COSINUS® MESSTECHNIK GMBH

LOW NOISE DC VOLTAGE SOURCE

LP6016-01 / LP6016-01P NEW

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 µVrms or lower typ. (Bandwidth 10 Hz to 20 MHz)
Output Voltage Stability	±10 ppm/°C typ.
Setting Accuracy	±(0.03%+250 µV)

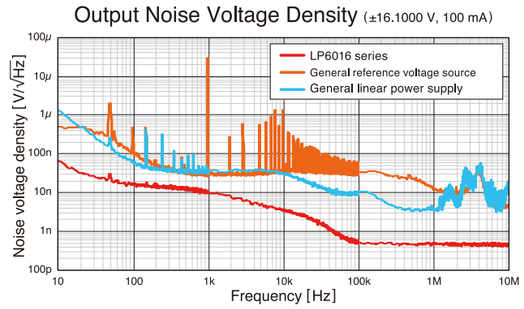
COSINUS® MESSTECHNIK GMBH

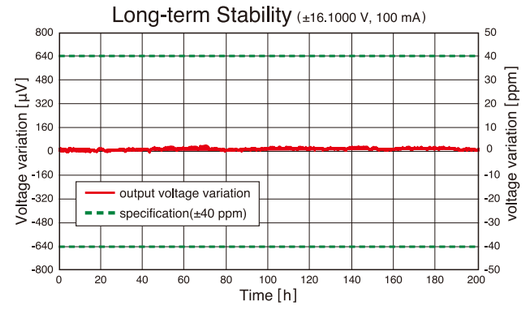
LOW NOISE DC VOLTAGE SOURCE LP6016-01/LP6016-01P

Low Noise | High Stability | High Accuracy

2U, Half-rack size

- Output noise 10 μVrms (Bandwidth 10 Hz to 20 MHz)
- Output voltage stability ±10 ppm/°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 μV
  - Setting accuracy ±(0.03% +250 μV)
- 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.

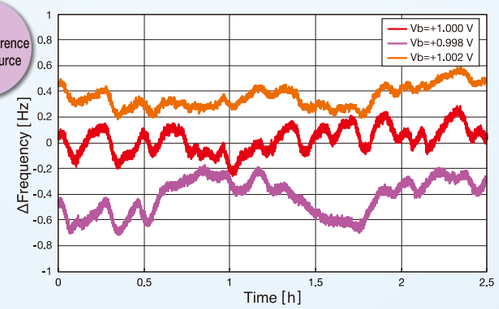
Example **VCXO frequency measurement**

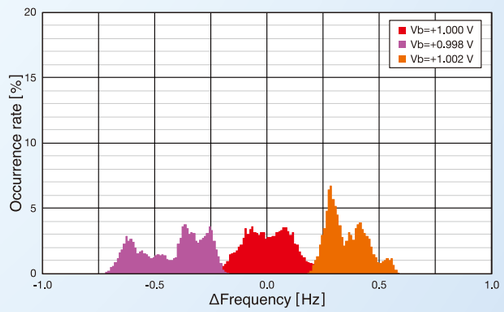
— Comparison of output frequency by control voltage sources —

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

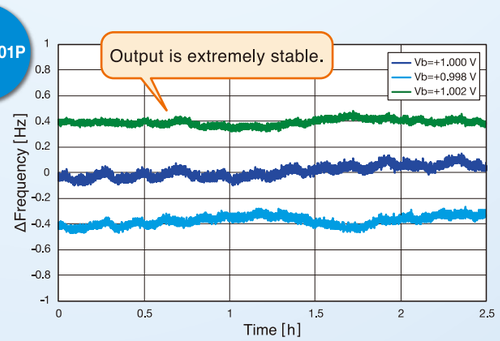
* The Δ frequency in the graph shows the difference with reference to the output frequency (approximately 30 MHz) when the control voltage Vctrl = 1.000 V.

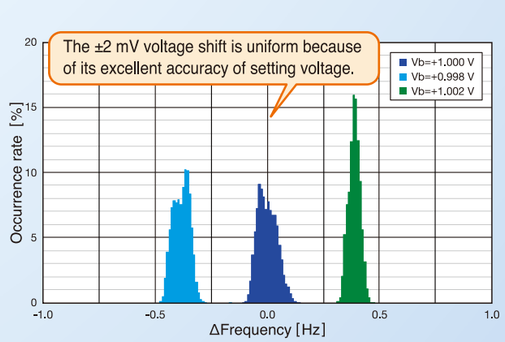
General reference voltage source





LP6016-01P





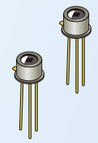
LP6016-01P can supply a stable voltage over time.
In the outgoing inspection, the accuracy of pass/fail judgment is improved, leading to improved yield.

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 volotage-to-current converter VI-309F1 capable of precise current output to configure a low-noise and stable LD driver.

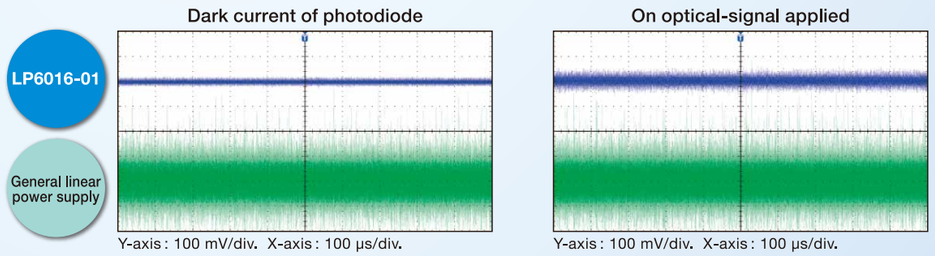


■Photodiode

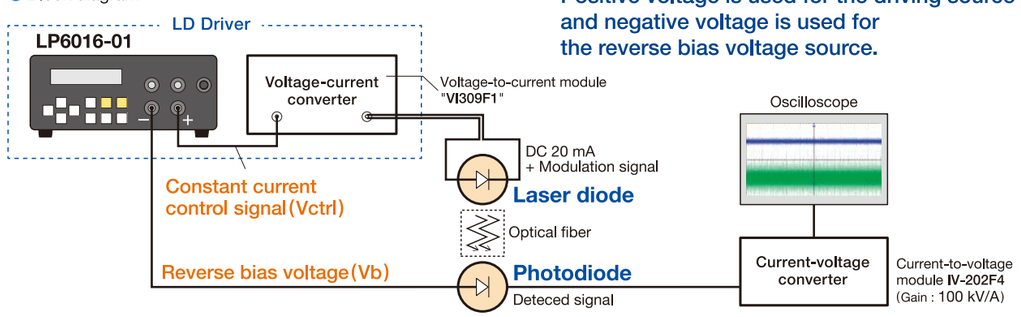
Photodiodes widely used as laser light receiving elements require a reverse bias voltage to increase sensitivity.
A high-sensitivity light detection requires a low-noise bias voltage source.

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.



● Block diagram

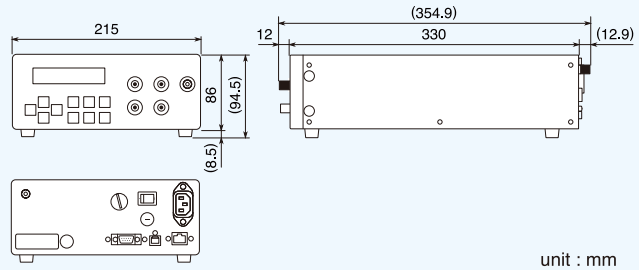


SPECIFICATIONS

		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 (I OutputI ≥ 1V, 0 to 50°C) ±100 mA (I OutputI < 1V, 0 to 40°C) ±90 mA (I OutputI < 1V, 40 to 50°C)	100 mA (I OutputI ≥ 1V, 0 to 50°C) 100 mA (I OutputI < 1V, 0 to 40°C) 90 mA (I OutputI < 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 V_{pk} (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 LP6016-01/LP6016-01P

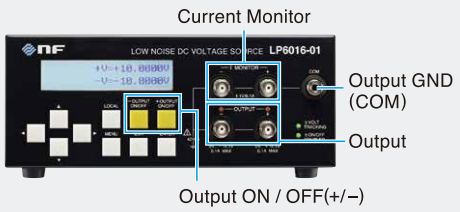


OPTIONS

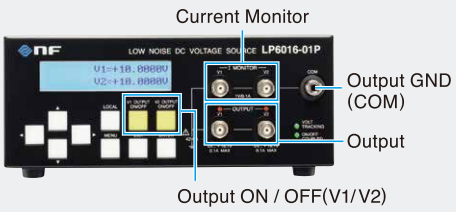
PA-001-3089 : **BNC-Binding Post Adapter**
PA-001-3230 : **Rack Mount Kit** (EIA, for 1 unit)
PA-001-3090 : **Rack Mount Kit** (EIA, for 2 units)
PA-001-3231 : **Rack Mount Kit** (JIS, for 1 unit)
PA-001-3091 : **Rack Mount Kit** (JIS, for 2 units)

[Front View]

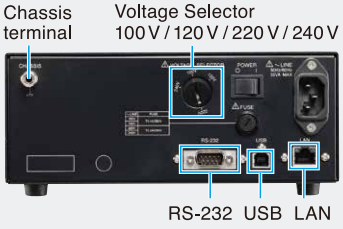
LP6016-01(plus/minus outputs)



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 specificaitons are subject to change without notice.
- Before urchase contact us to confirm the latest s ecifications, rice and deliver date.

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