High Voltage Power Supply EHS 80 80x)1

8 HV channels 8 kV / 1 mA with COMMON-GND

High Voltage Power Supply EHS 40 100x)1

4 HV channels 10 kV / 500 µA with COMMON-GND

Art. no.: EH080-80**x**)1105 ()1x = **p**: **+** or)1x = **n**: **-** 8 kV/ 1 mA)

EH040100**x**)1504 ()1x = **p**: **+** or)1x = **n**: **-** 10 kV/ 0,5 mA)

Operator's manual

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Operator's manual CAN-Interface

Attention!

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

-We decline all responsibility for damages and injuries caused by an improper use of the module. It is highly recommended to read the 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 EHS 80 80x[)1] is a 8-channel and the EHS 40 100x[)1] is a 4-channel high voltage power supply module in 6U Eurocard format. Each single channel is independently controllable with voltage and current control. The EHS are made to be mounted into a 19" crate. The powered system crate ECH xx8 (19" rack) carries up to 8 modules. It is also possible to supply the modules separately with the necessary power. The unit is software controlled via CAN-Interface directly through a PC or similar controller in this case. Using the w-ie-ner Mpod crates it is able to carries up to 10 modules with control via Ethernet-Interface. It is possible to create a multi-channel high voltage system of any configurable size. The HV outputs at the EHS 80 80x[)1] are equipped with SHV connectors and at the EHS 40 100x[)1] with KINGS connectors with Common-GND. Optionally it is possible to install an hardware INHIBIT for each channel.

2. Technical data

EHS		**80 80x[)1]**								**40 100x[)1]**
Output voltage $\mathbf{V_{O\ nom}}$		[)1]**x = p**: **+** 8 kV								[)1]**x = p**: **+** 10 kV
		[)1]**x = n**: **-** 8 kV								[)1]**x = n**: **-** 10 kV
Output per channel $\mathbf{I_{O\ nom}}$		1 mA								500 µA
Ripple and noise		< 30 mV								< 50 mV
Resolution of	voltage setting[)*]	300 mV								400 mV
	current setting[)*]	40 nA								20 nA
	voltage measurement[)*]	150 mV								200 mV
	current measurement[)*]	20 nA								10 nA
[)* with standard sample rate 500/s, digital filter 64 and only guarantied in the setting range										
Accuracy voltage measurement		$\pm$ (0,01% ∗ V_O + 0,02% ∗ $V_{O\ nom}$ + 1 digit) (for one year) only guarantied in the setting range **1% ∗ $\mathbf{V_{O\ nom}}$** < $V_O \leq V_{O\ nom}$								
Accuracy current measurement		$\pm$ (0,05% ∗ I_O + 0,02% ∗ $I_{O\ nom}$ + 1 digit) (for one year) only guarantied in the setting range **1% ∗ $\mathbf{V_{O\ nom}}$** < $V_O \leq V_{O\ nom}$								
Stability V_O		< 0,01% * $V_{O\ nom}$ (no load/load and Δ V_{IN})								
Temperature coefficient V_O		< 5 ∗ 10^{-5} /K								
Hardware limits V_{max} / I_{max}		potentiometer per module (V_{max} / I_{max} is the same for all channels)								
Interface		CAN-Interface (potential free)								
Operating mode		Full module and channel control via CAN interface in EHS mode: EDCP (Enhanced Device Control Protocol) or EHQ mode: DCP (Device Control Protocol) see manual CAN interface								
Module status		green LED at channels 0-7 will work with status ready								
Protection loop (I_s) potential free (2 pin Lemo-socket and REDEL SL)		5 mA < I_s < 20 mA ⇒ module on I_s < 0,5 mA ⇒ module off								
Optional INHIBIT per channel		About Sub-D-9 connector INHIBIT (TTL level)								
	INHIBIT 0-7 / Channel	0	1	2	3	4	5	6	7	GND
	Sub-D-9 connector / PIN	1	2	3	4	5	6	7	8	9

EHS	80 80x)[1]	40 100x)[1]
HV connector	SHV connectors	KINGS connectors
Power requirements V_{INPUT}	+ 24 V (< 3,5 A) and + 5 V (< 0,2 A)	
Packing	8/4-channels in 6U Euro cassette (40,64 mm wide and 220 mm deep)	
Connector on the rear	96-pin connector according to DIN 41612	
Operating temperature	0 ... +40 °C	
Storage temperature	-20 ... +60 °C	

3. Handling

The supply voltages and the CAN interface is connected to the module via a 96-pin connector on the rear side of the module.

The module will be controlled in the chosen CAN operating mode, factory setting is “EHS mode”.

The maximum output voltage for the channels 0 to 7 is defined through the position of the corresponding potentiometer V_{max} .
The maximum output current for the channels 0 to 7 is defined through the position of the corresponding potentiometer I_{max} .
The greatest possible set value of voltage or current follows from V_{max} – 2% resp. I_{max} – 2%.
It is possible to measure the hardware voltage and current limit, which have been set with reference to the maximum possible voltage and current at the socket below. 102 % V_{max} and 102 % I_{max} corresponds to 2,5 V.
The output voltage and current will be limited to the setting value after it exceeds the threshold and the corresponding green LED on the front panel is ‘OFF‘.

The safety loop is available on the safety loop socket (SL) on the front panel. If the safety loop is active then output voltage on all channels is only present if the safety loop is closed and an external current in a range of 5 to 20 mA of any polarity is flowing into the loop. If the safety loop is opened during operation then the output voltages are shut off without ramp and the corresponding bit in the ‘ModuleStatus’ (see manual CAN interface 5.5.2.1) and ModuleEventStatus (see manual CAN interface 5.5.2.3) will be cancelled. After the loop will be closed again the ModuleEventStatus (see manual CAN interface 5.5.2.3) must be restored and the channels must be switched ‘ON’. The pins of the loop are potential free, the internal voltage drop is ca. 3 V. Coming from the factory the safety loop is not active (the corresponding bits are always set). By removing of the internal jumper the loop will become active (see operator’s manual CAN-Interface, app. C).

Optionally it is possible to install an INHIBIT for each channel (n= 0 to 7) via the Sub-D connector INHIBIT 0-7.
When the INHIBIT contact pin (n) will be connected to GND or TTL-LOW potential then the HV-PS on this channel will be switched OFF without ramp permanently and the green LED on front panel is off.

The INHIBIT active time (LOW potential) has to be minimal 100 ms!

When the INHIBIT is no longer active (TTL-HIGH potential or not connected), then the INHIBIT flag has to be erased before the voltage can switched ON again (see manual CAN interface 5.5.1.3).

Pin assignment 96-pin connector according to DIN 41612:

PIN		PIN		PIN		Data
a1		b1		c1		+5V
a3		b3		c3		+24V
a5		b5		c5		GND
a11						@CAN_GND ⎫
		b11				@CANL ⎬ potential free
				c11		@CANH ⎭
a13						RESET
		b13				OFF with ramp (e.g. 10s after power fail)
a30	A4	b30	A5			⎫
a31	A2	b31	A3	c31	GND	⎬ Address field
a32	A0	b32	A1	c32	GND	⎭ module address (A0 ... A5)

The hardware signal “OFF with ramp” (Pulse High-Low-High, pulse width ≤ 100 µs) on pin b13 will be shut off the output voltage for all channels with a ramp analogue to the Group access “Channel ON/**OFF”**. The ramp speed is defined to V_{OUTmax} / 50 s. This is the actually module ramp speed after “OFF with ramp”.

With help of the Group access “Channel **ON**/OFF**”** all channels are switched “ON” again.

With the address field a30/b30 ..... a32/b32 the module address will be coded.

Connected to GND ⇒ A(n) = 0 ; contact open ⇒ A(n) = 1