

8.1. Electrostatic Field Meter

8.1.1. Electrostatic Field Meter PFM-711 A

The PFM-711 A is an ultimate professional instrument with a very high accuracy. The instrument is transportable and battery operated. The accuracy is better than $\pm 2\%$ at constant ambient conditions. The measurement range can be changed. Through the supplied cable the measurement results can be transferred to the PC, where they are evaluated.

This instrument does not only measure the electrostatic field, it is also the **basic unit** for the following measurement values:

- Inspection of the ionizer functions at IEC 61340-5-1 and EOS/ESD-S3.1
- Personnel charge at IEC 61340-4-5 and EOS/ESD-STM-97.2
- Discharge behaviour of packing materials
- Shielding behaviour of packing materials



Properties

Display	3-1/2 digits LCD with 0,4" digit high automatic polarity, HOLD - and LOW BATTERY - display
Output	analogue output and 30" cable with 2 plugs
Range	high range: 0 V to $\pm 19,99$ kV; highest accuracy: 10 V at a distance of 1" (2.54 cm) low range: 0 V to $\pm 1,999$ kV; highest accuracy: 1 V at a distance of 1" (2.54 cm)
Range light	red "Bulls Eye" at 1" (2,54 cm) distance
Accuracy	$\pm 2\%$ at normal conditions (23°C / 73°F and 30% rH) $\pm 5\%$ at 0 ... 50°C (32 ... 122°F) and 0 ... 85% rH (non-condensing)
Dimension	110 mm * 60 mm * 25 mm
Weight	150 g

Code	
8100.711	Electrostatic Field Meter PFM-711 A

Please inquire further information for this special instrument!

8.1.2. Static Locator PCS-715 A

The Static Locator is a indicator for electrostatic fields and the polarity on the charged surface. This instrument is easy to use.

Properties

Display	3-1/2 digits LCD, automatic display for measurement voltage, HOLD - and LOW BATTERY - display
Polarity	automatic, positive implied, indicator for negative polarity
Distance	1" (2.54 cm)
Zero	half-automatic, „Push to Zero“ Feature
Range	at 1" (2.54 cm): 0 ... 20,000 kV in 100 V steps at 1/10" (0.254 cm): 0 ... 2,000 kV in 10 steps
Accuracy	better than $\pm 10\%$
Dimension	110 mm * 60 mm * 25 mm
Weight	142 g



Code
8100.715 Static Locator PCS-715 A

8.1.3. Instrument Set PFK-100

Electrostatic fields can be measured and analysed with this instrument set as well as the ionizer function according to IEC 61340-5-1 and EOS/ESD-S3.1. The voltage generation of materials, equipments and persons can be assessed.

The set includes:

- an **Electrostatic Field Meter PFM-711 A**
- a **Charge Plate Monitor Assembly CPM-720**
- a **Charging Source PCS-730 (± 1 kV)**

Code
8100.100 Instrument Set PFK-100



8.1.4. Charge Plate Monitor Assembly CPM-760 A



The PFM-711 A can be completed with a CPM-760 A assembly for a Charge Plate Monitor.

6" – 20 pF

Code
8100.760 Charge Plate Monitor Assembly
CPM-760 A

8.1.5. Static Decay Timer PDT-740 B

The Static Decay Timer was designed to measure the time, which is needed to discharge materials from 1000 V to less than 100 V, 50 V or 10 V.

This instrument can be connected to the electrostatic filed meter PFM-711 A and a CPM-720 A to measure the discharge time of an ionizer.



Code
8100.740 Static Decay Timer PDT-740 B

8.1.6. Static Decay Time – Accessories PGB-745

The probes are specially designed for measuring the charge movement and the decay time of static controlled materials.

Sizes: diameter Ø 1" (2.54 cm)
 height 1.185" (3.59 cm)



Code
8100.745 Static Decay Timer – Accessories PGB-745

Measurement Systems

8.2. Resistance Systems

Different cylindrical probe arrangements are necessary for the measurement of the resistance to ground and the surface resistance according to the valid standards. The resistance systems PRS 801 and PRS 812 offer the standardized measurement voltages and show the results. The measurement voltages have to be constantly at the measured object during the operation.

8.2.1. Resistance System PRS 801

The resistance system PRS 801 is an universal ohmmeter with a big range. Additionally the minimum, maximum and the average of all stored results can be calculated. The measurement results can be transferred to the PC. The resistance system is transportable and battery operated or used with an accumulator. The range includes resistance values between $0,1$ and $2,0 \cdot 10^{14} \Omega$ with an accuracy better than $\pm 5\%$.

The resistance system can be operated automatically, half-automatically or manual with a digital or exponential display of the results.



Properties

Test range and voltages	automatic mode default
	< 0.01 ... 10 V $1 \cdot 10^4 \Omega$
	10 V $1 \cdot 10^4 \dots 1 \cdot 10^6 \Omega$
	100 V $1 \cdot 10^6 \dots 2 \cdot 10^{14} \Omega$
Accuracy	$\pm 5\%$ at 23°C (73°F) + 30% rH.
Display	multifunctional display
Timer	0 ... 99 s
Memory	80/100 results
Output	RS 232
Power	2 * 9 V batteries
Dimension	10 cm (4") * 15 cm (6") * 5 cm (2")
Weight	690 g with batteries

Accessories

- 2 shielded sensing cables (30")
- 1 self calibration reference
- Computer port clip, steel and acrylic test plate
- Software for documentation at the PC
- Transmission cable

Code

8801.001 Resistance System PRS 801

8.2.2. Resistance System PRS 812

The resistance system PRS 812 is an universal measurement system for the assessment of the resistance to ground and surface resistance of static controlled materials. The measurement system is transportable and has a range of 0.1 ... 1 * 10¹² Ω. All measurement voltages between 10 V and 100 V are offered.

Additionally the minimum, maximum and average of data can be calculated and showed. Up to 80 data can be stored.

In comparison to the PRS 801, the measurement data can not be transferred to the PC.



All other functions are similar to those of the resistance system PRS 801.

Accessories

- 2 sensing cables (10")
- 1 self calibration reference
- Metal alligator clip, steel and acrylic test plate
- Documentation

Code	
8812.001	Resistance System PRS 812

8.2.3. Surface and Resistance to Ground Test PSI-870

The static control steps can be controlled with this simple and handy testing instrument. The surface resistance can be controlled between 10² to 10¹² Ω. The instrument has two stripe probes on the backside. When it is connected to a potential the resistance to ground can be controlled.

Properties

Voltage	9 Volt
Accuracy	± ½ decade or ± 10%
Display	11 LED
Power	9 V battery
Dimension	115 mm * 69 mm * 26 mm
Weight	ca. 200g



Code	
8201.200	Testing Instrument PSI-870 incl. case, alligator clips, cables, documentation

Measurement Systems

8.2.4. Resistance Meter BMM2000ESD

The BMM2000ESD was developed to meet the rules in the IEC 61340-5-1.

The instrument features three test voltages: 10 V, 100 V, 500 V, whilst the 10 V range was included especially for the measurement in EPAs.

Properties

- Test voltages: 10 V, 100 V, 500 V
- Ranges:
 - 500 V \Rightarrow 10 G Ω
 - 100 V \Rightarrow 2 G Ω
 - 10 V \Rightarrow 1 G Ω
- Accuracy: $\pm 2\%$; ± 2 Digits



Code

8820.100 Resistance Meter BMM2000ESD

8.3. Probes

8.3.1. IEC 61340-4-1 + IEC 61340-5-1

Cylindrical probe at IEC 61340-4-1 Ed. 2 (VDE 0303 part 4-1) with conductive rubber

Size: 65 mm \varnothing
Weight: 2,5 kg + 5 kg

Probe set includes:
2,5 kg basic probe +
2,5 kg add-on +
additional grip



Example of 2 probe sets

Code

8220.320 Probe Set

Counter probe for the measurement of volume resistances at IEC 61340-4-1 Ed. 2 with conductive rubber

Sizes: 80 ... 100 mm \varnothing

Code

8220.301 Counter Probe

8.3.2. EOS/ESD – Association Standard

Cylindrical probe – ESD S 4.1 / ANSI ESD 7.1 with conductive rubber at DIN IEC 61340-4-1

Size: 63.5 mm Ø
Weight: 2.27 kg

Code
8220.200 Cylindrical Probe



8.3.3. IEC 61340-2-3 – Ring Probe

**Square- / ring probe at IEC 61340-2-3
ESD STM 11.12-2000**

Version 1: measurements up to approx. $10^{11} \Omega$
Version 2: measurements up to approx. $10^{14} \Omega$



Version 1*



Version 2*

Code
8220.400 Ring Probe

* please always specify

Measurement Systems

8.3.4. DIN EN 1081 – Tripod Probe

The tripod probe at DIN EN 1081 is only used for floor measurements. Alternatively it can also be used for testing the requirements at VDE 0100 (but an other test voltage will be used).

Code	
8220.500	Tripod Probe



8.3.5. Miniature – Ring Probes PRF-912/PRF-914

The miniature ring probes were designed for accurate measurements of surface resistances on small areas.

The probes permit resistance measurements up to surfaces of 0,32“ (0,8128 cm) diameters.

Properties

	PRF-912	PRF-914
Range	0.9 ... 1 * 10 ¹² Ω	0.9 ... 1 * 10 ¹⁴ Ω
Probe spring	1.6 kg	1.6 kg
Connection	BNC-plug	Shielded cable
Dimensions	150 mm * 12.7 mm	160 mm * 12.7 mm
Weight	43 g	57 g



The systems PRS 801 and PRS 812 can be used as resistance systems. Both probes have standard connectors and special connectors for these measurement systems.

Code	
8800.912	Ring Probe PRF-912
8800.914	Ring Probe PRF-914



8.3.6. Resistance Verification Fixture PRV-913

The **Resistance Verification Fixture PRV-913** is available for the verification of the probes PRF-912 and PRF-914. It serves the control before using the probes.



Code
8800.913 Resistance Verification Fixture PRV-913

8.3.7. 2-Point-Miniature – Probe PRF-922

The 2-Point-Miniature – Probe measures the point-to-point surface resistance of small areas and assemblies. It consists of a PRF-922 and a shielded cable equipped with BNC connectors as well as an adapter for the PRS-801 and PRS-812.



Properties

- Range: 0.9 ... 1.0 * 10¹²
- Probe spring: strength/test 0,68 kg
- Dimensions: 178 mm without probe cover (length)
195 mm with probe cover (length)
12.7 mm Ø
- Weight: 58 g
- Gold contacts

The diameter of a sample should not be smaller than 8.2 mm.

Code
8800.922 2-Point-Miniature - Probe PRF-922
8800.923 Verification Fixture PRV-913 'Two Point'

8.3.8. Probes for Static Control Clothing at ESD STM2.1-1997

These probes are used to measure the resistance of static control clothing according to the American standard ESD STM2.1-1997.

Code
8220.600 Garment Clips PGC-821



8.3.9. DIN EN 1149 Part 1



The special ring probe is used for testing static control clothing according to DIN EN 1149 Part 1.

Code
8201.149 Ring Probe DIN EN 1149 Part 1

8.3.10. Probe & Measurement Sets

Available probe & measurement sets (only a selection, other combinations are possible)

Code	Standard	Probes
8230.102	ESD S4.1 / ANSI ESD 7.1	2 cylindrical probes (2.27 kg)
8230.103	IEC 61340-4-1 + IEC 61340-5-1	2 cylindrical probe sets (2.5 kg / 5 kg) 1 counter probe
8230.104	For all standards	3 cylindrical probe sets (2.5 kg / 5 kg + 2.27 kg) 1 square probe 1 counter probe
8230.001	Case	

Code	Standard	Measurement Instruments & Probes
8250.200	IEC 61340-4-1 + IEC 61340-5-1	PRS 801 / PRS 812 (optional) 2 cylindrical probe sets (2.5 kg / 5 kg) 1 counter probe
8250.300	ESD S4.1 / ANSI ESD 7.1	PRS 801 / PRS 812 (optional) 2 cylindrical probes (2.27 kg) 1 counter probe
8250.400		surface resistance and resistance to ground tester + 2 cylindrical probes (2.5 kg)

8.4. Measurement Systems at IEC 61340-4-5

8.4.1. Walking Test



The Walking Test includes:

- Charge Plate Assembly CPM-760A
- Electrostatic Field Meter PFM-711A
- Documentation system
- Accessories for the shoe measurement PFA-860
- Software
- Cables, adapter

A CPM Assembly for an electrostatic field meter is used for the general measurement of the person charge. The measurement device is connected through the analogue junction on the PC with a fast measurement card. The charge recording is documented on the PC.

8.4.2. System Test

The System Test includes:

- Resistance System PRS-801 / PRS-812
- Accessories for the shoe measurement PFA-860
- Cable, adapter



8.5. Static Decay Time

The measurement system for the **ascertainment of the shielding behaviour and the static decay time of packing materials** includes several components:

The following devices are needed for the measurement:

- Static Decay Timer PDT-740 B
- Electrostatic Field Meter PFM-711 A
- Charge Plate Assembly CPM-720 A
- Charging Source PCS-730



Alternatively a field meter can be connected to the PC through a junction card.

The necessary accessories are the same like in section 8.1.6.

8.6. Personnel Test Stations
8.6.1. Personnel Test Station

The Personnel Test Station serves the daily control of wristbands and shoes.

Test voltage: 24 volts
Test range: 750 kΩ ... 100/35 MΩ at IEC 61340-5-1
Power: 230 volts

Code	
8511.100	PTS - standard
8511.101	PTS with output control

Power: battery operated

Code	
8511.200	PTS - standard
8511.201	PTS with output control



8.6.2. Wristband Test Station – 24 volts

The Wristband Test Station serves the daily control of wristbands.

Code	
8511.110	HTS - battery operated
8511.111	HTS - without panel
8511.112	HTS with output control
8511.210	HTS - 230 volts



8.6.3. Shoe Test Station – 24 volts

The Shoe Test Station serves the daily control of static controlled shoes.

Code	
8511.120	STS - battery operated
8511.121	STS with output control
8511.220	STS - 230 volts

All test station will be delivered with panel or with panel and foot probe, as long as nothing else is written.

8.6.4. Accessories

The accessories for the test stations can be also delivered separately.

Code	Description
8511.003	Power unit
8511.008	Panel - English
8511.010	Foot probe
8511.409	Temperature & humidity recording unit
8511.410	Output control with power unit

8.6.5. Calibration Unit

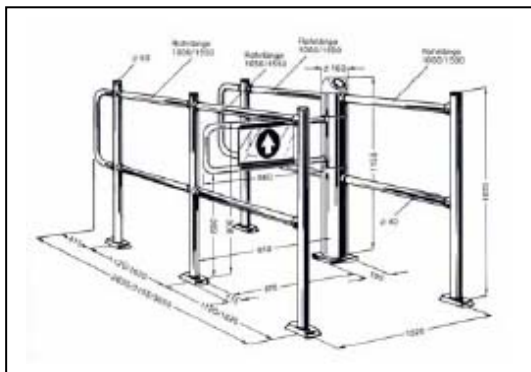
The calibration unit serves the regularly control and component adjustment of the Personnel Test Stations. This is available for the different standard requirements.



Code	Standard
8511.303	IEC 61340-5-1
8511.304	IEC 61340-5-1, ANSI/ESD S20.20-2007

8.6.6. Access Control Systems

The Personnel Test Stations can be extended through an access control system.



Measurement Systems

