

**Bath Temperature  
Cathode Voltage Drop**



**C-V-Therm™**

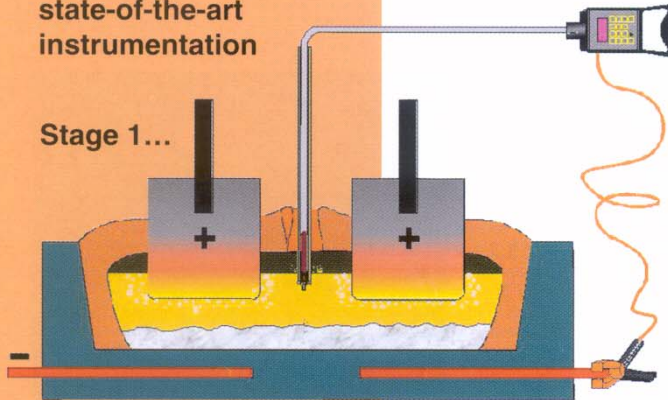


**Combined Sensor  
For Primary Aluminium**

# C-V-Therm

## Benefits

- ✓ Quick and easy shop floor test
- ✓ Accurate, reproducible bath temperature & Cathode Voltage Drop
  - Temperature pre-calibrated  $\pm 0.5^{\circ}\text{C}$  at gold melting point ( $1064^{\circ}\text{C}$ )
  - CVD reproducibility normally  $\pm 2.5\text{mV}$
- ✓ Reduced CVD labour costs
- ✓ Dedicated state-of-the-art instrumentation



Temperature

## Introduction...

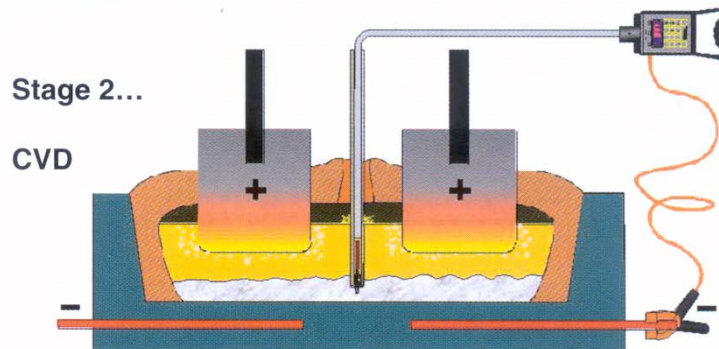
The measurement of the cathode lining voltage drop (CVD) is a well-established method of monitoring cathode condition in many aluminium smelters. Current methods include the use of an iron rod strategically placed in the cell to measure voltage drop. The use of an iron rod is generally regarded as cumbersome, labour intensive and often gives poor accuracy and reliability of measurement.

Heraeus Electro-Nite, the market leader in molten media sensor technology, has developed a quick, easy and reliable method of measuring cryolite bath temperature and cathode lining voltage drop in a single combined sensor.

## Measuring Technique...

Based upon the well-established Positherm<sup>®</sup>-Al technology, the C-V-Therm\* consists of a Positherm<sup>®</sup>-Al temperature sensor with a thin molybdenum wire attached, to provide a bath contact with the Al metal pad. Dedicated measuring and display instrumentation, Digilance C-V-Therm, includes data storage and infra-red transfer capabilities. The electrical circuit through the cathode lining is completed by a cable connection from the measuring instrument to the cell busbar.

The measuring technique is a simple 2-stage process, completed in about 15 seconds. In the first stage a sensor is connected to the Digilance C-V-Therm and immersed into the cryolite bath. The bath temperature is determined after about 12 seconds via visual and audible signals. The second stage of the measurement cycle consists of immersing the sensor into the metal pad for a further 3 seconds to determine voltage drop across the cathode lining. Bath temperature, pot number and cathode voltage drop are sequentially displayed on the instrument.



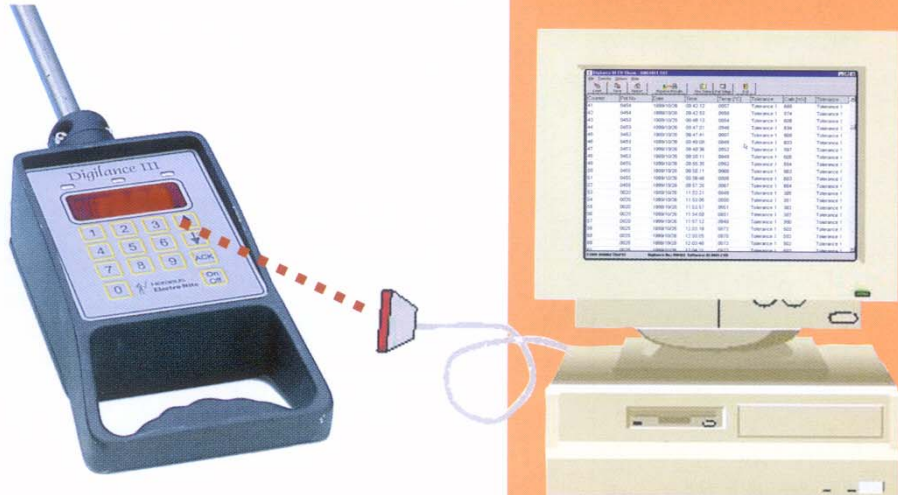
\* Patent Pending



## Instrument Features...

Digilance C-V-Therm is a hand held, battery operated, temperature and CVD measuring device for use with C-V-Therm and Positherm®-Al sensors in primary aluminium reduction cells. Temperature and CVD measurements are logged together with a pot number, date and time of dip. Up to 500 measurements can be stored in the instrument memory.

Digilance C-V-Therm comes equipped with a serial infrared interface and PC software package, to enable data to be rapidly and reliably transferred from the instrument to a PC, with little or no risk of human errors. The software program also provides access to reviewing and modifying measurement parameters set in the Digilance C-V-Therm. Housed in a robust aluminium case, the precision electronics are protected from the most demanding and adverse environmental conditions encountered in the molten metals industry.



## Digilance C-V-Therm

### Applications

- Indication of cathode condition and performance
- Assists optimisation of cell voltage
- Highlights cathode lining abnormalities such as sludge build up
- Comparison of different cathode types, suppliers etc.

Counter	Pot No.	Date	Time	Temp [°C]	Tolerance	Cath. [mV]	Tolerance
188	9999	2000/02/10	12:06:10	0950	Tolerance 1	200	Tolerance 1
189	0114	2000/02/10	13:31:51	0939	Tolerance 1	511	Tolerance 1
190	0113	2000/02/10	13:34:15	0931	Tolerance 1	517	Tolerance 1
191	0112	2000/02/10	13:35:46	0955	Tolerance 1	555	Tolerance 1
192	0111	2000/02/10	13:37:01	0960	Tolerance 1	483	Tolerance 1
193	0110	2000/02/10	13:38:38	0935	Tolerance 1	523	Tolerance 1
194	0109	2000/02/10	13:41:46	0940	Tolerance 1	435	Tolerance 1
195	0108	2000/02/10	13:42:50	0995	Tolerance 1	510	Tolerance 1
196	0107	2000/02/10	13:44:09	0926	Tolerance 1	452	Tolerance 1
197	0106	2000/02/10	13:45:18	0939	Tolerance 1	548	Tolerance 1
198	0105	2000/02/10	13:46:39	0933	Tolerance 1	457	Tolerance 1
199	0104	2000/02/10	13:49:36	0963	Tolerance 1	448	Tolerance 1
200	0103	2000/02/10	13:50:40	0944	Tolerance 1	476	Tolerance 1
201	0102	2000/02/10	13:52:01	0931	Tolerance 1	455	Tolerance 1
202	0101	2000/02/10	13:53:10	0923	Tolerance 1	477	Tolerance 1
203	0301	2000/02/10	14:00:59	0938	Tolerance 1	456	Tolerance 1
204	0302	2000/02/10	14:02:52	0936	Tolerance 1	457	Tolerance 1
205	0303	2000/02/10	14:04:17	0953	Tolerance 1	544	Tolerance 1
206	0304	2000/02/10	14:05:40	0964	Tolerance 1	522	Tolerance 1
207	0305	2000/02/10	14:06:46	0964	Tolerance 1	464	Tolerance 1
208	0306	2000/02/10	14:10:44	0981	Tolerance 1	472	Tolerance 1

COM2 9508Bd 7DeP1S      Digilance No.: 990422      Software: 02.0101 CVD

Typical display of C-V-Therm data downloaded to a PC

## C-V-Therm

### ORDERING INFORMATION :

• **C-V-Therm Sensor – 700mm (50 pcs/box) AV 101307**

• **Digilance C-V-Therm AI 38100600**

• **2.4 m Lance 90° Bend AL 10500000**

• **2.4 m Lance 45° Bend AL 10500001**

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