

# THQ 1 or 2 Channel High Voltage Desktop Unit

## Description

The THQ is a simple and rugged solution to providing low power high voltage modules in an AC powered desk top unit. Both the output voltage and current can be displayed on the two line LCD screen. Control is via front panel mounted potentiometers or a RS232 interface. Modules from the CPS, DPS and EPS ranges can be fitted to provide either a single or dual channel unit. With powers from 9W to 60W, currents of 0.3mA to 120mA and voltages up to 30kV the THQ provides a truly flexible approach to desk top HV power supplies. With an output power of = 24W ac AC input is 100 - 240VAC. With output power 24W > the AC input is user selectable 110/230VAC.



- Low cost desk top HV PS with 1 or 2 channels
- Analogue I/O via D Sub 9 connector (option)
- LED display for voltage & current
- Output voltages 500V up to 30kV
- Output power up to 60W
- Very low ripple & noise
- RS232 Control



## Available Options

1 channel versions with:

- CPS Series	500V up to 30kV	maximum 12W
- DPS Series	500V up to 6kV	maximum 12W
- EPS Series	500V up to 30kV	maximum 60W

2 channel versions with:

- CPS Series	500V up to 10kV	maximum 12W
- DPS Series	500V up to 6kV	maximum 12W



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# THQ 1 or 2 Channel High Voltage Desktop Unit

## Selection Table (1 Channel)

Part Number	Maximum Voltage	To Select Module See:	Connector Type	Connector Location	Module Type
T1-03 0006 EPU	=3 kV	Page 4	SHV	Front	DPS_EPU
T1-05 0006 (?5kV)	=5 kV	Page 4	SHV	Front	DPS
	=5 kV	Page 3	SHV	Front	CPS
T1-07 0006 (>5kV)	=6 kV	Page 4	SHV	Front	DPS
	=7 kV	Page 3	SHV	Front	CPS
T1-05 00012 (?5kV)	=5 kV	Page 5	SHV	Front	EPS
T1-07 00012 (>5kV)	=6 kV	Page 5	SHV	Front	EPS
T1-16 00012	10 kV	Page 5	LEMO 16kv	Rear	EPS
T1-16 0006	15 kV	Page 3	LEMO 16kv	Rear	CPS
T1-30 0006	30 kV	Page 3	LEMO 30kv	Rear	CPS

Different output ranges and application/user specific options are possible. Please contact ET to discuss your requirements.

## Selection Table (2 Channels)

Part Number	Maximum Voltage	To Select Module See:	Connector Type	Connector Location	Module Type
T2-03 0006 EPU	=3 kV	Page 4	SHV	Front	DPS_EPU
T2-05 0006 (?5kV)	=5 kV	Page 4	SHV	Front	DPS
	=5 kV	Page 3	SHV	Front	CPS
T2-07 0006 (>5kV)	=6 kV	Page 4	SHV	Front	DPS
	=7 kV	Page 3	SHV	Front	CPS
T2-16 0006	10 - 15 kV	Page 3	LEMO 16kv	Rear	CPS

Different output ranges and application/user specific options are possible. Please contact ET to discuss your requirements.

## Technical Data

Desk case dimensions.....	310 x 90 x 280mm (W x H x D) (with connectors)
Operating temperature.....	0 - 50°C
Storage temperature.....	-20 - 60°C

Order code example:

2 Channel HV-PS with DPS 3kV/4mA with option EPU = Order code T2 03 0006 EPU + 2 DPR 30 405 24 5

# CPS Modules



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## Selection Table

Part Number	Maximum Power	Input Voltage	Output Voltage	Output Current
CPx 05 206 24 5	10W	24 V	0.5 kV	0 - 20 mA
CPx 05 206 12 5	10W	12 V	0.5 kV	0 - 20 mA
CPx 10 106 24 5	10W	24 V	1 kV	0 - 10 mA
CPx 10 106 12 5	10W	12 V	1 kV	0 - 10 mA
CPx 15 805 24 5	12W	24 V	1.5 kV	0 - 8 mA
CPx 15 805 12 5	12W	12 V	1.5 kV	0 - 8 mA
CPx 20 605 24 5	12W	24 V	2 kV	0 - 6 mA
CPx 20 605 12 5	12W	12 V	2 kV	0 - 6 mA
CPx 30 405 24 5	12W	24 V	3 kV	0 - 4 mA
CPx 30 405 12 5	12W	12 V	3 kV	0 - 4 mA
CPx 40 305 24 5	12W	24 V	4 kV	0 - 3 mA
CPx 40 305 12 5	12W	12 V	4 kV	0 - 3 mA
CPx 50 205 24 5	10W	24 V	5 kV	0 - 2 mA
CPx 50 205 12 5	10W	12 V	5 kV	0 - 2 mA
CPx 70 155 24 5	10.5W	24 V	7 kV	0 - 1.5 mA
CPx 70 155 12 5	10.5W	12 V	7 kV	0 - 1.5 mA
CPx 100 105 24 5	10W	24 V	10 kV	0 - 1 mA
CPx 150 604 24 5	9W	24 V	15 kV	0 - 0.6 mA
CPx 200 504 24 5	10W	24 V	20 kV	0 - 0.5 mA
CPx 300 304 24 5	9W	24 V	30 kV	0 - 0.3 mA

Replace x with N for negative output or P for positive output polarity

## Technical Data

Stability (?V <sub>IN</sub> ).....	< 1 x 10 <sup>-4</sup> x V <sub>OMAX</sub>
Stability (?R <sub>LOAD</sub> ).....	< 2 x 10 <sup>-4</sup> x V <sub>OMAX</sub>
Ripple & noise (typical).....	< 2 x 10 <sup>-5</sup> x V <sub>OMAX</sub>
Ripple & noise (max).....	< 5 x 10 <sup>-5</sup> x V <sub>OMAX</sub>
Temperature coefficient.....	< 1 x 10 <sup>-4</sup> /K
Remote control.....	0 - 5V (0 - 10V option)
Protection.....	Overload and short circuit, INHIBIT signal, current and voltage limit
Case.....	Metal box or 3U cassette
Dimensions (V <sub>o</sub> = 7kV).....	75 x 155 x 40mm (W x D x H)
Dimensions (7kV < V <sub>o</sub> = 20kV).....	75 x 185 x 40mm (W x D x H)
Dimensions (20kV < V <sub>o</sub> ).....	95 x 185 x 40mm (W x D x H)
Supply voltage V <sub>IN</sub> .....	V <sub>IN</sub> = 24VDC ± 5% or V <sub>IN</sub> = 11.5 to 15.5VDC
Output polarity.....	Factory fixed (x = p - Positive, x = n - Negative)

## Options Table

Code	Description
/AI-10.....	0 - 10 VDC Analogue interface for control and measurement (Only possible with 15V or 24V input)
/3U-SHV.....	Unit built as 3U cassette with SHV connector for ? 6kV
/3U-LEMO.....	Unit built as a 3U cassette with LEMO connector for 7 to 15kV

# DPS Modules



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## Selection Table

Part Number	Maximum Power (Each Channel)	Output Voltage	Output Current	Supply Voltage
DPR 05 106 24 5	5W	0 - 0.5 kV	0 - 10 mA	24VDC
DPR 05 106 12 5	5W	0 - 0.5 kV	0 - 10 mA	12VDC
DPR 10 106 24 5	10W	0 - 1 kV	0 - 10 mA	24VDC
DPR 10 106 12 5	10W	0 - 1 kV	0 - 10 mA	12VDC
DPR 15 805 24 5	12W	0 - 1.5 kV	0 - 8 mA	24VDC
DPR 15 805 12 5	12W	0 - 1.5 kV	0 - 8 mA	12VDC
DPR 20 605 24 5	12W	0 - 2 kV	0 - 6 mA	24VDC
DPR 20 605 12 5	12W	0 - 2 kV	0 - 6 mA	12VDC
DPR 30 405 24 5	12W	0 - 3 kV	0 - 4 mA	24VDC
DPR 30 405 12 5	12W	0 - 3 kV	0 - 4 mA	12VDC
DPR 40 305 24 5	12W	0 - 4 kV	0 - 3 mA	24VDC
DPR 40 305 12 5	12W	0 - 4 kV	0 - 3 mA	12VDC
DPR 50 205 24 5	10W	0 - 5 kV	0 - 2 mA	24VDC
DPR 50 205 12 5	10W	0 - 5 kV	0 - 2 mA	12VDC
DPR 60 155 24 5	9W	0 - 6 kV	0 - 1.5 mA	24VDC
DPR 60 155 12 5	9W	0 - 6 kV	0 - 1.5 mA	12VDC

Different output ranges and application/user specific options are possible. Please contact ET to discuss your requirements.

## Technical Data

Stability load ( $?V_o/?V_{in}$ )	$< 1 \times 10^{-5} \times V_{NOM}$
Stability no load ( $?V_o$ )	$< 5 \times 10^{-5} \times V_{NOM}$
Ripple & noise	Typically $2mV_{pp}$ (maximum $7mV_{pp}$ )
Temperature coefficient	$< 5 \times 10^{-5}/K$
INHIBIT	TTL-Level, LOW = active
Polarity	Switchable
Protection	Overload, short circuit, voltage & current limit
Case	Metal box or 3U cassette
Dimensions (Metal Box)	75 x 185 x 40mm (W x D x H)
Supply voltage	24VDC $\pm$ 5% (option 11.5 - 15.5VDC)

## Options Table

Code	Description
/104	100 $\mu$ A current range with resolution of 10nA via display and 1nA via interface
/ON1	10 $\mu$ A current range with resolution of 1nA via display and 100pA via interface
/2MA	2 current measurement ranges with automatic crossover
/2MM	2 current measurement ranges with manual selection
/VHR	10mV voltage measurement resolution via interface up to 4kV
/N24	Only $\pm$ 24Vdc Input. (No $\pm$ 6Vdc Input)
/NHQxxN	Output power increased to 30W per channel (only up to 3kV)
/AI-10	0 -10 VDC analogue interface for control and measurement (Only possibly with 15V or 24V input)
/EPU	Polarity switchable with TTL, up to 3kV
/SHV	High voltage output with SHV connector
/3U-SHV	Unit built as a 3U cassette with SHV connector

# EPS Modules



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## Selection Table

Part Number	Maximum Power	Output Voltage	Output Current
EPx 05 127 24 5	60W	0.5 kV	0 - 120 mA
EPx 10 606 24 5	60W	1 kV	0 - 60 mA
EPx 15 406 24 5	60W	1.5 kV	0 - 40 mA
EPx 20 306 24 5	60W	2 kV	0 - 30 mA
EPx 30 206 24 5	60W	3 kV	0 - 20 mA
EPx 40 156 24 5	60W	4 kV	0 - 15 mA
EPx 50 126 24 5	60W	5 kV	0 - 12 mA
EPx 60 106 24 5	60W	6 kV	0 - 10 mA
EPx 80 705 24 5	56W	8 kV	0 - 7 mA
EPx 100 505 24 5	50W	10 kV	0 - 5 mA
EPx 150 405 24 5*	60W	15 kV	0 - 4 mA
EPx 200 305 24 5*	60W	20 kV	0 - 3 mA
EPx 300 205 24 5*	60W	30 kV	0 - 2 mA

Replace x with N for negative or P for positive output polarity

\*Built for capacitor charging

Different output ranges and application/user specific options are possible. Please contact ET to discuss your requirements.

## Technical Data

Stability load ( $\%V_{IN}$ ).....	$< 1 \times 10^{-4} \times V_{NOM}$
Stability load ( $\%R_{LOAD}$ ).....	$< 2 \times 10^{-4} \times V_{NOM}$
Ripple & noise.....	$< 5 \times 10^{-4} \times V_{NOM}$ ( $< 1 \times 10^{-4} \times V_{NOM}$ option)
Repetition accuracy.....	$< 1\% \times V_{NOM}$ (with option CLD)
Temperature coefficient.....	$< 1 \times 10^{-4}/K$
Remote control.....	0 - 5VDC analogue interface (option 0 - 10VDC)
Protection.....	Overload and short circuit, INHIBIT signal, current & voltage limit
Case.....	Metal box (option 3U x 12HP cassette)
Dimensions (Metal box).....	108 x 185 x 57mm (W x D x H)
Dimensions (Cassette).....	12HP x 60.96mm
Supply voltage $V_{IN}$ .....	24VDC $\pm 5\%$

## Options Table

Code	Description
/CLD.....	Built for capacitor charging
/AI-10.....	0 - 10 VDC Analogue interface for control and measurement
/3U-SHV.....	Unit built as 3U cassette (SHV connector for up to 6kV)
/3U-LEMO.....	Unit built as 3U LEMO for 8 - 10kV
/LF.....	Improved ripple & noise of $< 1 \times 10^{-4} V_{OMAX}$ (Only for units up to 6kV)
/CIO.....	CAN interface (See separate datasheet)