force transducer/impact hammer type 8203 is a unique structural testing kit designed for use with lightweight and delicate structures. the force transducer measures the force applied to the structure. it can be connected to the hammer kit for impact testing or to a small exciter (e.g., brüel & kjær type 4810) via the stinger kit provided.

uses
- dynamic and impact-force measurements on small structures
- measurement of frequency response functions using both impact and continuous excitation techniques
- as part of a dynamic structural testing system for modal analysis and the prediction of structural response

features
- compact size and low weight allied with an all-welded, robust construction
- good linearity
- excellent, long-term stability due to artificial aging
- individually calibrated and easily mounted
- easily attached to the stinger and hammer kits
- negligible changes to dynamic properties of test structure
- comes with all necessary accessories for every type of mounting
- titanium tip seating to minimise lateral deformation of tip material during impact
- aluminium shaft to reduce occurrence of double impact
- charge mode (pe) output

fig. 1 impulse shapes for the two hammer tips showing the plastic tip with the broadest pulse and lowest peak value (left); force spectrum of an impact on an aluminium plate using the plastic tip (centre) and the steel tip (right)

**force transducer**
the piezoelectric force transducer is designed to measure dynamic and impact forces. it is pre-loaded to precisely 1000 n, allowing compressive force measurements of up to 1000 n and tensile force measurements of up to 250 n. the transducer is mounted on the test structure so that the force to be measured is transmitted through the transducer. when used with an exciter, the transducer signal can be used to measure and control the applied force. the
frequency response function of the test structure can be measured by using a dual-channel analyzer. The force transducer is used to measure the input force and an ac-}

**Specifications - Force Transducer/Impact Hammer Type 8203**

**Force Transducer**

**Force Range:**
- 250 N tensile to 1000 N compressive with pre-loading nuts
- 1250 N compressive without pre-loading nuts

**Linearity Error:** <1% of maximum force

**Charge Sensitivity** (typical): 3.6pC/N with pre-loading nuts

**Capacitance (typical):** 9pF

**Leakage Resistance (at 25°C):** <10^5 MΩ

**Stiffness:**
- 1 x 10^8 N/m with pre-loading nuts
- 2 x 10^8 N/m without pre-loading nuts

**Deformation of the Transducer at Maximum Force:**
- 10µm with pre-loading nuts
- 5µm without pre-loading nuts

**Resonance Frequency with 5 gram Load Mounted on Top (typical):**
- 23 kHz with pre-loading nuts
- 30 kHz without pre-loading nuts

**Effective Seismic Mass**

**Above Piezoelectric Element (top):**
- 1.1 g with pre-loading nuts
- 1.2 g without pre-loading nuts

**Below Piezoelectric Element (base):**
- 2.1 g with pre-loading nuts
- 0.4 g without pre-loading nuts

**Temperature Range:** -196°C to 150°C

**Temperature Transient Sensitivity (typical):** 0.6 N/°C

**Transverse Sensitivity (typical):** 7%

**Bending Moment Sensitivity (typical):** 100 pC/Nm

**Maximum Bending Moment for Stated Bending Moment Sensitivity:** 0.5 mN

**Strain Sensitivity (top and base):** <0.002 N/µstrain with pre-loading nuts

**Magnetic Sensitivity at 50 Hz (typical):** 0.1 N/T

**Material:** Titanium and steel

**Height:**
- 15.8 mm with pre-loading nuts
- 7 mm without pre-loading nuts

**Dimensions**

**Diameter:** 9.0 mm

**Length:** 106 mm

**Stinger**

**Chuck Material:** Monel

**Max. Tensile Force:** >250 N

**Compliance with EMC Directive**

**Accessories Included**

- AO 0339 Cable
- DB 3041 Steel Tip
- UC 0205 Plastic Tip
- YS 9202 Tip Mounting Screw
- UC 5322 Pre-loading Nut (M3 Thread, M2 Screw)
- YM 0249 Pre-loading Nut (M3 and M2 Thread)
- DB 1425 M3/10–32 UNS Adaptor
- YQ 0204 M3 Screw for DB 1425
- QA 0041 Tap for M3 Thread
- 2 x QA 0186 5 mm Spanner
- QA 0042 Allen Key

**Hammer**

**Handle Material:** Anodised Aluminium

**Transducer Sealing:** Rubber

**Weight**

- Plastic Tip: 0.3 g
- Steel Tip: 0.3 g

**Impact Duration (on a heavy steel target)**

- Plastic Tip: 100 µs
- Steel Tip: 30 µs

**Length:** 106 mm

**Sinter Accessories Included**

- 10 x DA 9984 Stainless Steel Rod
- DB 3146 Chuck for Shaker
- DB 3147 Chuck for Transducer
- DB 3145 Chuck Tightening Collar
- Calibration Chart

**Accessories Available**

- Type 2646 DeltaTron® Amplifier