

i-Wheel Clever 3213.00-2111



Wheel hub drive with fully integrated Circulo 9 Motion Controller, with Safe Motion Modul (SMM), from Synapticon - a compact, intelligent drive system with minimal integration expenses.

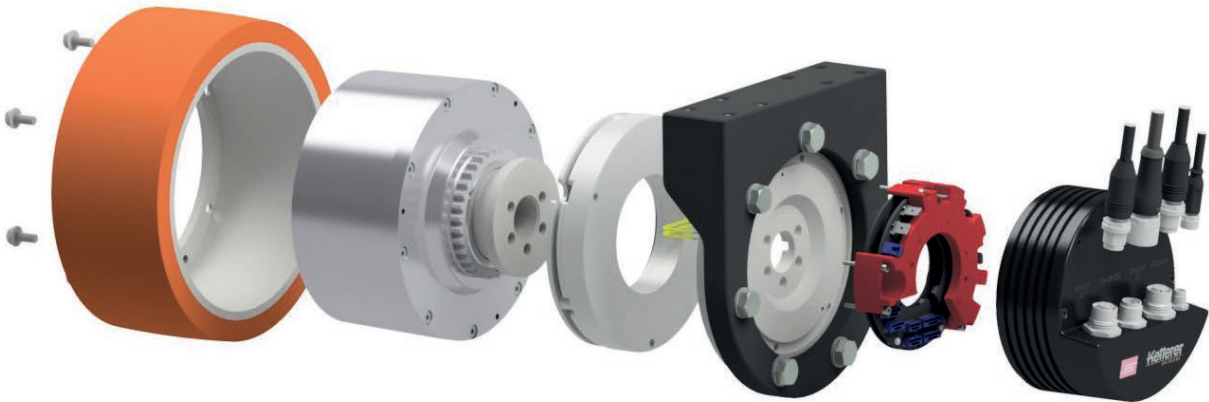
Direct drive: Advantages in a nutshell

- No gearbox – no wear
- Much longer service life compared to conventional drive technology with a gear stage
- Excellent running properties with barely perceptible noise level
- Safer operation through permanent temperature monitoring
- Ultra-compact with extremely high power density
- Easy replacement of wheel coating on site possible thanks to patented Ketterer solution



Overall System: Intelligent - Safe - Ultracompact

- Optimum Performance Scaling: Available in all three Ketterer standard performance classes of the i-Wheel family on request
- Highest performance in drive control in the smallest installation space
- Easy to Use: Seamless Integration in a few easy steps
- Plug & Play: Standard plug & standard cable can be used
- High speed EtherCAT interface, low latency, negligible jitter
- Over 10 certified safety functions (SIL2, PL-d)
- High Resolution Absolute Encoder
- User-friendly Synapticon parameterization and tuning software
- Model predictive field-oriented control for high efficiency, maximum bandwidth
- Emergency holding brake with energy saving mode
- With integrated Safe Motion Module (SMM) from Synapticon



3213.00-2111 i-WheelC-A-170-185	
Rated voltage	48 VDC
Rated current ¹⁾	4.5 A
Rated torque ¹⁾	5 Nm
Rated speed ¹⁾	316 rpm
Max. speed at rated torque ¹⁾	10 km/h
Shaft power (output) ¹⁾	165 W
Idle running speed ²⁾	450 rpm
No-load current ²⁾	0.3 A
Max. efficiency ²⁾	82 %
Standstill torque ²⁾	19.7 Nm
Starting current at idle speed ²⁾	35 A
Max. radial axle load F ³⁾	2,500 N
Max. axial axle load F ³⁾	1,250 N
Encoder resolution	262,144 cpr
Material of the coating	PU-Rad: 92° ±3° Shore A
Braking torque of the emergency holding brake	16 Nm

1) Max. ambient temperature = 40 °C, controller-specific
2) At the nominal point (TU = 20°C), controller-specific
3) Radial and axial forces apply to the nominal service life
L10h = 20,000h according to DIN ISO 281

Circulo 9 Motion Controller with Safe Motion Modul (SMM) by Synapticon	
Communications interface	EtherCAT, FSoE (FailSafe over EtherCAT)
Rated voltage range	24 - 48 V DC
Max. voltage	60 V DC
Continuous phase current RMS	20 A
Max. efficiency	99 %
Hardware Protection	Overcurrent, overvoltage, undervoltage, PW deadtime, overtemperature, PWM shoot through
Standard Safety Functions	STO/SBC SIL2, PL-d
Safe Motion Modul	FSoE, STO, SBC, SS1/2, SOS, SMS, 4xSLS, Safe Process Data (position, velocity)
Certified security functions	STO – SAFE TORQUE OFF SBC – SAFE BRAKE CONTROL SBT – SAFE BRAKE TEST* SS1 – SAFE STOP 1 SS2 – SAFE STOP 2 SLS – SAFELY LIMITED SPEED SLP – SAFELY LIMITED POSITION* SLT – SAFELY LIMITED TORQUE* SAFE VELOCITY PROCESS DATA SAFE POSITION PROCESS DATA SAFE TORQUE PROCESS DATA SAFE DIGITAL GPIO AND ANALOG INPUTS *The functions must be implemented in the safety controller using safe process data

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