



DCN1000L series

low temperature blackbodies

INTRODUCTION

Although similar to the traditional differential and absolute infrared reference sources, the DCN1000L blackbodies incorporate specific features in order to reach lower temperatures.

They consist in an emissive head equipped with thermoelectric coolers whose heat dissipation is ensured by a refrigerated liquid. The liquid is supplied by a separate cooling liquid unit and circulated through a jacket at the back of the thermoelectric coolers. The temperatures which can be reached with such a layout are much lower than those of traditional blackbodies equipped with fans for cooling.

In order to avoid dew condensation on low temperature surfaces, the system includes several options such as sweeping dry gas on the emissive area, enclosing the emissive area inside a nitrogen filled chamber sealed by an IR window, coupling the blackbody to a nitrogen filled cabinet housing the unit under test.

The emissive head also includes a target support. Temperatures of both the target and the emissive surface are measured in real time thanks to high precision calibrated Pt sensors. Various emissive area sizes are available to suit different applications, i.e. characterisation of thermal imagers (MRTD, LSF and NETD targets), calibration of focal plane arrays, non-uniformity correction of infrared sensors, etc.

CONFIGURATION

- Absolute temperature range from $-40\text{ }^{\circ}\text{C}$ to $+150\text{ }^{\circ}\text{C}$, for any ambient temperature
- Differential and absolute mode operation
- Real time display of emissive area and set point temperature
- Fast response time and high stability
- High thermal uniformity and emissivity
- Compact emissive head including target support
- Control through touchscreen panel
- Remote control via Ethernet link.

OPTIONS

- IEEE488, RS232 interfaces
- Radiometric calibration over $3\text{-}5\text{ }\mu\text{m}$ or $8\text{-}14\text{ }\mu\text{m}$ bandwidth
- Target wheel
- NETD, LSF/MTF and MRTD calculation software



DCN1000L blackbody



DCN1000L assembly with dry gas enclosure



DCN1000L assembly with refrigerating unit

TECHNICAL DATA

	DCN1000L2	DCN1000L3	DCN1000L4	DCN1000L7	DCN1000L12
Emissive area (mm) :	50 x 50	75 x 75	100 x 100	180 x 180	300 x 300
Temperature range (°C) :					
. absolute (for any ambient T)	-40 to +150	-40 to +150	-40 to +150	-40 to +150	-40 to +150
. differential (20°C ambient)	-60 to +130	-60 to +130	-60 to +130	-60 to +130	-60 to +130
Thermal uniformity :					
. at ambient ± 5 °C (°C)	0.01	0.01	0.01	0.03	0.04
. at 50 °C (typical) (°C)	0.3	0.3	0.4	0.4	0.4
Max. power consumption (W) :	3000	3000	3000	3200	3200
Dimensions W x H x D (mm) :	115x200x111	145x200x111	192x200x121	286x380x126	406x493x126
Head weight (kg) :	2	3	4	10	24
Electronic unit size :	3U x 19"	3U x 19"	3U x 19"	5U x 19"	5U x 19"
Electronic unit weight (kg) :	11	11	11	27	27
Emissivity :	0.98 \pm 0.02				
Regulation type :	real time PID adjustment				
Stability :	0.002 °C				
Temperature sensor type :	calibrated Pt sensor				
Temperature measurement accuracy (°C) :	differential mode : 0.01 absolute mode : 0.03				
Display resolution :	0.001 °C (actual temperature and set point display)				
Cool-down time from ambient to -20 °C \pm 0.2 °C :	5 minutes				
Warm-up time from ambient to 75 °C \pm 0.2 °C :	< 2 minutes				
Stabilisation time :					
at ± 0.02 °C for a $\Delta T < 10$ °C :	less than 1.5 minute				
at ± 0.01 °C over the whole temperature range :	less than 5 minutes				
Remote control :	Ethernet interface				
Power supply :	115/230 VAC, 1 ph., 50/60 Hz				

Above information is subject to changes without notice



SYSTEMES INFRAROUGES

ZAC de la Sablière, 10 rue Maryse Bastié
91430 IGNY - FRANCE
Tel: +33 1 69 35 47 70 Fax: +33 1 69 35 47 80
e-mail: hgh@hgh.fr http://www.hgh.fr