

PO series

Optical power isolators

apparateq

Electronics for Research and Science



- Photovoltaic technology
- Galvanic isolation
- 24/7 operation in contrast to batteries
- High suppression of noise
- Low in/out capacitance
- Single DC supply feed
- Variants for 1 or 2 DC outputs
- Customized versions available

Ground-loops, unwanted signal coupling and power supply noise can be a challenge when setting up experiments in a laboratory. To complicate matters, there may be safety requirements that call for isolation between parts of your system.

The PO series of power isolators provides a total galvanic isolation between your power supply and your device being powered. The result is an extremely reduced feedthrough of supply noise, and a large degree of freedom of how to power sensitive parts of even very elaborate setups.

The design of the PO series ensures a low parasitic capacitance between input and output, and complies with safety regulations for up to 1 kV voltage difference.

The isolator can be powered from a laboratory power supply, from a wall plug-in power adaptor, or from a DC rail in your setup. Thanks to the isolation and noise suppression even switched mode supplies find use as a power source for our isolators.

Adaptor cables are available for commonly used DC power connectors for laboratory equipment, such as the Lemo® series 1S or industrial M8 sockets.

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Specifications and characteristics

	PO-S5	PO-S12	PO-D5	PO-D12
Output *)	5V, ≤50 mA	12V, ≤20 mA	±5V, ≤25 mA	±12V, ≤10 mA
Supply	12 V -10% / +25%, ≤0.85 A	12 V -10% / +25%, ≤0.85 A	12 V -10% / +25%, ≤0.85 A	12 V -10% / +25%, ≤0.85 A
Input protection	Reverse voltage, Overvoltage to 60 V	Reverse voltage, Overvoltage to 60 V	Reverse voltage, Overvoltage to 60 V	Reverse voltage, Overvoltage to 60 V
Load stability *)	≤10 mV/A	≤10 mV/A	≤10 mV/A	≤10 mV/A
Output noise *)	≤10 μV RMS, 20 MHz bandwidth	≤20 μV RMS, 20 MHz bandwidth	≤10 μV RMS, 20 MHz bandwidth	≤20 μV RMS, 20 MHz bandwidth
Isolation (input-output) *)	≤15 pF // ≥1 GΩ Test 2 kV AC for 60 s	≤15 pF // ≥1 GΩ Test 2 kV AC for 60 s	≤15 pF // ≥1 GΩ Test 2 kV AC for 60 s	≤15 pF // ≥1 GΩ Test 2 kV AC for 60 s
Measures (incl. terminals)	164 mm (L) x 108 mm (W) x 48 mm (H)	164 mm (L) x 108 mm (W) x 48 mm (H)	164 mm (L) x 108 mm (W) x 48 mm (H)	164 mm (L) x 108 mm (W) x 48 mm (H)

*) Preliminary specifications; The parameters are yet to be fully characterized.

An array of high-efficiency LEDs in combination with a high-efficiency photovoltaic solar module are at the heart of the power conversion. Supporting circuitry takes care of reverse polarity and overvoltage protection. A low-noise post-regulator ensures a stable output.

The tight enclosure protects your experiment from stray light from the powerful LEDs. An integrated heat sink ensures sufficient cooling of the LEDs to maximize their operational life.

The low parasitic capacitance between the input and the output results in a high attenuation of common-mode noise from the supply. In many cases you may use a switched mode supply to power the PO series without introducing unwanted noise in your setup. Also, linear supplies with a switching pre-regulator have been used successfully as a power source for the PO series.

The input and the output terminals of the PO series are isolated from the enclosure. A separate grounding terminal allows you to connect the enclosure to ground potential.

For maximum flexibility the PO series of photovoltaic power converters comes with 4 mm terminal posts. These posts allow you to connect wires from an experiment directly to the output. However, some of the equipment the PO series is intended to power comes with a DC connector. For that reason a selection of cables with banana plugs to commonly found DC connectors is available, listed in the table to the right.

Connector	Rails	Pin configuration *)	Apparateq order #
M8, 3-Pin Female	2	1 = Pos. / 2 = GND / 3 = Neg.	PO-CA-01
M8, 4-Pin Female	1	1 = NC / 2 = NC / 3 = Pos. / 4 = GND	PO-CA-02
Mini-XLR, 3-pin Female	1	1 = Pos. / 2 = GND / 3 = NC	PO-CA-03
Male 2.5 mm plug	1	Tip = Pos. / Barrel = GND	PO-CA-04
Lumberg RSMV3 3-pin Male	2	1 = Pos. / 2 = GND / 3 = Neg.	PO-CA-05

*) The configuration assumes that the banana plugs are connected as follows:
Pos. = RED plug into RED terminal, GND = BLACK plug into BLACK terminal and
Neg. = BLUE plug into BLUE terminal

The power cables above are ordered separately. Consult the manual of the equipment you need to power in order to select the right cable. For custom connectors or cable lengths contact Apparateq.

Need higher current handling without the need for galvanic isolation? Take a look at our PS-series power supply filters, or the PSC series of power supply filters with common-mode suppression.

Need perhaps data acquisition with ultimate isolation? Consider our series of acquisition front-ends with power and data transmission through optical fibres.