

Omron's First Complete System for Sensing Under Vacuum

- Vacuum rated to 1×10^{-10} Pa • m³/s max. (7.5×10^{-10} torr • l/s)
- The industry's First *4-Channel Snap-On Fiber Mounting Feature* allows ease of use and implementation
- A Single-Channel Flange with screw-mounting is also available
- Increases process productivity by performing operations inside vacuum chambers
- The external fiber can be cut on both ends, allowing customized lengths
- Stainless steel and fluoro-resin fiber cables are available for vacuum processes
- CE approval



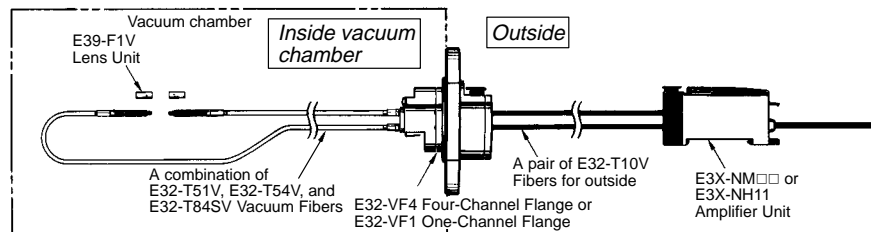
Ordering Information

■ CONFIGURATION EXAMPLE (TYPICAL)

To Order a Complete Fiber-Optic System for Sensing Under Vacuum

Select:

- A Flange
- Vacuum Fibers
- External Fiber Cable
- A Lens Unit (if necessary)
- The Appropriate Fiber-Optic Amplifier



■ FLANGES

Item	Part number
Four channel	E32-VF4
One-channel	E32-VF1

■ VACUUM FIBERS

Item	Through-beam, straight model	Through-beam, 90° model	Through-beam, heat-resistant model
Part number	E32-T51V 1M E32-T51V 0.5M	E32-T54V 1M E32-T54V 0.5M	E32-T84SV 1M —

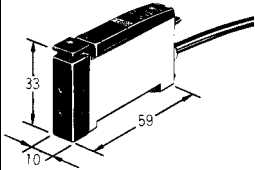
■ FIBERS FOR OUTSIDE

Item	Part number
External Fiber Cable	E32-T10V 2M

■ LENS UNIT

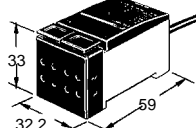
Item	Part number
Long distance lens	E39-F1V

■ AMPLIFIER UNIT W/HIGH-PRECISION SENSING AND TEACH FUNCTION (SOLD SEPARATELY)

Item	NPN output	PNP output
Part number	E3X-NH11	E3X-NH41
Appearance		
Light source	Red LED ($\lambda = 680 \text{ nm}$)	
Power supply voltage	12 to 24 VDC $\pm 10\%$, ripple (p-p) 10% max.	
Current consumption	75 mA max.	
Response time	1 ms max. (see note)	
Output	Control output	NPN open collector, load current: 50 mA max., residual voltage: 1 V max.
	Alarm output	
Sensitivity setting	Teaching method	
Fine sensitivity adjustment	Automatic or manual fine threshold adjustment (13 levels)	

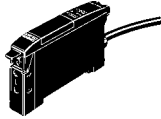
Note: The E3X-NH adopts a new digital sensing algorithm and has the same capacity for detecting minute objects as the conventional E3X-NT□1 (response time of 0.5 ms).

■ FOUR-CHANNEL AMPLIFIER UNIT WITH TEACH FUNCTION (SOLD SEPARATELY)

Item	Four-channel
Part number	E3X-NM11 (NPN output) E3X-NM41 (PNP output)
Appearance	
Light source	Red LED ($\lambda = 680 \text{ nm}$)
Power supply voltage	12 to 24 VDC $\pm 10\%$, ripple (p-p) 10% max.
Current consumption	150 mA max.
Response time	500 μs max. at rated sensing distance
Control output	PNP or NPN open collector, load current: 100 mA, residual voltage: 1 V max.
Timer function (see note)	OFF-delay timer (fixed to 40 ms) (independent channel)
Teaching confirmation function	Indicator (red/green LEDs) and buzzer
Remote teaching input	Pink and blue (0 V) wires are short-circuited when remote input is ON. (0 V short-circuit current: 1 mA max.) Pink and blue (0 V) wires are not short-circuited when remote input is OFF. (Open or 9 V min.; max. input voltage: 24 V) Response time is 0.5 ms max. when remote input is OFF.
Mode	Light-ON and Dark-ON switch-selectable

Note: It is possible to disable the OFF-delay timer function by using the switch setting.

■ DIGITAL FIBER AMPLIFIER UNIT (SOLD SEPARATELY)

Item	NPN output		PNP output		NPN output		PNP output	
Part number	E3X-DA11		E3X-DA41		E3X-DA21		E3X-DA51	
Appearance								
Light source (wavelength)	Red LED (660 nm)							
Supply voltage	12 to 24 VDC \pm 10%, ripple (p-p) 10% max.							
Current consumption	75 mA max.							
Response time	High-speed mode: 250 μ s for operation and reset Standard mode: 1 ms for operation and reset Long-distance mode: 4 ms for operation and reset							
Control output	ON/OFF output	NPN open collector Load current: 50 mA max. Residual voltage: 1 V max.	PNP open collector Load current: 50 mA max. Residual voltage: 2 V max.	NPN open collector Load current: 50 mA max. Residual voltage: 1 V max.	PNP open collector Load current: 50 mA max. Residual voltage: 2 V max.			
	Monitor output	---			Load 1 to 5 VDC, 10 k Ω min. Load resistance 10 k Ω min.			
Sensitivity setting	Teaching or manual method							
Timer function	OFF-delay timer, range: 0 to 200 ms (5 ms increment)							

Specifications

■ RATINGS/CHARACTERISTICS

Flanges

Item	E32-VF4	E32-VF1
Number of channels	Four-channel	One-channel
Vacuum ratings	1 x 10 ⁻¹⁰ Pa • m ³ /s max. (7.5 x 10 ⁻¹⁰ torr • l/s)	
Ambient operating temperature	-25°C to 55°C (-13°F to 131°F) with no icing	
Material	Aluminum (A5056)	Stainless steel (SS 304)
Flange seal material	Fluoro rubber	
Weight	Approx. 250 g	Approx. 220 g

Fiber Unit for Outside

Item	E32-T10V	
Standard length	2 m (cut freely)	
Ambient operating temperature	-25°C to 70°C (-13°F to 158°F) with no icing	
Permissible bending radius	25 mm max.	
Material	Core	Acrylic resin
	Sheath	Fluoro-resin
	Protection tube	Black polyethylene

Vacuum Fibers

Item	E32-T51V	E32-T54V	E32-T84SV	
Sensing method	Through-beam			
Standard length	1 m (not cut freely)			
Sensing distance	E3X-NM11/NM41	60 mm	40 mm	150 mm
	E3X-NH11	100 mm	100 mm	400 mm
Ambient operating temperature	-25°C to 120°C (-13°F to 248°F) with no icing		-25°C to 200°C	
Permissible bending radius	30 mm max.		25 mm max.	
Material	Core	Quartz		Optical glass
	Sheath	Fluoro-resin		Optical glass
	Protection tube	Fluoro-resin		Stainless steel (SS 304)
	Fiber head/ Connection tube	Aluminum (A5056), Stainless steel (SS 304)		

Lens Unit

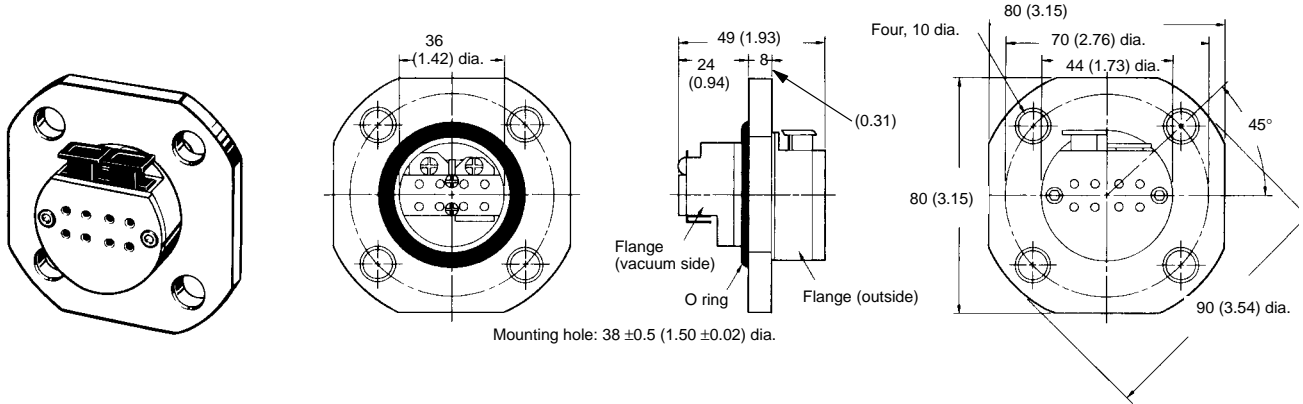
Item	E39-F1V		
Applicable fiber	E32-T51V		E32-T54V
Sensing distance	E3X-NM11/NM41	360 mm	240 mm
	E3X-NH11	700 mm	600 mm
Ambient operating temperature	-25°C to 120°C (-13°F to 248°F) with no icing		
Material	Housing	Aluminum (A5056)	
	Lens	Optical glass	

Dimensions

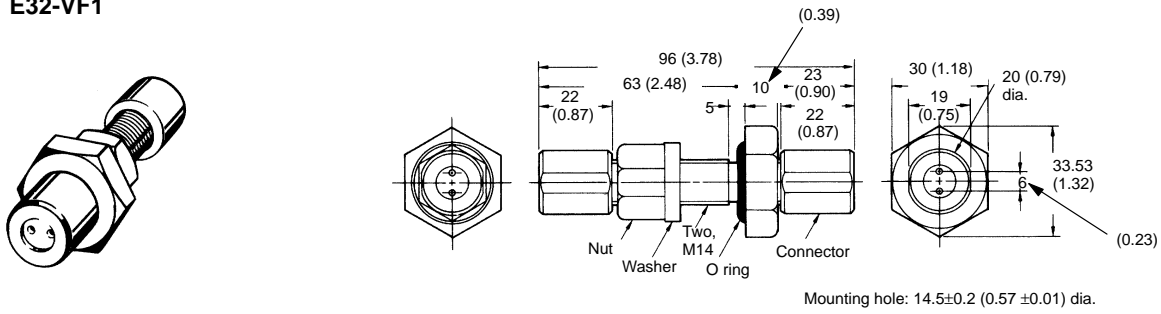
Unit: mm (inch)

■ FLANGES

E32-VF4

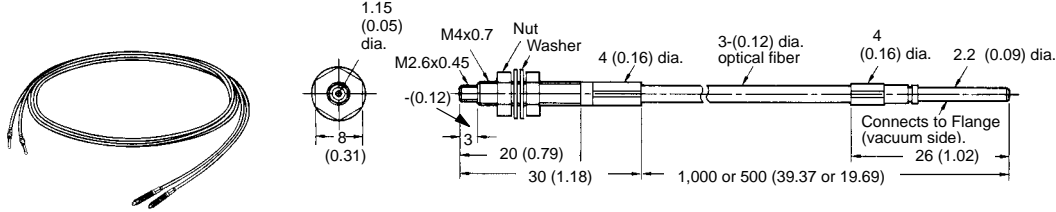


E32-VF1

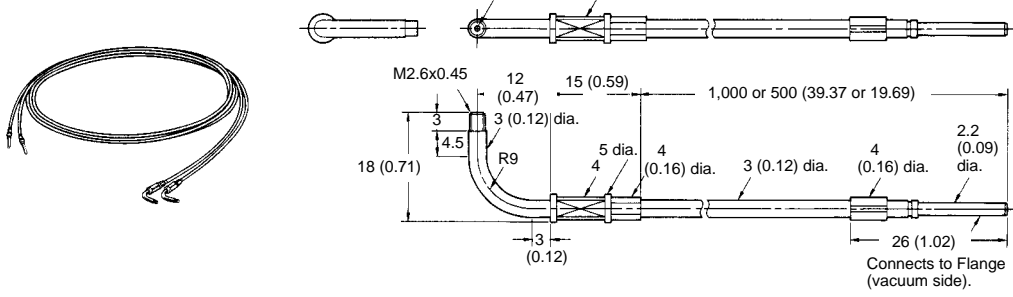


■ VACUUM FIBERS

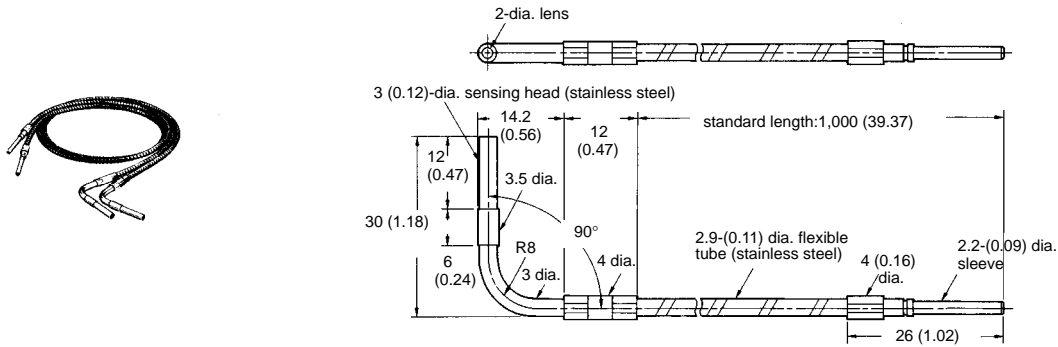
E32-T51V



E32-T54V

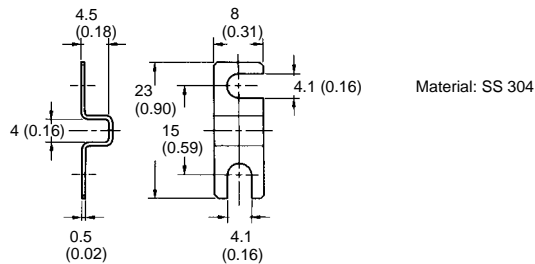


E32-T84SV



■ MOUNTING BRACKET

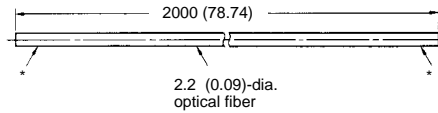
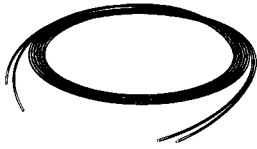
E39-L54V Mounting Bracket (Sold Separately)



Unit: mm (inch)

■ EXTERNAL FIBER CABLE

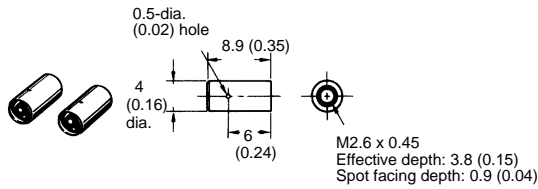
E32-T10V



* Freely cut and connected to the outside Flange or Amplifier Unit.

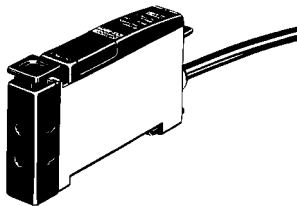
■ LENS UNIT

E32-F1V

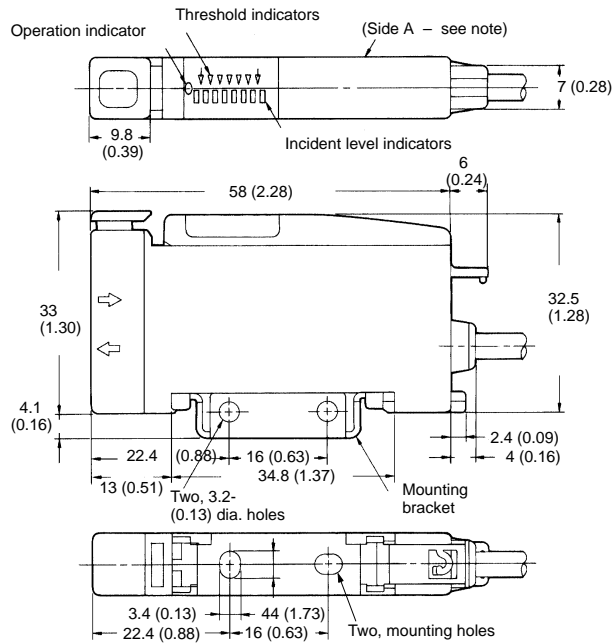
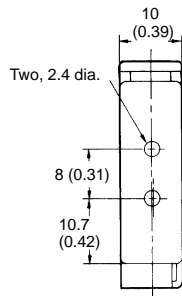


■ AMPLIFIER (SOLD SEPARATELY)

E3X-NH11



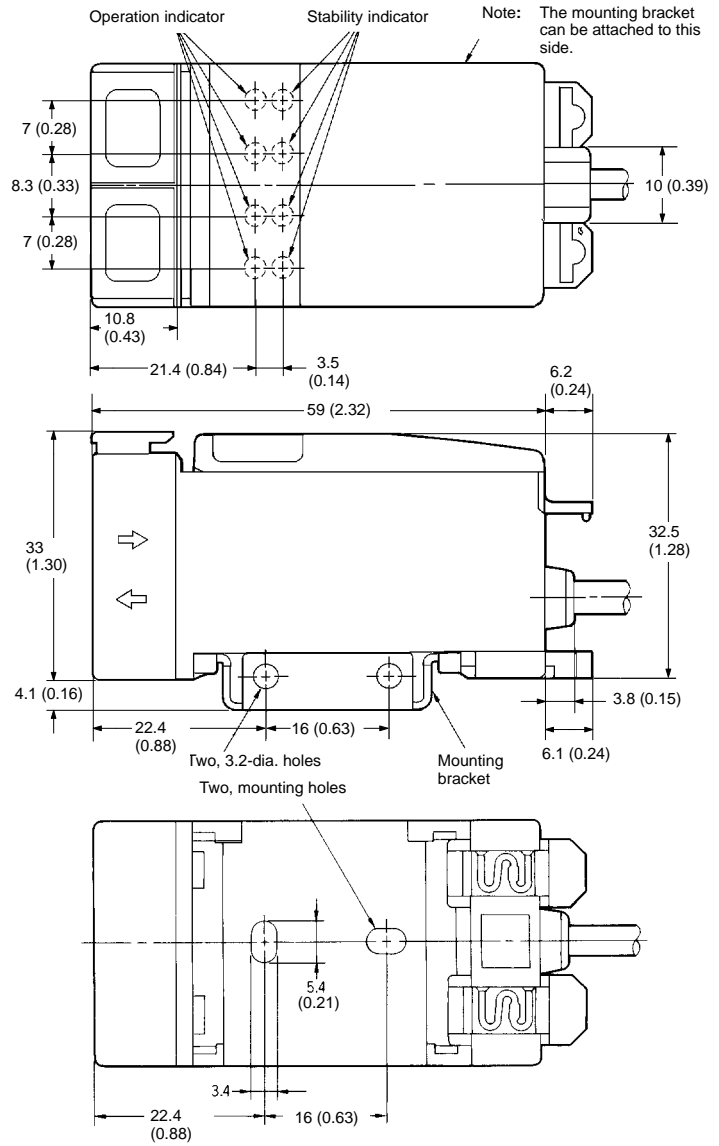
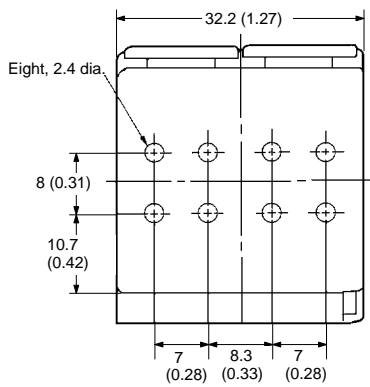
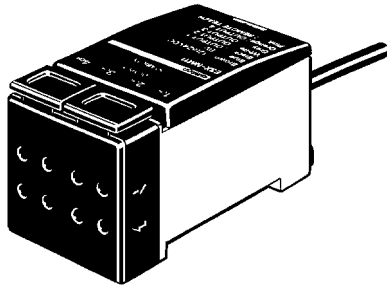
Note: The mounting bracket can be attached to side A.



Cable: Polyvinyl chloride covered cable
 4-mm dia. (18/0.12 dia), 4 cores
 Standard length: 2 m
 Weight: Approx. 100 g

■ AMPLIFIER UNIT (SOLD SEPARATELY)

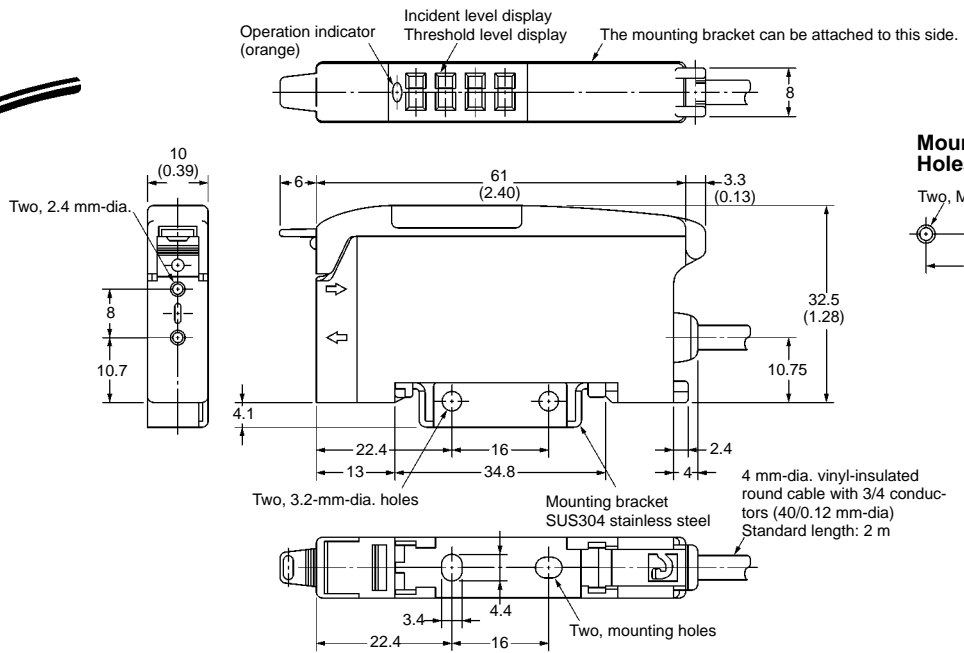
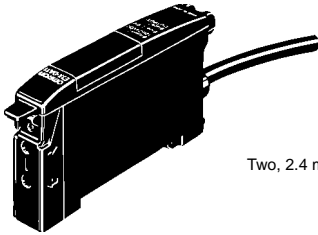
E3X-NM11
E3X-NM41



Cable: Polyvinyl chloride-covered cable
4-mm dia. (40/0.08 dia), 7 cores
Standard length: 2 m
Weight: Approx. 200 g

■ AMPLIFIER

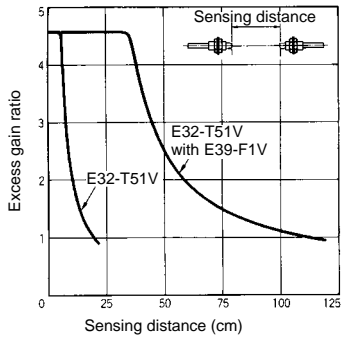
E3X-DA□1



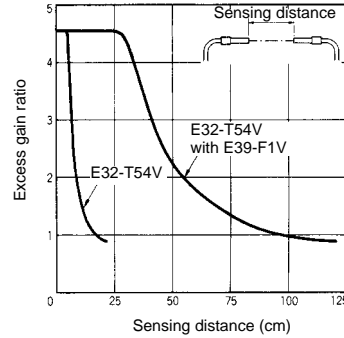
Engineering Data (with E3X-NM11/NM41 Amplifier Unit)

EXCESS GAIN RATIO VS. DISTANCE CHARACTERISTICS (TYPICAL)

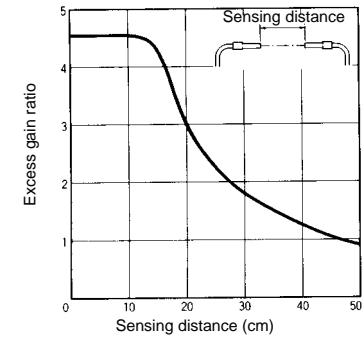
E32-T51V



E32-T54V

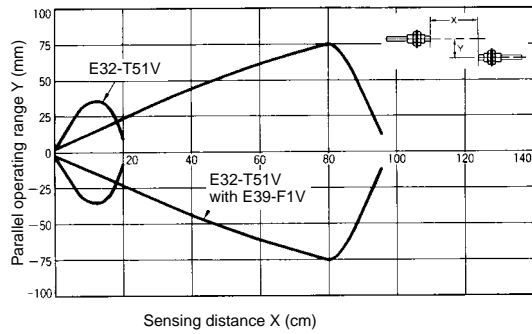


E32-T84SV

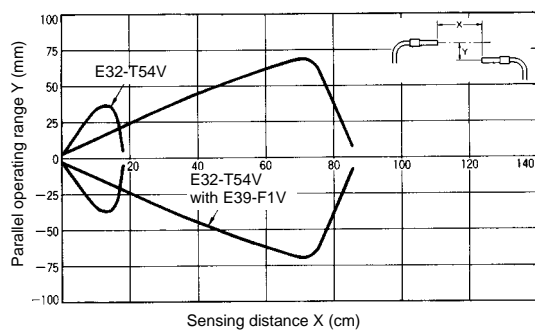


PARALLEL OPERATING RANGE (TYPICAL)

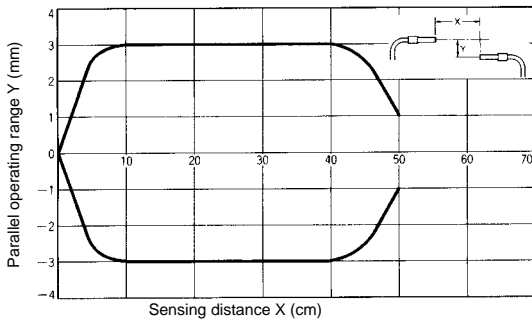
E32-T51V



E32-T54V



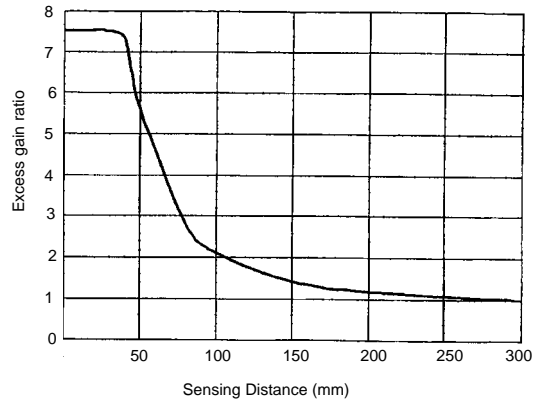
E32-T84SV



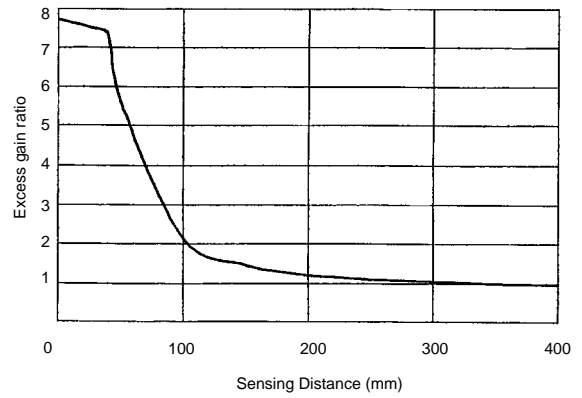
Engineering Data (with E3X-NH11 Amplifier Unit)

■ EXCESS GAIN RATIO VS. DISTANCE CHARACTERISTICS (TYPICAL)

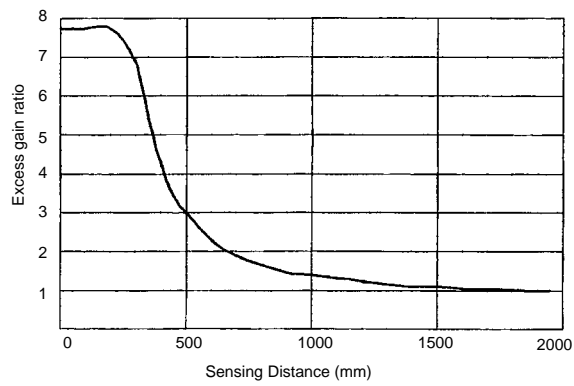
E32-T51V



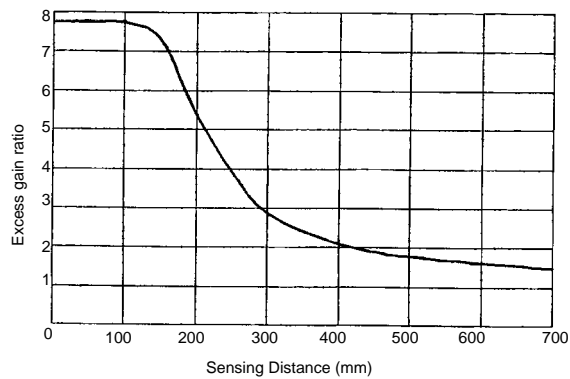
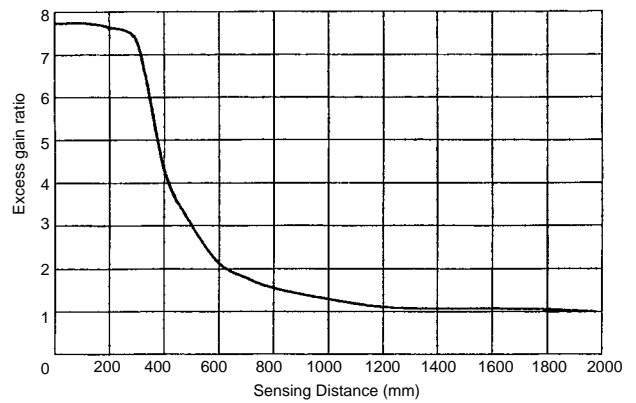
E32-T54V



E32-T51V + E39-F1V

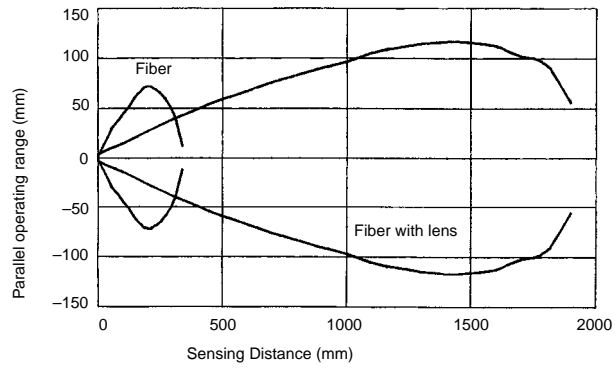


E32-T54V – E39-F1V

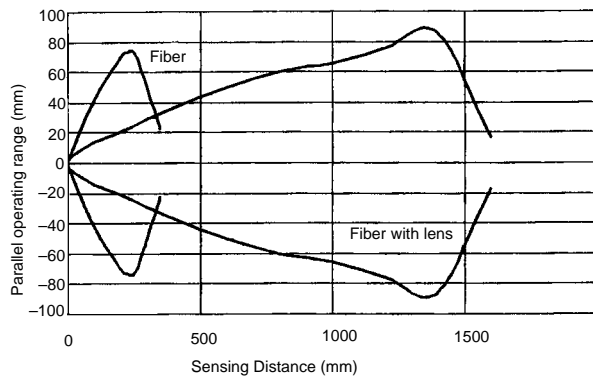


■ PARALLEL OPERATING RANGE (TYPICAL)

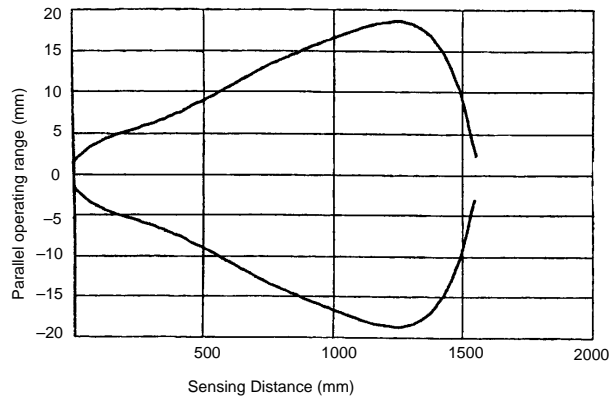
E32-T51V
E32-T51V + E39-F1V



E32-T54V
E32-T54V + E39-F1V



E32-T84SV



Precautions

■ APPLICATIONS

The E32-V Vacuum Fiber Unit is used to detect a variety of objects located in high-vacuum chambers heated up to 120°C (some chambers operate at a maximum temperature of 200°C).

■ CLEANING

Although Flanges, Vacuum Fibers, and Lens Units are cleaned before shipping, clean them with alcohol before use in high-vacuum chambers to make sure there is no foreign matter on them.

■ ORGANIC SOLVENTS

Keep organic solvents away from the E32-V Vacuum Sensor.

■ EXCESSIVE FORCE

The E32-V Vacuum Fiber Unit can resist a maximum force of 29.4 N (3 kgf). Do not impose extreme force, such as pulling force or pressure, on the E32-V Fibers.

■ FOR CONDITIONS OR ENVIRONMENTS NOT SPECIFIED FOR THIS PRODUCT

Consult your OMRON representative before attempting an application for: conditions or environments not specified in instruction manuals, and applications insuring safety, including nuclear reactor control, train facilities, aviation facilities, motorized vehicles, furnaces, medical equipment, amusement equipment, and safety equipment.

Note: You must allow a sufficient margin between ratings and required performance in addition to providing appropriate fail-safe measures and other safety measures when using the E32-V in applications such as mentioned above.

NOTE: DIMENSIONS SHOWN ARE IN MILLIMETERS. To convert millimeters to inches divide by 25.4.

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