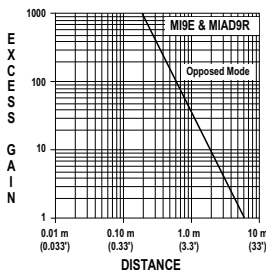
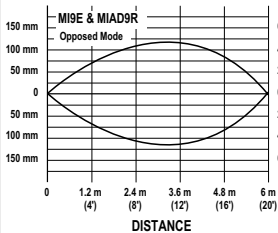
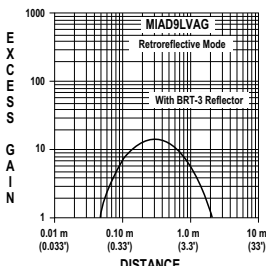
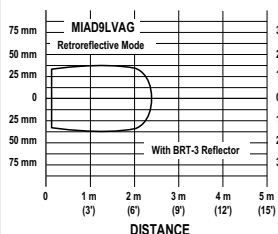




Features

- Intrinsically safe sensors with MINI-BEAM performance and small size
- For use with approved switching amplifiers with intrinsically safe input circuits
- Output 1 mA or less in the dark and 2 mA or more in the light
- Models with integral cable or quick-disconnect

Models

Sensing Mode	Model*	Sensing Beam and Range	Output Type	Excess Gain	Beam Pattern
				Diffuse mode performance based on 90% reflectance white test card	
Opposed	MI9E Emitter	Infrared, 880 nm Range: 6 m (20')	Constant Current 1.2 mA dark 2.1 mA light		
	MIAD9R Receiver				
Polarized Retroreflective	MIAD9LVAG	Visible Red, 650 nm Range: 50 mm to 2 m (2" to 7')			

*Only standard 2 m (6.5') cable models are listed.

For 4-pin Euro-style Integral QD models: add suffix "Q" to the model number (e.g., MIAD9RQ); accessory mating cable required, see page 7.

Additional models on following pages.

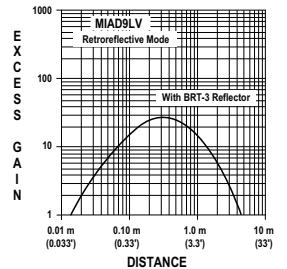
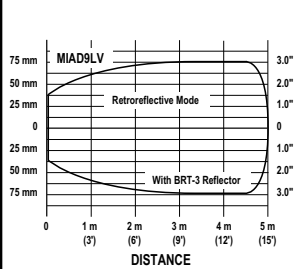
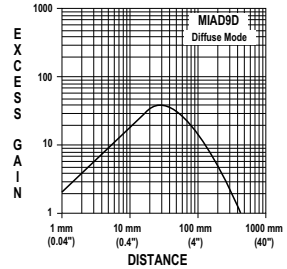
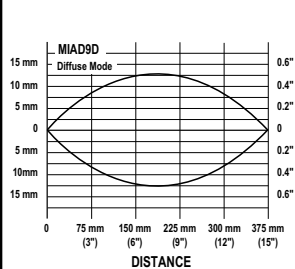
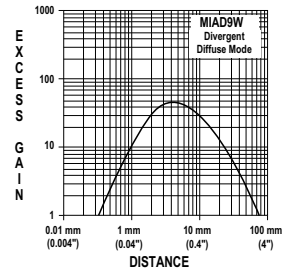
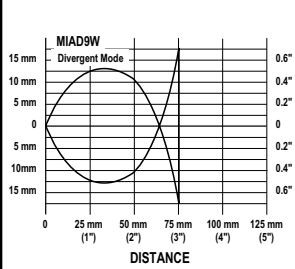
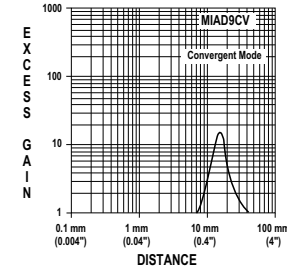
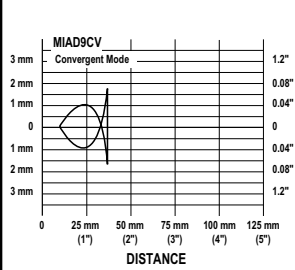
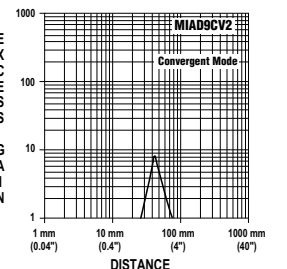
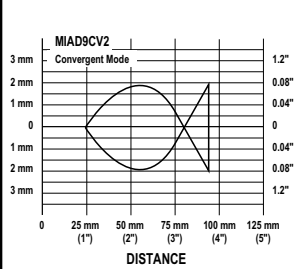


WARNING . . . Not To Be Used for Personnel Protection

Never use these products as sensing devices for personnel protection. Doing so could lead to serious injury or death. These sensors do NOT include the self-checking redundant circuitry necessary to allow their use in personnel safety applications. A sensor failure or malfunction can cause either an energized or de-energized sensor output condition. Consult your current Banner Safety Products catalog for safety products which meet OSHA, ANSI and IEC standards for personnel protection.

MINI-BEAM® MIAD9 Series — NAMUR

Models, continued

Sensing Mode	Model*	Sensing Beam and Range	Output Type	Excess Gain	Beam Pattern
				Diffuse mode performance based on 90% reflectance white test card	
Retroreflective	MIAD9LV	Visible Red, 650 nm Range: 50 mm to 2 m (2" to 7')	Constant Current 1.2 mA dark 2.1 mA light		
Diffuse	MIAD9D	Infrared, 880 nm Range: 380 mm (15")			
Divergent Diffuse	MIAD9W	Infrared, 880 nm Range: 75 mm (3")			
Convergent	MIAD9CV	Visible Red, 650 nm Range: 16 mm (0.6")			
	MIAD9CV2	Visible Red, 650 nm Range: 43 mm (1.7")			

*Only standard 2 m (6.5') cable models are listed.

For 4-pin Euro-style Integral QD models: add suffix "Q" to the model number (e.g., MIAD9RQ); accessory mating cable required, see page 7.

MINI-BEAM® MIAD9 Series — NAMUR

Models, continued

Sensing Mode	Model*	Sensing Beam and Range	Output Type	Excess Gain	Beam Pattern
				Diffuse mode performance based on 90% reflectance white test card	
Fiber Optic (Glass)	MIAD9F	Infrared, 880 nm Range varies by sensing mode and fiber optics used	Constant Current 1.2 mA dark 2.1 mA light		

* Only standard 2 m (6.5') cable models are listed.

For 4-pin Euro-style Integral QD models: add suffix "Q" to the model number (e.g., MIAD9RQ); accessory mating cable required, see page 7.

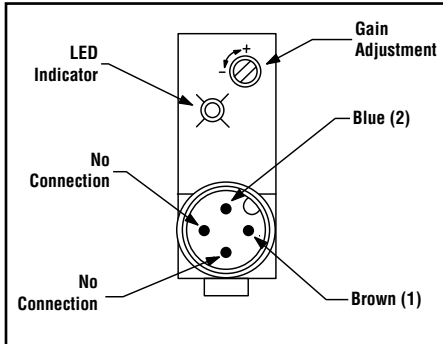


Figure 1. Features (rear of sensor, quick-disconnect model shown)

Overview

MIAD9 Series NAMUR Sensors are small, rugged, self-contained two-wire sensors designed for use with approved switching amplifiers with intrinsically safe input circuits. MIAD9 Series sensors are designed in accordance with DIN 19 234.

These sensors vary the impedance across the sensor output, which passes 1 mA or less in the "dark" condition and 2 mA or more in the "light" condition. A red LED on the rear of the sensor lights whenever the sensor sees the "light" condition. A rugged, clutched, 15-turn slotted brass screw Gain control potentiometer enables precise adjustment of system sensitivity.

Models are available with either a 2 m (6.5') or 10 m (30') long attached PVC-covered cable, or a 4-pin Euro-style quick disconnect (QD) connector. Quick disconnect models (with "Q" in the model number suffix) use MOD9-4.. mating cable (either straight or right-angle connector; see page 7). Contact the factory for availability of sensor models with 10 m (30') long attached cable.

NOTE: If sensors with output characteristics according to DIN 19 234 are used in hazardous areas, they must be used with approved switching amplifiers with intrinsically safe input circuits.

Special Conditions for Safe Use

Parts of the enclosure are non-conducting and may generate an ignition-capable level of ESD. Cleaning of the equipment shall be done only with a damp cloth.

Hazardous Area Application

Associated apparatus may include amplifiers and barriers to monitor apparatus supply current, which is the apparatus output signal. Associated apparatus must limit both supply voltage and supply current in the event of failures.

MINI-BEAM® MIAD9 Series — NAMUR

Installation Notes

Hazardous Area Application

Entity Parameters: Associated Apparatus may include amplifiers and barriers to monitor apparatus supply current, which is the apparatus output signal. Associated apparatus must limit both supply voltage and supply current in the event of failures.

Associated Apparatus

Voc 15V dc
Isc 60 mA
Ca C(cable)* + Ci
La L(cable)* + Li
Cable Parameters (if unknown)
* C(cable) = 60 pF/ft.
L(cable) = 0.2 µH/ft.

Sensor Apparatus

Vmax = 15V dc
Imax = 60 mA
Ci = 0.3 µF
Li = 0
Pi = 225 mW

FM Installation:

1. Associated Apparatus (barrier) entity parameters must meet the following requirements:

Voc	Vmax	Ca	Ci + Ccable
Isc	Imax	La	Li + Lcable

2. The Associated Apparatus shall not be connected to any device that uses or generates in excess of 250 Volts rms or dc.
3. Intrinsic safety ground, if required for the Associated Apparatus, shall be less than 1 ohm.
4. Installation shall be in accordance with the National Electrical Code (ANSI/NFPA70), local codes, Associated Apparatus manufacturer's installation requirements and ANSI/ISA RP12.6 for hazardous (classified) location installation.
5. Associated Apparatus is not required for installation of the devices within a Division 2 hazardous (classified) location. The maximum voltage for Division 2 installation is 15V dc.
6. Maximum connector torque: 6 ft-lbs

CSA Installation:

1. Associated Apparatus (barrier) entity parameters must meet the following requirements:

Voc	Vmax	Ca	Ci + Ccable
Isc	Imax	La	Li + Lcable

2. The Associated Apparatus shall not be connected to any device that uses or generates in excess of 250 Volts rms or dc.
3. Intrinsic safety ground, if required for the Associated Apparatus, shall be less than 1 ohm.
4. Installation shall be in accordance with the Canadian Electrical Code, Part 1.
5. Associated Apparatus (barrier) shall be installed in accordance with the manufacturer's instructions.
6. Associated Apparatus is not required for installation of the devices within a Division 2 hazardous (classified) location when installed in, or through the wall of a suitable enclosure with provision for connection of rigid metal conduit per the Canadian Electrical Code, as acceptable to the local inspection authority having jurisdiction. The maximum rating for Division 2 installation is 15V dc, 60 mA.
7. In Division 2 installations, observe the WARNING at right.








WARNING . . .
Explosion Hazard

Do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous.

MINI-BEAM® MIAD9 Series — NAMUR

Specifications

Supply Voltage and Current	5 to 15V dc (provided by the amplifier to which the sensor is connected)
Output	Constant current output: 1.2 mA in the "dark" condition and 2.1 mA in the "light" condition
Output Response Time	Opposed mode: 2 ms ON/400 µs OFF All other modes: 5 ms ON/OFF (does not include amplifier response)
Adjustments	15-turn slotted brass screw GAIN (sensitivity) adjustment potentiometer (clutched at both ends of travel); located on rear panel and protected by a clear gasketed acrylic cover
Indicators	Red LED Alignment Indicator Device (AID) located on rear panel lights when the sensor sees a "light" condition; pulse rate is proportional to signal strength (the stronger the signal, the faster the pulse rate).
Construction	Reinforced thermoplastic polyester housing, totally encapsulated, o-ring sealing, acrylic lenses, and stainless steel screws
Environmental Rating	Meets NEMA standards 1, 2, 3, 3S, 4, 4X, 6, 12 and 13; IEC IP67
Connections	PVC-jacketed 2-conductor 2 m or 9 m cables, or special 4-pin Euro-style quick-disconnect (QD) fitting are available; QD cables are ordered separately. See page 381.
Operating Conditions	Temperature: -40 to +70° C (-40 to +158° F)
Design Standards	MIAD9 Series sensors comply with the following standards: DIN 19 234, EN 50 014 Part 1. 1977, EN50 020 Part 7. 1977, Factory Mutual #3610 and 3611, CSA 22.2 #157-92 and 22.2 #213-M1987
Certifications	     Exia NRTL/C

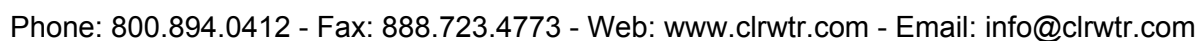
Approvals

CSA:	#LR 41887	Intrinsically Safe, with Entity for Class I, Groups A-D Class I, Div. 2, Groups A-D
FM:	#J.I. 5Y3A4.AX	Intrinsically Safe, with Entity for Class I, II, III, Div. 1, Groups A-G Class I, II, III, Div. 2, Groups A-D and G
KEMA:	#03ATEX1441X	II 1G EEx ia IIC T6
ETL:	#553868	



Dimensions

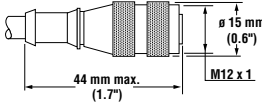
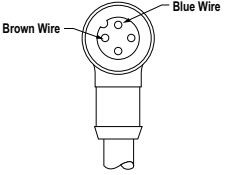
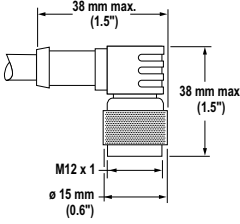
Technical drawing of the front view of the yellow rectangular component. The drawing shows a yellow rectangular body with a grey bezel on the right side. The bezel has two circular openings. Dimensions are indicated: 51.8 mm (2.04 inches) for the total width, 13.2 mm (0.52 inches) for the bezel width, and 18.0 mm (0.71 inches) for the distance between the two circular openings.













MINI-BEAM® MIAD9 Series — NAMUR

Accessories

Quick-Disconnect (QD) Cables







Style	Model	Length	Dimensions	Pinout
4-pin Euro-style Straight (NAMUR)	MQD9-406 MQD9-415	2 m (6.5') 5 m (15')		
4-pin Euro-style Right-angle (NAMUR)	MQD9-406RA MQD9-415RA	2 m (6.5') 5 m (15')		

Mounting Brackets

SMB312S	<ul style="list-style-type: none"> Stainless steel 2-axis, side-mount bracket 		SMB46U	<ul style="list-style-type: none"> "U" bracket 14 ga 316 stainless steel 	
SMB312B	<ul style="list-style-type: none"> Stainless steel 2-axis, bottom-mount bracket Includes mounting foot 		SMB18A	<ul style="list-style-type: none"> 12-ga. stainless steel right-angle mounting bracket with curved mounting slot for versatile orientation Clearance for M4 (#8) hardware 	
SMB312PD	<ul style="list-style-type: none"> Stainless steel 18 mm barrel-mount bracket 		SMB18FA	<ul style="list-style-type: none"> 14-ga. 304 stainless steel 18 mm swivel bracket with tilt and pan movement for precision adjusting 	
SMB46L	<ul style="list-style-type: none"> "L" bracket 14 ga 316 stainless steel 		SMB18Q	<ul style="list-style-type: none"> 12-ga. stainless steel 18 mm angled flanged bracket 	
SMB46S	<ul style="list-style-type: none"> "S" bracket 14 ga 316 stainless steel 		SMB18SF	<ul style="list-style-type: none"> 18 mm swivel, black reinforced thermoplastic polyester bracket Stainless steel mounting hardware included 	

MINI-BEAM® MIAD9 Series — NAMUR

Mounting Brackets, continued

SMB3018SC	<ul style="list-style-type: none">• 18 mm swivel; barrel- or side-mount• Black thermoplastic polyester		SMB18UR	<ul style="list-style-type: none">• 2-piece universal swivel bracket• 300 series stainless steel• Includes stainless steel swivel locking hardware	
SMB3018SUS	<ul style="list-style-type: none">• Side-mount swivel with extended range of motion• Black thermoplastic polyester• Includes stainless steel swivel locking hardware		SMBAMS18P	<ul style="list-style-type: none">• 12-ga. 300 series stainless steel• Flat SMBAMS series bracket with 18 mm hole for mounting sensors• Articulation slots for 90+° of rotation	
SMB30SK	<ul style="list-style-type: none">• Flat-mount swivel bracket with extended range of motion• Black thermoplastic polyester and 316 stainless steel		SMBAMS18RA	<ul style="list-style-type: none">• 12-ga. 300 series stainless steel• Right-angle SMBAMS series bracket with 18 mm hole for mounting sensors• Articulation slots for 90+° of rotation	



WARRANTY: Banner Engineering Corp. warrants its products to be free from defects for one year. Banner Engineering Corp. will repair or replace, free of charge, any product of its manufacture found to be defective at the time it is returned to the factory during the warranty period. This warranty does not cover damage or liability for the improper application of Banner products. This warranty is in lieu of any other warranty either expressed or implied.