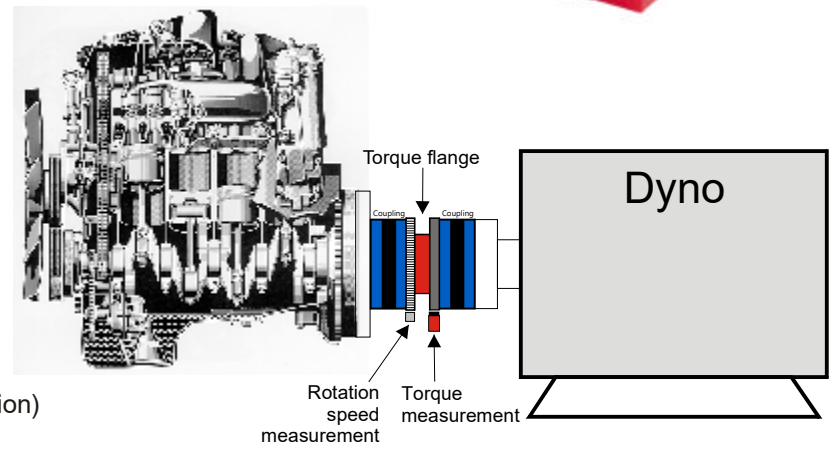
Torque measuring flange XTREMA HP
Improved Zerodrift Tk_0 0.005% / 10°C
Improved Tkc Conduct 0.005% / 10°C

XTREMA HP High Precision TORQUE

Characteristic features:

- ✓ Nominal (rated) torques
  50 N·m; 100 N·m; 200 N·m;
  500 N·m; 1 kN·m; 2 kN·m;
  3 kN·m; 5 kN·m; 10 kN·m
- ✓ Nominal (rated) speeds from 10,000 rpm to 32,000 rpm (depending on the measuring range)
- ✓ Integrated correction of speed influence depending on direction of rotation
- ✓ Accuracy class 0.02
- ✓ Large measuring frequency range up to 1 kHz (optional 10 kHz (-3dB))
- ✓ Low rotor weights and moments of inertia
- ✓ Digital transmission of measured values
- ✓ Short design, compatible flange image to HBM (DIN flange)
- ✓ Temperature range -40 to +160°C (optional)
- ✓ Integrated Speed acquistion (high resolution)





Topology



- CAN
- Ethernet (digital)
- EtherCat (digital)
- USB (digital)
- Frequency 60 +/-30 kHz
- Strain (U) +/-10 V
- Current (I) 4 to 20 mA
- Remote control
- Energy
- Remote shunt on/off



Integrated Pick Up



Torque flange with offsetted Pick Up

- Energy
- Remote shunt on/off
- Torque (digital)
- Temperature (digital)
- Status
- Remote control

max. Distance: 100 m



Evaluation Unit

- CAN
- Ethernet (digital)
- EtherCat (digital)
- USB (digital)
- Frequenz 60 +/-30 kHz
- Spannung (U) +/-10 V
- Strom (I) 4 ... 20 mA
- Remote Control
- Energie
- Remote Shunt ein/aus

MANNER® SENSORTELEMETRIE

Technical Data

Torque measuring system										
Type		XTREMA-HP TORQUE								
Accuracy Class		0.02								
Nominal (rated) torque M_{nom}	kN·m	0.05	0.1	0.2	0.5	1	2	3	5	10
Nominal sensitivity (range between torque = zero and nominal torque)										
Voltage output 10 V	V	+/-10								
Frequency output 60 kHz	kHz	+/-30								
Digital output EtherCat 16 Bit	dig. value	+/-29491 (471859[3])								
Digital output Ethernet TCP/IP 16 Bit	dig. value	+/-29491 (471859[3])								
Digital output CAN 16 Bit	dig. value	+/-29491 (471859[3])								
Sensitivity tolerance (deviation of the actual output value at M_{nom} of nominal sensitivity)	%	0.05 (0.01[1])								
Output signal at torque = zero										
Voltage output	V	0								
Frequency output 60 kHz	kHz	60								
Digital output	dig. value	32768 (524288[3])								
Nominal output signal										
Voltage output										
with positive nominal torque	V	+10								
with negative nominal torque	V	-10								
Frequency Output 60 kHz										
with positive nominal torque	kHz	90 (5 V TTL 0/5 V) (15[7])								
with negative nominal torque	kHz	30 (5 V TTL 0/5 V) (5[7])								
Digital output										
with positive nominal torque	dig. value	62258 (996147[3])								
with negative nominal torque	dig. value	3278 (52429[3])								
Load resistance										
Voltage output	kOhm	>2								
Frequency output 60 kHz	kOhm	>10								
Long-term drift over 48 h										
Voltage output	%	< +/-0.03								
Frequency output 60 kHz	%	< +/-0.03								
Measurement frequency range (-3dB)	kHz	1 (2[4], 5[5], 10[6])								
Group delay time	µm	<400 (<250[4], <130[5], <40[6])								
Residual ripple (voltage output)	mV	<10								
Temperature influence per 10 °K in the nominal temperature range on the output signal, related to the actual value of signal range										
Frequency output	%	+/-0.02								
Digital output	%	+/-0.02								
Voltage output	%	+/-0.05								
Temperature influence per 10 K in the nominal temperature range on the output signal, related to the zero signal										
Frequency output	%	+/-0.01 (+/-0.005[2])								
Digital output	%	+/-0.01 (+/-0.005[2])								
Voltage output	%	+/-0.04 (+/-0.02[2])								
Max. speed effect on zero signal:										
Left:	%	< +/- 0,004								
Right:	%	< +/- 0,004								
Max. modulation range										
Frequency output 60 kHz	kHz	+/-31.62 (+/-5.27[7])								
Digital output	digits	+/-32768 (524288[3])								
Voltage output	V	+/-11.2								
Power supply										
Nominal supply (protective low voltage DC)	V	24 V +/-10% (10 to 36 V optional)								
Current consumption in measuring mode	A	<0.7								
Current consumption in start-up mode	A	<1 A								
Rated input power	W	<5								
Max. cable length	m	100								

1) Option improved sensitivity tolerance
2) Option zerodrift
3) Option signal resolution 20 Bit
4) Option measuring signal bandwidth 2 kHz
5) Option measuring signal bandwidth 5 kHz
6) Option measuring signal bandwidth 10 kHz

Technical Data (Continuation 1)

Nenndrehmoment M_{nom}	kN·m	0.05	0.1	0.2	0.5	1	2	3	5	10
Linearity deviation including hysteresis, related to the nominal characteristic value										
Ethernet, EtherCAT, CAN, frequency output 60 kHz +/- 30 kHz										
0 ... 20% v. M_{nom}	%	<+/- 0.015 (<+/- 0.007 optional)								
20 ... 60% v. M_{nom}	%	<+/- 0.033 (<+/- 0.012 optional)								
60 ... 100% v. M_{nom}	%	<+/- 0.047 (<+/- 0.018 optional)								
Voltage output +/- 10 V										
0 ... 20% v. M_{nom}	%	<+/- 0.017								
20 ... 60% v. M_{nom}	%	<+/- 0.038								
60 ... 100% v. M_{nom}	%	<+/- 0.05								
Rel. standard deviation of repeatability according to DIN 1319, related to the output signal change										
Ethernet, EtherCAT, CAN, frequency output	%	< +/- 0,004								
Voltage output	%	< +/- 0.03								
Shunt signal on (active low)	V	<1 (GND)								
Shunt signal off	V	>2.5								
General information										
EMC EME (Emission per EN61326−1, sec.7) RFI field strength	-	Klasse B								
Interference immunity (EN 61326-1, Table 2)										
Electromagnetic field AM	V/m	80								
Magnetic field	A/m	200								
Electrostatic discharges (ESD)										
Contact discharge	kV	20								
Air discharge	kV	10								
Fast transients (burst)	kV	1								
Shock (surge)	kV	1								
Conducted disturbances	V	10								
Protection class according to EN 60529 standard/ oil resisrant/ waterproof[8)]		Ip54 (IP67[8)])								
Weight approx. rotor	**kg**	**0.8**	**2.1**	**2.1**	**2.5**	**2.5**	**4.6**	**4.6**	**8**	**13.5**
approx. stator	**kg**	**0,2 (new AW_MnAnt 0,4)**								
Reference temperature	**°C**	**23**								
Operating temperature range	°C	-10 ... +70								
Extended temperature range[9)]	°C	-40 ... +160								
Storage temperature range[9)]	°C	-25 ... +85								
Mech. Shock resistance according to EN 60068-2-27										
Number of impacts	n	100								
duration	ms	3								
Acceleration (half-sine)	m/s^2	650								
Vibration load in 3 directions according to EN 60068-2-27										
Frequency range	Hz	10 ... 2000								
duration	h	2.5								
Acceleration (amplitude)	m/s^2	200								
Nominal speed	min^{-1}	20000			20000		15000		12000	10000
Increased speed stability	min^{-1}	32000			25000		18000		15000	15000
Limitations of liability[11)]										
Limit torque related M_{nom}	%	400								
Breaking torque relative to M_{nom}	%	800								
Axial limit force[11)]	kN	5	5	10	20	20	30	35	50	100
Laterial force limit[11)]	kN	1	1.25	2	4	5	10	15	20	25
Limit bending moment[11)]	kN·m	0.025	0.05	0.1	0.25	0.5	1	1.5	2.5	5
Oscillation bandwith per DIN 50100 (peak to peak)[12)]	kN·m	0.2	0.2	0.4	1.0	2.0	4.0	5.1	8.5	17

8) Option protection class IP67

9) Option extended service temperature range
10) Option increased speed stability

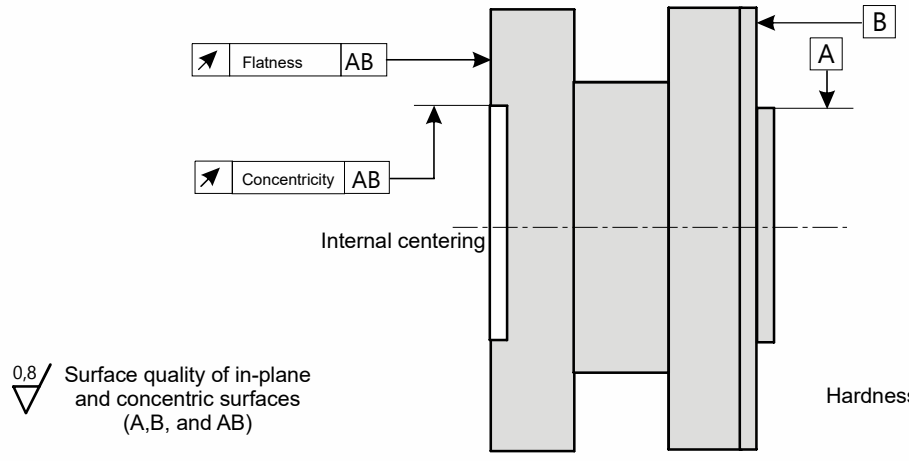
11) Static and dynamic
12) The nominal torque must not be exceeded

Technical Data (Continuation 2)

Nominal torque M_{nom}	kN·m	0.05	0.1	0.2	0.5	1	2	3	5	10
Effect of measured values by parasitic forces[14]										
Crosstalk bending moment M_B	kN·m/kN·m	<0.002								
Crosstalk side force F_s	kN·m/kN	<0.0002								
Crosstalk axial force F_z	kN·m/kN	<0.00015								
Mechanical values										
Material		Alu	Steel	Steel	Steel	Steel	Steel	Steel	Steel	Steel
Torsional stiffness c_T	kN·m/rad	79	79	149	561	895	2293	2865	4854	10989
Torsion angle at M_{nom}	Grad	0.037	0.073	0.077	0.051	0.064	0.051	0.061	0.059	0.052
Axial stiffness c_a	kN/mm	125	125	167	437	587	939	1090	1040	1412
Radial stiffness c_r	kN/mm	58	58	105	336	541	801	1028	985	1272
Stiffness with bending moment about a radial axis c_b	kN·m/Grad	1.20	1.20	2.10	2.89	3.8	9.1	10.4	13.7	27.2
Max. deflection at axial limit force	mm	<0.09	<0.09	<0.09	<0.045	<0.04	<0.05	<0.06	<0.08	<0.09
Additional max. concentricity error at lateral limit force	mm	<0.02								
Additional planeparallel deviation at bending limit moment d_B	mm	<0.07	<0.07	<0.07	<0.10	<0.085	<0.15	<0.18	<0.15	<0.12
Balance qualitylevel to DIN ISO 1940		G6.3 (G2.5 optional)								
Max. limits for relative shaft vibration (peak to peak)[13]										
Wave oscillations in the area of the connection flanges acc. to ISO 7919−3										
Normal mode (continuous operation)	µm	$s_{(p\text{-}p)} = \frac{9000}{\sqrt{n}}$ (n in min^{-1})								
Start and Stop mode/resonance ranges (temporary)	µm	$s_{(p\text{-}p)} = \frac{13200}{\sqrt{n}}$ (n in min^{-1})								
Mass moment of inertia of the rotor Lv Axis of rotation, without consideration of flange screws	kg m^2	0.0012	0.0034	0.0034	0.0058	0.0058	0.0175	0.0175	0.0443	0.1192
Max. permissible static eccentricity Rotor - stator spacing	mm	5								
Max. permissible axial displacement between rotor and stator	mm	+/-2								

13) Influencing the vibration measurements by runout, shock, defects in shape, notches, grooves, local residual magnetism have to be separated from the actual wave vibration
14) Basis: only one parasitäric force type is applied

Flatness and concentricity tolerances



Rated torque M_{nom}	kN·m	0.05	0.1	0.2	0.5	1	2	3	5	10
Flatness tolerances	mm	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02
Concentricity tolerances	mm	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02

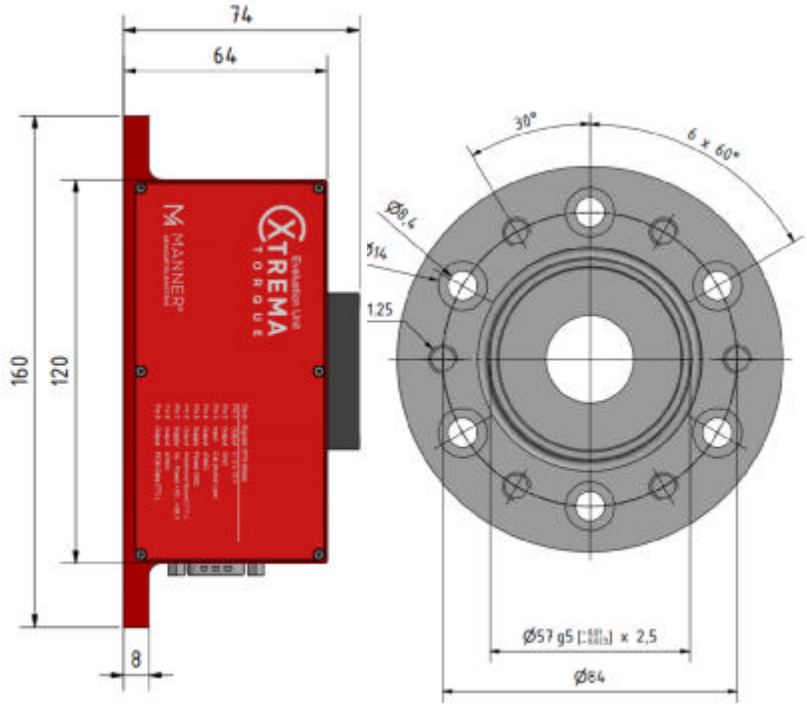
Integrated speed detection (laser scanning, Ip42)										
Optical speed detection (track A/B)	DZ-Marken/U	1024			1600			2048	2400	3600
Pick-up distance to rotor	mm	20+/-19								
Integrated speed detection (inductive, Ip67)										
Inductive speed detection (track A/B) - Rated speed	DZ-Marken/U	n.a.	60					80	100	120
Pick-up distance to rotor	mm	0.2 ... 2.0								
Inductive speed detection (track A/B) - Increased Dz stability	DZ-Marken/U	n.a.	36		48			60	80	
Pick-up distance to the rotor	mm	0.2 ... 2.0								

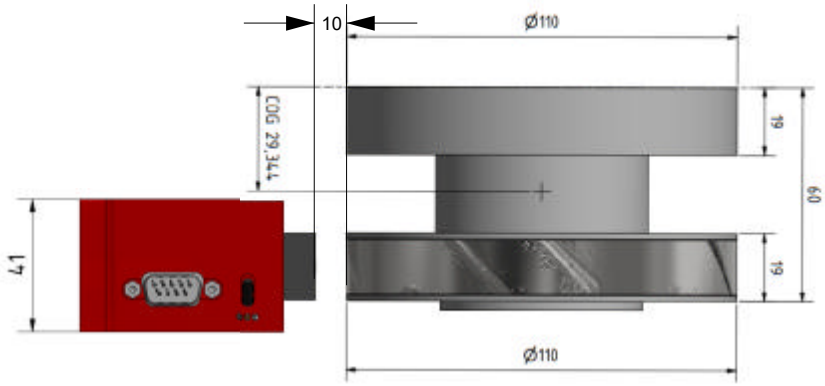
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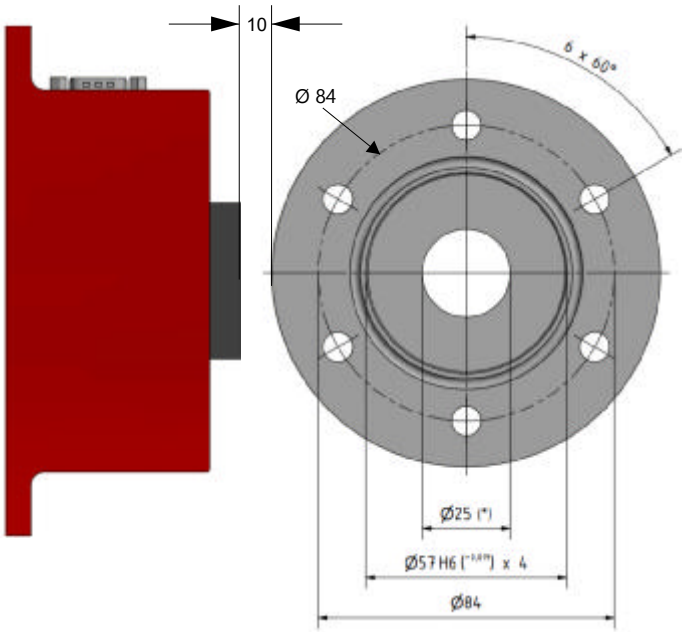
Dimensions XtreMA HP 0.05 kN·m (in mm)

Receiver with integrated Pick Up







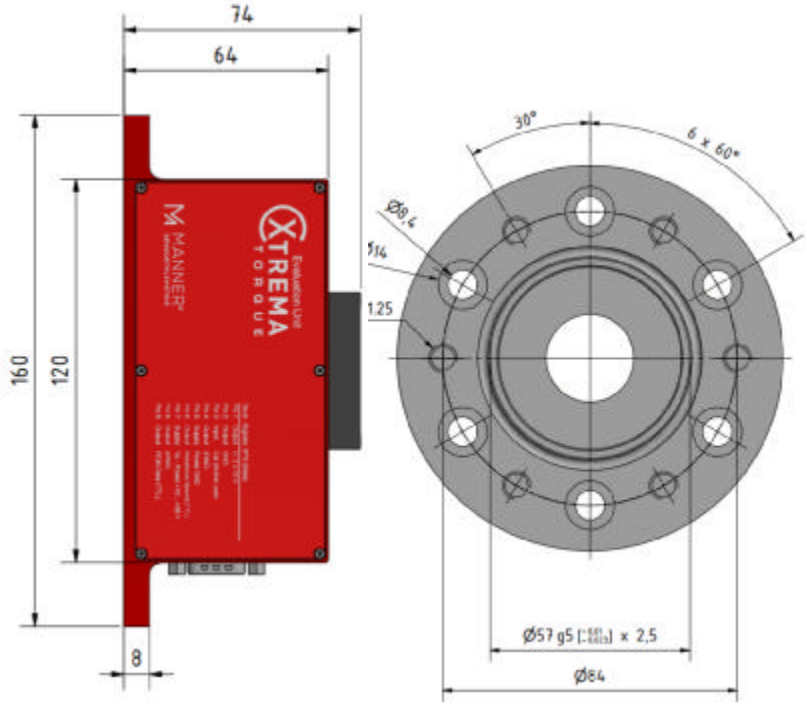


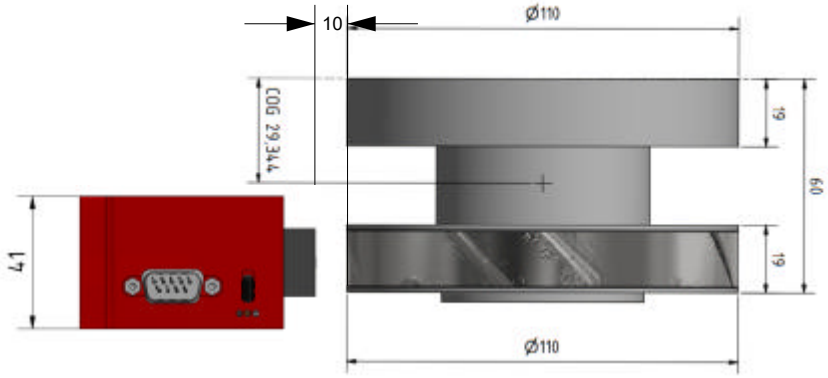
*Hollow shaft only available as an option

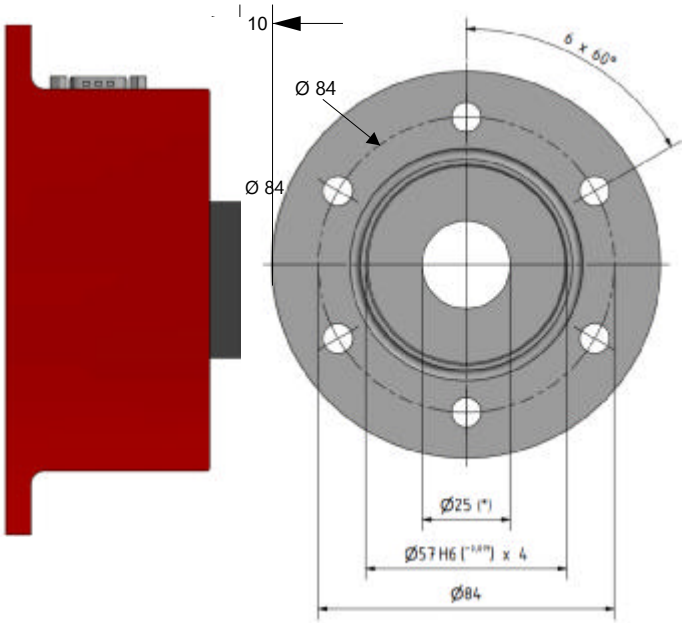
Dimensions XtreMA HP 0.1 kN·m (in mm)

Receiver with integrated Pick Up









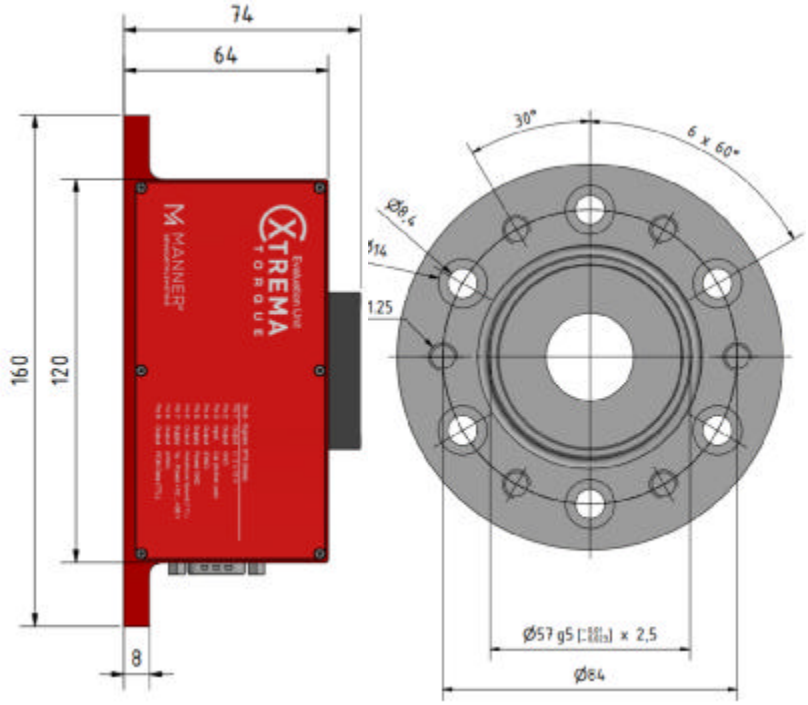
*Hollow shaft only available as an option

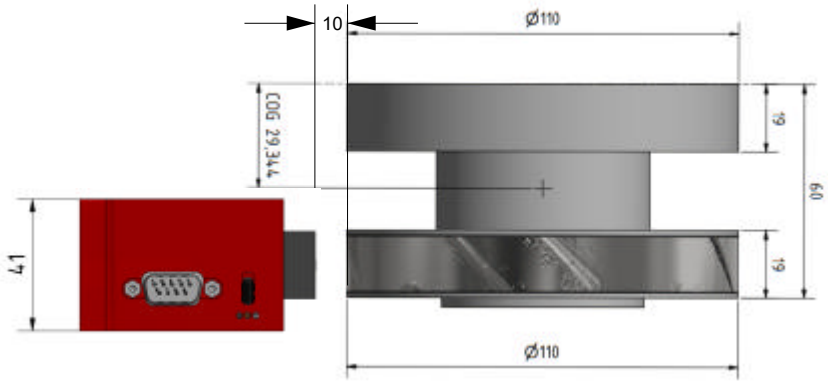
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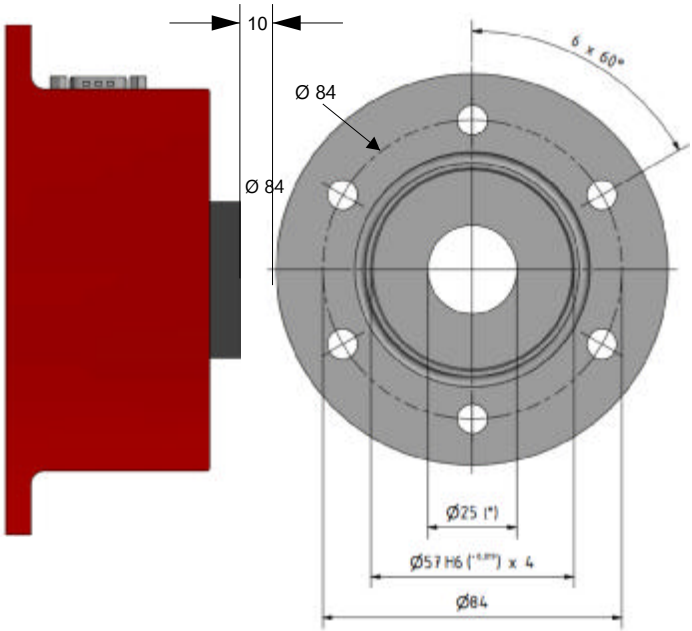
Dimensions XtreMA HP 0.2 kN·m (in mm)

Receiver with integrated Pick Up









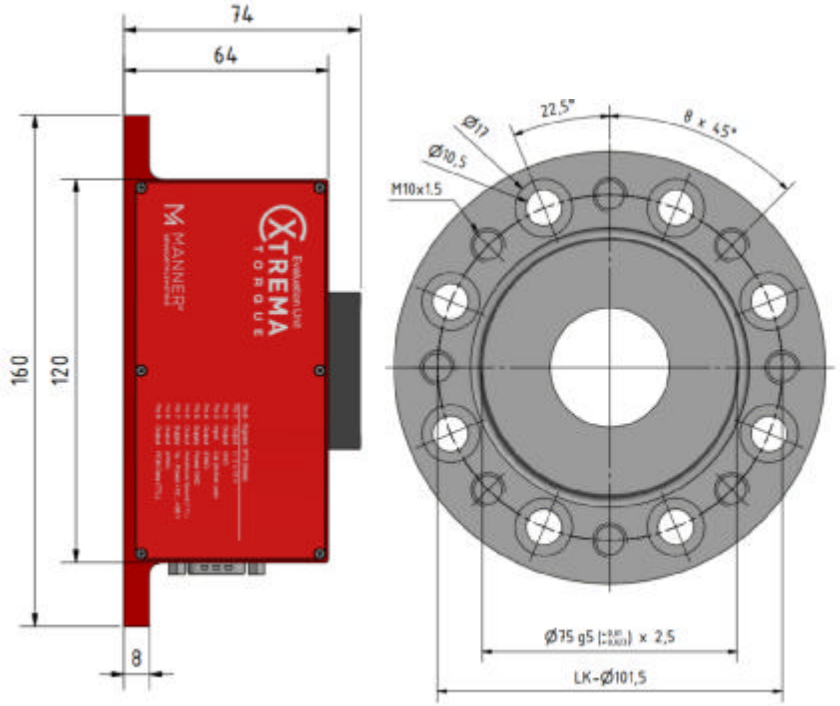
*Hollow shaft only available as an option

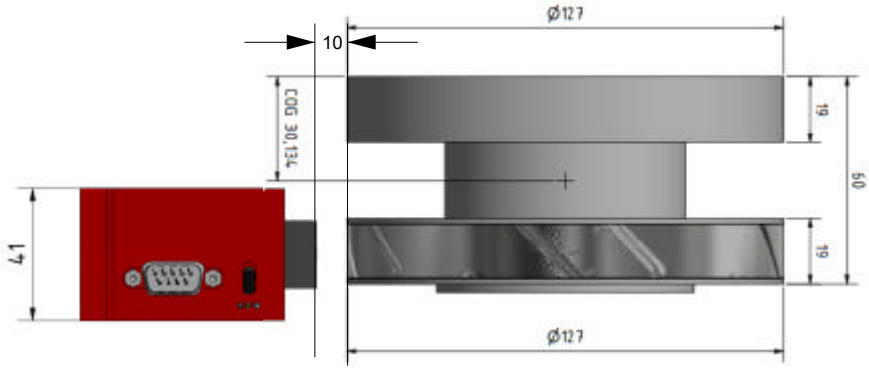
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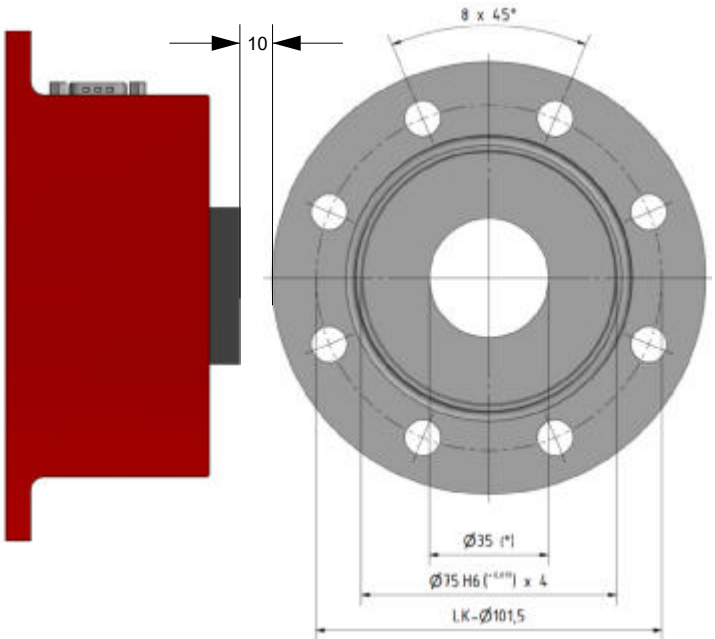
Dimensions XtreMA HP 0.5 kN·m (in mm)

Receiver with integrated Pick Up









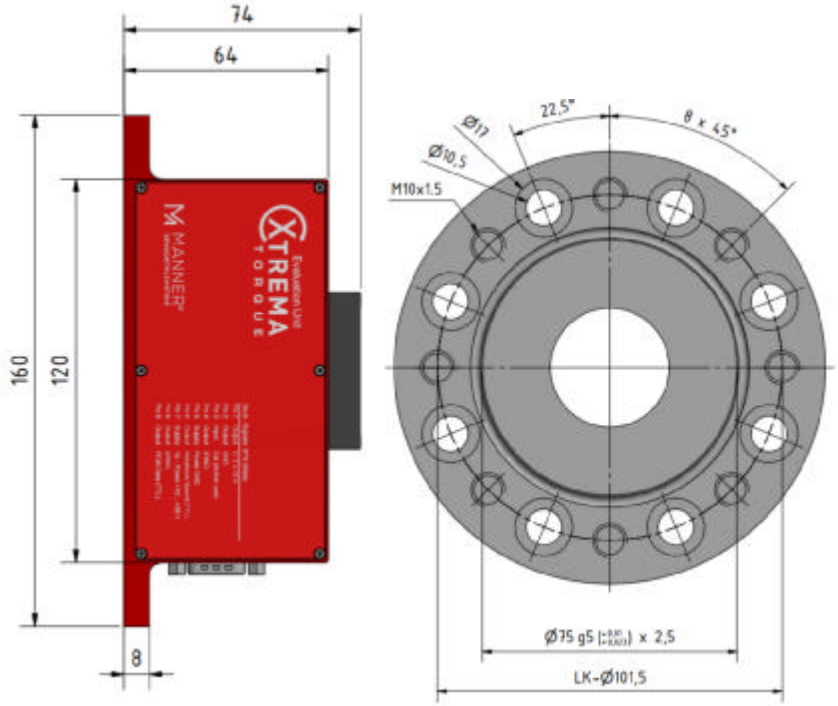
*Hollow shaft only available as an option

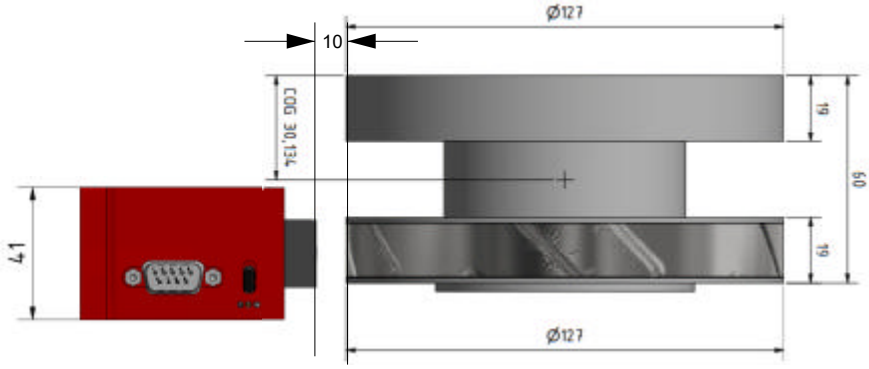
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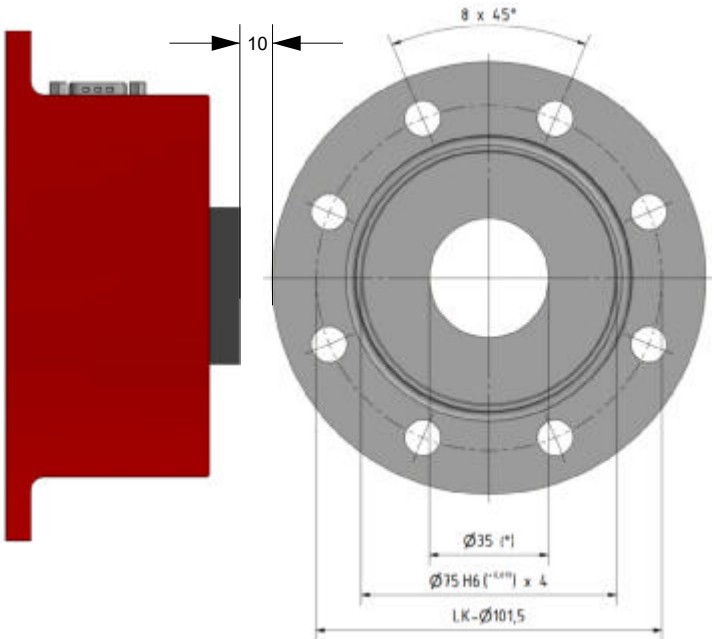
Dimensions XtreMA HP 1 kN·m (in mm)

Receiver with integrated Pick Up









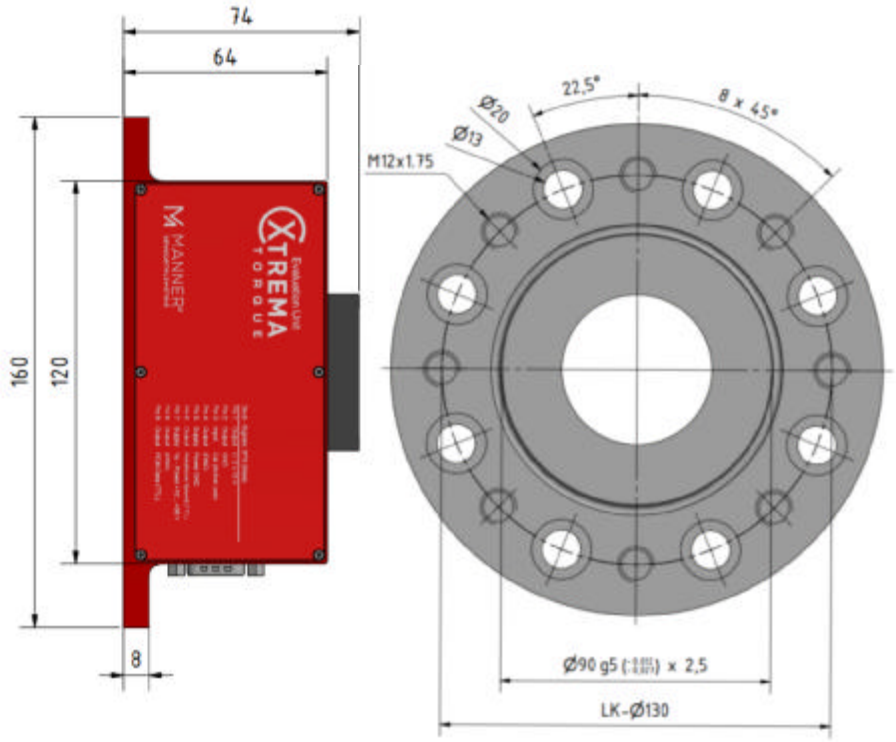
*Hollow shaft only available as an option

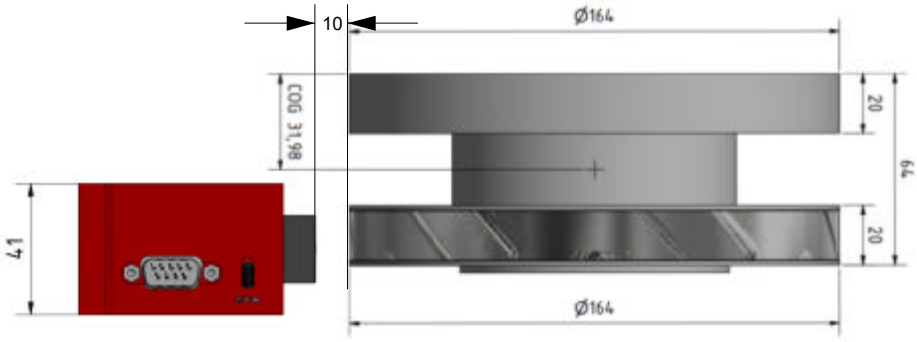
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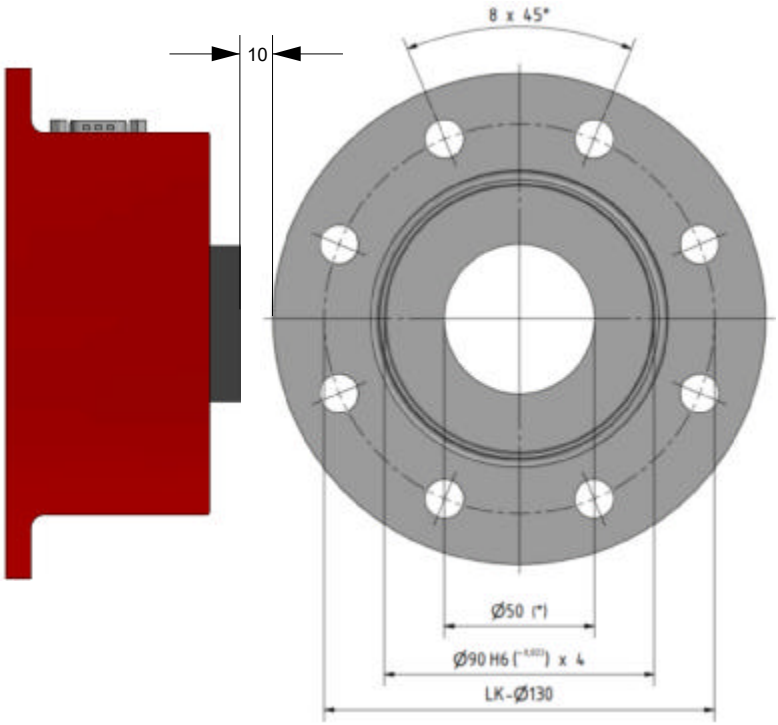
Dimensions XtreMA HP 2 kN·m (in mm)

Receiver with integrated Pick Up









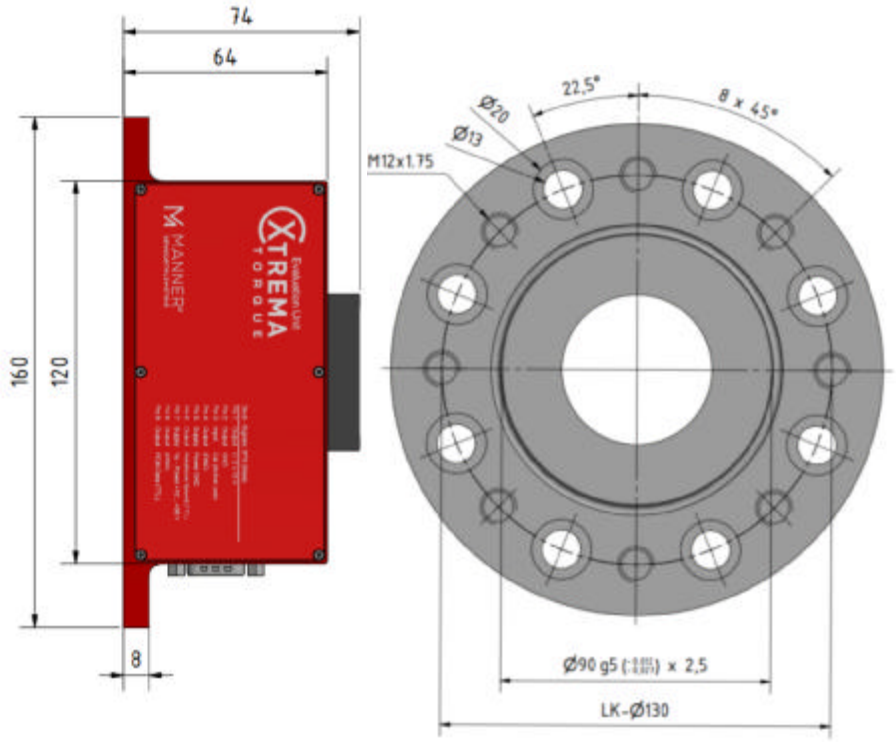
*Hollow shaft only available as an option

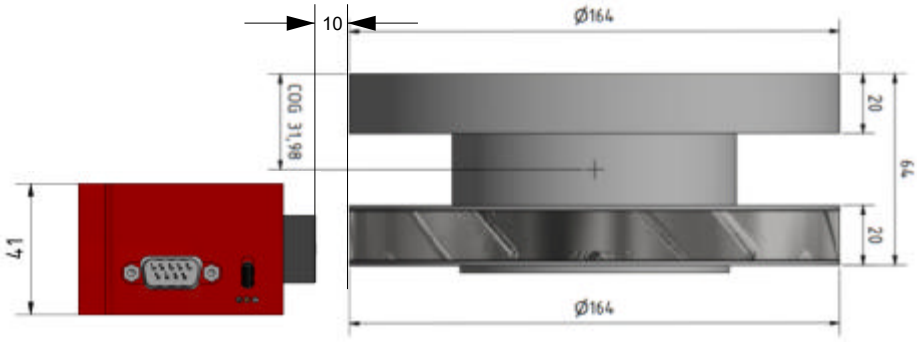
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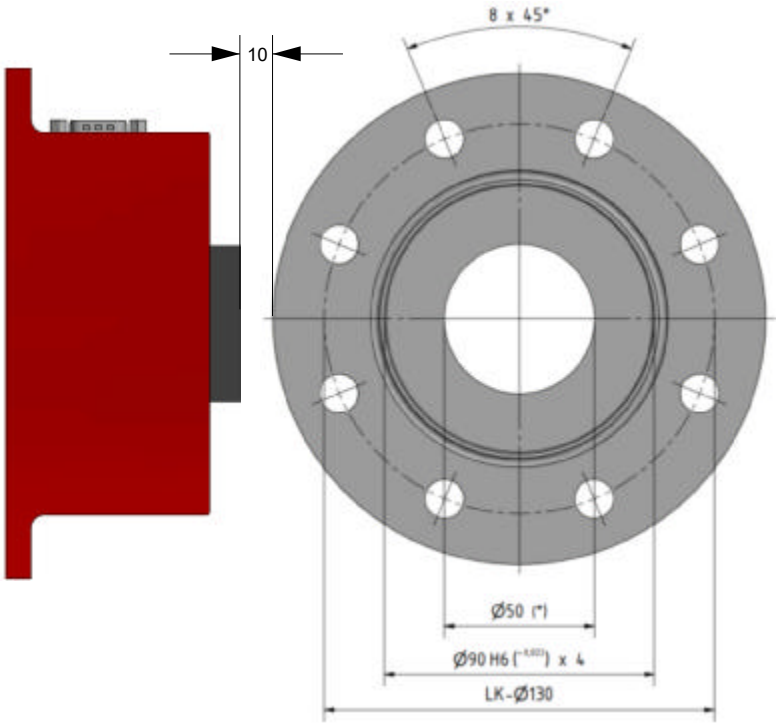
Dimensions XtreMA HP 3 kN·m (in mm)

Receiver with integrated Pick Up









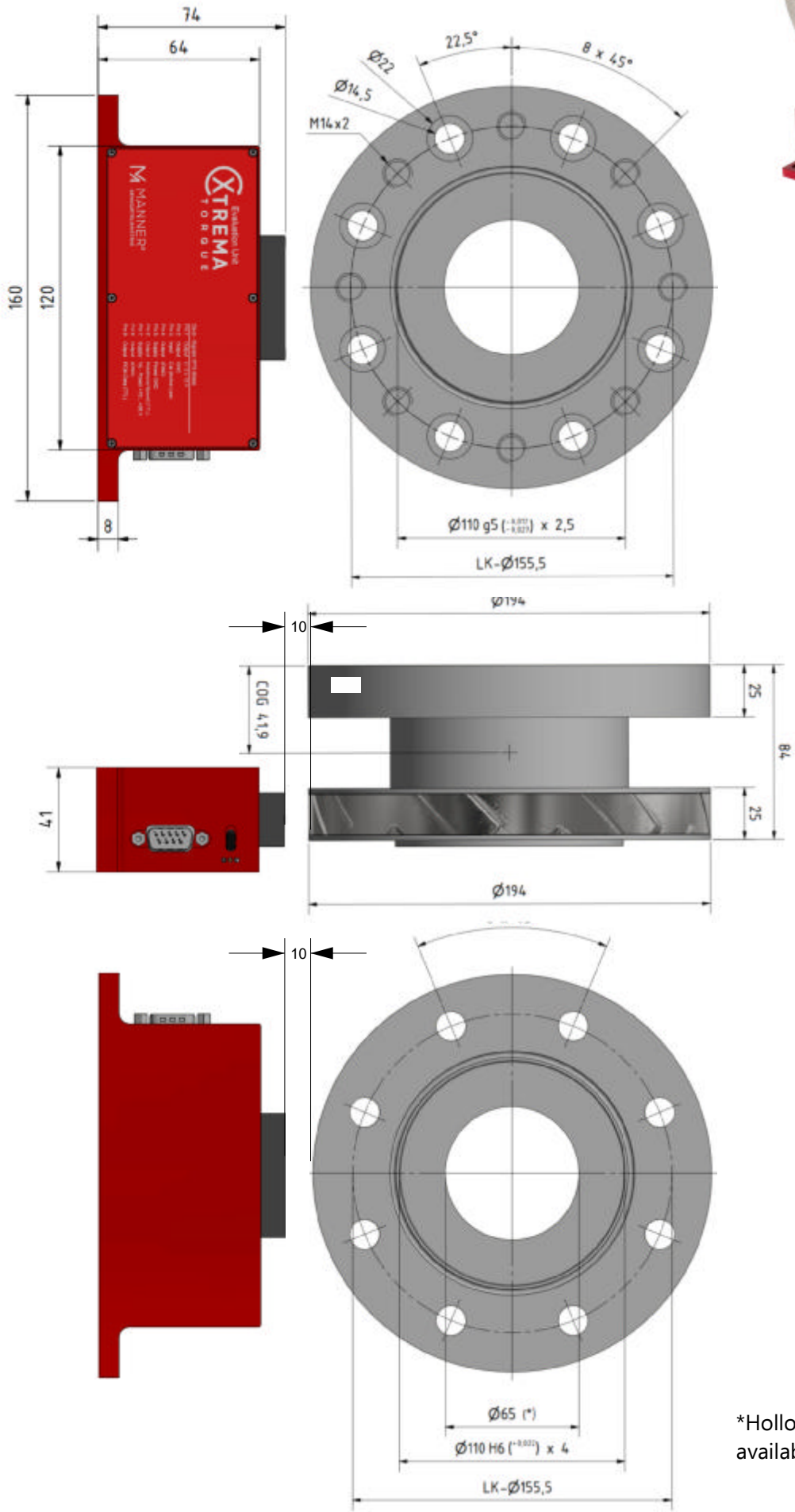
*Hollow shaft only available as an option

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Dimensions XtreMA HP 10 kN·m (in mm)

Receiver with integrated Pick Up





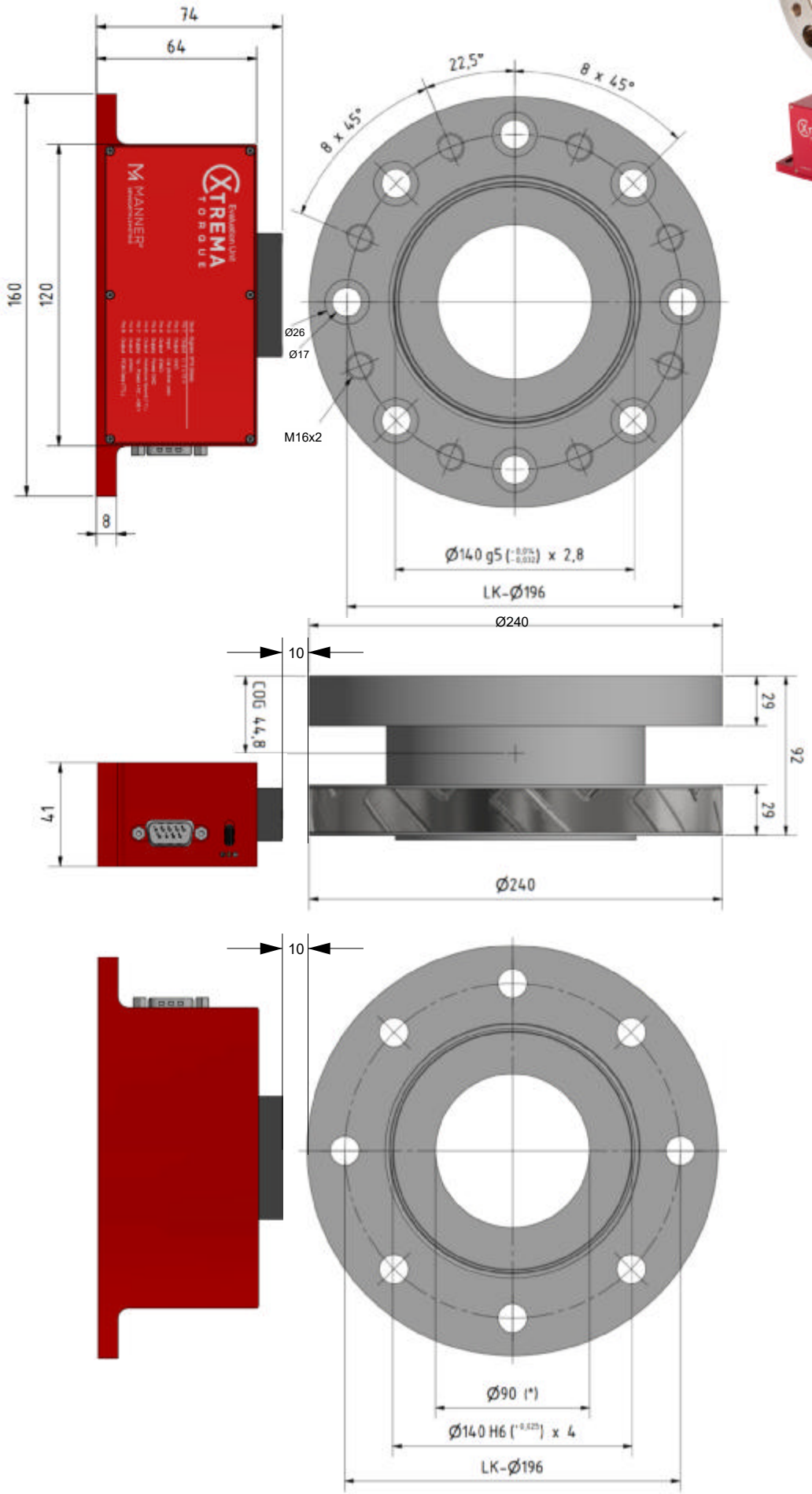
*Hollow shaft only available as an option

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Dimensions XtreMA HP 5 kN·m (in mm)

Receiver with integrated Pick Up

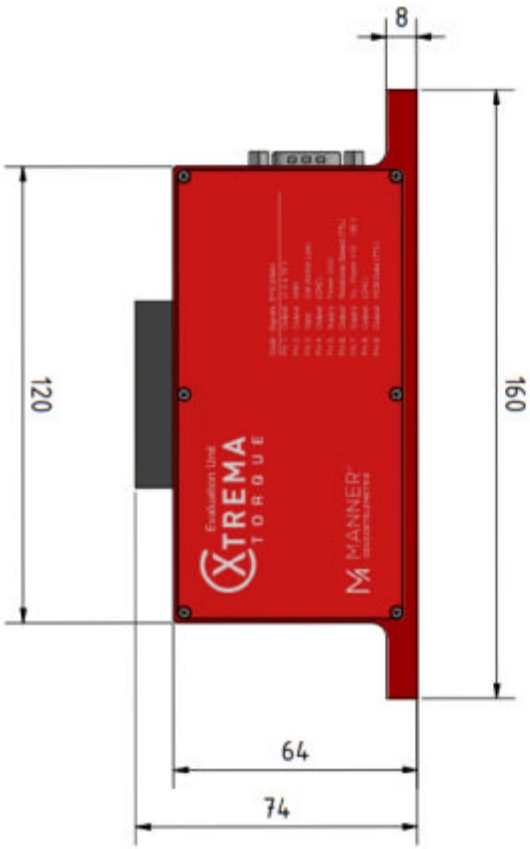


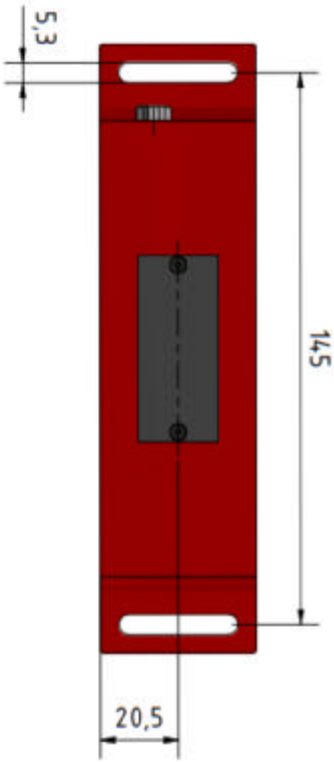


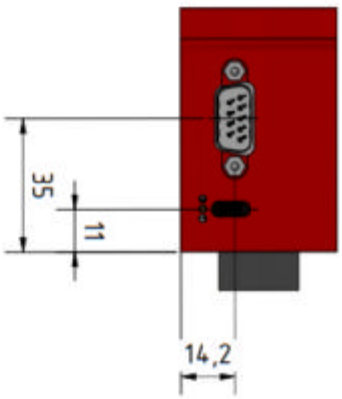
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Geometry Receiver Typ MnAnt integrated Pick UP



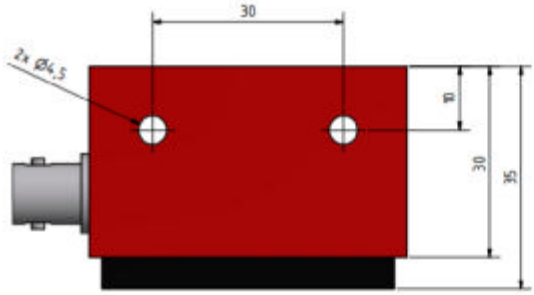


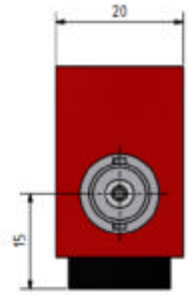


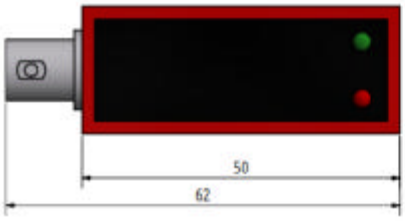


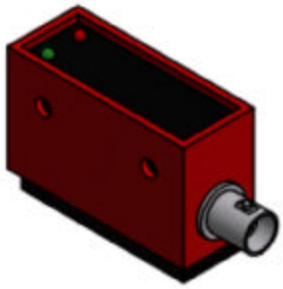
Variante offsetted Pick UP

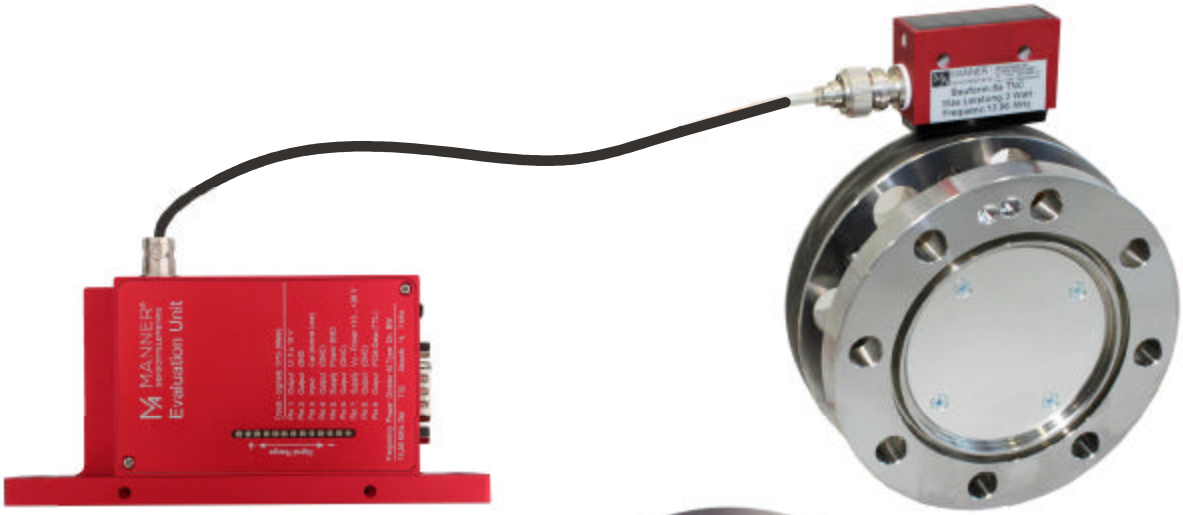
PICK UP 8a





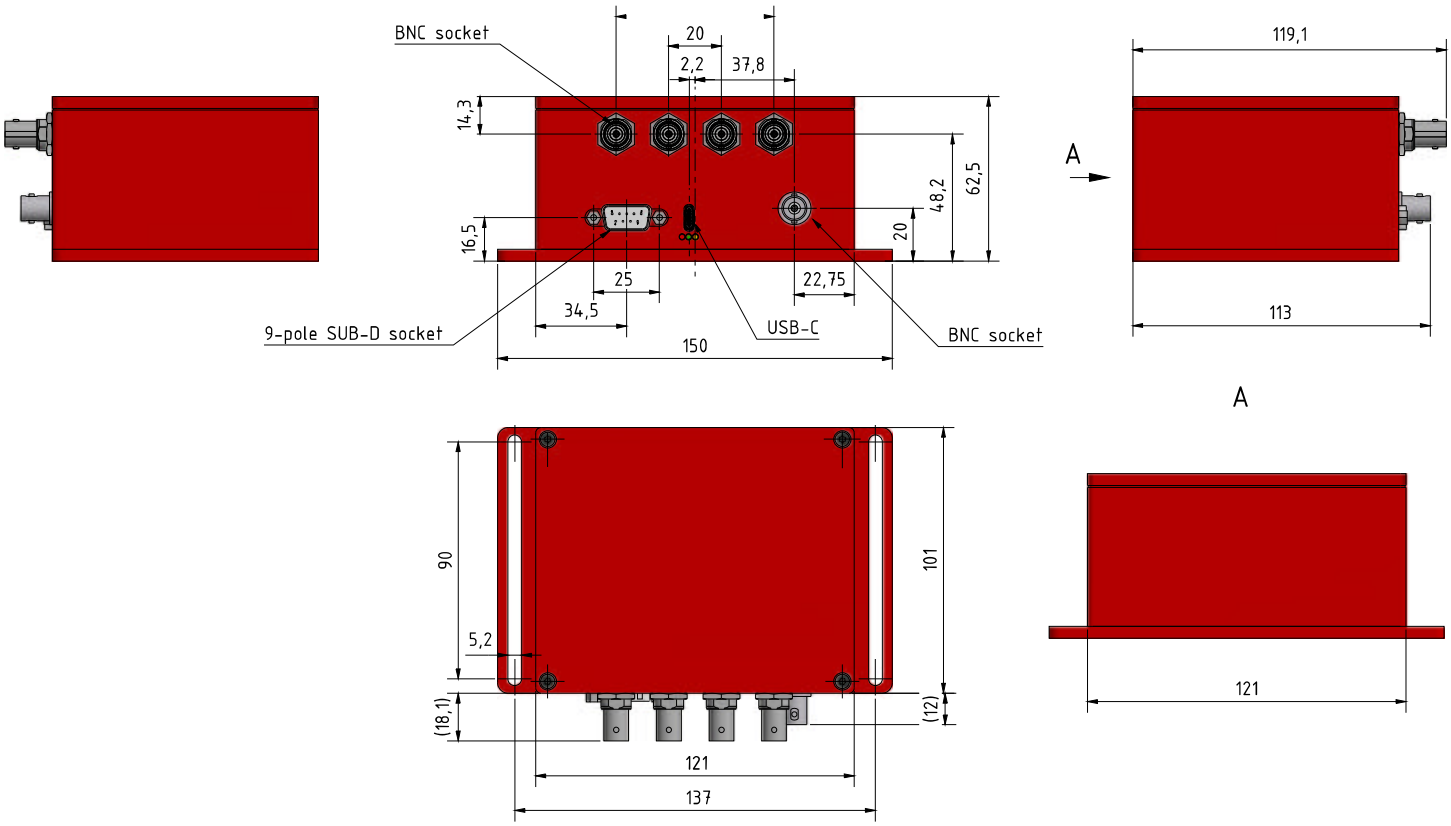


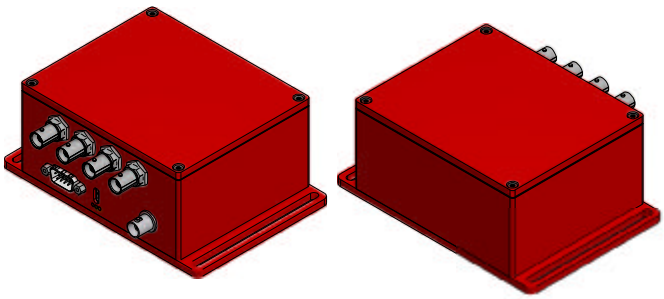






Geometry Evaluation Unit Type Fnh_4k_MPL
Offsetted pickup, control cabinet installation







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Anlage zur Akkreditierungsurkunde D-K-20850-01-00 nach DIN EN ISO/IEC 17025:2018

Gültig ab: **20.11.2020**

Ausstellungsdatum: 12.10.2023

Inhaber der Akkreditierungsurkunde:

Manner Sensortelemetrie GmbH
Eschenwasen 20, 78549 Spaichingen

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Mechanische Messgrößen
- **Drehmoment**

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Registrierungsnummer der Urkunde: **D-K-20850-01-00**

Braunschweig,
22.03.2019

Im Auftrag Dr. Heike Manke
Abteilungsleiterin

Siehe Hinweise auf der Rückseite

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