



Applicant: ecom instruments GmbH  
Industriestraße 2, 97959 Assamstadt, Germany

Electrical Apparatus: Intrinsically Safe TRUE RMS MULTIMETER type Fluke 28 II Ex

### Description of equipment

The FLUKE 28 II EX is a "TRUE RMS MULTIMETER" for measuring voltage, current, resistance and capacitance within (and outside) potentially explosive atmospheres. It can be used as an EPL Gb-equipment in gas hazardous areas of Group II, as an EPL Db-equipment in dust explosion hazardous area of Group II and as an EPL Ma-equipment in mines susceptible to firedamp of Group I.

The FLUKE 28 II EX is operated with the following accessories:

accessory	type	remark
test leads	TL175	
bead temperature probe	80BK-A	
alligator clips	AC 172, AC 175	
AC current clamp	i400	see special conditions
temperature probe	80PK-27	see special conditions

The permissible ambient temperature range is: -15°C...+50°C

### Electrical data

#### Supply

Primary cells: 3 alkaline AAA cells

Types:

1. Eveready Energizer, No. E92
2. Duracell Procell, MN2400 LR03
3. Varta Max Tech, No. 4703
4. Varta Industrial Alkaline, No. 4003
5. Duracell Plus, MN2400 LR03,
6. Rayovac, Alkaline AAA (U.S. type)
7. Panasonic, LR03XWA



Measuring circuits  
Connections:

In type of protection Intrinsic Safety Ex ia IIC  
resp. Ex ia I

Max. values:

V/Ohm - COM

$U_o = 9.54 \text{ V}$   
 $I_o = 3.7 \text{ mA}$   
 $P_o = \text{negligibly low}$   
 $R_i = 2.47 \text{ K}\Omega$   
Linear characteristic  
 $L_i = \text{negligibly low}$   
 $C_i = \text{negligibly low}$

The max. permissible external inductance  $L_o$  and capacitance  $C_o$  are listed below. For this the simultaneous occurrence of capacitance and inductance is taken into account.

$L_o/\text{mH}$	1000	100	2	0.5	0.1	0.01
$C_o/\mu\text{F}$	0	0.61	1	1.4	2.1	3.6

or

For connection to a certified intrinsically safe circuit.

$U_i \leq 65 \text{ V}$

The rules for interconnection of intrinsically safe circuits have to be taken into account.



mA/ $\mu$ A-COM

$$U_o = 1.95 \text{ V}$$

$$I_o = 9.7 \text{ } \mu\text{A}$$

$P_o$  = negligibly low

$L_i$  = negligibly low

$C_i$  = negligibly low

The max. permissible external inductance  $L_o$  and capacitance  $C_o$  are listed below. For this the simultaneous occurrence of capacitance and inductance is taken into account.

$L_o$ /mH	1000	100	5	1	0.5	0.005
$C_o$ / $\mu$ F	0	14	19	25	30	1000

or

For connection to a certified intrinsically safe circuit.

$$U_i \leq 65 \text{ V}$$

The rules for interconnection of intrinsically safe circuits have to be taken into account.

A-COM)

$$U_o = 0 \text{ V}$$

$$I_o = 0 \text{ mA}$$

$$P_o = 0 \text{ mW}$$

$L_i$  = negligibly low

$C_i$  = negligibly low

For connection to a certified intrinsically safe circuit.

$$U_i \leq 65 \text{ V}$$

$$I_i \leq 5 \text{ A}$$

The rules for interconnection of intrinsically safe circuits have to be taken into account.

Outside the explosion hazardous area, the intrinsically safe Fluke 28 II Ex True-rms multimeter may be operated with its nominal values ( $U_i \leq 1000\text{V}$  and  $I_i \leq 10\text{A}$ , see also the instructions).

The primary cells shall be only changed outside the hazardous area (note the label).



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Special conditions

1. The permissible ambient temperature range is:  $-15^{\circ}\text{C} \dots +50^{\circ}\text{C}$ .
2. The Fluke 28 II EX is suitable for short-term operation in mines susceptible to firedamp of Group I. Permanent contact of the Fluke 28 II EX with oil, hydraulic fluid or grease is to be avoided.
3. The device shall only be used with the provided (red) Ex-holster inside the explosion hazardous area.
4. The device must not be opened in the hazardous area.
5. The primary cells shall only be changed outside the hazardous area (note the label and safety instructions).
6. Use only the fuses which are tested for the Fluke 28 II EX (see safety instructions).
7. After each measurement of a non-intrinsically safe circuit, the Fluke 28 II Ex must be off for at least 3 minutes before it is put again into a hazardous area.
8. In the dust explosion hazardous area of Group II, the operation of the Fluke 28 II EX together with the i400 AC current clamp is permitted only under the following condition: The current probe shall not be placed in areas with strong charging processes (areas in which dust is transported or quickly moved).
9. The Fluke 28 II EX shall not be operated together with the 80PK-27 Temperature Probe as an EPL Db-equipment in the dust explosion hazardous area of Group II.