TOELLNER®

Performance

in absolute

perfection

RS 232 and GPIB interface

➜ Single-output and dual-output power supplies
with 400 W output power
➜ Outputs at front and rear
➜ Autoranging
➜ Polarity reversal protection, resistant to reverse current
➜ Small size, ½ 19" x 2 HU x 400 mm
Low weight, 5 kg
➜ ON/OFF switching of outputs
➜ Adjustment of output values using rotary pulse generators
➜ GPIB, RS 232 and analog interfaces
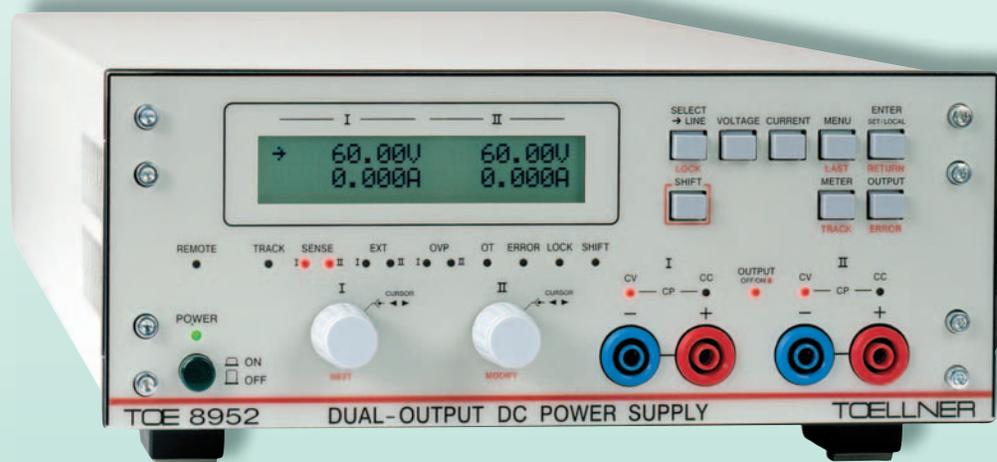
High-performance single-output and dual-output power supplies of the 400-W class: TOE 8951 / TOE 8952

## Convenient performance for your applications

The power supplies from the TOE 8950 range are suitable for applications associated with:
Research / development
Laboratory / testing / experiments
Production / test bays
Quality assurance
Service / training

Autoranging

Power supplies with autoranging can output their rated power over a wide and stepless range of voltage and current combinations.

Autoranging power supplies from TOELLNER have a significantly larger operating range than standard power supplies with the same output power.

Additional operating range
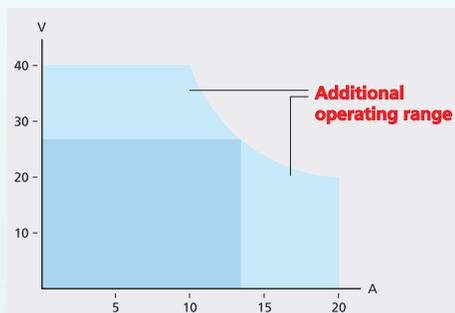
Example:

TOE 8951-40 (40 V / 20 A) compared to a standard power supply with 400 W output power.

400 W in compact design

The single-output and dual-output power supplies from the TOE 8950 range have an extremely compact design. As a result of the high efficiency of all units, the complete output power of 400 W is available without problem over wide voltage and current ranges at the front via safety sockets and at the rear via a screw-type terminal block.

Adjustment using rotary pulse generators

The output values are adjusted with a selectable resolution using wear-free spinwheels, guaranteeing reliable and precise setting of all output parameters and operating functions even after many years of use.

OVERVIEW

Model	Output 1		Output 2		Output power
	Voltage	Current	Voltage	Current	
TOE 8951-40	0 – 40 V	0 – 20 A	-	-	400 W
TOE 8951-60	0 – 60 V	0 – 14 A	-	-	400 W
TOE 8951-80	0 – 80 V	0 – 10 A	-	-	400 W
TOE 8952-40	0 – 40 V	0 – 10 A	0 – 40 V	0 – 10 A	2 x 200 W
TOE 8952-60	0 – 60 V	0 – 7 A	0 – 60 V	0 – 7 A	2 x 200 W
TOE 8952-80	0 – 80 V	0 – 5 A	0 – 80 V	0 – 5 A	2 x 200 W

Display

The set and measured values for voltage, current and power as well as the menu control functions are output on a 2-row LCD with 20 characters/row.

Highest degree of safety

is guaranteed for your applications by comprehensive protective measures: adjustable overvoltage protection, limit function, fast power OFF switching, polarity reversal protection, resistance to reverse current, various internal electronic monitoring functions.

Innovative sensing circuit

An innovative sensing circuit not only keeps the power supply to your load extremely constant, it even protects sensitive loads if there is a break in the sensor lead. The sensing inputs are available at the rear.

Tracking mode

With dual-output power supplies, automatic tracking permits control of the output voltage of part 2 as a function (0 – 100 %) of part 1 with retention of all control properties.

Digital and analog interfaces
Digital: RS 232 / GPIB

RS 232 and GPIB (option) interfaces with the following scope of functions are available for communication between PC and power supply:

● Adjustment of output values: voltage, current and power
● OVP and limit adjustment, autocal function, display, store and recall settings
● Switching on/off of output voltage
● Reading of actual values as well as warning/fault states

The command syntax complies with the IEEE 488.2 standard. Standardized SCPI commands are processed.

Fast analog control

The power supplies can be controlled in analog mode; i.e. the output voltage and current can be adjusted independent of one another using externally applied control voltages.

Short adjustment times for the output voltage are implemented using balanced circuitry.

It is therefore possible to generate powerful and fast output signals without problem; up to approx. 700 Hz at 2 V_{pp}.

ArbNet software

The new and extremely powerful Arb-Net software enables fast and convenient input of curves using a graphic curve editor. It is possible to simulate voltage dips, startup processes and interfering voltages, e.g. on the vehicle electrics, without problem using DAQ cards.

Interlock

By interrupting the interlock circuit, e.g. by an external emergency stop switch, the power supply output becomes de-energized directly.

Autocal function

The power supplies are equipped with a self-calibration function protected by a "security code". This function can be manually executed from a menu or also remote-controlled.

Price and performance

The exceptional specifications, extraordinary features, and best possible processing quality provide the power supplies of the TOE 8950 series with an excellent price/performance ratio.

Specifications

Power supply model	TOE 8951-40	TOE 8951-60	TOE 8951-80	TOE 8952-40	TOE 8952-60	TOE 8952-80
Output voltage	0 - 40 V	0 - 60 V	0 - 80 V	2 X 0 - 40 V	2 X 0 - 60 V	2 X 0 - 80 V
Resolution		10 mV			10 mV	
Setting accuracy	0.1%+20 mV	0.1%+30 mV	0.1%+40 mV	0.1%+20 mV	0.1%+30 mV	0.1%+40 mV
Measuring accuracy	0.1%+30 mV	0.1%+45 mV	0.1%+60 mV	0.1%+30 mV	0.1%+45 mV	0.1%+60 mV
Output current	0 - 20 A	0 - 14 A	0 - 10 A	2 X 0 - 10 A	2 X 0 - 7 A	2 X 0 - 5 A
Resolution	2 mA	2 mA	1 mA		1 mA	
Setting accuracy	0.2%+20 mA	0.2%+15 mA	0.2%+10 mA	0.2%+10 mA	0.2%+7 mA	0.2%+5 mA
Measuring accuracy	0.2%+30 mA	0.2%+20 mA	0.2%+15 mA	0.2%+15 mA	0.2%+10 mA	0.2%+7 mA
Output power P_{MAX}		400 W (adjustable 20 - 400 W)			2 X 200 W (adjustable 10 - 200 W)	
Resolution		0.1 W			0.1 W	
Setting accuracy		0.4% + 1 W			0.4% + 1 W	
Measuring accuracy		0.4% + 1 W			0.4% + 1 W	
Voltage regulation With change in load 0 - 100%		$1 \times 10^{-4} + 5$ mV			$1 \times 10^{-4} + 5$ mV	
With change in mains voltage ±10%		5×10^{-5}			5×10^{-5}	
With change in temperature		10^{-4} / K			10^{-4} / K	
Residual ripple ripple + noise, 10 Hz - 10 MHz	50 mV$_{pp}$/5 mV$_{rms}$	60 mV$_{pp}$/8 mV$_{rms}$	80 mV$_{pp}$/10 mV$_{rms}$	50 mV$_{pp}$/5 mV$_{rms}$	60 mV$_{pp}$/8 mV$_{rms}$	80 mV$_{pp}$/10 mV$_{rms}$
Drift within 8 hours		0.01%			0.01%	
Regulation time for a change in load in range 20 to 100% and setting to within 0.2% V_{rated} Change in load ±10%		< 100 μs			< 100 μs	
Setting time of output voltage within 0.5% V_{rated} 0 V → V_{rated} no-load/full-load	< 8 ms/10 ms	< 10 ms/15 ms	< 15 ms/20 ms	< 8 ms/10 ms	< 10 ms/15 ms	< 15 ms/20 ms
V_{rated} → 1 V no-load/full-load	< 50 ms/10 ms	< 100 ms/25 ms	< 200 ms/50 ms	< 50 ms/10 ms	< 100 ms/25 ms	< 200 ms/50 ms
Controllable voltage drop per line to consumer		Approx. 1 V			Approx. 1 V	
Current stabilization With change in load 0 - 100%	5×10^{-4}+10 mA	5×10^{-4}+7 mA	5×10^{-4}+5 mA	5×10^{-4}+5 mA	5×10^{-4}+3 mA	5×10^{-4}+2 mA
With change in mains voltage ±10%		5×10^{-5}			5×10^{-5}	
With change in temperature		10^{-4} / K			10^{-4} / K	
Residual ripple ripple + noise, 10 Hz - 10 MHz	10 mA$_{rms}$	7 mA$_{rms}$	5 mA$_{rms}$	5 mA$_{rms}$	3 mA$_{rms}$	2 mA$_{rms}$
Drift within 8 hours		0.1%			0.1%	
Protection functions OVP adjustment range	3 - 44 V	3 - 66 V	3 - 88 V	3 - 44 V	3- 66 V	3 - 88 V
Continuous loading of polarity reversal protection	20 A	14 A	10 A	2 X 10 A	2 X 7 A	2 x 5 A
Continuous resistance to feedback		100 V$_{DC}$			100 V$_{DC}$	

Output:
Floating and electrically isolated

Front:	Output sockets
Rear:	Output terminals
Insulation:	$\pm$ 250 V against ground

Remote control
RS 232 interface
Interface:	9-pin SUB-D connector, isolated from main output
Transmission mode:	Half-duplex, asynchronous
Transmission rate:	110-19200 bps
Setting rate:	Approx. 20 settings/s
Measuring rate:	Approx. 15 measurements/s
Software:	Command syntax acc. to IEEE 488.2; SCPI

GPIB interface (option)
Interface connection acc. to IEEE 488.1, isolated from main output

Setting rate:	Approx. 25 settings/s
Measuring rate:	Approx. 20 measurements/s
Functions:	AH1, SH1, L4, T6, SR1, PP1 RL1, DC1, DT0, E1, C0
Software:	Command syntax acc. to IEEE 488.2; SCPI

Analog interface
Control voltage:	0 – 5 V each for $0 - V_{Max}$ and $0 - I_{Max}$
Input resistance:	Approx. 10 kΩ
Max. transmission frequency with 2 V_{pp} output amplitude:	Approx. 700 Hz
Mains voltage:	115 V/230 V $\pm$ 10% 47 – 63 Hz
Power consumption:	Approx. 680 VA
Protective measures:	Protection class 1 acc. to DIN EN 61010-1

EMC:	EN61326
Operating temperature:	0 °C to 40 °C
Storage temperature:	-20 °C to +70 °C
Reference temperature:	23 °C $\pm$ 1 °C
Dimensions mm:	224 x 88 x 405
with feet mm:	224 x 103 x 405
19" system:	½ 19", 2 HU
Weight:	Approx. 5 kg
Housing:	Aluminium/steel

Ordering data:
Single-output power supplies

Power supply 40 V / 20 A	**TOE 8951-40**
Power supply 60 V / 14 A	**TOE 8951-60**
Power supply 80 V / 10 A	**TOE 8951-80**

Dual-output power supplies

Power supply 2 x 40 V / 10 A	**TOE 8952-40**
Power supply 2 x 60 V / 7 A	**TOE 8952-60**
Power supply 2 x 80 V / 5 A	**TOE 8952-80**

Supplied accessories
1 power supply cable
1 instruction manual
1 RS 232-cable

Options/accessories
Mains voltage 115 V	**TOE 8950/115**
GPIB remote control	
For **TOE 8951-xx**	**TOE 8951/015**
For **TOE 8952-xx**	**TOE 8952/015**
USB remote control	
For **TOE 8951-xx**	**TOE 8951/025**
For **TOE 8952-xx**	**TOE 8952/025**
Software driver for LabView for **TOE 8951 + TOE 8952**	**TOE 9071**
Free basic driver at	**www.toellner.de**
Arbitrary Funktion	
For **TOE 8951-xx**	**TOE 9151**
For **TOE 8952-xx**	**TOE 9152**
ArbNet Software	
For **TOE 8951-xx**	**TOE 9751**
For **TOE 8952-xx**	**TOE 9752**
Remote Interlock	**TOE 8950/101**
Remote Inhibit	**TOE 8950/102**
19" adapter 2 HU asymmetric	
For 1 x **TOE 8951**	**TOE 9521**
For 1 x **TOE 8952**	**TOE 9521**
19" adapter 2 HU parallel connector	
For 2 x **TOE 8951**	**TOE 9522**
For 2 x **TOE 8952**	**TOE 9522**