



Move People
Better

City
Trekking
Sportive
Cargo
Commercial

Stepless Shifting

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The Moving Standard.

enviolo is “The Moving Standard” for bicycles and eBikes today.

With our stepless and automatic shifting products incorporating the revolutionary enviolo technology, we elevate your riding experience and make it simpler, more fun, safer, and healthier.

Riding a bike with enviolo’s stepless or automatic shifting solution means concentrating less on changing gears and more on what’s important, for example: traffic, road hazards, passengers, or enjoying the beauty of your surroundings.

enviolo’s stepless and automatic shifting benefits are now available in five different group sets. All group sets are specifically designed for their use cases: city, trekking, sportive, cargo, and commercial.

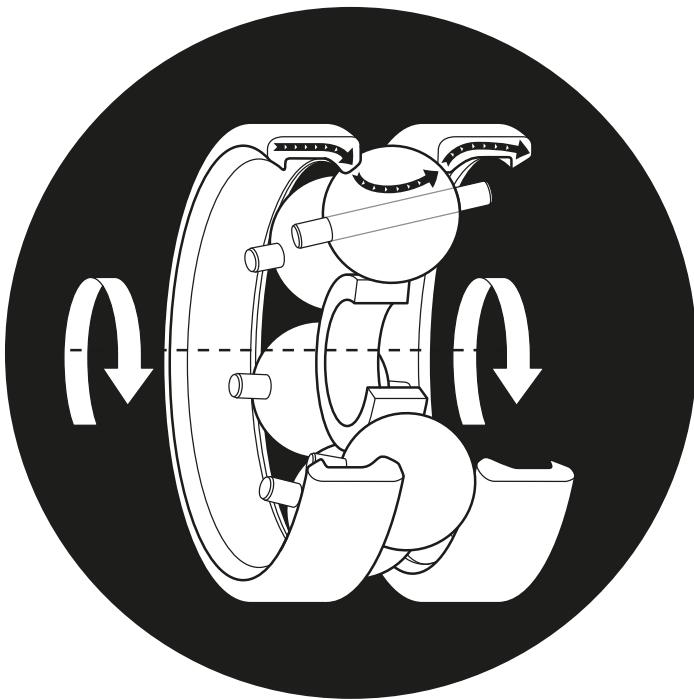
During the design process of these new components, we focused on the unique needs of the five different rider personas and the type of bicycles they ride. This mission to deliver the best possible shifting solution for each rider enables us to be “The Moving Standard.”

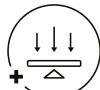
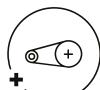
enviolo is a division of Fallbrook Technologies Inc. and until January 1, 2018, it was operating under the name “NuVinci® Cycling”. The enviolo head office is located in Amsterdam, The Netherlands.

Simplicity is the ultimate sophistication.

enviolo

Leonardo da Vinci



-  Near silent
-  Stepless shifting
-  Effortless shifting, even under load
-  Greater gear ratio range
-  No additional shifter
-  Wireless connection
-  Mobile app customisation
-  Comfortable pedaling at your desired preset cadence

Stepless Manual Shifting: As simple as adjusting the volume on a radio.

With our stepless manual technology, riders can effortlessly change their gear ratio, even under load. Thus we enable them to focus on the important aspects of their ride such as traffic or scenery. No more step changes, locked gears, empty pedaling, or creaking, just a unique ride feel created by the technology's ease of use.

The system enables low maintenance, long-lasting bikes, especially in a combination with a belt drive, the perfect fit for the new rider generation, focused on simplicity and comfort. Moreover, the technology can also be merged with powerful e-bike systems. The enviolo stepless manual technology was created based on use cases to serve specific rider needs, and consists of specifically designed internal gear hubs and matching controllers.

Stepless Automatic Shifting: Why bother switching gears manually?

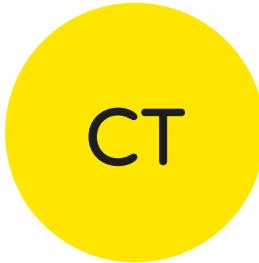
The stepless automatic technology takes the ride experience to the next level with its 'set it and forget it' approach. Cyclists only need to set up their desired cadence, and the stepless automatic technology will adjust the enviolo system so that they can always pedal at the same pace, even up or down hill.

To be in line with the trend of 'integrated systems', the technology can also be merged into the e-bike's control unit, thus cleaning up the handlebar and simplifying the ride experience.

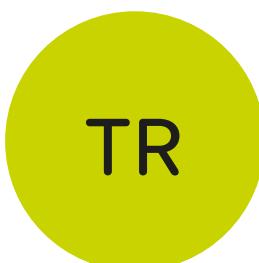
System Overview

enviolo
MANUAL

City, Trekking, Sportive,
Cargo, Commercial



enviolo^{CT}



enviolo^{TR}



enviolo^{SP}



enviolo^{CA}



enviolo^{CO}



System Overview

enviolo
AUTOMATiQ[™]

City, Trekking, Sportive,
Cargo, Commercial



enviolo^{CT}



enviolo^{TR}



enviolo^{SP}



enviolo^{CA}



enviolo^{CO}

Component Specifications

Our high-tech components, designed specifically for their use cases, offer unrivaled possibilities.

Internal gear hub



Colors	Matt black / dark grey	Matt black / dark grey
Weight	2450 g	2450 g
Max. speed RPM	800 RPM	800 RPM
Nominal ratio range	310% (0.55 - 1.7)	380% (0.5 - 1.90)
Lifetime	20,000 km	20,000 km
IP classification	Hub = IP65, freewheel = IP54, rear shifter = IP54	Hub = IP65, freewheel = IP54, rear shifter = IP54
Temperature range	-20°C to 48°C	-20°C to 48°C
Brake options	6-bolt disc/rim/roller	6-bolt disc/rim/roller
Max. brake disc rotor	180 mm	180 mm
Disc brake screw length requirements	10 - 17 mm	10 - 17 mm
Max. disc brake screw torque	Use disc brake manufacturers recommendation, but don't exceed 6.2 Nm	Use disc brake manufacturers recommendation, but don't exceed 6.2 Nm
Spoke options	32/36	32/36
Spoke size	2 mm - 2.34 mm	2 mm - 2.34 mm
Spoke flange diameter	125 mm	125 mm
Spoke hole diameter	2.9 mm	2.9 mm
Wheel size	Minimum 16"	Minimum 16"
Axle threads	M10 X 1	M10 X 1
Dropout width	135 mm	135 mm
Dropout thickness	6 - 10 mm	6 - 10 mm
Dropout length for no-turn washer engagement (measured from axle center)	Recommended 14 mm, minimum 10 mm	Recommended 14 mm, minimum 10 mm
Total axle width (without acorn nuts)	183 mm	183 mm
Chainline	49.0 +/- 0.5 mm	49.0 +/- 0.5 mm
Beltline (Gates)	45.5 +/- 0.5 mm	45.5 +/- 0.5 mm
Beltline (Continental)	46.2 +/- 0.5 mm	46.2 +/- 0.5 mm
Sprocket thickness (chain)	2.3 mm	2.3 mm
Sprocket thickness (belt)	4.3 mm	4.3 mm
Sprocket sizes (chain)	16 - 22 T	16 - 22 T
Sprocket sizes (belt)	20 - 28 T	20 - 28 T
Sprocket type	9-spline, one side flat	9-spline, one side flat
Chain type	3/32", 1/8" with 3 mm offset cog	3/32", 1/8" with 3mm offset cog
Recommended lacing patterns	2-cross for 26" or larger, 1-cross for 24" or smaller, radial spoking is not allowed	2-cross for 26" or larger, 1-cross for 24" or smaller, radial spoking is not allowed

Internal gear hub



enviolo SP



enviolo CA



enviolo CO

Colors	Matt black / silver	Matt black / dark grey	Matt black / dark grey
Weight	2450 g	2450 g	2450 g
Max. speed RPM	800 RPM	800 RPM	800 RPM
Nominal ratio range	380% (0.5 - 1.90)	380% (0.5 - 1.90)	310% (0.55 - 1.7)
Lifetime	20,000 km	20,000 km	20,000 km
IP classification	Hub = IP65, freewheel = IP54, rear shifter = IP54	Hub = IP65, freewheel = IP54, rear shifter = IP54	Hub = IP65, freewheel = IP54, rear shifter = IP54
Temperature range	-20°C to 48°C	-20°C to 48°C	-20°C to 48°C
Brake options	6-bolt disc/rim	6-bolt disc/rim	6-bolt disc/rim/roller
Max. brake disc rotor	203 mm	203 mm	180 mm
Disc brake screw length req.	10 - 17 mm	10 - 17 mm	10 - 17 mm
Max. disc brake screw torque	Use disc brake manufacturers recommendation, but don't exceed 6.2 Nm	Use disc brake manufacturers recommendation, but don't exceed 6.2 Nm	Use disc brake manufacturers recommendation, but don't exceed 6.2 Nm
Spoke options	32/36	32/36	32/36
Spoke size	2 mm - 2.34 mm	2 mm - 2.34 mm	2 mm - 2.34 mm
Spoke flange diameter	125 mm	125 mm	125 mm
Spoke hole diameter	2.9 mm	2.9 mm	2.9 mm
Wheel size	Minimum 16"	Minimum 16"	Minimum 16"
Axle threads	M10*1	M10*1	M10*1
Dropout width	135 / 142 / 148 mm	135 mm	135 mm
Dropout thickness	6 - 10 mm	6 - 10 mm	6 - 10 mm
Dropout length for no- turn washer engagement (measured from axle center)	Recommended 14 mm, minimum 10 mm	Recommended 14 mm, minimum 10 mm	Recommended 14 mm, minimum 10 mm
Total axle width (w/o acorn nuts)	183 mm	183 mm	183 mm
Chainline	49.0 +/- 0.5 mm for 135 mm and 142 mm and 52+/- 0.5 mm for 148 mm dropouts	49.0 +/- 0.5 mm	49.0 +/- 0.5 mm
Beltline (Gates)	45.5 +/- 0.5 mm for 135 mm and 142 mm and 48.7 +/- 0.5 mm for 148 mm dropouts	45.5 +/- 0.5 mm	45.5 +/- 0.5 mm
Sprocket thickness (chain)*	2.3 mm	2.3 mm	2.3 mm
Sprocket thickness (belt)	4.3 mm	4.3 mm	4.3 mm
Sprocket sizes (chain)	16 - 22 T	16 - 22 T	16 - 22 T
Sprocket sizes (belt)	20 - 28 T	20 - 28 T	20 - 28 T
Sprocket type	9-spline, one side flat	9-spline, one side flat	9-spline, one side flat
Chain type	3/32", 1/8" with 3mm offset cog	3/32", 1/8" with 3mm offset cog	3/32", 1/8" with 3mm offset cog
Recommended lacing patterns	2-cross for 26" or larger, 1-cross for 24" or smaller, radial spoking is not allowed	2-cross for 26" or larger, 1-cross for 24" or smaller, radial spoking is not allowed	2-cross for 26" or larger, 1-cross for 24" or smaller, radial spoking is not allowed

Groupset Power Limits

enviolo

enviolo requires the use of a sprocket ratio of minimally 2.0

Nominal Power

250 W

	120 kg	130 kg	140 kg	150 kg	160 kg	170 kg	180 kg	190 kg	200 kg	210 kg	220 kg	230 kg	240 kg	250 kg
50 Nm	CT	CO	CT	CO	CT	CO	CT	SP	CA	SP	CA	SP	CA	SP
55 Nm	CT	CO	CT	CO	CT	CO	CT	SP	CA	SP	CA	SP	CA	SP
60 Nm	TR	SP	CA	SP	CA	SP	CA	SP						
65 Nm	TR	SP	CA	SP	CA	SP	CA	SP						
70 Nm	TR	SP	CA	SP	CA	SP	CA	SP						
75 Nm	TR	SP	CA	SP	CA	SP	CA	SP						
80 Nm	TR	SP	CA	SP	CA	SP	CA	SP						
85 Nm	TR	SP	CA	SP	CA	SP	CA	SP						
90 Nm	SP	CA	SP	CA	SP	CA	SP	CA						
95 Nm	SP	CA	SP	CA	SP	CA	SP	CA						
100 Nm	SP	CA	SP	CA	SP	CA	SP	CA						

Nominal Power

350 W

	120 kg	130 kg	140 kg	150 kg	160 kg
50 Nm	SP	CA	SP	CA	SP
55 Nm	SP	CA	SP	CA	SP
60 Nm	SP	CA	SP	CA	SP
65 Nm	SP	CA	SP	CA	SP
70 Nm	SP	CA	SP	CA	SP
75 Nm	SP	CA	SP	CA	SP
80 Nm	SP	CA	SP	CA	SP
85 Nm	SP	CA	SP	CA	SP

Nominal Power

500 W

	120 kg	130 kg	140 kg	150 kg	160 kg
50 Nm	SP	CA	SP	CA	SP
55 Nm	SP	CA	SP	CA	SP
60 Nm	SP	CA	SP	CA	SP
65 Nm	SP	CA	SP	CA	SP

CT TR SP CA CO

enviolo

AUTOMATiQ Hub Interfaces



enviolo CT



enviolo TR



enviolo CO

IP classification

Electrical specifications*:

Nominal voltage range

IP54

IP54

IP54

Peak voltage

18 V - 55 V

18 V - 55 V

18 V - 55 V

Min. voltage

60 V

60 V

60 V

Built-in fuse protection

18 V

18 V

18 V

Average power consumption while shifting

3A

3A

3A

(2Nm X 2.5W) = 5W

(8Nm X 2.5W) = 20W

(8Nm X 2.5W) = 20W

(2Nm X 2.5W) = 5W

Peak power consumption

10.5W < 3s

48W < 3s

10.5W < 3s

Shut-down protection

Data is saved at shutdown

Data is saved at shutdown

Data is saved at shutdown

Sleep mode

Time can be pre-set using app

Time can be pre-set using app

Time can be pre-set using app

Power consumption Sleep mode

0.5W

0.5W

0.5W

Power consumption Non-shifting

0.5W

0.5W

0.5W

Wiring:

Wire diameter

I-Harness = 3.7mm

I-Harness = 3.7mm

I-Harness = 3.7mm

Connector Ø on AHI

4-pin = 9mm

4-pin = 9mm

4-pin = 9mm

Connector Ø to power source

10.2 X 14.2 mm

10.2 X 14.2 mm

10.2 X 14.2 mm

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AUTOMATiQ Hub Interfaces



enviolo SP



enviolo CA

IP classification

Electrical specifications:

Nominal voltage range

IP54

IP54

Peak voltage

18 V - 55 V

18 V - 55 V

Min. voltage

60 V

60 V

Built-in fuse protection

18 V

18 V

Average power consumption while shifting

3A

3A

Peak power consumption

(8Nm X 2.5W) = 20W

(8Nm X 2.5W) = 20W

Shut-down protection

48W < 3s

48W < 3s

Sleep mode

Data is saved at shutdown

Data is saved at shutdown

Power consumption Sleep mode

Time can be pre-set using app

Time can be pre-set using app

Power consumption Non-shifting

0.5W

0.5W

Wiring:

Wire diameter

I-Harness = 3.7mm

I-Harness = 3.7mm

Connector Ø on AHI

4-pin = 9mm

4-pin = 9mm

Connector Ø to power source

10.2 X 14.2 mm

10.2 X 14.2 mm

*Final specification under evaluation.



Manual Controller



enviolo CT



enviolo CA 2



enviolo CO

Shift cable length

Grip rotation options*

Handlebar diameter

Cable housing

Shift cable diameter

Compatible with all CVPs

IP classification

Grip Material

2200mm

Multi-turn or One-turn

22.2 mm

Full cable housing recommended, dual cable route

1.1 - 1.2 mm (original 1.2 mm)

Yes

IP54

Standard

3300mm

Multi-turn or One-turn

22.2 mm

Full cable housing recommended, dual cable route

1.1 - 1.2 mm (original 1.1 mm)

Yes

IP54

Extended Durability

2200mm or 3300mm

Multi-turn or One-turn

22.2 mm

Full cable housing recommended, dual cable route

1.1 - 1.2 mm (original 1.1 mm)

Yes

IP54

Extended Durability



Manual Controller



enviolo TR



enviolo SP

Shift cable length

Grip rotation options*

Handlebar diameter

Cable housing

Shift cable diameter

Compatible with all CVPs

IP classification

Grip Material

2200mm or 3300mm

Multi-turn or One-turn

22.2 mm

Full cable housing recommended, dual cable route

1.1 - 1.2 mm (original 1.1 mm)

Yes

IP54

Standard

2200mm

Multi-turn or One-turn

22.2 mm

Full cable housing recommended, dual cable route

1.1 - 1.2 mm (original 1.1 mm)

Yes

IP54

Standard



AUTOMATIQ Controller

Cable

Handlebar diameter

Compatible with all IGH

IP classification

Wireless

22.2mm

Yes

IP54

Controllers Compatibility Matrix

enviolo

	City	Trekking	Sportive	Cargo	Commercial
MANUAL					
	✓ ✓	○ ✓	○ ✗	○ ✗	○ ○
	○ ○	✓ ○	○ ✗	○ ✗	○ ○
	○ ✗	○ ✗	✓ ○	○ ○	○ ✗
	○ ✗	○ ✗	○ ✓	✓ ✓	○ ✗
	○ ○	○ ○	○ ✗	○ ✗	✓ ✓
AUTOMATiQ					
	✓ ✓	○ ○	○ ✗	○ ✗	○ ○
	○ ○	✓ ✓	○ ✗	○ ✗	○ ○
	○ ✗	○ ✗	✓ ✓	○ ○	○ ✗
	○ ✗	○ ✗	○ ○	✓ ✓	○ ✗
	○ ○	○ ○	○ ✗	○ ✗	✓ ✓

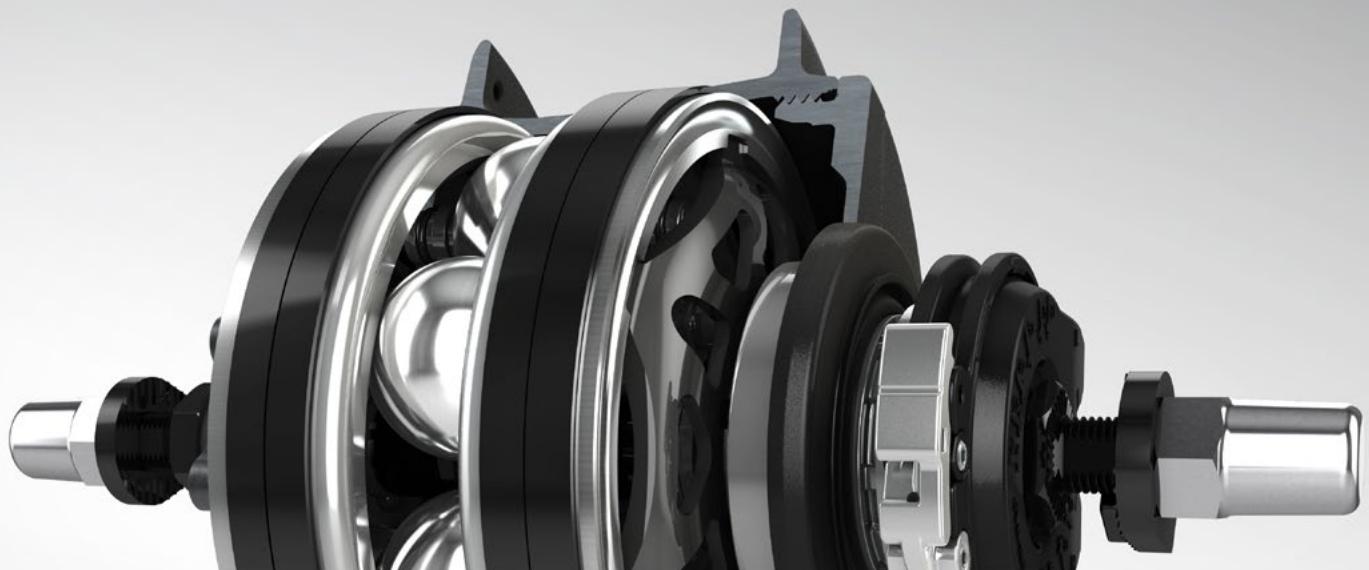
Frame Requirements

To assist you in designing your frames to be compatible with our products (e.g. sufficient clearance to chainstay/chain case) we have compiled an overview of our components with system measurements.

For 3D data please reach out to your responsible contact.

Mechanical Frame Requirements

enviolo



Vertical dropout

Using a vertical dropout requires a secondary chain tension adjustment option (e.g. eccentric bottom bracket or chain tensioner). The advantage of vertical dropouts is that once the tension is set, the rear wheel can be reinstalled without readjusting the tension.

Horizontal dropout

Horizontal dropouts are preferable for enviolo hubs, because they allow easy chain tension adjustment.

Mechanical cable routing

As in any other cable system, the number and sharpness of bends influences the ease of shifting. We recommend that you consider this in your cable routing to limit required shift effort.

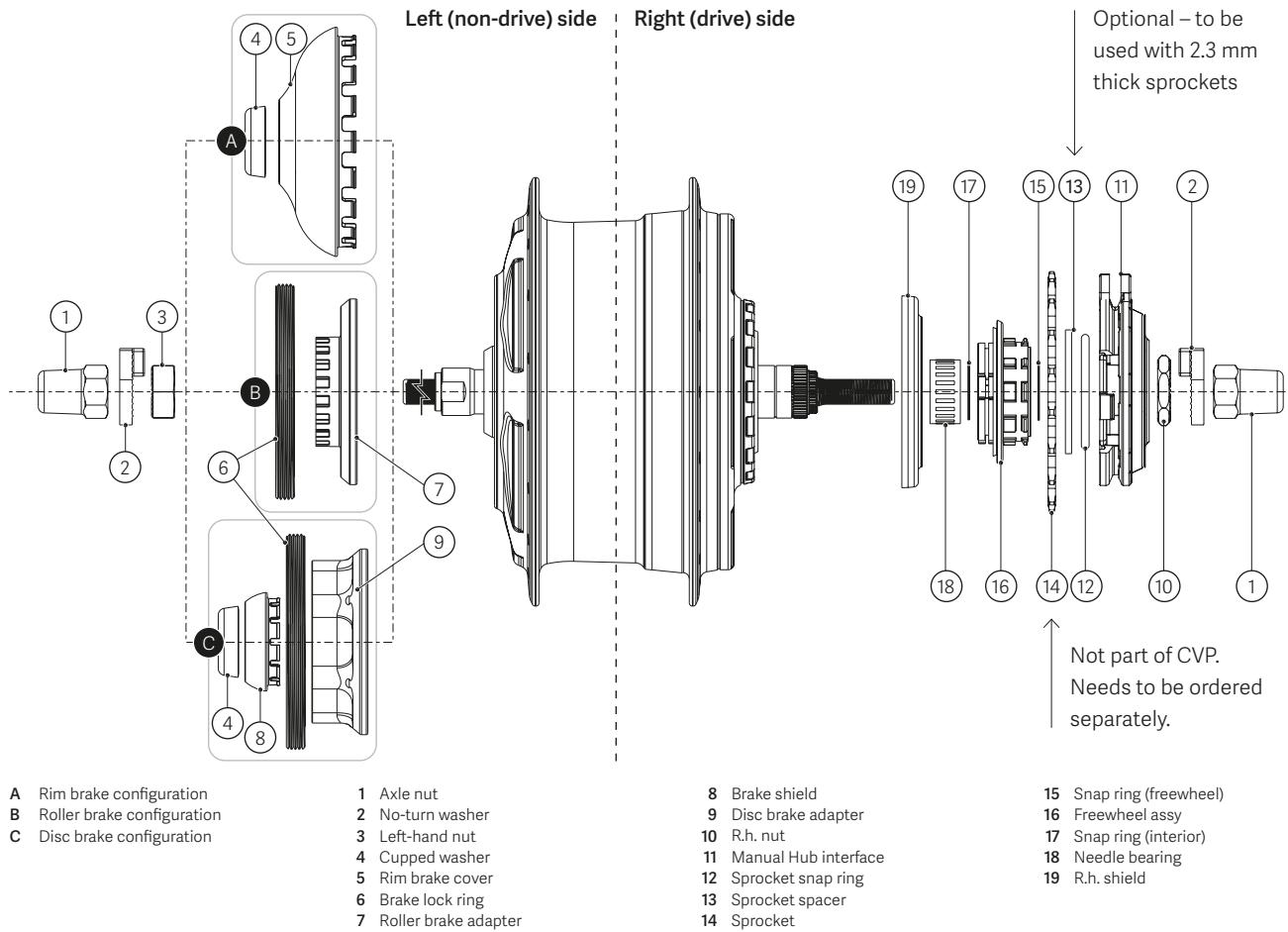
142/148 mm dropout configurations

On 142/148 mm dropouts, where you plan to use the AUTOMATiQ system, you require a sliding dropout, since the AHI is likely to interfere with derailleur hangers.

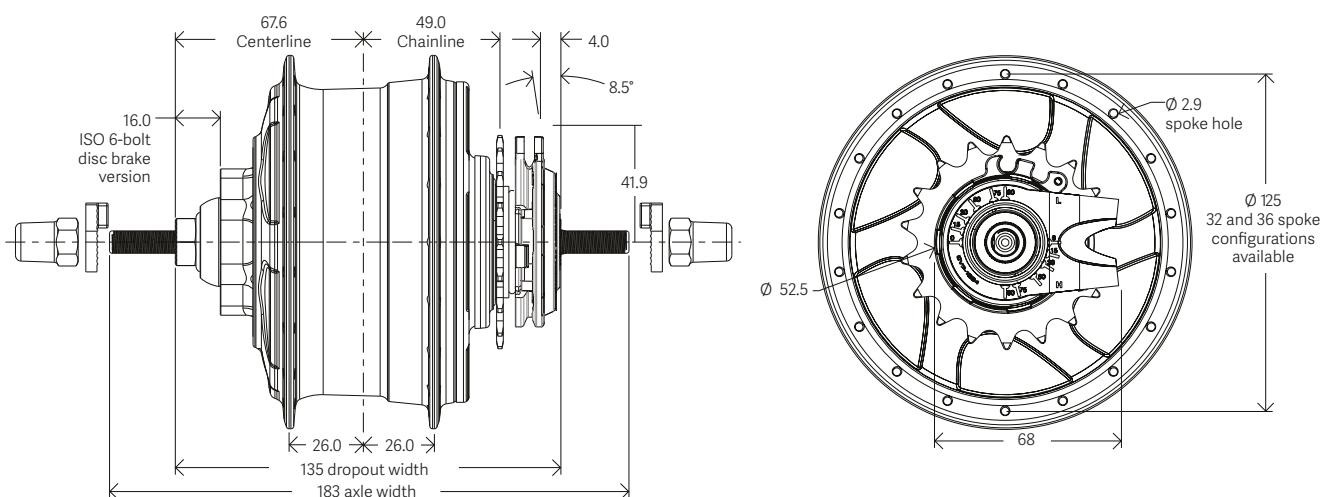
enviolo CT, enviolo TR, enviolo CO Required Package Space

enviolo
MANUAL

Components of Assembly



CVP with Manual Hub Interface



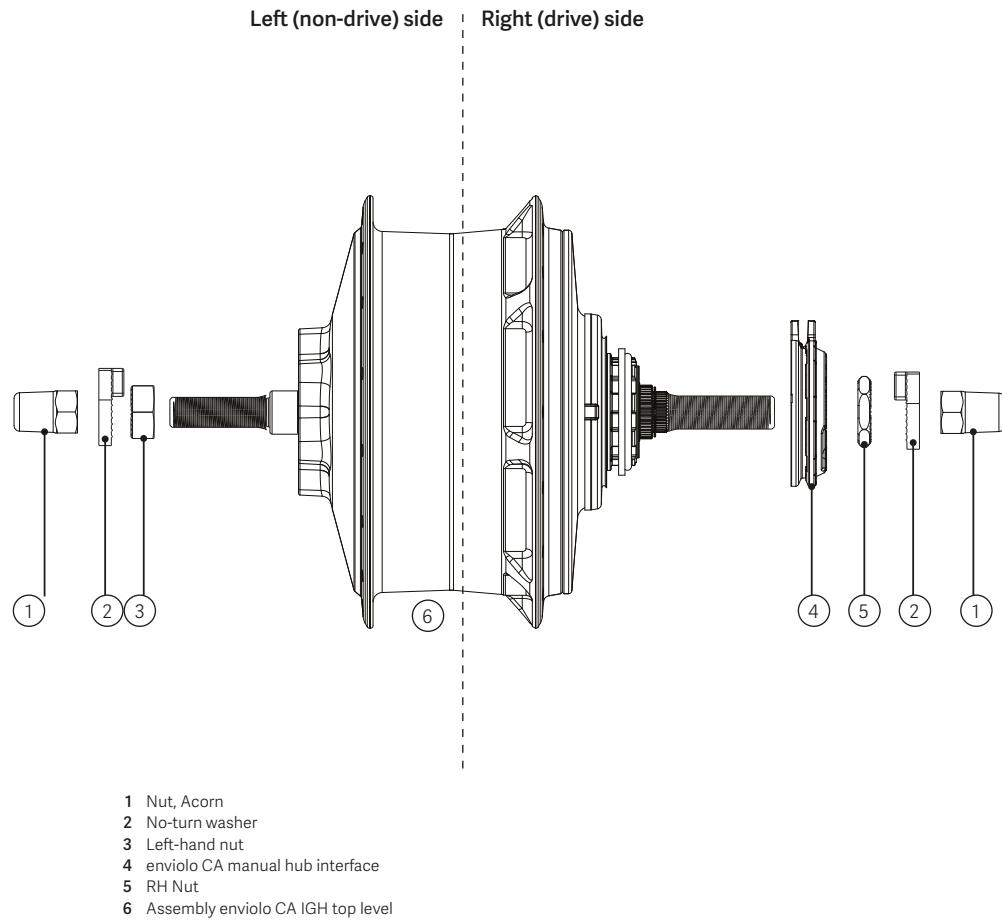
enviolo CA

Required Package Space

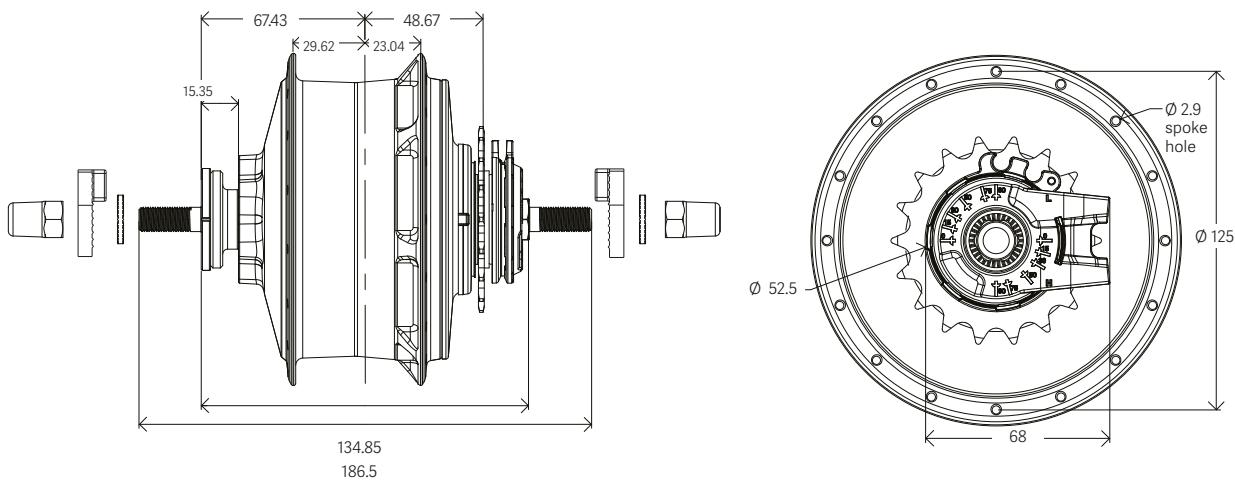
135 mm

enviolo
MANUAL

Components of Assembly



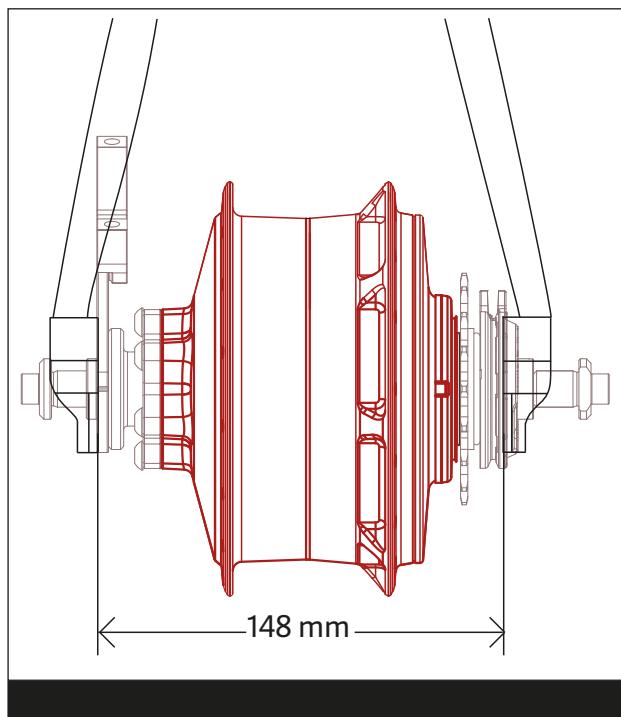
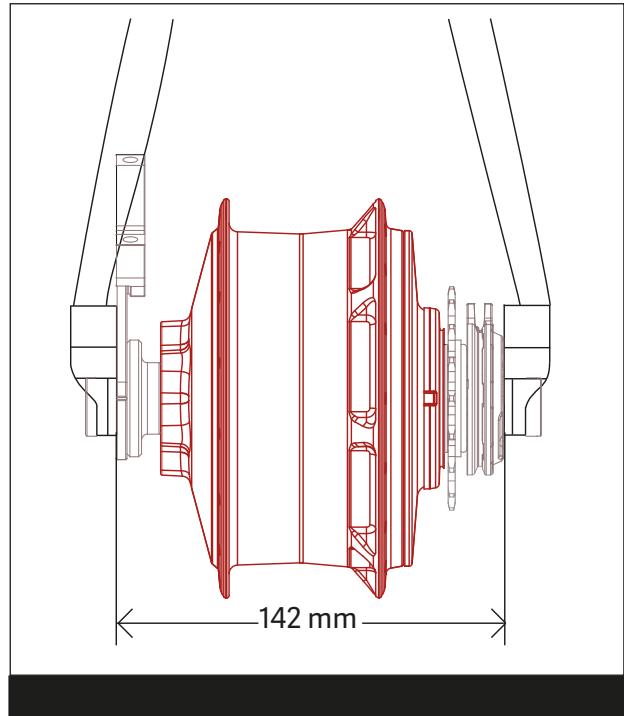
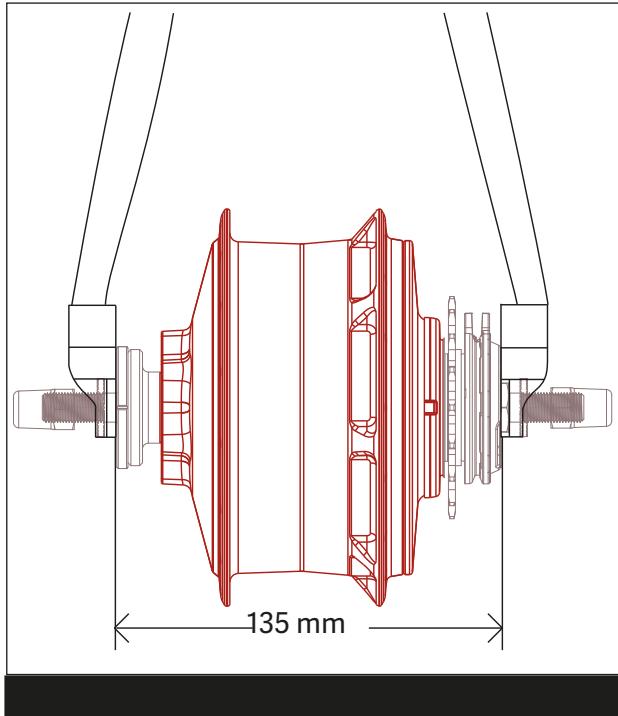
CVP with Manual Hub Interface



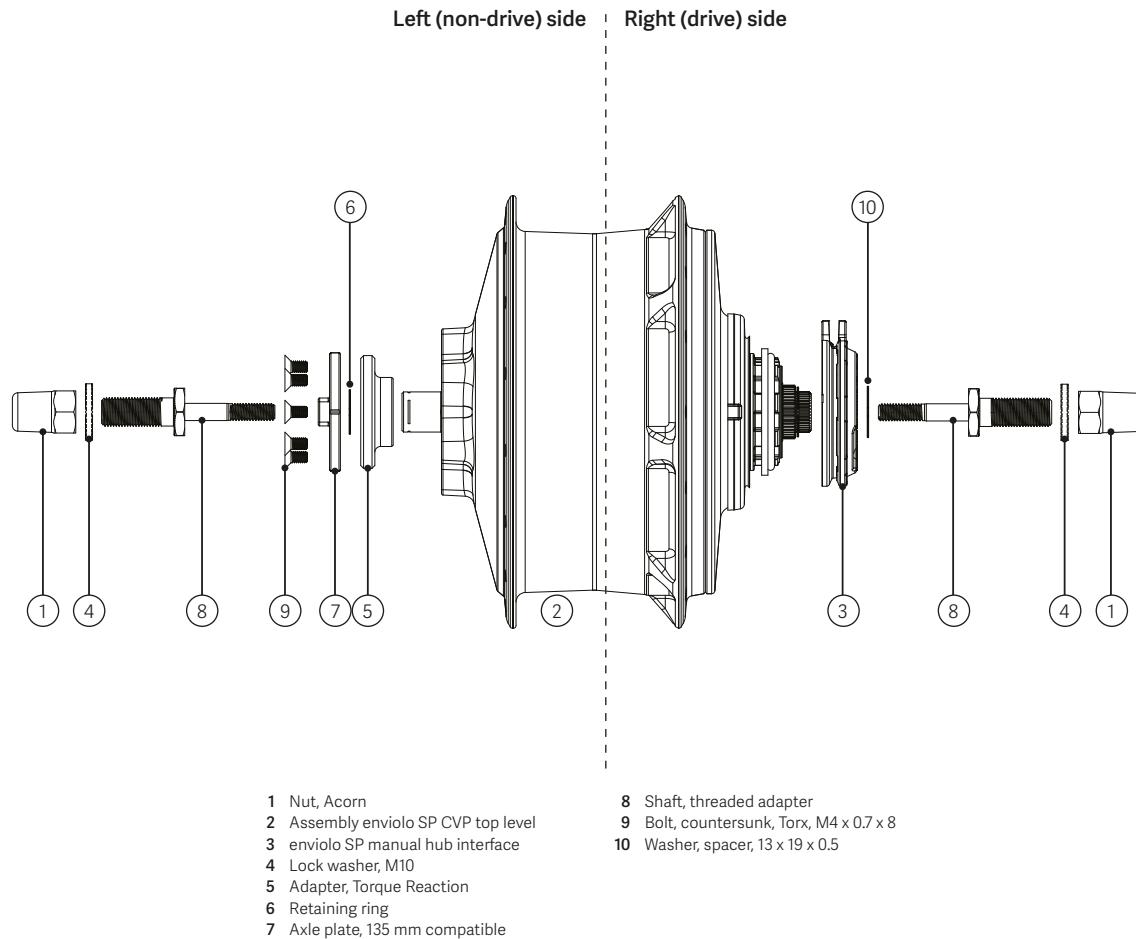
enviolo SP

Dropout Options

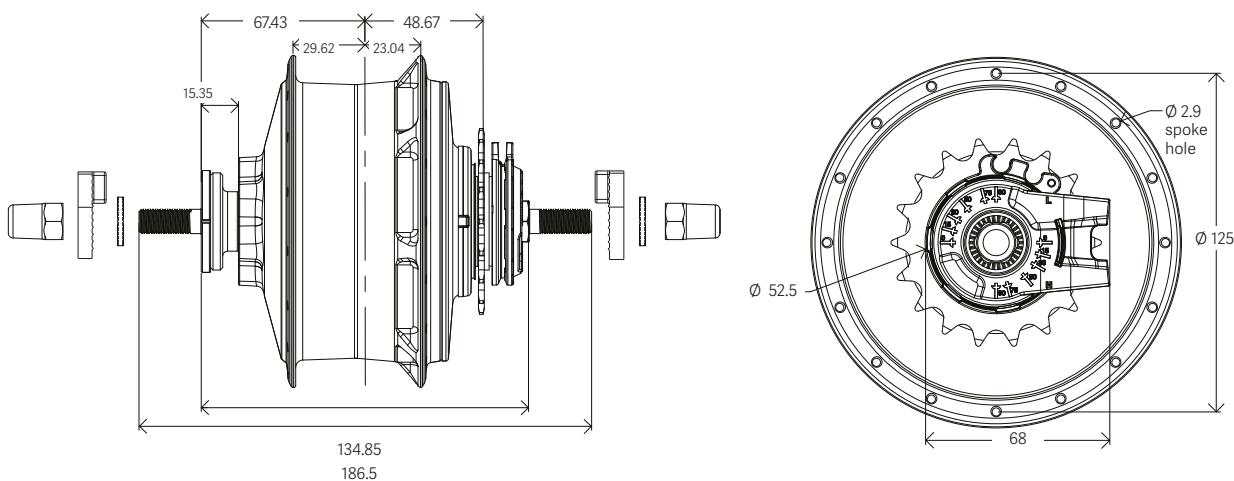
enviolo
MANUAL



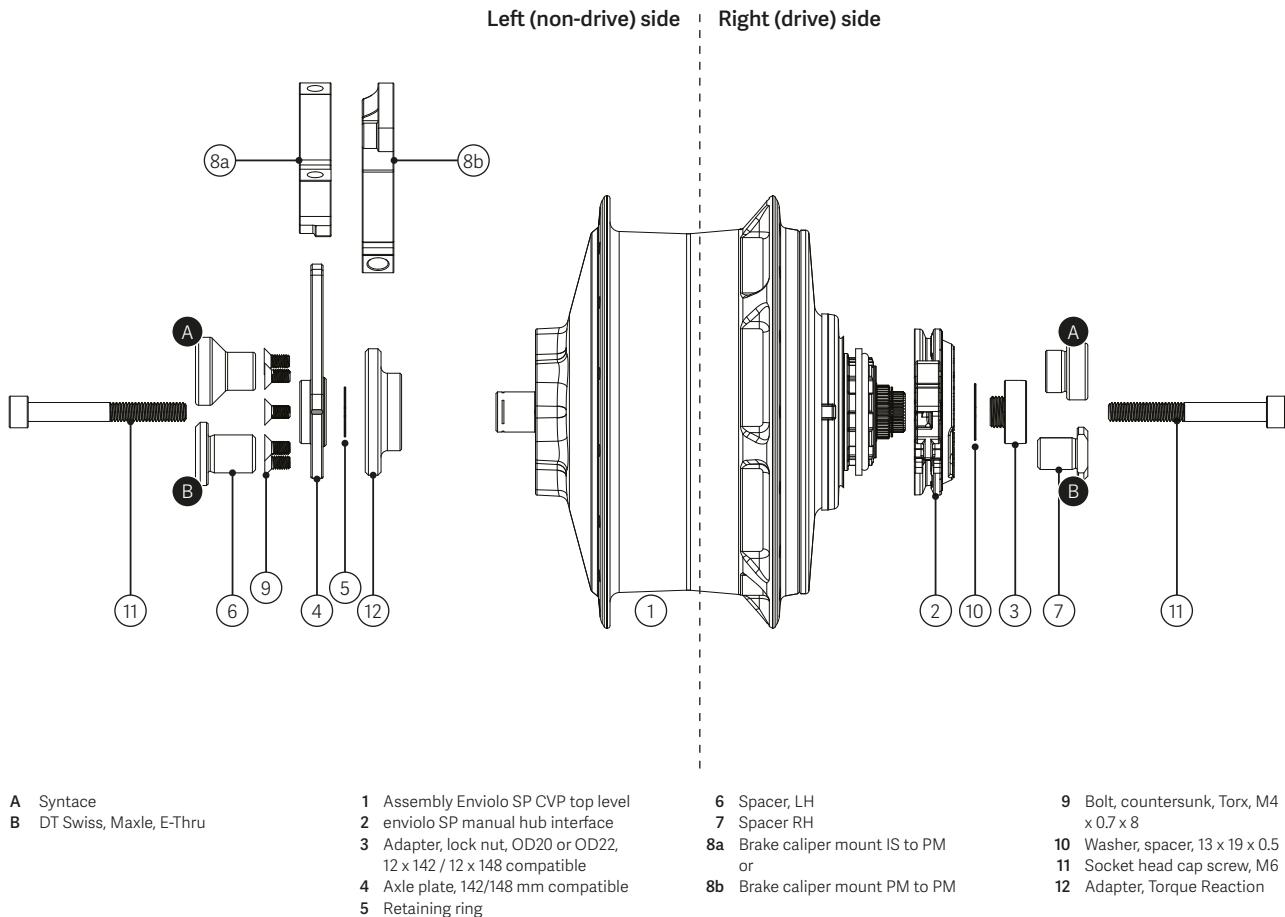
Components of Assembly



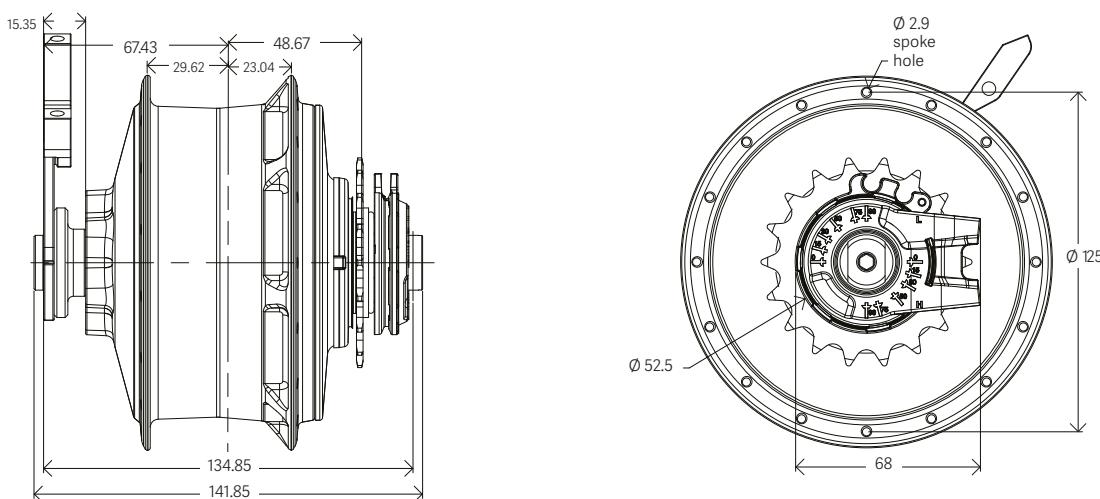
CVP with Manual Hub Interface



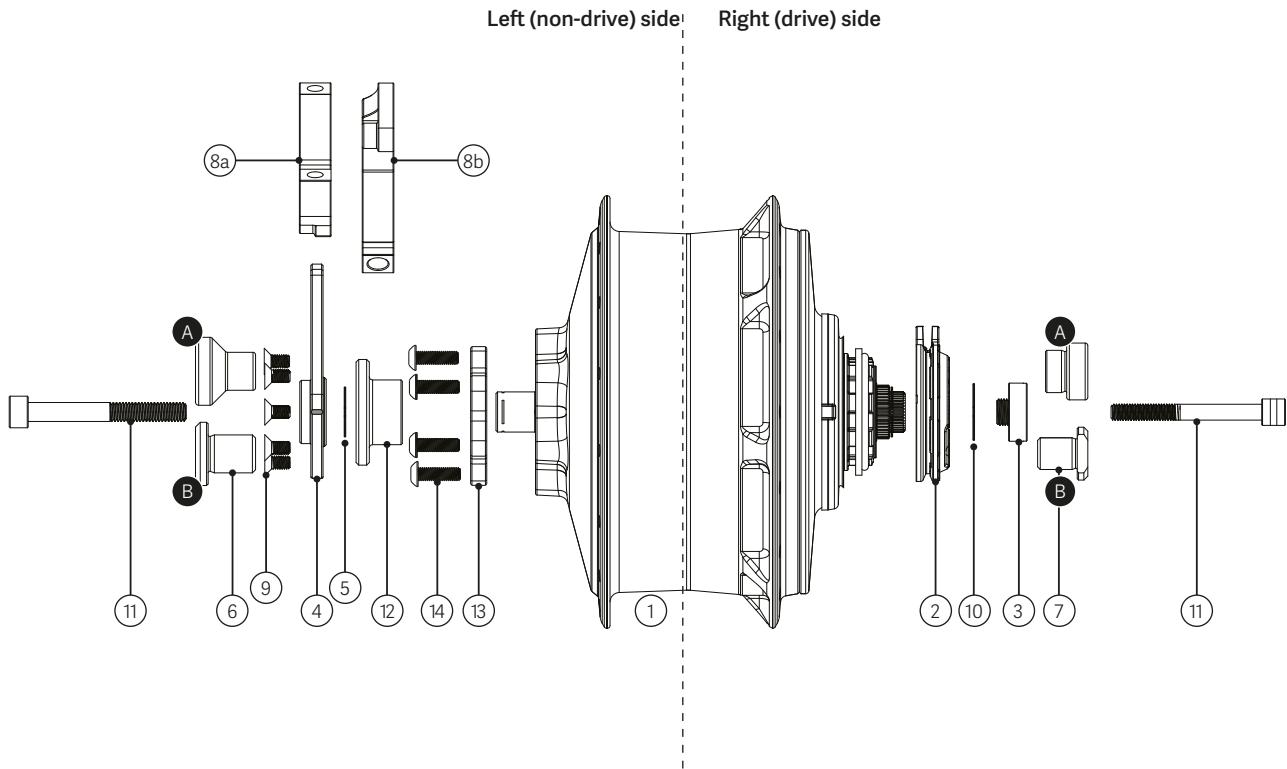
Components of Assembly



CVP with Manual Hub Interface



Components of Assembly



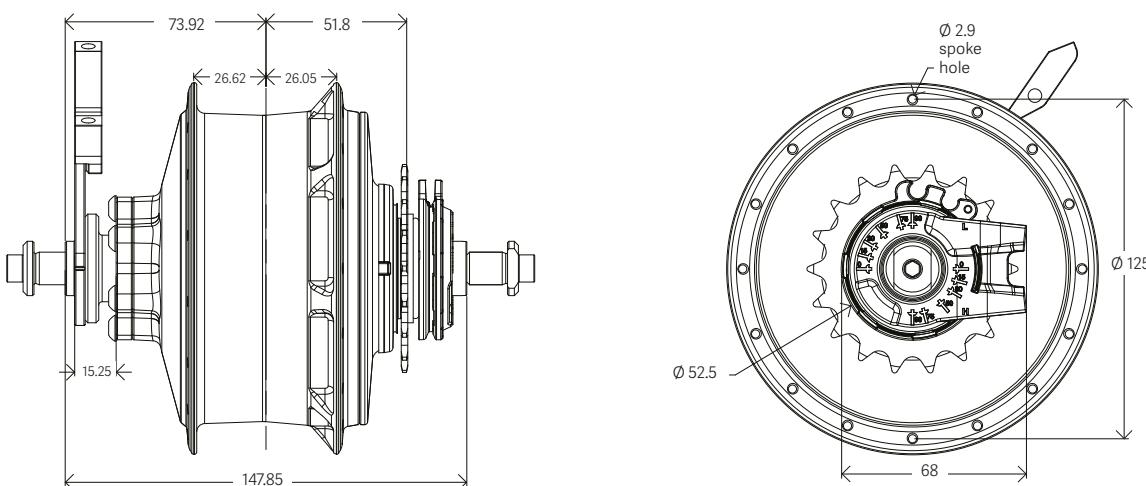
A Syntace
B DT Swiss, Maxle, E-Thru

1 Assembly enviolo SP CVP top level
2 enviolo SP manual hub interface
3 Adapter, lock nut, OD20 or OD22,
12 x 142 / 12 x 148 compatible
4 Axe plate, 142/148 mm compatible
5 Retaining ring

6 Spacer, LH
7 Spacer RH
8a Brake caliper mount IS to PM
or
8b Brake caliper mount PM to PM
9 Bolt, countersunk, Torx, M4 x 0.7 x 8

10 Washer, spacer, 13 x 19 x 0.5
11 Socket head cap screw, M6
12 Adapter, Torque Reaction
13 Spacer, disc brake, 12 x 148
14 Screw, button head, M5 x 0.8 x
16L, alloy

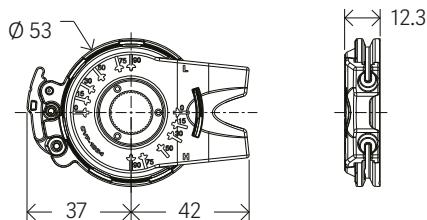
CVP with Manual Hub Interface



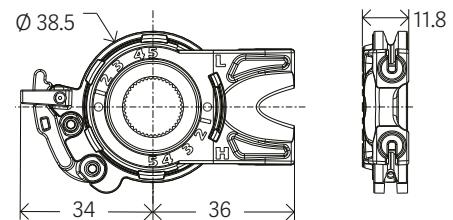
Individual Components

enviolo
MANUAL

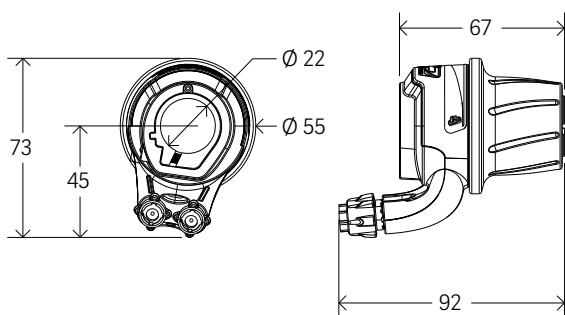
Multi-turn: Manual Hub Interface



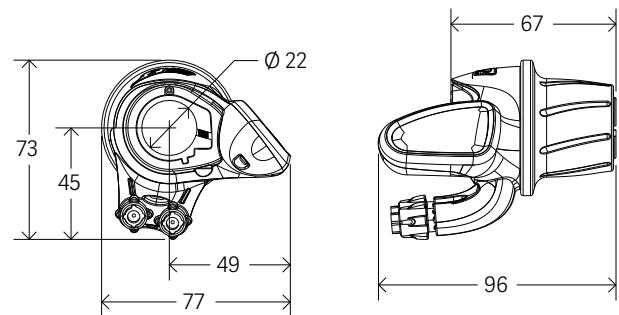
One-turn: Manual Hub Interface



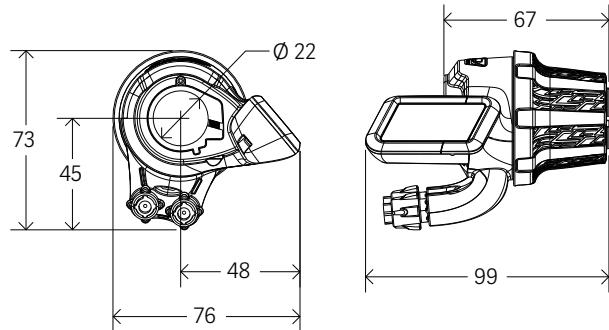
Multi-turn: Controller



One-turn: Controller



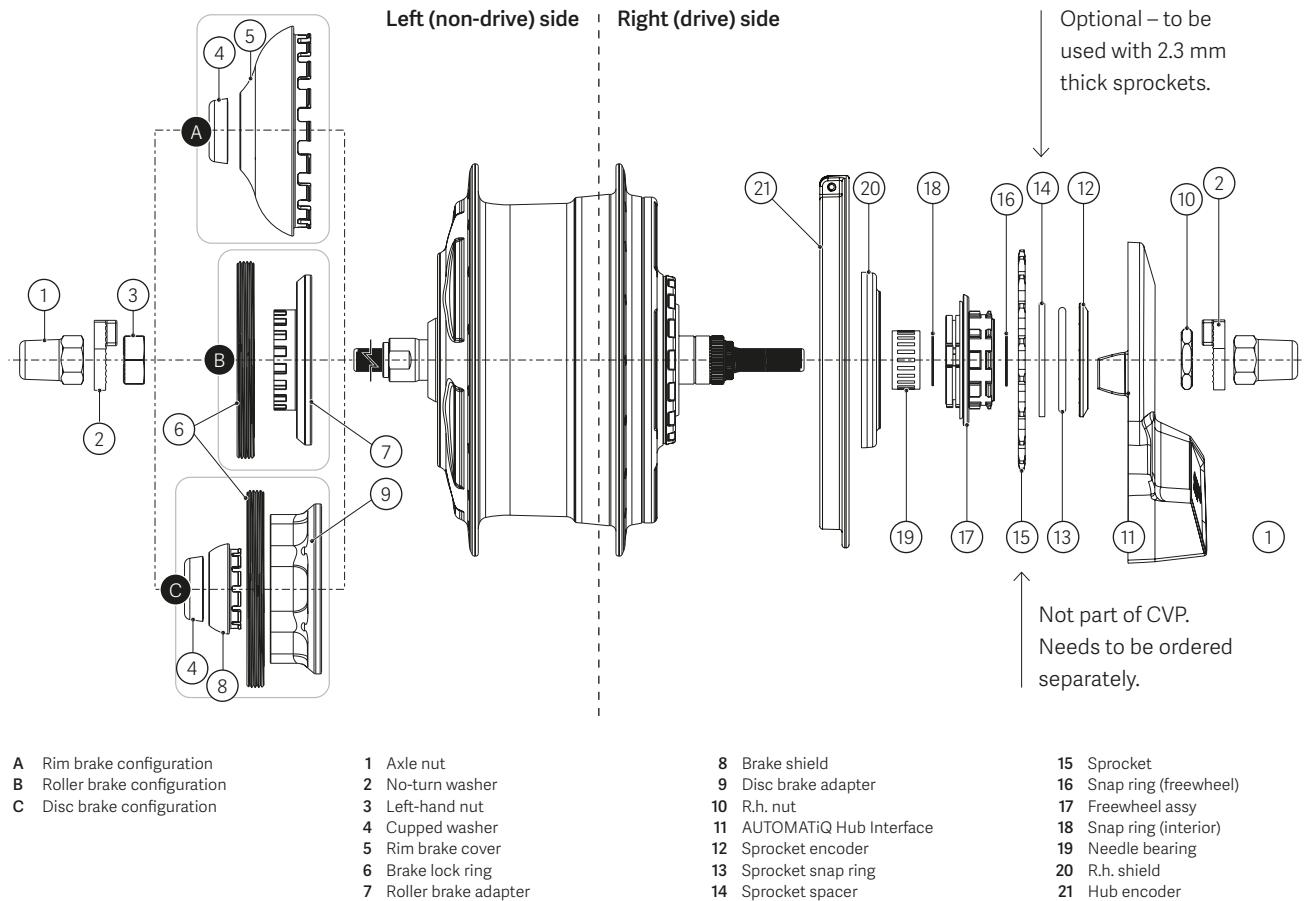
One-turn: Controller



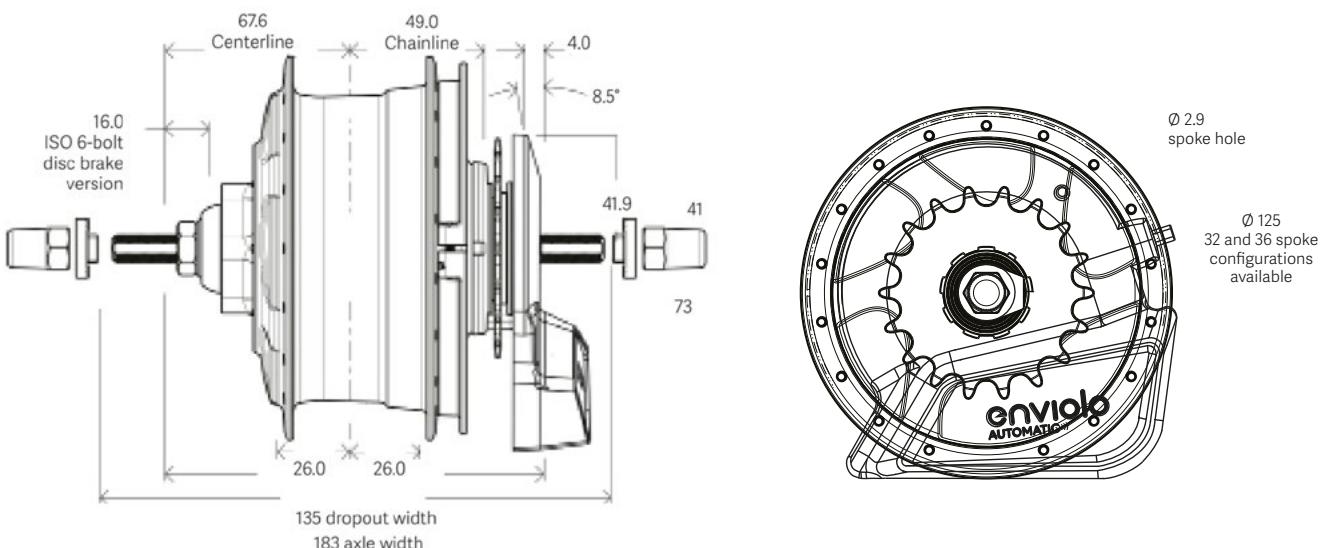
enviolo CT, enviolo TR, enviolo CO Required Package Space

enviolo
AUTOMATiQ[™]

Components of Assembly



CVP with AUTOMATiQ Hub Interface



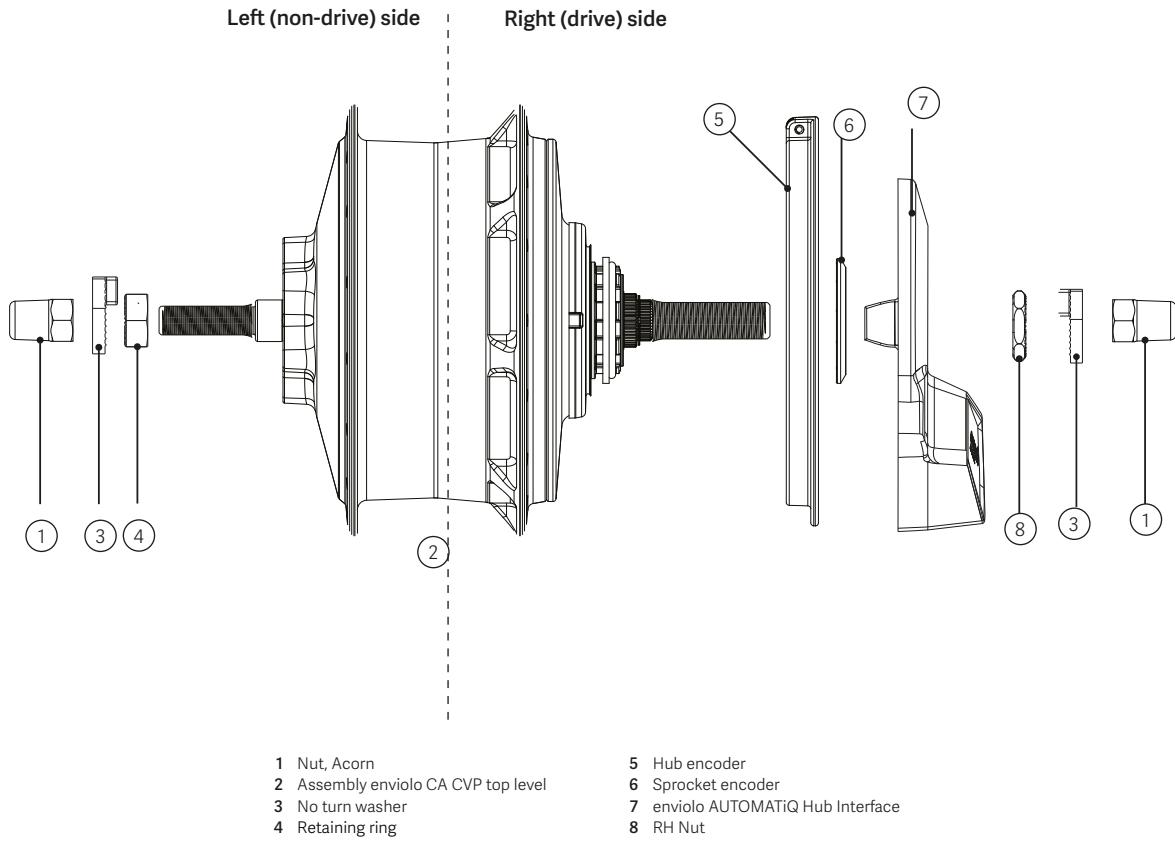
enviolo CA

Required Package Space

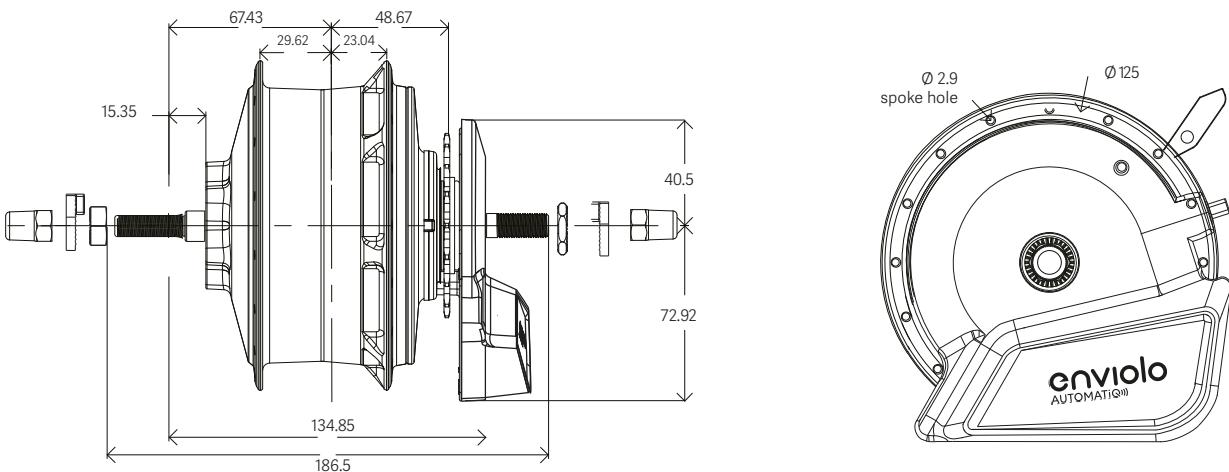
135 mm

enviolo
AUTOMATiQ

Components of Assembly



CVP with AUTOMATiQ Hub Interface



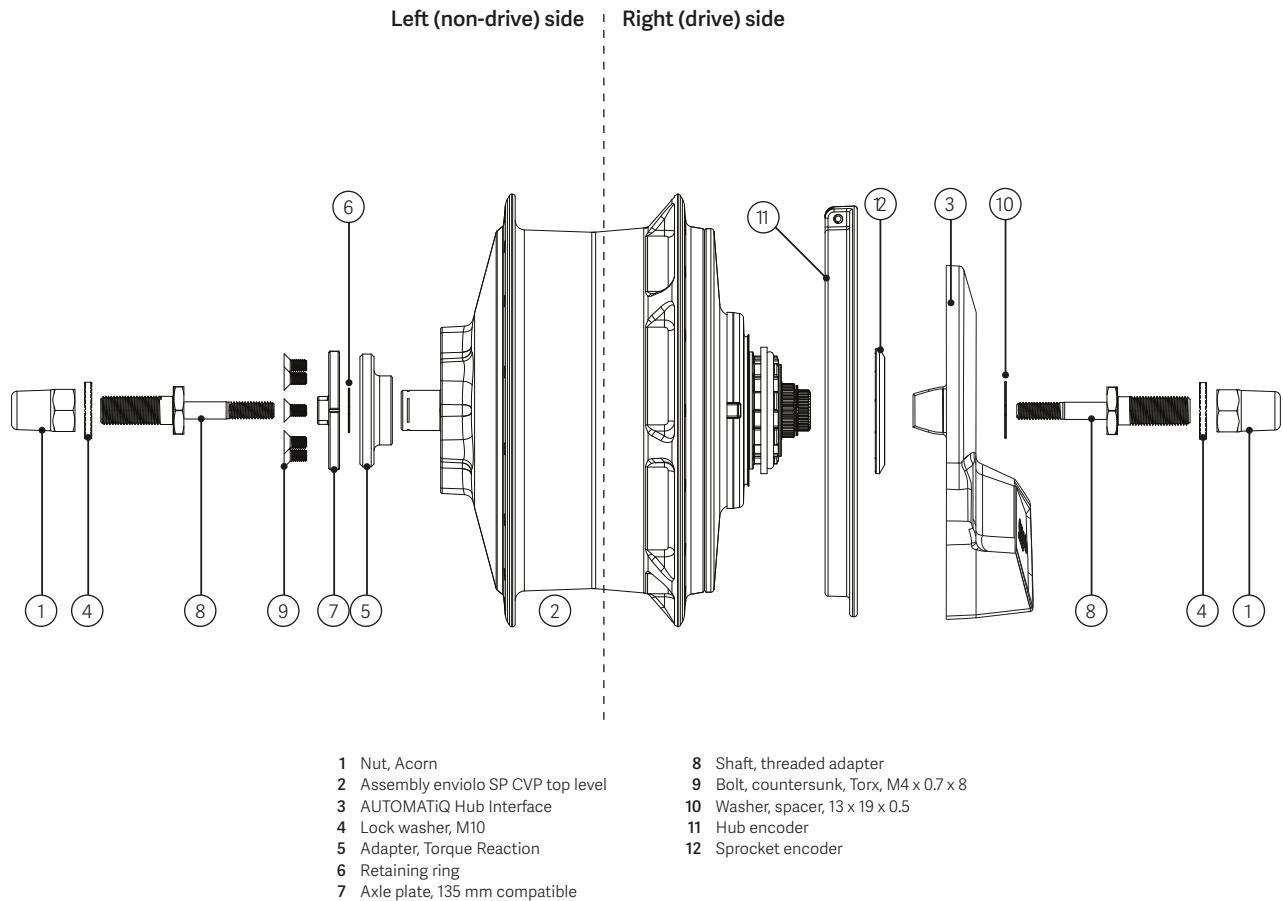
enviolo SP

Required Package Space

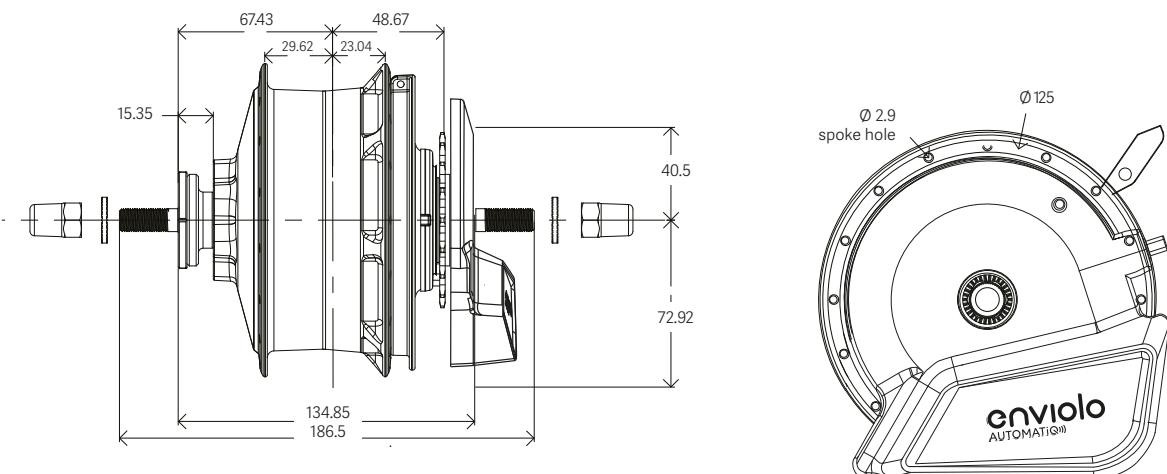
135 mm

enviolo
AUTOMATiQ

Components of Assembly



CVP with AUTOMATiQ Hub Interface

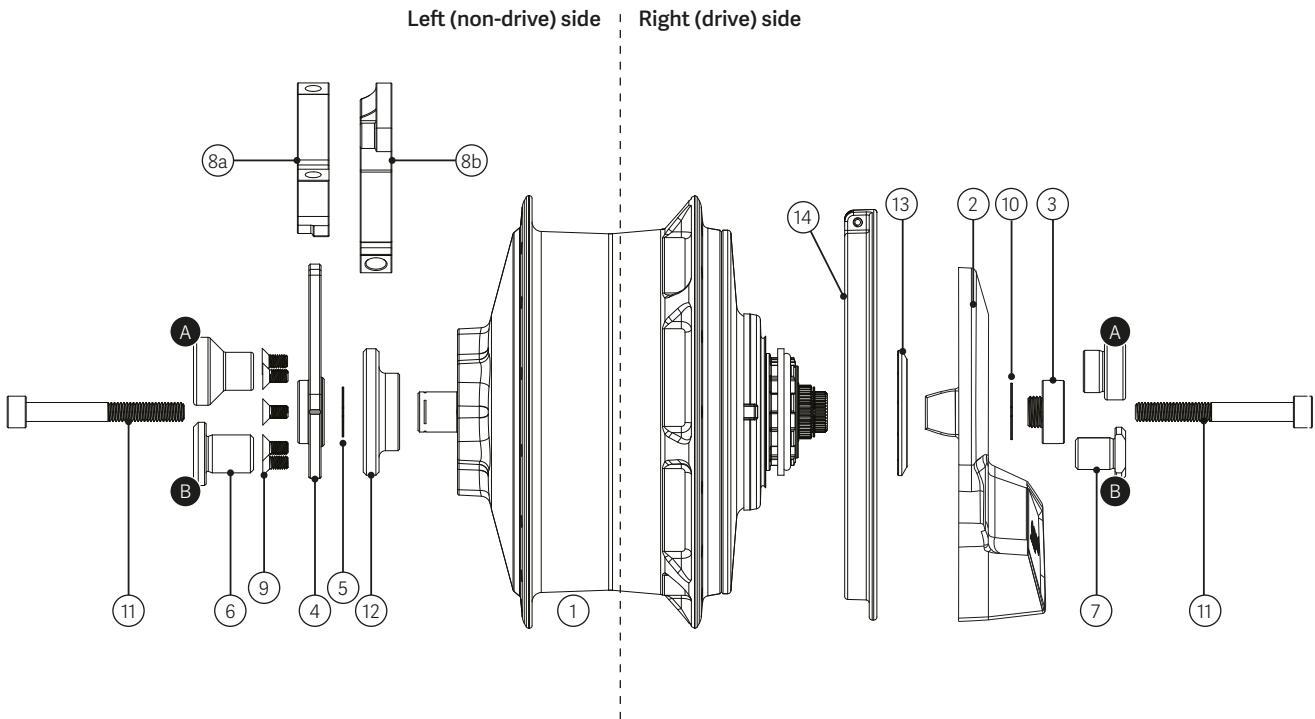


Required Package Space

142 mm

enviolo
AUTOMATiQ))

Components of Assembly



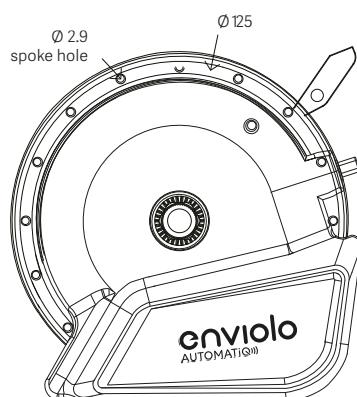
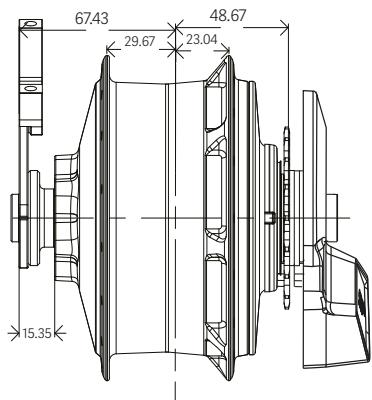
- A Syntace
- B DT Swiss, Maxle, E-Thru

- | | |
|--|---|
| 1 Assembly envio SP CVP top level | 6 Spacer, LH |
| 2 AUTOMATiQ Hub Interface | 7 Spacer RH |
| 3 Adapter, lock nut, OD20 or OD22,
12 x 142 / 12 x 148 compatible | 8a Brake caliper mount IS to PM
or |
| 4 Axle plate, 142/148 mm compatible | 8b Brake caliper mount PM to PM |
| 5 Retaining ring | 9 Bolt, countersunk, Torx, M4 x 0.7 x 8 |

- 6 Spacer, LH
 - 7 Spacer RH
 - 8a Brake caliper mount IS to PM
or
 - 8b Brake caliper mount PM to PM
 - 9 Bolt, countersunk, Torx, M4 x

- 10** Washer, spacer, 13 x 19 x 0.5
 - 11** Socket head cap screw, M6
 - 12** Adapter, Torque Reaction
 - 13** Hub encoder
 - 14** Sprocket encoder

CVP with AUTOMATiQ Hub Interface



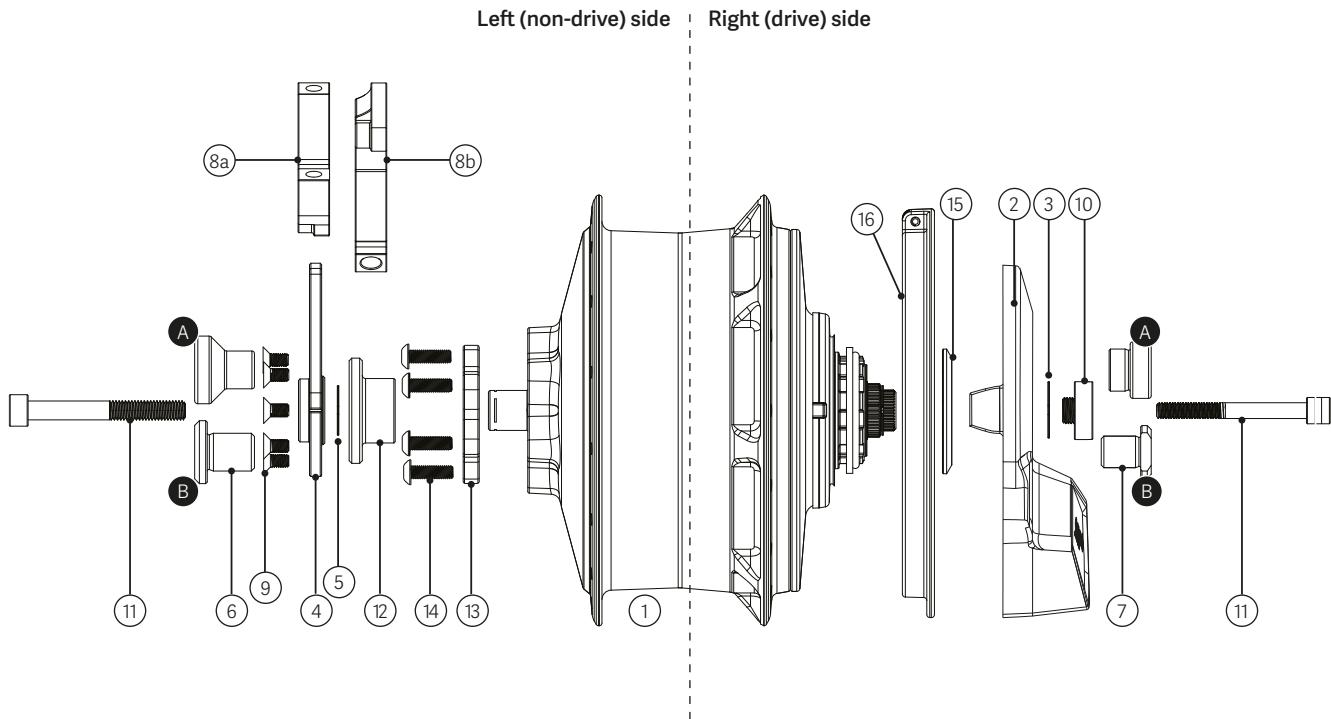
enviolo SP

Required Package Space

148 mm

enviolo
AUTOMATiQ™

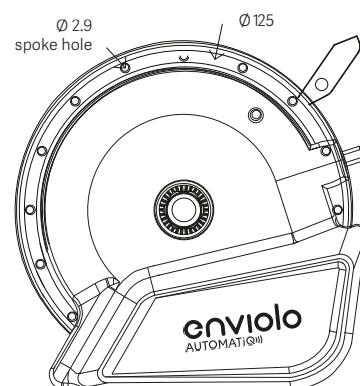
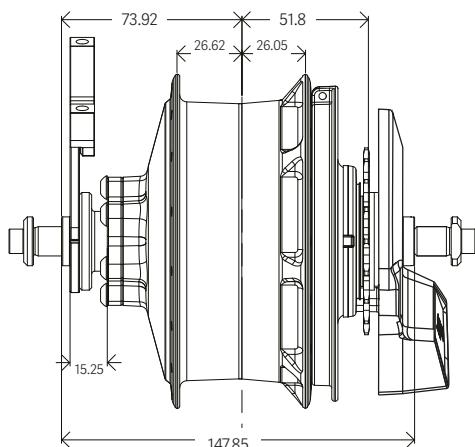
Components of Assembly



A Syntace
B DT Swiss, Maxle, E-Thru

- | | | |
|---|--|--|
| 1 Assembly enviolo SP CVP top level | 7 Spacer RH | 11 Socket head cap screw, M6 |
| 2 AUTOMATiQ Hub Interface | 8a Brake caliper mount IS to PM or 8b Brake caliper mount PM to PM | 12 Adapter, Torque Reaction Spacer, disc brake, 12 x 148 |
| 3 Adapter, lock nut, OD20 or OD22, 12 x 142 / 12 x 148 compatible | 9 Bolt, countersunk, Torx, M4 x 0.7 x 8 | 13 Screw, button head, M5 x 0.8 x 14L, alloy |
| 4 Axle plate, 142/148 mm compatible | 10 Washer, spacer, 13 x 19 x 0.5 | 14 Washer, spacer, 13 x 19 x 0.5 |
| 5 Retaining ring | | 15 Hub encoder |
| 6 Spacer, LH | | 16 Sprocket encoder |

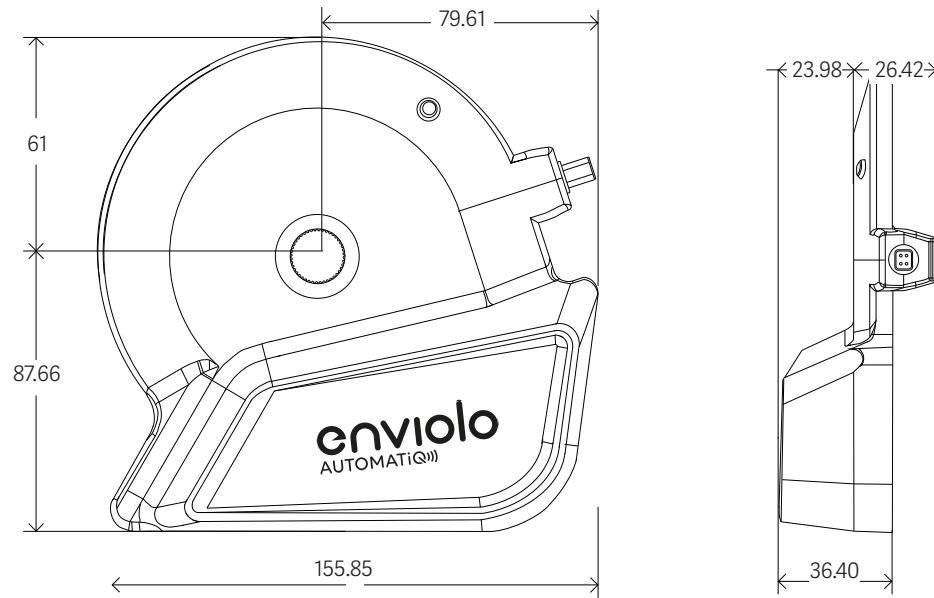
CVP with AUTOMATiQ Hub Interface



Individual Components

enviolo
AUTOMATiQ[™]

AUTOMATiQ Hub Interface

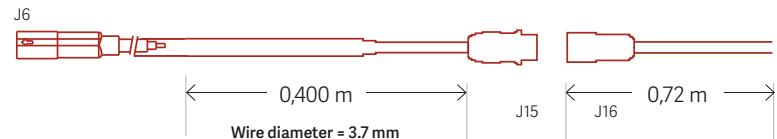


Wire Harness

enviolo
AUTOMATiQ



enviolo CT: AHI-AUT-CT-OE
enviolo CO: AHI-AUT-CO-OE
enviolo TR: AHI-AUT-TR-OE
enviolo CA: AHI-AUT-CA-OE
enviolo SP: AHI-AUT-SP-OE



Hirose connector:

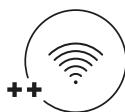
WIRE-AT3-400-OE
WIRE-AT3-600-OE

Available from drive system manufacturer.

-----OR-----



WIRE-AT3-DS-OE

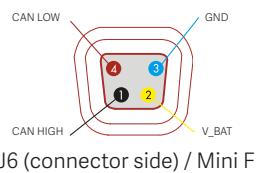


HI Pin	Cable Pin	Color	Function
1	2	Yellow	V_BAT
2	3	Blue	GND
3	4	Red	CAN_L
4	1	Black	CAN_H

NOTE: Pin-Numbering on AHI-side is different from Pin-Numbering on Cable-side

* This connector is only required if the counterplug is not provided by the drive system manufacturer. Please contact the drive system manufacturer for further information. For Yamaha we offer an alternative cable. Please contact the sales team for further information.

enviolo AUTOMATiQ is a CAN Bus / BLE system



J6 (connector side) / Mini F



J15/Hirose



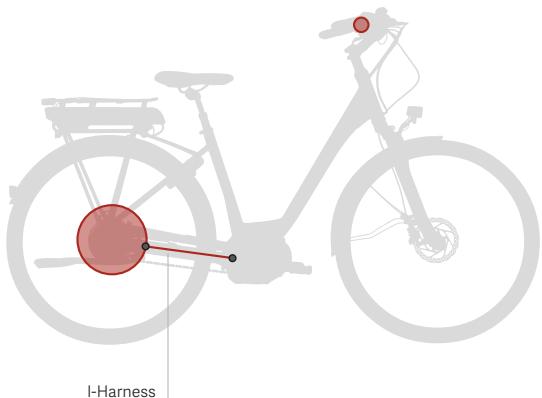
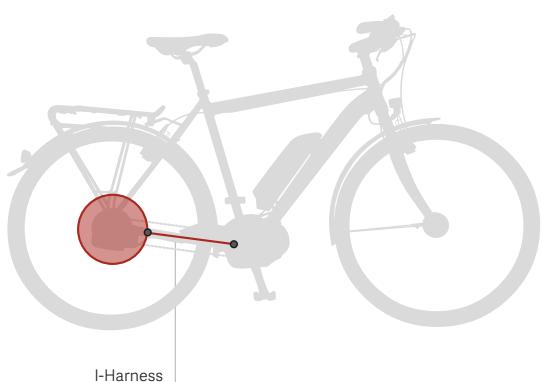
J5 (AHI side) / Mini F



J16/Hirose

AUTOMATiQ Wire Harness

This diagram provides you an overview of the system connections.



Further Information

System Efficiency

enviolo



Besides the components themselves several other factors influence the battery range:

- Type of tires
- Tire pressure
- Riding at high assistance levels
- Rider and vehicle weight
- High carry-on weight
- Straight sitting position
- Headwind
- Topography
- Frequent starting and stopping
- Frequent riding under 20 km/h
- Frequent riding under 50 RPM
- Low pedaling force by rider
- Low outside temperatures
- Rider cadence

Service Tools

enviolo

To support your assembly and maintenance of our products we offer four simple service tools:



BK-ADPT-TOOL
Brake adapter / disc assembly



HW-SNUT-TOOL
Spline nut tool



CE-HW-TOOL-MLD
Cable hardware installation tool



CE-HW-TOOL-LG-CNC
Cable hardware installation tool

enviolo AUTOMATiQ App

enviolo



Web download of software and manuals through: support.enviolo.com
App download through the Apple App Store and Google Play Store.



Wireless
connection

Operates via BLE connection
from hub interface to
smartphone/tablet



Update enviolo Automatic
firmware

Program correct cadence
and bicycle settings

The AHI to Smartphone or tablet connection lets you use our app to
configure the automatic shifting units for various applications.

OPTIONAL COMPONENT: Not required for use by end consumer.



Assembly Torque Specifications

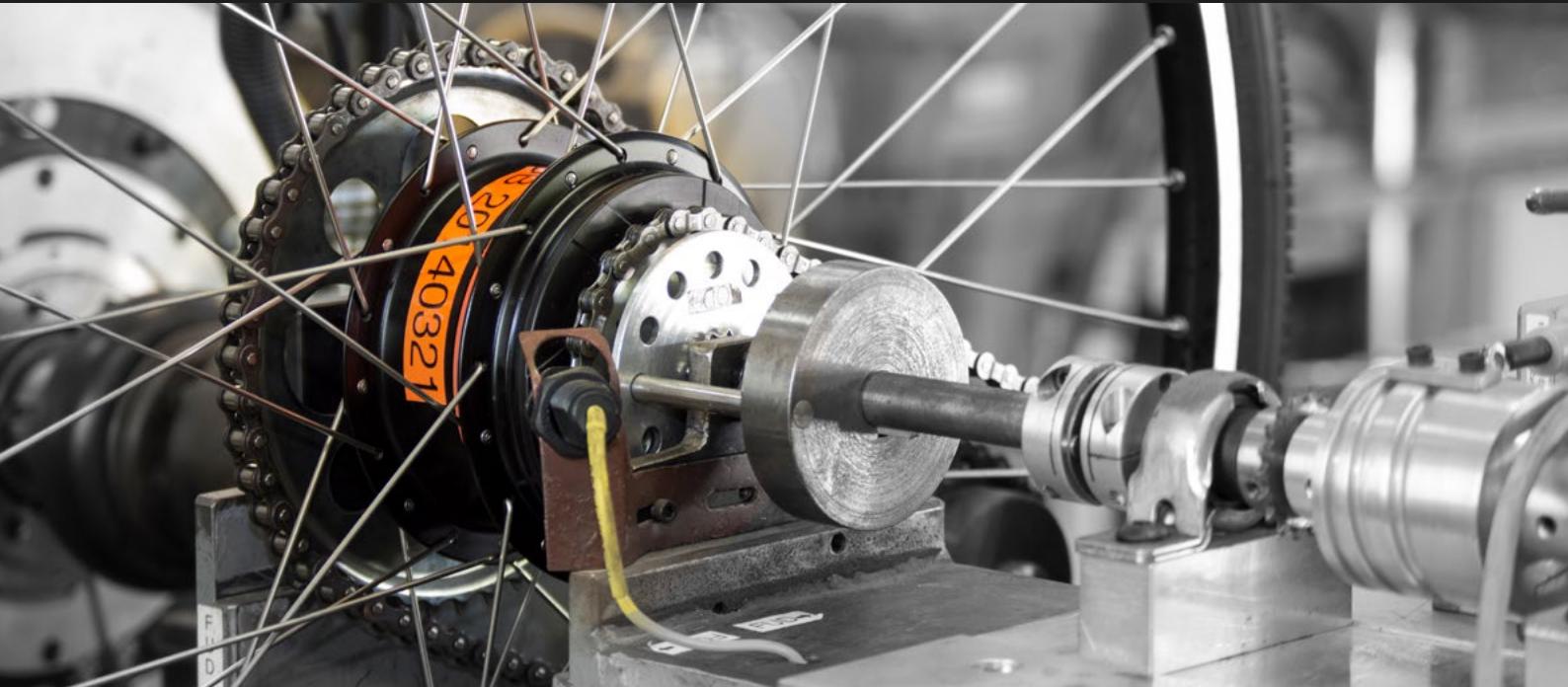
enviolo

Torque Specs enviolo CT, enviolo TR, enviolo CO, enviolo CA	Other Parts		
Axle nuts	30 - 40 Nm	Cable hardware	1.5 - 2.0 Nm
Brake adapter + Loctite® 277 or similar	55 - 65 Nm	Controller	2.0 - 2.5 Nm
Interface locknut	10 - 15 Nm	Output speed ring	1.0 Nm
Spline nut	9 - 10 Nm	Controller cable cover screw	0.2 - 0.3 Nm (handtight)

Torque Specs enviolo SP (135 mm)	enviolo SP (142/148 mm)		
Torque adapter screws	2.5 - 3 Nm	Torque adapter screws	2.5 - 3 Nm
Double threaded axle adapters	10 - 15 Nm	Interface adapter	10 - 15 Nm
Axle nuts	30 - 40 Nm	Dropout adapter (not threaded in all cases)	5 - 10 Nm
		Axle bolts	10 - 15 Nm

Quality & Validation

enviolo



Before we release our products to the market they have to run through a severe testing cycle, which is derived from automotive standards and includes an FMEA and functional safety analysis.

In addition all our products complete an extensive end-of-line testing and validation process.

Build quality

- Ride audit (quantity & quality)
- Ratio range
- R&D function
- Assembly tolerances

Design & overload tests

- Cold temperature operation test
- Torsional stress (DIN) test
- Wheel retention test
- Spoke flange ultimate load test
- Pedal drag test

Durability / fatigue tests

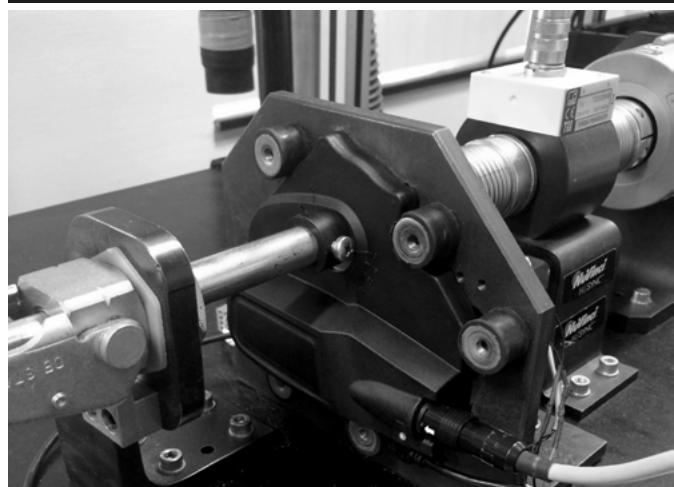
- Distributed fixed-ratio test (DFRT)
- Dynamic shift test (DST)
- Coasting test
- Canted wheel bump test
- Hub shell & cover fatigue test
- Spoke flange fatigue test
- Brake ultimate load & fatigue test
- Shifter system life test

Environmental tests

- Corrosion (salt spray) test
- UV test
- Environmental intrusion test
- Durability



Production Line Testing



End-of-Line Testing

Cooperation Partners

Current Partners

enviolo

To support the trend of system integration we cooperate with the leading drive system manufacturers to offer an integrated shift system and with the market leaders in the zero-maintenance belt drive supply chain.

enviolo
AUTOMATiQ[®]

- integrated in controller

epowered by

 **BOSCH**

 **YAMAHA**

 **SACHS**
MICRO MOBILITY

epowered by

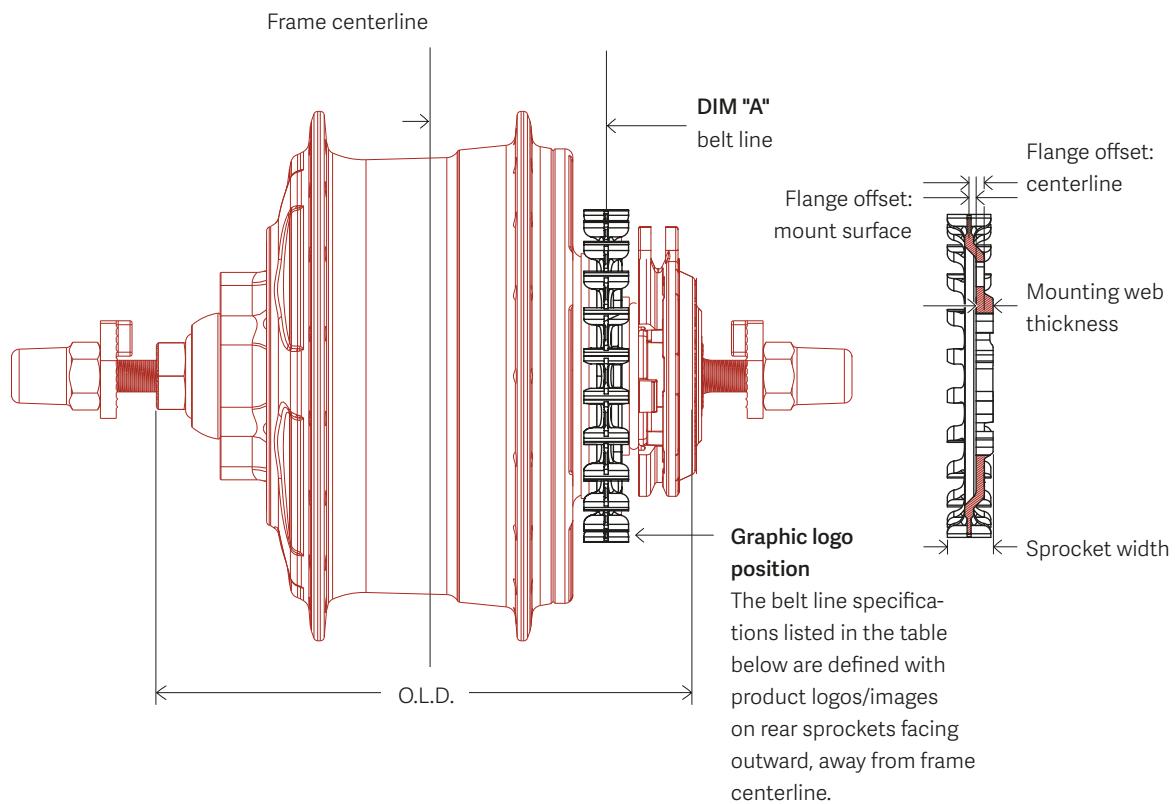
 **BOSCH**

 **MPF**
DRIVE

Further partners are in constant development. If a drive system is not listed, please reach out to your responsible contact, as solutions may already be available.

Gates Belt Drive Specifications

enviolo



CDX Beltline

enviolo CT, enviolo TR, **enviolo SP***, enviolo CA*, enviolo CO

* 135 / 142 mm only

Teeth	DIM "A" belt line	Tooth outer diameter	Sprocket width	Mounting web thickness	Article number
22	45.5 mm	75.33 mm	11.6 mm	4.3 mm	CT1122VMN
24	45.5 mm	82.26 mm	11.6 mm	4.3 mm	CT1124VMN
26	45.5 mm	89.31 mm	11.6 mm	4.3 mm	CT1126VMN
28	45.5 mm	96.31 mm	11.6 mm	4.3 mm	CT1128VMN
enviolo SP**					** 148 mm only
22	48.7 mm	75.33 mm	11.6 mm	4.3 mm	CT1122VMN
24	48.7 mm	82.26 mm	11.6 mm	4.3 mm	CT1124VMN
26	48.7 mm	89.31 mm	11.6 mm	4.3 mm	CT1126VMN
28	48.7 mm	96.31 mm	11.6 mm	4.3 mm	CT1128VMN

Compatible Chain Cases

Hebie Chain Case

enviolo



350R N16



350R NV16

Chainglider

enviolo CT, enviolo TR, enviolo SP, enviolo CA, enviolo CO

Compatible systems	Front part	Rear part	Chainstay length	Compatible sprocket size
Manual	350F 38 / 42 / 44 / 48	350R NV16	445 - 475mm	16 - 22
Manual	350F 38L / 42L / 44L / 48L	350R NV16	530 mm	16 - 22

*MY2020 AUTOMATiQ option in evaluation.

Hesling Chain Case

enviolo

Hesling®
bike parts



Finura

enviolo CT, enviolo TR, enviolo SP, enviolo CA, enviolo CO

Compatible systems	Chainstay length	Compatible front sprocket size	Compatible rear sprocket size
Manual	450 - 490 mm	38	18 - 22

*MY2020 AUTOMATiQ option available. Please contact your dedicated business development lead for more details.

Compatible Bicycle Trailers

Bike Trailer Adapters for enviolo CT, enviolo TR, enviolo CO enviolo SP (Solid Axle), enviolo CA

enviolo

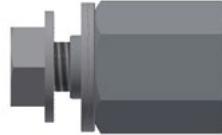
BURLEY®

Trailer	Adapter
Minnow, Bee, Honey Bee, Encore, Solo, Cub, D'Lite, Nomad, Flatbed, Tail Wagon	 Art. No. 960038

CROOZER®
The bicycle trailer

Trailer	For vehicles from 2016	For vehicles before 2016	
Croozer Kid Croozer Kid Plus Croozer Cargo Croozer Dog	 XL: + 10 mm Art. No. 122003516	 Art. No. 122003716	 Art. No. 122000715
		 Croozer axle nut adapter with Thule coupling	

THULE®
SWEDEN

Trailer	Adapter
Thule Chariot Lite Thule Chariot Cab Thule Chariot Cross Thule Chariot Sport Thule Coaster XT	 Art. No. 20100798

Use of third party adapters has not been tested by Fallbrook Technologies Inc. and therefore we cannot guarantee their performance or safety and hereby disclaim any liability resulting from their use. Please carefully follow all installation instructions provided by third party product producers for the installation and maintenance of such products.

Certificates & Declarations



Test Report

enviolo

Test:	European Bicycle Standards (Rear Hub Durability and Strength Criteria)
Test Articles:	CVP's: enviolo CT, enviolo CO, enviolo TR, enviolo CA, enviolo SP Shifters: enviolo CT, enviolo CO, enviolo TR, enviolo CA, enviolo SP
Date:	5 DEC 2017
Reference:	ISO 4210:2014(E) which supersedes: <ul style="list-style-type: none">• EN 14764:2005• EN 14766:2005• CEN/TC 333 N.96:2002• DIN 79100-2:1999 ISO 8098:2014(E), US CPSC 16 CFR Part 1512
Test Method:	Reference standard tests specific to rear hub durability and strength criteria
Test Location:	Fallbrook Technologies Inc., Cedar Park, TX

Test Results:

The enviolo CT, enviolo CO, enviolo TR, enviolo CA, enviolo SP are tested to industry standards for internal hubs, as well as proprietary additional tests specific to NuVinci technology in use with traditional, as well as electric-assist bicycles (eBikes or pedelecs) up to 250W (rated) power for the enviolo CT, enviolo CO, enviolo TR and up to 500W (rated) power for the enviolo CA, enviolo SP.

Specifically, the enviolo CT, enviolo CO, enviolo TR, enviolo CA, enviolo SP meet rear hub durability and strength criteria for bicycle standard ISO 4210:2014(E) and ISO 8098:2014(E). The enviolo CT, enviolo CO, enviolo TR, enviolo CA, enviolo SP shifters comply with requirements set forth in ISO 4210:2014(E) and ISO 8098:2014(E). In addition, the enviolo CT, enviolo CO, enviolo TR, enviolo CA, enviolo SP hubs and enviolo CT, enviolo CO, enviolo TR, enviolo CA, enviolo SP shifters meet US CPSC 16 CFR Part 1512.

Proprietary Fallbrook Technologies Inc. testing that exceeds industry standards include:

- Durability (simulating 18,000 km of use at extreme conditions)
- Dynamic Shift Test
- Canted Wheel Bump Fatigue Test
- Coasting Fatigue Test
- Hub Shell and Cover Axial Fatigue Test
- Hub Shell spoke Flange Fatigue and Ultimate Tests
- Brake Fatigue Test
- Shifter System Durability Test
- Corrosion Resistance Test
- Weatherability / UV Test
- Environmental Intrusion Test
- Ride Audit Test (including cold weather testing)
- End of Line Efficiency, Ratio Range, and Leak Tests

Rev C

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Certificate of Compliance – RoHS Declaration

enviolo

Fallbrook Technologies Inc.
505 Cypress Creek Road, Suite L
Cedar Park, TX 78613

12/05/17

Fallbrook Technologies certifies product compliance to the European Union Directive 2011/65/EU on the Restriction of the use of certain Hazardous Substances in electrical and electronic equipment (RoHS).

All enviolo automatic brand system components comply with the stated substances and maximum concentration values tolerated by weight in homogeneous materials.

Lead (0,1 %)
Mercury (0,1 %)
Cadmium (0,01 %)
Hexavalent chromium (0,1 %)
Polybrominated biphenyls (PBB) (0,1 %)
Polybrominated diphenyl ethers (PBDE) (0,1 %)

Fallbrook Technologies relies on its supply chain partners to ensure daily compliance.

Two handwritten signatures are shown side-by-side. The signature on the left is 'Brian' and the signature on the right is 'C. M.'

VP of Operations

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Declaration of Conformity

enviolo

Manufacturer:

Fallbrook Technologies Inc.
505 Cypress Creek Road, Suite L
Cedar Park, TX 78613

Authorized Representative:

Richard Hilgart
Fallbrook Technologies Inc.
Technical Product Manager
Popovstraat 12
8013 RK Zwolle, The Netherlands

Product Name: enviolo Automatic and Automatic + Shifting System with belt drive compatibility. The enviolo Automatic and Automatic + Shifting System with belt drive compatibility consists of the following components:

(1) enviolo AUTOMATiQ Hub Interface ("AHI-AUT"), enviolo Automatic + Hub Interface ("AHI-AUTI"); (2) "Y" or "i" Harness, and (3) may include Grip shifter Controller ("ARC") or 3-button controller. A picture of the enviolo Automatic Shifting System is attached as Exhibit A.

The object of declaration described above is in conformity with Directive 2004/108/EC of the European Parliament and the Council of 15 December 2004 on the approximation of the laws of the Member States relating to electromagnetic compatibility.

Testing Body: VDE Testing Certification Institute
Merianstrasse 28
63069 Offenbach
Notified Body No.: 0366

Date of Conformity: 1 September 2016

This declaration is issued under the sole responsibility of the Manufacturer and Authorized Representative described above.

Signed for on behalf of Fallbrook Technologies Inc.:

A handwritten signature in black ink, appearing to read 'RH', followed by a long, thin, sweeping line.

Richard Hilgart
Technical Product Manager



B35H-HARM-06 | Rev C

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Declaration of Conformity

Manufacturer:

enviolo
Vijzelstraat 68-72
1017 HL Amsterdam

Authorized representative:

Peter Kreuder
enviolo
Director of Product Management
Vijzelstraat 68-72
1017 HL Amsterdam

Product Name: enviolo AUTOMATiQ shifting system with belt drive compatibility. The enviolo AUTOMATiQ shifting system with belt drive compatibility consists of the following components:

(1) enviolo AUTOMATiQ Hub Interface (“AHI-CT/AHI-CO/AHI-TR/AHI-CA/AHI/SP”), (2) enviolo AUTOMATiQ “i” Harness, and (3) may include 3-button controller (“ARC”). A picture of the enviolo AUTOMATiQ Shifting System is attached as Exhibit A.

The object of declaration described above is in conformity with Directive 2004/108/EC of the European Parliament and the Council of 15 December 2004 on the approximation of the laws of the Member States relating to electromagnetic compatibility.

Testing Body:

DEKRA Certification B.V.
Meander 1051
6825 MJ Arnhem
Company registration: 09085396
Date of Conformity: 1 September 2019

This declaration is issued under the sole responsibility of the Manufacturer and is signed by its Authorized Representative described above.

Signed for on behalf of enviolo:

Peter Kreuder
Director of Product Management



Exhibit A

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REACH (Regulation, Evaluation, and Authorization of Chemicals) Declaration:

enviolo

Fallbrook Technologies Inc.
505 Cypress Creek Road, Suite L
Cedar Park, TX 78613

Effective Date: October 20, 2015

Supplier Declaration for Articles Provided

We declare that this information is true and complete to the best of our knowledge and that the articles we provide are compliant with restrictions on substances listed in Annex XVII of REACH regulations (15.06.2015). As a Non-EU company, we do not have a direct REACH obligation but we do verify compliance with Annex XVII to allow our customers to fulfill their REACH obligations. Fallbrook Technologies does not manufacture "substances" or "preparations" nor do we provide articles that involve the "intentional release of substances" per the definitions in Regulation (EC) No 1907/2006 – REACH.

Two handwritten signatures are shown side-by-side. The signature on the left appears to be 'Brian' and the signature on the right appears to be 'Curn'. They are written in a cursive, black ink style.

VP of Operations

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