

LOW NOISE DC VOLTAGE SOURCE

LP6016-01 / LP6016-01P

*High Precision Control for
Sensors and Devices!*

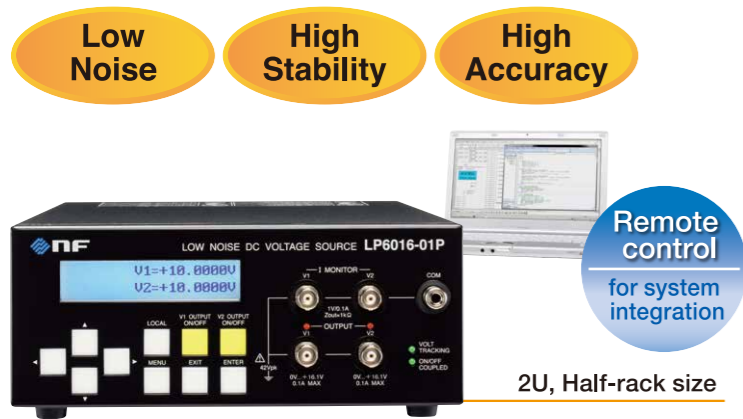
Precision Voltage Source Corresponding to Many Application



plus/minus outputs **LP6016-01**

plus outputs 2 channel **LP6016-01P**

- | | |
|----------------------------|--|
| ■ Output Noise | 10 μ Vrms or lower typ. (Bandwidth 10 Hz to 20 MHz) |
| ■ Output Voltage Stability | ± 10 ppm/ $^{\circ}$ C typ. |
| ■ Setting Accuracy | $\pm (0.03\% + 250 \mu$ V) |



- Output noise 10 μ Vrms (Bandwidth 10 Hz to 20 MHz)
- Output voltage stability ± 10 ppm/ $^{\circ}$ C typ.
- Output voltage LP6016-01 : 0 to +16.1 V(+) / 0 to -16.1 V(-)
LP6016-01P : 0 to +16.1 V(2 outputs, V1, V2)
- Setting resolution 500 μ V
- Setting accuracy $\pm(0.03\% + 250 \mu$ V)
- Maximum current 100 mA
- Interface USB, RS-232, LAN

Crystal Oscillator Control Voltage Source Yield Improvement of Outgoing Inspection

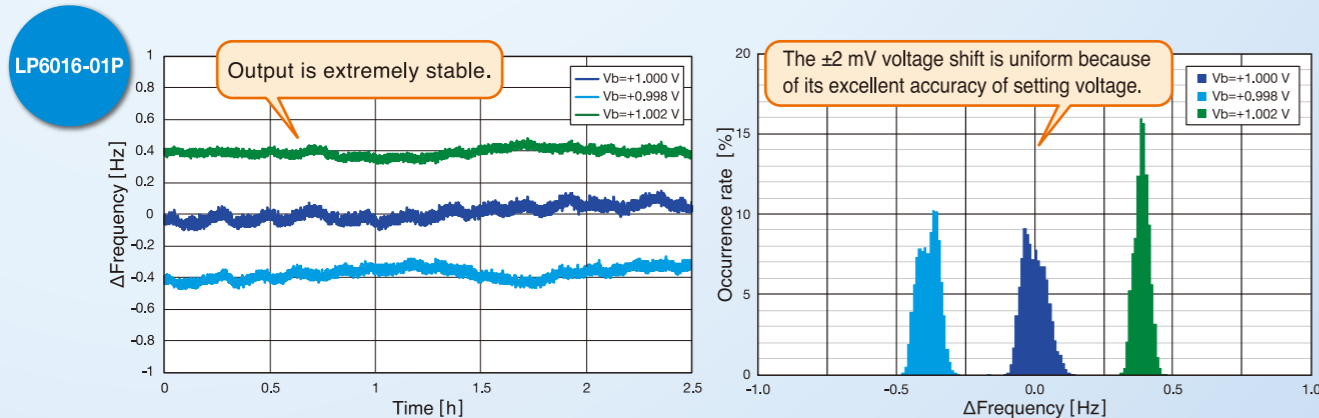
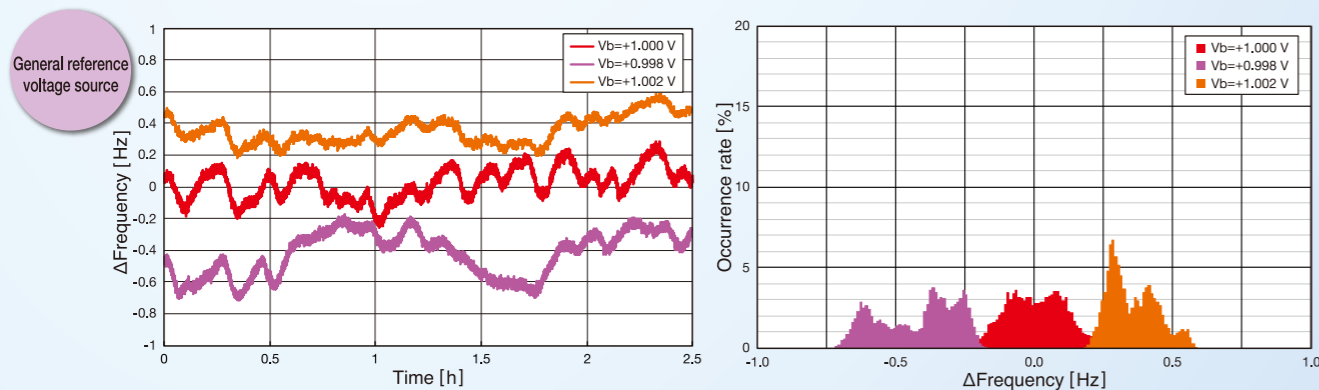
When evaluating the phase noise, frequency accuracy and frequency stability of a crystal oscillator, the stability of the control voltage source affects the evaluation results. To evaluate VCXO (voltage controlled crystal oscillator), TCXO (temperature compensated crystal oscillator), and OCXO (crystal oscillator with temperature chamber), it is important to use a precise voltage source.

Example VCXO frequency measurement

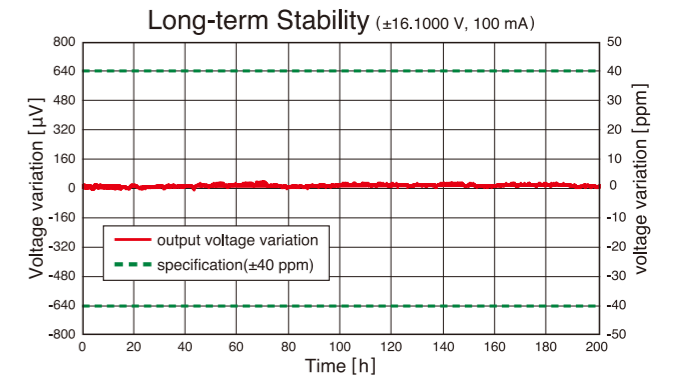
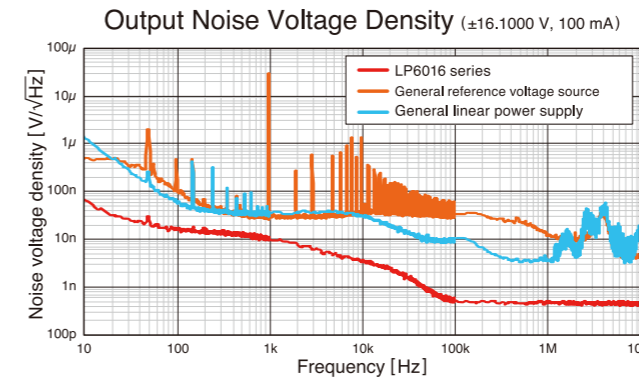
— Comparison of output frequency by control voltage sources —

The graph below shows a comparison of the LP6016-01P with a reference voltage source commonly used as a control voltage source for VCXO.

* The Δ frequency in the graph shows the difference with reference to the output frequency (approximately 30 MHz) when the control voltage $V_{ctrl} = 1,000$ V.



▶ LP6016-01P can supply a stable voltage over time. In the outgoing inspection, the accuracy of pass/fail judgment is improved, leading to improved yield.



Laser diode Driving Source Stabilizing of Laser Light
 Photodiode Bias Voltage Source Improving Signal-to-Noise Ratio

High-sensitivity sensors such as optical sensors and magnetic sensors are used to detect small signals such as biological signals. It is important to use a low noise voltage source to improve detection accuracy. The following is an actual measurement example using LP6016-01 for a light emitting element, laser diode, and light receiving element photodiode widely used in optical application systems.

■ Laser diode

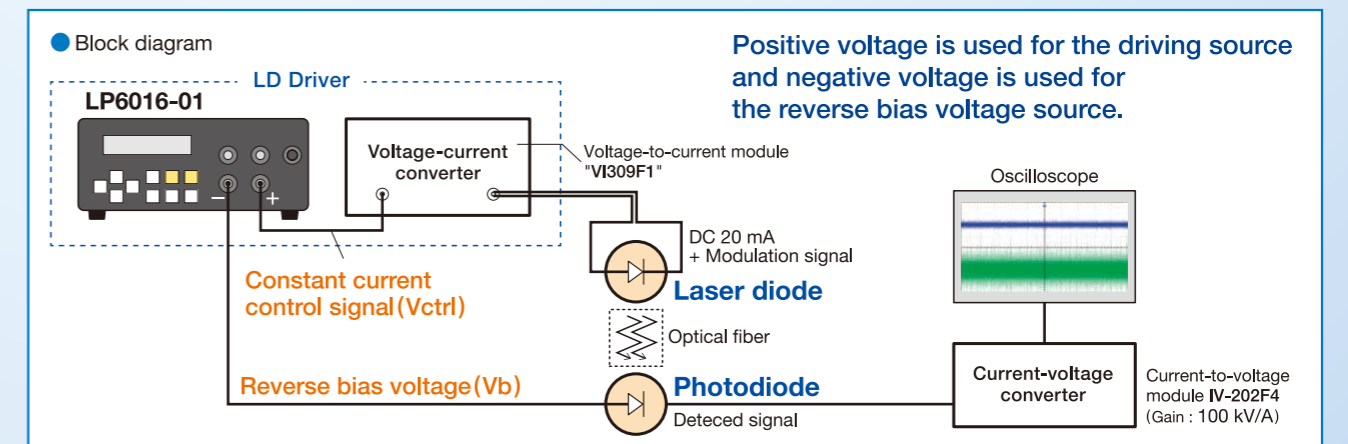
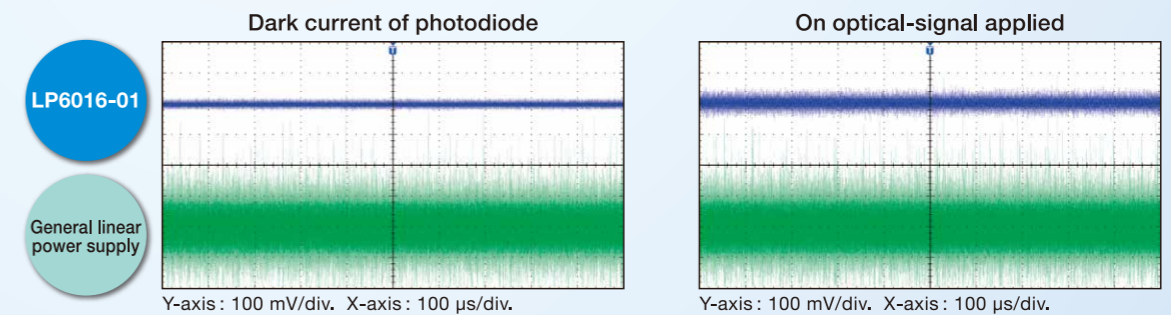
The laser light's stability is affected by the noise performance and stability of the LD driver. In the following example, LP6016-01 is used together with the voltage-to-current converter VI-309F1 capable of precise current output to configure a low-noise and stable LD driver.

■ Photodiode

Photodiodes widely used as laser light receiving elements require a reverse bias voltage to increase sensitivity. A high-sensitivity light detection requires a low-noise bias voltage source.

Example Comparison of detection signal by driving source and bias voltage source

This is the result of measuring the detection signal when LP6016-01 and a general linear power supply are used as the driving source (constant current control) and bias voltage source with the configuration of the following measurement block diagram.

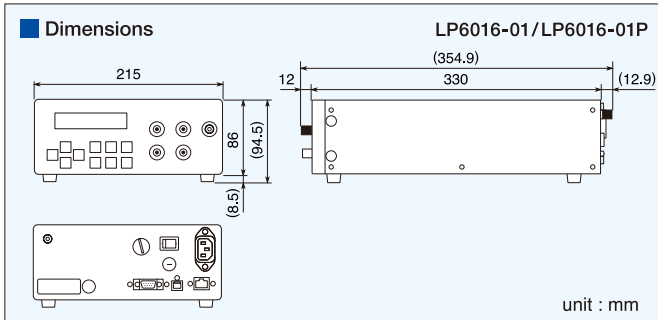


SPECIFICATIONS

| | LP6016-01 | LP6016-01P |
|-------------------------|---|--|
| Output voltage | + : 0.0000V to +16.1000 V - : 0.0000V to -16.1000 V | V1 : 0.0000V to +16.1000 V V2 : 0.0000V to +16.1000 V |
| Setting resolution | 0.0005 V (500 μV) | |
| Setting accuracy | ±(0.03% of I Setting value I + 250 μV) Ambient temperature 23°C ±5°C | |
| Temperature coefficient | ±10 ppm/°C typical | |
| Maximum current | ±100 mA (IOutputI ≥ 1V, 0 to 50°C) ±100 mA (IOutputI < 1V, 0 to 40°C) ±90 mA (IOutputI < 1V, 40 to 50°C) | 100 mA (IOutputI ≥ 1V, 0 to 50°C) 100 mA (IOutputI < 1V, 0 to 40°C) 90 mA (IOutputI < 1V, 40 to 50°C) |
| Settling time | 100 ms (with no load) | |
| Line regulation | Within ±0.1 mV (for supply voltage ±10%) | |
| Load regulation | Within ±5 mV (current 0 mA reference for 0 to 100 mA) | |
| Ripple noise | 10 μVrms or lower typical current : 0 mA to ±100 mA (100 mA : LP6016-01P) bandwidth : 10 Hz to 20 MHz | |
| Time drift | ±40 ppm (typical, 8 hours after warm-up) | |
| Output connector | BNC (receptacle) | |
| Current monitor | Feature | Voltage output is 1 V/100 mA times the absolute value of output current. |
| | Accuracy | ±(1%+1.5 mA) (23°C ±5°C) ±(1%+2.0 mA) (0°C to 50°C) |
| | Output impedance | 1 kΩ |
| | Output connector | BNC (receptacle) |
| Power source | Voltage | AC 100, 120, 220 and 240 V (selector switch) ±10% (AC250 V or lower) |
| | Frequency | 50 Hz/60 Hz ±2 Hz |
| | Power consumption | 28 VA or lower |
| Overvoltage category | II | |

| | LP6016-01 | LP6016-01P |
|--------------------------------------|---|------------|
| USB | USB2.0 full speed, Device Class CDC | |
| RS-232 | Baud rate : 9600/19200/38400/57600 bps | |
| LAN | 10 BASE-T/100BASE-TX, TCP/IP | |
| Insulation resistance | Between all power inputs and chassis : 50 MΩ or more (with DC 500 V) Between all power inputs and outputs : 50 MΩ or more (with DC 500 V) Between output GND(COM) and chassis : 10 MΩ | |
| Withstanding voltage | Between all power inputs and "outputs/chassis" : AC 1500 V for 1 minute Between output GND(COM) and chassis : ±42 Vpk (DC + AC peak) | |
| Overcurrent protection | "OCP" is displayed on the LCD screen when exceeding about ±100 mA. (100 mA : LP6016-01P) Drooping characteristic (approx. 150 mA, self recovery type) | |
| Overheat protection | Output is turned off when an internal temperature exceeds threshold "OHP" is displayed on the LCD screen | |
| Operating temperature/humidity range | Temperature : 0°C to +50°C Humidity : 5 % to 85 %RH, Absolute humidity : 1 g/m³ to 25 g/m³ Non-condensation | |
| Storage temperature/humidity range | Temperature : -10°C to +60°C Humidity : 5 % to 95 %RH, Absolute humidity : 1 g/m³ to 29 g/m³ Non-condensation | |
| Pollution degree | 2 (indoor use) | |
| Warm-up time | 60 minutes | |
| Dimensions (mm) | 215×86×330 (without protrusions) | |
| Weight | Approx. 3.5 kg without (accessories) | |
| RoHS | Directive 2011/65/EU | |
| EMC | EN 61326-1 : 2013 EN 61000-3-2 : 2014 EN 61000-3-3 : 2013 *Available soon for LP6016-01P | |
| Safety | EN 61010-1 : 2010 *Available soon for LP6016-01P | |
| Accessories | Power cord set (3 pole, 2 m), Fuse (spare), Instruction manual | |

Dimensions

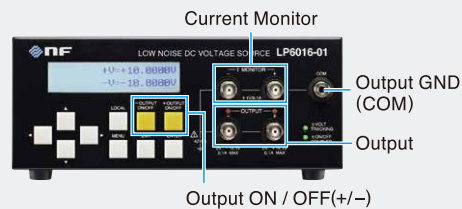


OPTIONS

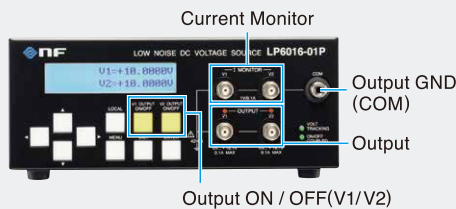
- PA-001-3089 : BNC-Binding Post Adapter
- PA-001-3230 : Rack Mount Kit (EIA, for 1 unit)
- PA-001-3090 : Rack Mount Kit (EIA, for 2 units)
- PA-001-3231 : Rack Mount Kit (JIS, for 1 unit)
- PA-001-3091 : Rack Mount Kit (JIS, for 2 units)

[Front View]

LP6016-01 (plus/minus outputs)

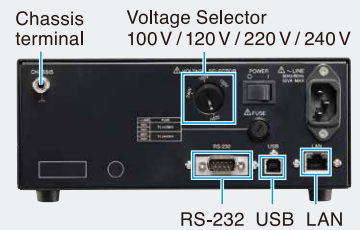


LP6016-01P (plus outputs, 2ch)



[Rear View]

LP6016-01/LP6016-01P



Note: The contents of this catalog are current as of October 2nd, 2019
 *Products appearance and specifications are subject to change without notice.
 *Before purchase contact us to confirm the latest specifications, price and delivery date.

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in allen elektrischen und physikalischen Anwendungen**

COSINUS Messtechnik GmbH

Rotwandweg 4

82024 Taufkirchen

Tel.: 089 / 66 55 94 - 0

Fax: 089 / 66 55 94 -30

office@cosinus.de
www.cosinus.de