



Screwdriving technology

Automation

Air motors

Air tools

DEPRAG

**MEASURING
ELECTRONIC**

Torque Transducers

In most situations, the essential element of screwdriving technology is torque. Controlling the torque generated by the screwdriver and inspecting the finished screw joint requires a suitable torque transducer. A torque transducer is a device that creates an electrical signal that is proportionate to the torsional load on the transducer. Technical tips on torque control are available in our leaflet D 0080 E.

Torque transducers vary widely in operation and appearance, and work on many different physical principles. The most common of these are:

a strain gage wrapped around a torsion bar, an eddy current transducer, a mechanical (spring or hydraulic) element, and a piezoelectric crystal.

To be effective, the torque transducer must have the following attributes. It must support

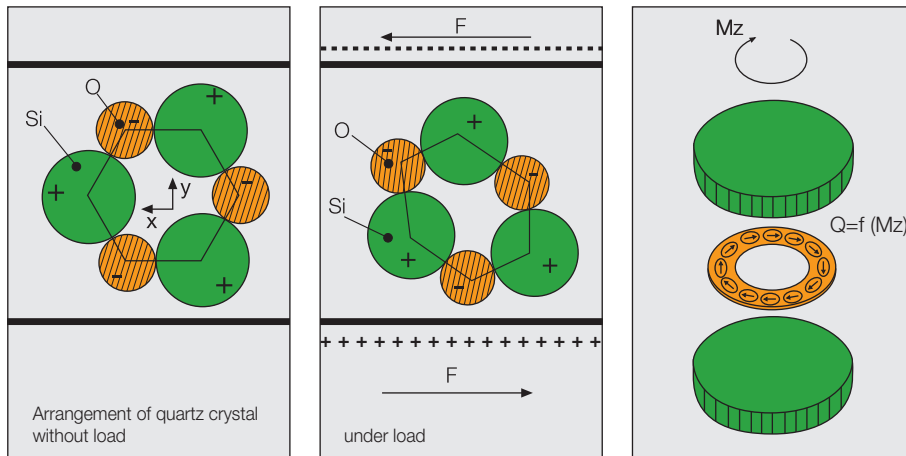
a sampling rate that will allow the measurement of rapidly changing loads, it must be sufficiently stiff to withstand the peak load, it must have a high degree of linearity, it must be stable under varying environmental conditions, and it must have a good operating lifetime.

DEPRAG offers torque transducers that work on two different physical principles, both meeting these requirements.

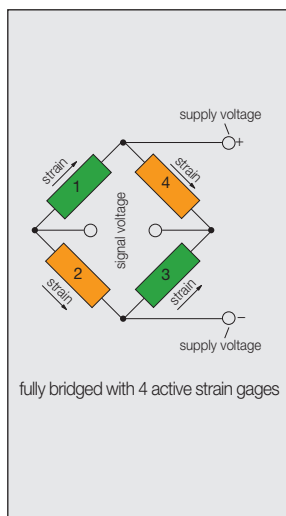
- PE (Piezo Electric) Transducer
- DMS (Strain Gage) Transducer

When connected to the correct measuring instrument, each type of torque transducer has applications in the screwdriving technology. The familiar DEPRAG piezoelectric transducer offers a large measuring range and a robust design. For less demanding applications, the strain gage transducer offers an economical alternative.

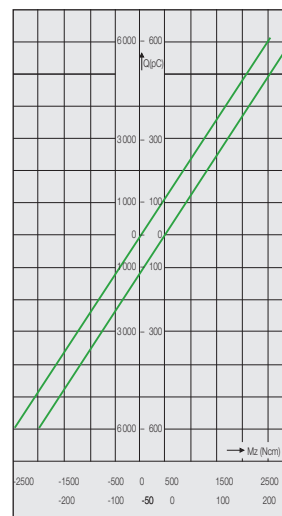
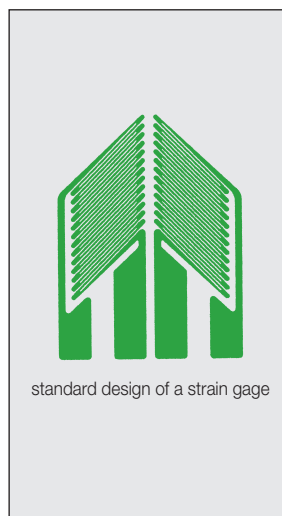




Function principle of the piezoelectric transducers



Function principle of the strain gage transducers



Linearity diagram

Torque transducers are available as stationary platforms as well as in portable version of straight and angular torque wrenches.

New in our program: Non-contact DMS transducers which measure directly on the customer's product.

Depending on Piezo-electric, strain gage or non-contact version the transducers are built to be connected to the relative electronic torque meters (see brochure D 3022 E).



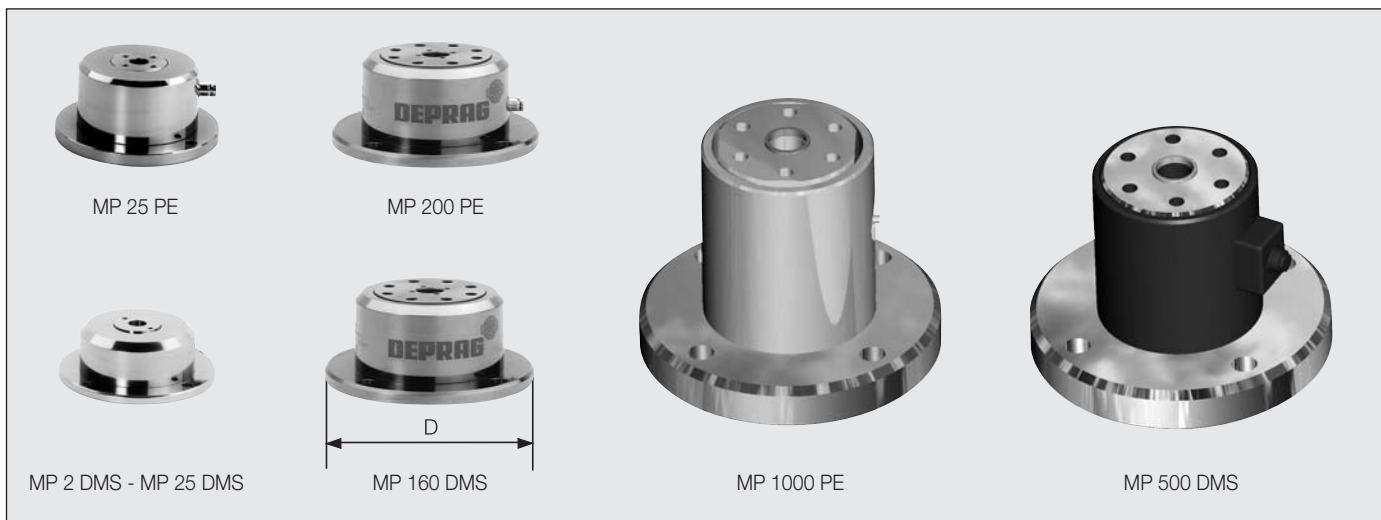
Technical data

Transducer (DMS, non-contact)					
	type order no.	V002-E6.3/F6.3	V005-E6.3/F6.3	V010-E6.3/F6.3	V020-E6.3/F6.3
Measuring range	Nm	0.2 - 2	0.5 - 5	1 - 10	2 - 20
	in.lbs	2 - 18	4 - 40	9 - 88	18 - 177
Overload Capacity	%	100	100	100	30
Speed max.	rpm	10,000	10,000	10,000	10,000
Weight approx.	kg / lbs	0.3 / 0.66	0.3 / 0.66	0.3 / 0.66	0.3 / 0.66

Required Accessories:	
Measuring Instrument	type ME 5000, ME 5400 or type ME 5600 (see brochure D 3022 E)
Connector Cable (for Transducer to Measuring Instrument ME 5...) Length 2 m / 4 m / 6 m 6.6' / 13' / 20'	order no. 385486 A / B / C
Power Supply for Transducer connected to Measuring instrument ME 5000	order no. 800827
Power Supply Cable 220 V / 110 V	order no. 812587 / 812295

When connected to a DEPRAG measuring instrument, this transducer is ideal for torque acquisition and documentation of all acquired results of screw joints and assembly requirements.

During the actual assembly process, performing torque acquisition and screw-joint analysis is possible. This feature fulfills most or all assembly-process requirements and assures even the highest quality demands.



Technical data

Piezoelectric (PA) transducers: measuring platforms		MP 25 PE	MP 200 PE	MP 1000 PE
	type order no.	360850 A	373205 A	408000 A
measuring range	Nm / in.lbs	± 25 / ± 220	± 200 / ± 1770	± 1000 / ± 8800
overload capacity	Nm / in.lbs	± 30 / ± 265	± 240 / ± 2120	± 1200 / ± 10570
sensibility	pC / Ncm	2.4	1.7	1.0
frequency response	kHz	approx. 15	approx. 3.5	approx. 11
linearity	≤ %	± 1	± 1	± 0.5
diameter D	mm / in.	105 / 4 1/8	140 / 5 1/2	200 / 7 7/8
weight	kg / lbs	1.3 / 2.9	3.5 / 7.7	16 / 35.2
connecting plug	type	BNC. neg.	BNC. neg.	10-32 UNF neg.

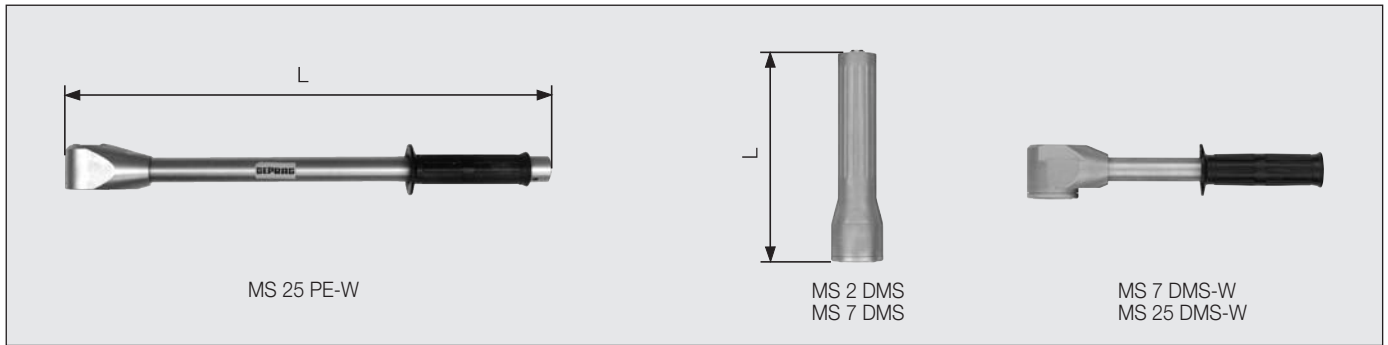
Strain gage (DMS) transducers: measuring platforms		MP 2 DMS	MP 7 DMS	MP 25 DMS	MP 160 DMS	MP 500 DMS
	type order no.	385200 B	385200 A	385200 C	385200 D	408088 A
measuring range	Nm	± 0.1 to ± 2	± 1 to ± 7	± 4 to ± 25	± 20 to ± 160	± 50 to ± 500
	in.lbs	± 0.9 to ± 18	± 9 to ± 62	± 35 to ± 221	± 177 to ± 1416	± 440 to ± 4400
admissible overload capacity	%	100	100	100	50	50
accuracy class		1	1	1	1	1
sensibility	mV/V	1.5	1.8	1.8	1.8	–
Operational temperature range	°C	0 to + 60	0 to + 60	0 to + 60	0 to + 60	0 to + 60
	°F	32 to 140	32 to 140	32 to 140	32 to 140	32 to 140
parameter temperature coefficient	% / K	0.01	0.01	0.01	0.01	0.01
zero signal temperature coefficient	% / K	0.02	0.02	0.02	0.02	0.02
supply voltage (DC)	V	5	5	5	5	12
diameter D	mm / in.	105 / 4 1/8	105 / 4 1/8	105 / 4 1/8	140 / 5 1/2	229 / 9 1/64
weight	kg / lbs	1 / 2.2	1 / 2.2	1 / 2.2	2 / 4.4	18 / 39.6
connecting plug		4-pole	4-pole	4-pole	4-pole	12-pole

Required Accessories:	Measuring Instrument (see brochure D 3022 E). Connection Cable and Screwplates see page 6.
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The measuring platforms are well suited for the installation into a calibration laboratory, as well as for the construction of a mobile measuring wagon. The robust and sturdy platform design guarantees permanent high measuring accuracies. As an optional accessory, we offer a clamping plate, which allows the temporary fastening of the platform into a vice. For specially high accuracy demands, or for the obtaining of extremely small torque values, we recommend to mount the

platform with its polished lower surface to a table top, which has been treated in a similar fashion.

Because of such an extreme high grade installation, even the smallest measuring-errors, created by lateral force, deflection, vibration, or misalignment, can be completely avoided.



Technical data

Piezoelectric (PE) transducer: torque wrench		
	type order no.	MS 25 PE-W 346217 A
measuring range	Nm / in.lbs	± 25 / ± 220
overload capacity	Nm / in.lbs	± 30 / ± 265
sensibility	pC/Ncm	2.4
frequency response	kHz	approx.15
linearity	≤ %	± 1
length L	mm / in.	440 / 17 ³ / ₈
weight	kg / lbs	1.1 / 2.4
connecting plug	type	BNC, neg.

Strain gage (DMS) transducers: torque wrench					
	type order no.	MS 2 DMS 387798 B	MS 7 DMS 387798 A	MS 7 DMS-W 388050 A	MS 25 DMS-W 388050 C
measuring range	Nm	± 0.2 to ± 2	± 1 to ± 7	± 1 to ± 7	± 4 to ± 25
	in.lbs	± 0.9 to ± 18	± 9 to ± 62	± 9 to ± 62	± 35 to ± 221
admissible overload capacity	%	100	100	100	100
accuracy class		1	1	1	1
sensibility	mV/V	1.5	1.8	1.8	1.8
operational temperature range	°C	0 to + 60	0 to + 60	0 to + 60	0 to + 60
	°F	32 to 140	32 to 140	32 to 140	32 to 140
parameter temperature coefficient	% / K	0.01	0.01	0.01	0.01
zero signal temperature coefficient	% / K	0.02	0.02	0.02	0.02
supply voltage (DC)	V	5	5	5	5
length L	mm / in.	186 / 7 ⁵ / ₁₆	186 / 7 ⁵ / ₁₆	268 / 10 ⁹ / ₁₆	423 / 16 ⁵ / ₈
weight	kg / lbs	0.5 / 1.1	0.5 / 1.1	0.5 / 1.1	0.7 / 1.5
connecting plug		4-pole	4-pole	4-pole	4-pole

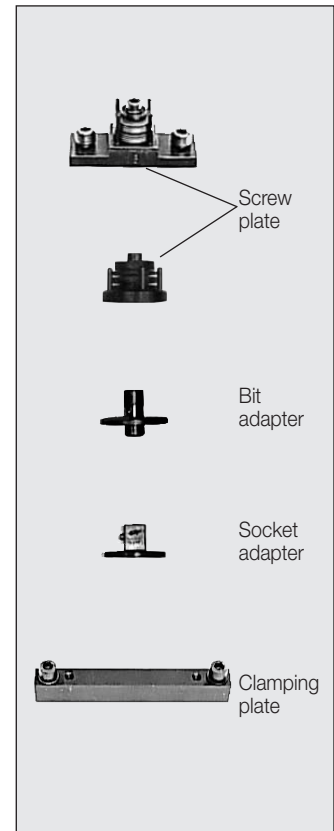
Required Accessories:	Measuring Instrument (see brochure D 3022 E). Connection Cable and Screwplates see page 6.
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The **torque wrenches** allow the testing of screwdriver-spindles without their removal from an assembly station. Because of the incorporated flat surfaces on the side of the wrench head, our torque wrenches can be temporarily clamped into a vice. In connection with the corresponding torque measuring instrument (DME 200 PC/DME 200 DMS-PC), the torque wrenches can also be used for the testing of a screw connection already, by either tightening or loosening the connection.

The torque wrench combines the application variety of conventional torque wrenches with the precision and the possibilities of up-to-date electronic torque measurement.

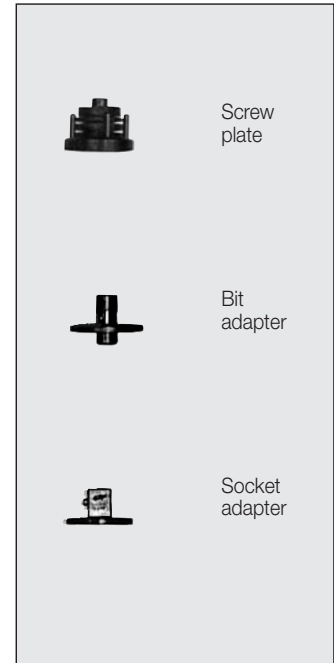
Required Accessories on special request:	for measuring platforms					
	MP 2 DMS	MP 7 DMS	MP 25 PE MP 25 DMS	MP 200 PE MP 160DMS	MP 1000 PE MP 500 DMS	
connection cable 1) 5 m / 16.4 ft. order no. (for MPXXXPE) 1 m / 3.3 ft. order no.	—	—	810675 —	810675 —	— 810629	
connection cable 1) 2 m / 6.6 ft. order no. (for MPXXXDMS) 4 m / 13.2 ft. order no. 6 m / 19.8 ft. order no.	385493 A 385493 B 385493 C	385493 A 385493 B 385493 C	385493 A 385493 B 385493 C	385493 A 385493 B 385493 C	385486 A 385486 B 385486 C	
screwplate 2) M3 (for above allen bit AF 2.5)	order no. 120425 B	120425 B	120425 B	120425 A	on request	
screwplate 2) M4 (for above allen bit AF 3)	order no. 120426 B	120426 B	120426 B	120426 A		
screwplate 2) M5 (for above allen bit AF 4)	order no. —	120427 B	120427 B	120427 A		
screwplate 2) M6 (for above allen bit AF 5)	order no. —	—	120428 C	120428 A		
screwplate 2) M8 (for above allen bit AF 6)	order no. —	—	120439 C	120439 A		
screwplate 2) M10 (for above socket AF 17)	order no. —	—	—	120453 A		
screwplate 2) M12 (for above socket AF 19)	order no. —	—	—	120446 A		
More Accessories on special request:						
bit adapter 2) hex. drive female (1/4")	order no. 120489 A	120489 A	120489 A	120489 A		
socket adapter 2) square drive male (1/2")	order no. 120488 A	120488 A	120488 A	120488 A		
clamping plate (for clamping the torque dynamometer into a vice)	order no. 120436 B	120436 B	120436 B	120436 A		

1) for connection of transducer and monitor
2) inserting tools see leaflet D 3320 E



Required Accessories on special request:	for torque wrench		
	MS 2 DMS	MS 7 DMS MS 7 DMS-W	MS 25 PE-W MS 25 DMS-W
connection cable 1) 5 m / 16.4 ft. order no. (for MS 25 PE-W)	—	—	810675
connection cable 1) 2 m / 6.6 ft. order no. (for MS XX DMS) 4 m / 13.2 ft. order no. 6 m / 19.8 ft. order no.	385493 A 385493 B 385493 C	385493 A 385493 B 385493 C	385493 A 385493 B 385493 C
screwplate 2) M3 (for above allen bit AF 2.5)	order no. 120425 B	120425 B	120425 B
screwplate 2) M4 (for above allen bit AF 3)	order no. 120426 B	120426 B	120426 B
screwplate 2) M5 (for above allen bit AF 4)	order no. —	120427 B	120427 B
screwplate 2) M6 (for above allen bit AF 5)	order no. —	—	120428 C
screwplate 2) M8 (for above allen bit AF 6)	order no. —	—	120439 C
More Accessories on special request:			
bit adapter 2) hex. drive female (1/4")	order no. 120489 A	120489 A	120489 A
socket adapter 2) square drive male (1/2")	order no. 120488 A	120488 A	120488 A

1) for connection of transducer and monitor
2) inserting tools see leaflet D 3320 E



Factory calibration on special order

Calibration of a measurement transducer (measurement platform, measuring wrench or non-contact transducer)

Calibration of a torque measuring instrument

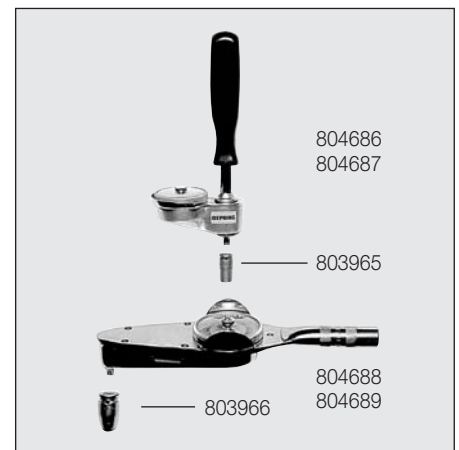
Calibration of a measurement chain (a measurement transducer and one torque measuring instrument)

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

Mechanical torque wrenches					
	order no.	804686	804687	804688	804689
measuring range	Nm/in.lbs	0 - 3.4 / 3.0	0 - 8.4 / 75	0 - 17 / 150	0 - 60 / 600
increment	Nm/in.lbs	0.1 / 1	0.2 / 5	0.5 / 5	1 / 20
drive (square male)		1/4"	1/4"	3/8"	3/8"
Optional equipment bit adapter *)	order no.	803965	803965	803966	803966

*) inserting tools see leaflet D 3320 E



The mechanical torque wrenches (manual indicator design) can be used for simple adjustment or control tasks. To obtain the torque of a screw connection, simply re-tighten the fastener. The use of a mechanical

torque wrench allows the fast appraisal of tightening torque values.

Possible Combinations

Measuring principle: Piezo-electric

Measuring Instrument

type ME 5000, type ME 5400
or type ME 5600

Connection Cable:

Length 5 m order no. 810675

Torque Transducer

Measuring Platforms: type MP 25 PE,
type MP 200 PE
Torque Wrenches: type MS 25 PE-W

Measuring Instrument

type ME 5000, type ME 5400
or type ME 5600

Connection Cable:

Length 1 m order no. 810629

Torque Transducer

Measuring Platform: type MP 1000 PE

Measuring principle: Strain gage

Measuring Instrument

type ME 5000, type ME 5400
or type ME 5600

Connection Cable:

Connection Measuring Instrument ME5... to
Measuring Platforms or Torque Wrenches
Length 2 m order no. 385493 A
Length 4 m order no. 385493 B
Length 6 m order no. 385493 C

Torque Transducer

Measuring Platforms: type MP 2 DMS
type MP 7 DMS
type MP 25 DMS
type MP 160 DMS
Torque Wrenches: type MS 2 DMS
type MS 7 DMS
type MS 7 DMS-W
type MS 25 DMS-W

Measuring principle: Strain gage or DMS non-contact

Connection Cable, Length 2 m / 4 m / 6 m

Measuring Instrument

type ME 5000, type ME 5400
or type ME 5600

Connection Cable:

Connection Measuring Instrument ME5... to
Non-contact Transducer or Measuring Platforms
Length 2 m order no. 385486 A
Length 4 m order no. 385486 B
Length 6 m order no. 385486 C

Torque Transducer

Non-contact Transducer
type V002-E6.3/F6.3
type V005-E6.3/F6.3
type V010-E6.3/F6.3
type V020-E6.3/F6.3

Additionally required when connected with ME5000:
Power Supply order no. 800827 and
Power Supply Cable 230 V order no. 812587
115 V order no. 812295

Measuring Platform
type MP 500 DMS

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DEPRAG INC.

P.O. Box 1554 · Lewisville, Texas 75067 - 1544
640 Hembry Street · Lewisville, Texas 75057 - 4728
Phone (972) 221 - 8731 · FAX (972) 221 - 8163
TOLL FREE (800) 4 DEPRAG
www.deprag.com
deprag@depragusa.com



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