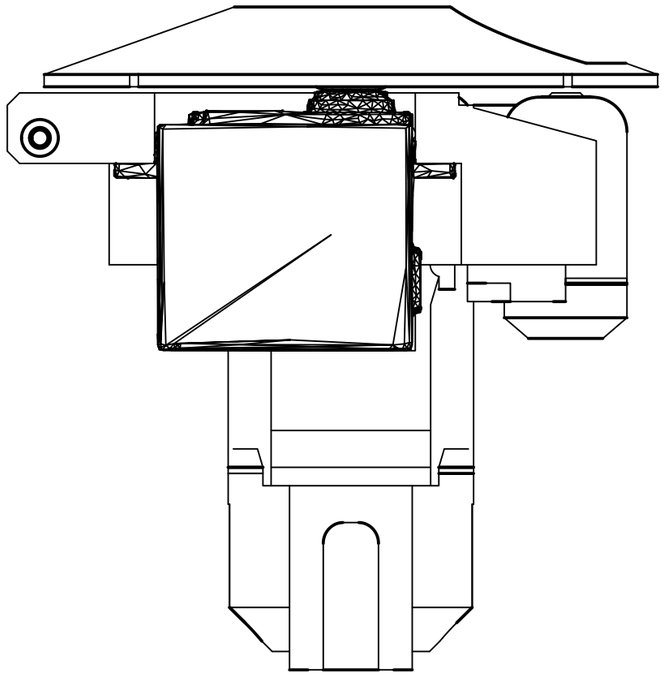
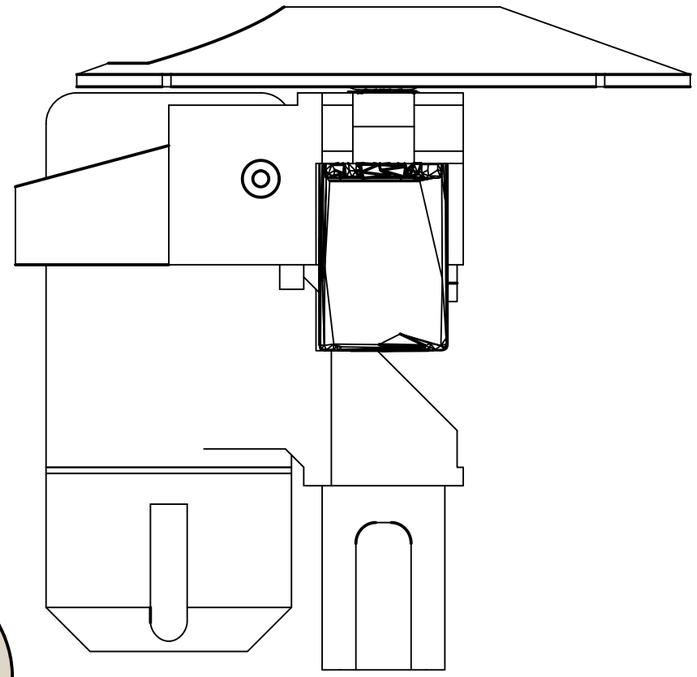
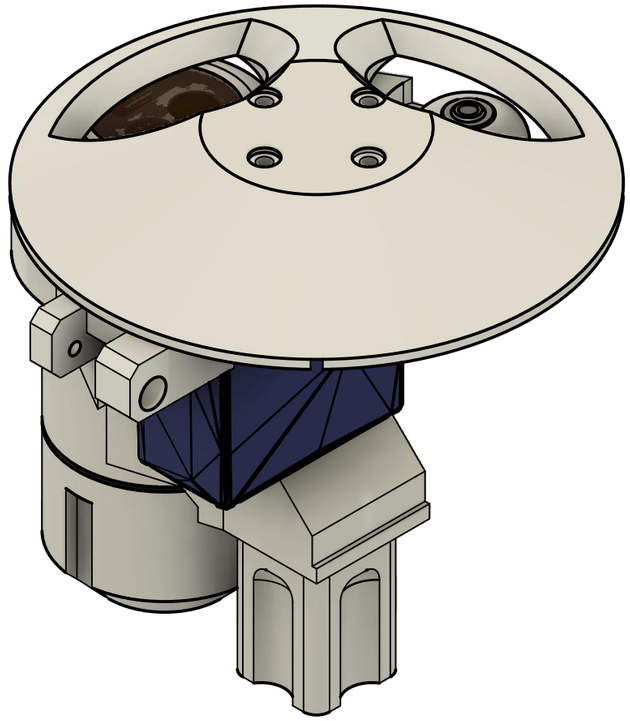
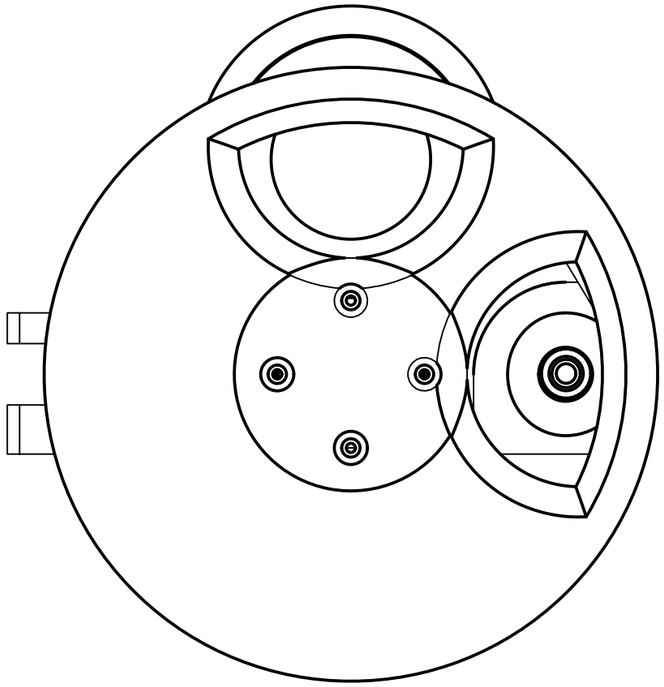
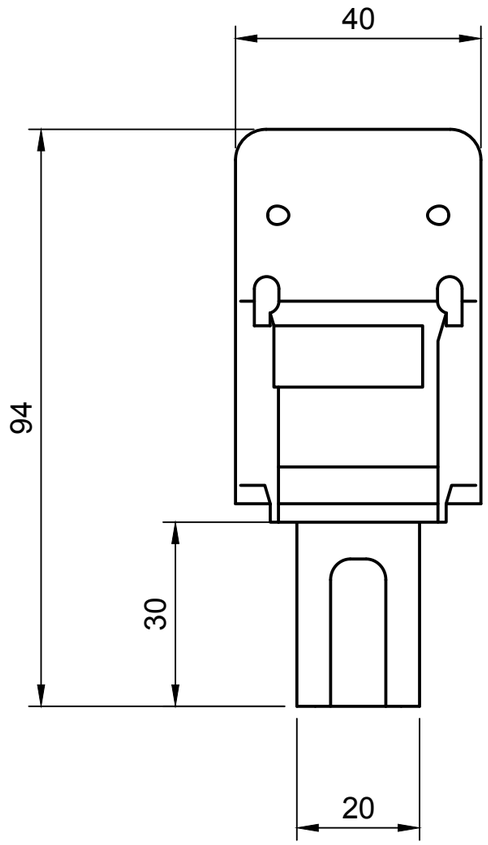


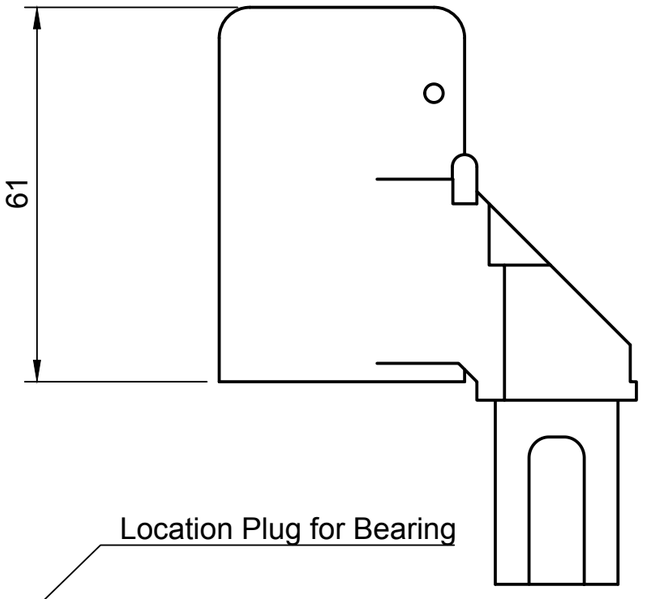


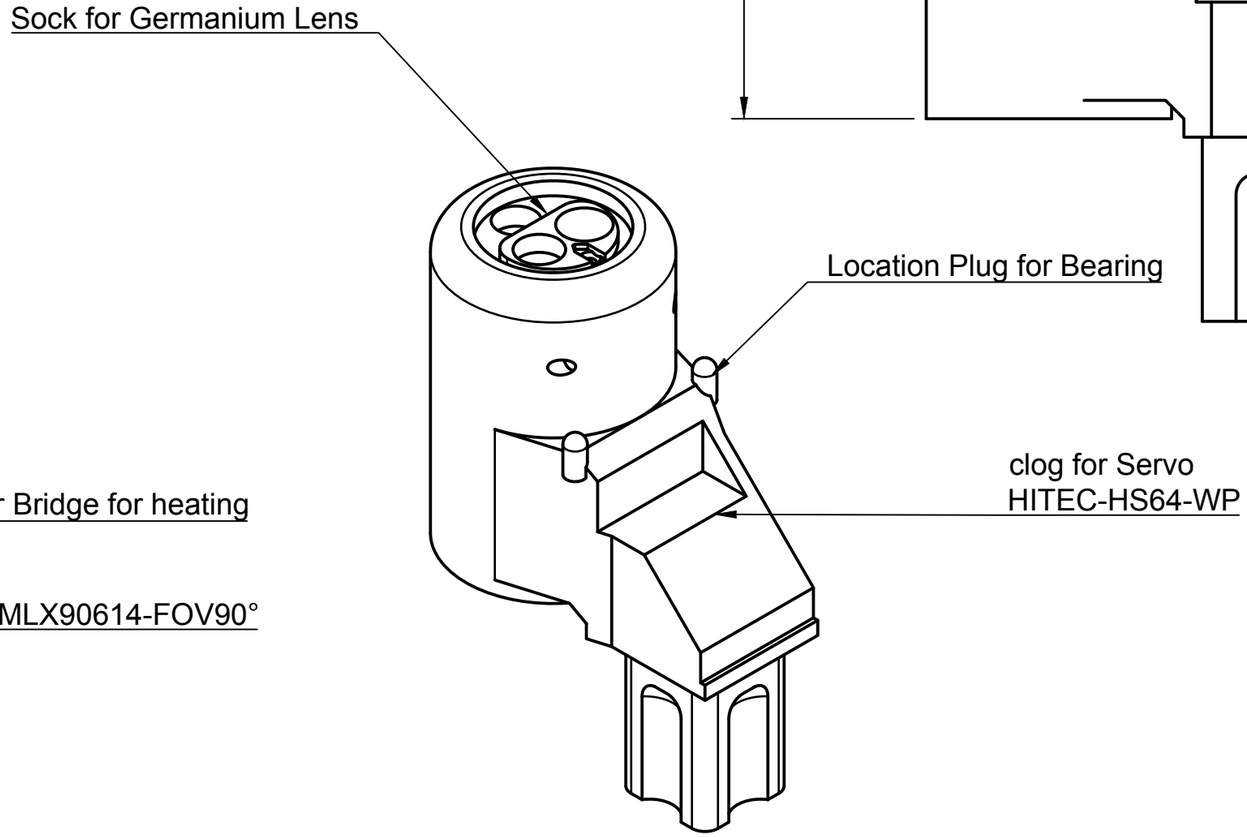


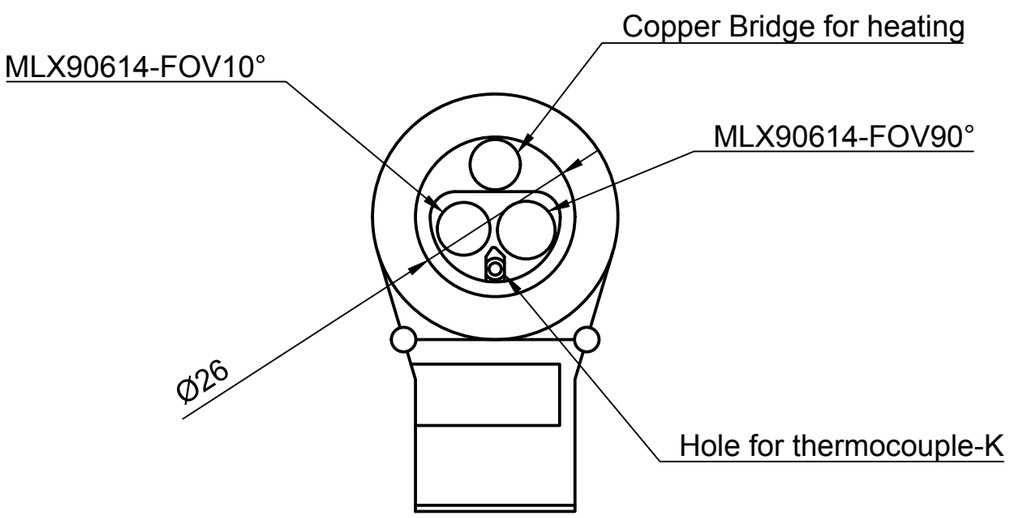


Dept.	Technical reference	Created by Sébastien Kubasik 03/01/2019	Approved by
		Document type Technical Drawing	Document status
		Title Ceilometer Overall view	DWG No.
			Rev. / Date of issue / Sheet 1/10





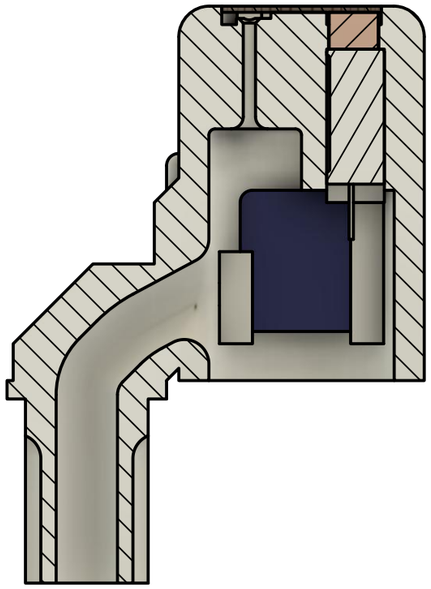




Dept.	Technical reference	Created by	Approved by
		Sébastien Kubasik 03/01/2019	
		Document type: Technical Drawing	Document status
		Title: Ceilometer Main Body	DWG No.
			Rev. / Date of issue / Sheet: 2/10

Main Body with its contents: MLX90614s + Heater + copper bridge + germanium disc + Internal PCB

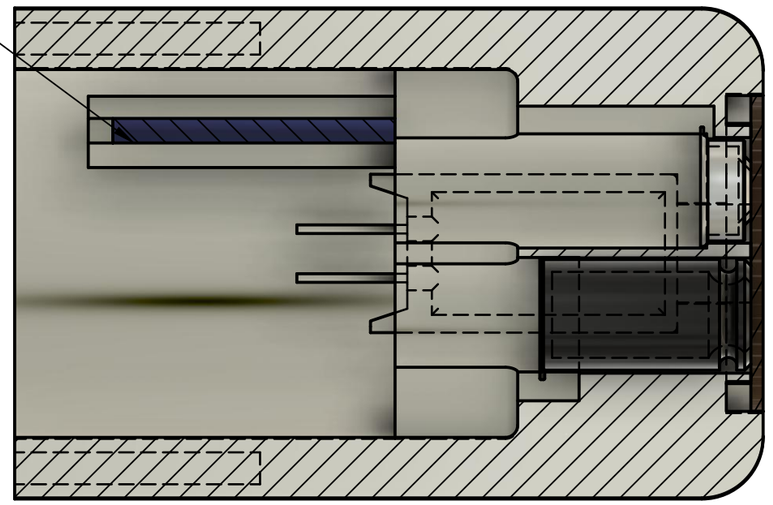
B-B (1:1)

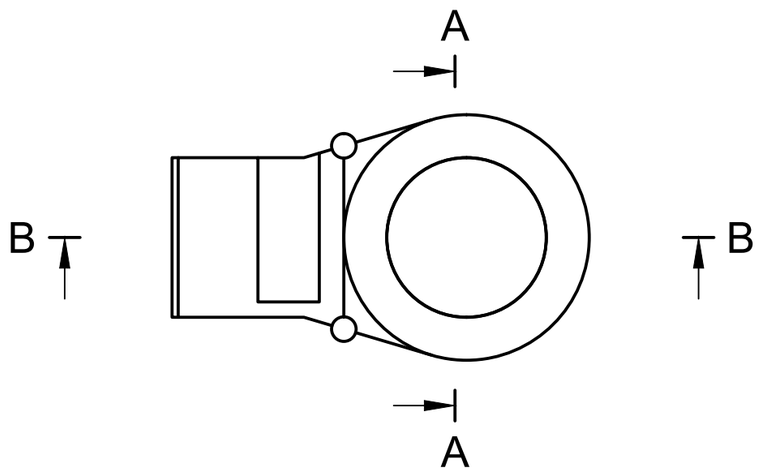


We didn't use the channel devoted for Disc's thermocouple because the temperature control could be assumed by the internal temp of each MLX. It's so enough to knox the Head's temp and the risk of ice.
We created a internal channel inside the casing and the square bearing, use to handle the I2C line, power supply, Heater and thermocouple.

Internal PCB realyse connections I2C for the Both internal MLX90614 and the external one for reference. Thermocouple & Heater are separately wired.

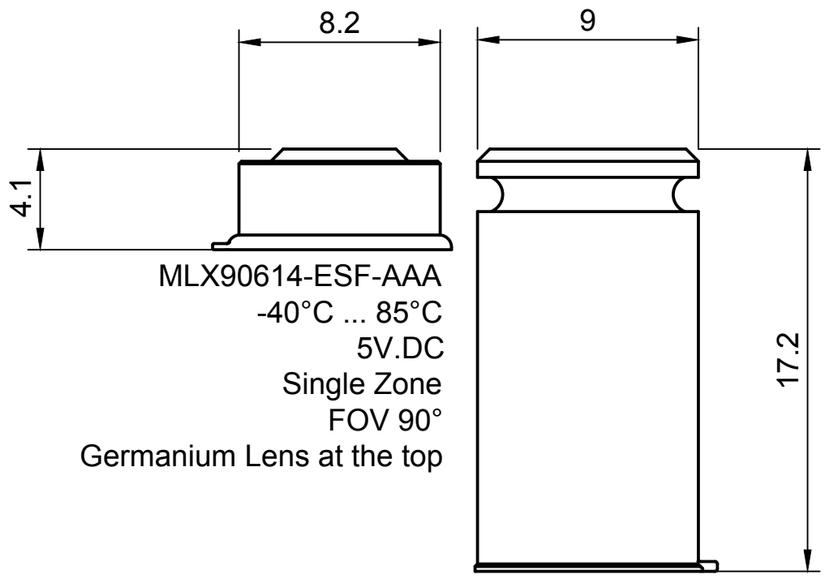
A-A (2:1)





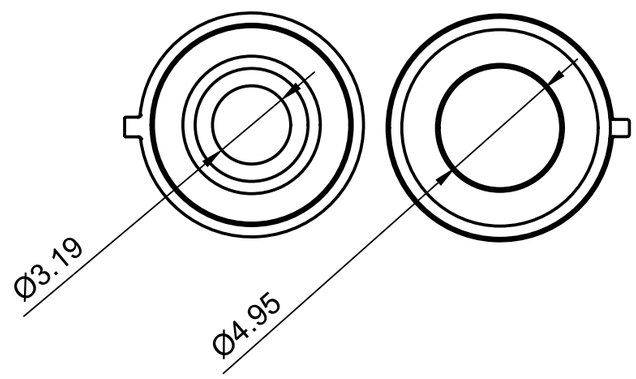
The both MLX90614 are in contact with the Germanium Disc. The Head is designed to handle space under the disc to place glue Loctite SI5940 and the sock permit to control this space and avoid covering the 2 sensors.
The Heater is returned back because there is no enough place to put it directly under the disc. To realize defrost we placed a copper cylinder called bridge to realyze a thermal conduction.

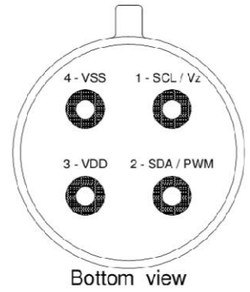
Dept.	Technical reference	Created by	Approved by
		Sébastien Kubasik 03/01/2019	
		Document type: Technical drawing	Document status
		Title: Ceilometer Main body Head definition	DWG No.
			Rev. / Date of issue / Sheet: 3/10



MLX90614-ESF-AAA
-40°C ... 85°C
5V.DC
Single Zone
FOV 90°
Germanium Lens at the top

MLX90614-ESF-ACF
-40°C ... 85°C
5V.DC
Gradient Compensated
FOV 10°
Sensor in the bottom Optical Orifice without lens

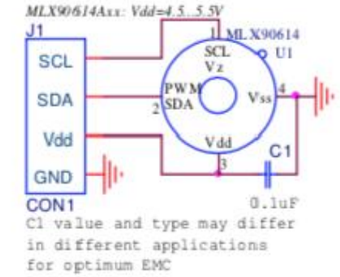




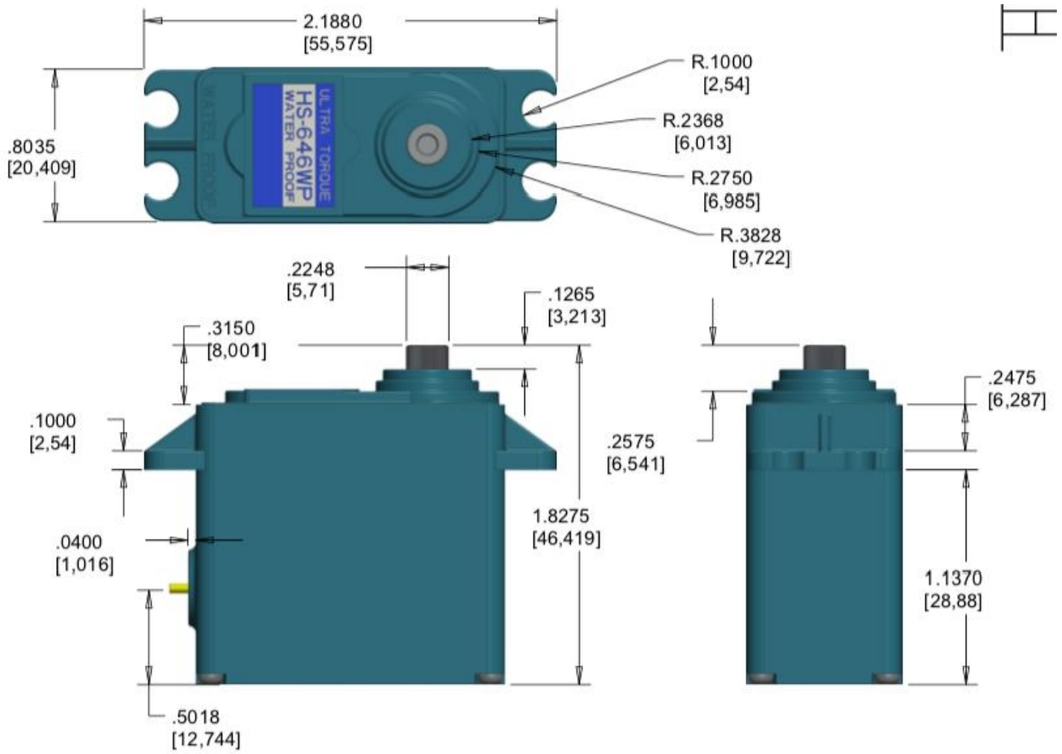
Bottom view

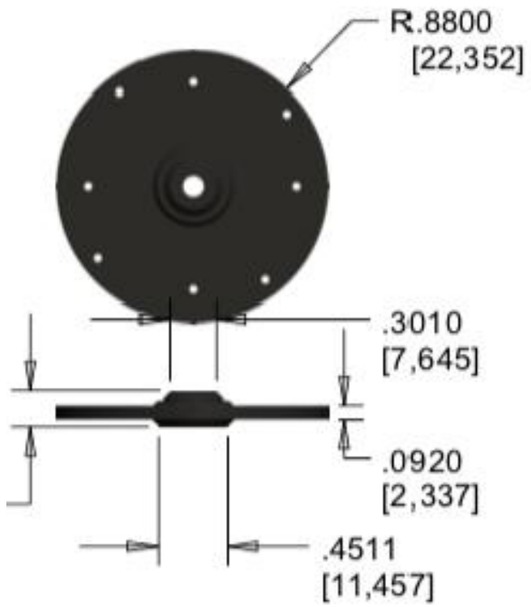
Figure 2: Pin description

Pin Name	Function
SCL / Vz	Serial clock input for 2 wire communications protocol. 5.7V zener is available at this pin for connection of external bipolar transistor to MLX90614Axx to supply the device from external 8 ...16V source.
SDA / PWM	Digital input / output. In normal mode the measured object temperature is available at this pin Pulse Width Modulated. In SMBus compatible mode the pin is automatically configured as open drain NMOS
VDD	External supply voltage.
VSS	Ground. The metal can is alsc connected to this pin.



Dept.	Technical reference	Created by Sébastien Kubasik 03/01/2019	Approved by
		Document type Technical Drawing	Document status
		Title Ceilometer IR Sensors MELEXIS 90614	DWG No.
			Rev. / Date of issue / Sheet 4/10

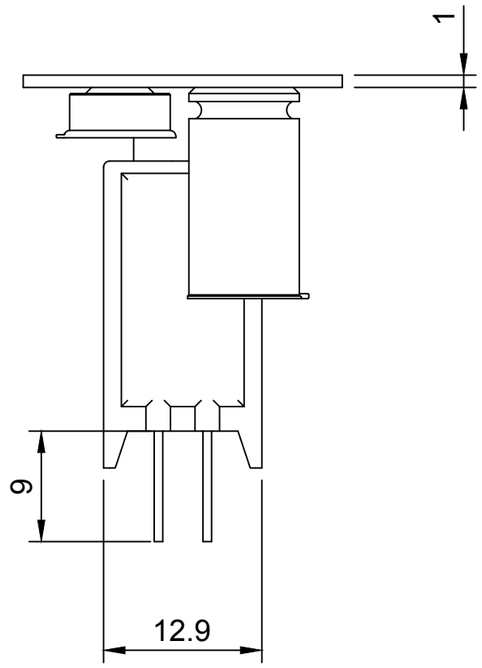




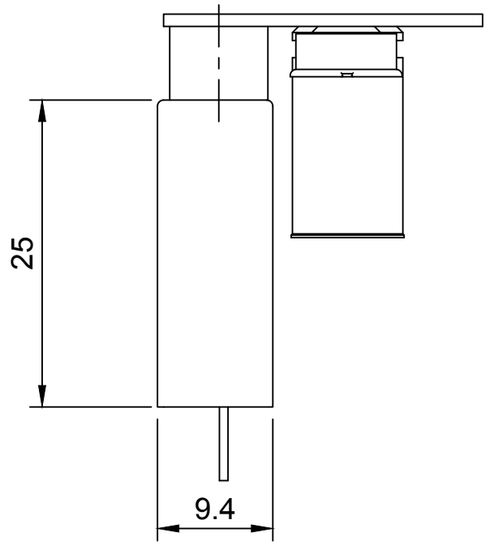
Features

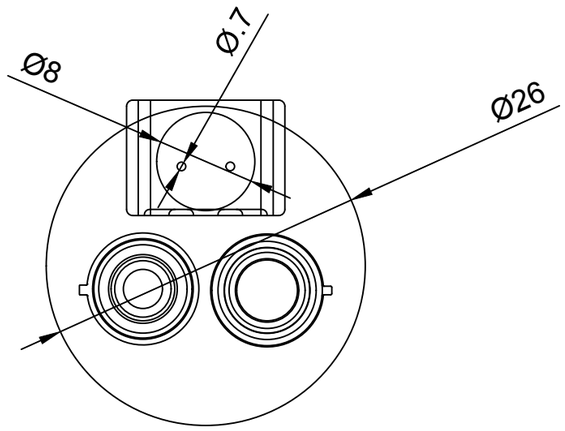
Voltage: 6-7.4 Volts
Torque: 133.3/161.1 oz-in. (6.0/7.4V)
Speed: 0.20/0.17 sec/60° (6.0/7.4V)
Direction: Clockwise/ Pulse Traveling 1500-1900usec
Rotation: 180°
Dual Ball Bearing
3 Metal Gears & 1 Nylon Gear
3-Pole Ferrite Motor
C1 Standard Spline
IP67 Waterproof Rating

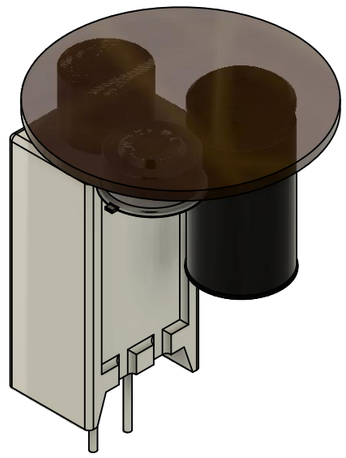
Dept.	Technical reference	Created by	Approved by
		Sébastien Kubasik 03/01/2019	
		Document type: Technical Drawing	Document status
		Title: Ceilometer Servo HITEC HS-646WP	DWG No.
			Rev. / Date of issue / Sheet: 5/10



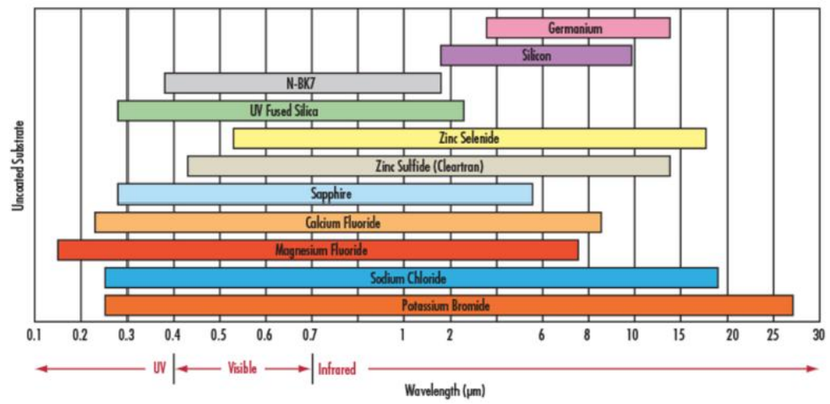
Heater
ROYAL741W
12V.DC 5W 22Ohm



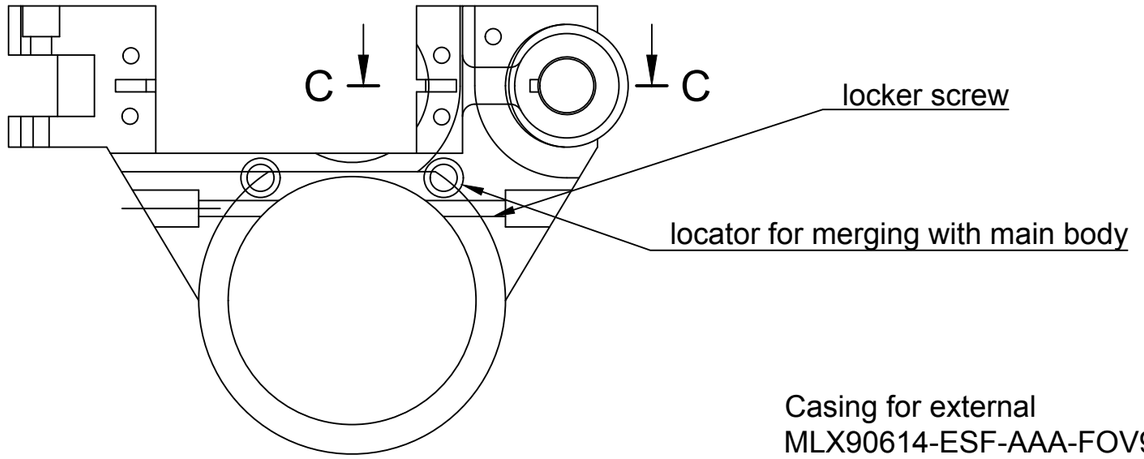




Clouds, will be considerated like a black object and we'll follow the WIEN rule. The both considerations permit to establish the efficient long wave at 4,44 – 14,3µm. It's a narrow band of IR but normally enough to locate the clouds. Germanium appear as a real good solution still compatible with the goal.
Here we use a disc Diameter 26mm and 0.9mm of thickness.

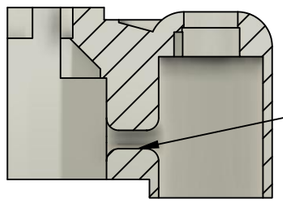


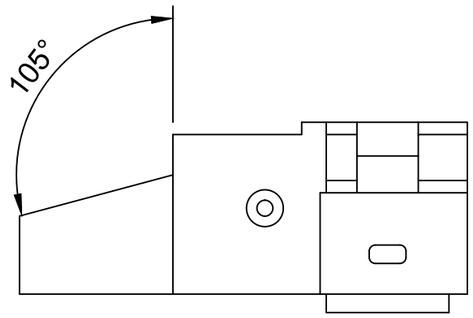
Dept.	Technical reference	Created by	Approved by
		Sébastien Kubasik 03/01/2019	
		Document type: Technical Drawing	Document status
		Title: Ceilometer Head Definition Heater & Ge Lens	DWG No.
			Rev. / Date of issue / Sheet: 6/10

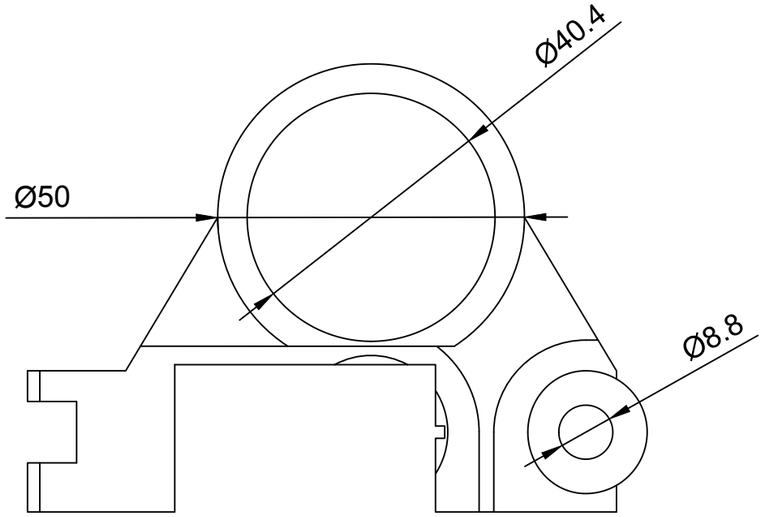


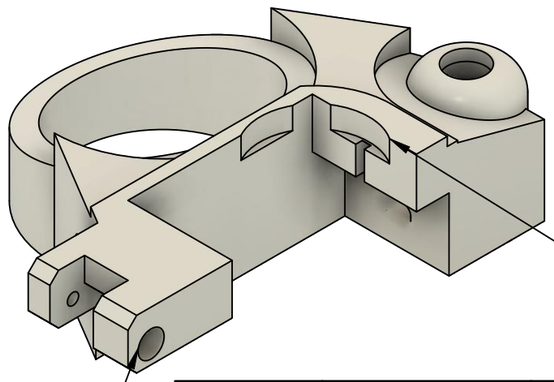
C-C (1:1)

Casing for external
MLX90614-ESF-AAA-FOV90°
It's consist to a reference measurment without additional lens to provide compensation to the main Head





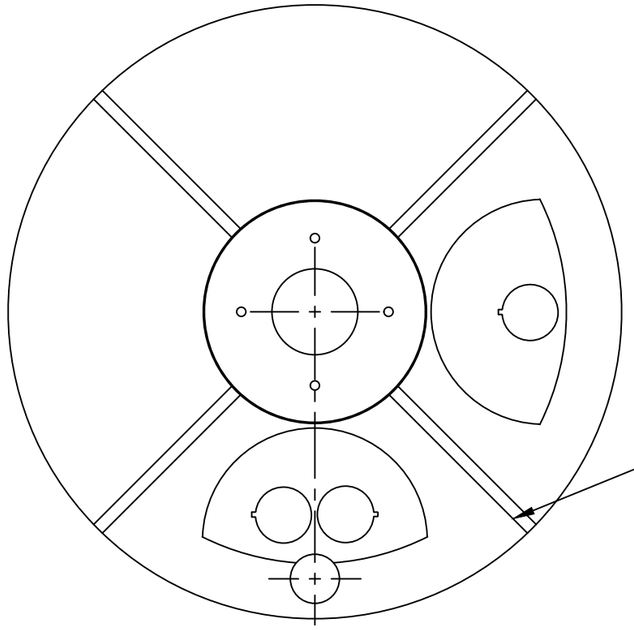




We define clearance to warranty a good rotation of servo's clutch

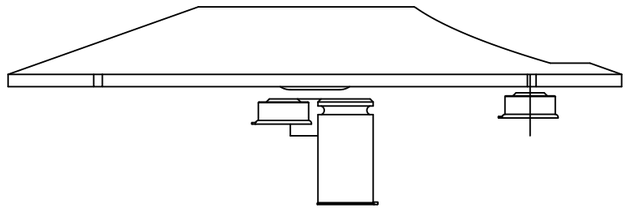
Connection for blade
to remove snow during cleanUp rotation

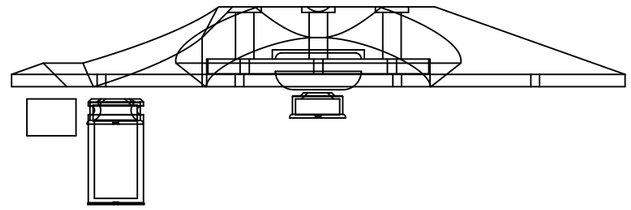
Dept.	Technical reference	Created by	Approved by
		Sébastien Kubasik 03/01/2019	
		Document type: Technical Drawing	Document status
		Title: Ceilometer Servo Bearing	DWG No.
			Rev. / Date of issue / Sheet: 7/10



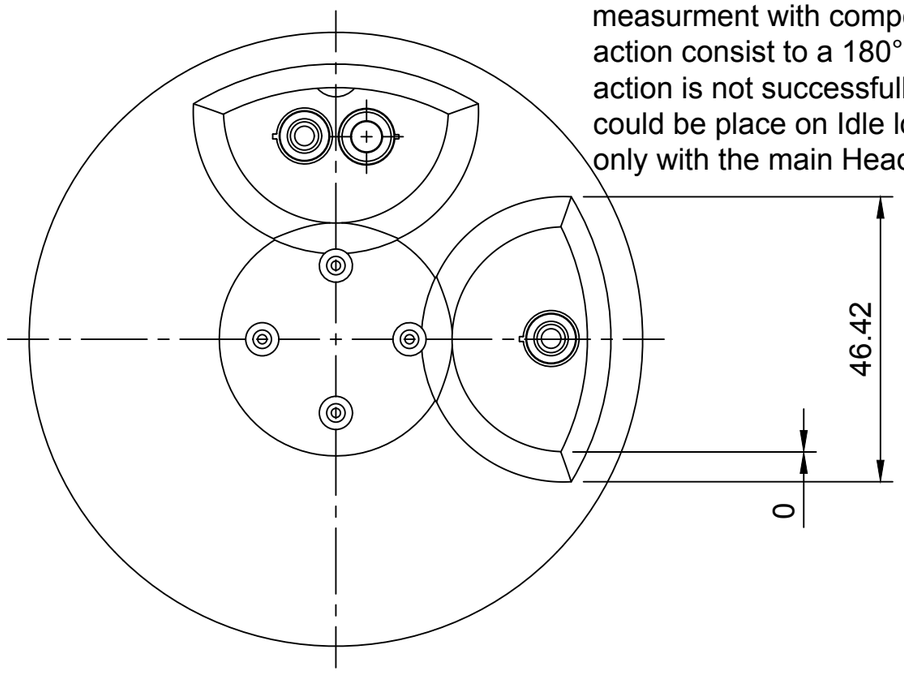
Each windows of the deflector are designed to cover the bothe FOV from Main Head and the single FOV90° from the reference measurment. We took in account the sensor element location and not the only casing.

We created grooves to implemente a kind of squeegees

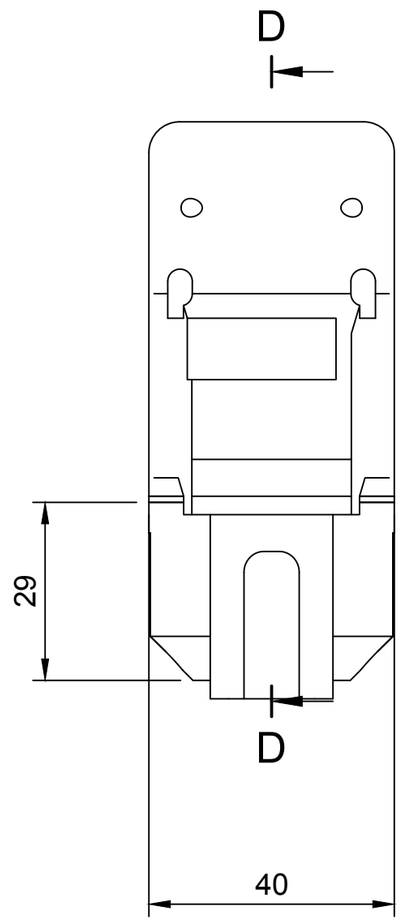


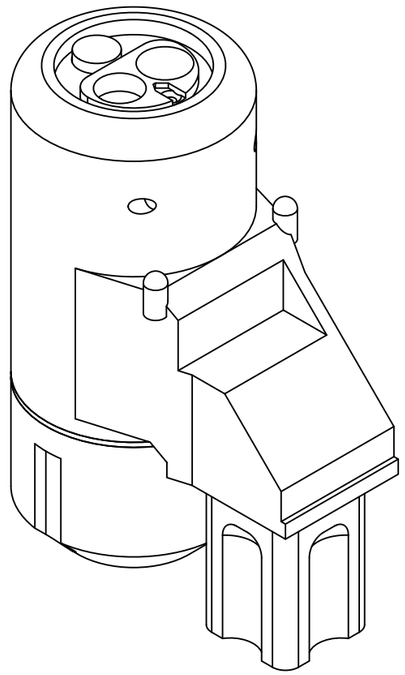


This configuration is a complete measurment with compensation. Clean Up action consist to a 180° rotation, but if the action is not successfull, the deflector could be place on Idle location 90° and run only with the main Head.

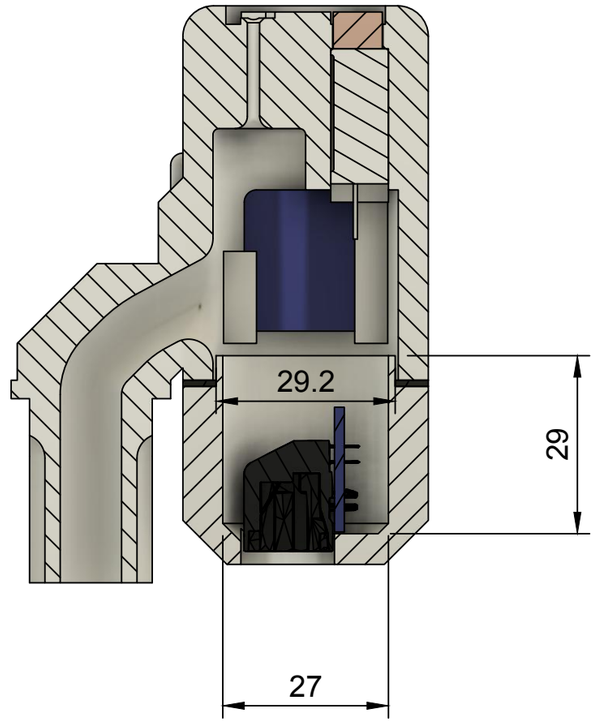


Dept.	Technical reference	Created by	Approved by
		Sébastien Kubasik 03/01/2019	
		Document type: Technical Drawing	Document status:
		Title: Ceilometer Deflector	DWG No.:
			Rev. / Date of issue / Sheet: 8/10



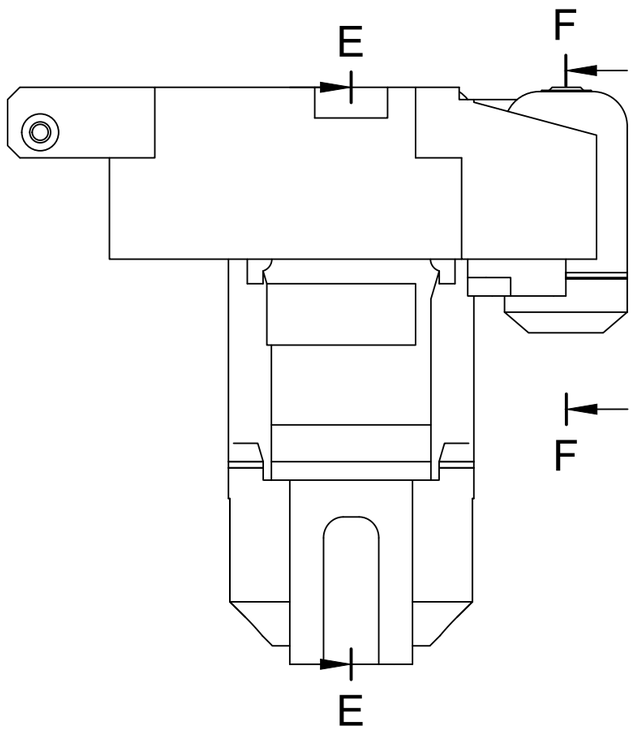


D-D (1:1)

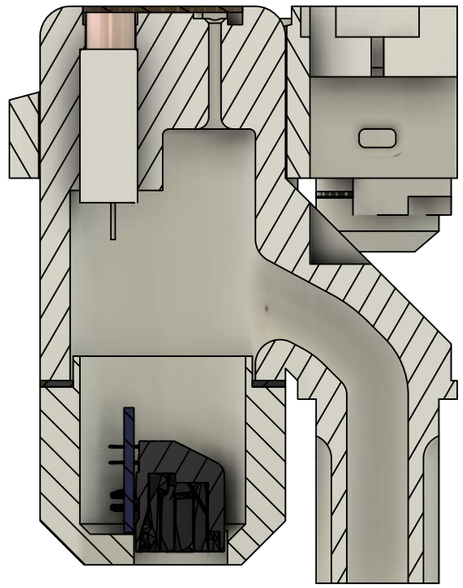


The bottom plug handle the RJ11 connection with a PCB, and provide so enough volume to contain a silica gel packet. The RJ11 connection assume the communication with the third MLX90614 externalized.

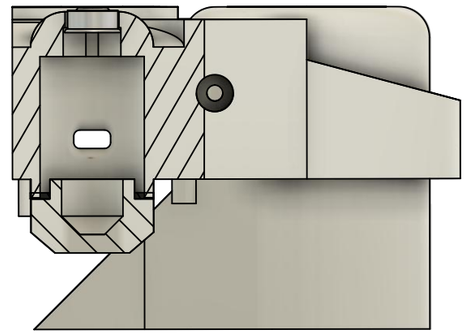
Dept.	Technical reference	Created by	Approved by
		Sébastien Kubasik 03/01/2019	
		Document type: Technical Drawing	Document status
		Title: Ceilometer Main Body Closed	DWG No.
			Rev. / Date of issue / Sheet: 9/10



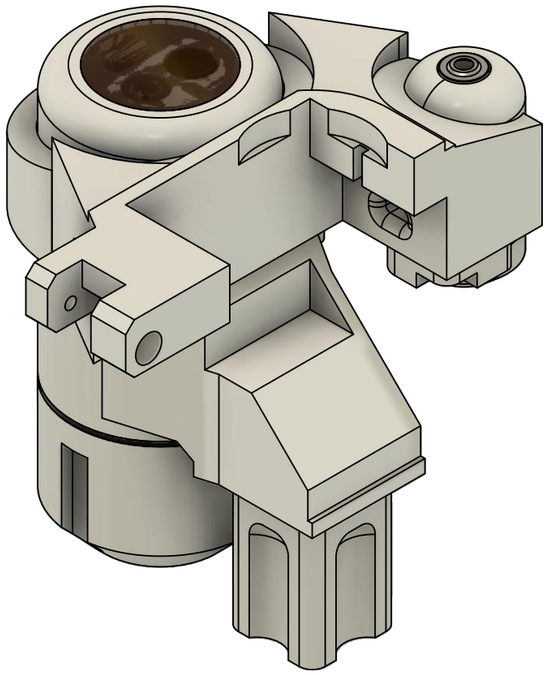
E-E (1:1)



F-F (1:1)



This reference sensor MLX 90614 should be withdraw after several sessions of measurment <> its goal is to establish a rule of compensation, and ideally, work without.
=> the casin is really simple, the sensor could be clean but not heated.



Dept.	Technical reference	Created by	Approved by
		Sébastien Kubasik 03/01/2019	
		Document type	Document status
		Title: Ceilometer Main body & servo bearging assembly	DWG No.
			Rev. / Date of issue / Sheet: 10/10