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Chicago Pneumatic™

Desoutter™

GEORGES RENAULT™

Measuring unit
Delta 4000/5000
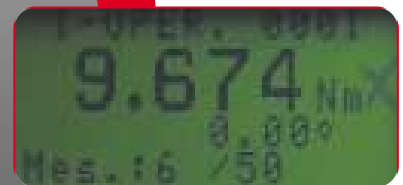
Delta 4000/5000

EASY-TO-USE AND VERSATILE

The **DELTA** is an easy-to-use, versatile system which allows the measurement of torque values with model **"4000"** or torque and angle values with model **"5000"**.

The parameters and features of all the transducers in the range are stored in the DELTA which are automatically set when selecting the type of transducer:
- Rotary transducers, CMD4000 type
- Static transducers, ST4000 type
- Hand wrenches, CD or CF type
- Torque & angle, CMD5000 type rotary transducers (with DELTA5000)

Its **memory** contains up to 5 000 results.
Lightweight and self-contained, the DELTA can operate for 14 hours without charge or a change of batteries. In addition, there is an easily interchangeable battery block option which doubles this operating time. The data autosave function allows you to perform this operation without the loss of results.

Communication The **DELTA** offers the option to connect various parallel printers. It is fitted with a RS232C serial type **PC port**.

DESIGNED FOR YOUR QUALITY PROCEDURE

Checking operation
Sequence of checking operations throughout the assembly line to verify that the tooling is operating to specified torques.
Each operation setting includes all requisite parameters for its performance (type of transducer used – number of required readings – specified torque - tolerances – etc…).

Manual sequencing:
Manual selection of the operation corresponding to the tool being verified.
### Automatic sequencing:

The selection of the various operations can also be carried out automatically, saving the operator the additional time to manually select the operation.

Number of operations:
You can program up to 1000 operations. Each operation can include 4 to 5 000 reading results depending on the number of operations stored.

DELTAPC SOFTWARE

The **DELTAPC** software allows you to save, control, modify and select all the checking operations, to define customised quality procedures. Each procedure can then be performed after being downloaded to the DELTA.
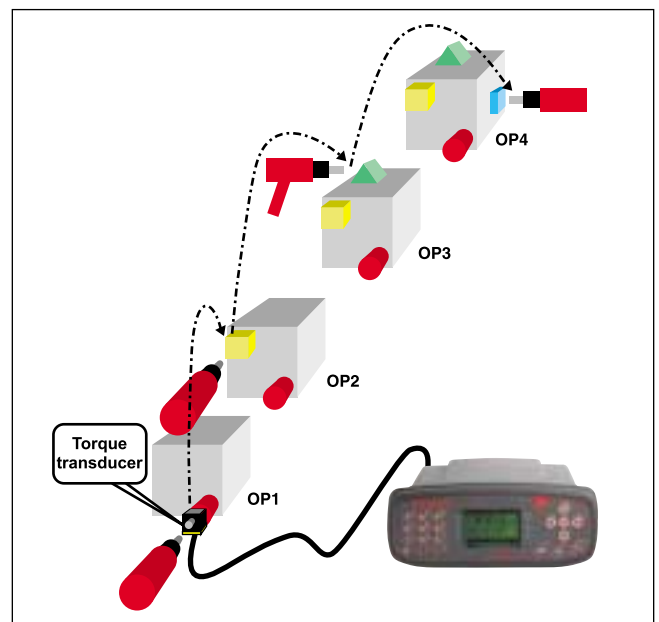
Continuous verification of the torque applied by the tightening tools

APPLICATIONS

Calibration of torque wrenches

Calibration of pneumatic screwdrivers

Calibration of controlled electric nutrunners

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Features

POWER REQUIREMENTS

POWER SUPPLY	Removable and rechargeable battery of 6 x 1.2 V (7.2V) NiMH elements inside or outside the unit.
BATTERY LIFE	14 hours minimum – 1000 Discharging/Recharging cycles – Programmable automatic stop.
BATTERY CONTROL	Low battery indication – Power miser – Charge level test – Global data backup during battery change.
CHARGER	Multi-voltage 115/230 Volts with multi-standard mains power cord.

TORQUE

TRANSDUCER INPUTS Connection of strain gauge transducers, CMD / ST / CD / CF /TD type or others.

TRANSDUCER INPUTS (Series 4000 : DELTA4000) (Series 4000/5000 : DELTA5000)	4001 / 5001 Nm / ft-lb 1-15 / 0.7-11	4005 / 5005 Nm / ft-lb 10-70 / 7.4-52	4010 / 5010 Nm / ft-lb 10-150 / 7.4-111	4050 / 5050 Nm / ft-lb 100-700 / 74-517	4100 / 5100 Nm / ft-lb 100-1500 / 74-1106
TORQUE RESOLUTION	0.001	0.01	0.01	0.1	0.1
ABSOLUTE MAXIMUM UNCERTAINTY (unit alone)	±0.006 / ±0.004	±0.06 / ±0.04	±0.06 / ±0.04	±0.6 / ±0.44	±0.6 / ±0.44

RANGE CHANGEOVER	Automatic, depending on the transducer selected.
SENSITIVITY	Automatic selection depending on the transducer selected. Automatic reading in the case of fixed electric power tools from 0.5 to 2.5 mV/V for any other transducer (load to be specified)
TRANSDUCER LOAD	Automatic selection depending on the transducer selected. Automatic reading in the case of fixed electric power tools.
SPECIFIC TRANSDUCERS	Torque: from 1 to 10 000 Nm - up to 20 specific transducers can be defined. Force: from 1 to 50 000 daN Sensitivity 0.5 to 2.5 mV/V.
UNITS	Nm – N.cm – kg.cm – Ft.lb – In.lb – kg – N – daN – kN

ANGLE

(DELTA 5000)	The angle measurement resolution is 0.25° with the G. RENAULT Series 5000 transducers.

SETTING

JOINT	Selection of the type of joint and application: Hard – Standard – Soft
MEASURING MODE	Standard – Impulse Wrenches.
ZERO POINT ADJUSTMENT	Automatic zero correction independent of the display reset.
DISPLAY RESET	Manual – External – Automatic (programmable).
OPERATING MODE	Acquisition mode - Programming Mode.

COMMUNICATION

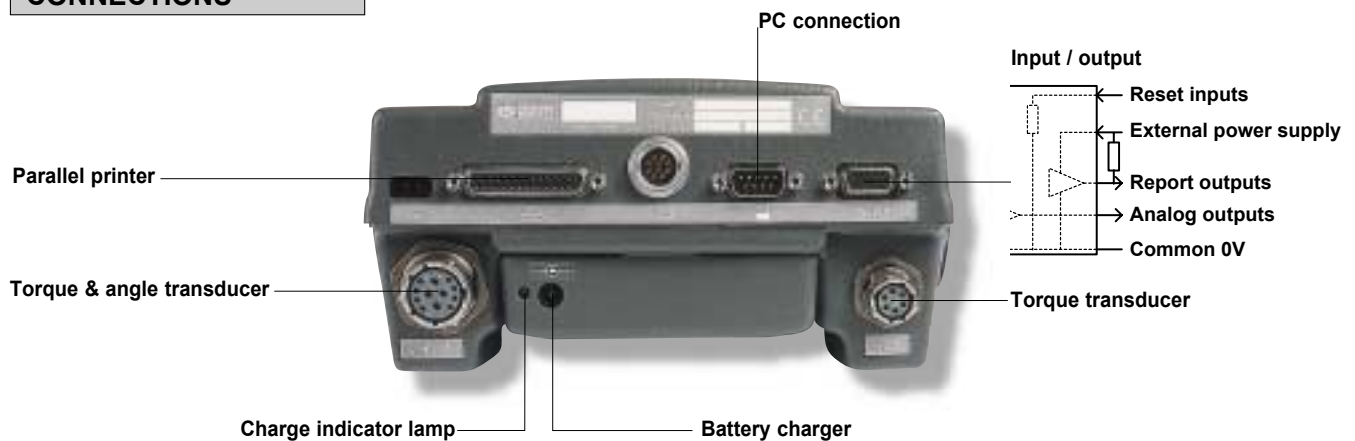|	
LEDS	Tightening reports: **DELTA4000**: Torque OK – Min. torque – Max. torque **DELTA5000**: Torque OK – Min. torque – Max. torque – Angle OK – Min. angle – Max. angle.
INPUTS	Reset the reading and saving the result. Reset the reading without saving the result.
OUTPUTS	3 torque reports: OK – Min. – Max. Torque reached for action on external device. Analog torque output (0-10V).
MEMORY	Up to 5 000 results (for 1 single operation programmed) including torque, (torque and angle with DELTA5000), Date and Time. 1 curve (DELTA4000) 5 curves (DELTA5000) can be programmed and displayed Up to 1 000 checking operations (4 results).
STATISTICS	ISO and CNOMO: CAM, CP, CPK, Mean, Standard deviation, ideal tolerances for a given compatibility.
PRINTER	Connected to SubD25 point parallel port with printing: - either in order of occurrence (print after each reading, automatically) / parameters / statistics / curves - or in increments of N readings starting from a given date.
TRANSFER TO PC	via serial link RS232 on SubD 9 points.

MISCELLANEOUS

WEIGHT	1050 gr
OVERALL SIZE	Depth: 190 mm - Width: 230 mm – Height: 100 mm
TEMPERATURES	Storage: from -10°C to +60°C - Operation: from 0°C to +50°C

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Environment

OPERATOR INTERFACE

On / off key

LEDs for reading torque reports "OK – Min. – Max."

Alphanumeric keyboard

Keys for browsing through the menus

LEDs for reading angle reports "OK – Min. – Max."

"Escape", "Validate" and "Print" keys

CONNECTIONS

PC connection

Input / output

Parallel printer

Reset inputs

External power supply

Report outputs

Analog outputs

Common 0V

Torque & angle transducer

Torque transducer

Charge indicator lamp

Battery charger

ORDERING ORDER

	PART NO.
DELTA4000 unit	615 935 035 0
DELTA5000 unit	615 935 043 0

ACCESSORIES INCLUDED

	PART NO.
Universal charger	615 922 948 0
Multilingual literature	615 993 801 0

START-UP KIT
To be ordered with the unit
Including: plugs + cable

PLUG	PART NO.
A	615 917 201 0
C	615 917 202 0
D	615 917 205 0
B	615 917 203 0
E	615 917 204 0

OPTIONAL ACCESSORIES

	PART NO.
Extra battery block	615 935 042 0
DELTA PC software	615 927 520 0
Torque & angle cable, 3 m long	615 917 250 0
Torque & angle cable, 4 m long	615 917 258 0
Analog torque cable, 2m long	615 917 251 0
Analog torque cable, 5m long	615 917 252 0
Spirally wound analog torque cable (stretched: 2m)	615 917 253 0
Unit/PC connection cable, RS232C type	615 917 047 0
Parallel printer cable	615 917 057 0

A	B	C	D	E

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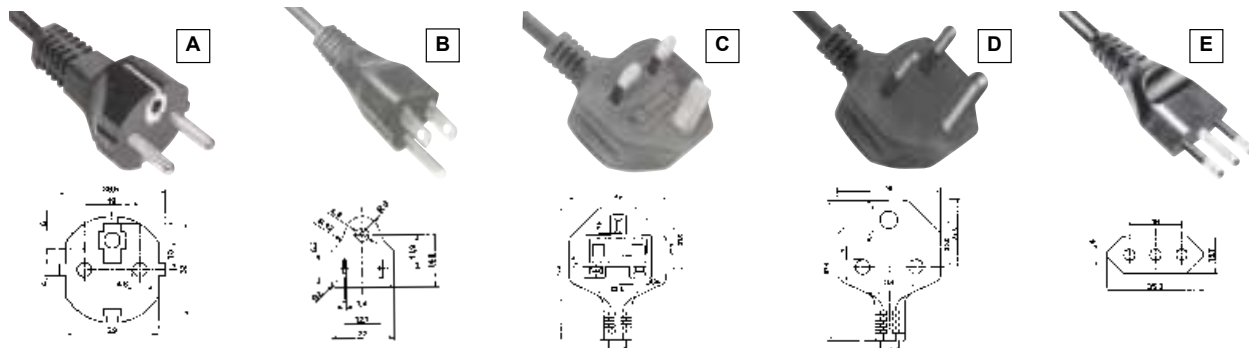
Delta 4000/5000

INTEGRATED STATISTICAL CALCULATIONS

- CAM, CP and CPK calculation and measurement of mean range on torque or angle values in accordance with ISO and CNOMO standards.
- Calculation of ideal tolerances
- Data screening (date or value interval)
- Tolerance interval selection
- "Population homogeneity" test
- Normal distribution" test
- Exporting the results

The results of the readings can be exported to the **DELTAPC*** software in order to:
- Store the results and perform statistical calculations
- Save and display curves
- Display histograms and control charts
- Transfer the results and curves to an EXCEL or other type data base.

*Available end of 2001

2 OPERATING MODES

Acquisition Mode
In this mode, DELTA allows the operator to acquire and store torque values or torque and angle values:
- Either automatically, after each tightening operation
- Or manually, by pressing the VAL key.

In manual mode, 2 types of reading are available:
- Peak: displays and stores the maximum torque read
- Track: the values displayed follow the evolution of the torque in a continuous process.

Examples of application in track mode
- Hand torque measuring wrenches (CF, CD)
- Reading the tension in a joint with a force meter
- Calibration of assembly machines in "static mode"
In this mode, the values are not stored.
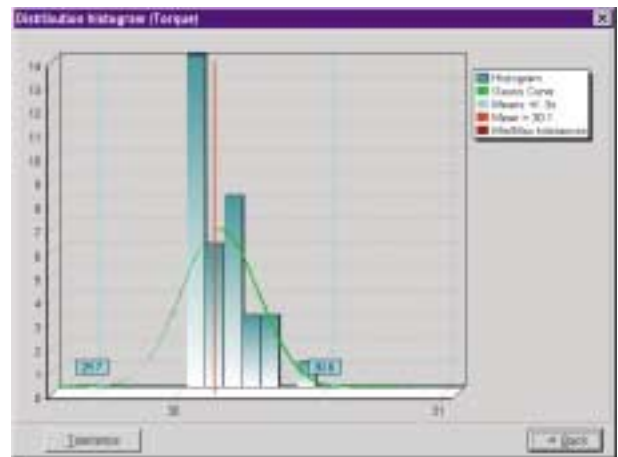
Programming Mode
With its ergonomic design, **DELTA** can be easily programmed by using the 5 browsing and the multifunction alphanumerical keys of the keyboard.

The main parameters that can be programmed are:
- Selection of transducer connected to unit
- The torque measuring unit
- The nominal torque
- The nominal torque tolerances
- The number of readings for each operation
- The mode used to start the reading
- The parameters used to save the curves
The unit is multilingual: Français, English, Espagnol, Deutsch, Italiano, Nederlands, Svenska.

FIELDS OF APPLICATION

Car industry

Aeronautics

TGV (high speed train)

Electronics