

Data sheet

**ML**



## Technical data

Type	ML				
Accuracy class	%	≤±0.10			
Rated torque (Md <sub>n</sub> )	Nm	50	100	200	400
<b>Torque measuring system</b>					
Technology	-	Rotating			
Rated torque (Md <sub>n</sub> ) #1	Nm	50	100	200	400
Outputs	-	Frequency, Voltage, Current, CAN bus, Alert			
Test signal	-	see test report			
<b>Torque accuracy class per output type (related to Md<sub>n</sub>)</b>					
Frequency output / CAN	%	≤±0.10			
Voltage output	%	≤±0.10			
<b>Linearity deviation including hysteresis related to Md<sub>n</sub> #2</b>					
Frequency / CAN, 0%...30%	%	≤±0.030			
Frequency / CAN, 30%...60%	%	≤±0.050			
Frequency / CAN, 60%...100%	%	≤±0.100			
Voltage output	%	≤±0.10			
<b>Rel. standard deviation of the reproducibility according to DIN 1319, by reference to variation of the output signal (rel. to Md<sub>n</sub>)</b>					
Frequency output / CAN	%	≤±0.10			
Voltage output	%	≤±0.10			
<b>Temperature influence per 10K in the nominal temperature range on the output signal related to the actual value of signal span (rel. to Md<sub>n</sub>)</b>					
Frequency output / CAN	%	≤±0.10			
Voltage output	%	≤±0.10			
<b>Temperature influence per 10K in the nominal temperature range on the zero signal (rel. to Md<sub>n</sub>)</b>					
Frequency output / CAN	%	≤±0.10			
Voltage output	%	≤±0.10			
<b>Long-term drift over 48h at reference temperature</b>					
Voltage output	mV	<1.0			

## Technical data

Type		ML			
Accuracy class	%	±0.10			
Rated torque (M <sub>d,n</sub> )	Nm	50	100	200	400
<b>Nominal sensitivity (range between zero torque and rated torque)</b>					
Frequency output	kHz	20			
Voltage output	V	5.0 / 10.0 / 2.5 / 5.0			
<b>Output signal at zero torque</b>					
Frequency output	kHz	60			
Voltage output	V	0.0 / 0.0 / 2.5 / 5.0			
<b>Nominal output signal</b>					
Frequency output at positive nominal value	kHz	80			
Frequency output at negative nominal value	kHz	40			
Voltage output at positive nominal value	V	5 / 10 / 5 / 10			
Voltage output at negative nominal value	V	-5 / -10 / 0 / 0			
<b>Max. modulation range</b>					
Frequency output	kHz	30...90			
Voltage output	V	-10.5...10.5			
<b>Group delay time</b>					
Frequency output	µs	10			
Voltage output	µs	3,000			
CAN	µs	1,000			

## Technical data

Type		ML			
Accuracy class	%	≤±0.10			
Rated torque (Md <sub>n</sub> )	Nm	50	100	200	400
<b>Angular measuring system</b>					
Pulses per rev	ppr	7,680			
Resolution	°	0.05			
Analogue voltage output	-	±10V 16 Bit			
<b>Temperature ranges</b>					
Nominal temperature range (System)	°C	0...70			
Operating temperature range (System) #3	°C	-10...70			
Storage temperature range (System)	°C	-10...70			
<b>Load limits #4</b>					
Limit torque, related to Md <sub>n</sub>	%	325	325	325	225
Breaking torque approx., related to Md <sub>n</sub>	%	750	750	750	450
<b>Requirements to application</b>					
Maximum diameter of vehicle steering wheel (when using straight splines) #5	mm	372			
Maximum diameter of vehicle steering wheel (when using bended splines) #5	mm	355			

## Technical data

Type	ML				
Accuracy class	%	±0.10			
Rated torque (Md <sub>n</sub> )	Nm	50	100	200	400
<b>Weight approx.</b>					
System	kg	1.30			
<b>Power supply</b>					
Nominal supply	V (DC)	N/A			
Supply range #6	V (DC)	9...36			
Max. current consumption in measuring mode	A	<0.70			
Max. current consumption in start-up mode	A	<2			
Nominal power consumption	W	<17			
<b>Load resistance</b>					
Frequency output	-	RS422			
Voltage output	kOhm	≥5			
<b>Dynamic</b>					
Frequency output	kHz	≤7.00			
Voltage output	kHz	≤1.00			
CAN output conversation rate	1/s	≤1000.00			
<b>Miscellaneous</b>					
CAN	-	2B			
Configuration interface	-	USB			
Material	-	Steel			
Measuring range (related to Md <sub>n</sub> )	%	120			
Matching evaluation units	-	VETAS III			
Article number	-	10001175			

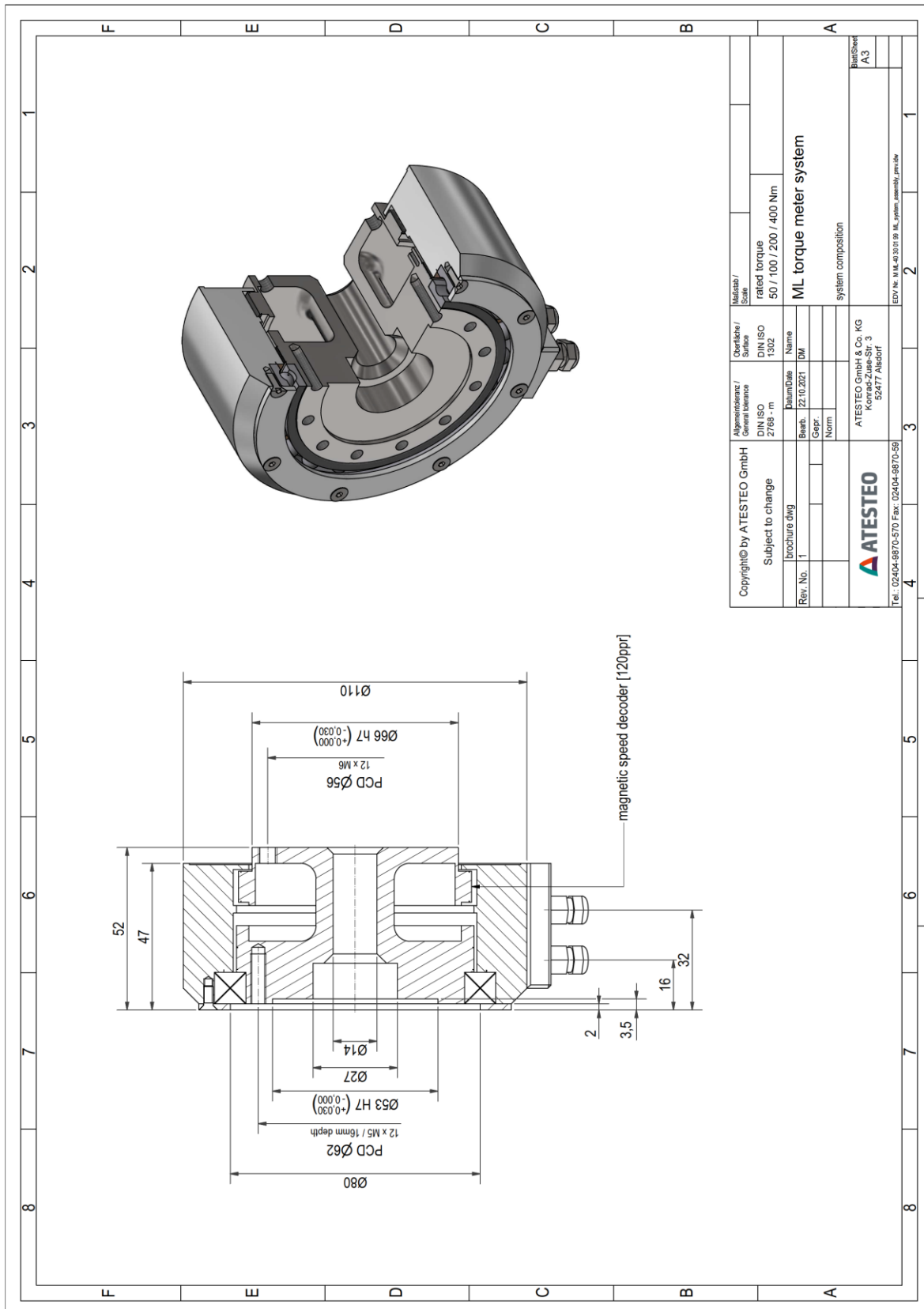
## Remarks and information

Link no.	Topic	Remark
#1	Nominal torque	Based on customer requests, the measurement systems can optionally be optimized for not listed nominal torque values (intermediate ranges possible).
#2	Linearity	Values of Linearity deviation incl. Hysteresis can only be reached if positive and negative sensitivity values are used.
#3	Temperature range (stator)	No condensation allowed. Temperature related to housing ground point.
#4	Load limits	The given values are only valid if no other load occurs at the same time. If the loads in sum are 100%, the max. error will be 0.3% of the nominal torque.
#5	Vehicle steering wheel	Applies only if adapter kit is used. The splines can be enlarged on demand for steering wheels with larger diameters.
#6	Supply voltage	The supply voltage range must be given at measurement system side. Long wires can reduce the voltage level from power supply to measurement system.

# Steering Wheel

Steering wheel

## Drawing



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