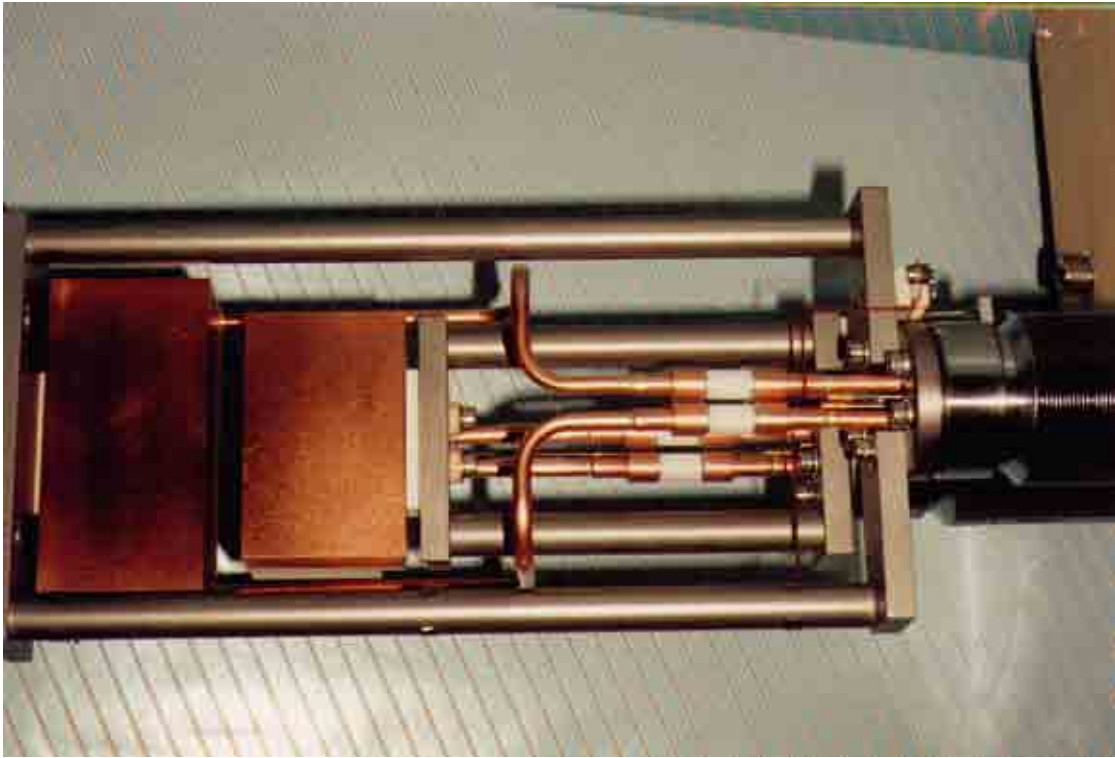


# COOLED SLIT SYSTEM, DB 015

for applications at accelerators



## Technical Specifications:

<b>Stopping material</b>	:	Copper
<b>Height of jaw</b>	:	70mm
<b>Width of jaw</b>	:	40 mm
<b>Depth of material</b>	:	20mm
<b>Thermal Characteristics</b>		
- <b>Maximum beam power</b>	:	2 kW, c.w.
- <b>Maximum range of particles*</b>	:	Less than 10 mm
- <b>Location of Bragg Peak*</b>	:	Larger than 5 mm
- <b>Minimum beam radius*</b>	:	Larger than 5 mm
- <b>Cooling water consumption</b>	:	Approx. 1 liter/minute

(2 kW,  $dT = 300$ )

\* Conditions from thermal calculations.

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## **Technical Specifications (continued):**

<b>Measurement of slit current</b>	:	Possible; ceramic insulation within the cooling pipes.
<b>Recommended conductivity of water</b>	:	Less than 3 uS/cm
<b>Mechanical slit protection</b>	:	One (1) contact (free of potential).
<b>Slit mounting</b>	:	Stainless steel frame
<b>Maximum aperture**</b>	:	70 mm
<b>Maximum offset for one (1) slit**</b>	:	15 mm over beam center line.
<b>Stroke/jaw**</b>	:	50mm
<b>Actuator (not shown)</b>	:	LM 16, dual, precision UHV-actuator

\*\* Given by the stroke of the feedthrough and the design of the mounting frame.

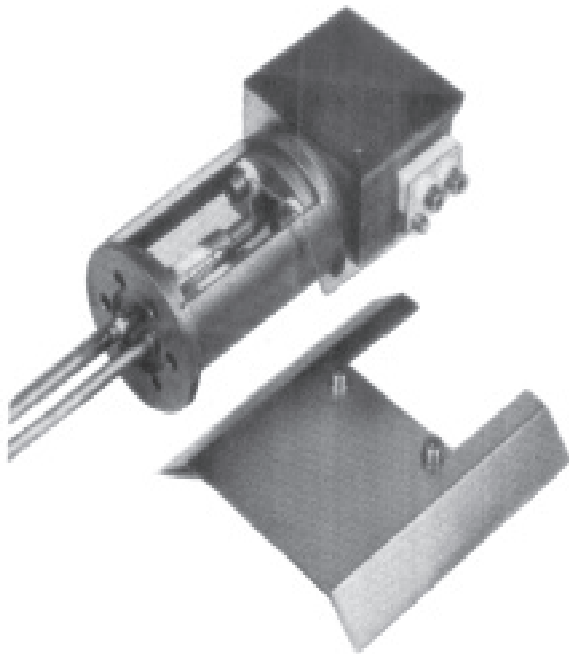
## **SLIT SYSTEM DB 010**

### **Application:**

Slit systems available (with UHV-Feedthrough, Type LM 17) are used for beam size limitation, beam analysis functions, and energy definition in beam transport systems of particle accelerators.

### **Design:**

The slit-jaw system pictured below, consists of a cooled copper block which is covered with a tantalum plate. To facilitate good heat conductivity between copper and tantalum, a special vacuum braze has been chosen (SCP 3 AT, 930 °C Degussa). To avoid tension between Ta jaw and Cu body components, a thin copper plate has been placed between the jaw and the body of system. Again, a special braze (UH 720 Degussa) has been used for joining of the Cu body to intermediate components manufactured from stainless steel and ceramic feedthroughs with copper or Vacon fittings.



Cooled slit-jaw provided for up to 6 kW beam power; ceramic insulation of cooling pipes; stainless steel shield as protection against sputtering; used for slit current measurement.

## **Technical Specifications:**

<b>Materials</b>	:	Copper for cooling body and cooling pipes; Tantalum for the jaw; ceramics for cooling pipe insulation and limit-switch insulation; stainless steel for intermediate components, mini conflat flanges and sputtering shield.
<b>Dimensions of jaw</b>	:	1.6 x 1.8 inches
<b>Thickness of Ta jaw</b>	:	0.05 inches (variable)
<b>Angle of jaw edge</b>	:	15°
<b>Precision of jaw edge</b>	:	Less than 0.004 inches
<b>Cooling pipes I.D.</b>	:	0.157 inches
<b>Cooling medium</b>	:	Deionized water (2.5 - 25 µmho/inch)
<b>Cooling medium flow</b>	:	260 liters/hour - 60 psi
<b>Vacuum sealing</b>	:	CF-16
<b>Support flange</b>	:	Mini conflat

**NOTE:** An insulation limit switch combination is provided for every one (1) Slit Jaw to be installed (each connection is protected with an appropriate electronic interlock). It should be noted that uncooled Ta slit jaw up to 600 W, with same jaw dimensions and specifications, can be attached to a LM 17 feedthrough. The LM 16 twin version feedthrough would require a double jaw system (cooled version: 6 kW; uncooled version: 600 W). Specifications for double jaw system are comparable to the slit jaw described above.