

# Installation Instructions—PHOTOSWITCH® Series 9000 Darkroom Photoelectric Sensors

All Sensors	Standard Diffuse	Retroreflective	Fiber Optic Infrared Glass	Transmitted Beam	
				Source ❶	Receiver
1	Sensing Distance	0.91m (3ft)	—	Depends on Fiber Optic selected	30m (100ft)
	78mm(3in) Reflector	—	9.1m (30ft)	—	—
	32mm(1.25in) Reflector	—	3.6m (12ft)	—	—
	16mm(0.625in) Reflector	—	3m (10ft)	—	—
2	Field of View	3.5°	1.5°	Depends on Fiber Optic selected	1.5°
3	Transmitting LED	Infrared 940nm			
4	Indicators	Yellow: Power, Green: Output, and Red: Margin (steady)/Short-Circuit Protection (flashing)			
5	Sensitivity Adjustment	Single-Turn Potentiometer			
6	Operating Temperature	0°C to +70°C (0°F to +158°F)			
7	Relative Humidity	5% to 95%			
8	Housing/Lens Material	Valox®/Acrylic			
9	Operating Environment	NEMA 3, 4X, 6P, 12, 13, IP67			
10	Approvals	UL listed, c-UL certified, and CE marked for all applicable directives			
11	Protections	All Versions: False Pulse, Solid State: Reverse Polarity, DC Versions: Short Circuit and Overload			
12	Vibration	10-55 Hz, 1 mm amplitude, Meets or exceeds IEC 947-5-2			
13	Shock	30G with 1 ms pulse duration, Meets or exceeds IEC 947-5-2			

## 10-40V DC Sensors—NPN and PNP

14	Catalog Number—2m 300V cable	42KRP-9000	42KRU-9000	42KRF-9000	42KRL-9000	42KRR-9000
	Catalog Number—4-pin DC micro QD	42KRP-9000-QD	42KRU-9000-QD	42KRF-9000-QD	42KRL-9000-QD	42KRR-9000-QD
15	Supply Current	30mA			15mA	25mA
16	Output Energized	Light/Dark Selectable			—	Light/Dark Selectable
17	Load Current	250mA			—	250mA
18	Leakage Current	10µA			—	10µA
19	Power Consumption	2.0 watts max				
20	Response Time	2ms			—	5ms

## 70-264V DC / 60-264V AC Sensors—SPDT EM Relay

14	Catalog Number—2m 300V cable	42KRP-9002	42KRU-9002	42KRF-9002	42KRL-9002	42KRR-9002
	Catalog Number—5-pin mini QD	42KRP-9002-QD	42KRU-9002-QD	42KRF-9002-QD	—	42KRR-9002-QD
	Catalog Number—4-pin mini QD	—			42KRL-9002-QD	—
15	Supply Current	15mA				10mA
16	Output Energized	Light/Dark Selectable			—	Light/Dark Selectable
17	Load Current	2A/132V AC, 1A/264V AC, 1A/150V DC			—	2A/132V AC, 1A/264V AC, 1A/150V DC
18	Leakage Current	—				
19	Power Consumption	4VA max				
20	Response Time	15ms			—	23ms

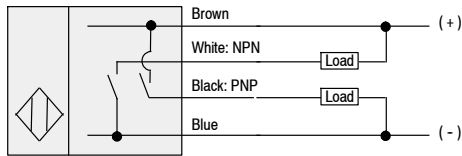
❶ Transmitted Beam Source rated 10-264V AC/DC.

English	Français	Italiano	Deutsch	Español	Português	
<b>Operating Distance Selection</b> The maximum operating distance is based on installing the sensor in a relatively clean environment. Normal industrial environments actually range from moderately dusty to extremely dirty. Greater operating margin may be required which can be obtained by reducing the operating distance of the control.	<b>Choix de la Distance de Fonctionnement</b> La distance maximale de fonctionnement dépend de la propreté relative de l'environnement d'installation de la cellule. A vrai dire, les environnements industriels normaux vont de modérément poussiéreux à extrêmement sales. Une marge d'opération plus grande peut être nécessaire et s'obtient en réduisant la distance opérationnelle du contrôle.	<b>Selezione Distanza Operativa</b> La massima distanza di funzionamento si basa sull'installazione del sensore in un ambiente relativamente pulito. Gli ambienti industriali normali vanno in verità da moderatamente polverosi a estremamente sporchi. Potrebbe essere necessario un margine di funzionamento superiore che si può ottenere riducendo la distanza operativa del controllo.	<b>Wahl der Reichweite</b> Die maximale Reichweite basiert auf einer Installation des Sensors in einer relativ sauberen Umgebung. Normale industrielle Umgebungen sind zumeist jedoch relativ staubig bis äußerst verschmutzt. In diesem Fall ist eine größere Betriebsmarge erforderlich, die durch einen geringeren Abstand erzielt werden kann.	<b>Selección de Distancia de Operación</b> La distancia máxima de operación se basa en la instalación del sensor en un ambiente relativamente limpio. Los ambientes industriales normales fluctúan entre moderadamente polvorosos a extremadamente sucios. Es posible que se requiera un margen de operación mayor, el cual puede obtenerse reduciendo la distancia operativa del control.	<b>Seleção do Alcance</b> O alcance máximo é baseado na instalação do detector em ambiente relativamente limpo. Os ambientes industriais normais efetivamente apresentam condições entre moderadamente empoeirados e extremamente sujos. Poderá ser exigida uma maior margem de operação, que pode ser obtida pela redução do alcance do controle.	
<b>Indicators</b> Yellow: Power Green: Output Red: Margin (steady)/SCP (flashing)	<b>Indicateurs</b> Jaune: alimentation Vert: Sortie Rouge: Marge (régulière)/SCP (clignotant)	<b>Indicatori</b> Giallo: Alimentato Verde: Uscita Rosso: Margine (costante)/SCP (lampeggiante)	<b>Leuchtanzeigen</b> Gelb: Versorgungsspannung Grün: Schaltausgang Rot: Funktionsreserve (unveränderlich)/ Kurzschluss-Schutz (Blinklicht)	<b>Indicadores</b> Amarillo: Alimentación Verde: Salida Rojo: Margen (constante)/SCP (parpadeando)	<b>Indicadores</b> Amarlo: alimentação Verde: Saída Vermelho: margem (constante)/SCP (piscamento)	
Single-Turn Potentiometer	Simple-gängiges le potentiomètre	Singolo-tours il potenziometro	Einzel-drehen Sie Potentiometer	Solo-dé vuelta al Potenciómetro	Único-gire o Potenciômetro	
UL listed, c-UL certified, and CE marked for all applicable directives	Listés UL, homologué c-UL, et marqués CE en conformité avec toutes les directives applicables.	Elencato UL, certificato c-UL, e marcato CE per tutte le direttive applicabili	UL-Eintragung, c-UL-Zertifikat, und CE-Kennzeichnung nach allen anwendbaren Richtlinien	Certificados c-UL, listado UL, y marca CE	Certificado c-UL, listado por UL, e marcado com CE segundo diretrizes aplicáveis	
10-55Hz, 1mm Amplitude, meets or exceeds IEC 947-5-2	10-55Hz, 1mm Amplitude, erfüllt oder übertrifft IEC 947-5-2	10-55Hz, amplitudine 1mm, conforme ou superiore à la norme CEI 947-5-2	10-55Hz, 1mm di ampiezza, soddisfa o supera le IEC 947-5-2	10-55Hz, 1mm de amplitud, satisfice o supera IEC 947-5-2	10-55Hz, 1mm de amplitude, atende ou excede a norma IEC 947-5-2	
30G with 1ms pulse duration	30G bei 1ms Pulsdauer	30G avec durée d'impulsion de 1ms	30G con durata impulso 1ms	30G con una duración de pulso de 1 ms	30G com duração de pulso de 1ms	
All Versions: False Pulse	Toutes versions: fausse impulsion	Tutte le Versioni: Falsi Impulsi	Alle Modelle: Einschaltimpulschutz	Todas las versiones: Pulsos en Falso	Todas as versões: pulso falsoversões	
Solid State Output Versions: Reverse Polarity	Versions sortie à semi-conducteur; Inversion de polarité	Versione con Uscita a Stato Solido: Inversione di Polarità	Ausführungen mit Halbleiterausgang: Verpolungsschutz	Saída Tipo Estado Sólido: Polaridad Invertida	Versão saída em estado sólido: Polaridade invertida	
DC Versions: Short Circuit and Overload	Versions c.c.: Protection contre et surcharges	Versioni in CC: Corto Circuito e Sovraccarichi	DC-Modelle: Kurzschluss-Schutz und Überlastschutz	Versões de CC: Cortocircuitos y Sobrecargas	Versões CC: Curto Circuito e Sobrecarga	
Light/Dark Selectable	Eclairment/déséclairage sélectionnable	Selezionabile chiaro/scuro	Hell-/Dunkel-Schaltung wählbar	Seleccionable Luz/Oscuridad	Selecionável luz/sombra	
SPDT EM Relay	Relais EM unipolaire NO/NF	Relé SPDT EM	SPDT EM Relais	Relé SPDT EM	relé EM SPDT	
Solid State Isolated N.O.	A semi-conducteur isolée N.O.	Uscita a Stato Solido N.O. Isolato	Halbleiterausgang (MOSFET)	Aislada de Estado Sólido N.A.	estado sólido, isolada, N.A.	
Standard Diffuse	Proximité standard	Taster	Lichttaster	Difuso Normal	Feixe difuso-reflexivo	
Long Range Diffuse	Proximité longue portée	Taster per lunghe distanze	Lichttaster mit grosser Tastweite	Difuso de Margen Largo	Feixe Difuso-Reflexivo de Longo Alcance	
Retroreflective	Réflexe	Retroflessivo	Reflexionslichtschranke	Retroreflectivo	Feixe Retro-Refletido	
Polarized Retroreflective	Réflexe polarisé	Retroflessivo polarizzato	Reflexionslichtschranke, polarisiert	Retroreflectivo polarizado	Feixe Retro-Refletido, Luz Polarizada	
Transmitted Beam Receiver	Récepteur de faisceaux transmis	Ricevitore raggio trasmesso	Einweglichtschranke, Empfänger	Receptor de rayos transmitidos	Feixe Transmitido, Receptor	
Transmitted Beam Source	Émetteur de transmission de faisceaux	Sorgenti raggi trasmessi	Einweglichtschranke, Sender	Fuentes de rayos transmitidos	Feixe Transmitido, Emissor	
Fiber Optic—Visible Red	Fibre optique—rouge visible	Fibra ottica—rosso visibile	Lichtleiter—f. sichtbar. Rotlicht	Fibra Óptica—Rojo Visible	Fibra Óptica—Vermelha Visível	
Fiber Optic—Infrared	Fibre optique—infrarouge	Fibra ottica—infrarosso	Lichtleiter—f. Infrarotlicht	Fibra Óptica—Infrarrojo	Fibra Óptica—Infravermelha	
Wiring Diagrams	Schémas de câblage	Schema Collegamenti	Anschluss-Schema	Diagramas de Cableado	Diagramas de Conexão	
Cable Version	Version de câble	Versione Cavo	Kabelaufführung	Versión de Cable	Versão pré-cabeada	
Micro Quick-Disconnect	Connecteur micro M12	Connettore Micro M12	Mikro-Steckverbinder	Conector Micro	Versão micro-desconexão rápida (QD)	
Mini Quick-Disconnect	Connecteur mini	Connettore Mini 7/8"	Mini-Steckverbinder	Conector Mini	Mini Q.D. (Desconexão Rápida)	
Typical Response Curve	Courbe de réponse	Curva di risposta	Diagramm. Relative Empfangs-Lichtstärke / Reich-/Tastweite	Curva de Respuesta Típica	Curva de resposta típica	
Operating Margin	Marge de fonctionnement	Margine operativo	Funktionsreserve	Margen Operativo	Margem	
Dimensions	Encombrements	Dimensioni	Abmessungen	Dimensiones	Dimensões	
Accessories	Accessoires	Accessori	Zubehör	Accesorios	Accesórios	
1	Sensing Distance	Distance de Détection	Distanza di Rilevamento	Reichweite	Dispositivo Sensor	Alcance
	Reflector	Réfecteur	Riflettore	Reflektor	Reflector	Refletor
2	Field of View	Angle de Visée	Campo di Visione	Sichtbereich	Campo de Visión	Campo de Visão
3	Transmitting (LED)	LED de Transmission	LED di Trasmissione	Lichtquelle (LED)	LED de Transmisión	LED de Transmissão
4	Indicators	Indicateurs	Indicatori	Anzeigen	Indicadores	Indicadores
5	Sensitivity Adjustment	Réglage de Sensibilité	Regolazione di Sensibilità	Empfindlichkeitseinstellung	Ajuste de Sensibilidad	Sensibilidade
6	Operating Temperature	Température de Fonctionnement	Temperatura di Funzionamento	Betriebstemperatur	Temperatura de Operación	Temperatura de Operação
7	Relative Humidity	Humidité Relative	Umidità Relativa	Relative Luftfeuchtigkeit	Humedad Relativa	Umidade Relativa
8	Housing/Lens Material	Matériaux du Boîtier/du Couvrecle/des Lentilles	Materiale dell'Involucro/per la Copertura/delle Lenti	Gehäusematerial/Werkstoff der Abdeckung/Linsenmaterial	Material del Alojamiento/de la Cubierta/del Lente	Material da Caixa/Tampa/Lente
9	Operating Environment	Environnement Opérationnel	Ambiente Operativo	Betriebsumgebung	Ambiente de Operación	Ambiente de Operação
10	Approvals	Homologations	Approvazioni	Approbation	Aprobaciones	Aprovações
11	Protections	Protections	Protezioni	Schutzart	Protecciones	Proteções
12	Vibration	Vibration	Vibrazione	Vibration	Vibración	Vibração
13	Shock	Choc	Urto	Schock	Impacto	Choque
14	Catalog Number	Référence de Commande	Numero di Catalogo	Bestellnummer	Número de Catálogo	Código de Catálogo
15	Supply Current	Intensité d'Alimentation	Corrente di Alimentazione	Versorgungsstrom	Corriente Suministrada	Corrente de Alimentação
16	Output Energized	Sortie activée	Uscita	Ausgang aktiviert	Salida Activada	Saída comutada
17	Load Current	Courant de Charge	Corrente di Carico	Laststrom	Corriente de Carga	Corrente de Carga
18	Leakage Current	Courant de Fuite	Corrente di Dispersione	Ruhestrom	Corriente de Fuga	Corrente de Fuga
19	Power Consumption	Consommation	Consumo Potenza	Leistungsaufnahme	Consumo de Alimentación eléctrica	Consumo de Energia
20	Response Time	Temps de Réponse	Tempo di Risposta	Ansprechzeit	Tiempo de Respuesta	Tempo de Resposta

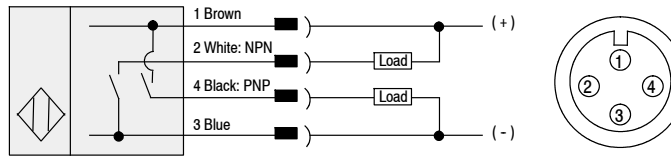
# Wiring Diagrams

## All Models Except Transmitted Beam Source

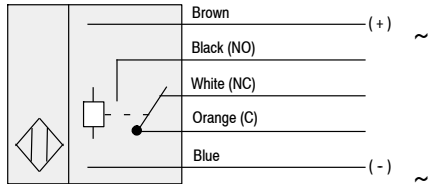
### Cable Model: 9000



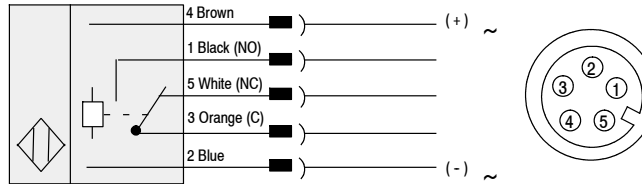
### DC Micro (M12) QD Model: 9000-QD



### Cable Model: 9002

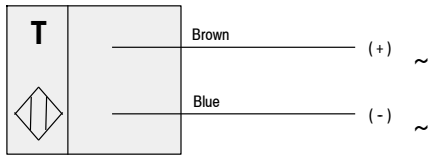


### AC/DC Mini QD Model: 9002-QD

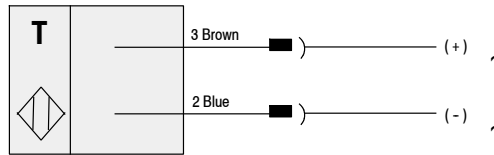


## Transmitted Beam Source

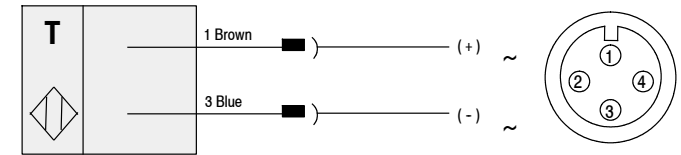
### Cable Model: 42KRL-900\_



### AC/DC Mini QD Model: 42KRL-9002-QD



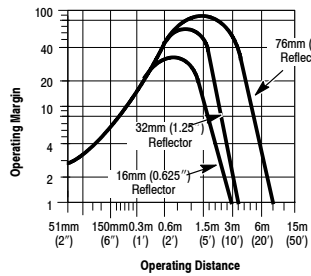
### DC Micro QD Model: 42KRL-90\_0-QD



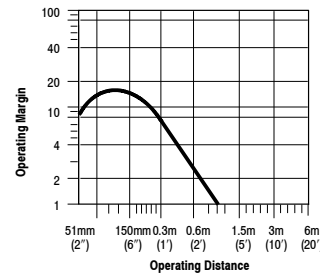
**Note:** Details regarding connection of Allen-Bradley Series 9000 photoelectric sensors to many Allen-Bradley Programmable Controllers can be found in Publication 42GR-7.4. All wire colors shown refer to Allen-Bradley quick-disconnect cables.

## Darkroom Typical Response Curves

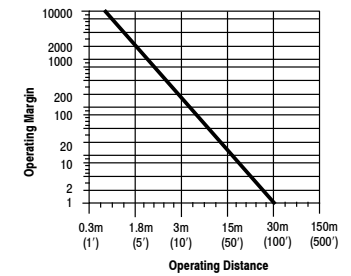
### Retroreflective



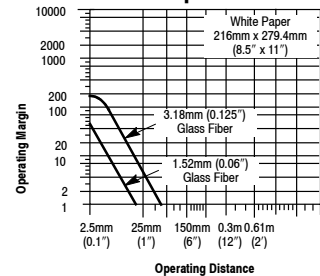
### Standard Diffuse



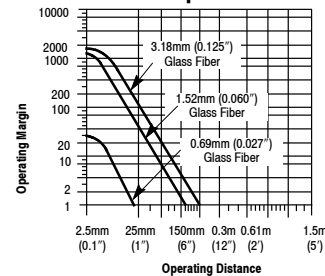
### Transmitted Beam



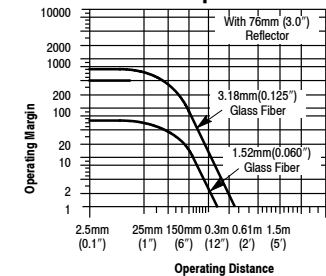
### Infrared Glass Fiber Optic—Standard Diffuse



### Infrared Glass Fiber Optic—Transmitted Beam

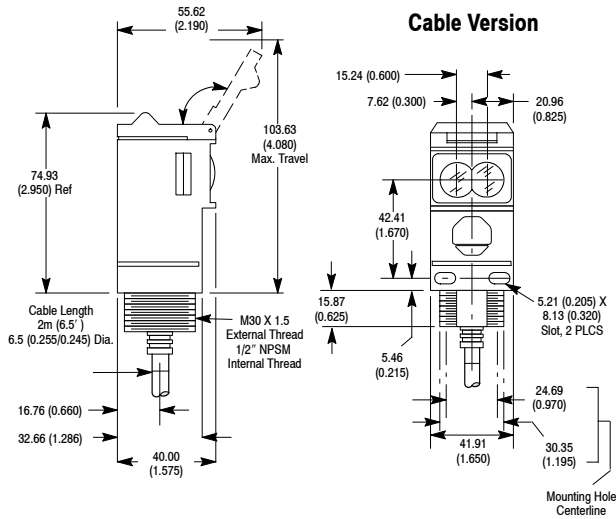


### Infrared Glass Fiber Optic—Retroreflective

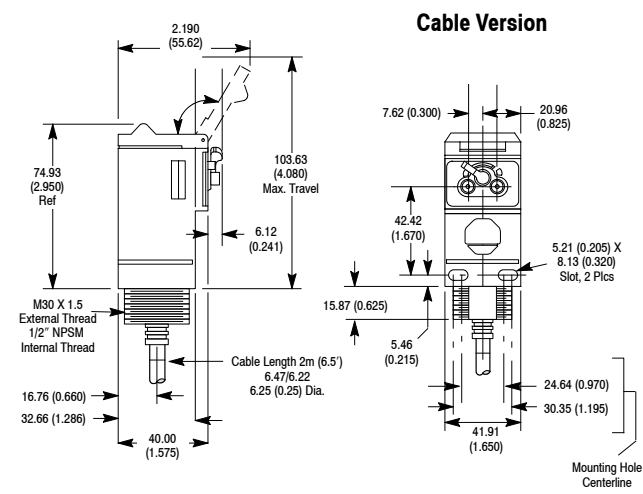


## Dimensions—mm (inches)

### All Versions Except Fiber Optic

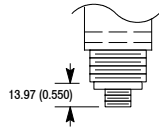


### Fiber Optic



### Connector Version

#### Micro Style



#### Mini Style



### Thread Size

	AC	DC
Micro Style	1/2-20 UNF 2 Keyways	M12 x 1 1 Keyway
Mini Style	7/8-16 UN 1 Keyway	

### Torx Replacement Screw Kit #129-135

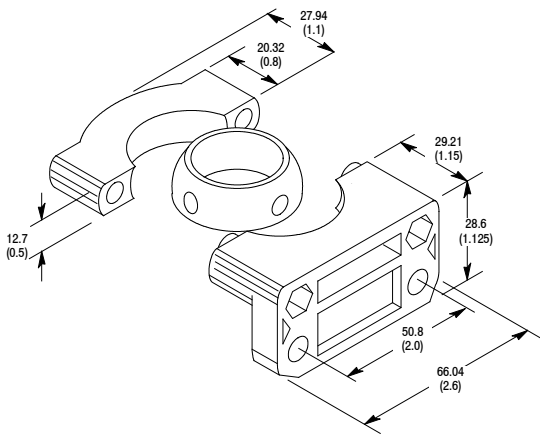
Kit consists of 25 torx screws to replace standard screw that holds down the cover on the Series 9000 and 10,000 sensors. Torx screws deter casual tampering by requiring a torx screwdriver #T8 to remove them.



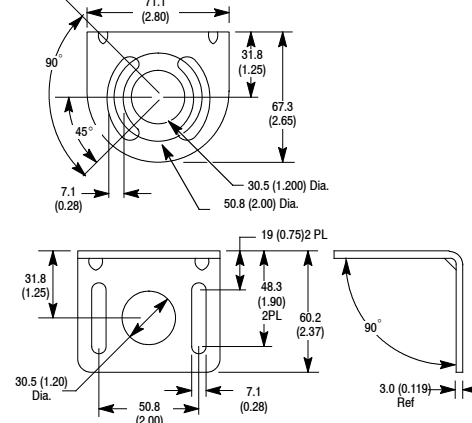
Screwdriver with torx head to be used with torx replacement screw kit 129-135.

## Accessories—mm (inches)

### Swivel/Tilt Mounting Assembly #60-2439



### Universal Mounting Assembly #60-2421



### 360° Rotation Mounting Assembly #60-2513

