

# Current Probes

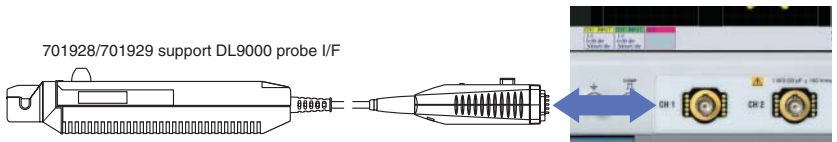
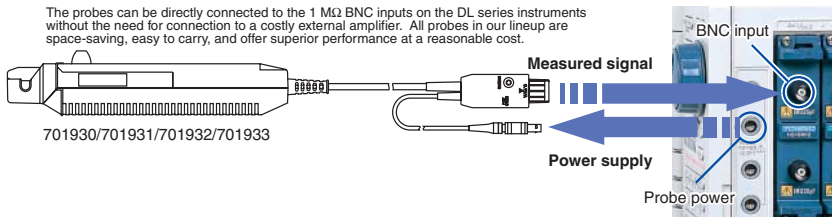
## for Digital Oscilloscopes and ScopeCoders

701928/701929/701930/701931/701932/701933



- **Bandwidth: DC to 2/10/50/100 MHz; Current Measurement: Max 30/150/500 A**
- **Clamp Configuration Makes Current Measurements Easy**  
The probe simply clamp around the conductor being measure.
- **No External Amplifier Required: Connects Directly to DL Series Instruments**

The probes can be directly connected to the 1 MΩ BNC inputs on the DL series instruments without the need for connection to a costly external amplifier. All probes in our lineup are space-saving, easy to carry, and offer superior performance at a reasonable cost.



- **Powered by the DL's Probe Power Supply Terminal**

701930, 701931, 701932, 701933:  
The probes are also compatible with external probe power supplies.  
701928, 701929:  
Support DL9000 probe I/F only.

- **Current Values Can Be Read Directly on DL Series Instruments**

Using the current probe selection menu eliminates the need to enter current/voltage conversion values.

- **Includes Demagnetizing Switch and Zero Adjust Functions**

- **701928/701929 support DL9000 probe I/F**

Easily connect the 701928/29 with the DL9000 series oscilloscopes. The probe power is supplied through the special connector. Current probes are automatically recognized, and the DL9000's display automatically changes to units of current (A). Make current probe zero adjustments from the DL9000's menu system. (Zero adjustments require DL9000 firmware Ver3.64 or greater.)

# Support for Wide Bandwidth Measurements, from Extremely Small to Large Currents

Yokogawa's, 701928, 701929, 701930, 701931, 701932, and 701933 current probes make it easy to observe current waveforms on an oscilloscope. Depending on your signal's bandwidth and maximum current, you can choose the right current probe for your measurement.

## 701933 DC to 50 MHz/30 A



## 701929 DC to 50 MHz/30 A DL9000 probe I/F

### 701933/701929 Specifications

Bandwidth*	Ambient temperature: 23±3°C, after power-on following 30 minutes warmup period DC to 50 MHz (-3dB) (typical characteristics shown in figure 1)
Rise time*	7 ns or less
Maximum continuous input range	30 Arms (derating according to frequency shown in figure 2)
Maximum peak current value*	50 Apeak (discontinuous)
Output voltage rate*	0.1 V/A
Amplitude accuracy*	0 to 30 Arms: ±1% of rdg ±1 mV To 50 Apeak: ±2% of rdg (DC, and 45 to 66 Hz)
Noise*	Equivalent to 2.5 mA Arms or less (for 20 MHz band measuring instrument)
Input impedance	Typical characteristic shown in figure 3
Temperature coefficient for sensitivity*	±2% or less
Maximum rated power	(within a range of 0 to 40°C when inputting 50 Hz, 30 Arms) 5.6 VA (Within maximum continuous input range)
Rated supply voltage	±12 V ±0.5 V (701933 only)
Operating temperature and humidity range	0 to 40°C, 80% RH or less (no condensation)
Storage temperature and humidity range	-10 to 50°C, 80% RH or less (no condensation)
Effect of external magnetic field	Equivalent to a maximum of 20 mA (in a DC or 60 Hz, 400 A/m magnetic field)
Maximum permitted circuit voltage	300 V CAT I (insulated conductor)
Maximum diameter of measured conductor	Ø5 mm
Cable length	Sensor cable: approx. 1.5 m (BNC terminal), Power supply cable: approx. 1 m
External dimensions	Sensor (701929, 701933 common) : approx. 175 (W) × 18 (H) × 40 (D) mm Terminator (701933): approx. 27 (W) × 55 (H) × 18 (D) mm Terminator (701929): approx. 29 (W) × 80 (H) × 24 (D) mm
Weight	701933: Approx. 230 g 701929: Approx. 190 g
Accessories	Instruction manual, soft case (701933), carrying case (701929)
* In conjunction with a waveform measuring instrument with an input impedance of 1 MΩ ±1%	
Standards Compliance	
Safety	EN 61010-2-032:2002 Overvoltage category I (anticipated transient overvoltage 1500 V), Pollution degree 2
EMC	EN 61326-1:1997+A1:1998+A2:2001

## 701932 DC to 100 MHz/30 A



## 701928 DC to 100 MHz/30 A DL9000 probe I/F

### 701932/701928 Specifications

Bandwidth*	Ambient temperature: 23±3°C, after power-on following 30 minutes warmup period DC to 100 MHz (-3dB) (typical characteristics shown in figure 4)
Rise time*	3.5 ns or less
Maximum continuous input range	30 Arms (derating according to frequency shown in figure 5)
Maximum peak current value*	50 Apeak (discontinuous)
Output voltage rate*	0.1 V/A
Amplitude accuracy*	0 to 30 Arms: ±1% of rdg ±1 mV To 50 Apeak: ±2% of rdg (DC, and 45 to 66 Hz)
Noise*	Equivalent to 2.5 mA Arms or less (for 20 MHz band measuring instrument)
Input impedance	Typical characteristic shown in figure 6
Temperature coefficient for sensitivity*	±2% or less
Maximum rated power	(within a range of 0 to 40°C when inputting 50 Hz, 30 Arms) 5.3 VA (Within maximum continuous input range)
Rated supply voltage	±12 V ±0.5 V (701932 only)
Operating temperature and humidity range	0 to 40°C, 80% RH or less (no condensation)
Storage temperature and humidity range	-10 to 50°C, 80% RH or less (no condensation)
Effect of external magnetic field	Equivalent to a maximum of 5 mA (in a DC or 60 Hz, 400 A/m magnetic field)
Maximum permitted circuit voltage	300 V CAT I (insulated conductor)
Maximum diameter of measured conductor	Ø5 mm
Cable length	Sensor cable: approx. 1.5 m (BNC terminal), Power supply cable: approx. 1 m
External dimensions	Sensor (701928, 701932 common) : approx. 175 (W) × 18 (H) × 40 (D) mm Terminator (701932): approx. 27 (W) × 55 (H) × 18 (D) mm Terminator (701928): approx. 29 (W) × 80 (H) × 24 (D) mm
Weight	701932: Approx. 240 g 701928: Approx. 190 g
Accessories	Instruction manual, carrying case (701932 and 701928)
* In conjunction with a waveform measuring instrument with an input impedance of 1 MΩ ±1%	
Standards Compliance	
Safety	EN 61010-2-032:2002 Overvoltage category I (anticipated transient overvoltage 1500 V), Pollution degree 2
EMC	EN 61326-1:1997+A1:1998+A2:2001

## 701930 DC to 10 MHz/150 A



### 701930 Specifications

Bandwidth*	Ambient temperature: 23±3°C, after power-on following 30 minutes warmup period DC to 10 MHz (-3dB) (typical characteristics shown in figure 7)
Rise time*	35 ns or less
Maximum continuous input range	150 Arms (derating according to frequency shown in figure 8)
Maximum peak current value*	300 Apeak (discontinuous) 500 Apeak at pulse width of 30 μs or less
Output voltage rate*	0.01 V/A
Amplitude accuracy*	0 to 150 Arms: ±1% of rdg ±1 mV To 300 Apeak: ±2% of rdg (DC, and 45 to 66 Hz)
Noise*	Equivalent to 25 mA Arms or less (for 20 MHz band measuring instrument)
Input impedance	Typical characteristic shown in figure 9
Temperature coefficient for sensitivity*	±2% or less
Maximum rated power	(within a range of 0 to 40°C when inputting 50 Hz, 150 Arms) 5.5 VA (Within maximum continuous input range)
Rated supply voltage	±12 V ±1 V
Operating temperature and humidity range	0 to 40°C, 80% RH or less (no condensation)
Storage temperature and humidity range	-10 to 50°C, 80% RH or less (no condensation)
Effect of external magnetic field	Equivalent to a maximum of 150 mA (in a DC or 60 Hz, 400 A/m magnetic field)
Maximum permitted circuit voltage	600 V CAT II (insulated conductor), 300 V CAT III (insulated conductor)
Maximum diameter of measured conductor	Ø20 mm
Cable length	Sensor cable: approx. 2 m (BNC terminal), Power supply cable: approx. 1 m
External dimensions	Sensor: approx. 176 (W) × 69 (H) × 27 (D) mm Terminator: approx. 27 (W) × 55 (H) × 18 (D) mm
Weight	Approx. 500 g
Accessories	Instruction manual, carrying case
* In conjunction with a waveform measuring instrument with an input impedance of 1 MΩ ±1%	
Standards Compliance	
Safety	EN 61010-2-032:2002 Overvoltage category II, III (anticipated transient overvoltage 4000 V), Pollution degree 2
EMC	EN 61326-1:1997+A1:1998+A2:2001

## 701931 DC to 2 MHz/500 A



### 701931 Specifications

Bandwidth*	Ambient temperature: 23±3°C, after power-on following 30 minutes warmup period DC to 2 MHz (-3dB) (typical characteristics shown in figure 10)
Rise time*	175 ns or less
Maximum continuous input range	500 Arms (derating according to frequency shown in figure 11)
Maximum peak current value*	700 Apeak (discontinuous)
Output voltage rate*	0.01 V/A
Amplitude accuracy*	0 to 500 Arms: ±1% of rdg ±5 mV To 700 Apeak: ±2% of rdg (DC, and 45 to 66 Hz)
Noise*	Equivalent to 25 mA Arms or less (for 20 MHz band measuring instrument)
Input impedance	Typical characteristic shown in figure 12
Temperature coefficient for sensitivity*	±2% or less
Maximum rated power	(within a range of 0 to 40°C when inputting 50 Hz, 500 Arms) 7.2 VA (Within maximum continuous input range)
Rated supply voltage	±12 V ±0.5 V
Operating temperature and humidity range	0 to 40°C, 80% RH or less (no condensation)
Storage temperature and humidity range	-10 to 50°C, 80% RH or less (no condensation)
Effect of external magnetic field	Equivalent to a maximum of 800 mA (in a DC or 60 Hz, 400 A/m magnetic field)
Maximum permitted circuit voltage	600 V CAT II (insulated conductor), 300 V CAT III (insulated conductor)
Maximum diameter of measured conductor	Ø20 mm
Cable length	Sensor cable: approx. 2 m (BNC terminal), Power supply cable: approx. 1 m
External dimensions	Sensor: approx. 176 (W) × 69 (H) × 27 (D) mm Terminator: approx. 27 (W) × 55 (H) × 18 (D) mm
Weight	Approx. 520 g
Accessories	Instruction manual, carrying case
* In conjunction with a waveform measuring instrument with an input impedance of 1 MΩ ±1%	
Standards Compliance	
Safety	EN 61010-2-032:2002 Overvoltage category II, III (anticipated transient overvoltage 4000 V), Pollution degree 2
EMC	EN 61326-1:1997+A1:1998+A2:2001

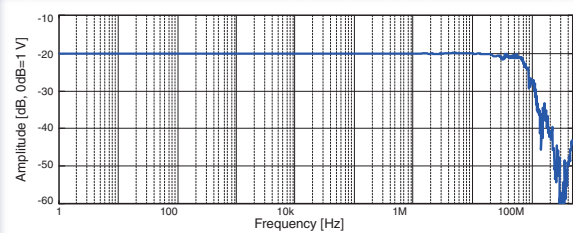


Fig.1 Frequency characteristics (typical)

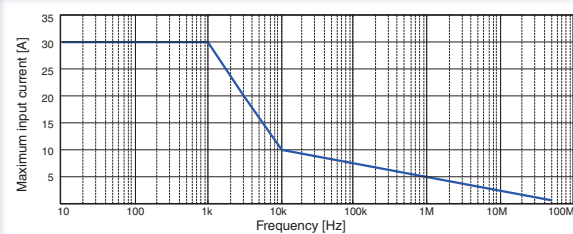


Fig.2 Current derating VS. frequency

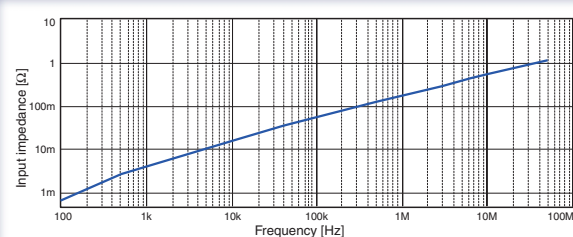


Fig.3. Input impedance (typical)

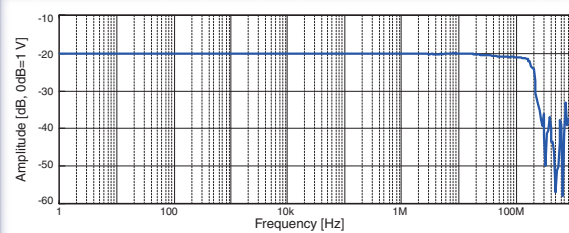


Fig.4 Frequency characteristics (typical)

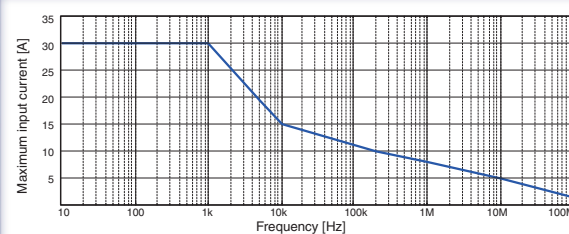


Fig.5 Current derating VS. frequency

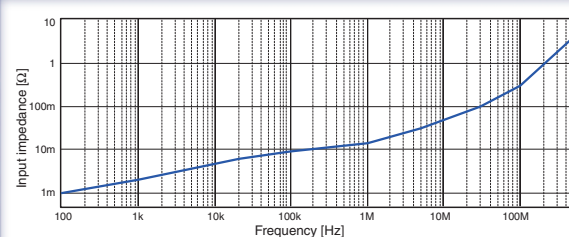


Fig.6. Input impedance (typical)

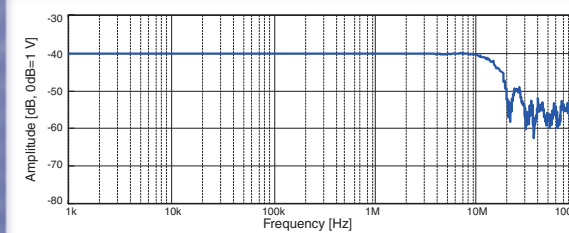


Fig.7 Frequency characteristics (typical)

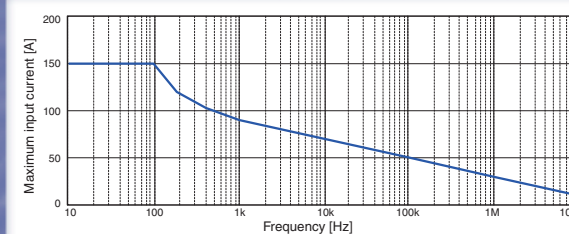


Fig.8 Current derating VS. frequency

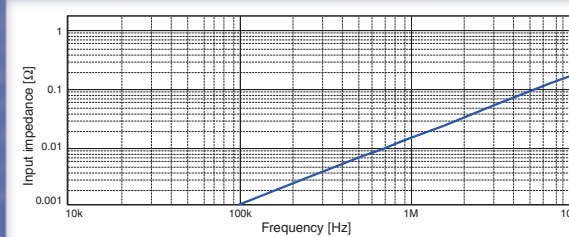


Fig.9. Input impedance (typical)

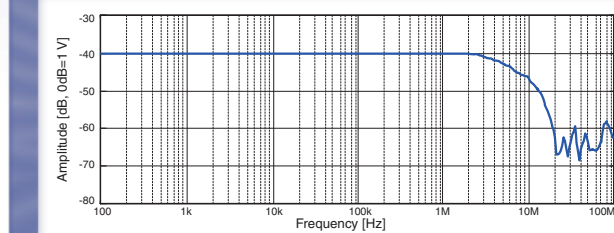


Fig.10 Frequency characteristics (typical)

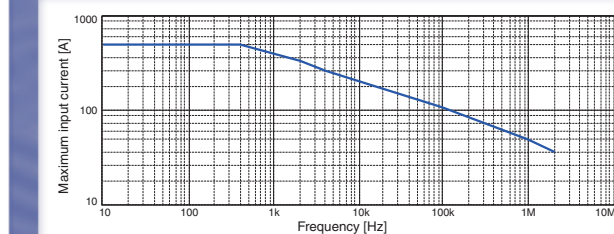


Fig.11 Current derating VS. frequency

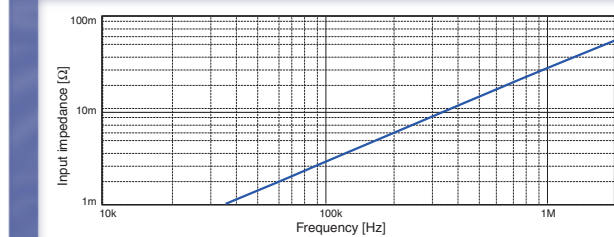
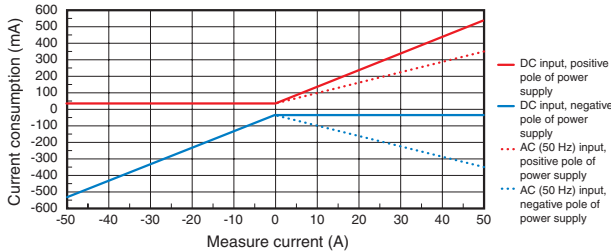


Fig.12. Input impedance (typical)

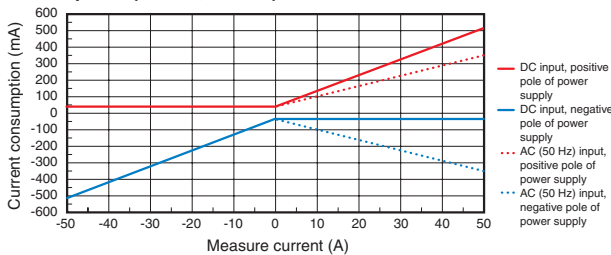
## Relationship between the Current being Measured and Probe's Current Consumption (Typical Values)

When using the DL to power the current probes, make sure that the total current consumption of the probes does not exceed the DL's probe power rating. For the probe power rating of each DL model, please visit [www.yokogawa.com/tm/probe/](http://www.yokogawa.com/tm/probe/)

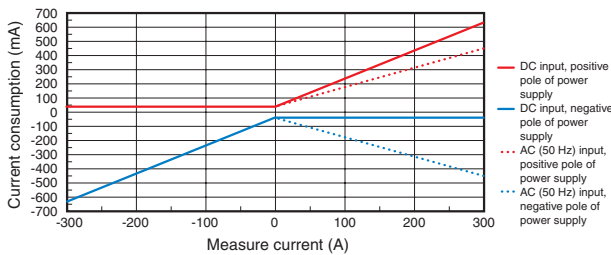
Current probe (701933, 701929)



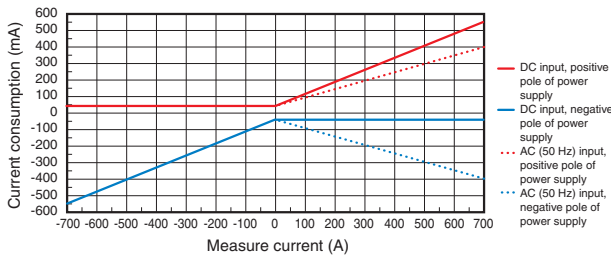
Current probe (701932, 701928)



Current probe (701930)



Current probe (701931)



### NOTICE



1. To avoid short circuits and electric shocks when using a current probe, use only with power lines carrying voltages within the rating limit of the current probe.
2. To avoid short circuits and electric shocks when the clamp core tip is opened, do not use on bare conductors.
3. Before operating the product, read the user's manual thoroughly for proper and safe operation.

## Current probe and power supply model numbers and suffix codes

Name	Model	Suffix Code	Description
Current probe	701933		30 Arms DC to 50 MHz, support probe power
	701932		30 Arms DC to 100 MHz, support probe power
	701930		150 Arms DC to 10 MHz, support probe power
	701931		500 Arms DC to 2 MHz, support probe power
	701929		30 Arms DC to 50 MHz, support DL9000 probe I/F *1
	701928		30 Arms DC to 100 MHz, support DL9000 probe I/F *1
Probe power supply	701934		Connects up to four active probes. Power voltage: 100 to 240 V, Output current: $\pm 2.5$ A
Power cable		-D	UL, CSA Standard
		-F	VDE Standard
		-H	GB Standard
		-Q	BS Standard
		-R	AS Standard

\*1) 701928/701929 can be used only with DL9000 series. DL9000 series with the firmware Ver3.64 or greater is necessary.

## 701934 Probe Power Supply

### Features

A power supply for current probes, FET probes, and differential probes. Probes work with both DL probe power connectors and the 701934 probe power supply. Supplies power for up to four probes, including large current probes. Supports both AC100 V and 200 V power supply requirements.

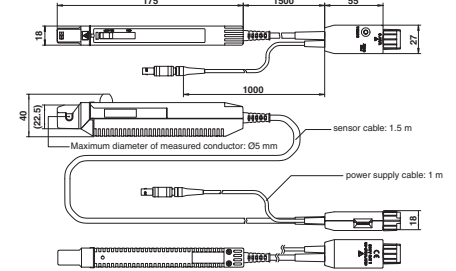
### Specifications

Number of power supply connectors 4  
 Output voltage  $\pm 12$  V  $\pm 0.5$  V  
 Rated output current  $\pm 12$  V: 2.5 A,  $-12$  V: 2.5 A (the total value of four outputs)  
 Operating temperature and humidity range 0 to 40°C, 80% RH or less (no condensation)  
 Storage temperature and humidity range  $-10$  to 50°C, 80% RH or less (no condensation)  
 Rated supply voltage AC100 to 240 V (50/60 Hz)  
 Maximum rated power 170 VA  
 External dimensions Approx. 80 (W)  $\times$  119 (H)  $\times$  200 (D) mm  
 Weight Approx. 1.1 kg  
 Notice 701934 does not support 71928 and 701929.

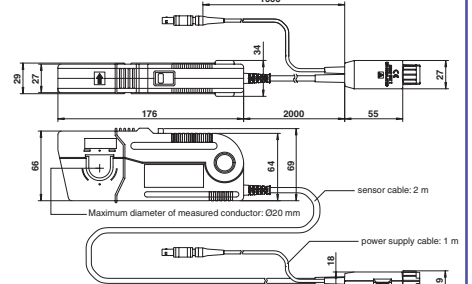


## Exterior Dimensions (mm)

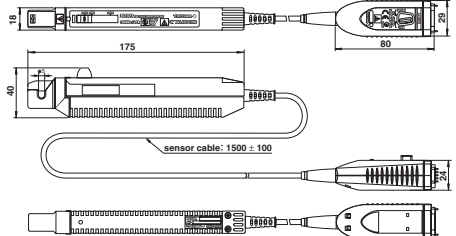
701933, 701932



701930, 701931



701928, 701929



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