

## **2002 Catalog Excerpts Magnetic Shield Cases**

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# Magnetic Shield Cases

## Magnetic Shield Cases E989 Series



TACCF0093

Photomultiplier tubes are extremely sensitive to magnetic fields and exhibit output variations even from sources such as terrestrial magnetism. Hamamatsu E989 series magnetic shield cases are designed specifically to protect photomultiplier tubes from the influence of such magnetic fields. The E989 series uses permalloy, a material that has an extremely high permeability (approximately  $10^5$ ). The magnetic field intensity within the shield case can be attenuated from 1/1000 to 1/10000 of that outside the shield case (this ratio is called the shielding factor). The E989 series ensures a stable output for photomultiplier tubes operating in proximity to magnetic fields.

### Features

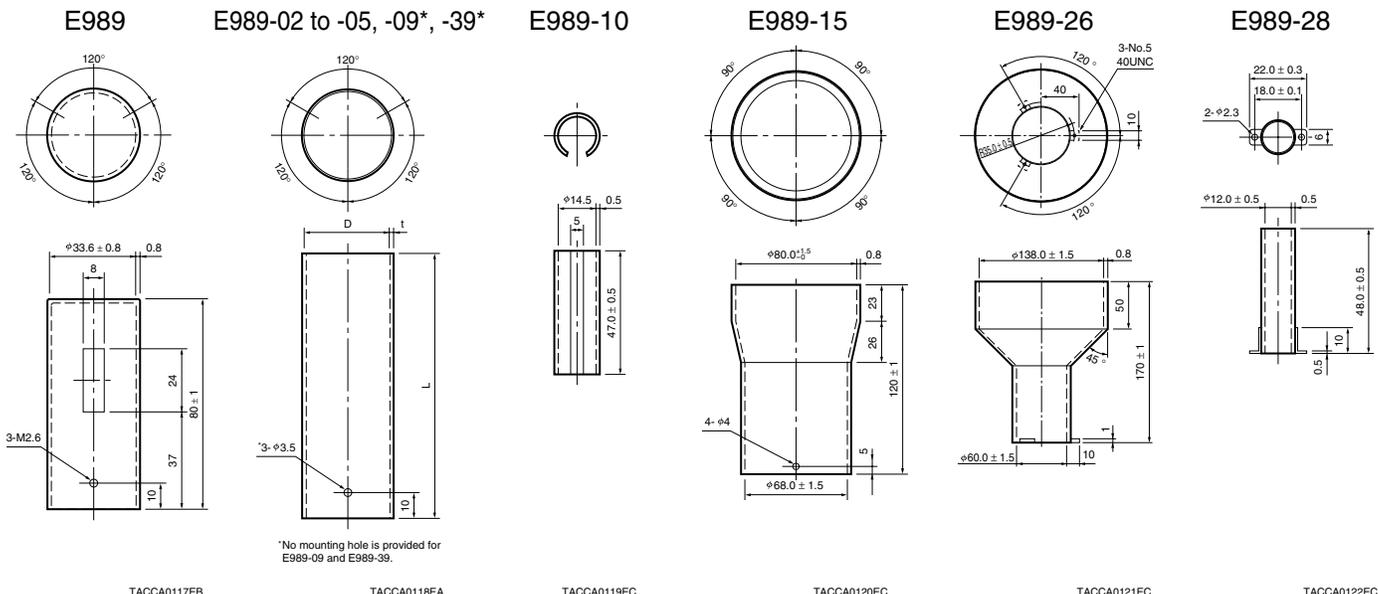
- Made of high-permeability permalloy (Ni: 78 %, Fe and others: 22 %)
- Various sizes available with inner diameters from 12 mm to 138 mm
- Lusterless black paint finish

### Specifications

	Photomultiplier Tube Diameter	Type No.	Internal Dia. D ( $\phi$ mm)	Thickness t (mm)	Length L (mm)	Weight (g)
Side-on	$\phi$ 13 mm (1/2")	E989-10	14.5	0.5	$47 \pm 0.5$	10
	$\phi$ 28 mm (1-1/8") *	E989	$33.6 \pm 0.8$	0.8	$80 \pm 1$	66
Head-on	$\phi$ 10 mm (3/8")	E989-28	$12 \pm 0.5$	0.5	$48 \pm 0.5$	9
	$\phi$ 13 mm (1/2")	E989-09	$16 \pm 0.5$	0.8	$75 \pm 0.5$	28
	$\phi$ 19 mm (3/4")	E989-02	$23 \pm 0.5$	0.8	$95 \pm 1$	50
	$\phi$ 25 mm (1")	E989-39	$29 \pm 0.5$	0.8	$48 \pm 0.5$	32
	$\phi$ 28 mm (1-1/8")	E989-03	$32 \pm 0.5$	0.8	$120 \pm 1$	90
	$\phi$ 38 mm (1-1/2")	E989-04	$44^{+1}_0$	0.8	$100 \pm 1$	102
	$\phi$ 51 mm (2")	E989-05	$60^{+1}_0$	0.8	$130 \pm 1$	180
	$\phi$ 76 mm (3")	E989-15	$80^{+1.5}_0$	0.8	$120 \pm 1$	200
	$\phi$ 127 mm (5")	E989-26	$138 \pm 1.5$	0.8	$170 \pm 1$	600

\* Photomultiplier tubes with HA coating extending to the base portion cannot be used. Please consult our sales offices for details.

### Dimensional Outlines (Unit: mm)



# Caution and Warranty

## SAFETY PRECAUTIONS

### WARNING



A high voltage is applied to a photomultiplier tube during operation. Always provide adequate safety measures to prevent the operator or service personnel from electrical shock and the equipment from being damaged.



The outer surface of metal package PMT R7400 and R5900 is connected to the cathode. When this PMT is operated with a high negative voltage applied to the cathode, the package is also at a high negative voltage so caution is required.

## HANDLING PRECAUTIONS

### ● Handle tubes with extreme care.

Photomultiplier tubes have evacuated glass envelopes. Allowing the glass to be scratched or subjected to shock can cause cracks. Take extreme care during handling, particularly for tubes with graded sealing on synthetic silica bulbs.

### ● Keep faceplate and base clean.

Do not touch the faceplate and base with bare hands. Dirt and grime on the faceplate causes loss of transmittance and dirt or grime on the base may cause ohmic leakage. If the faceplate becomes soiled wipe it clean using alcohol.

### ● Do not expose to strong light.

The photocathode of photomultiplier tubes may be damaged if exposed to direct sunlight or intense illumination. Never allow strong light to strike the photocathode.

### ● Carefully handle tubes with a glass base.

Photomultiplier tubes with a glass base (also called button stem) are less rugged than tubes with a plastic base, so sufficient care must be taken when handling this type of tube. When fabricating a voltage-divider circuit by soldering resistors and capacitors to socket lugs, solder them while the tube is fully inserted into the socket.

### ● Helium permeation through silica bulb

Helium will permeate through silica bulbs and increase noise, leading to damage that makes photomultiplier tubes unusable. Avoid operating or storing them in an atmosphere where helium is present.

## WARRANTY

Hamamatsu photomultiplier tubes and related products are warranted to the original purchaser for a period of 12 months after delivery. The warranty is limited to repair or replacement of a defective product due to defects in workmanship or materials used in its manufacture.

Even if within the warranty period, the warranty shall not apply to failures due to misuse, mishandling, modification by the customer, or to accidents such as natural or man-made disasters.

The customer should inspect and test all products as soon as they are delivered.

## ORDERING INFORMATION

Photomultiplier tubes and related products are warranted to the original purchaser. This catalog lists photomultiplier tubes and related products currently available from Hamamatsu Photonics. Please select those products that best match your design specifications. If you do not find the products you want in this catalog, feel free to contact our sales office nearest you. We will modify our current products or design new types to meet your specific needs.

\* Characteristics and specifications in this catalog are subject to change without prior notice due to product improvement or other factors.

Before you design equipment according to the characteristics and specifications of our products listed in this catalog, please con-

# HAMAMATSU

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## Main Products

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Light Sources  
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Image Intensifiers  
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Information in this catalog is believed to be reliable. However, no responsibility is assumed for possible inaccuracies or omission.

Specifications are subject to change without notice. No patent rights are granted to any of the circuits described herein.

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