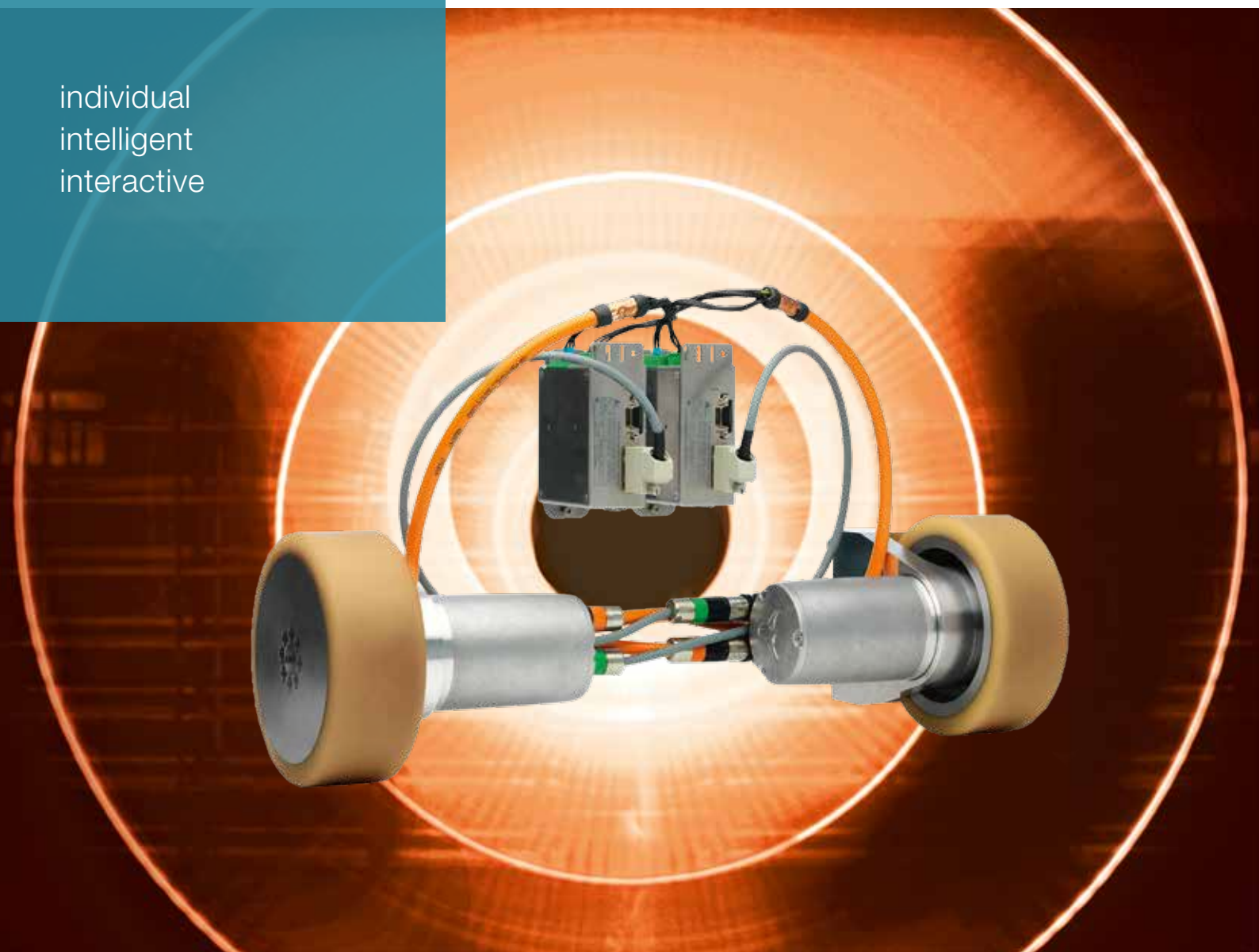
WITTENSTEIN | motion control

iTAS servo drive system
for automated guided vehicles

individual
intelligent
interactive



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Contents

iTAS
Servo drive system

iTAS
for automated guided vehicles: Servo drive technology – redefined.

The first completely scalable, modular drive system for AGV.

What is special about iTAS is its simplicity.
The latest generation of automated guided vehicles (AGV) needs drive solutions that reduce complexity, while ensuring maximum power density and safety.

The iTAS modular system gets right to the heart of this ambition: with its diversity, efficiency and individual scalability, our fully integrated, modular servo drive system offers an innovative modular solution that is specially tuned to the requirements of AGV and logistics systems.

iTAS: Simply more intelligent, individual and interactive.
The WITTENSTEIN servo drive system for AGV is more than a product – iTAS is the smart system solution from a single source. The combination of a freely configurable actuator system, an intelligent servo drive series and integrable, sector-specific components permits maximum flexibility when realizing new vehicle concepts – safe and space-saving in the smallest installation space.

Easy-to-integrate electronics
The iTAS drive system is rounded off by the simco® drive servo amplifier series, which is highly flexible and simple to integrate.

With branch-specific functions such as brake actuation, energy recovery and acceleration sensor, the drive regulator is ideally equipped for use in AGV.

Power density of actuators:
The core unit of the iTAS drive system is available in various sizes and equipment versions.

With sector-specific components such as a dynamic brake, an additional speed sensor for speed monitoring, and a wheel with mounting hardware, greater efficiency is achieved during development, implementation and operation.

Electronics

Actuators

i … for interactive:

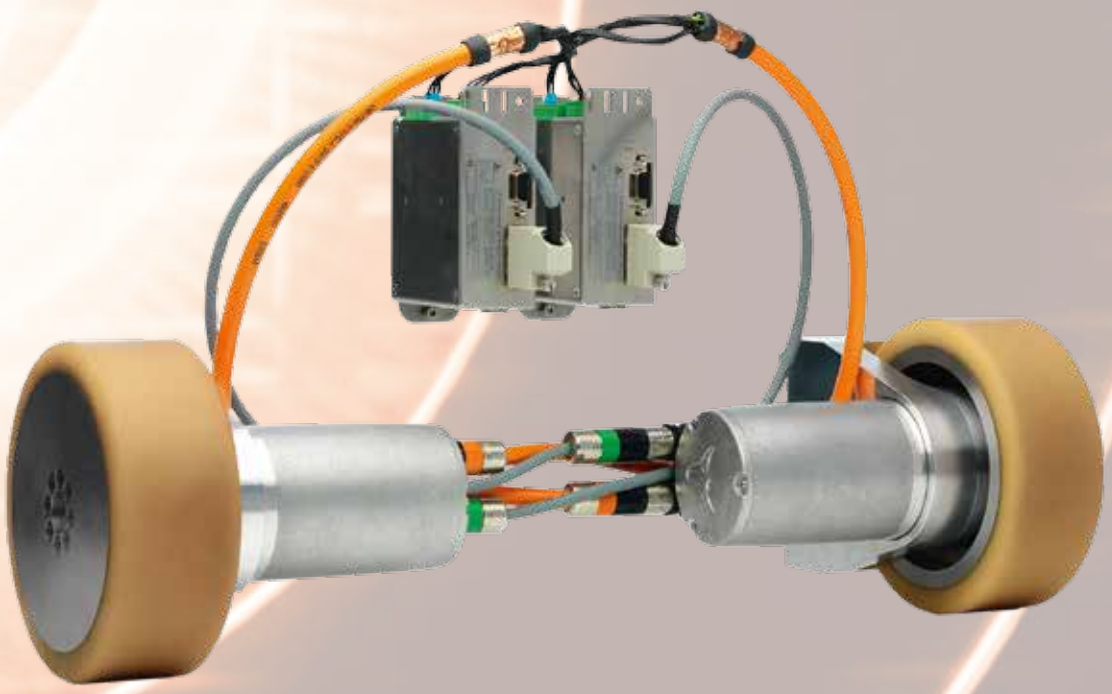
Design and individually scale AGV, get them up and running fast and use them reliably – with everything under control, at all times! With the interactive MotionGUI interface, “plug & play” is possible, even for complex vehicle concepts.

i … for intelligent:

Develop vehicle concepts in a simple and reliable way for every application with compact dimensions - due to a complete system, in which all components interact efficiently and process data can be continually monitored by an intelligent web server.

i … for individual:

Fully scalable modular systems for individual requirements or specific industry sectors, which despite their individuality can be integrated in the vehicle with the greatest of ease.



The **iTAS** principle: keep it simple, keep it safe.

Vehicle concepts simplified, performance completely re-thought.

Acutators + electronics = efficiency².
The previously available approaches for implementing AGV are mostly based on the market are mostly based on individual components, which have to be elaborately adapted to one another by the manufacturer himself. The intelligent combination of actuators and electronics in a single system, in contrast, enables a faster and easier integration of the drive system into the vehicle .

How is this possible?
Through the interaction of servo technology and sector-specific components (e.g. dynamic brake, and additional speed encoder for reliable speed monitoring in conjunction with a safety control system) extensive functional integration can be achieved together with enhanced high energy density in the drive. This integrated system approach is fundamentally new and refreshingly simple: Precisely matched system modules save space and increase efficiency during the development, implementation and operation of AGV. The result is a significantly higher overall utilization rate. iTAS is systems thinking in pure form.

Before:
Due to the confined conditions, installation and maintenance are complex. The installation space is not optimally utilized.

After:
The iTAS modular system simplifies the entire vehicle concept.

Source: SMZO hospital, Vienna

What makes the iTAS modular system so superior?
The iTAS servo drive system is a fully scalable and modular drive concept, that is more flexible than any other system solution. Thanks to its scalability, iTAS offers a multitude of application options – the range extends from size 004 to 050 with a number of ratio versions and for use in mini AGV for small loads through to larger vehicles.

iTAS provides systematic freedom.
The iTAS modular system combines a highly intelligent system structure with individual conceptual possibilities and interactive design freedom:

- iTAS is restricted to standard components in various vehicle sizes and versions – this simplifies vehicle design significantly.
- iTAS also offers great scope for optimum, highly customized design of the drive system.
- Moreover, iTAS operates with the highly efficient, particularly compact servo drive with various power ratings, which can be individually adapted to the relevant vehicles.
- iTAS can be designed on an application-specific basis using various equipment packages:
    - e.g. the **package “compact”** with integral dynamic brake, which is available as a standard version for all equipment packages.
    - e.g. the **package “advanced”,** which enables connection of an additional SICK Encoder for speed control or a mounted wheel, with mounting hardware, for optimized utilization of the output bearing and increased loads.
    - e.g. with the **package “performance”,** enabling compatibility of all equipment versions. The full version includes a dynamic brake, the additional SICK encoder and the wheel (VULKOLLAN® 93° Shore A) as an optimized connection to the vehicle.

Additional branch specific features,
e.g. additional speed encoder

A B D

Integrated web server for condition monitoring

A D

Perfectly matched wheel made from VULKOLLAN®

B C

Intelligent communication via the MotionGUI software

A D

Flexible and space-saving installation of the servo drive in the vehicle

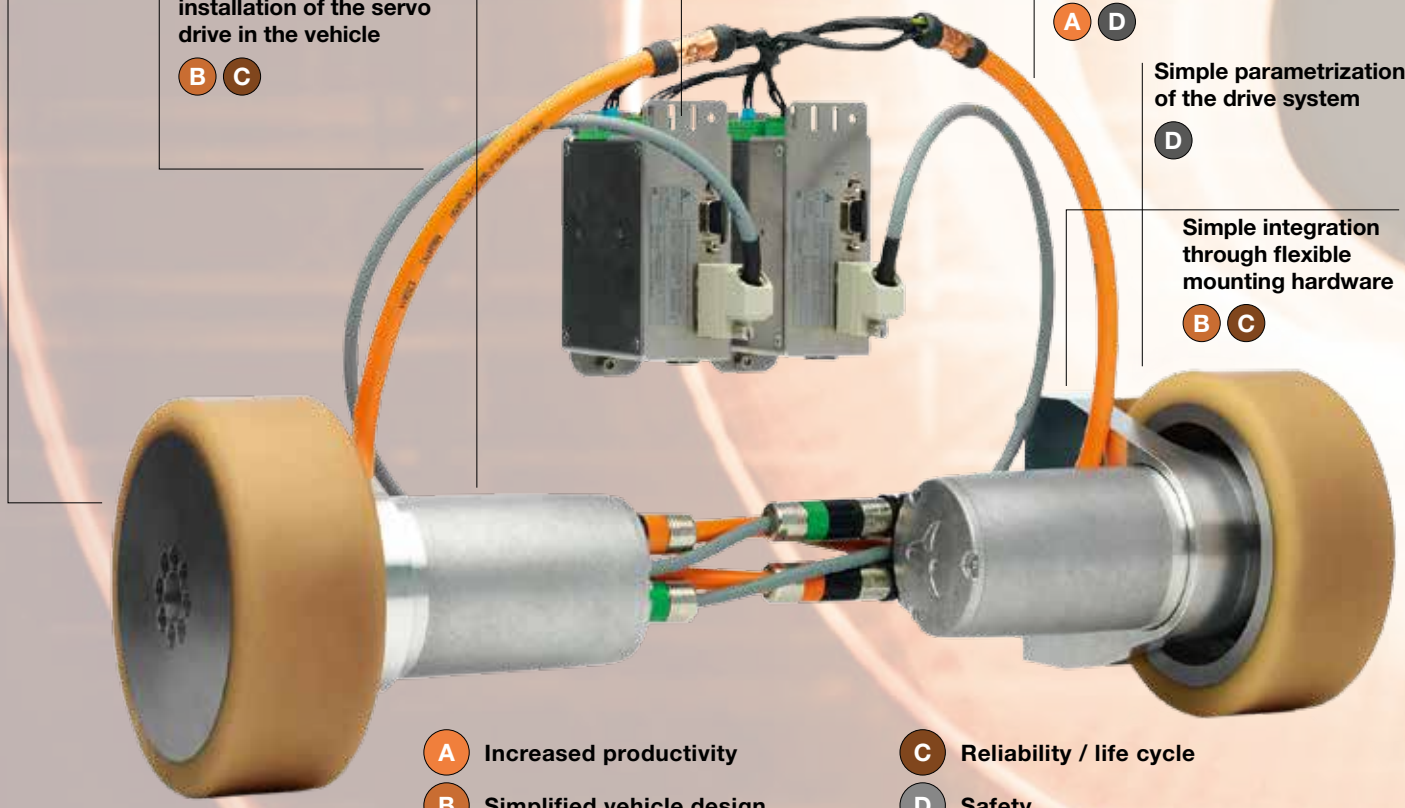
B C

Simple parametrization of the drive system

D

Simple integration through flexible mounting hardware

B C



A Increased productivity

B Simplified vehicle design

C Reliability / life cycle

D Safety

Your requirement	Our solution
Problem-free productivity	The consistent safety concept, achieved by the use of an additional speed encoder and the STO (Safe Torque Off) function according to SIL3, enables the **continuous checking of process data and rapid error diagnosis,** which can be performed via the MotionGUI, the web server – resulting in high system availability.
Lower operating costs	Generally: The faster, quality-reliable **selection of only one supplier** for a complete system saves effort and reduces risk. In detail: **On the one hand, the simplicity how TAS can be integrated without external ratio e.g. belt or chain, saves time and therefore costs. On the other hand, the drives work with high efficiency, reducing energy consumption and, ultimately, extending driving cycles or shifts.** TAS also features **set wheel dimensions and a vehicle connection system,** which also achieves time savings during installation. Branch specific functions of the simco® drive, such as e.g. current limitation, soft start or buck-boost converter to actuate the brakes, enable **additional components** to be **dispensed with** in the vehicle.
Simplified vehicle design	The **perfect fit product design** of simco® drive and TAS dramatically simplifies integration even in small vehicles – despite its **compact design**, the entire system can be individually scaled to suit different performance profiles. Moreover, intelligent system components enable **thoroughly safe vehicle concepts in a system:** TAS can, for example, be optionally equipped with an additional encoder for speed control.
Safe operation at all times	Generally: The user always enjoys extra safety thanks to **excellent technical support** (Support hotline for all questions regarding the system). The innovative **Software MotionGUI** also provides **intuitive operation** with condition monitoring, an error memory, a service function, parameter programming, etc. With the additional Motion Task software, e.g. decentralized control of driving commands via simco® drive can be realized. The system allows simple parameter programming of the system by selecting the actuator version from a database stored in the drive – saving time and preventing errors. Furthermore, diagnosis can take place faster **in the event of an error,** and downtimes can be shortened thanks to the integrated real-time clock function with event logging. **The system can also be safely shut down in an emergency** thanks to the integrated STO (Safe Torque Off) safety function according to SIL3.

The **iTAS** potential: Power made to order.

The perfect combination of a highly integrated drive system with a smart servo drive, additional speed encoder and dynamic brake offers a simple and power-dense drive solution for automated guided vehicles.

Maximum energy efficiency

The high efficiency of up to 96% of the servo actuators, in conjunction with recovery-capable servo drive systems, ensures enhanced energy efficiency and consequently optimized configuration of energy supply systems.

Thanks to the power density of the drive system, a smaller actuator and servo drive can be used to achieve the same power. This provides the conditions for significant downsizing of the drive train, which in turn leads to space and cost savings for the vehicle manufacturer.

Ultimately, use of the iTAS modular system can effectively result in operating cost savings for the plant operator.

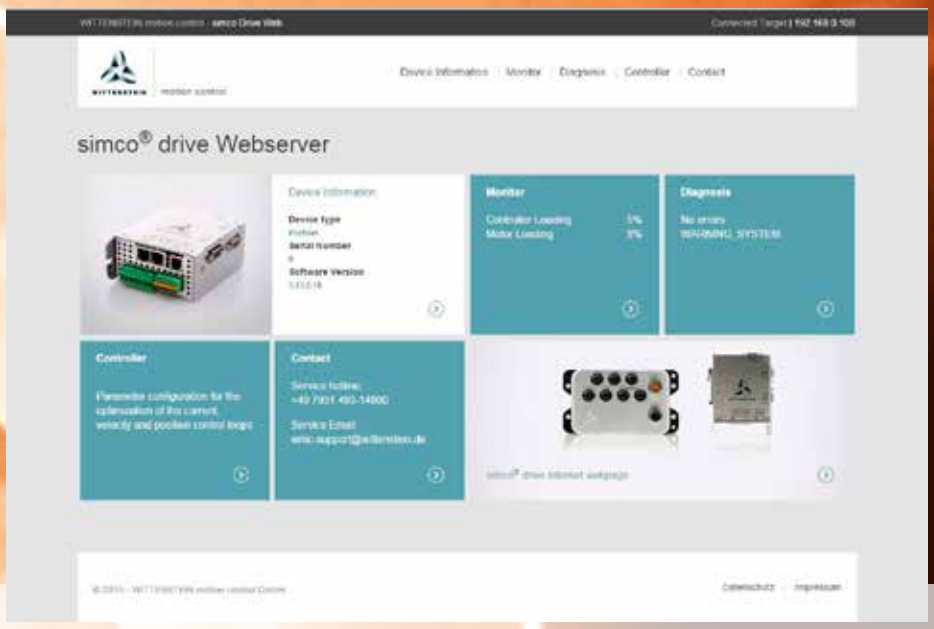
Wide performance range

In addition to flexibility in terms of version selection, the concept of a fully scalable and modular system yields further advantages.

Through the configuration of the overall system, a wide speed range can be covered for numerous applications and speeds.

This characteristic of the drive system is perfect for vehicles that need to carry heavy loads and also move at high speed unloaded.

With the iTAS servo drive system, nominal speeds of up to 2.6 m/s can be achieved.



Simple, intuitive and fast navigation through the web server

Intelligent communication

simco® drive enables the simple integration of intelligent communication concepts into the AGV.

Thanks to the motion tasks function integrated in simco® drive, complex movements such as clamping processes on the vehicle can be initiated and performed decentrally by means of a motion block table. In the case of several synchronized axes, movements can be started simultaneously via a synchronization signal from the control system. This decentralized intelligence leads to greater flexibility during use and reduces the programming requirements on the part of the vehicle manufacturer.

Monitoring of the system via the web server
Using the web server integrated in the simco® drive, the integrated servo drive can be accessed via the Internet. Not only can system utilization be monitored, the web server also permits the simple evaluation of errors and warning messages. Continuous condition monitoring helps to detect breakdowns at an early stage. These can then be analyzed quickly and wirelessly. The intelligent provision of data in the web server leads to greater safety, both during commissioning and operation.

Increased safety in the entire system

Here, one hand knows what the other is doing: with the iTAS complete system, all the components are intelligently adapted to one another. The interaction of actuators, electronics and branch specific features is proven, efficient and safe – this makes e.g. vehicle approval by the TÜV technical inspection agency simpler.

In terms of vehicle design, iTAS makes anything possible – but according to defined standards. This means that the machine construction company does not take any risks and can rely on an intelligent overall solution that always unites proven performance parameters and quality standards in the simplest possible way.

In addition to investment security and coordinated functional safety of the iTAS modular system, the “safety-first” principle of the WITTENSTEIN philosophy can also be taken at face value with iTAS: **top safety functions such as STO according to SIL3 in the simco® drive, make implementation of the latest safety concepts, for example, possible – more intelligently, individually and interactively than ever before.**

Machine construction

- Extensive speed range
- Flat drive system design
- High vertical loads of the drive system

Food industry

- Coverage of a wide performance range
- High efficiency of the overall system
- High reliability and safety

e-commerce

- Compact drive system for simple integration, also in small vehicles
- Extensive speed range
- High energy efficiency
- Flat design

Warehouse logistics

- Diverse scalability
- Decentralized intelligence of the drive system for additional axes (e.g. clamping processes)
- Simplified integration of the pre-parametrized drive system

Clinic logistics

- High safety
- Flat and space-saving solution
- Low energy consumption

Pharma-ceutical industry

- Maximum safety
- Plug and play integration
- High degree of reliability
- High degree of scalability and modularity

iTAS is ideally suited to meet the challenges of intralogistics.

Absolute cost effectiveness, permanent performance enhancement, continuous cost reduction, safety without compromise – the demands placed on internal logistics are just as high in industrial companies as they are in retail or public institutions. For the smooth flow of materials and information, intelligent complete solutions are required that enable the greatest possible degree of customization with the maximum level of standardization.

iTAS for automated guided vehicles combines standardized power density with freely scalable performance parametrization – for maximum freedom and safety in intralogistics.

The iTAS complete system comprising actuators, electronics and branch specificity is optimal for all unit-load AGVs as well as towing vehicles, piggyback AGVs, assembly AGVs and – owing to the compact dimensions of the system components – in particular mini AGVs.

New paths in the health sector

“iTAS saves space and offers a high power density. This way, our vehicle can drive at a speed of up to 2 m/s and manage gradients of up to 7 percent.”

Bernd Dalhoff, Managing Director of 2-IT GmbH

Customer:
2-IT GmbH from Alling near Munich

Branch:
AGV for the health sector and industrial applications

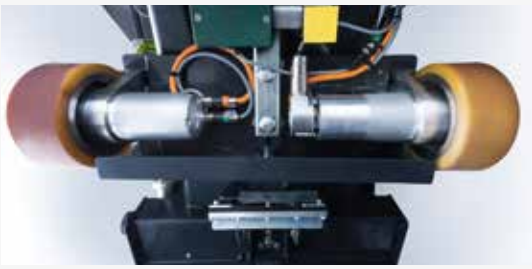
Task:
To develop an innovative unit-load AGV, which autonomously performs transport tasks in healthcare facilities.

Solution:
iTAS with TAS 025 in equipment package performance - optimally customized to the specific requirements placed upon unit-load AGVs in a hospital environment: flat, space-saving design, integrated safety concept, low energy consumption.

Description:
Their use in intralogistics in hospitals and care facilities is challenging, because the vehicles have to navigate around the contours of the building, negotiate uphill and downhill gradients as well as elevators and automatic doors, all while sharing the space with hospital staff. As iTAS is also designed as a differential drive, the vehicle is steered by means of a speed difference between the two drives, and can even turn on the spot if necessary. The drives have an energy efficiency of 93% and operating cycles in excess of 20 hours are possible without recharging.

Special feature: A particularly challenging requirement for the drive of this vehicle is moving underneath four-wheeled containers in order to transport them. Despite being 170 cm long and nearly 60 cm wide, the vehicle is only 33 cm high. A scissor lift table for carrying loads up to 600 kg is incorporated. Miniature laser scanners, ultrasonic sensors and floor detectors ensure safety and assist with navigation.

A real heavyweight for warehouse logistics



“Consulting from a single source and the coordinated interaction between the drive and control technology with iTAS ensure the reliable planning of our projects.”

Joachim Walter, Managing Director at BeeWaTec GmbH

Customer:
BeeWaTec GmbH from Pfullingen near Reutlingen

Branch:
Mini AGV for production and warehouse logistics

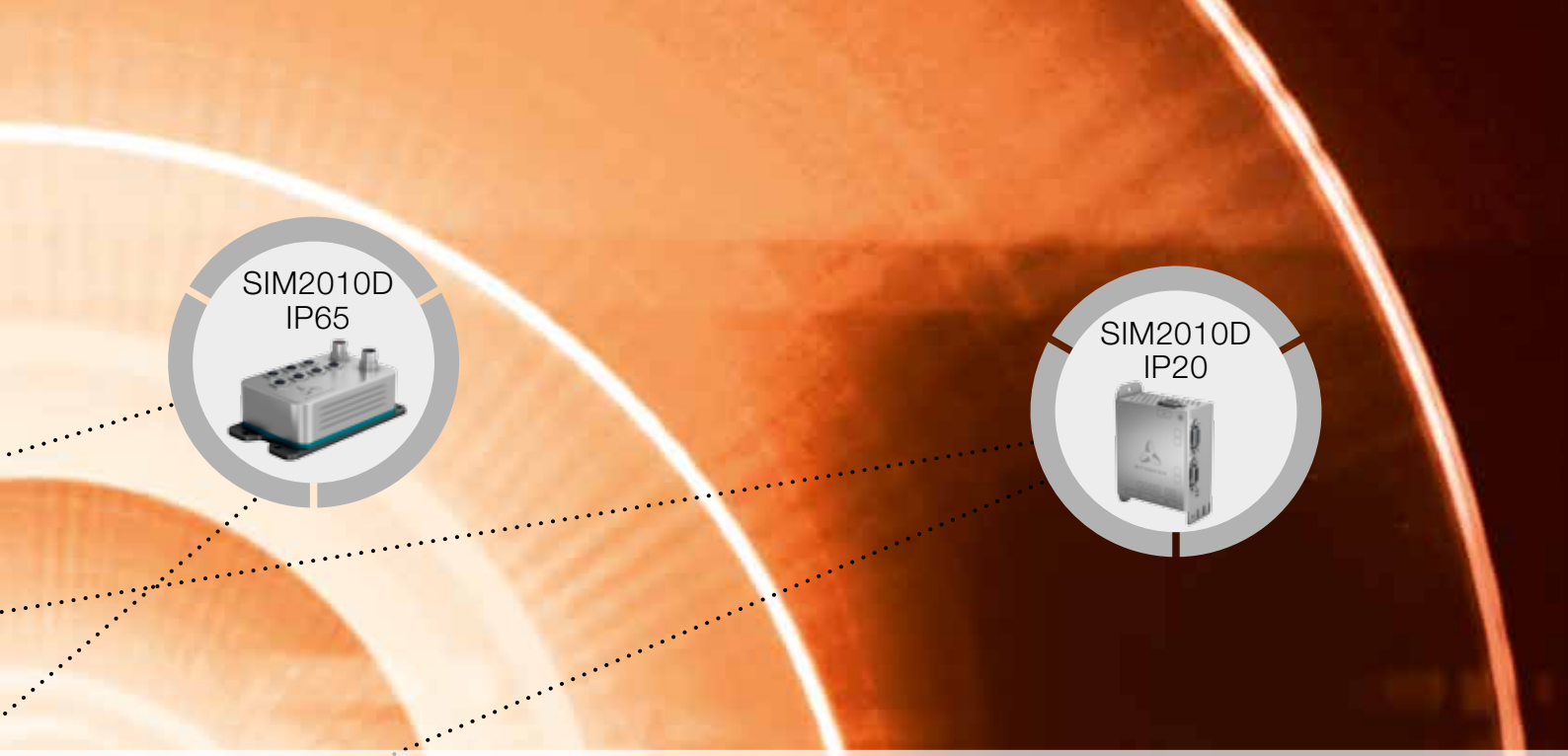
Task:
To develop a tailor-made drive solution for use in a modular mini-vehicle for transporting stacked goods containers.

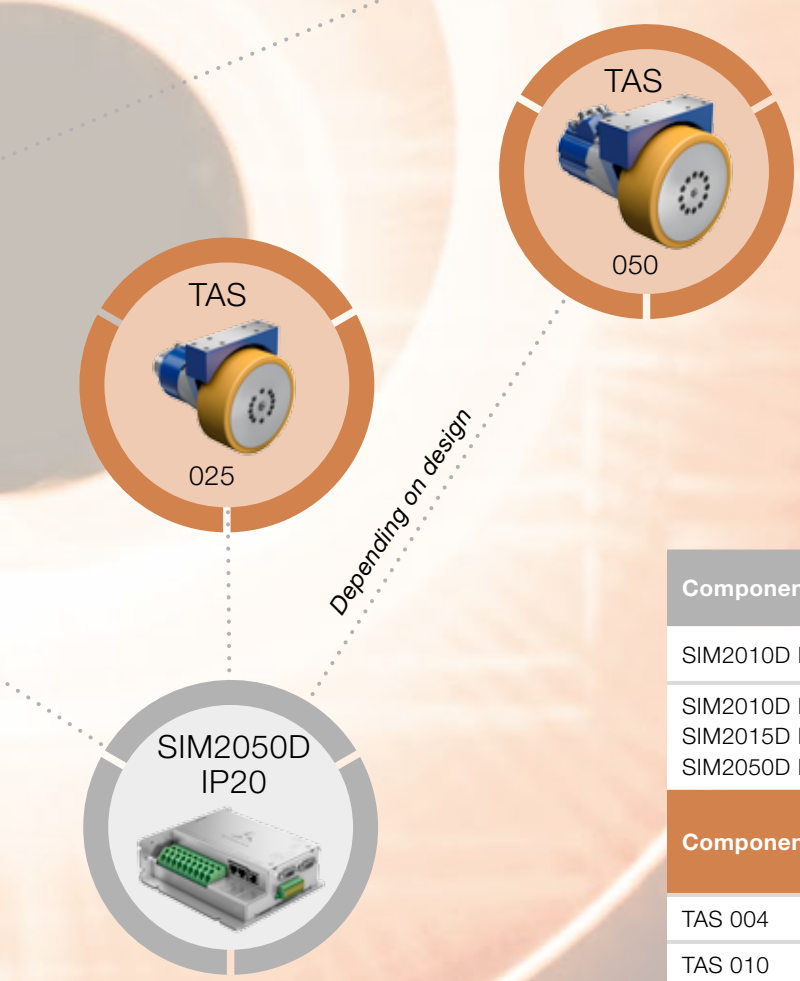
Solution:
iTAS: TAS 004 with simco® drive IP20
Perfect match: dynamic line size 40 with simco® drive IP20

Description:
Instead of designing vehicle drives itself, BeeWaTec relies on the iTAS complete drive system for its Bee-Mini series. The geared-motor-units are directly connected to the VULKOLLAN® wheels to ensure optimum capacity utilization. One iTAS is used for each vehicle axis. The vehicle is steered by means of the speed difference between the two drives. This halves the load on each drive and keeps the size to a minimum.

Special feature:
Unusual requirement for the complete drive system: the ability to transport an overall weight of up to 150 kg for the newly designed Bee-Mini compact vehicle. This is made possible by means of a clamping system, which was implemented with a dynamic line actuator in conjunction with the simco® drive servo amplifier. The clamping is controlled decentrally via the servo drive. It is connected to the vehicle computer via the digital inputs and outputs. Complex implementation with a field bus interface is omitted.

The **iTAS** possibilities: unlimited.

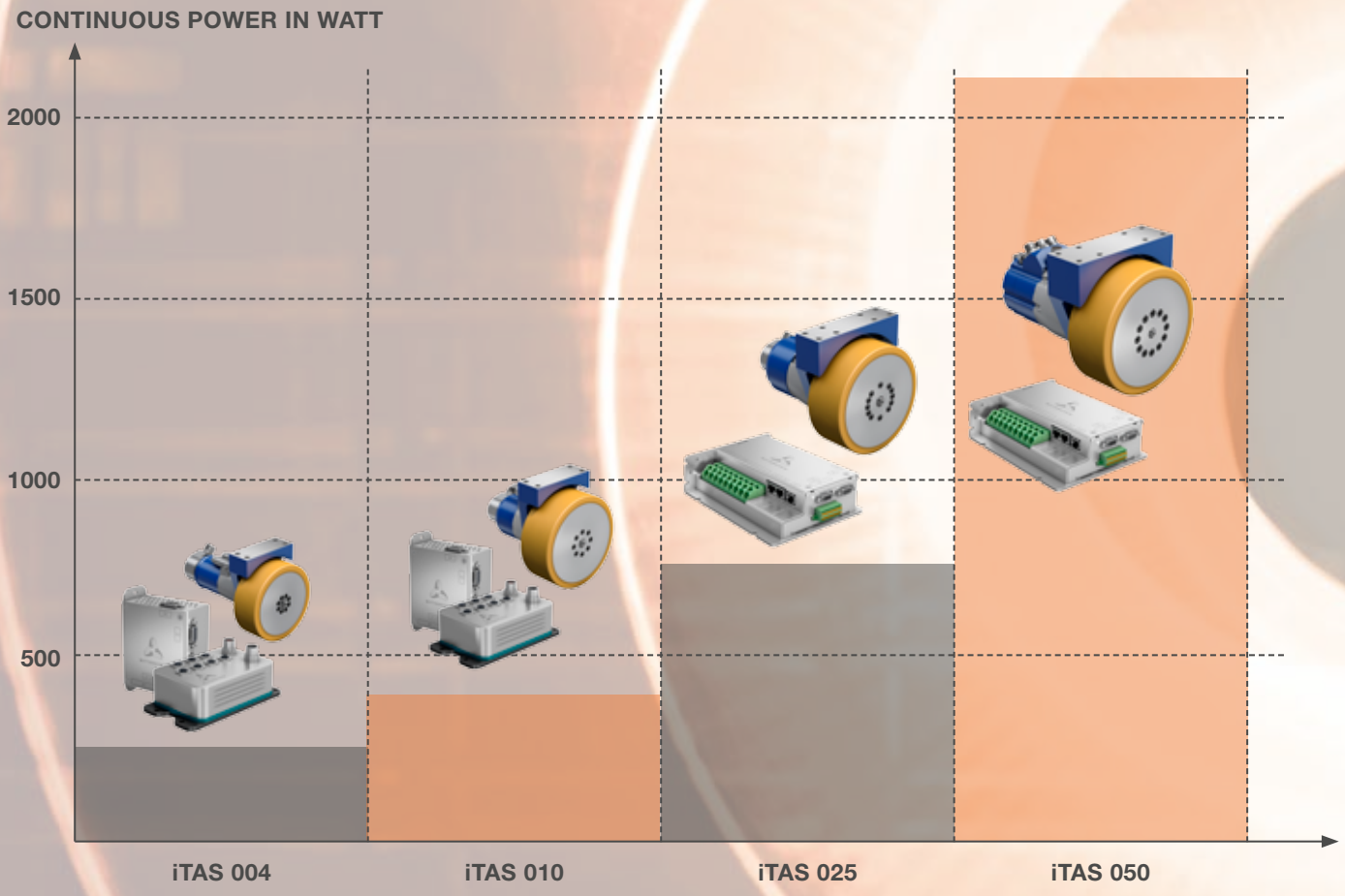




Components	Field bus version	Feedback interfaces	Inputs/outputs
SIM2010D IP65	2	4	6 x digital I/O
SIM2010D IP20 SIM2015D IP20 SIM2050D IP20	4	4	6 x digital I/O

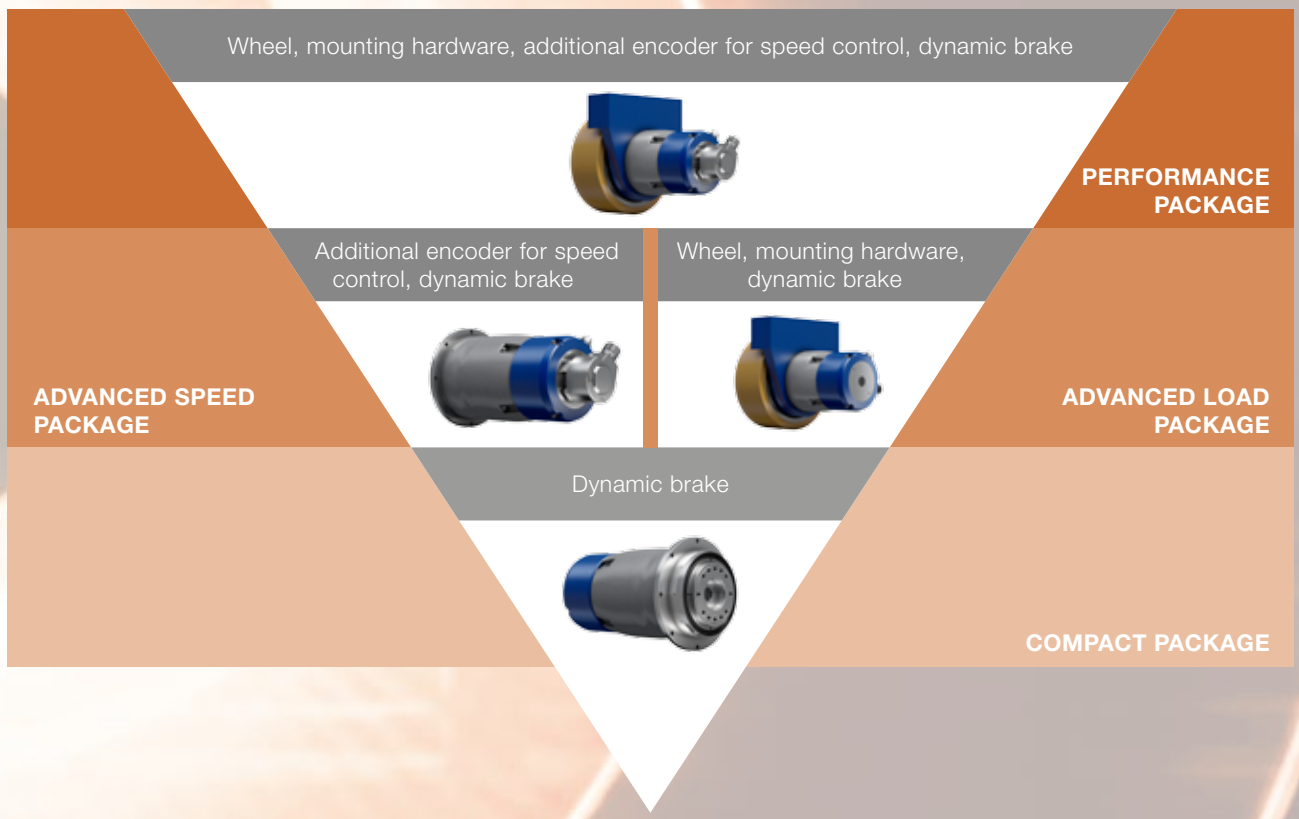
Components	Ratio versions	Feedback version	Versions of mounting hardware
TAS 004	8	3	Any
TAS 010 TAS 025 TAS 050	5	3	Any

Flexible, fully scalable



In the servo actuators of the iTAS system, the motor and the helical, low backlash planetary gearhead are combined to coupling-free drive units, which boast an impressively high torque, a compact design, high tilting moments and a wide speed range. In measurement terms, the servo drives that are available as a central version in IP20 and as a decentral version in IP65 feature high-resolution current control and high torque precision in the system. Due to the extremely precise regulation of torques, the components of iTAS are the ideal solution for AGV.

Servo drive platform



A temperature sensor, a resolver as a robust feedback system and a dynamic brake are integrated into the drives as standard. The drive system can be designed in a modular and application-specific manner using various equipment packages. The “advanced” package, for example, enables connection of an additional SICK speed encoder or the mounted wheel with mounting Hardware for optimized utilization of the output bearing and increased loads. The full version of the “performance”-package includes the wheel (VULKOLLAN® 93° Shore A) as well as a flexible vehicle connection system.

TAS

High power density in small installation space.

The TAS product range includes motor and gearhead. This results in compact units with a low moment of inertia. Optimal interaction of all the technical factors ensures high energy efficiency. The compact design of TAS simplifies installation and integration in the vehicle. Different AGV requirements can be reliably implemented using branch specific components.

Actuator	Wheel	Additional speed sensor
- Maximum power density - Compact design - Integrated planetary gearhead - High number of ratio versions - High precision - Integrated resolver	- Integrated wheel in system - Optimum mounting hardware for achieving higher vertical loads - Material: VULKOLLAN® 93° Shore A - Proven wheel technology - Various wheel diameters possible	- Additional encoder for speed control - Realization of a redundant speed monitoring system with direct connection to the safety control system of the vehicle. - Simplification through integrated solution
Dynamic brake	**Mounting hardware**	
- Safety of ramp travel and braking processes during running operation - High quality and reliability - Application-specific design of the brake - Factory-set brakes	- Configurable and efficient interface for connection to the vehicle frame - High vertical loads - Integrated design - High flexibility	

A High flexibility

B Installation space savings

C Additional components dispensed with

D Simplified vehicle concepts

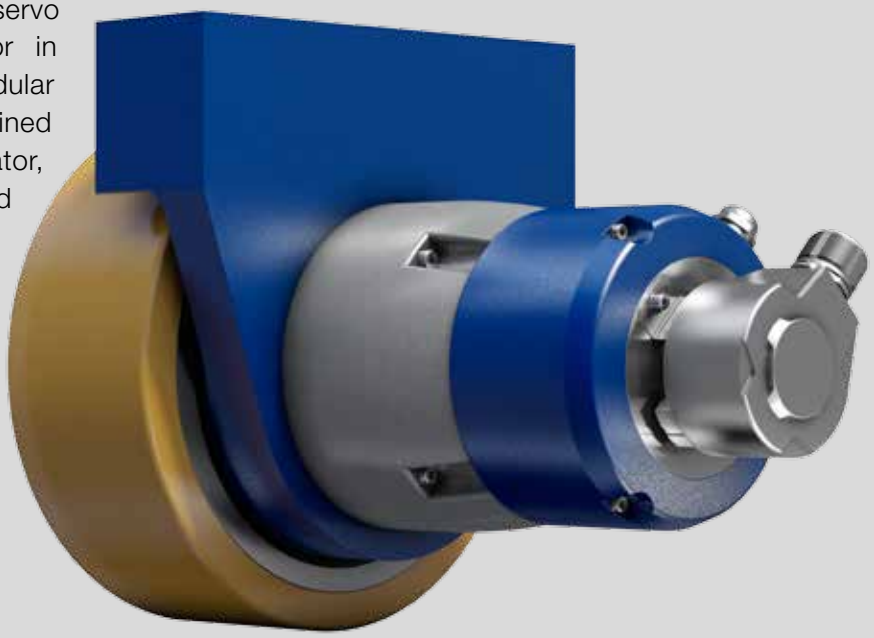
E High efficiency

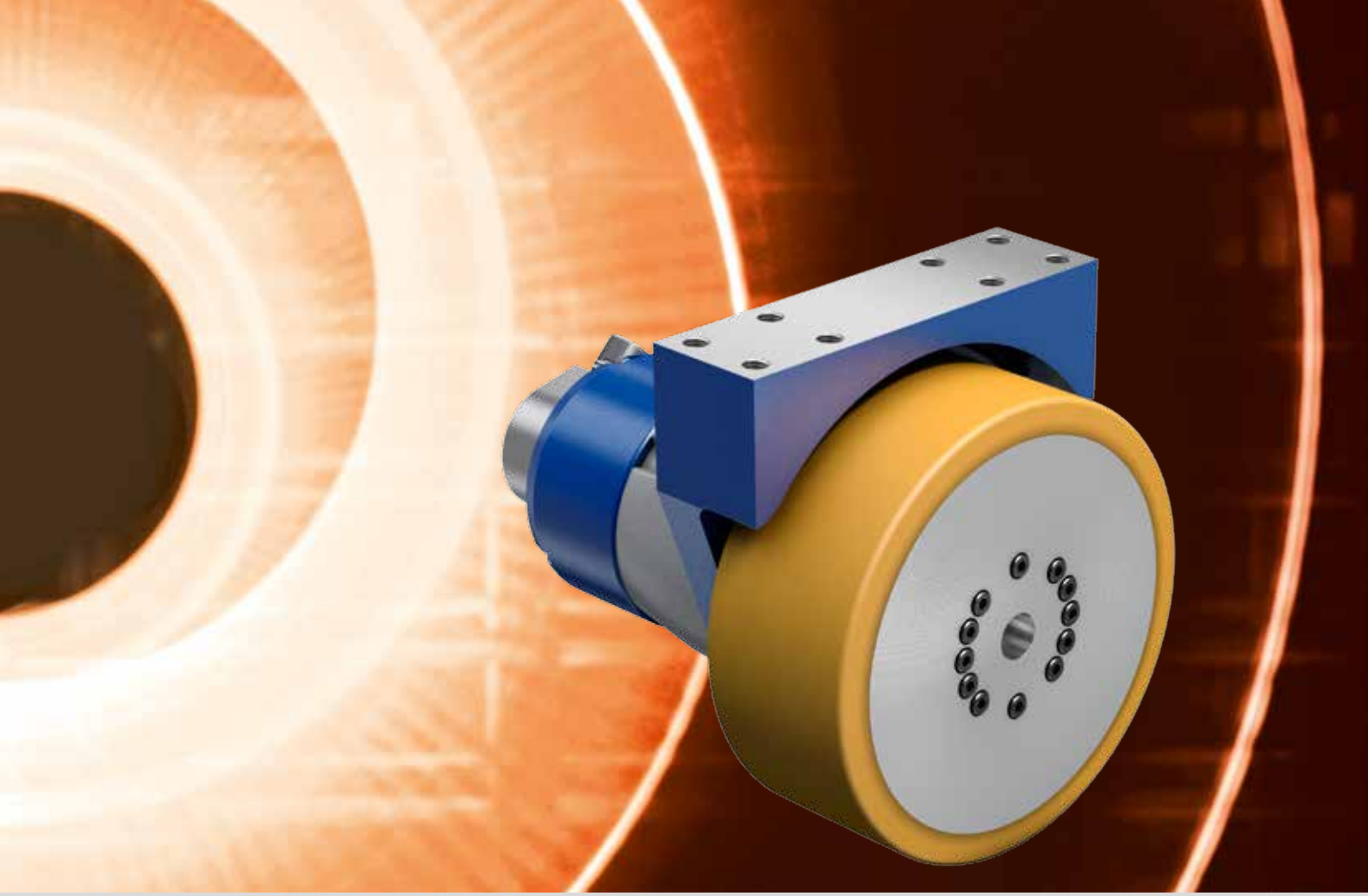
F High safety

TAS

Minimal space requirements. Higher flexibility.

The models from TAS 004 to TAS 050 provide numerous benefits thanks to their extreme compactness: the low space requirements enable more structure, better overview and higher flexibility during practical use in AGV. Thanks to the scalability of TAS, which is made possible by the individually selectable equipment packages for different requirements, this generation of servo actuators is the ideal performance factor in AGV – and consequently the optimal modular component in the flexible TAS system. Combined with the low moment of inertia of the actuator, the high torsional rigidity in the drive train and the exemplary smooth running, the TAS range also represents a decisive “plus” for productivity.



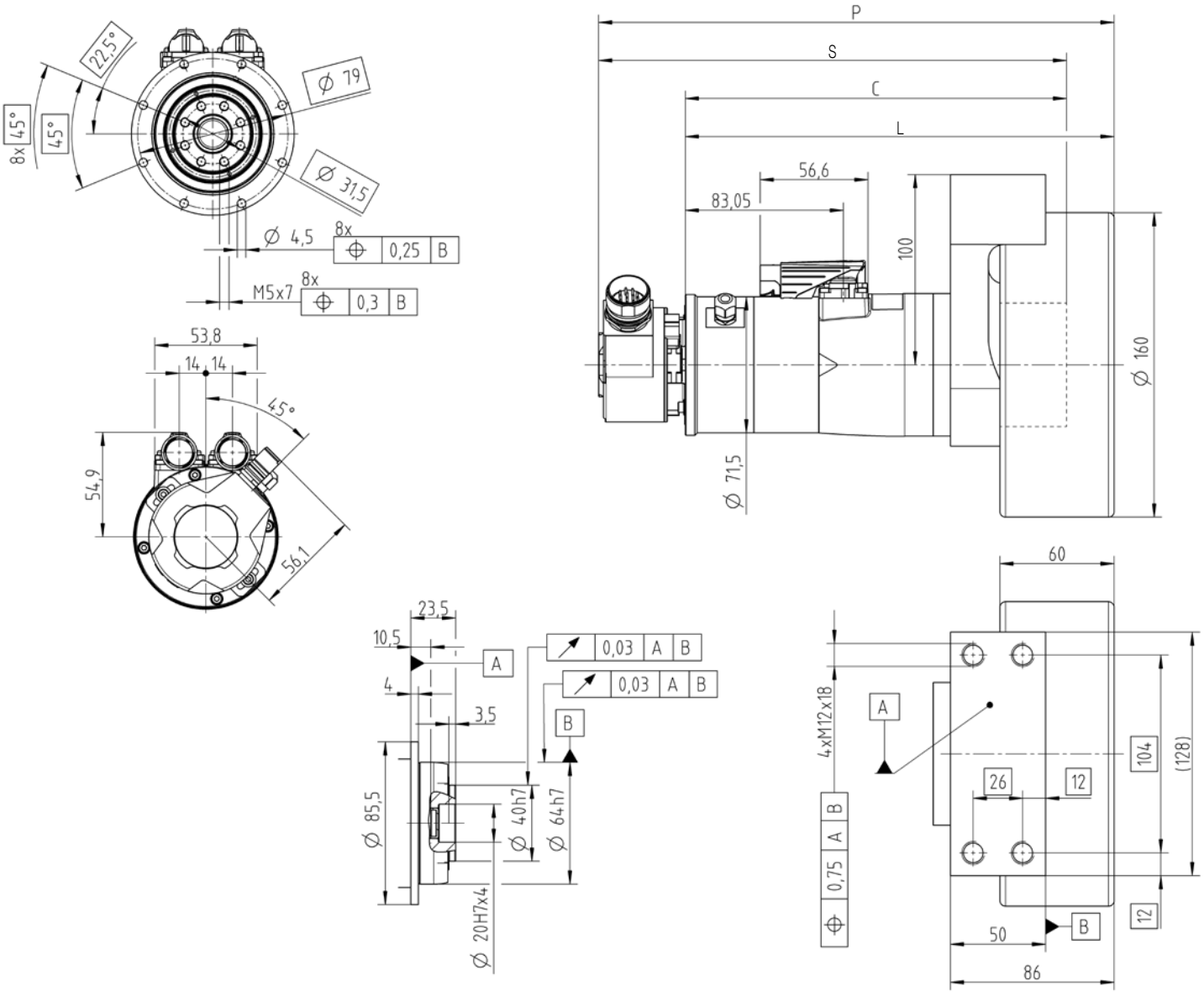


Unit	TAS 004	TAS 010	TAS 025	TAS 050
Wheel diameter	160 mm	200 mm	200 mm	250 mm
Gearhead ratio	16, 20, 28, 35, 50, 70, 100	16, 21, 31, 61, 91		
Vertical load per drive	280 kg	485 kg	655 kg	2000 kg
Intermediate circuit voltage	24 or 48 V DC			
Max. feed force	380 to 5200 N			
Continuous feed force	100 to 2000 N			
Nominal speed	Up to 2.6 m/s*			
Force dynamic brake	is specially designed for your operating system			
Resolution of addit. incremental speed encoder	1024 and 250 ppr			

* Dimensioning necessary

TAS
Size 004 – 24 V / 48 V

Ratio	**i**		**016**		**020**		**028**		**035**		**050**		**070**		**100**	
Motor size			**53B**	**53B**	**53B**	**53B**	**53B**	**53B**	**53B**	**53B**	**53B**	**53B**	**53B**	**53B**	**53B**	**53B**
Intermediate circuit voltage	V_D	V DC	24	48	24	48	24	48	24	48	24	48	24	48	24	48
Max. acceleration torque at drive (max. 1000 cycles per hour)	T_{2B}	Nm	29		36.2		51.8		55.0		55.0		55.0		35.0	
Static output torque	T_{20}	Nm	7.9		9.9		15.0		19.5		28.3		40.0		18.0	
Brake holding torque at output, 100°C	T_{2BR}	Nm	32		40		56		70		50		Design necessary		Design necessary	
Max. speed	n_{2max}	rpm	280.8	375.0	224.7	300	160.5	214.3	128.4	171.4	89.9	120	64.2	85.7	44.9	60.0
Max. motor acceleration current (static)	$I_{maxstst}$	A_{eff}	31.5		31.5		31.5		26.7		19.0		13.7		6.7	
Motor stall current	I_0	A_{eff}	10.5		10.5		10.5		10.5		10.5		10.3		4.0	
Backlash	j_t	arcmin	≤ 4													
Max. axial force	F_{amax}	N	1630													
Max. tilting torque (distance from point of rotation to output flange 57.6 mm)	M_{kmax}	Nm	110													
Weight (compact line)	m_1	kg	2.9													
Operating noise (measured at motor speed of 3000 rpm)	L_{PA}	dB(A)	≤ 58													
Max. permitted housing temperature	ϑ_{max}	°C	90													
Ambient temperature	ϑ_V	°C	0 to +40													
Protection class			IP65													
Mount. pos.			B5													
Lubrication			Synthetic oil, lubricated for life													
Insulating material class			F													
Paint			Painted blue as standard, unpainted upon request													

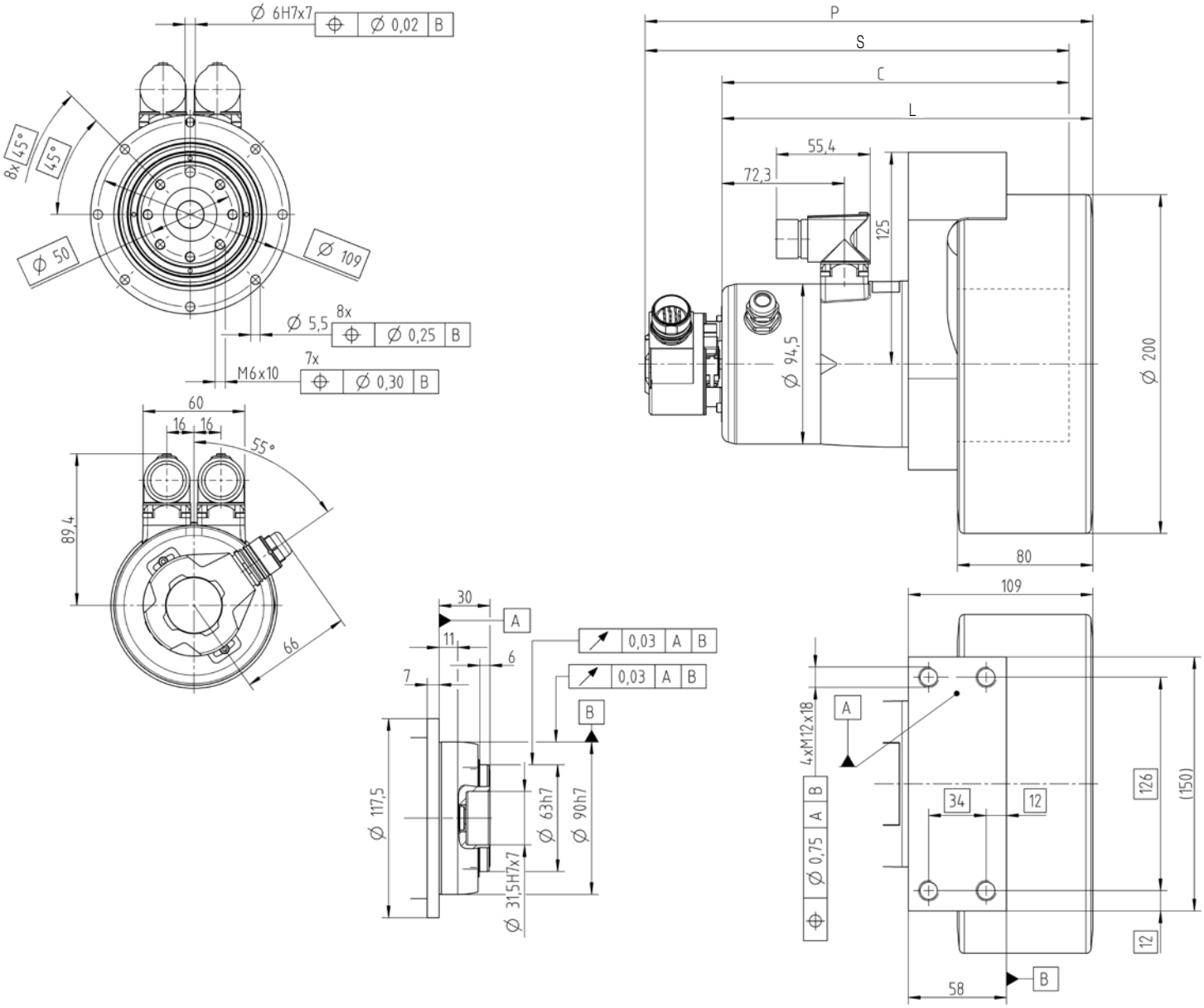


Options	Abbreviation	Length in mm
compact	C	212.7
advanced speed	S	258.2
advanced load	L	225.2
performance	P	270.7

Electrical connection	Type of connection
Motor phases	SpringTec quick fastener
Motor feedback	SpringTec quick fastener
Dynamic brake	M12 connector, 8-pin
Speed encoder	M23x1 connector

TAS
Size 010 – 24 V / 48 V

Ratio	**i**		**016**		**021**		**031**		**061**		**091**	
Motor size			**64B**	**64B**	**64B**	**64B**	**64B**	**64B**	**64B**	**64B**	**64B**	**64B**
Intermediate circuit voltage	V_D	V DC	24	48	24	48	24	48	24	48	24	48
Max. acceleration torque at drive (max. 1000 cycles per hour)	T_{2B}	Nm	43.0	49.4	57.1	65.5	84.9	97.3	80.0	80.0	80.0	80.0
Static output torque	T_{2nom}	Nm	10.7	13.4	14.7	18.3	22.3	27.6	35.0	35.0	35.0	35.0
Brake holding torque at output, 100°C	T_{2BR}	Nm	32		42		62		61		Design necessary	
Max. speed	n_{2max}	rpm	338.3	375.0	257.7	285.7	174.6	193.5	88.7	98.4	59.5	65.9
Max. Motor acceleration current (static)	$I_{maxstst}$	A_{eff}	60.0	43.8	60.0	43.8	60.0	43.8	29.3	18.5	20.6	12.9
Motor stall current	I_0	A_{eff}	20.0	14.6	20.0	14.6	20.0	14.6	14.9	9.3	11.1	6.9
Backlash	j_t	arcmin	≤ 3									
Max. axial force	F_{amax}	N	2150									
Max. tilting torque (distance from point of rotation to output flange 57.6 mm)	M_{kmax}	Nm	270									
Weight (compact line)	m_1	kg	5.7									
Operating noise (measured at motor speed of 3000 rpm)	L_{PA}	dB(A)	≤ 62									
Max. permitted housing temperature	ϑ_{max}	°C	90									
Ambient temperature	ϑ_V	°C	0 to +40									
Protection class			IP65									
Mount. pos.			B5									
Lubrication			Synthetic oil, lubricated for life									
Insulating material class			F									
Paint			Painted blue as standard, unpainted upon request									

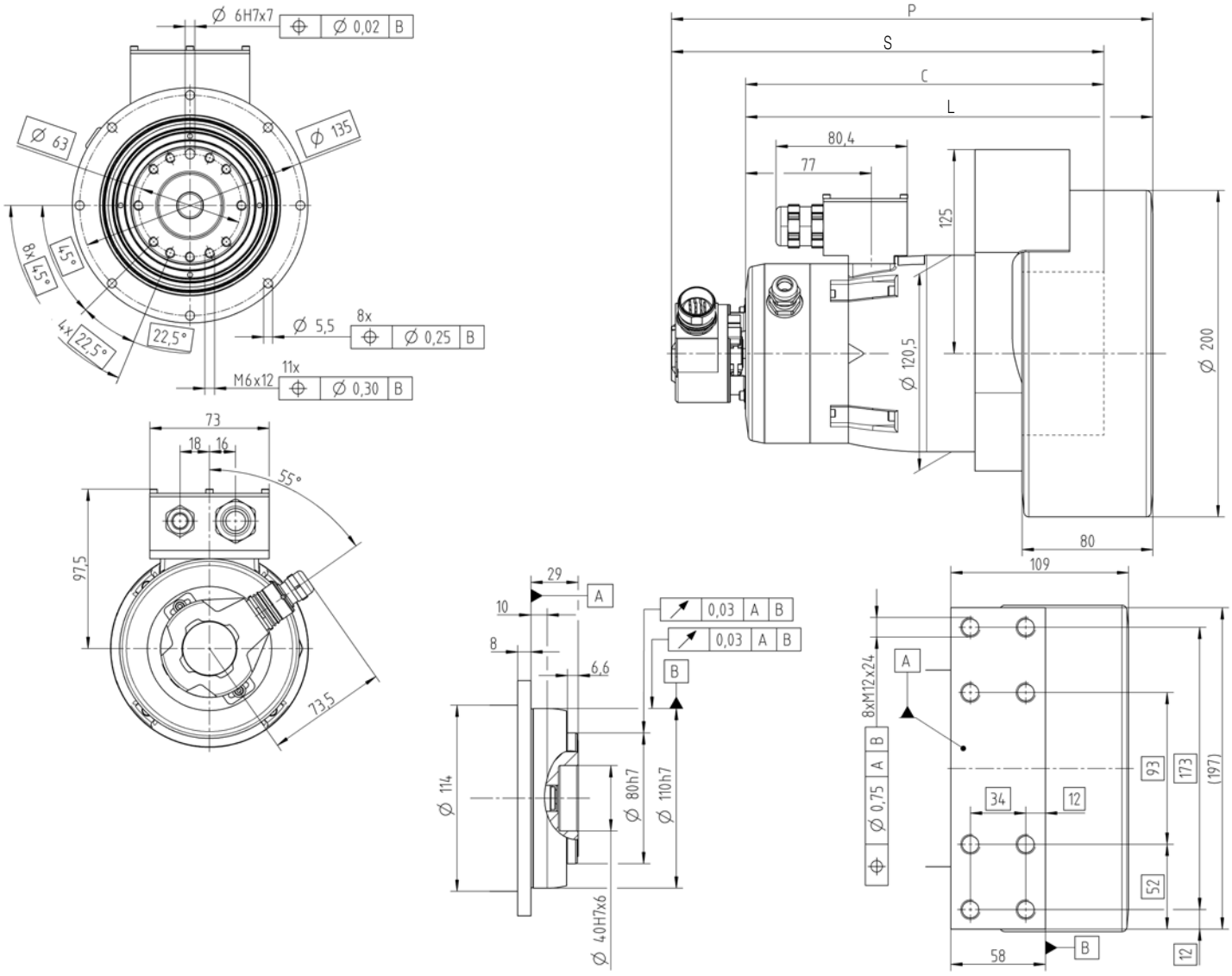


Option variants	Abbreviation	Length in mm
compact	C	205.1
advanced speed	S	250.6
advanced load	L	219.1
performance	P	264.6

Electrical connection	Type of connection
Motor phases	M23x1 integral socket
Motor feedback	M23x1 integral socket
Dynamic brake	M12 connector, 8-pin
Speed encoder	M23x1 connector

TAS
Size 025 – 24 V / 48 V

Ratio	**i**		**016**		**021**		**031**		**061**		**091**	
Motor size			**94C**	**94C**	**94C**	**94C**	**94C**	**94C**	**94C**	**94C**	**94C**	**94C**
Intermediate circuit voltage	V_D	V DC	24	48	24	48	24	48	24	48	24	48
Max. acceleration torque at drive (max. 1000 cycles per hour)	T_{2B}	Nm	74.9	113.6	99.1	149.9	148.2	223.2	250.0	250.0	250.0	250.0
Static output torque	T_{2nom}	Nm	15.7	30.7	21.4	41.2	33.5	62.6	87.8	100.0	100.0	100.0
Brake holding torque at output, 100°C	T_{2BR}	Nm	80		105		155		152.5		227.5	
Max. speed	n_{2max}	rpm	261.6	348.8	199.3	265.7	135.0	180.0	68.6	91.5	46.0	61.3
Max. motor acceleration current (static)	$I_{maxstst}$	A_{eff}	84.0	84.0	84.0	84.0	84.0	84.0	68.2	46.6	47.5	31.8
Motor stall current	I_0	A_{eff}	28.0	28.0	28.0	28.0	28.0	28.0	28.0	20.6	22.6	15.1
Backlash	j_t	arcmin	≤ 3									
Max. axial force	F_{amax}	N	4150									
Max. tilting torque (distance from point of rotation to output flange 57.6 mm)	M_{kmax}	Nm	550									
Weight (compact line)	m_1	kg	10.4									
Operating noise (measured at motor speed of 3000 rpm)	L_{PA}	dB(A)	≤ 64									
Max. permitted housing temperature	ϑ_{max}	°C	90									
Ambient temperature	ϑ_V	°C	0 to +40									
Protection class			IP65									
Mount. pos.			B5									
Lubrication			Synthetic oil, lubricated for life									
Insulating material class			F									
Paint			Painted blue as standard, unpainted upon request									

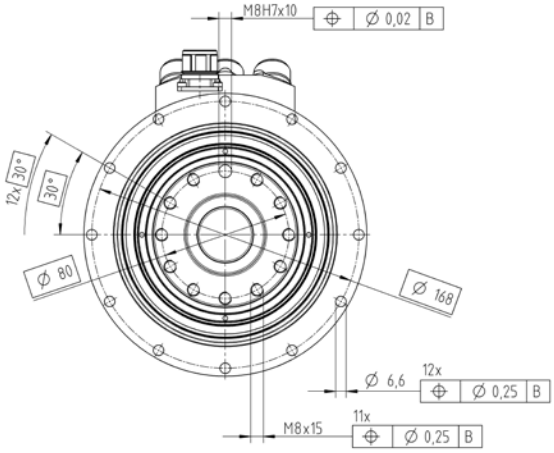


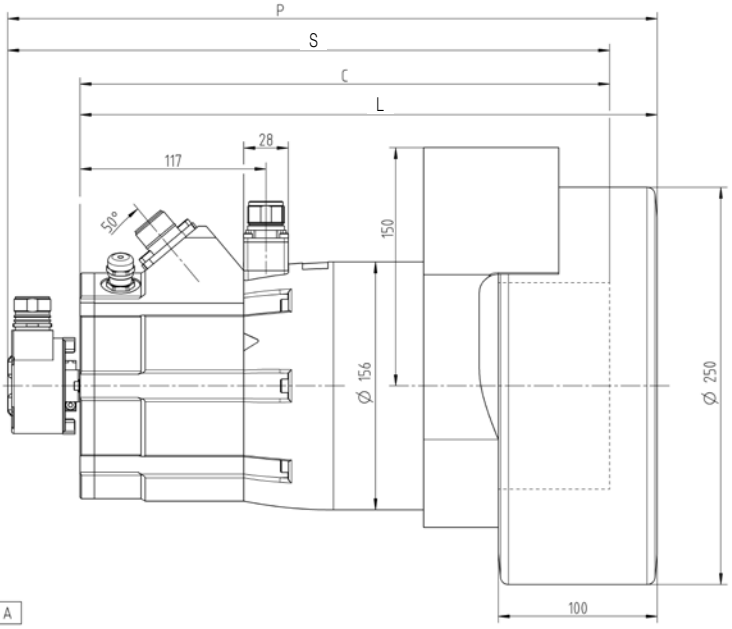
Options	Abbreviation	Length in mm
compact	C	235.5
advanced speed	S	281
advanced load	L	249.5
performance	P	295

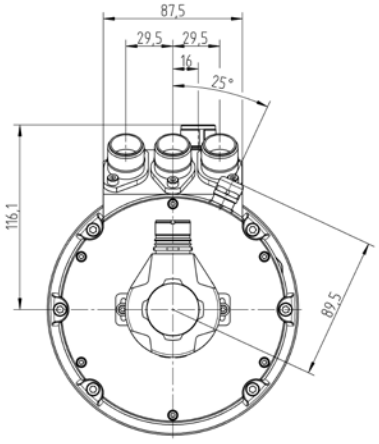
Electrical connection	Type of connection
Motor phases	Open cable ends
Motor feedback	Open cable ends
Dynamic brake	M12 connector, 8-pin
Speed encoder	M23x1 connector

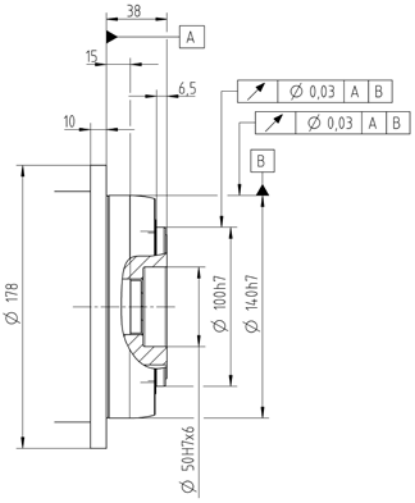
TAS
Size 050 – 24 V / 48 V

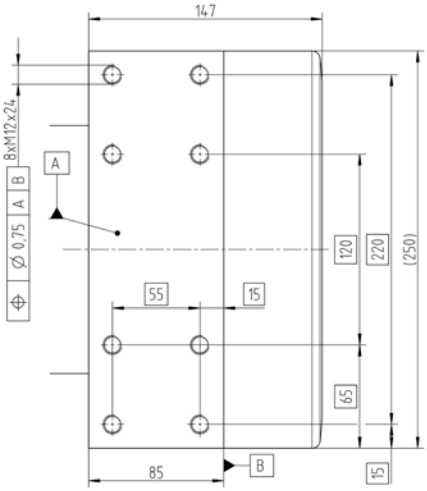
Ratio	**i**		**016**		**021**		**031**		**061**		**091**	
Motor size			**130D**	**130D**	**130D**	**130D**	**130D**	**130D**	**130D**	**130D**	**130D**	**130D**
Intermediate circuit voltage	V_D	V DC	24	48	24	48	24	48	24	48	24	48
Max. acceleration torque at drive (max. 1000 cycles per hour)	T_{2B}	Nm	365.9		482.8		650.0		500.0		500.0	
Static output torque	T_{2nom}	Nm	124.3		165.7		249.2		220.0		220.0	
Brake holding torque at output, 100°C	T_{2BR}	Nm	160		210		310		305		455	
Max. speed	n_{2max}	rpm	188	312.5	143.2	238.1	97.0	161.3	49.3	82.0	33.1	54.9
Max. Motor acceleration current (static)	$I_{maxstst}$	A_{eff}	312.0		312.0		282.1		95.9		66.4	
Motor stall current	I_0	A_{eff}	104.0		104.0		104,0		46.7		33.4	
Backlash	j_t	arcmin	≤ 3									
Max. axial force	F_{amax}	N	6130									
Max. tilting torque (distance from point of rotation to output flange 57.6 mm)	M_{kmax}	Nm	1335									
Weight (compact line)	m_1	kg	22.7									
Operating noise (measured at motor speed of 3000 rpm)	L_{PA}	dB(A)	≤ 66									
Max. permitted housing temperature	ϑ_{max}	°C	90									
Ambient temperature	ϑ_V	°C	0 to +40									
Protection class			IP65									
Mount. pos.			B5									
Lubrication			Synthetic oil, lubricated for life									
Insulating material class			F									
Paint			Painted blue as standard, unpainted upon request									











Options	Abbreviation	Length in mm
compact	C	349.2
advanced speed	S	394.7
advanced load	L	363.2
performance	P	408.7

Electrical connection	Type of connection
Motor phases	M23x1 integral socket
Motor feedback	M23x1 integral socket
Dynamic brake	M12 connector, 8-pin
Speed encoder	M23x1 connector

More intelligent. More efficient. Safer.

The TAS drive system is completed with the simco® drive servo amplifier series. A number of different power versions and designs are available: The drives are available with protection class IP20 with the power ratings 10, 15 and 50 A and IP65 with the power rating 10 A. The compact design enables their use in confined spaces and is ideal for AGV.

Your benefits at a glance		
- Flexible and diverse interfaces - Compact design - Simplified installation in the vehicle	- Reduced wiring effort - Reliable galvanic isolation between logic and power module	- Integrated safety functions STO and SS1* according to SIL 3 (* in conjunction with the vehicle control system)

1	2	3
SIM2010 with protection class IP65	**SIM2010 / SIM2015** with protection class IP20	**SIM2050** with protection class IP20

ENHANCED PERFORMANCE

Simple to install using a rail clip – perfect design for control cabinets

B C

Installation in the vehicle without enclosure, with protection class IP65

A D E

Flexible mounting position – optional heat sink for better heat removal

B C F

Cold plate for direct fitting to the vehicle architecture – optimum cooling

B C

Wide range input voltage to mitigate voltage supply fluctuations.

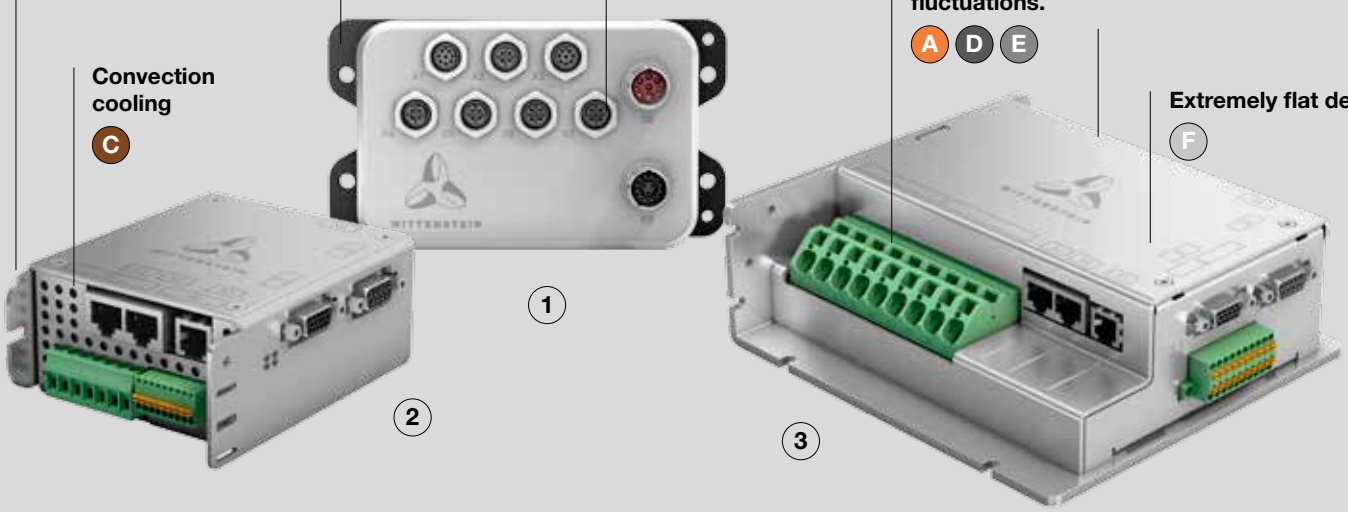
A D E

Convection cooling

C

Extremely flat design

F



A Flexibility

B Simple installation

C Saves costs and time

D Safety

E High robustness

F Saves space

simco® drive

Higher flexibility. Less effort.

simco® drive impresses with numerous hardware features which are perfectly adapted to the requirements for construction of an automated guided vehicle. The software functions of the simco® drive, however, also offer significant added value.

Product feature	Your benefits
Soft-start function	
- Limitation of current when the device is switched on - Protection against impermissible high currents	- Protection of external components (e.g. switches) - Reduced effort during development of the vehicle - Component savings
Rolling software updates	
- Integration of new software features with guaranteed availability of existing software versions	- Use of new features - Update of the drives firmware via independent download file

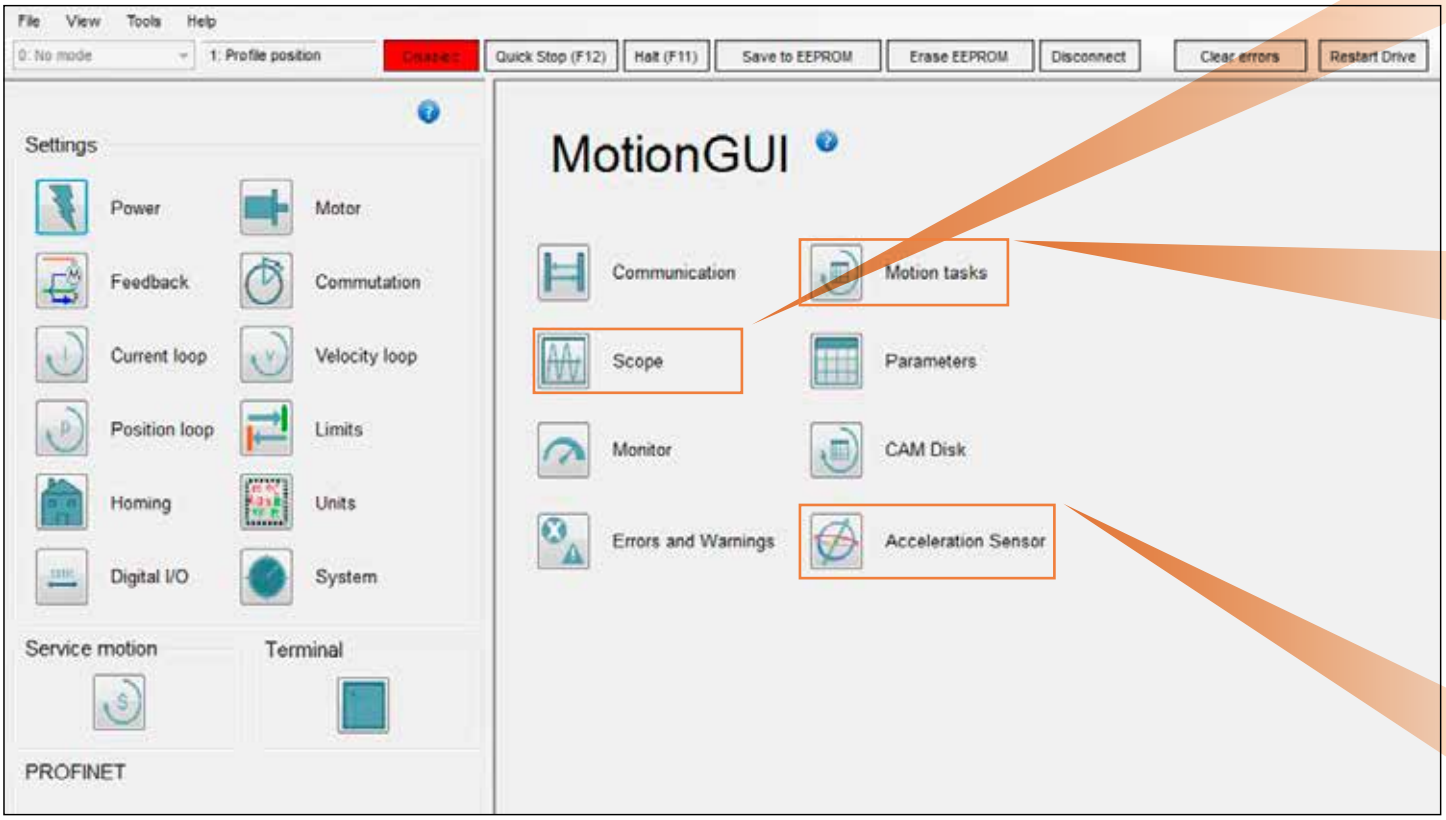
Product feature	Your benefits
Encoder emulation	
- Generation of differential incremental signals from the motor encoder. - Output of the signal at the encoder connector for transmission to the safety PLC	- Implementation of a redundant speed monitoring system - Saves effort - An additional encoder at the input/output can be omitted. - Simple implementation of the safety functions
Integrated PROFIdrive profile	
- Fully integrated drive profile for connection to SIEMENS controllers and for full utilization of existing technology functions	- Easy integration in SIEMENS control software - Simple configuration of the drive system through installation of the GSDML file - Error-free integration
Web server	
- Status analysis and monitoring of the drive system in existing network	- Simple and fast condition monitoring possible in the installed state - Performance of analyses in the network - No wiring necessary

MotionGUI

MotionGUI software

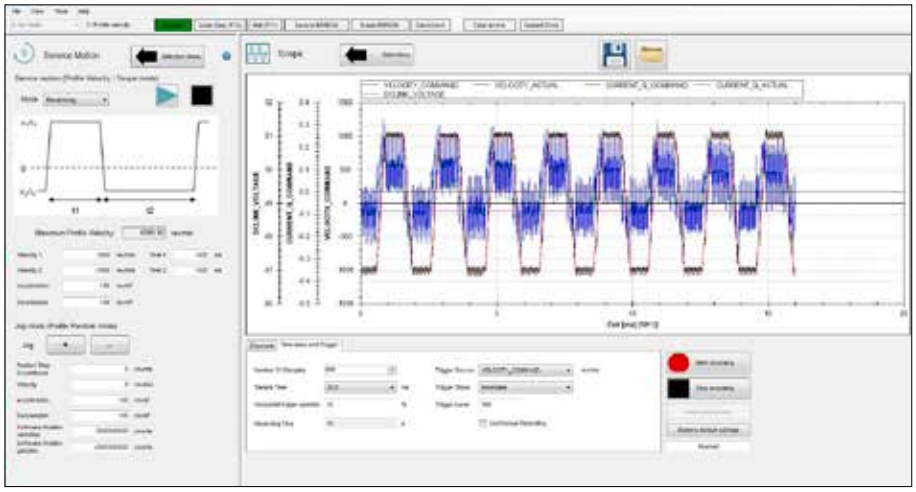
The MotionGUI graphical user interface guides the user intuitively during commissioning and operation of the drive system. Diagnoses, optimizations and parametrization of the drive can be performed via a number of functions.

Diagnostic routines and event logging are carried out by means of a real-time clock. Condition monitoring as well as integration and maintenance work can be carried out in an efficient and time-saving way – visible at any time in Software MotionGUI.



Remote maintenance via MotionGUI

- MotionGUI can be used for remote maintenance via TCP/IP communication
- Performance of analyses and diagnoses in the installed state (e.g. during machine breakdowns)

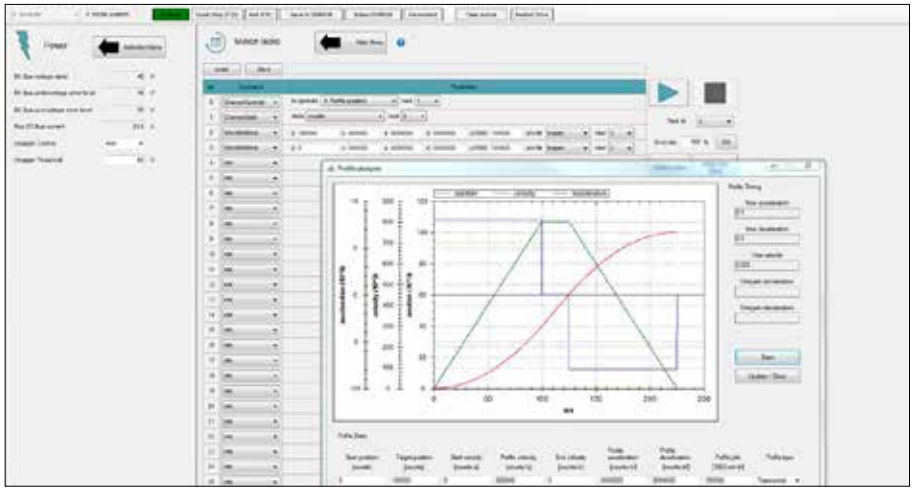


[SCOPE]

Diagnostic functions

- SCOPE function
Analysis of applications and movement sequences via the SCOPE function – also possible in offline mode

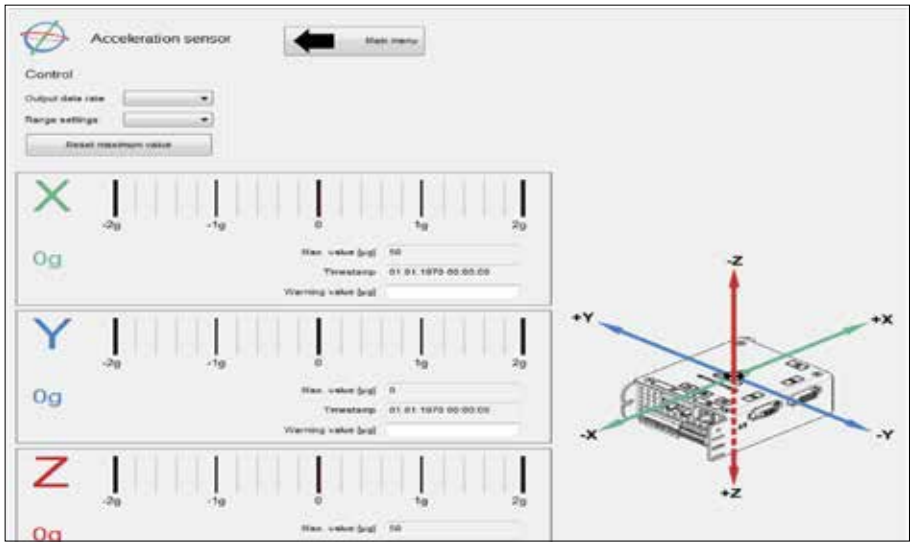
- Errors and Warnings
Logging of errors and warnings for fast troubleshooting –storage of errors in error history



[Motion tasks]

Motion tasks

- Extended motion block table with “decentralized intelligence” for individual modification and flexible programming of the application
- Simple creation of motion tasks with reduced programming effort for the vehicle manufacturer
- Complex single-axis movements, such as clamping processes on the vehicle or actuation of lifting modules can also be generated and executed decentrally
- In the case of several synchronized axes: movements can be started simultaneously via a synchronization signal from the controller
- Realization of stand-alone solutions by omitting the control system



[Acceleration sensor]

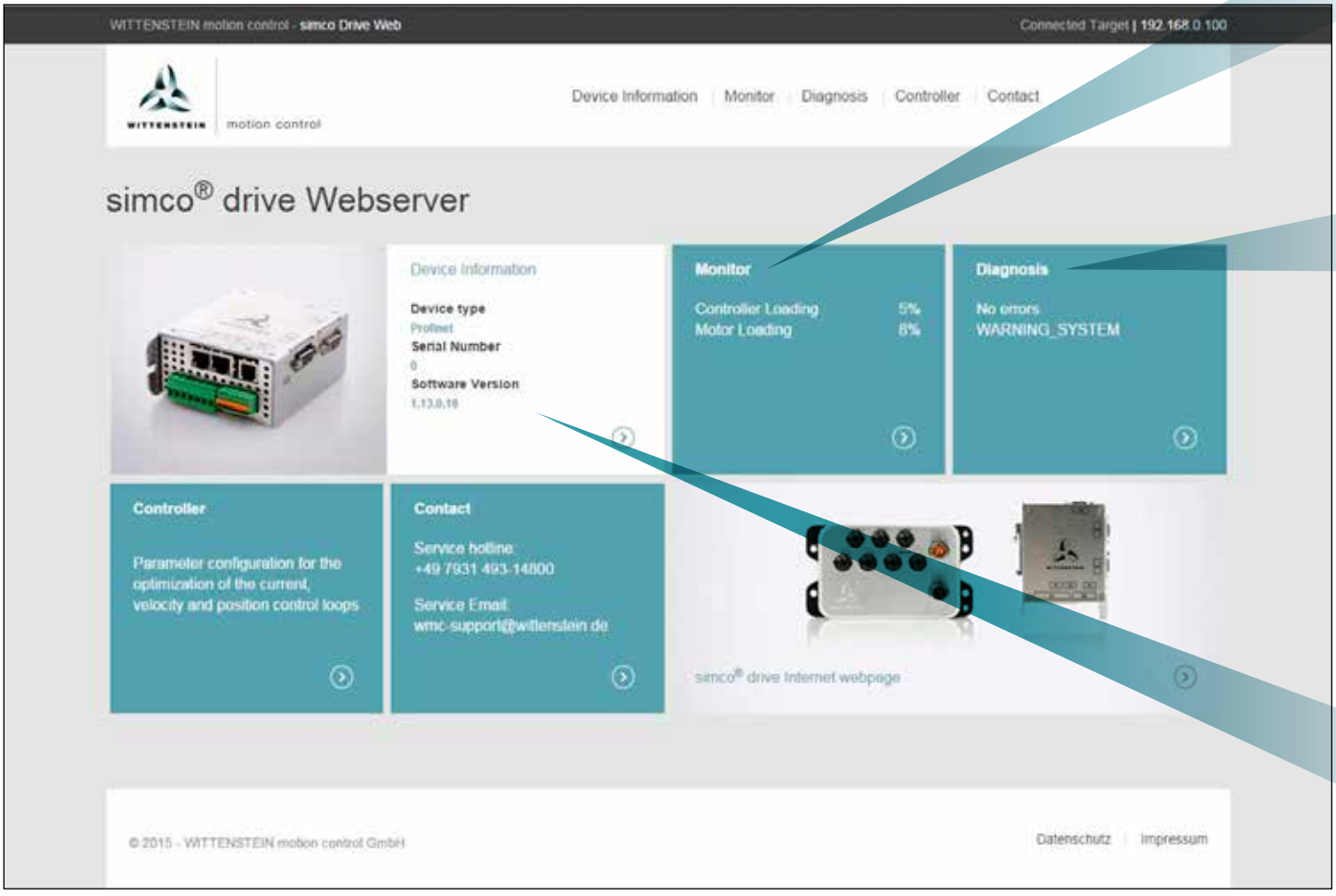
Acceleration sensor on board

- Analysis of acceleration values in the x,y,z direction
- Output of warnings and errors when defined maximum acceleration values are exceeded
- Analysis of crashes and the floor conditions of the plant

Web server

simco® drive web server

Using the web server integrated in the simco® drive, the amplifier can be accessed via the Internet during mobile operation. This makes it possible to check system utilization and respond to error or warning messages in an immediate and targeted manner at all times. The intelligent provision of data in the web server also facilitates commissioning and enables permanent condition monitoring during operational use of the vehicles, which contributes decisively to maximum availability of the entire AGV system.



What use cases does the web server have*?

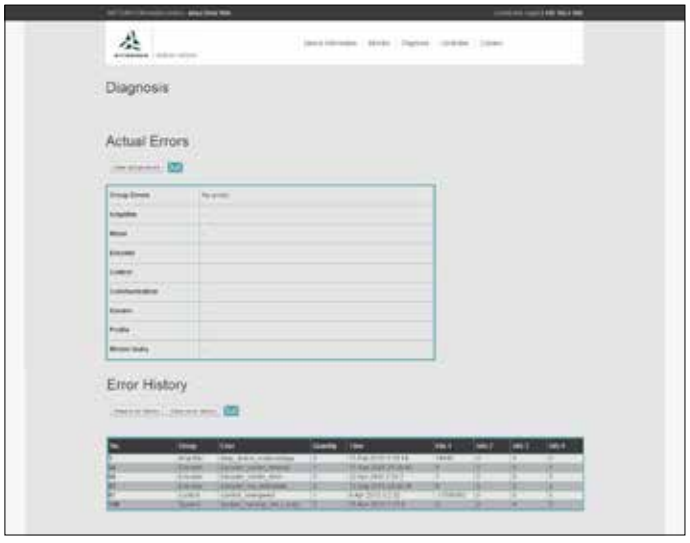
- Condition monitoring
- Optimization of the overall system / vehicle
- Analyses during running operation
- Analysis of the current vehicle condition through the drive components
- Rapid error analysis in the event of machine breakdowns
- Practical automation mechanisms for optimized troubleshooting (e.g. mailing support hotline)
- Implementation of measures for long-term error prevention
- Indication of information on the overall system

* the web server is currently available for the PROFINET version of the simco® drive.

Monitor

Function:
- Analysis of drive parameters during ongoing operation, e.g. temperature, torque, speed
- Determination of motor and servo drive utilization
- Output of diagrams for analysis of the values over time
- Definition of operating/utilization ranges
- Analysis of acceleration values (acceleration sensor)

Your benefits:
- Initiation of measures to optimize the system
- Simple condition monitoring
- Analysis of downsizing potential
- Optimization of operational processes



Diagnosis

Functions:
- Output of errors and warnings
- Acknowledgment of errors via the web server
- Display of error history

Your benefits:
- Fast and simple analysis
- Analysis of errors and warnings during ongoing operation
- Initiation of troubleshooting measures
- Solution finding via automated e-mailing of the error codes to the WITTENSTEIN support hotline

Device information

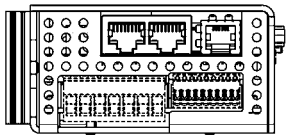
Functions:
- Indication of the device information such as serial number and order code
- Analysis of the overall drive system consisting of the motor and electronics
- Indication of the firmware status used and motor database version
- Display of operating hours

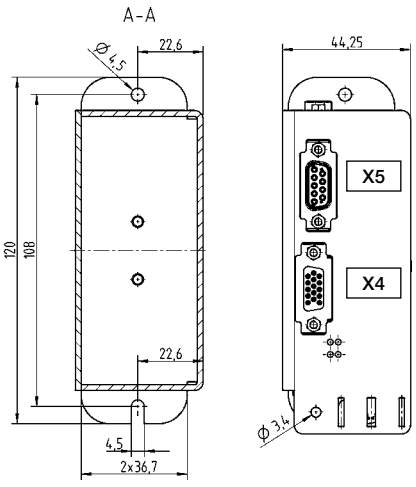
Your benefits:
- Optimal indication of device information
- Fast and simple analysis

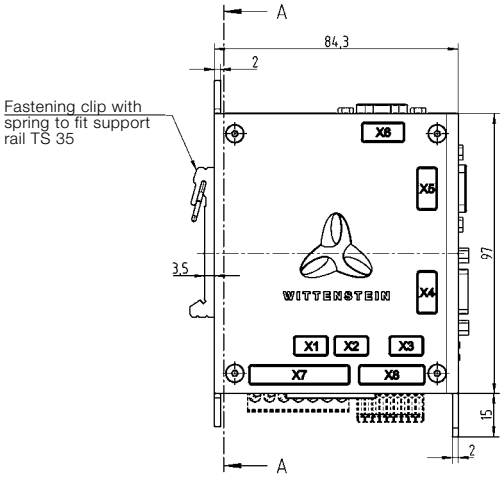
Servo drive version			SIM2010D-C	SIM2010D-F	SIM2015-C	SIM2050D-C
Rated output current	**I_N**	**A**	**10**	**10**	**15**	**50**
Supply voltage (power)	V_{DC}	V DC	+16 ... 56 (unregulated)	+16 ... 56 (unregulated)	+24 … +56 (unregulated)	+12 … +60 (unregulated)
Supply voltage (logic)	V_{log}	V DC	+24 (+/- 10 %)	+24 (+/- 10 %)	+24 (+/- 10 %)	+12 … +60 (unregulated)
Peak current	I_{max}	A_{eff}	20 (for 5s)	20 (for 5s)	30 (for 5s)	on request
Rated power	P_N	W	500	500	750	2500
Peak power	P_{max}	W	1000	1000	1500	on request
Switching frequency	f_{PWM}	kHz	8…32			
Current control resolutions		Bit	14	14	14	14
Communication			CANopen to DS402 EtherCAT with CoE PROFINET RT/ IRT TCP/IP* RS232	CANopen to DS402 EtherCAT with CoE PROFINET RT/ IRT (upon request) TCP/IP* RS232	CANopen to DS402 EtherCAT with CoE PROFINET RT/ IRT TCP/IP* RS232	CANopen to DS402 EtherCAT with CoE PROFINET RT/ IRT TCP/IP* RS232
Drive function to DS 402 for CANopen / EtherCAT communication			- Profile position mode - Homing mode - Profile velocity mode - Profile torque mode - Cyclic synchronous position mode - Cyclic synchronous velocity mode			
Supported PROFIdrive application classes for PROFINET communication			- Application class 1 (PROFINET RT) - Application class 3 (PROFINET RT) - Application class 4 (PROFINET IRT)			
Encoder interfaces			- BISS C - EnDat 2.2 - Hall sensor			
Safety function			STO (Safe Torque off) according to SIL 3 (certified)			STO (Safe Torque off) according to SIL3 (certification pending)
Technology functions			Disk cam, motion tasks			
Protection class			IP20	IP65	IP20	IP20
Digital inputs			4, opto decoupled, freely programmable function			
Digital outputs			2, opto decoupled, freely programmable function			
Event logging with real-time clock			✓			
Brake actuation			✓			
External ballast resistor			✓			
Drive program with PLC functions			✓			
Operating temperature range	ϑ_A	°C	0…45			
Weight	m	kg	0.3	0.85	0.3	on request

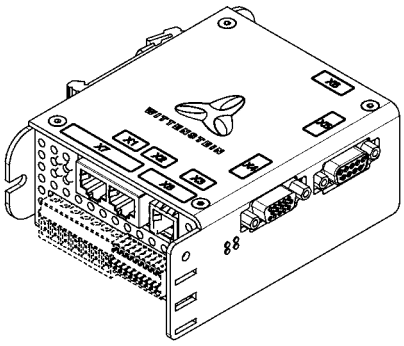
* Only available with PROFINET version

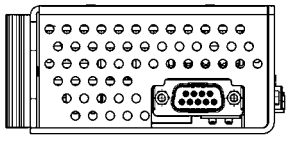
SIM2010D-C and SIM2015D-C







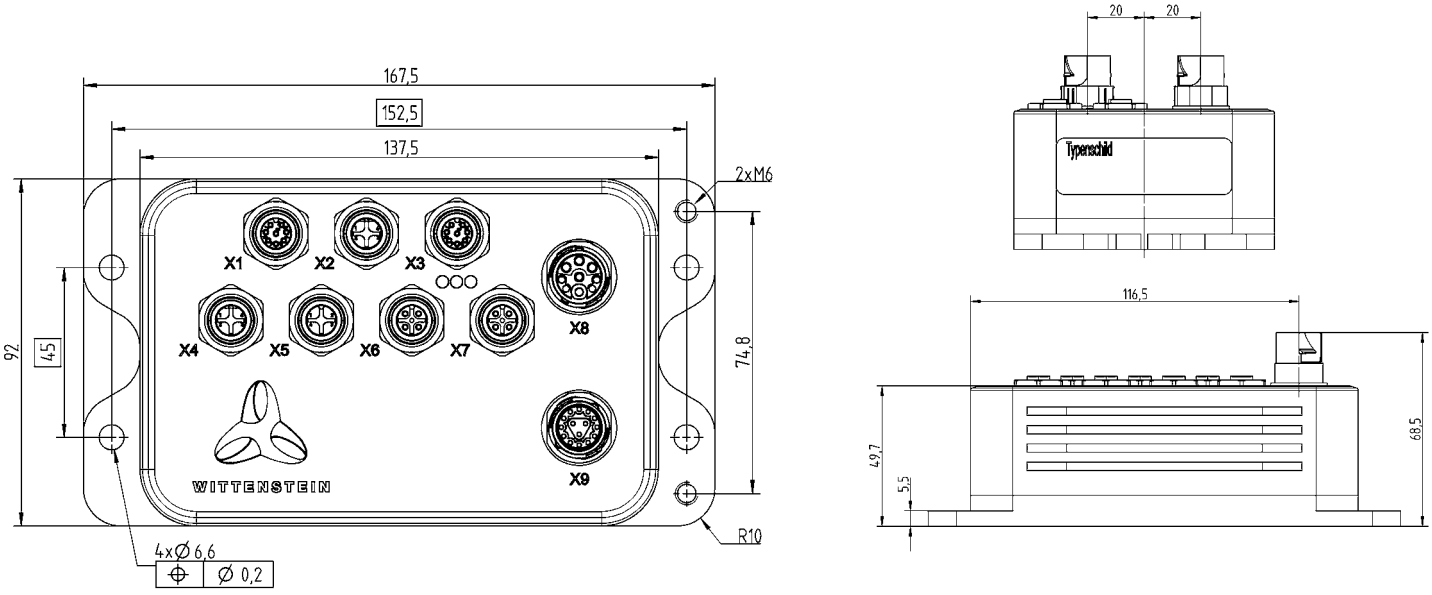




Plug connections

Marking	Interface type	Plug connection
X1	Input field bus interface	RJ45
X2	Output field bus interface	RJ45
X3	RS232 diagnostic interface	RJ12
X4	Encoder interface	D-Sub, 15-pin, female
X5	Resolver interface	D-Sub, 9-pin, female
X6	Digital inputs/outputs	D-Sub, 9-pin, male
X7	Motor connection	Phoenix_MSTBA_2.5_HC/7-G
X8	Voltage supply	Phoenix_MC_0.5/9-G-2.5

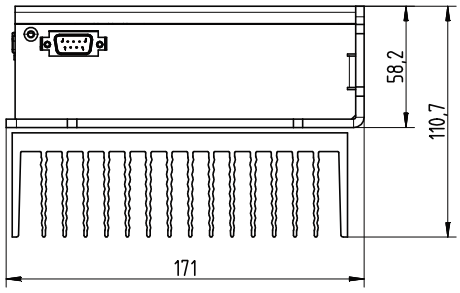
SIM2010D-F

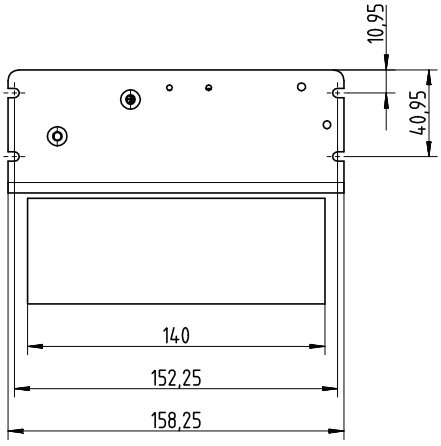


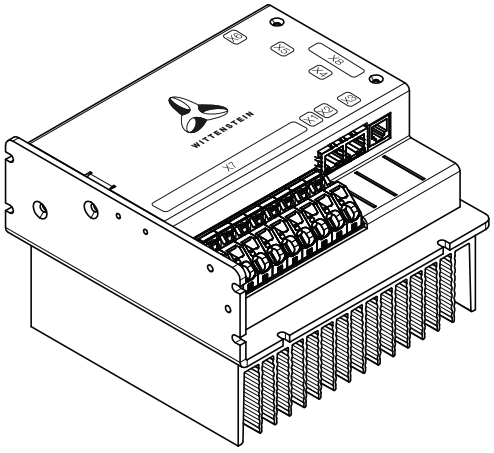
Plug connections

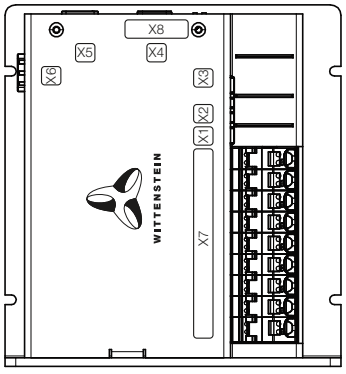
Marking	Interface type	Plug connection
X1	Resolver interface	M12 8-pin, female, A-coded
X2	Digital inputs	M12 5-pin, female, B-coded
X3	Encoder interface	M12 8-pin, female, A-coded
X4	Digital outputs	M12 5-pin, female, B-coded
X5	RS 232 diagnostic interface	M12 4-pin, female, A-coded
X6	Input field bus interface	CANopen version: M12 5-pin, female, A-coded EtherCAT version M12 4-pin, female, D-coded
X7	Output field bus interface	CANopen version: M12 5-pin, female, A-coded EtherCAT version M12 4-pin, female, D-coded
X8	Voltage supply	Intercontec itec 915, 9-pin, male
X9	Motor connection	Intercontec itec 915, 15-pin, female

SIM2050D-C







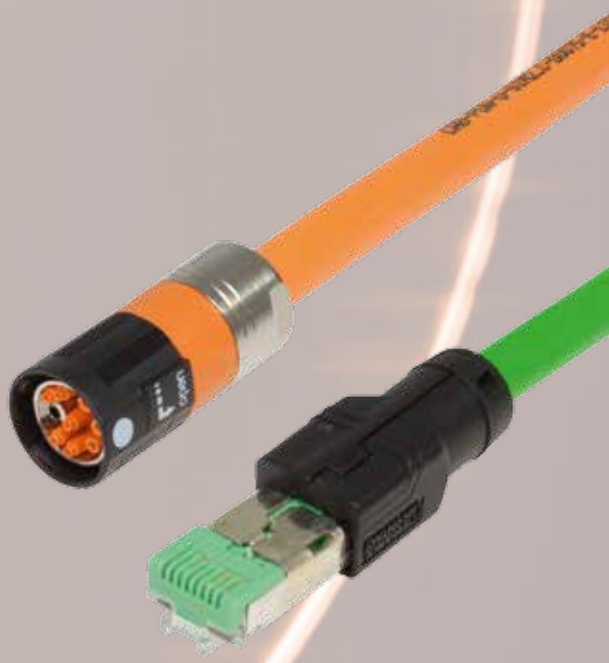


Plug connections

Marking	Interface type	Plug connection
X1	Input field bus interface	RJ45
X2	Output field bus interface	RJ45
X3	RS232 diagnostic interface	RJ12
X4	Encoder interface	D-Sub, 15-pin, female
X5	Resolver interface	D-Sub, 9-pin, female
X6	Digital inputs/outputs	D-Sub, 9-pin, male
X7	Motor connection	Phoenix Contact ZFKDS 10-10.00
X8	Voltage supply	Phoenix Contact MC 1.5/10-GF-3.5

Heat sink available as an accessory.

Accessories



Cables

Pre-configured lengths

The following pre-configured cables are available for fast commissioning of your drive system:

- Cables for **voltage supply** of the simco® drive
- **Field bus cables** for CANopen, EtherCAT and PROFINET communication
- Cables for **commissioning**
- **Motor connection cables** for connecting to the servo drive.

Further cable lengths are available upon request.

Technical details of the motor connection cables:

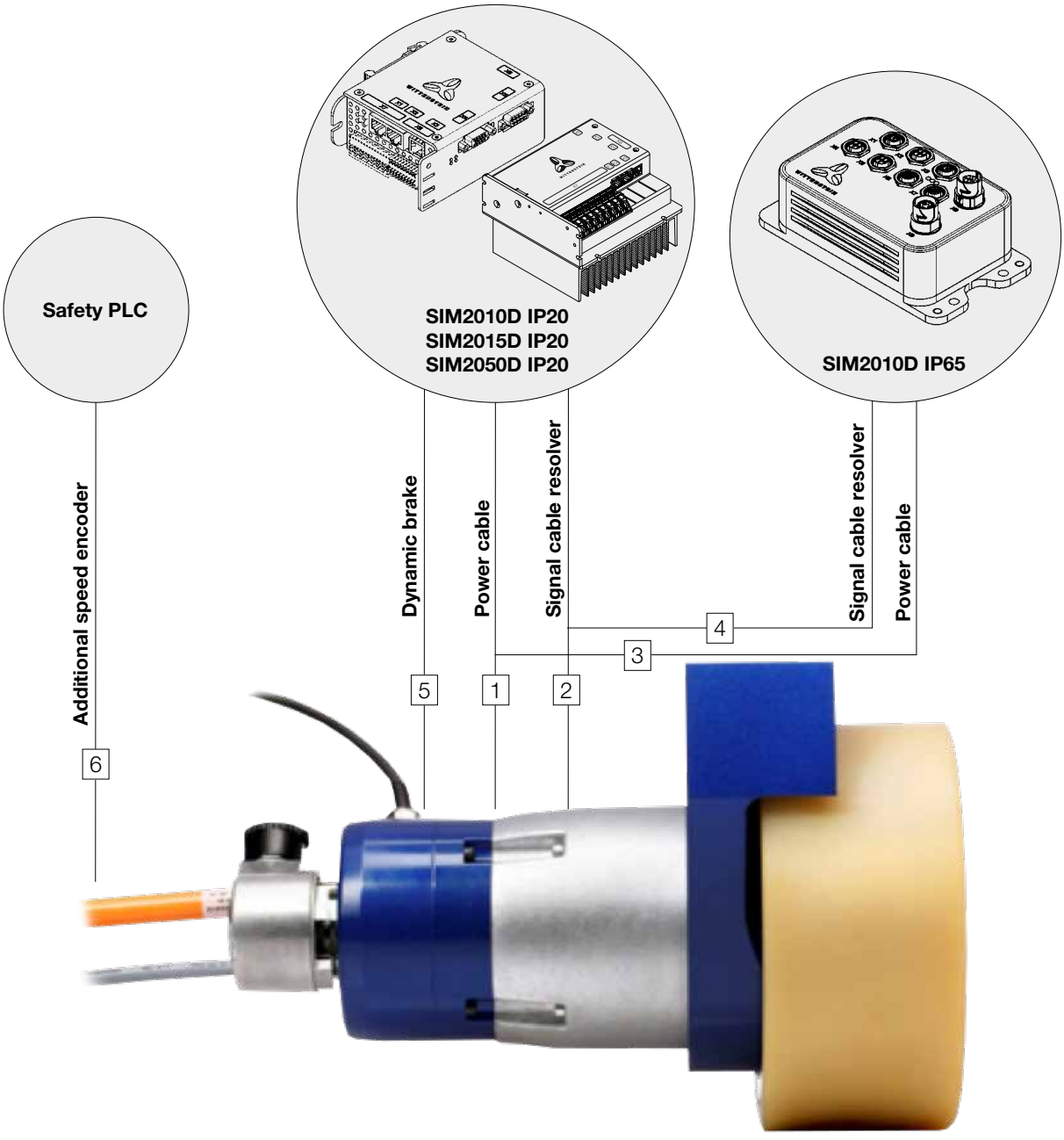
- Temperature range
  Cables for TAS: –30 to 80°C
- EMC shielding
- Material: PUR
- Drag chain suitable

Further technical data is available upon request.

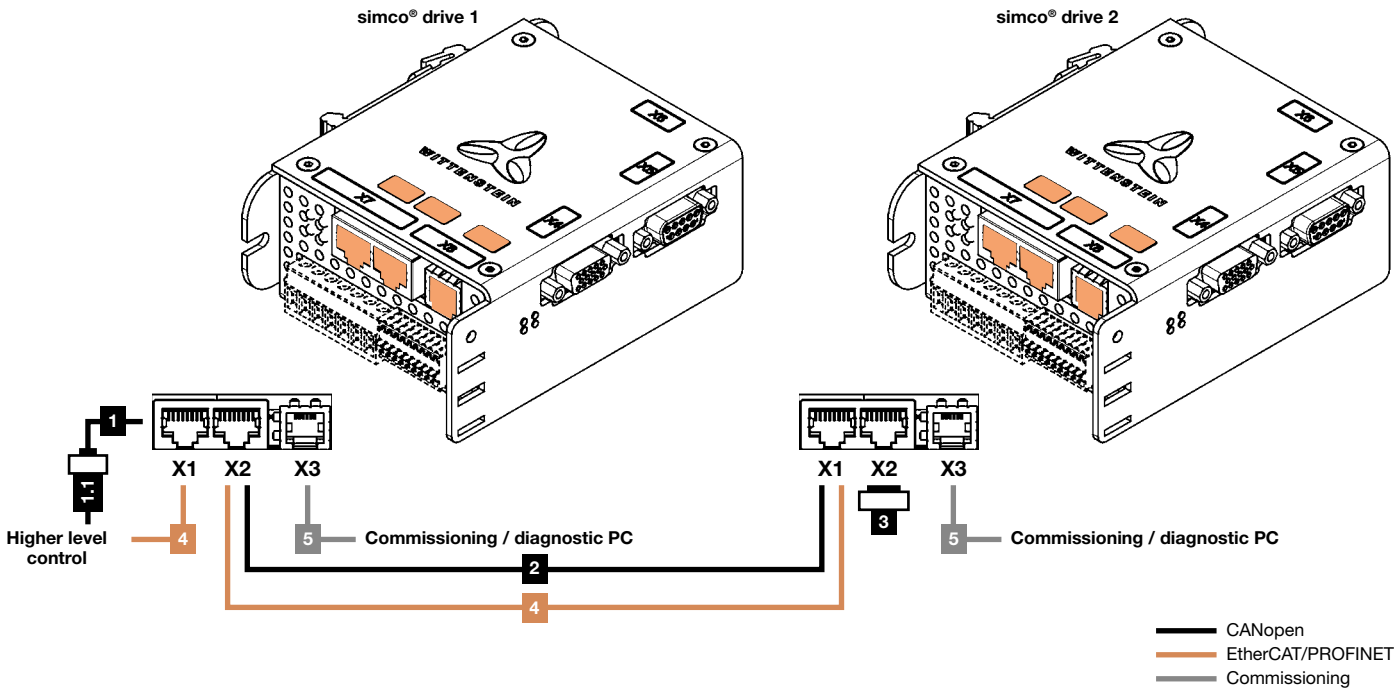
Motor connection cables

No.	Servo drive	Cable type	Description	Interfaces		Standard lengths
				Motor	Servo drive	
TAS 004						
1	SIM2010D/ SIM2015 IP20	Power cable	CAB-POW-U-SIM2_C-D0150-E-LXXXX	itec, series 915	Phoenix Contact connector	1 m; 2 m; 3 m; 5 m
2		Signal cable resolver	CAB-SIG-R-SIM__C-D0000-E-LXXXX		Sub-D connector, 9-pin	
3	SIM2010D IP65	Power cable	CAB-POW-U-SIM2_F-D0075-E-LXXXX		itec, series 915	
4		Signal cable resolver	CAB-SIG-R-SIM__F-D0000-E-LXXXX		M12 connector, 8-pin	
5	–	Dynamic brake*	contained in article code of actuator	Direct cable outlet	M12 connector, 4-pin	0.4 m
6	–	Additional speed encoder	Cable not available in scope of supply; support can be provided for sourcing upon request			
TAS 010						
1	SIM2010D/ SIM2015D IP20	Power cable	CAB-POW-U-SIM2_C-D0250-S-LXXXX	speedtec, series 923	Phoenix Contact connector	1 m; 2 m; 3 m; 5 m
2		Signal cable resolver	CAB-SIG-R-SIM__C-D0000-S-LXXXX		Sub-D connector, 9-pin	
3	SIM2010D IP65	Power cable	CAB-POW-U-SIM2_F-D0075-S-LXXXX		itec, series 915	
4		Signal cable resolver	CAB-SIG-R-SIM__F-D0000-S-LXXXX		M12 connector, 8-pin	
5	–	Dynamic brake*	contained in article code of actuator	Direct cable outlet	M12 connector, 4-pin	0.4 m
6	–	Additional speed encoder	Cable not available in scope of supply; support can be provided for sourcing upon request			
TAS 025						
1	SIM2050D IP20	Power cable	contained in article code of actuator	Direct cable outlet	Free cable ends	see actuator order code
2	SIM2050D IP20	Signal cable resolver			Sub-D connector, 9-pin	
5	–	Dynamic brake*			M12 connector, 4-pin	0.4 m
6	–	Additional speed encoder	Cable not available in scope of supply; support can be provided for sourcing upon request			
TAS 050						
1	SIM2050D IP20	Power cable	CAB-POW-U-STEC23-D5000-T-LXXXX (single-phase motor cable)	singletec, series 923	Free cable ends	1 m; 2 m; 3 m; 5 m
–	–	Signal cable resolver	CAB-SIG-R-CT_SP_-D0000-S-LXXXX	speedtec, series 923	Free cable ends	
2	SIM2050D IP20	Signal cable resolver	CAB-SIG-R-SIM_1C-D0000-S-LXXXX	speedtec, series 923	Sub-D connector 9-in; temp. sensor with separate outlet from connector	
5	–	Dynamic brake*	contained in article code of actuator	Direct cable outlet	M12 connector, 4-pin	0.4 m
6	–	Additional speed encoder	Cable not available in scope of supply; support can be provided for sourcing upon request			

** Connection to safety PLC or to regulator through individual preparation; extension cable (M12 at open cable ends) available upon request.*

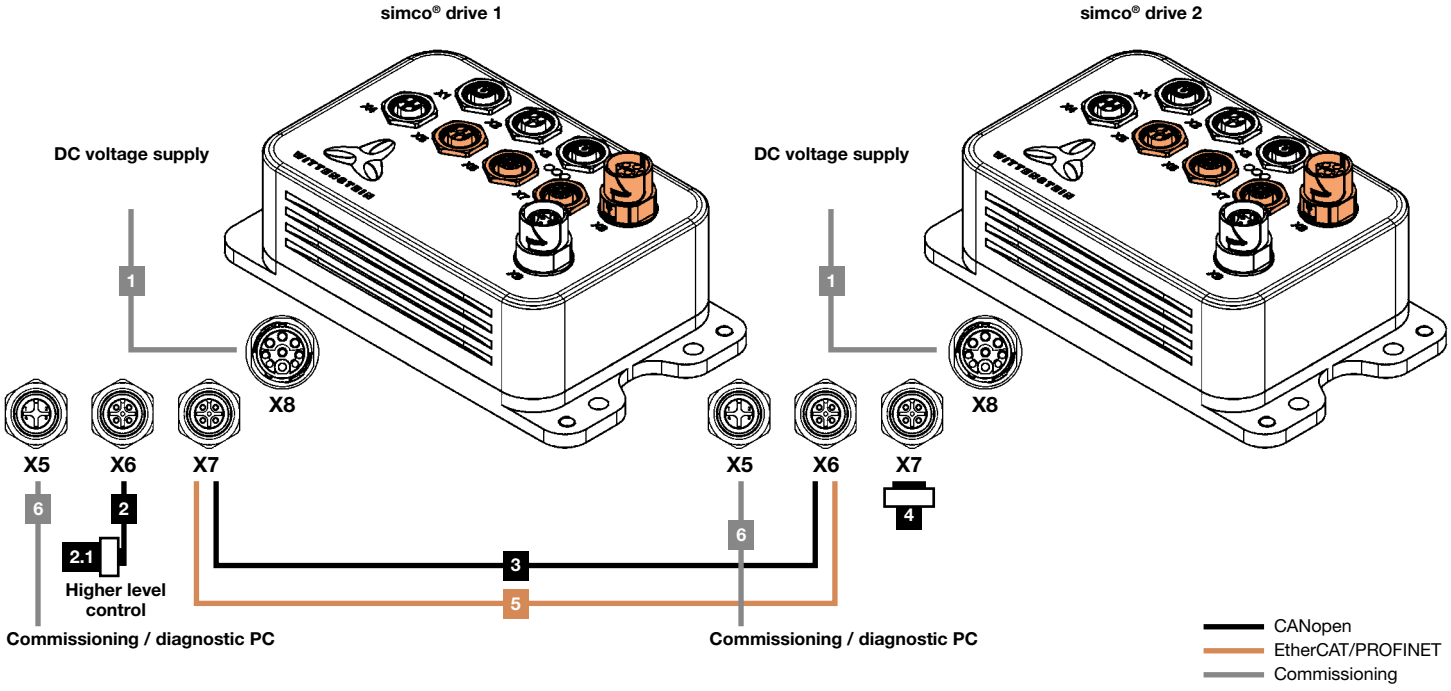

Safety PLC
SIM2010D IP20
SIM2015D IP20
SIM2050D IP20
SIM2010D IP65
Additional speed encoder
Dynamic brake
Power cable
Signal cable resolver
Signal cable resolver
Power cable
6
5
1
2
4
3

Cables



SIM2010D, SIM2015D and SIM2050D IP20

No.	Type of accessory	Description	Interfaces		Description	Standard lengths
			Servo drive	Controller / servo drive 2 / PC		
CANopen field bus						
1	CANopen field bus cable	CAB-BUS-CAN-RJ45-FL__-LXXXX	RJ45 connector, 8-pin	Free cable end	-	5 m
1.1	CAN Sub-D connector	SUBCON-PLUS-CAN/PG	-	-	9-pin connector with cable entry and outlet as well as switchable terminating resistor	-
2	CANopen field bus extension cable	CAB-BUS-CAN-RJ45-RJ45-LXXXX	RJ45 connector, 8-pin	RJ45 connector, 8-pin	-	1.5 m; 5 m
3	CANopen terminating resistor	CAB-BUS-CAN-RJ45-TERMINAT	-	RJ45 connector, 8-pin	Terminating resistor only necessary for CAN communication	-
EtherCAT / PROFINET field bus cable						
4	EtherCAT / PROFINET field bus cable	CAB-BUS-ETH-RJ45-RJ45-LXXXX	RJ45 connector, 8-pin	RJ45 connector, 8-pin	-	1.5 m; 3 m; 5 m; 7.5 m; 10 m
Commissioning						
5	Extension cable RS 232	CAB-BUS-RS_-RJ12-SF09-LXXXX	RJ12 connector, 6-pin	Sub-D connector, 9-pin	Connection cable RS 232 for diagnostic purposes, commissioning with MotionGUI	3 m



SIM2010D IP65

No.	Type of accessory	Description	Interfaces		Description	Standard lengths
			Servo drive	DC voltage supply / Controller / Servo drive 2 / PC		
Voltage supply						
1	Voltage supply	CAB-SUP-SIM2010D-F-D0075-LXXXX	itec, series 915	Free cable end	DC voltage supply cable	2 m; 5 m
CANopen field bus						
2	CANopen field bus cable	CAB-BUS-CAN-M12M-FL__-LXXXX	M12 connector, 5-pin, A-coded	Free cable end	-	5 m
2.1	CAN Sub-D connector	SUBCON-PLUS-CAN/PG	-	-	9-pin connector with cable entry and outlet as well as switchable terminating resistor	-
3	CANopen field bus extension cable	CAB-BUS-CAN-M12M-M12M-LXXXX	M12 connector, 5-pin, A-coded	M12 connector, 5-pin, A-coded	-	0.5 m; 1 m
4	CANopen terminating resistor	CAB-BUS-CAN-M12M-TERMINAT	-	M12 connector, 5-pin, A-coded	Terminating resistor only necessary for CAN communication	-
EtherCAT / PROFINET field bus cable						
5	EtherCAT / PROFINET field bus cable	CAB-BUS-ETH-M12M-M12M-LXXXX	M12 connector, 4-pin, D-coded	M12 connector, 4-pin, D-coded	-	1.5 m; 3 m; 5 m; 10 m
Commissioning						
6	Extension cable RS 232	CAB-BUS-RS_-M12M-SF09-LXXXX	M12, 4-pin	Sub-D connector, 9-pin	Connection cable RS 232 for diagnostic purposes, commissioning with MotionGUI	5 m

Order code

TAS

1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0
T	**A**	**S**	–	**0**	**0**	**4**	**C**	–	**0**	**2**	**8**	**P**	–	**1**	**P**	**0**	–	**0**	**5**	**3**	**W**	–	**W**	**4**	**E**	–	**0**	**0**	**0**

Product and series designation
3 characters (pos. 1-3):
TAS series

Size
3 characters (pos. 5-7):
004
010
025
050

Package
1 character (pos. 8):
C = compact
S = advanced speed
L = advanced load
P = performance

Ratio
3 characters (pos. 10-12):
according to the gearhead ratio

Mounting hardware
1 character (pos. 13):
0 = None
P = Parallel installation (motor axis parallel to vehicle axis)

Acceptable intermediate circuit voltage (max.)
1 character (pos. 15):
1 = 24 V
2 = 48 V

Temperature sensor
1 character (pos. 16):
P = PTC
T = PT1000

Additional encoder
1 character (pos. 17):
0 = No
1 = DFS060 low resolution
2 = DFS060 high resolution

Motor size
3 characters (pos. 19-21):
see performance data allocation table

Winding
1 character (pos. 22):
W = Wide performance range

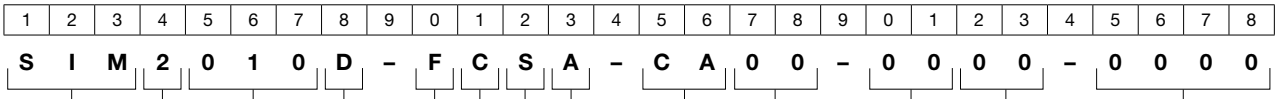
Electrical connection and pin assignment
2 characters (pos. 24-25):
W4 = Angled integral socket, pin assignment 4 (simco® drive compatible) (TAS 004, 010)
G4 = Straight integral socket, pin assignment 4 (simco® drive compatible) (TAS 004, 010)
G1 = Straight integral socket, pin assignment 1 (TAS 050)
KS = Cable outlet, pin assignment 4 (simco® drive compatible) (TAS 025)

Cable length / connector type
2 character (pos. 26):
E = itec®, series 615/915
S = speedtec®, series 923
T = singletec®, series 923
A = 1 m
B = 2 m
C = 3 m
D = 5 m

Special
3 characters (pos. 28-30), continuous

We will be pleased to configure a suitable iTAS system for YOU.

simco® drive



Product range
3 characters (pos. 1-3)

Intermediate circuit voltage
1 character (pos. 4):
2 = 48 V

Rated output current
3 characters (pos. 5-7):
010 = 10 A_{eff}
015 = 15 A_{eff}
050 = 50 A_{eff}

Voltage supply
1 character (pos. 8):
D = DC voltage

Housing version
1 character (pos. 10):
C = Version for control cabinet, IP20
F = Decentralized version, IP65

Cooling
1 character (pos. 11):
C = Convection

Overload factor
1 character (pos. 12):
S = 2x, internal

Device generation
1 character (pos. 13):
A = 1st generation

Field bus interface
2 characters (pos. 15-16):
CA = CANopen
EC = EtherCAT
PN = PROFINET, TCP/IP

Electrical connection
2 characters (pos. 17-18):
00 = Standard

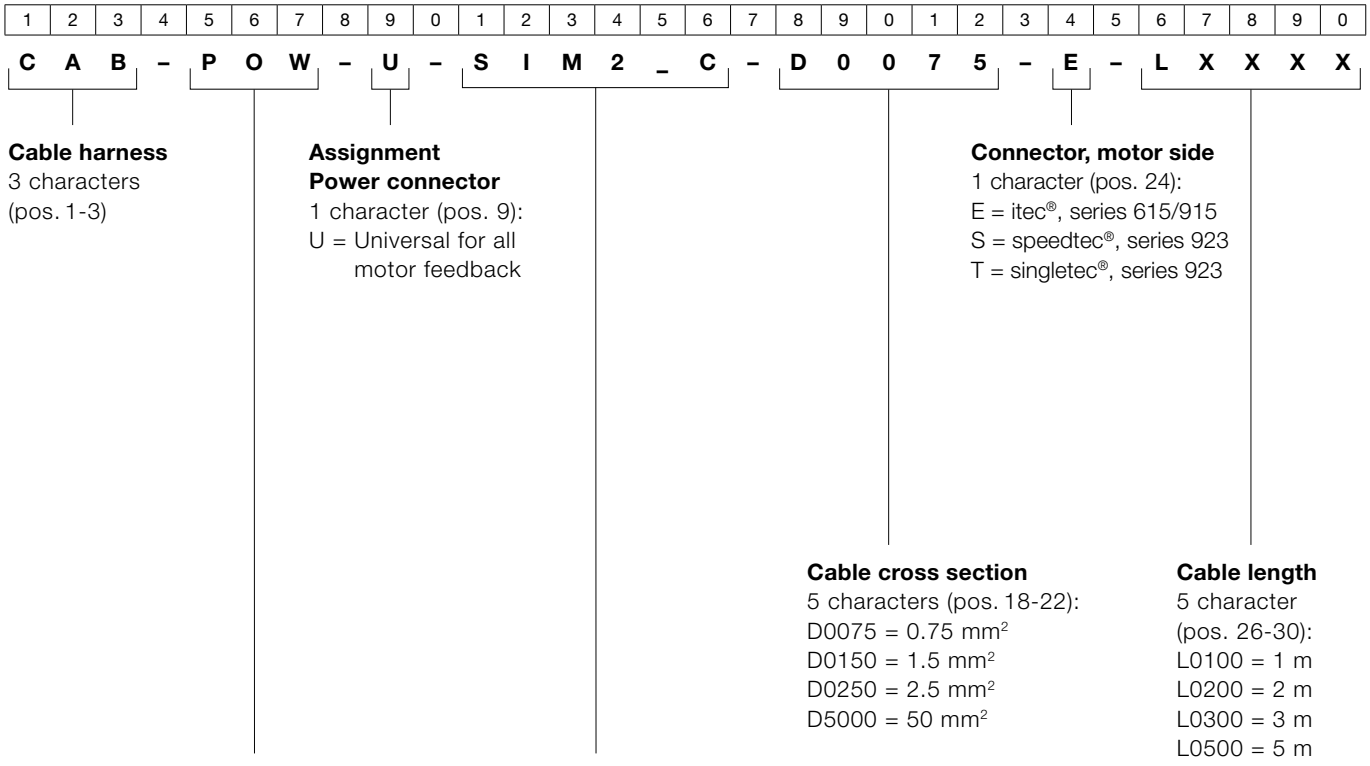
Safety version
2 characters (pos. 20-21):
00 = STO to SIL3 (certified)

Motor feedback system
2 characters (pos. 22-23):
00 = Standard EnDat / BiSS / resolver

Special
4 characters (pos. 25-28):
0000 = Standard
xxxx = Sequential number, special version

Order code

iTAS power cable



Cable harness
3 characters
(pos. 1-3)

Assignment
Power connector
1 character (pos. 9):
U = Universal for all
motor feedback

Connector, motor side
1 character (pos. 24):
E = itec®, series 615/915
S = speedtec®, series 923
T = singletec®, series 923

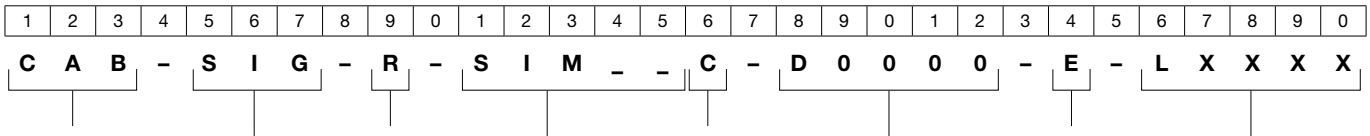
Cable cross section
5 characters (pos. 18-22):
D0075 = 0.75 mm²
D0150 = 1.5 mm²
D0250 = 2.5 mm²
D5000 = 50 mm²

Cable length
5 character
(pos. 26-30):
L0100 = 1 m
L0200 = 2 m
L0300 = 3 m
L0500 = 5 m

Type
3 characters (pos. 5-7):
POW = Power cable

Connector, motor side
and version of servo drive
6 characters (pos. 11-16):
SIM2_C = simco® drive IP20 (max. Vint = 48 V)
SIM2_F = simco® drive IP65 (max. Vint = 48 V)
STEC23 = singletec®, series 923 – free cable ends
(single-phase motor cable)

iTAS signal cable



Cable harness
3 characters (pos. 1-3)

Type
3 characters (pos. 5-7):
SIG = Signal cable

Feedback system
1 character (pos. 9):
R = Resolver

Pin assignment
4 characters (pos. 11-14):
SIM__ = simco® drive (standard pin assignment 4)
SIM_1 = simco® drive (pin assignment 1 – temperature sensor in signal cable)
CT_SP = Cable for pin-assignment 1 (temperature sensor in signal cable)

Connector, drive side
1 character (pos. 16):
C = IP20
F = IP65
_ = Open cable ends (universal)

Cable cross section
5 characters (pos. 18-22):
D0000 = standard for all sizes

Connector, motor side
1 character (pos. 24):
E = itec®, series 615/915
S = speedtec®, series 923

Cable length
5 character (pos. 26-30):
L0100 = 1 m
L0200 = 2 m
L0300 = 3 m
L0500 = 5 m

Order code

simco® drive voltage supply

1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0
C	**A**	**B**	**–**	**S**	**U**	**P**	**–**	**S**	**I**	**M**	**2**	**0**	**1**	**0**	**D**	**–**	**F**	**–**	**D**	**0**	**0**	**7**	**5**	**–**	**L**	**X**	**X**	**X**	**X**

Cable harness
3 characters
(pos. 1-3)

Type
3 characters (pos. 5-7):
SUP = Voltage supply cable

Connector, motor side
8 characters (pos. 9-16):
SIM2010D = simco® drive
(10 A rated current)

Version of servo drive
1 character (pos. 18):
F = IP65

Cable cross section
5 characters (pos. 20-24):
D0075 = 0.75 mm²

Cable length
5 characters (pos. 26-30):
Length in cm:
Note available cable
lengths on page 50/51

Fieldbus cable and RS232 connection cable

1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7
C	A	B	–	B	U	S	–	C	A	N	–	M	1	2	M	–	M	1	2	M	–	L	X	X	X	X

Cable harness
3 characters (pos. 1-3)

Type
3 characters (pos. 5-7):
BUS = Field bus cable

Type of connection
3 characters (pos. 9-11):
CAN = CANopen field bus cable
RS_ = RS232 connection cable
ETH = EtherCAT / PROFINET field bus cable

simco® drive cable end
4 characters (pos. 13-16):
M12M = M12 connector, 5-pin, straight
RJ45 = RJ45 connector, 8-pin
RJ12 = RJ12 connector, 6-pin

Cable end at controller
4 characters (pos. 18-21):
M12M = M12 connector, 5-pin, straight
RJ45 = RJ45 connector, 8-pin
FL__ = Free cable end
SF09 = Sub-D connector, 9-pin

Cable length
5 characters (pos. 23-27):
Length in cm:
Note available cable lengths on page 50/51

Service concept

Our services at a glance

Our service concept continues to raise the bar for service quality. We are there for you, from the initial concept and throughout the entire life cycle of your application.

PRE-SALES		AFTER-SALES	
Planning	Investment	Application	Re-investment
Consultation & design Customer training Info & CAD Finder	cymex® **sizing software** Engineering Sensors cymex® Statistics	Manuals Commissioning Pick-up & return service Repair service Preventive maintenance	Modernization service

Contact data

PRE-SALES	AFTER-SALES
Support hotline	Service hotline
For reliable and expert dimensioning.	For fast and unbureaucratic assistance with repairs and questions on supplied products.
Tel.: **+49 7931 493-14400** **Fax:** **+49 7931 493-10915** **E-mail:** **sales@wittenstein-motion-control.de**	**Tel.:** **+49 7931 493-14900** **Fax:** **+49 7931 493-10903** **Email:** **service@wittenstein-motion-control.de**

Technical support

For any questions on installation, commissioning and optimization.

Tel.: +49 7931 493-14800, E-mail: wmc-support@wittenstein.de

For detailed information, please visit **www.wittenstein-motion-control.com**

Notes

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