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Features

- Ranges from -45°C to 650°C
- Rapid heating, cooling and settling
- Reads set temperature and device output simultaneously
- Measures reference probe, RTDs, T/Cs, mA, mV and ohms
- Ramp, step and preset functions
- Automatic switch test

DBC 150/650 Series

Druck Dry Block Temperature Calibrators

DBC 150/650 Series is a Druck product. Druck has joined other GE high-technology sensing businesses under a new name—GE Sensing.

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Setting The Standard For Dry Block Calibrators
GE Druck, a leading manufacturer of portable and workshop calibrators, has redefined the term "temperature calibrator" with the introduction of the DBC series. This innovative calibrator combines a highly stable temperature source with precision measurement of temperature probe signals, providing a truly stand-alone temperature calibrator suitable for laboratory, workshop and portable use.

The product range includes Temperature Source (TS) and Temperature Calibrator (TC) versions. Each version is available with a choice of two temperature ranges for use up to 150°C (DBC 150) or alternatively 650°C (DBC 650).

GE Druck control technology ensures rapid settling time, excellent set-point stability and high accuracy. For improved measurement uncertainty, a traceable PT 100 reference probe can be positioned directly into the well insert. The probe output is measured and displayed by the DBC.

The TC version is a complete calibration system which simultaneously controls the applied temperature while measuring the device under test. In addition, loop power is provided for transmitters. In calibration mode the percentage error or temperature deviation is displayed together with the input and output readings.

DBC Series - Key Features
- Ranges: DBC 150: -45°C (below ambient) to 150°C.
  DBC 650: 50°C (25°C above ambient) to 650°C.
- Fast response: Rapid heating, cooling and settling.
- Stability: Druck control technology provides excellent temperature stability.
- Reference probe: PT 100 reference probe input.
- RS 232 interface: Allows fully automated PC control.
- Switch test: Open/closed detection with hysteresis displayed.
- Ramp, preset, step: Programmable Ramp, Preset recall and calibration Step sequences.
- Reduction Inserts: A wide range of standard interchangeable inserts are available.
- Easy to use: Full numeric keypad and input/output menu.

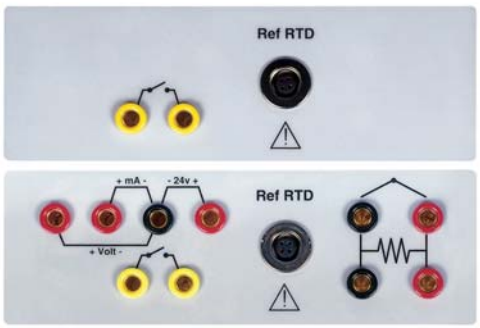
TC Version - Additional Features
The calibrator version includes the following features in addition to those listed above:
- Electrical Inputs: Measures RTDs, T/Cs, mV/V, mA and ohms.
- Dual Readout: Simultaneous reading of source temperature and device output.
- Error Analysis: Percentage error and deviation calculations.
- Loop Power: 24 VDC supply.

The DBC series is rugged, easy to use and designed to give years of reliable service. Stand alone operation eliminates the need for secondary equipment, making the DBC one of the most cost effective temperature calibration systems available.

Applications

Multifunction Dryblock Calibrators
The DBC Series is comprised of two models, the DBC TS Temperature Source and the stand alone DBC TC Temperature Calibrator. They are designed for calibrating and maintaining temperature elements, probes, transmitters and thermostats. The two models share the same temperature control technology and differ only in electrical measurement capabilities.

DBC TS Temperature Source
The DBC TS temperature source uses an internal high accuracy sensor to ensure maximum control stability. For direct measurement of the insert temperature, a PT 100 electrical input is provided and traceable reference probes are available. A switch detection input is supported with a fully automatic switch test facility.



DBC TC Temperature Calibrator
The DBC TC temperature calibrator adds electrical measurement capabilities for RTDs, thermocouples, mA, mV/V and ohms. 24V loop power is also provided. The dual parameter display is quickly configured from the input/output menu to read the reference temperature, the device output and the error. This is a self-contained temperature calibration system for stand-alone operation.

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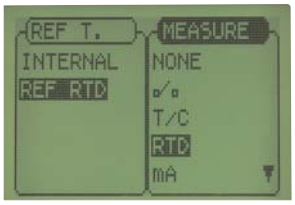
Calibrating RTD Sensors and Thermocouple Sensors

With conventional dryblock calibrators, ancillary indicators are usually required to measure sensor outputs. The DBC TC temperature calibrator can measure five types of RTDs and 11 types of thermocouples. It supports two, three, and four wire RTD configurations and provides automatic cold junction compensation for thermocouples.

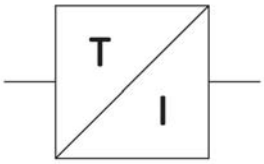
Preset temperatures can be programmed to standard test points for quick recall when required.



Calibrating Temperature Transmitters

Many temperature transmitters are supplied complete with the sensing element and it is common practice to calibrate the complete device.

The DBC TC temperature calibrator measures the transmitter output, powers the loop and calculates the error.

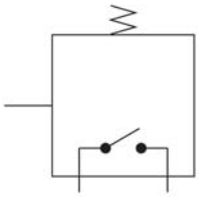


The Step function quickly divides specific transmitter ranges into temperature calibration points.

Testing Switches

Temperature switches, although simple devices, are difficult to maintain and conventional test methods often yield inaccurate results.

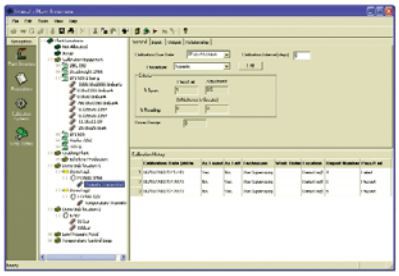
To save time and provide highly accurate results for compliance with quality systems, the DBC ramps through the switching points, captures the temperatures and displays the hysteresis value.



ISO 9000 Compliant Calibration Software

Intecal Advanced software substantially reduces the time to calibrate temperature sensors and virtually all process instrumentation. Reducing calibration time reduces maintenance costs, but Intecal also reduces the burden of quality system compliance by eliminating human error and printing clear traceable certificates.

Calibration procedures and schedules are defined in an instrument database. Results from the DBC can be manually entered into the database for analysis and printing certificates.



Inserts

Three pre-drilled inserts are available to accommodate a wide variety of industrial probes. By selecting the most closely fitting insert for the reference probe and probe under test the uncertainties of measurement can be kept to a minimum.

Careful design of the insert ensures temperature uniformity across the diameter and by positioning a reference probe to the same depth as the probe under test, measurement uncertainties can be further reduced.

Blank inserts are also available for customization.

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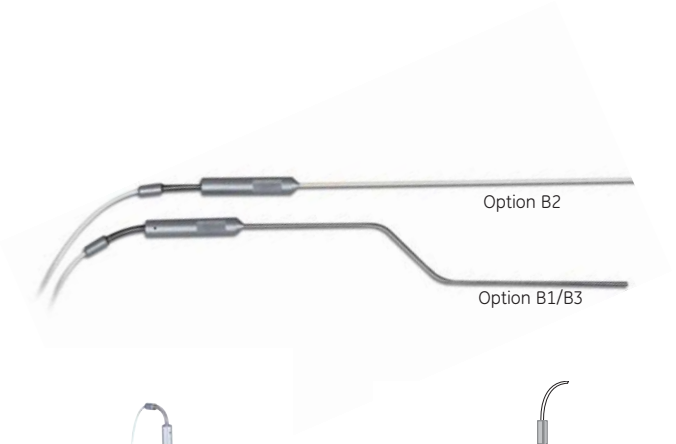
Reference Probes

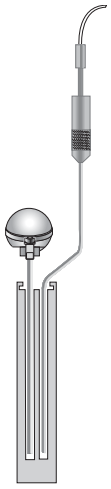
The DBCs internal control sensor provides a highly stable temperature source, but reduced uncertainties are achieved by using a reference probe inserted in the same relative position as the device under test. This method reduces the errors due to the insertion depth of the device under test.

The DBC includes a reference probe input as standard, eliminating the need to purchase and use a separate reference instrument.

Three optional reference probes are available. Option B1 is suitable for use up to 400°C and is angled to provide transmitter head clearance. Option B2 is a straight sheathed probe suitable for use to 650°C. Option B3 is also suitable for use up to 650°C and is angled to provide transmitter head clearance.

Alternatively, a preferred PT 100 probe can be connected using the plug provided and the DBC can be programmed with the probes correction coefficients.





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DBC Specifications

General

DBC 150 TS and DBC 150 TC	
Range	-45 (below ambient) to 150°C (over 18°C to 50°C ambient only)
Stability	0.03°C
Resolution	0.01°C
Radial Uniformity	0.15°C (assumes measuring elements are at the same height and standard insert is used)
Heating Time*	14 minutes from 20°C to 120°C
Cooling Time*	22 minutes from 25°C to -20°C

DBC 650 TS and DBC 650 TC	
Range	50° to 650°C (Ambient +25° to 650°C)
Stability	0.05°C (0.15°C between 50°C to 70°C)
Resolution	0.01°C
Radial Uniformity	0.25°C (assumes measuring elements are at the same height and standard insert is used)
Heating Time*	22 minutes from 25°C to 650°C
Cooling Time*	27 minutes from 60°C to 100°C (with optional cooling probe)

** Time to display ready indication. Insert temperature may lag depending on loading and ambient conditions.*

Additional Specifications - TC Versions Only

Input	Range	Resolution	Accuracy Initial	Accuracy (1 year)
RTD				
Pt 100	-99°C to 750°C	0.01°C	0.04°C	0.15°C
Pt 200, Pt 500	-99°C to 750°C	0.1°C	0.1°C	0.3°C
Pt 1000	-99°C to 550°C	0.1°C	0.1°C	0.3°C
Ni 100	-60°C to 250°C	0.01°C	0.05°C	0.15°C
Thermocouple				
T/C K, J, N, E	-99°C to 990°C	0.1°C	0.1°C	0.3°C
T/C S, R	-50°C to 100°C	0.1°C	0.3°C	1°C
	100°C to 990°C	0.1°C	0.2°C	0.6°C
T/C B	200°C to 500°C	0.1°C	0.8°C	2.5°C
	500°C to 990°C	0.1°C	0.5°C	1.5°C
T/C C	0°C to 990°C	0.1°C	0.2°C	0.6°C
T/C T	-99°C to 400°C	0.1°C	0.1°C	0.3°C
T/C L	-99°C to 800°C	0.1°C	0.1°C	0.3°C
	800°C to 900°C	0.1°C	0.3°C	0.9°C
T/C U	-99°C to -50°C	0.1°C	0.2°C	0.6°C
	-50°C to 0°C	0.1°C	0.1°C	0.3°C
	0°C to 500°C	0.1°C	0.1°C	0.3°C
	500°C to 600°C	0.1°C	0.3°C	0.9°C
Electrical				
Voltage	0 to 12V	0.001V	0.01 + 0.01	0.03 + 0.03
	0 to 79.2mV	0.001mV	0.003 + 0.002	0.01 + 0.006
Current	0 to 24mA	0.001mA	0.005 + 0.005	0.015 + 0.015
Ohms	0 to 400Ω	0.01Ω	0.003 + 0.003	0.01 + 0.01
Loop Supply	24V			

1. T/C and RTD accuracies include electrical and conversion table uncertainty.
2. T/C total accuracy not including CJ compensation.
3. RTD total accuracy measured at 0.2mA excitation.
4. Electrical accuracies are defined as %reading and % Full Scale.

Reference Probes

Parameter	Option B1	Option B2	Option B3
Range	-50°C to 400°C	-50°C to 650°C	-50°C to 650°C
Probe Type	Pt 100 (EN 60751)	Pt 100 (EN 60751)	Pt 100 (EN 60751)
Length	400 mm	400 mm	350 mm
Measuring Length	Tip to 30 mm	Tip to 30 mm	Tip to 30 mm
Diameter	4.75 mm	4.75 mm	4.75 mm
Accuracy*	0.24°C	0.3°C	0.3°C
1 Yr Accuracy	0.16°C	0.2°C	0.2°C
Sheath	Stainless Steel	Stainless Steel	Stainless Steel
Cable	3 ft. low loss cable terminated in 4 pin connector to suit DBC		

*Accuracy of DBC displayed value including probe errors but excluding long term stability.

Well Inserts

	Inserts	Hole Diameters
DBC 150*	DBC 650*	3/16, 1/4, 3/8 in (5, 6.6, 9.8 mm)
Option C1	Option C2	3/16, 1/2 in (5, 13 mm)
Option C3	Option C4	1/8, 3/16, 3/16, 5/16 (3.4, 5, 5, 8.2 mm)
Option C5	Option C6	Blank

** Supplied as standard.*
DBC 150 insert material: aluminum. DBC 650 insert material: bronze.

Standard Features

Display
2.4 x 1.6 in (60 x 40 mm) graphic LCD with backlight .

Keypad
21 keys including full numeric keypad and special function keys for Step, Ramp, Preset Recall and Switch Test. Key tone on/off.

User interface
Easy to use input/output menu.

Language
Selectable languages English, French, German, Italian, Portuguese and Spanish.

Units
°C, °F and °K

Reference probe input
Pt 100 input. 4 wire mating connector supplied. User programmable probe CVD coefficients. Refer to RTD Pt 100 Specifications.

Switch test
Continuity check with buzzer. Captures open/closed temperatures and records hysteresis.

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DBC Specifications

Percentage steps
20, 25, 33 and 50% divisions of user entered span. Up/down arrows activate.

Temperature steps
Programmable temperature steps. Up/down arrows activate.

Ramp
Programmable ramp rate (0.1° to 10°C/min) and end points.

Presets
Five programmable preset temperatures for instant recall using #1 to #5 keys.

RS 232 interface
Bi-directional RS 232 interface for on-line PC control.

Well dimensions
1.2 x 6.3 in (30 x 160 mm), maximum insertion depth 6.1 in (155 mm)

Reference standards
- EN 60584-1: 1997-10 (thermocouples)
- EN 60751-1: 1998-05 (Pt 100)

Power Supply
Switch selectable 85 to 125/200 to 265 VAC 50/60 Hz.

Environmental

Calibration reference
22ºC (72°F)

Operating temperature
DBC 150: 18 to 50°C
DBC 650: 10 to 50°C
Specifications quoted include temperature errors from 18°C to 28°C (60°F to 86°F).

Conformity
EN 61010-1
EN 50081-1
EN 50082-1
CE marked.

Physical
21 lbs, 12.7 x 6.1 x 12.9 in (9.5 kg, 322 x 156 x 328 mm)

Options

(A) Intecal calibration database software
Intecal Windows based software supports both portable field calibrators and online workshop calibrators. Manual data entry is also a key feature for recording data. Intecal is an easy to learn and easy to use calibration management software for process plants, workshops, contractors, manufacturers and service companies. It increases the productivity of calibration scheduling, calibration work and documentation tasks. Device information, calibration procedures and calibration results are stored in an instrument database and multiple databases can be created for organising client accounts, processes or areas. Extensive management features are provided including a database search engine, time based calibration due queries and standard reports.

(B) Reference probes (refer to specification page for option code)
Pt 100 reference probes for directly measuring the insert temperature. Each probe is provided with a traceable calibration certificate. The high accuracy options (B1 and B2) are supplied in a protective case. Option (B3) is a low cost probe for applications where accuracy is less critical. The probes connect directly to the DBC Pt 100 reference input.

(C) Well inserts (refer to specification page for option code)
Three optional inserts are available to suit different applications and test devices. The “C5” and “C6” type inserts are blank for user customization.

(D) Fast cooling probe
This 9/64 in (3.4 mm) diameter cooling probe fits any insert and allows air to be blown through the block to speed cooling.

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DBC Specifications

(E) Transit case
An aluminium case designed to offer maximum protection to the DBC during transportation. This case has a carrying handle and is secured by two lockable safety catches. Case dimensions : 18.3 x 13.8 x 5.7 in weight 9.5 lbs (465 x 350 x 145 mm, weight 4.3 kg)

Accessories

Each DBC is supplied with a power cord, test leads, standard well insert, insert extraction tool, user guide RS232 lead and traceable certificate of calibration.

Calibration Standards

Instruments manufactured by Druck are calibrated against precision calibration equipment traceable to International Standards.

Related Products

Portable Field Calibrators
GE Druck manufacture a wide range of portable pressure, temperature and electrical field calibrators.
A selection of these are shown below.

Laboratory And Workshop Instruments
Druck also manufacture a comprehensive range of pressure indicators and controllers. Included are Pressurements industrial deadweight testers and Ruska high precision controllers and primary standard piston gauges.

Multifunction Temperature Calibrators
The MCX II and TRX II are portable documenting calibrators for calibrating and maintaining instrumentation and process control loops; the ideal complement to the DBC series.

Pressure Transducers And Transmitters
GE Druck manufacture a wide range of pressure transducers and transmitters including HART/Smart devices. Please refer to GE Druck for further information.

Ordering Information

Please state the following (where applicable):
1. Full DBC type number e.g. DBC 650 TC.
2. Options. if required, option (A) should be ordered as a separate item.

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