

# T1EP vvv ccc x High Voltage Desk Top Power Supply

with built-in HV module of EPS series

## Operators Manual

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### WARNING!

-It is not allowed to use the unit if the covers have been removed.

- It is not allowed to connect or disconnect the HV cable if HV is ON !

-We decline all responsibility for damages and injuries caused by an improper use of the module. It is highly recommended to read the operators manual before any kind of operation.

### Note

The information in this manual is subject to change without notice. We take no responsibility for any error in the document. We reserve the right to make changes in the product design without reservation and without notification to the users.

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## 1. General information

The model T1EP **vvv iii x** is a one channel high voltage desk top supply which offer a very stable output voltage up to 10 kV for use in industry and research. The output is generated with a built-in high voltage module of the EPS-series, which is supplied by means of an AC/DC converter.

### Main Characteristics:

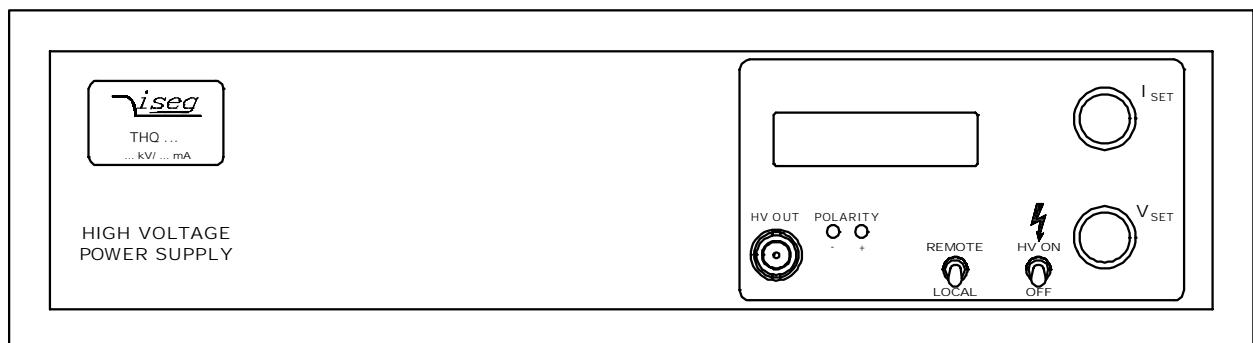
- High voltage desk top power supplies with either front-panel or remote control via analogue I/O or RS232
- Output voltage with low ripple and noise
- Compact and ruggedized enclosure
- Output short circuit and overload protected

## 2. Technical Data

1-channel HV-PS	T1EP	005 127x <sup>1)</sup>	010 606x <sup>1)</sup>	012 506x <sup>1)</sup>	015 356x <sup>1)</sup>	020 306x <sup>1)</sup>	030 206x <sup>1)</sup>	040 156x <sup>1)</sup>	050 126x <sup>1)</sup>	060 106x <sup>1)</sup>	080 705x <sup>1)</sup>	100 505x <sup>1)</sup>
Output voltage $V_{Onom}$ [kV]		0,5	1	1,2	1,5	2	3	4	5	6	8	10
Output current $I_{Onom}$ [mA]		120	60	50	35	30	20	15	12	10	7	5
Ripple & noise [V]		0,25	0,5	0,6	0,75	1	1,5	2	2,5	3	4	5
Polarity		positive ( <sup>1)</sup> x = p ) or negative ( <sup>1)</sup> x = n ), ex works										
Stability:	$\Delta V_O / \Delta V_{INPUT}$	$< 1 * 10^{-4}$										
	$\Delta V_O$ (no load/full load)	$< 2 * 10^{-4}$										
Temperature coefficient		$< 1 * 10^{-4}/K$										
Voltage measurement	Resolution:	$V_{Onom} < 1$ kV: 0,1 V ; $1$ kV $\leq V_{Onom} \leq 8$ kV: 1 V ; $10$ kV $\leq V_{Onom}$ : 10 V 4-digit LCD display										
	Accuracy:	$\pm ( 1\% * V_{Onom} )$ (for one year)										
Voltage setting	manual:	via 10-turn potentiometer ("LOC")										
	REMOTE:	via analogue I/O with $V_{SET/MON} = 0$ to 5 V ("REM") or interface										
Current measurement	Resolution:	$I_{Onom} < 10$ mA: 1 $\mu$ A; $10$ mA $\leq I_{Onom} < 0,1$ A: 10 $\mu$ A ; $0,1$ A $\leq I_{Onom}$ : 0,1 mA 4-digit LCD Display										
	Accuracy:	$\pm ( 1\% * I_{Onom} )$ (for one year)										
Current setting	manual:	via 10-turn potentiometer ("LOC")										
	REMOTE:	via analogue I/O with $V_{SET/MON} = 0$ to 5 V ("REM") or interface										
Change of output voltage:		fixed: $V_{Onom} / 4s$ (at HV-ON/OFF)										
Protection		Output short circuit and overload protected. <b>Attention !</b> There is only one short circuit or arc per second allowed! The integral output current must limited to the max. output current of the module external otherwise.										
Remote control		via analogue I/O or RS232 ("RS232") resp. USB ("USB") interface										
Line voltage AC ( $V_{INPUT}$ )		100 to 240 V-AC; 50/60 Hz; fused with 2 A-slow										

Connectors		HV output: $V_{Onom} \leq 6 \text{ kV}$ SHV connector on the front panel $V_{Onom} > 6 \text{ kV}$ LEMO connector 16kV on the rear side (ERA.1Y.416.CLL) <b>Attention: Use with connected HV connector only !</b>  analogue I/O: 9-pin male D-Sub connector RS232: 9-pin female D-Sub connector
Desk case		Size (W/H/D) : (310/90/280, 310 with SHV) mm, Weight: ca. 3,3 kg
Operating temperature		0 ... +40 °C
Storage temperature		-20 ... +60 °C
PIN	Name	Description 9-pin male D-Sub connector "analogue I/O"
1	n.c.	
2	V_I <sub>MON</sub>	Monitor voltage corresponding I <sub>o</sub> : I <sub>o</sub> = 0 to I <sub>Onom</sub> ⇒ V <sub>2-6</sub> = 0 to 5 V (R <sub>i</sub> = 10 kΩ)
3	INH	INHIBIT (TTL level, LOW ⇒ V <sub>O</sub> = 0, [LOW to] HIGH or open ⇒ V <sub>O</sub> = V <sub>SET</sub> with ramp)
4	V_I <sub>SET</sub>	Setting current (R <sub>IN</sub> = 10 kΩ): $V_{4-6} = 0 \text{ to } 5 \text{ V} \Rightarrow I_o = 0 \text{ to } I_{Onom}$ n.c. ⇒ I <sub>Onom</sub> is possible
5	n.c.	
6	GND	GND = V <sub>SET_0V</sub> Signal 0 V (connected to the metal module box)
7	V_V <sub>MON</sub>	Monitor voltage corresponding V <sub>O</sub> : V <sub>O</sub> = 0 to V <sub>Onom</sub> ⇒ V <sub>7-6</sub> = 0 to 5 V (R <sub>OUT</sub> = 10 kΩ)
8	V_V <sub>SET</sub>	Setting voltage: V <sub>8-6</sub> = 0 to 5 V (R <sub>IN</sub> ≈ 300kΩ) ⇒ V <sub>O</sub> = 0 to V <sub>Onom</sub> (R <sub>IN</sub> ≈ 300kΩ)
9	V <sub>REF</sub>	V <sub>9-6</sub> = 5 V ( 1 mA) Reference voltage for a external potentiometer (Sliding contact on V_V <sub>SET</sub> and/or V_I <sub>SET</sub> )

### 3. Front panel



If  $V_{Onom} > 6 \text{ kV}$ , „HV OUT“ is located on the rear side (LEMO connector 16kV).