

User's Manual

Model MY40
Insulation Resistance Tester

This manual describes the specifications and handling precautions of the insulation resistans tester. Before using this product, thoroughly read this manual to understand how to use it properly. The following manuals, including this one, are provided as manuals for the MY40. Please read all manuals.

IM MY40-E:	Safety precautions, components and specifications etc. (this manual)
IM MY40-02EN:	Operation manual
IM MY40-S03-EN:	Sales in Each Country or Region (Waste Electrical and Electronic Equipment, EU Battery Directive)
IM CROHS-MY40:	Document for China
IM MY40-93Z2:	Document for Korea

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

PIM 113-01Z2:	Inquiries	List of worldwide contacts
---------------	-----------	----------------------------

Store this manual in an easily accessible place for quick reference.

B3

YOKOGAWA

Yokogawa Test & Measurement Corporation

10th Edition: June 2023 (YMI)

All Rights Reserved. Copyright © 1996, Yokogawa M&C Corporation, 2015, Yokogawa Meters & Instruments Corporation, 2017, Yokogawa Test & Measurement Corporation

IM MY40-E

10th Edition: June 2023 (YMI)

Model and Suffix Code

MODEL	SUFFIX	Specifications
MY40		Insulation Resistance Tester
Rating	-01	125 V/200 MΩ, 250 V/200 MΩ, 500 V/2000 MΩ, 1000 V/2000 MΩ

1. Safety Precautions

This product is designed to be used by a person with specialized knowledge. When operating the instrument, be sure to observe the cautionary notes given below to ensure correct and safe use of the instrument. If you use the instrument in any way other than as instructed in this manual, the instrument's protective measures may be impaired. This manual is an essential part of the product; keep it a safe place for future reference. YOKOGAWA is by no means liable for any damage resulting from use of the instrument in contradiction to these cautionary notes.

The following safety symbols are used on the instrument and in this manual.

This symbol indicates that the operator must refer to an explanation in the user's manual in order to avoid risk of injury or death of personnel or damage to the tester.

WARNING

Indicates a hazard that may result in the loss of life or serious injury of the user unless the described instruction is abided by.

CAUTION

Indicates a hazard that may result in an injury to the user and/or physical damage to the product or other equipment unless the described instruction is abided by.

NOTE

Indicates information that is essential for handling the instrument or should be noted in order to familiarize yourself with the instrument's operating procedures and/or functions.

- High-voltage Terminal
This symbol indicates a dangerous voltage level (terminals with voltages exceeding 1000 volts must be so marked). Never touch the terminals.
- AC Voltage
This symbol indicates the presence of an AC voltage.
- Double Insulation
This symbol indicates double insulation.

Always observe the following instructions. Failure to do so may result in electric shock or other dangers that may lead to serious injury or the loss of life.

WARNING

This instrument is a insulation resistance tester that can measure insulation resistance (AC voltage). Do not use this instrument for other purpose. Do not use the instrument if there is a problem with its physical appearance.

1. During Measurement of Insulation Resistance
 - A high voltage is present at the probes. Do not touch the measured object or the earth or line terminal.
2. Immediately After Measurement of Insulation Resistance
 - The probes or the measured object may remain highly charged. Do not touch them immediately after the completion of measurement.
3. During Measurement of AC Voltages
 - Do not press the MEAS key while measuring AC voltages.
 - Voltage that exceeds the specified limit must not be applied to terminals.
4. Probes
 - Use the probes supplied by Yokogawa with this tester.
 - Do not use probes that have deteriorated or are defective.
 - Remove the probes from the measured object before attaching/detaching the probes to/from the tester.
5. Insulation of Casing
 - A puncture in the protective insulation may occur if there are any cracks or other damage in the casing as a result of the instrument having been dropped or knocked against another object. Do not use the instrument before taking the necessary remedial measures; ask the manufacturer to repair it.
6. The Measured Object
 - Turn off the power to the measured object before you begin measuring insulation resistance.
 - Avoid touching any electrified parts while using the tester in a location with live electricity. Safety protectors such as rubber-insulated gloves should be worn to prevent electrical shock when using the tester.
7. Operating Environment
 - Do not operate the tester in an atmosphere where any flammable or explosive gas is present.
 - Do not use the tester if there is condensation on it.
8. Do Not Remove the Casing or Disassemble
 - Do not open the case except when replacing batteries.
 - Only qualified YOKOGAWA personnel may remove the case and disassemble or alter the instrument. Do not attempt to repair/modify the instrument yourself, as doing so is extremely dangerous.

CAUTION

- The instrument is for domestic use (Class B) and meets the electromagnetic compatibility requirements.
- To verify the instrument's functionality, check that the measured value is update after turning on the power. If the measured value is not update, the reading will be incorrect and may lead to possible electrical shock or personal injury.

- Measurement Categories
- Measurement category of the MY40

WARNING

The instrument is designed for measurement category III. Do not use the instrument for measurements in locations falling that fall under measurement category IV.

Measurement category of the Probes		
Line probe (98001)	With cap: 600 V CAT III	Without cap: 600 V CAT II
Earth probe (98002)	600 V CAT III	

WARNING

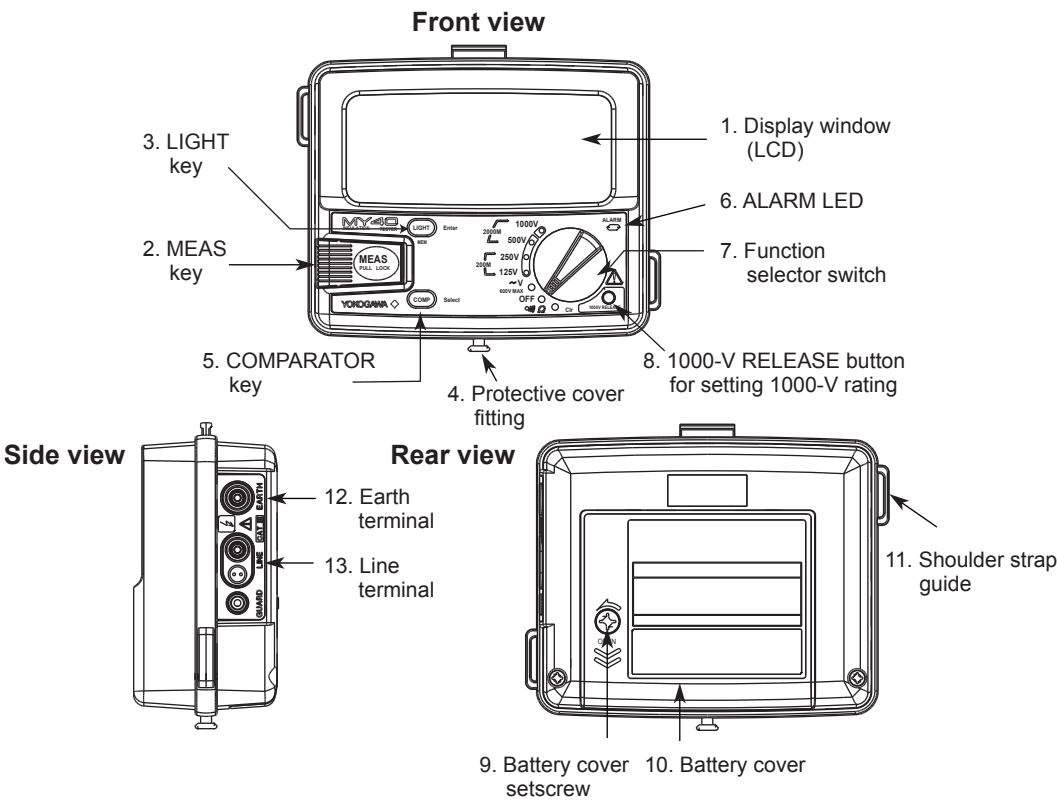
A cap is provided on the tip of the line probe. Use the line probe with the cap on for safety (safety standard: EN61010-031).

Measurement category	Description	Remarks
O (None, Other)	Other circuits that are not directly connected to MAINS.	Circuits not connected to a mains power source.
CAT II	For measurements performed on circuits directly connected to the low-voltage installation.	Appliances, portable equipment, etc.
CAT III	For measurements performed in the building installation.	Distribution board, circuit breaker, etc.
CAT IV	For measurements performed at the source of the low-voltage installation.	Overhead wire, cable systems, etc.

2. Measuring Functions and Additional Features

- Measuring Functions
 - Measuring the insulation resistance (four ratings)
125 V/ 200 MΩ, 250 V/ 200 MΩ, 500 V/ 2000 MΩ, 1000 V/ 2000 MΩ
 - Measuring AC voltages (sine wave at 45 to 400 Hz)
 - Measuring conductor resistances (0 to 400.0 Ω)
Continuity test (beeps for 40 Ω or less)
- Additional Features
 - Memory feature (data saving)
Up to 20 measured values of the insulation resistance for each rating can be saved to memory.
 - Live-line alarm
When an AC voltage of 40 V or more is applied between the input terminals, the ALARM LED flashes and the buzzer beeps (except during AC voltage measurement).
 - Comparator
When a measured insulation resistance is less than the reference value setting, the LOW mark appears and the buzzer beeps.
 - HOLD feature
Measured insulation resistances are automatically held for approximately five seconds.
 - High-voltage indication
If a DC voltage exists between the terminals, the HV mark and the ALARM LED come on.
 - Discharge feature
The tester is designed to begin discharging when the MEAS key is turned off. It indicates the discharging status with a bar graph, and the HV mark and ALARM LED come on during discharging (andoff when discharging is complete).
 - Auto-power off
The tester is automatically turned off when no key operations are performed for 10 minutes.
 - LCD backlight
The backlight can be turned on/off with the LIGHT key.
 - Locking the MEAS key
Pulling the MEAS key up allows for continuous measurement over a prolonged time.
 - Lock for inadvertent setting of 1000-V range
This mechanism protects the measured circuit from damage due to inadvertent measurement with the highest voltage (1000 V).

3. Components



1. Display window (LCD)

Displays the measured values and the function marks (see section 9, "Display Functions": IM MY40-02EN).
2. MEAS key

Used for measuring the insulation resistance only.
3. LIGHT key (MEM key) (Enter key)

Used for turning on/off the backlight. Also used for setting memory. Also used for confirmation for the comparator and memory functions.
4. Protective cover fitting
5. COMP key: (Select key)

Used for setting the comparator. Also used for selection for the comparator andmemory functions.
6. ALARM LED

Flashes for the live-line alarm, and is lit as a warning for the high-voltage alarm.
7. Function switch

A rotary switch for setting measurement ratings with the following positions:
 - 1000 V/2000 MΩ
 - 500 V/2000 MΩ
 - 250 V/200 MΩ
 - 125 V/200 MΩ
 - AC voltage measurement (maximum input voltage: 600 V)
 - Power off
 - Conductor resistance measurement
 - Continuity test
 - Clr: Memory clea
8. 1000-V RELEASE button

Turn the function switch to the 1000 V rating position while pressing this button.
9. Battery cover setscrew

Undo to replace batteries.
10. Battery cover
11. Shoulder strap guide

The shoulder strap is passed through it.
12. Earth terminal

Connection for earth probe.
13. Line terminal

Connection for line probe.

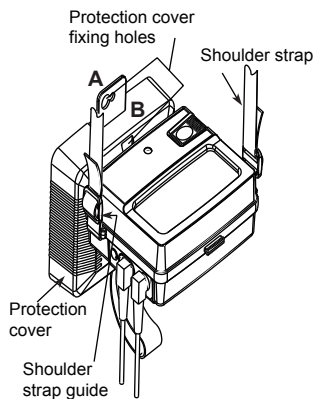
NOTE

GUARD function is not a standard function.

4. Using Protection Cover and Shoulder Strap

The tester comes with a protection cover and shoulder strap as standard accessories.

- The protection cover can be used as a front cover (for the display window) or as a bottom cover. (It is set as the front cover when delivered from the factory.)
- Using the shoulder strap allows you to position the tester in front of your chest for ease of reading. Pass the strap through the shoulder strap guide and adjust the length of the strap to allow you a good view of the tester.
- Remove the cover from the front, and attach it to the bottom using the fixing hole (B) on the surface of the cover. This is useful when the diaplay is too close to your body to see clearly (See the figure on the right).
- A belt on the cover which is fitted with pieces of Velcro, can be used to store the probes (Remove the probes from the tester terminals when storing them).



5. Battery Replacement

WARNING

- Remove the probes from the tester and then turn off the MEAS key before opening the casing to replace the batteries.
- Do not touch the MEAS key during replacement. Otherwise, a high voltage may be produced.

CAUTION

- Do not mix batteries of different types or new batteries with used ones.
- Always remove the batteries if the tester will not be used for a prolonged period of time. If you store the tester with the batteries left installed, fluid is likely to leak from them, resulting in a malfunctioning of the instrument.

<Procedure>

1. Loosen the battery cover setscrew, and then slide the cover off of the main unit.
2. Replace all of the 4 batteries at the same time and make sure the polarities of the new batteries are exactly as shown on the battery holder.
3. After replacing the batteries, attach the battery cover and tighten the setscrew.

■ Battery Life (Reference only)


For MY40 at rated 500 V/2000 MΩ:
Approximately 15 hours when in continuous operation with center value indicated (approx. 50 MΩ; with standard supplied batteries).

NOTE

The data above is typical. Nevertheless, the battery life varies depending on the operating conditions. Check the batteries before measurement.

6. Specifications

Item \ Rating	125 V/200 MΩ	250 V/200 MΩ	500 V/2000 MΩ	1000 V/2000 MΩ
Center Value Indicated (MΩ)	5	5	50	50
1st Effective Measuring Range (MΩ)	.0200 to 10.00	.0500 to 20.00	1.000 to 500	2.000 to 1000
2nd Effective Measuring Range Lower Limit (MΩ)	0 to .0199	0 to .0499	0 to .999	0 to 1.999
2nd Effective Measuring Range Upper Limit (MΩ)	10.01 to 200	20.01 to 200	501 to 2000	1001 to 2000
Lower Measuring Limit of Resistance (MΩ)	0.125	0.25	0.5	2
Rated Current (mA)	1 to 1.2	1 to 1.2	1 to 1.2	0.5 to 0.6
AC Voltage Measuring Range (V)	0 to 600			

Standard test conditions	
Ambient temperature and humidity:	23 ±5°C at 45 to 75% RH
Position :	Horizontal (within 5 degrees)
Influence of external magnetic field:	Earth magnetism
Battery voltage :	Within effective range of the battery (the  mark must not beindicated.)
Tolerances under the above conditions	
Insulation resistance measurement:	±(2% of rdg + 6 dgt) within the 1st effective measuring range ± (5% of rdg + 6 dgt) within the 2nd effective measuring range (Lower limit) ±(5% of rdg) within the 2nd effective measuring range (Upper limit) 6 dgt max.
Zero value indicated:	± (2% of rdg+6 dgt)
AC voltage:	± (2% of rdg+8 dgt)
Conductor resistance measurement:	± (2% of rdg+8 dgt)
No-load voltage:	within 130% of the rated voltage
Short-circuit current:	2 mA or less

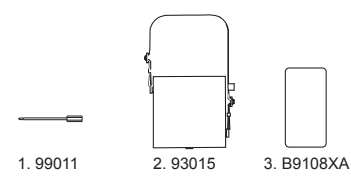
Item	Limit	Test condition
Response time	Digital indication: 3 seconds or less Bar graph indication (static) value: approx. 2 seconds	From the instant the resistors whose values correspond to central indication and zero indications are abruptly connected, to when the pointer reaches a level within tolerance
Effect of temperature	± (2% or rdg 6 dgt)	1st effective measuring range: maximum, center, and minimundicated values Deviation from those values when ambient temperature is varied from 20°C by ± 20°C.
Effect of humidity	Within tolerance	When the tester is left for 1 hour with the humidity at 90% RH
Effect of external magnetic field	1.2% or less of indication	A change when the maximum, center, and minimum values of the first effective measuring range are indicated and an external field of 400 A/m DC is applied in the most affected direction.
Effect of AC component	10% or less of indication	A change when a capacitor of 5 mF ±10% is connected in parallel with a resistor the value of which is determined from the rated measuring voltage and current, and which is itself connected to the measuring terminals
Withstand voltage	There must not be an abnormality (between electric circuits and outer case).	When a sine wave, or the like, is applied between the electric circuits and the outer case at 5550 V AC and 50/60 Hz for 1 minute
Effect of vibration	There is no structural damage and the difference in errors must be 100% or less of the tester's intrinsic errors	When a vibration frequency of 25 Hz and a peak-to-peak amplitude of 1 mm is applied for 20 minutes in each of three directions that are perpendicular to each other.
Effect of shock	There is no structural damage and the difference in errors must be 100% or less of the tester's intrinsic errors	When a half-sine pulse shock of 1000 m/s ² is applied in both forward and reverse for 6 ms, three times in each of three directions that are perpendicular to each other.
Effect of external voltage	There must not be an abnormality.	When an AC voltage 1.2-fold the rated measuring voltage at 50 Hz or 60 Hz is applied to the measuring terminals for 10 seconds with the MEAS key being on and then off.
Possible number of measurements	Model MY40-01 Range Number of measurements 125 V/200 MΩ Approx. 1,600 250 V/200 MΩ Approx. 1,400 500 V/2000 MΩ Approx. 1,000 1000 V/2000 MΩ Approx. 700	Test point: The minimum measurable resistance that can maintain the rated measuring voltage. Measuring time: Five seconds each with approx. 25 seconds between measurements Backlight: Off Battery used: Manganese battery Ambient temperature: 20 ±2 °C; Relative humidity: 65 ±20% (Battery testing conditions in compliance with JIS C8501)
Protection against water, solid matters, and dust penetration	Class IP 40: Foreign substances of 1.0 mm or more in diameter must not enter at all.	JIS C0920 compliance, with measuring probes attached to the tester. (IEC 60529: Degrees of protection provided by enclosures)

General Specifications

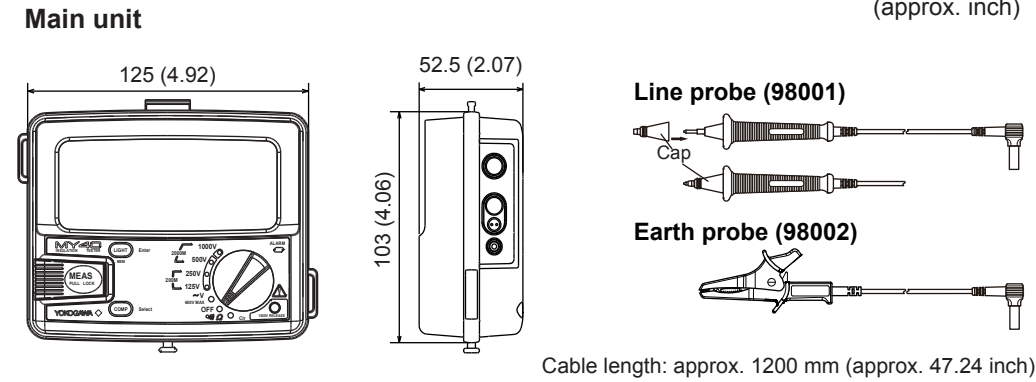
Operation temperature and humidity	0°C to 40°C at 90% RH or less (no condensation)
Storage temperature and humidity	−10°C to 60°C at 70% RH or less (no condensation)
Battery	Four AA-size (R6)
External dimensions	Approx. 125 (W) × 103 (H) × 52.5 (D) mm
Weight	Approx. 420 g (main unit and batteries only) Approx. 600 g (main unit, batteries, protective cover, earth probe and line probe)
Safety standards	EN 61010-1, EN 61010-2-030, EN 61010-031 Measurement category III (CAT III) 600 V Insulation class 2 Indoor use, alittitude 2000 m or less, pollution degree 2 EN 61326-1 Class B, EN 61326-2-2 EMC Regulatory Arrangement in Australia and New Zealand EN 55011 Class B Group 1 Korea Electromagnetic Conformity Standard (한국 전자파적합성기준)
EMC standards	Insulation resistance measurement 1st effective measuring range: ±(5% of rdg +12 dgt) 2nd effective measuring range: ±(10% of rdg +12 dgt) AC voltage measurement: ±(5% of rdg +12 dgt) Conductor resistance measurement: ±(10% of range)
Environmental standard	EN 50581 Monitoring and control instruments including industrial monitoring and control instruments

■ Standard Accessories		
Name	Model No.	Quantity
Protection cover	93013	1
Shoulder strap	99005	1
Line prob	98001	1
Earth probe	98002	1
Batteries	---	4
User's manual	IM MY40-E	1
	IM MY40-02EN	1

■ Optional Accessories		
Name	Model No.	Description
1. Spare probe tip for the line probe (Model 98001)	99011	105 mm, breaker pin
2. Hard case	93015	Houses both the main unit, the line probe and the earth probe.
3. Accessory bag	B9108XA	Soft case: approx. 100 (W)×190 (H)×40 (D) mm



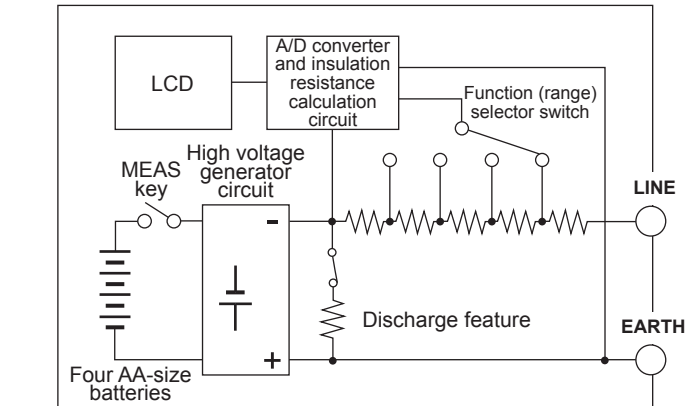
External Dimensions



NOTE

If the breaker pin (99011) is attached on the Line probe, detach the cap from Line probe.

7. Outline of Measurement Principle



Block Diagram of Insulation Resistance Measurement Circuit

8. Maintenance

8.1 Storage Conditions

- Temperature and humidity:-10°C to 60°C at 70% RH or less
- Remove the batteries before storing the tester.
- Avoid storing the tester in a location where there is: moisture; exposure to direct sunlight; a high-temperature heat source nearby; exposure to severe mechanical vibrations; a large amount of dust and/or salt, or a corrosive gas.

8.2 Removal of Dirt

Do not use solvents (such as paint thinners or benzine) or chemicals as they are likely to cause discoloration. Wipe off dirt with a cloth dampened water or alcohol.

8.3 Calibration Cycle

It is recommended that the tester be calibrated once every year for correct operation; ask Yokogawa to do the periodic calibration for you.

Authorized Representative in the EEA

Yokogawa Europe B.V. is the authorized representative of Yokogawa Meters & Instruments Corporation for this product in the EEA. (EEA: European Economic Area)
To contact Yokogawa Europe B.V., see the separate list of worldwide contacts, PIM 113-01Z2.

■ About This Manual

- The information contained in this manual is subject to change without notice.
- Copying or reproduction of any or all of the content of this manual without Yokogawa's permission is strictly prohibited.
- Every effort has been made to ensure the information contained herein is accurate. However, should any concerns, errors, or emissions come to your attention, or if you have any comments, please contact us.