

High-Torque Wheel Hub Drive

The HEINZMANN PMSG Wheel Hub Drive convinces due to clean and environmental-friendly drive system without any pollution and noise.

His advantages are a huge starting torque with a high overload factor. Furthermore it's highly efficient and maintenance-free motor.

Because of the direct mount to the rim no axle is needed. The PMSG has an integrated planetary gear and a wheel bearing for a direct mount on the rim. An emergency brake is optional.

It is suitable for 2- as well as for 4-wheel drives.




- Maintenance-free
- Energy recuperation
- High efficiency
- Low noise
- Huge starting torque

Range of application

- *Turf applications, lawn tractors*
- *Harvester*
- *Forklift trucks*
- *Lifters*
- *Floor care machinery*
- *Municipal vehicles*
- *Commercial vehicles*
- *Electric cars and NEV*
- *Replacement for hydraulic drives*



PMSG 100-500 (1.35 - 2.7 kW)

	Motor data					Gearing data			
	Output power	Speed	Torque	Current		Gear ratio	Efficiency	Speed	Torque
	kW	min ⁻¹	Nm	A		i	%	min ⁻¹	Nm
PMSG 100-500-1-7									
24 VDC	1.4	3000	4.5	69.4		7	96	429	30
	1.45	4500	3.1	71.8		7	96	643	21
	1.4	6000	2.2	71.4		7	96	857	15
36 VDC	2.2	3000	7.0	72.9		7	96	429	47
	2.6	4500	5.5	85.6		7	96	643	37
	2.6	6000	4.1	92.4		7	96	857	28
48 VDC	2.3	3000	7.3	60.2		7	96	429	49
	2.6	4500	5.5	65.4		7	96	643	37
	2.7	6000	4.3	66.9		7	96	857	29
PMSG 100-500-2-16									
24 VDC	1.4	3000	4.5	69.4		16	94	188	67
	1.45	4500	3.1	71.8		16	94	281	46
	1.4	6000	2.2	71.4		16	94	375	34
36 VDC	2.2	3000	7.0	72.9		16	94	188	105
	2.6	4500	5.5	85.6		16	94	281	83
	2.6	6000	4.1	92.4		16	94	375	62
48 VDC	2.3	3000	7.3	60.2		16	94	188	110
	2.6	4500	5.5	65.4		16	94	281	83
	2.7	6000	4.3	66.9		16	94	375	65
PMSG 100-500-2-24									
24 VDC	1.45	4500	3.1	71.8		24	94	188	69
	1.4	6000	2.2	71.4		24	94	250	50
36 VDC	2.6	4500	5.5	85.6		24	94	188	124
	2.6	6000	4.1	92.4		24	94	250	93
48 VDC	2.6	4500	5.5	65.4		24	94	188	124
	2.7	6000	4.3	66.9		24	94	250	97
PMSG 100-500-2-42									
24 VDC	1.45	4500	3.1	71.8		42	94	107	121
	1.4	6000	2.2	71.4		42	94	143	88
36 VDC	2.6	4500	5.5	85.6		42	94	107	218
	2.6	6000	4.1	92.4		42	94	143	163
48 VDC	2.6	4500	5.5	65.4		42	94	107	218
	2.7	6000	4.3	66.9		42	94	143	170

Implementation

Power connection: Cable length 1 m, open cable ends

Encoder connection: Cable length 1 m, open cable ends

Motor feedback: 8 Bit RLS


Temperature sensor: KTY 84-130

Cooling: External ventilation, generated independently from motor, min. air velocity > 5 m/s required


PMSG 100-1500 / 120-1500




PMSG 100-1500 (1.35 - 2.7 kW)

	Motor data					Gearing data			
	Output power	Speed	Torque	Current		Gear ratio	Efficiency	Speed	Torque
	kW	min ⁻¹	Nm	A		i	%	min ⁻¹	Nm
PMSG 100-1500-2-40									
24 VDC	1.45	4500	3.1	71.8		40	94	113	116
	1.4	6000	2.2	71.4		40	94	150	84
36 VDC	2.6	4500	5.5	85.6		40	94	113	207
	2.6	6000	4.1	92.4		40	94	150	156
48 VDC	2.6	4500	5.5	65.4		40	94	113	207
	2.7	6000	4.3	66.9		40	94	150	162
PMSG 100-1500-2-64									
24 VDC	1.45	4500	3.1	71.8		64	94	70	185
36 VDC	2.6	4500	5.5	85.6		64	94	70	332
48 VDC	2.6	4500	5.5	65.4		64	94	70	332
PMSG 100-1500-3-100									
24 VDC	1.45	4500	3.1	71.8		100	93	45	286
36 VDC	2.6	4500	5.5	85.6		100	93	45	513
48 VDC	2.6	4500	5.5	65.4		100	93	45	513
PMSG 100-1500-3-150									
24 VDC	1.45	4500	3.1	71.8		150	93	30	429
36 VDC	2.6	4500	5.5	85.6		150	93	30	770
48 VDC	2.6	4500	5.5	65.4		150	93	30	770

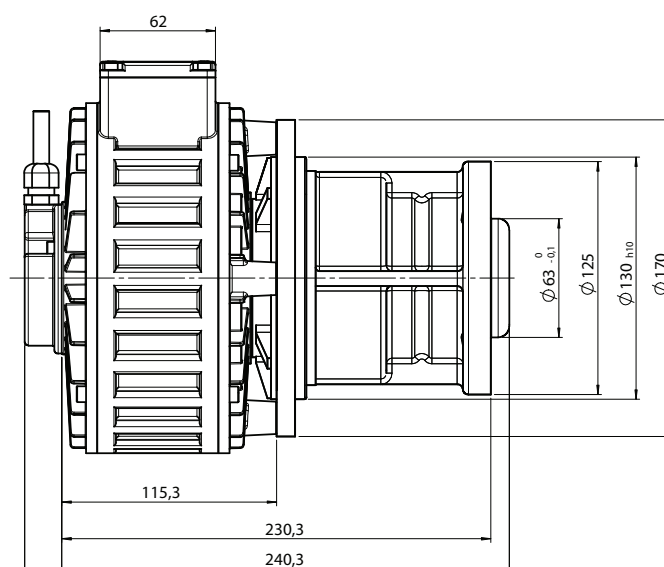
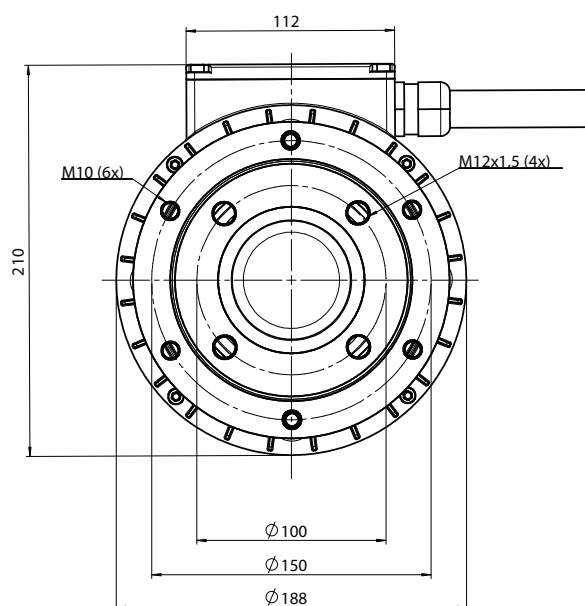
PMSG 120-500 (5.5 - 7.5 kW)

	Motor data					Gearing data			
	Output power	Speed	Torque	Current		Gear ratio	Efficiency	Speed	Torque
	kW	min ⁻¹	Nm	A		i	%	min ⁻¹	Nm
PMSG 120-500-1-7									
48 VDC	5.5	3000	17.5	126.9		7	96	429	118
	8.0	4500	17.0	178.7		7	96	643	114
	7.5	6000	11.9	170.3		7	96	857	80
96 VDC	6.4	3000	20.4	73.6		7	96	429	137
	7.5	4500	15.9	83.7		7	96	643	107
	8.0	6000	12.7	93.4		7	96	857	86
PMSG 120-500-2-16									
48 VDC	5.5	3000	17.5	126.9		16	94	188	263
	8.0	4500	17.0	178.7		16	94	281	255
	7.5	6000	11.9	170.3		16	94	375	180
96 VDC	6.4	3000	20.4	73.6		16	94	188	306
	7.5	4500	15.9	83.7		16	94	281	239
	8.0	6000	12.7	93.4		16	94	375	191
PMSG 120-1500-2-40									
48 VDC	5.5	3000	17.5	126.9		40	94	75	658
	8.0	4500	17.0	178.7		40	94	113	638
	7.5	6000	11.9	170.3		40	94	150	449
96 VDC	6.4	3000	20.4	73.6		40	94	75	766
	7.5	4500	15.9	83.7		40	94	113	598
	8.0	6000	12.7	93.4		40	94	150	479



 Motor data		PMMSG xxx-500	PMMSG xxx-1500
	Rated power	2 – 7.5 kW	
	Speed range	1500 – 6000 rpm	
	Max. torque	25 – 80 Nm	
	System voltage	24 – 96 VDC	
	Motor weight	6 – 29 kg	
Planetary gear	Reduction possibilities Some reduction possibilities are not available in standard versions	1:4/1:7/1:16/ 1:24/1:42/1:96/ 1:144/1:252	1:5/1:8/1:25/1:40/1:64/ 1:100/1:150/1:240/1:384 (optional manual decoupling possible)
	Max. continuous torque	160 Nm	500 Nm
	Max. peak torque	500 Nm	1500 Nm
	Max. axial forces	2500 N	5000 N
	Max. radial forces	7000 N	21000 N
	Lubrication	Lifetime	Lifetime
	Durability	20000 hours	20000 hours (depending on application)
	Protection class	Up to IP67	Up to IP67
	Planetary gear weight	~ 7 kg	14 – 17.5 kg

Dimensions



Note:

Dimensions of each particular drive system depends on the different motor/gearbox combination
In this example: PMMSG 100-500 (Motor 2.2 kW, 48 V, 6000 rpm, gear with reduction ratio 1:24, 2 step, max. peak torque 500 Nm)
(Drawings of other motor/gearbox combinations on request)

Direct Drive PRA 230

Gearless Wheel Hub Drive

The HEINZMANN PRA 230 is a gearless axial air gap motor with integrated wheel bearing for direct mount to the rim.

Maintenance-free and noiseless operation, energy regeneration and a high starting torque are some of the benefits of this often used direct drive

PRA Direct Drives are offered without gears. The wheel drive is mounted directly to the rim / via clamp-connection to the chassis. The protection class is IP65.

The PRA 230 is available as 1-, 2- or all-wheel drive.


- Gearless
- Maintenance-free
- Low noise
- Integrated wheel bearing
- Energy recuperation
- High starting torque

Range of application

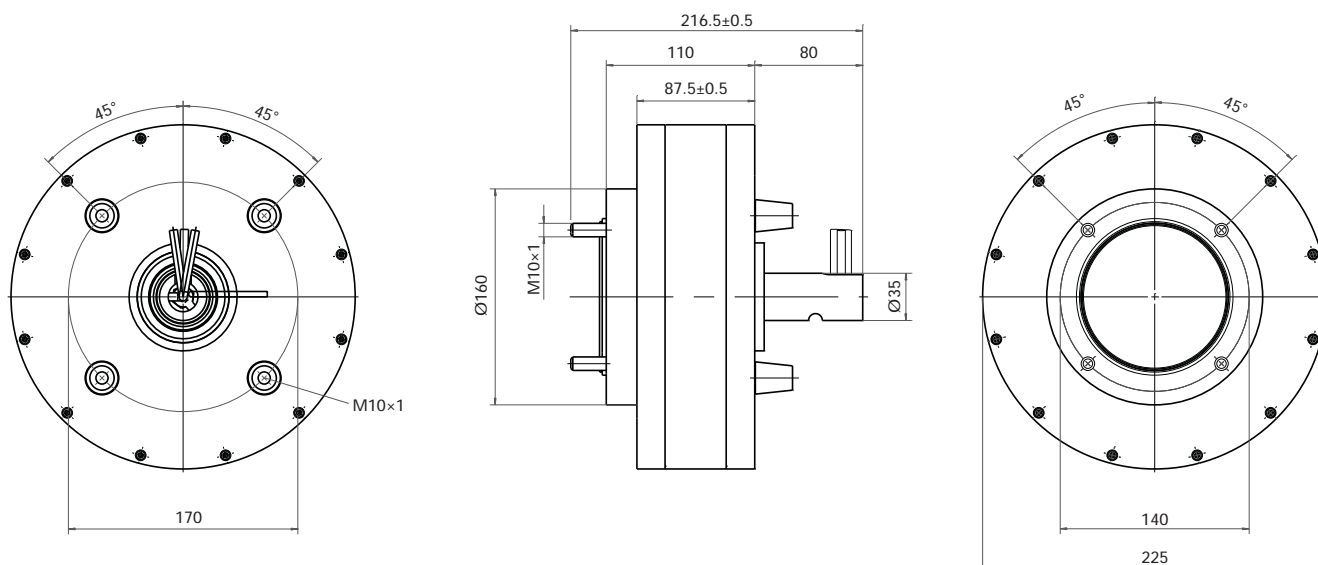
- *Light electric vehicles*
- *Electric scooters*
- *Handicapped vehicles*
- *Driverless transport vehicles*



Technical Data

<div>Motor data</div> 		PRA 230
	Rated power	1.6 kW – 100 % ED
	Speed	420 rpm
	Max. torque	160 Nm
	Battery voltage	48 V
	Max. wheel load	2000 N
	Weight	16 kg

Dimensions



PRA 180-25

Direct Drive DirectPower for E-Bikes

HEINZMANN direct drives from the DirectPower series are characterised by innovative technology and flexibility. They can be integrated in different systems thanks to the independent control built into the battery box. The power electronics is not installed in the motor, so the motor power is not limited as a result of the electronics heating up. Whether front or rear wheel drive - HEINZMANN E-Bike Drives can be adapted to suit your requirements.

The regeneration-enabled system can charge the battery during downhill travel and braking. This can achieve an increase in range up to 15%.

Our drive can be installed in the front or rear wheel thanks to strict compliance with the standard dimensions used in the bicycle industry. This reduces manufacturing costs and gives our customers the highest possible flexibility in product design. After Sales Service and spare parts planning are therefore made significantly easier.

The option of turning the drives in both directions opens up a wealth of usage options, including applications outside the e-bike market. The rehabilitation field is just one example.



- ➔ Front/rear wheel drive
- ➔ Support up to 50 km/h*
- ➔ Rates power up to 500 W*
- ➔ 11 Nm nominal and 40 Nm peak torque
- ➔ Weight: 4.7 kg (rear wheel), 4.5 kg (front wheel)

* For application an operation licence and a vehicle insurance may be required in your country. Keep to customary regulations.


Benefits PRA 180-25 DirectPower Motors

- ➔ *Regeneration in the front and rear wheel*
- ➔ *Brake discs can be mounted in the front and rear wheel*
- ➔ *Gearless, brushless, free from wear, free from noise*
- ➔ *Customer-defined colour of choice on request*
- ➔ *Cassette can be used*
- ➔ *The power electronics is not installed in the motor, so the motor power is not limited as a result of the electronics heating up*
- ➔ *Backwards travel is possible for special applications*

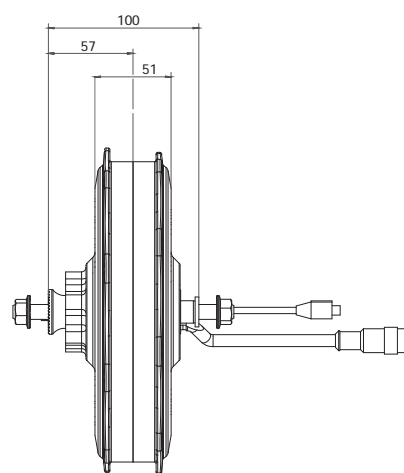




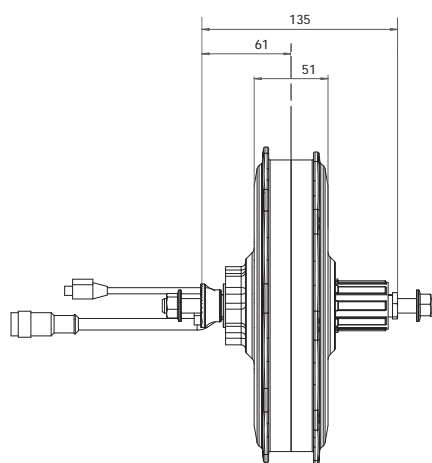
Technical Data

Motor data		Type	Pedelec	Pedelec 20"	Speed Pedelec
		DC supply voltage	36 VDC		
		Rated power	250 W	250 W	500 W
		Nominal speed	210 rpm	275 rpm	380 rpm
		Typical speed limit in km/h according to rim size	20"	25	38
			24"	32	42
			26"	34	46
			28"	37	50
		Impulse torque	60 Nm		
		Weight	4.5 kg front wheel 4.7 kg rear wheel		

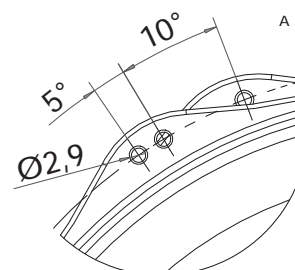
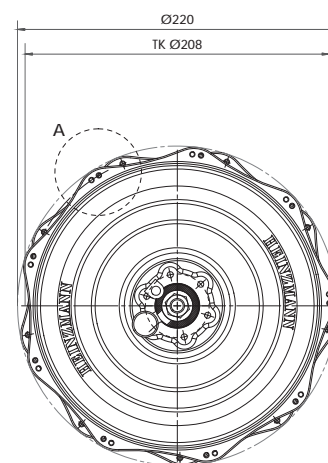
Dimensions



Front wheel



Rear wheel



Further information on www.ebike.heinzmann.com

RN 120

E-Bike Drive Classic

HEINZMANN Classic Motors have been proven since decades. The HEINZMANN Classic E-Bike Drive is characterised by the proven and tested robust technology, combined with the innovative optimisation of its components and properties. The powerful DC motor offers even power development with economical use of the battery capacity.

Powerful torques are achieved with the built-in gear, which offers the rider maximum support, even during uphill travel or with increased loads. This makes this drive particularly suited to use in the rehabilitation field, cargo bikes and special applications.

The RN 120 Motor is the heart of the Classic Drive System and combines the Classic Motor with robust and reliable system components.

Decades of experience in the field of e-bike drives make us a reliable partner. The reliability of HEINZMANN drives is also highly valued by Deutsche Post and is fitted on their electric bicycles.



- Support up to 25 km/h
- Rated power 250 W
- Torque up to nominal 11.5 Nm (28"), up to nominal 13.2 Nm (26")
- Weight: approx. 3.5 kg
- Max. values for the torques are 35 to 60 Nm depending on the design (see rating plate)

Benefits RN 120 Classic Motors

- *Powerful, proven DC wheel hub motor*
- *Front/rear wheel drive*
- *Gear for highest torques*

Range of Application


- *Cargo bikes*
- *Velotaxis*
- *Rehab bikes*
- *Three-wheelers for rehab*
- *Special applications*



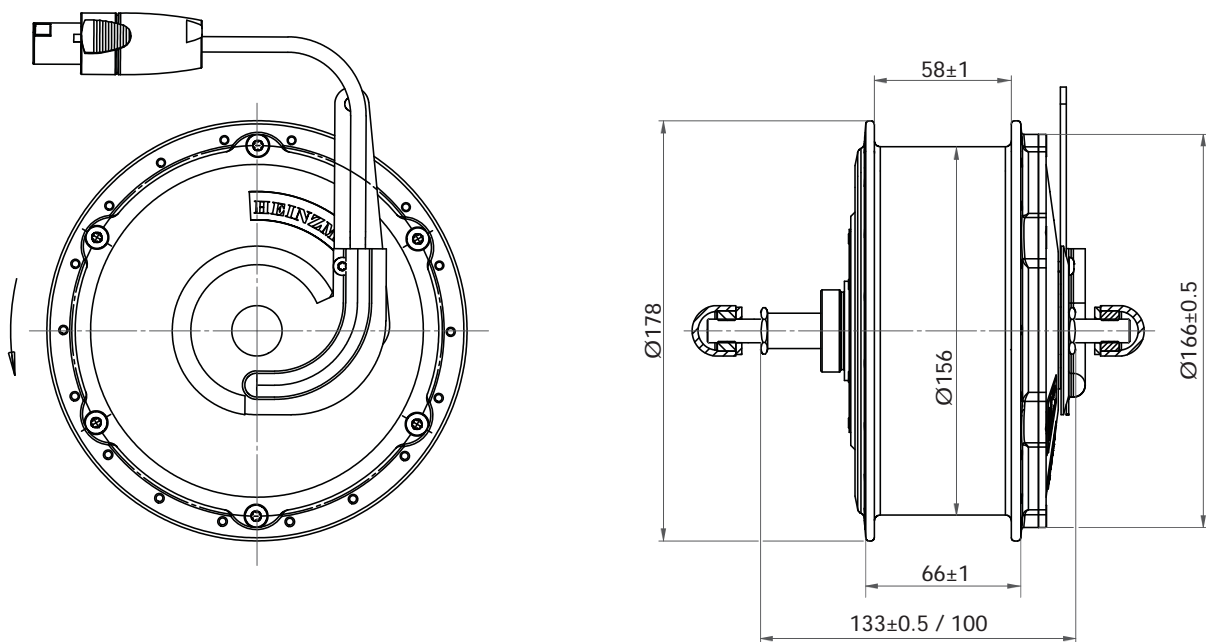
E-Bike Deutsche Post



Technical Data

Motor data		
	Nominal voltage	36 VDC
	Rated power	250 W
	Weight	3.5 kg
	Wheel size	26" 28"
	Nominal speed	210 rpm 180 rpm
	Rated torque in operational mode S1	11.4 Nm 13.2 Nm

Dimensions



Further information on www.ebike.heinzmann.com



E-Bike Danish Post

DirectPower and Classic System Components

HEINZMANN has adapted a selection of system components especially for the new DirectPower drive. These modular components can also be combined with the Classic motor. Depending on the configuration a selection can be made between the DirectPower and Classic systems.

Downtube battery



Carrier battery



Battery pack

Optionally perfectly integrated in the luggage carrier or as downtube battery
Safe, tested and proven lithium ion technology
Carrier battery: 36 V/11 Ah
Downtube battery: 36 V/14.25 Ah
Passive cell balancing increases the service life of the battery pack
Technically, mechanically and visually sophisticated
Magnetic plug connections for quick mounting of the battery
Watertight and robust
Shock and vibration resistant



Luggage carrier

The universal e-bike carrier made from aluminum tube
Aluminum tube 10 mm, weight 1000 g
Outstanding weight/stability ratio and lateral rigidity
Corrosion-resistant
Various adaptation options through the built-in Quick Snap System
With LineTec lighting from Busch & Müller
The maximum load limit for the carrier is 30 kg!



Control

Drive control in the luggage carrier or on the downtube
Pre-programmed for various torque sensors currently available
Various parameters can be adapted by the customer to set an individual driving style (support levels, assisted pull-away and many more)
Bluetooth soon available
Optimal monitoring of the electrical system
Integrated safety routines
Software can be updated via an interface
Optionally prepared for regeneration and equipped with brake levers MAGURA brand type MT2/MT4 with switches
Assisted pull-away can be parameterized via a control element on the display or via handle bar



Torque sensor

The system is pre-programmed and tested for a range of torque sensors. Additional adaptations can be made for the torque sensor of your choice as necessary.
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DirectPower and Classic System Components



Service software	
	Clear user interface
	Quick troubleshooting in the event of faults
	Built-in wizard for convenient quick configuration
	Parameters can be set easily by the dealer
	All major system parameters can be configured in the field
	Protection system against plant data manipulation
	Control firmware can be updated in the field
	Automatic Internet updates for service software

Besides the Classic motor, HEINZMANN also offers the following components:



Control	
	The digital control unit offers two control options: customers can choose between a twist grip with pedal speed sensor or a solution with twist grip only
	The control is pre-parameterized for all requirements, such as assisted pull-away up to 6 km/h or heavy load start



Battery	
	The lithium ion battery is in the saddle bag
	Supplied with a built-in battery management system for longer battery life
	Available as 36 V/9 Ah or 36 V/13 Ah



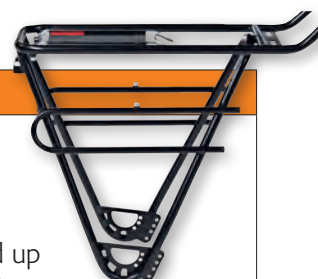
Display	
	Separate control unit on the handlebar for safe operation when traveling
	Clear display of key operating data
	Quick setting of support levels
	Simple activation of assisted pull-away
	Bicycle anti-theft protection through user-specific PIN
	Easy to read, even in bright conditions



Sensor	
	The pedal speed sensor can be mounted on the right or left
	Cable length on request



Twist grip	
	Digital twist grip
	LED light indicator charge condition
	ON/OFF switch
	Eco Mode
	Cable length on request



Luggage carrier	
	The luggage carrier is designed for mounting a control unit and up to two batteries
	Max. permitted total weight 30 kg