chanhvinh.com

T18-2 Epoxy Encapsulated Right-Angle Sensor

Original Instructions
p/n: 201875 Rev. F
25-Jun-26
© Banner Engineering Corp. All rights reserved. www.bannerengineering.com

chanhvinh.com

Contents

Chapter 1 Features 3
Models 3
Specifications 6
Performance Curves 7
Dimensions 9

Chapter 2 Installing the T18-2 Epoxy Encapsulated Right-Angle Sensor 11
Wiring Diagrams 11

Chapter 3 Accessories 12
Cordsets 12
Apertures 12
Brackets 13
Reflectors 14

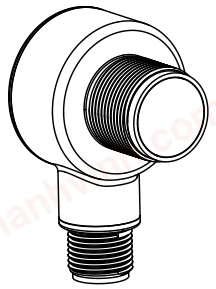
Chapter 4 Product Support and Maintenance 16
Clean Sensor with Compressed Air Then Isopropyl Alcohol 16
Repairs and Translations (No Field-Replaceable Parts) 16
Discontinued Models 18
Contact Us 20
Banner Engineering Corp Limited Warranty 20

© Banner Engineering Corp. All rights reserved. www.bannerengineering.com

chanhvinh.com

Chapter 1 Features

Next Generation of Self-Contained DC-Operated Sensors



- Complete family of sensors, all housed in the compact right angle 18 mm threaded housing designed for long service life in wet environments
- ECO-Lab certified chemically robust epoxy encapsulated plastic sensors for wash-down applications typically found in the food and beverage industry
- Epoxy encapsulation of electronics provides a redundant seal in addition to plastic ultrasonic weld joints for maximum reliability in wet thermal shock environments
- Permanent laser-etched product marking will not wear off after repeated cleaning cycles
- Food-grade plastic materials used for all exposed surfaces
- Hygienic shape for easier cleaning of the sensor
- Powerful and bright visible red emitter beam for easy alignment and set-up
- Highly visible output and dual-function power and stability indicators
- Advanced ASIC technology makes the sensor resistant to optical and electrical noise sources
- Wide operating temperature range: –40 °C to +70 °C (–40 °F to +158 °F)

WARNING:

- **Do not use this device for personnel protection**
- Using this device for personnel protection could result in serious injury or death.
- This device does not include the self-checking redundant circuitry necessary to allow its use in personnel safety applications. A device failure or malfunction can cause either an energized (on) or de-energized (off) output condition.

Models

Models with a quick disconnect require a mating cordset.

Emitter models

Visible Red Models	Sensor	Range	Output	Connection
T18-2NAEL-Q8	Visible red	25 m (82 ft)	None	4-pin M12 male quick disconnect
T18-2NAEL-2M				2 m (6.5 ft) cable
T18-2NAEL-9M				9 m (30 ft) cable
T18-2NAELIR-Q8	Infrared			4-pin M12 male quick disconnect
T18-2NAELIR-2M				2 m (6.5 ft) cable
T18-2NAEJ-Q8	Visible red	25 m (82 ft) with beam inhibit		4-pin M12 male quick disconnect
T18-2NAEJ-2M				2 m (6.5 ft) cable
T18-2NAEJ-9M				9 m (30 ft) cable
T18-2NAES-Q8	Visible red	25 m (82 ft) with adjustment		4-pin M12 male quick disconnect
T18-2NAES-2M				2 m (6.5 ft) cable

Receiver models

Model	Range	Output	Connection
T18-2VNRL-Q8	25 m (82 ft)	Complementary NPN	4-pin M12 male quick disconnect

Continued on page 4

© Banner Engineering Corp. All rights reserved.
www.bannerengineering.com

chanhvinh.com

Continued from page 3

Model	Range	Output	Connection
T18-2VNRL-2M		Complementary NPN	2 m (6.5 ft) cable
T18-2VNRL-9M		Complementary NPN	9 m (30 ft) cable
T18-2VPRL-Q8		Complementary PNP	4-pin M12 male quick disconnect
T18-2VPRL-2M		Complementary PNP	2 m (6.5 ft) cable
T18-2VPRL-9M		Complementary PNP	9 m (30 ft) cable
T18-2VNRS-Q8	25 m (82 ft) with adjustment	Complementary NPN	4-pin M12 male quick disconnect
T18-2VNRS-2M		Complementary NPN	2 m (6.5 ft) cable
T18-2VPRS-Q8		Complementary PNP	4-pin M12 male quick disconnect
T18-2VPRS-2M		Complementary PNP	2 m (6.5 ft) cable

Polarized retroreflective models

Model	Range	Output	Connection
T18-2VNLP-Q8	6 m (19.7 ft) with BRT-84 reflector	Complementary NPN	4-pin M12 male quick disconnect
T18-2VNLP-2M		Complementary NPN	2 m (6.5 ft) cable
T18-2VPLP-Q8		Complementary PNP	4-pin M12 male quick disconnect
T18-2VPLP-2M		Complementary PNP	2 m (6.5 ft) cable
T18-2VPLP-9M		Complementary PNP	9 m cable
T18-2VNLPC-Q8	6 m (19.7 ft) with BRT-84 reflector, with adjustment	Complementary NPN	4-pin M12 male quick disconnect
T18-2VNLPC-2M		Complementary NPN	2 m (6.5 ft) cable
T18-2VNLPC-9M		Complementary NPN	9 m cable
T18-2VPLPC-Q8		Complementary PNP	4-pin M12 male quick disconnect
T18-2VPLPC-2M		Complementary PNP	2 m (6.5 ft) cable
T18-2VPLPC-9M		Complementary PNP	9 m cable

Diffuse models

Models with Red Emitters	Sensor	Range	Output	Connection
T18-2VNDL-Q8	Visible red	750 mm (29.5 in) with adjustment	Complementary NPN	4-pin M12 male quick disconnect
T18-2VNDL-2M				2 m (6.5 ft) cable
T18-2VNDL-9M				9 m cable
T18-2VNDLIR-Q8	Infrared		Complementary NPN	4-pin M12 male quick disconnect
T18-2VPDL-Q8	Visible red		Complementary PNP	4-pin M12 male quick disconnect
T18-2VPDL-2M				2 m (6.5 ft) cable
T18-2VPDL-9M				9 m cable
T18-2VPDLIR-Q8	Infrared		Complementary PNP	4-pin M12 male quick disconnect
T18-2VPDLIR-2M				2 m (6.5 ft) cable
T18-2VPDLIR-9M				9 m cable
T18-2VNDS-Q8	Visible red	300 mm (11.8 in) with adjustment	Complementary NPN	4-pin M12 male quick disconnect
T18-2VNDS-2M				2 m (6.5 ft) cable
T18-2VNDS-9M				9 m cable

Continued on page 5

© Banner Engineering Corp. All rights reserved.

chanhvinh.com

Continued from page 4

Models with Red Emitters	Sensor	Range	Output	Connection
T18-2VPDS-Q8	Visible red		Complementary PNP	4-pin M12 male quick disconnect
T18-2VPDS-2M				2 m (6.5 ft) cable

Fixed-field models

Models with Red Emitters	Sensor	Range	Output	Connection
T18-2VNFF30-Q8	Visible red	30 mm	Complementary NPN	4-pin M12 male quick disconnect
T18-2VNFF30IR-Q8	Infrared			4-pin M12 male quick disconnect
T18-2VNFF30IR-2M				2 m (6.5 ft) cable
T18-2VPFF30-Q8	Visible red		Complementary PNP	4-pin M12 male quick disconnect
T18-2VPFF30-2M				2 m (6.5 ft) cable
T18-2VPFF30IR-Q8	Infrared			4-pin M12 male quick disconnect
T18-2VPFF30IR-2M				2 m (6.5 ft) cable
T18-2VNFF50-Q8	Visible red	50 mm	Complementary NPN	4-pin M12 male quick disconnect
T18-2VNFF50IR-Q8	Infrared			4-pin M12 male quick disconnect
T18-2VNFF50IR-2M				2 m (6.5 ft) cable
T18-2VPFF50-Q8	Visible red		Complementary PNP	4-pin M12 male quick disconnect
T18-2VPFF50-2M				2 m (6.5 ft) cable
T18-2VPFF50IR-Q8	Infrared			4-pin M12 male quick disconnect
T18-2VPFF50IR-2M				2 m (6.5 ft) cable
T18-2VPFF50IR-9M				9 m cable
T18-2VNFF75-Q8	Visible red	75 mm	Complementary NPN	4-pin M12 male quick disconnect
T18-2VPFF75-Q8	Visible red		Complementary PNP	4-pin M12 male quick disconnect
T18-2VPFF75IR-Q8	Infrared			4-pin M12 male quick disconnect
T18-2VNFF100-Q8	Visible red	100 mm	Complementary NPN	4-pin M12 male quick disconnect
T18-2VNFF100-2M				2 m (6.5 ft) cable
T18-2VNFF100-9M				9 m cable
T18-2VNFF100IR-Q8	Infrared			4-pin M12 male quick disconnect
T18-2VNFF100IR-2M				2 m (6.5 ft) cable
T18-2VNFF100IR-9M				9 m cable
T18-2VPFF100-Q8	Visible red		Complementary PNP	4-pin M12 male quick disconnect
T18-2VPFF100-2M				2 m (6.5 ft) cable
T18-2VPFF100-9M				9 m cable
T18-2VPFF100IR-Q8	Infrared			4-pin M12 male quick disconnect
T18-2VPFF100IR-2M				2 m (6.5 ft) cable

Continued on page 6

© Banner Engineering Corp. All rights reserved.
www.bannerengineering.com

chanhvinh.com

Continued from page 5

Models with Red Emitters	Sensor	Range	Output	Connection
T18-2VPFF100IR-9M				9 m cable
T18-2VNFF150-Q8	Visible red	150 mm	Complementary NPN	4-pin M12 male quick disconnect
T18-2VNFF150IR-Q8	Infrared			4-pin M12 male quick disconnect
T18-2VPFF150-Q8	Visible red		Complementary PNP	4-pin M12 male quick disconnect
T18-2VPFF150-2M				2 m (6.5 ft) cable
T18-2VPFF150IR-Q8	Infrared			4-pin M12 male quick disconnect
T18-2VNFF200-Q8	Visible red	200 mm	Complementary NPN	4-pin M12 male quick disconnect
T18-2VNFF200-2M				2 m (6.5 ft) cable
T18-2VNFF200-9M				9 m cable
T18-2VNFF200IR-Q8	Infrared			4-pin M12 male quick disconnect
T18-2VPFF200-Q8	Visible red		Complementary PNP	4-pin M12 male quick disconnect
T18-2VPFF200IR-Q8	Infrared			4-pin M12 male quick disconnect
T18-2VPFF200IR-2M				2 m (6.5 ft) cable

Specifications

Supply Voltage

10 V DC to 30 V DC for ambient temperature ≤ 55 °C

10 V DC to 24 V DC for ambient temperature > 55 °C

Supply Current (Exclusive of Load Current)

All models except FF IR: < 16 mA

FF IR models: < 25 mA

Output Protection Circuitry

Protected against false pulse on power-up and continuous short circuit of outputs. Short circuit protection at elevated temperature may require a power cycle to reset.

Supply Protection Circuitry

Protected against reverse polarity and transient voltages

Output Rating

≤ 50 mA total current for ambient temperatures > 55 °C

≤ 100 mA total current through both outputs ≤ 55 °C

OFF-State Leakage Current: < 50 µA at 30 V dc

ON-State Saturation Voltage: < 1.5 V at 10 mA; < 3.0 V at 100 mA

Output Configuration

Complementary PNP or NPN by model number

Emitter LED

Visible Red on most models

Infrared 850 nm on select models

Infrared fixed-field models provide higher excess gain on green and blue targets

Indicators

Two LEDs (1 green, 1 amber)

Green Solid: Indicates power applied and sensor ready

Green flashing: Indicates marginal sensing signal

Amber solid: Indicates Pin-4 (black wire) conducting

Vibration and Mechanical Shock

All models meet Mil. Std. 202G requirements. Method 201A (Vibration; frequency 10 to 60 Hz, max., double amplitude 0.06 in acceleration 10G). Method 213B conditions H&I (Shock: 75G with unit operating; 100G for non-operation)

Operating Conditions

–40 °C to +70 °C (–40 °F to +158 °F)

95% at +50 °C maximum relative humidity (non-condensing)

Environmental Rating

IP67 per IEC 60529

IP68 per IEC 60529

IP69K per ISO 20653

Certifications

Banner Engineering BV
Park Lane, Culliganlaan 2F bus 3
1831 Diegem, BELGIUM

c UL us LISTED Industrial Control Equipment 3TJJ

Class 2 power; UL Environmental Rating: Type 1

ECOLAB® Chemical compatibility certified. ECOLAB is a registered trademark of Ecolab USA Inc. All rights reserved.

Output Response Time

Response is independent of signal strength

Opposed models: 1.5 milliseconds ON, 1 millisecond OFF

Polarized Retro, and Diffuse models: 1.5 milliseconds ON, 0.75 milliseconds OFF

Fixed Field models: 2 milliseconds ON, 2 milliseconds OFF

Delay on Power-up: 100 milliseconds; outputs do not conduct during this time

© Banner Engineering Corp. All rights reserved.

chanhvinh.com

Repeatability

Repeatability is independent of signal strength

Opposed models: 187 microseconds

Retro, Polarized Retro, and Diffuse models: 100 microseconds

Fixed Field models: 200 microseconds

Adjustments

Diffuse (DL, DS), Emitter (ES), Receiver (RS), Polarized Retroreflective (LPC) models: Single turn sensitivity (gain) adjustment potentiometer

Emitter Beam Inhibit (EJ) models: Tie black wire to 10 to 30 V dc for beam inhibit

Construction

Housing, M12 QD, and cover: Black or Yellow PBT polyester

Indicator light pipes: Translucent white PMMA (acrylic)

Indicator cover and gain pot driver: PBT polyester

Front window: PMMA

Required Overcurrent Protection

WARNING: Electrical connections must be made by qualified personnel in accordance with local and national electrical codes and regulations.

Overcurrent protection is required to be provided by end product application per the supplied table.

Overcurrent protection may be provided with external fusing or via Current Limiting, Class 2 Power Supply.

Supply wiring leads < 24 AWG shall not be spliced.

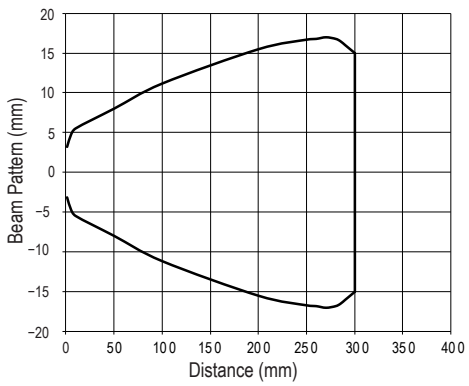
For additional product support, go to www.bannerengineering.com.

Supply Wiring (AWG)	Required Overcurrent Protection (A)	Supply Wiring (AWG)	Required Overcurrent Protection (A)
20	5.0	26	1.0
22	3.0	28	0.8
24	2.0	30	0.5

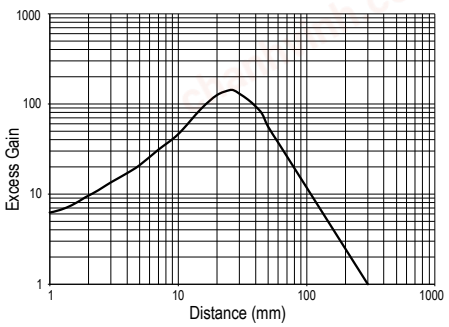
Performance Curves

Diffuse models (300 mm range)

Beam Pattern

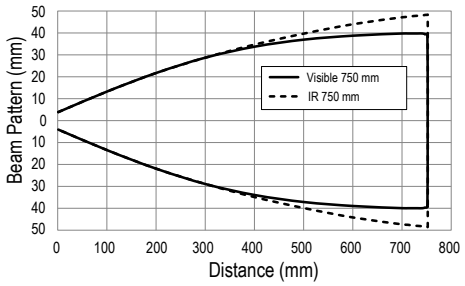


Excess Gain

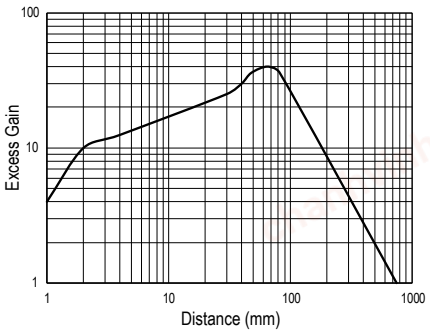


Diffuse models (750 mm range)

Beam Pattern



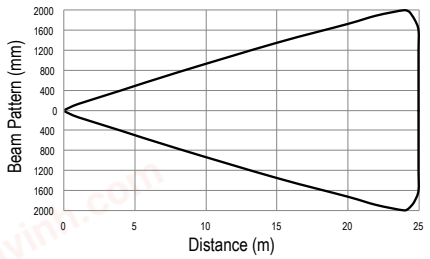
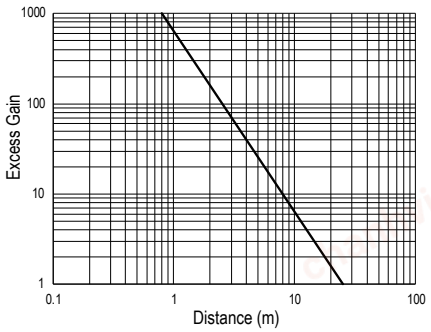
Excess Gain



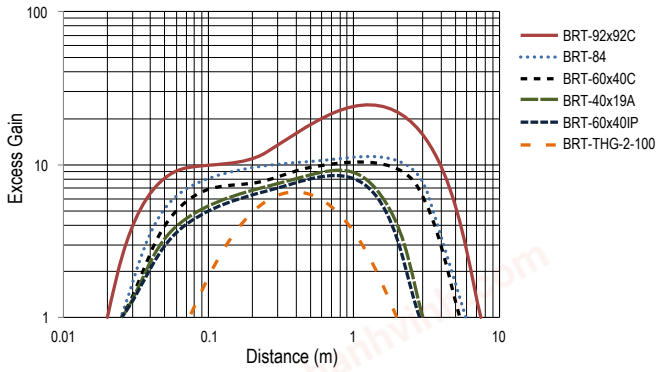
© Banner Engineering Corp. All rights reserved.
www.bannerengineering.com

chanhvinh.com

Emitter/receiver models (effective beam size: 15.2 mm)

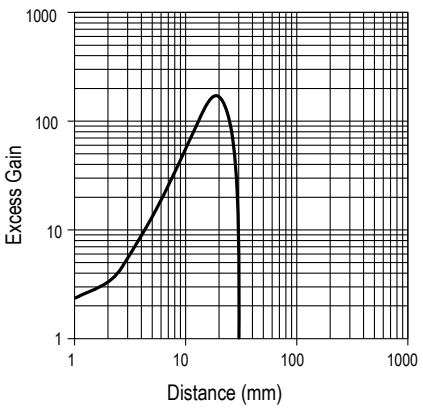
Beam Pattern	Excess Gain
	

Polarized retroreflective models

Beam Pattern	Excess Gain
	

Fixed-field models - Excess Gain (applies to both visible red and IR models)

Target for Excess Gain Curves uses a 90% Reflective White Card

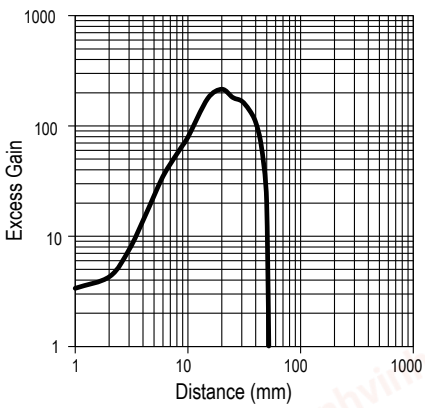


T18-2FF30

Emitter Image Size: 4.0 mm square at 15 mm and 3.5 mm square at 30 mm

18% Gray Test Card: Cutoff distance will be 98% of value shown

6% Black Test Card: Cutoff distance will be 95% of value shown



T18-2FF50

Emitter Image Size: 4 mm square at 25 mm and 3 mm square at 50 mm

18% Gray Test Card: Cutoff distance will be 98% of value shown

6% Black Test Card: Cutoff distance will be 95% of value shown

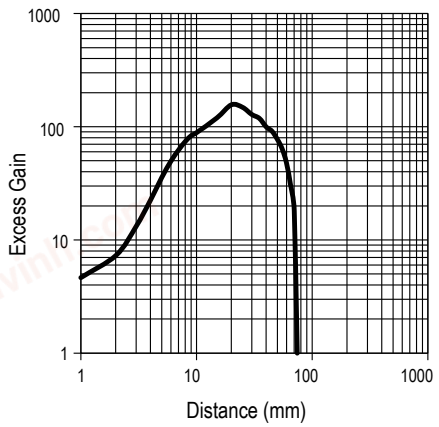
Continued on page 9

© Banner Engineering Corp. All rights reserved.
www.bannerengineering.com

chanhvinh.com

Continued from page 8

Target for Excess Gain Curves uses a 90% Reflective White Card

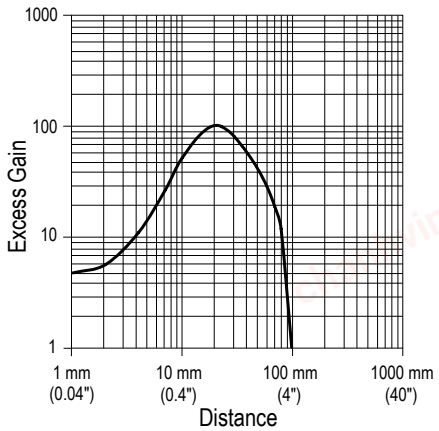


T18-2FF75

Emitter Image Size: 4.5 mm square at 37 mm and 4.0 mm square at 75 mm

18% Gray Test Card: Cutoff distance will be 98% of value shown

6% Black Test Card: Cutoff distance will be 92% of value shown

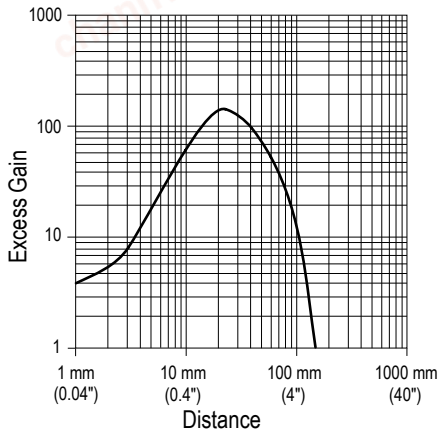


T18-2FF100

Emitter Image Size: 4.5 mm square at 50 mm and 4.5 mm square at 100 mm

18% Gray Test Card: Cutoff distance will be 95% of value shown

6% Black Test Card: Cutoff distance will be 90% of value shown

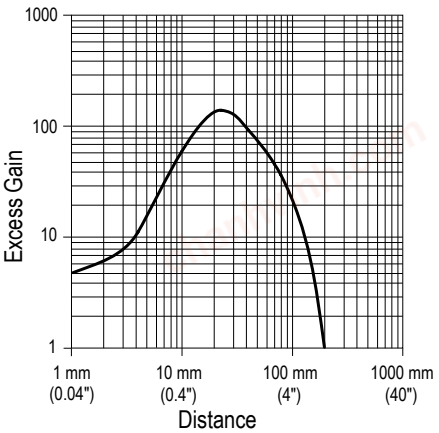


T18-2FF150

Emitter Image Size: 5 mm square at 75 mm and 8 mm square at 150 mm

18% Gray Test Card: Cutoff distance will be 90% of value shown

6% Black Test Card: Cutoff distance will be 70% of value shown



T18-2FF200

Emitter Image Size: 5 mm square at 100 mm and 8 mm square at 200 mm

18% Gray Test Card: Cutoff distance will be 85% of value shown

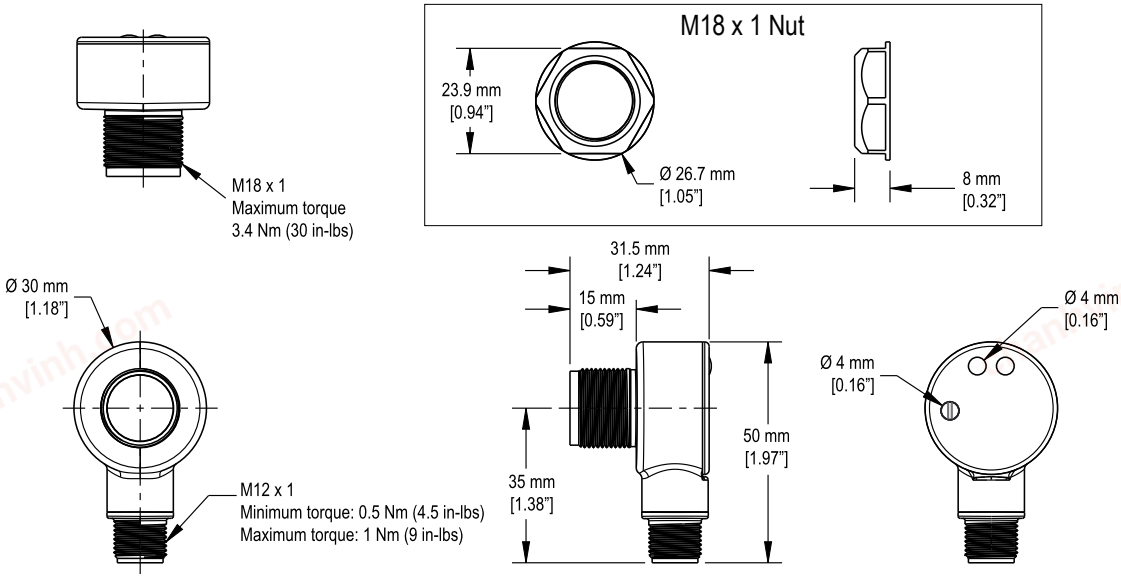
6% Black Test Card: Cutoff distance will be 60% of value shown

Dimensions

All measurements are listed in millimeters [inches], unless noted otherwise. The measurements provided are subject to change.

© Banner Engineering Corp. All rights reserved.
www.bannerengineering.com

chanhvinh.com



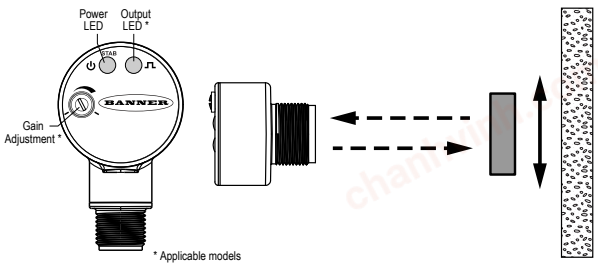
© Banner Engineering Corp. All rights reserved.
www.bannerengineering.com

chanhvinh.com

Chapter 2 Installing the T18-2 Epoxy Encapsulated Right-Angle Sensor

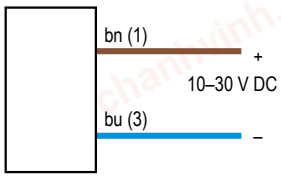
Follow these steps to install the T18-2 Epoxy Encapsulated Right-Angle Sensor.

1. Align the sensor as required for the application. For the most sensitive object detection, align the sensor so that the objects move across the sensor's axis.
2. Secure the sensor to a bracket.
3. Wire sensor as shown in the wiring diagrams.
4. Adjust the gain adjuster (sensitivity pot) if necessary.

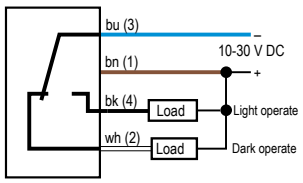


Wiring Diagrams

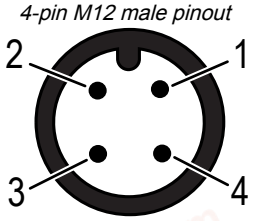
Emitter



Complementary NPN

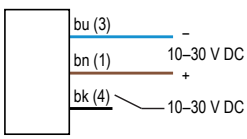


4-pin M12 male pinout

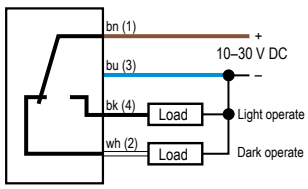


1. Brown
2. White
3. Blue
4. Black

Emitter with Active High Beam Inhibit



Complementary PNP



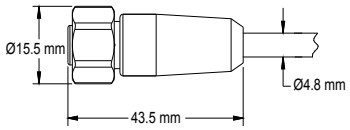
© Banner Engineering Corp. All rights reserved.
www.bannerengineering.com

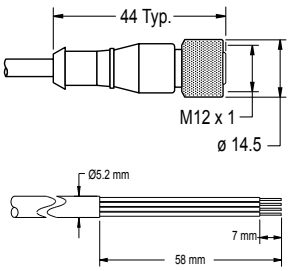
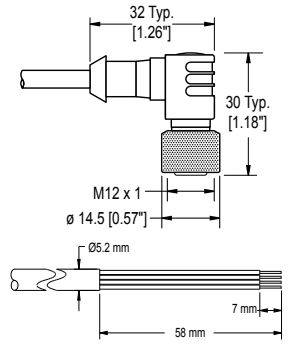
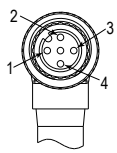
chanhvinh.com

Chapter 3 Accessories

Cordsets

All measurements are listed in millimeters, unless noted otherwise. The measurements provided are subject to change.

4-Pin Single-Ended M12 Female Washdown, Stainless Steel Cordsets				
Model	**Length**	**Style**	**Dimensions**	**Pinout (Female)**
MQDC-WDSS-0406	2 m (6.56 ft)	Straight		 1 = Brown 2 = White 3 = Blue 4 = Black
MQDC-WDSS-0415	5 m (16.4 ft)			
MQDC-WDSS-0430	9 m (29.5 ft)			

4-Pin Single-Ended M12 Female Cordsets					
Model	**Length**	**Style**	**Dimensions**	**Pinout (Female)**	
MQDC-406	2 m (6.56 ft)	Straight			1 = Brown 2 = White 3 = Blue 4 = Black 5 = Not used c UL us
MQDC-415	5 m (16.4 ft)				
MQDC-430	9 m (29.5 ft)				
MQDC-450	15 m (49.2 ft)				
MQDC-406RA	2 m (6.56 ft)	Right-Angle			
MQDC-415RA	5 m (16.4 ft)				
MQDC-430RA	9 m (29.5 ft)				
MQDC-450RA	15 m (49.2 ft)				

Apertures

Model	Units	Aperture Description	Product
AP18SCN	3	Kit includes black acetal round apertures of 0.5 mm (0.02 in), 1.0 mm (0.04 in), and 2.5 mm (0.10 in) diameter.	

Continued on page 13

© Banner Engineering Corp. All rights reserved.
www.bannerengineering.com

chanhvinh.com

Continued from page 12

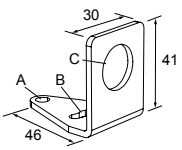
Model	Units	Aperture Description	Product
AP18SRN	3	Kit includes black acetal rectangular apertures of 0.5 mm (0.02 in), 1.0 mm (0.04 in), and 2.5 mm (0.10 in) wide. Each kit also includes a thread-on housing, Teflon® FEP® lens, and o-ring.	
APG18S	1	Kit with glass lens to protect plastic sensor lens from chemical environments and weld splatter damage.	

Brackets

SMB18A

- Right-angle mounting bracket with a curved slot for versatile orientation
- 12-ga. stainless steel
- 18 mm sensor mounting hole
- Clearance for M4 (#8) hardware
- CAD Files: DXF, PDF, IGS, STP

Hole center spacing: A to B = 24.2
Hole size: A = ø 4.6, B = 17.0 × 4.6, C = ø 18.5



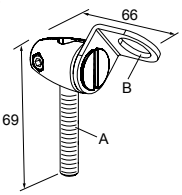
SMB18FA..-SS

- Swivel bracket with tilt and pan movement for precision adjustment
- Easy sensor mounting to extruded rail T-slots
- Stainless steel
- Metric and inch size bolts available
- 18 mm sensor mounting hole

Hole size: B=ø 18.1

Bolt Thread (A):

SMB18FA-SS = 3/8 - 16 × 2 in
CAD Files: DXF, PDF, IGS, STP
SMB18FAM10-SS = M10 - 1.5 × 50
CAD Files: DXF, PDF, IGS, STP
SMB18FAM12-SS = n/a; no bolt included. Mounts directly to 12 mm (½ in) rods
CAD Files: DXF, PDF, IGS, STP



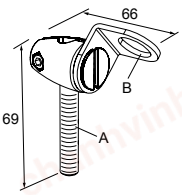
SMB18FA..

- Swivel bracket with tilt and pan movement for precision adjustment
- Easy sensor mounting to extruded rail T-slots
- Metric and inch size bolts available
- 18 mm sensor mounting hole

Hole size: B=ø 18.1

Bolt Thread (A):

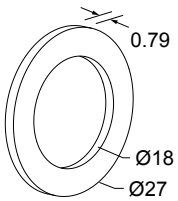
SMB18FA = 3/8 - 16 × 2 in
CAD Files: DXF, PDF, IGS, STP
SMB18FAM10 = M10 - 1.5 × 50
CAD Files: DXF, PDF, IGS, STP
SMB18FAM12 = n/a; no bolt included. Mounts directly to 12 mm (½ in) rods
CAD Files: DXF, PDF, IGS, STP



© Banner Engineering Corp. All rights reserved.
www.bannerengineering.com

chanhvinh.com

ACC-T18-2-GSK-FDA-10 Gasket Kit
- FDA-approved blue silicon
- 18 mm ID; 27 mm OD; 0.79 mm thick
- Quantity: 10



For additional brackets, check the current Banner catalog or visit www.bannerengineering.com. All measurements are listed in millimeters, unless noted otherwise. The measurements provided are subject to change.

Reflectors

BRT-2X2
- Square, acrylic target
- Reflectivity factor: 1.0
- Maximum temperature: +50 °C (+122 ºF)
- Optional brackets are available
- Reflector size: 51 mm × 51 mm
- Approximate size: 51.3 mm × 61 mm
- Two 4.2 mm diameter slots for mounting
- CAD files: DXF, PDF, IGS, STP

BRT-2X2-25 Qty 25

BRT-2X2-100 Qty 100



BRT-84X84A
- Square, acrylic target
- Reflectivity Factor: 2.0
- Temperature: –20 °C to +60 °C (–4 °F to +140 °F)
- Approximate size: 84 mm × 84 mm × 9 mm
- Two 4.2 mm diameter slots for mounting
- CAD Files: DXF, PDF, IGS, STP



BRT-40X19A
- Rectangular, acrylic target
- Reflectivity Factor: 1.3
- Temperature: –20 °C to +60 °C (–4 °F to +140 °F)
- Reflector size: 18 mm × 40 mm
- Approximate size: 18 mm × 60 mm × 7.3 mm
- Two 4 mm diameter mounting holes, 50 mm centers
- CAD Files: DXF, PDF, IGS, STP



BRT-60X40C and **BRT-60X40CM** (Microprism)
- Rectangular, acrylic target
- Reflectivity Factor: 1.4
- Temperature: –20 °C to +60 °C (–4 °F to +140 °F)
- Optional brackets are available
- Approximate size: 40 mm × 60 mm
- **BRT-60X40C** CAD Files: DXF, PDF, IGS, STP
- **BRT-60X40CM** CAD Files: DXF, PDF, IGS, STP



© Banner Engineering Corp. All rights reserved.
www.bannerengineering.com

chanhvinh.com

BRT-60X40IP69K

- Rectangular, acrylic target (color is amber)
- Reflectivity Factor: 0.7
- Temperature: –20 °C to +140 °C (–4 °F to +284 °F)
- Chemically resistant
- IP69K washdown rated
- Optional brackets are available
- Approximate size: 40 mm × 60 mm
- CAD Files: DXF, PDF, IGS, STP



BRT-60X40AF

- Rectangular, acrylic target
- Reflectivity Factor: 1.4
- Temperature: –20 °C to +60 °C (–4 °F to +140 °F)
- Anti-fogging coating for use around steam
- Optional brackets are available
- Approximate size: 40 mm × 60 mm
- CAD Files: DXF, PDF, IGS, STP



BRT-84

- Round, acrylic target
- Reflectivity Factor: 1.4
- Temperature: –20 °C to +60 °C (–4 °F to +140 °F)
- Optional brackets are available
- Size: 84 mm diameter
- Mounting Hole: 4.5 mm diameter
- CAD files: DXF, PDF, IGS, STP



Retroreflective Tape

Model	Reflectivity Factor	Maximum Temperature	Size
BRT-THG-2-100	0.7	+60 °C (+140 °F)	50 mm (2 in) wide, 2.5 m (100 in) long

© Banner Engineering Corp. All rights reserved.
www.bannerengineering.com

chanhvinh.com

Chapter 4 Product Support and Maintenance

Clean Sensor with Compressed Air Then Isopropyl Alcohol

Handle the sensor with care during installation and operation. Sensor windows soiled by fingerprints, dust, water, oil, etc. create stray light that may degrade the peak performance of the sensor.

Blow dust from the sensor using filtered, compressed air. If the sensor is still dirty, gently wipe the sensor with a dry optical cloth. If the dry optical cloth does not remove all residue, use 70% isopropyl alcohol on a clean optical cloth, then dry with a clean dry optical cloth and blow with filtered, compressed air. Do not use any other chemicals for cleaning.

Repairs and Translations (No Field-Replaceable Parts)

English

Contact Banner Engineering for troubleshooting of this device. **Do not attempt any repairs to this Banner device; it contains no field-replaceable parts or components.** If the device, device part, or device component is determined to be defective by a Banner Applications Engineer, they will advise you of Banner's RMA (Return Merchandise Authorization) procedure.

```
IMPORTANT: If instructed to return the device, pack it with care. Damage that occurs in return shipping is not covered by warranty.
```

Obtain assistance with product repairs by contacting your local Banner Engineering Corp distributor or by calling Banner directly at (763) 544-3164. Access literature translated into your native language on the Banner website at www.bannerengineering.com or contact Banner directly at (763) 544-3164.

Deutsch

Wenden Sie sich zur Fehlerbehebung dieses Geräts an Banner Engineering. **Versuchen Sie nicht, Reparaturen an diesem Banner-Gerät vorzunehmen. Das Gerät enthält keine am Einsatzort auszuwechselnden Teile oder Komponenten.** Wenn ein Banner-Anwendungstechniker zu dem Schluss kommt, dass dieses Gerät, ein Teil oder eine Komponente davon defekt ist, erhalten Sie von dem Techniker Erläuterungen zu Banners RMA-Verfahren (Return Merchandise Authorization) für die Warenrückgabe.

```
WICHTIG: Wenn Sie der Techniker anweist, das Gerät zurückzusenden, verpacken Sie es bitte sorgfältig. Transportschäden bei der Rücksendung werden von der Garantie nicht abgedeckt.
```

Unterstützung bei Produktreparaturen erhalten Sie von Ihrem örtlichen Banner Engineering Corp Händler oder direkt von Banner unter Tel. (763) 544-3164. Die in Ihre Muttersprache übersetzte Literatur finden Sie auf der Banner-Website unter www.bannerengineering.com oder kontaktieren Sie Banner direkt unter Tel. (763) 544-3164.

Français

Pour plus d'informations sur le dépannage du produit, contactez Banner Engineering. **Ne tentez pas de réparer ce dispositif Banner. Il ne contient aucun composant ou pièce qui puisse être remplacé sur place.** Si un ingénieur de Banner conclut que le dispositif ou l'une de ses pièces ou composants est défectueux, il vous informera de la procédure à suivre pour le retour des produits (RMA).

```
Important : Si vous devez retourner le dispositif, emballez-le avec soin. Les dégâts occasionnés pendant le transport de retour ne sont pas couverts par la garantie.
```

Pour vous aider lors de la réparation de produits, contactez votre distributeur Banner local our appelez directement Banner au (763) 544-3164. La documentation traduite dans votre langue est disponible sur le site internet de Banner www.bannerengineering.com ou contactez directement Banner au (763) 544-3164.

Italiano

Per le procedure di individuazione e riparazione dei guasti di questo dispositivo, contattare Banner Engineering. **Non tentare di riparare questo dispositivo Banner, in quanto non contiene parti o componenti sostituibili dall'utente.** Se il dispositivo, una parte del dispositivo o un componente del dispositivo viene riscontrato difettoso da un tecnico Banner, il nostro personale vi comunicherà la procedura da seguire per ottenere l'autorizzazione al reso.

```
Importante: Se si ricevono istruzioni di rispedire il dispositivo al produttore, imballarlo con cura. I danni dovuti al trasporto non sono coperti dalla garanzia.
```

Per assistenza nelle riparazioni dei prodotti, contattare il distributore locale Banner Engineering Corp o contattare direttamente Banner al numero (763) 544-3164. È possibile accedere alla documentazione tradotta nella propria lingua madre sul sito Web Banner all'indirizzo www.bannerengineering.com o contattare direttamente Banner al numero (763) 544-3164.

© Banner Engineering Corp. All rights reserved.

chanhvinh.com

Español

Comuníquese con Banner Engineering para solucionar de problemas de este dispositivo. **No intente ninguna reparación a este dispositivo de Banner, contiene piezas o componente que no se pueden cambiar en terreno.** Si algún ingeniero de aplicaciones de Banner determina que el dispositivo, alguna de las piezas o alguno de los componentes del dispositivo está defectuoso, le informará el procedimiento de autorización de devolución de mercancía (RMA, por sus siglas en inglés) de Banner.

Importante: Si se le solicita devolver el dispositivo, empáquelo con cuidado. Puede haber daños durante el envío de devolución que no estén cubiertos por la garantía.

Para reparaciones de productos, por favor contacte a su distribuidor local de Banner Engineering o llame a Banner directamente al 00 1 (763) 544-3164. Vea la literatura traducida en su idioma en el sitio web Banner en www.bannerengineering.com o comuníquese con Banner directamente al 00 1 (763) 544-3164.

中国人

如需对本装置进行故障排查，请联系邦纳。**请勿尝试自行维修该邦纳装置；本装置不包含任何可在现场更换的部件或组件。** 若经邦纳应用工程师确认设备、设备部件或组件存在缺陷，他们将告知您邦纳退货授权 (RMA) 流程。

重要注意事项： 如被要求退回装置，请妥善包装后寄回。退货运输过程中发生的损坏不在保修范围内。

请联系当地的 Banner Engineering Corp 经销商或直接致电 Banner +1 (763) 544-3164，以获得产品维修帮助。请访问邦纳网站 www.bannerengineering.com 或直接拨打 +1 (763) 544-3164 联系邦纳，获取翻译成您母语的资料。

한국인

이 장치의 문제를 해결하려면 Banner Engineering에 문의하십시오. **이 Banner 장치에는 현장에서 교체할 수 있는 부품 또는 구성품이 없으므로 수리를 시도하지 마십시오.** Banner 애플리케이션 엔지니어가 장치, 장치 부품 또는 장치 구성품에 결함이 있는 것으로 판정하면, Banner의 RMA(제품 반송 승인)절차에 대해 안내해 드립니다.

중요: 제품을 반송하도록 안내 받으셨다면 잘 포장해주십시오. 반송 도중에 발생한 손상은 보증 서비스가 적용되지 않습니다.

제품 수리에 대한 지원은 지역 Banner Engineering Corp 대리점에 문의하거나 Banner에 직접 (763) 544-3164로 문의하실 수 있습니다. 사용자의 모국어로 번역된 자료는 Banner 웹사이트 www.bannerengineering.com에서 액세스하거나 Banner에 직접 (763) 544-3164로 문의하실 수 있습니다.

日本語

この装置のトラブルシューティングについては、バナーエンジニアリングにお問い合わせください。**このバナー装置には、現場では交換できない部品またはコンポーネントが含まれているため、修理を試みてはいけません。** バナーのアプリケーションエンジニアが装置、装置の部品、または装置のコンポーネントに欠陥があると判断した場合、バナーのRMA（返品承認）手続きについてお知らせします。

重要 ： 返品を指示された場合は、装置を丁寧に梱包してください。返品時に発生した破損は保証の対象外となります。

製品の修理については、最寄りのBanner Engineering Corp代理店にお問い合わせいただくか、米国+1 (763) 544-3164まで直接お電話でお問い合わせください。バナーのウェブサイト（www.bannerengineering.com）でお客様の言語に翻訳された資料にアクセスするか、米国+1 (763) 544-3164まで直接お電話でお問い合わせください。

čeština

Pro řešení problémů se zařízením kontaktujte společnost Banner Engineering. **Neprovádějte žádné opravy zařízení Banner. Neobsahují žádné komponenty nebo části, které by byly vyměnitelné.** Pokud je zařízení, jeho část nebo díl označen technikem společnosti Banner jako poškozený, bude Vám doporučeno vyplnit reklamační RMA protokol.

Důležité: Pokud byl vydán požadavek na vrácení zařízení, pečlivě ho zabalte. Poškození vzniklé při dopravě není považováno za záruční opravu.

Pokud produkt potřebuje opravu, vyžádejte si pomoc od místního distributora společnosti Banner Engineering Corp nebo přímo na telefonním čísle (763) 544-3164. Dokumentaci přeloženou do vašeho jazyka si vyhledejte na webových stránkách společnosti Banner na adrese www.bannerengineering.com nebo se obraťte přímo na společnost Banner na telefonním čísle (763) 544-3164.

© Banner Engineering Corp. All rights reserved.

chanhvinh.com

Polski

W celu rozwiązania problemów z urządzeniem należy skontaktować się z działem technicznym firmy Banner Engineering. **Pod żadnym pozorem nie próbuj naprawiać tego urządzenia firmy Banner; nie zawiera ono części ani elementów, które można wymieniać samodzielnie.** Jeśli urządzenie, jego część lub element zostaną uznane za wadliwe przez inżyniera technicznego Banner, poinformuje on użytkownika o firmowej procedurze zwrotu towaru (RMA) firmy Banner.

Ważne: Jeśli urządzenie ma zostać zwrócone, należy je starannie zapakować. Uszkodzenia powstałe podczas odsyłki nie są objęte gwarancją.

Aby uzyskać pomoc w zakresie naprawy produktu, należy skontaktować się z lokalnym dystrybutorem Banner Engineering Corp lub zadzwonić bezpośrednio do firmy Banner pod numer (763) 544-3164. Dostęp do literatury przetłumaczonej na swój język ojczysty można uzyskać na stronie internetowej firmy Banner pod adresem www.bannerengineering.com lub kontaktując się bezpośrednio z firmą Banner pod numerem (763) 544-3164.

Português

Entre em contato com a Engenharia da Banner para a solução de problemas deste dispositivo. **Não tente fazer nenhum reparo neste dispositivo Banner; ele não contém peças ou componentes substituíveis em campo.** Se um técnico de aplicações da Banner determinar que o dispositivo, peça ou componente do dispositivo está com defeito, ele o informará sobre o procedimento de RMA (Autorização de Devolução de Mercadoria) da Banner.

Importante: Se for instruído a devolver o dispositivo, embale-o com cuidado. Os danos ocorridos no transporte de devolução não são cobertos pela garantia.

Obtenha assistência para reparos do produto entrando em contato com o distribuidor local da Banner Engineering Corp ou ligando diretamente para a Banner no telefone (763) 544-3164. Acesse a literatura traduzida para seu idioma nativo no site da Banner em www.bannerengineering.com ou entre em contato diretamente com a Banner pelo telefone (763) 544-3164.

Türkçe

Bu cihazda sorun giderme işlemleri için Banner Engineering ile iletişime geçin. **Bu Banner cihazını onarmaya çalışmayın; cihaz sahada değiştirilebilir parça veya bileşen içermez.** Bir Banner Uygulama Mühendisi tarafından cihazın, cihazın bir parçasının veya bir cihaz bileşeninin kusurlu olduğu tespit edilirse, Banner RMA (İade Mal Yetkilendirme) prosedürü hakkında bilgilendirilirsiniz.

ÖNEMLİ: İade etmeniz istenirse, cihazı dikkatli bir şekilde paketleyin. İade nakliyesinde meydana gelecek hasarlar garanti kapsamında değildir.

Yerel Banner Engineering Corp distribütörünüzle iletişime geçerek veya doğrudan (763) 544-3164 numaralı telefondan Banner'ı arayarak ürün onarımlarıyla ilgili yardım alın. Ana dilinize çevrilmiş dokümanlara www.bannerengineering.com adresindeki Banner web sitesinden erişebilir veya (763) 544-3164 numaralı telefondan doğrudan Banner ile iletişime geçebilirsiniz.

Discontinued Models

The following models are no longer available for order but are still covered by the information in this document.

Emitter models

Visible Red Models	Sensor	Range	Connection
T18-2NAELIR-9M	Infrared	25 m (82 ft)	9 m cable
T18-2NAEJIR-Q8	Infrared	25 m (82 ft) with beam inhibit	4-pin M12 male quick disconnect
T18-2NAEJIR-2M	Infrared		2 m cable
T18-2NAEJIR-9M	Infrared		9 m cable
T18-2NAES-9M	Visible red	25 m (82 ft) with adjustment	4-pin M12 male quick disconnect
T18-2NAESIR-Q8	Infrared		4-pin M12 male quick disconnect
T18-2NAESIR-2M	Infrared		2 m cable
T18-2NAESIR-9M	Infrared		9 m cable

Receiver models

Model	Range	Output	Connection
T18-2VNRS-9M	25 m (82 ft) with adjustment	Complementary NPN	9 m cable

Continued on page 19

© Banner Engineering Corp. All rights reserved.
www.bannerengineering.com

chanhvinh.com

Continued from page 18

Model	Range	Output	Connection
T18-2VPRS-9M		Complementary PNP	9 m cable

Polarized retroreflective models

Model	Range	Output	Connection
T18-2VNLP-9M	6 m (19.7 ft) with BRT-84 reflector	Complementary NPN	9 m cable

Diffuse models

Models with Red Emitters	Sensor	Range	Output	Connection
T18-2VPDS-9M	Visible red	300 mm (11.8 in) with adjustment	Complementary PNP	9 m cable

Fixed-field models

Models with Red Emitters	Sensor	Range	Output	Connection
T18-2VNFF30-2M	Visible red	30 mm	Complementary NPN	2 m cable
T18-2VNFF30-9M				9 m cable
T18-2VNFF30IR-9M	Infrared			9 m cable
T18-2VPFF30-9M	Visible red		Complementary PNP	9 m cable
T18-2VPFF30IR-9M	Infrared			9 m cable
T18-2VNFF50-2M	Visible red	50 mm	Complementary NPN	2 m cable
T18-2VNFF50-9M				9 m cable
T18-2VNFF50IR-9M	Infrared			9 m cable
T18-2VPFF50-9M	Visible red		Complementary PNP	9 m cable
T18-2VNFF75-2M	Visible red	75 mm	Complementary NPN	2 m cable
T18-2VNFF75-9M				9 m cable
T18-2VNFF75IR-Q8	Infrared			4-pin M12 male quick disconnect
T18-2VNFF75IR-2M				2 m cable
T18-2VNFF75IR-9M				9 m cable
T18-2VPFF75-2M	Visible red		Complementary PNP	2 m cable
T18-2VPFF75-9M				9 m cable
T18-2VPFF75IR-2M	Infrared			2 m cable
T18-2VPFF75IR-9M				9 m cable
T18-2VNFF150-2M	Visible red	150 mm	Complementary NPN	2 m cable
T18-2VNFF150-9M				9 m cable
T18-2VNFF150IR-2M	Infrared			2 m cable
T18-2VNFF150IR-9M				9 m cable
T18-2VPFF150-9M	Visible red		Complementary PNP	9 m cable
T18-2VPFF150IR-2M	Infrared			2 m cable
T18-2VPFF150IR-9M				9 m cable
T18-2VNFF200IR-2M	Infrared	200 mm	Complementary NPN	2 m cable
T18-2VNFF200IR-9M				9 m cable
T18-2VPFF200-2M	Visible red		Complementary PNP	2 m cable
T18-2VPFF200-9M				9 m cable

© Banner Engineering Corp. All rights reserved.
www.bannerengineering.com

chanhvinh.com

Contact Us

Banner Engineering Corp. | 9714 Tenth Avenue North | Plymouth, MN 55441, USA | Phone: + 1 888 373 6767

For worldwide locations and local representatives, visit www.bannerengineering.com.

Banner Engineering Corp Limited Warranty

Banner Engineering Corp. warrants its products to be free from defects in material and workmanship for one year following the date of shipment. Banner Engineering Corp. will repair or replace, free of charge, any product of its manufacture which, at the time it is returned to the factory, is found to have been defective during the warranty period. This warranty does not cover damage or liability for misuse, abuse, or the improper application or installation of the Banner product.

THIS LIMITED WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES WHETHER EXPRESS OR IMPLIED (INCLUDING, WITHOUT LIMITATION, ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE), AND WHETHER ARISING UNDER COURSE OF PERFORMANCE, COURSE OF DEALING OR TRADE USAGE.

This Warranty is exclusive and limited to repair or, at the discretion of Banner Engineering Corp., replacement. **IN NO EVENT SHALL BANNER ENGINEERING CORP. BE LIABLE TO BUYER OR ANY OTHER PERSON OR ENTITY FOR ANY EXTRA COSTS, EXPENSES, LOSSES, LOSS OF PROFITS, OR ANY INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES RESULTING FROM ANY PRODUCT DEFECT OR FROM THE USE OR INABILITY TO USE THE PRODUCT, WHETHER ARISING IN CONTRACT OR WARRANTY, STATUTE, TORT, STRICT LIABILITY, NEGLIGENCE, OR OTHERWISE.**

Banner Engineering Corp. reserves the right to change, modify or improve the design of the product without assuming any obligations or liabilities relating to any product previously manufactured by Banner Engineering Corp. Any misuse, abuse, or improper application or installation of this product or use of the product for personal protection applications when the product is identified as not intended for such purposes will void the product warranty. Any modifications to this product without prior express approval by Banner Engineering Corp will void the product warranties. All specifications published in this document are subject to change; Banner reserves the right to modify product specifications or update documentation at any time. Specifications and product information in English supersede that which is provided in any other language. For the most recent version of any documentation, refer to: www.bannerengineering.com.

For patent information, see www.bannerengineering.com/patents.

© Banner Engineering Corp. All rights reserved.

chanhvinh.com

LinkedIn

X

Facebook

Instagram



© 2026. All rights reserved.
www.bannerengineering.com