

# HPX-MA Series

The HPX-MA Series features analog output and high-resolution detection, making it ideal for a wide variety of applications.



- Sensitivity selector allows detection ranging from high resolution to high sensitivity.
- A 3-revolution potentiometer enables adjustment of the output range according to the detection range.
- Separate high-speed response mode for high-speed detection.
- Snap-on DIN rail mounting system and slim 10mm sensor body.



## AMPLIFIER UNIT ORDER GUIDE

Appearance	Supply voltage	Output voltage range	Catalog listing
	10.8 to 26.4Vdc	1 to 5Vdc (proportional to intensity of incoming light)	<b>HPX-MA</b>

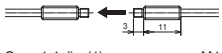


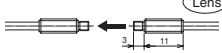


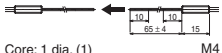
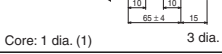
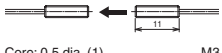





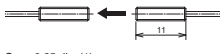


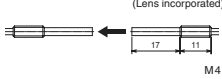


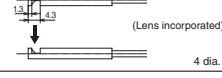


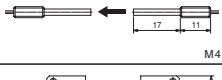


## AMPLIFIER UNIT SPECIFICATIONS

Model	Analog output model
Catalog listing	<b>HPX-MA</b>
Supply voltage	10.8 to 26.4Vdc (Max.10% ripple)
Current consumption	Max. 40mA
Output voltage range	1 to 5Vdc (proportional to intensity of incoming light)
Output impedance	47Ω
Load resistance	Min. 10kΩ
Resolution	NORMAL/NORMAL (SENS/RESP): 1% FS max., NORMAL/FAST (SENS/RESP): 6% FS max., FINE/NORMAL (SENS/RESP): 0.3% FS max., FINE/FAST (SENS/RESP): 2% FS max.
Response time (RESP)	NORMAL (RESP): 50ms, FAST (RESP): 1ms
Sensitivity selection (SENS)	NORMAL/FINE selectable
Light emitter	Red LED (680nm)
Indicator	Output indicator (green): Lights at output voltage 1V or more Output saturation (red): Lights at output voltage 5V or more
Span adjustment (sensitivity adjustment)	3-turn variable resistor
Offset adjustment	1-turn variable resistor (0.75 to 1.5V)
Ambient light immunity	Incandescent lamp: Max. 3,000lux, Solar light: Max. 10,000lux
Operating ambient temperature	-20 to +60°C (gang-mounting: -20 to +50°C)
Storage ambient temperature	-40 to +70°C
Operating ambient humidity	35 to 85% RH (no condensation allowed)
Insurance resistance	Min. 20MΩ (500Vdc megger)
Dielectric strength	1,000Vac 50/60Hz for 1 minute between case and electrically live metals
Vibration resistance	10 to 55Hz, 1.5mm peak-to-peak amplitude, 2 hours in X, Y and Z directions
Shock resistance	500m/s <sup>2</sup> 3 times in X, Y and Z directions
Connection method	Pre-leaded
Weight	Approx. 55g (body only, with 2m cable)
Others	Reverse connection protection circuit


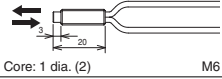
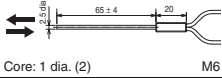
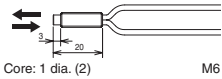
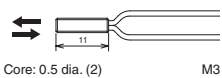
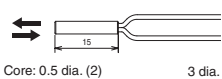
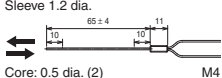
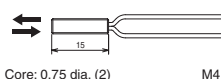
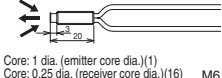
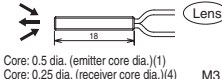
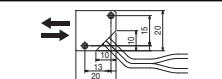
• Installation Instructions No.: CP-UM-5066E

# FIBER UNIT AND SENSING TYPE COMBINATIONS

## Thru scan

Group	Appearance	Sensing type	Scanning distance (mm)	Features	Cable length (cuttable)	Bend radius	Catalog listing
Long distance	 Core: 1.4 dia. (1) M4	NORMAL	 160	Long scanning distance	Cut to length 2m	R20	HPF-T001
		FINE	 20				HPF-T002
Standard	 Core: 1 dia. (1) Sleeve 1.2 dia. (Lens) M4	NORMAL	 80	Standard	Cut to length 2m	R20	HPF-T003
		FINE	 12				HPF-T004
	 Core: 1 dia. (1) Sleeve 1.2 dia. M4	Sleeve (flexible)	R10/R20	HPF-T005			
				HPF-T006			
		 Core: 1 dia. (1) Sleeve 1.2 dia. M4	Sleeve (flexible)	R10/R20	HPF-T005		
					HPF-T006		
Ultra bend - tolerant	 Core: 0.5 dia. (1) M3	NORMAL	 10	Static installation, flexible, and small diameter	Cut to length 2m	R1	HPF-T024
		FINE	 9				HPF-T025
Side view	 Sleeve 1 dia. 2.5 dia.	NORMAL	 12	Small diameter sleeve	Cut to length 2m	R15	HPF-T007
		FINE	 9				HPF-T007
Elastic	 Core: 0.25 dia. (1) M3	NORMAL	 20	Elastic small diameter	Cut to length 2m	R4	HPF-T008
		FINE	 3				HPF-T009
Narrow beam	 Core: 1 dia. (1) M4 (Lens incorporated)	NORMAL	 300	Parallel beam top view	Cut to length 2m	R20	HPF-T019
		FINE	 45				HPF-T020
	 Core: 1 dia. (1) M4 (Lens incorporated)	NORMAL	 320	Parallel beam side view	Cut to length 2m	R20	HPF-T020
FINE		 48	HPF-T020				
Wide beam	 Core: 1 dia. (1) M4 (Lens incorporated)	NORMAL	 50	Array	Cut to length 2m	R4	HPF-T021
		FINE	 7				HPF-T021

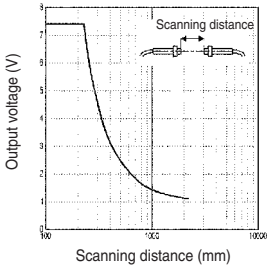
### Diffuse scan

Group	Appearance	Sensing type	Scanning distance (mm)	Features	Cable length (cuttable)	Bend radius	Catalog listing
Long distance	 Core: 1.4 dia. (2) M6	NORMAL FINE	24 2	Long scanning distance	Cut to length 2m	R20	HPF-D001
Standard	 Core: 1 dia. (2) M6	NORMAL FINE	16 2	Standard	Cut to length 2m	R20	HPF-D002
	 Core: 1 dia. (2) M6						HPF-D003
Ultra bend - tolerant	 Core: 1 dia. (2) M6	NORMAL FINE	8	Standard	Cut to length 2m	R2	HPF-D030
Small diameter	 Core: 0.5 dia. (2) M3	NORMAL FINE	4	Small diameter	Cut to length 2m	R15	HPF-D004
	 Core: 0.5 dia. (2) 3 dia.			HPF-D005			
	 Core: 0.5 dia. (2) M4	Small diameter sleeve	HPF-D006				
	 Core: 0.75 dia. (2) M4	Small diameter long scanning distance	HPF-D018				
Coaxial	 Core: 1 dia. (emitter core dia.)(1) Core: 0.25 dia. (receiver core dia.)(16) M6	NORMAL FINE	16 2	Coaxial	Cut to length 2m	R20	HPF-D009
	 Core: 0.5 dia. (emitter core dia.)(1) Core: 0.25 dia. (receiver core dia.)(4) M3	NORMAL FINE	4			R15	HPF-D010
Wide beam	 Core: 1.2 dia. (emitter core dia.)(1) Core: 0.25 dia. (receiver core dia.)(4) M3	NORMAL FINE	10	Array	Cut to length 2m	R4	HPF-D026

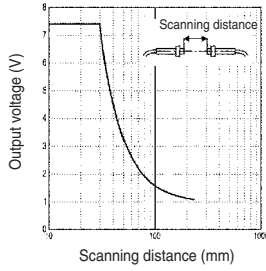
# CHARACTERISTICS DIAGRAMS (scanning distance and output voltage) (typical)

## ● Thru-scan fiber unit

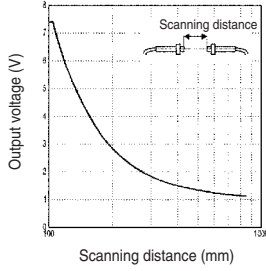
With **HPF-T001** or **T002**  
Normal mode



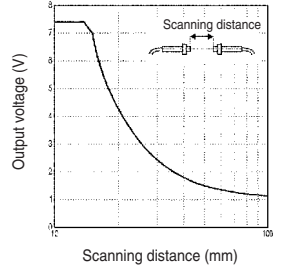
Fine mode



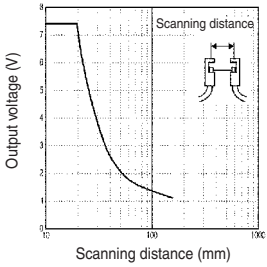
With **HPF-T003, T004, T005, or T006**  
Normal mode



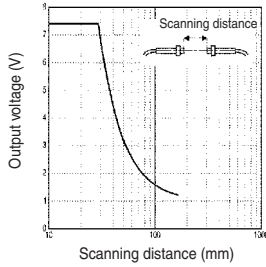
Fine mode



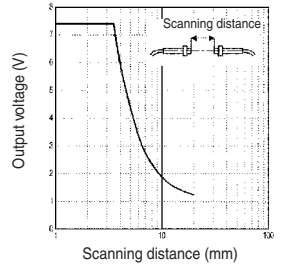
With **HPF-T007**  
Normal mode



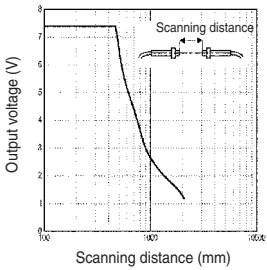
With **HPF-T008, or T009**  
Normal mode



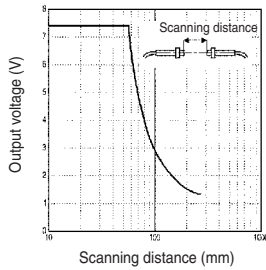
Fine mode



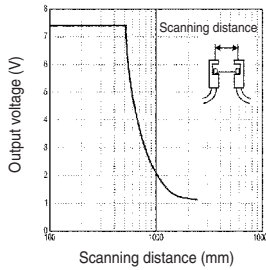
With **HPF-T019**  
Normal mode



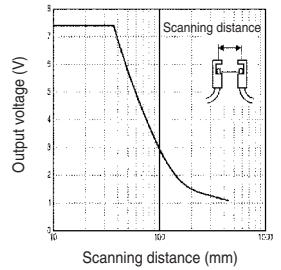
Fine mode



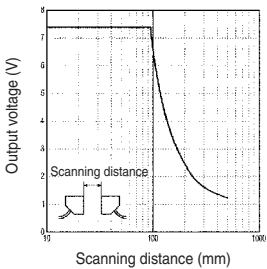
With **HPF-T020**  
Normal mode



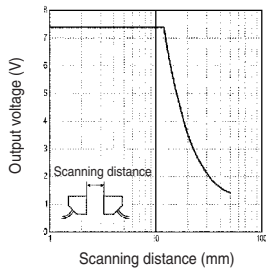
Fine mode



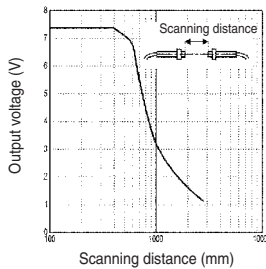
With **HPF-T021**  
Normal mode



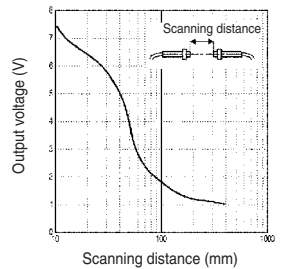
Fine mode



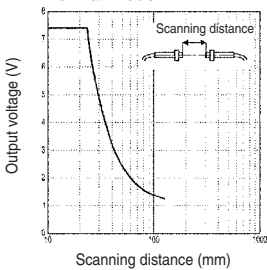
With **HPF-T023**  
Normal mode



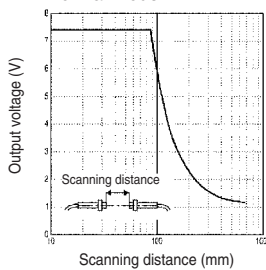
Fine mode



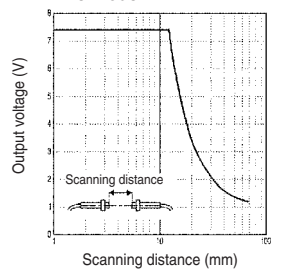
With **HPF-T024**  
Normal mode



With **HPF-T025**  
Normal mode



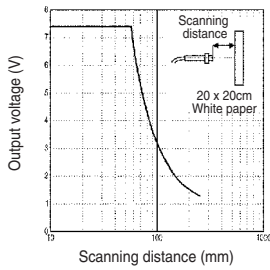
Fine mode



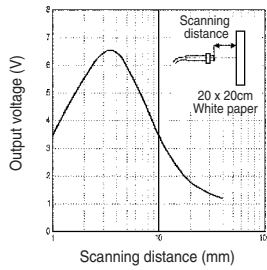
## ● Diffuse scan fiber unit

### With HPF-D001

Normal mode

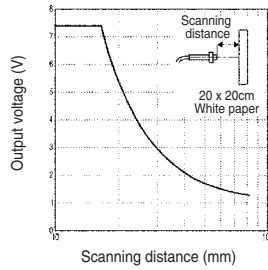


Fine mode



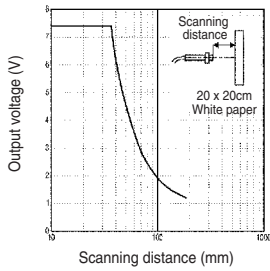
### With HPF-D018

Normal mode

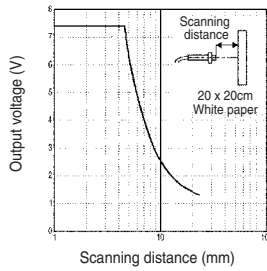


### With HPF-D002 or D003

Normal mode

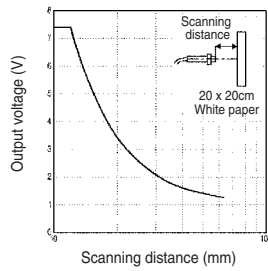


Fine mode



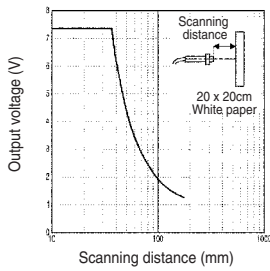
### With HPF-D004, D005, or D006

Normal mode

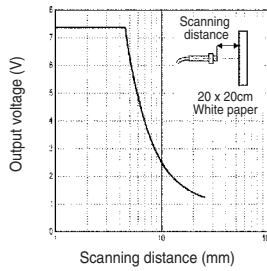


### With HPF-D009

Normal mode

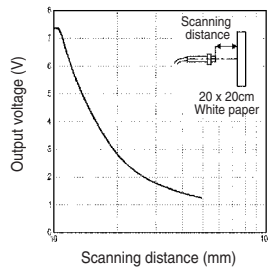


Fine mode



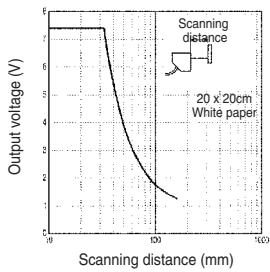
### With HPF-D010

Normal mode



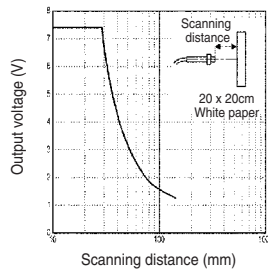
### With HPF-D026

Normal mode



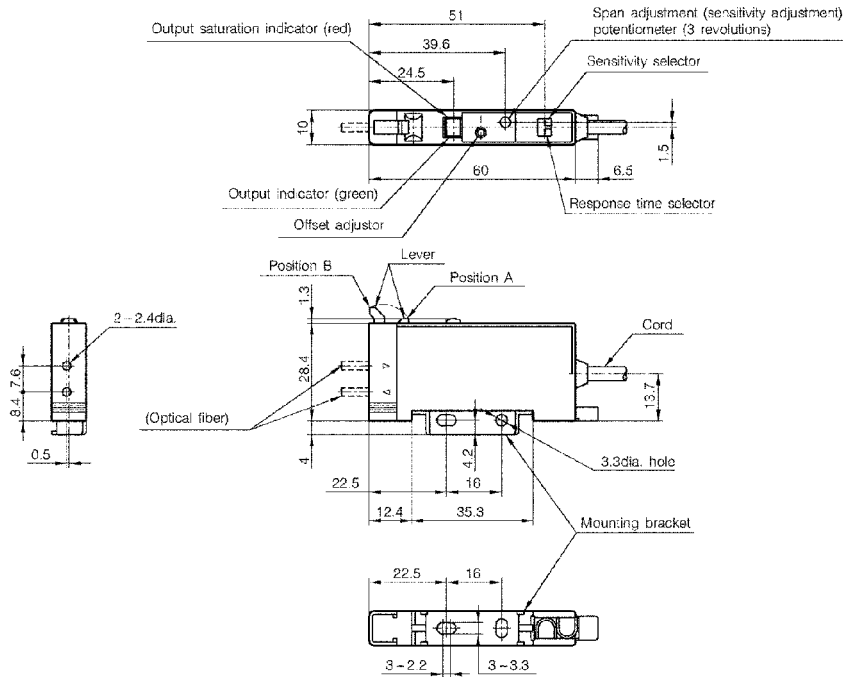
### With HPF-D030

Normal mode

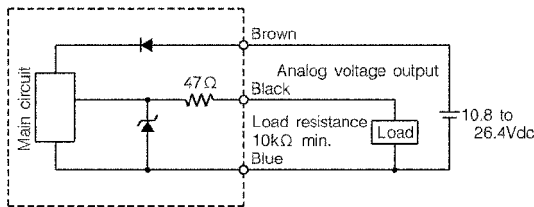


## EXTERNAL DIMENSIONS

(unit: mm)



## OUTPUT CIRCUIT DIAGRAM



## BASIC PRECAUTIONS

### • Wiring

- If cable is extended, the conductor resistance of cable may cause output voltage drop. In addition, the resolution may drop by the noise coming directly through the cable. If an extension cable is necessary, use a 0.3mm minimum leads (if possible, use a shielded cable) of maximum 5m. Be sure to check the output voltage and resolution before use. The resolution drop can be prevented to some degree by applying a 10nF ceramic capacitor between output and 0V.
- If the wires of photoelectric sensor are laid in the same conduit together with high-voltage or power lines or switching signal lines, the output voltage may become unstable by the inductance. Isolate the photoelectric sensor's cable or lay in a separate conduit.
- When using a commercially available switching regulator, ground the flame ground and ground terminals. If used without grounding, the switching noise may cause output fluctuations.

### • Handling

- Do not swing a photoelectric sensor by its cable.
- Do not impact or damage the scanning head.
- Do not pull the cable of the photoelectric sensor with excessive force. The tensile strength of the cable is about 49N at 50cm from the conduit.