

Thermoelectric Coolers

High Performance Thermoelectric Coolers C4877, C4878 Series



Left: C4877 Power Supply
Right: C4877 Cooled PMT Housing

TACCF0161

The C4877 series and C4878 series are thermoelectric coolers constructed with enhanced electrostatic and magnetic shielding (C4877 Series). This minimizes the influence of external noise on the photomultiplier tube and thus significantly improves photometric accuracy. These coolers offer user-friendly functions such as easy temperature control and pilot lamp blanking. The C4877 series is designed for use with 51 mm (2") or 38 mm (1-1/2") diameter head-on photomultiplier tubes, and the C4878 series for

Features

- Thermoelectric cooling using Peltier elements
- About -30 °C cooling temperature (with +20 °C cooling water)
- Evacuated, double-pane window with heater for frost prevention
- Built-in electrostatic and magnetic shielding (C4877 Series)
- Water shut-off protection to guard the Peltier elements
- Stable operation due to a regulated power supply

Specifications

[Cooled PMT Housing]

Parameter	Value/Description	
Cooling	Thermoelectric cooling using Peltier elements	
Heat Exchange Medium	Water	
Amount of Cooling Water	1 L/min to 3 L/min	
Cooling Temperature (with cooling water at +20 °C)	Approx. -30 °C	
Temperature Controllable Range (with cooling water at +20 °C)	-30 °C to 0 °C (continuously adjustable)	
Cooling Time	Approx. 120 min	
Optical Window Material	Evacuated double-pane fused silica window with heater	
Applicable PMTs (Optional)	C4877 Series	28 mm (1-1/8") Dia. and 38 mm (1-1/2") Dia. and 51 mm (2") Dia. Head-on
	C4878 Series	MCP-PMT (R3809U-50 Series)
Applicable Socket Assembly or PMT Holder (Optional)	C4877 Series	E2762 Series ^(A)
	C4878 Series	E3059-500 (R3809U-50 Series)
Weight	5.8 kg	

[Power Supply]

Parameter	Value/Description	
Input Voltage (AC)	C4877, C4878	100 V ± 10 V (50 Hz/60 Hz)
	C4877-01, C4878-01	120 V ± 12 V (50 Hz/60 Hz)
	C4877-02, C4878-02	230 V ± 23 V (50 Hz/60 Hz)
Power Consumption	270 V·A	
Output Voltage	28 V	
Output Current	4.3 A	
Protection Circuit	Functions against cooling water suspension and over current/short circuit	
Weight	8.5 kg	

[Components and Accessories]

- Cooled PMT Housing (Including an input window)
- Power Supply
- Light Shield Cap
- Spare Fuse
- Water Hose Clamps
- Connection Cable (1.5 m)
- AC Line Cable (2 m)

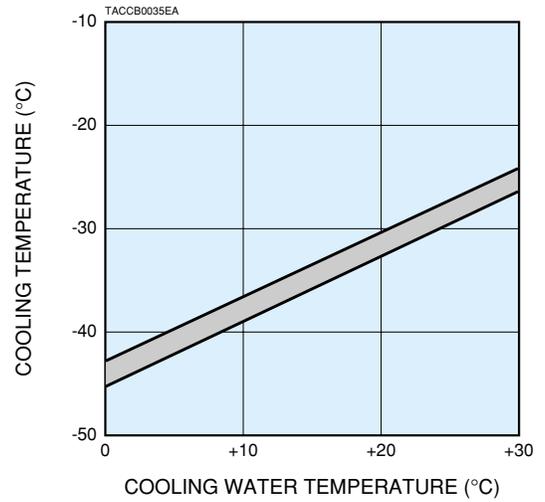
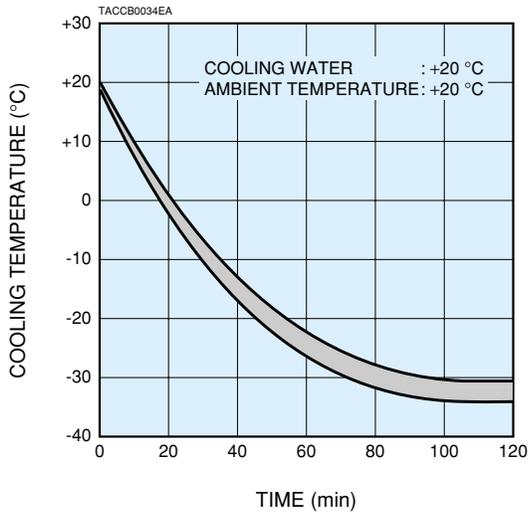
To operate C4877 and C4878, water hoses with an inner diameter of 15 mm are required.

NOTE: ^(A)

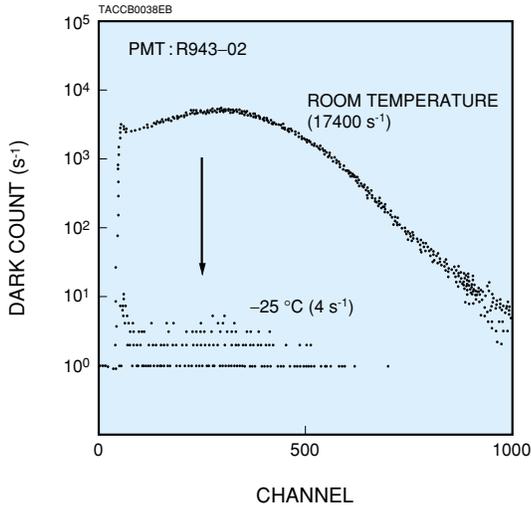
E2762 Series	PMT
E2762-502	R1767
E2762-506	R943-02, R3310-02
E2762-509	R464, R585, R649
E2762-510	R329, R331
E2762-511	R316-02, R374, R2228, R5929, R6249
E2762-513	R375, R669

All 6 models E2762 series listed here are SHV high voltage input and BNC current output type.

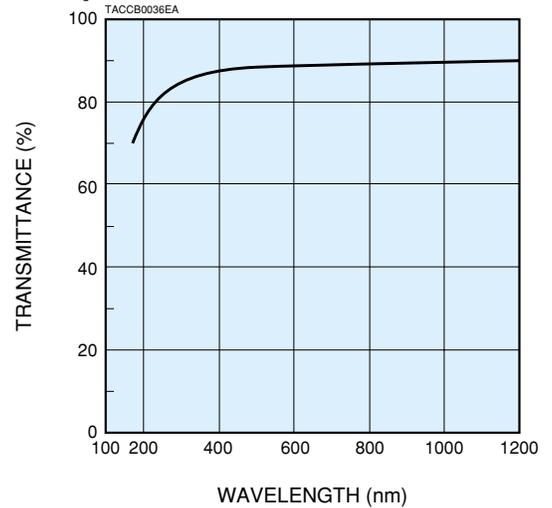
Cooling Characteristics



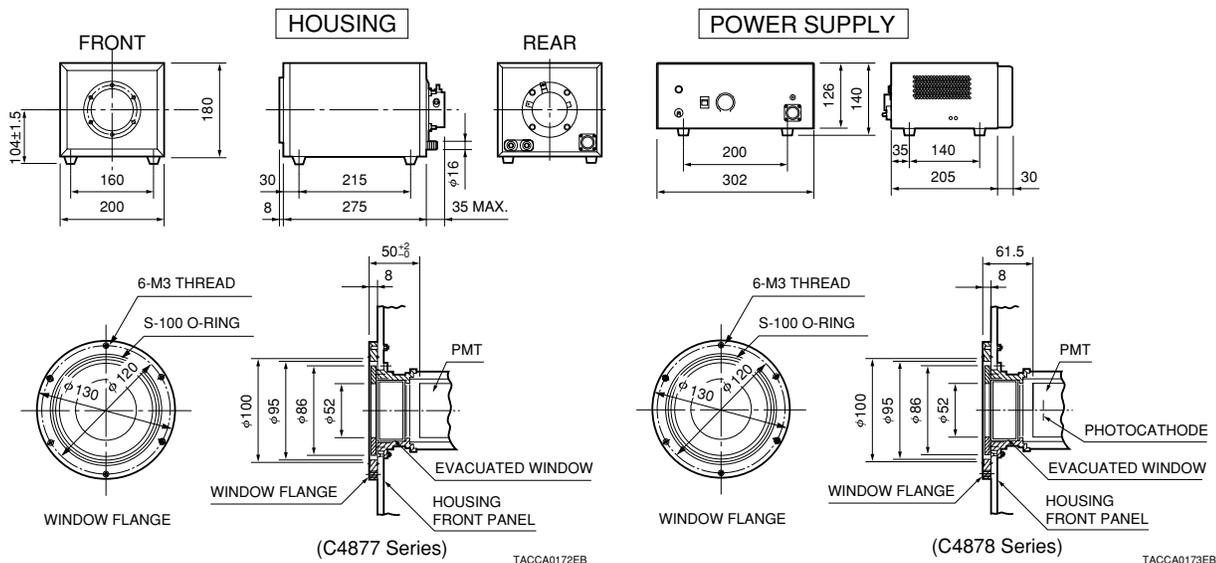
Cooling Effect on Dark Count (C4877)



Spectral Transmission Characteristics of Optical Window



Dimensional Outlines (Unit: mm)



* CE C4877-02 and C4878-02 conform to the EMC directive (89/336/EEC) and the LVD (73/223/EEC) of the European Union.

Thermoelectric Coolers

Thermoelectric Coolers C659 Series



▲Left: C659-50 Series Right: C659-70 Series

The C659 series is a thermoelectric cooler designed to reduce photomultiplier tube dark current and to enhance the photomultiplier tube lower detection limit. When used with a photomultiplier tube having an Ag-O-Cs photocathode in DC mode, the dark current can be reduced to 1/200 of its normal level at room temperature.

In cooling a photomultiplier tube one sometimes encounters problems such as dewing on the incident window and leakage current on the socket or base of the tube. But these problems are eliminated by use of an evacuated, double pane window and custom socket assembly.

The C659-50 series is designed for 38 mm (1-1/2") and 28 mm (1-1/8") diameter head-on photomultiplier tubes. The C659-70 series is specifically intended for use with 28 mm (1-1/8") diameter side-on photomultiplier tubes.

Features

- Thermoelectric cooling using Peltier elements
- Evacuated, double-pane window with heater for frost prevention
- Water shut-off protection to guard Peltier elements
- Built-in magnetic shield

Specifications

[Cooled PMT Housing]

Parameter		Value/Description
Cooling		Thermoelectric cooling using Peltier elements
Heat Exchange Medium		Water
Amount of Cooling Water		1 L/min to 3 L/min
Cooling Temperature ^(A)	C659-50 Series	Approx. -20 °C
	C659-70 Series	Approx. -15 °C
Cooling Time		Approx. 60 min
Optical Window Material		Evacuated double-pane fused silica window with heater
Applicable PMTs	C659-50 Series	38 mm (1-1/2") Dia. and 28 mm (1-1/8") Dia. Head-on
	C659-70 Series	28 mm (1-1/8") Dia. Side-on
Applicable Socket Assemblies	C659-50 Series	E1135-500, -501, -502 (Optional) ^(A)
	C659-70 Series	E1135-503 (Supplied) ^(A)
Weight	C659-50 Series	4.8 kg
	C659-70 Series	2 kg

NOTE: ^(A) Cooling water: +20 °C, Cooling temperature differs depending on photomultiplier tube type.

[Power Supply]

Parameter		Value/Description
Input Voltage (AC)	C659-50, -70	100 V ± 10 V (50 Hz/60 Hz)
	C659-51, -71	115 V ± 12 V (50 Hz/60 Hz)
	C659-52, -72	220 V ± 22 V (50 Hz/60 Hz)
Power Consumption	C659-50 Series	160 V·A
	C659-70 Series	110 V·A
Output Voltage	C659-50 Series	6 V
	C659-70 Series	3.4 V
Output Current	C659-50 Series	12 A
	C659-70 Series	12 A
Protection Circuit		Functions against cooling water suspension
Weight	C659-50 Series	10.7 kg
	C659-70 Series	8.5 kg

[Components and Accessories]

- Cooled PMT Housing (Including a magnetic shield and input window)
- Power Supply
- Light Shield Cap
- Connection Cable (2 m)
- Protective Circuit Cable (2 m)
- AC Line Cable (2 m)

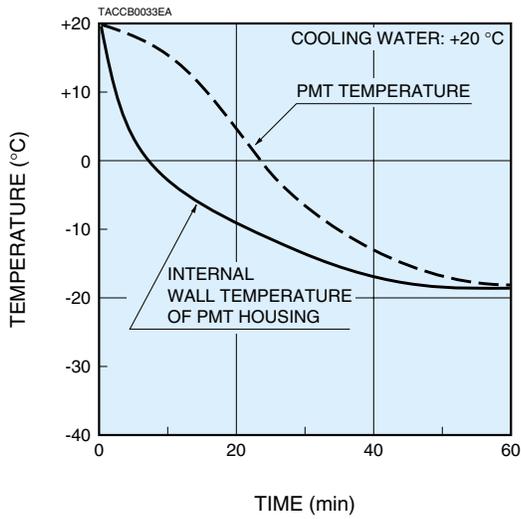
To operate C659 series, water hoses with an inner diameter of 15 mm are required.

NOTE: ^(A)

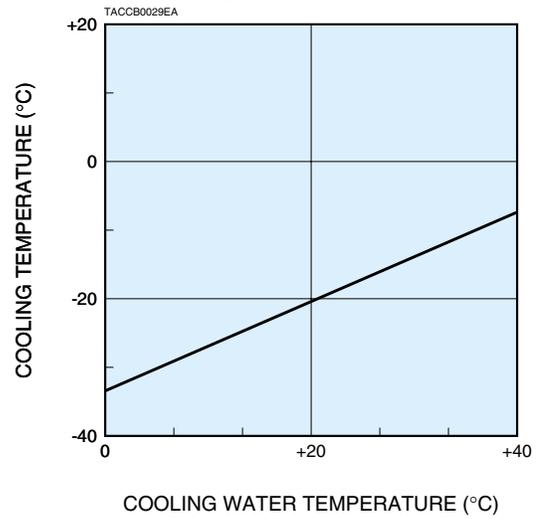
E1135 Series	PMT
E1135-500	R980, R1387
E1135-501	R580
E1135-502	R6248
E1135-503	28 mm Dia. Side-on

All 4 models E1135 series listed here are SHV high voltage input and BNC current output type.

Cooling Characteristics (C659-50 Series)

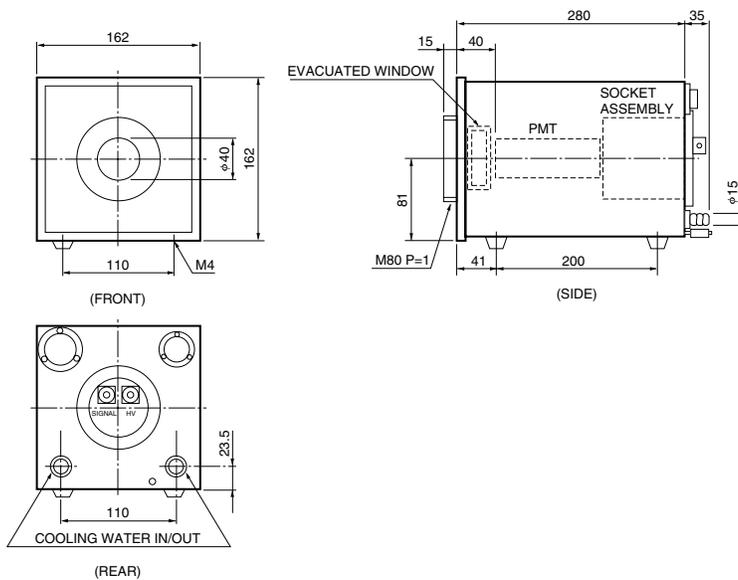


Effect by Cooling Water Temperature (C659-50 Series)

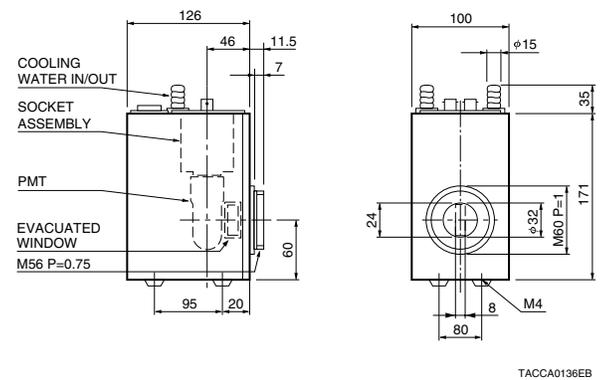


Dimensional Outlines (Unit: mm)

● Cooled PMT Housing (C659-50 Series)



● Cooled PMT Housing (C659-70 Series)



● Power Supply

