



Instruction Manual

Ex-DT 11



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1. Introduction

The intrinsically safe continuity tester is adapted for hazardous areas to check wirings, cables, coils, etc. The Ex-DT 11 is a multi-purpose continuity tester with optical and acoustic indication. The tester has two resistance ranges.

LO from 0 to approx. 200 Ω

HI from 0 to approx. 10k Ω

Resolution in the LO range is so high that even low-resistance windings (relays, contactors, coils, motor windings etc.) can be distinguished from a short-circuit or a loop. At the lower LO range, resolution is as high as a couple of ohms! Incorrect diagnoses are now a thing of the past.

2. Safety Advice

Safe operation of the equipment is maintained providing that all instructions and warnings contained in this manual are fully observed.

3. Faults and Damage

If there is any reason to suspect that the safety of the unit has been affected then it must be immediately withdrawn from use and precautionary measures taken in order to prevent any further use of in the Ex-hazardous area.

It is recommended that the equipment be then sent back to the manufacturers for testing.

The safety and integrity of the unit may be compromised by, for example:

- External damage to the housing.
- Exposure to excessive loads.
- Incorrect storage of the unit.
- Damage sustained in transit
- Correct certification is illegible.
- Functioning errors occur
- The permitted limitations are exceeded

4. Safety Regulations

The use of the intrinsically safe Ex-DT 11 meets the requirements of the regulations providing that the user observes and applies the requirements as laid down in the regulations and that improper and incorrect use of the unit is avoided.

- The device must not be opened within the Ex-hazardous area.
- Batteries must only be changed outside the Ex-hazardous area.
- The range limits which are defined in the instrument's technical data must not be exceeded

5. Ex-Data

Report Job Identification No.: 3009963

FM – Indicator: Class 1 Zone 0 AEx ia IIC T6

I.S. Class 1 Division 1 Group A-D T6

Permitted for Zone 0, Equipment group II, Gas group C, Temperature class T6

Output Entity Parameters:

$U_0 = 4,95 \text{ V}$

$I_0 = 19 \text{ mA}$

$P_0 = 22 \text{ mW}$

Group IIC (Class I, Division 1, Groups A&B):

Ca = 2000 μ F

La = 90 mH

Group IIB (Class I, Division 1, Group C):

Ca = 3000 μ F

La = 300 mH

6. Technical Data

Switch position: LO

Optical and acoustic indication of resistances from 0....200 Ω . At the bottom of the range the tester can distinguish between 1 and 2, 2 and 3 ohms etc.

Switch position: HI

Optical and acoustic indication of resistances from 0....10k Ω .

Features in switch positions LO or HI:

The tone is inversely proportional to the size of the resistance. The tonal range is from 1.5 kHz to almost 0 Hz.

Power: 3 batteries AA according IEC LR6
case: ABS-Platics

ambient operation temperature: - 20°C.....+ 40°C

storage temperature: - 25°C.....+ 50°C

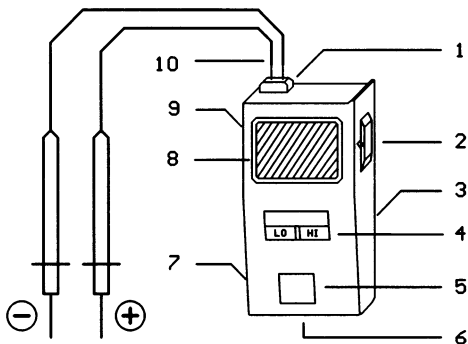
humidity: max. 90% r.h.

dimensions: 125 x 58 x 30 mm

weight: approx. 200g
(batteries incl.)

7. Application

7.1. Layout of unit



- 1 Cable-strain relief for test leads
- 2 Sliding switch with 2 positions LO and HI
- 3 Dual-purpose velcro strip
- 4 Optical display for LO and HI
- 5 Model designation
- 6 Opening to unlock cover for battery-changing.
- 7 Battery compartment at rear
- 8 Speaker grille for acoustic indication
- 9 Carrying clip on back
- 10 Test-lead pair with test probes

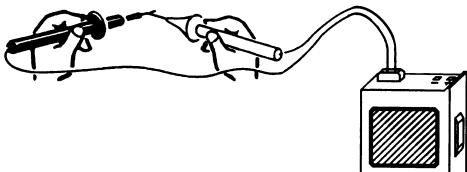
7.2. Operation

Each time you wish to operate the tester, carry out a self-test first:

Set the switch to LO or HI. Briefly touch one probe with the other. This will generate the short-circuit tone of 1.5 kHz. If it sounds loud and clear, the battery voltage is adequate.

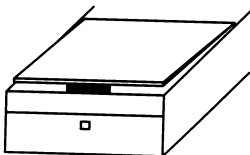
If the tone is weak and possibly fading, you must change the complete set of batteries.

Use the velcro tape to strap the instrument to your lower arm. When the instrument is not in use, you can use the velcro to secure the two probes to the housing.



7.3. Changing the batteries

The batteries must only be changed outside the hazardous area. Note that only specified replacements may be used. The use of other batteries is strictly prohibited! To open the battery compartment, press gently on the textured arrowhead to release the catch and slide the door in the direction of the arrowhead lift straight up. Replace the batteries with Alkaline to IEC LR6.



7.4. Continuity testing of voltage-free objects

You can rapidly and reliably test whether or not an item of equipment, module, a line or other form of connection will permit a current to flow.

To do this, attach the probes with suitable connectors to the object to be tested. If the Ex-DT 11 gives an acoustic signal, there is continuity. At the same time the signal indicator lights up. The pitch of the tone depends on the resistance of the test piece and is inversely proportional to it; the lower the resistance, the higher the tone. If the resistance approaches 0 Ω , the tone approaches its maximum of approx. 1.5 kHz, and corresponds to the comparison tone. This short-circuit or comparison tone is the reference tone for all tests.

By contrast with conventional continuity testers, the LO range offers extended possibilities and greater accuracy. From the wide range of applications, mention need only be made of the installation, maintenance and servicing of electrical equipment and the construction of switching cabinets.

7.5. Testing transfer resistances

Switch position LO

Testing transfer resistances, e.g. in switches, push-buttons or doubtful connections such as dry solder joints.

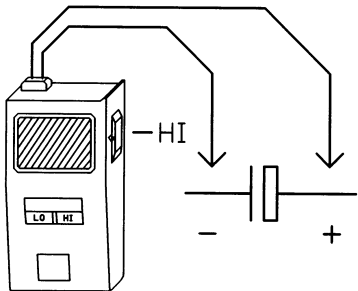
Connect the Ex-DT 11 to the object to be tested. Appropriately operate switches or push-buttons and note the acoustic signal. The real-time change in the tone frequency audibly identifies discontinuities.

In this respect, the Ex-DT 11 instrument is clearly superior to moving-coil needle and digital instruments. By contrast with conventional continuity testers, the LO range offers extended possibilities and greater accuracy, since the smallest alterations in resistance at the lowest ohm level are indicated acoustically. You can thus, for example, identify leads suspected of dubious connections such as dry solder joints-testing for the latter preferably by jogging them. You can also locate intermittent contacts in wires, terminals, plugs etc. by subjecting them to movement.

7.6. Testing capacitors

Switch
position HI

Capacitors can be functionally checked when they are not carrying a voltage, i.e., are discharged. A distinction must be made between foil (= non-directional) and electrolytic and tantalum (= directional) capacitors.



The testing range for capacitors is from approx. $1 \mu\text{F}$ upwards. Up to approx. $10 \mu\text{F}$ you will only hear a brief clicking. At capacitances $> 100 \mu\text{F}$ you will hear,

during the charging period, a tone that decreases until it gradually dies away. In the case of a 100 μF electrolytic capacitor this takes about a second.

In the case of a defective capacitor with a short-circuit, a continuous tone will be heard.

Be sure to note the polarity in the case of directional capacitors. Please note the external max. value of capacitance in hazardous area!

7.7. Testing diodes

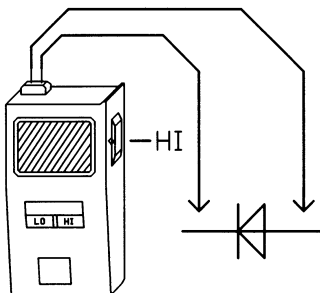
Switch position HI

It is very simple to test diodes with the Ex-DT 11.

A diode poled in the forward direction allows the Ex-DT 11 to give its acoustic signal, whereas it remains silent for one poled in the reverse direction. It is thus easy to discover if

a diode has a break or a short. The same applies to light-emitting diodes (LED's). Zener or Z-diodes also deliver a tone in the non-pass direction up to about 5V zener voltage. But this tone is significantly deeper than in the forward direction.

In the case of photo-diodes the frequency of the tone depends on the brightness of the impinging light.



8. Repairs

The general terms and conditions of ELEX V apply to repair work. The manufacturer must carry out the repair work in order to check for the safe functioning of the protective circuits.

9. Cleaning and Maintenance

The equipment should only be cleaned using a cloth or sponge dampened with water. Do not use solvents, abrasives or other cleaning solutions.

It is recommended that the manufacturer tests the operation and accuracy of the equipment every 2 years.

10. Guarantee and Liability

ECOM issue a guarantee of 2 years – starting from the date of delivery - for the operating and material of this product under normal operating and maintenance conditions.

This guarantee does not apply to products used improperly, altered or neglected, accidental damages or unusual operating conditions, as well as exposure to improper handling.

Guarantee claims can only be granted if the defective equipment is returned. We reserve the rights to repairs, new adjustments or exchanges of equipment. The existing regulations are the only right to compensation and are valid exclusively in place of all other contractual or legal guarantees. ECOM takes no responsibility for special, unavoidable or consequential damage, such as losses, including the loss of data, irrelevant of whether legitimate or illegitimate handling can be traced back to violation of the guarantee.

In case of some countries, where the restrictions of a legal guarantee as well as the exception or restriction of consequential damages is not permitted, it could be that the above mentioned limitations and exceptions are not valid for every purchase. Should any condition of these guarantee regulations be found to be ineffective or not acceptable by a responsible court, the effectiveness or force of any other condition, under these regulations, remains untouched.

11. Approval Report

APPROVAL REPORT

**Ex-DT 11
CONTINUITY TESTER
FOR HAZARDOUS (CLASSIFIED) LOCATIONS**

Prepared for:

**ECOM Rolf Nied GmbH
Industriestraße 2
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**Project ID. 3009963
Class 3610
Date: June 29, 2001**

Factory Mutual Research Corporation
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12. Control Drawing

HAZARDOUS (CLASSIFIED) LOCATION

Class I, Zone 0, Group IIC
Class I, Division 1, Groups A, B, C and D

DT-11 Output Entity Parameters:

U_0 (Voc) = 4.95 Volts, I_0 (Isc) = 19 mA, P_0 = 22 mW
Group IIC (Class I, Division 1, Groups A & B); C_0 = 2000 μ F; L_0 = 90 mH
Group IIB (Class I, Division 1, Group C); C_0 = 3000 μ F; L_0 = 330 mH



Notes:

1. No revision to this drawing is permitted without FMRC approval.

2. Intrinsic Safety Entity concept

The Intrinsic Safety Entity concept allows the interconnection of two FM Approved Intrinsically safe devices with entity parameters not specifically examined in combination as a system when:

U_0 or V_{oc} or $V_i \leq V_{max}$ or I_0 , I_0 or I_{sc} or I_i , C_0 or $C_0 \geq C_i$ + Cable, L_0 or $L_0 \geq L_i$ + Cable, $P_0 \leq P_i$,
 $V_{max} > V_i$; $I_{max} > I_i$; $(C_i$ of all loops + C cable) < C_0 ; $(L_i$ of all loops + L cable) < L_0 ,
 P_{max} or $P_i > P_0$

3. Installation must be in accordance with Article 500 of the NEC® (ANSI/NFPA 70) and ANSI/ISA RP12.6.

				ECOM Roif Nied GmbH	
				Control Drawing	
		SAS	4/12/01	Date 4/12/01	DT11-1
		By		Date	A
Rev	Description			SCALE: None	SHEET 1 of 1



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