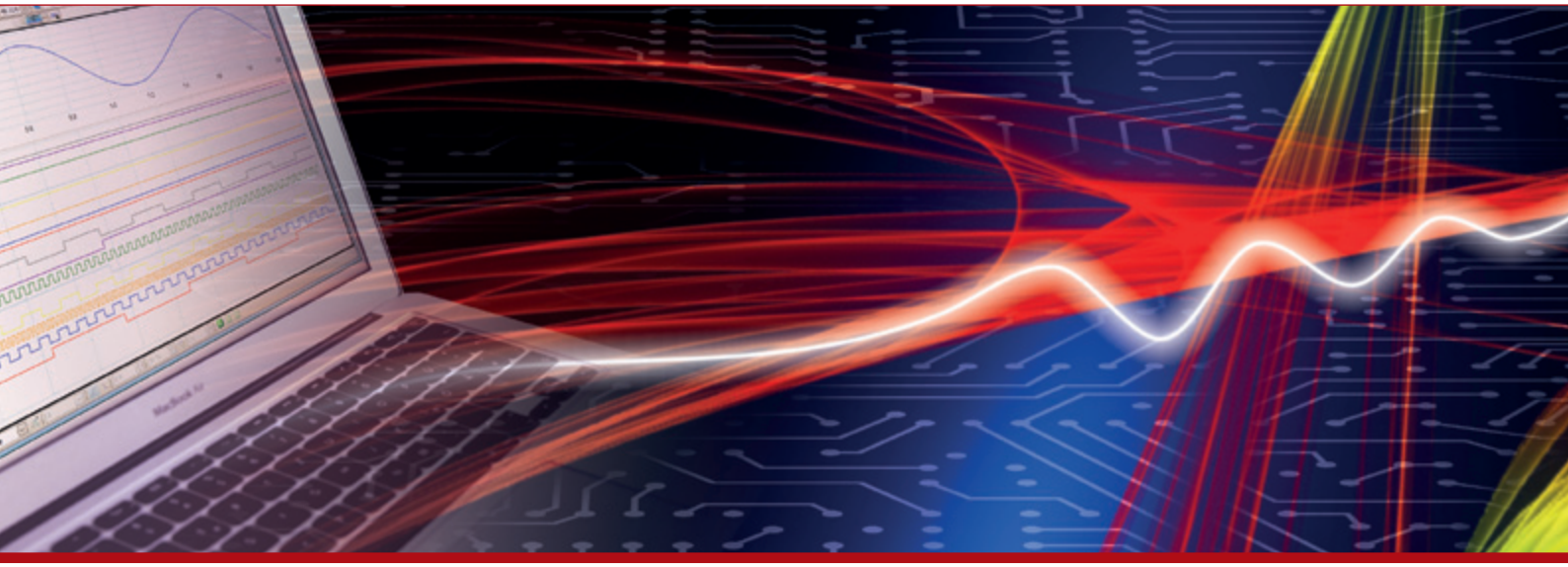
Product Datasheet - Technical Specifications



More information in our Web-Shop at ▸ **www.meilhaus.com**

Your contact

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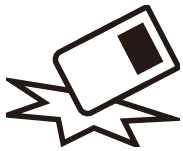
HIOKI

INSULATION TESTER Series

INSULATION TESTERS

Digital

DROP PROOF



Built tough to withstand
a 1-meter
drop onto a concrete floor

5 ranges

Rated output voltage (DC)
Effective maximum indicated value

- 50 V / 100 MΩ
- 125 V / 250 MΩ
- 250 V / 500 MΩ
- 500 V / 2000 MΩ
- 1000 V / 4000 MΩ

Manage measurement data using Bluetooth® communication

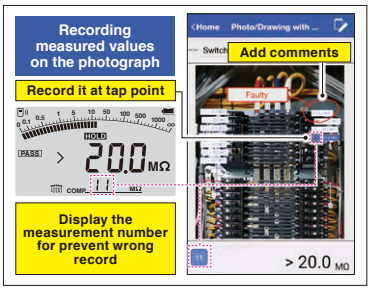
WIRELESS ADAPTER
Z3210 (Option)
Attach to enable Bluetooth® wireless technology

Learn More

Transport to the Excel® file

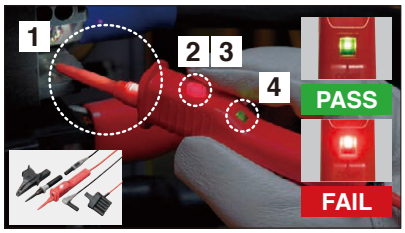
Open an Excel® file and select a cell. The measured value being held on the instrument's display will be transferred to the computer and entered into the selected cell.

Transport to GENNECT Cross



GENNECT Cross, a free app designed specifically for use with Hioki measuring instruments, lets you check and manage measurement results and create reports. The software provides a range of functionality that helps manage data in the field, including photographing measurement sites, placing measurement results on photographs, and saving handwritten memos.

Significantly improve testing speed using test lead with remote switch



1. LED light shines a spotlight on the target
2. Red light warns of live voltage detection
3. Measurement start switch
4. Identify pass/fail decisions with red or green light

TEST LEAD SET WITH REMOTE SWITCH L9788-11 (Option)
*Standard with the IR4056-21, Not CE Marked

Identify PASS / FAIL using light and sound

Compare measured values to pre-set reference values to generate a pass or fail decision with the Comparator function.

Convenient for inspections

Low resistance measurement[1]

Perform EV and HEV continuity checks as well as resistance measurement of protective conductors in facility electrical equipment as defined by IEC 60364.

AC/DC voltage measurement

Automatically detect AC or DC for testing. Use as a tester thanks to DC voltage measurement functionality.

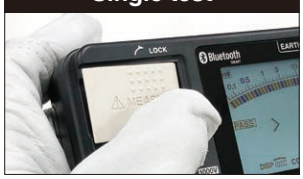
PV Ω dedicated function[2]

Measurement is not affected even when the PV system is online.

1. Excludes IR4053 2. IR4053 Only

One-touch Start and Stop

Single test



Measurement voltage is applied while MEASURE key is pressed

Continuous test

Lift and lock the MEASURE key to apply a continuous stream of voltage

Prevent Accidental High Voltage Generation

Flashing light

Release lock

Under [500V], [1000V], or [PVΩ] settings, the RELEASE button will blink. Press to unlock the release of high voltages as an extra safety meaure.

Lineup - Digital

CE

Product warranty for 3 years
Accuracy guaranteed for 1 year

Measurement type	Low voltage (less than 1000 V)				High voltage (less than 5000 V)	
	Standard	High-speed	EV	PV		Standard
Model	**IR4056-20 IR4056-21**	**IR4057-50**	**IR4059**	**IR4053-10**	**IR5051**	**IR5050**
Appearance						
Number of ranges	5				5	
Testing voltage (DC) / Effective maximum indicated value	50 V /100 MΩ 125 V /250 MΩ 250 V /500 MΩ 500 V /2000 MΩ 1000 V /4000 MΩ				250 V /500 GΩ 500 V /1.00 TΩ 1000 V /2.00 TΩ 2500 V /5.00 TΩ 5000 V /10.00 TΩ	
PV Ω measurement	N / A			500 V / 2000 MΩ 1000 V / 4000 MΩ	500 V /100 GΩ 1000 V /100 GΩ 1500 V /100 GΩ	N / A
Leakage current measurement	N / A				0.00 nA to 3.00 mA	
DC voltage measurement	600 V			1000 V	2000 V	
AC voltage measurement	600 V				1000 V	
Low resistance measurement	✔			N / A	N / A	
Displaying 1-min. values	N / A	✔		N / A	✔	
Comparator decision response time	✔ 0.8 second	✔ 0.3 second		✔ 0.8 second (PV : 4 second)	✔	
AUTO power save	✔				✔	
Bluetooth® communication	N / A	✔ (With Z3210)		N / A	✔ (With Z3210)	
Resistance gauge	N / A	✔		N / A	✔	
Backlight	✔				✔	
Safety standard category	CAT III 600 V				CAT IV 1000 V CAT III 2000 V	
CE	✔[1]				✔	
Dustproof and waterproof	IP40[2]				IP40[2, 3], IP65[4]	
Drop proof	✔				N / A	
Power supply	LR03 (AAA) alkaline battery × 4 HR6 (AA) NiMH rechargeable battery x4				LR6 (AA) alkaline battery × 8 HR6 (AA) NiMH rechargeable battery x8	
Dimensions (W × H × D)	159 × 177 × 53 mm 6.26 × 6.97 × 2.09 in.		160 × 98 × 46 mm 6.30 × 3.86 × 1.81 in.	159 × 177 × 53 mm 6.26 × 6.97 × 2.09 in.	195 × 254 × 89 mm 7.68 × 10 × 3.50 in.	
Weight	600 g (21.2 oz)	640 g (22.6 oz)	536 g (18.9 oz)	600 g (21.2 oz)	1.7 kg (59.97 oz)	

1 : IR4056-21 excluded 2 : Terminal not included 3 : With protector attached 4 : CARRYING CASE C0212

INSULATION TESTER IR4056-20, IR4056-21

CE * IR4056-20 only
Product warranty for 3 years
Accuracy guaranteed for 1 year

With
- TEST LEAD L9787
- Neck strap
- LR6 alkaline battery ×4
- Instruction manual

IR4056-20

With
- TEST LEAD SET WITH REMOTE SWITCH L9788-11
- Neck strap
- LR6 alkaline battery ×4
- Instruction manual

IR4056-21 **Not CE marked**

CAT III | DISPLAY HOLD | AUTO OFF

Comparator decision response time : 0.8 s

5 ranges

CAT III 600 V

INSULATION TESTER IR4057-50, IR4059

CE c SP US * IR4057-50 only
Product warranty for 3 years
Accuracy guaranteed for 1 year

IR4057-50

New

IR4059

L4930

L4938

WIRELESS ADAPTER Z3210 (Option)
Attach to enable Bluetooth® wireless technology

With Z3210

Bluetooth®
Please see www.hioki.com for list of supported regions.

GENNECT Cross

CAT III | DISPLAY HOLD | AUTO OFF

Comparator decision response time : 0.3 s

Digital bar graph

5 ranges

CAT III 600 V

Included accessories
- CONNECTION CABLE L4930
- ALLIGATOR CLIP SET L4935
- TEST PIN SET L4938
- TEST LEAD SET WITH REMOTE SWITCH (RED) L9788-10 (IR4059 only)
- PROTECTOR Z5042 (IR4059 only)
- Neck strap
- LR6 alkaline battery ×4
- Instruction manual

INSULATION TESTER (For Photovoltaic Generation Systems) IR4053-10

CE
Product warranty for 3 years
Accuracy guaranteed for 1 year

With
- TEST LEAD L9787
- Neck strap
- LR6 alkaline battery ×4
- Instruction manual

IR4053-10

CAT III | DISPLAY HOLD | AUTO OFF

Comparator decision response time : 0.8 s

Comparator decision response time (PV) : 4 s

5 ranges

CAT III 600 V

Model	IR4056-20	IR4056-21	IR4057-50	IR4059	IR4053						Basic accuracy
Measurement parameters: Insulation resistance	✔				✔	Testing voltage (DC)	50 V	125 V	250 V	500 V	1000 V	-
						Effective maximum indicated value (MΩ)	100	250	500	2000	4000	-
						1st effective measuring range (MΩ)	0.200 to 10.00	0.200 to 25.0	0.200 to 50.0	0.200 to 500	0.200 to 1000	±2% rdg. ±2 dgt.
						2nd effective measuring range (MΩ)	10.1 to 100.0	25.1 to 250	50.1 to 500	501 to 2000	1010 to 4000	±5% rdg.
PV Ω measurement	N / A				✔	Testing voltage (DC)	500 V		1000 V			-
						Effective maximum indicated value (MΩ)	2000		4000			-
						1st effective measuring range (MΩ)	0.200 to 500		0.200 to 1000			±4% rdg.
						2nd effective measuring range (MΩ)	501 to 2000		1010 to 4000			±8% rdg.
DC Voltage	N / A				✔	4.200 V/42.00 V/420.0 V/1000 V						±1.3% rdg. ±4 dgt.[1]
AC Voltage	✔				N / A	4.200 V/42.00 V/420.0 V/600 V						±1.3% rdg. ±4 dgt.[1]
Low resistance measurement	✔				✔	420.0 V[2]/600 V						±2.3% rdg. ±8 dgt.[1]
	✔				N / A	10.00 Ω/100.0 Ω/1000 Ω						±3% rdg. ±2 dgt.

Other	
Operating temperature	IR4056-20, IR4056-20, IR4057-50, IR4059: -25°C to 65°C, 90% RH or less (non-condensating) IR4053: 0°C to 50°C, 90% RH or less (non-condensating)
Storage temperature	IR4056-20, IR4056-20, IR4057-50, IR4059: -25°C to 65°C, 90% RH or less (non-condensating) IR4053: -10 °C to 50°C, 90% RH or less (non-condensating)
Dustproof and waterproof	IP40 (Terminal excluded)
Standards	EN61326 (EMC), EN61557-1/-2/-4[3]/-10
Power supply Continuous operating time	LR6 alkaline battery ×4 20 hours
Dimensions (W × H × D)	IR4056-20, IR4056-21, IR4057-50, IR4053-10: 159 × 177 × 53 mm (6.26 × 6.97 × 2.09 inch)
	IR4059: 160 × 98 × 46 mm (6.30 × 3.86 × 1.81 inch)
Weight	IR4056-20, IR4056-21. IR4053: 600 g (21.2 oz) IR4059: 536 (18.9 oz) IR4057-50: 640 g (22.6 oz)

1. Ranges in excess of 600 V/1000 V are outside the accuracy guarantee
2. Minimum indicated value: 30.0 V
3. Subclause 4.3 of Part 4 (interchanging of test leads) is not applicable when L9788-10 is used

Order code **IR4056-20**
Order code **IR4056-21**
Order code **IR4057-50**
Order code **IR4057-90**
Order code **IR4059**
Order code **IR4053-10**
Order code **Z3210**

Model IR4057-90 includes Z3210 as a set

HIGH VOLTAGE INSULATION TESTER IR5050, IR5051

CE

Product warranty for 3 years
Accuracy guaranteed for 1 year

IR5050

IR5051
IR5051-90
(Include Z3210 as a set)

Standard | **For PV systems**

5 ranges

CAT IV 1000 V, CAT III 2000 V

Order code **IR5050**

Order code **IR5051**

Order code **IR5051-90**

Included accessories

L9850, L9851

- TEST LEAD L9850-01 (Red), -02 (Black), -03 (Blue), 3 m (9.84 ft.)
- ALLIGATOR CLIP L9851-01 (Red), -02 (Black) ,-03 (Blue)
- CARRYING CASE C0212
- LR6 alkaline battery ×8
- Instruction manual
- TEST PIN SET L9852 (IR5051 and IR5051-90 only)
- WIRELESS ADAPTER Z3210 (IR5051-90 only)

1. With protector attached, excluding terminals

CAT S | DISPLAY HOLD | AUTO OFF

Measurement parameters	Insulation resistance	Testing voltage (DC) : measuring range	250 V: 0.00 MΩ to 500 GΩ
			500 V: 0.00 MΩ to 1.00 TΩ
			1000 V: 0.00 MΩ to 2.00 TΩ
			2500 V: 0.00 MΩ to 5.00 TΩ
			5000 V: 0.00 MΩ to 10.00 TΩ
		Rated current	1 mA to 1.2 mA
		Short-circuit current	2 mA or less
		Accuracy	±5% rdg. ±5 dgt., ±20% rdg.
		Induced noise removal	3 mA max.
	Leakage current		10 nA/ 100 nA/ 1000 nA/ 10 µA/ 100 µA/ 1 mA Guaranteed accuracy range: 1.00 nA to 3.00 mA Accuracy: ±3% rdg. ±3 dgt.
	DC voltage		±10 V to ±2000 V Accuracy: ±3% rdg. ±3 dgt.
	AC voltage		30 V to 1000 V Accuracy: ±3% rdg. ±3 dgt.
	Capacitance		100 nF/ 1000 nF/ 10 µF Guaranteed accuracy range: 10.0 nF to 25.0 µF Accuracy: ±10% rdg. ± 5 nF
	PV insulation resistance (IR5051 only)		500 V: 0.00 MΩ to 100 GΩ
			1000 V: 0.00 MΩ to 100 GΩ
			1500 V: 0.00 MΩ to 100 GΩ
Other	Operating temperature and humidity range		-20°C to 40°C, less than 80% RH (no condensation) 40°C to 45°C, less than 60% RH (no condensation) 45°C to 50°C, less than 50% RH (no condensation)
	Storage temperature and humidity range		-25°C to 65°C, less than 80% RH (no condensation)
	Dustproof/waterproof		IP40[1], IP65 (CARRYING CASE C0212)
	Standards		EN IEC61010 (safety), EN61326 (EMC), IEC61557-1, -2 (insulation resistence tester)
	Power supply Continuous operating time		• LR6 (AA) alkaline battery ×8: • Approx. 5 hours without Z3210 installed • Approx. 4 hours with Z3210 installed and using wireless communication • HR6 (AA) nickel-metal hydride (NiMH) rechargeable battery ×8
	Dimensions (W × H × D)		195mm (7.68 in.) × 254 mm (10 in.) × 89 mm (3.50 in.)
	Weight		1.7 kg (59.97 oz.)

Accurate, easy-to-use insulation resistance meter

CAT III 2000 V
CAT IV 1000 V

Start:
Press and hold for 1 sec.

Complete:
Auto-discharge

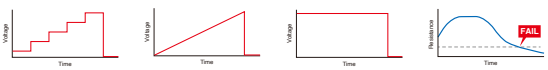
Never miss a change in measurement.

During measurement:
Simultaneous display of test voltage, insulation resistance and leakage current

After measurement:
Insulation indexes (PI, DAR, DD) and capacitance can be displayed.

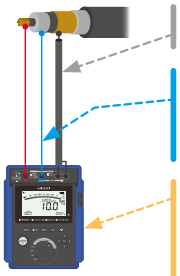
Failures caused by the application of a high voltage can be prevented.

Keep the applied voltage as low as possible



Step voltage | Ramp voltage | Timer | Comparator

Precision stability in high voltage insulation testing



Shielded wire minimizes measurement variability.

GUARD terminal minimizes the effects of leakage current flowing through the insulation's surface.

- **Filter function**
- **Inductive noise rejection function** (up to 3 mA)
- **Minuscule current measurement technology**

Wireless communication for even greater convenience

GENNECT Cross

(The optional Wireless Adapter Z3210 is required.)

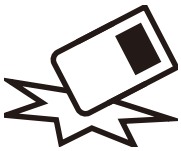
Measure insulation resistance while the solar PV system continues to generate

PV insulation resistance measurement function

In the past, it was impossible to measure a PV system's insulation resistance while the system was operating because the measurement current and generated current would mix together. Consequently, it was necessary to make such measurements at night, when the system being measured was not generating electricity.
The PV insulation resistance measurement function can measure PV systems while they're operating during daylight hours, without being affected by the generated current.

Analog Meters

DROP PROOF



Built tough to withstand
a 1-meter
drop onto a concrete floor

Single range
IR4016-20
IR4017-20
IR4018-20

3 range
3490

See better in the dark

Bright LED

Significantly improve testing speed using test lead with remote switch

L9788-11 (Option)

- Start and stop the test at the touch of a button
- Illuminate the test location with a bright white LED
- Work safely knowing that when the RED is lit, live wires, high voltage or electrical discharge is present

Check for Live Circuits

The LIVE CIRCUIT LED will light up in red whenever the voltage exceeds 20 V AC between the LINE and EARTH terminals, and when at least 20 V DC is still remaining during the auto discharge.

One-touch Start and Stop

Single test

Measurement voltage is applied while MEASURE key is pressed

Continuous test

Lift and lock the MEASURE key to apply a continuous stream of voltage

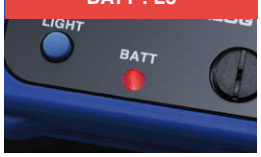
Flip the Cover

Quick and
easy storage
without
disconnecting
the leads

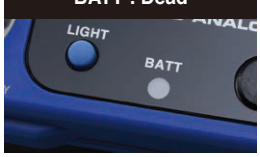
Check the Battery Status

BATT : Hi

BATT : Lo



BATT : Dead



Lineup - Analog Meters

CE

Product warranty for 3 years
Accuracy guaranteed for 1 year

Measurement parameters

1 Range

IR4016 -20

Testing voltage (DC)	500 V
Effective maximum indicated value	100 MΩ
1st effective measuring range	0.1 MΩ to 50 MΩ
2nd effective measuring range	0.01 MΩ to 0.1 MΩ or less 50 MΩ or more to 100 MΩ

IR4017 -20

Testing voltage (DC)	500 V
Effective maximum indicated value	1000 MΩ
1st effective measuring range	1 MΩ to 500 MΩ
2st effective measuring range	0.5 MΩ to 1 MΩ or less 500 MΩ or more to 1000 MΩ

IR4018 -20

Testing voltage (DC)	1000 V
Effective maximum indicated value	2000 MΩ
1st effective measuring range	2 MΩ to 1000 MΩ
2nd effective measuring range	1 MΩ to 2 MΩ or less 1000 MΩ or more to 2000 MΩ

3 Ranges

3490

Testing voltage (DC)	250 V	500 V	1000 V
Effective maximum indicated value	100 MΩ		4000 MΩ
1st effective measuring range	0.05 MΩ to 50 MΩ		2 MΩ to 1000 MΩ
2nd effective measuring range	0.01 MΩ to 0.05 MΩ or less 50 MΩ to 100 MΩ		0.5 MΩ to 2 MΩ 1000 MΩ to 4000 MΩ

Accuracy (Insulation)	±2% of scale length (1st effective measuring range) ±2% of scale length (2nd effective measuring range)
AC Voltage	0 to 600 V

Other

Operating temperature	0°C to 40°C, 90% RH or less (non-condensating)
Storage temperature	-10°C to 50°C, 90% RH or less (non-condensating)
Dustproof and waterproof	IP40 (Excludes measuring terminals)
Drop proof	YES
Backlight	YES
Safety standard category	CAT III 600 V
Standards	EN61010 (Safety), EN61326 (EMC)
Power supply Continuous operating time	LR6 alkaline battery ×4 20 hours
Dimensions(W × H × D)	IR4016, IR4017, IR4018: 162 × 182 × 57 mm (6.38 × 7.17 × 2.24 in) 3490: 162 × 167 × 52 mm (6.38 × 6.57 × 2.05 in)
Weight	IR4016, IR4017, IR4018: 820 g (28.9 oz), 3490: 840 g (29.6 oz)

Accessories

L9787

- TEST LEAD L9787 (1.2 m)
- Neck strap
- LR6 alkaline battery ×4
- Instruction manual

Order code **IR4016-20**

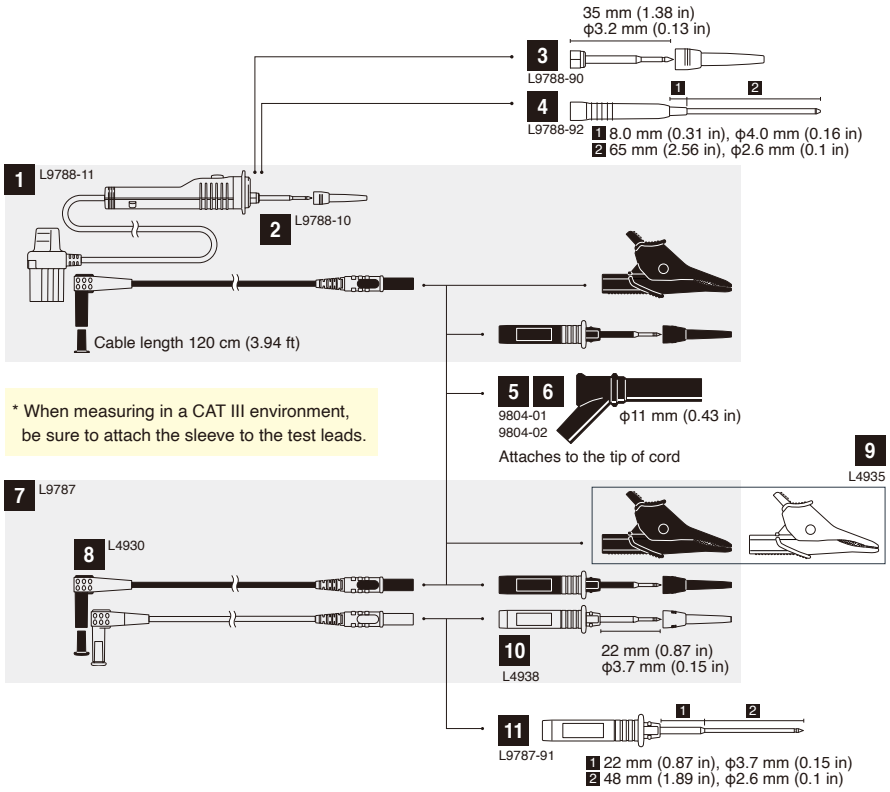
Order code **IR4017-20**

Order code **IR4018-20**

Order code **3490**

Options

IIR4016-20, IR4017-20, IR4018-20, IR4056-20, IR4056-21, IR4057-50, IR4057-90, IR4053-10, IR4059, 3490	
1	TEST LEAD SET WITH REMOTE SWITCH L9788-11
2	TEST LEAD WITH REMOTE SWITCH (RED) L9788-10
3	TIP PIN L9788-90
4	BREAKER PIN L9788-92
5	MAGNETIC ADAPTER 9804-01
6	MAGNETIC ADAPTER 9804-02
7	TEST LEAD L9787
8	CONNECTION CABLE SET L4930
9	ALLIGATOR CLIP SET L4935
10	TEST PIN SET L4938
11	BREAKER PIN L9787-91
12	WIRELESS ADAPTER Z3210 (For IR4057-50, IR4059)
13	PROTECTOR Z5042 (For IR4059)
14	CARRYING CASE C0213 (EV MAINTENANCE MANUAL INCLUDED)



IR5050, IR5051		
1	TEST LEAD L9850 -01	Red, 3 m (9.84 ft.)
2	TEST LEAD L9850 -02	Black, 3 m (9.84 ft.)
3	TEST LEAD L9850 -03	Blue, 3 m (9.84 ft.)
4	TEST LEAD L9850 -11	Red, 10 m (32.81 ft.)
5	TEST LEAD L9850 -12	Black, 10 m (32.81 ft.)
6	TEST LEAD L9850 -13	Blue, 10 m (32.81 ft.)
7	ALLIGATOR CLIP L9851 -01	Red
8	ALLIGATOR CLIP L9851 -02	Black
9	ALLIGATOR CLIP L9851 -03	Blue
10	TEST PIN SET L9852	Red and black
11	CARRYING CASE C0212	
12	WIRELESS ADAPTER Z3210	
13	COMMUNICATION PACKAGE DT4900-01 USB	

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