BeCu Mini Symmetric (40mm) Diamond Anvil Cell

Model BeCu-40mm-Mini-SYMM-DAC-LR(/RR)-REG(/SHORT)

The Symmetric Diamond Anvil Cell (DAC) is perhaps the most popular DAC in the World. It is compact, versatile, simple to operate, user-friendly, easily adaptable to multiple experimental environments and can be used for a multitude of optical and X-ray studies and a large variety of different experimental techniques. With proper diamonds, alignment and sample preparation the DAC can readily reach megabar pressures (>100 GPa).

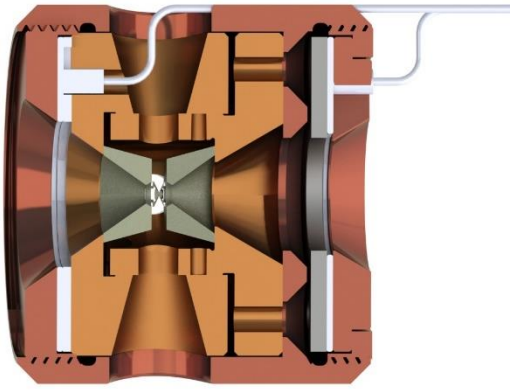
Mini Symmetric (40 mm) DAC is a direct derivative of the classic 1.875” / 48 mm symmetric DAC where unnecessary outside material was removed making it about 5 mm shorter (9 mm for shortened version) and ~8 mm smaller in diameter, thus reducing the mass of the DAC by ~50%. At the same time the inner diameter and height of the piston remain about the same as in classic symmetric DACs allowing to use standard size diamond seats and anvils.

This DAC was designed for cryogenic work, with possibility of using it in strong magnetic fields, and therefore is made of non-magnetic BeCu alloy (C17200 / Alloy 25) with full-hard HT04 temper. For such applications the DAC can be supplied with non-magnetic screws (e.g. BeCu, Inconel, Titanium5) and spring washers (Inconel), as well as non-magnetic diamond seats made of either BeCu, Pascalloy (non-magnetic NiCrAl alloy) or boron nitride.

To increase lifetime and decrease wear the DAC piston can be coated on request with a layer of hard chrome, or the whole DAC can be coated with a protective slippery layer of WS_2.

The combination of the extremely high strength of the cell material and excellent thermal conductivity makes it optimal for use in cold-finger type cryostats, for example Physike Technology Scryo S-500 / S-300 cryostats. The design of the DAC allows to conveniently attach temperature sensors, such as DT-670 in CU package, onto the DAC body close to the sample.

The DAC is versatile and can be used for x-ray diffraction with symmetric diffraction opening of 58°±4° with BA anvils with conical support. The short working distance (~12 mm / 11 mm for shortened version) also makes it convenient for optical studies, such as Raman spectroscopy and other spectroscopic techniques.



The DAC allows for multiple ways of pressure control. Typically the pressure in the DAC is controlled by four M4 screws – either two left (LH) and two right (RH) to minimize relative rotation of the diamonds during pressure increase, or all RH screws on request. Nevertheless the DAC can be easily integrated with single or double membrane BeCu canister (compression and decompression) and fit into 47 mm (all versions) and down to 61 mm (shortened version) cryostat bores along and perpendicular the bore axis respectively.

DAC Tools
Custom Equipment for High-Pressure Research

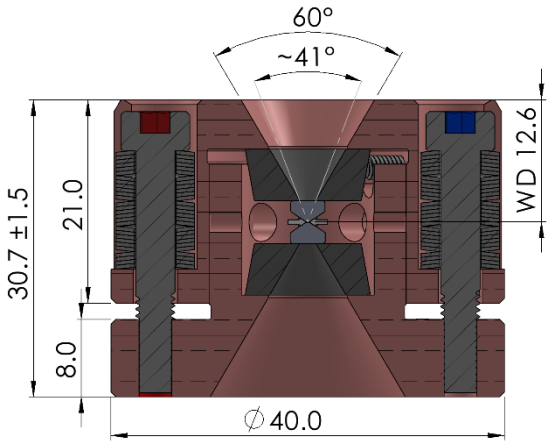
Specifications of BeCu Mini Symmetric DAC
40 mm Diameter Diamond Anvil Cell

Main DAC Specifications

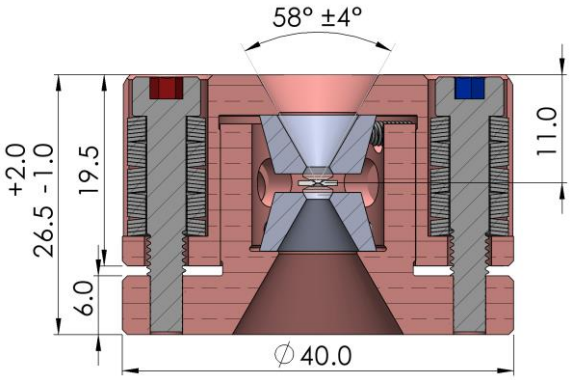
Material:	BeCu C17200 HT04
Height:	~30.7 (26.5) ± 1.5 mm
Diameter:	40.0 mm
Working distance:	~12.6 (11.0) ± 1 mm
Mass:	~ 250 (220) g
Optical opening:	Up to 60 degrees
Diamond seats:	Tungsten carbide (typ.), Optional BeCu, Pascalloy and cBN (Non-magnetic)
Pressure screws:	M4 x 25 (22) mm, 2x LH and 2x RH or 4x RH (model dependent)
Spring washers:	8.0 mm OD, 4.2 mm ID, 0.3-0.5 mm thick.
Diamond seat diameter:	12.5-13.0 mm (13.5 mm max)
Minimum height of two seats + two diamonds:	13.5 mm (13.0 mm)
Maximum experimental P:	>100 GPa

DAC Dimensions

Regular Version



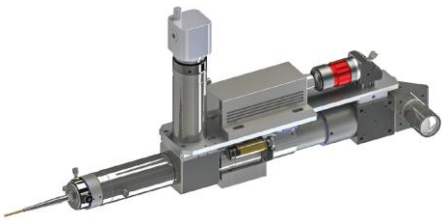
Shortened Version



Related equipment

Laser drilling systems

Ruby pressure systems



Membrane P Control

For more information please visit www.DACTools.com

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