XY Scanning Slits Beam Profiler

SS-35.1500 / CTRL-SS-12.A

A current-measurement system for mapping the spatial variation in intensity along two axes of beams up to 35 mm diameter and 1500 W total power.

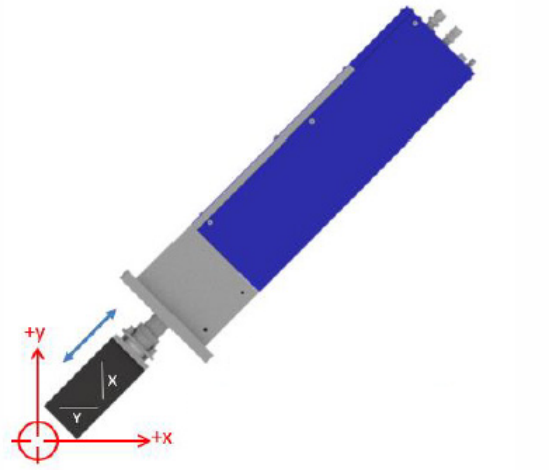
Probe (SS-35.1500).

Controller (CTRL-SS-12.A).

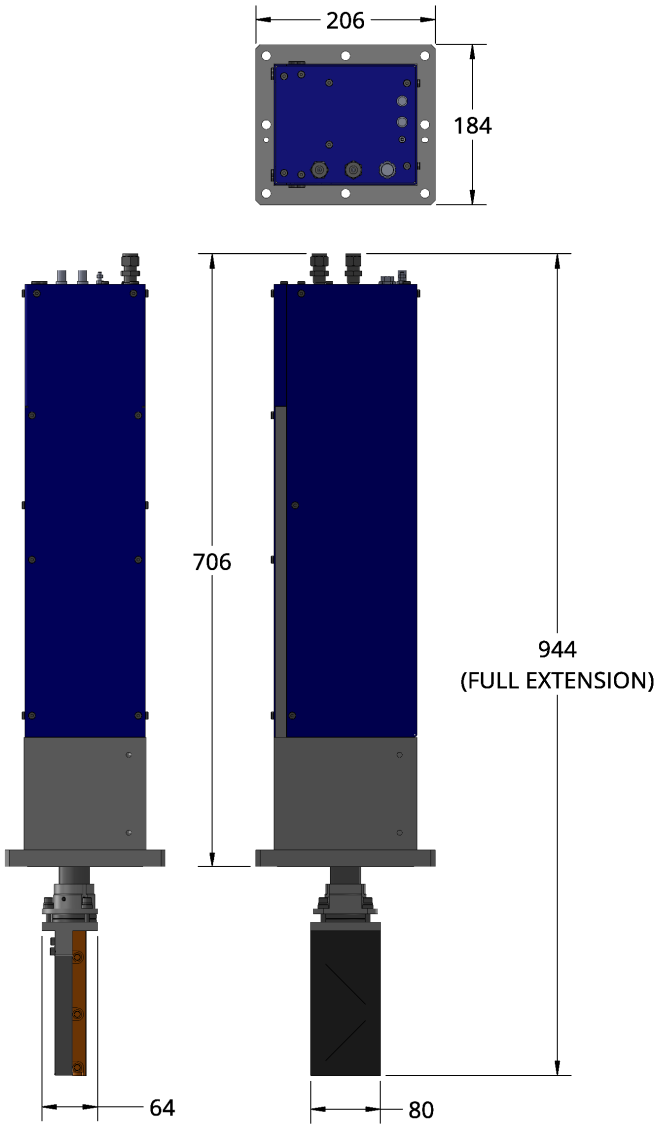
- Scan X and Y beam profiles with a single probe
- Greater maximum power density than common wire scanners
- No bias power supply required
- Remote operation with text-based TCP/IP commands

SPECIFICATION[1]: PROBE (SS-35.1500)	
MAXIMUM BEAM DIAMETER	35 mm
MAXIMUM BEAM POWER	1500 W
MAXIMUM POWER DENSITY	50 W/mm^2
SLIT WIDTH	0.5 mm
MINIMUM ACTUATOR STEP SIZE	0.050 mm
MAXIMUM SCAN SPEED	40 mm/s
PROBE TRAVEL	165 mm
SCANNING HEAD MATERIAL	Molybdenum (Face) Copper (Faraday Cups)
COOLING WATER FLOW RATE (MINIMUM)	2 LPM, deionized not required
WATER PRESSURE DROP	400 kPa (60 psi) at 2 LPM

The **XY Scanning Slits Beam Profiler** is a system to measure the intensity of charged particle beams and map the variation along two transverse axes. The probe in the system uses a plate with two perpendicular slots to intercept the beam. A small portion of the beam passes through the slots into integral Faraday cups mounted on the back side of the plate. The plate is moved across the beam to scan different cross sections. Shielded cables transmit the current generated by the capture of the charged particles in the cups to the controller where the signal is converted to voltage by a two-channel transimpedance amplifier and then recorded using an analog-to-digital converter and data acquisition software. A graphical user interface plots the results of the scan and allows the operator to control parameters such as the spatial resolution and scan speed. By using a water-cooled plate with a refractory metal coating to intercept the largest portion of the beam, the scanner is able to measure beams with greater power densities than typical wire scanners.

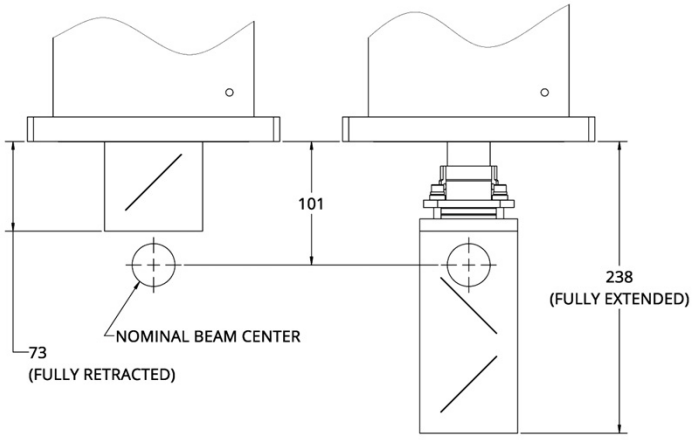


Dual slits scan through a beam. The beam direction is into the page.

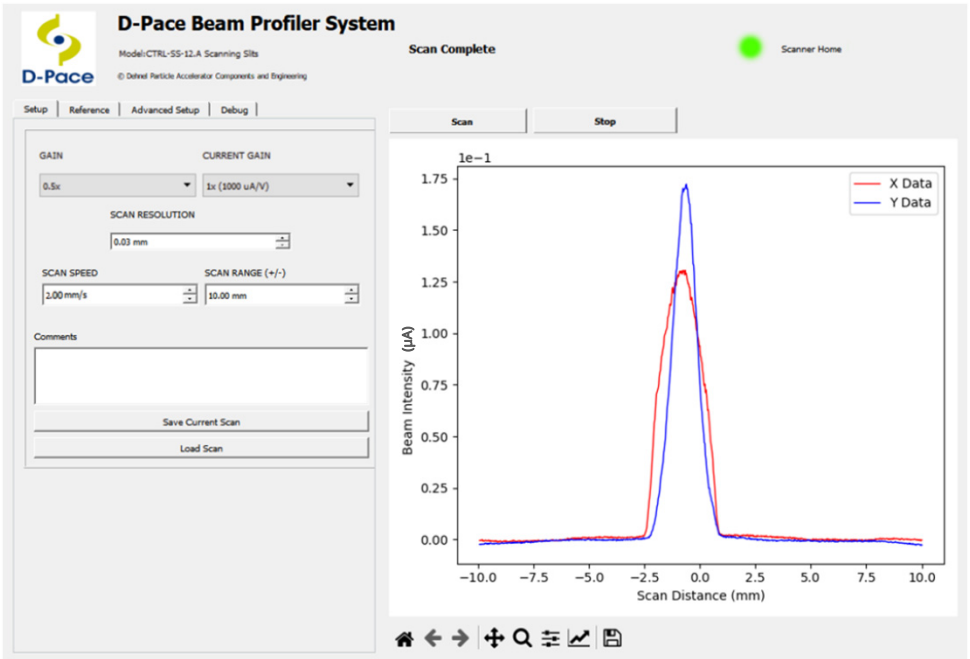


Overall dimensions (millimeters)[2].

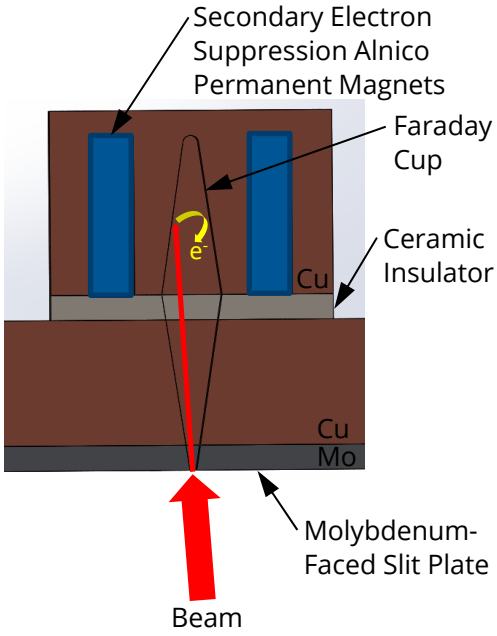
SPECIFICATION[1]: CONTROLLER (CTRL-SS-12.A)	
INPUT POWER	100-230 VAC, 47-63 Hz
COMMUNICATIONS	Ethernet, 10/100/1000 Mbps
FORM FACTOR	19 Inch Rack Mount, 2U
CURRENT-TO-VOLTAGE CONVERTER SENSITIVITY	1000 µA/V, 100 µA/V, 10 µA/V, 1 µA/V (software controlled)
VOLTAGE AMPLIFIER GAIN RANGES	0.5x-1000x (software controlled)
INTERNAL ANALOG-TO-DIGITAL CONVERTER	+/- 10 V Input, 12 bit Resolution
ANALOG SIGNAL BANDWIDTH (MAXIMUM)	1 kHz (-3 dB)
PROGRAMMABLE LOW-PASS FILTER	10 Hz – 1 kHz



Nominal beam-to-flange spacing (millimeters)[2].



Example of the user interface.



Cross section of the probe through a slit and Faraday cup.

1. D-Pace, Inc. reserves the right to update these specifications without notice as part of the continuous improvement program for its products.
2. Default flange is shown. Custom flanges and vacuum boxes are available. Contact D-Pace.