

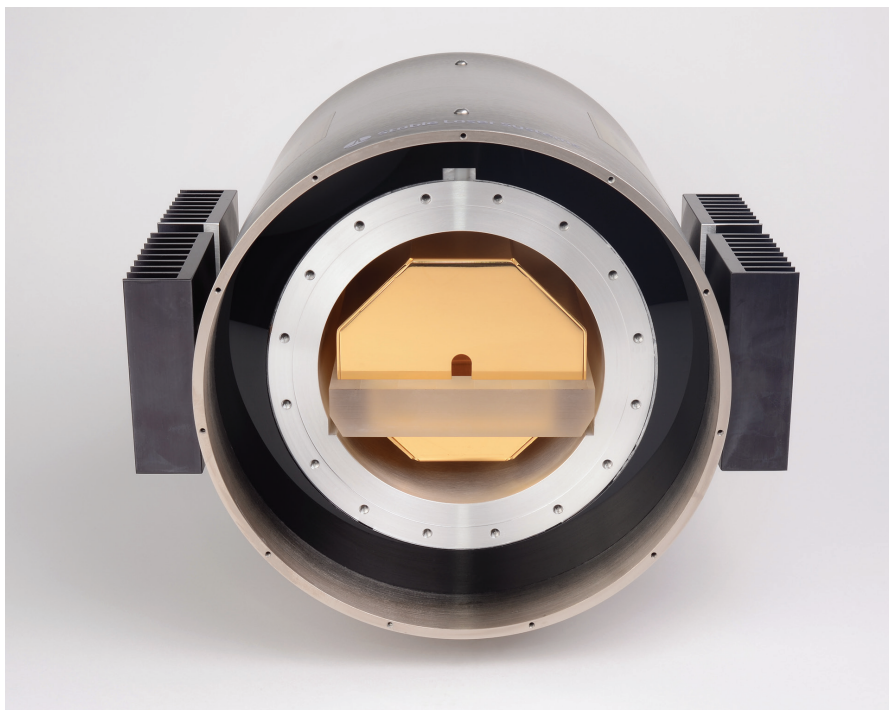
## A HIGH-FINESSE FABRY-PEROT CAVITY

is nothing without the right vacuum housing to isolate, mount, and control it. This housing is a well-matched cradle for either the ATF 6010 cylindrical cavity or ATF 6020 notched cavity, offering temperature control of  $<5\text{mK}/^\circ\text{C}$  for low frequency drift over a  $15 - 40^\circ\text{C}$  range. Thermally insulated and radiation-shielded, the aluminum housing mounts to an optical table using standard clamping forks. Two Peltier coolers or heaters provide temperature control, and thermistors are used for sensing. The mounting structure within is optimized for rigidity and low thermal expansion, makes use of common-mode techniques to reduce deformation, and provides some degree of vibration isolation. We start with our field-proven design and then build each vacuum housing to order, taking into account your specific application and needs.

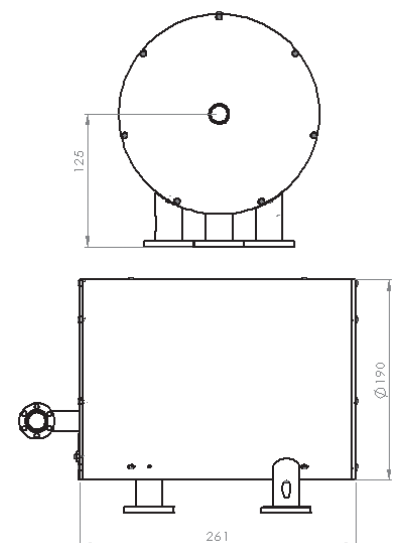
We design our vacuum housings with the user in mind, combining superior temperature performance with ease of use — right out of the box. Let our expertise speed your research, from concept to alignment to data. **Call us today!**

## INSIDER TIP

While a cylindrical cavity is the simplest design, notches decrease vibration sensitivity via common mode rejection of acceleration. Notched cavities are recommended for linewidths below 100Hz, and the mounts have Viton supports at the points calculated to minimize the acceleration sensitivity. For the best performance from a standard cavity spacer, we recommend a notched spacer with Fused Silica mirrors and ULE backing rings.



## ENGINEERING DIAGRAM



## MECHANICS

Vacuum can material	Aluminum
Fittings	Stainless steel tee has two 1.33 ConFlat fittings for attachment to ion pump & valve
Viewports/windows	Windows angled at 2° with respect to can axis AR coated, usually with mirror order from ATFilms
Seals	<ul style="list-style-type: none"> <li>• Front flange: Viton O-ring or Indium wire</li> <li>• Back flange, windows &amp; ConFlat tee: Indium wire</li> </ul>
Attachment to table	Forks to match Thorlabs 1" post assembly
Weight	8 kg

### ATFILMS CAVITY COMPATIBILITY

- Notched cavity [ATF 6020]
- Cylindrical cavity [ATF 6010]

## PERFORMANCE

Frequency Drift	~ 10 Hz/Minute <5kHz/day depending on $\Delta T$ from zero crossing temperature.
Temperature drift	< 5 mK/°C
Temperature control range	15 - 40 °C
Thermal insulation leakage	< 0.5 W/°C
Thermal time constants	> Aluminum block: 4 hours > Zerodur block: 7 hours
Cavity mounting accuracy	Within 1 mm of can axis
Leak rate (tested with Helium)	< 10 <sup>-9</sup> std cc/sec
Achievable pressure (tested with 2 l/s ion pump after 3 day bakeout @85°C)	< 10 <sup>-6</sup> Torr

## ELECTRONICS

Thermoelectric coolers	Two: 60 W Typically 1A current required to stabilize at 15°C with natural convection on heat sinks (0.8 W/°C)
Heater option (in place of coolers)	Two: 6 $\Omega$ , 20 W
Thermistors	Two: 10 k $\Omega$ @ 25°C
Electronic feedthroughs	None

### WE ALSO OFFER OPTIONAL MODE MATCHING FROM FIBER TO CAVITY

Mode matching fraction greater than 90%.