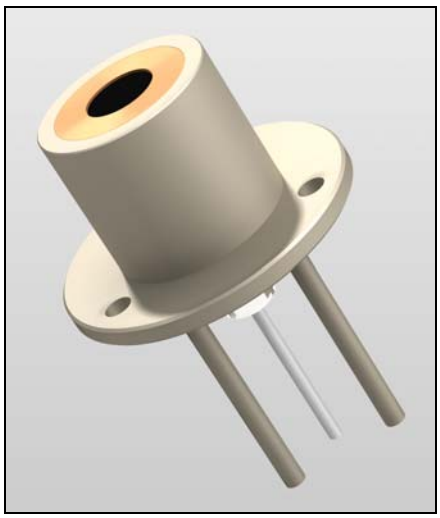
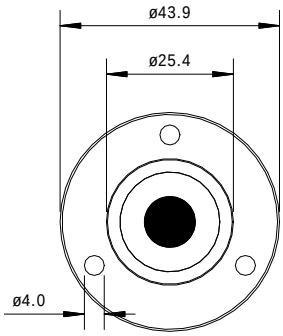
Hukseflux
Thermal Sensors

SBG01

WATER COOLED HEAT FLUX SENSOR ACCORDING TO SCHMIDT-BOELTER





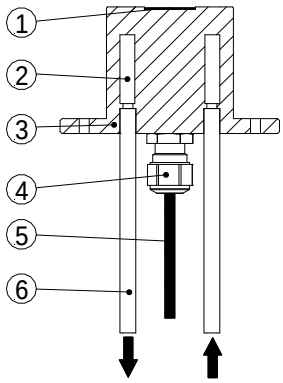


Figure 1 *SBG01 top view. Dimensions in mm. Below: SBG01 Schmidt-Boelter / Gardon gauge. Heat flux sensor (1), water cooling (2,6), gland (4), cable (5).*
Standard cable length is 2 m.

SBG01 is a water-cooled heat flux sensor. Its main purpose is the study of fire and flames, applied in flammability tests and smoke chamber tests. SBG01 measurements are in accordance with ASTM E 622-83, as well as ISO 5658, 5560 and 17554 standards.

SBG01 serves to measure the heat flux of fire and flames in the range up to 200 kW/m^2.
Heat flux sensors of this type are originally designed to work in an environment that is dominated by radiation. Application in environments with much convection should be done with care.
Working completely passive, using a thermopile sensors, SBG01 generates an output voltage proportional to the incoming flux.
The sensor is water cooled.
There are 6 types of SBG01; the differences are in the working range, sensitivity and response time.

Comparing to traditional Gardon and Schmidt Boelter gauges, SBG01 has several advantages:

- water supply tubes with increased robustness
- very robust stainless steel outer housing
- increased scratch resistance of absorber paint (slightly lowered surface)

SBG01 SPECIFICATIONS

Temperature range cooling water:	10 to +30 °C
Cooling water flow:	> 10 liter/hr, preferably 30 liters per hour @ 3 bar (normal tap water)
Working ranges kWm^{-2}:	5, 10, 20, 50, 100, 200
Response times:	
Working range 5, 10 kW/m^2:	< 450 ms (63%)
Working range 20, 50 kW/m^2:	< 250 ms (63%)
Working range 100, 200 kW/m^2:	< 200 ms (63%)
Maximum range:	150% of working range
Output signal:	> 5 mV at working range
Spectral range:	to 50.000 nm
Field of view:	180 degrees
Emissivity:	> 0.95
Calibration traceability:	NIST
Order Code:	SBG01/RANGE/ cable length

OPTIONS
Additional cable length x metres (add to 2 m)

ORDERING
Order Code: SBG01/RANGE/ cable length
Range 5, 10, 20, 50, 100, 200 kW/m^2, cable length in meters. Example: SBG01/50/2

SEE ALSO
Portable version: HF03
For separate measurement of radiative and convective heat flux model RC01 can be used. Hukseflux also manufactures highly robust heat flux sensors for use in boilers such as RHF01, and for flare monitoring such as HF02.

COOLING
Typically cooling water can be supplied from the tap. If it is impractical to use tap water, for passive closed circuit cooling of SBG01, Hukseflux successfully employed the Zalman reserator.
Closed circuit water cooling with convective heat exchanger. http://www.zalman.co.kr

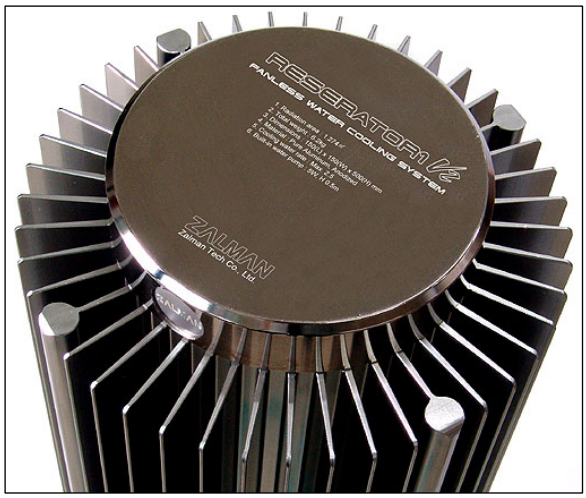


Figure 2: *close up of the convective cooling of the reserator.*


Figure 3: *coupling of cooling tubes to the reserator*

CALIBRATION
Hukseflux manufactures calibration equipment that will make comparison to reference sensors relatively easy.
The picture shows CU02 calibration unit for heat flux sensors.

Figure 4: *Picture of calibration unit CU02, showing water supply (in / out), power supply and heat source (1250 Watt lamp, housing in blue). At the background the water-cooled plate on which the sensors are mounted, is visible.*