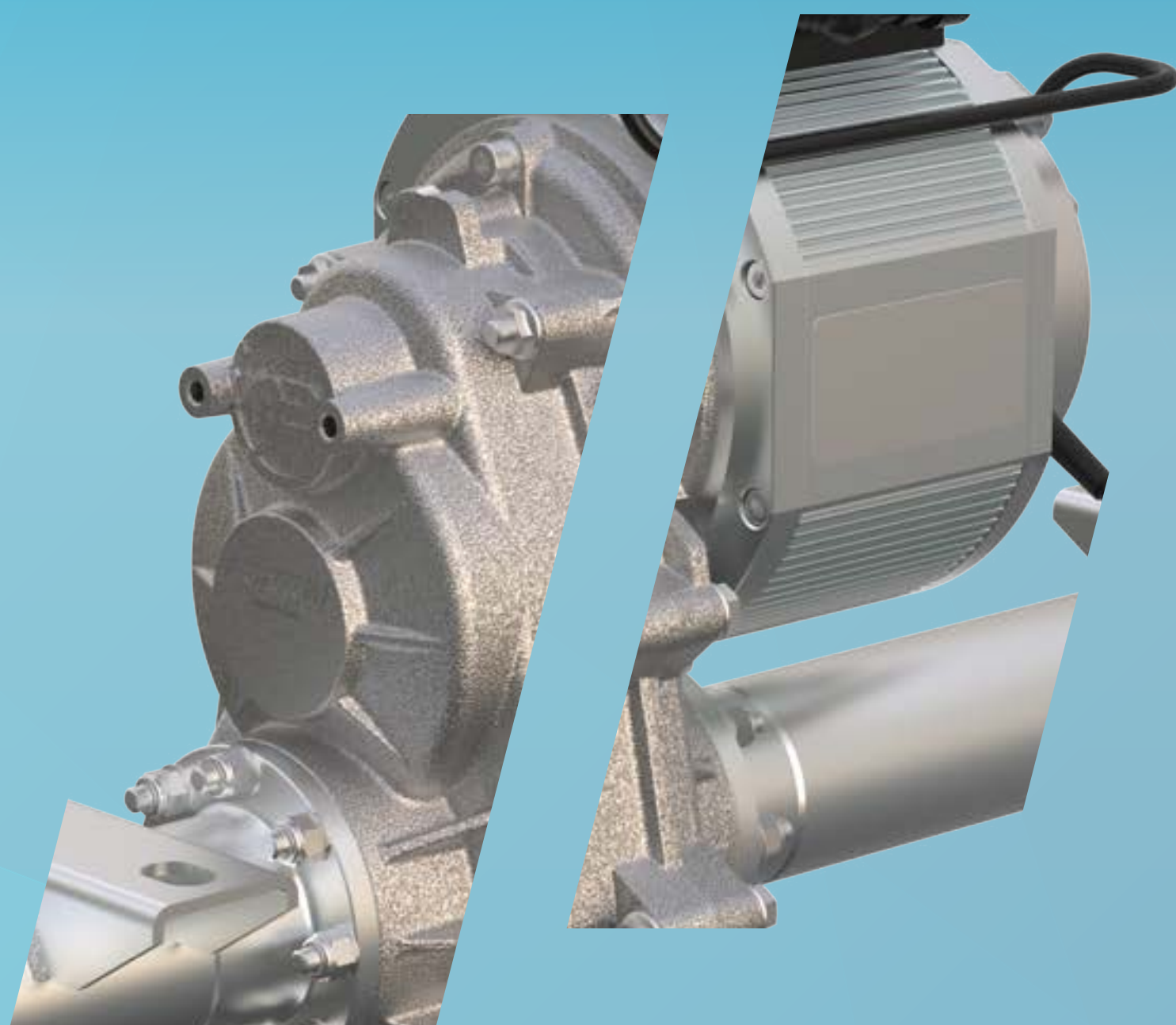




TX1 SERIE

Electric Transaxles

Contents

Intro	3
Features	6
Motor Options	7
Versions	8
TX1 Serie Datasheet	9
TX1 Serie Plus Datasheet	13
TX1 Serie Max Datasheet	17
Mounting Options	19
Wheel Hubs Options	20
Drum Brakes Options	21
Order Code	22
Benevelli Method	23

Welcome to TX1 Serie

TX1 Serie consists in high performance electric transaxles for battery powered vehicles. Powertrain includes a gearbox with differential (diff-lock optional), rigid axle, brake system and electric motor.

Application Sectors



AGRICULTURE



CLEANING



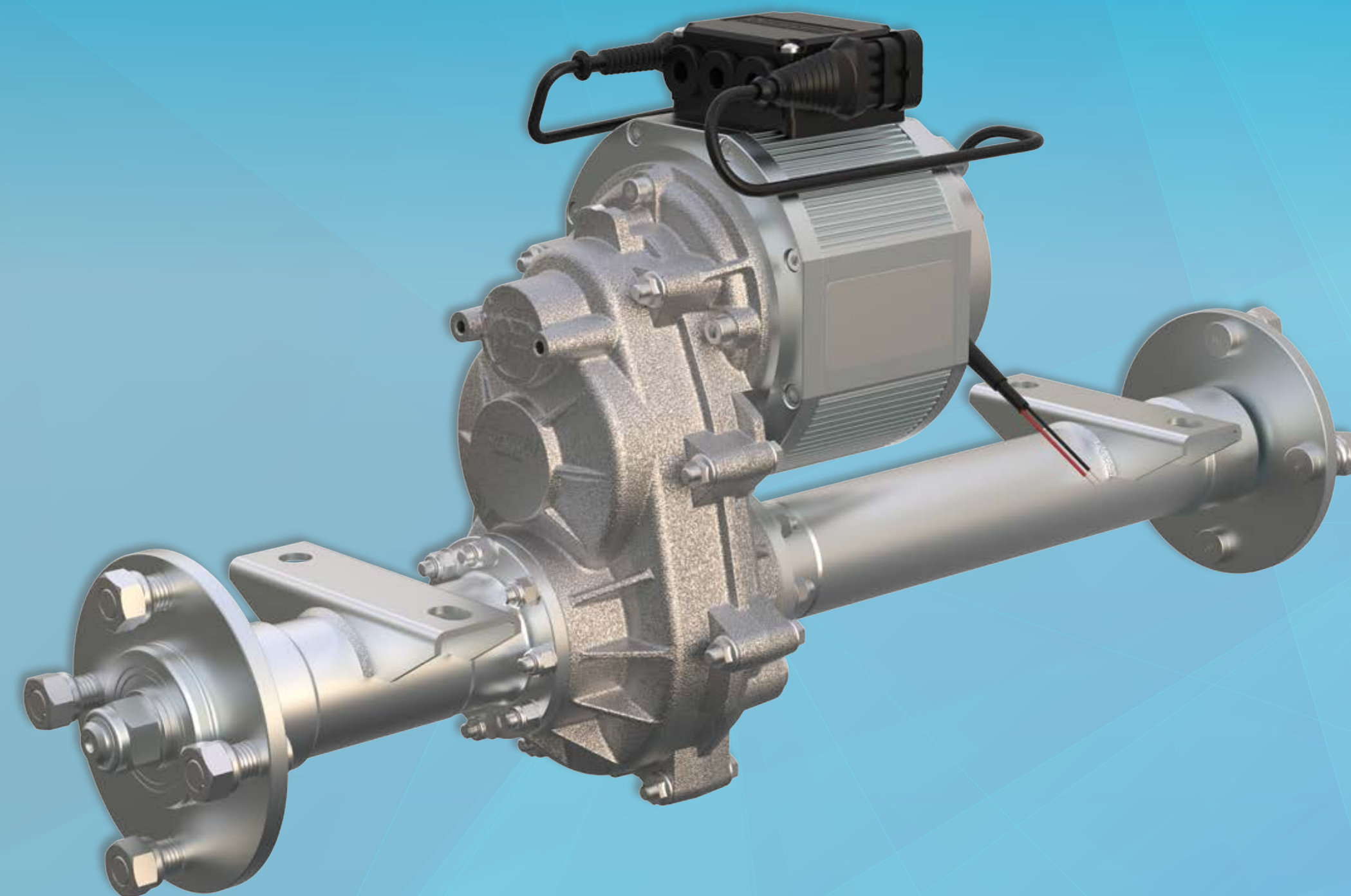
MATERIAL HANDLING



EMOBILITY



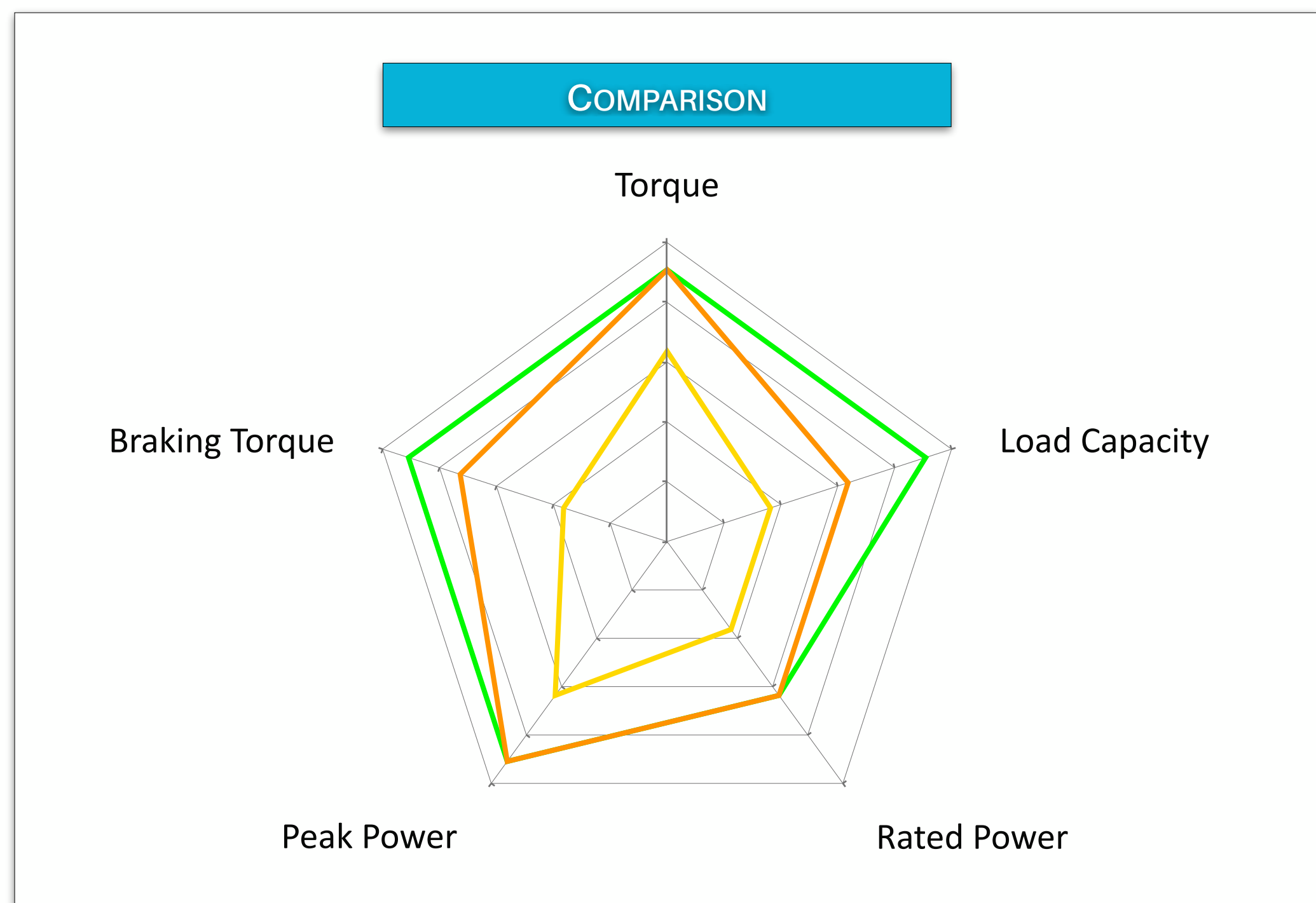
CONSTRUCTION



TX1 SERIE | WHEEL HUBS VERSION

	TX1 SERIE	TX1 SERIE PLUS	TX1 SERIE MAX
Load Capacity	400 kg	600 kg	800 kg
Torque Peak	400 Nm	600 Nm	600 Nm
Motor Power Rated	0,6 to 1,2 kW	0,6 to 3,0 kW	0,6 to 3,0 kW
Motor Power Peak	0,8 to 3,2 kW	3,2 to 10,0 kW	3,2 to 10,0 kW
Motor Voltage	24 to 80 V	24 to 600 V	24 to 600 V
Motor Type	DC AC Induction	AC Induction Synchronous IPM	AC Induction Synchronous IPM
IP Rating	IP 54 to 67	IP 54 to 6K9K	IP 54 to 6K9K
Efficiency (Electrical)	70 to 80%	80 to 95%	80 to 95%
Efficiency (Mechanical)	95%		
Available Ratios	6 - 10 - 12 - 16 - 19 - 22 - 24 - 28 - 32		
Input Speed Max	7.200 rpm		
Axle Width	400 to 1.380 mm		
Wheel Fitting	Hub Piloted 3 - 4 - 5 Studs		
Service Brakes	Hydraulic and/or Mechanical		
Parking Brakes	Electromagnetic and/or Mechanical		
Fixation System	Mounting Brackets		
Lubrication	0,25 l Mobil 1 SHC 75W90 Oil		

1 Serie. 3 Families



TX1 SERIE — **TX1** SERIE PLUS — **TX1** SERIE MAX



TX1 SERIE

Entry-level version, with semi-floating keyed axle shafts and standard ball bearing on wheels.



TX1 SERIE PLUS

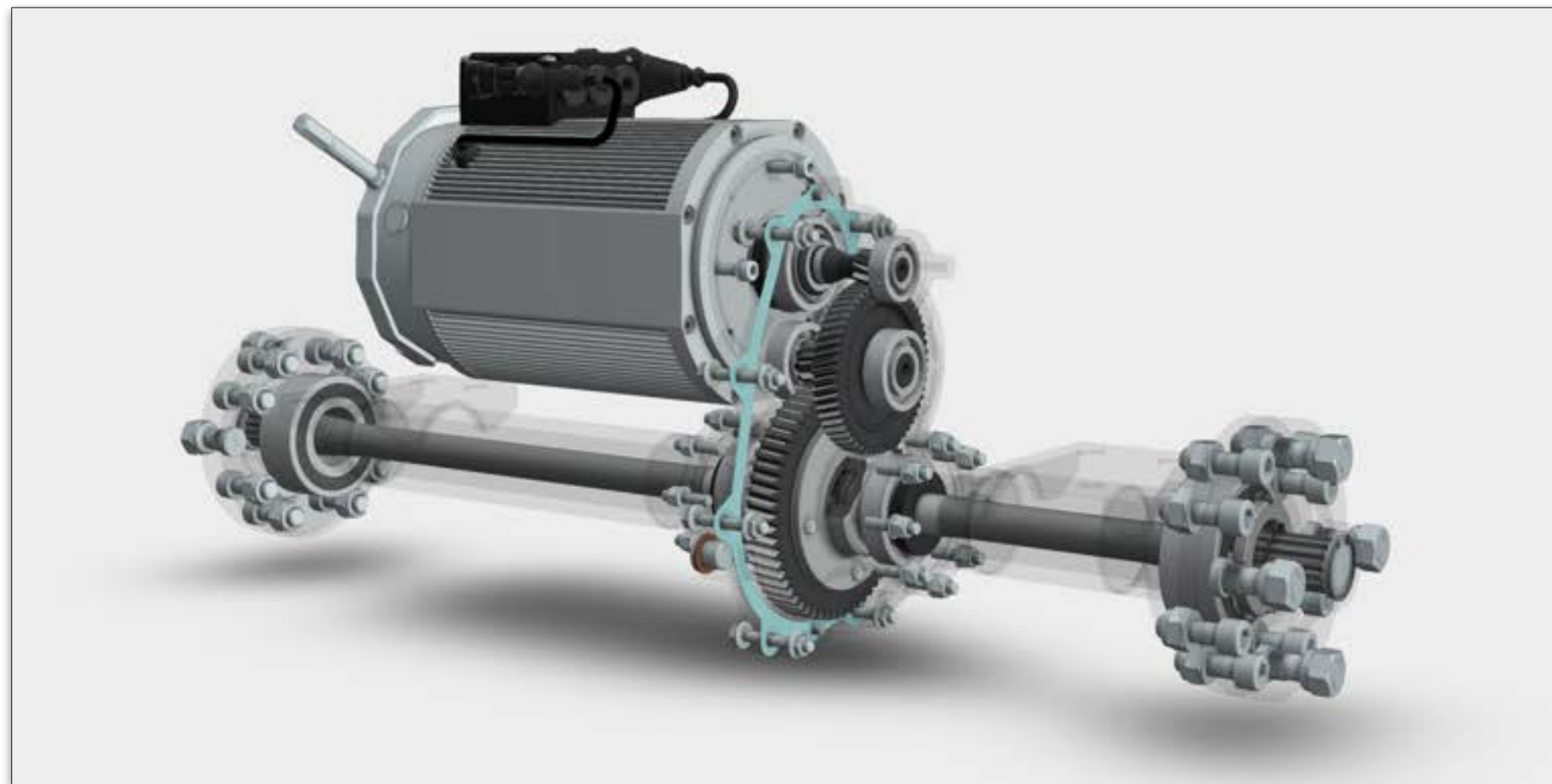
Best-selling version with semi-floating splined axle shaft and strong double row angular-contact bearing on wheels.



TX1 SERIE MAX

Most powerful version with full-floating axle and double row angular-contact bearing on wheels.

Features

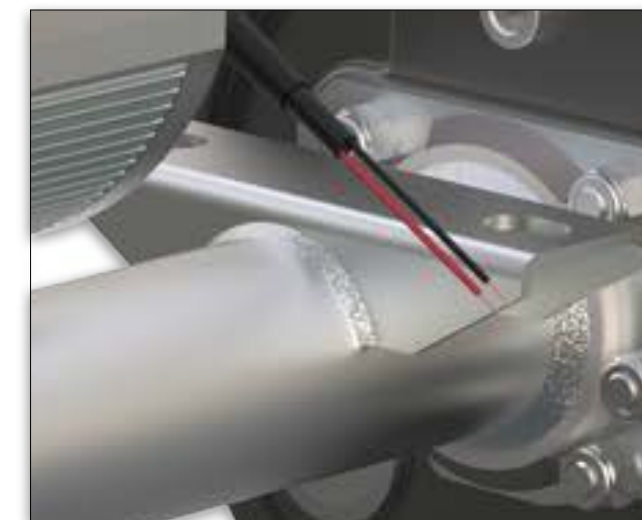


TX1 Serie is an entirely new electric transaxle. It packs outrageous performance, stunning silence and new capabilities, it delivers furthermore unbelievable power efficiency, a major breakthrough for your electric vehicles.



Gears Class

Class 5 gears with optimized design ensure the highest level of efficiency and quiet operations to your e-vehicle.



Modularity

Modular system covers needs of electric vehicle manufacturers thanks to thirteen standard mounting position.

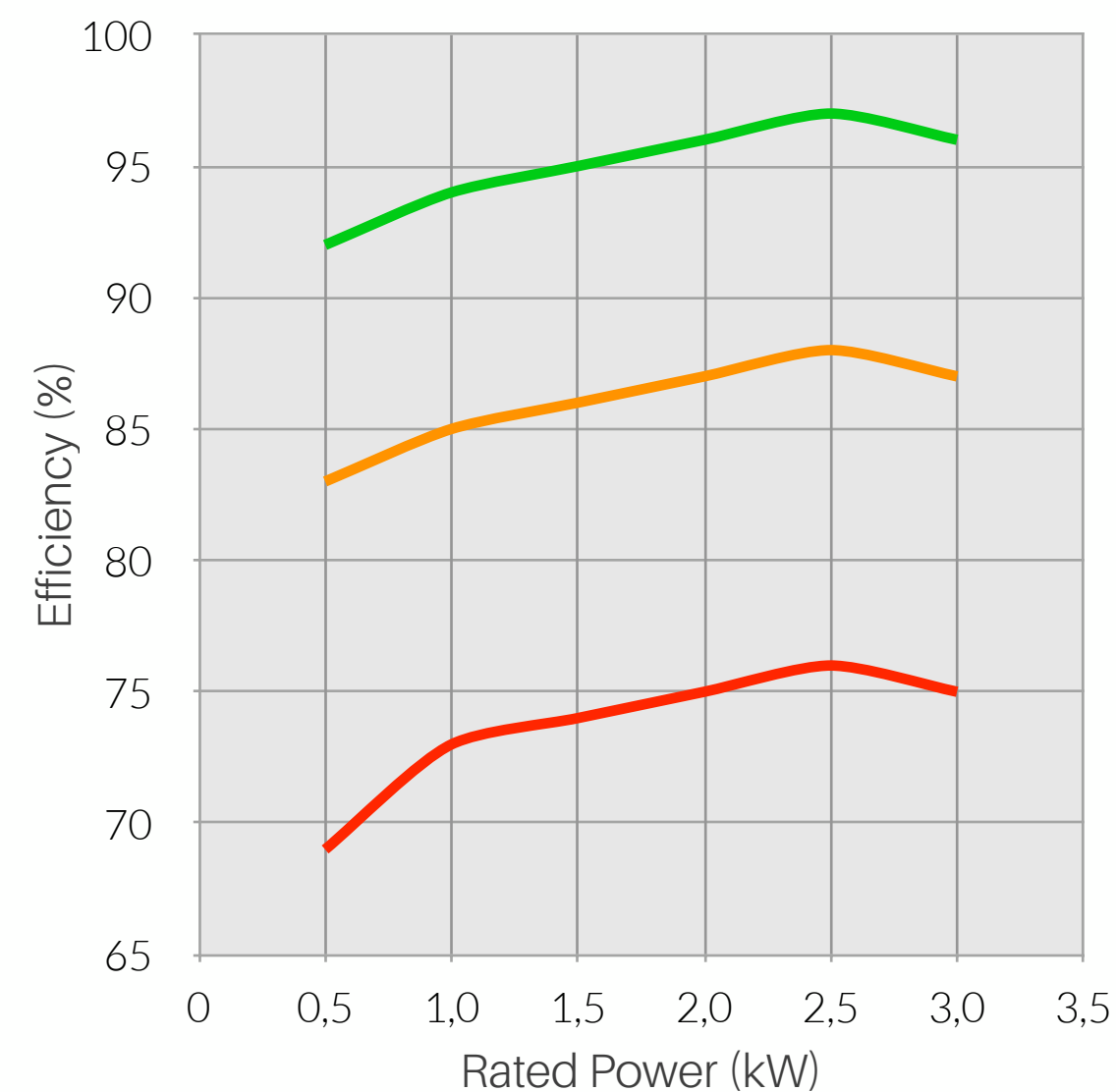


Rugged Design

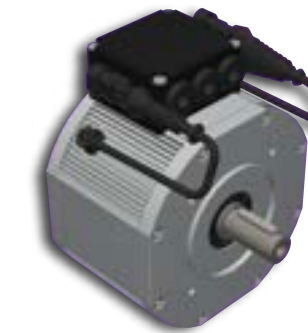
Robust gearbox design & construction enable large payload minimizes weight and dimensions. Stunningly compact.

Motor Options

COMPARISON



SMAC  **AMAC**  **PMDC** 



SMAC SERIE

Synchronous IPM motors, interior permanent magnets ensure constant torque and highest power density.



AMAC SERIE

AC Induction motors ensure great flexibility of installation and great performances.



PMDC SERIE

DC permanent magnets ferrite motors ensure good performance for small powers, ideal for entry level solutions.

All Models

TX1 SERIE



Pag. 9



Pag. 10



Pag. 11



Pag. 12

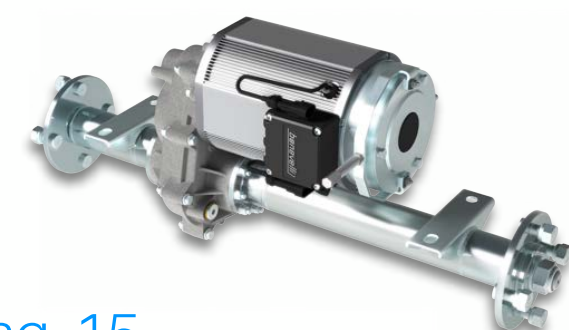
TX1 SERIE PLUS



Pag. 13



Pag. 14



Pag. 15



Pag. 16

TX1 SERIE MAX



Pag. 17



Pag. 18

Rigid Axle Version

TX1 **TX1** SERIE TX1 SERIE TX1 SERIE TX1 SERIE PLUS TX1 SERIE PLUS TX1 SERIE PLUS TX1 SERIE PLUS TX1 SERIE MAX TX1 SERIE MAX



Gearbox

Gear Ratios	i	6 - 10 - 12 - 16 - 19 - 22 - 24 - 28 - 32
Output Torque	Nm	400
Input Speed (Max)	Rpm	5.000
Static Load	kg	400
Axle Type		Semi floating keyed axle-shafts
Track-width	mm	400 ÷ 1380
Efficiency (Mech)	%	95
Gears Finishing		Class 5
Differential Type		Open type with four pinions
Differential Lock		Mechanical (option)
Service Brakes		n/a
Fixation System		Mounting brackets
Wheels Fitting		Keyed axle-shafts

Motor

Motor Type		PMDC Serie	AMAC Serie
Motor Technology		DC Permanent Magnet	AC Induction
Power Range (Rated)	kW	0,5 ÷ 0,8	0,6 ÷ 1,7
Power Range (Peak)	kW	Up to 1,5	Up to 3,2
Rated Voltage	V	24 ÷ 48	24 ÷ 600
IP Rating	IP	20 - 54	20 - 54 - 66 - 67
Motor Feedback		n/a	Hall effect 64 pulses
Thermal Class		F	F
Thermal Protection		n/a	PTY 84-130
Connections		Terminal box	Terminal box
Parking/Safety Brake		Electromagnetic	Electromagnetic
Braking Torque	Nm	6 ÷ 12	6 ÷ 20
Manual Release		Option	Option

Brakes

Brake Fluid Type		n/a
Brake Cylinder Ø	mm	n/a
Volume Displ.	Cc	n/a
Braking Torque	Nm	n/a
Input Pressure	bar	n/a
Brake Shoes	mm	n/a
Brake Linings		n/a
Adjusting system		n/a

Wheel Hubs Version

TX1 SERIE TX1 SERIE **TX1** SERIE TX1 SERIE TX1 SERIE PLUS TX1 SERIE PLUS TX1 SERIE PLUS TX1 SERIE PLUS TX1 SERIE PLUS TX1 SERIE MAX TX1 SERIE MAX



Gearbox

Gear Ratios	i	6 - 10 - 12 - 16 - 19 - 22 - 24 - 28 - 32
Output Torque	Nm	400
Input Speed (Max)	Rpm	5.000
Static Load	kg	400
Axle Type		Semi floating keyed axle-shafts
Track-width	mm	400 ÷ 1380
Efficiency (Mech)	%	95
Gears Finishing		Class 5
Differential Type		Open type with four pinions
Differential Lock		Mechanical (option)
Service Brakes		n/a
Fixation System		Mounting brackets
Wheels Fitting		Hub piloted 3 - 4 - 5 studs

Motor

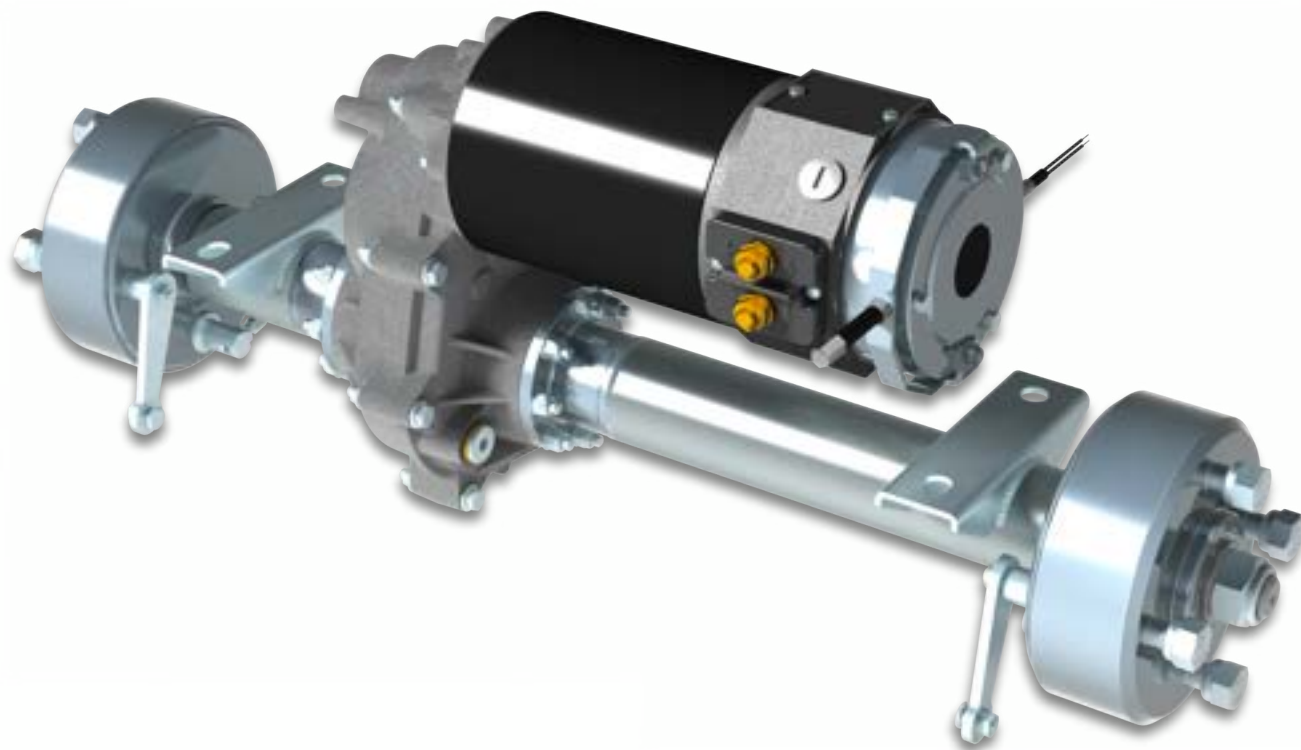
Motor Type		PMDC Serie	AMAC Serie
Motor Technology		DC Permanent Magnet	AC Induction
Power Range (Rated)	kW	0,5 ÷ 0,8	0,6 ÷ 1,7
Power Range (Peak)	kW	Up to 1,5	Up to 3,2
Rated Voltage	V	24 ÷ 48	24 ÷ 600
IP Rating	IP	20 - 54	20 - 54 - 66 - 67
Motor Feedback		n/a	Hall effect 64 pulses
Thermal Class		F	F
Thermal Protection		n/a	PTY 84-130
Connections		Terminal box	Terminal box
Parking/Safety Brake		Electromagnetic	Electromagnetic
Braking Torque	Nm	6 ÷ 12	6 ÷ 20
Manual Release		Option	Option

Brakes

Brake Fluid Type		n/a
Brake Cylinder Ø	mm	n/a
Volume Displ.	Cc	n/a
Braking Torque	Nm	n/a
Input Pressure	bar	n/a
Brake Shoes	mm	n/a
Brake Linings		n/a
Adjusting system		n/a

Drum Brakes Version

TX1 SERIE TX1 SERIE TX1 SERIE **TX1** SERIE TX1 SERIE PLUS TX1 SERIE PLUS TX1 SERIE PLUS TX1 SERIE PLUS TX1 SERIE MAX TX1 SERIE MAX



Gearbox

Gear Ratios	i	6 - 10 - 12 - 16 - 19 - 22 - 24 - 28 - 32
Output Torque	Nm	400
Input Speed (Max)	Rpm	5.000
Static Load	kg	400
Axle Type		Semi floating keyed axle-shafts
Track-width	mm	400 ÷ 1380
Efficiency (Mech)	%	95
Gears Finishing		Class 5
Differential Type		Open type with four pinions
Differential Lock		Mechanical (option)
Service Brakes		Mechanical
Fixation System		Mounting brackets
Wheels Fitting		Hub piloted 3 - 4 - 5 studs

Motor

Motor Type		PMDC Serie	AMAC Serie
Motor Technology		DC Permanent Magnet	AC Induction
Power Range (Rated)	kW	0,5 ÷ 0,8	0,6 ÷ 1,7
Power Range (Peak)	kW	Up to 1,5	Up to 3,2
Rated Voltage	V	24 ÷ 48	24 ÷ 600
IP Rating	IP	20 - 54	20 - 54 - 66 - 67
Motor Feedback		n/a	Hall effect 64 pulses
Thermal Class		F	F
Thermal Protection		n/a	PTY 84-130
Connections		Terminal box	Terminal box
Parking/Safety Brake		Electromagnetic	Electromagnetic
Braking Torque	Nm	6 ÷ 12	6 ÷ 20
Manual Release		Option	Option

Brakes

Brake Fluid Type		n/a
Brake Cylinder Ø	mm	n/a
Volume Displ.	Cc	n/a
Braking Torque	Nm	360
Max Force at Lever	N	500
Brake Shoes	mm	124 x 25
Brake Linings		Beral 1109
Adjusting system		n/a

CVJ Version

TX1 TX1 TX1 TX1 **TX1** TX1 TX1 TX1 TX1 TX1



Gearbox

Gear Ratios	i	6 - 10 - 12 - 16 - 19 - 22 - 24 - 28 - 32
Output Torque	Nm	600
Input Speed (Max)	Rpm	7.000
Static Load	kg	600
Axle Type		n/a
Track-width	mm	n/a
Efficiency (Mech)	%	95
Gears Finishing		Class 5
Differential Type		Open type with four pinions
Differential Lock		Mechanical (option)
Service Brakes		n/a
Fixation System		n/a
Wheels Fitting		n/a

Motor

Motor Type		AMAC Serie	SMAC Serie
Motor Technology		AC Induction	Synchronous IPM
Power Range (Rated)	kW	0,6 ÷ 1,7	1,5 ÷ 3,2
Power Range (Peak)	kW	Up to 3,2	Up to 10,0
Rated Voltage	V	24 ÷ 600	24 ÷ 600
IP Rating	IP	20 - 54 - 66 - 67	20 - 54 - 66 - 67 - 6K9K
Motor Feedback		Hall effect 64 pulses	SinCos (resolver option)
Thermal Class		F	F
Thermal Protection		PTY 84-130	PTY 84-130
Connections		Terminal box	Terminal box
Parking/Safety Brake		Electromagnetic	Electromagnetic
Braking Torque	Nm	6 ÷ 20	6 ÷ 20
Manual Release		Option	Option

Brakes

Brake Fluid Type		n/a
Brake Cylinder Ø	mm	n/a
Volume Displ.	Cc	n/a
Braking Torque	Nm	n/a
Input Pressure	bar	n/a
Brake Shoes	mm	n/a
Brake Linings		n/a
Adjusting system		n/a

Rigid Axle Version

TX1 SERIE TX1 SERIE TX1 SERIE TX1 SERIE TX1 SERIE PLUS TX1 SERIE PLUS TX1 SERIE PLUS TX1 SERIE MAX TX1 SERIE MAX



Gearbox

Gear Ratios	i	6 - 10 - 12 - 16 - 19 - 22 - 24 - 28 - 32
Output Torque	Nm	600
Input Speed (Max)	Rpm	7.000
Static Load	kg	600
Axle Type		Semi floating keyed axle-shafts
Track-width	mm	400 ÷ 1380
Efficiency (Mech)	%	95
Gears Finishing		Class 5
Differential Type		Open type with four pinions
Differential Lock		Mechanical (option)
Service Brakes		n/a
Fixation System		Mounting brackets
Wheels Fitting		Keyed axle-shafts

Motor

Motor Type		AMAC Serie	SMAC Serie
Motor Technology		AC Induction	Synchronous IPM
Power Range (Rated)	kW	0,6 ÷ 1,7	1,5 ÷ 3,2
Power Range (Peak)	kW	Up to 3,2	Up to 10,0
Rated Voltage	V	24 ÷ 600	24 ÷ 600
IP Rating	IP	20 - 54 - 66 - 67	20 - 54 - 66 - 67 - 6K9K
Motor Feedback		Hall effect 64 pulses	SinCos (resolver option)
Thermal Class		F	F
Thermal Protection		PTY 84-130	PTY 84-130
Connections		Terminal box	Terminal box
Parking/Safety Brake		Electromagnetic	Electromagnetic
Braking Torque	Nm	6 ÷ 20	6 ÷ 20
Manual Release		Option	Option

Brakes

Brake Fluid Type		n/a
Brake Cylinder Ø	mm	n/a
Volume Displ.	Cc	n/a
Braking Torque	Nm	n/a
Input Pressure	bar	n/a
Brake Shoes	mm	n/a
Brake Linings		n/a
Adjusting system		n/a

Wheel Hubs Version

TX1 SERIE TX1 SERIE TX1 SERIE TX1 SERIE TX1 SERIE PLUS TX1 SERIE PLUS TX1 SERIE PLUS TX1 SERIE PLUS TX1 SERIE PLUS



Gearbox

Gear Ratios	i	6 - 10 - 12 - 16 - 19 - 22 - 24 - 28 - 32
Output Torque	Nm	600
Input Speed (Max)	Rpm	7.000
Static Load	kg	600
Axle Type		Semi-floating spline axle-shafts
Track-width	mm	400 ÷ 1380
Efficiency (Mech)	%	95
Gears Finishing		Class 5
Differential Type		Open type with four pinions
Differential Lock		Mechanical (option)
Service Brakes		n/a
Fixation System		Mounting brackets
Wheels Fitting		Hub piloted 3 - 4 - 5 studs

Motor

Motor Type		AMAC Serie	SMAC Serie
Motor Technology		AC Induction	Synchronous IPM
Power Range (Rated)	kW	0,6 ÷ 1,7	1,5 ÷ 3,2
Power Range (Peak)	kW	Up to 3,2	Up to 10,0
Rated Voltage	V	24 ÷ 600	24 ÷ 600
IP Rating	IP	20 - 54 - 66 - 67	20 - 54 - 66 - 67 - 6K9K
Motor Feedback		Hall effect 64 pulses	SinCos (resolver option)
Thermal Class		F	F
Thermal Protection		PTY 84-130	PTY 84-130
Connections		Terminal box	Terminal box
Parking/Safety Brake		Electromagnetic	Electromagnetic
Braking Torque	Nm	6 ÷ 20	6 ÷ 20
Manual Release		Option	Option

Brakes

Brake Fluid Type		n/a
Brake Cylinder Ø	mm	n/a
Volume Displ.	Cc	n/a
Braking Torque	Nm	n/a
Input Pressure	bar	n/a
Brake Shoes	mm	n/a
Brake Linings		n/a
Adjusting system		n/a

Pag. 16

Wheel Hubs Version

TX1 SERIE TX1 SERIE TX1 SERIE TX1 SERIE TX1 SERIE PLUS TX1 SERIE PLUS TX1 SERIE PLUS TX1 SERIE PLUS TX1 SERIE MAX TX1 SERIE MAX



Gearbox	Gear Ratios	i	6 - 10 - 12 - 16 - 19 - 22 - 24 - 28 - 32	
	Output Torque	Nm	600	
	Input Speed (Max)	Rpm	7.000	
	Static Load	kg	800	
	Axle Type		Full-floating spline axle-shafts	
	Track-width	mm	400 ÷ 1380	
	Efficiency (Mech)	%	95	
	Gears Finishing		Class 5	
	Differential Type		Open type with four pinions	
	Differential Lock		Mechanical (option)	
	Service Brakes		n/a	
	Fixation System		Mounting brackets	
	Wheels Fitting		Hub piloted 4 studs	
Motor	Motor Type		AMAC Serie	SMAC Serie
	Motor Technology		AC Induction	Synchronous IPM
	Power Range (Rated)	kW	0,6 ÷ 1,7	1,5 ÷ 3,2
	Power Range (Peak)	kW	Up to 3,2	Up to 10,0
	Rated Voltage	V	24 ÷ 600	24 ÷ 600
	IP Rating	IP	20 - 54 - 66 - 67	20 - 54 - 66 - 67 - 6K9K
	Motor Feedback		Hall effect 64 pulses	SinCos (resolver option)
	Thermal Class		F	F
	Thermal Protection		PTY 84-130	PTY 84-130
	Connections		Terminal box	Terminal box
	Parking/Safety Brake		Electromagnetic	Electromagnetic
	Braking Torque	Nm	6 ÷ 20	6 ÷ 20
	Manual Release		Option	Option
Brakes	Brake Fluid Type		n/a	
	Brake Cylinder Ø	mm	n/a	
	Volume Displ.	Cc	n/a	
	Braking Torque	Nm	n/a	
	Input Pressure	bar	n/a	
	Brake Shoes	mm	n/a	
	Brake Linings		n/a	
	Adjusting system		n/a	

Drum Brakes Version

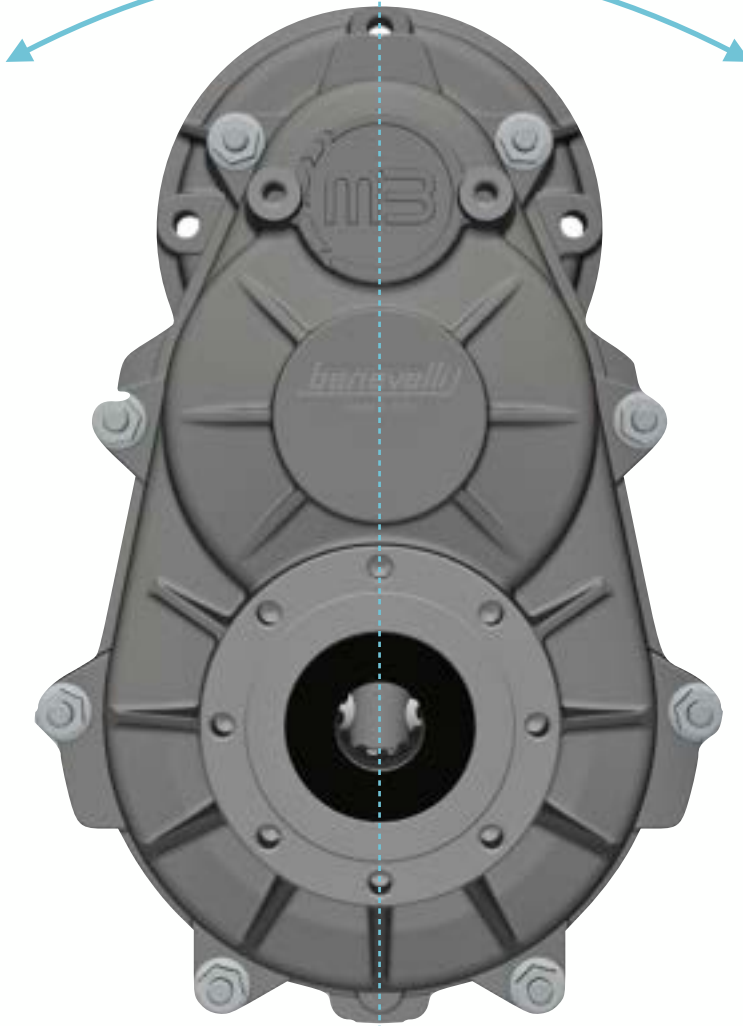
TX1 SERIE TX1 SERIE TX1 SERIE TX1 SERIE TX1 SERIE PLUS TX1 SERIE PLUS TX1 SERIE PLUS TX1 SERIE PLUS TX1 SERIE PLUS TX1 SERIE MAX



Gearbox	Gear Ratios	i	6 - 10 - 12 - 16 - 19 - 22 - 24 - 28 - 32	
	Output Torque	Nm	600	
	Input Speed (Max)	Rpm	7.000	
	Static Load	kg	800	
	Axle Type		Full-floating spline axle-shafts	
	Track-width	mm	400 ÷ 1380	
	Efficiency (Mech)	%	95	
	Gears Finishing		Class 5	
	Differential Type		Open type with four pinions	
	Differential Lock		Mechanical (option)	
	Service Brakes		Hydraulic	
	Fixation System		Mounting brackets	
	Wheels Fitting		Hub piloted 4 studs	
Motor	Motor Type		AMAC Serie	SMAC Serie
	Motor Technology		AC Induction	Synchronous IPM
	Power Range (Rated)	kW	0,6 ÷ 1,7	1,5 ÷ 3,2
	Power Range (Peak)	kW	Up to 3,2	Up to 10,0
	Rated Voltage	V	24 ÷ 600	24 ÷ 600
	IP Rating	IP	20 - 54 - 66 - 67	20 - 54 - 66 - 67 - 6K9K
	Motor Feedback		Hall effect 64 pulses	SinCos (resolver option)
	Thermal Class		F	F
	Thermal Protection		PTY 84-130	PTY 84-130
	Connections		Terminal box	Terminal box
	Parking/Safety Brake		Electromagnetic	Electromagnetic
	Braking Torque	Nm	6 ÷ 20	6 ÷ 20
	Manual Release		Option	Option
Brakes	Brake Fluid Type		DOT4	
	Brake Cylinder Ø	mm	22	
	Volume Displ.	Cc	0,8 ÷ 1,0	
	Braking Torque	Nm	1.000	
	Input Pressure	bar	85	
	Brake Shoes	mm	180 x 30	
	Brake Linings		Bremskerl 5504	
	Adjusting system		Self-registering	

Mounting Options

90° 75° 60° 45° 30° 15° 0° 15° 30° 45° 60° 75° 90°



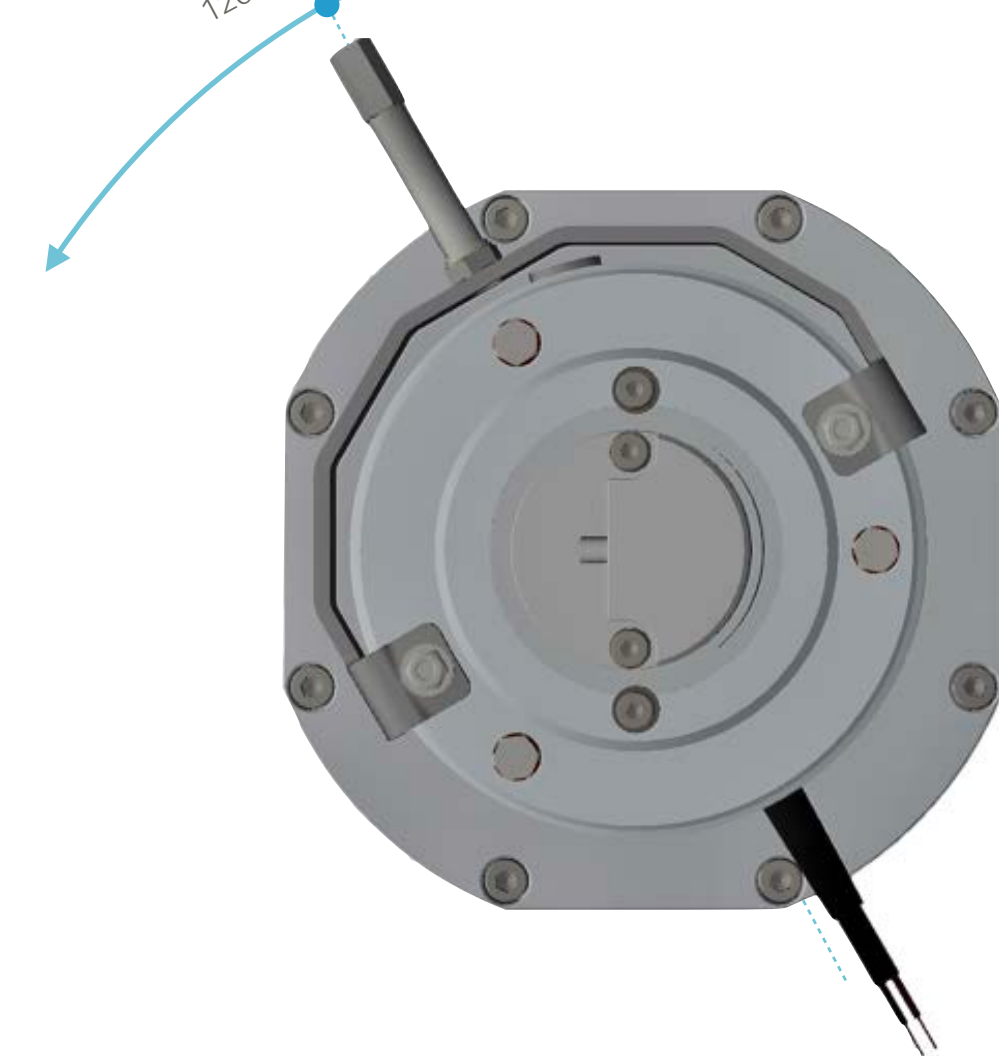
Gearbox

90° 45° 0° 45° 90°



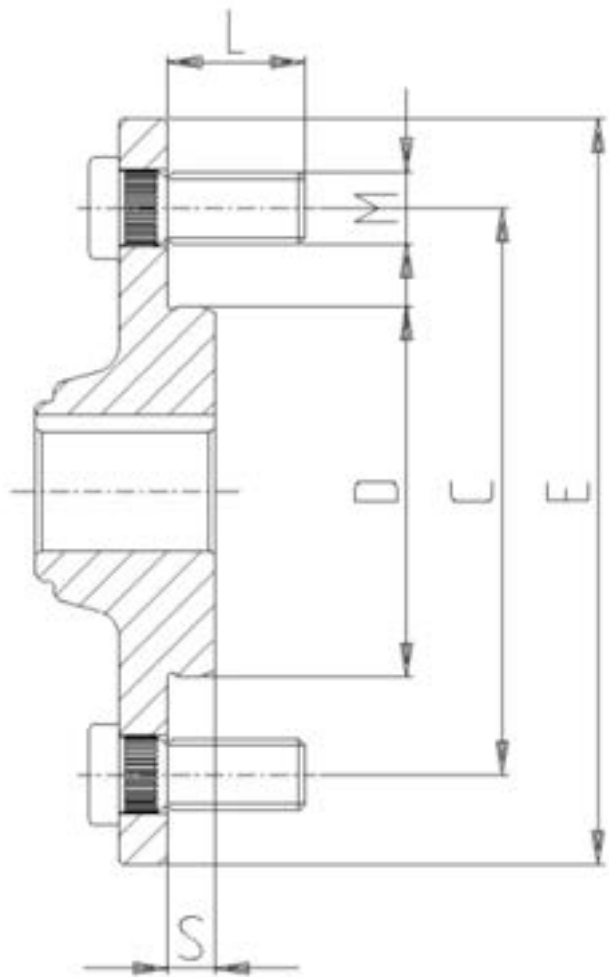
Motor

120° 0° 120°



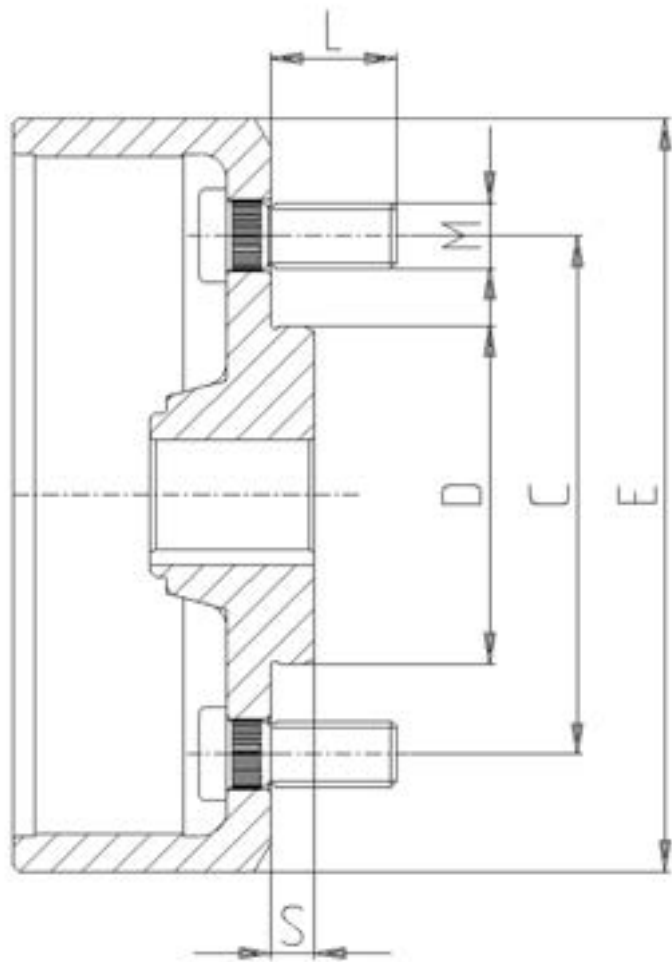
EM Brake

Wheel Hubs Options



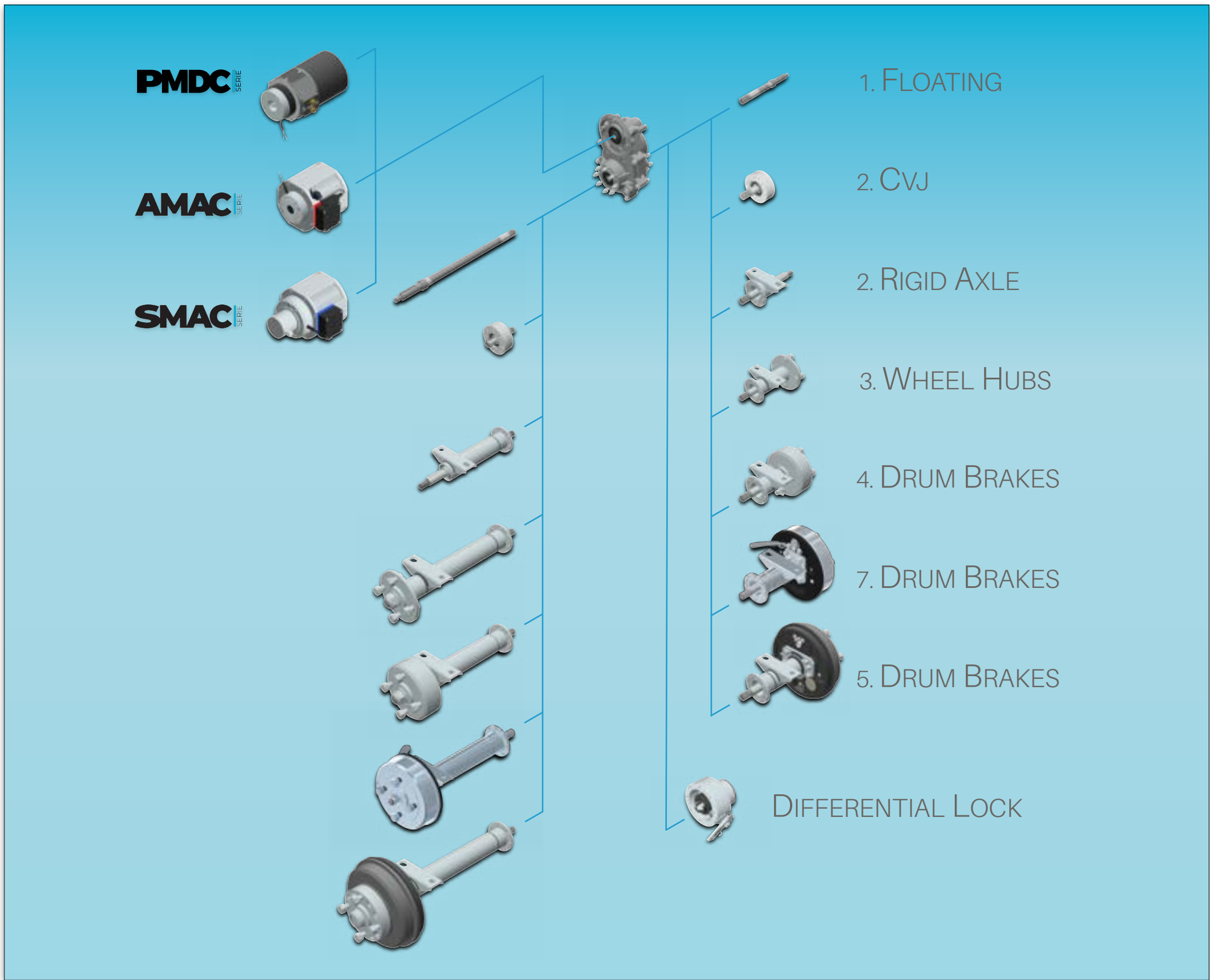
Type	E	D	C	M	N°	S	TX1 SERIE	TX1 SERIE PLUS	TX1 SERIE MAX
Balilla	125	62	95	M12x1,5	4	8	●	●	
Fiat	125	58	98	M12x1,5	4	8	●	●	
BMW	125	60	100	M12x1,5	4	8	●	●	
USA	125	60	101.6	M12x1,5	4	8	●	●	
Francia	138	85	115	M10x1,5	4	8	●	●	
Special	108	60	90	M8	4	8	●	●	
Nerviani	90	40	77	M8	3	8	●	●	
Custom 1	84	50	70	M8	4	8	●	●	
Vespa 4	100	52	70	M10	4	8	●		
Custom 2	88	53	68	M8	3	8	●		
Custom 3	108	60	90	M8	4	8	●		
Custom 4	111.8	40	88.9	M12x1.5	3	8	●		
Custom 5	125	50	100	M8	5	8	●		
Custom 6	138	80	112	M14x1.5	5	8	●		
Custom 7	84	52	70	M8	4	8		●	
Custom 8	125	55	100	M12x1.5	4	8			●
Custom 9	135	66	110	M12x1.5	4	8			●
Custom 10	154	80	130	M14	4	8			●
Internat.	168	94	140	M16x1.5	5	8			●
Tedesco	125	57	100	M12x1.5	4	8			●

Drum Brakes Options



Type	E	D	C	M	N°	S	TX1 SERIE	TX1 SERIE PLUS	TX1 SERIE MAX
Balilla	138	62	95	M12x1.5	8	4	●	●	●
Fiat	138	58	98	M12x1.5	8	4	●		●
BMW	138	60	100	M12x1.5	8	4	●	●	●
USA	125	60	101.6	M12x1.5	4	8		●	●
Tedesco	125	57	100	M12x1.5	4	8			●
Internat.	164	94	140	M16x1.5	5	8			●
Francia	138	85	115	M10	4	8			●
Custom 1	125	55	100	M12x1.5	4	8			●
Custom 2	135	66	110	M12x1.5	4	8			●
Custom 3	154	80	130	M14	4	8			●
Custom 4	175	60	100	M12x1.5	4	8		●	
Custom 5	175	60	101.6	M10x1.25	4	8		●	

Order Code



Coding	Product Category	
91	Electric Transaxles	
	Serie	
1	TX1 Serie	
	Gear Ratio	
1	1:10,96	
2	1:16,37	
3	1:21,96	
4	1:23,57	
5	1:31,64	
6	1:6,43	
7	1:9,60	
8	1:12,89	
9	1:15,79	
A	1:28,50	
B	1:19,79	
	Electric Motor	Available On
0	None	TX1 TX1 TX1
1	PMDC Serie	TX1 TX1 TX1
2	PMDC Serie + EM Brake	TX1 TX1 TX1
7	AMAC Serie	TX1 TX1 TX1
8	AMAC Serie + EM Brake	TX1 TX1 TX1
9	SMAC Serie	TX1 TX1 TX1
A	SMAC Serie + EM Brake	TX1 TX1 TX1
	Configuration	Available On
0	None	TX1 TX1 TX1
1	Floating	TX1 TX1 TX1
2	Cvj Rigid axle	TX1 TX1 TX1
3	Wheel hubs	TX1 TX1 TX1
4	Drum brakes	TX1 TX1 TX1
5	Drum brakes	TX1 TX1 TX1
7	Drum brakes	TX1 TX1 TX1

Start Now

Discover Benevelli Method

Facing with an increasing number of different components such as electric motors, inverters, PTOs, hydraulic pumps, steering, batteries, transmissions knowing how to define and choose the right models is of fundamental importance for the success of the project.

From this need comes Benevelli Method, a new scientific approach to quickly define which are the ideal components for your e-vehicle.

START NOW



#GoElectric

