



Fastest current transformer

Reaches 3 GHz bandwidth

Ideal for non-destructive observations of short pulses or high repetition rate beams

Rise time below 120 ps

Sensitivity about 1 V/A

Operating Principle

The VFCT is a wall current transformer is based on an original idea from the 1970s for inductive beam position measurements. Via inductive coupling, the beam induces a current flowing on the surface of the vacuum chamber, the so-called wall current.

By cutting the vacuum chamber in segments equally distributed around the beam, the wall current becomes measurable by small current transformers placed around each of the segments. The sum of these individual signals is proportional to the beam current.

The internal structure of the VFCT differs considerably from normal current transformers. Resonances can be avoided. And a higher bandwidth can be reached. Yet, integration and especially length of the VFCT are like a standard current transformer.

Integration

In-flange VFCT is mounted in the beam line. Short axial length, includes a ceramic gap vacuum-brazed to kovar. Does not require bellows, wall current bypass nor electromagnetic shield. UHV compatible.

Specifications

Inner diameter	34.9	96.0	mm
Sensitivity (approx.)	~1.0	~1.0	V/A
Rise time (typ.)	120	180	ps
Droop (typ.)	<0.13	<0.13	%/ns
Upper cutoff frequency -3dB (typ.)	3	2	GHz
Lower cutoff frequency -3dB (typ.)	200	200	kHz
L/R time constant (typ.)	800	800	ns

Order codes

In-flange VFCT sensor order code	Pipe OD	Mating flange	ID (mm)	H (mm)
VFCT-CF6"-34.9-40-UHV	1.5"	DN/NW100CF	34.9	40
VFCT-CF10"-96.0-40-UHV	4"	DN/NW200CF	96.0	40
For other diameters please ask.				

Connectors

Two SMA jacks 50Ω, differential, to be read by two oscilloscope/digitizer channels (50Ω terminated) or transformed to single-ended signal by external balun

Options

-316LN AISI 316LN instead of AISI 304 SS

MANUFACTURER

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