ANALOG SERVICES, INC.
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Codatron HT™*

High Voltage Regulators

General Description - Codatron HT (formerly called theTitanTwo) high voltage shunt regulators are designed to give superior regulation over rapid temperature changes, and are for use in high temperature environments. The regulation of the Codatron HT over rapid temperature changes is superior to any other currently manufactured high voltage regulator. The Codatron HT regulator acts like a high voltage zener, but with low noise and a low temperature coefficient (TC). The regulated voltages offered include those available for the original, now discontinued, Victoreen Corotron, and many more. The Codatron HT regulator has been optimized to operate at approximately 60 microamps, the current favored by many well logging tool technicians, but functions well over a wide range of currents up to a maximum current rating of 500 microamps. A much higher pulse or transient current rating is allowed due to the unique electrical characteristics of the Codatron HT. A small positive temperature coefficient has been included in the design to partly compensate downhole logging detector temperature response characteristics. The Codatron HT was designed for high temperature downhole well logging tools, but can be used as a direct replacement for the Victoreen Corotron in most applications. Shunt capacitors may be used, since the Codatron HT has a positive resistance characteristic at all operating currents. The Codatron HT is the high temperature member of the Codatron family, a different design than the original Codatron, and with extended temperature capability.

- **Available in standard Victoreen Corotron voltages (custom voltages also)**
- ***Standard* model specifications good from -55°C (-67°F) to +177°C (350°F)**
- ***Grade "A"* model specifications good from -75°C (-103°F) to +204°C (400°F)**
- **Nominal voltage rating specified at 100°C (212°F)**
- **Operating current range: 20μA to 200μA, -75°C (-103°F) to +204°C (400°F)**
- **Minimum shunt current for regulation: 2μA, 0°C (32°F) to 75°C (167°F)**
- **Maximum shunt current: 500μA, -75°C (-103°F) to +177°C (350°F)**
- **Suggested operating current: 60μA**
- **Excellent peak current rating**
- **Stable at all operating currents by design**
- **Precision tolerance**
- **Excellent voltage regulation from 20μA to 500μA**
- **Low noise generation and no self-oscillation**
- **Slight positive temperature coefficient added for downhole detector compensation**
- **Available in a selectable dual voltage version**

Well Logging & Wireline Related Services

Society of Petrophysicists & Well Log Analysts (SPWLA), Mineral & Geotechnical Logging Society (MGLS), Society of Petroleum Engineers (SPE), Health Physics Society (HPS), Kentucky Oil & Gas Association (KOGA), International Society of Explosives Engineers (ISEE), and Association of Energy Service Companies (AESC)

FEIN: 61-1258888 Kentucky Sales Tax: 196584 DUNS: 15-982-7740 CAGE/NCAGE: 37HD2 USDOT: 625045
BATF Explosives Manufacturers License: 4-KY-091-20-5H-12220 Kentucky Permit: 06112405 Blasters License: 99372
Kentucky NRC Agreement State Radioactive Materials License: 201-456-41

ORDERING GUIDE

Model[1,2,3]	Voltage[4]	Part Number
Codatron HT	100 Volts	Codatron HT - 100
Codatron HT	In 50 Volt Steps To	Codatron HT - xxxx
Codatron HT	1250 Volts	Codatron HT - 1250
Codatron HT[2]	1300 Volts	Codatron HT - 1300
Codatron HT[2]	In 50 Volt Steps To	Codatron HT - xxxx
Codatron HT[2]	2500 Volts	Codatron HT - 2500
Codatron HT[2,3]	2550 Volts	Codatron HT - 2550
Codatron HT[2,3]	In 50 Volt Steps To	Codatron HT - xxxx
Codatron HT[2,3]	3750 Volts	Codatron HT - 3750
Codatron HT Dual[5]	Selectable Dual Voltages	Codatron HT - xxxx / xxxx

Notes:

1. Specify ***Standard*** to 177°C (350°F), or ***Grade "A"*** to 204°C (400°F).
2. A surcharge applies to models over 1250 volts.
3. An additional surcharge applies to models over 2500 volts.
4. Custom voltages available on special order.
5. Selectable dual voltage models available on special order. A surcharge applies in addition to any voltage surcharges noted above. Two close voltages can be selected for tuning nuclear detector response, or more removed voltages can be selected making it possible to stock one regulator to repair two-detector well logging tools (the 1050 volt / 1250 volt version is ideal for many gamma-ray / neutron tools).

ELECTRICAL CHARACTERISTICS

Standard Models

Parameter[5]	Conditions[1]	Min	Typ	Max	Units
Temperature Range	***Standard*** Models	-55/-67		177/350	°C/°F
Operating Current Range	-55°C to +177°C (350°F)	20	60	500	μA
Minimum Shunt Current	0°C (32°F) to 75°C (167°F)		2		μA
Maximum Shunt Current	-55°C to +177°C (350°F)		500		μA
Suggested Current			60		μA
Peak Current	PW<300μSec, <0.1% Duty	0		+30	mA
Voltage Rating[2]	60μA, 100°C (212°F)		0.5	1	%
Temperature Coefficient	60μA, 20°C to 177°C (350°F)		3		%
Tolerance[2]	60μA, 100°C (212°F)		0.5	1	%
Voltage Regulation[3]	At Constant Temperature		1.6	2	%
Voltage Regulation[4]	Over Temperature Range		4.3	5	%

Notes:
1. Ta = -55°C (-67°F) to +177°C (350°F), unless otherwise specified.
2. Voltage is specified at 100°C (212°F), not at 25°C (77°F).
3. From 20μA to 500μA at constant temperature.
4. From 25°C (77°F) at 20μA to 177°C (350°F) at 500μA (absolute worst case scenario).
5. Specifications are preliminary and subject to change.

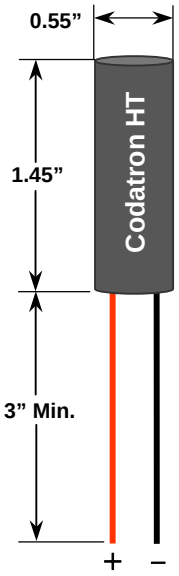
ELECTRICAL CHARACTERISTICS

Grade "A" Models

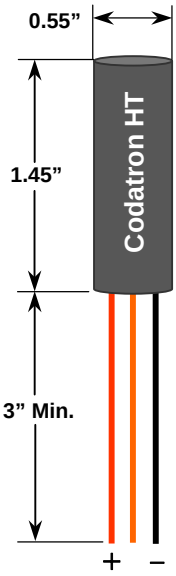
Parameter[6]	Conditions[1]	Min	Typ	Max	Units
Temperature Range	***Grade "A"*** Models	-75/-103		204/400	°C/°F
Operating Current Range	-75°C to +204°C (400°F)	20	60	200	μA
Minimum Shunt Current	0°C (32°F) to 75°C (167°F)		2		μA
Maximum Shunt Current[2]	-75°C to +177°C (350°F)		500		μA
Suggested Current			60		μA
Peak Current	PW<300μSec, <0.1% Duty	0		+30	mA
Voltage Rating[3]	60μA, 100°C (212°F)		0.5	1	%
Temperature Coefficient	60μA, 20°C to 204°C (400°F)		3		%
Tolerance[3]	60μA, 100°C (212°F)		0.5	1	%
Voltage Regulation[4]	At Constant Temperature		2.0	2.5	%
Voltage Regulation[5]	Over Temperature Range		5.2	7	%

Notes:
1. Ta = -75°C (-103°F) to +204°C (400°F) for grade "A" models, unless otherwise specified.
2. From -75°C (-103°F) to +177°C (250°F); derate to 200μA above 177°C (350°F).
3. Voltage is specified at 100°C (212°F), not at 25°C (77°F).
4. From 20μA to 200μA at constant temperature.
5. From 25°C (77°F) at 20μA to 204°C (400°F) at 200μA (absolute worst case scenario).
6. Specifications are preliminary and subject to change.

PACKAGING INFORMATION



Single Voltage



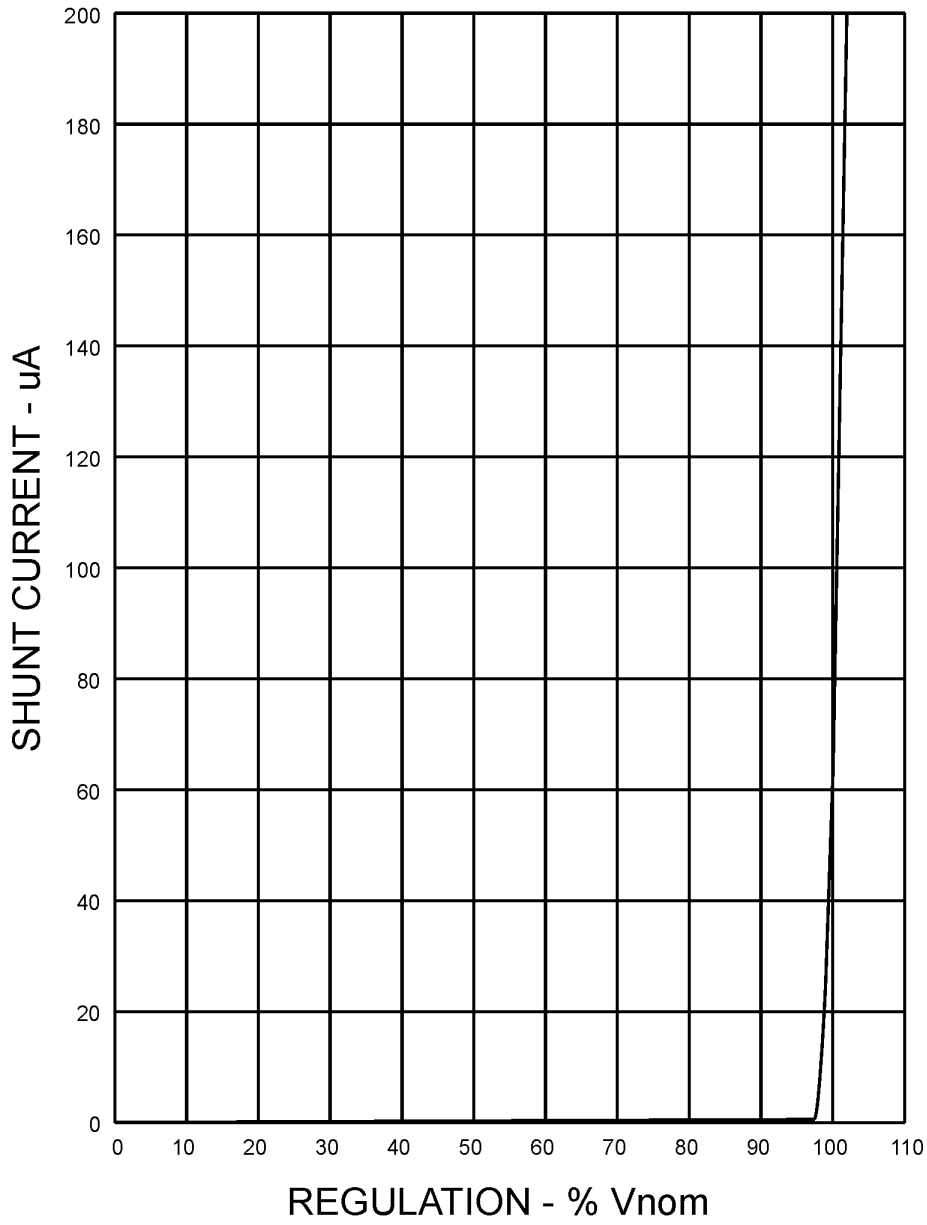
Dual Voltage[4]

Depth Dimension:
Up to 1250 volt models 0.24”.
1300-2500 volt models 0.36”.
2550-3750 volt models 0.48”.

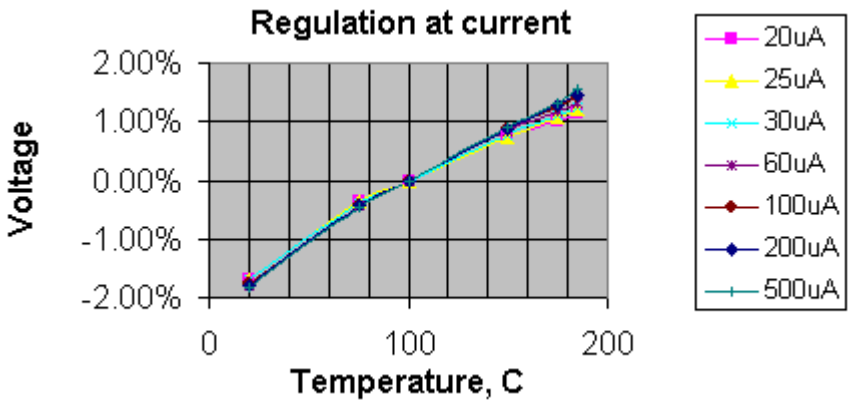
Notes:

1. 24 gauge stranded EE grade Teflon insulated leads (colors may vary).
2. Ends stripped and tinned with lead-free high temp. solder on special order.
3. Custom lead lengths available on special order.
4. Dual voltage models may have a third lead or a looped wire jumper.
5. Viton shrink tubing with Kapton film over-wrap standard packaging.

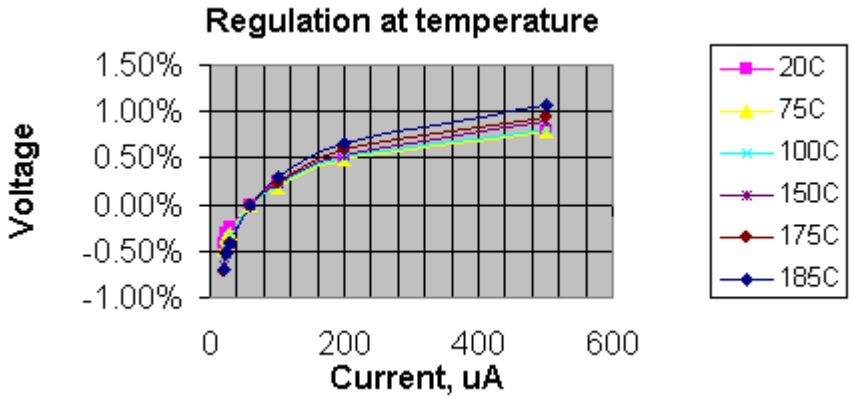
TYPICAL CURRENT AS A FUNCTION OF VOLTAGE



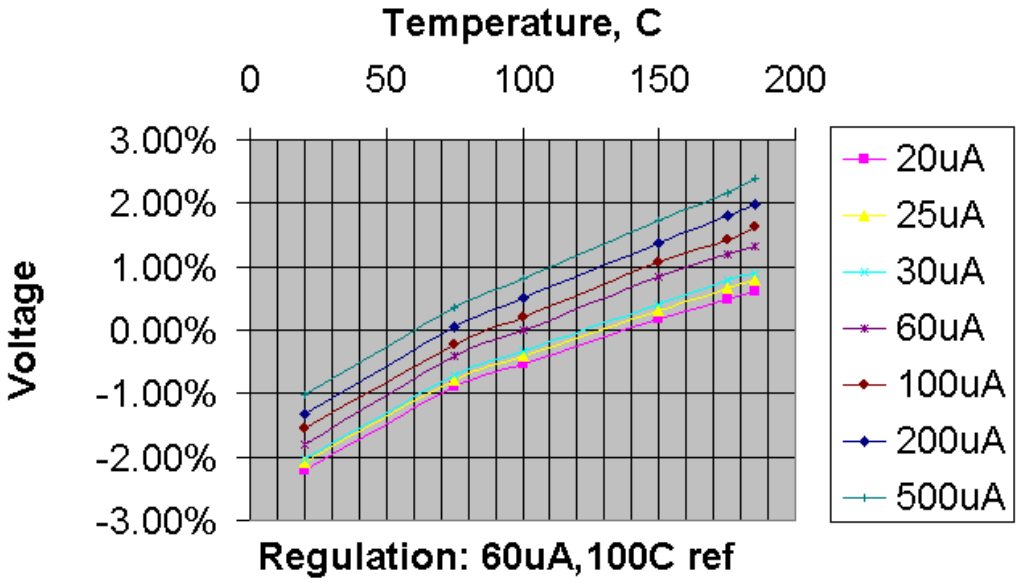
TYPICAL PERFORMANCE CURVES



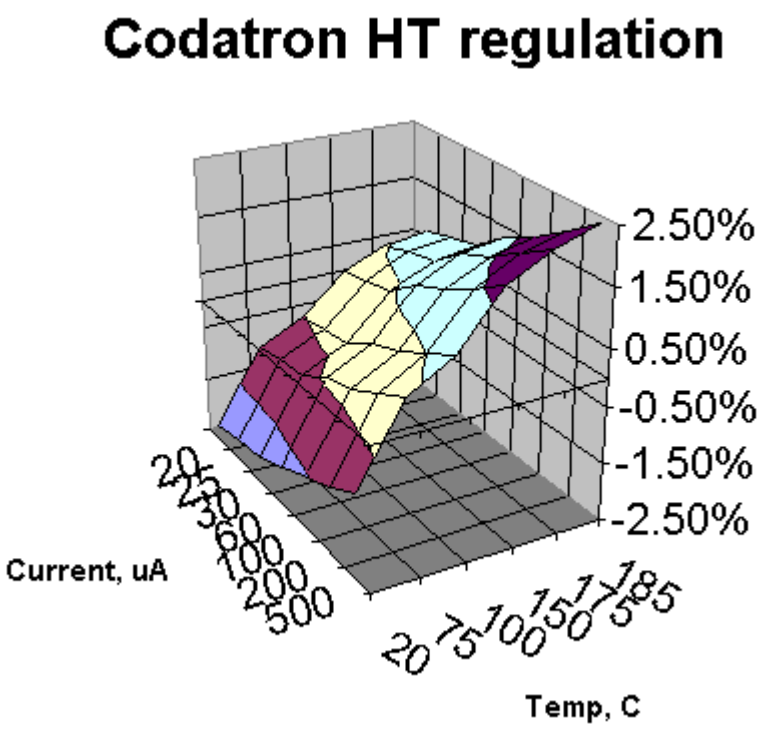
Note: Voltage seen at 100C used as reference.



Note: Voltage seen at 60uA used as reference.



Note: Voltage seen at 60uA and 100C is used as reference.



Note: Voltage seen at 60uA and 100C is used as reference.

*Formerly called the TitanTwo.