ATESTEO

Excellence in drivetrain testing

Data sheet

FxiS / FxeS

Technical data

Type		F0iS-SV	F0iS-SV	F0eS-SV	F0eS-SV	
Accuracy class (standard)	%	≤±0.05				
Rated torque Mn	Nm	200 400	500 1,000	200 400	500 1,000	
Torque measuring system						
Technology	-	Rotating				
Rated torque Mn #1	Nm	200 400	500 1,000	200 400	500 1,000	
Rated torque second channel (Minimum), optional #2	Nm	40 80	100 200	40 80	100 200	
Accuracy class (extended)	%	≤±0.03				
Outer diameter of rotor #3	mm	94				
Lengths (Rotor, without centering)	mm	54				
Pitch circle diameter #4	mm	75.0				
Outputs	-	Frequency, Voltage, Current, CAN bus, Alert				
Speeds and speed measuring systems						
Speed detection (integrated)	-	without				
Speed detection (optional)	-	optical				
Maximum Speed without optional speed detection system	rpm	20,000				
Optional increased speed	rpm	30,000				
Maximum speed with magnetic speed encoder	rpm	N/A				
Maximum speed with optical speed encoder	rpm	see below in speed detection description				
Maximum speed with inductive speed encoder	rpm	N/A				
Torque accuracy class per output type (related to rated torque)						
Frequency output / CAN	%	≤±0.05				
Voltage output	%	≤±0.10				
Current output	%	≤±0.10				
Frequency output / CAN (option higher accuracy)	%	≤±0.03				

Technical data

Type		F0iS-SV	F0iS-SV	F0eS-SV	F0eS-SV	
Accuracy class (standard)	%		≤±0.05			
Rated torque Mn	Nm	200 400	500 1,000	200 400	500 1,000	
Linearity deviation including hysteresis related to nominal value #5						
Frequency / CAN, 0%...30% of Mn	%		≤±0.010			
Frequency / CAN, 30%...60% of Mn	%		≤±0.020			
Frequency / CAN, 60%...100% of Mn	%		≤±0.030			
Voltage output	%		≤±0.05			
Current output	%		≤±0.05			
Rel. standard deviation of the reproducibility according to DIN 1319, by reference to variation of the output signal						
Frequency output / CAN	%		≤±0.03			
Voltage output	%		≤±0.05			
Current output	%		≤±0.05			
Test signal	-		see test report			
Temperature Influence per 10K in the nominal temperature range on the output signal related to the actual value of signal span						
Frequency output / CAN	%		≤±0.05			
Voltage output	%		≤±0.10			
Current output	%		≤±0.10			
Temperature influence per 10K in the nominal temperature range on the zero signal, related to the nominal sensitivity						
Frequency output / CAN	%		≤±0.05			
Voltage output	%		≤±0.10			
Current output	%		≤±0.10			
Long-term drift over 48h at reference temperature						
Voltage output	mV		<1.0			
Current output	µA		<0.80			

Technical data

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Accuracy class (standard)	%		≤±0.05			
Rated torque Mn	Nm	200 400	500 1,000	200 400	500 1,000	
Nominal sensitivity (range between zero torque and rated torque)						
Frequency output	kHz		20			
Voltage output	V		5.0 / 10.0 / 2.5 / 5.0			
Current output	mA		8 / 10			
Output signal at zero torque						
Frequency output	kHz		60			
Voltage output	V		0.0 / 0.0 / 2.5 / 5.0			
Current output	mA		12 / 10			
Nominal output signal						
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			
Current output at positive nominal value	mA		20			
Current output at negative nominal value	mA		4 / 0			
Max. modulation range						
Frequency output	kHz		30...90			
Voltage output	V		-10.5...10.5			
Current output	mA		0...24			
Group delay time						
Frequency output	µs		10			
Voltage output	µs		3,000			
CAN	µs		1,000			

Technical data

Type		F0iS-SV	F0iS-SV	F0eS-SV	F0eS-SV	
Accuracy class (standard)	%	≤±0.05				
Rated torque Mn	Nm	200 400	500 1,000	200 400	500 1,000	

Speed measuring system	Inductive (integrated track at rotor)		
Pulse per rev (PPR)	ppr.	N/A	
Maximum speeds (related to PPR)	rpm	N/A	
Max. output frequency (RS422)	kHz	N/A	
Minimum speed for sufficient pulse stability	rpm	N/A	
Speed measuring system	**Magneto resistive (2 tracks approx. 90 degree phase shifted)**		
Pulses per rev (PPR)	ppr.	N/A	
Maximum speeds (related to PPR)	rpm	N/A	
Max. output frequency (RS422)	kHz	N/A	
Minimum speed for sufficient pulse stability	rpm	N/A	
Nominal clearance (sensor - pole ring)	mm	N/A	
Working airgap (sensor - pole ring)	mm	N/A	
Nominal axial displacement (rotor - stator) #6	mm	N/A	
Tolerance to nominal axial displacement (rotor - stator)	mm	N/A	
Speed measuring system	**Optical**		
Pulses per rev (PPR)	ppr.	240 / 360 / 400	
Maximum speeds (related to PPR)	rpm	20,000 / 16,500 / 14,000	
Max. output frequency (RS422)	kHz	80 / 99 / 94	
Minimum speed for sufficient pulse stability	rpm	>0	
Nominal clearance (stator - pole disk)	mm	1.5	
Working airgap (stator - pole disk) #6	mm	1.4...1.6	
Nominal axial displacement (rotor - stator) #6	mm	4	
Tolerance to nominal axial displacement (rotor - stator)	mm	+0.5/-0.3	

Technical data

Type		F0iS-SV	F0iS-SV	F0eS-SV	F0eS-SV	
Accuracy class (standard)	%	≤±0.05				
Rated torque Mn	Nm	200 400	500 1,000	200 400	500 1,000	
Temperature ranges						
Nominal temperature range (Rotor)	°C	0...80				
Operating temperature range (Rotor) #7	°C	-20...85				
Storage temperature range (Rotor)	°C	-30...85				
Nominal temperature range (Stator)	°C	0...80				
Operating temperature range (Stator) #8	°C	-20...80	-20...80	-20...85	-20...85	
Storage temperature range (Stator)	°C	-30...85				
Mechanical shock (EN 60068-2-27)						
Quantity	-	1,000				
Duration	ms	3				
Acceleration	m/s²	650				
Vibration load (EN 60068-2-6)						
Frequency	Hz	10...2,000				
Duration	min.	150				
Acceleration	m/s²	200				
Load limits #9						
Limit torque, related to Mn	%	500				
Breaking torque approx., related to Mn	%	1,000				
Axial limit force	kN	23.00 27.00	31.00 62.00	23.00 27.00	31.00 62.00	
Lateral limit force	N	4200.00 5100.00	6200.00 11700.00	4200.00 5100.00	6200.00 11700.00	
Bending limit torque	Nm	161.00 177.00	208.00 430.00	161.00 177.00	208.00 430.00	

Technical data

Type		F0iS-SV	F0iS-SV	F0eS-SV	F0eS-SV	
Accuracy class (standard)	%		≤±0.05			
Rated torque Mn	Nm	200 400	500 1,000	200 400	500 1,000	
Mechanical values						
Torsional stiffness	kNm/rad	355 462	550 939	355 462	550 939	
Angle of twist at Mn	°	0.030 0.050	0.050 0.060	0.030 0.050	0.050 0.060	
Axial stiffness	kN/mm	767 918	1,040 2,072	767 918	1,040 2,072	
Radial stiffness	kN/mm	249 324	387 731	249 324	387 731	
Bending stiffness	kN/°	4.00 4.40	5.20 10.70	4.00 4.40	5.20 10.70	
Deflection at axial limit force	mm		<0.04			
Additional radial deviation at lateral limit force	mm		<0.02			
Parallel deviation at bending limit torque	mm		<0.07			
Inherent frequency	Hz	2,900 3,300	3,600 4,800	2,900 3,300	3,600 4,800	
Balance quality-level to DIN ISO 1949	-		G2.5			
Inertia of rotor	kgm²	0.0013	0.0013 0.0011	0.0013	0.0013 0.0011	
Max. limits for relative shaft vibration (peak to peak) #10	µm		$S_{(p-p)} = \frac{9000}{\sqrt{n}}$			

Technical data

Type		F0iS-SV	F0iS-SV	F0eS-SV	F0eS-SV	
Accuracy class (standard)	%		≤±0.05			
Rated torque Mn	Nm	200 400	500 1,000	200 400	500 1,000	
Weight approx.						
Rotor #11	kg	1.0	1.0 0.9	1.0	1.0 0.9	
Stator (without speed encoder) #11	kg	2.10	2.10	1.10	1.10	
Mounting distances (without optional speed detection system)						
Nominal radial displacement (rotor - stator)	mm		2.1			
Tolerance to nominal radial displacement (rotor - stator)	mm		≤±0.1			
Nominal axial displacement (rotor - stator) #6	mm		4			
Tolerance to nominal axial displacement (rotor - stator)	mm		≤±0.5			
Flatness and concentricity tolerances rotor						
Circular run-out-axial tolerance #12	mm		0.01			
Circular run-out-radial tolerance #12	mm		0.01			
Power supply						
Nominal supply	V (DC)		24			
Supply range #13	V (DC)		23...25			
Max. current consumption in measuring mode	A		<0.70			
Max. current consumption in start-up mode	A		<2			
Nominal power consumption	W		<17			
Load resistance						
Frequency output	-		RS422			
Voltage output	kOhm		≥5			
Dynamic						
Frequency output	kHz		≤7			
Voltage output	kHz		≤1			
Current output	kHz		≤1			
CAN Output conversation rate	1/s		≤1,000			

Technical data

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Accuracy class (standard)	%	≤±0.05				
Rated torque Mn	Nm	200 400	500 1,000	200 400	500 1,000	

Miscellaneous						
Protection class (rotor) #14	-	IP54				
Protection class (stator) #14	-	IP54				
Pitch circle screw information	-	4 * M10 (12.9)	4 * M10 (12.9) 8 * M10 (12.9)	4 * M10 (12.9)	4 * M10 (12.9) 8 * M10 (12.9)	
CAN	-	2B				
Configuration interface	-	RS232				
Central hole	mm	N/A				
Material	-	Steel				
Measuring range (related to Mn)	%	120				
Matching evaluation units	-	Integrated	Integrated	TCU2	TCU2	
Stator type	-	iS	iS	eS	eS	

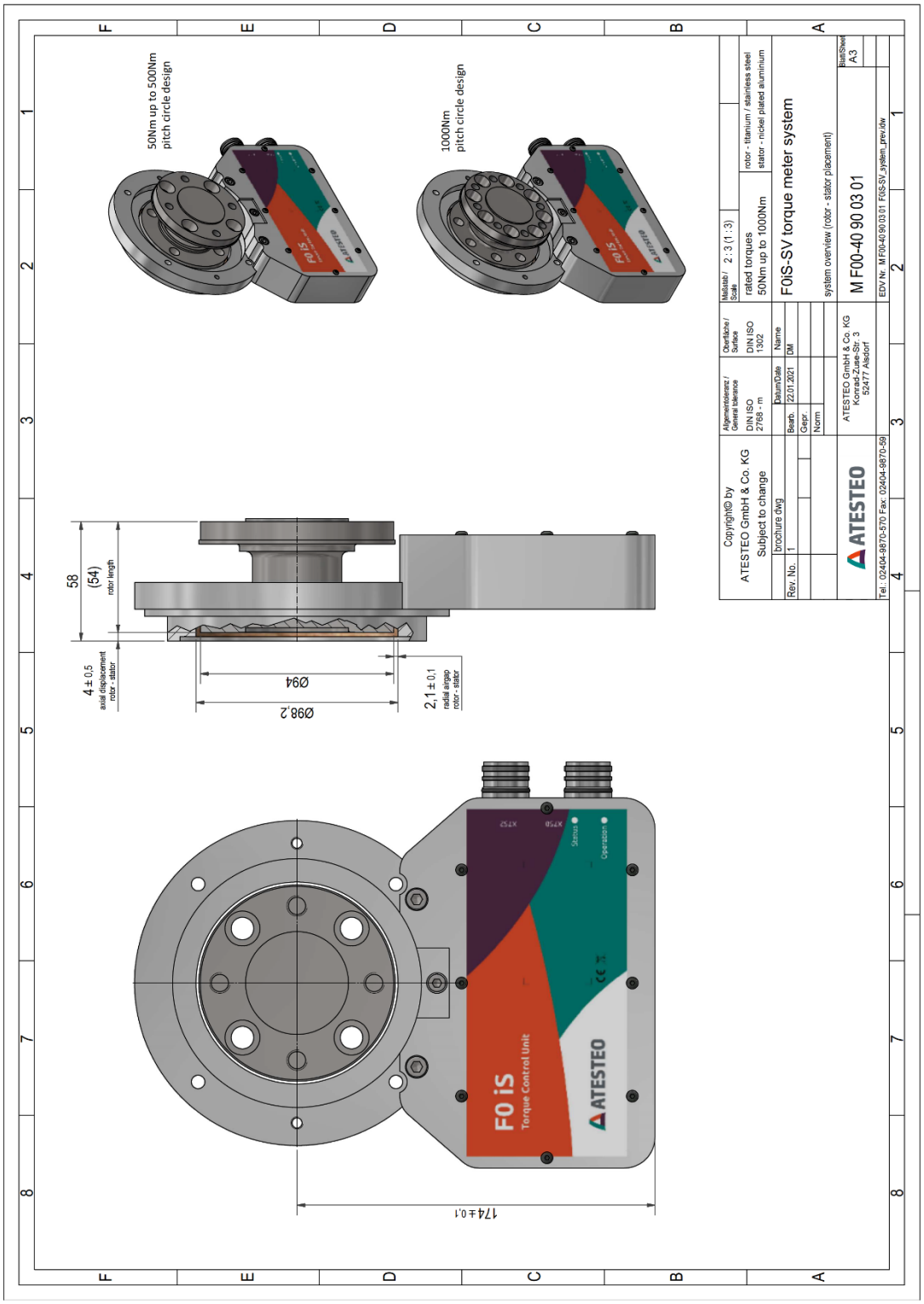
Remarks and information

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	Second torque range	The written second torque range is the smallest possible complying with the given accuracy class. Greater second torque ranges can be chosen on demand. It must be noticed that the mechanical data and load limts will vary for systems with a second measurement range.
#3	Detail in the drawings	Value can vary by optional components. Please find details to this attribute in the integrated drawings.
#4	Pitch circle diameter	The pitch circle diameter is identically at input and output side for most systems. More information is given in the drawings of a product.
#5	Linearity	Values of Linearity deviation incl. Hysteresis can only be reached if positive and negative sensitivity values are used.
#6	Reference planes	Please check the drawings for information about the reference planes of this attribute.
#7	Temperature range (rotor)	No condensation allowed.
#8	Temperature range (stator)	No condensation allowed. Temperature related to housing ground point.
#9	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.
#10	Vibration limits	Vibration limits are not an influence to the machine. They reflect the allowed effect onto the rotor (ISO 7919-3). Parameter "n" is given in "r/min.".

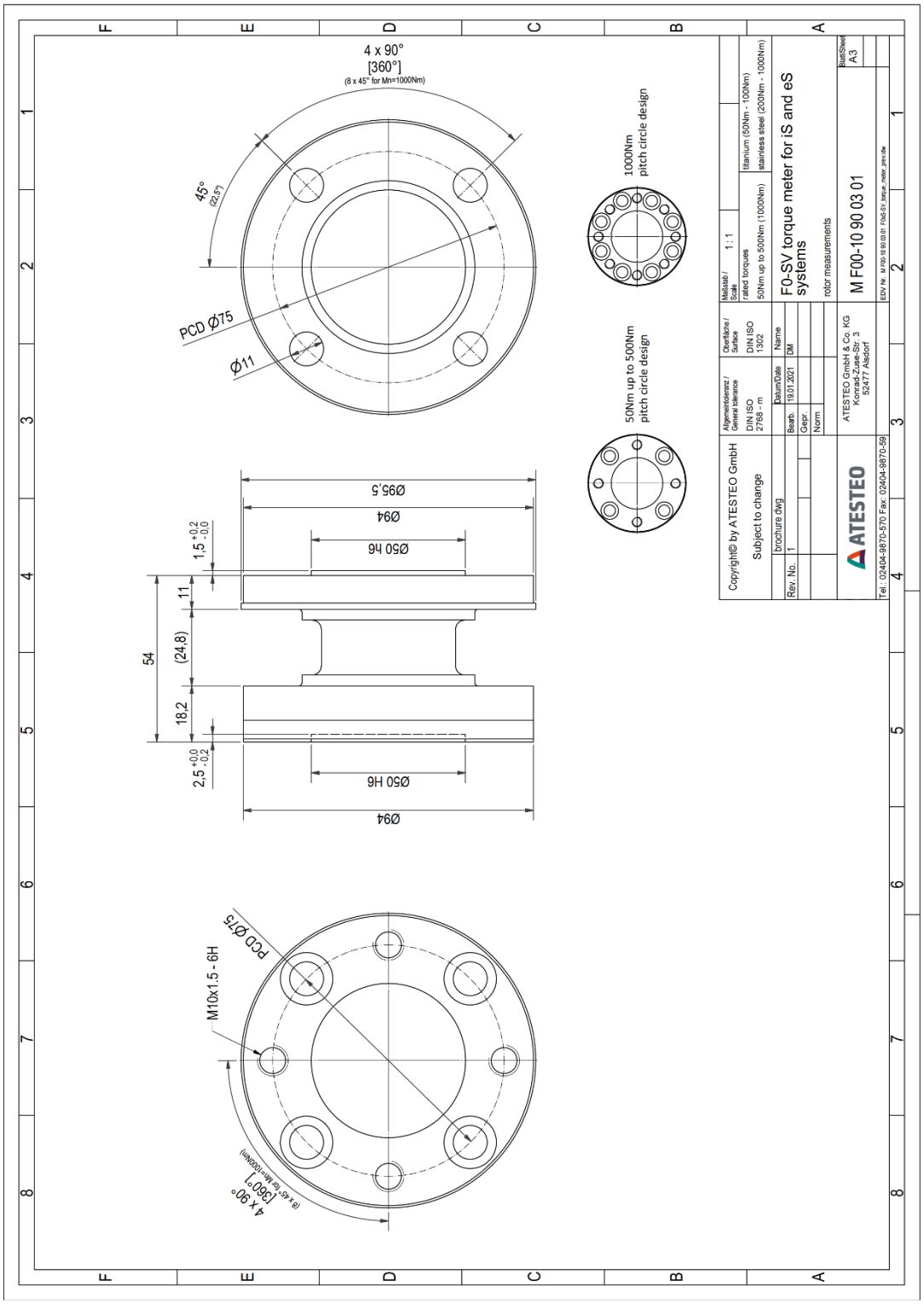
Remarks and information

Link no.	Topic	Remark
#11	Weights	Weights are related to components without speed detection system and based on calculations. Please contact us for exact weight information.
#12	Flatness and concentricity tolerances	The parameters of "Flatness and concentricity tolerances rotor" are manufacturing tolerances.
#13	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.
#14	Protection class	IP class can be increased on demand.

Drawing



Drawing



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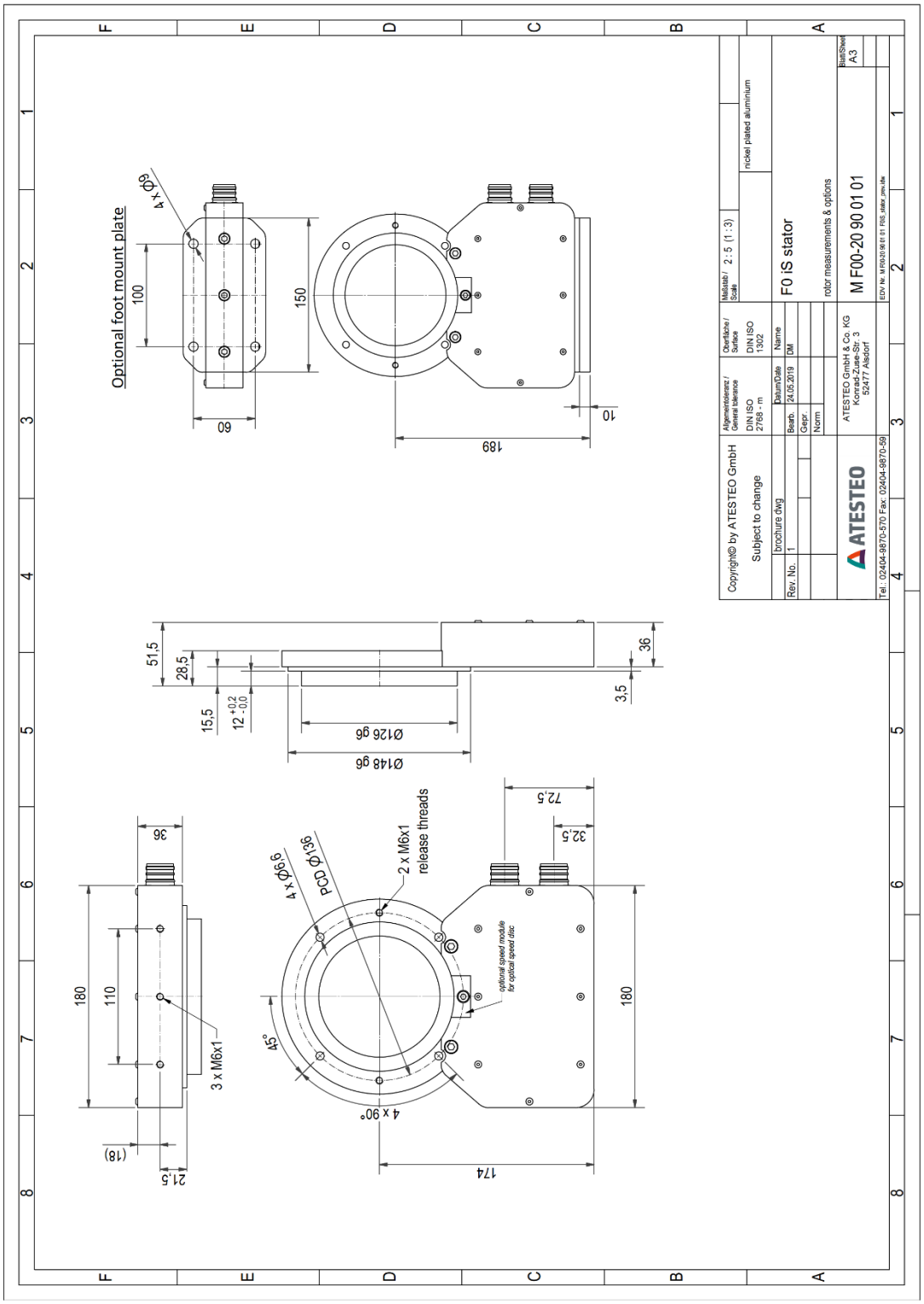
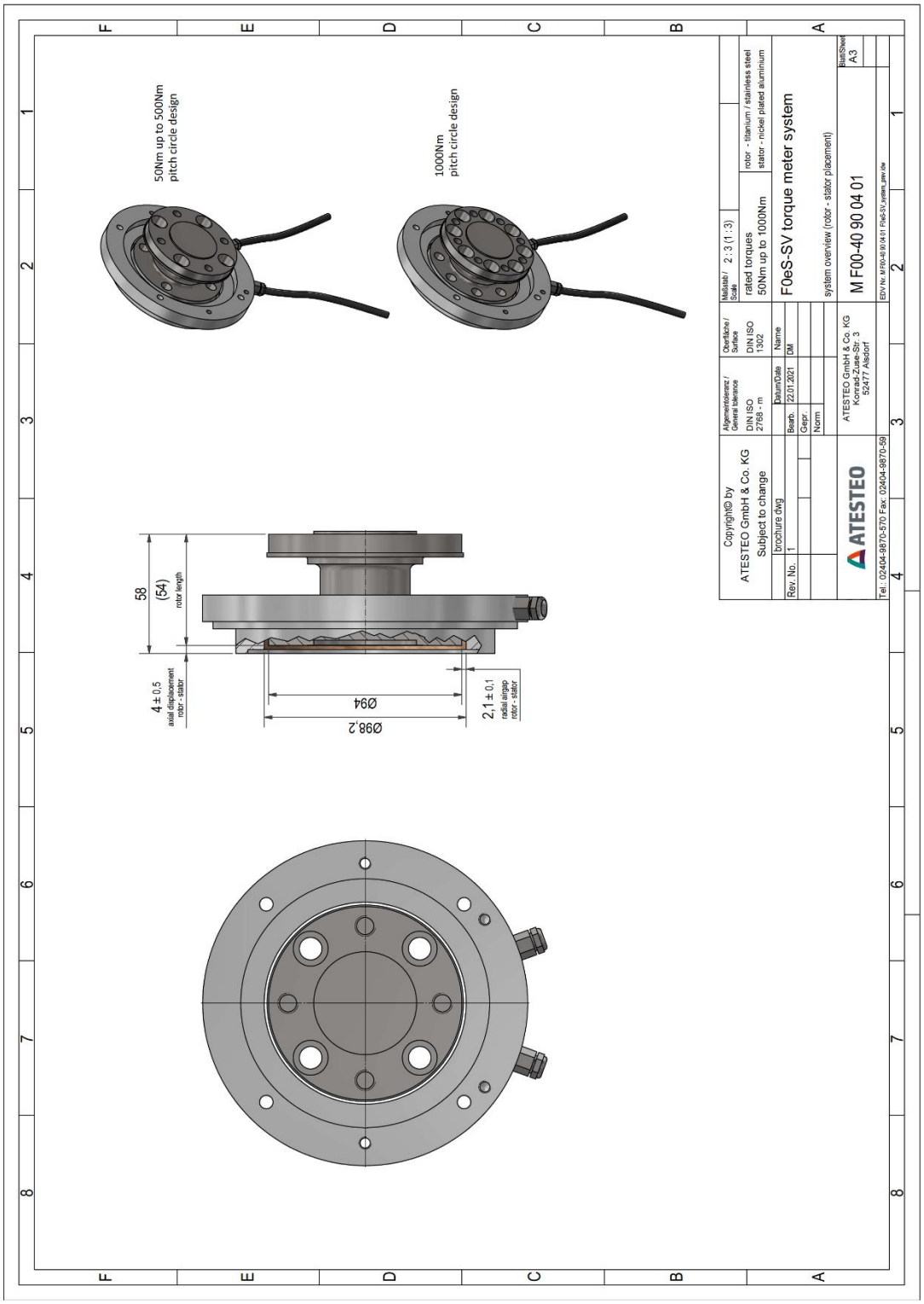


F0eS-SV

Drawing



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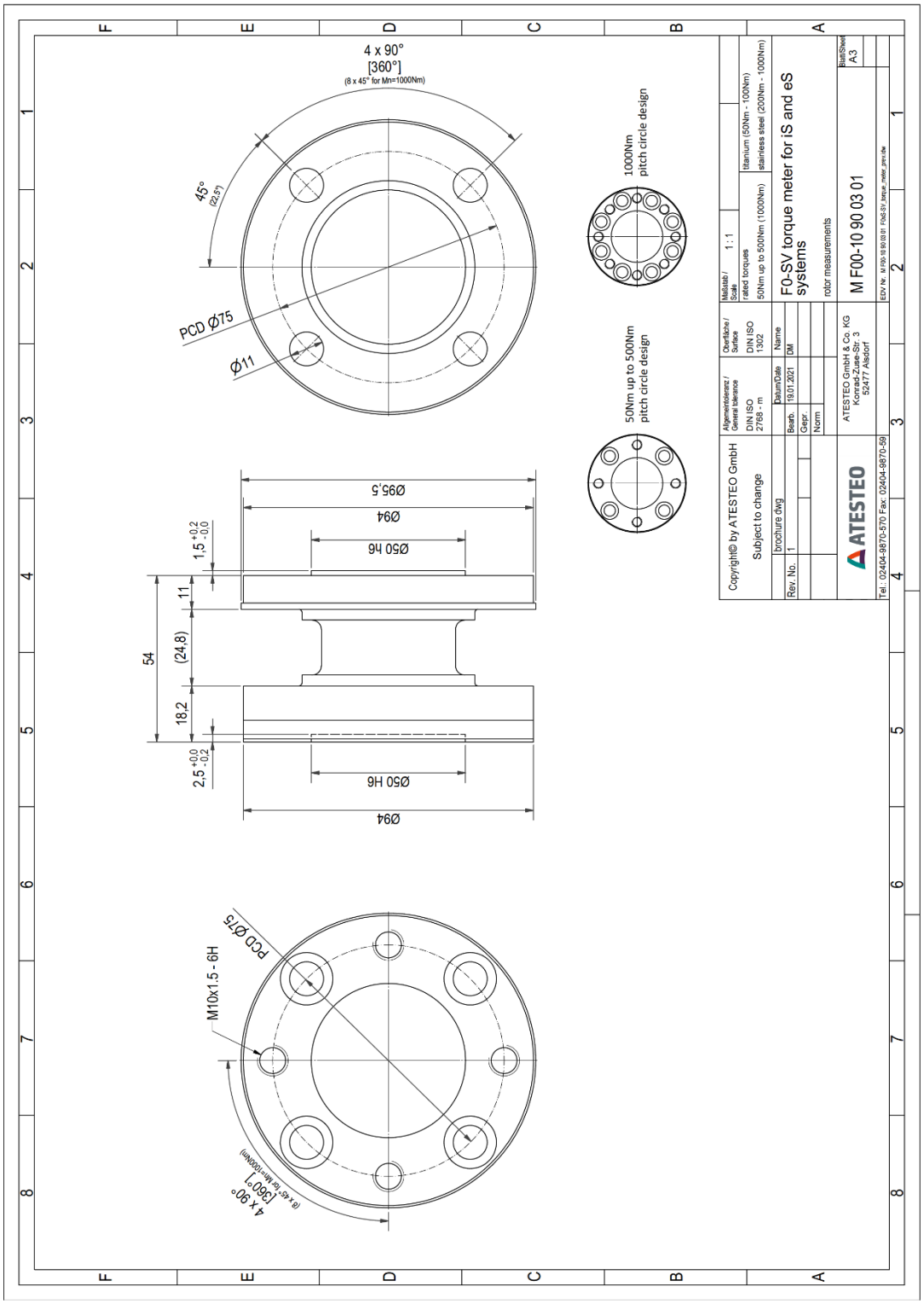
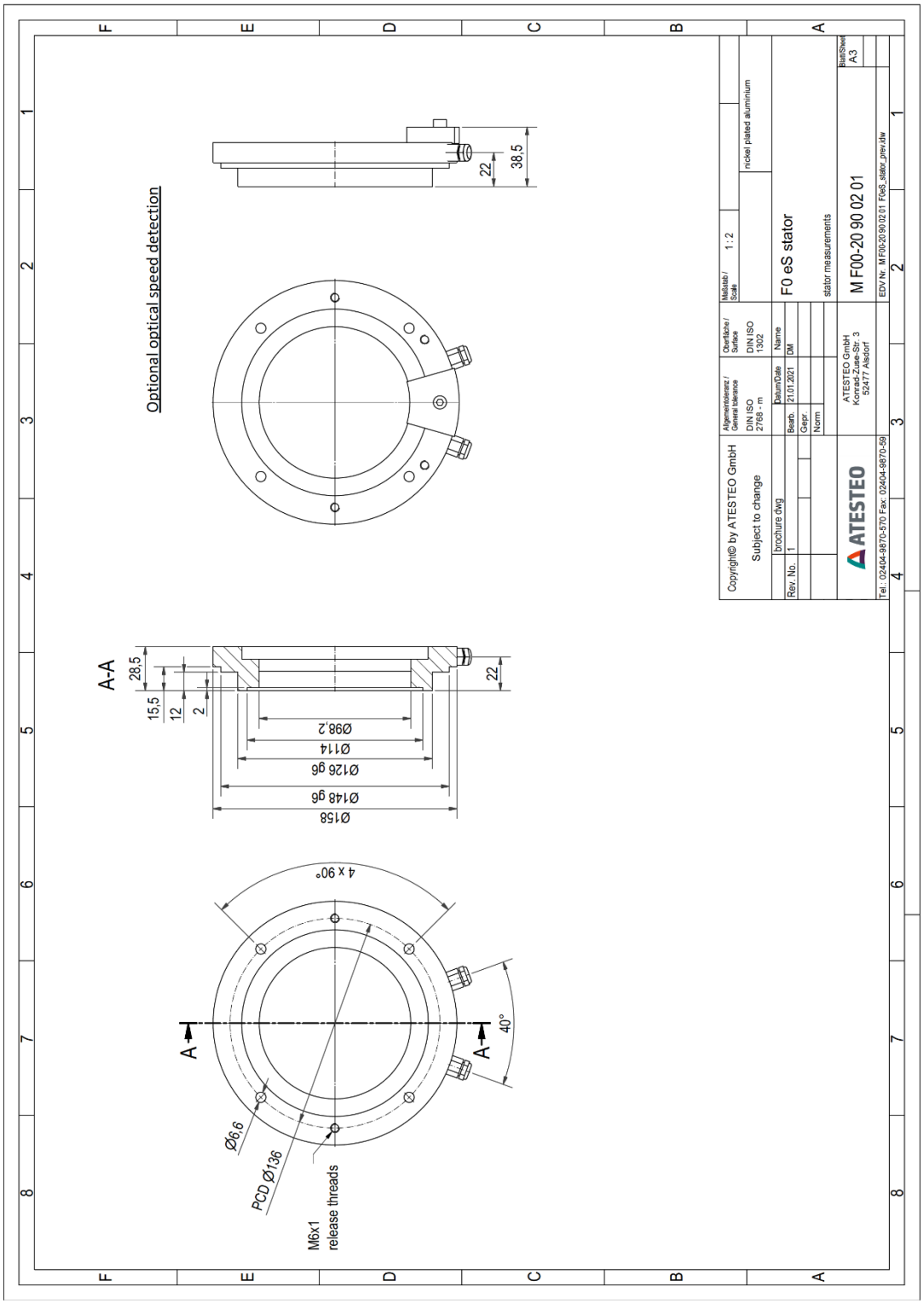


F0eS-SV

Drawing



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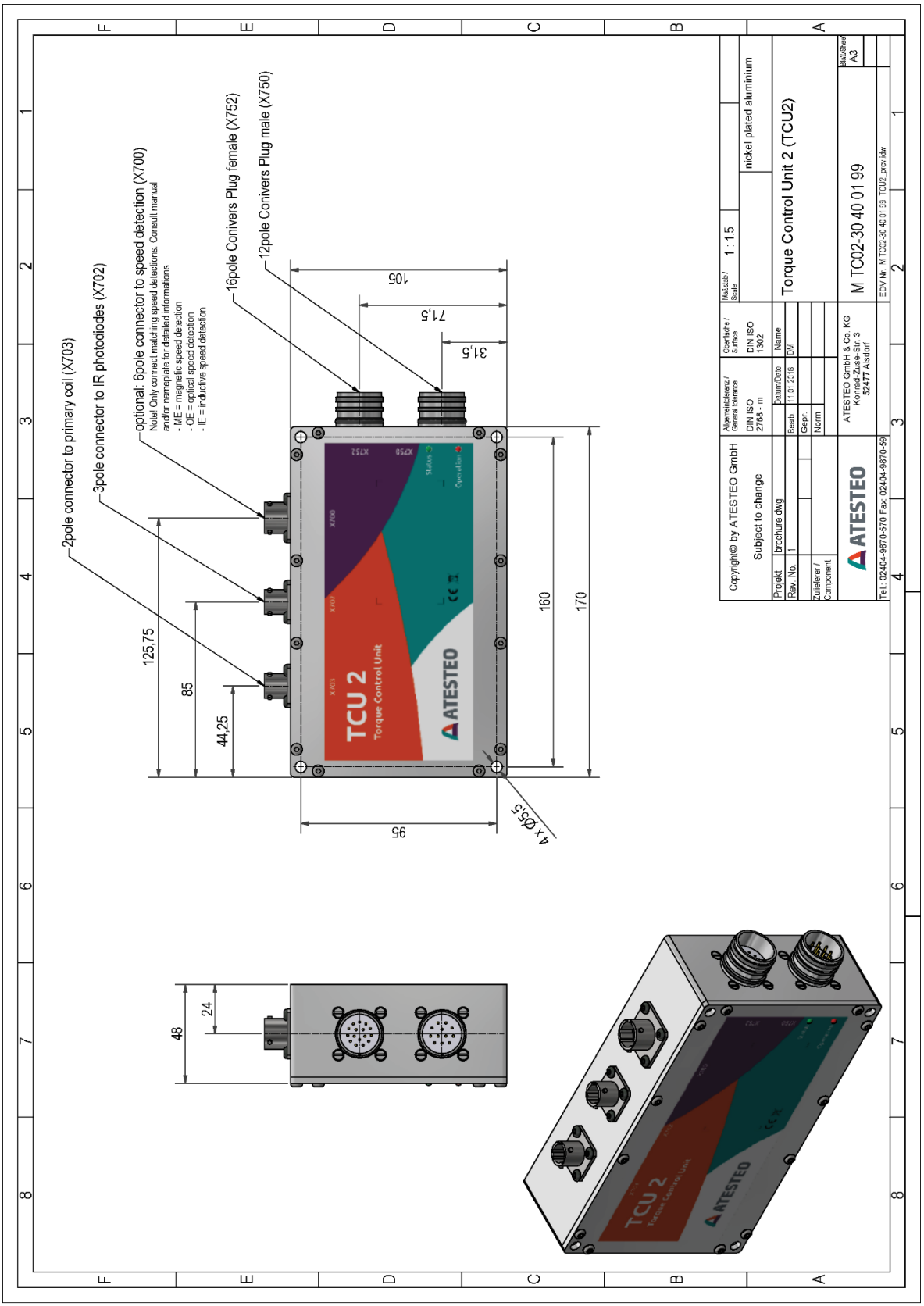

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