

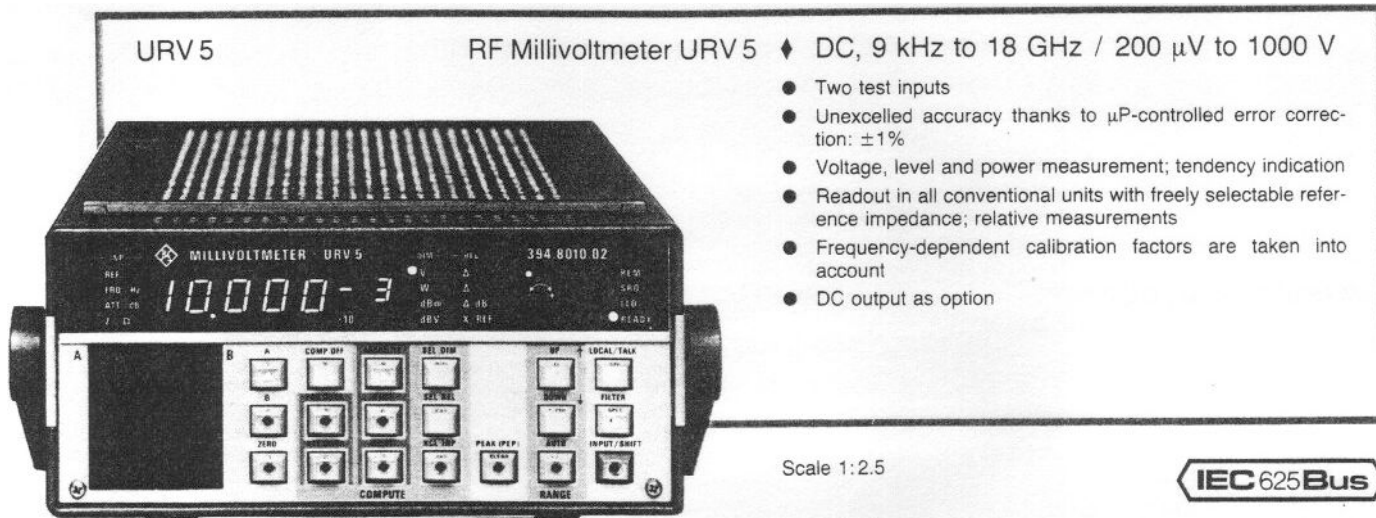
RF DC MILLIVOLTMETERS

With compliments

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voltmeters



URV 5

RF Millivoltmeter URV 5 ♦ DC, 9 kHz to 18 GHz / 200 μ V to 1000 V

- Two test inputs
- Unexcelled accuracy thanks to μ P-controlled error correction: $\pm 1\%$
- Voltage, level and power measurement; tendency indication
- Readout in all conventional units with freely selectable reference impedance; relative measurements
- Frequency-dependent calibration factors are taken into account
- DC output as option

Scale 1:2.5

IEC 625 Bus

The **Millivoltmeter URV 5** is a broadband, sensitive voltage, level and power meter of high accuracy. It is suitable both for manual operation and for use in systems. A great variety of measuring heads and accessories allows the URV 5 to be used for all kinds of measurement:

- With RF probe and DC probe for no-load AC and DC voltage measurements in electronic circuits
- Voltage (and power) measurements in coaxial 50- Ω and 75- Ω systems using the low-reflection and low-loss insertion units (up to 2 GHz).
- Power measurement up to 18 GHz using the power sensors of Power Meter NRV.

Readout One or two measuring heads can be connected to the URV 5. The values measured in the two channels can be displayed separately, set off against one another or referred to any reference (A, B, A/B, B/A, A/REF_A, R/REF_B). For absolute measurement, four different units can be selected:

volt V watt W dBm dBV

In the case of **relative measurements**, the difference, the difference in percent, the logarithmic difference or the ratio is indicated (ΔV , ΔW , $\Delta\%$, ΔdB , X/REF).

Tendency indication The Millivoltmeter has a fast tendency indication which follows the variations of the measured values, thus facilitating adjustments and maxima-minima settings.

Measurement rate With a test rate of up to 30 measurements/s, the URV 5 is ideally suited for use in systems. For applications requiring a noise-free indication rather than a high measurement rate, the results can be filtered, the measurement rate being then reduced accordingly. The measurement rate can be set in six steps via the filter functions (F0 to F5).

Waveform weighting The rectifiers used in the AC voltage measuring heads handle an extremely wide input voltage range of more than 90 dB. The partly non-linear transfer characteristic is individually linearized, so that for sinewave voltages the rms value is always read out. Non-sinewave voltages up to about 30 mV are also measured with rms weighting, whereas for voltages above 1 V the result is read out as $V_{pp}/2\sqrt{2}$ (peak weighting). If dividers are connected ahead of the measuring heads, the specified limits are shifted upwards (300 mV and 10 V for 100-V insertion units).

PEP measurement The PEAK (PEP) key is used for reading the peak envelope power of a modulated signal. Signals with a minimum pulse width of 200 μ s and pulse repetition frequencies down to 0.05 Hz can be measured in this mode.

Frequency-response correction Each measuring head is individually calibrated. The test frequency need only be entered via the keyboard or IEC/IEEE bus and the URV 5 will take account of the calibration factor in the measurement result.

Attenuation correction The URV 5 automatically takes account of the division factors of the measuring heads. If a plug-on divider or attenuator pad is connected ahead of the measuring head, the corresponding attenuation can be entered and will be taken into account in the result.

Data input Upon pressing the SHIFT key, a decimal keypad is available to the user for data entry or for calling up **special functions**, such as:

- display test,
- entry and checking of IEC/IEEE-bus address,
- nonvolatile storage of reference values,
- selection of filters F0 to F5,
- indication of calibration date/recalling of calibration routines,
- transfer of reference value channel A to B and vice versa.

DC output (option) This option delivers a DC voltage proportional to the numerical readout. Thanks to the versatile conversion capability of the URV 5, the scale can be linear or logarithmic.

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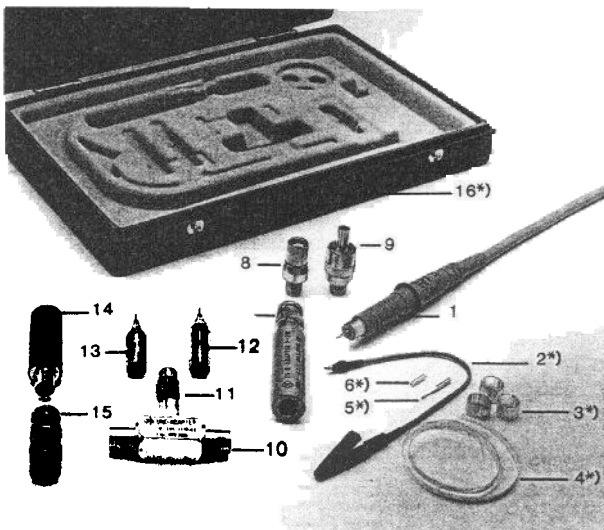
The **measuring heads** are individually calibrated and therefore interchangeable without affecting the error limits (the calibration data stored in the measuring head are automatically taken into account by the URV 5).

URV 5-Z1 DC Probe
0 to 400 V, $R_{in} = 9 \text{ M}\Omega \parallel 6 \text{ pF}$



DC probe

URV 5-Z7 RF Probe with ground cable and clip, ground sleeve, ground strip, hook tip and solder tip without plug-on divider
200 μV to 10 V, 20 kHz to 1 GHz
with **20-dB plug-on divider** (URV-Z6)
2 mV to 100 V, 1 to 500 MHz
with **40-dB plug-on divider** (URV-Z6)
20 mV to 1000 V, 500 kHz to 500 MHz
with **BNC adapter** (URV-Z6) with or without plug-on divider, for voltage measurement on 50- Ω coaxial lines
with **50- Ω adapter** (URV-Z50)
200 μV to 10 V, 20 kHz to 1 GHz
RF voltage measurement with integrated termination in 50- Ω coaxial systems
with **75- Ω adapter** (URV-Z3)
200 μV to 10 V, 20 kHz to 500 MHz
RF voltage measurement with integrated termination in 75- Ω coaxial systems (adaptable connectors)

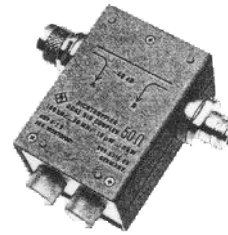


RF probe (1) with accessories: ground cable and clip (2); ground sleeve (3); ground strip (4); hook tip (5); solder tip (6); 75- Ω adapter (7) with BNC adapter, adapter to 1.6/5.6 connectors (8) and to 2.5/6 connectors (9); BNC adapter (10) with reducer sleeve (11) for plug-on dividers (12, 13); 50- Ω adapter (14) with BNC adapter;

*) supplied with RF Probe URV 5-Z7

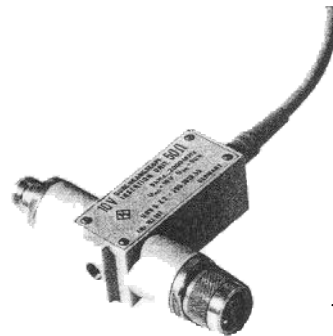
RF DC MILLIVOLTMETERS

URV 5-Z9 Dual Directional Coupler, 50 Ω
100 kHz to 80 MHz, 10 μW to 2 kW
Coupling of forward and reflected power; in conjunction with two RF Probes URV 5-Z7 for measurement of directional power and reflection



Dual directional coupler

URV 5-Z2 10-V Insertion Unit, 50 Ω
200 μV to 10 V
9 kHz to 2 GHz (model 55)
9 kHz to 1 GHz (model 04)
RF voltage measurement with **low reflection coefficient** in 50- Ω coaxial systems



10-V insertion unit

URV 5-Z4 100-V Insertion Units, 50 and 75 Ω
2 mV to 100 V
100 kHz to 2 GHz, 50 Ω (model 55)
100 kHz to 1 GHz, 50 Ω (model 04)
100 kHz to 2 GHz, 75 Ω (model 75)
RF voltage measurement in 50- Ω and 75- Ω coaxial systems for higher voltages and with extremely low reflection coefficient; power measurements up to 200 W (130 W) possible with suitable termination

NRV-Z1 1-nW Power Sensor, 50 Ω
1 nW to 20 mW, 10 MHz to 18 GHz

NRV-Z2 Precision Power Sensor, 50 Ω
100 nW to 500 mW, 10 MHz to 18 GHz
VSWR < 1.05 up to 4 GHz, < 1.2 up to 18 GHz

NRV-Z3 400-pW Power Sensor, 75 Ω
400 pW to 13 mW, 1 MHz to 2.5 GHz

NRV-Z4 500-pW Power Sensor, 50 Ω
500 pW to 20 mW, 100 kHz to 6 GHz

NRV-Z5 50-nW Power Sensor, 50 Ω
50 nW to 500 mW, 100 kHz to 6 GHz

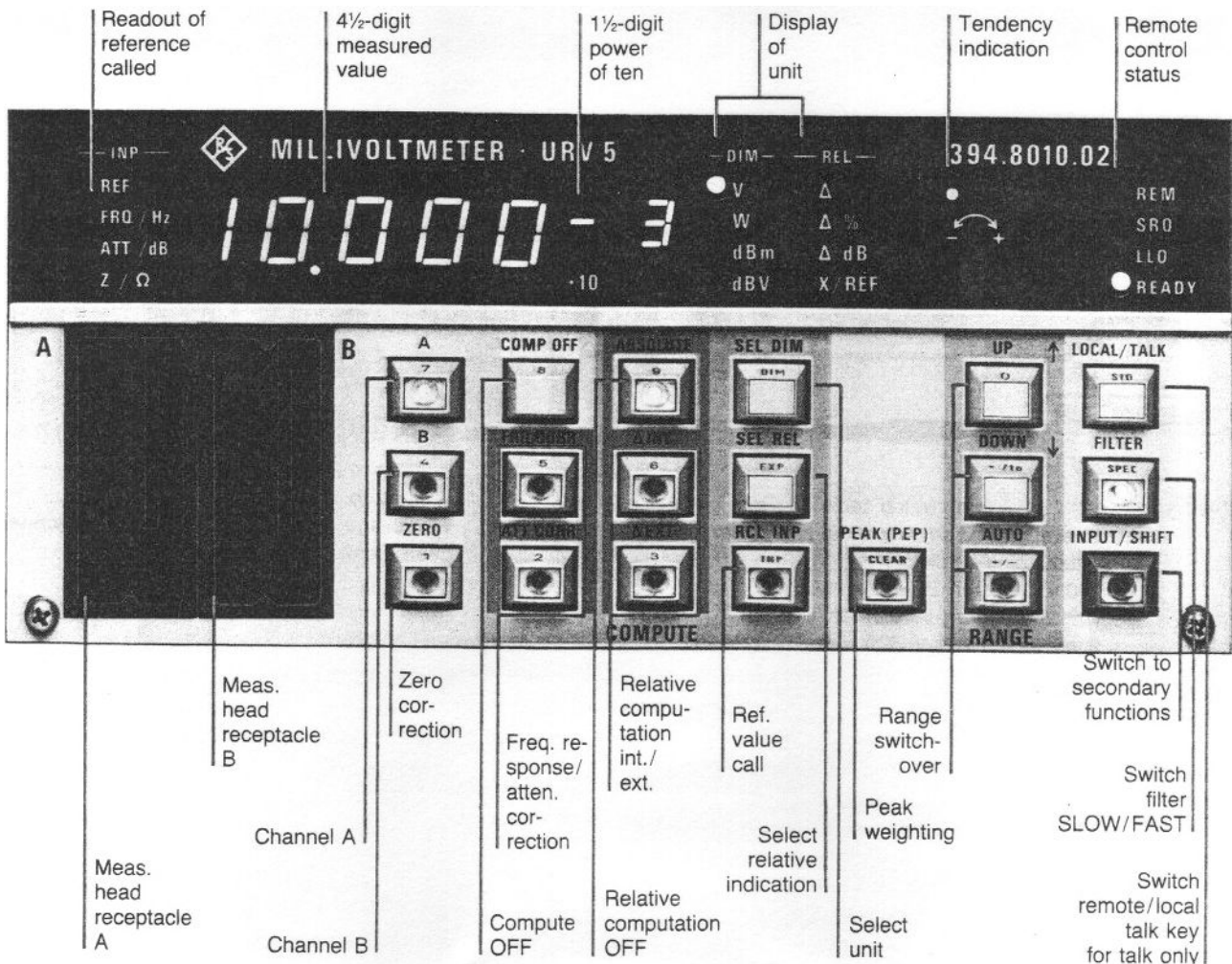


Power sensor

RF DC MILLIVOLTMETERS

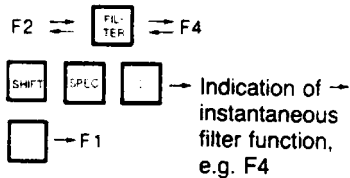
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URV 5 Operation



Selection of filter functions

SLOW (F2) ↔ FAST (F4)
F0 to F5



Call of a special function eg LED test



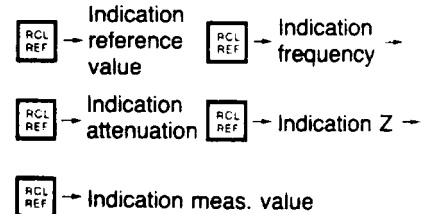
IEC-bus address indication of address set



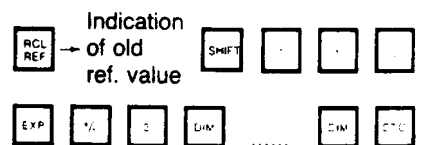
Blue: secondary functions

Reference correction values

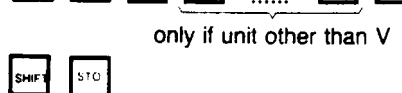
Indication: reference or correction values for selected channel



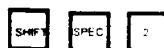
Storage of reference value, eg 150 mV for channel set



Transfer of instantaneous meas. value as reference



Nonvolatile storage of all reference, correction and impedance values (both channels)



Specifications

URV 5, basic unit (unless otherwise stated, all specifications refer to voltage readout in V)

| | |
|------------------------------------|--|
| Test channels | 2 (A and B), independent of each other, separately adjustable |
| Measuring heads | all intelligent measuring heads for URV 5 and NRV can be used >94 dB (4 ranges in 20-dB steps) |
| Measurement range | A, B |
| Measurement mode | A/REF _A , B/REF _B , A/B, B/A |
| absolute | V, W, dBm, dBV |
| relative | ΔV, ΔW, Δ%, ΔdB, X/REF |
| Readout mode | ±19.999 · 10 ^{±19} |
| absolute | 0.01% (0.1%) ¹⁾ of nominal measurement range with readout in V; |
| relative | 0.01 dB with readout in dBm, dBV or ΔdB; |
| Display range | 0.01% with readout in Δ% |
| Resolution | |
| Error limits | ±0.15% of rdg per channel |
| 18 to 28 °C | |
| Temperature effect | ±0.25% of rdg per channel |
| 10 to 40 °C | |
| 0 to 50 °C | ±0.5% of rdg per channel |
| Filter | for reduction of display noise, adjustable ²⁾ in 6 steps (F0 to F5) via keyboard or remote-controlled, duration approx. 4 s ²⁾ |
| Zero adjustment | |
| Measurement rate (manual) | approx. 1 measurement/s with filter F0 up to 30 measurements/s with filter F5 ²⁾ |
| Measurement time (IEC/IEEE bus) | approx. 0.05 s with filter F5 up to 20 s with filter F0 ²⁾ ; with dual-channel measurement sum of the individual times as maximum, no switchover delay; all measurements triggered via IEC/IEEE bus are in steady state, even in case of range switchover |
| PEP measurement | |
| Pulse width approx. | 200 μs to CW |
| Minimum pulse repetition frequency | |
| Filter | F0 F1 F2 F3 F4 F5 |
| f _{min} /Hz | 0.05 0.25 1 5 25 100 |

| | |
|-------------------------------|---|
| Frequency-response correction | can be selected for all AC voltage and power measuring heads; frequency response of measuring head is accounted for after entry of test frequency; one frequency per channel can be entered |
| Attenuation correction | can be switched on for all measuring heads; one attenuation value per channel can be entered (-199.99 to +199.99 dB) |
| Reference values | one reference value per channel for relative measurements (REF _A , REF _B); entry via keyboard, IEC/IEEE bus or transfer of measured value for computation and indication of power and power level; one value per channel can be entered (10 ⁻⁴ to 10 ⁴ Ω); automatic initialization with impedance value (50/75 Ω) of power sensors for NRV and insertion units URV 5-Z2/-Z4 |
| Reference impedance | |
| Remote control | |
| Interface | IEC 625-1 (IEEE 488) for control of all device functions |
| Interface functions | SH1, AH1, T5, L4, SR1, RL1, DC1, DT1, PP1 |
| General data | |
| Operating temperature range | 0 to +50 °C, class I to IEC 359 (no dewing) |
| Storage temperature range | -40 to +70 °C |
| Power supply | 100/120/220/240 V ±10% 47 to 63 Hz, 400 Hz (30 VA) |
| Dimensions, weight | 241 mm × 110 mm × 340 mm, 4.4 kg |
| Option DC Output URV 5-B2 | |
| Output impedance | 1 kΩ |
| Output voltage range (EMF) | -1.999 to +1.999 V |
| Resolution | 1 mV (10 digits) |
| Error | ±2 mV |

Measuring heads and measurement functions (all specifications without error of basic unit)

DC voltage measurement – using DC Probe URV 5-Z1

| | |
|--|---------------------------|
| Voltage measurement range | 0 to 400 V |
| Input impedance | 9 MΩ 6 pF |
| Maximum load | 400 V |
| General data | |
| Dimensions, weight | 15 mm dia. × 125 mm, 80 g |
| Length of connecting cable | 1.2 m |
| Temperature range | see basic unit URV 5 |
| Filter-dependent data | |
| Filter | |
| Series-mode rejection 50 (60) Hz | ±0.05% in dB |
| Measurement rate (manual) ⁴⁾ | |
| Measurement time (IEC/IEEE bus), trigger to output of 1st byte ⁴⁾ | |

AC voltage measurement – using Insertion Unit URV 5-Z2

| | |
|--|--|
| Voltage measurement range | 200 μV to 10 V |
| Level/power measurement range | -60 to +33 dBm/1 nW to 2 W |
| Frequency range | 100 kHz to 2 GHz (model 55) 100 kHz to 1 GHz (model 04) |
| Characteristic impedance | 50 Ω |
| Max. input voltage rms (sinewave) | 15 V |
| peak | 22 V |
| DC | 50 V |
| Maximum reflection coefficient and VSWR (model 04 up to 1 GHz) | |
| | DC 200 500 1 1.6 GHz 2 |
| r% VSWR | 1 2 7 10 15 |
| | 1.02 1.04 1.15 1.22 1.35 |

| | |
|----------------------------|---------------------------------|
| General data | |
| Connectors | N male, N female |
| Dimensions, weight | 85 mm × 115 mm × 30 mm, 0.35 kg |
| Length of connecting cable | 1.2 m |
| Temperature range | see basic unit |

Footnotes see following page.

| Nominal range | Resolution ³⁾ | Max. reading | Error limits 18 to 28 °C |
|---------------|--------------------------|--------------|----------------------------|
| 1 V | 100 μV | 1.2200 V | ±(0.15% of rdg + 5 digits) |
| 10 V | 1 mV | 12.200 V | ±(0.15% of rdg + 1 digit) |
| 100 V | 10 mV | 122.00 V | ±(0.15% of rdg + 1 digit) |
| 400 V | 100 mV | 420.00 V | ±(0.35% of rdg + 1 digit) |

| | |
|--------------------|---------------|
| Temperature effect | |
| 10 to 40 °C | ±0.25% of rdg |
| 0 to 50 °C | ±0.5% of rdg |

| | | | | | |
|---------|---------|---------|---------|---------|---------|
| F0 | F1 | F2 | F3 | F4 | F5 |
| 64 (15) | 64 (15) | 64 (15) | 64 (15) | 64 (15) | — |
| 1/s | 2/s | 5/s | 9/s | 15/s | 31/s |
| 13 s | 3.2 s | 0.8 s | 0.22 s | 0.07 s | 0.034 s |

| Nominal range | Resolution ³⁾ | Max. reading | Error limits 18 to 28 °C |
|---------------|--------------------------|--------------|---|
| 10 mV | 1 μV | 12.200 mV | ±(0.3% of rdg + 3 digits + frequency response error + zero error) |
| 100 mV | 10 μV | 122.00 mV | |
| 1 V | 100 μV | 1.2200 V | |
| 10 V | 1 mV | 10.500 V | |

| | |
|--------------------------------------|--|
| Frequency response error in % of rdg | |
| | 9 20 50 kHz 30 100 200 500 MHz 1 2 GHz |
| Model 55 | 6" 2 0.5 1.5 2 3 5 7" " |
| | 1.5 2 5 11 18 " |
| Model 04 | 6" 2 0.5 1.5 2 3 5 " |
| | 1.5 2 6 13 " |

Zero error, display noise, measurement rate and temperature effect see additional data for AC voltage measurement on page 427.

URV 5 measuring heads and measurement functions (continued)

AC voltage measurement – using Insertion Unit URV5-Z4

| | |
|-----------------------------------|--|
| Voltage measurement range | 2 mV to 100 V |
| Level measurement range | -40 to +53 dBm (models 55 and 04) -42 to +51 dBm (model 75) |
| Power measurement range | 100 nW to 200 W (models 55 and 04) 50 nW to 130 W (model 75) |
| Frequency range | 100 kHz to 2 GHz (models 55 and 75) 100 kHz to 1 GHz (model 04) |
| Characteristic impedance | 50 Ω (models 55 and 04) 75 Ω (model 75) |
| Max. input voltage rms (sinewave) | 150 V |
| peak | 220 V |
| DC | 1000 V |

| Nominal range | Resolution ³⁾ | Max. reading | Error limits 18 to 28 °C |
|---------------|--------------------------|--------------|-----------------------------|
| 100 mV | 10 μV | 122.00 mV | ±(0.3% of rdg + 3 digits |
| 1 V | 100 μV | 1.2200 V | + frequency response error |
| 10 V | 1 mV | 12.200 V | + zero error) |
| 100 V | 10 mV | 105.00 V | |

Maximum reflection coefficient and VSWR

| | | DC | 200 | 500 | 1 | 1.6 | 2 |
|----------|------|------|------|------|---|------|---|
| | | MHz | | | | | |
| | | GHz | | | | | |
| Model 55 | r/% | 1 | | 2 | | 3 | |
| | VSWR | 1.02 | | 1.04 | | 1.06 | |
| Model 04 | r/% | 1 | | 2 | | | |
| | VSWR | 1.02 | | 1.04 | | | |
| Model 75 | r/% | 1.5 | 2 | 3 | | 5 | |
| | VSWR | 1.03 | 1.04 | 1.06 | | 1.11 | |

Frequency response error in % of rdg

| | | kHz | | | MHz | | | | | | |
|----------|------------------|-----|-----|-----|-----|-----|-----|-----|------------------|-----|-------|
| | | 100 | 200 | 500 | 1 | 30 | 200 | 500 | 1 | 1.6 | 2 GHz |
| Model 55 | 15 ⁴⁾ | 6 | 2 | 1 | 1.5 | 2 | 4 | 6 | 8 ⁸⁾ | | |
| | | | | | 2 | 5 | 7 | 10 | 18 | * | |
| Model 04 | 15 ⁴⁾ | 6 | 2 | 1 | 1.5 | 2 | 4 | | | | |
| | | | | | 2 | 6 | 9 | | * | | |
| Model 75 | 20 ⁵⁾ | 8 | 2 | 1 | 2 | 2.5 | 5 | 7 | 10 ⁶⁾ | | |
| | | | | | 2 | 5 | 7 | 12 | 20 | * | |

Zero error, display noise, measurement rate and temperature effect see additional data for AC voltage measurement on next page.

General data

| | |
|----------------------------|---------------------------------|
| Connectors | N male, N female |
| Dimensions, weight | 85 mm × 115 mm × 30 mm, 0.35 kg |
| Length of connecting cable | 1.2 m |
| Temperature range | see basic unit |

AC voltage measurement – using RF Probe URV5-Z7

| RF probe | | without plug-on divider |
|--|------------------|-------------------------|
| Voltage measurement range | 200 μV to 10 V | 200 μV to 10 V |
| Level measurement range 50 (75) Ω | -60 to +33 dBm | -60 to +33 dBm |
| Power measurement range 50 (75) Ω | 1 nW to 2 W | 1 nW to 2 W |
| Frequency range | 20 kHz to 1 GHz | 20 kHz to 1 GHz |
| Input impedance C _{in} R _p (f = 10 MHz) | 2.5 pF >80 kΩ | 2.5 pF >80 kΩ |
| Max. input voltage rms (sinewave) | 15 V | 15 V |
| peak | 22 V | 22 V |
| DC | 400 V | 400 V |

| | with 20-dB plug-on divider | with 40-dB plug-on divider | with 50-Ω adapter | with 75-Ω adapter |
|-----------------------------------|----------------------------|----------------------------|-------------------|-------------------|
| Voltage measurement range | 2 mV to 100 V | 20 mV to 1000 V | 200 μV to 10 V | 200 μV to 10 V |
| Level measurement range | -40 to +53 dBm | -20 to +73 dBm | -60 to +33 dBm | (-62 to +31 dBm) |
| Power measurement range | 100 nW to 200 W | 10 μW to 20 kW | 1 nW to 2 W | (500 pW to 1.3 W) |
| Frequency range | 1 to 500 MHz | 0.5 to 500 MHz | 20 kHz to 1 GHz | 20 kHz to 500 MHz |
| Input impedance | 1 pF >1 MΩ | 0.5 pF >10 MΩ | 50 Ω | 75 Ω |
| Max. input voltage rms (sinewave) | 150 V | 1050 V | 10 V | 12 V |
| peak | 220 V | 1500 V | 22 V | 22 V |
| DC | 1000 V | 1000 V | 10 V | 12 V |

Maximum reflection coefficient and VSWR (adapter with probe)

| | | DC | 50 | 100 | 200 | 500 | 700 | 1 GHz |
|-----------------------------------|------|------|------|------|------|------|-----|-------|
| 50-Ω adapter | r/% | 1.5 | 3 | 5 | 10 | 18 | | |
| | VSWR | 1.03 | 1.06 | 1.11 | 1.22 | 1.44 | | |
| 75-Ω adapter (with BNC connector) | r/% | 1.5 | | 3 | 10 | | | |
| | VSWR | 1.03 | | 1.06 | 1.22 | | | |

| Nominal range | Resolution ³⁾ | Max. reading | Error limits 18 to 28 °C |
|---------------|--------------------------|--------------|------------------------------|
| 10 mV | 1 μV | 12.200 mV | ±(0.3% of reading + 3 digits |
| 100 mV | 10 μV | 122.00 mV | + frequency response error |
| 1 V | 100 μV | 1.2200 V | + zero error) |
| 10 V | 1 mV | 10.500 V | |

Frequency response error in % of rdg

| | | kHz | | | MHz | | | | | | | | |
|----------------------------------|------------------|-----|-----|-----|-----|-----|---|---|------------------|-----|-----|-------------------|-------|
| | | 20 | 50 | 100 | 200 | 500 | 1 | 2 | 30 | 100 | 200 | 500 | 1 GHz |
| RF probe with 50-Ω adapter | 10 ⁶⁾ | 2 | 1.5 | | 1 | | | | 2 | 3 | 7 | 11 ¹⁰⁾ | |
| | | | | | | | | | 2 | 4 | 10 | 20 | * |
| 75-Ω adapter with BNC connector) | 10 ⁶⁾ | 2 | 1.5 | | 1 | | | | 2 | 4 | 12 | | |
| | | | | | | | | | | | | | |
| RF probe with BNC adapter | 10 ⁶⁾ | 2 | 1 | | 0.5 | | | | 1.5 | 3 | 12 | | |
| | | | | | | | | | | | | | |
| and with 20-dB plug-on divider | | | | | | | | | 20 ⁷⁾ | 12 | 15 | 20 | |
| | | | | | | | | | | | | | |
| 40-dB plug on divider | | | | | | | | | 20 ⁷⁾ | 7 | 10 | 15 | |
| | | | | | | | | | | | | | |

Zero error, display noise, measurement rate and temperature effect see additional data for AC voltage measurement on next page.

General data

| | |
|----------------------------|----------------------------|
| Dimensions, weights | |
| Probe | 18 mm dia. × 100 mm, 140 g |
| Plug-on divider | 10 mm dia. × 45 mm, 7 g |
| BNC adapter | 30 mm × 50 mm, 45 g |
| 50-Ω adapter | 16 mm dia. × 50 mm, 30 g |
| 75-Ω adapter | 16 mm dia. × 75 mm, 50 g |
| Length of connecting cable | 1.25 m |
| Temperature range | see basic unit |

1) Filter F5.
 2) Further details see measuring heads and measuring functions.
 3) With filters F0 to F4.
 4) Without range switchover, 1 channel.
 5) The temperature effect stated in the additional data may be exceeded at temperatures above 28 °C.
 6) +3% for 1 to 10 V.
 7) With frequency response correction (linear interpolation between calibration frequencies).
 Calibration frequencies: 32/40/50/64/80/100/120/160/200/250/320/400/500/600/700/800/900/1000/1100/1200/1300/1400/1500/1600/1700/1800/1900/2000 MHz
 1100 to 2000 MHz models 55 and 75 only.
 8) Without frequency response correction.
 9) +5% for 10 to 100 V.
 10) +7% for 1 to 10 V.
 11) With frequency response correction (linear interpolation between calibration frequencies).
 Calibration frequencies: 32/40/50/64/80/100/120/160/200/250/300/350/400/450/500/550/600/650/700/750/800/850/900/950/1000 MHz.

measuring heads and measurement functions (continued)

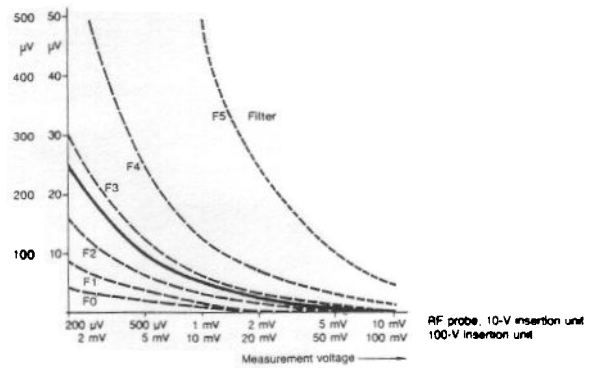
AC voltage measurement – additional data

Measurement rate

| Filter | F0 | F1 | F2 | F3 | F4 | F5 |
|--|------|-------|-------|--------|--------|---------|
| Measurement rate (manual operation) | 1/s | 1.5/s | 3/s | 5/s | 10/s | 16/s |
| Measuring time (IEC/IEEE bus), trigger to output of 1st byte | 22 s | 5.5 s | 1.4 s | 0.36 s | 0.10 s | 0.065 s |

Dashed curves: display noise¹²⁾ (double standard deviation, observation time 1 min, temperature of measuring head 18 to 28 °C, approx. double values at 0 °C) ▶
 Solid curve: zero error¹²⁾ (1 h after zero adjustment, ± 1 °C; after warmup of 2 hours with measuring head connected) ▶

Temperature effect
 10 to 40 °C ±2% of rdg
 0 to 50 °C ±5% of rdg



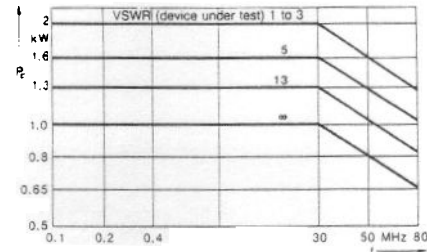
Directional power and reflection measurement – using Dual Directional Coupler URV5-Z9 and 2 RF Probes URV5-Z7

Level/ power measurement range -20 to +63 dBm/ 10 μW to 2 kW
 Minimum forward power required for reflection measurements 50 mW (17 dBm)
 Frequency range 100 kHz to 80 MHz
 Characteristic impedance 50 Ω
 Coupling (nominal value) 40 dB

Insertion loss ≤0.015 dB
 Reflection coefficient
 0.1 to 30 MHz ≤1% (VSWR ≤1.02)
 30 to 80 MHz ≤1.5% (VSWR ≤1.03)
 Max. permissible forward power P_F see diagram

Error limits in dB for forward power measured with reflection-free load (18 to 28 °C)

| 0.1 | 0.2 | 0.4 | 30 | 50 | 80 MHz |
|---------|-----------|-------|-------|-------|--------|
| ±0.20 | ±0.15 | ±0.10 | ±0.15 | ±0.20 | ±0.20 |
| -1/+0.2 | -0.4/-0.2 | ±0.2 | ±0.35 | ±0.8 | ±0.8 |



Display noise and zero error see page 444 (RF probe), taking into account the coupling
 Temperature effect incl. RF Probe URV5-Z7
 10 to 40 °C ±0.2 dB
 0 to 50 °C ±0.5 dB

Minimum directivity in dB (typ. values in parentheses)

| 0.1 | 0.2 | 0.4 | 30 | 50 MHz | 80 |
|---------|---------|---------|---------|---------|----|
| 23 (30) | 28 (35) | 35 (40) | 30 (35) | 20 (30) | |

General data
 Connectors N male, N female
 Dimensions, weight 118 mm × 102 mm × 45 mm, 0.5 kg
 Temperature range see basic unit URV5

Power measurement – using Power Sensors NRV-Z1/-Z2/-Z3/-Z4/-Z5

See page 423. detailed information on Dual-channel Power Meter NRV from page 438.

Measuring heads and measurement functions (continued)

| | | |
|--|-----------------------|-------------|
| Order designation | ▶ Millivoltmeter URV5 | |
| | 394.8010.02 | |
| Option DC Output | URV5-B2 | 395.0112.02 |
| 19" Rack Adapter | ZZA-12 | 079.0631.00 |
| Measuring heads | | |
| DC Probe with ground cable, clamp-on tip and BNC adapter | URV5-Z1 | 395.0512.02 |
| 10-V Insertion Unit | | |
| 50 Ω, 2 GHz (model 55) | URV5-Z2 | 395.1019.55 |
| 50 Ω, 2 GHz 5-m cable | URV5-Z4 | 395.1019.56 |
| 50 Ω, 1 GHz (model 04) | URV5-Z2 | 395.1019.04 |
| 100-V Insertion Unit | | |
| 50 Ω, 2 GHz (model 55) | URV5-Z4 | 395.1619.55 |
| 50 Ω, 1 GHz (model 04) | URV5-Z4 | 395.1619.04 |
| 75 Ω, 2 GHz (model 75) | URV5-Z4 | 395.1619.75 |
| 75 Ω, 2 GHz, 5-m cable | URV5-Z4 | 395.1619.76 |

RF Probe
 with ground cable and clip, ground sleeve and strip, hook tip and solder tip.
 in case URV5-Z7 395.2615.02
 75 Ω, 2 GHz, 5-m cable URV5-Z4 395.1619.76
 Power Sensors see NRV

Recommended extras for RF probe
Accessory Set
 comprising plug-on dividers 20 dB/40 dB, BNC adapter, reducing sleeve for dividers URV-Z6 292.5364.02
50-Ω Adapter
 (BNC female connector) with adapter to BNC connector URV-Z50 394.9816.50
75-Ω Adapter
 with adapters to BNC connector, 2.5/6 connectors and 1.6/5.6 connectors URV-Z3 243.9118.70
 Dual Directional Coupler 2 kW, 0.1 to 80 MHz URV5-Z9 265.5315.02

Servicing aids
 Service Kit for calibration of basic units URV5 and NRV UZ-8 394.9968.02

¹²⁾ Higher values with plug-on dividers and attenuation correction.
¹³⁾ Taking into account calibration values for coupling, including probe error.
 Calibration frequencies: 0.1/0.15/0.2/0.3/0.4/0.45/0.5/0.7/1/1.5/3/5/10/20/30/40/50/60/70/80 MHz
¹⁴⁾ When using nominal coupling of 40 dB, including probe error.