Megger

Duplex connector test leads

Accessories important information

User Guide

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1. SAFETY WARNINGS

⚠ **This document provides important safety information.**
Keep with the accessories, Do Not Discard !

These safety warnings must be read and understood before the instrument is used.

Always refer to the user manual of the instrument being used with these test leads.

Do not touch the universal connector during test or while connected to hazardous voltages.

Whenever possible, circuits should be de-energised before testing.

If it is impossible to de-energise the circuit, (e.g. high voltage batteries cannot be switched off while their connections are tested) the user must be aware of the dangers. The instrument terminals will become live when connected to the circuit. Therefore when used on hazardous voltages the Megger terminal cover (available separately) must be used. See the accessories section of this user guide.

When running any test, or when attached to a test load, do not undo the modular connections. Isolate both test leads before changing any part of the modular leadset.

These test leads on their own not safety CAT rated due to the bare hook terminations. However when fitted with insulating instrument terminal covers and a suitably rated test termination the overall safety CAT rating will be the lowest of the ratings between the instrument, the terminal covers and the test termination.

For example if used with a DLRO10HD fitted with terminal cover part number 1002-390 and a pair of DP1-C duplex probes the safety rating of the complete system will be CAT 300 V. However if the test terminations were changed to KC1-C kelvin clips the safety rating would drop to <30 V as the KC1-C are un-rated.

1.0.1 Testing inductive circuits can be hazardous:

- After testing an inductive load there will be an amount of energy stored in the inductance. This energy is released in the form of a discharge current. Disconnecting an inductive load while current is still flowing will cause a high voltage arc, which is a danger to both the user and the item under test
- The DLRO connector lit lead sets are fitted with a ‘test in progress lamp’ associated with the TEST button which indicates that current is flowing in the C1-C2 loop. For testing large inductive resistances the current carrying leads should be connected securely to the item under test before starting the test
- It is not recommended that duplex handspikes be used to carry out tests on inductive loads. If inadvertently using the handspikes on an inductive load, the L1 lamp on the handspikes will flash amber while discharge current flows, thereby duplicating the function of the ‘I’ lamp on the instrument. It is important to maintain contact until the L1 light stops flashing amber and turns green indicating the end of the test

1.1 This product is not intrinsically safe. Do not use in an explosive atmosphere.

Do not operate the test leads or connect to any external system if any visible signs of damage are apparent or if they have been stored for prolonged periods in unfavourable conditions.

1.2 Inspection

Before each use of the test leads, perform a thorough visual inspection to confirm that their condition is good, with no damaged or broken insulation.

The Measurement Category rating of the measurement system is that of the lowest rated component. If any part of the measurement leads is unrated, the instrument is safe for connection only up to 30 V."

1.3 CAT ratings:

CAT IV: Measurement category IV: Equipment connected between the origin of the low-voltage mains supply and the distribution panel.

CAT III: Measurement category III: Equipment connected between the distribution panel and the electrical outlets.

CAT II: Measurement category II: Equipment connected between the electrical outlets and the user's equipment. Measurement equipment may be safely connected to circuits at the marked rating or lower.

1.4 User Guide

Duplex connector test lead system for use with 10 A DLRO and BT51 instruments

The Megger DLRO duplex connector four terminal test lead system is designed to provide the most cost effective and convenient way to provide the user with all off the test lead terminations and lead lengths required for the many different applications encountered in low resistance testing.

At the centre of this unique test lead system is a bespoke connector allowing terminations such as kelvin clips or duplex test probes to be changed as required. There are two connector versions, one being fitted with indicator LEDs that operate with the DLRO10 range of instruments. The indicator LEDs provide enhanced safety and convenience with indications as follows:-

1.4.1 DLRO10, DLRO10X, DLRO10HD and DLRO10HDX

- Warning of connection to hazardous live voltage
  (Not DLRO10X, warning is given on the display)
- When continuity is made
- When a test complete and measurement is on instrument display

1.4.2 DLRO10X adds

- Indication of pass / fail to user set test limits

All of these important indications are therefore seen near the point of connection without needing to view the instrument display. There is even a 6 m extension lead to provide the ultimate in flexibility.

2. Duplex connector system – component parts

2.1 Duplex connector test lead with indicator lights

2.1.1 Description

These duplex test leads are single test leads supplied without probe or clip test terminations.

2.1.2 Features

- Ultra bright LED indicator lights warning of:
  - Hazardous live voltage
  - Test continuity
  - Test complete
  - Pass / fail to set limits (DLRO10X only)
- Locking ring to prevent test termination disconnection
- Works with any connector termination
- Lead resistance :
  - 1.5 m long 20 mΩ
  - 3 m long 30 mΩ
  - 6 m long 40 mΩ

2.1.3 Designed to work with:

DLRO10	DLRO10X
DLRO10HD	DLRO10HDX

2.1.4 Ordering information

TL1.5-CL	Test lead 1.5 m connector lit	(1 supplied)	1006-456
TL3-CL	Test lead 3 m connector lit	(1 supplied)	1006-458
TL6-CL	Test lead 6 m connector lit	(1 supplied)	1006-459

2.2 Duplex connector test lead without indicator lights

2.2.1 Description

These duplex test leads are single test leads supplied without probe or clip test terminations.

2.2.2 Features

- Locking ring to prevent test termination disconnection
- Works with any connector termination
- Lead resistance :
  - 1.5 m long 20 mΩ
  - 3 m long 30 mΩ
  - 6 m long 40 mΩ

2.2.3 Designed to work with:

DLRO10	DLRO10X
DLRO10HD	DLRO10HDX

2.2.4 Ordering information

TL1.5-C	Test lead 1.5 m connector	(1 supplied)	1006-452
TL3-C	Test lead 3 m connector	(1 supplied)	1006-454
TL6-C	Test lead 6 m connector	(1 supplied)	1006-455
There are separate versions available to fit the BT51 as follows:			
TL3-C-BT51	Test lead 3 m connector for BT51	(1 supplied)	1007-023
TL6-C-BT51	Test lead 6 m connector for BT51	(1 supplied)	1007-024

2.3 EL6-C Duplex connector extension lead

2.3.1 Description

Extension lead 6 m connector (x1)

2.3.2 Features

- 6 m long
- Locking ring to prevent disconnection
- Works with any duplex connector test lead without indicator lights
- Single extension lead resistance : 40 m ohms
- More than one may be used but take into account overall test resistance
- Note: 10 A operation possible on any 10 A DLRO instrument with:
  - Pair of 3 m test leads
  - Any test probe or clip termination
  - Two extension leads
  - Based on maximum 100 Ωm lead resistance specification

2.3.3 Designed to work with:

TL1.5-C	
TL3-C	TL3-C-BT51
TL6-C	TL6-C-BT51

Note: These extension leads will not fit any of the leads fitted with indicator lights

2.3.4 Ordering information

EL6-C Duplex connector extension lead 1006-460

2.4 TL3-C-4 mm Duplex connector to 4 mm plug test leads (x2)

2.4.1 Description

These Duplex test leads are single test leads supplied without probe or clip terminations

This lead set has been modified with new adators to connect the Duplex connector range to products with 4 mm plugs (listed under "Designed to work with").

2.4.2 Features

- Locking ring to prevent test termination disconnection
- Works with any connector termination
- Lead resistance :
  - 3 m long 30 mΩ

2.4.3 Consists of the following:

4 mm plug test lead	x2
3 m connector lead	x2

2.4.4 Designed to work with:

DLRO2,	DLRO2X
MTR105,	ADX

2.4.5 Ordering information

TL3-C-4mm Test lead 3 m connector	1014-072

3. Lead test connection terminations available – sold individually

3.1 DP1-C Duplex connector probe

1006-450

3.1.1 Description

Duplex connector handspike with sprung loaded tips.

3.1.2 Features

- Fits any duplex connector test lead or extension
- Replaceable gold plated, hardened steel, needle point probe tips for excellent low resistance contact
- Stainless steel springs to provide 1.3 kg probe force
- Ideal for general applications on none coated or corroded surfaces
- Optional serrated (waffle) tips available
- Connector to probe tip resistance : 14 mΩ

3.1.3 Specifications

Maximum current rating:	10 A
Probe spacing between P and C tips:	6 mm
Safety:	CAT III 600 V only when suitable terminal covers are used

3.1.4 Designed to work with:

Any duplex connector test lead and extension lead

3.1.5 Ordering information

DP1-C Duplex connector probe	1006-450
Spare / optional parts:	
Replacement needle tips	2003-551
Waffle / serrated tips	25940-014

3.2 DTP1-C Duplex connector twist probe

1006-449

3.2.1 Description

Duplex connector handspike with sprung twisting tips.

3.2.2 Features:

- Fits any duplex connector test lead or extension
- None replaceable hardened and tempered square section probe tips
- Probes twist while compressing providing 2.4 kg sprung probe force
- Ideal for cutting through surface coatings or corrosion
- Connector to probe tip resistance : 10mΩ

3.2.3 Specifications

Maximum current rating:	10 A
Probe spacing between P and C tips:	10 mm
Safety:	<30 V only

3.2.4 Designed to work with:

Any Duplex connector test lead and extension lead

3.2.5 Ordering information

DTP1-C Duplex connector twist probe	1006-449

Lead test connection terminations available – sold individually

3.3 CP1-C Concentric duplex connector probe

1006-448

3.3.1 Description

Duplex connector concentric handspike with sprung loaded potential tip.

3.3.2 Features:

- Fits any duplex connector test lead or extension
- Connection via an outer hardened and tempered steel crown with two contact points or tips.
- Replaceable gold plated, hardened steel, needle point P tip
- P tip with stainless steel spring to provide 1.3 kg probe force
- Ideal for reaching deeply recessed terminal screws
- Ideal for connection to rivet heads or screw/bolt heads
- Connector to C crown tip resistance : 10 mΩ.

3.3.3 Specifications

Maximum current rating:	10 A
Probe tip spacing:	Between two outer C tips 7.6 mm P tip central between two C tips with 3.8 mm spacing
Probe dimensions:	From finger guard to tip 110 mm Diameter is tapered from 14 mm nearest the finger guard to 11 mm at tip crown
Safety	<30 V only

3.3.4 Designed to work with:

Any Duplex connector test lead and extension lead

3.3.5 Ordering information

CP1-C Concentric probe	1006-448
Spare / optional parts	
Replacement P needle tip	2003-551
Waffle / serrated P tip	25940-014

3.4 KC1-C Heavy duty kelvin clip

1006-447

3.4.1 Description

Duplex connector Kelvin Clip 1 is a heavy duty clip for general purpose applications.

3.4.2 Specifications

Maximum current rating:	10 A
Connector to clamp resistance:	14 mΩ
Clip capacity:	40 mm
Safety	<30 V only

3.4.3 Designed to work with:

Any Duplex connector test lead and extension lead

3.4.4 Ordering information

KC1-C Kelvin Clip (x1)	1006-447

3.5 KC2-C Large touch proof insulated clip – adjustable jaw opening

1006-451

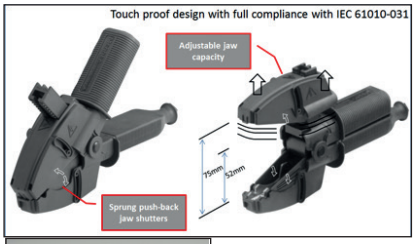
3.5.1 Description

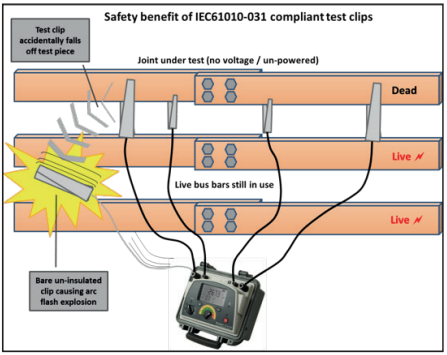
Duplex connector Kelvin Clip 2 is a fully insulated touch proof clip for applications where a high safety rating is required. (x2)

3.5.2 Specifications

Maximum current rating:	20 A
Connector to clamp resistance:	10 mΩ
Clip capacity:	52 mm to 75 mm with sliding jaw
Safety	CATIV 600 V

The actual safety CAT rating in use will always be the rating of the lowest part of the complete system For example if used with a DLRO10 without terminal covers the system will be unrated and must not be connected to live voltages above 30 V.





In this example using a DLRO10HD a terminal cover should also be used.

3.5.3 Designed to work with:

Any Duplex connector test lead and extension lead

4. Complete duplex connector lead sets available

4.1 Probe lead-sets

4.2 DH1-C Double duplex twist probe lead set

1006-442

4.2.1 Description

Two wire, four terminal duplex twist probe lead set 3 m long

4.2.2 Consists of the following:

DTP1-C duplex twist probe	x2
TL3-C-BT51 3 m lead connector	x2

4.2.3 Designed to work with:

BT51

BT51 120 V

4.3 DH2-C Single duplex twist probe lead set

1006-443

4.3.1 Description

Single duplex twist probe lead - 6 m long.

4.3.2 Consists of the following:-

DTP1-C duplex twist probe	x1
TL6-C-BT51 6 m lead connector	x1

4.3.3 Designed to work with:

BT51

BT51 120 V

Complete duplex connector lead sets available

4.4 DH4-C Duplex connect probe lead set

1006-444

4.4.1 Description

Two wire, four terminal duplex connector probe lead set 1.5 m long. One lead fitted with indicator lights.

4.4.2 Consists of the following:-

DP1-C duplex connector probe	x2
TL1.5-C 1.5 m connector lead	x1
TL1.5-CL 1.5 m connector lead with indicator lights	x1

4.4.3 Designed to work with:

DLRO10,	DLRO10X
DLRO10HD,	DLRO10HDX

4.5 DH4-CHDC



DH4-CHDC 1006-463

As DH4-C but supplied with DLRO10HD terminal cover for CAT III 300 V rating

DH5-C as DH4-C but 3 m long 1006-445

4.6 KC1-TL3-C Kelvin clip lead set

1006-462

4.6.1 Description

Two wire, four terminal kelvin clip lead set 3 m long.

4.6.2 Consists of the following:-

KC1-C Kelvin clip	x2
TL3-C 3 m connector lead	x1
TL3-CL 3 m connector lead with indicator lights	x1

4.6.3 Designed to work with:

DLRO10,	DLRO10X
DLRO10HD,	DLRO10HDX

4.7 KC2-TL3-C Insulated kelvin clip lead set

1006-461

4.7.1 Description

Two wire, four terminal insulated kelvin clip lead set 3m long.

4.7.2 Consists of the following:-

KC2-C Insulated kelvin clip	x2
TL3-C 3 m connector lead	x1
TL3-CL 3 m connector lead with indicator lights	x1

4.7.3 Designed to work with:

DLRO10,	DLRO10X
DLRO10HD,	DLRO10HDX

Complete duplex connector lead sets available

4.8 ADX-LV1 Twist probe lead set

1014-029

4.8.1 Description

Two wire, four terminal duplex twist probe lead set 3 m long.

4.8.2 Consists of the following:-

DTP1-C duplex twist probe	x2
TL3-C-4 mm 3 m connector lead	x2

4.8.3 Designed to work with:

DLRO2,	DLRO2X
MTR105,	ADX

5. Duplex connector Test Lead System

			Duplex connector individual parts - all available separately							
Indicates quantity supplied or compatible option			Connector probes			Connector clips		Single connector Leads		
	Model reference		CP1-C	DTP1-C	DP1-C	KC1-C	KC2-C	TL1.5-C	TL3-C	
		Description	Concentric Probe	Duplex Twist Probe	Duplex Probe	Kelvin Clip	Insulated Kelvin Clip	1.5 m lead	3 m lead	
DLRO10 range-test lead sets available	DH1-C	DH1-C 3 m Connector Duplex Handspike (X2)	■	2	■	■	■	■	2	
	DH2-C	DH2-C 6.0 m Connector Duplex Handspike (X1)	■	1	■	■	■	■	■	
	DH4-C	DH4-C Connector Duplex Hand-spikes 1.5 m (X2)	■	■	2	■	■	1	■	
	DH5-C	DH5-C Connector Duplex Handspike 3 m (X2)	■	■	2	■	■	■	1	
	DH6-C	DH6-C, As DH4-C, 600 V Rated For DLRO10 CAT III 600 V	■	■	2	■	■	N/A	N/A	
	KC2-TL3-C	KL2-C Ins Kelvin Clip Ld 3 m Connector (X2)	■	■	■	■	2	■	1	
	KC1-TL3-C	KL1-C Kelvin Clip Lead 3 m Connector (X2)	■	■	■	2	■	■	1	
	DH4-CHDC	DH4-C Connex Duplex Hd CAT IV 600 V	■	■	2	■	■	1	■	
	ADX-LV1	ADX -LV1 3 m Connector Duplex Handspike (X2)	■	2	■	■	■	N/A	N/A	
			1006-448	1006-449	1006-450	1006-447	1006-451	1006-452	1006-454	

Duplex connector individual parts - all available separately									
Single connector leads		Single connector leads with indicator lights					Connector extension lead	DLRO10HD cover	
TL6-C	TL1.5-C-C	TL3-C-4 mm	TL1.5-CL	TL3-CL	TL6-CL	TL1.5-CL-C	EL6-C	N/A	
6 m lead	1.5 m lead + terminal cover	3 m lead 4 mm connector	1.5 m lead	3 m lead	6 m lead	1.5 m lead + terminal cover	6 m (no lights)	Insulated cover for CATIII 300 V	
■	N/A	N/A	■	■	■	N/A	■	N/A	1006-442
1	N/A	N/A	■	■	■	N/A	■	N/A	1006-443
■	N/A	N/A	1	■	■	N/A	■	■	1006-444
■	N/A	N/A	■	1	■	N/A	■	■	1006-445
N/A	1	N/A	N/A	N/A	N/A	1	N/A	N/A	1006-446
■	■	N/A	■	1	■	■	■	■	1006-461
■	N/A	N/A	■	1	■	N/A	■	N/A	1006-462
■	N/A	N/A	1	■	■	N/A	■	1	1006-463
N/A	N/A	2	N/A	N/A	N/A	N/A	■	N/A	1014-029
1006-455	1006-453	1014-072	1006-456	1006-458	1006-459	1006-457	1006-460	1002-390	Order part num-bers

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DLROTestLeads--2007-431_UG_en_V12 07 2023