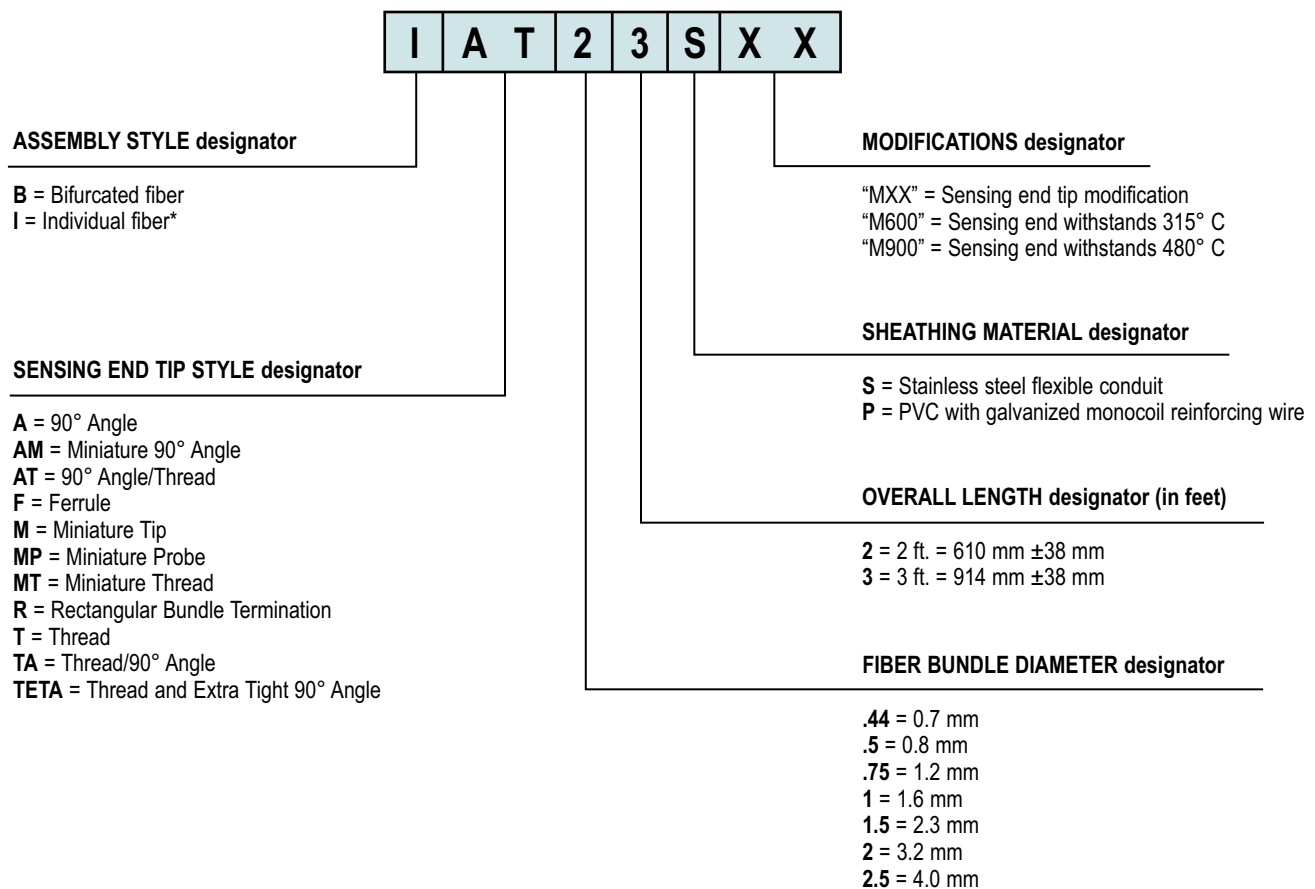


Glass Fiber Optics



Glass Fiber Optic Model Key



* Individual glass fibers are packaged separately.

Glass Fiber Optics Specifications

Construction	Combination of optical glass fiber, stainless steel or PVC, brass, molded thermoplastics, and optical-grade epoxy. Optical fiber is F2 core, EN1 clad, approx. 50 µm diameter per strand. Flexible steel interlock sheathing is 302 stainless.
Sensing Range	Refer to the specific fiber optic to be used.
Bend Radius	Inside bend radius must be 12 mm or greater for PVC covered fiber optic assemblies, and 25 mm or greater for stainless steel armored cable covered fibers.
Length	Standard length for assemblies is 915 mm; see dimension diagrams. Most models are available from the factory with shorter or longer cable lengths, up to 18 m max.
Length Dimension Tolerance	Overall assembly length: ± 12 mm per 300 mm of length Shrink junction dimensions: ± 12 mm
Implied Dimensional Tolerances	All dimensions are in millimeters: $x = \pm 2.5$ mm, $x.x = \pm 0.25$ mm and $x.xx = \pm 0.12$ mm, unless specified.
Operating Conditions	Fiber assemblies with stainless-steel (SS) sheathing and metal end tips: -140° to $+249^{\circ}$ C Fiber assemblies with PVC sheathing and/or plastic end tips: -40° to $+105^{\circ}$ C Special order assemblies with SS sheathing and metal end tips and model suffix "M600": -140° to $+315^{\circ}$ C* Special order assemblies with SS sheathing and metal end tips and model suffix "M900": -140° to $+480^{\circ}$ C*; note dimensional changes from STD models * sensing end tip only

⚠ Application Notes and Warnings ⚠

- 1** The ends of glass fiber optic assemblies are optically ground and polished. Care taken in this manufacturing process accounts for the light coupling efficiency of the fiber optic assembly. As a result, glass fiber assemblies cannot be shortened, spliced or otherwise modified.
- 2** Use caution when applying fiber optics in hazardous locations. Although fiber optic assemblies are by themselves, intrinsically safe, the sensor and associated electronics must be LOCATED IN A SAFE ENVIRONMENT. Alternatively, fiber optics may be used with sensor model SM1912FQD (page 43). This sensor is approved for use inside hazardous areas when used with an appropriate intrinsic barrier. Also, see NAMUR sensor models Q45AD9F (page 196) and MIAD9F (page 116). Fiber optics do not necessarily provide a hermetic seal between a hazardous environment and the safe environment.
- 3** In applications where glass fibers to insulate the control from high voltage, specify silicone rubber, Teflon®, or high-density polyethylene sheathing with no reinforcing wire in the cable. It is the responsibility of the user to test each fiber optic assembly for insulation capacity.
- 4** Do not subject the fibers to sharp bends, pinching, repeated flexing or high levels of radiation.
- 5** When ordering fiber lengths in excess of 1 m, take into account light signal reduction of 5 percent per 300 mm of additional length.

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Indicates lenses available for model. See page 25 for details.

M600 Available 315° C models. Add **M600** to end of model number (example, **BA23SM600**)

M900 Available 480° C models. Add **M900** to end of model number (example, **BA23SM900**)
Dimensions may vary for these models.

Model Number	Drawing & Dimensions (mm)	Core Dia. (mm)	Min. Bend Radius (mm)	Features	Typical Range (mm)
Standard		3.18	19	90° angle	
		3.18	19	90° angle/thread	
		3.18	19	Smooth ferrule	
		0.69	9.5	Miniature thread	
		3.18	19	Thread	
		3.18	19	Thread/90° angle	
Miniature Probe		1.17	19	Ø 1.5 mm non-bendable probe; 90° angle	
		1.17	19	Ø 1.5 mm non-bendable probe	
		1.17	9.5	Ø 1.5 mm non-bendable probe	
Area Sensing (Array)		3.96	19	Straight exit; 36 mm width	
		3.18	19	Straight exit; 10 mm width	

NA: WORLD-BEAM QS18 not recommended.

More on next page



M600 Available 315° C models. Add **M600** to end of model number (example, **BA23SM600**)

M900 Available 480° C models. Add **M900** to end of model number (example, **BA23SM900**)
Dimensions may vary for these models.

Model Number		Drawing & Dimensions (mm)	Core Dia. (mm)	Min. Bend Radius (mm)	Features	Typical Range (mm)
Diffuse	Side-View	BA1.53SMETA 	2.29	19	• M600 impact head	
		BA1.53SMTA 	2.29	19	• M600 impact head	
		BTETA1.53S 	2.29	19	• Ultra-compact M600 thread	
	Vacuum	BMT13SMVF 	1.57	19	• Miniature thread; entire cable withstands 480° C	Contact factory for sensing range.
Convergent Beam Spot	L10 	ref. glass fiber key or call factory	ref. glass fiber key or call factory	• Glass lens; withstands 315° C • Focuses light to .80 mm with ø 1.6 mm fiber		

Photoelectrics Sensors

Fiber Optic Sensors

Special Purpose Sensors

Measurement & Inspection Sensors

Vision

Wireless

Indicators

Safety Light Screens

Safety Laser Scanners

Fiber Optic Safety Systems

Safety Controllers & Modules

Safety Two-Hand Control Modules

Safety Interlock Switches

Emergency Stop Devices

FIBER SENSORS

PLASTIC FIBERS

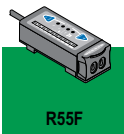
GLASS FIBERS

More Models Available!

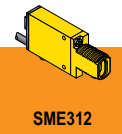
Glass Fiber Optics—Additional Models Available

In addition to the configurations shown, Banner offers thousands of readily available alternative fiber models:

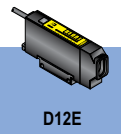
- Substitute PVC over monocoil sheathing for stainless steel.
- Reduce or increase glass fiber optic bundle diameters.
Example: Change ø 3.18 mm bundle to ø 1.57 mm.
- Substitute a rectangular-shaped fiber bundle (0.5 x 2.5 mm) for a circular bundle.
- Change endtip material from brass to stainless steel.
- Modify straight or angled probe tip dimensions.
- Modify overall fiber length in intervals of 305 mm (standard lengths are 914 and 610 mm).



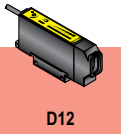
R55F



SME312



D12E



D12



QS18



Indicates lenses available for model. See page 261 for details.



Available 315° C models. Add **M600** to end of model number (example, **BA23SM600**)

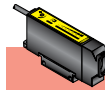
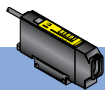
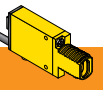
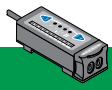


Available 480° C models. Add **M900** to end of model number (example, **BA23SM900**)
Dimensions may vary for these models.

Model Number	Drawing & Dimensions (mm)	Core Dia. (mm)	Min. Bend Radius (mm)	Features	Typical Range (mm)
Opposed	IA23S	3.18	19	• 90° angle 	
	IAT23S	3.18	19	• 90° angle/thread 	
	IF23P	3.18	19	• Smooth ferrule 	
	IMT.442P	0.69	9.5	• Miniature thread 	
	IT23S	3.18	19	• Thread 	
	ITA23S	3.18	19	• Thread/90° angle 	
Miniature Probe	IAM.752S	1.17	19	• Ø 1.5 mm non-bendable probe; 90° angle 	
	IM.752S	1.17	19	• Ø 1.5 mm non-bendable probe 	
	IMP.753P	1.17	9.5	• Ø 1.5 mm non-bendable probe 	
Area Sensing (Array)	IR2.53S	3.69	19	• Straight exit; 38 mm width 	
	IR23S	3.18	19	• Straight exit; 10 mm width 	

More on next page

NA: WORLD-BEAM QS18 not recommended.



M600 Available 315° C models. Add **M600** to end of model number (example, **BA23SM600**)

Photoelectrics
Sensors
**Fiber Optic
Sensors**
Special Purpose
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Safety
Laser Scanners
Fiber Optic
Safety Systems
Safety Controllers &
Modules
Safety Two-Hand
Control Modules
Safety Interlock
Switches
Emergency Stop
Devices

FIBER SENSORS
PLASTIC FIBERS
GLASS FIBERS

Model Number	Drawing & Dimensions (mm)	Core Dia. (mm)	Min. Bend Radius (mm)	Features	Typical Range (mm)
Side-View		2.29	19	Ultra-compact head	
		2.29	19	Compact head	
		2.29	19	Ultra-compact head; thread	
Vacuum		1.27	19	Miniature thread; entire cable withstands 480° C	Contact factory for sensing range.
Opposed Extended Range Lens		ref. model IT23S	ref. model IT23S	Glass lens; withstands 315° C	
		ref. model IT23S	ref. model IT23S	Plastic housing; withstands 105° C	
		ref. model IT23S	ref. model IT23S	Aluminum housing; withstands 315° C	
		ref. model IT23S	19	Stainless steel housing withstands 480° C	
Vacuum Feed Through		3.56	—	Seals to 1 x 10⁻⁹ torr; withstands 120° C	
Liquid Level		3.18	—	- Use with BT23S - Sensor switches when tip of glass rod is immersed in liquid	