DEPRAG

MEASURING
ELECTRONIC

Torque Measuring Instruments

For manual use

In connection with PE-(piezoelectric) or DMS-(strain gage) transducers, our torque measuring instruments permit the:

- **torque adjustment, supervision and control of rotational screwdrivers**
- **control and calibration of hand torque wrenches**
- **torque control of stationary screwdriver spindles mounted in an assembly station**
- **torque verification and documentation of the assembly quality**

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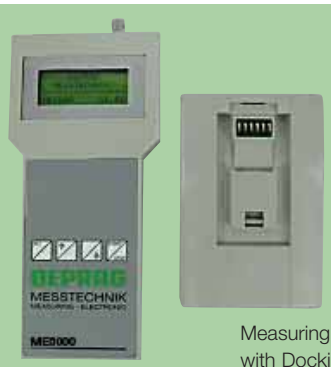
          D E P R A G
          DME 200
DATE  :   28.03.2007
TIME  :   14:47

TYPE  :   ..............

SER.#:    ..............

  1       + 12.43 in.lbs
  2       + 12.39 in.lbs
  3       + 12.39 in.lbs
  4       + 12.45 in.lbs
  5       + 12.45 in.lbs
  6       + 12.45 in.lbs
  7       + 12.41 in.lbs
  8       + 12.41 in.lbs
  9       + 12.44 in.lbs
 10       + 12.41 in.lbs

  X̄ =     + 12.41 in.lbs
  S =       0.024 in.lbs
```



Measuring Electronic ME 5000
with Docking Station

DME 200

DME 200 PC-V
DME 200 PC
DME 200 DMS-PC

All measuring instruments of the series DME, allow the truly high dynamic measurement of torque values, when used in connection with the transducers of the PE-(piezoelectric) or DMS- (strain gage) design series (see our leaflet D 3020 E). They are intended for the manual use in different application areas, such as: supervision, control and torque adjustment of screwdrivers; control and calibration of mechanical torque wrenches; control of integrated DEPRAG screwdriver spindles and finally for verification and documentation of the assembly quality in accordance with DIN EN ISO 9001 quality requirements.

The measuring instruments, intended for the connection with the PE-transducer design series, operate according to the following signal processing principle. The electric load emitted by the transducer is changed by a specially tuned charge amplifier into an analog measuring signal. When connecting a strain gage transducer with a DMS measuring instrument, the transducer is already powered by an analog voltage signal. The digital end values are displayed, with help of a fast, high resolution AD-converter. The integrated microprocessor controls and supervises all adjustments and sequences. The standard software allows the change of the measurement unit (metric/imperial) as well as the change of language (German/ English).

Operational Mode:

The measuring instruments can be operated in the following operational modes:

– Single measurement with display of the peak value
  With this mode, all incoming measurements are registered and the highest single value, detected during the entire duration of the measurement, is displayed as the measurement result.

– Measurement Series
  During the measurement series mode, the peak values of several single measurements are automatically summarized into a measurement series. From the measurement series, essential statistical values are calculated, such as the average torque value $\bar{X}$ and standard deviation S.

– Single measurement with display of an prevailing torque value.
  The measuring instrument DME 200 allows a third operating mode, which constantly displays the prevailing torque-value.

All measurements are recognizable on the display. Depending on the instrument-design, the values can additionally be sent to one of our printers or to a primary host computer.

ME 5000

The compact, handheld measuring instrument ME 5000 allows that torque measuring operations can be done right at the assembly location. An integrated battery speeds up the automatic torque acquisition. This feature determines the best possible torque adjustment for a Screwriver by measuring the torque directly on the product to be assembled.
The standard ME 5000 includes a Docking Station, which is needed to recharge the battery. The Docking Station also contains a serial port (RS232) to transfer acquired measuring values to a PC.
The measuring instrument ME 5000 can also be connected to the DEPRAG printer ND 40.

DME 200:

Because of its integrated power supply, the measuring instrument DME 200 allows the operation of different printers as well as the recording of larger measurement series up to 100 values. Furthermore, it excels by an improved resolution of the measurement data and the additional operating mode for prevailing torque values. This unit is frequently applied in set-ups on a mobile measurement waggon or in a calibration lab, for the stationary torque testing and torque adjustment of all types of screwdrivers. Also, a connection port for our ND 40 and ND 100 printers is provided.

DME 200 PC / DME 200 PC-V /
DME 200 DMS-PC:

The measuring instrument DME 200 PC respectively DME 200 DMS-PC contains only the instrumentational portion of the DME 200. A standard PC assumes all remaining functions, such as display, operation, and printing. The operation of the DME 200... is only possible in connection with a PC (starting with “WINDOWS 95”). This combination allows the processing of an even larger data volume, and exhibits an increased processing flexibility, since all relevant data is available as an ASCII file on the PC. This offers outstanding possibilities, especially for the reprocessing of measuring results with customary statistics programs. Furthermore, the possibility exists to accomplish a complete screw joint analysis, since the entire measurement cycle-event – torque over time – can be displayed on the PC.
Only our curve analysis program which is a standard accessory with the torque monitor is required for this function.

The combination of the DME 200... with a customary PC, is perfectly suited for a stationary laboratory site, which additionally incorporates – beside all other functions of the three basic measurement instruments – the possibility to analyze a particular screw joint. In connection with our measurement platforms and piezo screwdriver-spindles, the most diversified assembly problems may be examined in detail. Measuring instrument can be connected to PC (LPT) via the printer interface.

Printers:

As an essential accessory, the two dot-matrix printers ND 40 and ND 100 are available.
The compact and robust printer ND 40 is best suited for the use in harsh work areas. This printer can be operated using a power supply.
The inexpensive and versatile printer ND 100 can also be used to connect to the DME 200. Of course, for the DME 200 PC / DME 200 DMS-PC/DME 200 PC-V, all standard printers can be used in connection with a customary PC.

Factory Calibration on special order

- Calibration of a measurement transducer (measurement platform, torque wrench or non-contact transducer).
- Calibration of a torque measuring instrument.
- Calibration of a measurement chain (a measurement transducer and one torque measuring instrument).
- The factory calibration includes testing, calibration, a calibration certificate or a measuring protocol, which is traceable to national standards in accordance with DIN EN ISO 9001.

Technical Data

Measuring Instrument type		**ME 5000**	**DME 200**	**DME 200 PC**	**—**
for Piezoelectric	order no.	385484 A	349951 A (230 V)	349979 A (230 V)	—
Transducers	order no.	—	349951 B (115 V)	349979 B (115 V)	—
Measuring Instrument type		**ME 5000**	**—**	**—**	**DME 200 DMS-PC**
for Strain Gage	order no.	385484 A	—	—	385422 A (230 V)
Transducers	order no.	—	—	—	385422 B (115 V)
Measuring Instrument type		**ME 5000**	**—**	**DME 200 PC-V**	**—**
for non-contact	order no.	385484 A	—	385479 A	—
Transducers		—	—	—	—
Operating Mode:					
– Peak Value Display		yes	yes	yes	yes
– Prevailing Torque-Value Display _		no	yes	yes	yes
– Measurement Series with Statistics X, S		yes (max. 40 series of 100 values each)	yes (up to 100 values)	yes (up to 1000 values)	yes (up to 1000 values)
Total Measuring-Range	Nm / in.lbs	see transducer	0.04-200 / 0.35 - 1770	see transducer	0.04-500 / 0.35 - 4425
Number of Measuring Ranges		depending on measuring system	6	6	6
Display		LC-Display Alphanumeric 4-lines 16 digits per line	LCD-Display Alphanumeric 2-lines 16 digits per line	External, standard PC-Monitor	External, standard PC-Monitor
Data Output (for printer or PC)		SUB-D 9-pin RS 232 (9600 Baud)	SUB-D 9-pin Connector RS 232 (9600 Baud)	ASCII-Data CSV-Data JPG, BMP	ASCII-Data CSV-Data JPG, BMP
Connection for Measuring Transducer		8-pin Connector / BNC-Connector	BNC-Connector	BNC-Connector (..200 PC) 4-pin M 12 Connector (..200 PC-V)	4-pin Connector
Linearity	%	< 1	< 0.2	< 1	< 0.2
Accuracy	% FS	< ± 1	< ± 0.5	< ± 1	< ± 0.5
Electrical Power Supply		Rechargeable Battery	Power Supply (AC 230 V / 50 Hz) or (AC 115 V / 60 Hz)	Power Unit (AC 230 V - DC 9 V) (AC 115 V - DC 9 V) DC 12 V (..PC-V) PC (DC 5 V)	Power Unit (AC 230 V - DC 9 V) (AC 115 V - DC 9 V) or PC (DC 5 V)
Dimensions (WxHxD)	mm	224 x 106 x 40	342 x 146 x 335	180 x 65 x 125	180 x 65 x 125
	in.	8 $^{13}/_{16}$ x 4 $^{11}/_{64}$ x 1 $^{9}/_{16}$	13$^{15}/_{32}$ x 5$^{3}/_{4}$ x 13$^{3}/_{16}$	7$^{3}/_{32}$ x 2$^{9}/_{16}$ x 4$^{15}/_{16}$	7 $^{3}/_{32}$ x 2 $^{9}/_{16}$ x 4$^{15}/_{16}$
Weight	kg / lbs	1 / 2.2	5 / 11	1 / 2.2	1 / 2.2

Required Accessories:	**Connector Cable** (see below). **Measuring Transducer** (see leaflet D 3020 E).				
Connector Cable					
Measuring Instrument to **Measuring Transducer**	**ME 5000**	**DME 200**	**DME 200 PC**	**DME 200 PC-V**	**DME 200 DMS-PC**
MP 25 PE, MP 200 PE or MS 25 PE-W	810675 (5 m)	810675 (5 m)	810675 (5 m)	—	—
MP 1000 PE	810629 (1 m)	—	810629 (1 m)	—	—
MP 2 DMS, MP 7 DMS, MP 25 DMS or MP 160 DMS	385410 A (1 m) 385410 B (2 m) 385410 C (3 m)	— — —	— — —	— — —	385410 A (1 m) 385410 B (2 m) 385410 C (3 m)
MP 500 DMS	385486 A (2 m)* 385486 B (4 m)* 385486 C (6 m)*	— — —	— — —	385480 A (2 m)* 385480 B (4 m)* 385480 C (6 m)*	— — —
MS 2 DMS, MS 7 DMS, MS 7 DMS-W or MS 25 DMS-W	385410 A (1 m) 385410 B (2 m) 385410 C (3 m)	— — —	— — —	— — —	385410 A (1 m) 385410 B (2 m) 385410 C (3 m)
V002-E6.3/F6.3, V005-E6.3/F6.3, V010-E6.3/F6.3 or V020-E6.3/F6.3	385486 A (2 m)* 385486 B (4 m)* 385486 C (6 m)*	— — —	— — —	385480 A (2 m)* 385480 B (4 m)* 385480 C (6 m)*	— — —

Additionally required: Power Supply order no. 800827 and Power Supply cable 230/115 V order no. 812587 / 812295

Optional Equipment

For Measuring Instrument	ME 5000	DME 200	DME 200 PC (-V) DME 200 DMS-PC
Charger (230 V / 50 Hz) order no.	824006	—	—
Battery 1800 mA order no.	824007	—	—
(necessary quantity: 4 pcs.)			
Software:			
DFQ-Interface Port for QS-STAT order no.	—	—	830474
PC Software ME 5000 order no.	832612	—	—
Charge Calibrator order no.	349960 A	349960 A	349960 A
(for functional test)			
Connector Cable (ME 5000-RS232) order no.	832415	—	—

Printer **type**	**ND 40**	**ND 40**	**ND 100**	**—**
order no.	200715 A	200715 A	823476	—
Technical Data:				
Print Method	8-pin Printer	8-pin Printer	9-pin Printer	—
Digits per Line	40	40	> 100	—
Print Speed	approx. 2 lines/sec.	approx. 2 lines/sec.	approx. 2 lines/sec.	—
Print Storage	0.5 KB	0.5 KB	2 KB	—
Interface Port	RS 232	RS 232	RS 232 / parallel	—
Electrical Power Supply	5 V	5 V	230 V / 50 Hz	—
Dimensions (W x H x D) mm	160 x 42 x 106	160 x 42 x 106	385 x 135 x 300	—
in.	$6^{5}/_{16}$ x $1^{11}/_{16}$ x $4^{3}/_{16}$	$6^{5}/_{16}$ x $1^{11}/_{16}$ x $4^{3}/_{16}$	$15^{5}/_{8}$ x $5^{5}/_{16}$ x $11^{13}/_{16}$	—
Weight kg / lbs.	0.35 / 0.8	0.35 / 0.8	4 / 8.8	—
Standard Equipment:				
Paper Roll (width 58 mm / $2^{9}/_{32}$ in.) order no.	200716	200716	—	—
Paper	—	—	standard	—
Ribbon order no.	200718	200718	—	—
Power Unit 100 - 240 V order no.	200717	200717	—	—
Required Accessories:				
Connector Cable				
(Measuring Instrument – Printer) order no.	349938 A	349938 B	349938 A	—

Printer ND 40

Printer ND 100

DEPRAG SCHULZ GMBH u. CO.
P.O. Box 1352, D-92203 Amberg, Germany
Kurfürstenring 12–18, D-92224 Amberg
Phone (0 96 21) 371-0, Fax (0 96 21) 371-120
www.deprag.com
info@deprag.de

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