

User's Manual

Model 701680 Battery Box

Thank you for purchasing the Battery Box (Model 701680)..

This user's manual contains useful information about the functions and operating procedures of the 701680 as well as precautions that should be observed during use. To ensure proper use of the instrument, please read this manual thoroughly before beginning operation. Please keep this manual in a convenient location in case questions arise during operation.

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Yokogawa Electric Corporation

IM 701680-01E
2nd Edition

Notes

- The contents of this manual are subject to change without prior notice as a result of continuing improvements to the device's performance and functions.
- Every effort has been made in the preparation of this manual to ensure the accuracy of its contents. However, should you have any questions or find any errors, please contact your nearest YOKOGAWA dealer.
- Copying or reproducing all or any part of the contents of this manual without YOKOGAWA's permission is strictly prohibited.
- A guarantee card is attached to the instrument. The card will not be reissued, so please read it carefully and keep it in a safe place.

Checking the Contents of the Package

Unpack the box and check the contents before using the device. If the contents are not correct or missing or if there is physical damage, contact the dealer from which you purchased them.

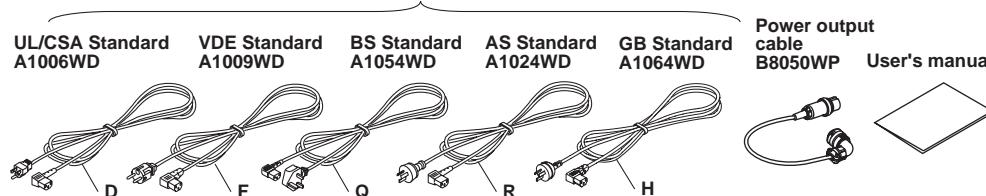
701680

Check that the model name given on the name plate match that on the order. When contacting the dealer from which you purchased the device, please quote the device No.

MODEL	SUFFIX SPECIFICATIONS
701680	
Power Cord	-D UL/CSA standard power cord (A1006WD) Maximum rated voltage: 125 V, maximum rated current: 7 A
	-F VDE standard power cord (A1009WD) Maximum rated voltage: 250 V, maximum rated current: 10 A
	-Q BS standard power cord (A1054WD) Maximum rated voltage: 250 V, maximum rated current: 10 A
	-R AS standard power cord (A1024WD) Maximum rated voltage: 250 V, maximum rated current: 10 A
	-H GB standard power cord (A1064WD) Maximum rated voltage: 250 V, maximum rated current: 10 A

Accessories

Power Cord (one of the following power cords is supplied according to the instrument's suffix codes)



Safety Precautions

Make sure to comply with the following safety precautions. Not complying might result in injury or death, or damage to the instrument.

WARNING

Power Supply

Before connecting the power cord, make sure that the power supply voltage matches the voltage rating of the instrument and that it does not exceed the maximum rated voltage of the power cord.

Power Cord and Plug

To prevent an electric shock or fire, be sure to use the power cord supplied by YOKOGAWA. The main power plug must be plugged in an outlet with a protective grounding terminal. Do not invalidate protection by using an extension cord without protective grounding.

Protective Grounding

The protective grounding terminal must be connected to ground to prevent an electric shock before turning ON the power.

Necessity of Protective Grounding

Never cut off the internal or external protective grounding wire or disconnect the wiring of the protective grounding terminal. Doing so poses a potential shock hazard.

Defect of Protective Grounding and Fuse

Do not operate the instrument when the protective grounding or fuse might be defective.

Do Not Operate Near Flammable Materials

Do not operate the instrument in the presence of flammable liquids or vapors. Operation of any electrical instrument in such an environment constitutes a safety hazard.

Do Not Remove Any Covers

There are some areas inside the instrument with high voltages. Do not remove any cover if the power supply is connected. The cover should be removed by qualified personnel only.

External Connection

To ground securely, connect the protective grounding before connecting to measurement or control unit.

Proper Disposal of This Instrument

The Battery Box uses nickel metal hydride (Ni-MH) batteries and must be disposed of according to local laws. Contact your nearest YOKOGAWA dealer for assistance if necessary.

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This instrument is an IEC safety class I instrument (provided with terminal for protective grounding). The following general safety precautions must be observed during all phases of operation, service and repair of this instrument. If this instrument is used in a manner not specified in this manual, the protection provided by this instrument may be impaired. Also, Yokogawa Electric Corporation assumes no liability for the customer's failure to comply with these requirements.

The Following Symbols are Used on this Instrument



To avoid injury, death of personnel or damage to the instrument, the operator must refer to an explanation in the user's manual or service manual.



Alternating current



ON (power)



OFF (power)

Precautions During Use

Safety Precautions

When you are using this instrument, read "Safety Precautions", as well as the following points.

Do not Remove the Cover from the Instrument

Some parts of the instrument use high voltages, which are extremely dangerous. When the instrument needs internal inspection or adjustment, contact your dealer or nearest YOKOGAWA representative, as listed on the back cover of this manual.

In Case of Irregularity

If you notice smoke or unusual odors coming from the instrument, immediately turn OFF the main power and unplug the power cord. If such an irregularity occurs, contact your dealer or the nearest YOKOGAWA representative as listed on the back cover of this manual.

Power Cord

Nothing should be placed on the power cord. Also, it should be kept away from any heat sources. When unplugging the power cord from the AC outlet, never pull the cord itself. Always hold the plug and pull it. If the power cord is damaged, contact your dealer. See page ii for the part number to use when placing an order.

General Handling Precautions

Observe the following precautions when handling the instrument.

Do Not Place Anything Other Than the DL1600 on Top of This Instrument

Do not place any instrument other than the DL1600, nor any container containing liquids on top of this instrument. Doing so can cause damage.

When the Instrument is not going to be Used for a Long Period

Unplug the power cord from the AC outlet.

Carrying the Instrument

Before carrying the instrument remove the power cord and other cables.

Cleaning

When cleaning the case or the operation panel, unplug the power cord from the plug first, then wipe with a dry, soft, clean cloth. Do not use volatile chemicals such as benzene or thinner for cleaning, as this may lead to discoloration or deformation.

Overview

The Battery Box outputs DC voltage using a built-in nickel metal hydride (Ni-MH) battery or an AC power supply.

When used with an AC power supply:

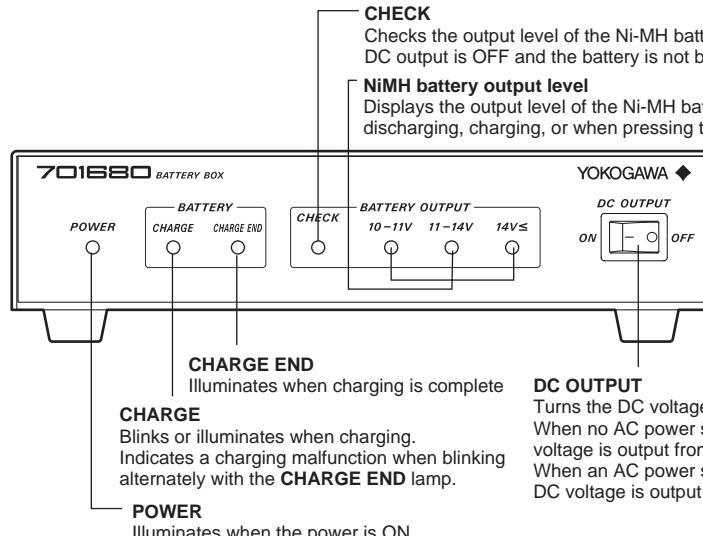
AC voltage from the power supply is converted to 14 VDC and output

When no AC power supply is available:

12 VDC is output from the built-in Ni-MH battery

Name and Use of Each Part

Front Panel



CHECK

Checks the output level of the Ni-MH battery when DC output is OFF and the battery is not being charged

NiMH battery output level

Displays the output level of the Ni-MH battery when discharging, charging, or when pressing the CHECK button

CHARGE END

Illuminates when charging is complete

CHARGE

Blinks or illuminates when charging.

Indicates a charging malfunction when blinking alternately with the CHARGE END lamp.

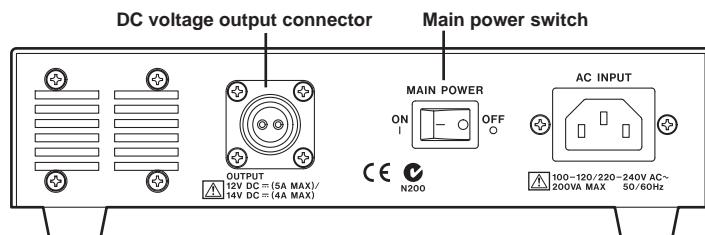
POWER

Illuminates when the power is ON

DC OUTPUT

Turns the DC voltage output ON/OFF. When no AC power supply is connected, voltage is output from the Ni-MH battery. When an AC power supply is connected, DC voltage is output using the AC power.

Rear Panel



Connecting the Battery Box to the DL1600

Before Connecting the Battery Box

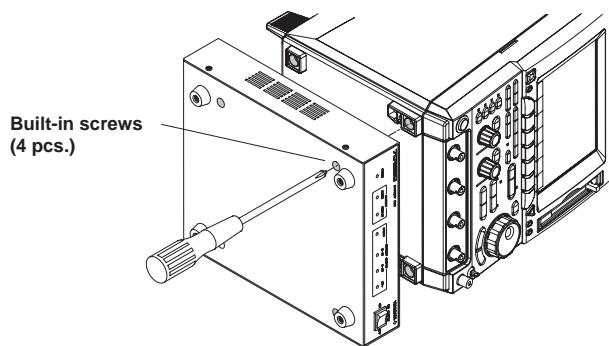
Please heed the following warnings before connecting the Battery Box to the DL1600. Failure to do so may result in electric shock or damage to instruments.

WARNING

- To avoid electric shock, do not connect the AC power cord while connect the battery box to the DL1600.

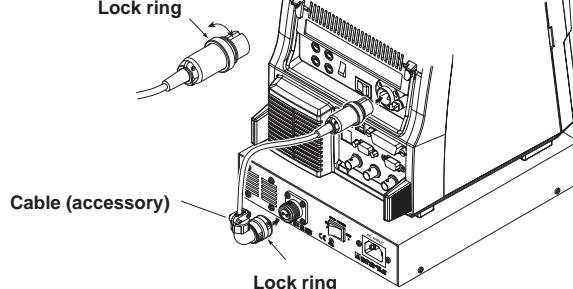
Connecting the Battery Box to the DL1600

- Check that the power switches to both the Battery Box and DL1600 are turned OFF, and that the DC OUTPUT switch on the Battery Box is turned OFF.
- Attach the Battery Box to the DL1600 using the 4 built-in screws as shown.



- Connect the Battery Box to the DL1600 using the provided DC power supply cable.

Connect the L-shaped connector to the Battery Box, and the other connector to the DL1600. Confirm that the connectors are inserted correctly, then secure them using the lock ring.



Connecting the Power Supply

Make sure that you observe the following points before connecting the power. Failure to do so may cause electric shock or damage to the instrument.

WARNING

- Before connecting the power cord, make sure that the source voltage matches the voltage of the power supply and that it is below the rated voltage of the power cord.
- Connect the power cord after confirming that the instrument power switch is OFF.
- Always use protective ground to prevent electric shock. Connect the instrument power cord to the 3-prong power outlet with grounding terminal.
- Do not use non-grounding extension cords or other measures that defeat the protective grounding.
- Never use an extension cord that does not have a protective grounding, otherwise the protection feature will be invalidated.
- To avoid electric shock, ensure proper protective grounding of the DL1600 to which you will connect the Battery Box.

Connecting the Power Cord

- Check that the power switch is turned OFF.
- Connect the plug on the power cord to the power supply connector on the rear panel.
- Plug the other end of the cord into a power outlet that satisfies the conditions below. Use a 3-prong power outlet equipped with protective grounding.

Rated supply voltage*: 100 to 120 VAC/220 to 240 VAC

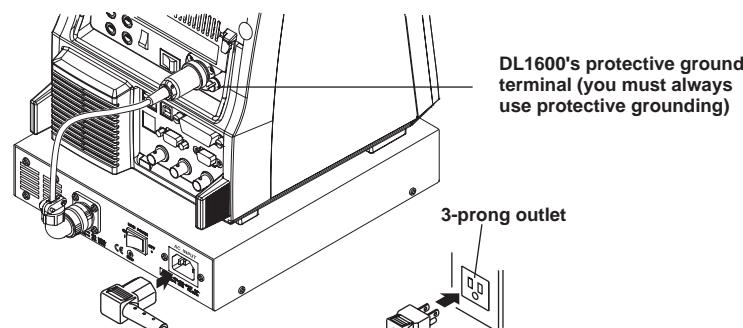
Permitted supply voltage range: 90 to 132 VAC/198 to 264 VAC

Rated supply voltage frequency: 50/60 Hz

Permitted supply voltage frequency range: 48 to 63 Hz

Maximum power consumption: 200 VA

* The 701680 can be used in 100-V and 200-V systems. Before using the 701680, make sure that the source voltage matches the voltage of the power supply and that it is below the rated voltage of the power cord.



Charging the Battery

The Battery Box's Ni-MH battery is not charged at the time of shipment. Therefore, you must charge the Ni-MH battery before using the Battery Box for the first time. You must also charge the battery if the output level decreases.

- Turn OFF the DC voltage output power ON/OFF switch.
- Turn ON the power switch to the Battery Box. The CHARGE LED illuminates or blinks.

When charging finishes, the CHARGE LED goes out, and the CHARGE END LED illuminates.

Checking the Charge State of the Ni-MH Battery

When DC voltage output is OFF, press the CHECK button. The 10-11V, 11-14V, or 14V LED illuminates to indicate the charge state of the Ni-MH battery. Charging is required if the 11-14V LED does not illuminate. Also, when the Ni-MH battery is outputting voltage (when not connected to an AC power supply and when DC voltage output is ON), the 10-11V, 11-14V, or 14V LED illuminates to indicate the battery's output level.

Note

- When the Ni-MH battery's temperature or voltage falls within a certain range, the battery is charged rapidly and the CHARGE LED illuminates, otherwise the CHARGE LED blinks.
- If a malfunction occurs during charging, the CHARGE and CHARGE END LEDs blink alternately. If this occurs, please contact the Yokogawa Engineering Services representative from whom you purchased the instrument.
- Four hours and thirty minutes are required to fully charge a completely discharged battery.
- If the number of recharges exceeds the specification, the battery must be replaced. Also, even if the number of charges is less than the specification, if the battery is discharging quickly or the charge time is increasing, the battery's life has expired. Please contact the dealer from whom you purchased the Battery Box, or your nearest Yokogawa Engineering Services representative.
- When charging the Ni-MH battery for the first time after purchase, or for the first time after prolonged non-use, a single charging cycle may be insufficient to achieve a full charge. If this is the case, charge the battery 2 or 3 times repeatedly.
- Wait at least 10 seconds after turning the power OFF before turning it back ON again.

Outputting DC Voltage

Outputting DC Voltage from the Ni-MH Battery

- Turn OFF the power switch on the rear panel. The cable can be connected or disconnected (it will not affect the output).
- Press the CHECK button, then check the battery's charge state. If charging is required, charge the unit according to the steps described above.
- Turn ON the DC OUTPUT switch on the front panel. DC voltage is output from the DC voltage output connector.

Outputting DC Voltage without the Ni-MH Battery

- Connect the Battery Box to an AC power supply, then turn ON the power switch on the rear panel.
- Turn ON the DC OUTPUT switch on the front panel. DC voltage is output from the DC voltage output connector.

Note

When the Ni-MH battery is not charged, voltage can be output by using an AC power supply.

Specifications

Rating:	14 VDC, 4.0 A (when not using the Ni-MH battery) 12 VDC, 5.0 A (when using the Ni-MH battery)	
Number of Charges:	Approx. 500 (varies depending on usage environment)	
Storage Conditions	Temperature: -20 to 60°C Humidity: 20 to 80% RH (no condensation allowed)	
Operating Conditions	Temperature: 5 to 40°C Humidity: 5 to 35°C (when charging) 20 to 80% RH	
Storage Altitude:	3000 m or below	
Operating Altitude:	2000 m or below	
Rated Supply Voltage:	100 to 120 VAC, 220 to 240 VAC	
Permissible Supply Voltage Range:	90 to 132 VAC, 198 to 264 VAC	
Rated Supply Voltage Frequency:	50Hz, 60 Hz	
Permissible Supply Voltage Frequency Range:	48 to 63 Hz	
Withstand Voltage:	1.5 kVAC for 1 minute (between power supply and case)	
Insulation Resistance:	10 MΩ or more at 500 VDC (between power supply and case)	
External Dimensions:	220 (W) x 50 (H) x 248 (D) mm	
Weight:	Approx. 2.9 kg (options excluded)	
Installation Position:	Horizontally No stacking (except for using with DL1600).	
Accessories	• 1 power cord • Cable: 1 (for connection to the DL1600) • User's Manual (this manual)	
Safety standard	Complying standard	EN61010-1
Emission	Complying standard	• Pollution degree 2* ¹ • EN61326 Class A, C-Tick AS/NZS 2064 • EN61000-3-2 • EN61000-3-3 • This product is a Class A (for industrial environment) product. Operation of this product in a domestic environment may cause radio interference in which case the user is required to correct the interference.
Immunity	Complying standard	EN61326 Industrial environment

*¹ "Pollution degree" describes the degree to which a solid, liquid, or gas which deteriorates dielectric strength or surface resistivity is adhering. "2" applies to normal indoor atmosphere. Normally, only non-conductive pollution occurs.

External Dimensions

