Thank you for purchasing the Differential Probe (Model 701922) for the DL series. To ensure correct use, please read this manual thoroughly before beginning operation. After reading the manual, keep it in a convenient location for quick reference whenever a question arises during operation.

Contact information of Yokogawa offices worldwide is provided on the following sheet.

* PIM113-0122  List of worldwide contacts

The following symbols are used in this manual.

- **WARNING**: Calls attention to actions or conditions that could cause serious or fatal injury to the user, and precautions that can be taken to prevent such occurrences.

- **CAUTION**: Calls attention to actions or conditions that could cause slight injury to the user or damage to the instrument or user’s data, and precautions that can be taken to prevent such occurrences.

**Safety Precautions**

This product is designed to be used by a person with specialized knowledge. Make sure to comply with the safety precautions mentioned below when handling the probe. YOKOGAWA assumes no responsibility for any consequences resulting from failure to comply with these safety precautions. Also, read the User’s Manual of the measuring instrument thoroughly so that you are fully aware of its specifications and handling, before starting to use the probe.

This manual is part of the product and contains important information. Store this manual in a safe place. If you dispose of the instrument, make sure to dispose of the manual that was sold with it.

The following symbols are used on this instrument.

- **AVERTISSEMENT**: Advert à l’attention sur des gestes ou des conditions susceptibles de provoquer des blessures graves (voire mortelles), et sur les précautions de sécurité pouvant prévenir de tels accidents.

- **ATTENTION**: Advert à l’attention sur des gestes ou des conditions susceptibles de provoquer des blessures légères ou d’endommager l’instrument ou les données de l’utilisateur, et sur les précautions de sécurité susceptibles de prévenir de tels accidents.

**Note**: Calls attention to information that is important for proper operation of the instrument.

**Maximum Input Voltage**

Do not apply any voltages exceeding the maximum input voltage to the probe.

- **Correct use of the power supply**
  - Use with the DL series probe power supply terminal, 700938, or 701934.
  - Connecting the external power supply to the probe
  - Always turn OFF the probe’s power switch when connecting or disconnecting the external power supply.

**Conditions of Use**

This product has not been designed or manufactured for applications in which high reliability is required over a long time period.

**Operating Environment Limitations**

This product is Class A (for industrial environments) product. Operation of this product in a residential area may cause radio interference in which case the user is required to correct the interference.

**Waste Electrical and Electronic Equipment**

This product complies with the WEEE directive marking requirement.

- **ATTENTION**: Tension d’entrée maximum
  - Ne pas appliquer à la sonde de tension dépassant la tension d’entrée maximum.
  - Utilisation adéquate de l’alimentation
  - Ne pas utiliser dans une atmosphère explosive
  - Ne pas retirer la sonde de l’instrument de mesure après avoir connecté l’objet de la mesure.

**Authorized Representative in the EEA**

Yokogawa Europe B.V. is the authorized representative of Yokogawa Test & Measurement Corporation for this product in the EEA. To contact Yokogawa Europe B.V., see the separate list of worldwide contacts, PIM 113-0122.
1 Description
By using this device, oscilloscopes with single-ended input can be easily used as oscilloscopes with differential inputs.

2 Appearance

3 Operation
f. Connect this probe’s power supply cable to the probe power supply connector on the YOKOGAWA measuring instrument, 700938, or 701934.

2. Simply plug-in the BNC output connector to the vertical input of a oscilloscope, and connect the auxiliary grounding terminal to a proper ground. If necessary, use a ground extention lead. Set the oscilloscope’s input resistance to 50 Ω.

3. Connect the input to the circuits under measurement.

WARNING
• To protect against electric shock the ground side of the output cable (the shielded side of the BNC connector) must be grounded.

• Make sure to avoid an electric shock when connecting the probe to the object of measurement. Do not remove the probe from the measuring instrument after the object of measurement is connected.

• When disconnecting the probe BNC output connector, first turn OFF the power to the circuit under measurement. Then, disconnect the probe from the high voltage parts of the circuit under measurement.

• When connecting an external power supply, first turn OFF the power to the circuit under measurement. Then, remove the input lead from the circuit under measurement.

CAUTION
• This probe is to carry out differential measurement between two points on the circuit under measurement. This probe is not for electrically insulating the circuit under measurement and the measuring instrument.

• Use a soft cloth to clean the dirt. Prevent damage to the probe. Avoid immersing the probe, using abrasive cleaners, and using chemicals contains benzene or similar solvents.

French

AVERTISSEMENT
• Pour éviter les chocs électriques, la mise à la terre du câble de sortie (côté blindé du connecteur BNC) doit être effectuée.

• S’assurer d’éviter un choc électrique lors de la connexion de la sonde à l’objet de la mesure. Ne pas retirer la sonde de l’instrument de mesure après avoir connecté l’objet de la mesure.

• Lors de la déconnexion du connecteur de sortie BNC de la sonde, mettre d’abord HORS tension le circuit faisant l’objet de la mesure. Puis déconnecter la sonde des parties à haute tension du circuit faisant l’objet de la mesure.

• Lors de la connexion d’une alimentation externe, coupez d’abord l’alimentation du circuit sous tension. Ensuite, reliez le câble d’entrée du circuit à mesurer.

ATTENTION
• Cette sonde doit effectuer une mesure différentielle entre deux points sur le circuit à mesurer.Cette sonde n’est pas destinée à isoler électriquement le circuit à mesurer et l’instrument de mesure.

• Utiliser un chiffon doux pour nettoyer la sonde. Faire attention de ne pas casser la sonde.

• Ne pas immerger la sonde dans un liquide ni utiliser de nettoyants abrasifs sur la sonde.

• Ne pas utiliser de benzène ni d’autres solvants sur la sonde.

Note
• Connect the BNC connector to the input terminal of the oscilloscope and for two point measurement (differential measurement), connect both input leads. Because the performance declines in case you carry out measurements with only one input lead connected, make sure to always connect both.

• Accurate measurement may not be possible near objects with strong electric fields (such as cordless equipment, transformers, or circuits with large currents).

• To take accurate measurements, we recommend that you calibrate the probe once a year.

4 Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency bandwidth</td>
<td>DC to 100 MHz (±3 dB)</td>
</tr>
<tr>
<td>Input type</td>
<td>Balancing differential input</td>
</tr>
<tr>
<td>Attenuation ratio</td>
<td>1:1</td>
</tr>
<tr>
<td>Output offset voltage</td>
<td>±5 mV</td>
</tr>
<tr>
<td>Input resistance/capacitance</td>
<td>500 kΩ (if each side to ground)</td>
</tr>
<tr>
<td>Differential allowable voltage (between + − terminal)</td>
<td>±20 V (DC + ACpeak)</td>
</tr>
<tr>
<td>Max common mode voltage</td>
<td>±60 V (DC + ACpeak)</td>
</tr>
<tr>
<td>Max input voltage (no ground)</td>
<td>±60 V (DC + ACpeak)</td>
</tr>
<tr>
<td>CMRR (typical)</td>
<td>100 kHz: less than ~80dB, 10 MHz: less than ~50 dB</td>
</tr>
<tr>
<td>Output voltage</td>
<td>±2 V (DC + ACpeak)</td>
</tr>
<tr>
<td>Output impedance</td>
<td>Using 50 Ω input system oscilloscope</td>
</tr>
<tr>
<td>Gain accuracy</td>
<td>±1%</td>
</tr>
<tr>
<td>Operating Environment</td>
<td>5 to 40°C, 25 to 85% (no condensation)</td>
</tr>
<tr>
<td>Storage Environment</td>
<td>−30 to 60°C, 25 to 85% (no condensation)</td>
</tr>
<tr>
<td>Operating altitude</td>
<td>2000 m or less</td>
</tr>
<tr>
<td>Power Voltage</td>
<td>Power is supplied from a YOKOGAWA measuring instrument’s probe power supply terminal or from a 700938 or 701934 probe power supply.</td>
</tr>
<tr>
<td>Warm-up time</td>
<td>At least 30 minutes</td>
</tr>
<tr>
<td>Dimensions</td>
<td>111 mm × 22 mm × 14 mm (excluding connector and cable)</td>
</tr>
<tr>
<td>Weight</td>
<td>Approx. 130 g</td>
</tr>
<tr>
<td>Safety standards</td>
<td>Complying standards</td>
</tr>
<tr>
<td>Emission</td>
<td>Complying standards</td>
</tr>
<tr>
<td>Immunity</td>
<td>Complying standards</td>
</tr>
</tbody>
</table>

1. Ambient temperature 23±5°C, humidity 55±10% RH, 30 minutes after the power is turned on.
2. The accuracy is the total of the attenuation ratio accuracy and offset voltage.
3. Typical volaties are typical or mean values. They are not strictly guaranteed.

Input voltage derating (load reduction) applies.

<table>
<thead>
<tr>
<th>Frequency (MHz)</th>
<th>Input voltage (V)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>150</td>
</tr>
<tr>
<td>50</td>
<td>40</td>
</tr>
<tr>
<td>0.1</td>
<td>20</td>
</tr>
</tbody>
</table>

5. The accuracy depends on the tolerance of the oscilloscope’s 50 Ω internal resistance.

Example: If the tolerance is 50 ± 1%, the accuracy is 52% ± 5 mV.

6. This equipment is for measurement category I (CAT I). Do not use it with measurement category II (CAT II), measurement category III (CAT III), or measurement category IV (CAT IV).

CAT I applies to electrical equipment on a circuit that is not connected directly to the power source and measurement performed on such wiring. CAT II applies to electrical equipment that is powered through a fixed installation such as a wall outlet wired to a distribution board and measurement performed on such wiring. CAT III applies to measurement of the distribution level, that is, building wiring, fixed installations. CAT IV applies to measurement of the primary supply level, that is, overhead lines, cable systems, and so on.

Pollution degree applies to the degree of adhesion of a solid, liquid, or gas which deteriorates withstand voltage or surface resistivity. Pollution degree 2 applies to normal indoor atmospheres (with only non-conductive pollution).