



SFRA Measurement Cables Quick Start Guide

Introduction

The SFRA measurement cables comply with FRA measurement requirements according to IEC 60076-18. Two cable kits are available: **SFRA Classic Plus** and **IEC 1**.



NOTE! Beginning mid-December 2018, both cable options have been redesigned. As part of this redesign, both cable options will now be single-cable assemblies, rather than the two-cable sets. This redesign improves performance and reliability.

SFRA Classic Plus

This is the default cable shipped with the M5400 in the 18 m (60 ft) length, with classic 3.6 m (12 ft) fixed-length ground connection. A 30 m (100 ft) variant is also available as an option for use with larger bushings. The Classic Plus also provides ring-style reference ground connections for:

- Shorted lead testing
- IEC 60076-18 FRA Method 1 (shortest braid) grounding technique (with optional braid kit)



Figure 1 SFRA Classic Plus

IEC 1 with Braid Kit

Use this kit if you test only by the IEC 60076-18 Method 1 technique (shortest braid). The optional SFRA IEC 1 cable kit includes a measurement cable assembly (also available in 18 m and 30 m variants) and a Braid Kit for grounding using the shortest braid method. SFRA IEC 1 cables do not have the fixed length ground connections of the Classic Plus design.



Figure 2 IEC 1

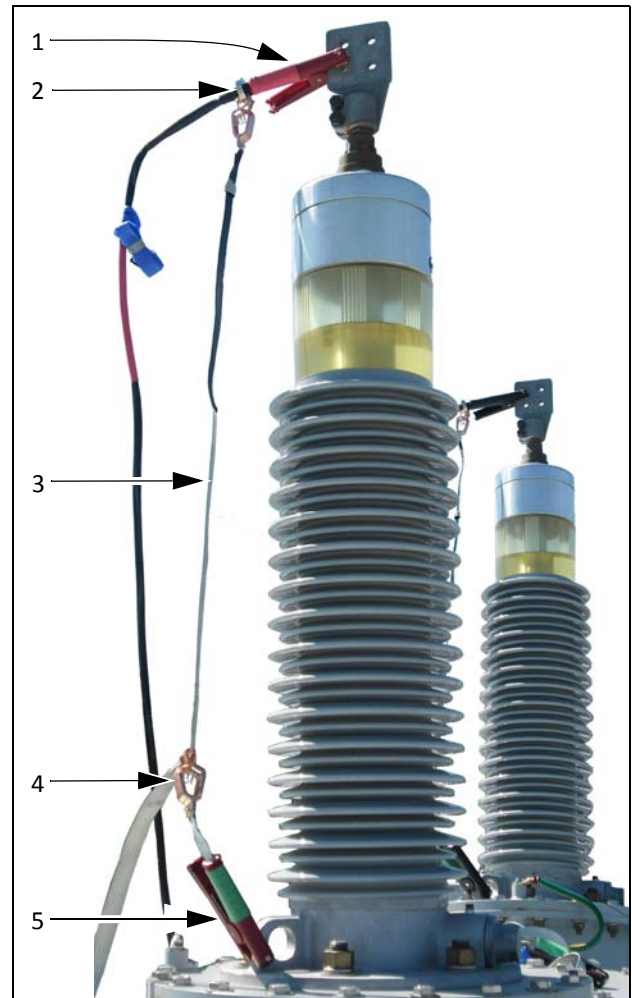


Figure 3 Braid Kit

Sample IEC Method 1 Connections

The photo to the right illustrates typical IEC Method 1 connections to transformer bushings:

- **1**—Lead connection
- **2**—Cable shield ring connection
- **3**—Ground extension braid
- **4**—Shortest braid connection
- **5**—Bushing-flange-ground clamp



To set up IEC Method 1 connections:

1. Confirm that you have a good measurement cable and cable connection. To do this, run the shorted lead test that is appropriate for your cable type. The shorted lead tests are given in [“New Ring-Style Cable Shield Connection”](#) on page 4 .
2. Referring to the photo at the right, attach the **Red** (input and reference) lead (1) to the center conductor of the bushing.
3. Connect the ground extension braid (3) to the cable shield ring (2).
4. Run the ground extension braid down the full length of the bushing.
5. Connect the ground extension braid to the bushing flange by using the bushing-flange-ground clamp (5).
6. Pull the ground extension braid (3) taut and attach (4) the shortest braid clamp.

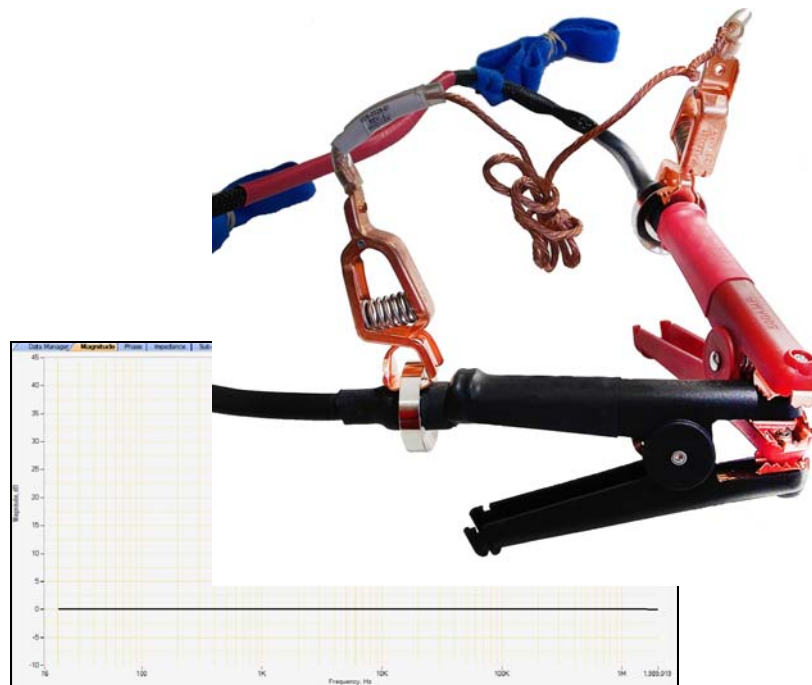
Follow this procedure a second time to connect the **Black** (measurement) lead.

This procedure fulfills the Method 1 test setup requirement per IEC Standard 60076-18 for Power Transformers – Measurement of Frequency Response.

Shorted Lead Test Procedure with Expected Test Results

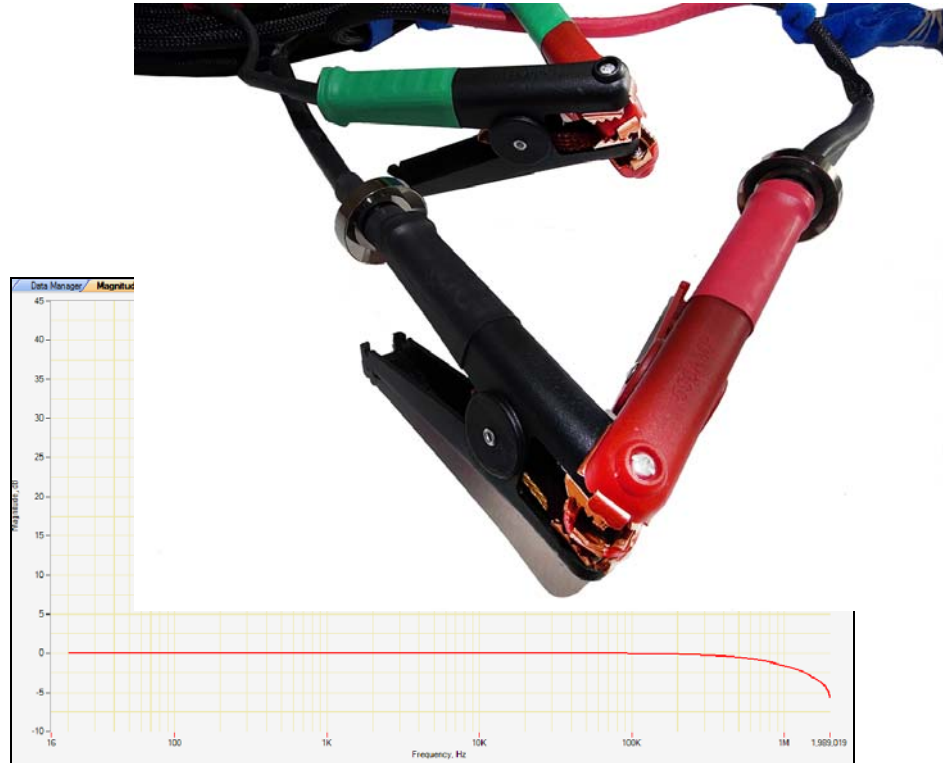
New Ring-Style Cable Shield Connection

1. Short the **Red** and **Black** leads by connecting the clamps to one another.
2. Connect the ground reference rings on **Red** and **Black** leads using Doble jumper as shown in photo.
3. Observe expected flat line test response on the 0 dB (Y axis) from 20 Hz to 2 MHz (X axis).



Classic Fixed-Length Shield Connection

1. Short the **Red** and **Black** leads by connecting the clamps to one another.
2. Connect the **Green** ground reference clamps as shown in photo.
3. Observe expected line test response on the 0 dB (Y axis) from 20 Hz to 2 MHz (X axis), noting a roll-off.



SFRA Classic Plus Part Numbers

18 m (60 ft)	Kit with Test Cable and Quick Start Guide	030-2297-01
30 m (98.4 ft)	Kit with Test Cable and Quick Start Guide	030-2297-02
	Optional Braid Kit	030-1945-01

IEC 1 Part Numbers

18 m (60 ft)	Kit with test cable, braid kit and Quick Start Guide	030-2266-01
30 m (98.4 ft)	Kit with test cable, braid kit and Quick Start Guide	030-2266-02
	Extra Braid Kit	030-1945-01

Questions?

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The limitations on liability and copyright notices contained in the Doble *Sweep Frequency Response Analyzer (SFRA) User Guide* shall apply to the use of this Quick Start Card and are hereby incorporated by reference.

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