



Scalable Drive System Solution



www.smartris.com

Shaping the future
together



Sumitomo Drive Technologies
LAFERTGROUP



**Combination of three smart components.
Creating a compact, integrated and intelligent solution
of: GEAR + SERVO MOTOR + DRIVE**

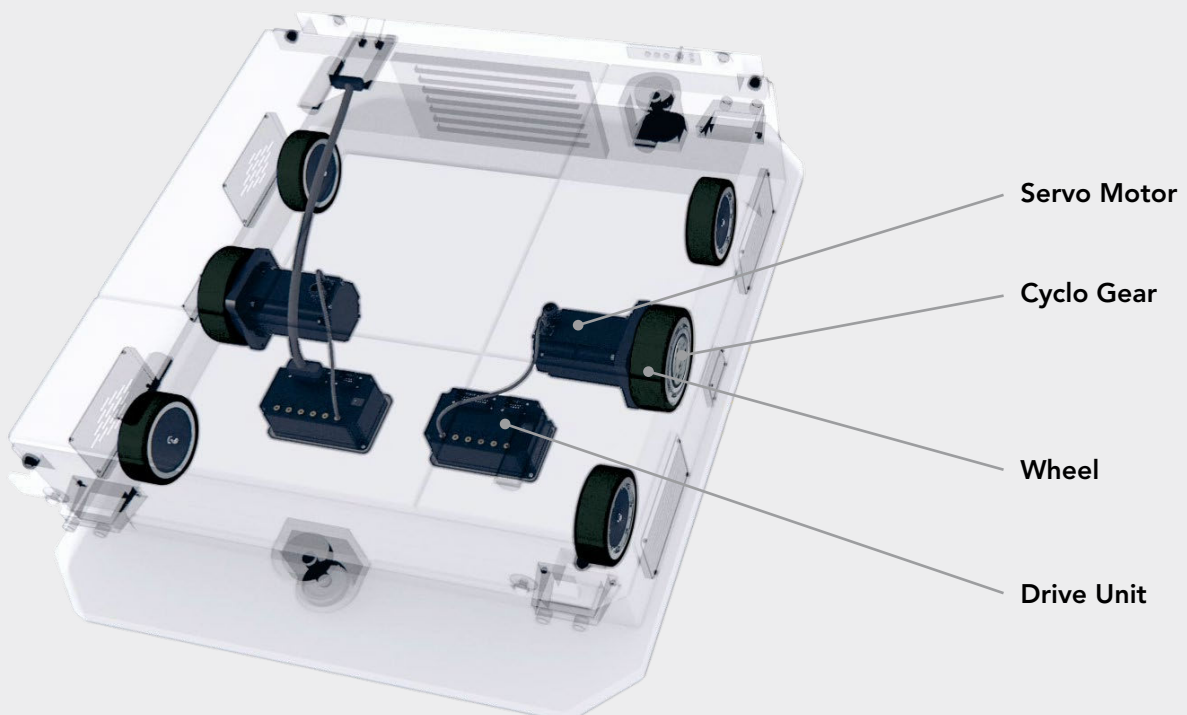
Smartris is the **Complete Package Solution** including Gear, Servo Motor and Drive for AGV systems, and combines the extensive technological competences of two world-class companies.

The integration of Lafert's customized solutions for Electric Motors and Drives with Sumitomo's expertise in Gears and Gearboxes has created an industry-leading product, offering opportunity to any AGV manufactures to make the difference through the relevant market.

In fact, both brands have strong reputations in the motor and gear market, including the AGV sector. With this **New Integrated Package**, we can offer a compact, reliable and intelligent drive system solution that provides AGV manufacturers and end users worldwide with an **extended range of customized configurations and alternative options** to satisfy any kind of AGV units.



AGV Unit (with 4 supporting wheels)



Packaged-Drive Solution for AGV



Benefits

- Complete Package Solution: Gear + Servo Motor + Drive + Wheel
- High integration of all components
- One single supplier with global presence
- **Compact solution**
- Safety features
- Easy installation and commissioning
- Maintenance free
- **Customizations** available on request

Target Applications

- Unit Load Carriers
- Tow Vehicles
- Assembly Line Trucks
- Mobile Robots

Target Product

- Total weight up to approx. 3000 kg
- Max speed 2.0 m/s
- Max acceleration 1.0 m/s²



Example of AGV Configuration

		ECO		PRO	
		S	M	M	L
Max Tot Weight (AGV mass + payload)	[kg]	800	1100	1800	2700
No. of Driving Wheels		2	2	2	2
No. of Supporting Wheels		4	4	4	4
Max AGV Speed	[m/s]	2	2	2	2
Max AGV Acceleration	[m/s ²]	1	1	1	1
Wheel Diameter	[mm]	180	200	200	280
Gear Ratio		21	21	22	22
Nominal Wheel Speed	[rpm]	212	191	191	136
Average Wheel Torque	[Nm]	15.8	24.0	39.3	82.5
Average Wheel Power	[W]	392	537	878	1347
Load Bearing per Supporting Wheel	[kg]	125	125	125	175

Options

	FEATURE	STANDARD CONFIGURATION	OPTIONS
MOTOR	Transducer	SKS36S	SKS36 Resolver
	Brake	Dynamic brake	Holding brake
	Signal cable	-	Resolver (1m) SKS36 (1m) SKS36S (1m)
	Power cable	IP54 cable (1m)	IP64 cable (1m)
	Power connector	-	IP64 connector
	Safety function	With STO	Without STO
	DRIVE	Control stage	For SKS36S

Gearmotor Performances

		ECO		PRO	
		S	M	M	L
Voltage	[Vdc]	48	48	48	48
Max Radial Load per Driving Wheel	[N]	1500	3000	6500	10000
Gear Ratio		21 - 25 - 29	21 - 25 - 29	22 - 26	22 - 26 - 30
Max Motor Speed	[rpm]	4500	4500	4500	3000
Max Wheel Speed	[rpm]	214 - 180 - 155	214 - 180 - 155	205 - 173	136 - 115 - 100
Nominal Wheel Torque	[Nm]	16 - 18.9 - 18.9	39.3 - 40.4 - 40.5	39.3 - 40.4	84.7 - 87.5 - 80.3
Max Acceleration Wheel Torque for 2 sec	[Nm]	61.9 - 73.7 - 84.8	145 - 179 - 207	145 - 179	312 - 365 - 246
Ambient Temperature	[°C]	-10 - 40		-10 - 40	
Protection Class		IP54		IP54	
Thermal Motor Class		F		F	
Rotation Type	[kg]	Gear Output Shaft Rotation		Ring Gear Housing Rotation	

Packaged-Drive Solution

Smart-wheel-drive solution for Automated Guided Vehicle (AGV) consisting of **gear, servo motor, drive & wheel**. Developed for various types of AGV solutions to deliver highest performance, maximum precision at every speed and reliability.

Performance

The integration of a Servo Motor and Drive provides high performance with energy efficiency.

Speed up to 2m/s and 1,0m/s² acceleration.

Rated output torques up to 90Nm, max acceleration torque > 300Nm.

The **Cyclo principle** provides highest shock load capacity.

Dimensions

The packaged solution provides space-saving integration into the AGV. Our solution is one of the smallest on the market. This means the AGV can be much lower to the ground as well as creating more effective space within it.

Payload

Depending on product specification, the AGV can carry a wide range of payloads. **Radial load from 1.500N to 10.000N** per driven wheel.

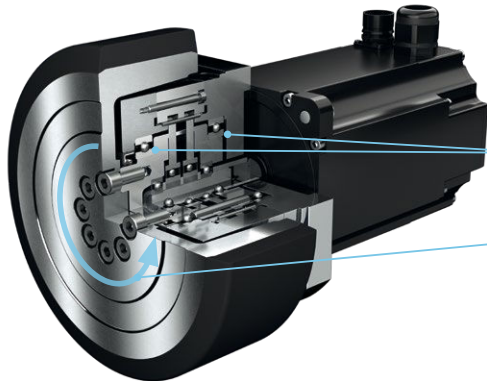
Safety

Safely operates using Cyclo technology with **high overload capacity**. Leak-proof design for environmental safety and protection. Certified STO (Safe Torque Off) function included.

Servo Motor & Gear

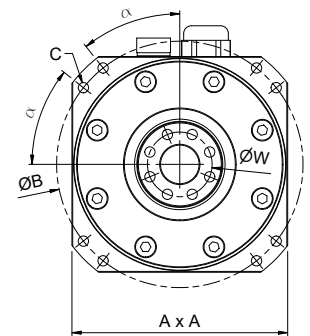
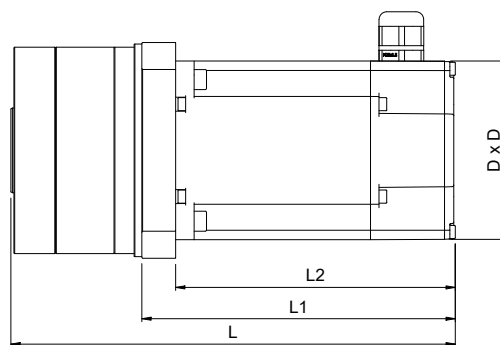
ECO LINE

- Gear Output Shaft Rotation Design
- Cost efficient
- Ideal for light payloads and high-speed AGV



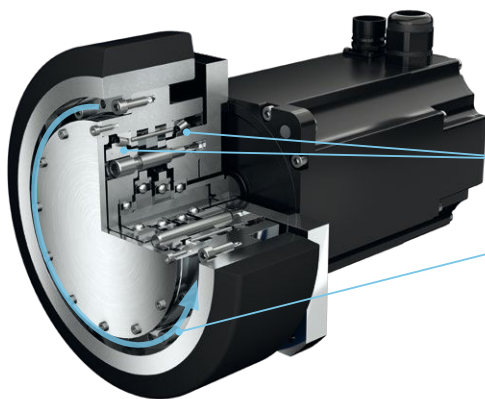
Ball Bearings

Output Flange Rotating



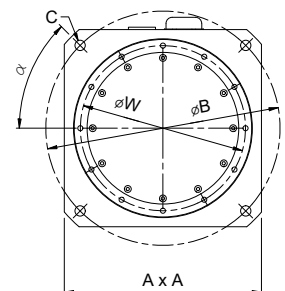
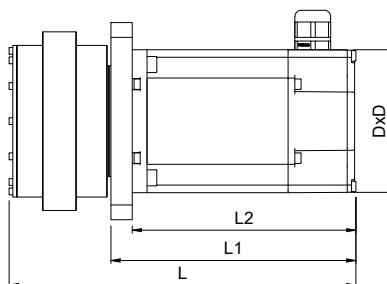
PRO LINE

- Ring Gear Housing Rotation Design
- High radial loads
- Reduced overall dimension



Tapered Roller Bearings

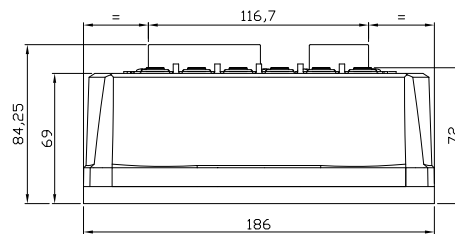
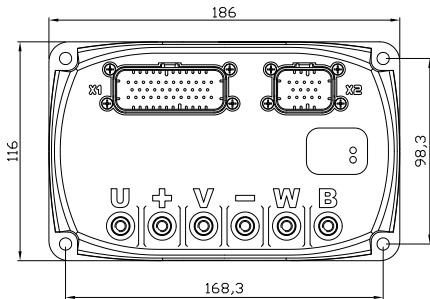
Ring Gear Housing Rotating



Line	Size	TOTAL LENGTH		MOTOR DIMENSIONS			ADAPTING FLANGE			WHEEL FIXING		WEIGHT [Kg]
		Without wheel L [mm]	With wheel L1 [mm]	Square D x D [mm]	Length L2 [mm]	Square A x A [mm]	Circular bolt diameter Ø - B [mm]	Fixing hole C	α	Screw	Bolt Cricle Diameter Ø - W [mm]	
ECO	S	249	173	80 x 80	157	110 x 110	130	4 x M8	45°	10 x M6	35	5.6
ECO	M	289	204	116 x 116	182	140 x 140	160	8 x M8	38,5°	8 x M8	42	11.3
PRO		282.5	199	116 x 116	182	160 x 160	190	4 x M10	45°	12 x M5	134	14.5
PRO	L	309	213	142 x 142	196	196 x 196	230	4 x M12	45°	12 x M6	170	24.5

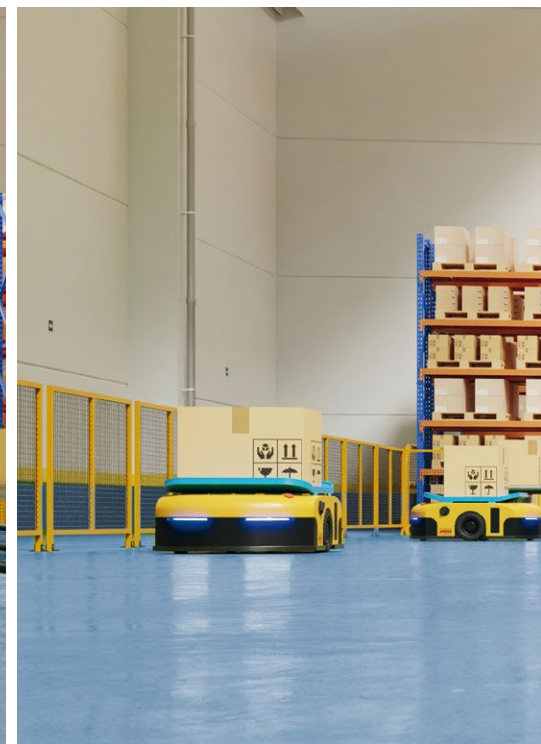
Drive

- Easy installation without additional PID tuning
- Easy to install with state machine profile suitable for all AGVs
- Specifically designed for prompt reaction in case of AGV emergency quick stop



Drive	ECO		PRO	
	SMALL	MEDIUM	MEDIUM	LARGE
Voltage	[Arms]	48V (60V Max)		48V (60V Max)
Rated Current	[Arms]	11.5	25.8	35.8
Peak Current for 2 sec	[Arms]	41.7	96.3	136.2
Peak Current for 10 sec	[Arms]	24.9	57.5	81.3
Transducer	Sin/Cos Encoder - Resolver (double encoder configuration available on request)			
Fieldbus	CanOpen (DS402)			
Control Mode	Torque, Speed and Position			
Brake Management	Manual or Automatic			
Auxiliary power supply for control stage	Available (24 or 48 Vdc)			
Digital Output	4 Output Optical Isolated @ 24V - 100mA			
Digital Input	4 Input Optical Isolated @ 24V - 7mA (NPN or PNP type)			
Analog Input	1 Input $\pm 10V$ or Single ended 0-10V (10 K Ω)			
Analog Output	1 Output 0-10V R _{LOAD} $\geq 1 K\Omega$			
Safety Feature	STO (24V typical - 29 mA) certified according to IEC 61800-5-2			
Options	Heatsink - Brake Chopper Management			
Protection	IP54			
Certification	CE			
Weight	[kg]	1.6		

Up-to-date data, along with dimensional drawings and 3D models, available at www.smartris.com



Smartris Codification

eg:

P	L	D	S	K	S	B	C	A	0	0	2	1	0	0	0	1	M	1	1	0
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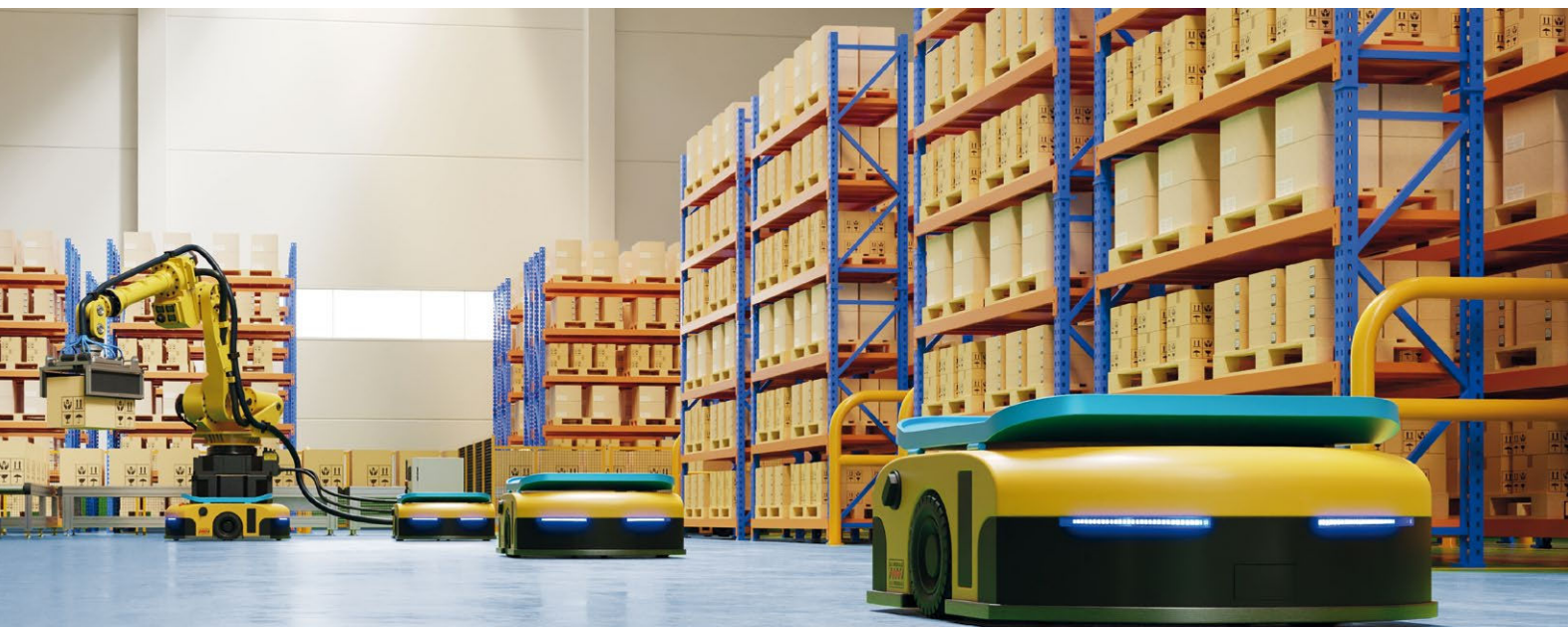
PACKAGE SECTION		MOTOR SECTION				GEAR SECTION			WHEEL SECTION	CABLE SECTION	DRIVE SECTION		
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PACKAGE SECTION		MOTOR SECTION										
P	L	D	S	K	S	B	C	A	0	0		

TYPE	SIZE	SPEED	BRAKE	FEEDBACK	VOLTAGE	CONNECTION	OPTIONS	REVISION
P PRO	S small	1 1000 rpm	S with dynamic brake	05 Resolver	B 48 Vdc	4 2 fixed connectors	A0 2 straight connectors	0 Rev 0
E ECO	M medium	2 2000 rpm		P with holding brake			KS SKS36	
	L large	3 3000 rpm	T without brake		KM SKM36			
		4 4000 rpm			KN SKS36S (SIL2)			
		A 1500 rpm	KO SKM36S (SIL2)					
		B 2500 rpm						
		C 3500 rpm						
		D 4500 rpm						

GEAR SECTION			WHEEL SECTION		CABLE SECTION	DRIVE SECTION			
2	1	0	0	0	1	M	1	1	0

RATIO	OPTIONS	DIAMETER	OPTIONS	DRIVE-MOTOR	SIZE	VERSION	SAFETY	OPTIONS
21 ECO type	0 no option	0 no wheel	0 no option	0 no cable	X custom	1 Gen 1	0 no safety	0 analog mode
25 ECO type				1 1m signal cable	S small		1 STO	1 Can Open fieldbus
29 ECO type					M medium			
22 PRO type					L large			
26 PRO type								
30 PRO type								



Will engineering innovate the world?

We say yes.

Our shared project and ideals commit to industrial progress and technological development - shaping the future together.

Leaders create outcomes that benefit everyone's future.

Sumitomo Heavy Industries (SHI) is a leading global manufacturer and distributor of power transmission and control ("PTC") equipment, known under the **Sumitomo Drive Technologies** brand. Our current strategy is to further strengthen and expand our business by integrating new technologies in the areas of electric motors and variable frequency drives. Our strategy also includes global growth in target segments such as robotics and positioning, material handling and intralogistics and food & beverages.

As part of this strategy, we entered into a new partnership which not only expanded the SHI family, but also grew our product portfolio and our global reach. **Lafert** is a world leader in the design and manufacture of Super Premium Efficiency Electric Motors for industrial use. With our focus on innovation and customization, we aim to improve performance and reduce environmental impact.

This utilization of Lafert's motor and drive technology allows Sumitomo Drive Technologies to extend its product portfolio in the motor control industry. This has become increasingly important as demand for IoT, automation, labour productivity and energy-saving solutions also increases. Moreover, this partnership will be forged in the technology hub of Europe - while responding to the advanced market needs of our customers in Europe and around the world.

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