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FIBER SENSORS

STATIC CONTROL DEVICES

LASER MARKERS

HUMAN MACHINE INTERFACES

FA COMPONENTS

MACHINE VISION SYSTEMS

UV CURING SYSTEMS

> Selection Guide

> > Contact

Metal-sheet Double-feed Detection

Controller

GP-X

GP-A

Digital Panel

Other Products

Laser Displacement

Displacement Collimated Beam Sensors

PLC

ENERGY MANAGEMENT SOLUTIONS

LASER SENSORS PHOTOELECTRIC SENSORS MICRO PHOTOELECTRIC SENSORS AREA SENSORS SAFETY LIGHT CURTAINS / SAFETY COMPONENTS PRESSURE / FLOW SENSORS INDUCTIVE PROXIMITY SENSORS PARTICULAR USE SENSORS SENSOR SIMPLE WIRE-SAVING UNITS WIRE-SAVING SYSTEMS



Resolution 0.04 % F.S., Linearity ±0.5 % F.S., IP67G environment resistance

Accurate measurement of minute displacements

Minute displacement of metallic objects can be accurately measured with a resolution of 0.04 % F.S. $\begin{bmatrix} GP-A5S (For 1 mm 0.039 in sensing type) \\ Resolution: 0.4 \mu m 0.016 mil \end{bmatrix}$

ENVIRONMENTAL RESISTANCE

The sensor head protected as per IP67G

With IP67G environment resistance, various measurements are possible under many different conditions.

FUNCTIONS

Equipped with a zero-adjustment function

By pressing the zero-adjustment button, you can reset the output voltage to 0 V with one touch. (Resets the current output to 4 mA)

This function comes in handy when performing tolerance diagnosis of a masterwork to be used as the standard. Easy adjustment for product changes. (Remote operation is also possible)

by way of an external input.



MOUNTING

Sensor heads can be mounted in narrow spaces

If mounting standard types and different frequency types parallel to each other, they use up one-third the space needed for mounting compared to the same models. In addition, the **GP-A14F** type can be mounted close together and the sensor heads can be set in a narrow range for distortion and other difficult measurements

Linearity ±0.5 % F.S.

Displacement is accurately output since it incorporates a high accuracy linearity correction circuit.

BASIC PERFORMANCE

Stable temperature characteristics

These sensor heads boast a 2 mm 0.079 in or more sensing range enabling 0.03 % F.S./°C. (Excluding the different frequency type). **GP-A8S** (For 2 mm 0.079 in sensing type)

Temperature characteristics: 0.6 µm/°C 0.024 mil/°C

OPERABILITY

Fine adjustment of output

Fine adjustment according to the sensing conditions is possible with shift and span functions.

Shift adjustment Span adjustment +5 V Shift adjustment 6.5 V ange: ±0.5 V 2ero-adjustment 5 V 0 V 3.5 V 3.5 V -5 V Shift adjustment 0 V

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FIBER SENSORS

LASER SENSORS

PHOTO-ELECTRIC SENSORS

MICRO PHOTO-ELECTRIC SENSORS

AREA SENSORS

SAFETY LIGHT CURTAINS / SAFETY COMPONENTS

PRESSURE / FLOW SENSORS

INDUCTIVE PROXIMITY SENSORS

PARTICULAR USE SENSORS

SENSOR OPTIONS

APPLICATIONS

Measuring parallelism of chassis Measuring gap between rollers Fine gap measurement is possible to Even a slight tilt can be reliably detected. control the gap between rollers.

ORDER GUIDE

Sensor heads Amplifier 600 multiple 65.4 0.0213 65.4 0.0213 0 to 1 mm 0 to 0.039 in GP-A5S 60 pread uses 0 do pread uses 0 do pread uses 0 do 20 multiple 0 do 1 mm 0 to 0.039 in GP-A5S GP-A5S 60 pread uses 0 do pread uses 0 do 0 so 2 mm 0 to 0.079 in 0 to 2 mm 0 to 0.079 in GP-A8SI Analog voltage • Output voltage: 0 to 5 V 60 pread uses 0 do pread uses 0 do 0 so 2 mm 0 to 0.079 in 0 to 2 mm 0 to 0.079 in GP-A10MI Analog voltage • Output voltage: 0 to 5 V 60 pread uses 0 do pread uses 0 do 0 so 2 mm 0 to 0.079 in GP-A10MI Analog current • Output voltage: 0 to 5 V 61 pread uses 0 do 0 to 0.079 in GP-A12MLI GP-A12MLI Analog current • Output current: 4 to 20 mA	Туре	Appea	irance (mm in)	Sensing range	Set model No.	Output	SI W																				
Building of the subscription of the		Sensor heads	Amplifier				W																				
Building of the part of	9 in sensing ded type ad	ø5.4 ø0.213		0 to 1 mm	GP-A5S		S' M N S																				
O O ULL C JOL O to 2 mm 0 to 0 to 0.079 in O to 2 mm 0 to 0 to 0.079 in GP-A10M Analog voltage 0 to 5 V Analog voltage: 0 to 5 V O to 5 V Analog voltage: 0 to 5 V O to 5 V Analog voltage: 0 to 5 V O to 5 V Analog voltage: 0 to 5 V O to 5 V Analog voltage: 0 to 5 V O to 5 V Analog voltage: 0 to 5 V O to 2 mm 0 to 5 mm 0 to 5 mm 0 to 0.197 in GP-A12MLI	For 1 mm 0.03 Non-threa sensor he: Different frequency	17 0.669			GP-A5SI	_	SOL																				
Constrained Analog voltage Output Oto 2 mm Oto 2 mm Oto 2 mm Oto 100 to 0.079 in GP-A10MI GP-A10Mi GP-A10Mi Image: Oto 5 V Analog voltage Oto 5 V GP-A10Mi Image: Oto 2 mm Oto 5 V Image: Oto 5 V Analog voltage Image: Oto 5 V Image: Oto 5 V Image: Oto 5 V	nsing aded type ead									GP-A8S	_	L															
Image: Section of the section of t	79 in se Non-thre sensor h Different frequency	a0 315 - 10	90	0 to 0.079 in	0 to 0.079 in	0100.07911	0 to 0.079 in		0100.07911	0 10 0.079 III	0100.07911	0100.07911	0100.07911	0100.07911	0100.0791h	0 10 0.079 IN	0100.07911	0100.07911	0100.07911	0100.0791h	0 10 0.079 IN	0 10 0.079 III	0 10 0.079 IN	0 10 0.079 IN	GP-A8SI		F
Image: Property of the state of the stat	0.0 9			67			GP-A10M	 Output voltage: 	H M H F																		
GP-A12ML GP-A12ML GP-A12ML GP-A12ML	For 2 Threade sensor b Different frequency				0 to 0.079 in	GP-A10MI	Output current:	E S F																			
Image: Series of the series	37 in sensing ed type head		2.087	2.087	2.087		GP-A12ML	- 4 to 20 mA																			
Oto 3 mm 0 to 0.118 in Oto 3 mm 0 to 0.118 in	For 5 mm 0.11 Thread sensor Different frequency	M12							0 to 0.197 in	GP-A12MLI																	
0 to 0.118 in	18 in sensing Tsing sor head	5.4 0.213			GP-A14F		_																				
$\frac{E}{2} \begin{bmatrix} 5 \\ -2 \\ -2 \end{bmatrix} \begin{bmatrix} 15 \\ -2 \\ -2 \end{bmatrix} \begin{bmatrix} 15 \\ -2 \\ -1 \end{bmatrix} \begin{bmatrix} 15 \\ -2 \\ -2 \end{bmatrix} \begin{bmatrix} 15 \\ -2 \\ -2$	For 3 mm 0.11 Front ser type sens Different frequency	15 0.591 34 1.339		0 to 0.118 in	GP-A14FI		50																				

Please ensure to order the sensor head and the amplifier as a set. The set is calibrated and delivered.

OPTIONS

Туре	Model No.	Description
Sensor head	MS-SS5	Mounting bracket for GP-A5S(I)
mounting bracket	MS-SS8	Mounting bracket for GP-A8S(I)

Sensor head mounting bracket

- MS-SS5
- MS-SS8

It enables easy fixing of the sensor head.

Contact Displacem Collimated Beam Sensors Metal-sheet Double-feed Detection Digital Panel Controller Other Products

GP-X GP-A FIBER SENSORS

LASER SENSORS

For 1 mm 0.039 in sensing

SPECIFICATIONS

					Sensing
PHOTO- ELECTRIC SENSORS		\backslash	Туре	Non-threaded ty	/pe sensor head
MICRO					Different frequency
PHOTO- ELECTRIC SENSORS	Item	n Se	t model No.	GP-A5S	GP-A5SI
AREA SENSORS	Sensing range			0 to 1 mm 0) to 0.039 in
SAFETY LIGHT CURTAINS / SAFETY	Stan	dard sensing c	bject	Iron sheet 8 0.315 × 0.31	× 8 × t 1 mm 5 × t 0.039 in
COMPONENTS PRESSURE /	Supp	oly voltage			
FLOW SENSORS	Curr	ent consumption	on		
INDUCTIVE PROXIMITY SENSORS	(Ana	og outputs alog voltage ou alog current ou		Ana •	
PARTICULAR USE SENSORS		Response fre	·		
		Resolution	quonoy		
SENSOR		Linearity			
SIMPLE WIRE-SAVING UNITS					
WIRE-SAVING SYSTEMS	Aları	m output			
MEASURE- MENT SENSORS		Output operat	lion		Turns ON
STATIC		Short-circuit p			
DEVICES					
LASER MARKERS	Exte	rnal zero-adjus	stment input		
PLC					
HUMAN	Zero	-adjustment se	tting method		
INTERFACES	Pow	er indicator			
ENERGY MANAGEMENT	Over	rindicator			
SOLUTIONS	Aları	m indicator			
FA COMPONENTS	Adju	stments	1		
MACHINE VISION SYSTEMS	char	perature acteristics	Sensor head		m/°C mil/°C
UV	(Not	e 2)	Amplifier	0.4 µm/°C (0.016 mil/°C
CURING SYSTEMS	Prote	ection	Sensor head		
			Amplifier		
	Amb		Sensor head		
0.1	temp	perature	Amplifier		0 to +50 °
Selection Guide	Amb	ient humidity			
Laser Displacement		ge withstandability	Sensor head		250
Magnetic Displacement	Insula	ation resistance	Sensor head		20 MΩ, or mo
Contact Displacement	Vibra	ation resistance	Sensor head		10 to 55 Hz
Collimated Beam Sensors			Amplifier		10 to 150 Hz
Metal-sheet Double-feed Detection	Shoo	ck resistance	Sensor head		
Digital Panel Controller			Amplifier	Faslance Outst	
Other			Sensor head	Enclosure: Stainle	t: Rolyalylate

Other Products

		туре	Non-uneaueu ij	pe sensor neau		ype sensor neau		e sensor neau	Threaded typ	e sensor nead		pe sensor neau
				Different frequency		Different frequency		Different frequency		Different frequency		Different frequency
Item	Se	et model No.	GP-A5S	GP-A5SI	GP-A8S	GP-A8SI	GP-A10M	GP-A10MI	GP-A12ML	GP-A12MLI	GP-A14F	GP-A14FI
Sens	ing range		0 to 1 mm () to 0.039 in		0 to 2 mm () to 0.079 in		0 to 5 mm () to 0.197 in	0 to 3 mm () to 0.118 in
Standard sensing object			Iron sheet 8 × 8 × t1 mm Iron sheet 12 × 12 × t1 mm Iron sheet 30 × 30 × t1 mm Iron sheet 15 × 15 × t1 mm 0.315 × 0.315 × t0.039 in 0.472 × 0.472 × t0.039 in 1.181 × 1.181 × t0.039 in 0.591 × 0.591 × t0.039 in									
Supp	ly voltage					24 V D0	C±10 % Rip	ople P-P 10 %	6 or less			
Curre	ent consumption	on					150 mA	or less				
Analog outputs (Analog voltage output (Analog current output)						age: 0 to 5 V edance: 100 9	Ω approx.		current put current: 4 d resistance			
ſ	Response fre	quency					1.6 kHz	(–3 dB)				
	Resolution						0.04 %	% F.S.				
Γ	Linearity						Within ±0	0.5 % F.S.				
Alarn	n output				• Max • App	en-collector tra kimum sink cu lied voltage: sidual voltage	urrent: 100 m 30 V DC or le : 1.6 V or less	ess (between	sink current)	and 0 V)		
ſ	Output opera	tion		Turns ON	when the se	nsor head co	nnection is in	nproper or the	e sensor hea	d cable is dis	connected	
ľ	Short-circuit p	protection										
External zero-adjustment input				Input condition: Non-voltage contact or NPN open-collector transistor input Signal condition: Low 0 to 1 V (duration 30 ms or more) High 5 to 30 V, or open Operation: Low External zero-adjustment setting High External zero-adjustment ineffective								
Zero-	adjustment se	tting method	Push button setting / External input setting									
Powe	er indicator			Green LED (lights up when the power is ON)								
Over	indicator		Orange LED (lights up when sensing range is exceeded)									
Alarn	n indicator		Yellow LED (lights up when the alarm output is ON)									
Adjus	stments		① Shift adjustment (by push-buttons), ② Span adjustment (by 14-turn adjuster)									
chara	perature acteristics	Sensor head		m/°C mil/°C	0.6 µm/°C 0.024 mil/°C	1 μm/°C 0.039 mil/°C		1 μm/°C 0.039 mil/°C	1.5 μm/°C 0.059 mil/°C		0.9 µm/°C 0.035 mil/°C	1.5 μm/°C 0.059 mil/°C
(Note	= 2)	Amplifier	0.4 µm/°C (0.016 mil/°C		0.8 µm/°C (0.031 mil/°C		2.0 µm/°C	0.079 mil/°C	1.2 µm/°C	0.047 mil/°C
Prote	ection	Sensor head	IP67 (IEC), IP67G									
		Amplifier										
Ambi		Sensor head	-10 to +55 °C +14 to +131 °F , Storage: -20 to +70 °C -4 to +158 °F									
temp	erature	Amplifier	0 to +50 °C +32 to +122 °F (No dew condensation allowed), Storage: 0 to +50 °C +32 to +122 °F									
Ambi	ent humidity					35 to 8	5 % RH, Stor	rage: 35 to 8	5 % RH			
	e withstandability	withstandability Sensor head 250 V AC for one min. between all supply terminals connected together and enclosure										
Insula	Insulation resistance Sensor head 20 MΩ, or more, with 250 V DC megger between all supply terminals connected together and enclosure					;						
Vibrat	tion resistance	Sensor head	10 to 55 Hz frequency, 1.5 mm 0.059 in double amplitude in X, Y and Z directions for two hours each									
		Amplifier	10 to 150 Hz frequency, 0.75 mm 0.030 in double amplitude in X, Y and Z directions for two hours each									
Shoc	k resistance	Sensor head	500 m/s ² acceleration (50 G approx.) in X, Y and Z directions five times each									
Amplifier						celeration (10			1			
Material Sensor head			t: Polyalylate	1	osure: Stainle ing part: ABS			Enclosure: Bras	s (Nickel plated) rt: Nylon	Enclosure: Stainle Sensing par	ess steel (SUS303) rt: ABS	
Amplifier			Enclosure: ABS									
Cable Sensor head					ctor attached		-					
Cable	length (Note 3)	Amplifier										
Net V	Veight	Sensor head		40 g a	ipprox.			ox. (Note 4)	45 g appro	ox. (Note 4)	50 g a	approx.
		Amplifier					170 g a	approx.				
Accessories				Adjusting scre	ewdriver: 1 p	с.		pcs., Tootheong screwdriv	d lock washe er: 1 pc.	r: 1 pc.	head screws, s plain washers	M3 countersunk spring washers, s and M3 nuts ewdriver: 1 pc.

For 2 mm 0.079 in sensing

Non-threaded type sensor head Threaded type sensor head Threaded type sensor head

For 5 mm 0.197 in sensing

For 3 mm 0.118 in sensing

Front sensing type sensor head

Notes: 1) Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of +20 °C +68 °F.

2) These values are for a range which is 20 to 60 % of the maximum sensing distance.

3) Take care that the output voltage is reduced due to the resistance of the wiring cable.

4) The given weight of the threaded type sensor head is the value including the weight of the nuts and the toothed lock washer.

FIBER SENSORS

LASER SENSORS

PHOTO-ELECTRIC SENSORS

MICRO PHOTO-ELECTRIC SENSORS

AREA SENSORS

SAFETY LIGH

CURTAINS / SAFETY COMPONENTS

PRESSURE / FLOW SENSORS

INDUCTIVE PROXIMITY SENSORS

PARTICULAR

USE SENSORS

SENSOR OPTIONS

SIMPLE WIRE-SAVING UNITS

WIRE-SAVING SYSTEMS

STATIC CONTROL DEVICES

LASER MARKERS

HUMAN MACHINE INTERFACES

ENERGY MANAGEMENT SOLUTIONS

FA COMPONENTS

MACHINE VISION SYSTEMS

UV CURING SYSTEMS

Selectior Guide

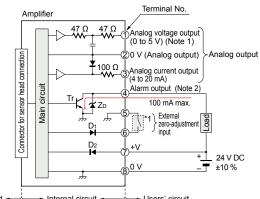
Contact

Collimate Beam Sensors

PLC

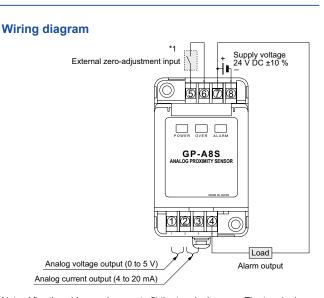
I/O CIRCUIT AND WIRING DIAGRAMS

I/O circuit diagram

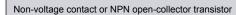


- Notes: 1) In case of using the analog voltage output, connect a device having a high input impedance. Also, take care that the output voltage is reduced due to the resistance of the wiring cable.
 - The alarm output is not incorporated with a short-circuit protection circuit. Do not connect it directly to a power supply or a capacitive load.

Symbols D1: Input protection diode	
D2: Reverse supply polarity protection dio	de
ZD: Surge absorption zener diode	
Tr : NPN output transistor	



Note: After the wiring, make sure to fit the terminal covers. The terminal cover having a concave depression at the top should be fitted on the side having terminal Nos. 1 to 4.



or 6

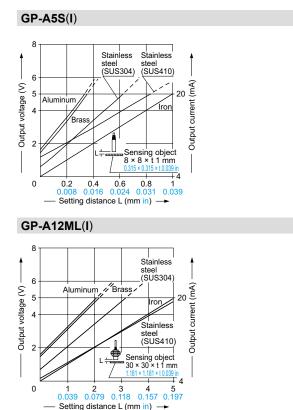
Low (0 to 1 V) (duration 30 ms or more): External zero-adjustment setting High (5 to 30 V, or open): External zero-adjustment ineffective

SENSING CHARACTERISTICS (TYPICAL)

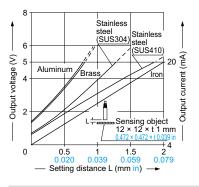
Correlation between material and output voltage / current

The **GP-A** series is made for all types of standard iron sensing objects. The graph below describes the output discrepancies that occur when detecting different types of metals.

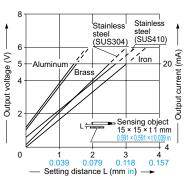
*1



GP-A8S(I) GP-A10M(I)



GP-A14F(I)





GP-X

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PRECAUTIONS FOR PROPER USE

- Never use this product as a sensing device for personnel protection. In case of using sensing devices for personnel protection, use products which
 - meet laws and standards, such as OSHA, ANSI or IEC etc., for personnel protection applicable in each region or country.
- · Make sure to use in combination the sensor head and amplifier which have the same production serial number (5 digits). Since adjustment is done before shipment, if items with different production serial numbers are combined, the sensing characteristics will deteriorate even if they have the same model number.
- The length of the sensor head cable cannot be changed.

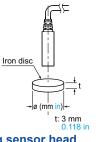
Linearity in case of disc-shaped or cylindrical objects

 In case the sensing object is disc-shaped or cylindrical, the linearity of the analog output varies with the sensing object size. In such a case, conduct zero adjustment when close mounting and, by adjusting to the maximum sensing distance and to 5 V as the voltage output (current output 20 mA), linearity (±0.5 % F.S.) can be attained on a full-scale if the sensing object's size is larger than those described in the table below.

Model No.	Iron disc diameter ø (mm in)	Iron cylinder diameter ø (mm in)
GP-A5S(I)	12 0.472	10 0.394
GP-A8S(I)	12 0.472	10 0.394
GP-A10M(I)	12 0.472	10 0.394
GP-A12ML(I)	30 1.118	50 1.969
GP-A14F(I)	12 0.472	10 0.394

<In case of disc>

<In case of cylinder>



Iron cylinder ø (mm in) ℓ: 50 mm

Mounting sensor head

Mounting with set screw

Set screw (M

(Cup-p

- The tightening torque should be under the value given below. Make sure to use an M3 or smaller set screw having a cup-point.
- <Non-threaded type sensor head>

Controller Other Products	
GP-X	

Contact

Collimated

Digital Panel

GP-A

13 or less) oint)	Model No.	A (mm in)	Tightening torque
	GP-A5S(I)	5 0.197	0.44 N·m
	GP-A8S(I)	or more	0.58 N·m
	Note: Do not apply	y excess to	rque.

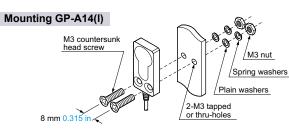
Mounting with nut

• The tightening torque should be under the value given below. <Threaded type sensor head>

GP-A10M(I)	GP-A12ML(I)	Model No.	B (mm in)
Attached toothed lock washer	Attached toothed lock washer	GP-A10M(I)	7 0.276 or more
		GP-A12ML(I)	14 0.551 or more
Mounting plate	Mounting plate	Note: Install in such	as way so

o that the nut does not protrude from

Refer to p.1595 for general precautions.



Distance from surrounding metal

· As metal around the sensor may affect the sensing performance, pay attention to the following points.

<Embedding of the sensor in metal>

· Since the analog output may change if the sensor is completely embedded in metal, keep the minimum distance specified in the table below.

	type sensor head	
\ threaded type	sensor head	



Model No.	C (mm in)	D (mm in)	
GP-A5S(I)		4 0.157	
GP-A8S(I)	ø18 ø0.709	4 0.137	
GP-A10M(I)		7 0.276	
GP-A12ML(I)	ø50 ø1.969	14 0.551	

GP-A14F(I) can be used by being

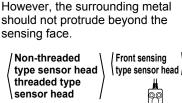
completely embedded in metal.

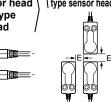
<Front sensing type sensor head>



Mutual interference

· When two or more sensor heads are installed in parallel or face to face, since the specifications may not be met, keep the minimum separation distance specified in the table below.





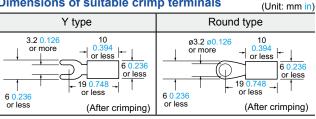
Model No.	E (mm in)			
would no.	Between "I" type and non-"I" type	Between two "I" types or two non-"I" types		
GP-A5S(I)	11 0.433	36 1.417		
GP-A8S(I) GP-A10M(I)	11 0.433	38 1.496		
GP-A12ML(I)	14 0.551	130 5.118		
GP-A14F(I)	0 0	30 1.181		

Е

Notes: 1) "I" type is different frequency type.

2) If the required resolution is lower than the specification (0.04 % F.S.), it is possible to bring the sensor heads nearer than the separation distances given in the table above. For further details, please contact our office.

Dimensions of suitable crimp terminals



Note: Please use crimp terminals which have insulation sleeves. Recommended crimp terminal: Type 1.25 - 3.0

Others

- Do not use during the initial transient time (0.5 sec.) after the power supply is switched on.
- Do not use the sensor at places having intense vibrations, as this can cause malfunction.

Tightening torque

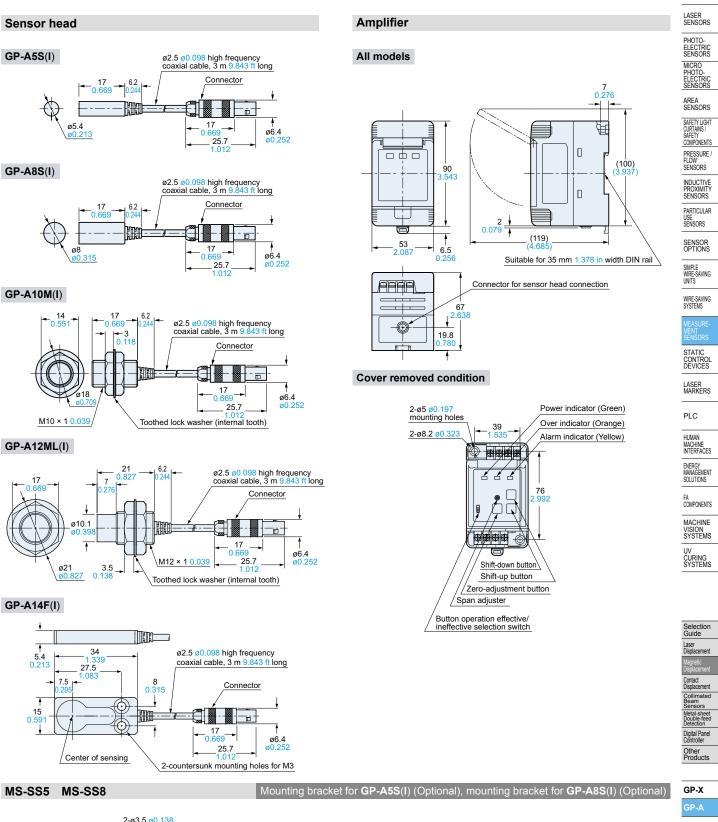
9.8 N·m

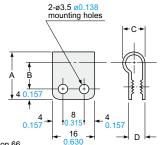
20 N·m

The CAD data can be downloaded from our website.

FIBER SENSORS

DIMENSIONS (Unit: mm in)





Material: Nvlon 66

......

Model No. Item	MS-SS5	MS-SS8
А	18 0.709	20 0.787
В	10 0.394	11 0.433
С	8.3 0.327	10.3 0.406
D	6.1 0.240	6.5 0.256
Applicable model	GP-A5S(I)	GP-A8S(I)

单击下面可查看定价,库存,交付和生命周期等信息

>>Panasonic(松下)