

User's Manual

Model 701922 Differential Probe for the DL Series

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.

- PIM113-01Z2 List of worldwide contacts

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YOKOGAWA

IM 701922-01E
7th Edition

The following symbols are used in this manual.



Improper handling or use can lead to injury to the user or damage to the instrument. This symbol appears on the instrument to indicate that the user must refer to the user's manual for special instructions. The same symbol appears in the corresponding place in the user's manual to identify those instructions. In the manual, the symbol is used in conjunction with the word "WARNING" or "CAUTION."

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 light injury to the user or damage to the instrument or user's data, and precautions that can be taken to prevent such occurrences.

French

AVERTISSEMENT

Attire 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

Attire 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.

Safety Precautions

This product is designed to be used by a person with specialized knowledge.

Make sure to comply with the safety precautions mentioned hereafter 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 close to the instrument so that you can refer to it immediately. Keep this manual until you dispose of the instrument.

The following symbols are used on this instrument.



Handle with care. Refer to the user's manual or service manual. This symbol appears on dangerous locations on the instrument which require special instructions for proper handling or use. The same symbol appears in the corresponding place in the manual to identify those instructions.



Risk of electric shock

French



À manipuler délicatement. Toujours se reporter aux manuels d'utilisation et d'entretien. Ce symbole a été apposé aux endroits dangereux de l'instrument pour lesquels des consignes spéciales d'utilisation ou de manipulation ont été émises. Le même symbole apparaît à l'endroit correspondant du manuel pour identifier les consignes qui s'y rapportent.



Risque de choc électrique

Make sure to comply with the following safety precautions in order to prevent accidents such as an electric shock which impose serious health risks to the user and damage to the instrument.



WARNING

Grounding of the measuring instrument

The protective grounding terminal of the measuring instrument must be connected to ground.

Connecting the object of measurement

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.

Do not operate with suspected failures

If you suspect that there is damage to this probe, have it inspect by a service personnel.

Observe maximum working voltage

Do not apply a voltage exceeding 60 V peak between each input lead and ground, or between the input leads themselves.

Must be grounded

This probe must be grounded with the BNC shell and an auxiliary grounding terminal, through the grounding conductor of the power cord of the measuring instrument or other appropriate grounding conductor. Before making connections to the input terminals of the product, ensure that the output connector is attached to the BNC connector of the measuring instrument and the auxiliary grounding terminal is connected to a proper ground, while the measuring instrument is properly grounded.

Do not operate in wet/damp conditions

To avoid electric shock, do not operate this probe in wet or damp conditions.

Do not operate in explosive atmosphere

To avoid injury or fire hazard, do not operate this probe in an explosive atmosphere.

Avoid exposed circuitry

To avoid injury, remove jewelry such as rings, watches, and other metallic objects. Do not touch exposed connections and components when power is present.

Do not disassemble or modify

Do not disassemble or modify the product. YOKOGAWA assumes no liability if you disassemble or modify the product.

Damaged Signal Cable

If the signal cable is torn and the inner metal is exposed or if a color different from the outer sheath appears, stop using the cable immediately.



CAUTION

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 a 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.

French



AVERTISSEMENT

Mise à la terre de l'instrument de mesure

S'assurer de connecter la mise à la terre protectrice de l'instrument de mesure.

Connexion de l'objet de la mesure

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.

Ne pas utiliser en cas de défaillances suspectées

Si vous suspectez que la sonde est endommagée, contactez votre revendeur ou représentant commercial YOKOGAWA.

Respecter la tension d'entrée maximum

Ne pas appliquer une tension dépassant 60 V (c.c. + crête c.a.) entre un fil d'entrée et la terre ou entre deux fils d'entrée.

Doit être mis à terre

Cette sonde doit être mise à terre avec le connecteur BNC et le connecteur de terre auxiliaire du cordon d'alimentation de l'instrument de mesure ou d'un autre conducteur de mise à la terre approprié. Avant d'effectuer les connexions aux bornes d'entrée du produit, vérifiez que le connecteur de sortie est connecté au connecteur BNC de l'instrument de mesure et que la borne de mise à la terre auxiliaire est connectée à une mise à la terre appropriée.

Ne pas utiliser dans des conditions humides

Afin d'éviter un choc électrique, ne pas utiliser cette sonde dans des conditions humides."

Ne pas utiliser dans une atmosphère explosive

Afin d'éviter des risques de blessures ou d'incendie, ne pas utiliser cette sonde dans une atmosphère explosive.

Éviter les circuits exposés

Afin d'éviter des blessures, retirer les bijoux comme les bagues, montres et autres objets métalliques. Ne pas toucher les connexions et les composants exposés après mise sous tension.

Ne pas démonter ou modifier

Ne pas démonter ou modifier le produit. YOKOGAWA se dégage de toute responsabilité si vous démontez ou modifiez le produit.

Câble de signal endommagé

Si le câble de signal est déchiré et que le métal intérieur est exposé ou si une couleur différente de la gaine externe est visible, arrêter immédiatement d'utiliser ce câble.



ATTENTION

Tension d'entrée maximum

Ne pas appliquer à la sonde de tension dépassant la tension d'entrée maximum.

Utilisation adéquate de l'alimentation

Utiliser avec le terminal d'alimentation de la sonde série DL, 700938 ou 701934.

Connexion de l'alimentation externe à la sonde

Toujours éteindre l'interrupteur d'alimentation de la sonde lors de la connexion ou de la déconnexion de l'alimentation externe.

Conditions d'utilisation

Ce produit n'est pas conçu ou fabriqué pour des applications nécessitant une fiabilité élevée sur une longue période.

Limitations relatives à l'environnement opérationnel

Ce produit est un produit de classe A (pour environnements industriels). L'utilisation de ce produit dans une zone résidentielle peut entraîner une interférence radio que l'utilisateur sera tenu de rectifier.

Waste Electrical and Electronic Equipment



Waste Electrical and Electronic Equipment (WEEE), Directive

(This directive is valid only in the EU.)

This product complies with the WEEE directive marking requirement. This marking indicates that you must not discard this electrical/electronic product in domestic household waste.

Product Category

With reference to the equipment types in the WEEE directive, this product is classified as a "Monitoring and control instruments" product.

When disposing products in the EU, contact your local Yokogawa Europe B.V. office.

Do not dispose in domestic household waste.

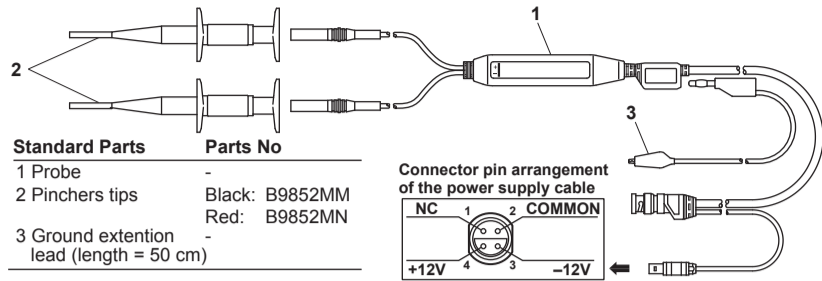
Authorized Representative in the EEA

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 113-01Z2.

1 Description

By using this device, oscilloscopes with single-ended input can be easily used as oscilloscopes with differential inputs.

2 Appearance



Standard Parts	Parts No
1 Probe	-
2 Pinchers tips	Black: B9852MM Red: B9852MN
3 Ground extension lead (length = 50 cm)	-

3 Operation

1. 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 extension 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, retirez 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.

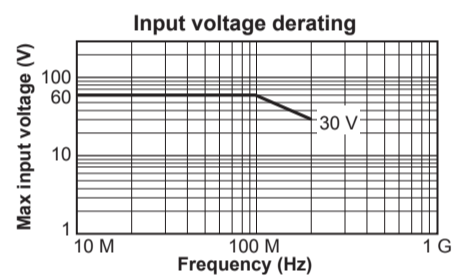
Note

- 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

Item	Specifications
Frequency bandwidth ¹	DC to 200 MHz (-3 dB)
Input type	Balancing difference input
Attenuation ratio	10:1
Output offset voltage ^{1,2}	± 5 mV
Input resistance/capacity ³	500 k Ω /7 pF each side to ground
Differential allowable voltage (between + - terminal)	± 20 V (DC + ACpeak)
Max common mode voltage	± 60 V (DC + ACpeak)
Max input voltage(to ground) ⁴	± 60 V (DC + ACpeak)
CMRR (typical) ^{1,3}	100 kHz: less than -80 dB; 10 MHz: less than -50 dB
Output voltage ¹	± 2 V (DC + ACpeak)
Output impedance	Using 50 Ω input system oscilloscope
Gain accuracy ^{1,2,5}	$\pm 1\%$
Operating Environment	5 to 40°C, 25 to 85% (no condensation)
Storage Environment	-30 to 60°C, 25 to 85% (no condensation)
Operating altitude	2000 m or less
Storage altitude	3000 m or less
Power Voltage	Power is supplied from a YOKOGAWA measuring instrument's probe power supply terminal or from a 700938 or 701934 probe power supply.
Warm-up time	At least 30 minutes
Dimensions	111 mm \times 22 mm \times 14 mm (excluding connector and cable)
Weight	Approx. 130 g
Safety standards	Complying standards EN61010-031 Measurement category I ⁶ : 60 V (DC + ACpeak) Pollution degree 2 ⁷
Emission	Complying standards EN61326-1 Class A EN55011 Class A, Group 1 EMC standards of Australia and New Zealand EN55011 Class A, Group 1 This product is a Class A (for industrial environment) product. Operation of this product in a residential area may cause radio interference in which case the user is required to correct the interference.
Immunity	Complying standards EN61326-1 Table 1

- 1 Ambient temperature 23 \pm 5°C, humidity 55% \pm 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 values are typical or mean values. They are not strictly guaranteed.
- 4 Frequency derating (load reduction) applies.



- 5 The accuracy depends on the tolerance of the oscilloscope's 50 Ω internal resistance. Example: If the tolerance is 50 Ω \pm 1%, the accuracy is $\pm 2\% \pm 5$ 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), nor 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.
- 7 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).