04 | 2015

DriveLine | Actuators

4.0

With a clear vision for the future!

Today SIKO can look back over five decades of experience in the production of measuring instruments for length, angle and speed measurement as well as the measurement of tilt angles and speed. With these core competencies as its foundation, SIKO develops and produces measuring instruments and positioning systems for automation and manufacturing processes that are geared to the future.

The highest demands of our customers from the industry and the mechanical engineering sector are more than met by the quality, precision and functionality of our products and services.

SIKO is certified to DIN EN ISO 9001 : 2008. In our company sustainable use of resources is a matter of course.

Six product ranges - a wide portfolio for very different measuring assignments

The SIKO product portfolio comprises a total of six ranges,
including high-quality measuring instruments and positioning systems for the industry and the
mechanical engineering sector.

We develop sensor systems for measured value acquisition either for you or in collaboration with your company. Shorter tooling times and the optimization of manufacturing and production processes are often the centre of focus.

OEM customers, projects and special solutions, retrofits or spare parts supplies directly to end users - all our customers are important!

6 distinctive product lines	
PositionLine	mechanical and electronic position indicators, handwheels with analog displays, adjustment buttons
RotoLine	magnetic and optical rotary encoders, geared potentiometers
LinearLine	wire-actuated encoders
DriveLine	actuators
MagLine	magnetic length and angle measuring systems
OptoLine	high-precision optical sensors

Global success is never coincidental

Today the robust and innovative SIKO measuring instruments are in use in industrial and mechanical engineering installations around the world.

Five SIKO subsidiaries are at your disposal in the following countries:

- U.S.A.
- Italy
- Switzerland
- China
- Singapore

In addition, around 60 national and international agencies are on the spot for direct customer contact and technical support. Sales engineers and service technicians support OEM customers as well as users at their own facilities, providing competent advice and services in the respective national languages.

Horst Wandres & Sven Wischnewski | Management of SIKO GmbH

"The AG02 drives do the same job in around 1.5 minutes – irrespective of whether only one axis is adjusted or all 14. In the latter case – 30 minutes compared to 1.5 minutes – we are 20 times faster with automatic format adjustment".

Mr Salzani, Mechanical Department Manager at Vimco S.r.l.
Extract from A&D, February

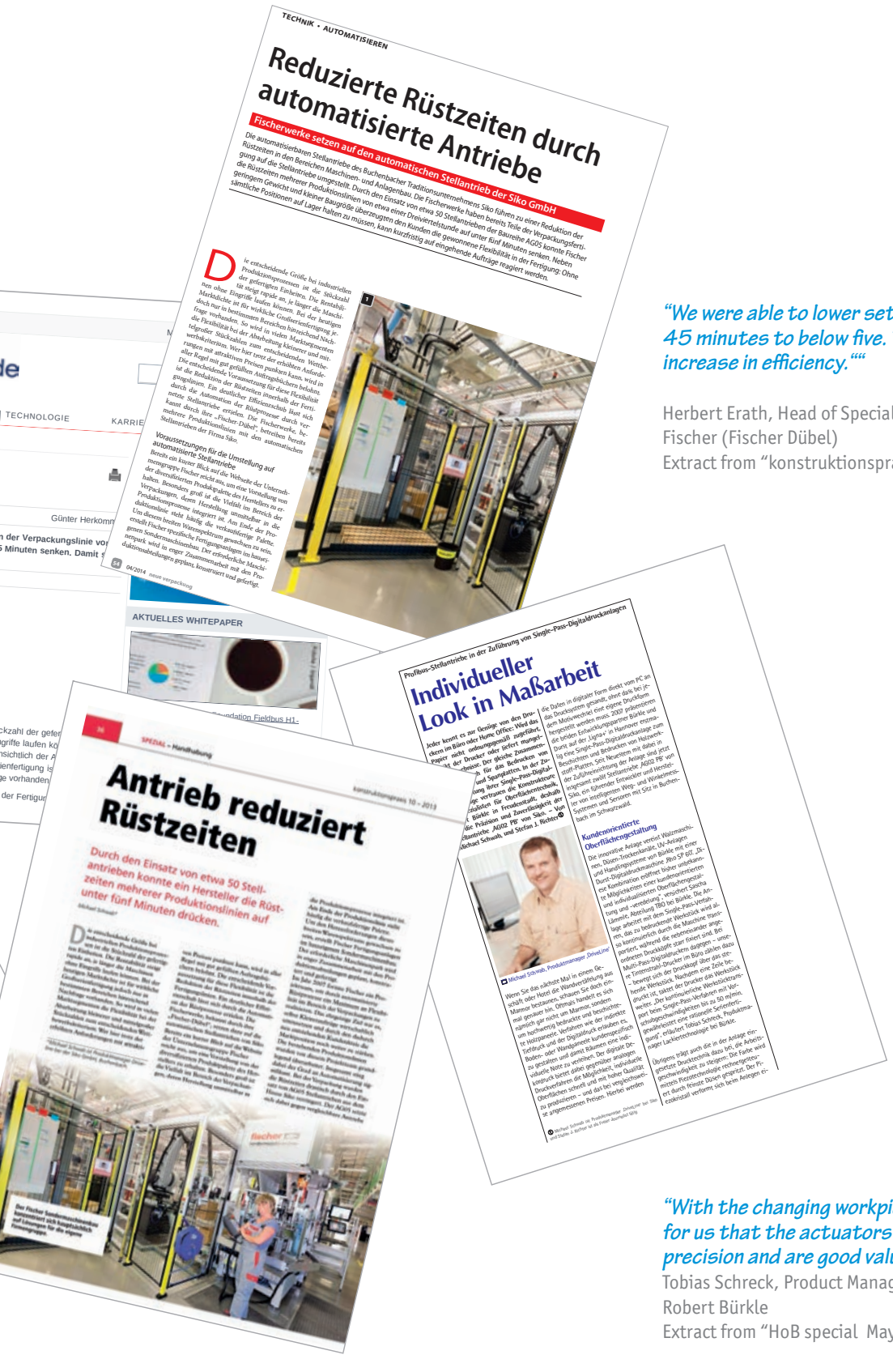
"In addition, no more adjustment errors can occur with automated processes, the product quality is enhanced and off-spec products are minimized."

Extract from A&D, February 2007

4.0

"Automated actuators Set-up times slashed by around 90 percent""

Günter Herkommer, editor at computer-automation.de
online publication of 6 May 2014



"We were able to lower set-up times from 45 minutes to below five. This is a tremendous increase in efficiency.""

Herbert Erath, Head of Special Mechanical Engineering, Fischer (Fischer Dübel)
Extract from "konstruktionspraxis" October 2013

"With the changing workpiece formats it was essential for us that the actuators we use guarantee maximum precision and are good value for money.""

Tobias Schreck, Product Manager, Coating Technology Robert Bürkle
Extract from "HoB special May 2008"

4.1

4.1 | Actuators

SIKO DriveLine: Shorter setup times, higher productivity !

"Short cycle times and changeover times, high productivity and quality with lower capital expenditure" is the recipe for success of ideal industrial processes.

The DriveLine actuators are particularly well suited for automatic format adjustment, stop positioning, tool alignment and valve adjustment as well as many other comparable positioning tasks: from a rotary actuator or actuator for simple applications and ancillary functions to a rotary drive and spindle drive or servo drive replacement for the control of complex machine processes and main processes, all of these tasks are easily mastered.

Thanks to a variety of sizes and forms, the integration of the actuator, the sensor and the control technology in a compact housing, different interfaces and bus systems, professional mechanical engineering is supported effectively in the integration and commissioning of the systems. The hollow shaft is mounted by simply attaching and locking the drive shaft using a clamping ring (keyway is optional), also making flexible retrofitting of existing axes possible without the need for lengthy preparation for assembly and fastening with the corresponding couplings, adapters and covers.

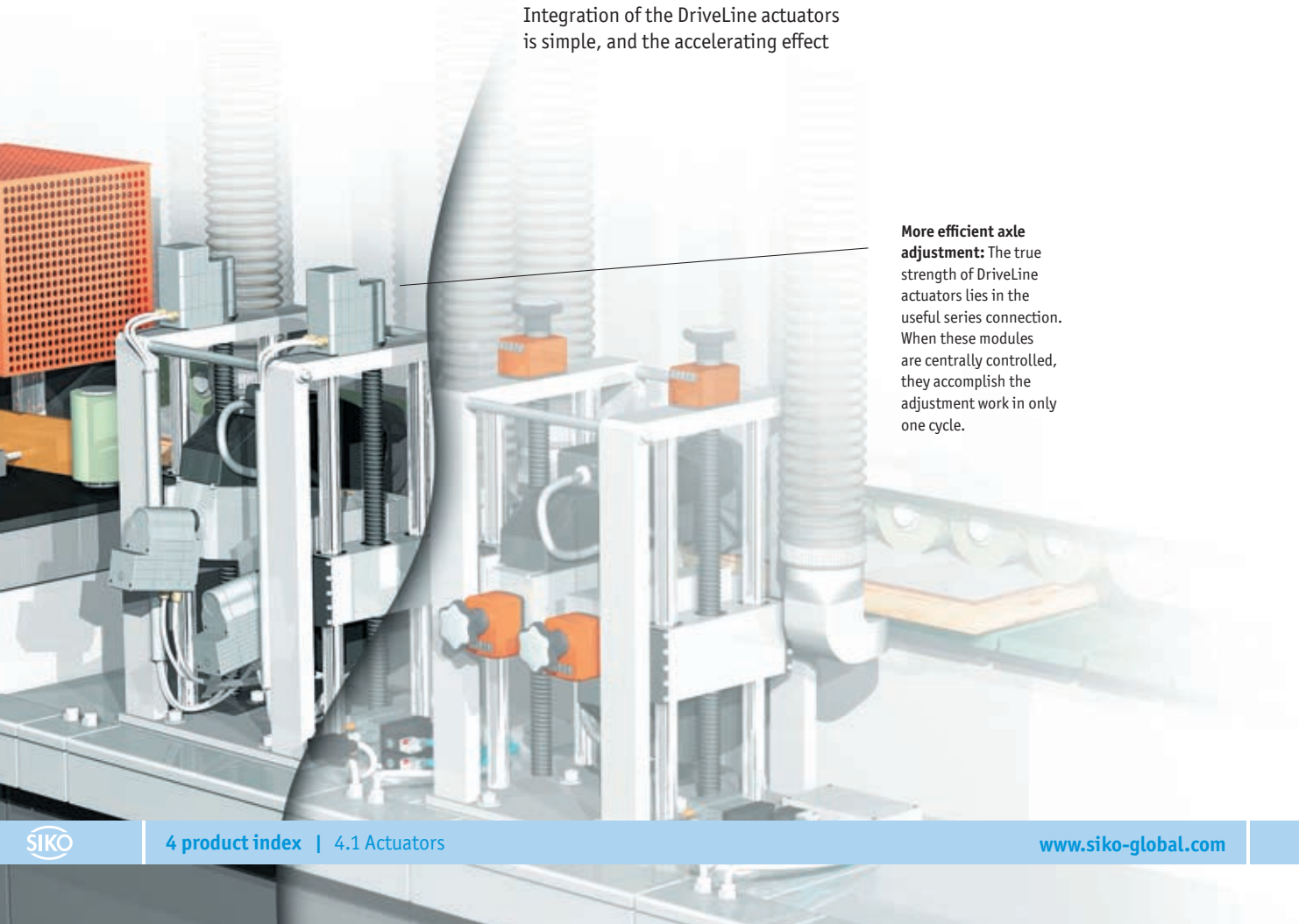
Drives and actuators can be used in many production processes – both on individual machines or within whole production lines, for example in packaging technology, press technology, the wood, glass and printing industries, the plastics and textile industries as well as in tool construction and special machine construction.

Product change with parameters that vary substantially is an everyday occurrence and requires numerous adjustment procedures. In such cases, the exact reproducibility of each adjustment is just as important as performing tasks at difficult-to-access or dangerous positions. The flexibility in terms of changing production goods grows in line with increasing product quality.

Integration of the DriveLine actuators is simple, and the accelerating effect as well as a lasting increase in machine efficiency and operational safety can be measured immediately. They are predestined for manufacturing chains where small batch sizes, frequent format changes or varying product sizes are daily business.

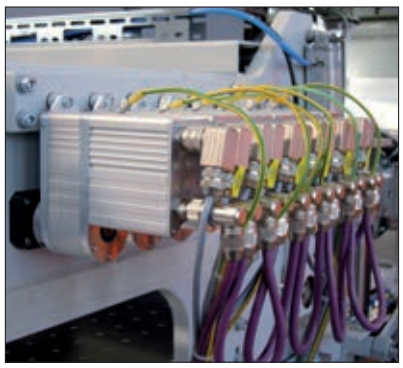
Benefit from the decentralized and modular automation with DriveLine and enhance your competitive edge: A wide range of versions and performance classes enables flexible scaling. Start and implement custom-made solutions – from the basic model up to high-end application.

4.1

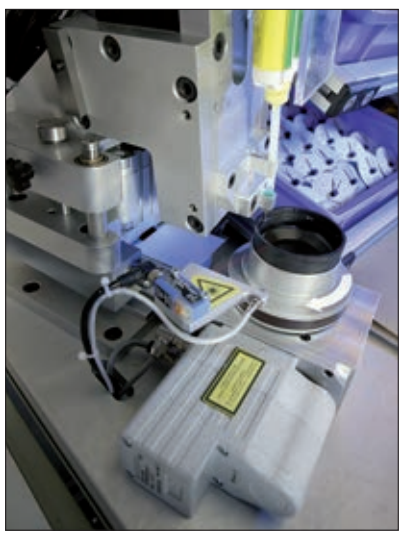


More efficient axle adjustment: The true strength of DriveLine actuators lies in the useful series connection. When these modules are centrally controlled, they accomplish the adjustment work in only one cycle.

Drive Technology: New dynamics for production processes



1



2

The declared aim when designing modern processing machines and systems is to enhance the efficiency of machining processes while keeping costs down. Maximum productivity with minimum cycle times are key factors that have a considerable influence on the efficiency and profitability of a company. Flexible and modular axis automation with DriveLine actuators makes it easy to achieve a long-term increase in both the machine efficiency as well as the product quality. Adjustment with DriveLine actuators is around four times faster and much more accurate than with manual processes. Users speak of a boost in the production capacity of up to 50 percent.

These components are integrated into a very compact and modular design. They therefore set standards when it comes to size and performance:

- 24 V DC high-performance motor
- Spur gear / planetary gear with hollow output shaft
- Position encoder
- Power and control electronic units

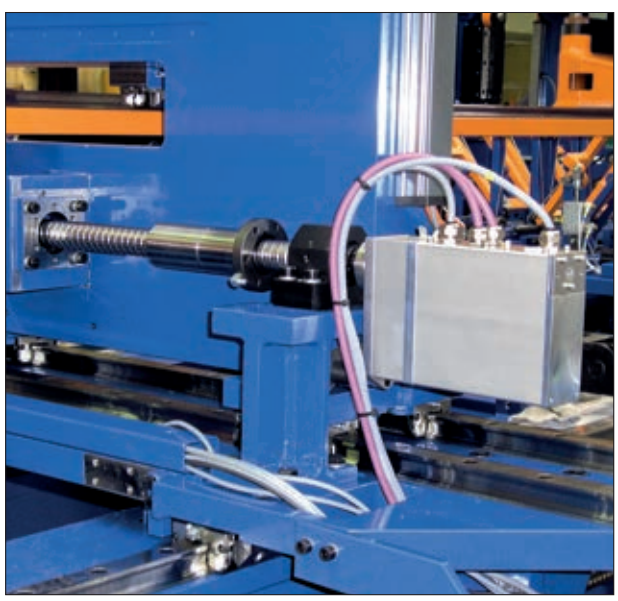
These components are integrated into a very compact and modular design. They therefore set standards when it comes to size and performance. .

Benefits

- Flexible machine conception
- Very little installation and mounting effort
- Fast commissioning
- Short cycle or retrofitting time
- High productivity and quality
- High availability and maintenance-free

Versatile application

Automation with DriveLine actuators is suitable in any application if decentralised positioning tasks in the machine or the system are to be solved and space is at a minimum – without taking up any additional room in the control cabinet. Versatile retrofitting of existing axes is also possible without extending the control cabinet.



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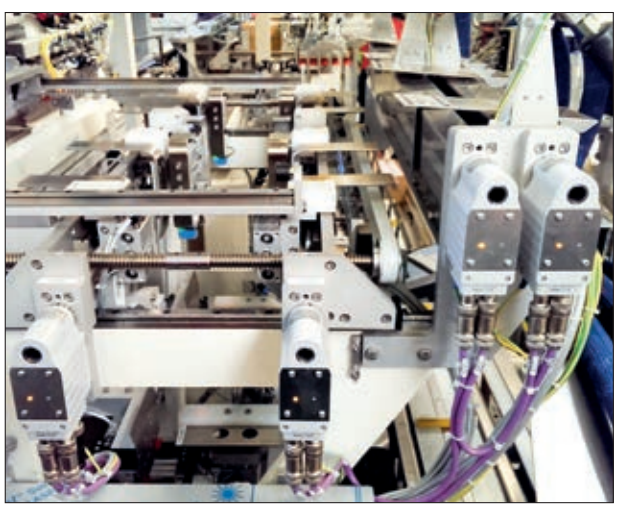

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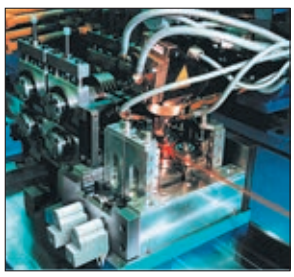


5

[1] DriveLine-actuators ensure precise product position on a panel feeding unit when on-the-fly production change is required. [2] Insert the part to be glued and press the start button: semi-automated gluing process with measurement feedback via a combination of magnetic ring and sensor (SIKO MagLine). [3] Power-pack: For applications with higher strength and safety requirements – precise setting position even in the de-energized state. [4] Many settings, quickly made: the benefits of decentralized modular automation of axes. [5] Spacing of guide rollers is regulated in a laser welding system for stainless steel pipes.

Performance charts

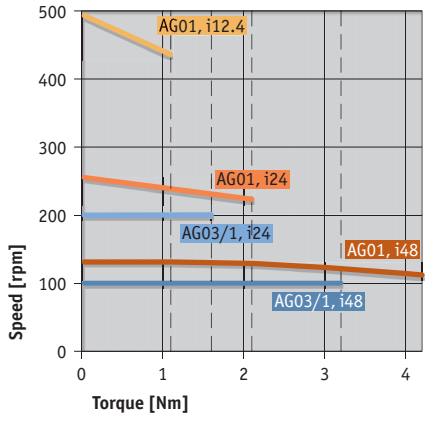
Key performance characteristics can be seen and compared in the following charts.

Measurement procedure

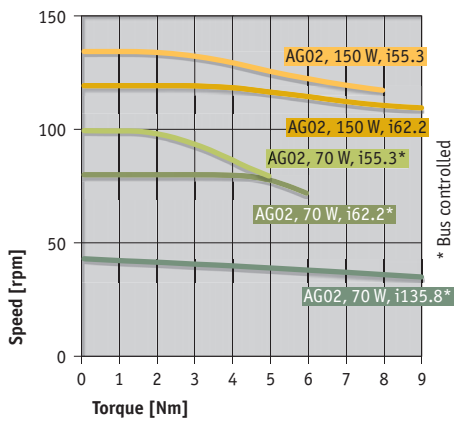
The performance chart of a DriveLine actuator shows the maximum performance curve (rpm/Nm) in relation to a particular motor/gear combination. All the characteristics refer to 24 V DC motors.

It can be seen that, performance data can deviate from the displayed values in actual use. This is due to a number of factors, such as motor-induced revolution divergences of ±15 %. We will be pleased to give you more detailed advice on these special cases.

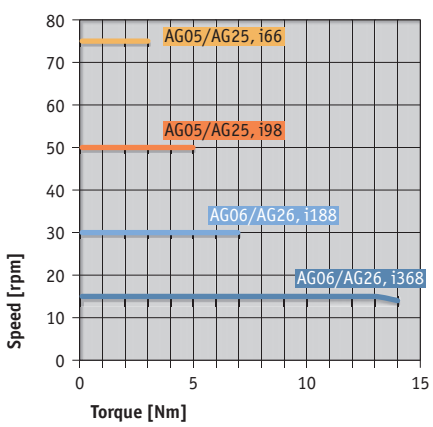
AG01, AG03/1



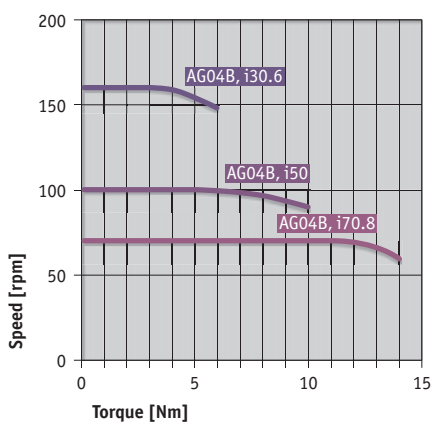
AG02



AG05/AG06/AG25/AG26



AG04B

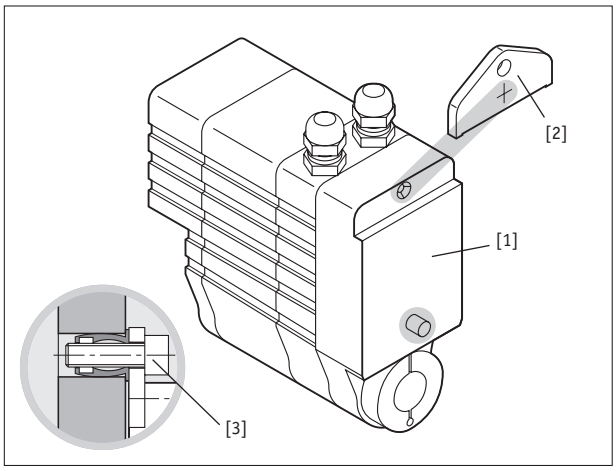


Torque support

The hollow shaft design of the DriveLine actuators is made for very simple mounting. A clamping ring on the device mounting side provides secure connection to the machine shaft.

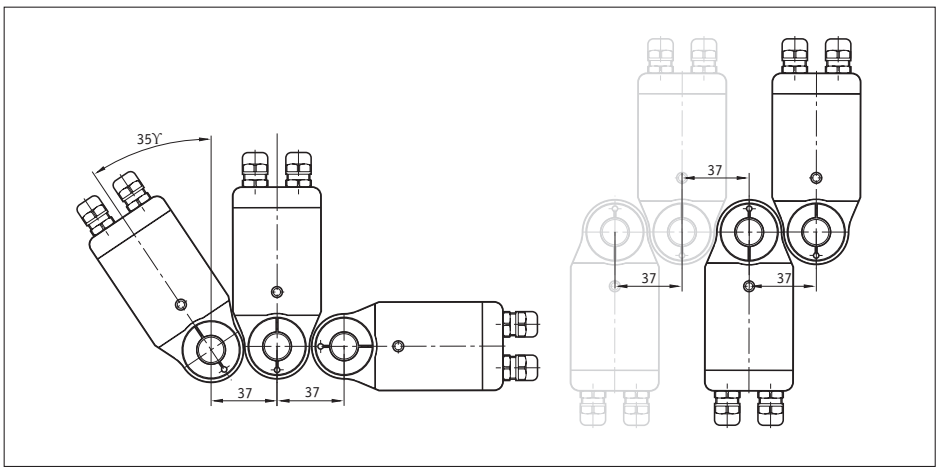
The torque bracing to the machine frame is by means of a pin [1]. Alternatively, a mounting bracket can be used [2]. This type of securing enables use of an elastomere bushing [3], which provides a low-tension connection from the actuator to the machine shaft.

Advantage: The distortion forces on the bearing are reduced.



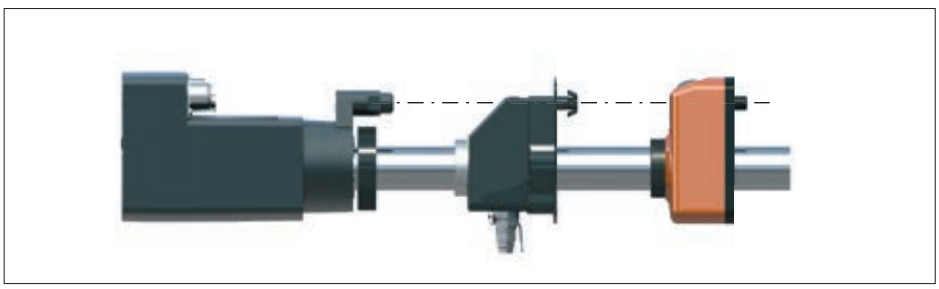
Mounting variants

The cleverly engineered design of the AG01 and AG03/1 opens up a host of installation variations. The tapered construction in the area of the hollow shaft makes small center-to-center distances of as little as 37 mm achievable.



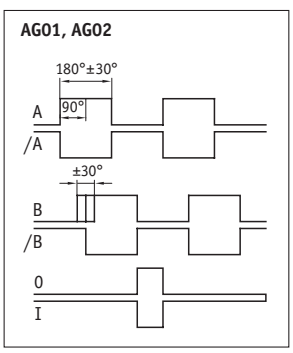
Compatible installations

Installation of the AG05, AG06, AG25 and AG26 actuators is compatible with DA09S and AP04 position indicators.



Output signals incremental

Note (AG01, AG02): The status of the signals A and B with regard to the reference signal 0/I is not defined and may deviate from this drawing.

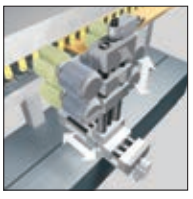


Ambient conditions	Examples of use

Direct adjustment:
Direct action via axle or spindle. The principle of action corresponds to that of a compound table or of linear guides.

Wood, metal and plastic processing



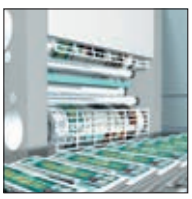



e.g., stop adjustment on saws and milling machines, tool settings according to the compound table principle ...


e.g., angle and position adjustment in the wood and metal industries ...

Indirect adjustment:
Indirect action (offset) on racks via cogwheel or worm gear.

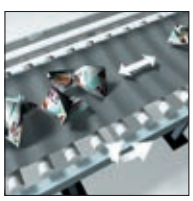
Paper/converting


e.g., automated format, distance or throughput adjustment with spooling slitting machines (paper, foil), printing presses, filling machines ...

Logistics

Rotating adjustment:
Direct action on the rotation axis or indirect action (offset) on a rotation axis via bevel gear or worm gear.



e.g., adjustment of plants to rapidly changing tasks of conveyor belts ...

Actuators

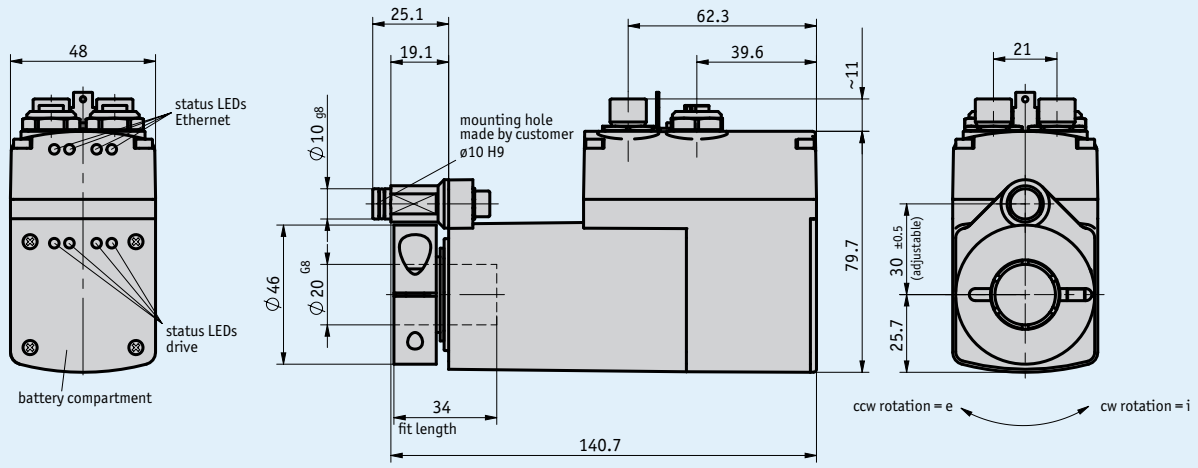
							
	AG26 Fieldbus/IE	**AG25** Fieldbus/IE	**AG06** Fieldbus	**AG05** Fieldbus	**AG04B** Fieldbus	**AG03/1** Fieldbus	**AG02** Fieldbus
Page	16	19	22	25	28	32	36
Speed/torque							
Rated torque max.	13 Nm	5 Nm	13 Nm	5 Nm	14 Nm	3.2 Nm	9 Nm
Rated speed max.	30 rpm	75 rpm	30 rpm	75 rpm	150 rpm	200 rpm	80 rpm
Driving shaft	20 mm hollow shaft	14 mm hollow shaft	20 mm hollow shaft	14 mm hollow shaft	20 mm hollow shaft	14 mm hollow shaft	14 mm hollow shaft
Outputs							
Absolute digital	•	•	•	•	•	•	•
Fieldbus (option)			CANopen SIKONETZ5	CANopen SIKONETZ5	Profibus DP	Profibus DP CANopen SIKONETZ5	Profibus DP CANopen
Industrial Ethernet	Ethernet/IP EtherCat POWERLINK PROFINET	Ethernet/IP EtherCat POWERLINK PROFINET					

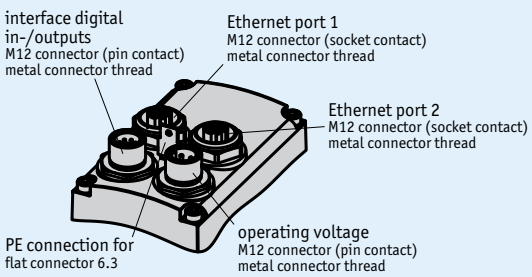
Actuators

				
	AG02 Analog	**AG02** Incremental	**AG01** Analog	**AG01** Incremental
Page	39	42	46	50
Speed/torque				
Rated torque max.	9 Nm	9 Nm	4.2 Nm	4.2 Nm
Rated speed max.	120 rpm	120 rpm	500 rpm	500 rpm
Driving shaft	14 mm hollow shaft	14 mm hollow shaft	14 mm hollow shaft	14 mm hollow shaft
Encoder				
Without		•		•
Potentiometric	•		•	
Current source 4 ... 20 mA	•		•	
Voltage 0 ... 10 V DC	•		•	
Incremental LD5		•		•
Incremental LD24		•		•
Incremental OP		•		•
Motor control				
Integrated		option		
External	option	option	option	option

Profile

- compact dimensions, high power density
- easy mounting and commissioning
- High flexibility, high protection category
- stainless steel 20 mm hollow shaft, robust housing
- Brushless EC motor with a long service life
- solid absolute sensor, magnetic sensing technology
- integrated power and control electronics
- integrated Industrial-Ethernet-Fieldbus
- Integrated positioning controller
- M12 component mounting technology





Mechanical data

Feature	Technical data	Additional information
Shaft	stainless steel	
Housing	glass-fiber reinforced plastic / zinc die-cast	
Clamping ring	stainless steel	
Torque pin	stainless steel	
Nominal torque/rated speed	7 Nm at 30 rpm ±10 %	i = 188
	13 Nm at 15 rpm ±10 %	i = 368 (transiently adm. break-away torque 14 Nm)
Operating mode	intermittent duty S3: 25% DC, 10 min.	EN 60034-1

Electrical data

Feature	Technical data	Additional information
Operating voltage	24 V DC ±10 %	reverse polarity protected, output stage
	24 V DC ±10 %	reverse polarity protected, control
Current consumption	2.2 A ±10 %	at nominal torque/speed (output stage)
	<150 mA	starting current >150 mA (control)
Power input	≤58 W	output stage
	≤3.6 W	control
Battery	CR2477N, 3 V lithium, 950 mAh	
Battery service life	~5 year(s)	depending on ambient conditions
Digital inputs	17 ... 30 V DC	typically 10 mA
Status display	8 LEDs	
Keys	2 internal keys, internal DIP switch	
Switching outputs	24 V DC ±10 %	≤40 mA
Bus connection	EIP-EtherNet/IP	
	EPN-PROFINET	
	ECT-EtherCAT	
	EPL-POWERLINK	
Type of connection	2x M12 plug connectors (A-coded)	4-pole, 1x pin; 8-pole, 1x pin
	2x M12 plug connectors (D-coded)	4-pole, 2x socket
	grounding via flat connector 6.3 mm	

System data

Feature	Technical data	Additional information
Resolution	720 increments/revolution shaft	
Repeat accuracy	±1 increment(s)	
Travel range	±697 revolution(s)	i = 188
	±356 revolution(s)	i = 368

Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	0 ... 45 °C	
Storage temperature	-20 ... 60 °C	
Relative humidity		condensation inadmissible
EMC	EN 61800-3, second environment	interference resistance / immission
	EN 61800-3, C2	emitted interference / emission
Protection category	IP54, IP65	EN 60529, only with mating connector
Shock resistance	500 m/s^2, 11 ms	EN 60068-2-27
Vibration resistance	<100 m/s^2, 5 ... 150 Hz	EN 60068-2-6

Pin assignment

EtherCAT, EtherNet/IP, POWERLINK, PROFINET

Signal	PIN
Tx+	1
Rx+	2
Tx-	3
Rx-	4

Digital inputs / outputs

Signal	PIN
Input 1	1
Input 2	2
Input 3	3
Input 4	4
Output 1	5
RXD	6
TXD	7
SGND*	8

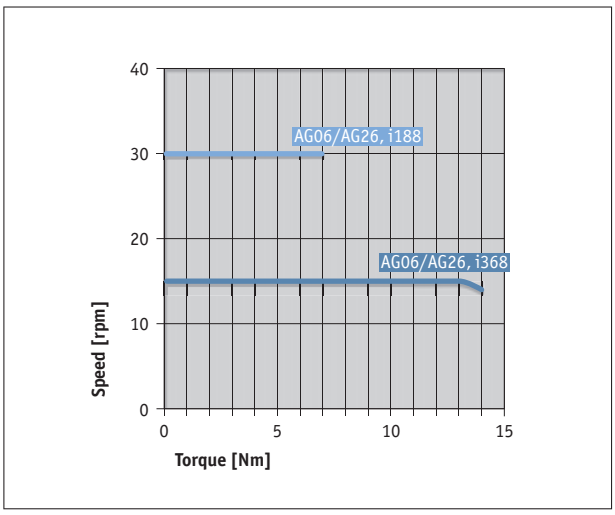
* internally connected with GND of operating voltage

Operating voltage (output stage / control)

Signal	PIN
+UB (output stage)	1
+UB (control)	2
GND (output stage)*	3
GND (control)*	4

* internally connected with SGND

Performance curve



4.1

Order

Ordering table

Feature	Ordering data		Specification	Additional information
Gear ratio	188	A	i = 188	
	368		i = 368	
Protection category	IP54	B	IP54	
	IP65		IP65	
Interface/protocol	ECT	C	EtherCAT	
	EIP		EtherNet/IP	
	EPL		POWERLINK	
	EPN		PROFINET	

Order key

AG26 Fieldbus/IE - [ ] - 50W - [ ] - KR/20 - B - ABM - [ ] - SW

A B C

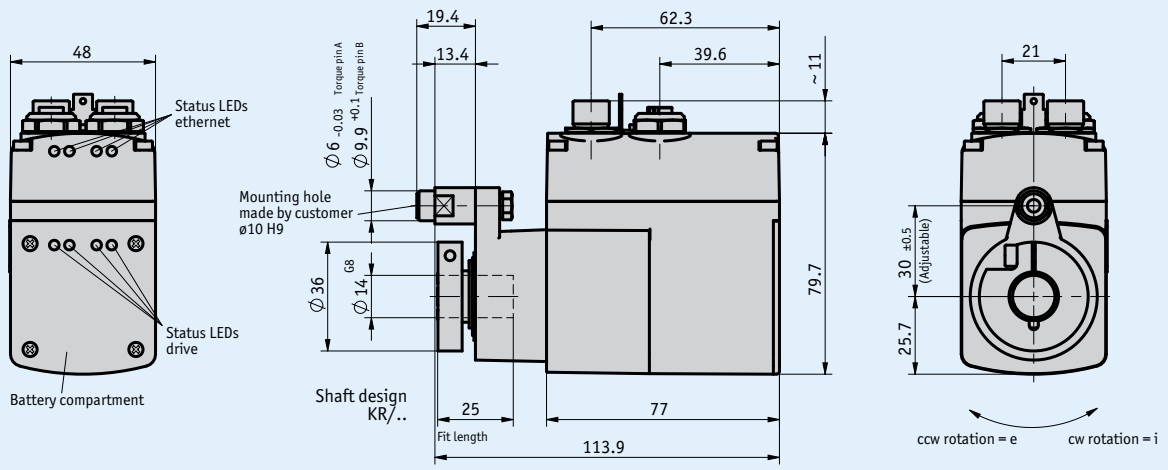
Scope of delivery: *AG26 Fieldbus/IE, Documentation on CD, Mounting instructions*

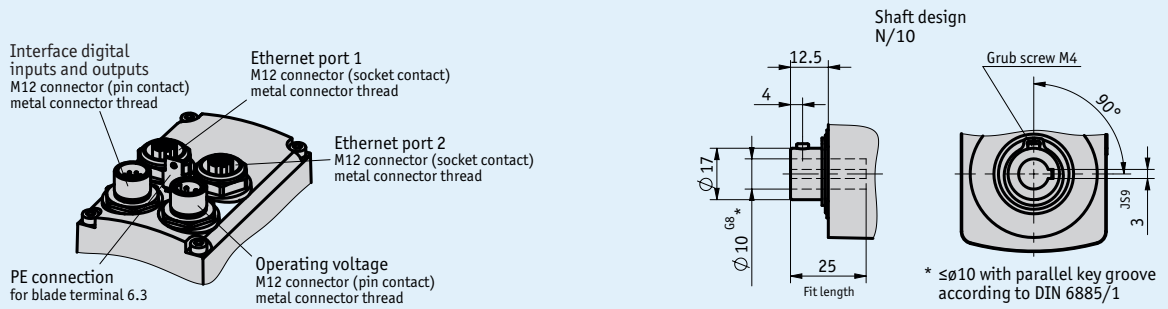
Accessories:

Additional information:

Profile

- Small dimensions, high power density
- easy mounting and commissioning
- High flexibility, high protection category
- stainless steel 14 mm diam. hollow shaft, robust housing
- Brushless EC motor with a long service life
- solid absolute sensor, magnetic sensing technology
- integrated power and control electronics
- integrated Industrial-Ethernet-Fieldbus
- Integrated positioning controller
- M12 component mounting technology





Mechanical data

Feature	Technical data	Additional information
Shaft	stainless steel	
Housing	glass-fiber reinforced plastic / zinc die-cast	
Clamping ring	stainless steel	
Torque pin	stainless steel	form A
	aluminum, hard anodic coating	form B
Nominal torque/rated speed	5 Nm at 50 rpm ±10 %	i = 98
	3 Nm at 75 rpm ±10 %	i = 66
Operating mode	intermittent duty S3: 25% DC, 10 min.	EN 60034-1

Electrical data

Feature	Technical data	Additional information
Operating voltage	24 V DC ±10 %	reverse polarity protected, output stage
	24 V DC ±10 %	reverse polarity protected, control
Current consumption	2.2 A ±10 %	at nominal torque/speed (output stage)
	<150 mA	starting current >150 mA (control)
Power input	≤58 W	output stage
	≤3.6 W	control
Battery	CR2477N, 3 V lithium, 950 mAh	
Battery service life	~5 year(s)	depending on ambient conditions
Digital inputs	17 ... 30 V DC	typically 10 mA
Status display	8 LEDs	
Keys	2 internal keys, internal DIP switch	
Switching outputs	24 V DC ±10 %	≤40 mA
Bus connection	EIP-EtherNet/IP	
	EPN-PROFINET	
	ECT-EtherCAT	
	EPL-POWERLINK	
Type of connection	2x M12 plug connectors (A-coded)	4-pole, 1x pin; 8-pole, 1x pin
	2x M12 plug connectors (D-coded)	4-pole, 2x socket
	grounding via flat connector 6.3 mm	

System data

Feature	Technical data	Additional information
Resolution	720 increments/revolution shaft	
Repeat accuracy	±1 increment(s)	
Travel range	±1300 revolution(s)	i = 98
	±1980 revolution(s)	i = 66

Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	0 ... 45 °C	
Storage temperature	-20 ... 60 °C	
Relative humidity		condensation inadmissible
EMC	EN 61800-3, second environment	interference resistance / immission
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RXD	6
TXD	7
SGND*	8

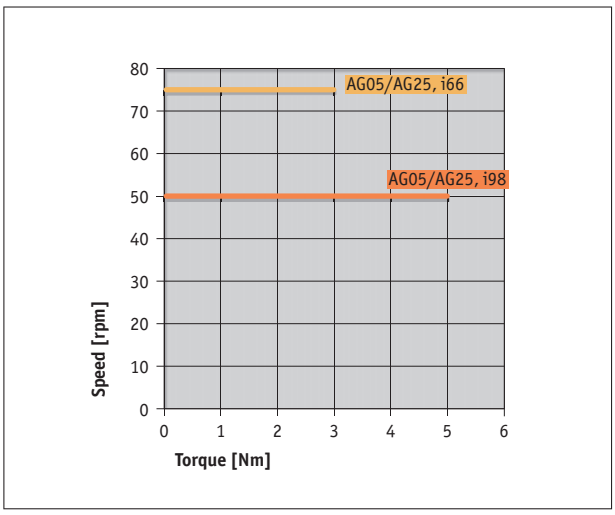
* internally connected with GND of operating voltage

Operating voltage (output stage / control)

Signal	PIN
+UB (output stage)	1
+UB (control)	2
GND (output stage)*	3
GND (control)*	4

* internally connected with SGND

Performance curve



Order

Ordering table

Feature	Ordering data		Specification	Additional information
Gear ratio	66	A	i = 66	
	98		i = 98	
Protection category	IP54	B	IP54	
	IP65		IP65	
Shaft design/diameter	KR/14	C	clamping ring, ø14 mm	
	N/10		keyway, ø10 mm	
Torque pin	A	D	bolt, ø6 mm	
	B		bolt, ø10 mm	Aluminum
Interface/protocol	ECT	E	EtherCAT	
	EIP		EtherNet/IP	
	EPL		POWERLINK	
	EPN		PROFINET	

Order key

AG25 Fieldbus/IE - [A] - 50W - [B] - [C] - [D] - ABM - [E] - SW

Scope of delivery: *AG25 Fieldbus/IE, Mounting instructions, Documentation on CD*

Accessories:

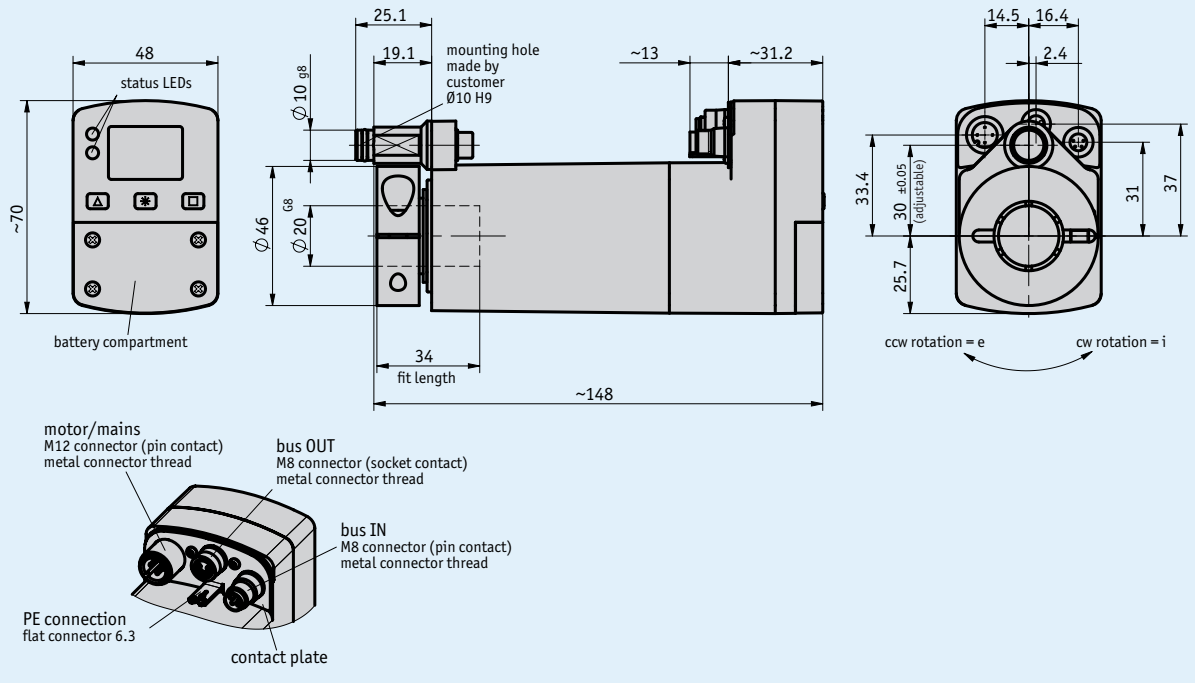
Cable extension KV04S2	*page 70*
Cable extension KV08S2	*page 76*
Programming software ProTool DL	*www.siko-global.com*
Mating Connector Overview	*page 58*
Mating connector, operating voltage, 4-pole, socket	*Order key 83526*
Mating connector, operating voltage, 4-pole, angle socket	*Order key 83091*
Mating connector, digital inputs/outputs, 8-pole, socket	*Order key 83525*
Mating connector, digital inputs/outputs, 8-pole, angle socket	*Order key 87599*
Mating connector, port 1 + port 2, 4-pole, pin	*Order key 87601*
Mating connector, port 1 + port 2, 4-pole, angular pin	*Order key 87600*

Additional information:

General information and areas of application *page 10*

Profile

- easy mounting, no additional coupling needed
- stainless steel hollow shaft, glass fibre reinforced casing
- brushless 24 VDC motor with long service life
- solid absolute sensor, magnetic sensing technology
- 2-line LCD for target and position value and operating keys
- 2 LEDs for user guidance
- integrated RS485 or CANopen interface
- Integrated positioning controller
- M8 + M12 component mounting technology



Mechanical data

Feature	Technical data	Additional information
Shaft	stainless steel	
Housing	glass-fiber reinforced plastic	
Clamping ring	stainless steel	
Torque pin	stainless steel	
Nominal torque/rated speed	7 Nm at 30 rpm ±10 %	i = 188
	13 Nm at 15 rpm ±10 %	i = 368 (14 Nm temporarily adm. break-away torque)
Operating mode	S3 intermittent duty: 25 % DC, 10 min.	EN 60034-1
Weight	~0.9 kg	

Electrical data

Feature	Technical data	Additional information
Operating voltage	24 V DC ±10 %	reverse polarity protected, output stage
	24 V DC ±10 %	reverse polarity protected, control
Current consumption	2.42 A	max. adm. at set point 100% (output stage)
Power input	~48 W	output stage
Battery	CR2477N, 3 V lithium, 950 mAh	
Battery service life	~5 year(s)	depending on environmental conditions
Rated current	2.2 A ±10 %	at max. adm. torque (output stage)
	<60 mA	at 24 V DC (control)
Display/dispaly range	5-digit LCD 7-segment, ~7 mm height	decimal points, 2 rows, special characters
Special character	battery, direction arrows	
Status display	two LEDs	
Keys	parameterizing, resetting, inching, setpoint definition	
Bus connection	RS485; CANopen	no galvanic isolation
Type of connection	1x M12-plug connector (A-coded)	4-pole, 1x pin
	2x M8 plug connectors	4-pole, 1x socket, 1x pin
	grounding via flat connector 6.3 mm	

System data

Feature	Technical data	Additional information
Resolution	720 increments/revolution shaft	
Repeat accuracy	±1 increment(s)	
Travel range	±697 revolution(s)	i = 188
	±356 revolution(s)	i = 368

Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	0 ... 45 °C	
Storage temperature	-20 ... 60 °C	
Relative humidity		condensation inadmissible
EMC	EN 61800-3, second environment	interference resistance / immission
	EN 61800-3, C3	emitted interference / emission
Protection category	IP54, IP65	EN 60529, mating connectors mounted
Shock resistance	500 m/s^2, 11 ms	EN 60068-2-27
Vibration resistance	<100 m/s^2, 5 ... 150 Hz	EN 60068-2-6

Pin assignment

Operating voltage (A-coded)

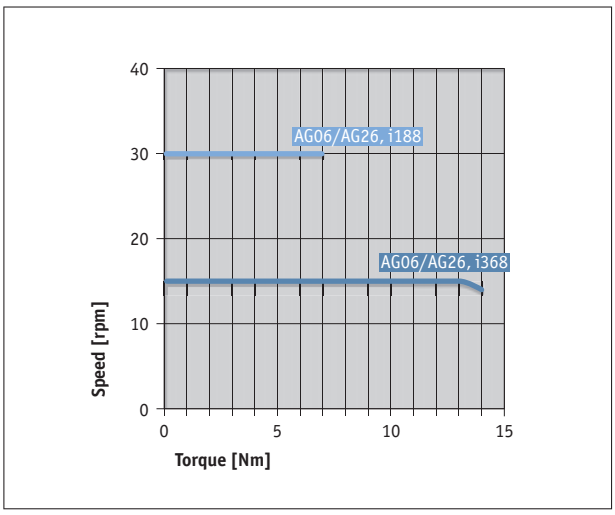
Signal	PIN
+24 V Output stage	1
+24 V Control	2
GND Output stage*	3
GND Control*	4

Interfaces M8

Signal	PIN
DÜB/TxRX-/CANL	1
DÜA/TxRX+/CANH	2
Do not connect!	3
SGND*	4

* internally linked

Performance curve



4.1

Order

Ordering table

Feature	Ordering data		Specification	Additional information
Gear ratio	188	A	i = 188	
	368		i = 368	
Protection category	IP54	B	IP54	
	IP65		IP65	
Shaft design/diameter	KR/20	C	clamping ring, ø20 mm	
			others on request	
Interface/protocol	S3/09	D	RS485/SIKONETZ5	
	CAN		CANopen	

Order key

AG06 Fieldbus - [A] - 50W - [B] - [C] - B - ABM - [D] - SW

Scope of delivery: *AG06 Fieldbus, Mounting instructions, Documentation on CD*

Accessories:

Cable extension KV04S1	*page 68*
Cable extension KV04S2	*page 70*
Easy Touch Control ETC5000	*www.siko-global.com*
Programming software ProTool DL	*www.siko-global.com*
Mating Connector Overview	*page 58*
Mating connector, Fieldbus IN, 4-pole, pin	*Order key 84209*
Mating connector, Fieldbus OUT, 4-pole, pin	*Order key 84210*
Mating connector, voltage supply, 4-pole, angle socket	*Order key 83091*
bus terminating connector, Fieldbus, 4-pole, pin	*Order key BAS-0005*

Additional information:

General information and areas of application	*page 10*

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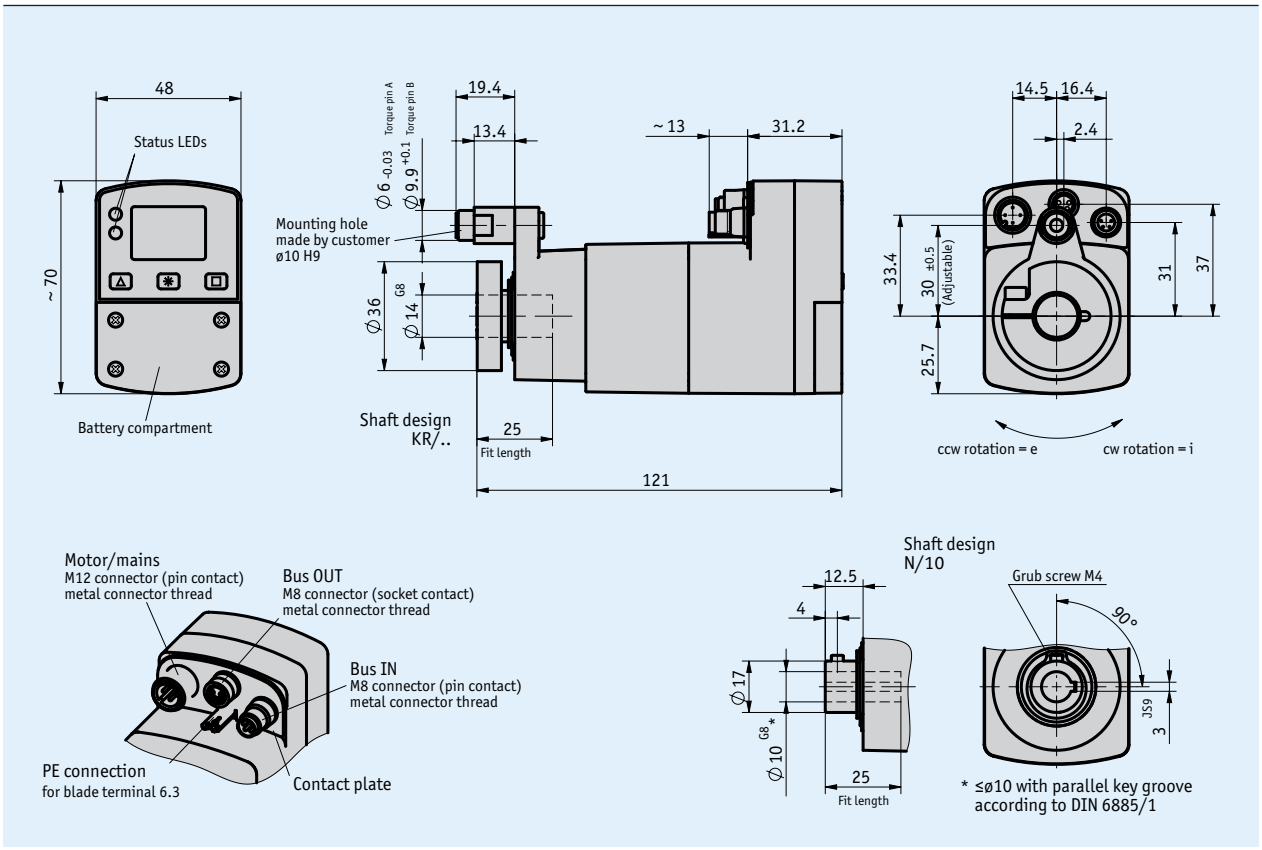
Profile

- easy mounting, no additional coupling needed
- stainless steel 14 mm hollow shaft, glass fibre reinforced casing
- brushless 24 VDC motor with long service life
- solid absolute sensor, magnetic sensing technology
- 2-line LCD for target and position value and operating keys
- 2 LEDs for user guidance
- integrated RS485 or CANopen interface
- Integrated positioning controller
- M8 + M12 component mounting technology



Mechanical data

Feature	Technical data	Additional information
Shaft	stainless steel	
Housing	glass-fiber reinforced plastic	
Clamping ring	stainless steel	
Torque pin	stainless steel	form A
	aluminum, hard anodic coating	form B
Nominal torque/rated speed	3 Nm at 75 rpm ±10 %	i = 66
	5 Nm at 50 rpm ±10 %	i = 98
Weight	~0.45 kg	

Electrical data

Feature	Technical data	Additional information
Operating voltage	24 V DC ±10 %	reverse polarity protected, output stage
	24 V DC ±10 %	reverse polarity protected, control
Power input	~58 W	output stage
Battery	CR2477N, 3 V lithium, 950 mAh	
Battery service life	~5 year(s)	depending on ambient conditions
Rated current	2.2 A ±10 %	at max. admissible torque (output stage)
	<60 mA ±10 %	at 24 V DC (control)
Display/dispaly range	5-digit LCD 7-segment, ~7 mm height	decimal points, 2 rows, special characters
Special character	battery, direction arrows	
Status display	two LEDs	
Keys	parameterizing, resetting, inching, setpoint definition	
Bus connection	RS485, CANopen	no galvanic isolation
Type of connection	1x M12 plug connector (A-coded)	4-pole, 1x pin
	2x M8 plug connectors	4-pole, 1x socket, 1x pin
	grounding via flat connector 6.3 mm	

System data

Feature	Technical data	Additional information
Resolution	720 increments/revolution shaft	
Repeat accuracy	±1 increment(s)	
Travel range	±1980 revolution(s)	i = 66
	±1300 revolution(s)	i = 98

Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	0 ... 45 °C	
Storage temperature	-20 ... 60 °C	
Relative humidity		condensation inadmissible
EMC	EN 61800-3, second environment	interference resistance / immission
	EN 61800-3, C3	emitted interference / emission
Protection category	IP54, IP65	EN 60529, only with mating connector
Shock resistance	500 m/s^2, 8 ms	EN 60068-2-27
Vibration resistance	<100 m/s^2, 5 ... 150 Hz	EN 60068-2-6

Pin assignment

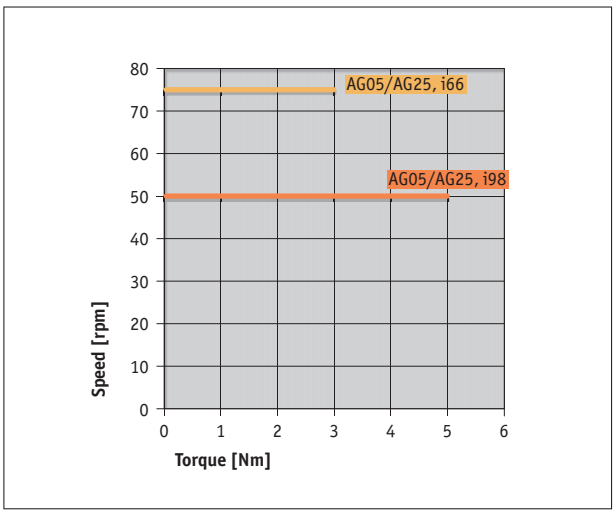
Power/electronics (A-coded)

Signal	PIN
+24 V Power/output stage	1
+24 V Control	2
GND Power/output stage	3
GND Control	4

Interfaces M8

Signal	PIN
TxRx-/DÜB	1
TxRx+/DÜA	2
N.C.	3
GND	4

Performance curve



Order

Ordering table

Feature	Ordering data		Specification	Additional information
Gear ratio	66	A	i = 66	
	98		i = 98	
Protection category	IP54	B	IP54	
	IP65		IP65 on request	
Shaft design/diameter	KR/14	C	clamping ring ø14 mm	
	N/10		keyway, ø10 mm	
Torque pin	A	D	bolt, ø6 mm	
	B		bolt, ø10 mm	
Interface/protocol	S3/09	E	RS485 / SIKONETZ5	
	CAN		CANopen	

Order key

AG05 Fieldbus - [A] - 50W - [B] - [C] - [D] - ABM - [E]

Scope of delivery: *AG05 Fieldbus, Mounting instructions, Documentation on CD*

Accessories:

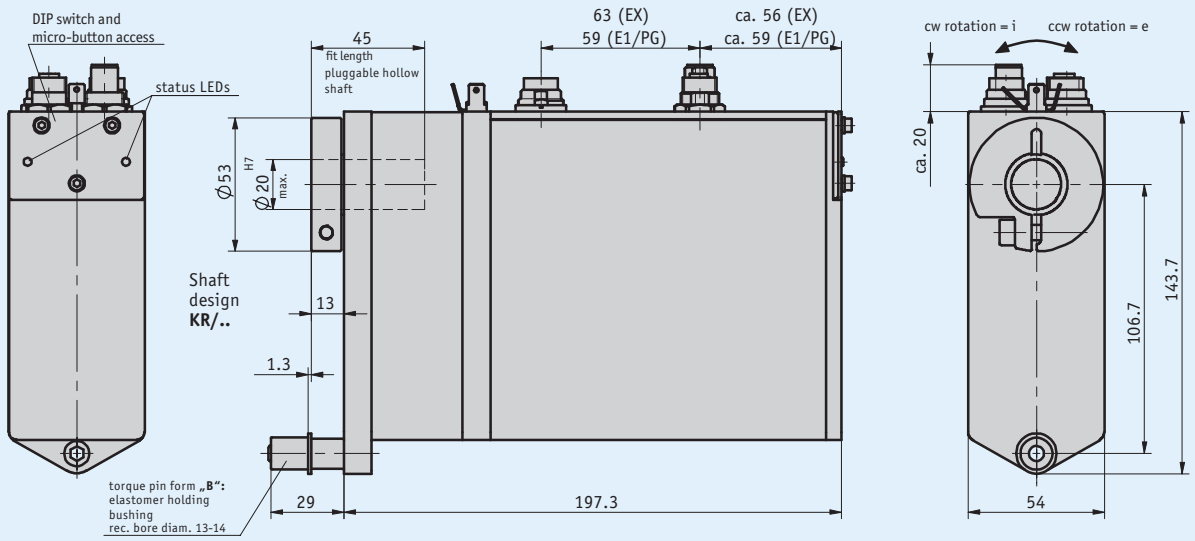
Cable extension KV04S1	*page 68*
Cable extension KV04S2	*page 70*
Easy Touch Control ETC5000	*www.siko-global.com*
Programming software ProTool DL	*www.siko-global.com*
Mating Connector Overview	*page 58*
Mating connector, Fieldbus IN, 4-pole, pin	*Order key 84209*
Mating connector, Fieldbus OUT, 4-pole, pin	*Order key 84210*
Mating connector, voltage supply, 4-pole, angle socket	*Order key 83091*
bus terminating connector, Fieldbus, 4-pole, pin	*Order key BAS-0005*

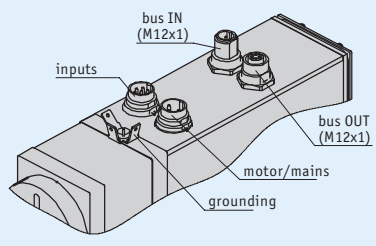
Additional information:

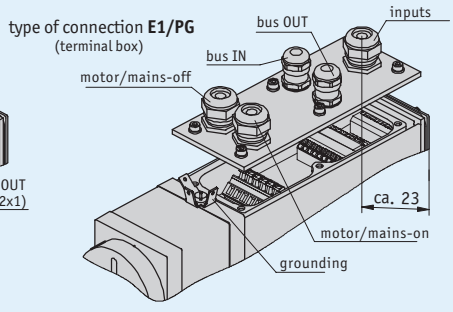
General information and areas of application	*page 10*

Profile

- Easy mounting
- Stainless steel hollow shafts up to max. Ø 20 mm
- "Manual" traveling without control via micro-button
- Brushless 160 W, 24 V DC motor with long service life
- Integrated magnetic absolute position encoder on the output shaft
- Electrical connection via spring terminals or connector
- Integrated positioning controller
- Integrated fieldbus interface
- Integrated spring-operated brake (option)







Mechanical data

Feature	Technical data	Additional information
Shaft	stainless steel	
Housing	aluminum	
Nominal torque/rated speed	6 Nm at 150 rpm (±10 %)	i = 30.6 (max. adm. operating point)
	10 Nm at 90 rpm (±10 %)	i = 50 (max. adm. operating point)
	14 Nm at 64 rpm (±10 %)	i = 70.8 (max. adm. operating point)
Operating mode	S3 intermittent duty: 25 % DC, 10 min.	EN 60034-1
Weight	~3.2 kg	

Electrical data

Feature	Technical data	Additional information
Operating voltage	24 V DC ±10 %	reverse polarity protected
Power input	~160 W	
Rated current	6 A ±5 %	
No-load current	350 mA ±20 %	(with transmission)
Type of connection	5x PG9, terminal strip	0.13 ... 2.5 mm^2 or 0.25 ... 1.5 mm^2 (E1/PG)
	2x M16 plug connectors	3-pole, 1x pin; 7-pole, 1x pin (EX)
	2x M12 plug connectors (B-coded)	5-pole, 1x pin, 1x socket (EX)
	grounding via flat connector 6.3 mm	

System data

Feature	Technical data	Additional information
Resolution	1024 increment(s)	singleturn / 10 bit
Travel range	254 revolution(s)	8 bit multiturn (rounded)
	4094 revolution(s)	12 bit multiturn (rounded)

Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	0 ... 45 °C	
Storage temperature	-20 ... 80 °C	
Relative humidity		condensation inadmissible
EMC	EN 61800-3, second environment	interference resistance / immission
	EN 61800-3, C3	emitted interference / emission
Protection category	IP50 / IP54 / IP65	EN 60529, mating connectors mounted
Shock resistance	500 m/s^2, 11 ms	EN 60068-2-27
Vibration resistance	100 m/s^2, 50 Hz	EN 60068-2-6

Pin assignment

Motor/voltage supply

Signal	EX	E1 (terminal)
+Ub	1	X1.1 X1.2
Enable	2	X3.5
GND	3	X1.3 X1.4
Screen		X1.5 X1.6

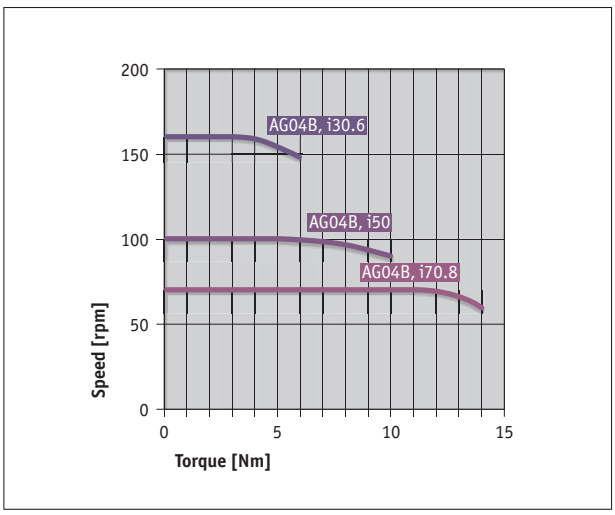
Fieldbus

Signal	EX	E1 (terminal)
BUS A	2	X2.2, X2.9
BUS B	4	X2.1, X2.10
Do not connect!	1, 3, 5	X2.3, X2.4, X2.5, X2.6, X2.7, X2.8

Inputs

Signal	EX	E1 (terminal)
Limit switch 1	1	X3.1
Limit switch 2	2	X3.2
Input 1	3	X3.3
Input 2	4	X3.4
N.C.	5-7	
Enable		X3.5
EXT_GND		X3.6
GND		X3.7

Performance curve



4.1

Order

Ordering table

Feature	Ordering data		Specification	Additional information
Gear ratio	70.8	A	i = 70.8	
	50		i = 50.0	
	30.6		i = 30.6	
			others on request	
Motor/brake	160W/MB	B	160 W EC motor with brake	
	160W/OB		160 W EC motor without brake	
Protection category	IP50	C	IP50	
	IP54		IP54	
	IP65		IP65	
Shaft design/diameter	KR/20	D	clamping ring ø20 mm	
	KR/14		clamping ring ø14 mm	
			others on request	
Type of connection	EX	E	industrial connector	without mains outlet
	E1/PG		terminal box	with mains outlet
Number of revolutions	254	F	8 Bit (rounded)	254 revolutions
	4094		12 Bit (rounded)	4094 revolutions

Order key

AG04B Fieldbus - [A] - [B] - [C] - [D] - B - [E] - [F] - PB - SW

Scope of delivery: *AG04B Fieldbus, Mounting instructions, Documentation on CD*

Accessories:

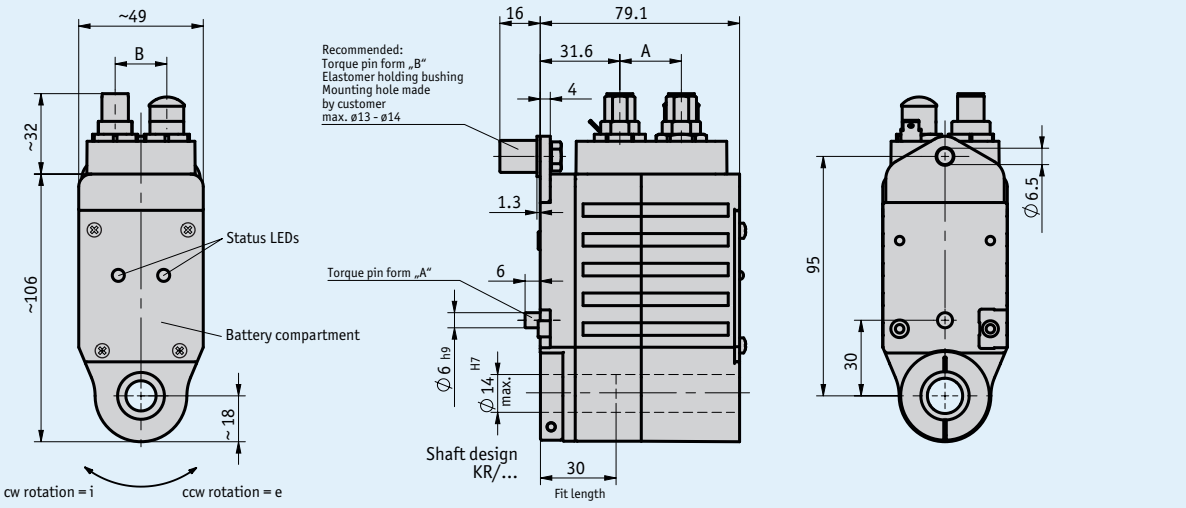
Cable extension KV03S1	*page 64*
Cable extension KV07S0	*page 72*
Programming software ProTool DL	*www.siko-global.com*
Mating Connector Overview	*page 58*
Mating connector, encoder/digital inputs, 7-pole, socket	*Order key 76141*
Mating connector, encoder/digital inputs, 7-pole, angle socket	*Order key 78088*
Mating connector, motor/voltage supply, 3-pole, socket	*Order key 85057*
Mating connector, motor/voltage supply, 3-pole, socket	*Order key 85057*
Mating connector, Profibus IN, 5-pole, socket	*Order key 83991*
Mating connector, Profibus IN, 5-pole, angle socket	*Order key 82804*
Mating connector, Profibus OUT, 5-pole, pin	*Order key 83992*
Mating connector, Profibus OUT, 5-pole, angular pin	*Order key 82805*

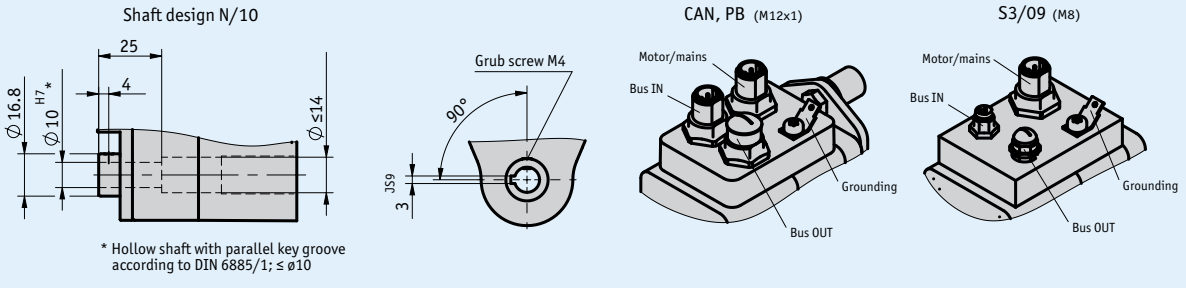
Additional information:

General information and areas of application *page 10*

Profile

- Space-saving, easy mounting
- Through hollow shafts up to max. ø14 mm
- Brushless 50 W, 24 V EC motor with long service life
- Integrated power and control electronics with inverse polarity and overload protection
- Integrated magnetic absolute position encoder on the output shaft
- Integrated CANopen or Profibus-DP with M12 component mounting technology
- Integrated RS458/SIKONETZ5 interface with M8 component mounting technology





	Measure "A"	Measure "B"
S3/09	27.2	23.0
CAN, PB	24.4	20.5

Mechanical data

Feature	Technical data	Additional information
Shaft	black-finished steel	
Housing	aluminum/zinc die cast	anodized / powder-coated
Nominal torque/rated speed	3.2 Nm at 100 rpm	i = 48
	1.6 Nm at 200 rpm	i = 24
Operating mode	S3 intermittent operation: 25 % DC, 10 min.	EN 60034-1

Electrical data

Feature	Technical data	Additional information
Operating voltage	24 V DC ±10 %	reverse polarity protected, output stage
	24 V DC ±10 %	reverse polarity protected, control (only CAN, PB, S3/09)
Power input	58 W	output stage
Battery	CR2477N, 3 V lithium, 950 mAh	
Battery service life	~5 year(s)	depending on ambient conditions
Rated current	2.4 A ±10 %	at max. adm. torque (output stage)
	<100 mA	at 24 V DC (control), only CAN, PB, S3/09
Status display	two LEDs	
Keys	touch keys	for setting-up mode
Bus connection	CANopen, Profibus-DP, SIKONETZ5	galvanic isolation
	Profibus-DP	galvanic isolation
	SIKONETZ5	galvanic isolation
Type of connection	2x M12-plug connectors (A-coded)	5-pole, 1x socket, 1x pin (CAN)
	2x M12 plug connectors (B-coded)	5-pole, 1x socket, 1x pin (PB)
	2x M8-plug connectors	4-pole, 1 x socket, 1 x pin (S3/09)
	1x M12-plug connector (A-coded)	4-pole, 1x pin (CAN + PB + S3/09)
	grounding via flat connector 6.3 mm	

System data

Feature	Technical data	Additional information
Resolution	1600 increments/revolution	
System accuracy	±0.8°	unidirectional
Repeat accuracy	±1 increment(s)	unidirectional / bidirectional
Travel range	±8192 revolution(s)	

Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	0 ... 45 °C	
Storage temperature	-20 ... 60 °C	
Relative humidity		condensation inadmissible
EMC	EN 61800-3, second environment	interference resistance / immission
	EN 61800-3, C3	emitted interference / emission
Protection category	IP50 / IP54 / IP65	EN 60529, mating connectors mounted
Shock resistance	500 m/s^2, 8 ms	EN 60068-2-27
Vibration resistance	≤100 m/s^2, 5 ... 150 Hz	EN 60068-2-6

Pin assignment

Motor/network

CAN, PB, S3/09	PIN
+UB (output stage)	1
+UB (control)	2
GND (output stage + control)	3
N.C.	4

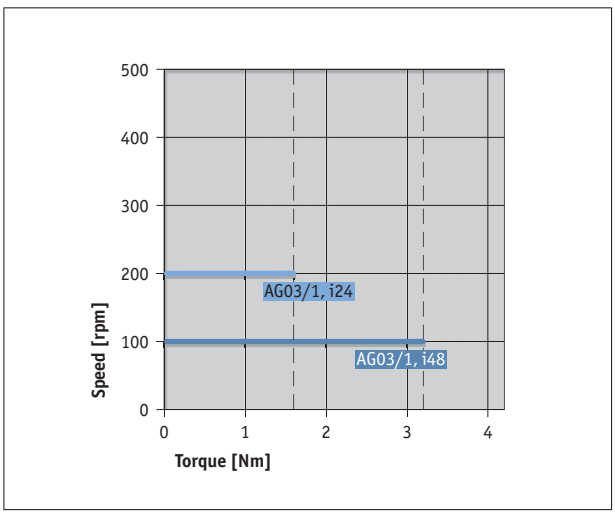
Fieldbus S3/09

Signal	PIN
DÜB/TxRx-	1
DÜA/TxRx+	2
N.C.	3
SGND	4

Fieldbus PB, CAN

PB	CAN	PIN
N.C.	N.C.	1
BUS A	N.C.	2
N.C.	CAN_GND	3
BUS B	CAN_H	4
N.C.	CAN_L	5

Performance curve



4.1

Order

Ordering table

Feature	Ordering data		Specification	Additional information
Gear ratio	48	A	i = 48	
	24		i = 24	
Protection category	IP50	B	IP50	
	IP54		IP54	
	IP65		IP65	
Shaft design/diameter	KR/14	C	clamping ring ø14 mm	
	KR/12		clamping ring ø12 mm	
	N/10		keyway JS9 DIN 6885/1 ø10 mm	
Torque pin	A	D	bolt, ø6 mm	
	B		lug I	
Fieldbus	CAN	E	CANopen	
	PB		Profibus-DP	Profidrive
	S3/09		RS485 / SIKONETZ5	

Order key

AG03/1 Fieldbus - [A] - [B] - [C] - [D] - ABM - [E] - SW

4.1

Scope of delivery: *AG03/1 Fieldbus, Mounting instructions, Documentation on CD*

Accessories:

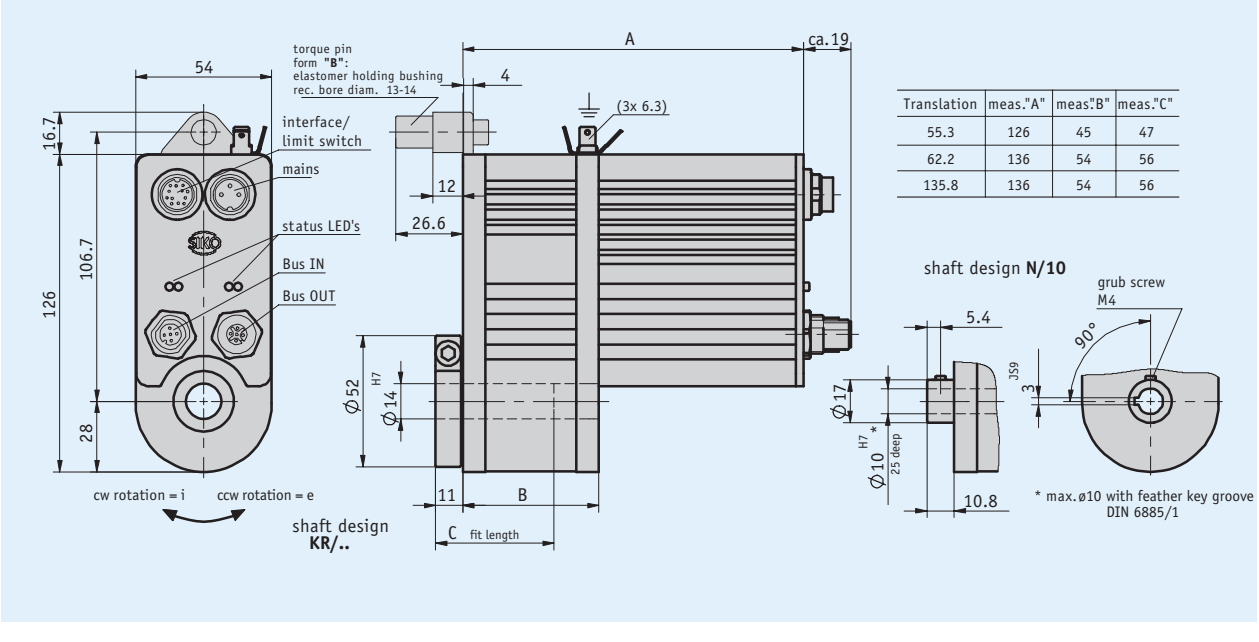
Cable extension KV04S1	*page 68*
Cable extension KV04S2	*page 70*
Easy Touch Control ETC5000	*www.siko-global.com*
Programming software ProTool DL	*www.siko-global.com*
Mating Connector Overview	*page 58*
Mating connector, Motor/power supply, 4-pole, socket	*Order key 83526*
Mating connector, Motor/power supply, 4-pole, angle socket	*Order key 83091*
Mating connector, Profibus IN, 5-pole, angle socket	*Order key 82804*
Mating connector, Profibus IN, 5-pole, socket	*Order key 83991*
Mating connector, Profibus OUT, 5-pole, angular pin	*Order key 82805*
Mating connector, Profibus OUT, 5-pole, pin	*Order key 83992*
Mating connector, CANopen IN, 5-pole, angle socket	*Order key 83006*
Mating connector, CANopen IN, 5-pole, socket	*Order key 84109*
Mating connector, CANopen OUT, 5-pole, angular pin	*Order key 83007*
Mating connector, CANopen OUT, 5-pole, pin	*Order key 84732*
Mating connector, bus IN, 4-pole, pin	*Order key 84209*
Mating connector, bus OUT, 4-pole, pin	*Order key 84210*

Additional information:

General information and areas of application	*page 10*

Profile

- Easy mounting
- Through hollow shafts up to max. ø14 mm
- Integrated magnetic absolute position encoder on the output shaft
- Integrated positioning controller
- Integrated fieldbus interface (option)



Translation	meas."A"	meas."B"	meas."C"
55.3	126	45	47
62.2	136	54	56
135.8	136	54	56

Mechanical data

Feature	Technical data	Additional information
Shaft	black-finished steel	
Housing	aluminum	
Nominal torque/rated speed	5 Nm at 80 rpm	i = 55.3 (70 W-M motor)
	6 Nm at 70 rpm	i = 62.2 (70 W-M motor)
	9 Nm at 35 rpm	i = 135.8 (70 W-M motor)
Operating mode	S3 intermittent operation: 25 % DC, 10 min.	EN 60034-1
Weight	~1.2 kg	(Fieldbus)

Electrical data

- **Motor**

Feature	Technical data	Additional information
Operating voltage	24 V DC ±10 %	reverse polarity protected, fieldbus
Power input	70 W	
Rated current	2.9 A ±4 % (70 W-M motor)	max. load current i = 55.3 / i = 62.2
	2.1 A ±4 % (70 W-M motor)	max. load current i = 135.8
Type of connection	2x M16 plug connectors	3-pole, 1x pin; 12-pole, 1x pin
	-2x M12 plug connectors (A-coded)	5-pole, 1x pin; 5-pole, 1x socket (CAN)
	2x M12 plug connectors (B-coded)	5-pole, 1x pin; 5-polig, 1x socket (PB)

System data

Feature	Technical data	Additional information
Resolution	1600 intervals/revolution	ABM P10 position encoder
Travel range	±6250 revolution(s) (multiturn)	ABM position encoder

Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	0 ... 50 °C	
Storage temperature	-20 ... 60 °C	
Relative humidity		condensation inadmissible
EMC	EN 61800-3, second environment	interference resistance / immission
	EN 61800-3, C3	emitted interference / emission
Protection category	IP50	EN 60529, mating connectors mounted
Shock resistance	500 m/s^2, 11 ms	EN 60068-2-27
Vibration resistance	100 m/s^2, 5 ... 150 Hz	EN 60068-2-6

Pin assignment

Voltage supply

Signal	PIN
+Ub	1
N.C.	2
-Ub	3

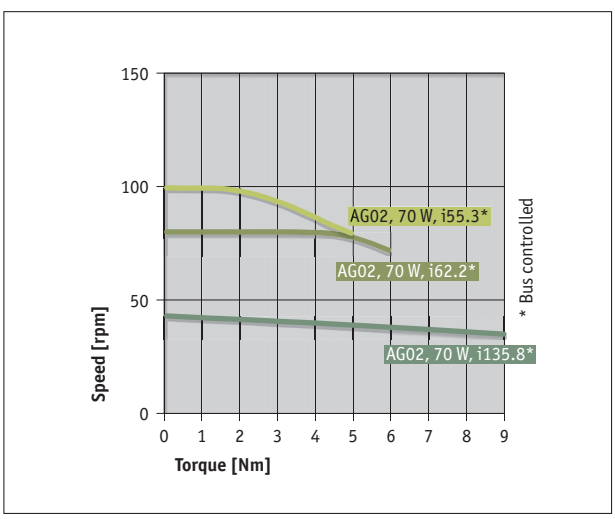
Fieldbus

Profibus-DP	CANopen	PIN
+5 V DC	N.C.	1
BUS A	N.C.	2
GND	CAN_GND	3
BUS B	CAN_H	4
N.C.	CAN_L	5

Interface/limit switch

Signal	PIN
ES1	A
ES2	B
Enable (24 V DC)	C
nc	D
+24 V DC	E
nc	F
RXD/DÜA	G
TXD/DÜB	H
GND/serial interface	J
GND (ES1, ES2,Emergency-off, CAL)	K
CAL	L
GND	M

Performance curve



Order

Ordering table

Feature	Ordering data		Specification	Additional information
Gear ratio	55.3	A	i = 55.3	
	62.2		i = 62.2	
	135.8		i = 135.8	
Shaft design	KR/14	B	clamping ring, ø14 mm	
	N/10		keyway, ø10 mm	
Torque pin	B	C	lug	incl. elastomer bushing
	OD		without	
Interface	S1/00	D	RS232, standard, electronic control unit	
	S3/00		RS485, standard, electronic control unit	
Fieldbus	OFB	E	without fieldbus	
	PB		Profibus-DP	
	CAN		CANopen	

Order key

AG02 Fieldbus - [A] - 70W-M - [B] - D - [C] - LA - ABM - OMS - [D] - [E] - SW

Scope of delivery: *AG02 Fieldbus, Mounting instructions, Documentation on CD*

Accessories:

Cable extension KV02S0	*page 60*
Cable extension KV12S0	*page 78*
Programming Tool PT232	*www.siko-global.com*
Cable adaptor KA232	*www.siko-global.com*
Programming Tool PT485	*www.siko-global.com*
Cable adaptor KA485	*www.siko-global.com*
Programming software ProTool DL	*www.siko-global.com*
Mating Connector Overview	*page 58*
Mating connector, motor/voltage supply, 3-pole, socket	*Order key 82182*
Mating connector, motor/voltage supply, 3-pole, angle socket	*Order key 81363*
Mating connector, encoder, 12-pole, socket	*Order key 76572*
Mating connector, encoder, 12-pole, angle socket	*Order key 79666*
Mating connector, Profibus IN, 5-pole, socket	*Order key 83991*
Mating connector, Profibus IN, 5-pole, angle socket	*Order key 82804*
Mating connector, Profibus OUT, 5-pole, pin	*Order key 83992*
Mating connector, Profibus OUT, 5-pole, angular pin	*Order key 82805*
Mating connector, CANopen IN, 5-pole, socket	*Order key 84109*
Mating connector, CANopen IN, 5-pole, angle socket	*Order key 83006*
Mating connector, CANopen OUT, 5-pole, pin	*Order key 84732*
Mating connector, CANopen OUT, 5-pole, angular pin	*Order key 83007*
bus terminating connector, Profibus, 5-pole, pin	*Order key 82816*
bus terminating connector, CANopen, 5-pole, pin	*Order key 82815*

Additional information:

General information and areas of application	*page 10*

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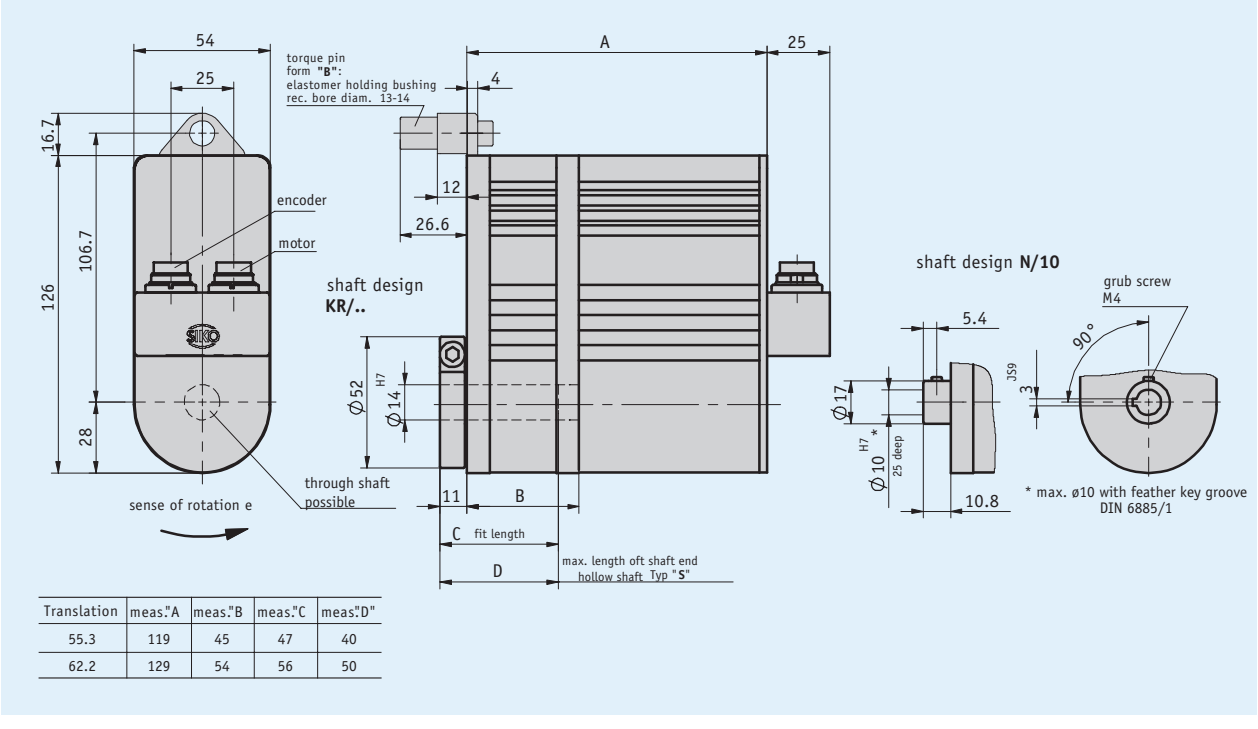
Profile

- Easy mounting
- Optional through hollow shafts up to max. Ø 14 mm
- Integrated analog absolute position encoder



Translation	meas."A	meas."B	meas."C	meas."D"
55.3	119	45	47	40
62.2	129	54	56	50

Mechanical data

Feature	Technical data	Additional information
Shaft	black-finished steel	
Housing	aluminum	
Nominal torque/rated speed	8 Nm at 120 rpm	i = 55.3 (150 W motor)
	9 Nm at 110 rpm	i = 62.2 (150 W motor)
Operating mode	S3 intermittent operation: 25 % DC, 10 min.	EN 60034-1
Weight	~1.8 kg	(analog)

Electrical data

- **Motor**

Feature	Technical data	Additional information
Operating voltage	0 ... 24 V DC	reverse polarity protected
Power input	150 W	
Rated current	5.8 A ±4 % (150 W motor)	max. load current i = 55.3 / i = 62.2
Type of connection	2x M16 plug connectors	3-pole, 1x pin; 7-pole, 1x pin

Encoder potentiometer

Feature	Technical data	Additional information
Power rating	2 W at 40 °C	P10 position encoder
Resistance tolerance	±5 %	P10 position encoder
Standard terminal resistance	0.5 %or 1 Ω	P10 position encoder (always the higher value)
Linearity tolerance	±0.25 %	P10 position encoder

MWI transducer, power source

Feature	Technical data	Additional information
Operating voltage	24 V DC ±20 %	at ≤500 Ω load, reverse polarity protected

MWU transducer, voltage source

Feature	Technical data	Additional information
Operating voltage	24 V DC ±20 %	I_{Load} ≤10 mA, reverse polarity protected

Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	0 ... 70 °C	
Storage temperature	-20 ... 80 °C	
Relative humidity		condensation inadmissible
EMC	EN 61800-3, second environment	interference resistance / immission
	EN 61800-3, C3	emitted interference / emission
Protection category	IP50	EN 60529, mating connectors mounted
Shock resistance	500 m/s², 11 ms	EN 60068-2-27
Vibration resistance	100 m/s², 5 ... 150 Hz	EN 60068-2-6

Pin assignment

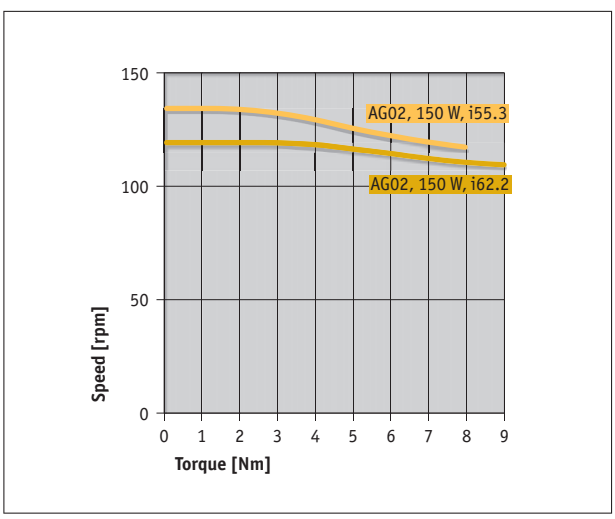
Motor

Signal	PIN
Motor +	1
N.C.	2
Motor -	3

Potentiometer

P01/P10	MWI	MWU	PIN
Pe	I-	GND	1
Po	I+	+24 V DC	2
S	N.C.	Uout	3
N.C.	N.C.	N.C.	4-7

Performance curve



Order

Ordering table

Feature	Ordering data		Specification	Additional information
Gear ratio	55.3	A	i = 55.3	
	62.2		i = 62.2	
Shaft design/diameter	KR/14	B	clamping ring, ø14 mm	
	N/10		keyway, ø10 mm	
Hollow shaft type	S	C	blind hole	for the max. length of the stub shaft refer to the table of dimensions
	D		through	
Torque pin	B	D	lug	incl. elastomer bushing
	OD		without	
Position encoder	MWI	E	transducer 4 ... 20 mA	10-turn potentiometer
	MWU		transducer 0 ... 10 V	10-turn potentiometer
	P01		potentiometer 1 kΩ	10-turn potentiometer
	P10		potentiometer 10 kΩ	10-turn potentiometer
			others on request	
Potentiometer transmission	...	F	1 ... 128 max.	
Sense of rotation	i	G	clockwise ascending values	only with MWI and MWU encoders
	e		counter-clockwise ascending values	only with MWI and MWU encoders

* Calculation of potentiometer gear ratio: For example, if 120 revolutions are required for one adjustment, then a gear ratio of 12 should be indicated for the 10-turn potentiometer. To be precise: number of revolutions required/10 (10-turn potentiometer) = potentiometer gear ratio

Order key

AG02 Analog - [A] - 150W - [B] - [C] - [D] - LR - [E] - [F] - [G] - OMS - XX/XX - OFB

Scope of delivery: *AG02 Analog, Mounting instructions*

Accessories:

Cable extension KV02S0	*page 60*
Cable extension KV07S0	*page 72*
Motor control module MS02	*page 56*
Electronic display MA50	*www.siko-global.com*
Mating Connector Overview	*page 58*
Mating connector, motor/voltage supply, 3-pole, socket	*Order key 82182*
Mating connector, motor/voltage supply, 3-pole, angle socket	*Order key 81363*
Mating connector, encoder/digital inputs, 7-pole, socket	*Order key 76141*
Mating connector, encoder/digital inputs, 7-pole, angle socket	*Order key 78088*

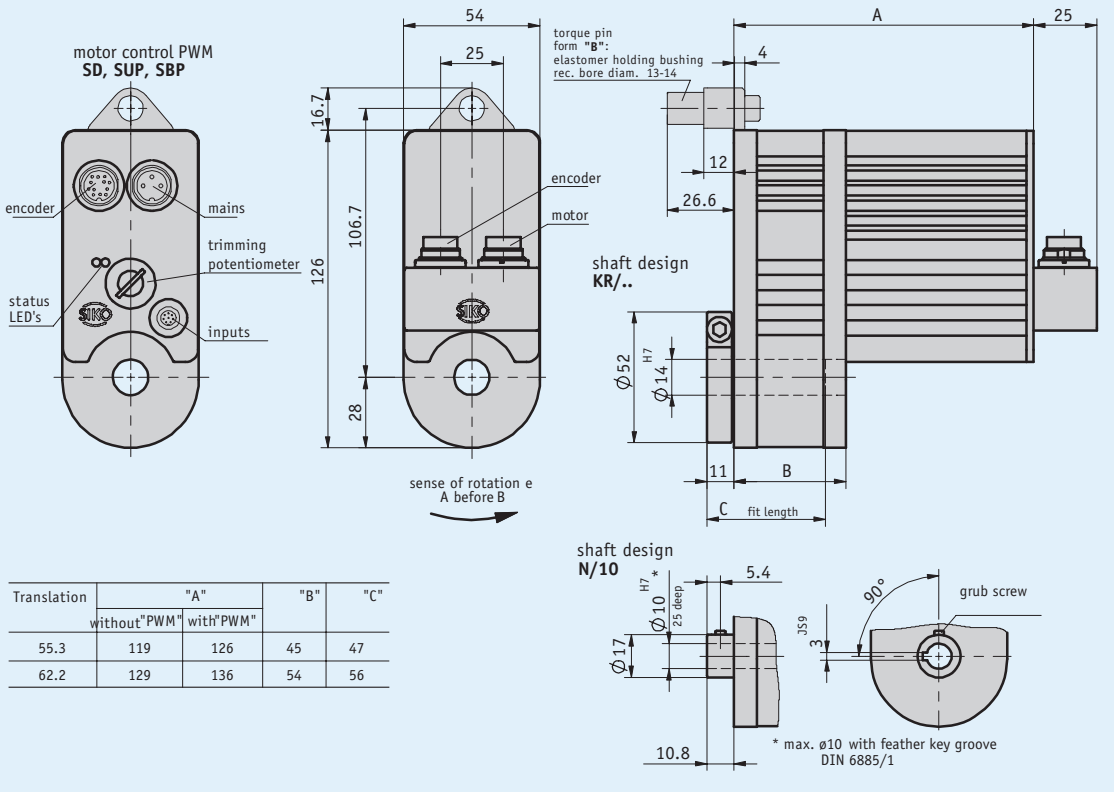
Additional information:

General information and areas of application *page 10*

Profile

- Easy mounting
- Through hollow shafts up to max. ø14 mm
- Integrated magnetic position encoder on output shaft
- Integrated motor control (option)

4.1



Translation	"A"		"B"	"C"
	without "PWM"	with "PWM"		
55.3	119	126	45	47
62.2	129	136	54	56

Mechanical data

Feature	Technical data	Additional information
Shaft	black-finished steel	
Housing	aluminum	
Nominal torque/rated speed	5 Nm at 80 rpm	i = 55.3 (70 W-M motor)
	8 Nm at 120 rpm	i = 55.3 (150 W motor)
	6 Nm at 70 rpm	i = 62.2 (70 W-M motor)
	9 Nm at 110 rpm	i = 62.2 (150 W motor)
Operating mode	S3 intermittent operation: 25 % DC, 10 min.	EN 60034-1
Weight	~1.6 kg	(incremental)

Electrical data

Motor

Feature	Technical data	Additional information
Operating voltage	0 ... 24 V DC	reverse polarity protected
	24 V DC ±10 %	reverse polarity protected, with PWM motor control
Power input	70 W	
	150 W	
Rated current	5.8 A ±4 % (150 W motor)	max. load current i = 55.3 / i = 62.2
	2.9 A ±4 % (70 W-M motor)	max. load current i = 55.3 / i = 62.2
Type of connection	2x M16 plug connectors	3-pole, 1x pin; 12-pole, 1x pin

PWM motor control

Feature	Technical data	Additional information
Operating voltage	24 V DC ±20 % controlled, with LED indicator	reverse polarity protected
Inputs	digital with LED indicator / analog	
Analog inputs	0 ... 10 V	impedance >1.3 MΩ
	-10 ... 10 V	impedance >1.3 MΩ
Digital inputs	15 ... 30 V, typical 10 mA	
PWM (Pulse width modulation) input	~16 kHz, continuously variable, 0 ... 100 %	soft start

Encoder

Feature	Technical data	Additional information
Operating voltage	5 V DC ±5 %	LD5 position encoder, no reverse polarity protection
	24 V DC ±20 %	LD24 + OP, position encoder, reverse polarity protected
Current consumption	<50 mA	LD5 position encoder
	<25 mA	LD24 + OP position encoders
Output circuit	Line Driver (RS422)	LD5 + LD24 position encoders
	Push Pull (OP)	OP position encoder
Output signals	A, B, I, /A, /B, /I	
Pulse frequency	≤20 kHz	

Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	0 ... 50 °C	
	0 ... 70 °C	without motor control, with position encoder
	0 ... 80 °C	without motor control, without position encoder
Storage temperature	-20 ... 80 °C	
Relative humidity		condensation inadmissible
EMC	EN 61800-3, second environment	interference resistance / immission
	EN 61800-3, C3	emitted interference / emission
Protection category	IP50	EN 60529, mating connectors mounted
Shock resistance	500 m/s^2, 11 ms	EN 60068-2-27
Vibration resistance	100 m/s^2, 5 ... 150 Hz	EN 60068-2-6

Pin assignment

Motor/voltage supply

Signal	PIN
Motor+/+Ub	1
N.C.	2
Motor-/0 V	3

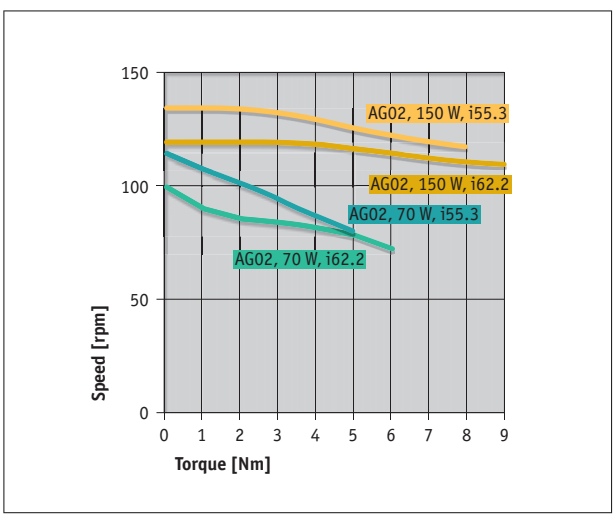
Encoder

LD24	LD5	PIN
/B	/B	A
nc	+SUB (sensor)	B
/I	/I	C
I	I	D
A	A	E
nc	nc	G
/A	/A	F
B	B	H
nc	nc	J
GND	GND	K
nc	SGND (sensor)	L
+Ub	+Ub	M

PWM motor control

digital	analog unipolar	analog bipolar	PIN
Clockwise rotation plus	Enable plus	Enable plus	1
Clockwise rotation ground	Enable ground	Enable ground	2
Counter-clockwise rotation plus	cw/ccw plus	nc	3
Counter-clockwise rotation ground	cw/ccw ground	nc	4
Fast/creep plus	Analog 0 ... +10 V	Analog 0 ... +10 V	5
Fast/creep ground	Analog ground	Analog ground	6
nc	nc	nc	7
nc	nc	nc	8

Performance curve



Order

Ordering table

Feature	Ordering data		Specification	Additional information
Gear ratio	55.3	A	i = 55.3	
	62.2		i = 62.2	
Motor performance	150W	B	150 W	
	70W-M		70 W	only with SD, SUP or SBP motor control
Shaft design/diameter	KR/14	C	clamping ring, ø14 mm	
	N/10		keyway, ø10 mm	
Torque pin	B	D	lug	incl. elastomer bushing
	OD		without	
Position of electrical connection	LR	E	radial	with external motor control
	LA		axial	with integrated motor control
Position encoder	LD24	F	incremental 1000 Impulse	+10 ... +30 V DC
	LD5		incremental 1000 Impulse	+5 V DC ±5 %
	OP		push-pull with inverting	+10 ... +30 V DC
	O		without	only with LR "Position of electrical connection"
Motor control pwm	OMS	G	without	only with 150 W motor power
	SD		digital input	
	SUP		analog input, unipolar 0 ... +10 V	
	SBP		analog input, bipolar -10 ... +10 V	

Order key

AG02 Incremental - [A] - [B] - [C] - D - [D] - [E] - [F] - [G] - XX/XX - OFB

Scope of delivery: *AG02 Incremental, Mounting instructions*

Accessories:

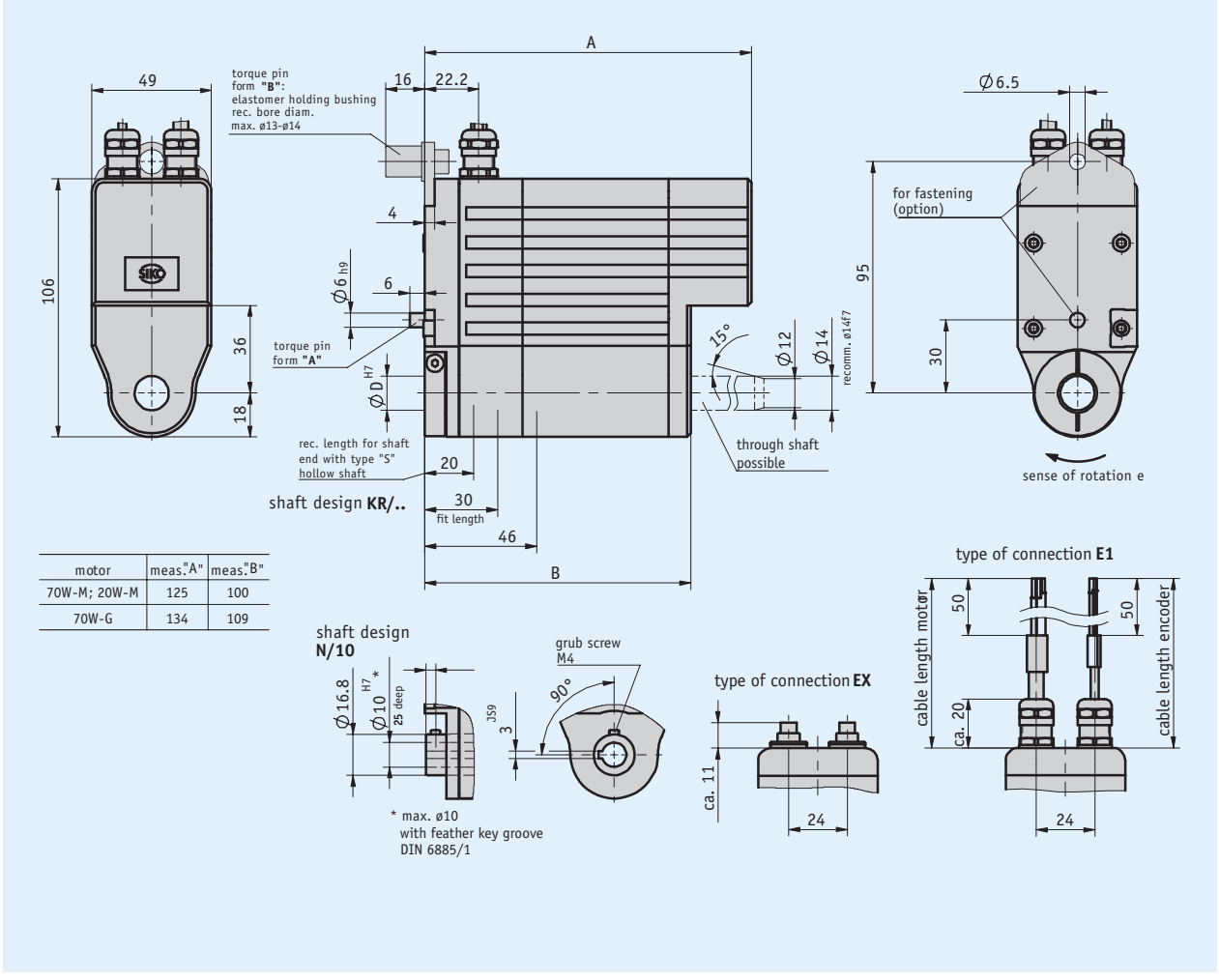
Cable extension KV04S0	*page 66*
Cable extension KV08S0	*page 74*
Cable extension KV12S0	*page 78*
Motor control module MS02	*page 56*
Electronic display MA55	*www.siko-global.com*
Electronic display MA48	*www.siko-global.com*
Electronic display MA10/4	*www.siko-global.com*
Mating Connector Overview	*page 58*
Mating connector, motor/voltage supply, 3-pole, socket	*Order key 82182*
Mating connector, motor/voltage supply, 3-pole, angle socket	*Order key 81363*
Mating connector, encoder, 12-pole, socket	*Order key 76572*
Mating connector, encoder, 12-pole, angle socket	*Order key 79666*
Mating connector, motor control, 8-pole, socket	*Order key 81351*

Additional information:

General information and areas of application	*page 10*

Profile

- Easy mounting
- Through hollow shafts up to max. ø14 mm possible
- Integrated analog absolute position encoder
- Electrical connection via cable or connector



motor	meas."A"	meas."B"
70W-M; 20W-M	125	100
70W-G	134	109

Mechanical data

Feature	Technical data	Additional information
Shaft	black-finished steel	
Housing	aluminum, powder coated zinc die cast	
Nominal torque/rated speed	1.1 Nm, 430 rpm	i = 12.4 (70 W motors)
	2.1 Nm, 225 rpm	i = 24 (70 W motors)
	4.2 Nm, 110 rpm	i = 48 (70 W motors)
Operating mode	S3 intermittent operation: 25 % DC, 10 min.	EN 60034-1
Weight	~1.5 kg	

Electrical data

Motor

Feature	Technical data	Additional information
Operating voltage	0 ... 24 V DC	70 W motors
Power input	70 W	
Rated current	2.9 A ±10 % (70W-M)	3.2 A max. load current
	4.1 A ±10 % (70W-G)	4.5 A max. load current
Type of connection	2x M9 plug connectors	4-pole, 1x pin; 3-pole, 1x pin

Encoder potentiometer

Feature	Technical data	Additional information
Power rating	2 W at 40 °C	P10 position encoder
Resistance tolerance	±5 %	P10 position encoder
Standard terminal resistance	0.5 %or 1 Ω	P10 position encoder (always the higher value)
Linearity tolerance	±0.25 %	P10 position encoder

MWI transducer, power source

Feature	Technical data	Additional information
Operating voltage	24 V DC ±20 %	at ≤500 Ω load

MWU transducer, voltage source

Feature	Technical data	Additional information
Operating voltage	24 V DC ±20 %	I_{Load} ≤10 mA

Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	0 ... 70 °C	
Storage temperature	-20 ... 80 °C	
Relative humidity		condensation inadmissible
EMC	EN 61800-3, second environment	interference resistance / immission
	EN 61800-3, C3	emitted interference / emission
Protection category	IP63	EN 60529, with mating connectors mounted
Shock resistance	500 m/s², 11 ms	EN 60068-2-27
Vibration resistance	100 m/s², 50 Hz	EN 60068-2-6

Pin assignment

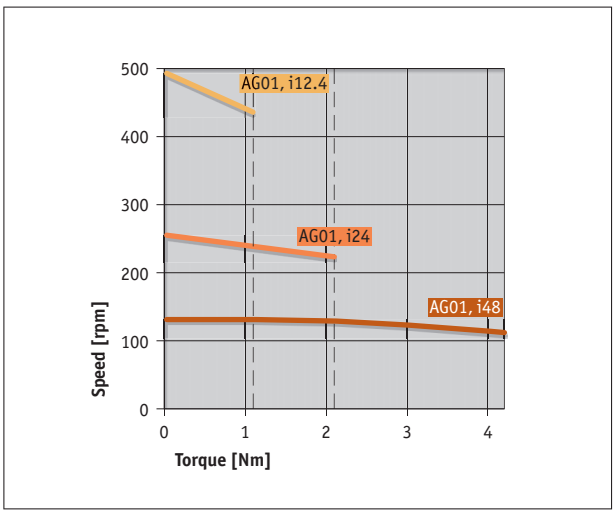
Motor

Signal	EX	E1
+	1	M1, white imprinted
+	2	
-	3	M2, white imprinted
-	4	

Potentiometer

Signal	MWU	MWI	EX	E1
Po	+24 V DC	I+	1	brown
S	Uout		2	green
Pe	GND	I-	3	white

Performance curve



Order

Ordering table

Feature	Ordering data		Specification	Additional information
Gear ratio	48	A	i = 48	
	24		i = 24	
	12.4		i = 12.4	
Motor performance	70W-M	B	24 V DC	
	70W-G		24 V DC	
			others on request	
Shaft design/diameter	KR/14	C	clamping ring, ø14 mm	
	KR/12		clamping ring, ø12 mm	
	N/10		keyway	only for type S hollow shaft
Hollow shaft type	S	D	blind hole	
	D		full-length	
Torque pin	A	E	bolt, ø6 mm	
	B		lug I	incl. elastomer bushing
Type of connection	E1	F	open cable	
	EX		socket on the device	
Motor cable length	02.0	G	in m	
			others on request	
Encoder cable length	02.0	H	in m	
			others on request	
Position encoder	P10	I	potentiometer 10 kΩ	10 helipot potentiometer
	MWI		transducer 4 ... 20 mA	10 helipot potentiometer
	MWU		transducer 0 ... 10 V	10 helipot potentiometer
			others on request	
Potentiometer transmission	...	J	1 ... 128 max.	only for P10, MWI and MWU encoders
			others on request	
Sense of rotation	i	K	clockwise ascending values	only for MWI or MWU encoders
	e		counter-clockwise ascending values	only for MWI or MWU encoders

* Calculation of potentiometer transmission ratio: for instance, if 120 revolutions are required for one adjustment, then the transmission ratio of 12 must be indicated for the 10 helipot potentiometer. In practice: number of necessary revolutions/10 (10 helipot potentiometer) = potentiometer transmission ratrio

Order key

AG01 Analog - [A] - [B] - [C] - [D] - [E] - [F] - [G] - [H] - [I] - [J] - [K]

Scope of delivery: *AG01 Analog, Mounting instructions*

Accessories:

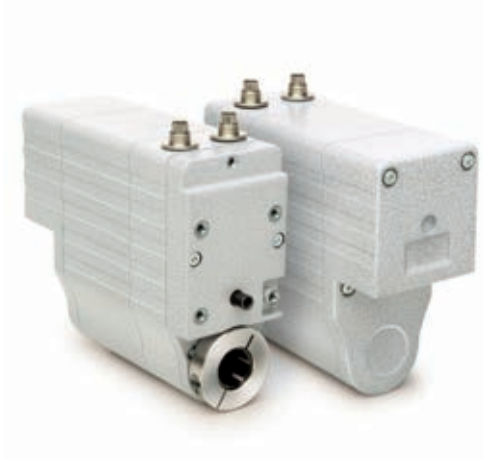
Cable extension KV03S0	*page 62*
Cable extension KV04S0	*page 66*
Motor control module MS02	*page 56*
Electronic display MA50	*www.siko-global.com*
Mating Connector Overview	*page 58*
Mating connector, motor, 4-pole, socket	*Order key 83447*
Mating connector, potentiometer, 3-pole, socket	*Order key 81487*
Mating connector, potentiometer, 3-pole, angle socket	*Order key 82366*

Additional information:

General information and areas of application *page 10*

Profile

- Easy mounting
- Through hollow shafts up to max. ø14 mm possible
- Integrated magnetic position encoder on output shaft
- Electrical connection via cable or connector



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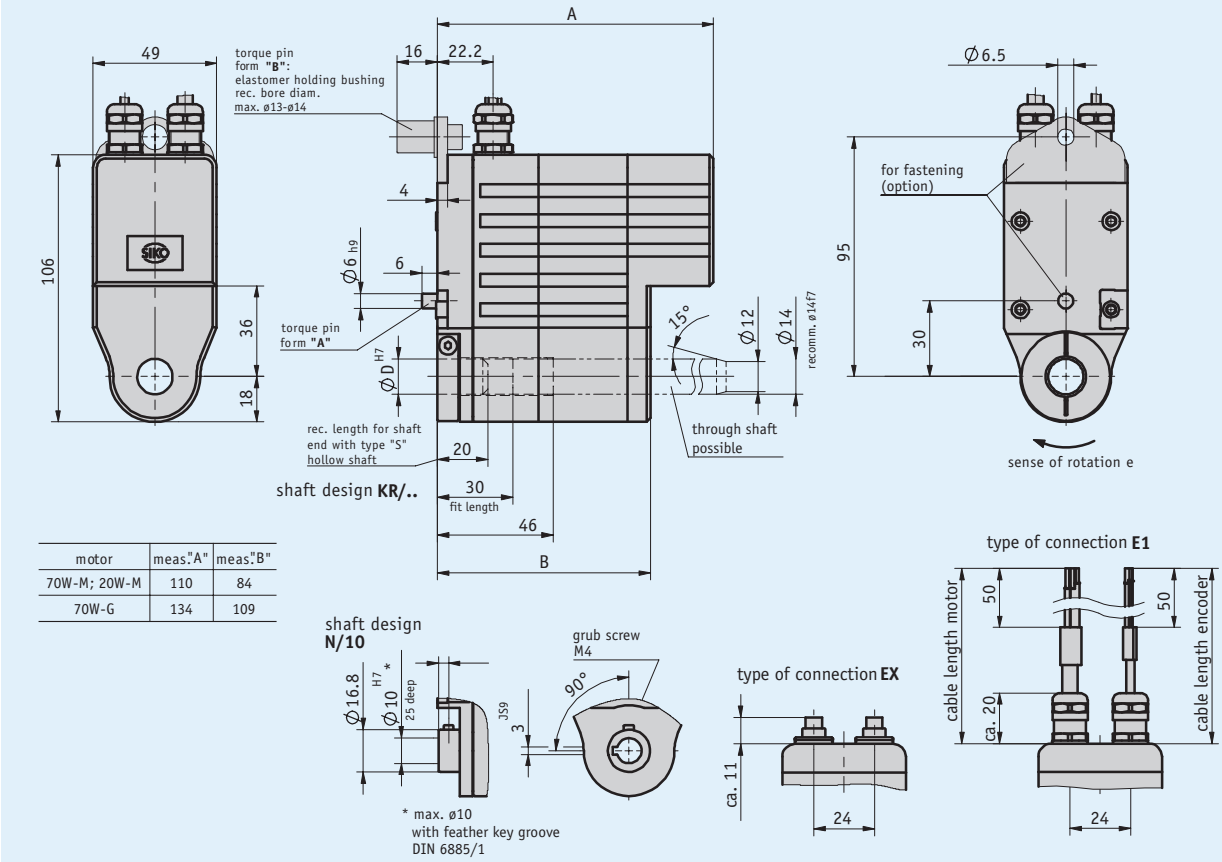


motor	meas."A"	meas."B"
70W-M; 20W-M	110	84
70W-G	134	109

Mechanical data

Feature	Technical data	Additional information
Shaft	black-finished steel	
Housing	aluminum, powder coated zinc die cast	
Nominal torque/rated speed	1.1 Nm, 430 rpm	i = 12.4 (70 W motors)
	2.1 Nm, 225 rpm	i = 24 (70 W motors)
	4.2 Nm, 110 rpm	i = 48 (70 W motors)
Operating mode	S3 intermittent operation: 25 % DC, 10 min.	EN 60034-1
Weight	~1.5 kg	

Electrical data

Motor

Feature	Technical data	Additional information
Operating voltage	0 ... 24 V DC	70 W motors
Power input	70 W	
Rated current	2.9 A ±10 % (70W-M)	3.2 A max. load current
	4.1 A ±10 % (70W-G)	4.5 A max. load current
Type of connection	2x M9 plug connectors	4-pole, 1x pin; 8-pole, 1x pin

Encoder

Feature	Technical data	Additional information
Operating voltage	5 V DC ±5 %	LD5 position encoder
	24 V DC ±20 %	LD24 + OP position encoder
Current consumption	≤35 mA	
Output circuit	Line Driver (RS422)	LD5 + LD24 position encoders
	Push Pull (OP)	OP position encoder
Output signals	A, B, 0, /A, /B, I	
Pulse frequency	≤20 kHz	

Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	0 ... 70 °C	
	0 ... 80 °C	without position encoder
Storage temperature	-20 ... 80 °C	
Relative humidity		condensation inadmissible
EMC	EN 61800-3, second environment	interference resistance / immission
	EN 61800-3, C3	emitted interference / emission
Protection category	IP63	EN 60529, with mating connectors mounted
Shock resistance	500 m/s^2, 11 ms	EN 60068-2-27
Vibration resistance	100 m/s^2, 50 Hz	EN 60068-2-6

Pin assignment

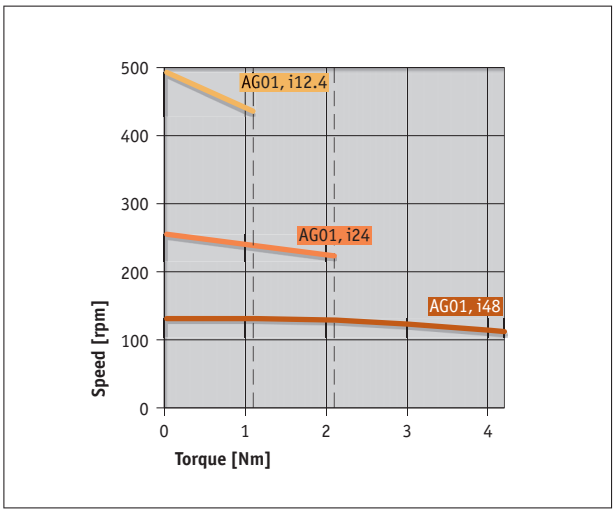
Motor

Signal	EX	E1
+	1	M1, white imprinted
+	2	
-	3	M2, white imprinted
-	4	

Encoder

Signal	EX	E1
B	1	white
+UB	2	brown
0	3	green
A	4	yellow
GND	5	gray
/A	6	pink
/B	7	blue
I	8	red

Performance curve



Order

Ordering table

Feature	Ordering data		Specification	Additional information
Gear ratio	48	A	i = 48	
	24		i = 24	
	12.4		i = 12.4	
Motor performance	70W-M	B	24 V DC	
	70W-G		24 V DC	
			others on request	
Shaft design/diameter	KR/14	C	clamping ring, ø14 mm	
	KR/12		clamping ring, ø12 mm	
	N/10		keyway	only for type S hollow shaft
Hollow shaft type	S	D	blind hole	
	D		full-length	
Torque pin	A	E	bolt, ø6 mm	
	B		lug I	incl. elastomer bushing
Type of connection	E1	F	open cable	
	EX		socket on the device	
Motor cable length	02.0	G	in m	
			others on request	
Encoder cable length	02.0	H	in m	
			others on request	
Position encoder	LD24	I	incremental encoder 1024 pulses	
	LD5		incremental encoder 1024 pulses	
	OP		Push-pull with inverting	
	0		without	

Order key

AG01 Incremental - [A] - [B] - [C] - [D] - [E] - [F] - [G] - [H] - [I]

Scope of delivery: *AG01 Incremental, Mounting instructions*

Accessories:

Cable extension KV04S0	*page 66*
Cable extension KV08S0	*page 74*
Motor control module MS02	*page 56*
Electronic display MA55	*www.siko-global.com*
Electronic display MA48	*www.siko-global.com*
Electronic display MA10/4	*www.siko-global.com*
Mating Connector Overview	*page 58*
Mating connector, motor, 4-pole, socket	*Order key 83447*
Mating connector, encoder, 8-pole, socket	*Order key 81351*

Additional information:

General information and areas of application	*page 10*

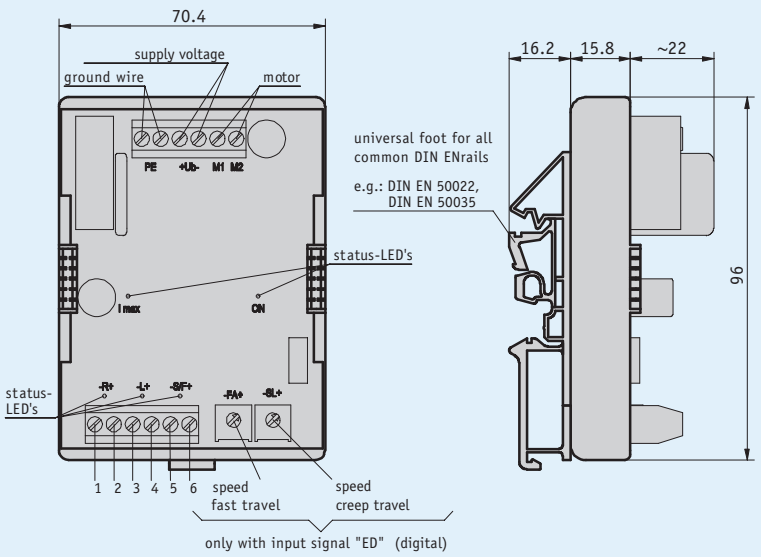
4.2

4.2 | Accessories

Motor control module MS02
Accessories

Profile

- Easy mounting (top-hat rail)
- Variable control variants
- Use with different positioning controls
- Fast or creep motion continuously variable
- Pulse width modulation (PWM) for 24 V DC actuators



Electrical data

Feature	Technical data	Additional information
Operating voltage	24 V DC ±20 % (controlled)	with LED indicator, reverse polarity protected
Motor current	3/5/6 A (≤12 A peak)	overcurrent protection with multifuse
Inputs	digital with LED indicator/ analog	
Analog inputs	0 ... 10 V	impedance >1.3 MΩ
	-10 ... 10 V	impedance >1.3 MΩ
Digital inputs	15 ... 30 V, typical 10 mA	
Status display	overcurrent protection, input state, operating voltage	
PWM (Pulse width modulation) output	~16 kHz , stepless, 0 ... 100 %	soft start

Ambient conditions

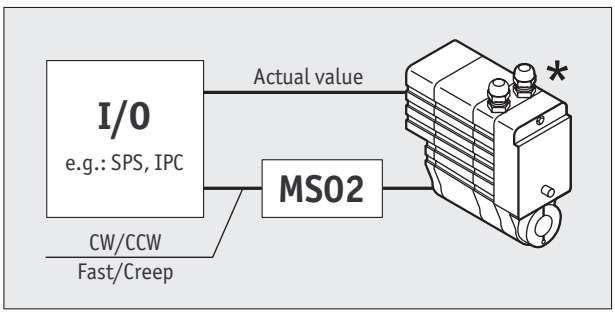
Feature	Technical data	Additional information
Ambient temperature	0 ... 50 °C	
Relative humidity	≤95 %	condensation inadmissible

Pin assignment

Terminal board

Digital	Analog unipolar	Analog bipolar	PIN
Clockwise ground	enable ground	enable ground	1
Clockwise plus	enable plus	enable plus	2
Counter-clockwise ground	cw/ccw ground	N.C.	3
Counter-clockwise plus	cw/ccw plus	N.C.	4
Fast/creep ground	analog ground	analog ground	5
Fast/creep plus	analog 0 ... +10 V	analog 0 ... +10 V	6

Functional diagram



* possible field of application with AG01, AG02

Order

Ordering table

Feature	Ordering data		Specification	Additional information
Load current	3A	A	3 A	others on request, max. 12 A
	5A		5 A	
	6A		6 A	
Input signal	ED	B	digital	
	EUP		analog unipolar	0 ... +10 V, impedance >1.3 MΩ
	EBP		analog bipolar	-10 ... +10 V, Impedanz >1.3 MΩ

Order key

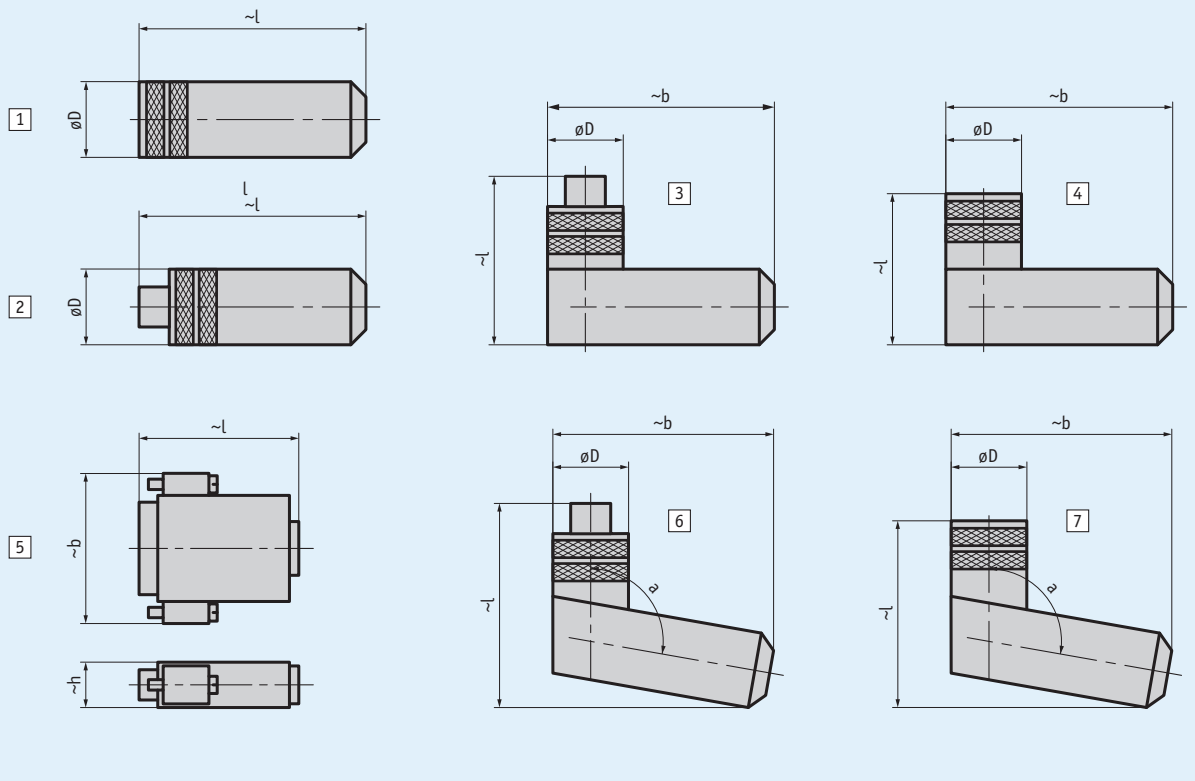
MS02 - [ ] - [ ]
A B

Scope of delivery: *MS02, Mounting instructions*

Profile

- Mating connector, straight
- Mating connector, offset
- D-SUB connector
- Bus terminator, straight

When screwed, the distance to the device will increase by approx. 3 mm.



Order

Overview of orders

Order key	Picture	Type	PIN	Name	ø Cable	øD	l	b	h	a
71364+71365	5	D-SUB	9	pin+shell	≤8.5		35	31	15.5	
71366+71365	5	D-SUB	9	socket+shell	≤8.5		35	31	15.5	
73947+73946	5	D-SUB	15	socket+shel	≤8.5		42	40	15.2	
76141	1	M16	7	socket	4 ... 6	18.5	61			
76572	1	M16	12	socket	6 ... 8	18.5	62			
77087	1	M16	7	socket	6 ... 8	18.5	62			
78088	4	M16	7	angle socket	4 ... 6	20	38	54		
79665	4	M16	7	angle socket	6 ... 8	20	38	54		
79666	4	M16	12	angle socket	6 ... 8	20	38	54		
81351	1	M9	8	socket	3.5 ... 5	14	38			
81363	4	M16	3	angle socket	4 ... 6	20	38	54		
81487	1	M9	3	socket	3.5 ... 5	14	38			
81935	1	M23	12	socket	≤8.5	26	51.1			
82182	1	M16	3	socket	4 ... 6	18.5	61			
82247	4	M9	4	angle socket	3.5 ... 5	14	30	30.5		
82366	4	M9	3	angle socket	3.5 ... 5	14	30	30.5		
82804	7	M12 B-Cod.	5	angle socket	4 ... 8	19	48	41		100°
82805	6	M12 B-Cod.	5	angular pin	4 ... 8	19	50	41		100°
82815	2	M12 A-Cod.	5	bus terminating plug (CAN)		14.5	55			
82816	2	M12 B-Cod.	5	bus terminating plug (PB)		14.2	44			
83006	7	M12 A-Cod.	5	angle socket	4 ... 8	19	48	41		100°
83007	6	M12 A-Cod.	5	angular pin	4 ... 8	19	50	41		100°
83091	7	M12 A-Cod.	4	angle socket	4 ... 8	19	48	41		100°
83419	1	M12 A-Cod.	4	socket	4 ... 6	20	54			
83447	1	M9	4	socket	3.5 ... 5	14	38			
83525	1	M12 A-Cod.	8	socket	6 ... 8	20	57			
83526	1	M12 A-Cod.	4	socket	6 ... 8	20	57			
83527	2	M12 A-Cod.	8	pin	6 ... 8	20	62			
83991	1	M12 B-Cod.	5	socket	6 ... 8	20	57			
83992	2	M12 B-Cod.	5	pin	6 ... 8	20	62			
84109	1	M12 A-Cod.	5	socket	6 ... 8	20	57			
84209	1	M8	4	socket	3.5 ... 5	12	43			
84210	2	M8	4	pin	3.5 ... 5	12	50			
84732	2	M12 A-Cod.	5	pin	6 ... 8	20	62			
85057	1	M16	3	socket	6 ... 8	18.5	62			
85058	4	M16	3	angle socket	6 ... 8	20	38	54		
85277	1	M12 A-Cod.	12	socket	6 ... 8	20	57			
85278	4	M12 A-Cod.	12	angle socket	6 ... 8	20	38	54		
87599	7	M12 A-Cod.	8	angle socket	4 ... 8	19	48	41		100°
87600	3	M12 D-Cod.	4	angular pin	6 ... 8	20	42	54		
87601	2	M12 D-Cod.	4	pin	6 ... 8	20	63			
BAS-0005	2	M8	4	bus terminating plug		12	45			

Order key

...

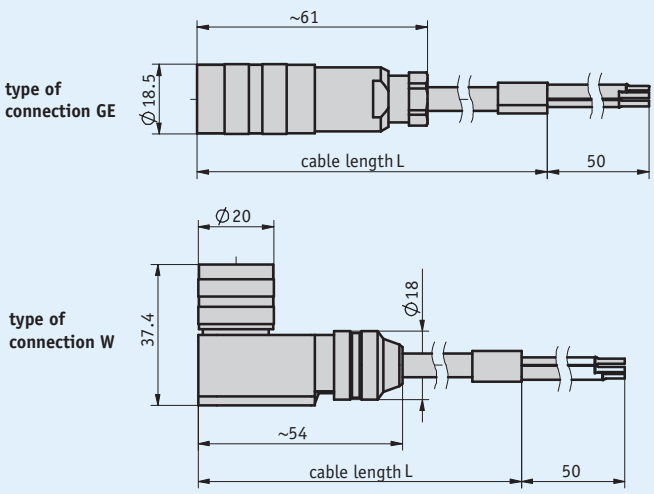
Scope of delivery: *mating connector*

Cable extension KV02S0
Accessories

Profile

- Ready-to-use cable connection
- Cable lengths up to 20 m
- Connection technology M16, 3-pole

Voltage drop should be envisaged with increasing cable length. This should be taken into account for the electrical design.



Mechanical data

Feature	Technical data	Additional information
Cable sheath	PVC	2x 0.75 mm^2, ø6.3 mm

Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	-30 ... 80 °C	

Pin assignment

KV02S0

Cable number	PIN
1 (black)	1
	2
2 (black)	3

Order

Ordering table

Feature	Ordering data		Specification	Additional information
Type of connection	GE	A	straight connector	
	W		right angle plug	
Cable length	...	B	01.0 ... 20.0 m, in steps of 1 m	

Order key

KV02S0 - [ ] - [ ]
A B

4.2

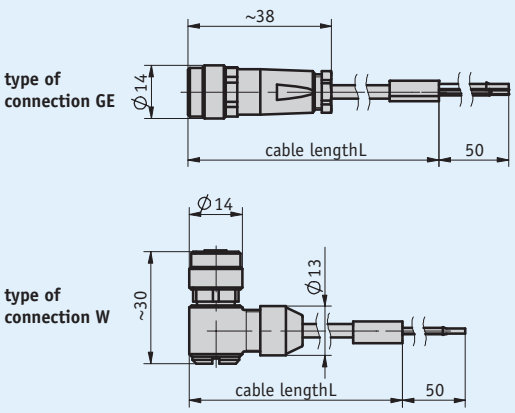
Scope of delivery: KV02S0

Cable extension KV03S0
Accessories

Profile

- Ready-to-use cable connection
- Cable lengths up to 20 m
- Connection technology M9, 3-pole

Voltage drop should be envisaged with increasing cable length. This should be taken into account for the electrical design.



Mechanical data

Feature	Technical data	Additional information
Cable sheath	PUR	3x 0.15 mm^2, ø3.5 mm

Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	-30 ... 80 °C	

Pin assignment

- **KV03S0**

Cable color	PIN
brown	1
green	2
white	3

Order

- **Ordering table**

Feature	Ordering data		Specification	Additional information
Type of connection	GE	A	straight connector	
	W		right angle plug	
Cable length	...	B	01.0 ... 20.0 m, in steps of 1 m	

- **Order key**

KV03S0 - [ ] - [ ]
A B

4.2

Scope of delivery: KV03S0

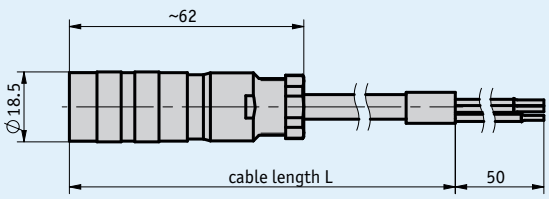
Cable extension KV03S1
Accessories

Profile

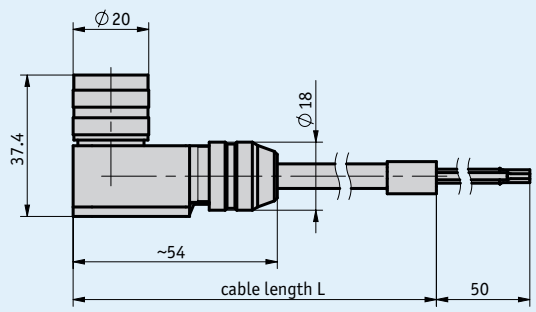
- Ready-to-use cable connection
- Cable lengths up to 10 m
- Connection technology M16, 3-pole

Voltage drop should be envisaged with increasing cable length. This should be taken into account for the electrical design.

type of connection GE



type of connection W



Mechanical data

Feature	Technical data	Additional information
Cable sheath	PUR	3x 0.75 mm^2, ø7.5 mm

Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	-30 ... 100 °C	

Pin assignment

KV03S1

Cable number	PIN
1 (black)	1
2 (black)	2
3 (black)	3

Order

Ordering table

Feature	Ordering data		Specification	Additional information
Type of connection	GE	A	straight connector	
	W		right angle plug	
Cable length	...	B	01.0 ... 10.0 m, in steps of 1 m	

Order key

KV03S1 - [A] - [B]

4.2

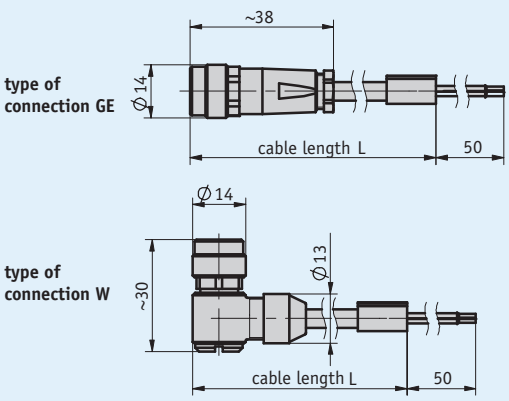
Scope of delivery: KV03S1

Cable extension KV04S0
Accessories

Profile

- Ready-to-use cable connection
- Cable lengths up to 20 m
- Connection technology M9, 4-pole

Voltage drop should be envisaged with increasing cable length. This should be taken into account for the electrical design.



Mechanical data

Feature	Technical data	Additional information
Cable sheath	PVC	4x 0.15 mm^2, ø4.8 mm

Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	-30 ... 80 °C	

Pin assignment

KV04S0

Cable color	PIN
white	1
brown	2
green	3
yellow	4

Order

Ordering table

Feature	Ordering data		Specification	Additional information
Type of connection	GE	A	straight connector	
	W		right angle plug	
Cable length	...	B	01.0 ... 20.0 m, in steps of 1 m	

Order key

KV04S0 - [A] - [B]

4.2

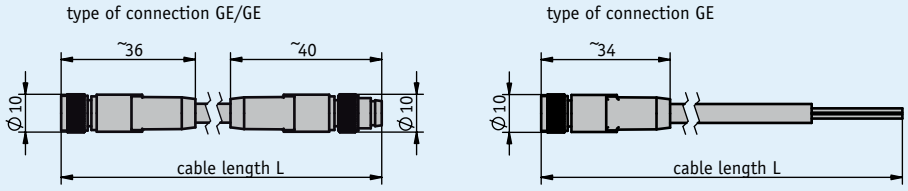
Scope of delivery: KV04S0

Cable extension KV04S1
Accessories

Profile

- Ready-to-use cable connection
- Cable lengths up to 10 m
- Connection technology M8, 4-pole

Voltage drop should be envisaged with increasing cable length. This should be taken into account for the electrical design.



Mechanical data

Feature	Technical data	Additional information
Cable sheath	PUR	

Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	-25 ... 80 °C	

Pin assignment

KV04S1

Cable color	PIN
brown	1
white	2
blue	3
black	4

Order

Ordering table

Feature	Ordering data		Specification	Additional information
Type of connection	GE	A	straight connector	
	GE/GE		2x straight connector	
Cable length	...	B	00.5, 01.0, 03.0, 05.0, 10.0 m	
			others on request	

Order key

KV04S1 - [A] - [B]

Scope of delivery: KV04S1

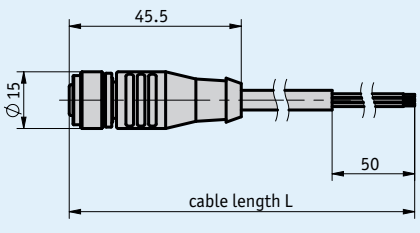
Cable extension KV04S2
Accessories

Profile

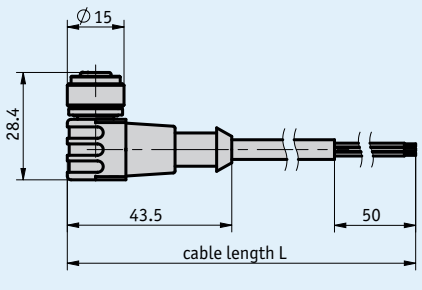
- Ready-to-use cable connection
- Cable lengths up to 10 m
- Connection technology M12 (A-coded), 3-pole

Voltage drop should be envisaged with increasing cable length. This should be taken into account for the electrical design.

type of connection GE



type of connection W



Mechanical data

Feature	Technical data	Additional information
Cable sheath	PVC, PUR	4x0.34 mm², ø5.2 mm

Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	-30 ... +80 °C	PVC
	-30 ... +90 °C	PUR

Pin assignment

Cable color	PIN
brown	5
white	6
blue	7
black	8

Order

Ordering table

Feature	Ordering data		Specification	Additional information
Type of connection	GE	A	straight connector	
	W		angular connector	
Cable sheath	PVC	B	PVC	
	PUR		PUR	
Cable length	...	C	02.0, 05.0, 10.0 m	

Order key

KV04S2 - [ ] - [ ] - [ ]
A B C

4.2

Scope of delivery: KV04S2

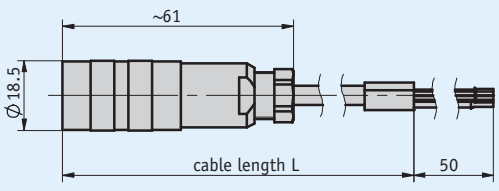
Cable extension KV07S0
Accessories

Profile

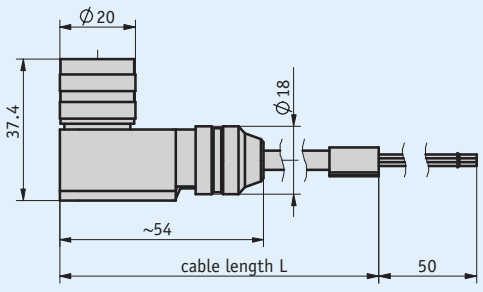
- Ready-to-use cable connection
- Cable lengths up to 20 m
- Connection technology M16, 7-pole

Voltage drop should be envisaged with increasing cable length. This should be taken into account for the electrical design.

type of connection GE



type of connection W



Mechanical data

Feature	Technical data	Additional information
Cable sheath	PUR	

Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	-30 ... 100 °C	

Pin assignment

- **KV07S0**

Cable color	PIN
white	1
brown	2
green	3
yellow	4
gray	5
pink	6
blue	7

Order

- **Ordering table**

Feature	Ordering data	Specification	Additional information
	... A	00.2 ... 20.0 m, in steps of 1 m	

- **Order key**

KV07S0 - GE/GE - [ ]
A

4.2

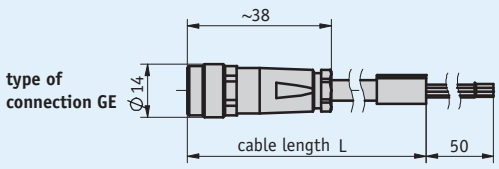
Scope of delivery: KV07S0

Cable extension KV08S0
Accessories

Profile

- Ready-to-use cable connection
- Cable lengths up to 15 m
- Connection technology M9, 8-pole

Voltage drop should be envisaged with increasing cable length. This should be taken into account for the electrical design.



Mechanical data

Feature	Technical data	Additional information
Cable sheath	PVC	8x 0.14 mm^2, ø5.4 mm

Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	-30 ... 80 °C	

Pin assignment

- **KV08S0**

Cable color	PIN
white	1
brown	2
green	3
yellow	4
gray	5
pink	6
blue	7
red	8

Order

- **Ordering table**

Feature	Ordering data	Specification	Additional information
	... A	01.0 ... 10.0 m, in steps of 1 m	
	...	12.0, 14.0, 15.0 m	

- **Order key**

KV08S0 - GE - [ ]
A

4.2

Scope of delivery: KV08S0

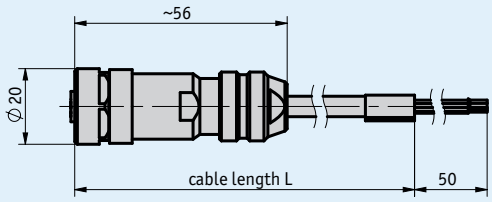
Cable extension KV08S2
Accessories

Profile

- Ready-to-use cable connection
- Cable lengths up to 20 m
- Connection technology M12 (A-coded), 8-pole

Voltage drop should be envisaged with increasing cable length. This should be taken into account for the electrical design.

type of connection GE



Mechanical data

Feature	Technical data	Additional information
Cable sheath	PUR	8x0.14 mm², ø5.4 mm

Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	-30 ... +90 °C	

Pin assignment

Cable color	PIN
white	1
brown	2
green	3
yellow	4
black	5
orange	6
green	7
violet	8

Order

Ordering table

Feature	Ordering data	Specification	Additional information
Cable length	... A	1 ... 20 m, in steps of 1 m	

Order key

KV08S2 - GE - [ ]
A

4.2

Scope of delivery: KV08S2

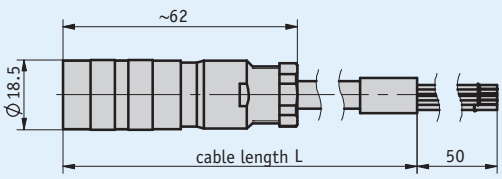
Cable extension KV12S0
Accessories

Profile

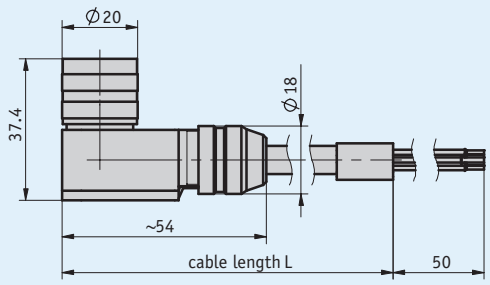
- Ready-to-use cable connection
- Cable lengths up to 20 m
- Connection technology M16, 12-pole

Voltage drop should be envisaged with increasing cable length. This should be taken into account for the electrical design.

type of connection GE



type of connection W



4.2

Mechanical data

Feature	Technical data	Additional information
Cable sheath	PUR	

Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	-30 ... 100 °C	

Pin assignment

KV12S0

Cable color	PIN
blue	A
violet	B
green	C
red	D
yellow	E
pink	F

Cable color	PIN
red-blue	G
white	H
gray-pink	J
gray	K
black	L
brown	M

Order

Ordering table

Feature	Ordering data		Specification	Additional information
Type of connection	GE	A	straight connector	
	W		right angle plug	
Cable length	...	B	01.0 ... 20.0 m, in steps of 1 m	

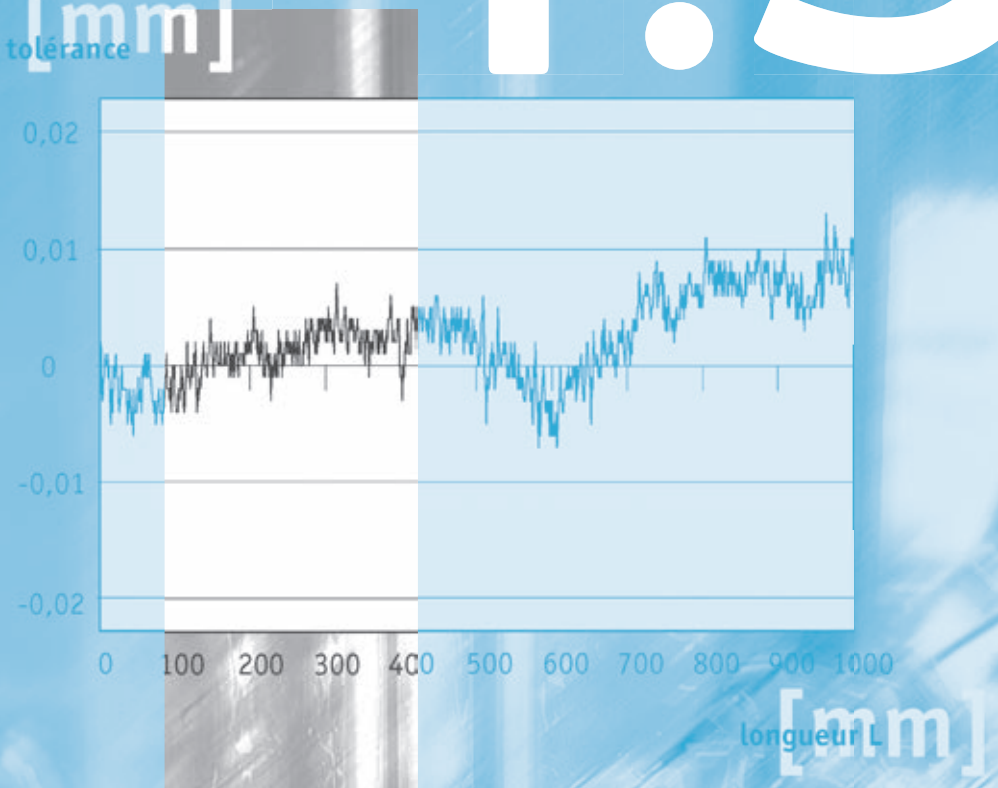
Order key

KV12S0 - [A] - [B]

4.2

Scope of delivery: KV12S0

4.3


[mm]
tolérance
0,02
0,01
0
-0,01
-0,02
0
100
200
300
400
500
600
700
800
900
1000
longueur L
[mm]

Protection classes according to DIN EN 60529

IP . .

	Touch and foreign bodies protection	Water protection
	0 No protection.	**0** No protection.
	1 Protected against access with the back of the hand. Protection against solid foreign bodies with Ø > 50 mm.	**1** Protection against vertical water drips.
	2 Protected against contact with a finger. Protected against solid foreign bodies with diameters > 12.5 mm.	**2** Protection against vertical water drips if the housing is tilted up to ±15°.
	3 Protected against access with a tool. Protected against solid foreign bodies with diameters > 2.5 mm.	**3** Protection against spray up to ±60° towards verticality.
	4 Protected against access with a wire. Protected against solid foreign bodies with diameters > 1.0 mm.	**4** Protection against splash water coming from any angle.
	5 Full protection against contact. Protection against harmful quantities of dust.	**5** Protection against hose water (nozzle) coming from any angle.
	6 Full protection against contact. Dust-proof.	**6** Protection against strong hose water coming from any angle .
		7 Protection against temporary immersion.
		8 Protection against continuous immersion.
		9k* Protection against ingress of water during high pressure or steam-jet cleaning, specific for road vehicles.

The standards deal with the protection of electric equipment by means of housings, covers and so forth. For purely mechanical devices, the information is used figuratively.

The two numbers are not indicative of the protection against ingress of oils or similar liquids. The second figure indicates the protection class exclusively for water.

* IPx9k is not part of DIN EN 60 529, rather it is contained in DIN 40 050

4.4

4.4 | Product index, contact information

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