SUGAWARA

Nano Pulse Light

Flash device for high-speed phenomenon analysis

A light shutter on the nanosecond level captures ultrafast phenomena.

Nano Pulse Light Strobodriver	NP-3A
Lamphouse	NPL-45
	NPL-75
	NPL-150
	NPL-180
Function Generator	FG-310

SUGAWARA Laboratories Inc.

Ultrahigh-Speed Stroboscope Nano Pulse Light

The Nano Pulse Light is a stroboscope that generates flashes of light of the world's shortest class flash duration of 45–180 nanoseconds (one billionth of 45–180 seconds).
It can be used to capture ultrafast phenomena and instantaneous states, which makes it effective for magnifying, observing, and imaging microscopic objects.

■Main features

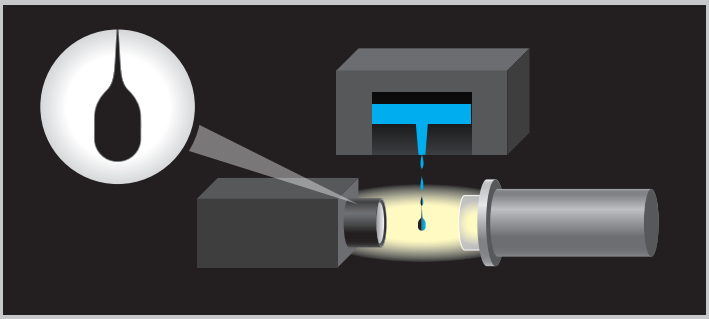
- Four models of the Lamphouses (45 nsec, 75 nsec, 150 nsec, and 180 nsec models) can be selected.
- The flash lamps are gas-sealing types that can be replaced with one-touch operation.
- The Lamphouse is compact and slim (ø 51 mm × 230 mm).

Gas-sealing typed flash lamp

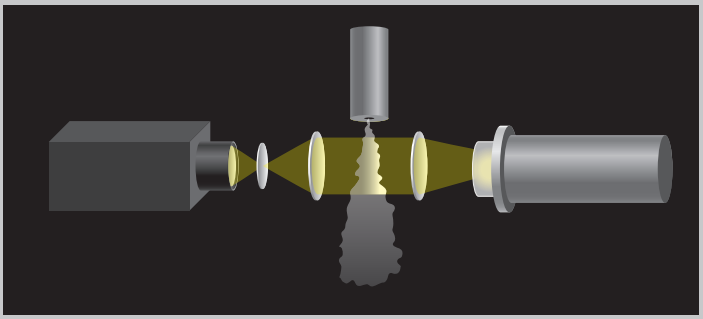
■Applications

- Observation of ink droplet flight in inkjet printers
- Study of "flow visualization" in gases, liquids, and shockwaves by schlieren method
- Observation of the condition of diamond grains fixed on high precision wire saw
- Inspection of micro solder balls used in semiconductor packages
- Observation of deformations or distortions in the blades of a high-speed turbine
- Used by universities and research institutions as a light source for capturing diverse types of ultrafast phenomena

Observation of ink droplet flight



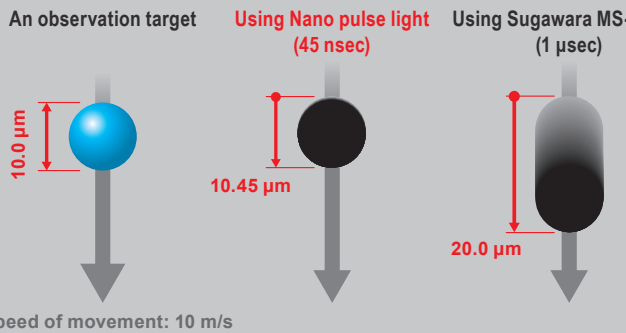
Observation of gas-injection by schlieren photography



■Advantages of ultra-short flashing

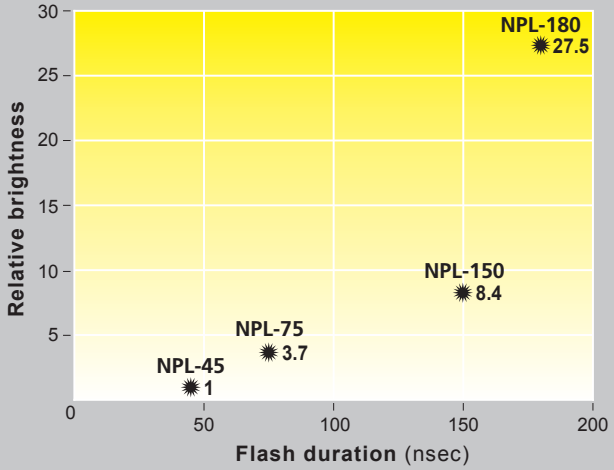
The Nano pulse light that emits flashes of light of extremely short duration is optimal for magnifying and imaging microscopic objects moving at highspeeds. For example, a blurred image obtained at a flash duration of 1 microsecond comes out sharp when using the Nano pulse light.

Imaging of an observation target (circular object) moving at 10 m/s



Speed of movement: 10 m/s

Relationship between flash duration and brightness



Lamphouse

NPL-45 NPL-75 NPL-150 NPL-180

■Specifications

Model	NPL-45	NPL-75	NPL-150	NPL-180
Flash duration (FWHM)	45 nsec	75 nsec	150 nsec	180 nsec
Max flash frequency	Continuous: 100 Hz	Continuous: 60 Hz 3 minutes: 100 Hz	Continuous: 100 Hz	Continuous: 50 Hz 3 minutes: 100 Hz
Flash lamp model	Argon Lamp AH-61KN		Xenon Lamp X-63KN	Xenon Lamp XH-63KN
Flash delay time (typical)	1 µsec			
Flash delay jitter (typical)	200 nsec		100 nsec	150 nsec
Dimensions & Weight	ø 51 (Flange ø 70) × 230 (D) mm, 1.2 kg			
Temperature & Humidity range	0–40°C, 20–80%RH (non-condensing)			

Lamphouse (with/without flange)

■Selection guide

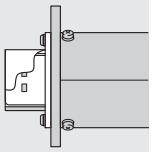
NPL - 45 -D -302
Model

Code	Lamp section	
None (standard)	With fixing flange / Use with protective lamp cover	(with interlock)
-F	Without fixing flange / Use with protective lamp cover	(with interlock)
-D	With fixing flange / Use without protective lamp cover	(without interlock)

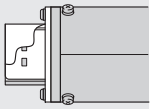
Code	Cable length
None (standard)	2 m
-302	3 m
-602	6 m
-103	10 m

●Lamp section

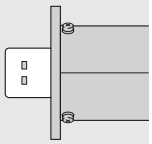
Standard type
With fixing flange



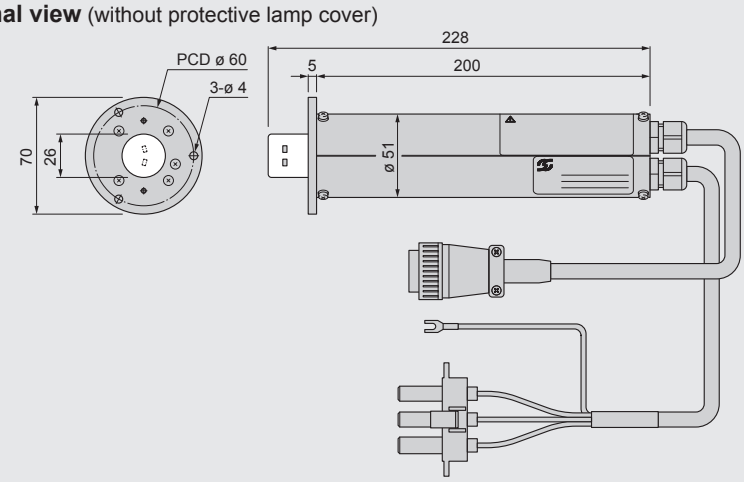
F type
Without fixing flange



D type
With fixing flange



●External view (without protective lamp cover)

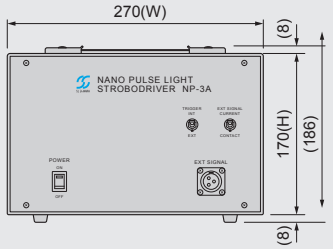


Nano Pulse Light Strobodriver

NP-3A

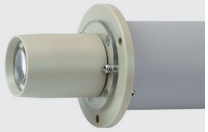
■Specifications

External trigger	Current signal	ON current: 8–15 mA, OFF current: 1 mA or less, Pulse width: 10 µsec–5 msec
	Open collector	Voltage between input terminals when ON: 1.5V or less, Pulse width: 10 µsec–5 msec Generated voltage at OFF: 5 V, Short-circuit current at ON: max 13 mA
Power supply		100–240 VAC, 50/60 Hz
Dimensions		270 mm (W) × 170 mm (H) × 190 mm (D)
Weight		4.1 kg



Accessories

Lens unit	1A1-029	Collecting lens (to be used with Standard and F type)
Tripod attachment	1S2-008	For attaching lamp body to camera tripod (1/4-20UNC)



Lens unit 1A1-029

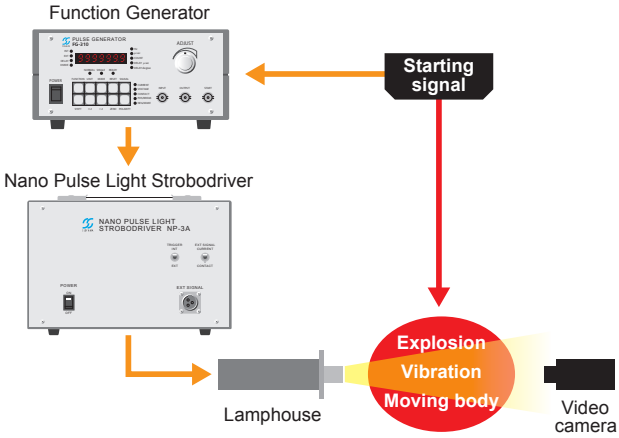
Function Generator

FG-310

The FG-310 integrates functions of signal generator, digital retarder, and preset counter. It enables precise adjustment of flash timing of the Stroboscopes and the Nano Pulse Lights in industrial optical inspection, multiple-exposure photography in physics experiments, and observation of high-speed motion.

■Applications

Target example Capture method	Signal operation	Settings in FG-310
Exploding phenomena Schlieren imaging	Set capture timing	Time delay: 10 nsec–1 sec
High-frequency vibration phenomena Photoelastic imaging	Set capture phase	Time delay: 10 nsec–1 sec
Microscopic high-speed moving bodies Photomicrography	Set frequency and number of captured images	Internal triggering: 1 Hz–1 MHz Number of preset pulses: 1–1,000



■Specifications

Internal oscillation	Cycle setting range	1 µsec–1 sec (1 Hz–1 MHz) Setting resolution: 10 nsec
	Number of preset pulses	1–1000 (or continuous)
	Pulse width	Duty cycle 50% of pulse cycle or less Minimum setting: 500 nsec Setting resolution: 10 nsec
External signal input	Current signal	Trigger edge: Rising edge or falling edge ON Current: 8–15 mA Input series resistor: 330 Ω Pulse width: 5 µsec or more
	Voltage signal	Signal level: 3–5 Vp Trigger edge: Rising edge or falling edge Input impedance: 1.5 kΩ Pulse width: 5 µsec or more
	Contact signal	Trigger edge: Make or break

External signal delay	Input signal cycle	50 µsec or more (20 kHz or less) Display resolution: 10 nsec
	Number of preset pulses	1–1000 (or continuous)
	Delay time	Less than the input signal cycle Setting resolution: 10 nsec
	Angle delay	0–359°, offset function available
External signal dividing	Input signal cycle	50 µsec or more (20 kHz or less) Display resolution: 10 nsec
	Dividing rate	1/1–1/1000
Output signal	Voltage signal	Signal level: 5 Vp, positive pulse Output series resistance: 47 Ω
Accuracy	Internal oscillation	±0.01% of setting
	Delay time	±0.005% of setting + 62.5 nsec + propagation delay time
Power supply		100–240 VAC, 50/60 Hz
Dimensions		215 mm (W) × 99 mm (H) × 250 mm (D)
Weight		2.7 kg

Danger

**The products use high voltages. Do not touch anything inside the unit.
Do not look directly at flash lamps while lit.
Read the instruction manual before using the device to ensure safety and to avoid damage to the device.**

Specifications are subject to change without prior notice for improvement.

Products: Xenon Flash, Torque Dynamometers, Bearing Inspection Systems, etc.

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