

LVA 5000 AMPLIFIER

TECHNICAL DATA

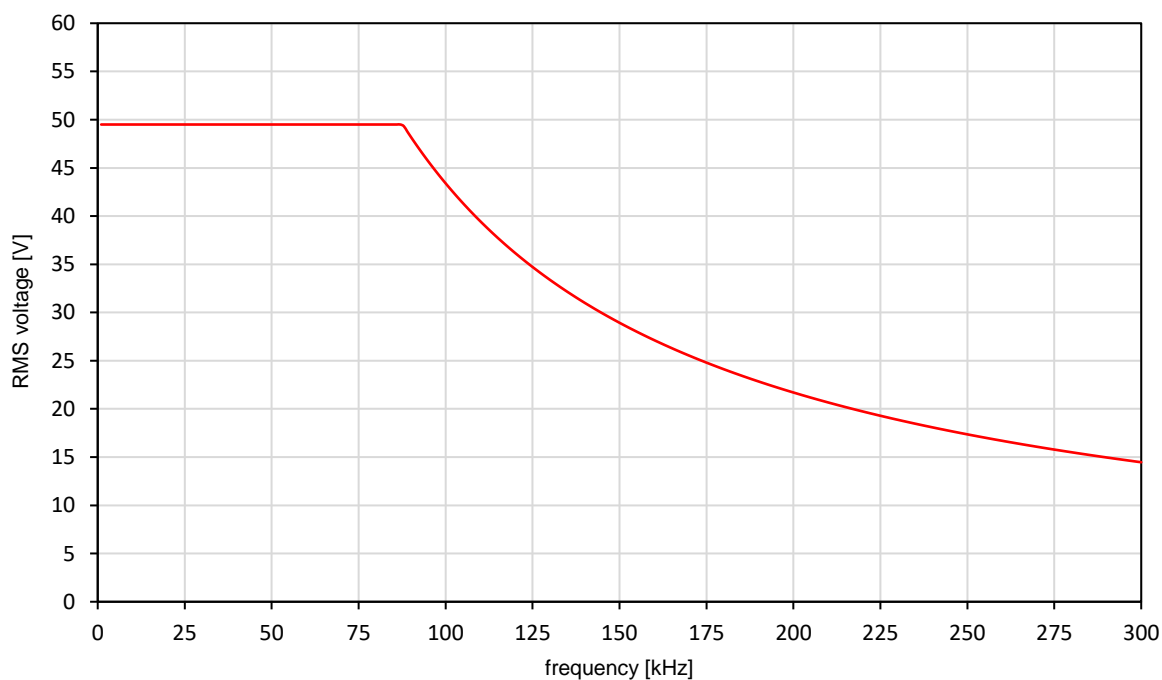
LVA 5000		
Nominal voltage ranges (DC)	-15 V ... +20 V -15 V ... +36 V -15 V ... +54 V -15 V ... +70 V	
Max. continuous current capability	250 A (range depending, see diagrams)	
Max. short-time current capability (up to 30 s)	400 A (range depending, see diagrams)	
Max. peak current capability (up to 50 ms)	600 A	
Frequency bandwidth	large signal: DC ... 100 kHz (-3 dB)	
	small signal (10 %): DC ... 300 kHz (-3 dB)	
Slew rate (at resistive load = 10 Ω)	> 40 V/ μ s	
Rise time (at resistive load = 10 Ω)	$\leq 1 \mu$ s (0 ... 20 V)	
Noise at output (RMS)	< 20 mV (< 20 MHz)	
Load regulation: 0 ... nominal load	max. 0.2 %, typ. < 0.1 %	
Adjustable current limitation	accuracy, see current measurement unit response time < 20 μ s	
Protection circuits	overload / short circuit / overtemperature	
Source resistance (optional)	Ri programmable: 0 ... 500 m Ω	
Floating output	max. voltage between earth and the amplifier's ground output: < 300 V (RMS)	
External input (optional)	<i>Max. peak voltage</i>	0 ... U _{ExtMax} (U _{ExtMax} is adjustable between ± 2 V ... ± 25 V)
	<i>Input impedance</i>	approx. 10 k Ω
	<i>Delay time</i>	signal delay between amplifier's external input and amplifier's output < 5 μ s
Internal oscillator unit		
	<i>Type</i>	4-channel synthesiser
	<i>Wave forms</i>	DC, sine, square, triangle, ramp, arbitrary
	<i>Amplitude resolution</i>	17 Bit
	<i>Frequency range</i>	DC ... 1 MHz
	<i>Frequency resolution</i>	1 μ Hz
	<i>Frequency accuracy</i>	25 ppm
	<i>Phase range</i>	0° ... 360°
	<i>Phase resolution</i>	0.001°
	<i>Memory depth</i>	1 MSample
	<i>Synthesiser functions</i>	ADD, AM, FM, PM, PWM
	<i>Sequence memory</i>	1024 steps
Internal control unit		
	<i>Display</i>	7.0" touchscreen (17.8 cm, resolution 800 x 480)
	<i>Sequencer</i>	integrated sequences: amplitude pulse, frequency pulse (lin/log) user defined sequences memory
	<i>User interface</i>	touchscreen / front panel button / incremental encoder webinterface
	<i>Digital I/O</i>	8 digital DC inputs: +5 V ... +24 V 8 digital DC outputs: +5 V (internal U _{CC}), I _L = 40 mA (external DC input U _{CC} : +5 V ... +24 V, I _L = 250 mA)

Measurement			
	Voltage measurement ranges (DC)	20 V / 40 V / 80 V (autoranging)	
	Voltage accuracy	DC: $\pm(0.1 \% \text{ of reading} + 0.02 \% \text{ of range})$	
	Current measurement ranges	75 A / 150 A / 300 A / 600 A	
	Current accuracy	DC: $\pm(0.2 \% \text{ of reading} + 0.04 \% \text{ of range})$	
Monitoring unit (optional)		voltage	current
	Max. peak output	$\pm 10 \text{ V}$	
	Scaling factor 'sf' (adjustable)	sf: 0.2 ... 1000	sf: 0.1 ... 1000
	Bandwidth	300 kHz	200 kHz
	Monitoring accuracy	$\pm(\% \text{ of reading} + \% \text{ of range} + \text{error(sf)})$	
	Frequency	DC	
	Voltage monitor accuracy	$0.12 + 0.02 + 2 \text{ mV} * \text{sf}$	
	Current monitor accuracy	$0.22 + 0.04 + 2 \text{ mA} * \text{sf}$	
	Noise of ADC measurement (RMS)	< 20 mV (DC ... 300 kHz)	< 1.5 mA (DC ... 300 kHz)
	Noise DAC output (RMS)	< 0.2 mV (DC ... 300 kHz)	
	Delay time	< 1 μs	
	Output impedance	47 Ω	
	Isolation	earth / remaining electronics / each other	
	Protection	short circuit	
Interface		Ethernet 100 Mbit/s (HiSLIP SCPI) USB 2.0 Host	
Synchronisation bus (multiple devices)		device synchronisation and internal communication optical fibre, LC duplex: - synchronised sequence start - parallel operation - only one ethernet connection required	
Insulation resistance		> 1 M Ω	
Peak withstand voltage (max. 10 s, output to earth)		> 2000 V	
Cooling		temperature-controlled forced air cooling	
Ambient temperature		+10 °C up to +40 °C	
Storage temperature		-25 °C up to +60 °C	
Relative humidity		non condensing, max. 80 % for temperature < 31 °C, decreasing linearly to 50 % at 40 °C	
Ingress protection		IP20	
Power supply ($\pm 10 \%$, 50/60 Hz)		230 V / 400 V	
Line protection, connection		3 x 32 A, CEE	
Housing		rack, colour light grey (RAL 7035)	
	Amplifier + power supply in rack, integrated	19", 20 U	
	Dimensions of rack (H x W x D), minimum	19", 24 U 1320 x 600 x 1050 mm	
Weight	Amplifier + power supply in rack (approx.)	400 kg	

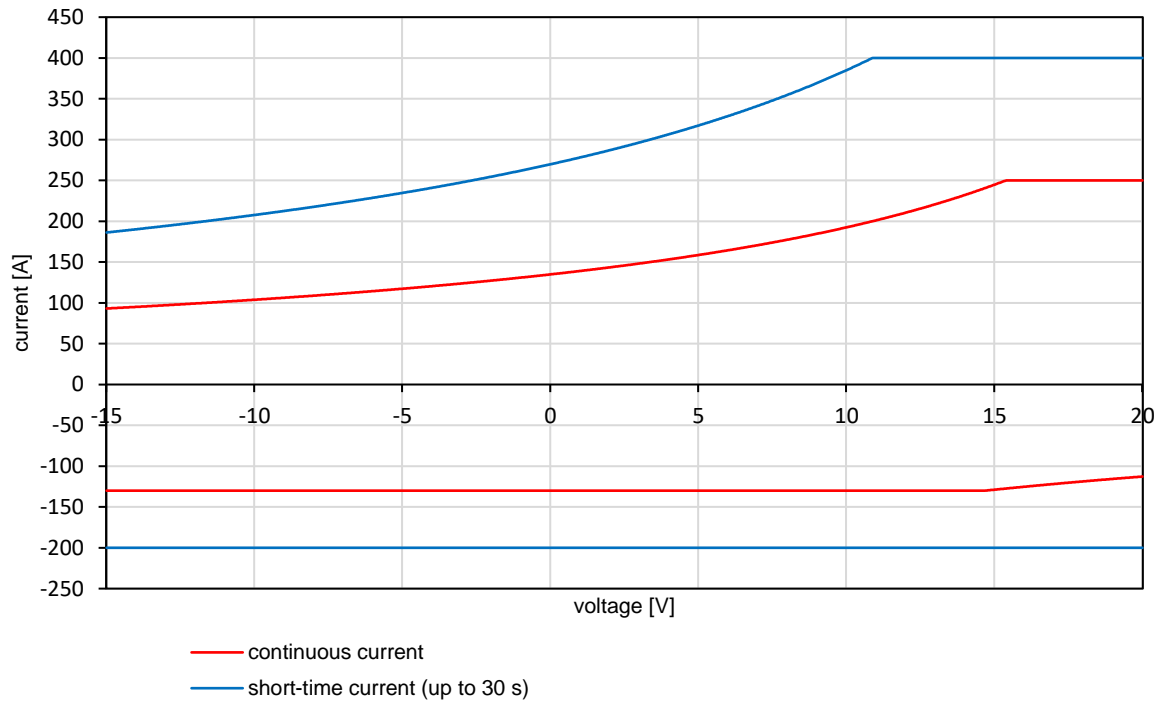
OPTIONS AND ACCESSORIES

Options			
OPT.01	IEEE488	Not in combination with OPT.02	optional
OPT.02	RS232	Not in combination with OPT.01	optional
OPT.05	U/I monitor	Galvanically isolated voltage and current measurement outputs accessible via BNC sockets (includes OPT.14)	optional
NT.11.70S	Additional voltage range	Symmetrical DC voltage range (e.g. for magnetic field tests) U: 0 ... ± 70 V (see diagram)	optional
OPT.14	External input	0 ... $U_{Ext\ max}$ $U_{Ext\ max}$ peak is adjustable between ± 2 V ... ± 25 V OPT.14 includes a digital low pass input filter Type Bessel or Butterworth, order 1 ... 6 (adjustable) Filter frequency selectable 100 Hz ... 10 MHz	optional
OPT.24	Programmable internal resistance	Programmable internal resistance R: 0 m Ω ... 500 m Ω / accuracy: ± 2 m Ω	optional
OPT.25	Constant current mode		optional
OPT.30	Optical link	Optical interface to real time simulator LC duplex interface / Aurora 8B/10B protocol / 2 Gb/s data rate	optional
OPD	Overvoltage protection device	Voltage suppression for DC voltage range: -15 V ... +20 V	optional
OPT.70	Disable sink mode of amplifier	Only in combination with option OPD	optional

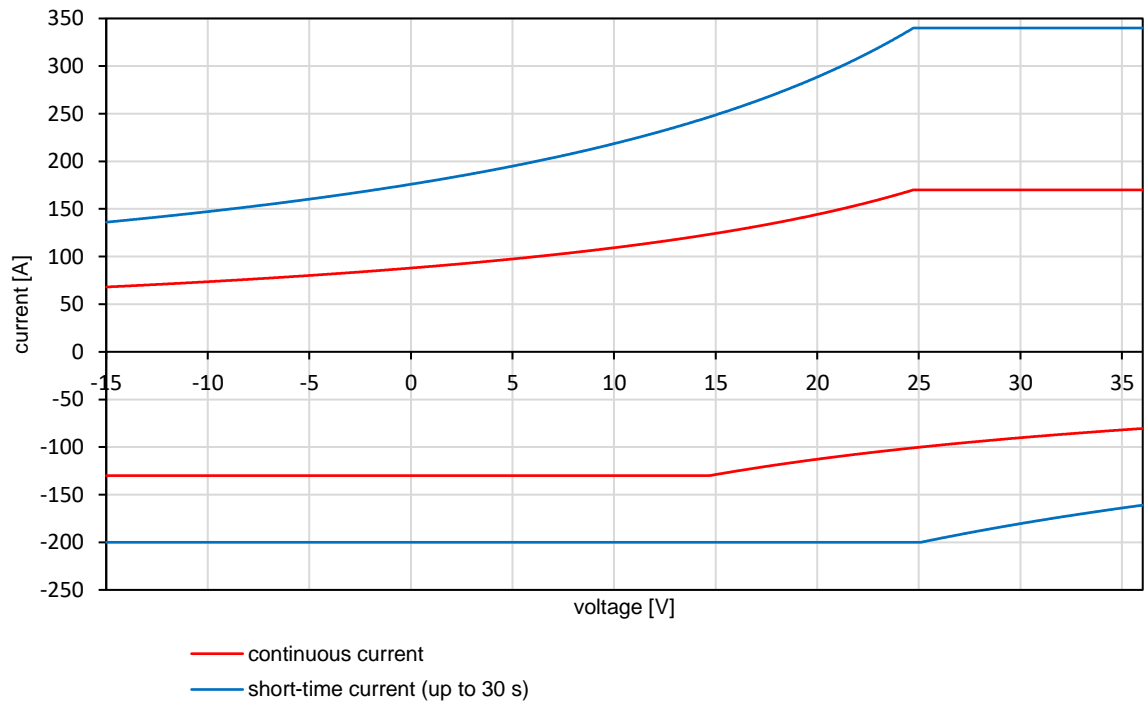
MAXIMUM ALLOWABLE OUTPUT VOLTAGE (NT.11.70S)



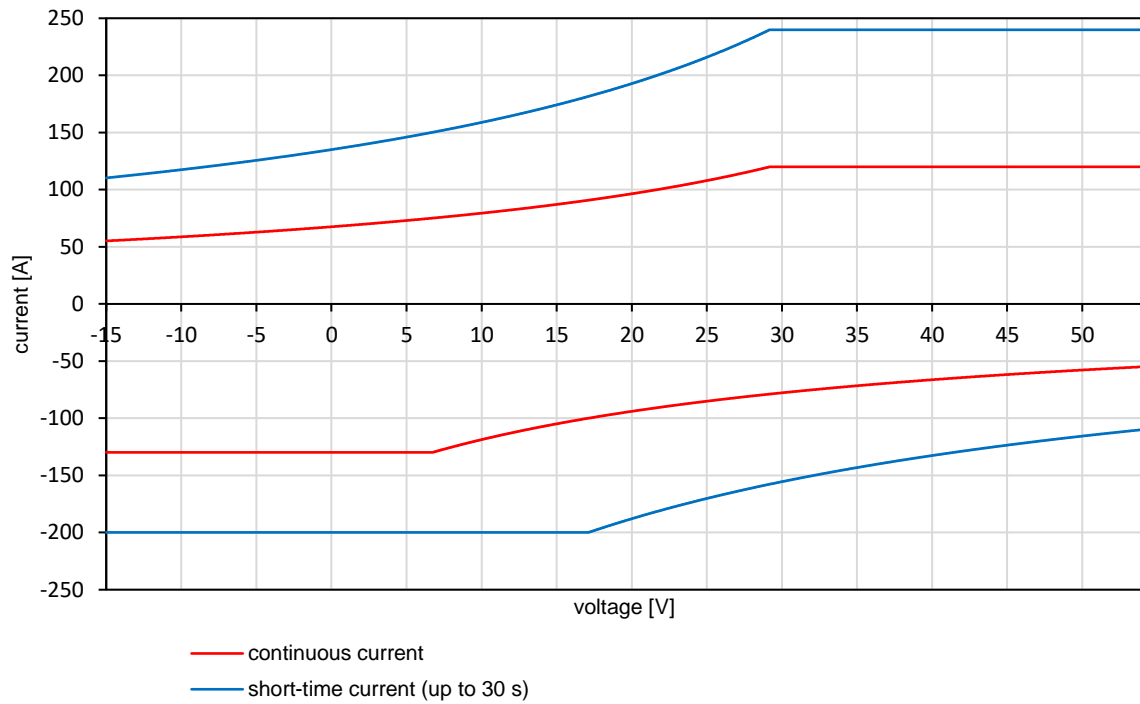
OUTPUT CURRENT CAPABILITY¹⁾ - 20 V Range



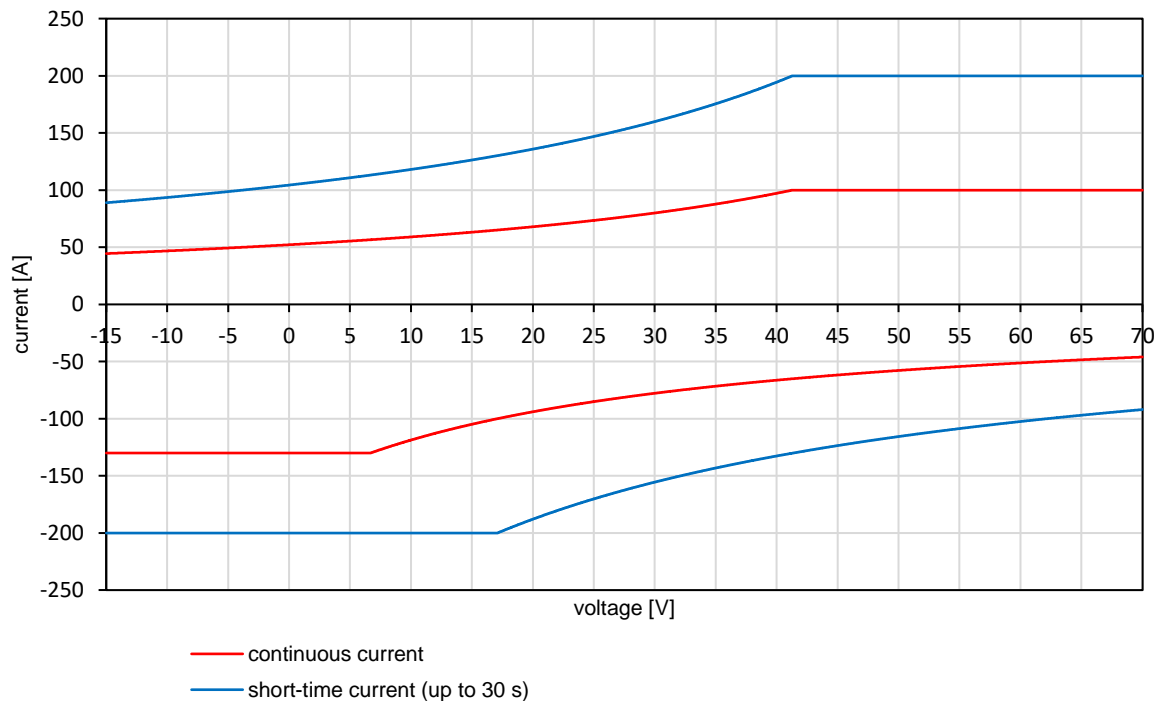
OUTPUT CURRENT CAPABILITY¹⁾ - 36 V Range



OUTPUT CURRENT CAPABILITY¹⁾ - 54 V Range



OUTPUT CURRENT CAPABILITY¹⁾ - 70 V Range



Remarks:

- 1) Diagrams refer to a supply voltage of 230 V and 23 °C ambient temperature