

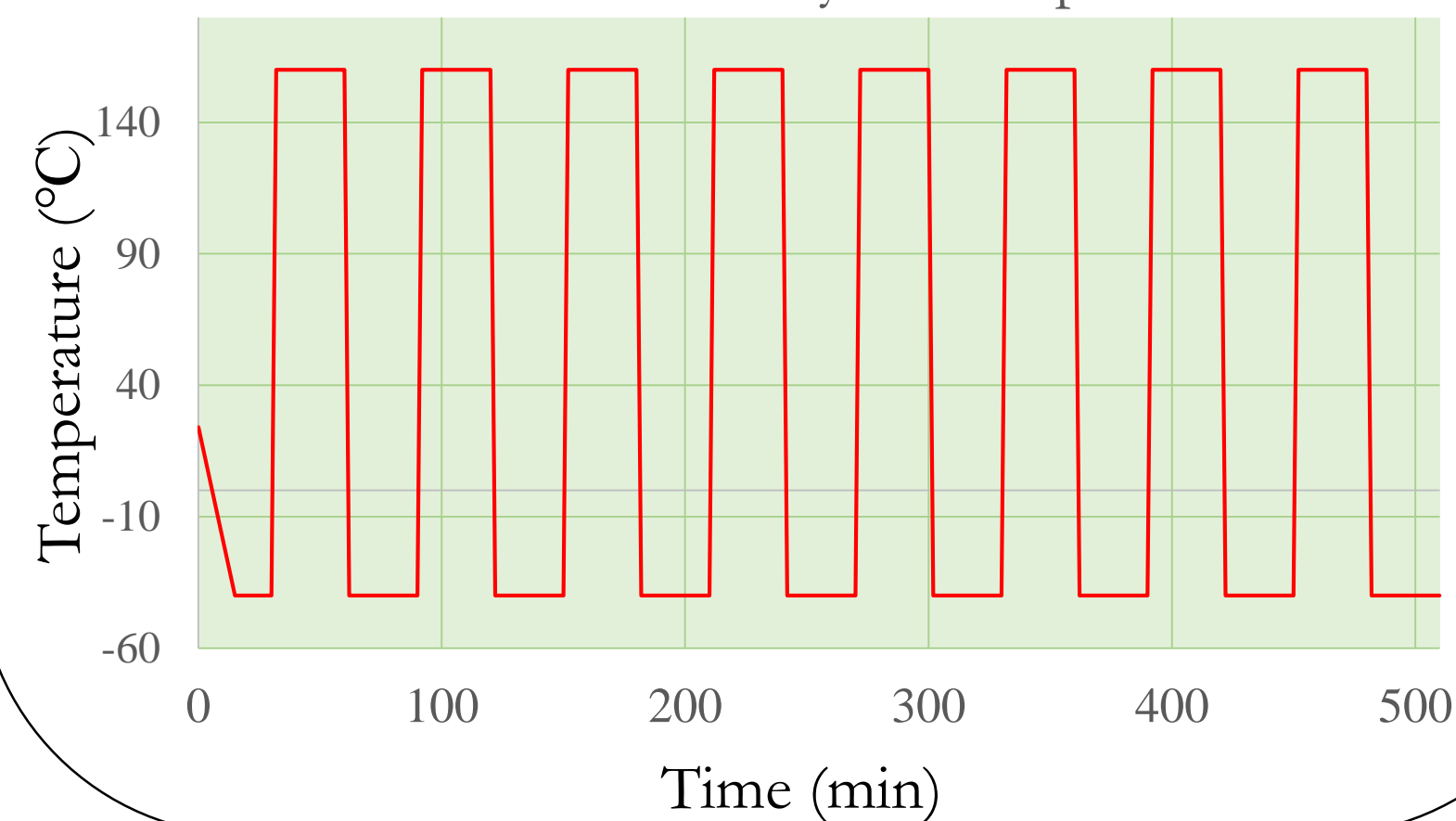
## 1. Project Background

Danfoss tests components for reliability before manufacturing and selling. Tests include:

- Extreme Temperature exposure (-40 °C to 160 °C)
- Humidity exposure (10-98% RH)
- Vibrational Tests

These test can last up to 71 days and can have any combination of the above 3 mentioned

Climatic Chamber Cyclic Temperature Test



## 2. Objectives

Our main objective is to improve failure detection for Danfoss reliability department.

Our goals include:

- Displaying live feed of testing components
- Maintaining operation of the recording device
- Eliminating any condensation or dew on camera lens
- Allow portability and adjustability
- Inexpensive



## 3. Selected Design

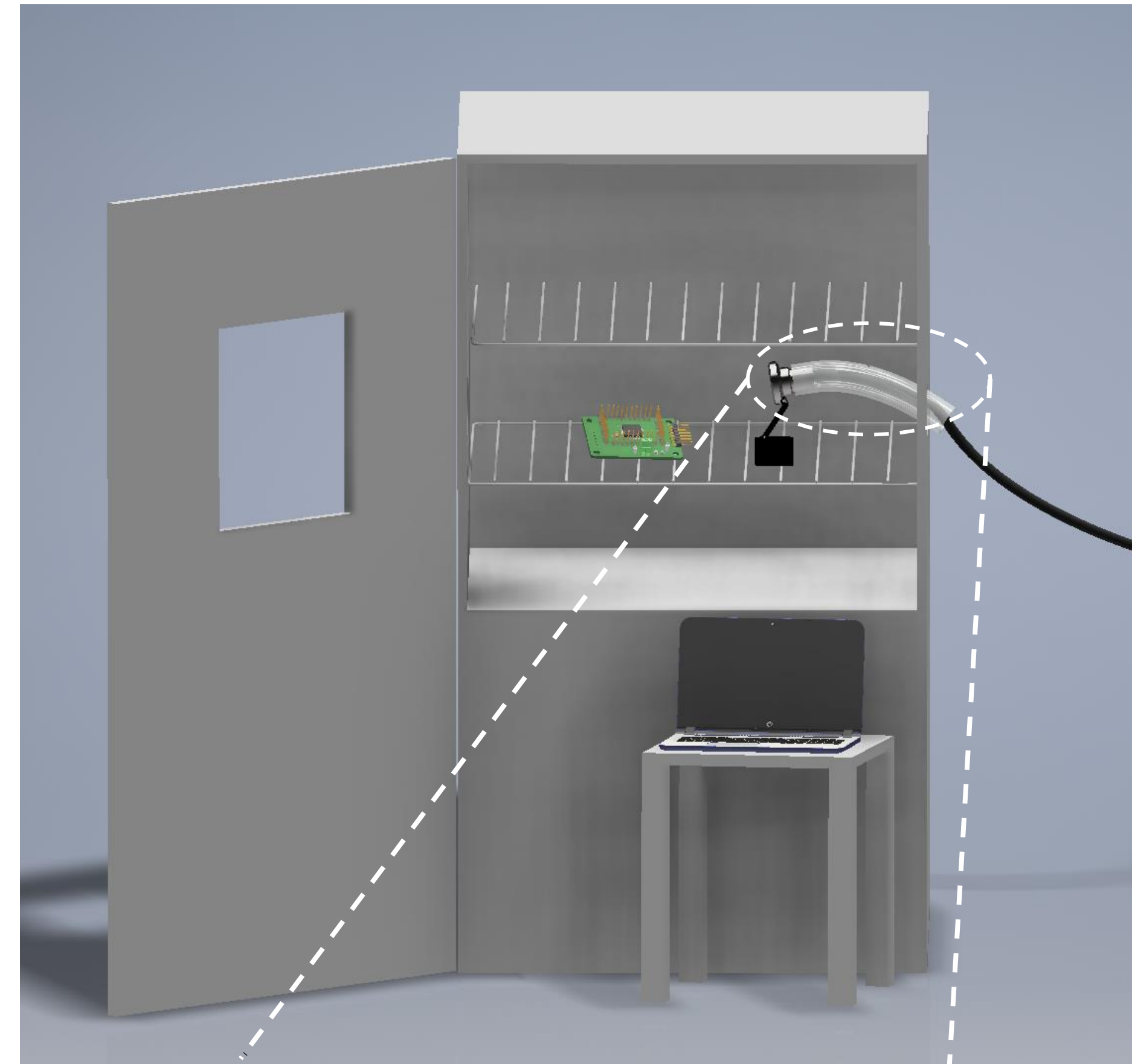


Figure 1: Close up of Climatic Camera

## 4. Simulation

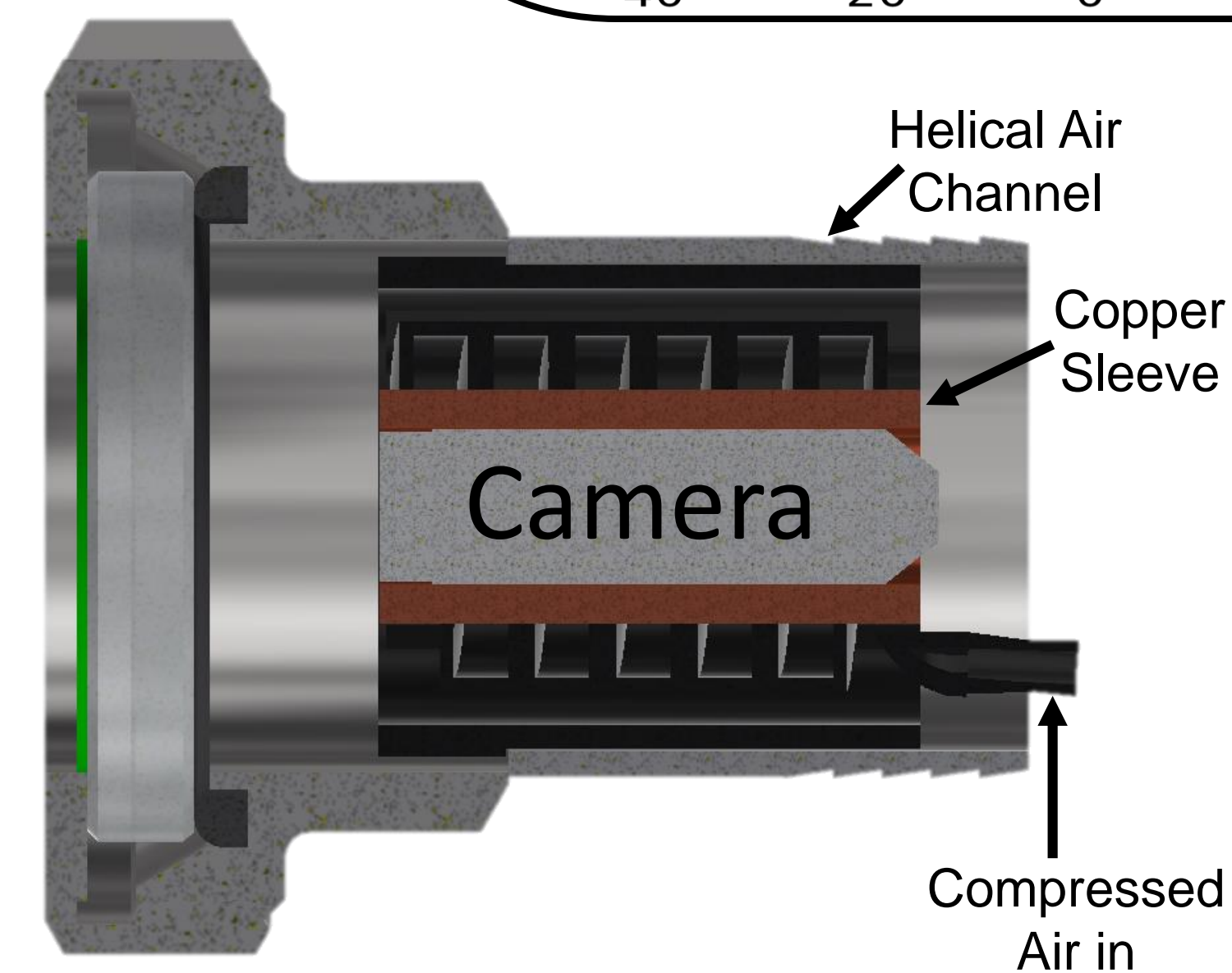
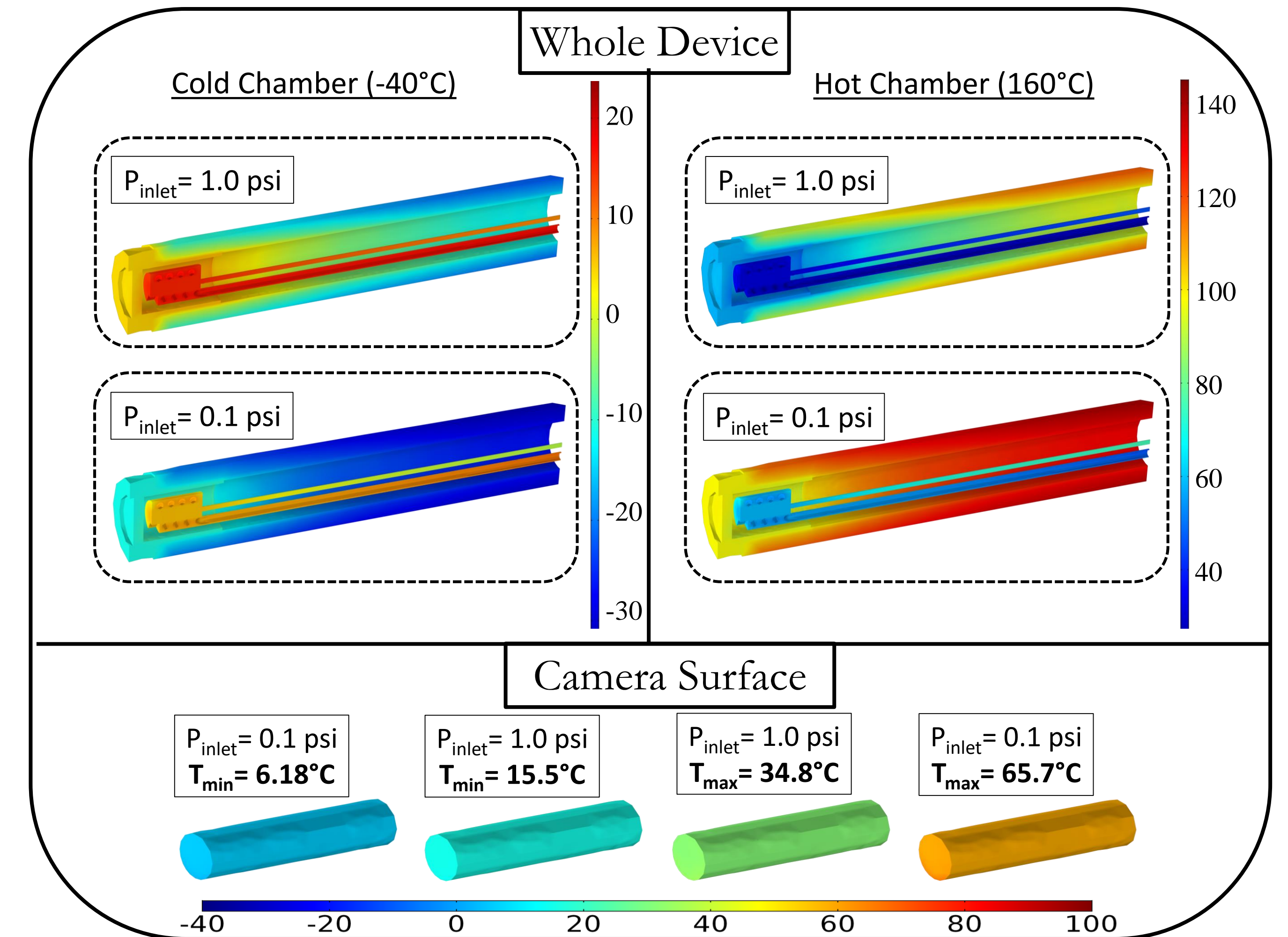


Figure 2: Cross Section of Climatic Camera

## 5. Validation

Conditions	Theoretical Results	Actual Results
160°C Chamber	Camera Temp. = 34.8°C	N/A
-40°C Chamber	Camera Temp. = 14.1°C	N/A
70 days functionality	Yes	N/A
Adequate Lighting	Yes	N/A
Condensation	No	N/A
Camera Heat Generation	Negligible	≈ 0.0025 W