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69-850-06 Lab agg TSX 1820
69-850-22 Lab agg TSX 3510
69-850-48 Lab agg TSX 1820P
69-850-63 Lab agg TSX 3510P

THURLBY THANDAR INSTRUMENTS

TSX Series

High Power Laboratory DC Power Supplies

350/360 watts, standard and programmable

the TSX series of high output DC power supplies

power with precision & simplicity

The standard & P versions

The Thurlby-Thandar TSX series represents the state of the art in high output PSU design.

A wide range of voltage-current output combinations will become available with power levels of 360 Watts and more.

Each output combination is available in two versions: with conventional analogue controls (TSX) and with programmable controls (TSX-P).

Linear post regulation for unrivalled performance

The heart of all TSX series PSUs is an innovative regulator design which combines switch mode pre-regulation with linear post-regulation.

The pre-regulator uses specially developed techniques to dramatically reduce the capacitance between input and output thus eliminating the high levels of common-mode noise normally associated with switch mode PSUs.

The linear post-regulator combines very low levels of output noise with excellent load regulation and transient response. The result is performance comparable with a pure linear design.

Compact and lightweight

The hybrid regulator design provides a PSU which is both smaller and lighter than competitive products.

The high thermal efficiency also means that the PSUs are silent in operation since fan cooling is unecessary *.

- *High power levels in a compact & lightweight casing*
- *35V-10A & 18V-20A models with more to come*
- *Bench or rack mounting, front & rear terminals*
- *Very low noise, excellent transient reponse*
- *CV & CI operation with automatic crossover*
- *Comprehensive protection including variable OVP trip*
- *High setting resolution, remote sense terminals*
- *High accuracy digital meters, current meter damping*
- *Safe and easy to use*

Bench or rack mounting

The attractively styled casing takes up very little bench space and incorporates a tilt bail to angle the front panel when required.

The case is half rack width (3U height), an optional rack-mount kit is available.

Output terminals are fitted at both front and rear.

** Note that in rack environments with limited ventilation fan cooling may become necessary.*

Constant voltage or constant current operation

All TSX series PSUs can operate in both constant voltage and constant current modes with automatic crossover and automatic mode indication.

High accuracy metering

All versions incorporate high resolution digital meters for both voltage and current.

V and I levels can be set to high accuracy prior to connection to the load and the limit settings can be checked at any time.

A damping switch for the current meter enables the average value of rapidly changing currents to be read.

Full overvoltage protection

All versions incorporate a fully variable OVP trip to protect against regulator failure.

The output is fully protected and other protection functions include regulator overtemperature, and sense miswiring.

The standard versions

The standard TSX versions of the series incorporate conventional analogue controls for precision with simplicity.

Large diameter knobs and large padded switches combine with the big bright displays to provide simple and unambiguous control.

Coarse and fine voltage controls offer fast setting with high setting resolution at all levels while a semi-logarithmic current control provides resolution commensurate with the current level.

These PSUs are ideally suited to general purpose applications in many technology areas.

power with programmable versatility

The P versions

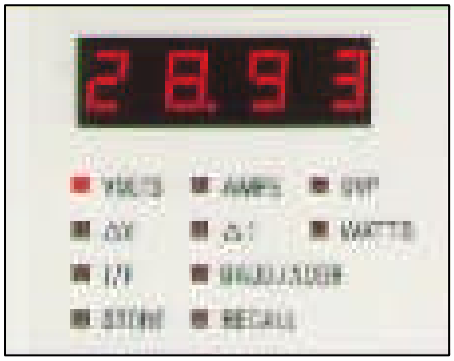
The TSX-P ver sions rep re sent a ma jor step for ward in PSU de sign.

They com bine a wealth of “ease of use” orientated keyboard functions with full remoteprogrammability.

The result is the most comprehensive and ver sa tile PSU con trol sys tem avail-able any where.

A third display for clarity & safety

To pro vide ad di tional data and to avoid any pos si bil ity of am bi gu ity or er ror an auxiliary dis play is in cor po rated.



All key board en tries ap pear on this dis-play for inspection before they are ac-tioned by press ing the “con firm” key.

This failsafe sys tem avoids such pos si-bili ties as set ting 25 Volts in stead of 2.5 Volts as could oc cur on other less care fully de signed sys tems.

The aux il iary dis play is also used to set and dis play a va ri ety of use ful in for ma-tion.

Keyboard or quasi-analogue control

Voltage and current levels can be en-tered di rectly from the key pad to a reso-lution of 10mV or 10mA giving un par al leled speed and pre ci sion.

Alternatively a rotary control can be used to set volt age or cur rent in a man-ner simu lat ing a con ven tional ana logue control.

Watts display for added convenience

When not be ing used for other pur poses the auxiliary display shows the output power in Watts (Volts x Amps).

Delta-mode control

Voltages and currents can be stepped up and down by a fixed increment set from the key board. This fa cil ity is in valu-able for re peti tive test ing where, for ex-ample, the effect of 1% changes in volt age need to be ob served.

The delta in cre ment is clearly shown on the aux il iary dis play.

Non-volatile storage of multiple settings

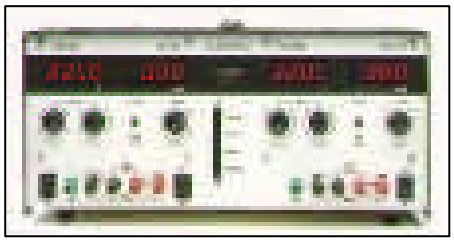
25 non- volatile memo ries are pro vided for storing frequently used settings. Each store holds a volt age, cur rent and OVP set ting.

This facility is particularly useful in re-peti tive test ing situa tions within pro duc-tion, de vel op ment or in spec tion ar eas.

Part of an extensive PSU range

The TSX se ries is only a small part of the extensive range manufactured by Thurlby- Thandar, one of the mar ket lead-ers in DC power sup plies.

Other se ries of fer pow ers from 30 Watts up to 200 Watts in sin gle, dual and tri ple output con figurations.

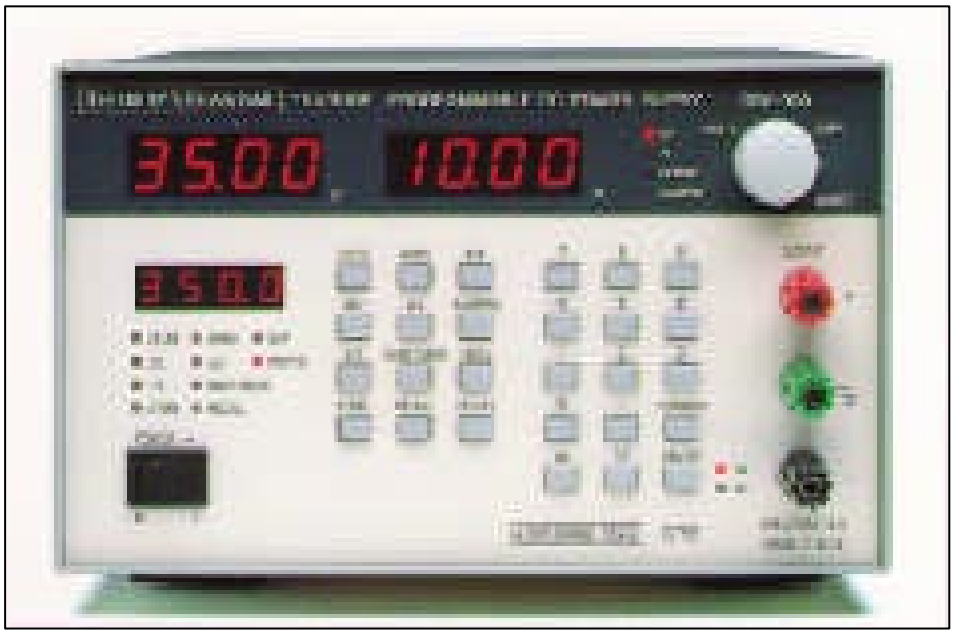


Full bus control, GPIB & RS232

The P ver sions in cor po rate both GPIB (con form ing to IEEE- 488.1 & .2) and ad-dressable RS232 (ARC) interfaces as standard.

The ARC sys tem al lows up to 32 in stru-ments to be “daisy-chained” together and to be individually addressed and con trolled us ing a sin gle RS232 port on a com puter.

Bus con trolled func tions in clude set volt-age, set current, set OVP, set output on/off, read volt age, read cur rent.



- *Keyboard setting of all parameters*
- *Rotary and delta (step) control of V and I*
- *Watts display, non-volatile storage of 25 settings*
- *Fully programmable with bus readback of V and I*
- *GPIB (.2) & addressable RS232 (ARC) interfaces*

Technical Specifications

OUTPUT SPECIFICATIONS

Operating modes:	Constant voltage or constant current with automatic crossover.
Voltage range:	0V to 35V (TSX3510/TSX3510P). 0V to 18V (TSX1820/TSX1820P).
Current range:	0A to 10A (TSX3510/TSX3510P). 0A to 20A (TSX1820/TSX1820P).
Overvoltage protection:	10% to 110% of max. output voltage.
Setting resolution:	10mV, 10mA.
Load regulation:	<0.01% of max. O/P for 90% change.
Line regulation:	<0.01% of max. O/P for 10% change.
Output impedance:	<1mΩ in constant voltage mode. >5kΩ in constant current mode.
Ripple & noise:	<1mV RMS typical in constant voltage. <3mA RMS typical in constant current.
HF common mode noise:	Typically <3mV RMS, <10mV pk.
Transient load response:	<20us to within 50mV of set level for 90% load change.
Temperature coefficient:	typically <100ppm/°C.
Overvoltage protection delay:	<200us.
Protection functions:	Overvoltage trip Regulator overtemperature Sense miswiring.
Status indication:	Output on/off lamp Constant voltage mode lamp Constant current mode lamp Trip message on display.
Output switch:	Electronic.
Output terminals:	4mm output terminals at front, screw terminals for output and sense at rear.
Output protection:	Full forward and reverse protection via OVP and diode clamp.

INPUT SPECIFICATIONS

Input voltage range:	180V to 270V RMS, 90V to 135V RMS & 47 to 63Hz.
Power requirement:	750VA max.
Voltage range selection:	Rear panel slide switch.

METER SPECIFICATIONS

Meter types:	Separate 4 digit meters for voltage and current with 12.5mm (0.5") LED displays.
Meter resolutions:	10mV, 10mA.
Meter accuracies:	Voltage ±(0.2% + 1 digit) Current ±(0.5% + 1 digit).

MECHANICAL & ENVIRONMENTAL

Electrical safety:	Complies with EN61010-1.
EMC:	Complies with EN50081-1 and EN50082-1.
Temperature:	+5°C to +40°C operating, 20% to 80% RH, -40°C to +70°C storage.
Size:	210 x 130 x 350mm (WxHxD) (half rack width x 3U height), optional rack mounting kit available.
Weight:	5.0kg (TSX versions). 5.5kg (TSX-P versions).

FRONT PANEL CONTROLS (standard versions)

Voltage setting:	Via single rotary controls for coarse and fine control.
Current setting:	Via single turn semi-logarithmic rotary control.
Overvoltage setting:	Via screwdriver adjustable preset potentiometer.
Output On/Off:	Via large paddle lever switch.

FRONT PANEL CONTROLS (P versions)

Voltage setting:	Direct keyboard entry or quasi-analogue rotary control.
Current setting:	Direct keyboard entry or quasi-analogue rotary control.
Overvoltage setting:	Direct keyboard entry.
Output On/Off:	Push button with dual indicator lamps.

Note: all voltage and current levels set via the keyboard are displayed on a separate 0.3" 4 digit display. This entry preview system ensures that the user can observe the value entered before it is effected thus avoiding possible error. The display is also used for setting additional functions and for displaying watts.

Additional keyboard functions:	Increase or decrease voltage or current in user-selectable steps (delta mode). Store/recall voltage, current & OVP levels from non-volatile memory (25 memories). Set digital interface type (RS232 or GPIB), set baud rate, set address.

DIGITAL INTERFACES (P versions)

RS232:	Variable baud rate, 9600 baud maximum, 9 pin D connector (male). Fully compatible with standard RS232 or TTi addressable RS232 system (ARC).
IEEE-488 (GPIB):	Conforming with IEEE488.1 & IEEE488.2.
Operational functions:	Set voltage; set current; set OVP; set output On/Off; read output voltage/current.
Setting resolution:	Voltage - 10mV; Current - 10mA.
Setting accuracy:	Voltage - ±(0.1% + 10mV); Current - ±(0.2% + 20mA).
Response times:	Interface - <15ms (single command); PSU - Depends on Load conditions, typically 150ms to within 0.1% of final value (except for voltage reduction with low load current which will be longer).
Readback resolution:	Voltage - 10mV; Current - 10mA.
Readback accuracy:	Voltage - ±(0.1% + 1 digit); Current - ±(0.5% +1 digit).
Operating software:	Software for operating the PSUs under GPIB or RS232 control is available including a Labwindows* driver and ARC-TALK software for a PC.

Models		Voltage/Current	Power
TSX1820	TSX1820P	18 volts, 20 amps	360 watts
TSX3510	TSX3510P	35 volts, 10 amps	350 watts

*Thurlby Thandar Instruments Ltd. operates a policy of continuous development and reserves the right to alter specifications without prior notice. * Labwindows is a trademark of National Instruments Corporation.*

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