

Advanced Test Equipment Corp. www.atecorp.com 800-404-ATEC (2832)

www.narda-sts.com **EXPOSURE LEVEL TESTER**

ELT-400

Safety Evaluation Within a Magnetic Field Environment

- Direct evaluation of field exposure in comparison with major standards and regulations such as Directive 2013/35/EU for workplaces
- Automatic exposure evaluation for various waveforms in compliance with Weighted RMS and Weighted Peak methods
- Eliminates the overestimation that occasionally occurs with FFT-based evaluation
- Ultra wide frequency range (1 Hz to 400 kHz)
- Wide measurement range up to 80 mT (dependent on type)
- IEC/EN 62311 and 62233 standard compliant including isotropic 100 cm² and 3 cm² probe
- Three-axis analog output for time signal analysis with oscilloscope / analyzer







Exposure Level Tester ELT-400

NSTS 1221-E0205Q

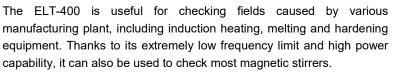


APPLICATIONS

The ELT-400 is an innovative exposure level meter for measuring magnetic fields in the workplace and in public spaces. The model is designed for health and safety professionals in industry, the insurance business and service industries.

The instrument can simply and precisely handle practically any level measurement required in the low and medium-frequency range. It is comparable to the sound level meters that are commonly used in the assessment of noise at the workplace.

Production Areas



Special demands often occur with machinery in production areas where non-sinusoidal signals are common, e.g. in industrial applications that use resistance welding machinery (pulse waveform, phase angle control) with traditional 50/60 Hz systems, as well as in newer medium-frequency switching units.

General Environment

The different types of electronic article surveillance systems generate complex fields in public spaces. Most electromagnetic and magneto acoustic gates operate within the frequency range of the ELT-400.

EMC Test House

The magnetic fields generated by household appliances or other electrical devices have become the focus of increased attention. Some new standards such as IEC/EN 62233 describe how to investigate such products. The ELT-400 is the ideal measuring device when it comes to compliance with these standards. Benefits include the perfectly matched frequency range and implementation of the specified transfer function.

The ELT-400 allows to greatly simplify the assessment process. With EXPOSURE STD (Shaped Time Domain) mode, the instrument achieves a new standard in simple but reliable measurement of magnetic fields, whether in straightforward or in very complex field environments.



Industrial melting furnace



Resistance welding machinery in operation



Magneto acoustic gate used for product surveillance



The easily misinterpreted time-consuming measurements with a spectrum analyzer or scope are rendered obsolete. Detailed knowledge about the evaluation procedure or the field waveform or frequency is no longer needed. The results are reliable, and speed and ease of use are significantly better than all traditional methods.

BASIC OPERATION

The ELT-400 covers the wide frequency range of 1 Hz to 400 kHz. The measurement range of the ELT-400 is far wider than the reference limits of common guidelines. The instrument has an external isotropic magnetic field probe with a 100 cm² cross-sectional area. This is suitable for standards-compliant measurement even in non-homogeneous fields. The ELT-400 has a rugged housing and is easy to operate using only six buttons. The measurement result and the instrument settings are clearly displayed on a backlit LCD panel.

The optional probe extension cable is specially designed for low influence on the frequency response and sensitivity of the instrument. The cable is a good choice in cases where the probe and instrument must be handled separately. Variants of the ELT-400 are available with different operating mode combinations, e.g. "Exposure STD" or "Field Strength". Please refer to the Ordering Information section for details.



Compliance testing of household appliances

EXPOSURE STD (SHAPED TIME DOMAIN) MODE

Signal-Shaped-Independent Field Evaluation

In EXPOSURE STD mode, the level of the magnetic (B) field is directly displayed as a "Percent of Standard" regardless of the signal shape and frequency. The numeric result clearly reflects the current situation and the remaining safety margin. The method employed can be compared to sound level meters that are commonly used to determine noise in the workplace.

The variation with frequency specified in the standard is normalized by means of an appropriate filter. Users no longer need to know the frequency or the frequency-dependent limits. The standard is easily selected by pressing just one button. Multi-frequency signals are just as easy to measure as single frequencies.



Coupling factors can be determined in compliance with IEC/EN 62233 by use of the optional 3 cm² probe



The newer safety standards and guidelines also specify waveformspecific evaluation procedures. For example, stationary sinusoidal and pulsed fields are differentiated. With the ELT-400 the waveform is automatically taken into account. Users no longer need any knowledge about the waveform or the duty cycle. Measurements on pulsed signals are also possible. Different evaluation patterns are occasionally specified in the standard for certain pulse waveforms. These patterns (valid for all imaginable waveforms) are directly handled by EXPOSURE STD mode. This completely eliminates the need to analyze the waveform in the time domain using a scope.

Even when faced with pulses that include DC fields, the EXPOSURE STD method provides valuable results. The ELT-400 covers all the signal components down to 1 Hz that are relevant in assessing such a situation.

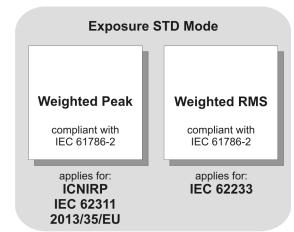
Occasionally both the RMS value and the peak value are critical for assessing exposure in the low-frequency range. Both detector types are provided (*Weighted RMS* and *Weighted Peak*), and are simultaneously activated in the default setting. Depending on the incoming signal and standard selected, the most suitable detector is automatically employed at all times. The necessary weighting factors are also taken into account. The detectors may also be selected independently for further interpretation of the signal.

Detailed knowledge of the field, the test equipment and other auxiliary conditions is necessary to obtain insight into the degree of exposure when using traditional analysis instruments. The exposure level is derived through extensive calculation. Results can be easily misinterpreted or other problems may occur. For example, FFT spectrum analysis tends to overestimate results for the ICNIRP standard. The ELT-400 continuously monitors the field, and the results are constantly updated. Any change in the field, e.g. due to a power reduction, can be evaluated immediately.

Proper evaluation in a personal safety context is achieved quickly and reliably using the STD technique.



In Exposure STD mode the result is displayed directly as a percentage of the permitted limit



Exposure STD automatically sets the prescribed detector applicable for the selected standard



FIELD STRENGTH MODE

Broadband Field Strength Measurements

If the field under test is essentially a single frequency component, broadband mode is also a good choice.

The ELT-400 provides an ultra wideband, flat frequency response. The measurement range can handle extremely high field strength levels. Both detectors, RMS and Peak, are available for broadband measurement. The field strength result is displayed in "Tesla".



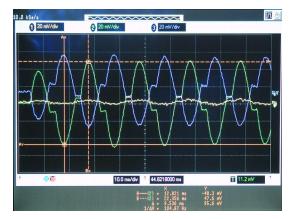
Broadband measurement in "mT" with RMS detector

ACTIVE FIELD PROBE

Three-Axis Analog Signal Output

For scientific studies or advanced signal-shape / frequency analysis, a scope or an FFT analyzer can be connected to the analog output. The output signal ensures proper phase within the three axes and covers the full bandwidth of the instrument.

The buffered output provides an adequate voltage swing to allow for simple operation.



The oscilloscope display shows the welding current when using the analog signal output of ELT-400



SPECIFICATIONS ^a

Frequency range (-3 dB), selectable 1 Hz to 400 kHz, 10 Hz to 400 kHz, 30 Hz to 400 kHz Probe type Magnetic (B-) field Sensor Isotropic coil 100 cm ² Damage level RMS 160 mT The damage level reduces linearly with increasing frequency above 77.5 Hz (1/f) Peak 26 mT The damage level reduces linearly with increasing frequency above 77.5 Hz (1/f) Measurement uncertainty ⁴ ±4 % (50 Hz to 120 kHz) Explosition 100 cm ² E-Field response < 20 nT @ (7 c 2 kHz)	ELT – 400 with 10	0 cm² probe							
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Operating humidity range < 95 % (30 °C) or < 29 g/m³, non-condensing Weight 910 g (with probe) Dimensions 180 mm x 100 mm x 55 mm (basic unit) / 290 mm x 125 mm Ø (probe)	GENERAL SPECIFI	CATIONS							
Operating humidity range < 95 % (30 °C) or < 29 g/m³, non-condensing Weight 910 g (with probe) Dimensions 180 mm x 100 mm x 55 mm (basic unit) / 290 mm x 125 mm Ø (probe)	Operating temperatu	re range	-10 °C to +50	°C					
Weight 910 g (with probe) Dimensions 180 mm x 100 mm x 55 mm (basic unit) / 290 mm x 125 mm Ø (probe)			< 95 % (30 °C	c) or < 29 g/m ³	³ , non-condensing				
Dimensions 180 mm x 100 mm x 55 mm (basic unit) / 290 mm x 125 mm Ø (probe)									
	Dimensions		180 mm x 100) mm x 55 mm					
Display LCD with backlight; refresh rate 4 times per second	Display								
Battery NiMH batteries (4 x Mignon, AA), exchangeable	Battery								
Operating life, typical 12 h		Operating life, typical 12 h							
Charger unit 100 to 240 V AC / 47 to 63 Hz, fits all AC line connectors			100 to 240 V AC / 47 to 63 Hz, fits all AC line connectors						
Charging time, typical 2 h									
Recommended calibration interval 24 months	Recommended calib	ration interval	24 months						
Country of origin Germany	Country of origin		Germany						

a Unless otherwise stated, these specifications apply for the reference condition: ambient temperature 23±3 °C, relative air humidity 40 % to 60 %, continuous wave signal (CW) and RMS detection
 b Depends on type; see Ordering Information

Detection: Automatic according information
 Detection: Automatic according to selected standard, for IEC/EN 62233 based on ICNIRP limit values
 Includes flatness, isotropy, absolute and linearity variations (frequency range: 1 Hz to 400 kHz or 10 Hz to 400 kHz). The uncertainty increases at the frequency band limits to ±1 dB based on the nominal frequency response.

e For Frequency Range 10 Hz to 400 kHz and 30 Hz to 400 kHz only.



Frequency range (3 dB), selectable 1 Hz to 400 kHz, 10 Hz to 400 kHz, 30 Hz to 400 kHz Probe type Magnetic (B) field Sensor Isotropic coil 3 cm² Damage level RMS 1 500 mT Measurement uncertainty ⁴ 2 121 mT The damage level reduces linearity with increasing frequency above 240 Hz (1/n). The damage level (peak) septies for pulse duration \$ 15.6 ms and duty cycle \$ 104. Kessurement uncertainty ⁴ 4 6% (50 Hz to 120 kHz) E Field response < 187.5 m @ 1 < 2 kHz, 100 V/m E-Field response < 187.5 m @ 1 < 2 kHz, 100 V/m EXPOSURE 50 MODE EXPOSURE 50 MODE EXposure evaluation Comparison with standard (see Ordering Information) EC/EN 62233 MODE ^b 100 % 15 000 % 15 000 % 15 000 % MODE ^b 100 % 15 000 % 15 000 % 15 000 % Noise level, typical ^c 10 % 1500 % 15 000 % 15 000 % Prequency range Flat 300 µT 30 mT RANCE MODE ^b 000 1% (RANGE: LOW) HIGH LOW HIGH OW % Prequency range Flat 300 µT 30 mT 75 m mT 750 mT 80 mT NODE ^b 00 0 nT <th>ELT – 400 with 3 c</th> <th>m² probe</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>	ELT – 400 with 3 c	m² probe							
Sensor IsoTropic coli 3 cm ² Damage level RMS 1 500 mT The damage level reduces linearly with increasing frequency above 240 Hz (1/f). The damage level (pek) applies for pulse duration ≤ 15.6 ms and duty cycle ≤ 1/64. Measurement uncertainty 4 64 % (50 Hz to 120 kHz) 100 V/m E-Field response < 187 5 nT @ f 2 kHz, 100 V/m	Frequency range (-3 dB), selectable		1 Hz to 400 kHz, 10 Hz to 400 kHz, 30 Hz to 400 kHz						
Barnage level RMS 1 500 mT The damage level reduces linearly with increasing frequency above 20 Hz (1/f). The damage level (pack) applies for pulse duration \$15.6 ms and duty cycles \$1764. Measurement uncertainty * 45 % (50 Hz to 120 KHz) The damage level reduces linearly with increasing frequency above 20 Hz (1/f). The damage level (pack) applies for pulse duration \$15.6 ms and duty cycles \$1764. E-Field response < 2187.5 n T @ 1 + 50 Hz, 50 KV/m Mounting thread EXPOSURE \$1D MODE Comparison with standard (see Ordering Information) EXPOSURE \$10 MODE Exposure evaluation Comparison with standard (see Ordering Information) IEC/EN 62233 RANGE LOW HIGH LOW HIGH Overload limit 1 500 % 1 500 % 1 500 % Overload limit 0 0% 50 % 4 % 20 % Detection, selectable Instantaneous or Max Hold HIGH LOW HIGH MODE * 20 µT 80 mT RANGE LOW HIGH LOW HIGH Overload limit ' 300 µT 3 20 µT 80 mT RANGE MODE * Exercent MoDE Resolution 1 nf (RANGE: LOW)									
Damage level 2 2 The damage level reduces linearly with increasing frequency above 240 H2 (1/h).	,,		• ()						
Peak2 121 mTThe damage level feed apples for pulse duration? above 240 H2 (1/h). The damage level feed apples for pulse duration = 156 ms and dury cycle = 164.Measurement uncertainty d±6 % (50 Hz to 120 KHz)E-Field response<187.5 m (g f < 2 KHz, 100 V/m	RMS		1 500 mT	•					
E-Field response< 187, \$ nT @ f < 2 kHz, 100 V/m < 2.2 mT @ f = 50 Hz, 50 kV/mMounting thread(14-20UNC-28 (standard thread))Exposure evaluationComparison with standard (see Ordering Information) 2013/35/EU, EMFV 2016IECONDComparison with standard (see Ordering Information) 2013/35/EU, EMFV 2016MODE *LOWHIGHOverload limit1 500 %1 500 %Noise level, typical *10 %50 %Out of %(RANGE: LOW)HIGHOut of %Resolution0.001 % (RANGE: LOW)Detection, selectableAutomatic according to selected standard, or RMS (averaging time 1 s), or Peak ValueDisplay mode, selectableInstantaneous or Max HoldFrequency rangeFlatFrequency rangeFlatRANGELOWHIGHLOWMODE *80 mTRANGELOWHIGHLOWMoise level, typical *600 nT3.2 µT100 µTResolution1 nT (RANGE: LOW)Detection, selectableInstantaneous or Max HoldOut put1 nT (RANGE: LOW)Analog scope outputThree channel (X-Y-Z)Resolution1 nT (RANGE: LOW)Display mode, selectableRNS (averaging time 1 s) or Peak ValueDisplay mode, selectableRNS (averaging time 1 s) or Peak ValueOperating they selectedRNS (averaging time 1 s) or Peak ValueOut put1 nT (RANGE: LOW)Analog coutputThree channel (X-Y-Z)Analog coutputResolutionOperating themperature range<	Damage level	Peak	2 121 mT						
E-Field response< 2.8 mT @ $f = 50$ Hz, 50 K/mMounting thread1/4-20UNC-2B (standard thread)Exposure evaluationComparison with standard (see Ordering Information)MODE *2013/35/EU, EMFV 2016IEC/EN 62233IEC/EN 62233RANGELOWHIGHVoerload limit1 500 %15 000 %1 500 %Voerload limit1 500 %0.001 % (RANGE: LOW)HIGHDetection, selectableAutomatic according to selected standard, or RMS (averaging time 1 s), or Peak ValueDisplay mode, selectableInstantaneous or Max HoldFrequency rangeFlatMODE *320 µT80 mTOverload limit *300 µT3 mT75 mT750 mTNoise level, typical *600 µT300 µT3 mT75 mT750 mT000 µTNoise level, typical *600 µT1 nT (RANGE: LOW)HIGHDetection, selectableInstantaneous or Max HoldOverload limit *300 µT75 mT750 mTNoise level, typical *600 µT1 nT (RANGE: LOW)Detection, selectableDetection, selectableInstantaneous or Max HoldOutPUTAnalog scope outputAnalog scope outputThree channel (X-Y-Z)Analog scope outputThree channel (X-Y-Z)Analog output levelthe overload limit (sensitivity = 300 mV voerload limit). Load limit densitivity = 300 mV voerload limit). Load limit densitivity = 300 mV voerload limit). Load limit densitivity = 300 mV voerload limit). Lo	Measurement uncerta	ainty ^d							
Exposure evaluationExposure evaluationComparison with standard (see Ordering Information)MODE b 2013/35/EU, EMFV 2016 ICNIRP / IEC 62311IEC/EN 62233RANGELOWHIGHLOWHIGHOverload limit1500 %15 000 %1 5000 %15 000 %Noise level, typical $^{\circ}$ 10 %50 %4 %20 %Resolution0.001 % (RANGE: LOW)HIGHLOWHIGHDetection, selectableAutomatic according to selected standard, or RMS (averaging time 1 s), or Peak ValueDisplay mode, selectableInstantaneous or Max HoldField STRENGTH MODEFlat80 mTFrequency rangeFlat80 mTWODE $^{\circ}$ 300 µT3 mT75 mTNoise level, typical $^{\circ}$ 600 nT3.2 µT100 µTNoise level, typical $^{\circ}$ 600 nT3.2 µT100 µTNoise level, typical $^{\circ}$ 600 nT1.3 C µT800 mTNoise level, typical $^{\circ}$ 600 nT1.0 or Peak ValueDisplay mode, selectableInstantaneous or Max HoldOutputThree channel (X-Y-Z)Analog scope outputThree channel (X-Y-Z) <td>E-Field response</td> <td></td> <td></td> <td colspan="5"></td>	E-Field response								
Exposure evaluation Comparison with standard (see Ordering Information) MODE b 2013/35/EU, EMFV 2016 IEC/EN 62233 RANGE LOW HIGH LOW Overload limit 1.500 % 1500 % 1500 % Noise level, typical c 10 % 50 % 4 % 20 % Resolution 0.001 % (RANGE: LOW) Detection, selectable Automatic according to selected standard, or RMS (averaging time 1 s), or Peak Value Display mode, selectable Instantaneous or Max Hold Frequency range Flat MODE b S20 µT 80 mT 80 mT RANGE LOW HIGH LOW HIGH Overload limit ' 300 µT 3 mT 75 mT 750 mT RANGE LOW HIGH LOW HIGH Output Overload limit ' 300 µT 3 art 75 mT 750 mT Noise level, typical ° 600 nT 3.2 µT 100 µT 800 µT Rasolution 1 nT (RANGE: LOW) Evencional materia set on the overload limit (sensitivity = 800 mV/ when the field strength value corresponds to the over	Mounting thread		1/4-20UNC-28	3 (standard thread)					
MODE $^{\circ}$ 2013/35/EU, EMP 2016 (CNIRP / IEC 62311)IEC/EN 62233RANGELOWHIGHLOWHIGHLOWOveroad limit1 500 %15 000 %15 000 %Noise level, typical $^{\circ}$ 10 %50 %4 %20 %Resolution0.001 % (RANGE: LOW)4 %20 %Display mode, selectableAutomatic according to selected standard, or RMS (averaging time 1 s), or Peak ValueDisplay mode, selectableInstantaneous or Max HoldFrequency rangeFlatMODE $^{\circ}$ 320 µT80 mTRANGELOWHIGHLOWOveroad limit $^{\circ}$ 300 µT3 mT75 mT750 mTNoise level, typical $^{\circ}$ 600 nT3.2 µTNoise level, typical $^{\circ}$ 600 nT3.2 µTResolution1 nT (RANGE: LOW)Detection, selectableRMS (averaging time 1 s) or Peak ValueDisplay mode, selectableInstantaneous or Max HoldOUTPUTThe open-circuit analog output voltage is 800 mV when the field strength value corresponds to the overload limit (sensitivity = 800 mV/ overload limit).Load impedance 2 to k Ω RS-232 (19200 baud, 8n1, XON/XOFF), 3-wire, 2.5 mm stereo jackGERERAL SPECIFICATIONSOperating temperature rangeOperating thumidity range< 95 % (30 °C) or < 29 g/m³, non-condensing	EXPOSURE STD MO	DE							
MODE $^{\circ}$ 2013/35/EU, EMP 2016 (CNIRP / IEC 62311)IEC/EN 62233RANGELOWHIGHLOWHIGHLOWOveroad limit1 500 %15 000 %15 000 %Noise level, typical $^{\circ}$ 10 %50 %4 %20 %Resolution0.001 % (RANGE: LOW)4 %20 %Display mode, selectableAutomatic according to selected standard, or RMS (averaging time 1 s), or Peak ValueDisplay mode, selectableInstantaneous or Max HoldFrequency rangeFlatMODE $^{\circ}$ 320 µT80 mTRANGELOWHIGHLOWOveroad limit $^{\circ}$ 300 µT3 mT75 mT750 mTNoise level, typical $^{\circ}$ 600 nT3.2 µTNoise level, typical $^{\circ}$ 600 nT3.2 µTResolution1 nT (RANGE: LOW)Detection, selectableRMS (averaging time 1 s) or Peak ValueDisplay mode, selectableInstantaneous or Max HoldOUTPUTThe open-circuit analog output voltage is 800 mV when the field strength value corresponds to the overload limit (sensitivity = 800 mV/ overload limit).Load impedance 2 to k Ω RS-232 (19200 baud, 8n1, XON/XOFF), 3-wire, 2.5 mm stereo jackGERERAL SPECIFICATIONSOperating temperature rangeOperating thumidity range< 95 % (30 °C) or < 29 g/m³, non-condensing	Exposure evaluation		Comparison v	vith standard (see Or	dering Inform	nation)			
Overload limit1 500 %1 500 %1 500 %1 500 %Noise level, typical °10 %63 %4 %20 %Resolution0.001 % (RANCE: LOW)Detection, selectableAutomatic according to selected standard, or RMS (averaging time 1 s), or Peak ValueDisplay mode, selectableInstantaneous or Max HoldFIELD STRENSTH MODEFrequency rangeFlatMODE °320 μT80 mTRANGELOWHIGHOverload limit '300 μT3 mT75 mT750 mTNoise level, typical °600 nT600 nT3.2 μT100 μT8esolution1 nT (RANGE: LOW)Detection, selectableRMS (averaging time 1 s) or Peak ValueDisplay mode, selectableInstantaneous or Max HoldOurPUT0Analog scope outputThree channel (X-Y-Z)Analog scope outputThree channel (X-Y-Z)Analog scope outputRS-232 (19200 baud, 8n1, XON/XOFF), 3-wire, 2.5 mm stereo jackGENERAL SPECIFICATIONSOperating temperature range-10 °C to +50 °COperating temperature range-10 °C to +50 °COperating temperature range-10 °C to +50 °COperating temperature range10 °C to +50 °COperating temperature rang			201	2013/35/EU, EMFV 2016					
Noise level, typical ° 10 % 50 % 4 % 20 % Resolution 0.001 % (RANGE: LOW) Display mode, selectable Automatic according to selected standard, or RMS (averaging time 1 s), or Peak Value Display mode, selectable Instantaneous or Max Hold FIELD STRENGTH MODE Frequency range Flat MODE ° 320 μT 80 mT RANGE LOW HIGH LOW Overload limit 1 300 μT 3 mT 75 mT Noise level, typical ° 600 nT 3.2 μT 100 μT 80 mT Resolution 1 nT (RANGE: LOW) Detection, selectable RMS (averaging time 1 s) or Peak Value	RANGE		LOW	HIGH		LOW		HIGH	
Resolution 0.001 % (RANGE: LOW) 1 Detection, selectable Automatic according to selected standard, or RMS (averaging time 1 s), or Peak Value Display mode, selectable Instantaneous or Max Hold FIELD STRENGTH MODE Flat MODE ^b 320 µT 80 mT RANGE LOW HIGH LOW HIGH Overload limit ¹ 300 µT 3 mT 75 mT 750 mT Noise level, typical ^o 600 nT 3.2 µT 100 µT 800 µT Resolution 1 nT (RANGE: LOW) HIGH 00 µT 800 µT Resolution 1 nT (RANGE: LOW) Boo µT 800 µT 800 µT Display mode, selectable Instantaneous or Max Hold 00 0 OUTPUT Three channel (X-Y-Z) 0 NThee channel (X-Y-Z) Nalog scope output Three channel (X-Y-Z) Analog output level the overload limit (sensitivity = 800 mV/ overload limit). Load impedance ≥ 10 kΩ S0 mV/ overload limit). Load impedance ≥ 10 kΩ Operating temperature range -10 °C to +50 °C 0 9 95 % (30 °C) or < 29 g/m³, non-condensing	Overload limit		1 500 %	15 000 %		1 500 %		15 000 %	
Resolution0.001 % (RANGE: LOW)Detection, selectableAutomatic according to selected standard, or RMS (averaging time 1 s), or Peak ValueDisplay mode, selectableInstantaneous or Max HoldFIELD STRENGTH MODEFlatFrequency rangeFlatMODE $^\circ$ 320μ T $80 m$ TRANGELOWHIGHLOWHIGHUWHIGHOverload limit 1 300μ T $3 m$ TNoise level, typical $^\circ$ $600 n$ T 3.2μ T 100μ TNoise level, typical $^\circ$ $600 n$ T 3.2μ T 100μ TResolution1 nT (RANGE: LOW)Detection, selectableRMS (averaging time 1 s) or Peak ValueDisplay mode, selectableInstantaneous or Max HoldOUTPUTAnalog scope outputThree channel (X-Y-Z)Analog output levelthe overload limit (sensitivity = 800 mV/ overload limit). Load impedance $\geq 10 k\Omega$ Interface (remote control and readout)RS-232 (19200 baud, 8n1, XON/XOFF), 3-wire, 2.5 mm stereo jackGENERAL SPECIFICATIONSOperating temperature range $-10 ^\circ$ C to $+50 ^\circ$ COperating temperature range $-10 ^\circ$ C to $+50 ^\circ$ COperating temperature range $-30 ^\circ$ C or 2 g/m³, non-condensingWeight840 g (with probe)Dimensions180 mm x 100 mm x 55 mm (basic unit) / 250 mm x 32 mm Ø (probe)DisplayLCD with backlight; refresh rate 4 times per secondBatteryNiMH batteries (4 x Mignon, AA), exchangeableOperating life, typical12 hCharging un	Noise level, typical ^c		10 %	50 %		4 %		20 %	
Detection, selectable Automatic according to selected standard, or RMS (averaging time 1 s), or Peak Value Display mode, selectable Instantaneous or Max Hold Frequency range Flat MODE ^b 30 μT RANGE LOW HIGH LOW Verload limit ¹ 300 μT 300 μT 3 mT 75 mT 75 mT Noise level, typical ^o 600 nT 600 nT 3.2 μT 100 μT 800 μT Resolution 1 nT (RANGE: LOW) Detection, selectable RMS (averaging time 1 s) or Peak Value Display mode, selectable Instantaneous or Max Hold OUTPUT Three channel (X-Y-Z) Analog scope output Three channel (X-Y-Z) Analog output level Three channel (X-Y-Z) Interface (remote control and readout) RS-232 (19200 baud, 8n1, XON/XOFF), 3-wire, 2.5 mm stereo jack GENERAL SPECIFICATIONS C Operating temperature range -10 °C to +50 °C Operating temperature range -10 °C to +50 °C Operating temperature range -10 °C to +50 °C<			0.001 % (RAN	IGE: LOW)					
Display mode, selectable Instantaneous or Max Hold FIELD STRENGTH MODE Flat Frequency range Flat MODE \circ 320μ T $80 m$ T RANGE LOW HIGH LOW HIGH Overload limit ¹ 300μ T $3 m$ T $75 m$ T $750 m$ T Noise level, typical \circ $600 n$ T 3.2μ T 100μ T 800μ T Resolution $1 n$ T (RANGE: LOW) Detection, selectable RMS (averaging time 1 s) or Peak Value Display mode, selectable Instantaneous or Max Hold OUTPUT Three channel (X-Y-Z) The open-circuit analog output voltage is 800 mV when the field strength value corresponds to the overload limit (sensitivity = 800 mV/ overload limit). Load impedance ≥ 10 kΩ Interface (remote control and readout) RS-232 (19200 baud, 8n1, XON/XOFF), 3-wire, 2.5 mm stereo jack GENERAL SPECIFICATIONS Goperating temperature range -10 °C to +50 °C Operating temperature range -10 °C to +50 °C Goperating tumidity range <95 % (30 °C) or < 29 g/m³, non-condensing	Detection, selectable				andard, or R	MS (averaging t	time 1 s),	or Peak Value	
Frequency rangeFlatMODE b320 μT80 mTRANGELOWHIGHLOWRANGELOWHIGHOverload limit f300 μT3 mT75 mT750 mTNoise level, typical b600 nT3.2 μT100 μT800 μTResolution1 nT (RANGE: LOW)Detection, selectableRMS (averaging time 1 s) or Peak ValueDisplay mode, selectableInstantaneous or Max HoldOUTPUTThree channel (X-Y-Z)Analog scope outputThree channel (X-Y-Z)Analog output levelThe open-circuit analog output voltage is 800 mV when the field strength value corresponds to the overload limit (sensitivity = 800 mV/ overload limit). Load impedance ≥ 10 kΩInterface (remote control and readout)RS-232 (19200 baud, 8n1, XON/XOFF), 3-wire, 2.5 mm stereo jackGENERAL SPECIFICATIONSOperating humidity rangeOperating humidity range<95 % (30 °C) or <29 g/m³, non-condensing Weight840 g (with probe)DimensionsDisplayLCD with backlight; refresh rate 4 times per second BatteryDisplayLCD with backlight; refresh rate 4 times per second 		Display mode, selectable				UU			
MODE b $320 \ \mu\text{T}$ $80 \ \text{mT}$ RANGELOWHIGHLOWHIGHOverload limit 1 $300 \ \mu\text{T}$ $3 \ \text{mT}$ $75 \ \text{mT}$ $750 \ \text{mT}$ Noise level, typical ° $600 \ \text{nT}$ $3.2 \ \mu\text{T}$ $100 \ \mu\text{T}$ $800 \ \mu\text{T}$ Resolution1 nT (RANGE: LOW) $100 \ \mu\text{T}$ $800 \ \mu\text{T}$ Detection, selectableRMS (averaging time 1 s) or Peak ValueDisplay mode, selectableInstantaneous or Max Hold OUTPUTOUTPUT Analog scope outputThree channel (X-Y-Z)Analog output levelThree open-circuit analog output voltage is $800 \ mV$ when the field strength value corresponds to the overload limit (sensitivity = $800 \ mV$ / overload limit). Load impedance $\geq 10 \ k\Omega$ Interface (remote control and readout)RS-232 (19200 baud, $8n1$, XON/XOFF), 3-wire, 2.5 mm stereo jack GENERAL SPECIFICATIONS $95 \% (30 \ ^{\circ}C) \ or < 29 \ g/m^{3}, non-condensing$ Weight840 g (with probe)Dimensions180 mm x 100 mm x 55 mm (basic unit) / 250 mm x 32 mm Ø (probe)DisplayLCD with backlight; refresh rate 4 times per secondBatteryNiMH batteries (4 x Mignon, AA), exchangeableOperating life, typical12 hCharger unit100 to 240 V AC / 47 to 63 Hz, fits all AC line connectorsCharging time, typical2 hRecommended calibration interval24 months	FIELD STRENGTH M	IODE							
MODE * $320 \ \mu\text{T}$ $80 \ m\text{T}$ RANGELOWHIGHLOWHIGHOverload limit f $300 \ \mu\text{T}$ $3 \ m\text{T}$ $75 \ m\text{T}$ $750 \ m\text{T}$ Noise level, typical * $600 \ n\text{T}$ $3.2 \ \mu\text{T}$ $100 \ \mu\text{T}$ $800 \ \mu\text{T}$ Resolution1 nT (RANGE: LOW) $100 \ \mu\text{T}$ $800 \ \mu\text{T}$ Detection, selectableRMS (averaging time 1 s) or Peak Value $100 \ \mu\text{T}$ $800 \ \mu\text{T}$ Display mode, selectableInstantaneous or Max Hold $0UTPUT$ Analog scope outputThree channel (X-Y-Z)The open-circuit analog output voltage is $800 \ mV$ when the field strength value corresponds to the overload limit (sensitivity = $800 \ mV$ / overload limit). Load impedance $\geq 10 \ k\Omega$ Interface (remote control and readout)RS-232 (19200 baud, 8n1, XON/XOFF), 3-wire, 2.5 mm stereo jackGENERAL SPECIFICATIONS $00 \ mx \ x \ 50^\circ \text{C}$ Operating temperature range $-10^\circ \text{C} \ c \ 50^\circ \text{C}$ Operating humidity range $95 \ \% (30^\circ \text{C}) \ or < 29 \ g/m^3, non-condensing$ Weight840 g (with probe)Dimensions180 mm x 100 mm x 55 mm (basic unit) / 250 mm x 32 mm Ø (probe)DisplayLCD with backlight; refresh rate 4 times per secondBatteryNiMH batteries (4 x Mignon, AA), exchangeableOperating life, typical12 hCharging time, typical2 hRecommended calibration interval24 months	Frequency range		Flat						
Overload limit 1 300 µT3 mT75 mT750 mTNoise level, typical $^{\circ}$ 600 nT3.2 µT100 µT800 µTResolution1 nT (RANGE: LOW)Detection, selectableRMS (averaging time 1 s) or Peak ValueDisplay mode, selectableInstantaneous or Max HoldOUTPUTAnalog scope outputThree channel (X-Y-Z)Analog output levelThree channel (X-Y-Z)Interface (remote control and readout)RS-232 (19200 baud, 8n1, XON/XOFF), 3-wire, 2.5 mm stereo jackGENERAL SPECIFICATIONSOperating temperature rangeOperating temperature range-10 °C to +50 °COperating humidity range<95 % (30 °C) or <29 g/m³, non-condensing				320 µT			80 r	nT	
Noise level, typical °600 nT3.2 μT100 μT800 μTResolution1 nT (RANGE: LOW)Detection, selectableRMS (averaging time 1 s) or Peak ValueDisplay mode, selectableInstantaneous or Max HoldOUTPUTAnalog scope outputThree channel (X-Y-Z)Analog output levelThe open-circuit analog output voltage is 800 mV when the field strength value corresponds to the overload limit (sensitivity = 800 mV/ overload limit). Load impedance ≥ 10 kΩInterface (remote control and readout)RS-232 (19200 baud, 8n1, XON/XOFF), 3-wire, 2.5 mm stereo jackGENERAL SPECIFICATIONS-10 °C to +50 °COperating temperature range-10 °C to +50 °COperating humidity range< 95 % (30 °C) or < 29 g/m³, non-condensing	RANGE		LOW	HIGH		LOW		HIGH	
Resolution1 nT (RANGE: LOW)Detection, selectableRMS (averaging time 1 s) or Peak ValueDisplay mode, selectableInstantaneous or Max HoldOUTPUTThree channel (X-Y-Z)Analog scope outputThree channel (X-Y-Z)Analog output levelThe open-circuit analog output voltage is 800 mV when the field strength value corresponds to the overload limit (sensitivity = 800 mV/ overload limit). Load impedance ≥ 10 kΩInterface (remote control and readout)RS-232 (19200 baud, 8n1, XON/XOFF), 3-wire, 2.5 mm stereo jackGENERAL SPECIFICATIONSOperating temperature range-10 °C to +50 °COperating temperature range-10 °C to +50 °COperating humidity range≤ 95 % (30 °C) or < 29 g/m³, non-condensing	Overload limit ^f		300 µT	3 mT		75 mT		750 mT	
Detection, selectable RMS (averaging time 1 s) or Peak Value Display mode, selectable Instantaneous or Max Hold OUTPUT The Analog scope output Three channel (X-Y-Z) Analog output level The open-circuit analog output voltage is 800 mV when the field strength value corresponds to the overload limit (sensitivity = 800 mV/ overload limit). Load impedance ≥ 10 kΩ Interface (remote control and readout) RS-232 (19200 baud, 8n1, XON/XOFF), 3-wire, 2.5 mm stereo jack GENERAL SPECIFICATIONS Operating temperature range Operating tumperature range -10 °C to +50 °C Operating humidity range < 95 % (30 °C) or < 29 g/m³, non-condensing	Noise level, typical ^e		600 nT	3.2 µT		100 µT		800 µT	
Display mode, selectable Instantaneous or Max Hold OUTPUT Three channel (X-Y-Z) Analog scope output Three channel (X-Y-Z) Analog output level The open-circuit analog output voltage is 800 mV when the field strength value corresponds to the overload limit (sensitivity = 800 mV/ overload limit). Load impedance ≥ 10 kΩ Interface (remote control and readout) RS-232 (19200 baud, 8n1, XON/XOFF), 3-wire, 2.5 mm stereo jack GENERAL SPECIFICATIONS Operating temperature range Operating temperature range -10 °C to +50 °C Operating humidity range < 95 % (30 °C) or < 29 g/m³, non-condensing	Resolution								
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Analog output levelThe open-circuit analog output voltage is 800 mV when the field strength value corresponds to the overload limit (sensitivity = 800 mV/ overload limit). Load impedance $\geq 10 \ k\Omega$ Interface (remote control and readout)RS-232 (19200 baud, 8n1, XON/XOFF), 3-wire, 2.5 mm stereo jackGENERAL SPECIFICATIONSOperating temperature range-10 °C to +50 °COperating humidity range< 95 % (30 °C) or < 29 g/m³, non-condensingWeight840 g (with probe)Dimensions180 mm x 100 mm x 55 mm (basic unit) / 250 mm x 32 mm Ø (probe)DisplayLCD with backlight; refresh rate 4 times per secondBatteryNiMH batteries (4 x Mignon, AA), exchangeableOperating life, typical12 hCharger unit100 to 240 V AC / 47 to 63 Hz, fits all AC line connectorsCharging time, typical2 hRecommended calibration interval24 months	OUTPUT								
Analog output levelthe overload limit (sensitivity = 800 mV/ overload limit). Load impedance $\geq 10 k\Omega$ Interface (remote control and readout)RS-232 (19200 baud, 8n1, XON/XOFF), 3-wire, 2.5 mm stereo jackGENERAL SPECIFICATIONS 0 Operating temperature range-10 °C to +50 °COperating humidity range< 95 % (30 °C) or < 29 g/m³, non-condensingWeight840 g (with probe)Dimensions180 mm x 100 mm x 55 mm (basic unit) / 250 mm x 32 mm Ø (probe)DisplayLCD with backlight; refresh rate 4 times per secondBatteryNiMH batteries (4 x Mignon, AA), exchangeableOperating life, typical12 hCharger unit100 to 240 V AC / 47 to 63 Hz, fits all AC line connectorsCharging time, typical2 hRecommended calibration interval24 months	Analog scope output		Three channe	I (X-Y-Z)					
GENERAL SPECIFICATIONS Operating temperature range -10 °C to +50 °C Operating humidity range < 95 % (30 °C) or < 29 g/m³, non-condensing			the overload limit (sensitivity = 800 mV/ overload limit).						
Operating temperature range-10 °C to +50 °COperating humidity range< 95 % (30 °C) or < 29 g/m³, non-condensingWeight840 g (with probe)Dimensions180 mm x 100 mm x 55 mm (basic unit) / 250 mm x 32 mm Ø (probe)DisplayLCD with backlight; refresh rate 4 times per secondBatteryNiMH batteries (4 x Mignon, AA), exchangeableOperating life, typical12 hCharger unit100 to 240 V AC / 47 to 63 Hz, fits all AC line connectorsCharging time, typical2 hRecommended calibration interval24 months	Interface (remote con	trol and readout)	RS-232 (1920	0 baud, 8n1, XON/X	OFF), 3-wire	, 2.5 mm stereo	jack		
Operating humidity range < 95 % (30 °C) or < 29 g/m³, non-condensing	GENERAL SPECIFIC	ATIONS							
Weight 840 g (with probe) Dimensions 180 mm x 100 mm x 55 mm (basic unit) / 250 mm x 32 mm Ø (probe) Display LCD with backlight; refresh rate 4 times per second Battery NiMH batteries (4 x Mignon, AA), exchangeable Operating life, typical 12 h Charger unit 100 to 240 V AC / 47 to 63 Hz, fits all AC line connectors Charging time, typical 2 h Recommended calibration interval 24 months	Operating temperature	e range	-10 °C to +50	°C					
Dimensions 180 mm x 100 mm x 55 mm (basic unit) / 250 mm x 32 mm Ø (probe) Display LCD with backlight; refresh rate 4 times per second Battery NiMH batteries (4 x Mignon, AA), exchangeable Operating life, typical 12 h Charger unit 100 to 240 V AC / 47 to 63 Hz, fits all AC line connectors Charging time, typical 2 h Recommended calibration interval 24 months	Operating humidity ra	nge	< 95 % (30 °C	;) or < 29 g/m³, non-c	ondensing				
Display LCD with backlight; refresh rate 4 times per second Battery NiMH batteries (4 x Mignon, AA), exchangeable Operating life, typical 12 h Charger unit 100 to 240 V AC / 47 to 63 Hz, fits all AC line connectors Charging time, typical 2 h Recommended calibration interval 24 months	Weight	•	840 g (with pr	obe)					
Battery NiMH batteries (4 x Mignon, AA), exchangeable Operating life, typical 12 h Charger unit 100 to 240 V AC / 47 to 63 Hz, fits all AC line connectors Charging time, typical 2 h Recommended calibration interval 24 months	Dimensions						(probe)		
Operating life, typical 12 h Charger unit 100 to 240 V AC / 47 to 63 Hz, fits all AC line connectors Charging time, typical 2 h Recommended calibration interval 24 months	Display								
Charger unit 100 to 240 V AC / 47 to 63 Hz, fits all AC line connectors Charging time, typical 2 h Recommended calibration interval 24 months			NiMH batterie						
Charging time, typical 2 h Recommended calibration interval 24 months									
Recommended calibration interval 24 months									
	Charging time, typical								
Country of origin	Recommended calibra	ation interval							
Ociniary Ociniary	Country of origin	Country of origin Germany							

a Unless otherwise stated, these specifications apply for the reference condition: ambient temperature 23±3 °C, relative air humidity 40 % to 60 %, continuous wave signal (CW) and RMS detection
 b Depends on type, see Ordering Information

Depends on type, see ordening information
 Detection: Automatic according to selected standard, for IEC 62233 based on ICNIRP limit values
 Includes flatness, isotropy, absolute and linearity variations (frequency range: 1 Hz to 400 kHz or 10 Hz to 400 kHz). The uncertainty increases at the frequency band limits to ±1 dB based on the nominal frequency response.

For frequency range 10 Hz to 400 kHz and 30 Hz to 400 kHz only.
 The overload limit is different from the value of the field strength mode, because the value of the mode is related to the 100 cm² probe.



ORDERING INFORMATION

ELT-40	00 Exposure Level Tester	Part number P/N		
Sets inc / progra	clude: Calibrated Basic Unit and B-field probe (100 mming manual and rechargeable batteries) cm ²), with calibration certificate, charger unit (fi	ts all AC line connectors), operating	
MODES	S (included in instrument)			
Set 1	EXPOSURE STD: ICNIRP 1998 Gen. Pub. EXPOSURE STD: ICNIRP 1998 Occup.	2304/101		
Set 4	EXPOSURE STD: IEC/EN 62233 EXPOSURE STD: ICNIRP 1998 Occup.	2304/104		
Set 5	EXPOSURE STD: IEC 62311 EXPOSURE STD: ICNIRP 1998 Occup.	2304/105		
Set 6	EXPOSURE STD: ICNIRP 2010 Gen. Pub. EXPOSURE STD: ICNIRP 2010 Occup.	2304/106		
Set 7	EXPOSURE STD: 2013/35/EU Low ALs EXPOSURE STD: 2013/35/EU High ALs	2304/107		
Set 8	EXPOSURE STD: EMFV 2016 Low ALs EXPOSURE STD: EMFV 2016 High ALs	2304/108		
OPTION	NAL ACCESSORIES			
Cable, F	Probe Extension, 1 m	2300/90.30		
Cable, S	Serial Interface, Stereo Jack/DB9, 2 m	2260/90.51		
Cable, I	Interface Analog, DSUB15/3xBNC, 3 m	2260/90.80		
. /	Non-Conductive, 1.65 m with Carrying Bag	2244/90.31		
	Extension, 0.50 m, Non-Conductive	2244/90.45		
Transpo	ort Soft Case for ELT-400	2245/90.07		
	Probe 3 cm ² de required for all ELT-400 with firmware version b	2300/90.20		

Narda Safety Test Solutions GmbH

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