

ACCT

AC Current Transformer

Precise waveform measurement of long pulses and macropulses, up to several milliseconds, with minimal droop and noise.

$\pm 10\text{mA}$ up to $\pm 2\text{A}$ full scale current range

Output $\pm 1\text{V}$ or $\pm 10\text{V}$ depending on version

Dynamic range $>10^4$

Bandwidth 3 Hz up to 1 MHz

Output signal droop $< 2 \text{ %/ms}$

Two versions are available:

High-resolution (-HR):

$< 1\mu\text{Arms}$ wideband noise

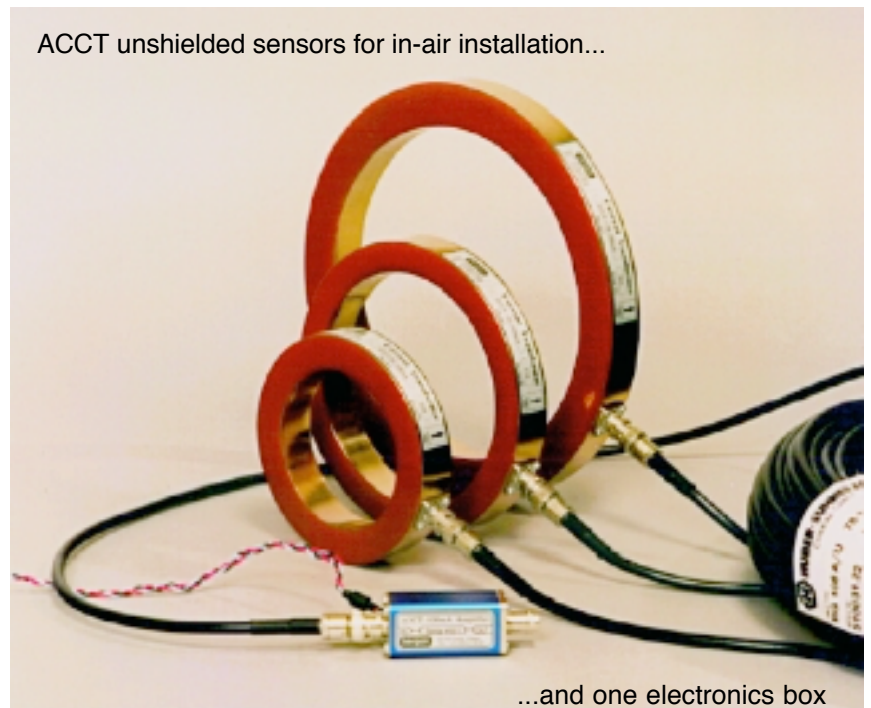
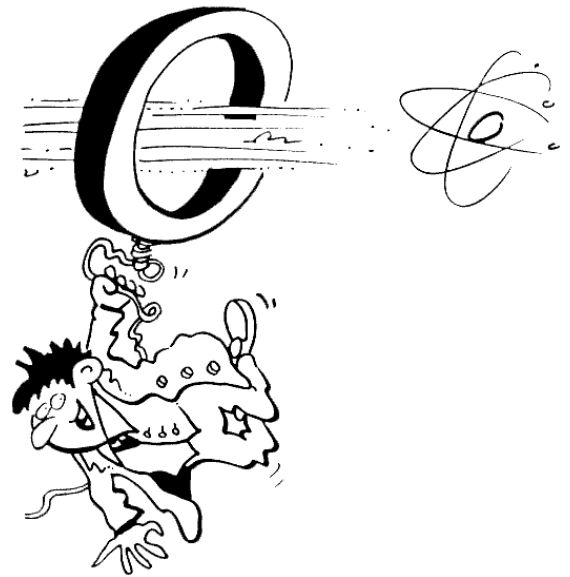
Wideband (-WB):

Up to 1 MHz

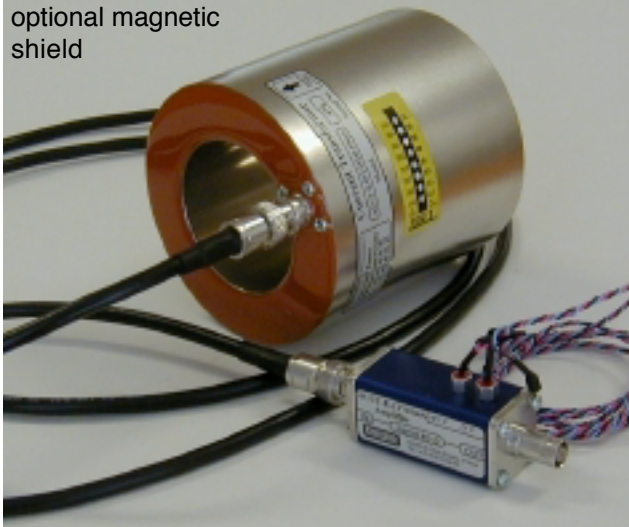
Three packaging types for the sensor:

- Toroid for in-air installation over the vacuum chamber
- Inside an optional magnetic shield for high-resolution measurement in noisy environment
- In-flange for in-line UHV installation

Cable from sensor to electronics up to 100m long.



ACCT sensor with optional magnetic shield



Operating principle

The ACCT is an evolution of the active transformer first proposed by Hereward in 1960. Compared to the Hereward transformer, the ACCT presents much lower noise, a DC offset of the output reduced to a very small value and excellent long-term stability. The sensor is built with a single winding, which requires only one wire pair between sensor and electronics; this allows much better EMI rejection when long cables are used. The electronics circuit is multistage, implementing the best low-noise operational amplifier available for this application.



BNO connector

Specifications

Full scale range	Any value from $\pm 10\text{mA}$ to $\pm 2\text{A}$, factory preset electronics.	
Connectors	Sensor: BNO (bipolar BNC) Electronics input: BNO (bipolar BNC) Electronics output: BNC	
Sensor cable	RG108 recommended, up to 100 meters	
Version	High-resolution	Wideband
Output full scale	$\pm 10\text{V}$	$\pm 1\text{V}$
Lower cutoff (-3dB)	3 Hz	3 Hz
Droop	$< 2\%/ms$	$< 2\%/ms$
Upper cutoff (-3dB)	300 kHz	1 MHz
Risetime	Slew rate limited	
Slew rate dV/dt	1.5 V/ μs	2 V/ μs
Output offset	0.2 mV typ. 0.5 mV max.	0.2 mV typ. 0.5 mV max.
Noise at 10mA F.S.	$< 1\mu\text{Arms}$	$< 5\mu\text{Arms}$
Noise at 100mA F.S.	$< 5\mu\text{Arms}$	$< 20\mu\text{Arms}$
Power supply	$\pm 15\text{Vdc}$, 100mA	$\pm 5\text{Vdc}$, 100mA
Saturation	External magnetic field: 20 Gauss max.	
Primary DC current	1 A max.	
Ratio accuracy error	$< 0.1\%$ FS	
Destructive level	DC current: Unlimited Spikes $> 100\text{ mC}$ AC current $> 20\text{ Arms}$	
Output current limit	$\pm 20\text{ mA}$ max.	
Mag. field sensitivity	To be characterized. Cannot be ignored when low currents are measured. Optional magnetic shield recommended.	
Temperature drift	Negligible.	

Order codes

Sensors

In-air:	ACCT-S-XXX (ID= XXXmm)
In-air shielded:	ACCT-S-XXX-MSH
In-flange:	ACCT-CF3"3/8-22.2-40-UHV (1" pipe) ACCT-CF4"1/2-34.9-40-UHV (1.5" pipe) ACCT-CF6"-60.4-40-UHV (2.5" pipe) ACCT-CF6"3/4-96.0-40-UHV (4" pipe) ACCT-CF8"-96.0-40-UHV (4" pipe)
Rad-hard option	ACCT-H (6E7 Gy max)

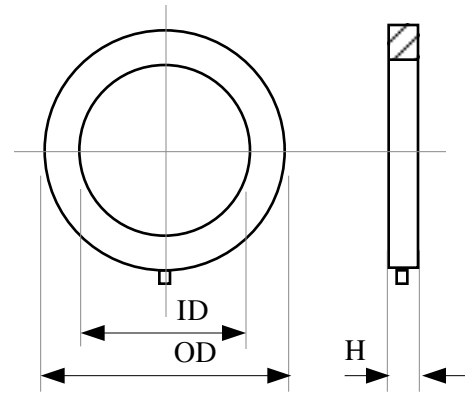
Electronics

High-resolution	ACCT-E-XXXmA-HR (XXXmA full scale)
Wideband	ACCT-E-XXXmA-WB

Cable

BNO-BNO twisted pair	ACCT-C-XX (XX meters, max.100 meters)
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Dimensions



ACCT-S-	ID (min)	OD (max)	H (max)	Mass [g]
Unshielded models				
-016	16	42	22	60
-028	28	64	22	115
-055	55	91	22	175
-082	82	118	22	250
-122	122	156	22	320
-178	178	226	22	700
Shielded models, with ACCT-MSH option				
-055-MSH	55	98	102	900
-075-MSH	75	118	102	1200
-115-MSH	115	158	102	1700
-130-MSH	115	175	102	2000
-175-MSH	175	222	102	2400
-198-MSH	197	250	102	2600
-202-MSH	202	248	102	2600
-245-MSH	245	298	102	3300
In-flange models, see "In-flange" data sheet				

Distributors

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