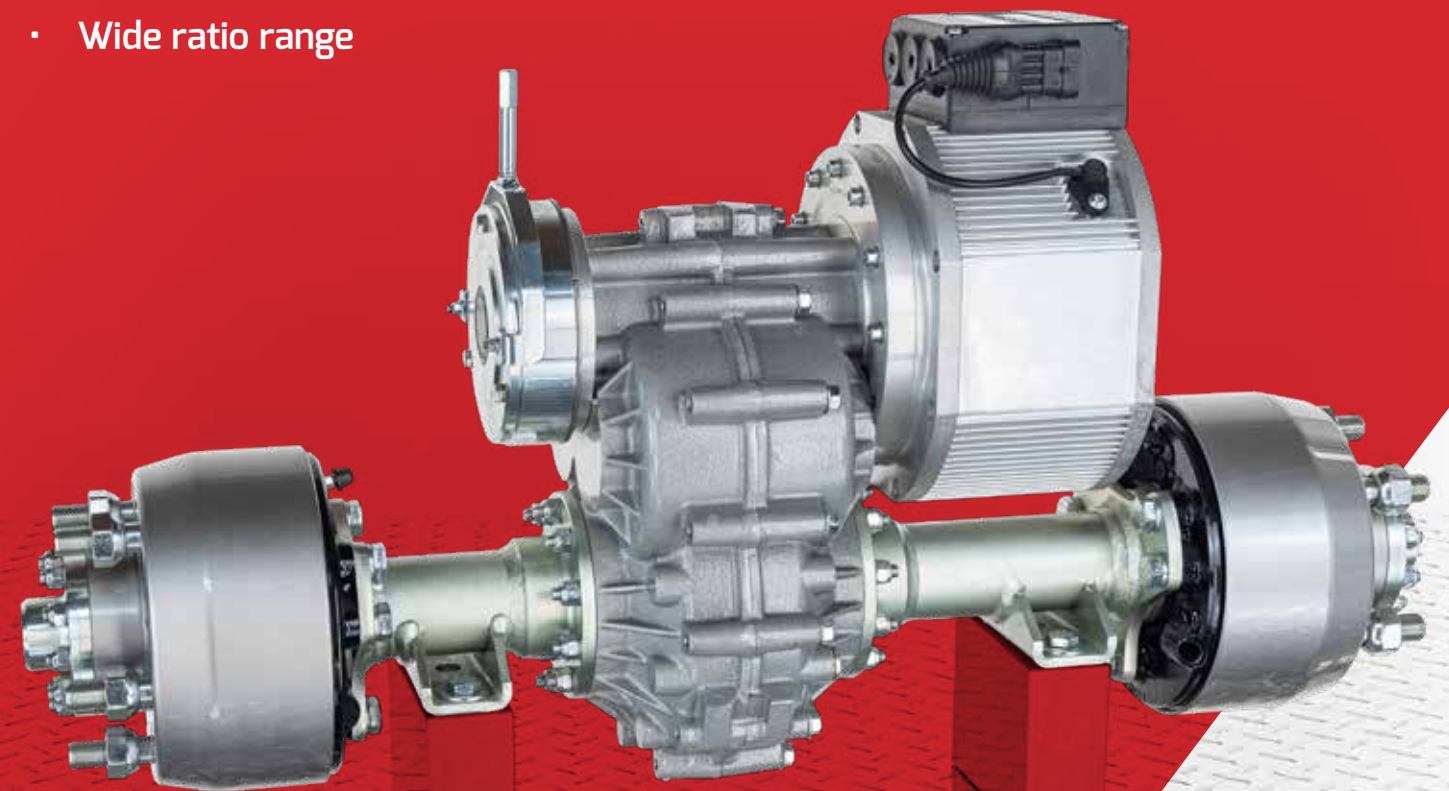


# AXLES

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- Modular design
- Low noise
- Resistance to corrosion
- Ultra-high efficiency
- Many options available
- Many versions available
- Wide ratio range
- Parking brake available
- Easy installation
- Easy maintenance
- Amazing battery autonomy



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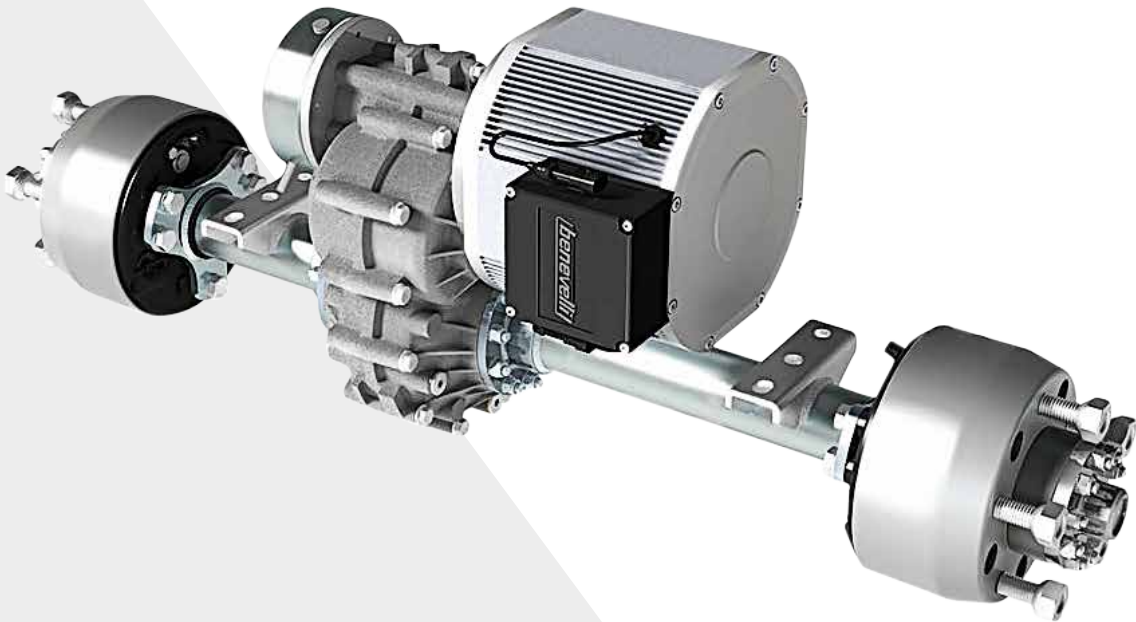
## ELECTRIC WHEEL DRIVES – BENEVELLI

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# ELECTRIC DRIVE AXLES



- Various standard mounting possibilities tilting from 0 to 180°
- Includes various types of wheel hub or mechanical-hydraulic drum brakes
- All models are also available with mechanical locking differential
- Many different track width configurations
- Welding operations performed by robotic systems certified ISO 15614:2012



ELECTRIC DRIVE AXLES

DRIVE AXLES

- Modular design that allows many different track width configurations
- Hardened steel gears with involute grinding profile ensure constant low noise level
- Gear housing in heavy-duty aluminum alloy to minimize weight and add strength
- Built-in studs on gearbox housing
- Metallic parts subjected to Chromiting® zinc coating to withstand corrosive agents
- Benevelli solutions ensure more energy-efficient operations and greater battery autonomy with optimized profile gears
- Easy to install thanks to six standard mounting positions tilting from 0° to 180°
- Designed for complete protection up to IP67 under IEC standard 60529



WHY ELECTRIC ?

Electric powertrains provide instant low-speed torque, with the benefit of zero emissions; they also significantly reduce downtime and operating costs. Battery-powered vehicles are more efficient than with any other technology, allowing peak efficiency of up to 95% compared to 35% for an internal combustion engine.



ELECTRIC DRIVE AXLES

TX1 SERIES

- Parallel configuration and precise gear machining allowing:
  - Ultra-high efficiency of up to 95%
  - Battery autonomy increased by as much as 30%
  - Easy maintenance
  - Compact design
  - Low noise
- SKF bearings for improved efficiency
- Wide ratio range – 8 ratios available from 6 to 32
- Many options available (mechanical brakes, no brake, parking brake, differential lock...)
- Three versions: Standard, Plus and Max
- Fully customizable (track width, bracket position, CV joints version, motor...)
- Power/volume ratio higher than competition
- High resistance to corrosion
- Highest ground clearance in the industry
- Parking brake available on all models

Series	Version	GEARBOX FEATURES				MOTOR FEATURES				Service brake
		Output torque	Max. input speed	Static load	Track-width	Motor type	Rated power	Rated voltage	Prot. degree	
		Nm	RPM	kg	mm		kW	V	IP	
TX1	CV joints	300	7000	---	---	PMDC - AMAC	0.3 - 1.7	24 - 120	54/67	---
	Floating driveshaft	300	7000	---	---		0.3 - 1.7	24 - 120	54/67	---
	Rigid axle	300	7000	400	400 to 1150		0.3 - 1.7	24 - 120	54/67	---
	Wheel hubs	300	7000	400	400 to 1150		0.3 - 1.7	24 - 120	54/67	---
	Drum brakes	300	7000	400	400 to 1150		0.3 - 1.7	24 - 120	54/67	Mechanical 500 Nm
TX1 PLUS	CV joints	500	7000	---	---	AMAC - SMAC	0.6 - 3.0	24 - 120	54/67	---
	Rigid axle	500	7000	500	400 to 1150		0.6 - 3.0	24 - 120	54/67	---
	Wheel hubs	500	7000	500	400 to 1150		0.6 - 3.0	24 - 120	54/67	---
	Drum brakes	500	7000	500	400 to 1150		0.6 - 3.0	24 - 120	54/67	Mechanical 500 Nm
TX1 MAX	Wheel hubs	600	7000	700	400 to 1150	AMAC - SMAC	0.6 - 3.0	24 - 120	54/67	---
	Drum brakes	600	7000	700	400 to 1150		0.6 - 3.0	24 - 120	54/67	Hydraulic/mechanical 1200 Nm

TX1 series available ratios: 1:6 1:10 1:12 1:16 1:22 1:24 1:28 1:32  
Please refer to the SMAC-AMAC subsection of the Electrical group section in this catalog





ELECTRIC DRIVE AXLES

TX2 SERIES



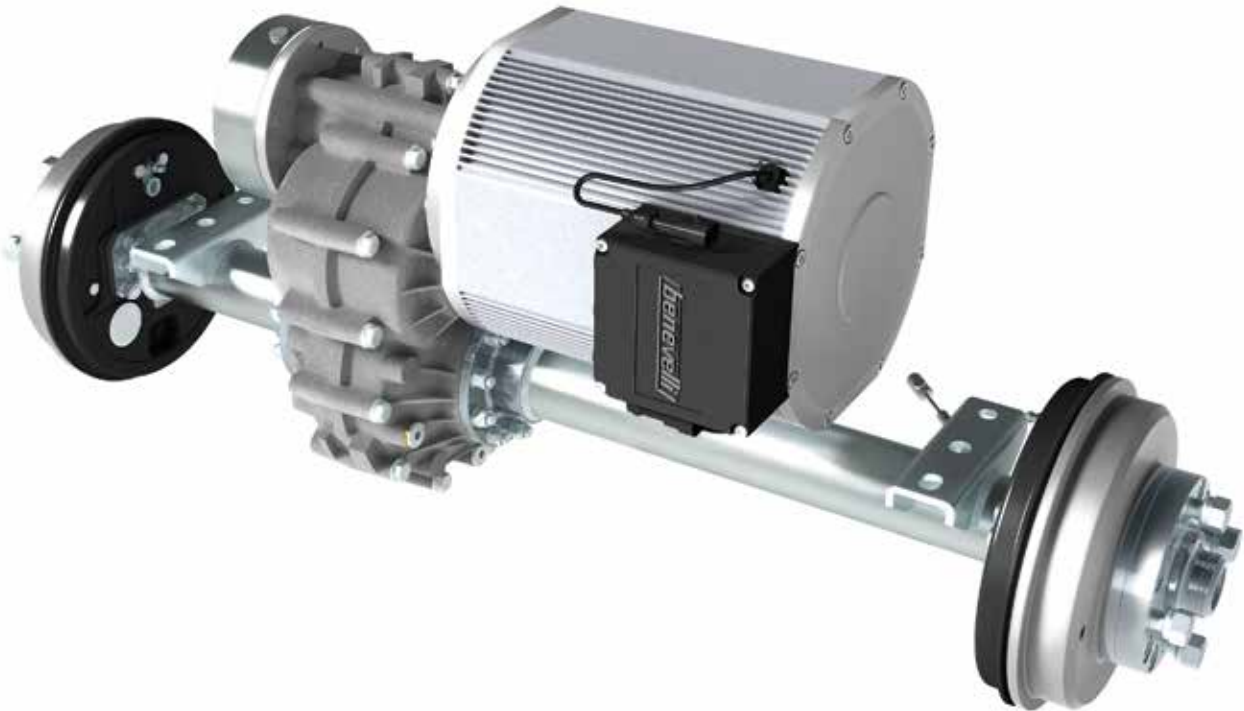
- Parallel configuration and precise gear machining allowing:
    - Ultra-high efficiency of up to 95%
    - Battery autonomy increased by as much as 30%
    - Easy maintenance
    - Compact design
    - Low noise
  - SKF bearings for improved efficiency + tapered roller bearing at wheel hubs for increased safety
  - Full floating axle for increased torque, load and safety
- Wide ratio range – 13 ratios available from 3 to 80
  - Two versions: Standard and Plus
  - Fully customizable (track width, bracket position, CV joints version, motor, etc)
  - Power/volume ratio higher than competition
  - High resistance to corrosion
  - Ground clearance highest in the industry
  - Parking brake available on all models

		GEARBOX FEATURES				MOTOR FEATURES				
Series	Version	Output torque	Max. input speed	Static load	Track-width	Motor type	Rated power	Rated voltage	Prot. degree	Service brake
		Nm	RPM	kg	mm		kW	V	IP	
TX2	CV joints	1000	7200	---	---	AMAC - SMAC	3.0 - 20.0	24 - 120	54/67	---
	4WD transfer case	1000	7200	---	---		3.0 - 20.0	24 - 120	54/67	---
	Wheel hubs	1000	7200	1000	560 to 1988		3.0 - 6.5	24 - 120	54/67	---
	Drum brakes	1000	7200	1000	560 to 1988		3.0 - 10.0	24 - 120	54/67	Mechanical 500 Nm
TX2 PLUS	CV joints	1600	7200	---	---	AMAC - SMAC	3.0 - 20.0	24 - 120	54/67	---
	4WD transfer case	1600	7200	---	---		3.0 - 20.0	24 - 120	54/67	---
	Wheel hubs	1600	7200	1600	560 to 1988		3.0 - 20.0	24 - 120	54/67	---
	Drum brakes	1600	7200	1600	560 to 1988		3.0 - 20.0	24 - 120	54/67	Hydraulic/mechanical 3400 Nm

TX2 series available ratios: 1:3 1:5 1:7 1:9 1:10 1:12 1:16 1:22 1:27 1:35 1:43 1:56 1:80  
Please refer to the SMAC-AMAC subsection of the Electrical group section in this catalog

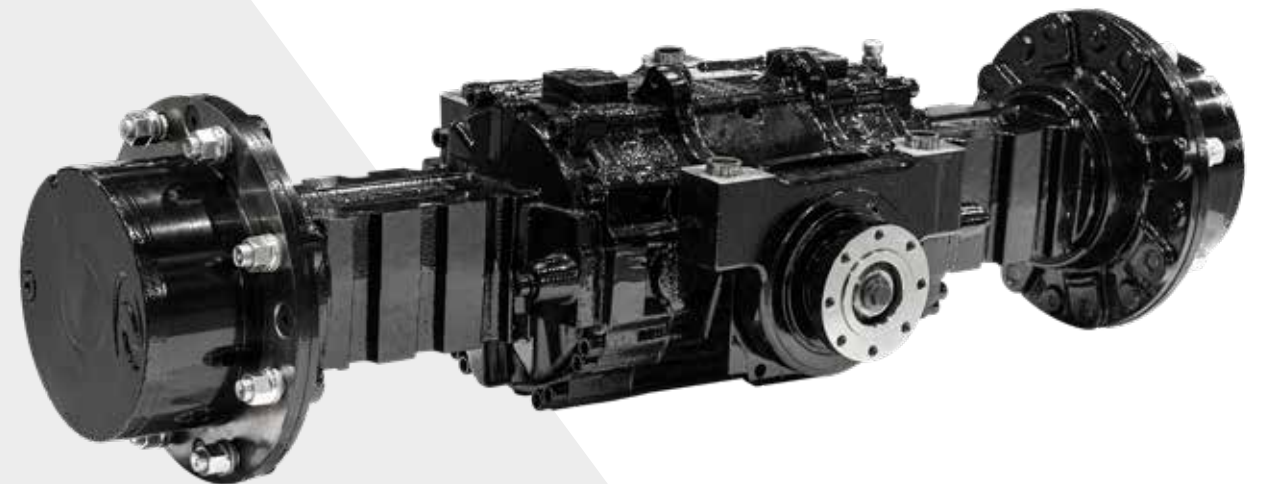
	MOTOR SERIES		
	PMDC	AMAC	SMAC
EM parking brake	X	X	X
Speed encoder	-	X	X
Maintenance free	-	X	X
Noise level	-	X	X
Temp sensor	-	X	X
UL ready	-	X	X
High efficiency	-	X	X
Constant torque	-	-	X

Please refer to the SMAC-AMAC subsection of the Electrical group section in this catalog



# DRIVE AXLES

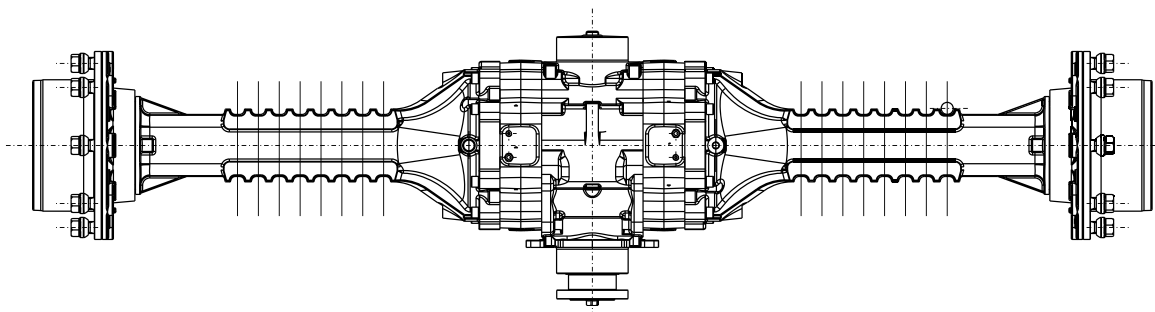
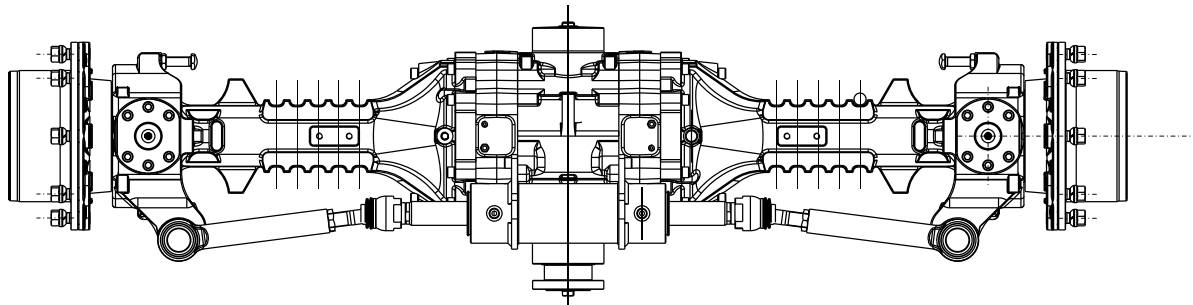
- Rigid and steering axles (off-road)
- Axles with rigid or oscillating mounting
- Open, limited slip or locking differential
- Spring applied hydraulically released brakes (SAHR)
- Optional central or top pivot mounting
- Single-stage and two-stage reduction



# DRIVE AXLES

## AVAILABLE OPTIONS

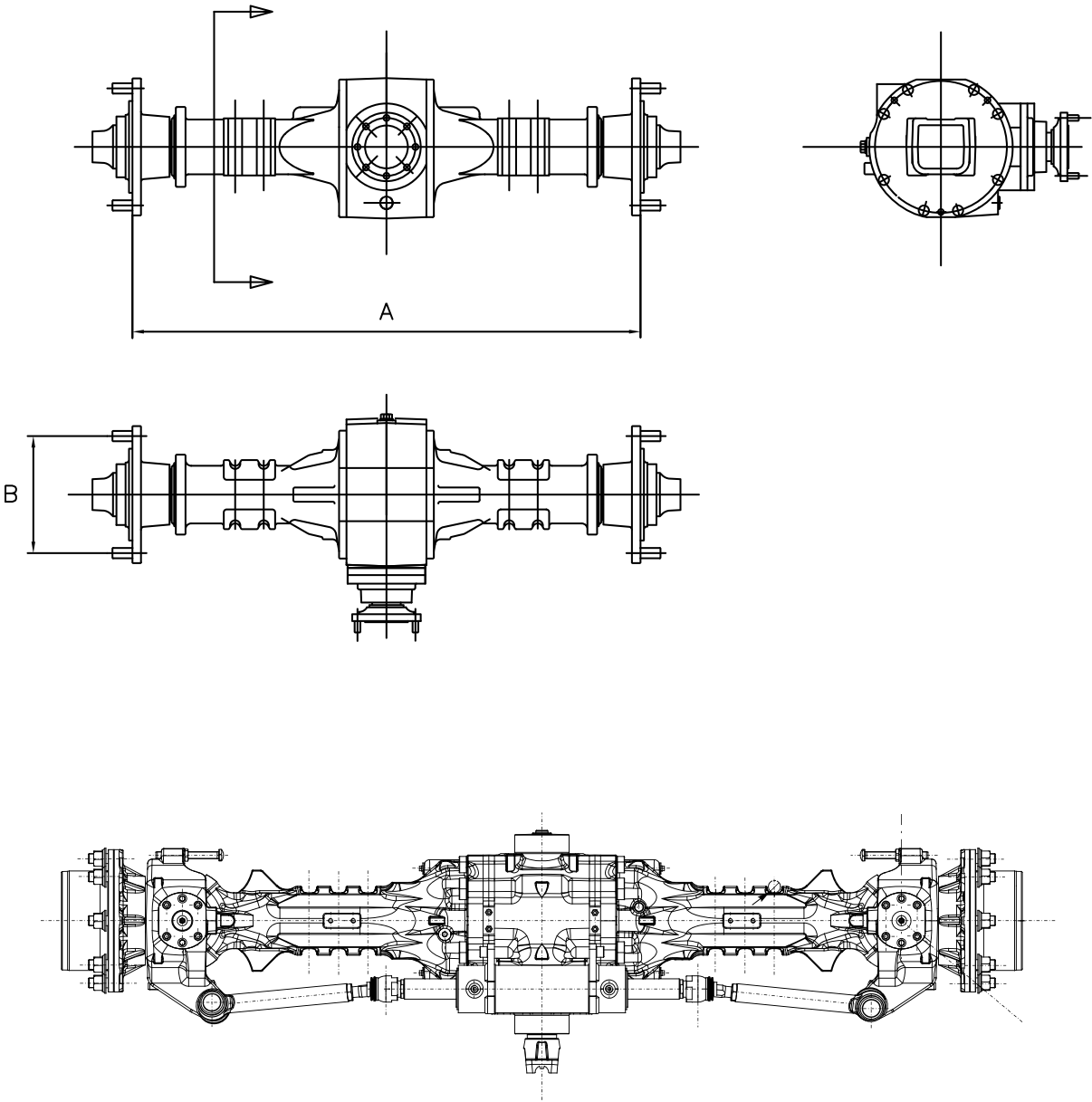
- Open, limited slip or locking differential
- Reduction at the wheel hub
- Spring applied hydraulically released brakes (SAHR)
- Central or upper pivot mounting option
- Four-wheel drive
- Hydraulic motor flange



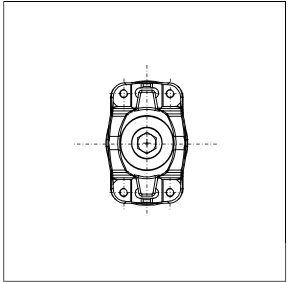
DRIVE AXLES

RIGID AND STEERING DRIVE AXLES

Series	Type	Max. dynamic load	Max. static load	Max. output torque	Reduction ratio (wheel hub)	Total reduction	Flange to flange (A)	Wheel hub bolt circle diameter (B)
		daN	daN	daN.m			mm	mm
046	Rigid	2500	4500	440	-	2.23:1 ÷ 5.57:1	750 ÷ 890	205
068	Rigid	2700	6600	850	4.31:1	9.63:1 ÷ 24.00:1	806 ÷ 1263	205
	Steering							
080	Rigid	4800	9000	2100	4.80:1	10.73:1 ÷ 26.74	850 ÷ 1575	205
	Steering	2700					1272 ÷ 1810	205
128	Rigid	5800	12000	2400	6.00:1	13.41:1 ÷ 24.66:1	1010 ÷ 1810	275
	Steering						1530 ÷ 1810	
228	Rigid	8000	20000	3400	6.00:1	13.41:1 ÷ 24.66:1	1660 ÷ 2050	275
	Steering						2050	335
238	Rigid	9300	22000	3400	6.00:1	13.41:1 ÷ 24.66:1	1660 ÷ 2050	275
	Steering						2050	335
258	Rigid	9300	-	4200	6.40:1	14.28:1 ÷ 26.30:1	1660 ÷ 2050	335
	Steering							



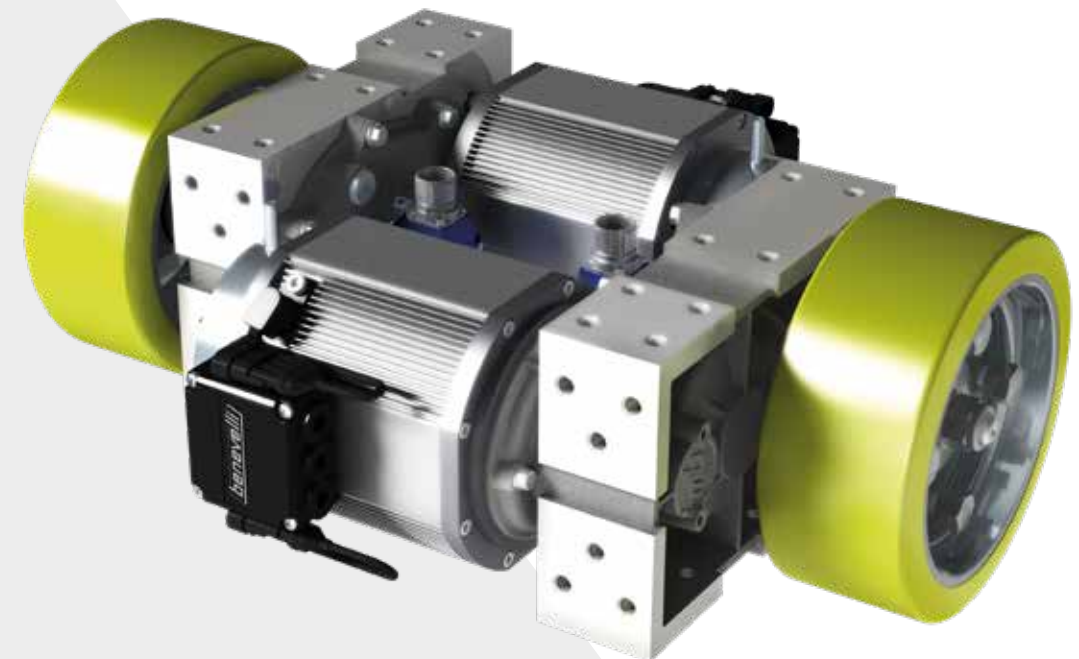
FLANGED END YOKE 1410



# ELECTRIC WHEEL DRIVES



- Compact design
- Easy maintenance
- Low noise
- Ultra-high efficiency up to 95%
- Parking brake available on all models
- Easy installation without bracket increasing assembly stiffness
- High resistance to corrosion
- Many options available





ELECTRIC WHEEL DRIVES

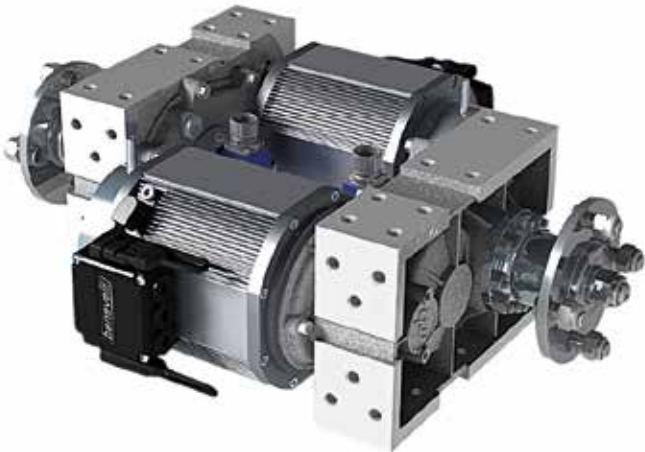
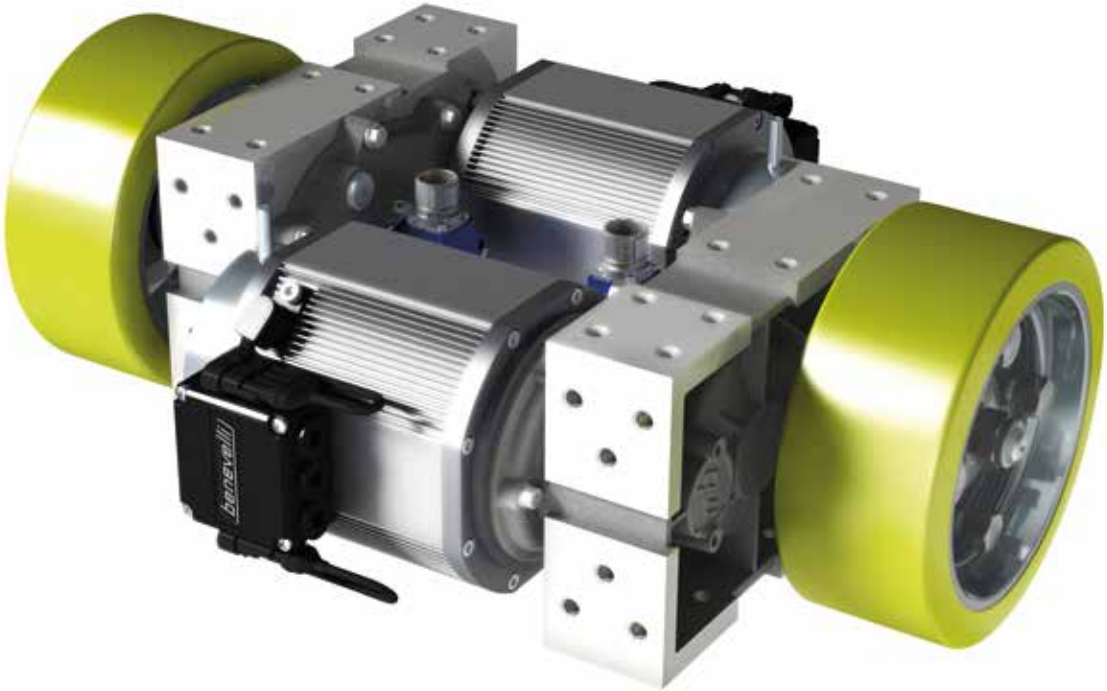


DD1 SERIES

- Parallel configuration and precise gear machining allowing:
    - Ultra-high efficiency of up to 95%
    - Battery autonomy increased by as much as 30%
    - Easy maintenance
    - Compact design
    - Low noise
  - SKF bearings for improved efficiency
  - Wide ratio range – 8 ratios available from 6 to 32
- Many options available (mechanical brakes, no brake)
  - Adaptable to different types of wheels
  - Power/volume ratio higher than competition
  - High resistance to corrosion
  - Easy installation without brackets to increase assembly stiffness
  - Parking brake available on all models

Series	Version	GEARBOX FEATURES				MOTOR FEATURES			Service brake
		Output torque*	Max. input speed	Static load*	Wheel diameter (min.)	Motor type	Rated power*	Rated voltage	
		Nm	RPM	kg	mm		kW	V	
DD1	Polyurethane wheels	800	3500	800	200	PMDC – AMAC	0.6 - 1.6	24 - 120	---
	Wheel hubs	800	3500	800	200		0.6 - 1.6	24 - 120	---
	Mechanical drum brakes	800	3500	800	200		0.6 - 1.6	24 - 120	Mechanical 500 Nm
DD1 PLUS	Polyurethane wheels	1000	7200	1000	200	AMAC – SMAC	1.2 - 6.0	24 - 120	---
	Wheel hubs	1000	7200	1000	200		1.2 - 6.0	24 - 120	---
	Mechanical drum brakes	1000	7200	1000	200		1.2 - 6.0	24 - 120	Mechanical 500 Nm
	Drum brakes	1000	7200	1000	200		1.2 - 6.0	24 - 120	Hydraulic/mechanical 1200 Nm

DD1 Series available ratios: 1:6 1:10 1:12 1:16 1:22 1:24 1:28 1:32  
Please refer to the SMAC - AMAC subsection of the Electrical group section in this catalog  
\* For a pair of DD1



ELECTRIC WHEEL DRIVES



TR1 SERIES

- Parallel configuration and precise gear machining allowing:
  - Ultra-high efficiency of up to 95%
  - Battery autonomy increased by as much as 30%
  - Easy maintenance
  - Compact design
  - Low noise
- Designed for a complete protection up to IP67 under IEC standard 60529
- Wide ratio range – 8 ratios available from 6 to 32
- Minimized backlash guarantees a precise positioning of the machine
- High resistance to corrosion
- Easy installation without brackets to increase assembly stiffness
- Parking brake available on all models

Series	Version	GEARBOX FEATURES				MOTOR FEATURES			Service brake
		Output torque	Input speed (max.)	Static load	Diff. lock	Motor type	Rated power	Rated voltage	
		Nm	RPM	kg			kW	V	
TR1	Single unit	300	3500	300	---	PMDC – AMAC	0.3 - 0.8	24 - 120	---
	Dual units	600	3500	600	Electronic		0.6 - 1.6	24 - 120	---
	Wheel hubs	600	3500	600	Electronic		0.6 - 1.6	24 - 120	---
	Drum brakes	600	3500	600	Electronic		0.6 - 1.6	24 - 120	Mechanical 500 Nm
TR1 PLUS	Single unit	400	7200	300	---	AMAC – SMAC	0.6 - 3.0	24 - 120	---
	Dual units	800	7200	800	Electronic		1.2 - 6.0	24 - 120	---
	Wheel hubs	800	7200	800	Electronic		1.2 - 6.0	24 - 120	---
	Mechanical drum brakes	800	7200	800	Electronic		1.2 - 6.0	24 - 120	Mechanical 500 Nm
	Drum brakes	800	7200	800	Electronic		1.2 - 6.0	24 - 120	Hydraulic/mechanical 1200 Nm

TR1 series ratios: 1:6 1:10 1:12 1:16 1:22 1:24 1:28 1:32

Motor type: please refer to the SMAC-AMAC subsection of the Electrical group section in this catalog

	MOTOR SERIES		
	PMDC	AMAC	SMAC
EM parking brake	X	X	X
Speed encoder	-	X	X
Maintenance Free	-	X	X
Noise level	-	X	X
Temp sensor	-	X	X
UL ready	-	X	X
High efficiency	-	X	X
Constant torque	-	-	X

Learn more about the CNX series that offers a range of complementary products for Benevelli axles. Contact your representative for more information.





ELECTRIC WHEEL DRIVES

WD220 SERIES

- Parallel configuration and precise gear machining allowing:
  - Compact and scalable design
  - Ultra-high efficiency of up to 95%
  - Lightweight
  - Battery autonomy increased by as much as 30%
  - Low noise
  - Integrated safety brake
- Easy maintenance
- High radial loads
- High power density
- High resistance to corrosion
- Adaptable to different types of wheels
- Easy installation without brackets to increase assembly stiffness
- Parking brake available

Series	Version	GEARBOX FEATURES				MOTOR FEATURES			Service brake
		Output torque Nm	Input speed RPM	Static load kg	Wheel diameter (min.)	Motor type	Rated power kW	Rated voltage V	
WD220	Wheel hubs	≥500	---	≥1000	---	SMAC	1.5 - 3	24 - 600	Optional

Ratio available: 1:41



CONTRIBUTING TO PEOPLE’S QUALITY OF LIFE, EVERY DAY.

