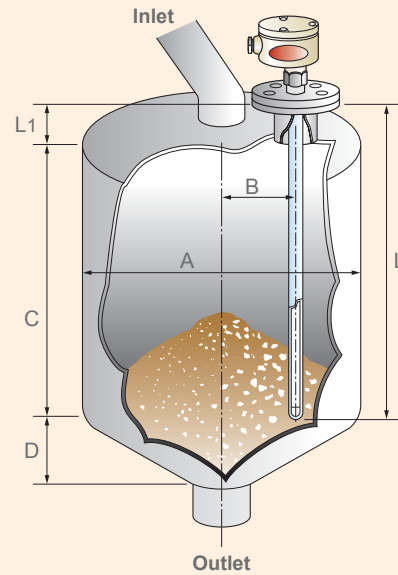


\*As for the model of "Pyrex" and "Special", please check with our Sales staff.



**Please inform us of the following when inquiring and ordering**

1. Name of material to be measured	[	]
2. Dielectric constant, Specific resistance	[	]
3. Granularity	[	]
4. Viscosity / Agglomerating Nature	[	Yes • No
5. Corrosive Nature	[	Yes • No
6. Foamy Nature	[	Yes • No
7. Tank Material	[	]
8. Tank Shape (1.Circular, 2.Square)	[	]
9. Agitator	[	Yes • No
10. Service Temperature / °C	[	°C
11. Service Pressure / Pa	[	Pa
12. Length of Exclusive Cable (attachment)	[	]
13. Type of Amplifier Housing	[	]
14. Indicator and other ancillary equip.	[	Yes • No



**Caution**

**You may come across some indication errors under the varied conditions as follows:**

1. Varied water content of a material to be measured
2. Varied dielectric constant of a material to be measured
3. Varied particle size of a material to be measured

**Fill out the following blanks:**

A Tank Diameter	[	]
B Instrument Location	[	]
L Length of Electrode	[	]
L1 Height of Nozzle installed	[	]
ℓ Measuring Span	[	]
C Height of Tank's Cylindrical Part	[	]
D Height of Tank's Conical Part	[	]

**Line of business**

- Rotary Paddle Type Level Switch
- Vibration Type Level Switch
- Swing Type Level Switch
- Acoustic Level Switch
- Capacitance Type Level Switch
- Capacitive Proximity Sensor
- Capacitance Type Level Indicator
- Diaphragm Type Level Switch
- Tilt Switch
- Leak Type Level Switch
- Microwave Switch
- Sounding Bob Type Level Indicator
- Flow Switch
- Conductance Type Level Switch
- Float Switch
- Float Type Level Indicator
- Ultrasonic Type Level Indicator
- Equipments For Conveyor Lines
- Dust Monitor System
- Zirconia Oxygen Analyzer
- Laser Type Level Indicator
- RADAR Type Level Indicator
- On-line Sensors for Accurate Liquid Analysis
- Ultrasonic Flow meter

Nuclear Power Generation to Rice Milling  
All-round Manufacturer of Level Controllers for Powder, Granules and Liquid

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\*Please be sure to read USER'S GUIDE, Installation & Operation Instructions before using the instrument.  
\*The specifications herein may be subject to change without advance notice.