

The First Sensing Solution For The 21st Century
W.2000 PHOTOELECTRIC SENSORS



SICK

The fusion of state-of-the-art electronics

Visible Indicators

The three LED indicators for power (green), signal strength (red), and output status (yellow) are easy to identify. Optical light guides and prisms molded into the top cover allow true visibility from any angle, and from long distances. Imagine being able to see the indicators on a sensor while mounting a reflector, from 45 feet away!

Sealed Top

The cover on the W.2000 opens for easy access to timing functions, sensitivity adjustments, and a light/dark mode switch. The top cover was specially designed with a cantilever action and a "U" shaped gasket to provide a true watertight seal.

NEMA 6 / IP 67

All aspects of the W.2000 have been designed for harsh environments. The W.2000 handles washdown areas with ease. High-pressure washdown, immersion, cleaning agents, cutting fluids, and almost anything else you can imagine are no match for the W.2000.

A Wide Range of Options.....

The W.2000 series includes the WS/WE 2000 through beam sensors, the WL 2000 polarized reflex sensor, the WT 2000 energetic proximity sensor and the WLL 2000 fiber optic sensor. All models are available in DC or AC supply versions and have an alarm output. Models are also available with On and Off delay timing options.

Ultrasonic Welding

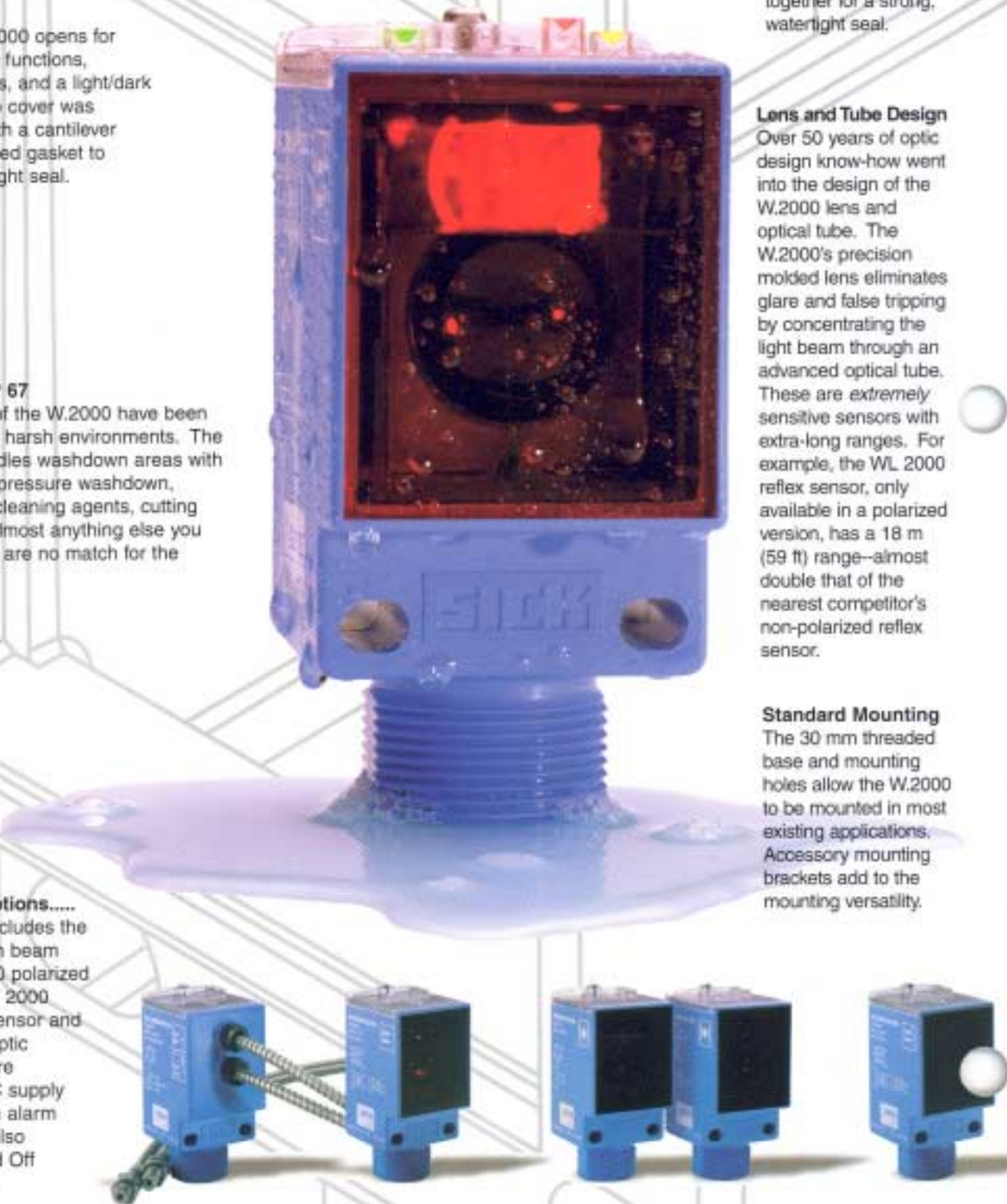
Where others use gaskets and screws or glue, the W.2000's front window is actually welded to the body. Ultrasonic sound waves melt the window and body together for a strong, watertight seal.

Lens and Tube Design

Over 50 years of optic design know-how went into the design of the W.2000 lens and optical tube. The W.2000's precision molded lens eliminates glare and false tripping by concentrating the light beam through an advanced optical tube. These are *extremely* sensitive sensors with extra-long ranges. For example, the WL 2000 reflex sensor, only available in a polarized version, has a 18 m (59 ft) range—almost double that of the nearest competitor's non-polarized reflex sensor.

Standard Mounting

The 30 mm threaded base and mounting holes allow the W.2000 to be mounted in most existing applications. Accessory mounting brackets add to the mounting versatility.



and the world's greatest optics.



Over/Under Lens

Common side-by-side lenses have an overlapping field of view making switch points dependent on the distance from the sensor (see Figure 1). The W.2000 with over/under lenses holds the same switch point regardless of the distance from the sensor (see Figure 2).



Figure 1



Figure 2

Any Connection You Need!

Whether you opt for the simplicity of a cable version or the flexibility of a quick-disconnect version, the W.2000 series meets your needs. All models are available with built-in cables. An M12 Quick Disconnect on DC versions and a Mini Quick Disconnect on AC versions are optional.



Cutting Edge Advances

SICK has developed a custom ASIC (application specific integrated circuit) for photoelectric sensors. The ASIC has two sections: an analog amplifier section for superior sensitivity, and a digital section which provides the W.2000 with unique features including crosstalk avoidance and immunity to high frequency lighting.



Crosstalk Avoidance

In many applications, photoelectric devices need to be mounted near each other. Light emitted from one sensor that confuses another sensor is known as crosstalk. The W.2000 with SICK's custom ASIC has built-in logic to avoid crosstalking. Light modulation is shifted on the fly so that no switch settings or different models are required.

High Frequency Lighting

Increasingly, high frequency lights are being installed on the factory floor. These new lights operate at such high frequencies, they confuse traditional photoelectric sensors. The advanced digital signal processing of SICK's custom ASIC provides immunity to these high frequency lights.

WS/AWE

50 m

- ▶ Blinking LED signal strength indicator with alarm output to warn of alignment or dirt problems
- ▶ Test Input for testing system
- ▶ Sensitivity adjustment
- ▶ Selectable time delays
- ▶ Immune to ambient light



Max. Range @ Excess Gain 1 50 m (164 ft)

Light Spot Size Approximately 320 mm @ 14 m (12.5 in @ 45.9 ft)

Light Source LED Infrared, average service life 100,000 hours @ 25°C (77°F)

WT

3.5 m

- ▶ Energetic proximity sensor
- ▶ Blinking LED signal strength indicator with alarm output to warn of alignment or dirt problems
- ▶ Adjustable sensing range
- ▶ Selectable time delays
- ▶ Immune to ambient light
- ▶ Crosstalk avoidance allows two sensors to be mounted side-by-side



Sensing Range • Adjustable 3.5 m (11.5 ft)

Light Spot Size Approximately 55 mm @ 2.5 m (2.2 in @ 8.2 ft)

Light Source LED Infrared, average service life 50,000 hours @ 25°C (77°F)

WLL



18 m

- ▶ Polarizing filters reject false readings
- ▶ Red light for easy alignment
- ▶ Blinking LED signal strength indicator with alarm output to warn of alignment or dirt problems
- ▶ Selectable time delays
- ▶ Immune to ambient light
- ▶ Crosstalk avoidance allows two sensors to be mounted side-by-side



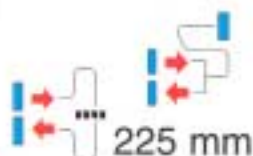
Max. Range @ Excess Gain 1 with PL 80A 18 m (59 ft)

Typ. Range with PL 80A 15 m (49.2 ft)

Light Spot Size Approximately 320 mm @ 14 m (12.5 in @ 45.9 ft)

Light Source LED Red, average service life 100,000 hours @ 25°C (77°F)

WLL



1 m

- ▶ Compatible with all industry standard plastic and glass fibers.
- ▶ Red light for easy alignment
- ▶ Blinking LED signal strength indicator with alarm output to warn of alignment or dirt problems
- ▶ Sensitivity adjustment
- ▶ Selectable time delays
- ▶ Immune to ambient light
- ▶ Crosstalk avoidance allows two sensors to be mounted side-by-side



Max. Range @ Excess Gain 1 Dependent on fiber

Light Spot Size Dependent on fiber

Light Source LED Red, average service life 100,000 hours @ 25°C (77°F)

Product Specifications

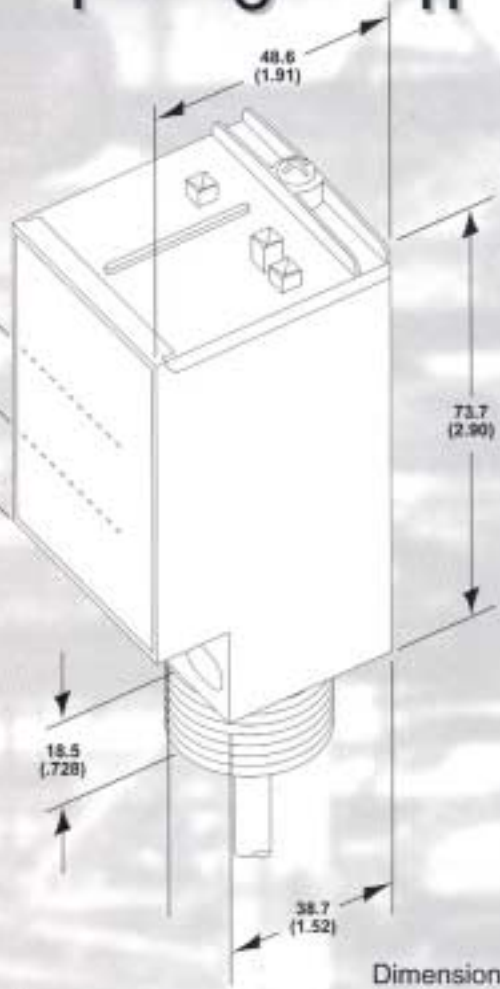
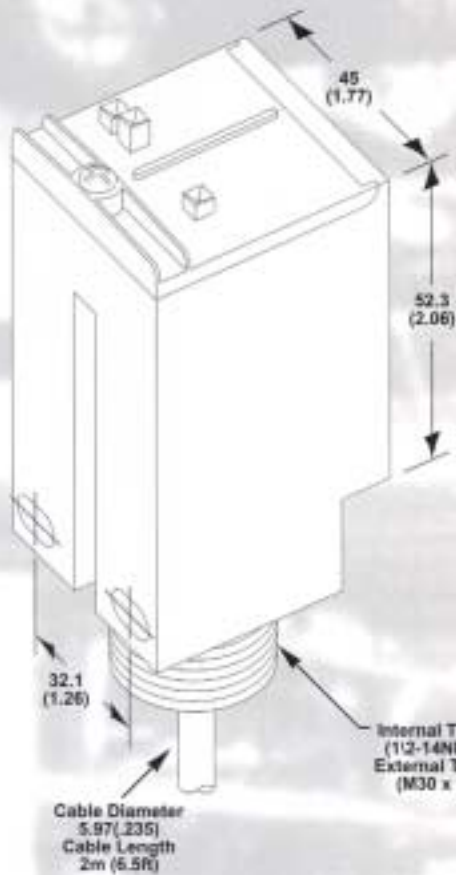
DC Versions

AC Versions

External Light Immunity	Immune to high frequency lights via SICK Opto-Electronic custom ASIC	
Response Time/Frequency	< 1 ms / 500 Hz	< 10 ms / 10 Hz
Supply Voltage	10...30 V DC (limit values)	90...240 V AC (limit values)
Current/Power Consumption (no load)	80 mA	6 watts
Ripple (within V_{ce} Tolerance)	>12 V @ 24 V	n/a
Output Type	PNP and NPN complementary outputs	Relay, SPDT isolated
Output Voltage High	PNP: $V_{ce} - (< 2 V)$ NPN: approx. V_{ce}	n/a
Output Voltage Low	PNP: approx. 0 V NPN: < 2 V	n/a
Output Current Max.	100 mA	n/a
Switching Voltage Max.	n/a	265 V
Switching Current Max.	n/a	3 A
Operation Mode	Light or dark switching selectable via switch	
Connection Type	Cable or M12 5-pin connector	Cable or Mini 5-pin connector
Connecting Cable	PVC, 2 m, 5 x 20 AWG	
Housing	Glass fiber reinforced ABS plastic	
Enclosure Rating	IP 67, NEMA 6	
VDE Protection Class	II Double Insulated	
Circuit Protection	Short circuit protected, V_{ce} reverse polarity protected	n/a
Alarm Output	PNP, static, 100 mA max	n/a
Timing Options	No delays, Off delays, or On and Off delays	
Time Settings	0, 5, 10, 20 or 50 ms	0, 1, 5, 10 or 14 s
Ambient Operating Temperature	-25...40°C (-13...104°F)	
Storage Temperature	-40...70°C (-40...158°F)	
Weight	approx. 150 g (5.3 oz)	

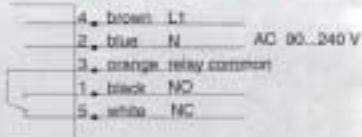


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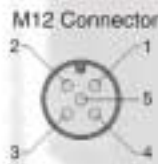
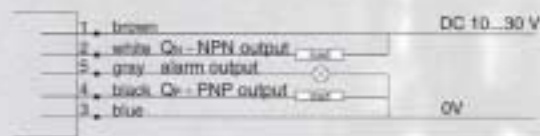


Dimensions in mm (in)

WL, WT, WLL • AC

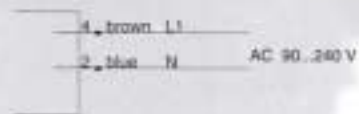


WL, WT, WLL • DC

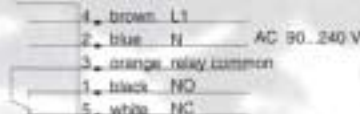


WS/WE • AC

Sender



Receiver

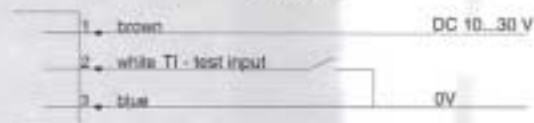


Mini Connector

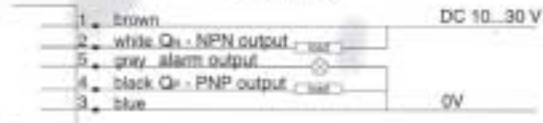


WS/WE • DC

Sender



Receiver



M12 Connector



Ordering Information

DC AC Cable M-12 Mini Off Delays On/Off Delays

	DC	AC	Cable	M-12	Mini	Off Delays	On/Off Delays		
THROUGH BEAM	WS/WE 2000-B1102	*		*				7 023 173	
	WS/WE 2000-B1122	*		*			*	7 023 174	
	WS/WE 2000-B5100	*			*			7 023 176	
	WS/WE 2000-B5120	*			*		*	7 023 178	
	WS/WE 2000-R1102		*	*				7 023 179	
	WS/WE 2000-R1122		*	*			*	7 023 180	
	WS/WE 2000-R5100		*			*		7 023 182	
	WS/WE 2000-R5120		*			*	*	7 023 184	
REFLEX	WL 2000-B1302	*		*				7 023 044	
	WL 2000-B1312	*		*		*		7 023 045	
	WL 2000-B1322	*		*			*	7 023 046	
	WL 2000-B5300	*			*			7 023 047	
	WL 2000-B5310	*			*		*	7 023 048	
	WL 2000-B5320	*			*		*	7 023 049	
	WL 2000-R1302		*	*				7 023 050	
	WL 2000-R1312		*	*			*	7 023 051	
	WL 2000-R1322		*	*			*	7 023 052	
	WL 2000-R5300		*			*		7 023 053	
	WL 2000-R5310		*			*	*	7 023 054	
	WL 2000-R5320		*			*	*	7 023 055	
	PROXIMITY	WT 2000-B1102	*		*				7 023 056
		WT 2000-B1112	*		*		*		7 023 057
WT 2000-B1122		*		*			*	7 023 058	
WT 2000-B5100		*			*			7 023 059	
WT 2000-B5110		*			*		*	7 023 060	
WT 2000-B5120		*			*		*	7 023 061	
WT 2000-R1102			*	*				7 023 062	
WT 2000-R1112			*	*			*	7 023 063	
WT 2000-R1122			*	*			*	7 023 064	
WT 2000-R5100			*			*		7 023 065	
WT 2000-R5110			*			*	*	7 023 066	
WT 2000-R5120			*			*	*	7 023 067	
FIBER OPTIC	WLL 2000-B1302	*		*				7 023 068	
	WLL 2000-B1312	*		*		*		7 023 069	
	WLL 2000-B1322	*		*			*	7 023 070	
	WLL 2000-B5300	*			*			7 023 071	
	WLL 2000-B5310	*			*		*	7 023 072	
	WLL 2000-B5320	*			*		*	7 023 073	
	WLL 2000-R1302		*	*				7 023 074	
	WLL 2000-R1312		*	*			*	7 023 075	
	WLL 2000-R1322		*	*			*	7 023 076	
	WLL 2000-R5300		*			*		7 023 077	
	WLL 2000-R5310		*			*	*	7 023 078	
WLL 2000-R5320		*			*	*	7 023 079		

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