8-channel High Voltage Power Supply EHQ 84 05x$^{)1}$_156-F

$^{)1}$x = p: 0 to + 490 V / 15 mA

$^{)1}$x = n: 0 to - 490 V / 15 mA

with discharge relay

Operators Manual

(Art. no.: E084-05p156R51 / E084-05n156R51)

Contents

Attention!

--The unit shall not be operated with the cover 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

1. General information

The EHQ 84 05x[)1]_yyy-F is a 8-channel high voltage power supply in 6U Eurocard format. Each single channel is independently controllable. The outputs "floating HV-GND" and HV-out (positive or negative polarity) of each channel are both floating against each other and against module ground.

The EHQ 84 05x[)1]_yyy-F is made to be mounted into a 19" crate. 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 with the commands for the **device class 2** according the attached manual for the CAN Interface. The HV output at the EHQ 84 05x[)1]_yyy-F is available with ERNI- Multipin-Connector, LEMO connector ERA.0S.302.CLL or with REDEL-Connector.

The EHQ EHQ 8**4** 05x[)1]_yyy-F is equipped with a discharge relay.

2. Technical data

EHQ 84 05x[)1]_156-F	
Output current I_O	max. 15 mA
Output voltage V_O	[)1]**x = p**: 0 to + 490 V [)1]**x = n**: 0 to - 490 V
Floating	Connector HV-GND "C" to module GND: $\leq \lvert 15\ V \rvert$ Connector HV-out ("+" or "-") to GND: $\leq \lvert 15\ V \rvert + V_O$
Ripple and noise	f = 10 Hz to 100 kHz: < 50 mV (at max. load and f > 100 kHz: < 50 mV V_O > 50 V)
Hardware current limit I_{max}	Potentiometer per channel internal
Interface	CAN-Interface
Voltage setting	Via software, resolution 10 mV
Voltage measurement	Via software, resolution 10 mV
Current measurement	Via software, resolution 300 nA
Accuracy of measurement (for one year)	Voltage: $\pm\ (0{,}01\% * V_O + 0{,}02\% * V_{O\ max})$ Current: $\pm\ (0{,}01\% * I_O + 0{,}01\% * I_{O\ max})$
Temperature coefficient	$< 5 * 10^{-5}/_K$
Stability	$< 2 * 10^{-4}$ (no load/load and ΔV_{IN})
Rate of change of output voltage	Via software: 0,2 V/s to 50 V/s resolution 0,5 V
Channel control via software	Status 8 bit: channel error, KILL- enable, channel emergency cut-off, ramp, channel on/off, input error, current trip
8 channels error control via software	Current limit ("Channels are OK" is signalled if these limits do not exceed on each.)
Error signal with green LED	"Channels 0-7 OK"
Protection loop (I_s) (2 pin Lemo-socket)	5 mA < I_s < 20 mA $\Rightarrow$ module on I_s < 0,5 mA $\Rightarrow$ module off
Power requirements V_{IN}	+ 24 V (< 1,5 A) and + 5 V (< 0,5 A)
Packing	8-channels in 6U Euro cassette (40,64 mm wide and 220 mm deep)
Connector	96-pin connector according to DIN 41612
HV connector	32-pin Erni Multipin-Connector or REDEL-Connector or LEMO connector ERA.0S.302.CLL

EHQ 8405p-F
8 x +500 V / 15 mA

CH 0-7 OK

HV-OUT

+

C
0
1
2
3
4
5
6
7
C

HV-OUT

SL

iseg
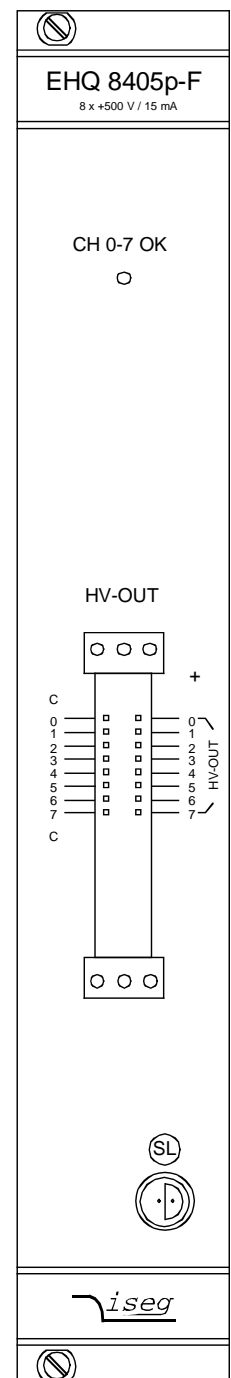
3. Handling

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 maximum output current for each channel is defined through the position of the corresponding internal potentiometer $I_{max}0$ to $I_{max}7$ on the board. Factory setting is full range I_{MAX}.
The output current will be limited to the setting value after it exceeds the threshold and the green LED on the front panel is 'OFF'.

At the bottom on the right side of the front panel is the socket for the safety loop. If the safety loop is active then output voltage on all channels is only present if a current is flowing in a range of 5 to 20mA of any polarity (i.e. safety loop closed). If the safety loop is opened during operation then the output voltages are shut off without ramp and the corresponding bit in the 'Status module' will be cancelled. After the loop will be closed again the channels must be switched 'ON' and a new set voltage must be given before it is able to offer an output voltage. 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 bit is always set). Removing of an internal jumper makes the loop active (s. App. A).

The connector "C" - floating HV-GND - of each channels should be connected to ground at a certain chosen point. Otherwise it must be sure, that the potential between "C" - floating HV-GND - and module GND should not exceed the amount of $|15\,V|$.

The EHQ 8**4** 05x$^{)1}$_yyy-F is equipped with a discharge relay. The relay contacts will discharge connected load capacities about a integrated load resistor (see the schematic under the command description "Discharge relay configuration"). The command group access "Discharge relay configuration" will configure the conditions on this relay will work.

If the implementation of these conditions will close the discharge contacts

- the HV will shut off without ramp in all channels by software before and
- the set voltage will set to 0V by software for all channels after that.

Note!   The max. discharge current for all channels is 15 mA ! Please limit the discharge current with external resistors in series from HV-out $_{0\,to\,7}$ to the capacity load!

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	c30	GND	⎤
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 $\leq$ 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 $\Rightarrow$ A(n) = 0 ; contact open $\Rightarrow$ A(n) = 1