

# M191 Insulation meters calibrator

High voltage, high resistance programmable decade



**Range**

**10kΩ ... 1000GΩ**

**Accuracy**

**0.1% ... 4%**

**Resolution**

**4 digits**

**Maximal voltage**

**10000V dc**

**10kV / 1TΩ**

# M191 Insulation meters calibrator

## Features

- ✓ **IEEE488 and RS232 interface (optionally USB)**
- ✓ **Internal high voltage meter**
- ✓ **Internal current meter (SHORT current testing)**
- ✓ **Built-in high voltage capacitors**
- ✓ **Grounded or floating operation**
- ✓ **Dielectric absorption ratio and polarization indexes**
- ✓ **Easy recalibration using front panel keypad**

# M191 Applications



**Computer - controlled calibration of:**

**Safety analyzers**

**Safety testers**

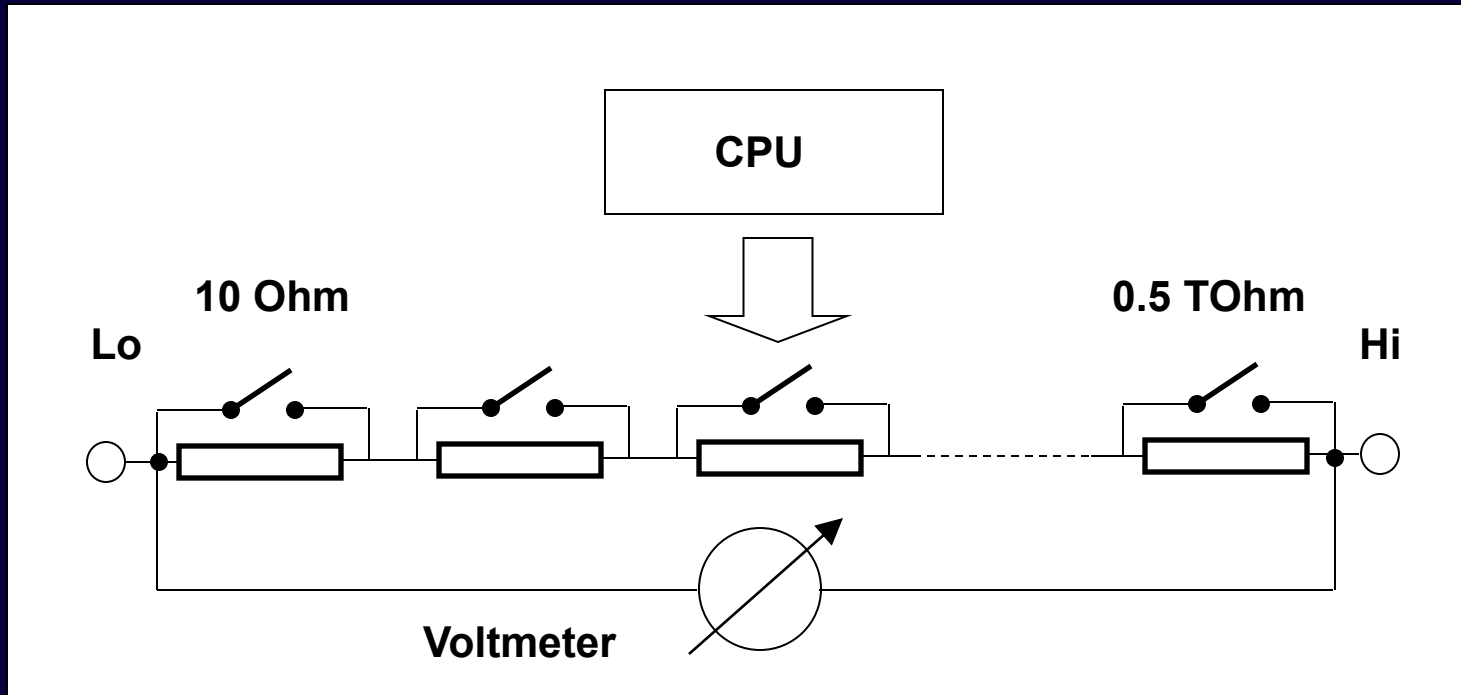
**Mega ohmmeters**

**Insulation testers**



# M191 Schematic

Serial combination of resistors



# M191 – Functions

## Selection via Function keys

<b>Function</b>	<b>Description</b>
<b>HVR</b>	<b>High voltage resistance</b> Range 10.00k $\Omega$ ... 1000.0G $\Omega$
<b>SHORT</b>	<b>Short current mode</b> Range 0.000mA ... 5.000mA
<b>HVC</b>	<b>High voltage capacitance</b> Fix values: 10nF, 50nF, 100nF (5000Vdc)
<b>TIMER</b>	<b>Timer</b> Range 1s ... 9999s
<b>PSP</b>	<b>Programmable simulation of polarization parameters</b>
<b>DPP</b>	<b>Dielectric and polarization parameters</b>

# M191 HVR function

## Application: Calibration of insulation meters



### Resistance value setting using:

- numerical keypad
- cursor keys or rotary knob

- ✓ Resistance value
- ✓ Max. allowed voltage
- ✓ Accuracy
- ✓ Test voltage
- ✓ Test current
- ✓ Output ON / OFF
- ✓ Remote control

# M191 SHORT function

Application: Testing of meter's SHORT current



- ✓ Measured current
- ✓ Accuracy
- ✓ Output ON / OFF
- ✓ Remote control

Output resistance in SHORT current function is  $2.5k\Omega$  .

# M191 HVC function

**Application: Testing capacitance ranges of safety testers**



**Three capacitance values available:  
10nF – 50nF – 100nF**

- ✓ **Capacitance value**
- ✓ **Max. allowed voltage**
- ✓ **Actual test voltage**
- ✓ **Accuracy**
- ✓ **Output ON / OFF**
- ✓ **Remote control**



# M191 TIMER function

**Application: Testing internal timer of safety testers**

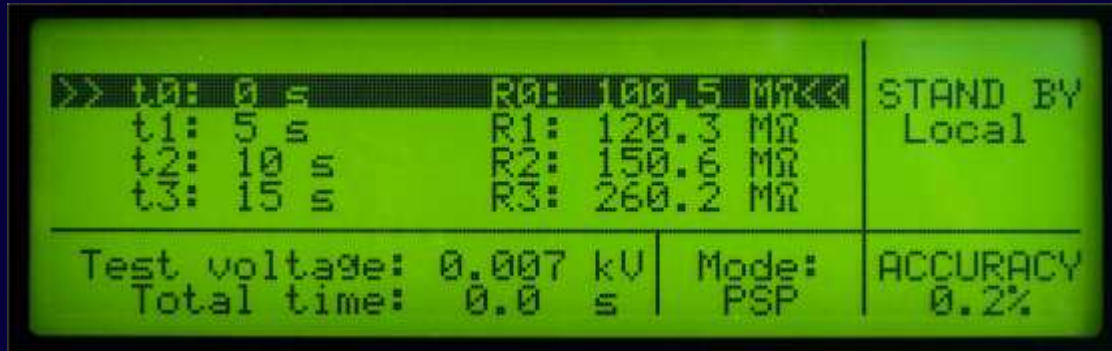


**Output resistance in TIMER function is 100MΩ.**

- ✓ Measured time
- ✓ Max. DC voltage during the test
- ✓ Actual test voltage
- ✓ Accuracy
- ✓ Output ON / OFF
- ✓ Remote control

# M191 PSP function

**Application: Testing polarization and absorption functions**



The screenshot shows a green monochrome display with the following data:

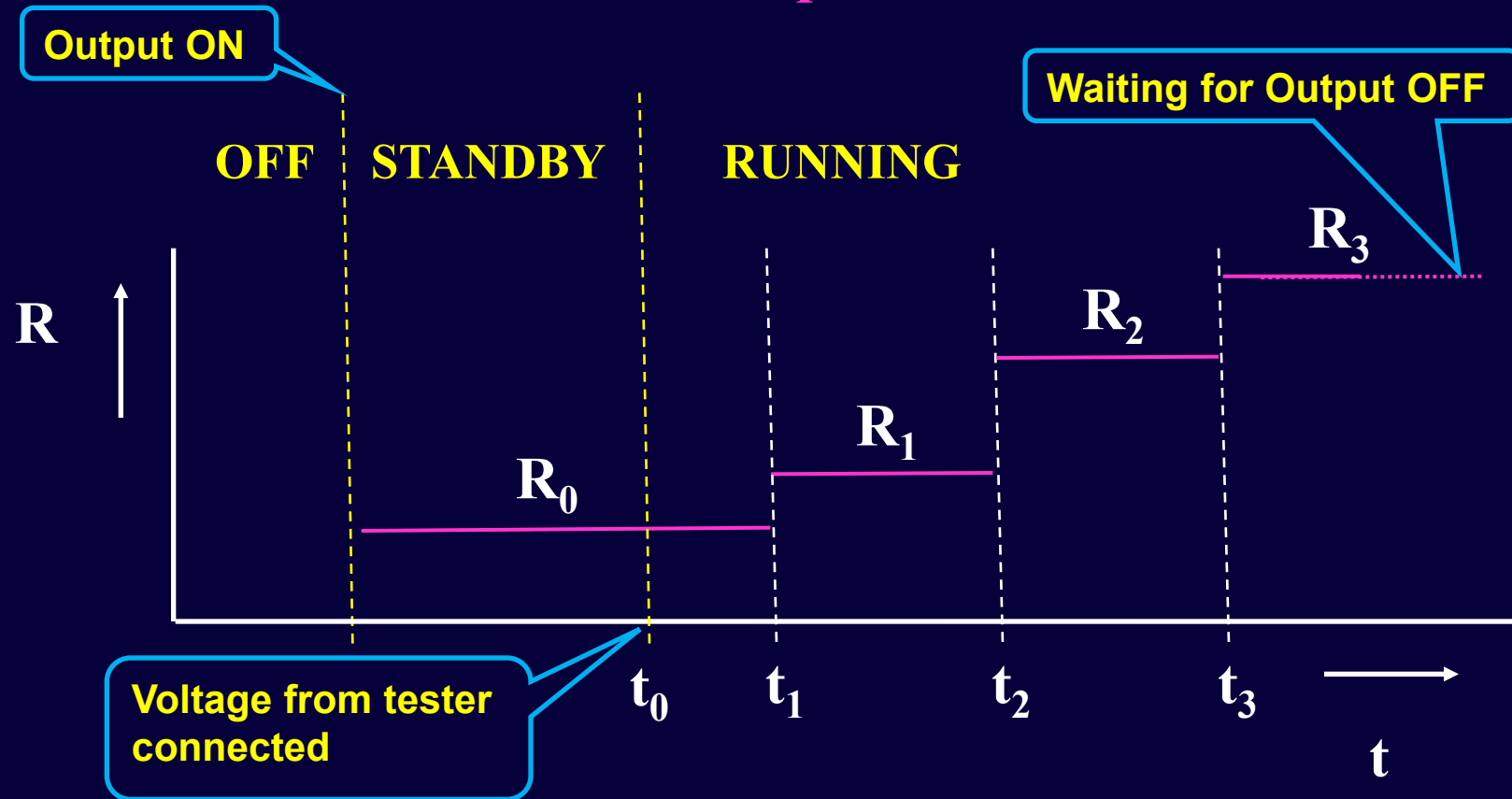
t0: 0 s	R0: 100.5 MΩ	STAND BY
t1: 5 s	R1: 120.3 MΩ	Local
t2: 10 s	R2: 150.6 MΩ	
t3: 15 s	R3: 260.2 MΩ	
Test voltage: 0.007 kV	Mode: PSP	ACCURACY 0.2%
Total time: 0.0 s		

**Resistances are connected to the output in predefined time intervals.**

- ✓ Resistances and time intervals
- ✓ Actual test voltage
- ✓ Total time of switching sequence
- ✓ Accuracy
- ✓ Output OFF / STANDBY / RUNNING
- ✓ Remote control

# M191 PSP function

## Time sequence



# M191 DPP function

**Application: Testing DAR, PI, PR parameters of insulation meters**



**Resistances are connected to the output in fixed time intervals (depends on selected parameter – DAR / PI / PR)**

- ✓ Tested parameter
- ✓ Starting resistance R0
- ✓ DAR coefficient
- ✓ Total time of switching sequence
- ✓ Accuracy
- ✓ Output OFF / STANDBY / RUNNING
- ✓ Remote control

# M191 DPP function

## Definition of individual parameters

### Dielectric Absorption Ratio

R (60s)

$$\text{DAR} = R1 (60s) / R0 (30s)$$

resistance measured 60s  
after the test voltage is  
connected

### Polarization Index

$$\text{PI} = R1 (600s) / R0 (60s)$$

### Polarization Ratio

$$\text{PR} = R1 (180s) / R0 (15s)$$