BERGOZ Instrumentation
Espace Allondon Ouest
01630 Saint Genis Pouilly, France
Tel.: +33-450.426.642
Fax: +33-450.426.643

bergoz
Instrumentation

Test Report Rev. 1.0

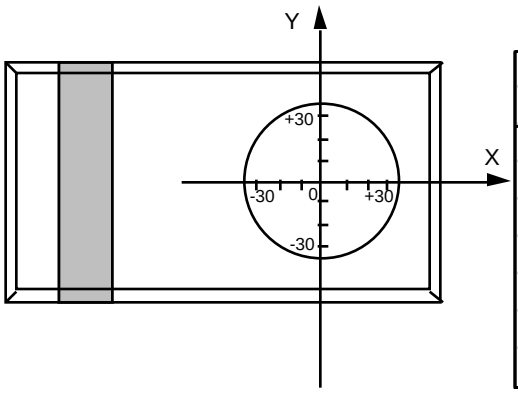
Objective of test: To determine the IPCT transfer function dependence on
a) the position of the conductor inside the sensor hole
b) the angle of the conductor inside the sensor hole

Date of test: December 13, 1995, 8h45-9h15
By: Alain Charvet and Julien Bergoz
Location: Crozet workshop
Temperature: 22.8 °C

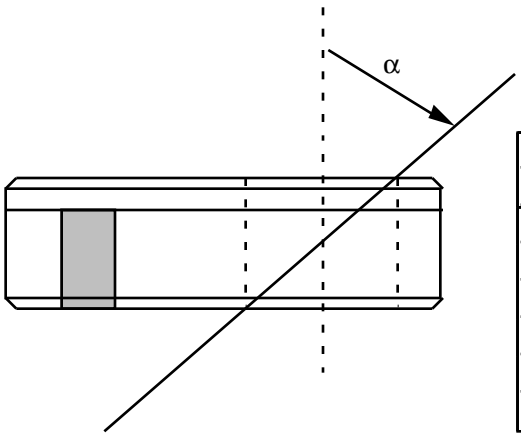
Unit tested: IPCT-100T serial #039
Burden resistor 1kΩ ±1%
Corresponding full scale range: ±1A

Test conditions: AWG20 isolated wire thru the IPCT sensor hole
Primary current source: 1A constant current power supply thru 10Ω

Test data



Position X	Output [V]	Equivalent current [A]	Error X axis	Position Y	Output [V]	Equivalent current [A]	Error Y axis
30	9,987	0,9987	-0,13%	30	9,981	0,9981	-0,19%
20	9,986	0,9986	-0,14%	20	9,980	0,9980	-0,20%
10	9,985	0,9985	-0,15%	10	9,980	0,9980	-0,20%
0	9,985	0,9985	-0,15%	0	9,980	0,9980	-0,20%
-10	9,984	0,9984	-0,16%	-10	9,979	0,9979	-0,21%
-20	9,984	0,9984	-0,16%	-20	9,978	0,9978	-0,22%
-30	9,983	0,9983	-0,17%	-30	9,978	0,9978	-0,22%



Position α	Output [V]	Equivalent current [A]	Error X axis
0	9,981	0,9981	-0,19%
10	9,980	0,9980	-0,20%
20	9,980	0,9980	-0,20%
30	9,979	0,9979	-0,21%
40	9,979	0,9979	-0,21%
50	9,978	0,9978	-0,22%

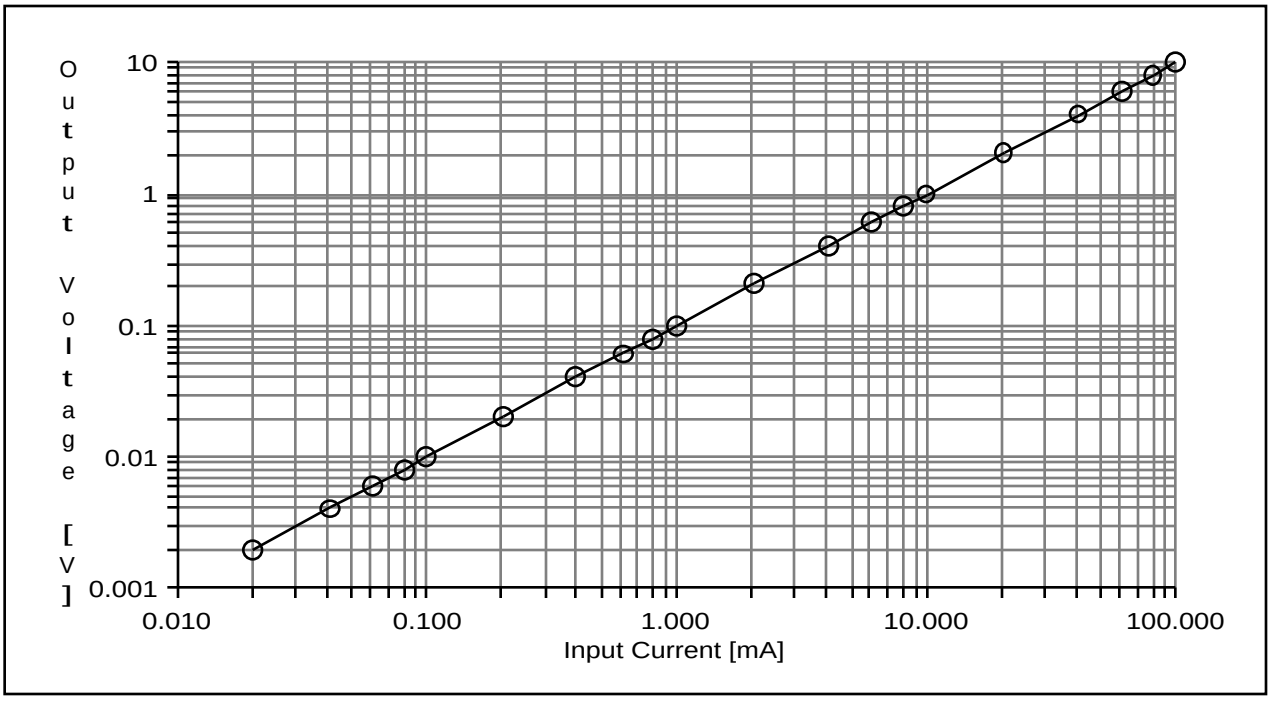
Primary current drift during tests			
Time	Event	Primary Current	Drift
8h55	Start	1,000	
9h15	End	0,999	-0,10%

Remark: The IPCT ouput drift appears to be due to the 1A power supply drift (cold start).

Measurement of Output voltage vs. Input current

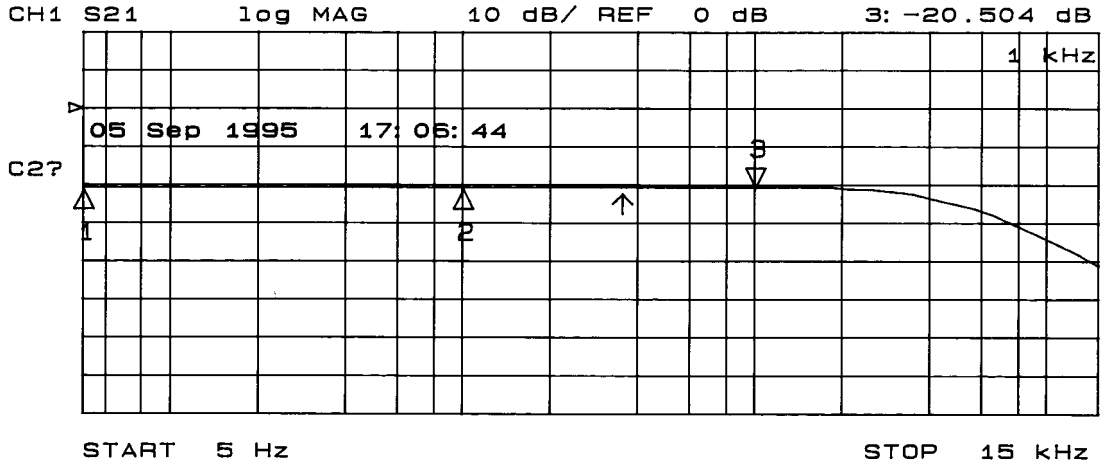
Unit tested: IPCT-10T, serial #021, with 100 mA full scale range (1kΩ ±0.01% burden resistor)
Date: 6 september 1995
Temperature 22.6 °C
1st measurement: Voltage drop across a standard 1 kΩ+0.0006% resistor in the input current
2nd measurement: Output voltage from the IPCT
3rd measureemnt: Output voltage from the IPCT when input current is disconnected

IPCT Range (mA)	Input voltage (V)	Precision resistor (Ω)	Equ. Input current (mA)	Output voltage (V)	Offset voltage (mV)	Adjusted output (V)	Equivalent current (mA)	Abolute error (µA)	Relative error (% of FS)
100	10,038	100	100,380	10,049	1,130	10,048	100,4767	-96,7000	-0,097%
100	8,051	100	80,510	8,060	1,060	8,059	80,5894	-79,4000	-0,079%
100	6,088	100	60,880	6,096	1,060	6,095	60,9494	-69,4000	-0,069%
100	4,049	100	40,490	4,057	1,070	4,056	40,5593	-69,3000	-0,069%
100	2,048	100	20,480	2,051	1,141	2,050	20,4986	-18,5900	-0,019%
100	10,016	1000	10,016	1,004	1,600	1,002	10,0240	-8,0000	-0,008%
100	8,090	1000	8,090	0,806	1,700	0,804	8,0430	47,0000	0,047%
100	6,012	1000	6,012	0,604	2,200	0,602	6,0180	-6,0000	-0,006%
100	4,031	1000	4,031	0,406	2,200	0,404	4,0380	-7,0000	-0,007%
100	2,028	1000	2,028	0,205	2,200	0,203	2,0280	0,0000	0,000%
100	1,005	1000	1,005	0,103	3,200	0,100	0,9980	7,0000	0,007%
100	0,803	1000	0,803	0,0835	3,120	0,080	0,8038	-0,8000	-0,001%
100	0,601	1000	0,601	0,0634	3,400	0,060	0,6000	1,0000	0,001%
100	0,400	1000	0,400	0,0436	3,400	0,040	0,4020	-2,0000	-0,002%
100	0,202	1000	0,202	0,0236	3,300	0,020	0,2030	-1,0000	-0,001%
100	0,101	1000	0,101	0,0135	3,500	0,010	0,1000	0,5000	0,001%
100	0,0801	1000	0,080	0,0115	3,400	0,008	0,0810	-0,9000	-0,001%
100	0,0605	1000	0,060	0,0096	3,500	0,006	0,0610	-0,5000	-0,001%
100	0,0404	1000	0,040	0,0077	3,600	0,004	0,0410	-0,6000	-0,001%
100	0,0200	1000	0,020	0,0056	3,600	0,002	0,0200	0,0000	0,000%



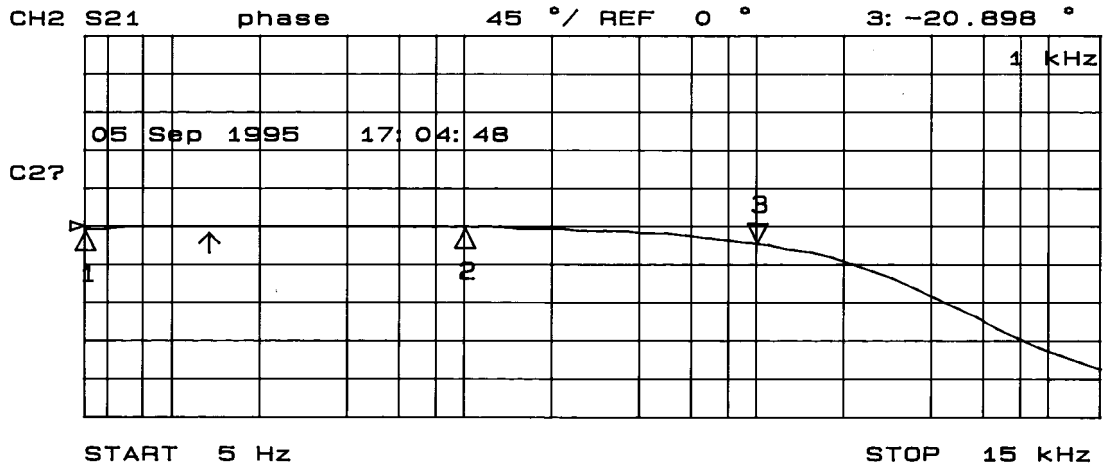
Output voltage vs. input current

Unit tested: IPCT-10T, serial #021, Range selected: 100 mA ÷ 10 V
Date: 5 september 1995
Test instrument: HP 8751A Baseband network analyzer
Stimulus signal +10 dBm thru HP 87512A Transmission/Reflexion test set. Attenuation -10dB, termination in 50Ω.
Signal from IPCT-10T into Network analyzer thru an series 1kΩ resistor (for input protection, negligible effect on measurement)



N	STIMULUS	val
1	5 Hz	-20.696 dB
2	100 Hz	-20.475 dB
3	1 kHz	-20.504 dB

Phase shift vs. frequency

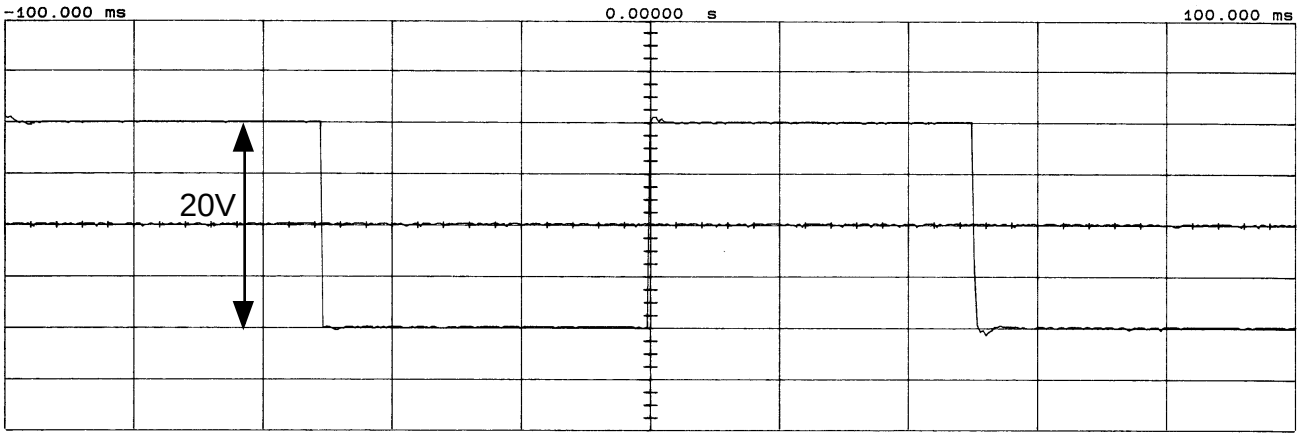


N	STIMULUS	val
1	5 Hz	-1.5016 °
2	100 Hz	-912.93 m°
3	1 kHz	-20.898 °

Noise and residual modulator ripple in the IPCT-10T output signal

Unit tested: IPCT-10T, serial #056, Range selected: 10 mA ÷ 10 V
Date: March 7, 1996
Test instruments: Function generator Philips PM 5132
Ouput signal into a 50Ω calibrated resistor
Oscilloscope HP 54503A with HP plotter
Current passing thru the IPCT sensor is adjusted to about. ±10mA

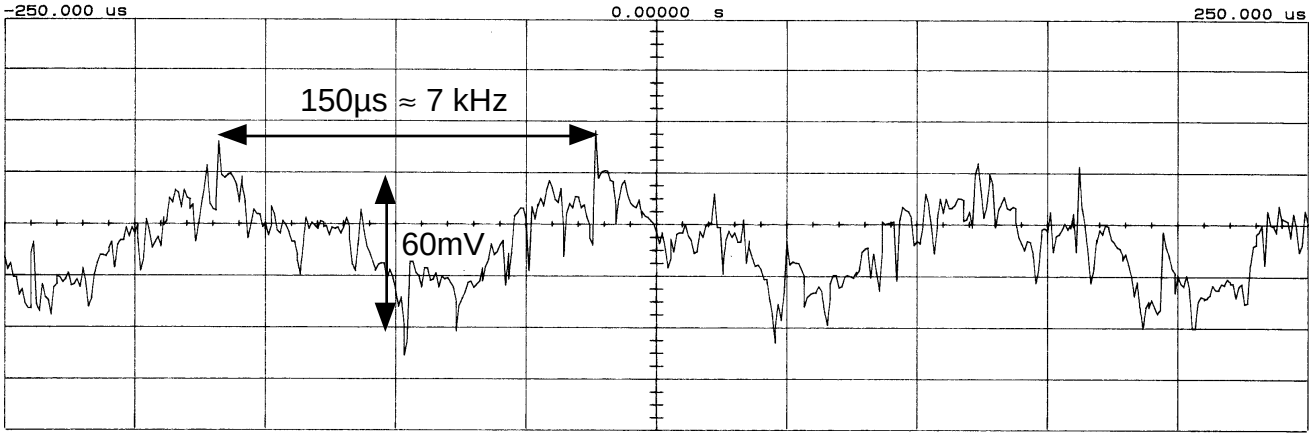
Plot of the IPCT-10T full swing signal: square wave +10mA…–10mA



	Timebase	Delay/Pos	Reference	
Main	20.0 ms/div	0.00000 s	Center	
	Sensitivity	Offset	Probe	Coupling
Channel 1	5.00 V/div	0.00000 V	1.000 : 1	dc (1M ohm)
Channel 2	5.00 V/div	0.00000 V	1.000 : 1	dc (1M ohm)

Trigger mode : Edge
On Positive Edge Of Chan2
Trigger Level
Chan2 = 0.00000 V (noise reject ON)
Holdoff = 40.000 ns

Zero noise magnification: IPCT-10T in ±10mA range



	Timebase	Delay/Pos	Reference	
Main	50.0 us/div	0.00000 s	Center	
	Sensitivity	Offset	Probe	Coupling
Channel 2	20.0 mV/div	-80.000 mV	1.000 : 1	dc (1M ohm)

Trigger mode : Edge
On Positive Edge Of Chan2
Trigger Level
Chan2 = -50.400 mV (noise reject OFF)
Holdoff = 40.000 ns

In range ±10mA ÷ ±10V:

Noise ≈ 20 mV rms in ±10V FS
Rms noise ≈ 0.2 % FS