Dakota NDT
an Elcometer company


# CX Series

## Thickness Gauges

### HIGHLIGHTS:

- Stores up to 100,000 readings in up to 1,000 sequential batches
- Selectable reading rate of 4, 8, 16Hz (4, 8, 16 readings per second)
- Scan Mode at 16Hz, ideal for measuring a large surface area
- User selectable reading resolution; 0.1mm (0.01") or 0.01mm (0.001")
- Pulse Echo (PE), Echo Echo ThruPaint™ & Velocity (VM) measurement modes
- Hi & Lo limit indicators provides indication of problem areas
- Integrated zero disc, ensures maximum accuracy
- Auto recognition, ensures correct probe is identified when transducer is changed

**STANDARDS:**
ASTM E 797, EN 14127, EN 15317

Bluetooth® wireless technology

compatible with DakMaster™

## Dakota CX

# Ultrasonic Material Thickness Gauge


Easy to use with minimum set up

### Accurate

## A range of calibration options for accuracy and efficiency

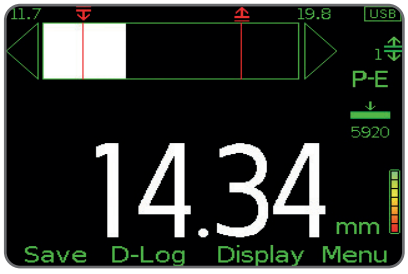
The CX gauges have a range of calibration options including the 1-Point calibration method. Users can also select one of 39 pre-set materials stored within the gauge or store up to three calibrations into the memory.


Coatings up to 2mm (80mils) can be ignored

### Versatile

## Measures uncoated & coated surfaces

Flexible & easy to use, the Dakota CX range doesn't just measure uncoated surfaces but can also measure coated surfaces. Using Echo Echo ThruPaint™ Mode (EE), coatings up to 2mm (80mils) are ignored.




Customisable reading display

### Customisable

## Choose & customise the reading display

The Dakota CX range has a choice of display modes allowing the user to select the most appropriate for their needs; Readings, Selected Statistics, Bar Graph, Run Chart, B-Scan & Differential Mode.


Set user definable limits for audible and visual pass/fail warnings

### Intelligent

## User definable limits for pass/fail indication

Users are able to set upper and lower limits with audible and visual pass/fail warnings. Limits can be set for individual readings or for each batch.

Connect the gauge via Bluetooth® or USB to PC

### Wireless Connectivity

## Connect to any PC

Compatible with DakMaster™ PC, readings can be downloaded via USB or Bluetooth® to PC for further analysis and reporting.

## Dakota CX

# Ultrasonic Material Thickness Gauge

### User Definable Upper and Lower Limits


The CX gauges have user definable upper and lower limits with audible and visual pass/fail warnings allowing the user to compare readings to pre-defined values. The CX8 can store up to 40 pre-programmed limits which can be set for individual readings or for each batch.

If a measurement is taken which falls outside set limits, the reading value and the limit icon turn red, the red LED flashes and the alarm beeps providing immediate indication of problem areas.

### A Range of Calibration Methods

**1 Point;** after setting the zero point a reading is taken and adjusted on an uncoated sample piece of test material of a known thickness. Once the thickness has been entered and confirmed, the derived sound velocity is displayed.

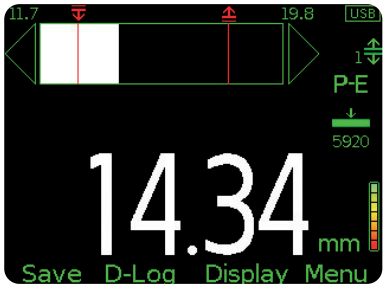
**2 Point;** readings are taken and adjusted on two uncoated sample pieces of test material with known thicknesses. Once the second thickness has been entered and confirmed, the derived sound velocity is displayed.

**Material;** calibration using the sound velocity of a material, selected from a pre-defined list of materials stored in the gauge.

**Velocity;** calibration using the known sound velocity of the material under test.

**Thickness Set;** calibration is performed using the known thickness of the material under test. Up to three calibrations can also be saved in the gauge memory. Once saved, the user can select the calibration memory - without the need to re-calibrate the gauge.

### Scan Mode



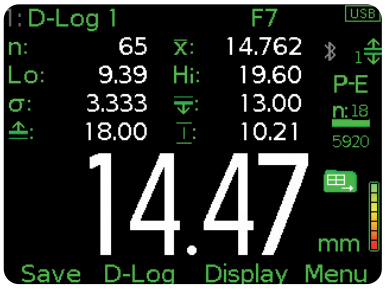

When enabled, users can slide the transducer over a large surface area whilst the gauge takes readings at a rate of 16Hz (16 readings per second). During each scan, the live thickness is displayed together with an analogue bar graph showing the thickness relative to the set nominal value and any user defined limits, with audible and visual warnings if any readings fall outside the set limits.

When the transducer is lifted off the surface, the average, lowest and highest thickness value is displayed making scan mode ideal for checking a sample's overall uniformity.

## Dakota CX

# Ultrasonic Material Thickness Gauge

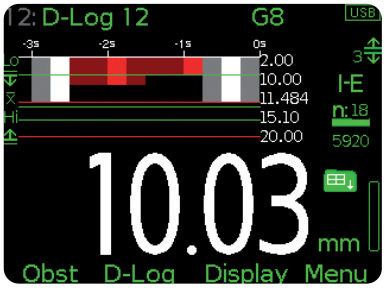
### Sequential or Grid Batching




Individual readings can be stored in up to 1,000 sequential or grid type, alpha-numeric batches, together with date and time stamp and reading location*. Users have the option to view batch readings, statistics and a graph of all readings stored within the batch.

The obstruction feature (Obst), allows the user to record areas of obstruction on the grid where measurements could not be taken.

### B-Scan Reading




A time based, cross sectional 2 dimensional B-Scan provides a graphical view of the material under test, ideal for relative depth analysis.

The zoom of the B-Scan reading can either be set to automatic or can be defined by the user to focus on areas of interest.

### Differential Mode


Once a user defined nominal thickness value has been set, the gauge displays the measured thickness together with the variation from the set nominal value thus indicating areas of the material which are thinner or thicker than expected.

### Velocity Mode

Velocity mode measures the speed of sound of materials and is ideal for determining the homogeneity of a material/alloy and the correct velocity of a material for calibration.

* Grid batches only

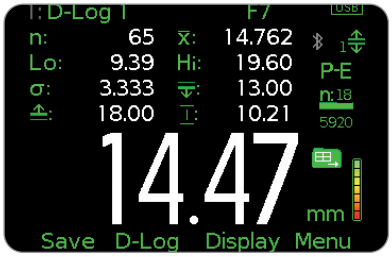
## Dakota CX — Ultrasonic Material Thickness Gauge

# A choice of display and measurement modes

### Readings

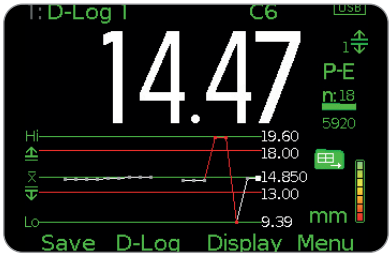

The reading value is displayed.

### Selected Statistics



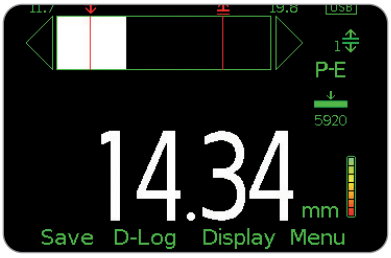

Up to 8 statistical values can be displayed as defined by the user.

### Run Chart




A line trend graph of the last 20 measurements which is updated after each reading.

### Bar Graph

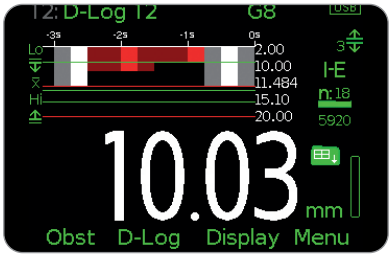



An analogue representation of the current measurement value together with the highest (Hi), lowest (Lo) and average (x̄) reading.

### Readings & Differential


The last reading is displayed together with the variation from the nominal value (if set).

### B-Scan



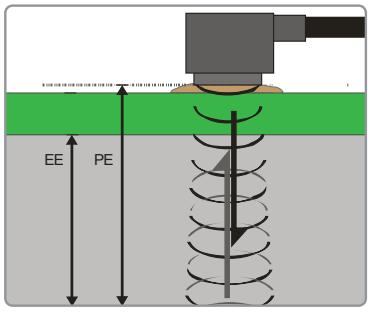

A cross-sectional view of the material being tested is displayed along with readings taken, saved readings, highest (Hi), lowest (Lo) and average (x̄) reading and upper/lower limit values (if set).

### Measurement Modes

**Pulse Echo (PE);** the total thickness from the base of the transducer to the material density boundary (typically the back-wall) is measured. Suitable for measurement of materials between 0.63mm and 500mm (0.025” to 20”) thick.

**Echo Echo ThruPaint™ (EE);** a coating of up to 2.0mm (0.08”) thick is ignored and the material thickness from the top surface of the material to the material density boundary (typically the back-wall) is measured. Suitable for measurement of materials between 2.54mm and 25.4mm (0.1” to 1.0”) thick.

**Velocity Mode (VM);** measures the speed of sound of the material. Ideal for measuring the homogeneity of a material/alloy.



# Dakota CX — Ultrasonic Material Thickness Gauge

## Product Features

| Model Number | CX2 | CX4 | CX6-DL | CX8-DL |
|---|---|---|---|---|
| Easy to use menu structure in multiple languages | ■ | ■ | ■ | ■ |
| Tough, impact, waterproof and dust resistant equivalent to IP64 | ■ | ■ | ■ | ■ |
| Bright colour screen with permanent backlight | ■ | ■ | ■ | ■ |
| Ambient light sensor, with adjustable brightness | ■ | ■ | ■ | ■ |
| Scratch and solvent resistant display; 2.4" (6cm) TFT | ■ | ■ | ■ | ■ |
| Large positive feedback buttons | ■ | ■ | ■ | ■ |
| USB power supply via PC | ■ | ■ | ■ | ■ |
| Gauge software updates[1] via DakMaster™ Software | ■ | ■ | ■ | ■ |
| 2 year gauge warranty[2] | ■ | ■ | ■ | ■ |
| Limits: 40 definable audible & visual pass/fail warnings | | | | ■ |
| **Measurement Mode** | | | | |
| Pulse Echo (PE) | ■ | ■ | ■ | ■ |
| Echo Echo ThruPaint™ (EE)[3] | | ■ | ■ | ■ |
| Velocity Mode (VM) | | | ■ | ■ |
| **Measurement Rate** | | | | |
| 4, 8, 16Hz | 4Hz | 4Hz | 4, 8, 16Hz[4] | 4, 8, 16Hz[4] |
| **Gain** | | | | |
| Low, Medium, High | | | | ■ |
| **Thickness Range[5]** | | | | |
| PE 0.63-500mm (0.025-19.999") | ■ | ■ | ■ | ■ |
| EE 2.54-25.4mm (0.100-1.0") | | ■ | ■ | ■ |
| **Measurement Units** | | | | |
| mm or inches | ■ | ■ | ■ | ■ |
| m/s, inch/µs | | | ■ | ■ |
| Repeatability / Stability Indicator | ■ | ■ | ■ | ■ |
| **Display Mode** | | | | |
| Reading | ■ | ■ | ■ | ■ |
| Selected statistics | | | ■ | ■ |
| Scan thickness bar graph | | | ■ | ■ |
| Run Chart | | | ■ | ■ |
| Readings and Differential | | | | ■ |
| B-Scan cross sectional display | | | | ■ |
| **Selectable Reading Resolution** | | | | |
| Lo; 0.1mm, 0.01 Inch, 10m/s, or 0.001 in/µs | ■ | ■ | ■ | ■ |
| Hi; 0.01mm, 0.001 Inch, 1m/s, or 0.0001 in/µs | | | ■ | ■ |

[1] Internet connection required.

[2] The Dakota CX range is supplied with a 1 year warranty against manufacturing defects. The warranty can be extended free of charge to 2 years within 60 days of purchase via www.DakotaNDT.com.

[3] HD transducer is required. [4] User selectable default setting in Scan Mode is 16Hz.

[5] Dependent on the material being measured and the transducer being used.

# Dakota CX — Ultrasonic Material Thickness Gauge

## Product Features

| Model Number | CX2 | CX4 | CX6-DL | CX8-DL |
|---|---|---|---|---|
| **Statistics** | | | | |
| Number of readings,n; Mean average, $\bar{x}$ ; Standard deviation, σ. | | | ■ | ■ |
| Lowest reading, Lo; Highest reading, Hi | | | ■ | ■ |
| Low / high limit value | | | | ■ |
| Reading range value ⌶ | | | | ■ |
| Nominal value | | | | ■ |
| Number of readings below the low limit | | | | ■ |
| Number of readings above the high limit | | | | ■ |
| **Calibration Options** | | | | |
| Zero (using the integral zero disc) | ■ | ■ | ■ | ■ |
| 1 - point | | ■ | ■ | ■ |
| 2 - point | | | ■ | ■ |
| Material selection; 39 preset materials* | | ■ | ■ | ■ |
| Factory; resets to the factory calibration | | ■ | ■ | ■ |
| Velocity (speed of sound) | | | ■ | ■ |
| Known thickness value | | | ■ | ■ |
| **Calibration Features** | | | | |
| Calibration lock; with optional PIN Lock | | | ■ | ■ |
| Test calibration feature | | | ■ | ■ |
| Calibration memories: 3 programmable memories | | | | ■ |
| Measurement outside calibration warning | | | | ■ |
| **Data Logging** | | | | |
| Number of readings | | | 1,500 | 100,000 |
| Number of batches | | | 1 | 1,000 |
| Sequential batching | | | ■ | ■ |
| Grid batching | | | | ■ |
| Fixed Batch Size Mode; with batch linking | | | | ■ |
| Obstruct entry; add 'obst' into grid location | | | | ■ |
| Delete last reading | | | ■ | ■ |
| Date & time stamp | | | ■ | ■ |
| Review, clear & delete batches | | | ■ | ■ |
| Alpha numeric batch names; user definable | | | | ■ |
| Batch review graph | | | | ■ |
| **Data Output** | | | | |
| USB to PC | ■ | ■ | ■ | ■ |
| Bluetooth® to PC, Android™ & iOS devices | | | ■ | ■ |
| DakMaster™ Software | | | ■ | ■ |
| **Transducer Probe Type** | | | | |
| Dual Element | ■ | ■ | ■ | ■ |
| **Auto transducer recognition** | ■ | ■ | ■ | ■ |
| **Auto V-path correction** | ■ | ■ | ■ | ■ |

* See page 5-23 for lists of preset materials.

# Dakota CX — Ultrasonic Material Thickness Gauge

## Technical Specification

| Part Number | Description | Certificate |
|---|---|---|
| CX2 | Dakota CX2 Ultrasonic Material Thickness Gauge | ● |
| CX4 | Dakota CX4 Ultrasonic Material Thickness Gauge | ● |
| CX6-DL | Dakota CX6-DL Ultrasonic Material Thickness Gauge | ● |
| CX8-DL | Dakota CX8-DL Ultrasonic Material Thickness Gauge | ● |

| Model Number | CX2 | CX4 | CX6-DL | CX8-DL |
|---|---|---|---|---|
| Measurement Range[1] | | | | |
| Pulse Echo (PE) | 0.63-500mm (0.025-19.999”) | 0.63-500mm (0.025-19.999”) | 0.63-500mm (0.025-19.999”) | 0.63-500mm (0.025-19.999”) |
| Echo Echo ThruPaint™ (EE) | | 2.54-25.4mm (0.100-1.0”) | 2.54-25.4mm (0.100-1.0”) | 2.54-25.4mm (0.100-1.0”) |
| Velocity Mode (VM) | | 1,250-10,000m/s (0.0492-0.3937in/µs) | 1,250-10,000m/s (0.0492-0.3937in/µs) | 1,250-10,000m/s (0.0492-0.3937in/µs) |

| | |
|---|---|
| Operating Temperature | -10 to 50°C (14 to 122°F) |
| Power Supply | 2 x AA batteries |
| Battery Life[3] | Alkaline: 15 hours Lithium: 28 hours |
| Gauge Weight | 210g (7.4oz) - including batteries, without transducer |
| Gauge Dimensions | 145 x 73 x 37mm (5.7 x 2.84 x 1.46”), without transducer |
| Packing Lists | Dakota CX2 Ultrasonic Material Thickness Gauge, 5MHz ¼” right angle dual element transducer (TXC5M00CP-4), ultrasonic couplant, carry pouch, screen protector, wrist harness, 2 x AA batteries, operating instructions, test certificate |
| | Dakota CX4 Ultrasonic Material Thickness Gauge, 5MHz ¼” HD right angle dual element transducer (TXC5M00CP-10), ultrasonic couplant, carry pouch, screen protector, wrist harness, 2 x AA batteries, operating instructions, test certificate |
| | Dakota CX6-DL Ultrasonic Material Thickness Gauge, 5MHz ¼” HD right angle dual element transducer (TXC5M00CP-10), ultrasonic couplant, plastic transit case, 3 x screen protectors, wrist harness, 2 x AA batteries, operating instructions, calibration certificate, DakMaster™ software CD & USB cable |
| | Dakota CX8-DL Ultrasonic Material Thickness Gauge, 5MHz ¼” HD right angle dual element transducer (TXC5M00CP-10), ultrasonic couplant, plastic transit case, 3 x screen protectors, wrist harness, 2 x AA batteries, operating instructions, calibration certificate, DakMaster™ software CD & USB cable |

● Calibration Certificate supplied as standard.

[1] Dependent on material being measured & transducer being used.

[2] On steel.

[3] Approximate battery life, when in Continuous Reading Mode at a reading rate of 4Hz. Rechargeable batteries may differ.

## Dakota CX

## Material Thickness Transducers

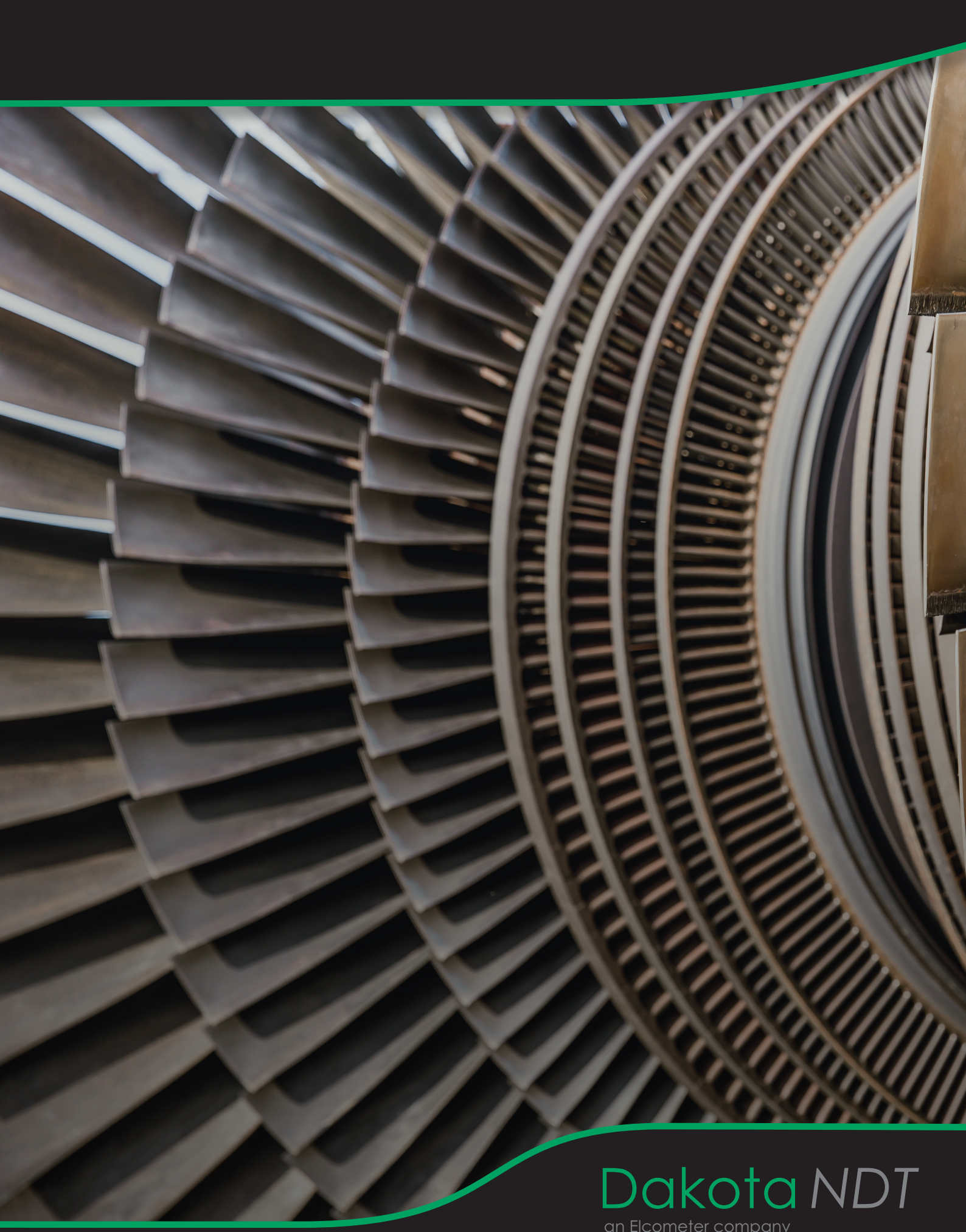

The **CX Transducer range** has intelligent automatic transducer recognition ensuring correct probe identification even when the transducer is changed.

| Disk | Part Number | Probe Diameter | Probe Characteristic | Damping* | ThruPaint™ | Connector Type: Potted | Connector Type: Top | Connector Type: Side | Suitable for: CX2 | Suitable for: CX4 | Suitable for: CX6-DL | Suitable for: CX8-DL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **1.00MHz Dual Element Thickness Transducer** | | | | | | | | | | | |
| ● | TXC1M00EP-2 | ½" | Standard | S | | • | | • | | • | • | • |
| | **5.00MHz Dual Element Thickness Transducer** | | | | | | | | | | | |
| ● | TXC5M00CP-4 | ¼" | Standard | S | | • | | • | • | • | • | • |
| ● | TXC5M00CP-10 | ¼" | Standard | H | • | • | | • | | • | • | • |
| ● | TXC5M00CP-8 | ¼" | Hi Temp | S | | • | • | | | • | • | • |
| ● | TXC5M00EP-10 | ½" | Standard | H | • | • | | • | | • | • | • |
| | **7.50MHz Dual Element Thickness Transducer** | | | | | | | | | | | |
| ● | TXC7M50BP-3 | 3⁄16" | Standard | S | | • | | • | | • | • | • |
| ● | TXC7M50CP-4 | ¼" | High Resolution | S | | • | | • | | • | • | • |

* Damping: **S** - Standard undamped Transducer, **H** - Highly Damped Transducer

All transducers are supplied with a calibration certificate.

To select another transducer from the one supplied with the gauge please remove TXC from the part number.



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