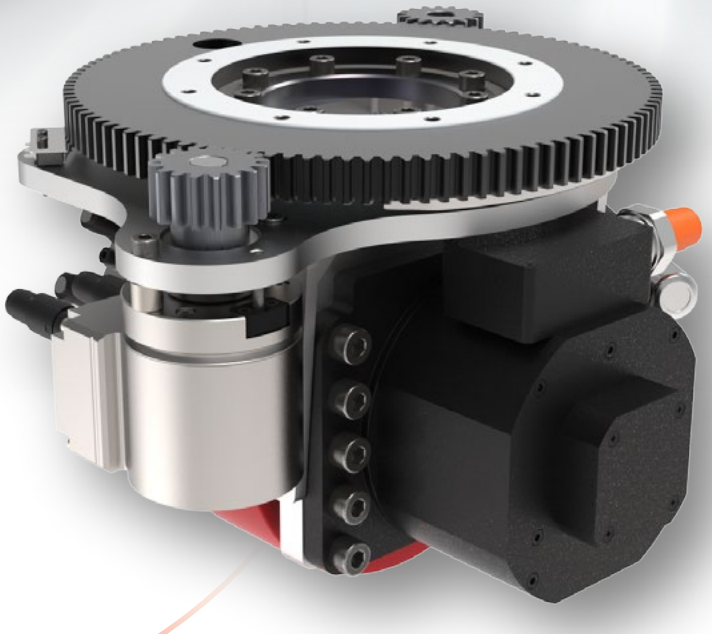
SPINEA
BY TIMKEN



MoveSpin

DRIVE UNITS FOR AGV/AMR

About MoveSpin

MoveSpin is one of the key components for designing the AGV/AMR vehicles used in the production and logistics. AGV and AMR systems are significant in modern production, warehouse, and logistics supply chains. The primary role of these vehicles is to drag, guide and transport different kinds of cargo by using peripheral devices designated for safe maneuvering in the area. The demand from the customers is usually aimed at more complex solutions based on the combination of cell production and AGV/AMR system. AGV/AMR vehicles are designed for 24/7 operation and transportation of heavy cargo with specific demands on radial load (payload), transfer speed, compact size, reliability, and lifespan which can be acquired using reduction gear TwinSpin®. This reduction gear has strengthened main bearing, lowered weight, and reduced the value of lost motion to ≤ 2. Our traction wheel MoveSpin applies to any type of drag and transport application. Thanks to the diversity of the product portfolio, it is possible to design different combinations of the AGV/AMR units, such as a traction unit with a steering unit and differential unit with or without reduction gear. MoveSpin is delivered with special tires wheels with polyurethane surface, which can be selected from various manufacturers such as VULKOLLAN®, VULKOSOFT®, etc.

Why choose our product?

- Our product offers a solution for your applications.
- The solution can be modified according to your innovative requirements.
- The whole product is manufactured in EU.

Our team of engineers has multiple years of experience in industrial applications and the designing of high-precision reduction gears and actuators. Our solution offers unique features in a compact design (small size, high load capacity, excellent maneuverability, and high-quality materials).

Unique products and services:
SPINEA® offers quick and complete state-of-the-art solutions based on the needs of your application. We also provide our technical support services before, during, and after the purchase, considering every requirement of our customers.

Key benefits of the product

- Customization – High degree of flexibility and customization of design.
- Compatibilty – Wide range of encoders for drives to be compatible with most used servodrives in the market.
- Safety features – Direct implementation or design preparation for safety encoders, end switches implementation for steering part.
- Service – Long service life (load dependent).
- Reduction of installation space – The drive unit is almost completely enclosed by the wheel. The required installation space in the vehicle is therefore reduced to a minimum.
- High load capacity – The preloaded, double-designed bearings permit very high radial forces.
- Direct mounting – The mounting interface allows direct mounting of the drive unit to the vehicle.

Applications

- Automotive
- Food & Beverage
- Healthcare & Pharma
- Packaging
- Paper & Printing
- Production
- Warehouse & Distribution
- Agriculture
- Military
- Non-System AGV
- Sea Cargo Container
- Very Narrow Aisle (VNA)

MoveSpin product line

Traction and Steering units

Differential units

Actuator + Wheel

Servo Motor + Wheel

Traction and Steering units

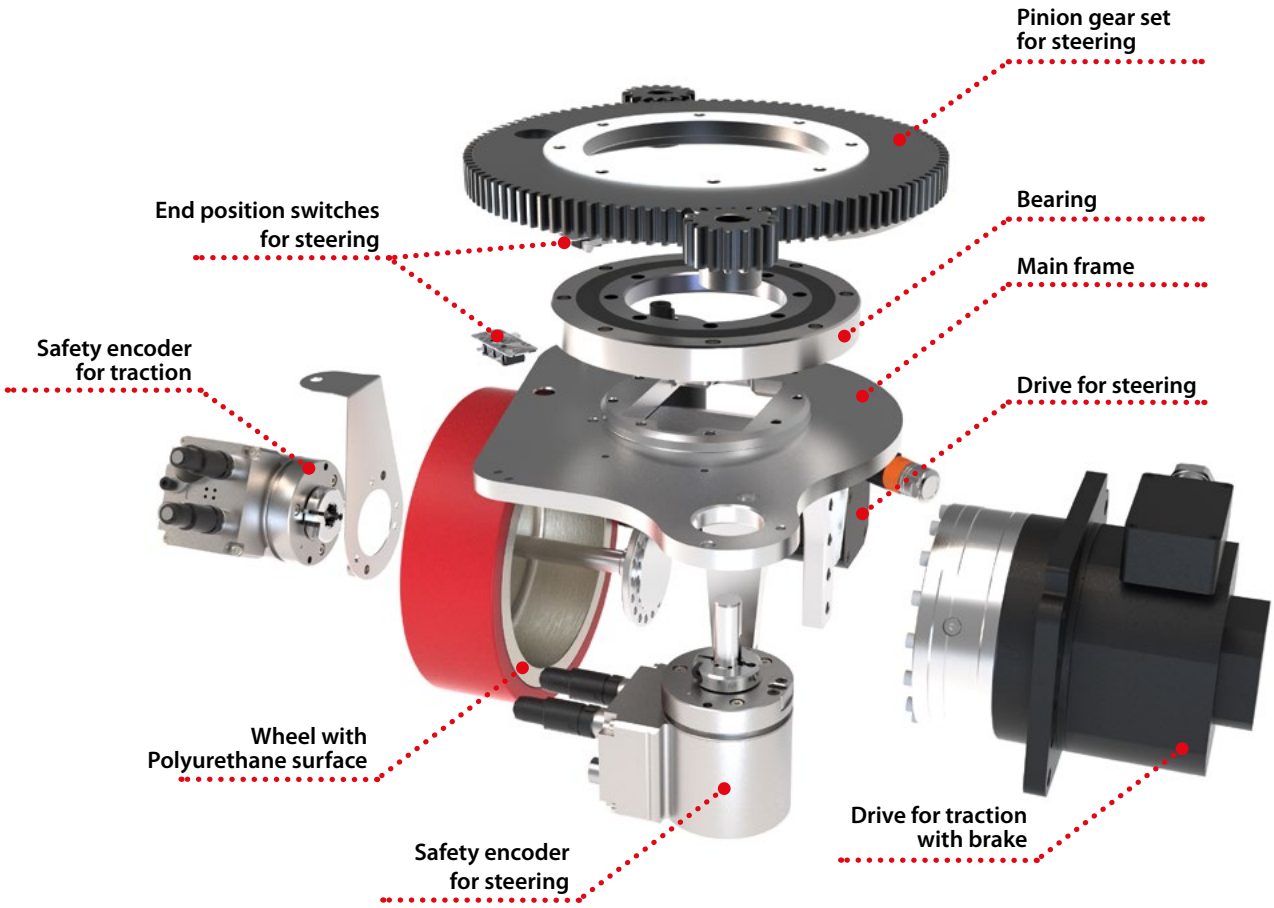
This MoveSpin category represents a complex unit that includes a separate drive for traction and a separate drive for wheel rotation. In the case of a traction drive, the composition is the same as for a differential units. For steering, it is usually a combination of a servomotor, a reducer (planetary gearbox, angular planetary gearbox, or worm gearbox), and a gear wheel connected via a bearing to the main structure, which can be rotated. Additional elements, such as end sensors for rotation, safety sensors or others, are mostly customized to the customer's requirements.

Differential units (Traction units)

Basic MoveSpin category consists of servomotor, reduction gear, encoder, brake and wheel with Polyurethane surface. Servomotor without reduction gear is used in specific application where demand for wheel payload is not high.

Traction and steering drive unit description

MoveSpin is a drive wheel for AGV/AMR that integrates a transmission mechanism, a traction and turning drive unit, end position sensors, and safety sensors into a compact unit. The result of this combination is a product with a compact design, high performance, safety features, high reliability, and an excellent price/performance ratio. In addition, its control, accuracy, overload capacity, efficiency, and other technical indicators are highly beneficial in logistics and storage processes, flow assembly, port transportation, and other areas.



Ordering code

MS	160 - 500	S	2	B	1	1 - 1

Type	Wheel diameter	Maximum payload	Rotation	DC BUS voltage	Brake	End switch	Safety sensors	Modification
	140	500	S: Steering D: No (differential drive)	1: 24 VDC [2] 2: 48 VDC [2]	0: No B: Yes	0: No 1: Mechanical 2: Inductive	0: No 1: Yes	Other customer requirements / specifications
	160	500						
	190	500						
	200	500						

2) 48V standard, 24V on request

We currently offer a version with a load capacity of 500 kg per wheel. Other versions are on request.

Wheel for AGV/AMR

The wheel is one of the basic load-bearing elements of the whole unit and therefore it is necessary to pay attention to it. The important parameters to know when choosing the right wheel are as follows:

1. **Required wheel surface material**
   Most used wheel surface is Polyurethane:
   Polyurethane hardness:
   Standard 93 – 95 ShA (Shore A).
   Optional 80 – 85 ShA (Shore A), softer compound for better sound and vibration dampening.
   Popular trade names of polyurethane surface: VULKOLLAN®, VULKOSOFT®, PEVOPUR®, PEVODYN® and so on.

2. **Wheel diameter**
   Affects speed of whole trolley.
   Affects total height of whole unit.

3. **Wheel payload**
   Required for surface hardness and disk strength double check.

Traction and steering units

MS 140–500

The MS 140-500 is a complex traction and steering unit with a static platform for rotation and a small dimensions in terms of rotation. It is currently the lowest solution on the market, allowing for a very compact integration into the AGV/AMR platform. The solution implements end position sensors with the ability to sense end positions of the steering part and a safety structure of the rotating part based on two sensors: SSI and CAN Open.

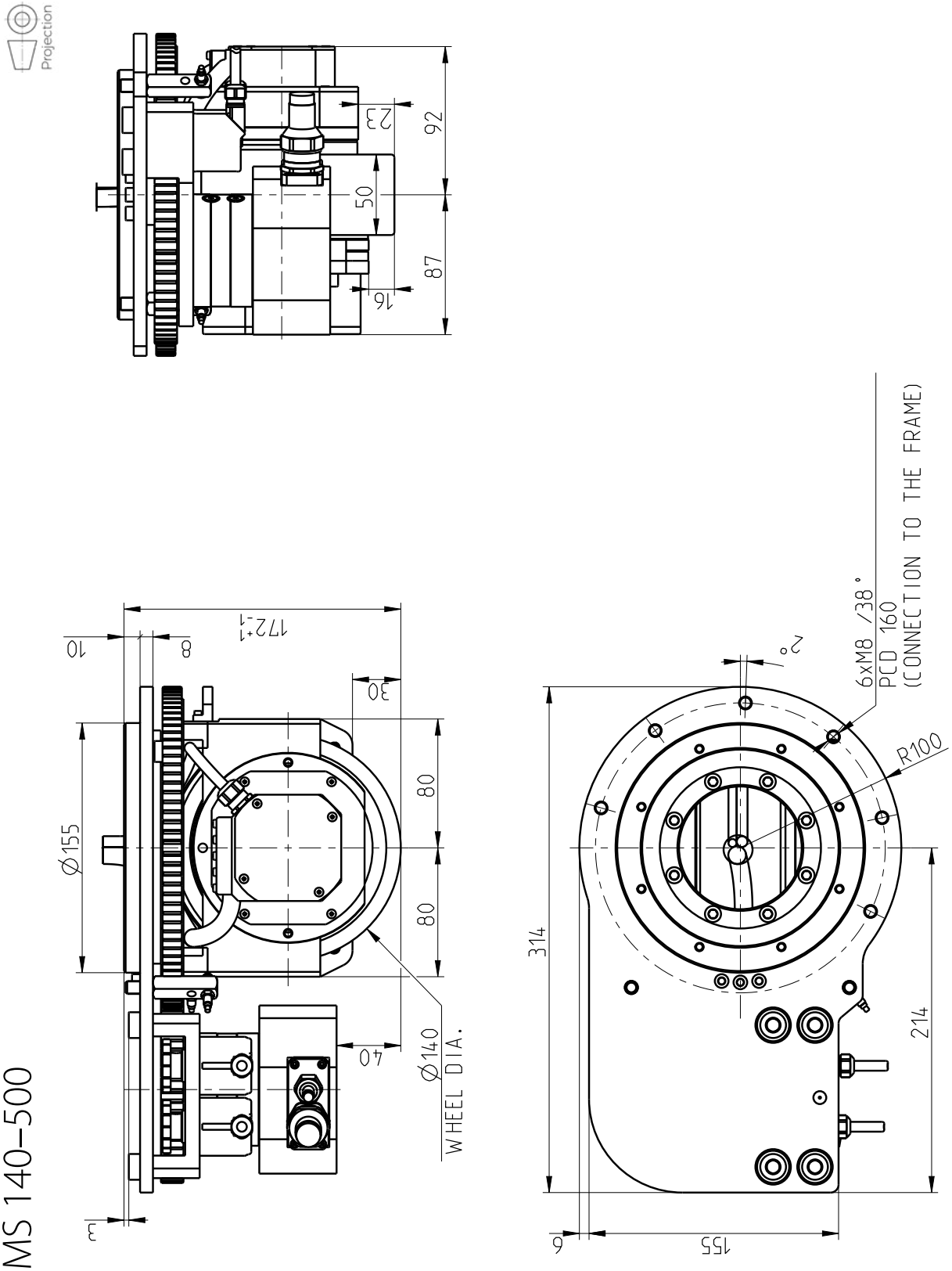
Traction wheel		
Type		Polyurethane
Diameter	[mm]	140
Width	[mm]	50
Hardness	[ShA]	93
Recommended max wheel load	[kg]	500
Traction drive		
Gear ratio		21
Motor type		PMSM
Motor DC Bus voltage [1]	[V]	48
Nominal motor current	[A]	17.2
Peak motor current	[A]	66
Nominal torque at wheel	[Nm]	36
Peak torque at wheel	[Nm]	97
Nominal AGV speed	[m/s]	0.7
Peak AGV speed	[m/s]	1.7
Encoder [2]		Incremental
Brake [3]		Yes

1) 48V standard, 24V on request.
2) Standard, another type of encoder on request (available communication protocols Hiperface, Hiperface DSL, EnDat, Biss-C, Resolver, Incremental).
3) Standard parking brake, on request also with dynamic emergency braking (aprox. 500 cycles).
4) Standard safety encoder TR electronic CDH582M, another type of encoder on request.

Steering drive		
Total gear ratio		99.75
Motor type		PMSM
Motor DC Bus voltage [2]	[V]	48
Nominal motor current	[A]	12.3
Peak motor current	[A]	37
Nominal torque for steering	[Nm]	51
Peak torque for steering	[Nm]	157
Nominal speed for steering	[rpm]	20
Peak speed for steering	[rpm]	49
Encoder [2]		Incremental
End switches		
Type		Inductive
Activation		± 115°
Mechanical stop		± 120°
Additional encoders		
Safety function		No
CANopen encoder for steering		Yes
SSI encoder for steering		Yes
Overall dimensions		
Height	[mm]	172
Mounting space	[mm]	200 x 314
Diameter of steering part	[mm]	200

Traction and steering units

MS 140–500



Traction and steering units

MS 160–500

MS 160–500 represents a complex traction and steering unit with a rotating platform. It is very compact solution available on the market, which allows perfect integration into AGV/AMR platforms. In addition, the solution implements end-position sensors with the possibility of sensing the end positions of the steering part and a safety encoders for traction and steering part increases safety level of whole unit to the new level.

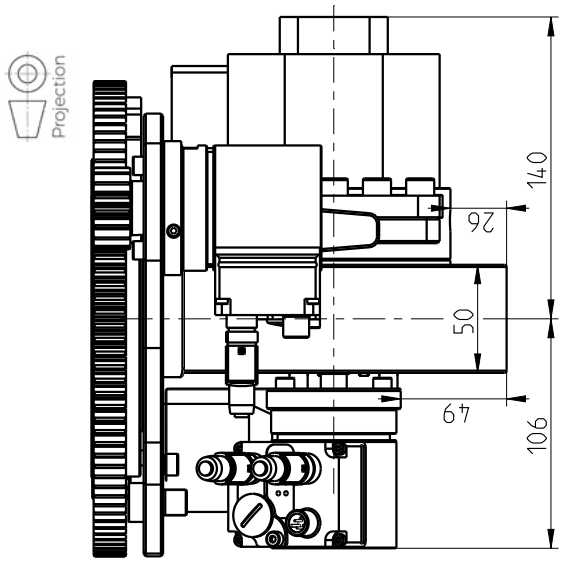
Traction wheel		
Type		Polyurethane
Diameter	[mm]	160
Width	[mm]	50
Hardness	[ShA]	80
Recommended max wheel load	[kg]	500
Traction drive		
Gear ratio		21
Motor type		PMSM
Motor DC Bus voltage [1]	[V]	48
Nominal motor current	[A]	17.2
Peak motor current	[A]	66
Nominal torque at wheel	[Nm]	36
Peak torque at wheel	[Nm]	97
Nominal AGV speed	[m/s]	0.8
Peak AGV speed	[m/s]	1.99
Encoder [2]		Hiperface DSL
Brake [3]		Yes

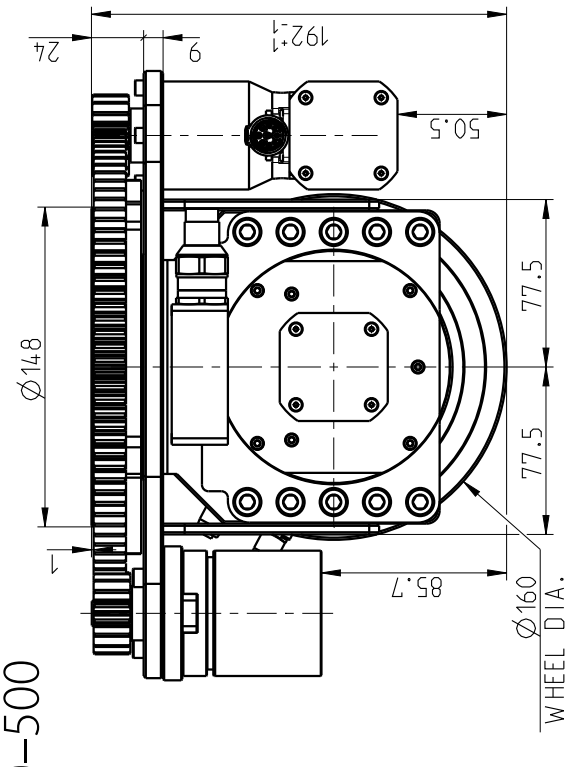
1) 48V standard, 24V on request.
2) Standard, another type of encoder on request (available communication protocols Hiperface, Hiperface DSL, EnDat, Biss-C, Resolver, Incremental).
3) Standard parking brake, on request also with dynamic emergency braking (aprox. 500 cycles).
4) Standard safety encoder TR electronic CDH582M, another type of encoder on request.

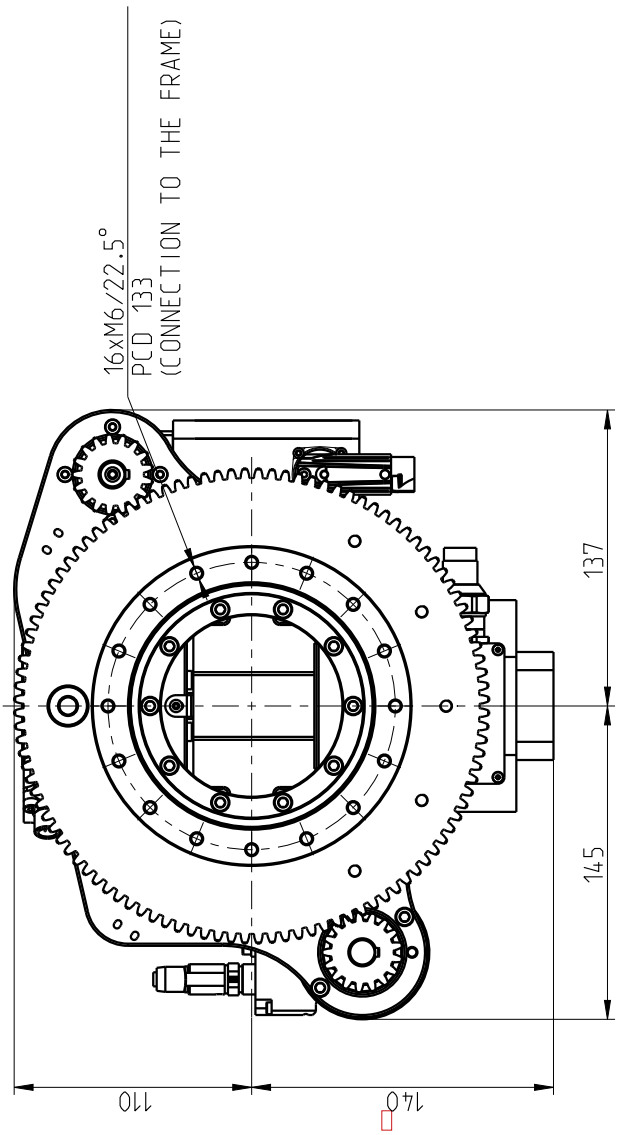
Steering drive		
Total gear ratio		127
Motor type		PMSM
Motor DC Bus voltage [1]	[V]	48
Nominal motor current	[A]	3.9
Peak motor current	[A]	17
Nominal torque for steering	[Nm]	23
Peak torque for steering	[Nm]	97
Nominal speed for steering	[rpm]	24
Peak speed for steering	[rpm]	57
Encoder [2]		Hiperface DSL
End switches		
Type		Mechanical
Activation		± 95°
Mechanical stop		± 110°
Additional encoders		
Safety function [4]		Yes
CANopen encoder for steering		-
SSI encoder for steering		-
Overall dimensions		
Height	[mm]	192
Mounting space	[mm]	250 x 282
Diameter of steering part	[mm]	310

Traction and steering units

MS 160–500







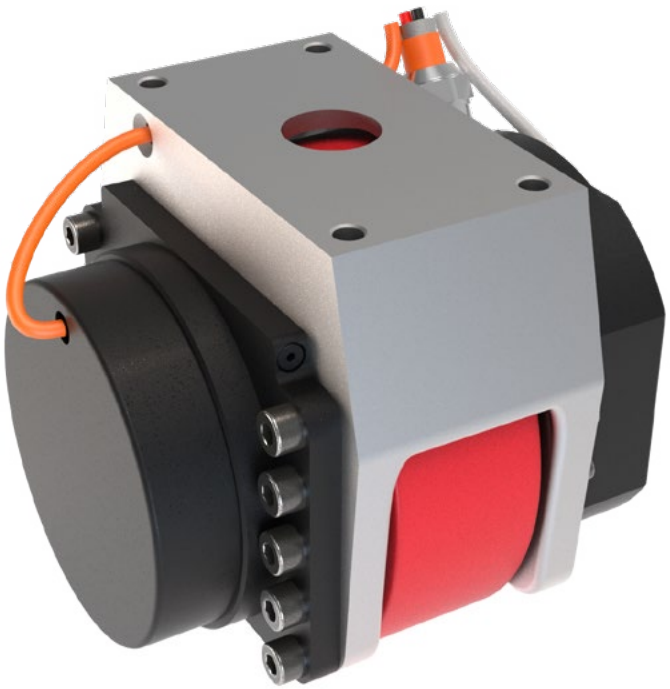
Differential drives

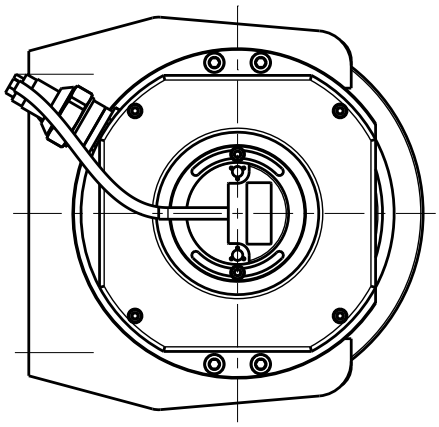
MS 160–500

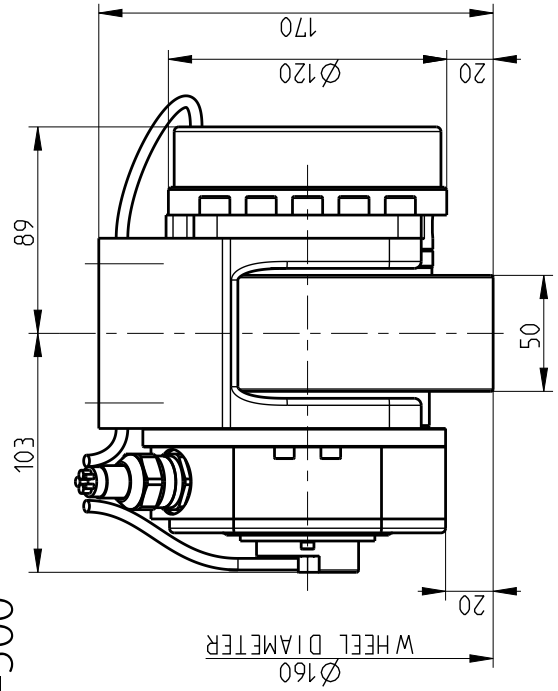
The MS 160-500 traction unit is characterized by minimal dimensions and a design aimed at reducing the turning radius of the unit to a minimum. In addition, the unit does not contain a rotary part, which gives the designers of AGV/AMR platforms certain freedom in the design of the rotary part, or it can be used as a differential traction unit.

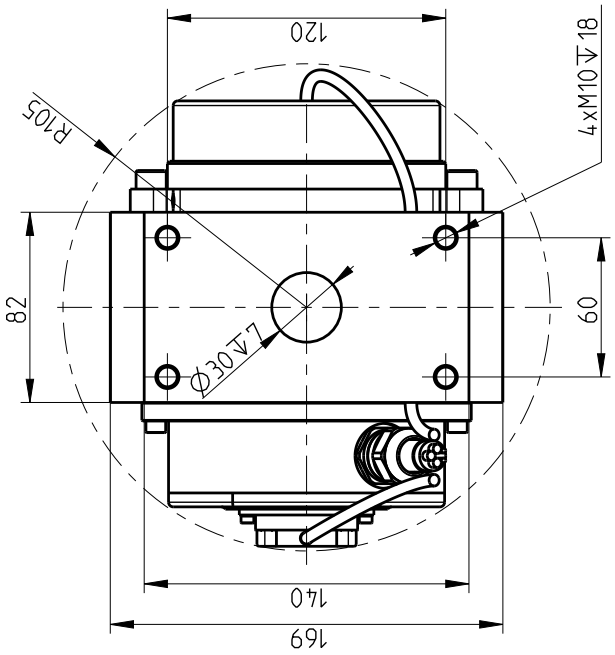
Traction wheel		
Type		Polyurethane
Diameter	[mm]	160
Width	[mm]	50
Hardness	[ShA]	93
Recommended max wheel load	[kg]	500
Traction drive		
Gear ratio		21
Motor type		PMSM
Motor DC Bus voltage [1)]	[V]	48
Nominal motor current	[A]	18
Peak motor current	[A]	88.4
Nominal torque at wheel	[Nm]	36
Peak torque at wheel	[Nm]	151
Nominal AGV speed	[m/s]	0.8
Peak AGV speed	[m/s]	1.9
Encoder [2)]		Incremental
Brake [3)]		Yes
Overall dimensions		
Height	[mm]	170
Mounting space	[mm]	-
Diameter of steering part	[mm]	210

1) 48V standard, 24V on request.
2) Standard, another type of encoder on request (available communication protocols Hiperface, Hiperface DSL, EnDat, Biss-C, Resolver, Incremental).
3) Standard parking brake, on request also with dynamic emergency braking (aprox. 500 cycles).
4) Standard safety encoder TR electronic CDH582M, another type of encoder on request.









Differential drives

MS 160–500

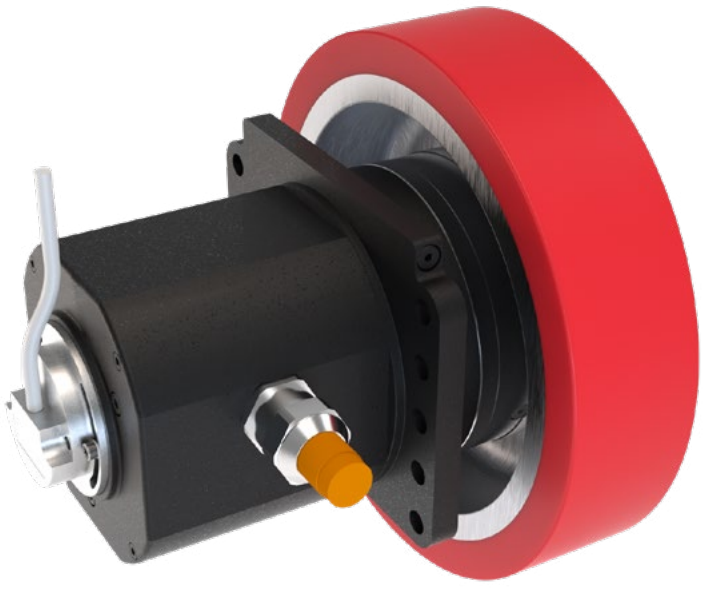
Differential drives

MS 200–500

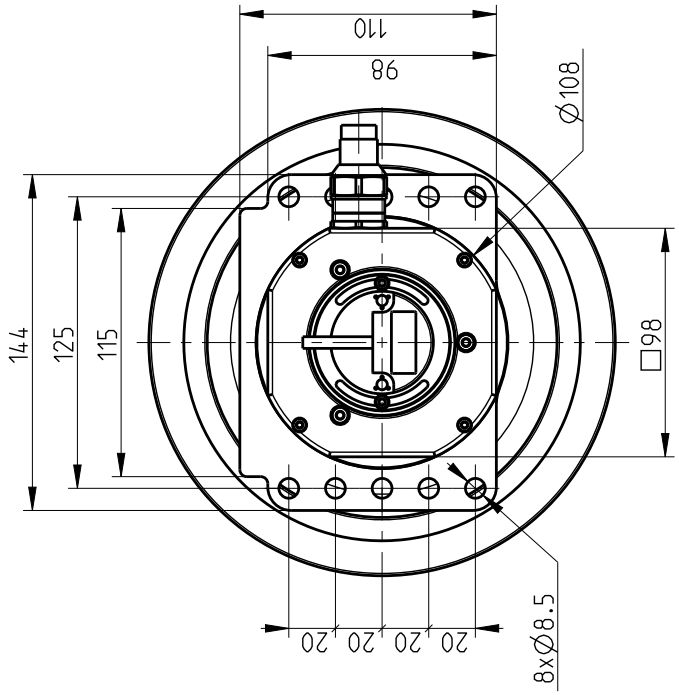
The MS 200-500 is a powerful representative of the differential traction unit with high load capacity thanks to the implemented reinforced bearing. This differential unit is the ideal choice for the design of platform trucks with electronic differential-based steering.

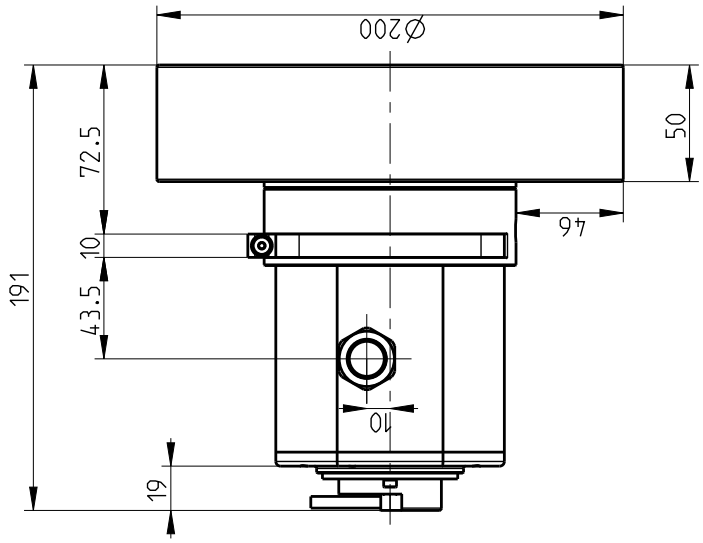
Traction wheel		
Type		Polyurethane
Diameter	[mm]	200
Width	[mm]	50
Hardness	[ShA]	93
Recommended max wheel load	[kg]	500
Traction drive		
Gear ratio		21
Motor type		PMSM
Motor DC Bus voltage [1)]	[V]	48
Nominal motor current	[A]	17.2
Peak motor current	[A]	66
Nominal torque at wheel	[Nm]	36
Peak torque at wheel	[Nm]	97
Nominal AGV speed	[m/s]	1
Peak AGV speed	[m/s]	2.49
Encoder [2)]		Incremental
Brake [3)]		Yes
Overall dimensions		
X	[mm]	200
Y	[mm]	191
Z	[mm]	200

1) 48V standard, 24V on request.
2) Standard, another type of encoder on request (available communication protocols Hiperface, Hiperface DSL, EnDat, Biss-C, Resolver, Incremental).
3) Standard parking brake, on request also with dynamic emergency braking (aprox. 500 cycles).
4) Standard safety encoder TR electronic CDH582M, another type of encoder on request.



Projection





Differential drives

MS 200–500

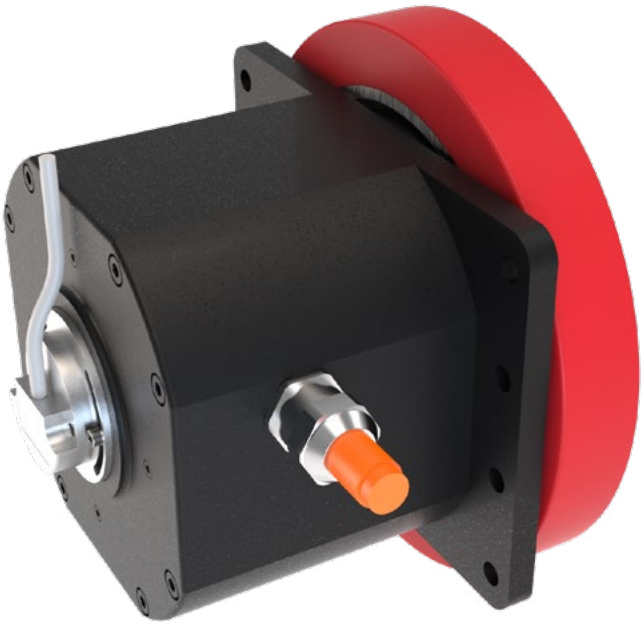
Differential drives

MS 200–060

The MS 200-060 is a powerful representative of the differential traction unit for lower-capacity AGV/AMR units. This compact unit is built with minimal maintenance needs in mind and achieves the high operating speeds of the AGV/AMR platform. This differential unit is the ideal choice for the design of platform robots with electronic differential-based swivel and small payloads AGV/AMR.

Traction wheel		
Type		Polyurethane
Diameter	[mm]	200
Width	[mm]	30
Hardness	[ShA]	93
Recommended max wheel load	[kg]	60
Traction drive		
Gear ratio		-
Motor type		PMSM
Motor DC Bus voltage [1)]	[V]	48
Nominal motor current	[A]	8
Peak motor current	[A]	31.4
Nominal torque at wheel	[Nm]	7
Peak torque at wheel	[Nm]	25
Nominal AGV speed	[m/s]	2.1
Peak AGV speed	[m/s]	4.19
Encoder [2)]		Incremental
Brake [3)]		Yes
Overall dimensions		
X	[mm]	200
Y	[mm]	165
Z	[mm]	200

1) 48V standard, 24V on request.
2) Standard, another type of encoder on request (available communication protocols Hiperface, Hiperface DSL, EnDat, Biss-C, Resolver, Incremental).
3) Standard parking brake, on request also with dynamic emergency braking (aprox. 500 cycles).
4) Standard safety encoder TR electronic CDH582M, another type of encoder on request.



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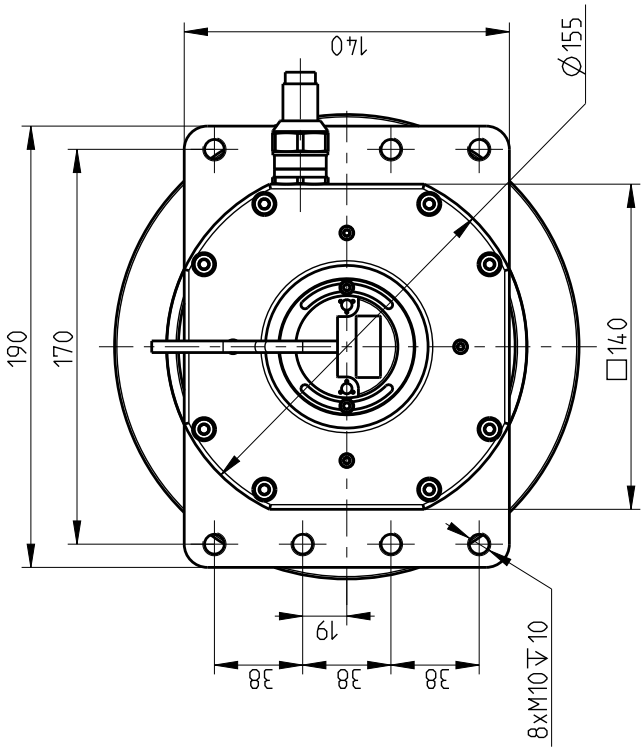

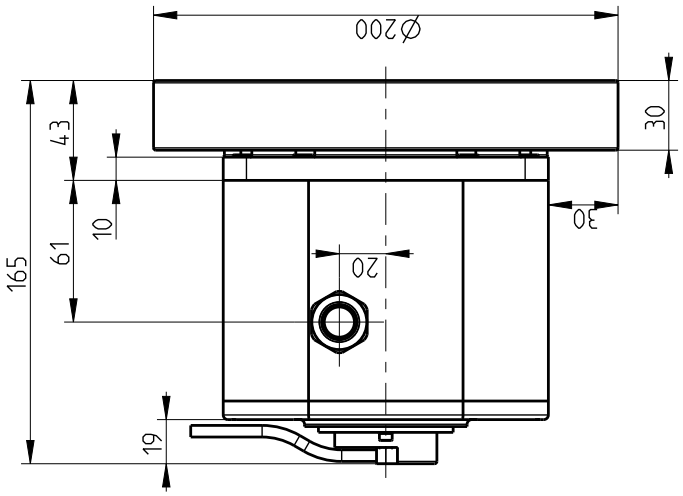

Differential drives

MS 200–060

SPINEA
BY TIMKEN

Do you have any questions or need further information?

We are happy to advise you on all topics relating to drive technology.
You can find personal contact for you country at:

SPINEA, s.r.o.
Ku Magašu 702/3
080 01 Haniska
SLOVAKIA, EU

Sales Department:
Phone: +421 51 770 01 56
Email: sales@spinea.com
info@spinea.com
Web: www.spinea.com

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