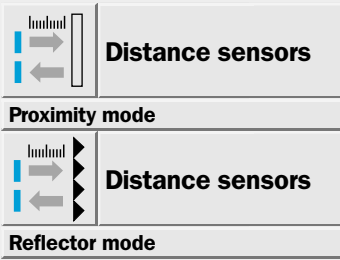


DME 2000/DME 3000: Precise non-contact distance determination



Two versions are available. The DME 2000 measures distances of up to 130 metres and, in proximity mode (i.e. without reflector), up to 2 metres. The DME 3000 has a scanning range of 500 metres – distances of up to ten metres can be measured in the proximity version.

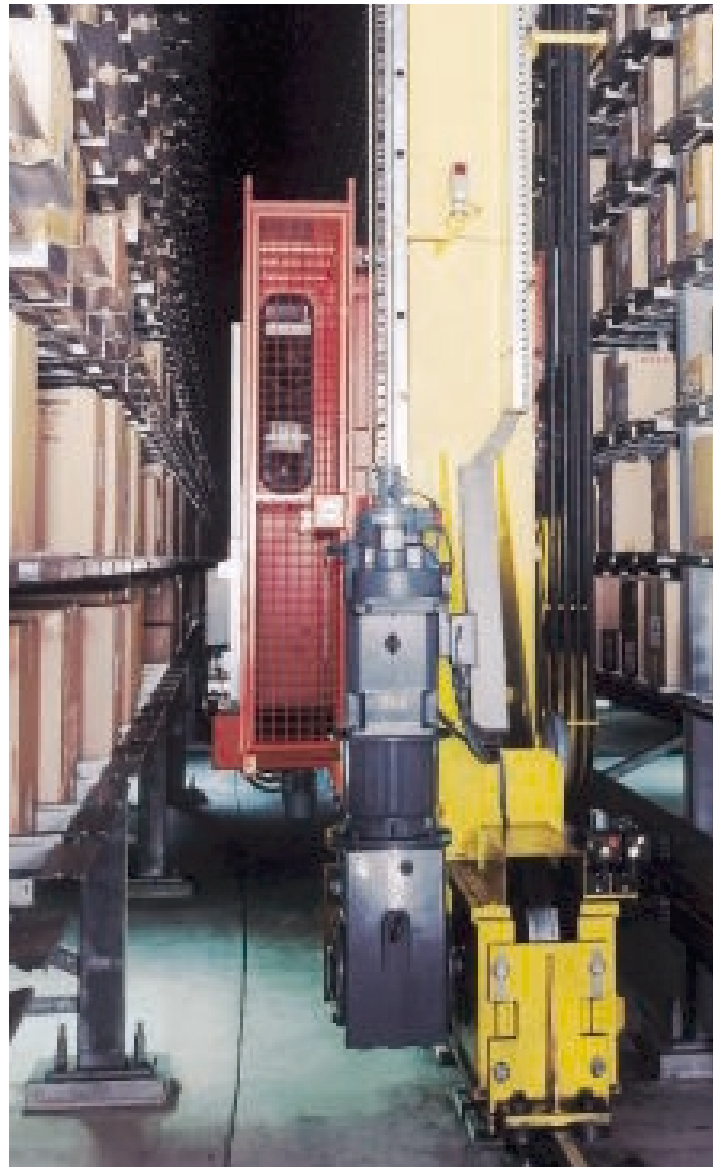
Serial interfaces permit external further processing of the measured values. Interfacing to Profibus is also possible and the DME can be connected to warehouse control circuits via the SSI interface.

In handling systems, DME distance measuring devices are the perfect alternative to control components that are subject to wear, such as rotary transducers. They allow high-bay stackers, cranes, lift cabins or automated guided vehicle systems to be positioned with precision.

The visible red light of the Class 2 laser sender facilitates alignment and handling. Adjustment and adaptation to individual automation tasks can be carried out quickly and easily by means of programming buttons on the device, an eight-digit display and the user-friendly menu-driven dialogue.



▲ Crane monitoring with DME: The distance measuring device triggers the emergency stop when a minimum distance is undershot.



▲ Positioning high-bay stackers with the DME 3000 distance measuring device.



▲ Non-wearing, precise and flexible: A DME 3000 sensor used for positioning a rail-mounted rack-serving unit with millimetre precision; mechanical switches are no longer required, new docking points can be set quickly without any assembly requirements.



▲ DME process information: The weight of a coil can be determined from its diameter.



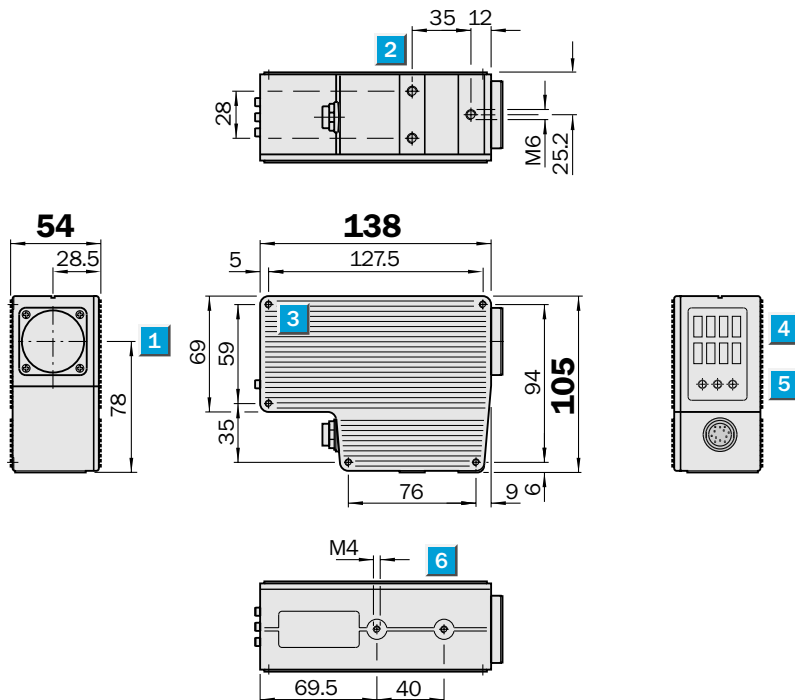
▲ A DME distance measuring device used to detect drill holes as part of inspection/quality control.

	Measurement range 100...2047 mm
	Measurement range 0,1...130 m
Distance measuring devices	

- Excellent measurement accuracy and reproducibility thanks to time-of-flight measurement
- Simple adjustment using visible red light
- Freely programmable parameters
 - 2 switching outputs
 - pre-failure signalling output
 - plausibility control
- RS 232 serial interface
- Analogue output

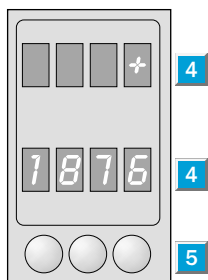


Dimensional drawing



Adjustments possible

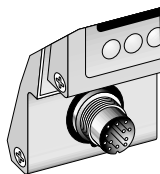
DME 2000-000



- 1** Centre of optical axis
- 2** M6 threaded mounting hole, 10 mm deep
- 3** M4 threaded mounting hole, 14 mm deep (this side only)
- 4** 8-digit alphanumeric indicator
- 5** Programming switches
- 6** M4 threaded mounting hole, 6 mm deep

Connection type

DME 2000-000



12-pin, M 16

wht	A	DTR	Data terminal ready (RS 232 output)
brn	B	Q ₁	Q ₁ switching output
grn	C	CTS	Clear to send (RS 232 input)
yel	D	Q _A	Q _A analogue output
gra	E	Q _S	Q _S service output
pnk	F	Q _P	Q _P plausibility output
red	G	L+	+ 18...30 V DC V _S
blk	H	RxD	R x D (receive data, RS 232 input)
vio	I	S&H	Blanking input
gra/pnk	K	TxD	T x D (send data, RS 232 output)
red/blu	L	Q ₂	Q ₂ switching output
blu	M	M	0 V (earth)



Laser class 2

Accessories	page
Cable receptacles	496
Mounting brackets	510
Link mountings	510
Reflectors	520
Special accessories	556
Dust covers	
Cooling plates	
Remote positioning tubes	

Technical Data		DME 2000-	000								
Light source¹⁾, light type	Laser diode, red light										
Laser category	2 (IEC 825-1/EN 60825-1)										
Supply voltage V_S	18...30 V DC ²⁾										
Ripple	< 5 V _{SS} ³⁾										
Power consumption	< 6 W ⁴⁾										
Switching outputs											
Q ₁ , Q ₂ , Q _P , Q _S	PNP										
Output voltage	HIGH = V _S - ≤ 2 V/LOW = 2 V										
Output current I _A	100 mA										
Q ₁ and Q ₂ switching outputs	Reversible										
Switching limit	Adjustable in 1 mm increments										
Switching hysteresis	Adjustable in 2mm increments, 0...254 mm										
Q _P plausibility output	HIGH: measurement correct/ LOW: measurement error										
Q _S service output	HIGH: device has no faults/ LOW: pre-failure signalling output										
Blanking input S/H	HIGH: ≥ 10 V; ≤ V _S / LOW: ≤ 2 V or unswitched;										
	HIGH: Measured value stored/ LOW: free-running										
Analogue output	0...20 mA or 4...20 mA										
Connection type	Plug										
VDE protection class⁵⁾	<input type="checkbox"/>										
Circuit protection⁶⁾	A, B, C										
Enclosure rating	IP 65 (IEC 529)										
Ambient temperature T_A	Operation - 10 °C...+ 45 °C Storage - 25 °C...+ 75 °C										
Weight	Approx. 980 g										
Shock load	To IEC 68										
Serial interface	RS 232 (4.8/9.6, 19.2 kBaud)										
Temperature drift	Type 0.4 mm/K										

1) Average service life 50,000 h
at T_A = +25 °C

2) Limit values
3) May not exceed or fall short of
V_S tolerances

4) Without load
5) Reference voltage 50 V DC

6) A = V_S connections reverse-polarity
protected
B = Output Q reverse-polarity protected
C = Interference pulse suppression

	Mode 1.1: Proximity mode	Mode 2.1: Reflector mode	Order information	
			Standard type	Part no.
Measurement range⁷⁾	100...2047 mm	0.1...130 m	DME 2000-000	1 010 578
Resolution	1 mm	1 mm		
Light spot dimensions	Approx. 3 mm/2 m	Approx. 250 mm/130 m		
Effect of compressed air		0.3 ppm/mbar		
Effect of air temperature		1 ppm/K		
Measured value output cycle	29 ms	100 ms		
Target remission	> 6...< 36000 %	Reflective tape		
Max. running speed		3 m/s		
Reproducibility⁸⁾	1 mm (= 90 % remission)	2 mm		
Statistical error 1 σ	3 mm (> 18 % remission)	3...130 m APM reflective tape		
	25 mm (> 6 % remission)	3...100 m Diamond Grade		
Statistical error 3 σ ⁹⁾	Typical 1 mm; max. 2 mm	0.1...90 m reflective tape 7610 0.1...40 m reflective tape 3290		
Accuracy¹⁰⁾	± 5 mm (= 90 % remission)	+ 5/- 20 mm		
	± 11 mm (> 18 % remission)	In range as below		
	± 65 mm (> 6 % remission)	reproducibility stated		

7) Relative to front edge of object
8) Environmental conditions constant at
30 min. minimum switching period
9) Measurement distance 1 m,
90 % remission

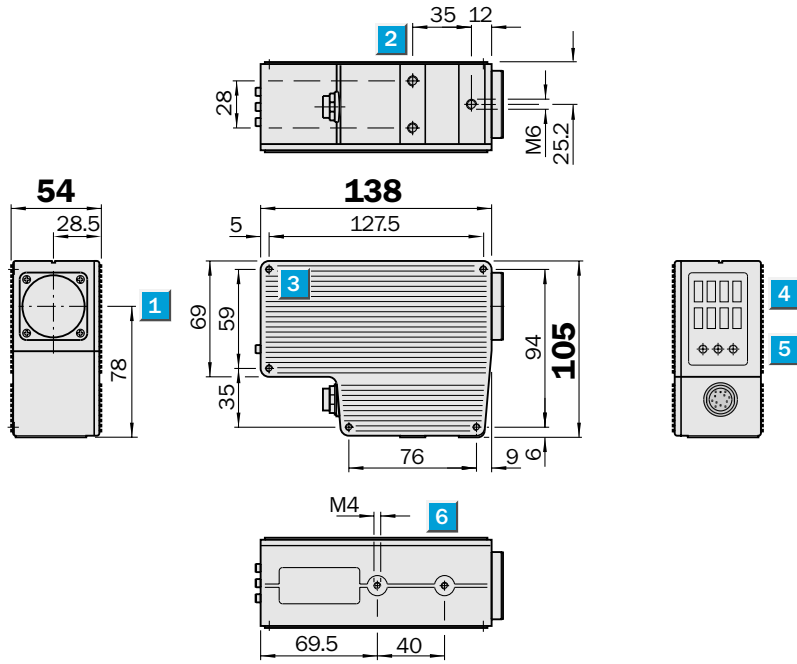
10) 20 °C ambient temperature,
1013 mbar, 30 min. switching period,
re-calibration recommended after
25,000 h

Measurement range up to 500 m

Distance measuring devices

- Excellent measurement accuracy and reproducibility thanks to time-of-flight measurement
- Simple adjustment using visible red light
- Easy handling due to programmable parameters
 - 2 switching outputs
 - pre-failure signalling output
 - plausibility control
- RS 422 serial interface and SSI interface
- Profibus
- Gateway to Interbus, DeviceNet

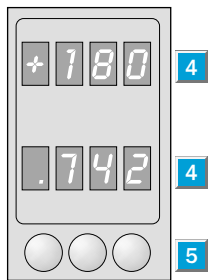
Dimensional drawing



Adjustments possible

DME 3000-111	DME 3000-111P
DME 3000-311	

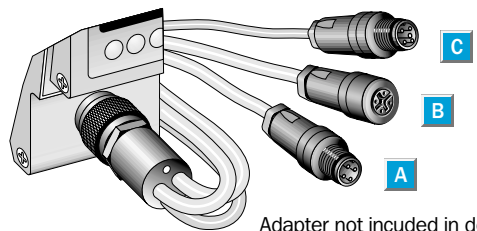
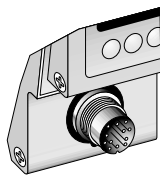
- 1 Centre of optical axis
- 2 M6 threaded mounting hole, 10 mm deep
- 3 M4 threaded mounting hole, 14 mm deep (this side only)
- 4 8-digit alphanumeric signal indicator
- 5 Programming switches
- 6 M4 threaded mounting hole, 6 mm deep



Connection types

DME 3000-111
DME 3000-311

DME 3000-111P



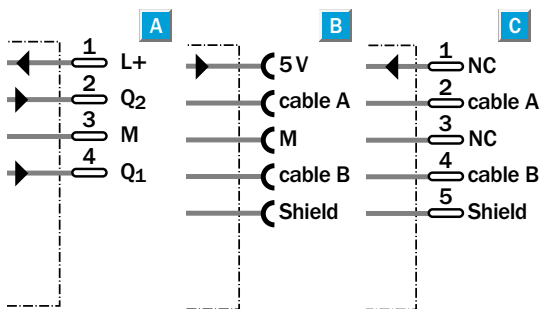
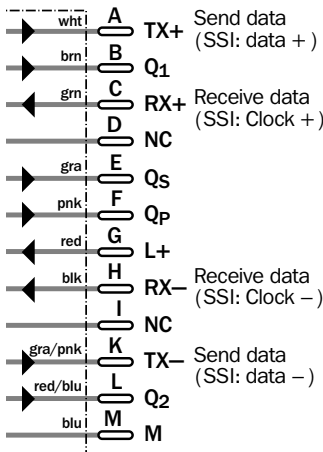
Adapter not included in delivery

12-pin, M 16

4-pin, M 12

5-pin, M 12

5-pin, M 12



Accessories	page
Cable receptacles	496
Mounting brackets	510
Link mountings	510
Reflectors	520
Special accessories	556
Dust covers	
Cooling plates	
Remote positioning tube	

Technical Data		DME 3000-	111	311	111P						
Measurement range	0.1... 500 m ¹⁾ depending on reflector, see below										
Accuracy ^{2) 3)}	± 5 mm										
Reproducibility ⁴⁾	Depending on measurement range, see below										
Light spot diameter	1 m (measurement distance 500 m)										
Resolution	0.125 mm										
Light source ⁵⁾ , light type	Laser diode, red light										
Laser category	2 (IEC 825-1/EN 60825-1)										
Supply voltage V _S	18...30 V DC ⁶⁾										
Ripple	< 5 V _{SS} ⁷⁾										
Power consumption	≤ 6 W ⁸⁾										
Switching outputs	PNP/NPN										
Q ₁ , Q ₂ , Q _P , Q _S	HIGH = V _S - < 2 V / LOW = < 2 V										
Output current I _A max.	100 mA										
Q ₁ and Q ₂ switching outputs	Reversible Q/ \bar{Q}										
Switching limit/switching hysteresis	Adjustable										
Q _P plausibility output	HIGH: measurement correct/ LOW: measurement error										
Q _S service output	HIGH: OK / LOW: pre-failure signalling output										
Connection type	Plug										
VDE protection class ⁹⁾	<input type="checkbox"/>										
Circuit protection ¹⁰⁾	A, B, C										
Enclosure rating	IP 65										
Ambient temperature T _A	Operation - 10 °C...+ 45 °C Storage - 25 °C...+ 75 °C										
Weight	Approx. 980 g										
Interfaces	SSI: GRIS/BINARY adjust., 24 or 25 bits										
Serial interface	RS 422: 4.8/9.6/19.2/38.4 kBaud										
Profibus	Max. 12 MBaud										
Effect of compressed air	0,3 ppm/hPa										
Effect of air temperature	1 ppm/K										
Temperature drift	Typical 0.4 mm/K Typical 0.2 mm/K										
Measured value output											
SSI/Profibus	1.5 ms										
RS 422, 38.4 kBaud	18 ms										
Initialisation period	6 s										
Max. running speed	6 m/s										
1) Relative to front edge of object	4) Environmental conditions constant, min. switching period 30 min.	7) May not exceed or fall short of V _S tolerances	10) A = V _S connections reverse-polarity protected								
2) 23 °C air temperature, 977 hPa, min switching period 30 min	5) Average service life 100,000 h at T _A = +25 °C	8) Without load	B = Output Q short-circuit protected								
3) Re-calibration recommended after 25,000 h	6) Limit values	9) Reference voltage 50 V DC	C = Interference pulse suppression								

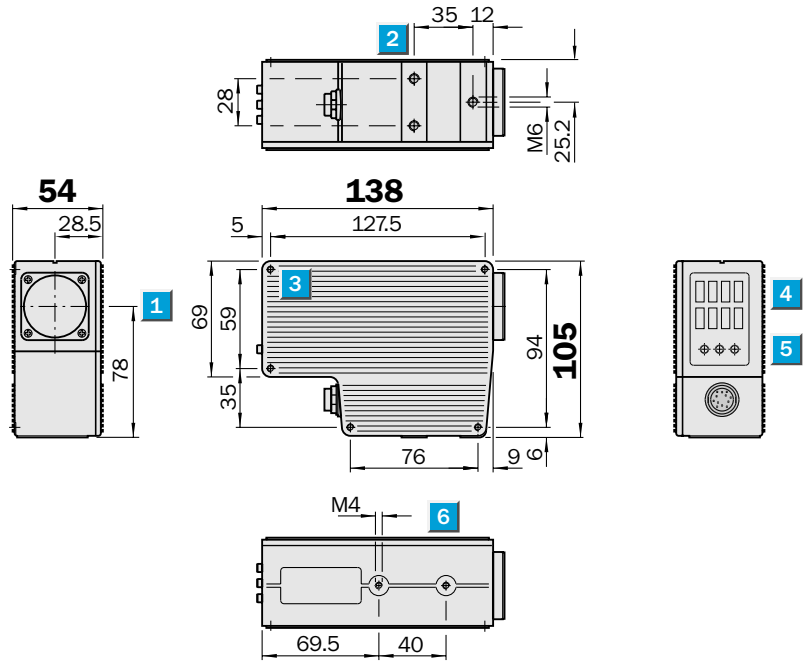
Measurement range			Order information	
Reproducibility	0.5 mm	2 mm	Type	Part no.
Statistical error 1 σ (switching period min. 30 min, environmental conditions constant)				
Measurement range with reflector				
Reflective tape 3290	0.1 m... 20 m	0.1 m... 40 m	DME 3000-111	1 013 110
Reflective tape 7610	0.1 m... 40 m	0.1 m... 90 m	DME 3000-311	1 016 283
Reflective tape «Diamond Grade»	2.0 m... 70 m	0.5 m... 250 m	DME 3000-111P	1 018 063
Reflective tape APM	2.0 m... 90 m	1.0 m... 200 m		
Multi-reflector PL240F	0.1 m... 250 m	0.1 m... 300 m		
Multi-reflector PL560F	0.1 m... 270 m	0.1 m... 350 m		
Multi-reflector PL880F	10 m... 300 m	8.0 m... 500 m		

Measurement range up to 10 m

Distance measuring devices

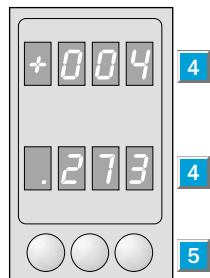
- Excellent measurement accuracy and reproducibility thanks to time-of-flight measurement
- Simple adjustment using visible red light
- Easy handling due to programmable parameters
 - 2 switching outputs
 - pre-failure signalling output
 - plausibility control
- RS 422 serial interface and SSI interface
- Profibus
- Gateway to Interbus, DeviceNet

Dimensional drawing



Adjustments possible

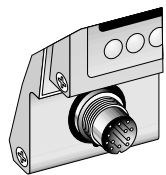
DME 3000-211	DME 3000-232
DME 3000-212	DME 3000-211P



- 1 Centre of optical axis
- 2 M6 threaded mounting hole, 10 mm deep
- 3 M4 threaded mounting hole, 14 mm deep (this side only)
- 4 8-digit alphanumeric indicator
- 5 Programming switches
- 6 M4 threaded mounting hole, 6 mm deep

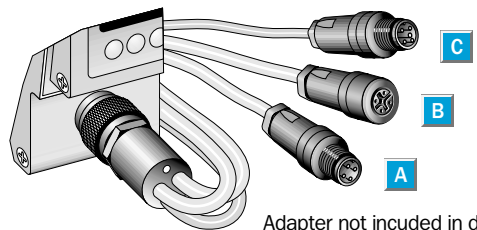
Connection types

DME 3000-211
DME 3000-212
DME 3000-232



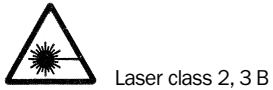
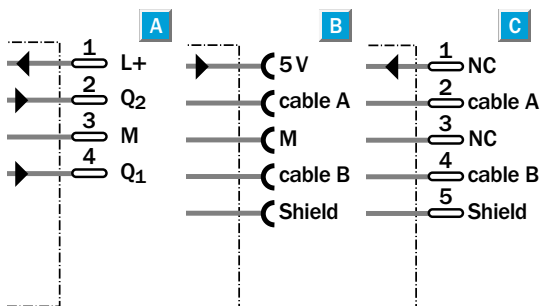
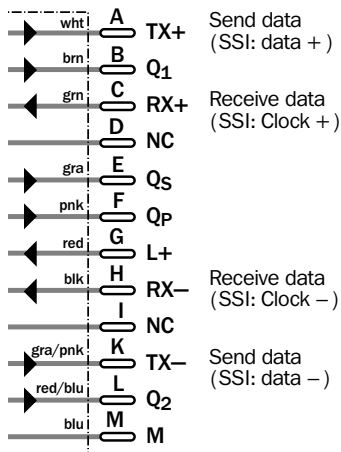
12-pin, M 16

DME 3000-211P



Adapter not included in delivery

4-pin, M 12 5-pin, M 12 5-pin, M 12



Accessories	page
Cable receptacles	496
Mounting brackets	510
Link mountings	510
Special accessories	556
Dust covers	
Cooling plates	
Remote positioning tubes	

Technical Data		DME 3000-		211	212	232	211P				
Measurement range	100...8,000 mm										
	100...10,000 mm										
Light spot diameter	5 mm (measurement distance 8 m)										
Resolution	0.125 mm										
Light source²⁾, light type	Diode laser, red light										
Laser category	2 (IEC 825-1/EN 60825-1)										
Laser category	3 B (IEC 825-1/EN 60825-1)										
Service life (at 25 °C)	MTTF 50,000 h										
NIR blocking filter											
Supply voltage V_S	18...30 V DC ³⁾										
Ripple	< 5 V _{SS} ⁴⁾										
Power consumption	≤ 6 W ⁵⁾										
Switching outputs	PNP/NPN										
Q ₁ , Q ₂ , Q _P , Q _S	HIGH = V _S - < 2 V/LOW = < 2 V										
Output current I _A max.	100 mA										
Q ₁ and Q ₂ switching outputs	Reversible Q/ \bar{Q}										
Switching limit/switching hysteresis	Adjustable										
Q _P plausibility output	HIGH: measurement correct/ LOW: measurement error										
Q _S service output	HIGH: OK/ LOW: pre-failure signalling output										
Connection type	Plug										
VDE protection class⁶⁾	<input type="checkbox"/>										
Circuit protection⁷⁾	A, B, C										
Enclosure rating	IP 65										
Ambient temperature T_A	Operation - 10 °C...+ 45 °C										
	Storage - 25 °C...+ 75 °C										
Weight	Approx. 980 g										
Interfaces	SSI: GRIS/BINARY adjust., 24 or 25 bits										
Serial interface	RS 422: 4.8/9.6/19.2/38.4 kBaud										
Profibus	Max. 12 MBaud										
Temperature drift	Typical 0.4 mm/K										
	(compensation on request)										
Measured value output											
SSI/Profibus	21 ms										
RS 422, 38.4 kBaud	21 ms										
Initialisation period	6 s										

- 1) Relative to front edge of object
- 2) Average service life 50,000 h at T_A = + 25 °C
- 3) Limit values

- 4) May not exceed or fall short of V_S tolerances
- 5) Without load
- 6) Reference voltage 50 V DC

- 7) A = V_S connections reverse-polarity protected
- B = Output Q short-circuit protected
- C = Interference pulse suppression

- 8) Environmental conditions constant, min. switching period 30 min.
- 9) 23 °C air temp, 977 hPa, min. switching period 30 min.
- 10) Re-calibration recommended after 25,000 h.

Reproducibility and accuracy as a function of measurement distance											
	DME 3000-										
	21..	232	21..	232	21..	232	21..	232	21..	232	
Measurement distance	1 m		2 m		4 m		6 m		8 m		10 m
Reproducibility⁸⁾											
White, 90 % remission	1 mm	0.5 mm	2 mm	1 mm	5 mm	2 mm	10 mm	5 mm	25 mm	20 mm	
Grey, 18 % remission	2 mm	1 mm	5 mm	2.5 mm	25 mm	5 mm	-	25 mm	-	-	
Black, 6 % remission	5 mm	2 mm	25 mm	8 mm	-	25 mm	-	-	-	-	
Accuracy⁹⁾¹⁰⁾											
White, 90 % remission	±5 mm	±5 mm	±5 mm	±5 mm	±10 mm	±5 mm	±20 mm	±5 mm	±30 mm	±20 mm	
Grey, 18 % remission	±5 mm	±5 mm	±10 mm	±5 mm	±30 mm	±10 mm	-	±25 mm	-	-	
Black, 6 % remission	±10 mm	±5 mm	±20 mm	±10 mm	-	±10 mm	-	-	-	-	

Order information	
Type	Part no.
DME 3000-211	1 013 782
DME 3000-212	1 015 906
DME 3000-232	1 015 794
DME 3000-211P	1 018 064