



High Voltage  
Positive And Negative  
Double-Width AMC Series



## HV-PANDA

- The HV-PANDA is a full-size standard AMC board that houses 4 High Voltage channels as a MTCA.4 carrier
- High Voltage channels with different output ratings - i.e. 6 kV, 4 kV and 500V - and factory-selectable polarity
- Infrastructure for management of Rear Transition Module (RTM) boards

### FEATURES

- Double-width AMC board
- MTCA.4 carrier
- 4 High Voltage (HV) channels per board
- Output ratings up to 6 kV @ 1 mA
- Different output voltage ratings available
- Factory-selectable polarity
- Provides interconnections between CPU unit and HV channels
- Communication through FAT PIPE using PCI-e 1x standard
- Provides infrastructure for management of Rear Transition Module (RTM) boards

### APPLICATIONS

- Semiconductor Detectors
- Gaseous Detectors
- Vacuum Photomultipliers
- Micro Channel Plates (MCP)
- Drift Chambers

**HV-PANDA.** The HV-PANDA (High Voltage Positive And Negative Double-width AMC) is an AMC board designed as MTCA.4 carrier. The board houses four different High Voltage (HV) channels that are inherited from the widespread and well-known CAEN VME Technology.

The HV modules can be configured with different output ratings and polarity, ranging from 500 V to 6 kV and from 1.5 W to 7 W.

The HV channels have a floating return per pair of channels, rated up to  $\pm 20$  V with respect to Protective Earth (PE).

Semiconductor detectors, gaseous detectors, vacuum photomultipliers, MCPs, silicon and germanium detectors as well as drift chambers are

typical fields of application of such rated HV channels.

Each HV channel has a nominal voltage accuracy better than 0.05 % of Full-Scale (FS) and a ppm-level peak-to-peak output voltage ripple.





The current and voltage limits can be changed real-time by the user as well as the behavior of the channels when the current limit threshold is exceeded; the module can switch off or can continue to operate in current-source mode.

The ramp speed can be configured with a 1 V/s resolution and can range from 1 V/s to 500 V/s. Output voltage and current digital readbacks are also accessible by the user with a resolution of 0.01% of the FS value.

The module communication is

#### About Us

CAEN ELS is a leading company in the design of power supplies and state-of-the-art complete electronic systems for the Physics research world, having its main focus on dedicated solutions for the particle accelerator community and high-end industrial applications.

-  Power Supply Systems
-  Precision Current Measurements
-  Beamline Electronics Instrumentation
-  FMC and MicroTCA

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**CAEN High-Voltage Module**

performed through FAT PIPE using the PCI-e 1x standard and provides interconnection between the CPU unit and the High Voltage channels.

The HV-PANDA provides also the

infrastructure for management of optional Rear Transition Module (RTM) board. Zone 3 connections are carried according to DESY guidelines for Digital uRTM - Class D1.1.

#### Technical Specifications

#### HV-PANDA

<b>Board Size</b>	Full-Size
<b>Number of HV channels</b>	4
<b>AMC Board Type</b>	PICMG - AMC.0 R.2
<b>Output Voltage Ratings</b>	6 kV @ 6 W 4 kV @ 7 W 500 V @ 1.5 W
<b>Polarity</b>	Positive or Negative ( <i>Factory-selectable</i> )
<b>RTM Support</b>	Yes
<b>High-Voltage Return</b>	Floating (per pair of channels) ±20 V to PE
<b>Nominal Voltage Accuracy</b>	< 0.05 %
<b>Voltage/Current Readback Accuracy</b>	< 0.05 %
<b>Voltage/Current Readback Resolution</b>	< 0.01 %
<b>Output Voltage Ripple (@max P<sub>OUT</sub>)</b>	up to 4 kV: < 3 ppm/FS up to 6 kV: < 4 ppm/FS
<b>Ramp Slew Rate</b>	from 1 to 500 V/s
<b>Ramp Slew Rate Step Size</b>	1 V/s
<b>Stand-by Voltage Set Resolution</b>	1 % of FS
<b>Current Limit Value Accuracy</b>	< 4 % of FS
<b>Output Current Threshold Behaviour</b>	Switch-off Current-Source Mode
<b>Output Voltage Connectors</b>	SHV-type

#### Ordering Codes

Ordering Code	Acronym	Description
HVPANDA6KPXA	HVPANDA6KP	4-channel HV Full-size AMC Board (6 kV@6 W channel) - Positive polarity
HVPANDA6KNXA	HVPANDA6KN	4-channel HV Full-size AMC Board (-6 kV@6 W channel) - Negative polarity
HVPANDA4KPXA	HVPANDA4KP	4-channel HV Full-size AMC Board (4 kV@7 W channel) - Positive polarity
HVPANDA4KNXA	HVPANDA4KN	4-channel HV Full-size AMC Board (-4 kV@7 W channel) - Negative polarity
HVPANDA60SPXA	HVPANDA05P	4-channel HV Full-size AMC Board (500 V@1.5 W channel) - Positive polarity
HVPANDA05NXA	HVPANDA05N	4-channel HV Full-size AMC Board (-500 V@1.5 W channel) - Negative polarity