BLIQ

Liquid cooled blackbodies

Fig.1. Photo of BLIQ-12D and BLIQ-4D blackbodies

BASIC INFORMATION:

BLIQ blackbodies special area blackbodies designed to offer temperatures at sub-zero range (as low as -40ºC) even when the blackbody works at typical laboratory conditions (ambient temperature about 20ºC). In this way BLIQ blackbodies can eliminate need for testing thermal imagers at big cumbersome temperature chambers. BLIQ blackbodies can be used to eliminate the need for expensive, big size and slow temperature chambers needed to achieve Earth temperature range including sub-zero temperatures (advanced two point NUC of thermal imager).

BLIQ blackbodies are built using three temperature regulators. First, standard Peltier element enables precision temperature regulation in range from about 0ºC to about 100ºC. Second, liquid cooler is used to lower blackbody temperature to sub-zero region. Third, optional heater is activated when temperatures over 100ºC are to be achieved.

Next, special hood is attached to BLIQ blackbody. This hood when filled using dry nitrogen gas and protects blackbody emitter against frosting or vapor condensation.

All these features makes BLIQ blackbodies an ideal choice for blackbodies to be used as sources of infrared radiation in systems for testing/calibration thermal imagers/IR FPA modules or as temperature standards in national standard laboratories.

LIMITATIONS:

BLIQ blackbodies eliminate potentially temperature chambers needed to achieve sub-zero temperatures. However, there are several limitations.

1. Special hood attached to BLIQ blackbody is needed (delivered by Inframet). This hood must be filled with dry nitrogen gas to protects blackbody emitter against frosting or vapor condensation. Customer is expected to deliver dry nitrogen gas source.
2. There cannot be any holes in the hood where hot humid air can get inside the hood. The optics case of tested imager must fully cover the input hole in the hood.
3. The hood length must be at least equal the size of blackbody emitter. Is means that the tested imager cannot be located at a very short distance to the emitter of the BLIQ blackbody.

FEATURES:

- Extremely wide temperature range
- Extremely good temporal stability: ±2 mK
- High speed, easy control from PC
- Very high resistibility to EMI (blackbody is integrated with controller)

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SPECIFICATIONS

Model	BLIQ-4D	BLIQ-6D	BLIQ-12D
Aperture	100× 100 mm	150× 150 mm	300× 300 mm
Absolute temperature range	–40°C ÷ +100°C –40°C ÷ +170°C (option)	–30°C ÷ +100°C –40°C ÷ +100°C (option X1) –30°C ÷ +170°C (option X2)	–30°C ÷ +100°C –40°C ÷ +100°C (option X1) –30°C ÷ +170°C (option X2)
Set point and resolution	1 mK	1 mK	1 mK
Emissivity	0.97±0.01	0.97±0.01	0.97±0.01
Temperature uniformity (temperature spatial distribution uncertainty)	<0.02 °C or <0.4% of ΔT	<0.02 °C or <0.5% of ΔT	<0.02 °C or <0.6% of ΔT
Regulation stability	±2 mK @ ΔT=10°C	±2 mK @ ΔT=10°C	±3 mK @ ΔT=10°C
Total temperature uncertainty	0.03°C	0.03°C	0.03°C
Approximate Heating Rate	0.4ºC/s at 25ºC	0.25ºC/s at 25ºC	0.18ºC/s at 25ºC
Approximate Cooling Rate	0.2ºC/s at 25ºC	0.08ºC/s at 25ºC	0.06ºC/s at 25ºC
Settling Time	<50 s	<90 s	<120 s
Computer control	USB 2.0 RS-232 (option) RS-485 (option)	USB 2.0 RS-232 (option) RS-485 (option)	USB 2.0 RS-232 (option) RS-485 (option)
Power requirements	230VAC 110VAC – option	230VAC 110VAC – option	3Phase 230/400VAC 3phase 120/208VAC
Max power consumption	800 W	1400 W	4500 W
Operating temperature	5˚C to 40˚C	5˚C to 40˚C	5˚C to 40˚C
Storage temperature	–10°C ÷ +60 °C	–10°C ÷ +60 °C	–10°C ÷ +60 °C
Relative humidity	5% to 95%, non-condensing	5% to 95%, non-condensing	5% to 95%, non-condensing
Dimensions [mm] [H x W x L]	846 x 580 x 625	1150 x 720 x 760	1380 x 882 x 903
Approx. mass [kg]	85	150	250

OPTIONS

Option code	X	Y	Z
Description	extended temperature range: to 170ºC (X1)	long range communication via RS485 up to 50 m	110VAC power supply instead of 230VAC
	extended temperature range up to –40ºC (X2)		

Version 1.5

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