PositionLine | Position Indicators

Mechanical digital position indicators
Electronic digital position indicators
Control knobs
Mechanical analog position indicators and handwheels

1.0 | Overview

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.

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

The SIKO product portfolio comprises a total of 5 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!

5 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

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

1.0

Mechanical or electronic: Absolute tracking of path and angle positions

PositionLine is a track-proven range of products which has grown in line with customers' needs. The latest generation of SIKO programmable electronic indicators is a consistent further development of the versatile mechanical digital position indicators and handwheels and also ensures outstanding performance in bus-controlled applications.

The mechanical control knobs are a special feature, combining miniaturized handwheel technology with the gear unit assisted, mechanical digital indicators in orange.

Mechanical digital position indicators

Position values on shafts and spindles can be simply and clearly controlled with the original SIKO counters. High mechanical precision and fully developed details combined with easy readability and a long service life have put these orange counters at the forefront of this technology market. Extremely simple installation and retrofitting is one of the decisive advantages of the SIKO position indicators. The displayed value can be adapted to the required spindle pitch with an integrated gear unit.

Mechanical displays
Hollow shaft diameters ranging from 6 ... 35 mm
Maximum digit height 7 mm
Mechanical detent/lock
Selectable design (reading position)
Plastic or metal housing

Electronic digital position indicators

Electronic position indicators offer additional advantages for automation compared with mechanical position indicators. The movement of axes is recorded capacitively and magnetically with this functional principle. Spindle pitch, sense of rotation and decimal place can be programmed flexibly. Moreover, bus-compatible position indiators enable the specification of setpoints and the transmission of the position value to a control unit hence guaranteeing 100% process reliability.

Electronic displays
LCD displays
Absolute, battery-buffered
Programmable parameters
Resolutions up to 0.0001 mm
RS485 bus interface, CAN and more

Control knobs

This sophisticated new SIKO development combines precise functionality with modern industrial design. An innovative gear unit permits integration of the mechanical digital display directly in the control knob. The mechanical control knobs stand for economy, a wide application range, easy handling and outstanding design.

Control knobs with display
Hollow shaft diameters of 6 ... 20 mm
Display integrated in adjustment element
Analog and digital displays
Selectable design (reading position)
Rotary knob made of metal or plastic

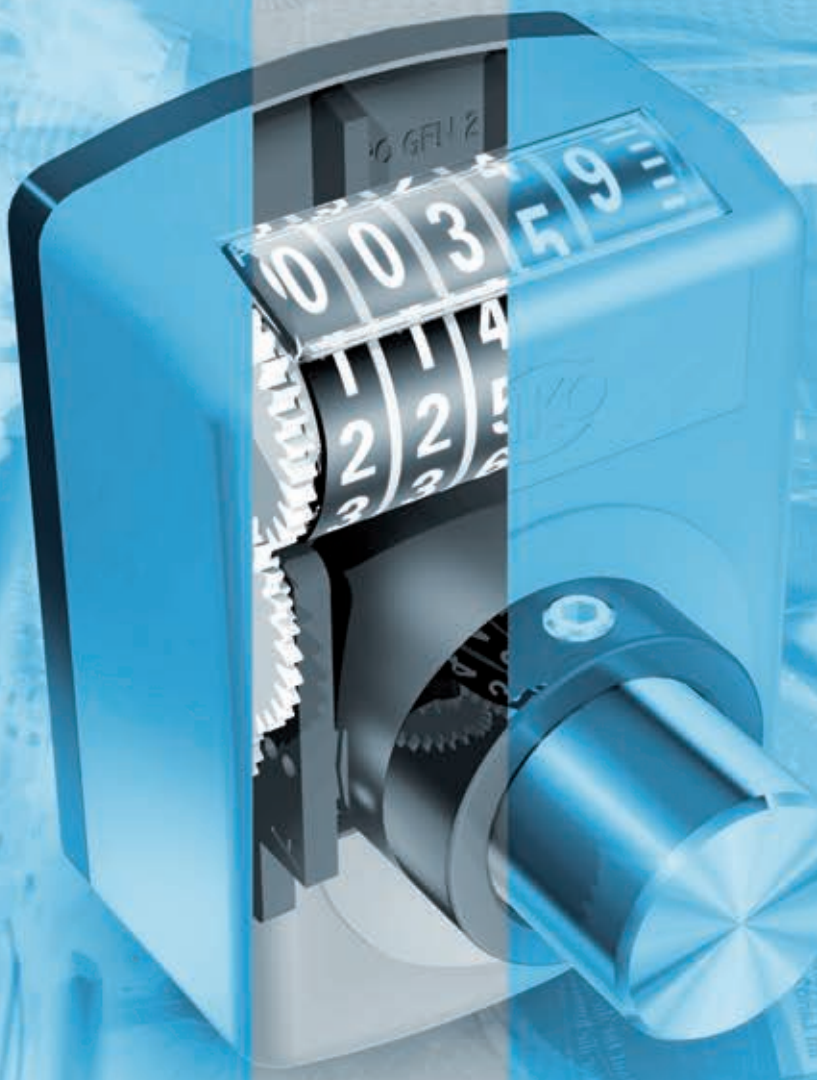
Mechanical analog position indicators and handwheels

If machine spindles are not only adjusted manually but the position is to be displayed at the same time, then handwheels with an integrated position indicator are the right choice.

Handwheels with display
Handwheel diameters of 56 ... 200 mm
Analog display with scale
Digital via integrated display
Corrosion and vibration-resistant, oil-filled
Handwheel made of metal or plastic

This reliable combination can also be simply mounted on horizontal or vertical spindles under demanding conditions. Exact manual positioning is therefore possible without additional adjustment elements. Everything is in full view: Individual scale division or even integrated digital indicators guarantee reliable readability.

1.1



Measurement and indication directly on the shaft – always clearly readable and versatile.

With its mechanical digital position indicators, SIKO offers customers an original and mature product line. The highly adaptable, functional concept is world-famous and the interaction of variable gear ratios and modular roll indicators is unique.

Digital indicators are a further development of the handwheel with analog displays. However, their "nonius", a type of vernier on handwheel indicators, can only display the values of one spindle rotation. But what happens if you have to log several rotations?

This requires technology which is functional and robust and has two outstanding features:

- A multi-digit display including a digital point and fine reader for optimum reading precision
- A gear unit that can be customized to suit individual requirements which "converts" a shaft rotation into an easily understandable unit of measurement

Position values can be monitored reliably and directly on the shaft or spindle with the original SIKO counters. Simply slip onto the shaft, secure in place – ready! With their mature technology, the small "orange indicators" are in untiring use in millions of applications all over the world.

Seeing what's important: Indication precision even after the decimal point – you won't miss anything with the effective SIKO magnifying lens.

Benefits:

- Long service life due to consistent further development
- Clear and precisely controllable, readable digital values
- Modifiable displays due to individual ratios
- Simple and cost-effective retrofitting
- Easy slip-on hollow shaft mounting

1.1

Clever solution: Window with magnifying lens permits an even more compact design.

The digital indicator gear units can be adapted flexibly to specified ratios.

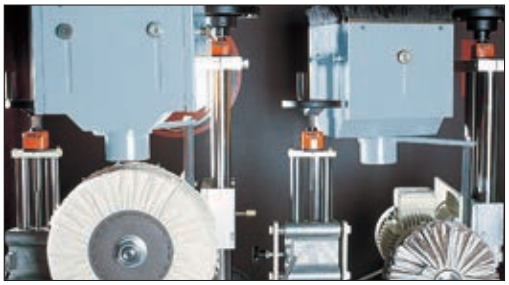
Simple and practical: Variable gear unit versions, functional overall design with a simple slip-on and locking method make the digital indicators a true classic.

Applications

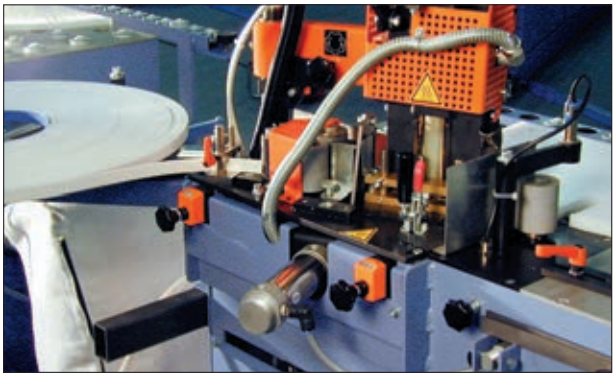
SIKO position indicators are used in a wide range of sectors and for all production environments, as almost all machines and systems feature guide elements, material stops or tools which require precise and reliable positioning or alignment.

The digital position indicators are ideal for monitoring roller adjustment on sheet metal bending machines. The solid cast design of the counters withstands the extreme mechanical influences under tough conditions such as those on round sheet polishing machines, ensuring exact manufacturing. They are also suitable for a wide range of wood-processing applications. Several work steps are often performed on a single machine, panels cut and milled and edges glued and polished.

SIKO counters are ideal adjustment aids in the metal, plastic and wood processing industries.



1



2

3

4

Photographs provided by the companies according to the sequence of numbers: Ott, Hymnen, Hebrock, Dreistern

[1] Surface processing in the furniture industry: Tools which are perfectly coordinated with digital indicators ensure a perfect finish. [2] Edge jointing and forming – in manual operation number settings must be accessible quickly and reliably. [3] Both as original equipment or retrofitted components, digital position indicators mounted on a shaft can be effectively integrated into all machine configurations. [4] Within the metal forming process chain, digital indicators are responsible for the workpiece alignment.

Determining decimal points

The following table shows the digital point principle of the digital indicators. For example, to obtain the reading "10.0", the indicator must count "100" with the decimal place 1 after the first rotation. During series production, the decimal point is marked by a colored intermediate ring.

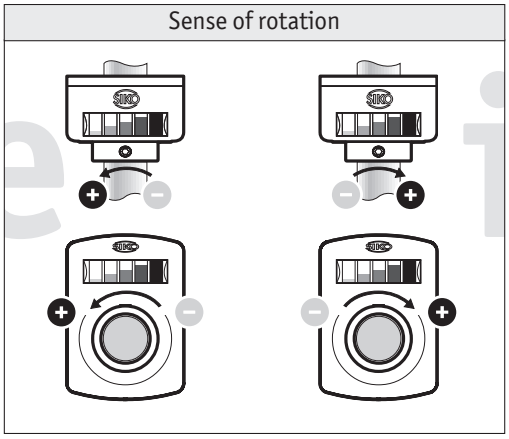
Ordering code	Indication	Display
for decimal place	e.g., 5-digit	
0	00000	00000
1	0000.0	0000|0
2	000.00	000|00
3	00.000	00|000
4	0.0000	0|0000

Sense of rotation

The sense of rotation of the axis influences the gear unit installed in the digital indicator. Digital position indicators are available in two directions of rotation in relation to the machine axis:

"i" stands for clockwise
"e" stands for counter-clockwise

Ascending values are shown on the display in accordance with the "i" and "e" ordering code.

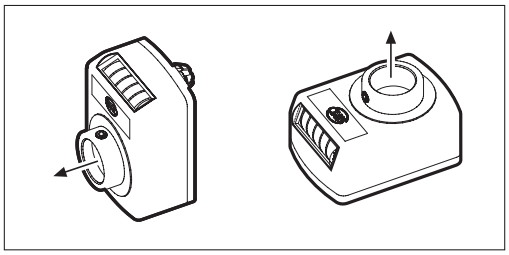


"+" shows the direction of rotation of the respective machine shaft. The ordering codes "e" and "i" specify in which direction of rotation the increasing values appear on the display.

Mounting position

Two factors determine this ordering code:
a) The orientation of the machine shaft
b) The line of vision to the window (decades)

The number and orientation of the digital indicator window and the visible decades are determined with a numeric code (e.g., 02, 04, etc.).



Orientation aid for the counting direction

The "direction arrow" can be printed on the DA04 and DA09S models as an option. Combined with "+" and "-", this shows clearly in which direction of rotation of the shaft/spindle the decades are increased or decreased [Fig. 1]. Printing is not available on black housings.

Axial seal

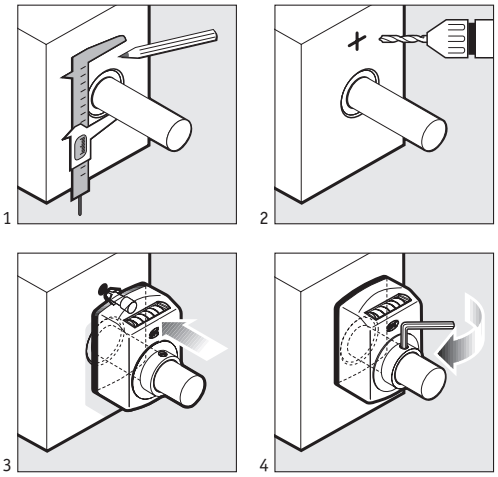
When axial seals are used [Fig 2], the set screw should not protrude over the shaft surface. Please screw in until it is flush; if necessary provide a recess in the shaft.


1


2

Mounting torque support

The radius of the shaft is added to the space measurement between the hollow shaft and torque shaft. This measurement is marked on the mounting surface with a slide gauge and scriber [1], then center-punched [2] and drilled (for the drilling diameter and depth refer to the technical drawings). After correct pre-drilling, stress-free mounting of the position indicator must be possible [3, 4].

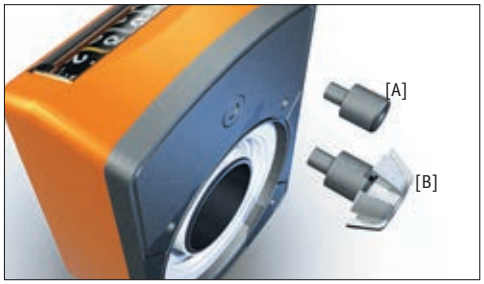


Locking on the shaft

The set screw is screwed in and tightened for reliable locking on the shaft. If axial seals are used, the set screw must be screwed in until it is flush (if necessary provide a recess in the shaft).

Torque support (2 versions)

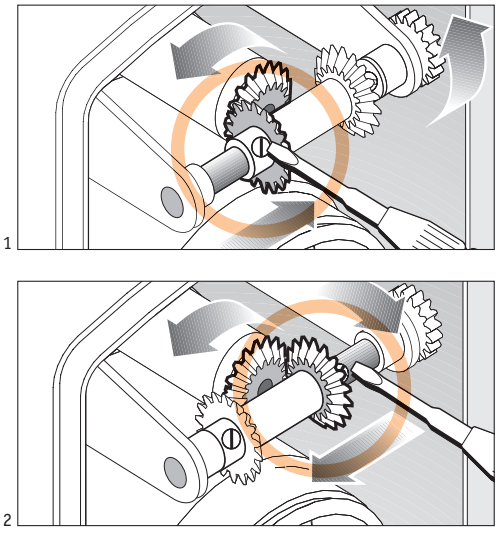
You have the choice between the pin [A] or umbrella [B] versions on almost all position indicators. The umbrella type torque pin is the optimum solution for compensating for installation tolerances.



Changing the counting direction

The counting direction can be subsequently changed on the position indicators DA05/1 and DA08. To this purpose carefully open the housing. Slacken the clamping screws of the bevel gears on the shaft, so that they can be moved. These must be subsequently firmly re-tightened. When moving the gears, ensure correct meshing and smooth running.

If the left gear wheel is engaged [1], the counting direction is positive in a clockwise direction; if the right gear wheel is engaged [2], the counting direction is positive in an anti-clockwise direction. The diagram shows a view from the rear.



Inch display: Advantages of the analog principle

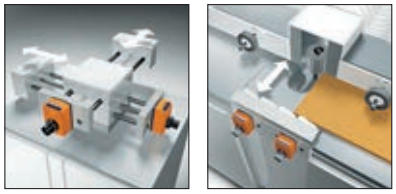
While digital principles depend on the resolution, axial rotation has an infinite resolution. Theoretically the smallest of rotation dimensions can be divided into any required number of intermediate steps. This means that loss-free display of metric pitches is also possible in inches. The gear unit makes the conversions.

Example:
4 mm in inches; display value is 4/25.4 = 0.15 (748). Although the last 3 digits "748" are not shown, they are "carried along" in the gear unit due to the analog measuring principle.

mm < > inch

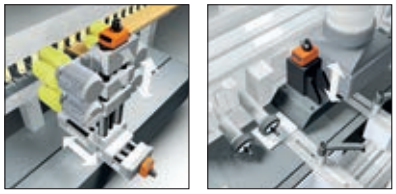
Ambient conditions	Examples of use	Benefits

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

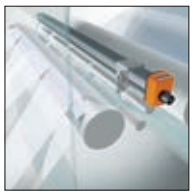


E.g., compound tables, planing or dowel drilling machines ...

- Direct display after x,y adjustment
- Easy mounting
- Precise positioning
- Flexible indication of values
- mm or inch



E.g., tooling in the lumber and metal industries



E.g., rewind cutting machines in the paper/foil industries

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

E.g., angle adjustment units on saws, rotary and milling tables

- Exact angle indication
- Variable diameters
- Variable mounting positions

E.g., end stop systems

Mechanical digital position indicators

	 DA02	 DA04	 DA05/1	 DA08	 DA09S	 DA10	 DA10R/1
Page	16	18	24	26	20	22	29
Housing							
Plastic	•	•			•	•	•
Zinc die-cast			•	•	•		
Displays							
3 decades*	•						
4 decades*		•		•			
5 decades*			•	•	•	•	•
Digit height							
in mm,approximately	4	6	7	4.5	7	7	7
Hollow shaft							
Diameter (mm)	10	14	20	20	20	30	30
Dimensions							
WxHxD (mm), approx.	22x33x26	33x47x31	56x82x70	57x107x59	48x67.5x38.5	56x75x52	56x84x70

* Decade = digit ring with 10-division

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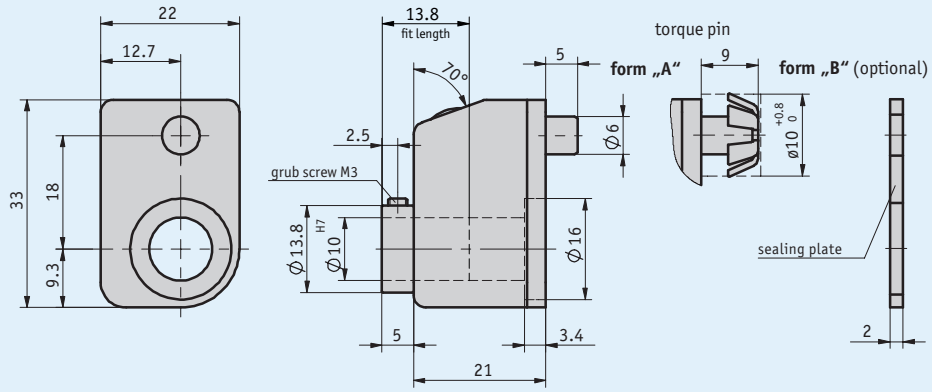
Digital position indicator DA02
Very small design

Profile

- Ultra-small design
- Hollow shaft with max. Ø of 10 mm
- Minimum axle base of 19 mm
- Counter can be designed for “mm” or “inch”
- Stainless-steel driving shaft as an option



Mechanical data

Feature	Technical data	Additional information
Housing	reinforced plastic	
Counter	3 decades	
Digit height	~4 mm	
Weight	0.02 kg	

Max. speed

Display (after 1st revolution)	max. speed [rpm]
010	500 (1500)
015	500 (1000)
020	500 (750)
025	500 (600)
030	500
040	375
050	300
060	250
080	180
100	150

Formula:

$$\text{max. speed} = \frac{15000}{\text{indication after 1st revolution}}$$

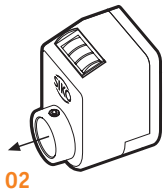
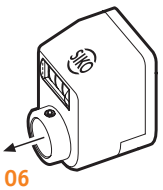
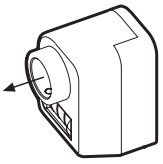
Speeds >500 rpm must only be run for short periods.

Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	0 ... 80 °C	

Order

Ordering information

Display	Mounting position				Counting direction
123	 02	 04	 06	 07	

Hint: Texts highlighted in orange color are ordering features

Ordering table

Feature	Ordering data		Specification	Additional information
Mounting position	...	A	02, 04, 06, 07	see the icons illustrating the mounting positions
Indication after 1st revolution	...	B	7/5, 10, 12/5, 15, 17/5, 20, 25, 30, 40, 50, 60, 80, 100	/5 = arithmetical value not displayed
			others on request	
Decimal place	0	C	0 = 000	
	1		1 = 00.0	
	2		2 = 0.00	
Counting direction	i	D	clockwise ascending values	
	e		counter-clockwise ascending values	
Hollow shaft/diameter	10	E	ø10 mm	
	VA10		ø10 mm	stainless steel
	...		RH6, RH7, RH8	reducing bushes
Color	0	F	orange RAL 2004	
	S		black RAL 9005	

Order key

DA02 - [ ] - [ ] - [ ] - [ ] - [ ] - [ ] - [A]
A B C D E F

Scope of delivery: DA02

Accessories:
Reduction sleeve RH page 132

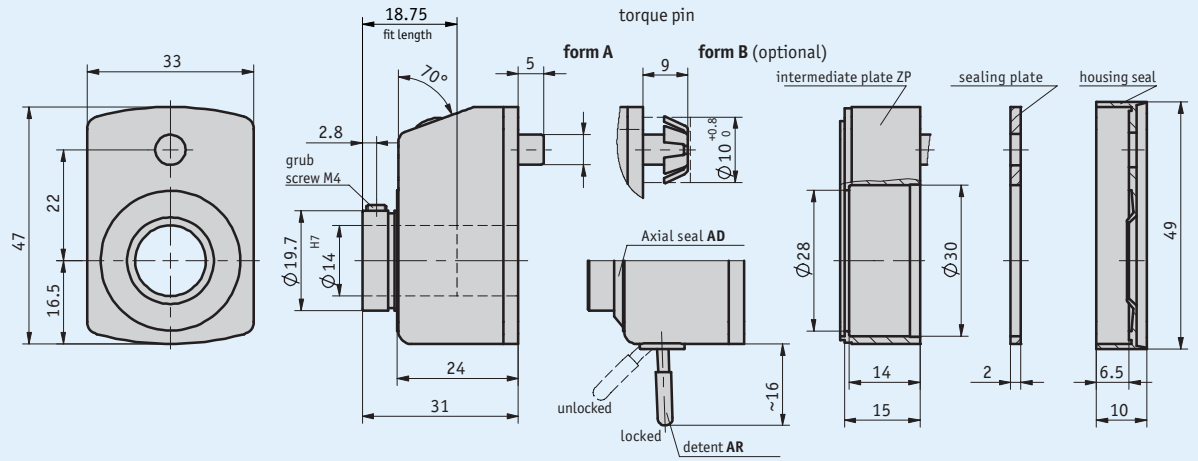
Additional information:
General information and areas of application page 10

subject to technical alteration • 2016/11/18 • 09:19 • K

Digital position indicator DA04
Basic device with 4 decades

Profile

- Hollow shaft, max. Ø 14 mm
- Counter with 4 decades and fine reading
- Detent as an option
- Magnifying function for good readability
- Stainless-steel driving shaft as an option
- Axial seal, dustproof and splash-proof
- Clamping plate (see accessories)



Mechanical data

Feature	Technical data	Additional information
Housing	reinforced plastic	
Sight window	plastic	mineral glass as an option
Counter	4 decades, fine reading	
Digit height	~6 mm	
Weight	0.05 kg	

Max. speed

Display (after 1st revolution)	max. speed [rpm]
0010	500 (1500)
0015	500 (1000)
0020	500 (750)
0025	500 (600)
0030	500
0040	375
0050	300
0060	250
0080	180
0100	150

Formula:

$$\text{max. speed} = \frac{15000}{\text{indication after 1st revolution}}$$

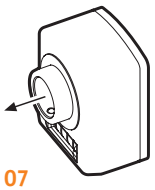
Speeds >500 rpm must only be run for short periods.

Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	0 ... 80 °C	

Order

Ordering information

Display	Mounting position				Counting direction
1234	 02	 04	 06	 07	

Hint: Texts highlighted in orange color are ordering features

Ordering table

Feature	Ordering data		Specification	Additional information
Mounting position	...	A	02, 04, 06, 07	see the icons illustrating the mounting positions
Indication after 1st revolution	...	B	10, 12/5, 15, 17/5, 20, 25, 30, 35, 40, 50, 60, 80, 100	/5 = arithmetical value not displayed
			others on request	
Decimal place	0	C	0 = 0000	
	1		1 = 000.0	
	2		2 = 00.00	
	3		3 = 0.000	
Counting direction	i	D	clockwise ascending values	
	e		counter-clockwise ascending values	
Hollow shaft/diameter	...	E	12.7, 14, 15, 16 in mm	
	...		VA5, VA10, VA14, VA15	stainless steel
	...		RH4, RH6, RH8, RH10, RH12	reducing bushes
Color	0	F	orange RAL 2004	
	S		black RAL 9005	
	GR		gray RAL 7035	
	FR		red RAL 3000	
Seal	OAD	G	without additional seal	
	AD		with axial seal	
	GD		with axial and housing seal	sealing plate not applicable
Detent/hollow shaft	OAR	H	without lock	
	AR		with lock	vibration protection M ~20 Ncm, only with "0" or "S" housing color
Intermediate plate	OZP	I	without intermediate plate	
	ZP		with intermediate plate	not with seal "GD"

Order key

DA04 - [A] - [B] - [C] - [D] - [E] - [F] - A - K - [G] - [H] - [I] - BP - ORP

Scope of delivery: DA04

Accessories:

Reduction sleeve RH page 132
Clamping plate KP04 page 126
Clamping plate KPL04 page 127

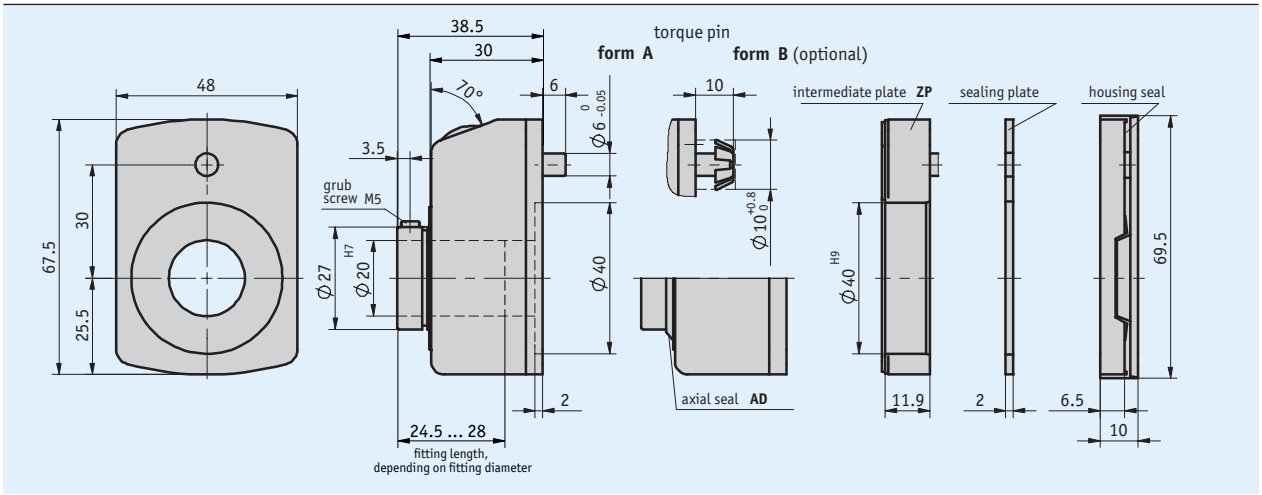
Additional information:

General information and areas of application page 10

Digital position indicator DA09S
Basic device with 5 decades

Profile

- Most-used size in slim design
- Hollow shaft, max. Ø 20 mm
- Counter with 5 decades and fine reading
- Display can be designed for “mm” or “inch”
- Magnifying function for good readability
- Stainless-steel driving shaft as an option
- Axial seal, dustproof and splash-proof
- Clamping plate (see accessories)



Mechanical data

Feature	Technical data	Additional information
Housing	reinforced plastic	
	zinc die-cast	MCM housing
Sight window	plastic	mineral glass as an option
Counter	5 decades, fine reading	
Digit height	~7 mm	
Weight	0.1 kg	

Max. speed

Display (after 1st revolution)	max. speed [rpm]
00010	500 (1500)
00015	500 (1000)
00020	500 (750)
00025	500 (600)
00030	500
00040	375
00050	300
00060	250
00080	180
00100	150

Formula:

$$\text{max. speed} = \frac{15000}{\text{indication after 1st revolution}}$$

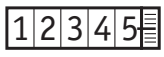
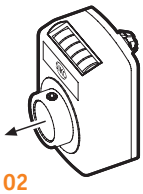
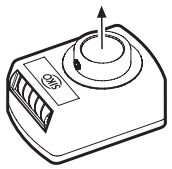
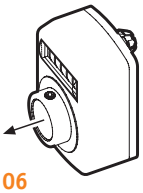
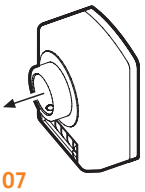
Speeds >500 rpm must only be run for short periods.

Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	0 ... 80 °C	

Order

Ordering information

Display	Mounting position				Counting direction
	 02	 04	 06	 07	

Hint: Texts highlighted in orange color are ordering features

Ordering table

Feature	Ordering data		Specification	Additional information
Mounting position	...	A	02, 04, 06, 07	see the icons illustrating the mounting positions
Indication after 1st revolution	...	B	10, 12/5, 15, 15/75, 17/5, 20, 25, 30, 39/375, 40, 50, 60, 78/75, 80, 100	/5 = arithmetical value not displayed
			others on request	
Decimal place	0	C	0 = 00000	
	1		1 = 0000.0	
	2		2 = 000.00	
	3		3 = 00.000	
	4		4 = 0.0000	
Counting direction	i	D	clockwise ascending values	
	e		counter-clockwise ascending values	
Hollow shaft/diameter	20	E	ø20 mm	
	...		RH8, RH10, RH12, RH14, RH18	reducing bushes
	...		VA8, VA10, VA14, VA20	stainless steel
Housing	0	F	orange RAL 2004	plastic
	S		black RAL 9005	plastic
	GR		gray RAL 7035	plastic
	FR		red RAL 3000	plastic
	MCM		chromatized matt	metal
Seal	OAD	G	without axial seal	
	AD		with axial seal	
	GD		with axial and housing seal	sealing plate not applicable
Intermediate plate	OZP	H	without intermediate plate	
	ZP		with intermediate plate	not with seal "GD"

Order key

DA09S - [A] - [B] - [C] - [D] - [E] - [F] - A - K - [G] - [H] - BP - ORP

Scope of delivery: *DA09S*

Accessories:

Reduction sleeve RH *page 132*
Clamping plate KP09 *page 129*
Clamping plate KPL09 *page 130*
Pneumatic clamping plate KP09P *page 131*

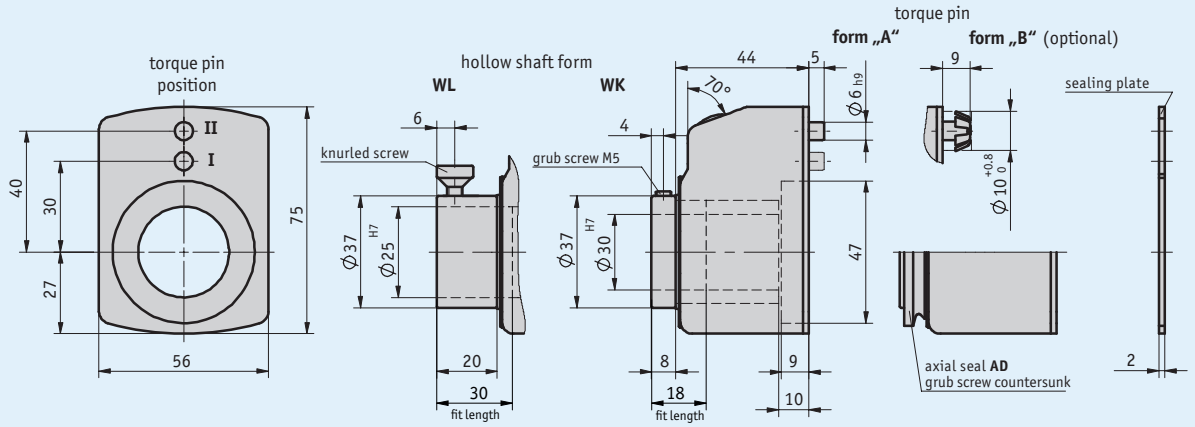
Additional information:

General information and areas of application *page 10*

Digital position indicator DA10
For large shaft diameters

Profile

- Designed for large diameters
- Hollow shaft, max. Ø 30 mm
- Counter with 5 decades and fine reading
- Display can be designed for “mm” or “inch”
- Magnifying function for good readability
- Stainless-steel driving shaft as an option
- Axial seal, dustproof and splash-proof



Mechanical data

Feature	Technical data	Additional information
Housing	reinforced plastic	
Sight window	plastic	mineral glass as an option
Counter	5 decades, fine reading	
Digit height	~7 mm	
Weight	0.1 kg	

Max. speed

Display (after 1st revolution)	max. speed [rpm]
00010	500 (1500)
00015	500 (1000)
00020	500 (750)
00025	500 (600)
00030	500
00040	375
00050	300
00060	250
00080	180
00100	150

Formula:

$$\text{max. speed} = \frac{15000}{\text{indication after 1st revolution}}$$

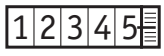
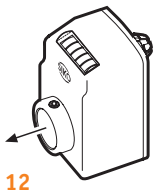
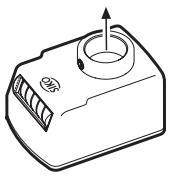
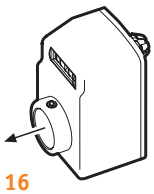
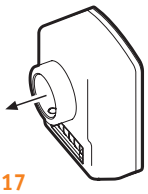
Speeds >500 rpm must only be run for short periods.

Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	0 ... 80 °C	

Order

Ordering information

Display	Mounting position				Counting direction
	 12	 14	 16	 17	

Hint: Texts highlighted in orange color are ordering features

Ordering table

Feature	Ordering data		Specification	Additional information
Mounting position	...	A	12, 14, 16, 17	see the icons illustrating the mounting positions
Indication after 1st revolution	...	B	6/5, 10, 15, 17/5, 20, 25, 30, 39/4, 40, 50, 60, 80, 100	/5 = arithmetical value not displayed
			others on request	
Decimal place	0	C	0 = 00000	
	1		1 = 0000.0	
	2		2 = 000.00	
	3		3 = 00.000	
	4		4 = 0.0000	
Counting direction	i	D	clockwise ascending values	
	e		counter-clockwise ascending values	
Hollow shaft/diameter	...	E	30, 25	
	...		VA30	stainless steel
	...		RH10, RH12, RH14, RH16, RH20, RH25	reducing bushes
Hollow shaft/design	WK	F	hollow shaft short	not with hollow shaft/diameter "25"
	WL		hollow shaft long	only with hollow shaft/diameter "25"
Torque pin/position	I	G	position I	
	II		position II	
Color	0	H	orange RAL 2004	
	S		black RAL 9005	
Axial seal	OAD	I	without axial seal	
	AD		with axial seal	

Order key

DA10 - [A] - [B] - [C] - [D] - [E] - [F] - A - [G] - [H] - K - [I] - BP

Scope of delivery: DA10

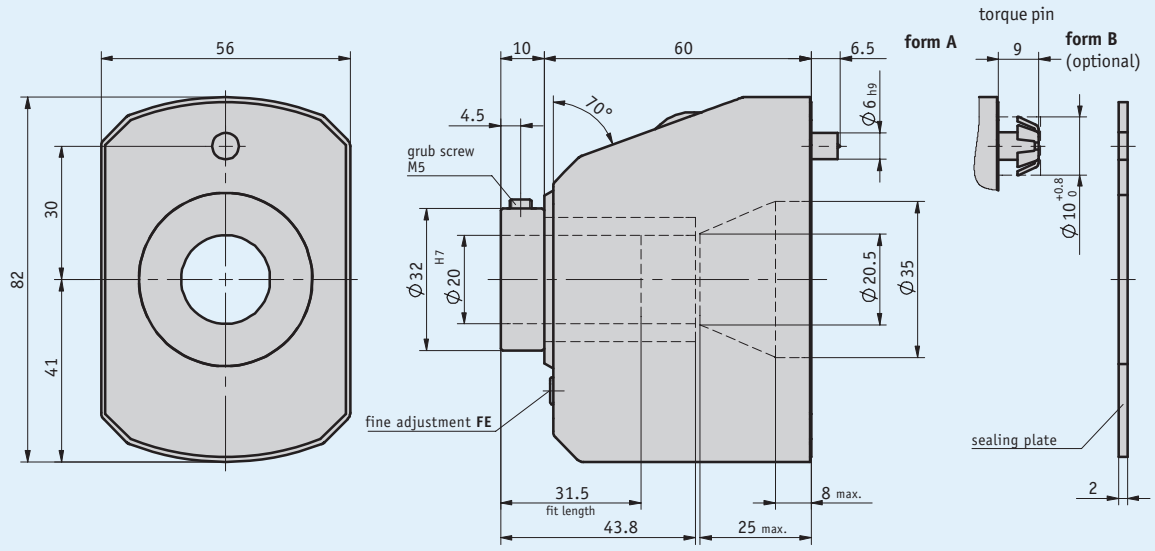
Accessories:
Reduction sleeve RH page 132

Additional information:
General information and areas of application page 10

Digital position indicator DA05/1
With fine adjustment

Profile

- Robust design in a metal housing
- Hollow shaft, max. Ø 20 mm
- Counter with 5 decades and fine reading
- Display can be designed for “mm” or “inch”
- Attenuated counter system
- Fine setting for correction of dimensions
- Reversible counting direction



Mechanical data

Feature	Technical data	Additional information
Housing	zinc die-cast	
Counter	5 decades, fine reading	
Digit height	~7 mm	
Weight	0.5 kg	

- **max. speed**

Display (after 1st revolution)	max. speed [rpm]
00010	500 (1500)
00015	500 (1000)
00020	500 (750)
00025	500 (600)
00030	500
00040	375
00050	300
00060	250
00080	180
00100	150

Formula:

$$\text{max. speed} = \frac{15000}{\text{indication after 1st revolution}}$$

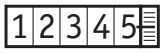
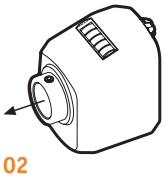
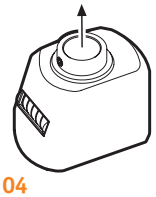
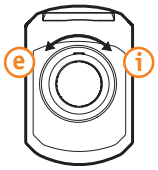
Speeds >500 rpm must only be run for short periods.

Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	0 ... 80 °C	

Order

Ordering information

Display	Mounting position		Counting direction
	 02	 04	

Hint: Texts highlighted in orange color are ordering features

Ordering table

Feature	Ordering data		Specification	Additional information
Mounting position	...	A	02, 04	see the icons illustrating the mounting positions
Indication after 1st revolution	...	B	10, 15, 20, 25, 30, 40, 50, 60, 80, 100, 75	
			others on request	
Decimal place	0	C	0 = 00000	
	1		1 = 0000.0	
	2		2 = 000.00	
	3		3 = 00.000	
	4		4 = 0.0000	
Counting direction	i	D	clockwise ascending values	
	e		counter-clockwise ascending values	
	e/i		can be adjusted by the customer	by opening the housing, see mounting instructions
Hollow shaft/diameter	...	E	20, 19.05, 19 in mm	
	...		RH8, RH10, RH12, RH14, RH16, RH18	reducing bushes
Color	0	F	orange RAL 2004	
	S		black RAL 9005	
Fine adjustment	FE	G	with fine adjustment	
	OFE		without fine graduation	
Slipping clutch	RK	H	with sliding clutch	only with fine adjustment "OFE"
	ORK		without sliding clutch	only with fine adjustment "FE"
Labyrinth seal	OLD	I	without labyrinth seal	
	LD		with labyrinth seal	

Order key

DA05/1 - [ ] - [ ] - [ ] - [ ] - [ ] - [ ] - [ ] - [ ] - A - [ ]
A B C D E F G H I

Scope of delivery: *DA05/1, Mounting instructions*

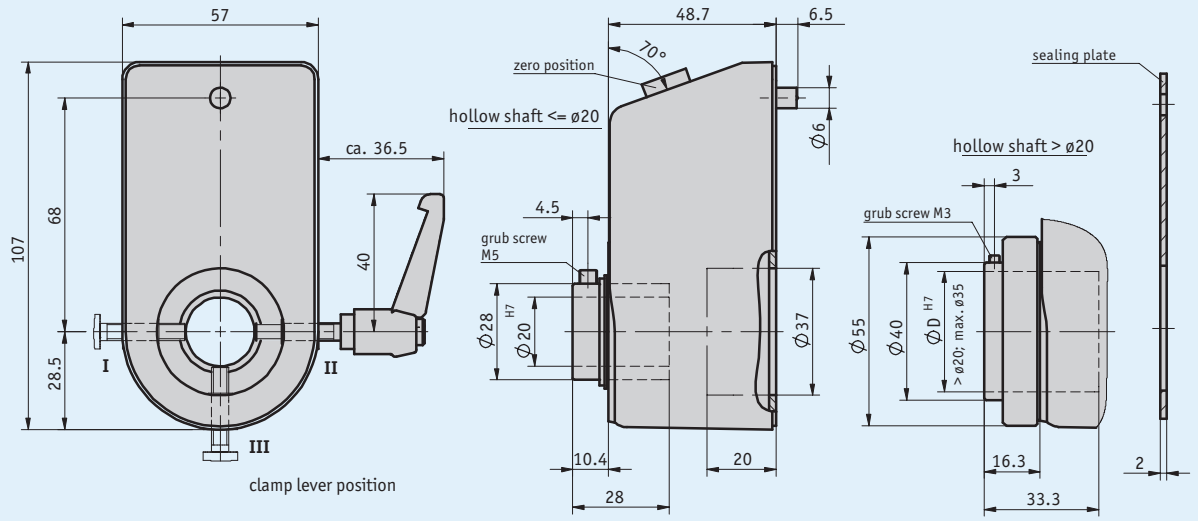
Accessories:
Reduction sleeve RH *page 132*

Additional information:
General information and areas of application *page 10*

Digital position indicator DA08
In the metal housing

Profile

- Extremely sturdy design in a metal housing
- Hollow shaft, max. Ø 35 mm
- Counter with 4 or 5 decades
- with zeroing function
- Clamp lever integrated in the design
- Stainless-steel driving shaft as an option
- Reversible counting direction



Mechanical data

Feature	Technical data	Additional information
Housing	zinc die-cast	
Counter	4 decades, fine reading	
Digit height	~4.5 mm	
Weight	0.07 kg	

max. speed

Display (after 1st revolution)	max. speed [rpm] with zero position	max. speed [rpm] without zero position
(0)0010	500	500 (1200)
(0)0020	250	500 (600)
(0)0025	200	480
(0)0030	165	400
(0)0040	125	300
(0)0050	100	240
(0)0060	85	200
(0)0080	60	150
(0)0100	50	120

Formula:

with zero position

$$\text{max. speed} = \frac{5000}{\text{indication after 1st revolution}}$$

without zero position

$$\text{max. speed} = \frac{12000}{\text{indication after 1st revolution}}$$

Speeds >500 rpm must only be run for short periods.

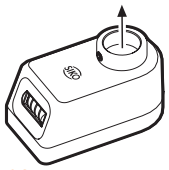
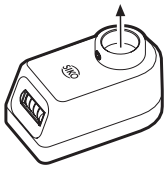
Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	0 ... 80 °C	

1.1

Order

Ordering information

Display	Mounting position with zero position		Mounting position without zero position		Counting direction
1234 12345	 01	 03	 02	 04	

Hint: Texts highlighted in orange color are ordering features

Ordering table

Feature	Ordering data		Specification	Additional information
Mounting position	01	A	with zero position	see the icons illustrating the mounting positions
	02		without zero position	see the icons illustrating the mounting positions
	03		with zero position	see the icons illustrating the mounting positions
	04		without zero position	see the icons illustrating the mounting positions
Counter/digits	4	B	4 decades	
	5		5 decades	
Indication after 1st revolution	...	C	10, 15, 16, 20, 25, 30, 40, 50, 60, 80, 100	
			others on request	
Decimal place	0	D	0 = 00000	only with 5 decades
	1		1 = 0000.0	
	2		2 = 000.00	only with 5 decades
	3		3 = 00.000	only with 5 decades
	4		4 = 0.0000	only with 5 decades
Counting direction	i	E	clockwise ascending values	
	e		counter-clockwise ascending values	
	e/i		can be adjusted by the customer	by opening the housing
Hollow shaft/diameter	...	F	35, 25, 20, 19	
	...		VA20	stainless steel
	...		RH10, RH12, RH14, RH16, RH18	reducing bushes
Color	0	G	orange RAL 2004	
	S		black RAL 9005	
Clamp lever/position	OKL	H	without locking lever	
	I		position I	
	II		position II	
	III		position III	

Order key

DA08 - [ ] - [ ] - [ ] - [ ] - [ ] - [ ] - [ ] - [ ]
A B C D E F G H

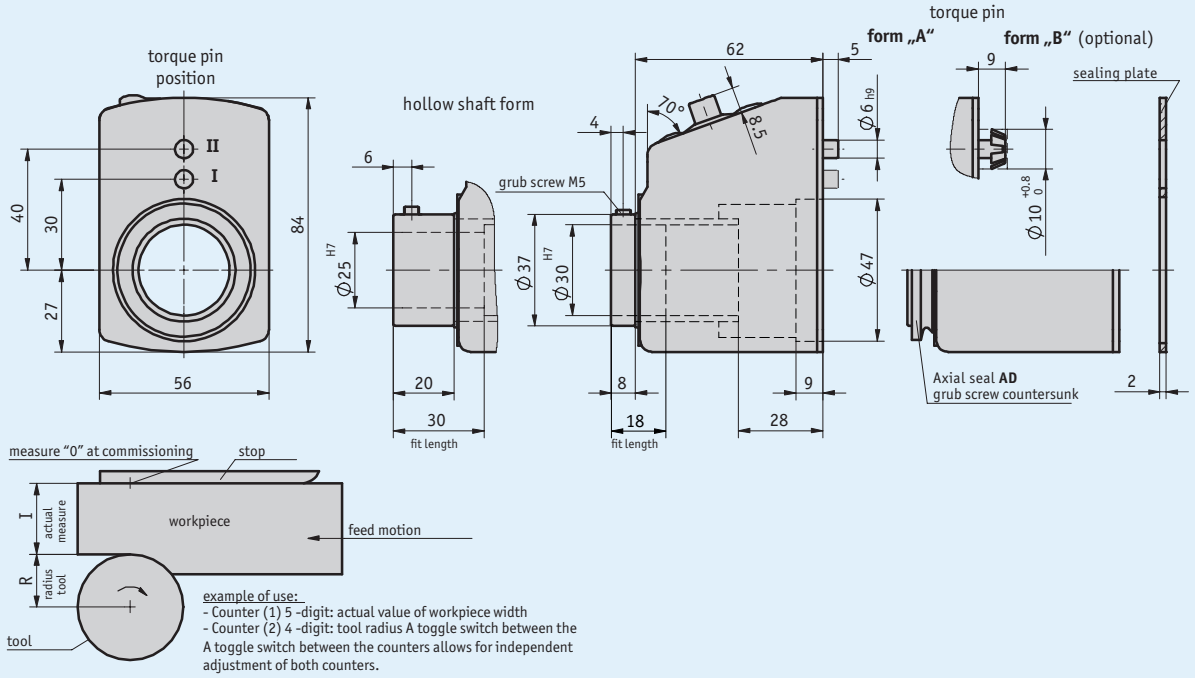
Scope of delivery: DA08

Accessories:
Reduction sleeve RH page 132

Additional information:
General information and areas of application page 10

Profile

- Version with two counters (4 or 5 decades) and fine reading
- Predestined for use with wood milling machines
- Hollow shaft, max. Ø 30 mm
- Display can be designed for “mm” or “inch”



Mechanical data

Feature	Technical data	Additional information
Housing	reinforced plastic	
Counter	4and 5 decades, fine reading	
Digit height	~7 mm	
Weight	0.1 kg	

max. speed

Display (after 1st revolution)	max. speed [rpm]
00010	500 (1500)
00015	500 (1000)
00020	500 (750)
00025	500 (600)
00030	500
00040	375
00050	300
00060	250
00080	180
00100	150

Formula:

$$\text{max. speed} = \frac{15000}{\text{indication after 1st revolution}}$$

Speeds >500 rpm must only be run for short periods.

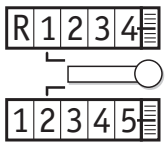
Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	0 ... 80 °C	

1.1

Order

Ordering information

Display	Counting direction
	

Hint: Texts highlighted in orange color are ordering features

Ordering table

Feature	Ordering data		Specification	Additional information
Indication after 1st revolution	...	A	7/874, 10, 15/747, 20, 25, 39/368, 40, 50, 80, 100	/874 = nicht angezeigter rechnerischer Wert
			others on request	
Decimal place	0	B	0 = 0000	
	1		1 = 000.0	
	2		2 = 00.00	
	3		3 = 0.000	
Counting direction	i	C	clockwise ascending values	
	e		counter-clockwise ascending values	
Hollow shaft/diameter	...	D	25, 30	
	...		RH20, RH25	reducing bushes
Hollow shaft/design	WK	E	short hollow shaft	
	WL		long hollow shaft	
Torque pin/position	I	F	position I	
	II		position II	
Axial seal	OAD	G	without axial seal	
	AD		with axial seal	

Order key

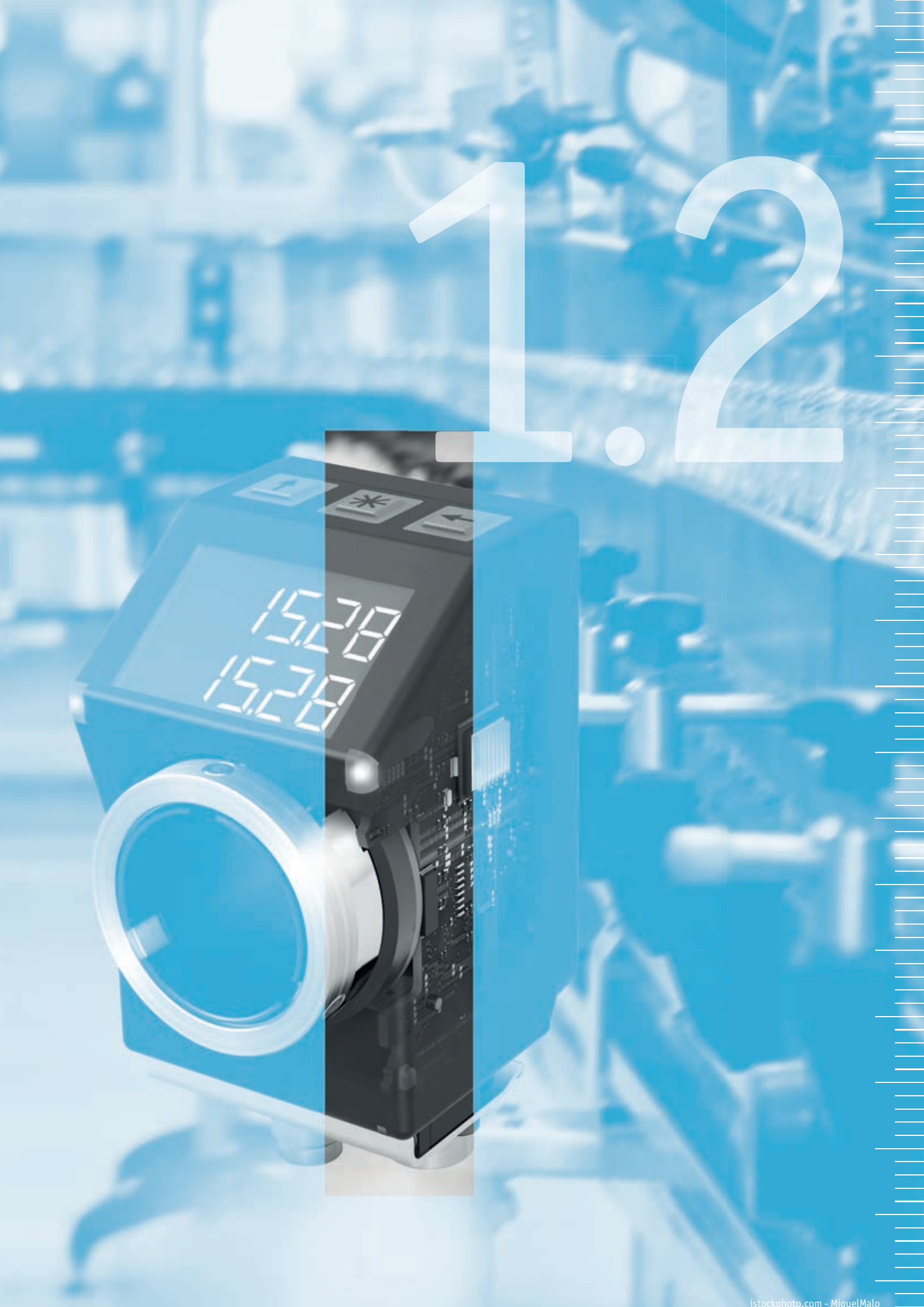
DA10R/1 - [ ] A - [ ] B - [ ] C - [ ] D - [ ] E - A - [ ] F - S - K - [ ] G

Scope of delivery: DA10R/1

Accessories:
Reduction sleeve RH page 132

Additional information:
General information and areas of application page 10

1.2



istockphoto.com - MiguelMalo

High-resolution measuring technology – flexibly programmed, robust and precise

Mechanical position indicators are already used successfully on shafts and spindles for displaying position values. Electronic digital position indicators are, formally speaking, a logical further development of their mechanical counterparts. Thanks to comparable outer dimensions and the track-proven slip-on principle on the shaft, reconfiguration from mechanical to electronic-programmable indicator technology is a matter of minutes.

The standalone indicators of the DE range are particularly effective as an alternative to mechanical counters if no suitable gearing is available for these. Their free programmability also permits positive and negative display values or operation in angled mode.

The ProTool DE software solution is mainly of interest for mechanical engineering applications, because it can be used to program DEs directly before they are mounted on adjustment spindles.

Therefore only one basic device type has to be kept on stock, which is set up in accordance with the respective application requirements.

Automated manual work

As an extension to the electronic standalone units of the DE range, the AP models also feature a bus interface. During bus-controlled operation,can be communicated setpoint and actual values between the individual absolute position indicators and a higher-level controller.

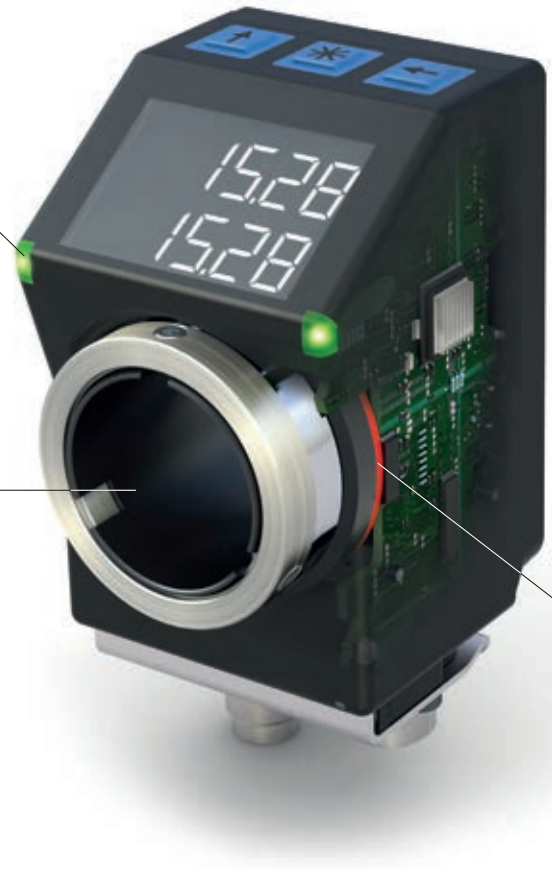
Teamwork in bus operation

This semi-automated spindle adjustment offers a much higher level of process reliability and shortens set-up times during format changes considerably. Due to the display of the set value directly on the shaft and feedback of the manually correctly set actual value, incorrectly set stops and tool positions are a thing of the past. The overall system is only enabled when all spindle positions have been correctly signaled, so that off-spec material or damaged tools caused by incorrectly set adjusting shafts are no longer possible.

Benefits

The electronic SIKO position indicators feature a series of software assisted functions:

- The spindle pitch, direction of rotation and decimal point can be freely programmed
- Length or angle indication: Two modes are possible
- Incremental measurement function, offset input: Flexible adaptation to user specifications is possible
- Zero setting of the shaft is performed at the touch of a button



100% process reliability: 2 red/green LEDs signal the position status, which is ascertained by the integrated nominal-actual alignment of the bus-compatible electronc system.

Leaves nothing to be desired: maximum hollow shaft opening of 20 mm with minimum size of the unit.

Genuinely SIKO – the AP05 impresses with functional industrial design and ultra-compact size. The 2-line backlit LCD display optimum readability of the target and actual values directly on the spindle.

The robust magnetic measurement technology combined with a durable battery ensures reliable absolute position values.

Applications

In an industrial environment, our customers really appreciate the precise and reliable measurement of the electronic position indicators. The shaft motion is no longer tracked by a gear unit but with non-contacting magnetic or capacitive methods. The magnetic measuring method is particularly robust and insensitive to soiling and vibration, and covers applications in particularly rough environmental conditions. The large LCD display also permits reliable reading of the respective position values. A typical application: Stop adjustment on miter saws requires very precise display values.

Additional flexibility is ensured by the implemented chain dimension function and offset input.

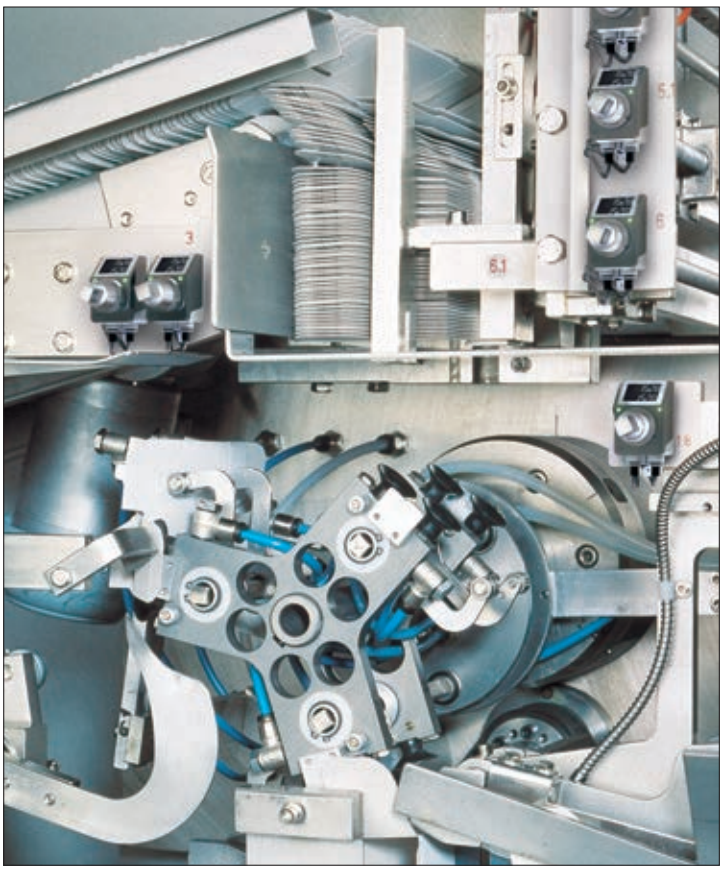
With the AP range it is also possible to perform easily controllable, semi-automated adjustment processes in complex machine environments. Communication "in the team" is standardized, and faulty adjustment is immediately visible during bus operation.

IEF Werner GmbH

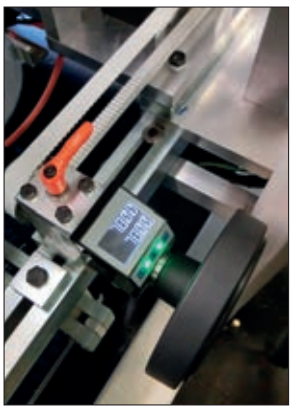
1

Wittels Albert GmbH

2



3



Wilhelm Fischer Spezialmaschinenfabrik GmbH

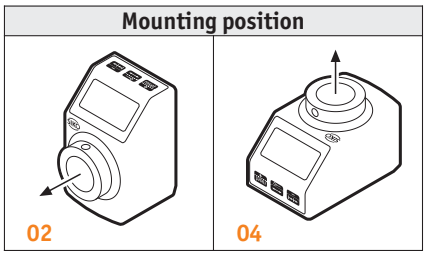
4

[1] Highest flexibility: The same basic device with programming adjusted to the application. [2] Easy optical upgrading via compatible mounting dimensions of mechanical and electronic position indicators. [3] Multiple format settings with monitored position indicators: Folding box production requires a number of adjustments. [4] Automated handiwork: bus-compatible position indicator for controlled spindle postioning.

Mounting position

Zwei Faktoren bestimmen dieses Bestellmerkmal:
a) The orientation of the machine shaft
b) Display viewing direction

The number and orientation of the LCD display and the reading direction in the display are determined with a numeric code (e.g., 02, 04, etc.).

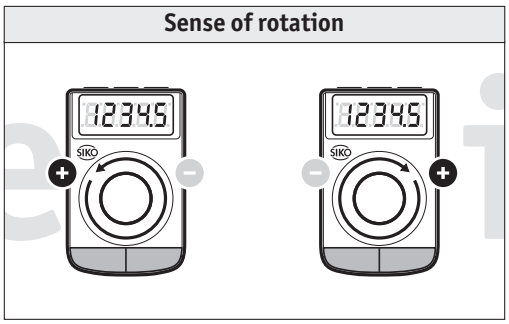


Sense of rotation

The sense of rotation of the axis influences the parameters programmed in the devices. Digital position indicators are available in two directions of rotation in relation to the machine axis:

"i" stands for clockwise
"e" stands for counter-clockwise

Ascending values are shown on the display in accordance with the "i" and "e" ordering code.



"+" shows the direction of rotation of the respective machine shaft. The ordering codes "e" and "i" specify in which direction of rotation the increasing values appear on the display.

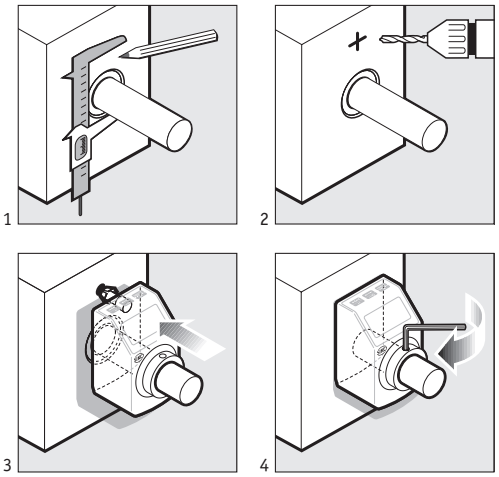
1.2

Mounting the torque support

The radius of the shaft is added to the space measurement between the hollow shaft and torque shaft. This measurement is marked on the mounting surface with a slide gauge and scriber, then center-punched and drilled (for the drilling diameter and depth, refer to the technical drawings). With correct predrilling, stress-free mounting of the position indicator must be possible.

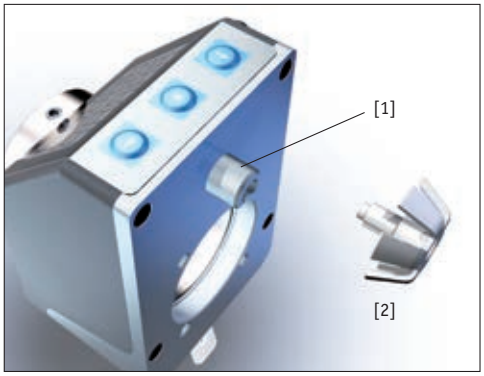
Locking on the shaft

Only the set screw is screwed in and tightened to achieve a positive connection with the shaft.



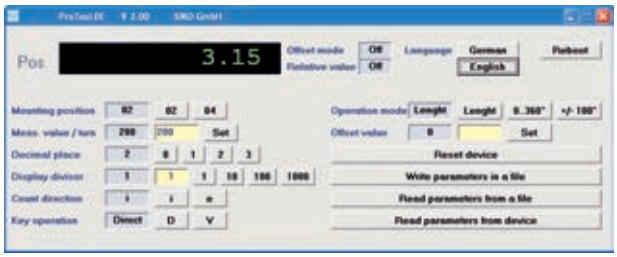
Torque support (2 versions)

On all electronic position indicators you have the choice between two different designs: [1] Either the pin belonging to the housing or [2] an additional umbrella. The umbrella is an optimum solution for compensating for mounting tolerances.



Programming software

ProToolDE is a convenient software solution for programming the electronic DE04 , DE10 and DKE01 digital indicators. This tool permits programming of a specific display value after one rotation, depending on the respective use of the device. The use of ProToolDE is particularly advantageous when several unprogrammed DE devices are to be kept in stock. Each digital indicator can be freely programmed with this software in accordance with the respective different demands.



ProTool DE offers:

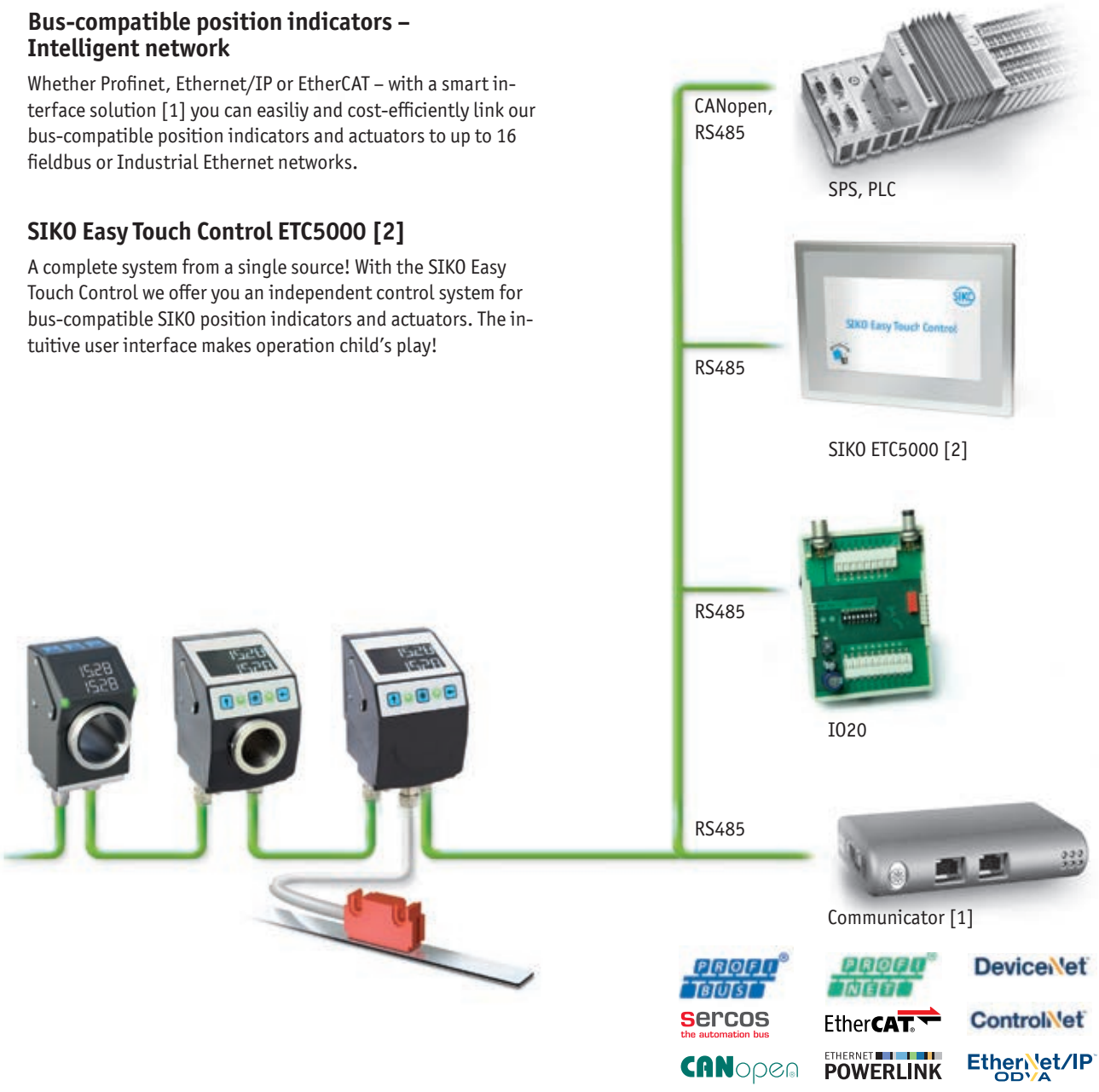
- Free programming of all parameters
- Switchover mode between angle and linear measurement
- USB connection cable included

Bus-compatible position indicators – Intelligent network

Whether Profinet, Ethernet/IP or EtherCAT – with a smart interface solution [1] you can easiliy and cost-efficiently link our bus-compatible position indicators and actuators to up to 16 fieldbus or Industrial Ethernet networks.

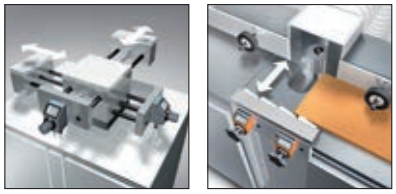
SIKO Easy Touch Control ETC5000 [2]

A complete system from a single source! With the SIKO Easy Touch Control we offer you an independent control system for bus-compatible SIKO position indicators and actuators. The intuitive user interface makes operation child's play!

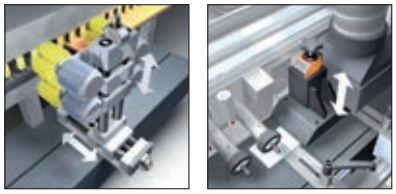


Ambient conditions	Examples of use	Benefits

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



E.g., compound tables, planing or dowel drilling machines ...



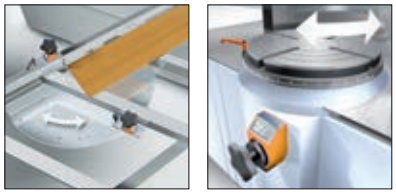
E.g., tooling in the lumber and metal industries ...

- Direct display after x,y adjustment
- Easy mounting
- Precise positioning
- Function keys for reset and incremental measurement
- Freely programmable display values

Special AP... features
- Bus operation
- Indication of actual value on the spindle

1.2

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



E.g., angle adjustment units on saws, rotary and milling tables

E.g., end stop systems ...

- Linear or angular modes
- Freely programmable display values
- Easy battery change
- Reset and incremental measurement

Electronic digital position indicators

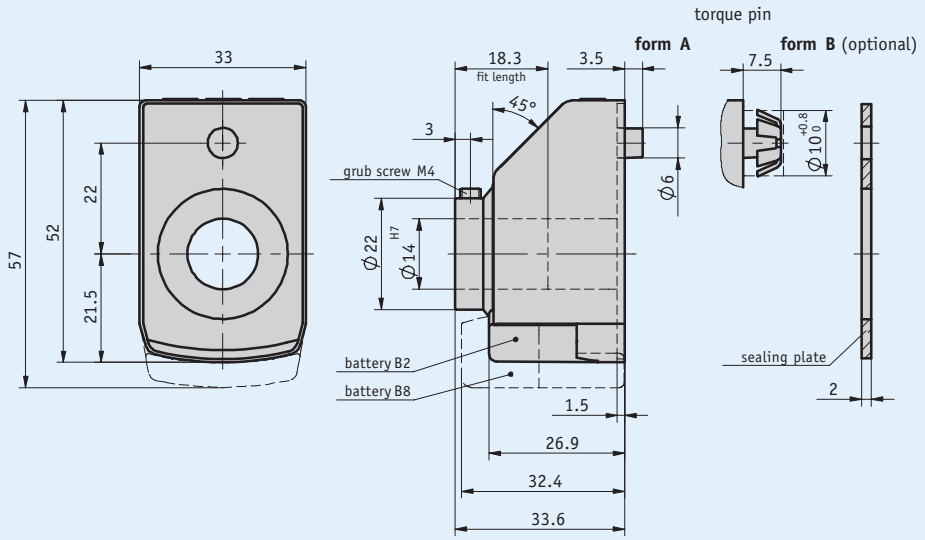
	 DE04	 DE10	 DE10P	 AP05	 AP10	 AP10S	 AP10T
Page	40	43	46	48	51	54	63
Display							
5-digit LCD	•	•		•			
6-digit LCD			•		•	•	•
Special characters	•	•	•	•	•	•	•
Interface							
RS485				•	•	•	•
CANopen (option)				•	•	•	•
Key functions							
Incremental measurement	•	•	•	•	•	•	
Offset input	•	•	•	•	•	•	
Calibration	•	•	•	•	•	•	
Confirmation							•
Programming	ProTool DE	ProTool DE	•	•	•	•	•
Digit height							
mm,approximately	8	12	11	6	8	8	8
Hollow shaft							
Diameter (mm)	14	30	30	20	20		
Dimensions							
WxHxD (mm),approximately	33x52x34	48x71x39	54x76x39	35x52x34	48x69x56	48x69x51	48x69x55

1.2

Electronic position indicator DE04
Freely programmable

Profile

- Freely programmable electronic digital display for length or angular measurement
- Freely programmable via the ProToolDE programming software
- Hollow shaft, max. Ø 14 mm
- LCD display with 5 digits and special characters
- Digit height approx. 8 mm
- Reset, incremental measurement, offset via keyboard
- Long battery life
- Easy battery change without dismantling of the device



Mechanical data

Feature	Technical data	Additional information
Shaft	black-finished steel (supported in friction bearings)	(≤ ø16H7)
Housing	plastic	
Speed	≤600 rpm	(100 % ED)
Weight	~0.05 kg	

Electrical data

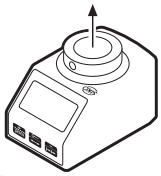
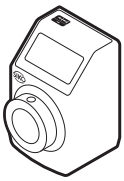
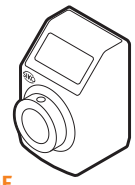
Feature	Technical data	Additional information
Battery	lithium coin cell, 3 V, CR2032 type	~2-year service life
	lithium coin cell, 3 V, CR2477 type	~8-year service life
Display/display range	5-digit LCD 7-segment, ~8 mm height	-19999 ... 99999

Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	-10 ... 60 °C	
Storage temperature	-30 ... 80 °C	
EMC	EN 61000-6-2	interference resistance / immission
	EN 61000-6-4	emitted interference / emission
Protection category	IP51	EN 60529
Shock resistance	300 m/s^2, 15 ms	EN 60068-2-27
Vibration resistance	100 m/s^2, 5 ... 150 Hz	EN 60068-2-6
	200 m/s^2, 100 Hz ... 2 kHz	EN 60068-2-6

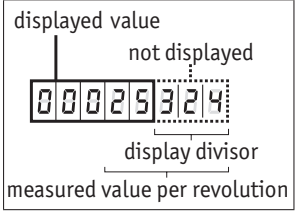
Order

Ordering information

Mounting position		Key pad operation			Counting direction
					
O2	**O4**	**D/V**	**K**	**OF**	

Hint: Texts highlighted in orange color are ordering features

Display



Display divisor
The indication of the measured value on the display can be influenced by means of the divisor (divider). The divisor shifts figures of the measured value into the invisible sector of the display unit. Although the figures are not displayed, they are also calculated by the lectronics unit and mathematically rounded.

Calculation of value displayed (example order text):

Measured value per revolution	25324
Display divisor	1000

Feature	Displayed value	Measured value
1st revolution	25	25324
2nd revolution	51	50648
3rd revolution	76	75972

Please note that the value displayed (=measured value per revolution / display divisor) must be at least 2!

Electronic position indicator DE04
Freely programmable

Ordering table

Feature	Ordering data		Specification	Additional information
Mounting position*	02	A	horizontal spindle	
	04		vertical spindle	
Measured value per revolution*	...	B	00002 ... 90000	see calculation of value displayed
	W3600		angle mode 0° ... 360°, resolution 0.1°	only with comma position "1"
	Z3600		angle mode -180° ... +180°, resolution 0.1°	only with comma position "1"
Decimal place*	0	C	0 = 00000	
	1		1 = 0000.0	
	2		2 = 000.00	
	3		3 = 00.000	
Display divisor*	...	D	1, 10, 100, 1000	see calculation of value displayed
Counting direction*	i	E	clockwise ascending values	
	e		counter-clockwise ascending values	
Key pad operation	D	F	direct zeroing*	
	V		zeroing delayed by 5 s*	
	K		only incremental measurement function	
	0F		without function keys	
Hollow shaft/diameter	14	G	ø14 mm	
	16		ø16 mm	
	...		RH6, RH8, RH9.525, RH10, RH12	reducing bushes
Color	0	H	orange RAL 2004	
	S		black RAL 9005	
Battery	B2	I	~2 years service life	
	B8		~8 years service life	observe technical drawing

* Programmable via ProTool DE programming software

Order key

DE04 - [A] - [B] - [C] - [D] - [E] - [F] - [G] - [H] - A - BP - [I]

Scope of delivery: *DE04, Mounting instructions*

Accessories:

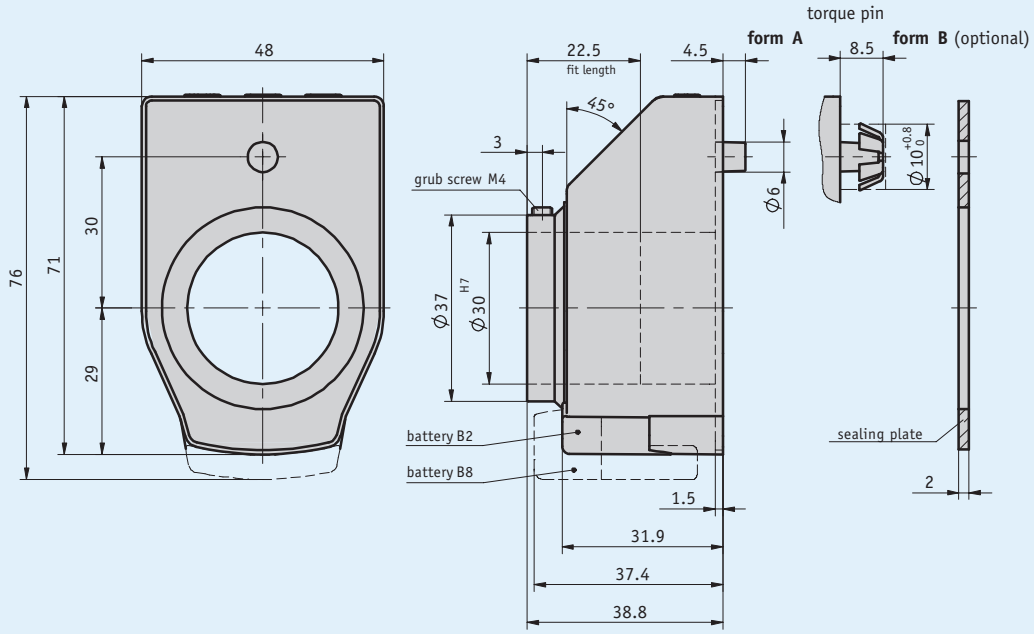
Programming software ProTool DE	*page 142*
Reduction sleeve RH04	*www.siko-global.com*
Clamping plate KPE04	*page 128*

Additional information:

General information and areas of application	*page 34*

Profile

- Freely programmable electronic digital display for length or angular measurement
- Freely programmable via the ProToolDE programming software
- Hollow shaft, max. Ø 30 mm
- LCD display with 5 digits and special characters
- Digit height approx. 12 mm
- Reset, incremental measurement, offset via keyboard
- Long battery life
- Easy battery change without dismantling of the device



Mechanical data

Feature	Technical data	Additional information
Shaft	black-finished steel (supported in friction bearings)	(≤ ø30H7)
Housing	plastic	
Speed	≤600 rpm	(100 % ED)
Weight	~0.1 kg	

Electrical data

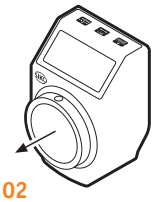
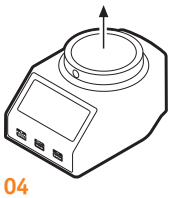
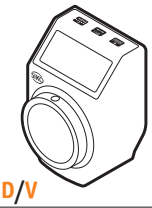
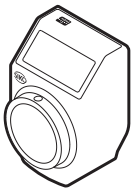
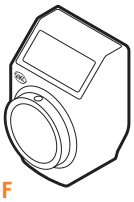
Feature	Technical data	Additional information
Battery	lithium coin cell, 3 V, CR2032 type	~2-year service life
	lithium coin cell, 3 V, CR2477 type	~8-year service life
Display/display range	5-digit LCD 7-segment, ~8 mm height	-19999 ... 99999

Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	-10 ... 60 °C	
Storage temperature	-30 ... 80 °C	
EMC	EN 61000-6-2	interference resistance / immission
	EN 61000-6-4	emitted interference / emission
Protection category	IP51	EN 60529
Shock resistance	300 m/s^2, 15 ms	EN 60068-2-27
Vibration resistance	100 m/s^2, 5 ... 150 Hz	EN 60068-2-6
	200 m/s^2, 100 Hz ... 2 kHz	EN 60068-2-6

Order

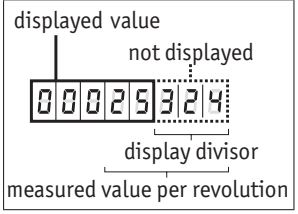
- **Ordering information**

Mounting position		Key pad operation			Counting direction
					
02	04	D/V	K	OF	

Hint: Texts highlighted in orange color are order characteristics.

1.2

Display



Display divisor
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Calculation of value displayed (example order text):

Measured value per revolution	25324
Display divisor	1000

Feature	Displayed value	Measured value
1st revolution	25	25324
2nd revolution	51	50648
3rd revolution	76	75972

Please note that the value displayed (=measured value per revolution / display divisor) must be at least 2!

Ordering table

Feature	Ordering data		Specification	Additional information
Mounting position*	02	A	horizontal spindle	
	04		vertical spindle	
Measured value per revolution*	...	B	00002 ... 90000	see display value calculation
	W3600		angle mode 0° ... 360°, resolution 0.1°	only with comma position "1"
	Z3600		angle mode -180° ... +180°, resolution 0.1°	only with comma position "1"
Decimal place*	0	C	0 = 00000	
	1		1 = 0000.0	
	2		2 = 000.00	
	3		3 = 00.000	
Display divisor*	...	D	1, 10, 100, 1000	see display value calculation
Counting direction*	i	E	clockwise ascending values	
	e		counter-clockwise ascending values	
Key pad operation	D	F	direct zeroing*	
	V		zeroing delayed by 5 s*	
	K		only incremental measurement function	
	0F		without function keys	
Hollow shaft/diameter	30	G	ø30 mm	
	20		ø20 mm	
	...		RH16, RH22, RH24, RH25, RH25.4, RH26	reducing bushes
			others on request	
Color	0	H	orange RAL 2004	
	S		black RAL 9005	
Battery	B2	I	~2 years service life	
	B8		~8 years service life	observe technical drawing

* Programmable via ProTool DE programming software

Order key

DE10 - [ ] - [ ] - [ ] - [ ] - [ ] - [ ] - [ ] - [ ] - A - BP - [ ]
A B C D E F G H I

Scope of delivery: *DE10, Mounting instructions*

Accessories:

Programming software ProTool DE *page 142*
Reduction sleeve RH *page 132*
Pneumatic clamping plate KP09P *page 131*
Clamping plate KPL09 *page 130*

Additional information:

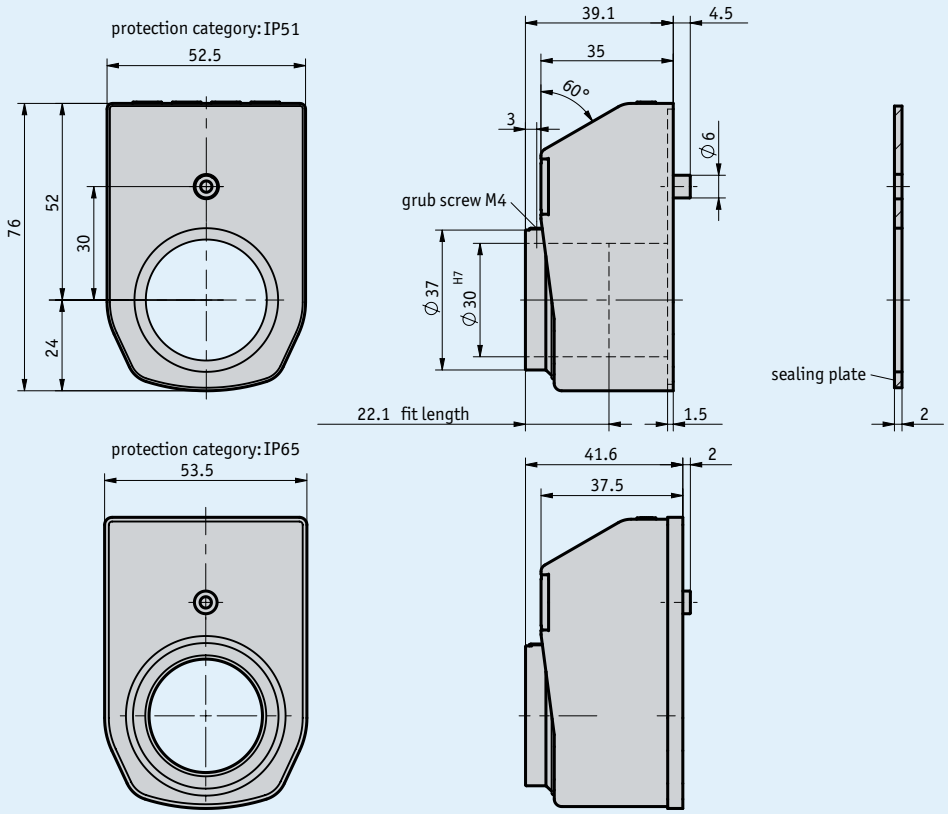
General information and areas of application *page 34*

subject to technical alteration • 2016/11/18 • 09:19 • K

Electronic position indicator DE10P
freely programmable

Profile

- Freely programmable directly via buttons on the device
- Hollow shaft, max. Ø 30 mm
- Stainless-steel hollow shaft
- LCD display with 6 digits and special characters
- Digit height approx. 11 mm
- Long battery life
- Easily replaceable batteries (standard AAA)
- Incremental measurement function, absolute value display
- High degree of protection



Mechanical data

Feature	Technical data	Additional information
Shaft	stainless steel (supported in friction bearings)	(≤ ø30H7)
Housing	plastic	
Speed	≤600 rpm	(100 % ED)
Weight	~0.13 kg	

Electrical data

Feature	Technical data	Additional information
Operating voltage	2x 1.5 V DC, >1000 mAh	2x AAA batteries, ~2-year service life
	integrated battery compartment	replaceable by customer
Display/display range	6-digit LCD 7-segment, ~11 mm height	-99999 ... 999999

System data

Feature	Technical data	Additional information
System accuracy	±0.25°	

Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	-10 ... 60 °C	
Storage temperature	-30 ... 80 °C	
Relative humidity		condensation inadmissible
EMC	EN 61000-6-2	interference resistance / immission
	EN 61000-6-4	emitted interference / emission
Protection category	IP51, IP65	EN 60529
Shock resistance	300 m/s^2, 15 ms	EN 60068-2-27
Vibration resistance	100 m/s^2, 5 ... 150 Hz	EN 60068-2-6
	200 m/s^2, 100 Hz ... 2 kHz	EN 60068-2-6

Order

Ordering table

Feature	Ordering data		Specification	Additional information
Hollow shaft/diameter	30	A	ø30 mm	
	20		ø20 mm	
	...		RH12, RH14, RH25	reducing bushes
			others on request	
Color	0	B	orange RAL 2004	
	S		black RAL 9005	
Protection category	IP51	C	IP51	
	IP65		IP65	

Order key

DE10P - [ ] - [ ] - S - [ ]
A B C

Scope of delivery: *DE10P, Mounting instructions*

Accessories:
Reduction sleeve RH *page 132*

Additional information:
General information and areas of application *page 34*

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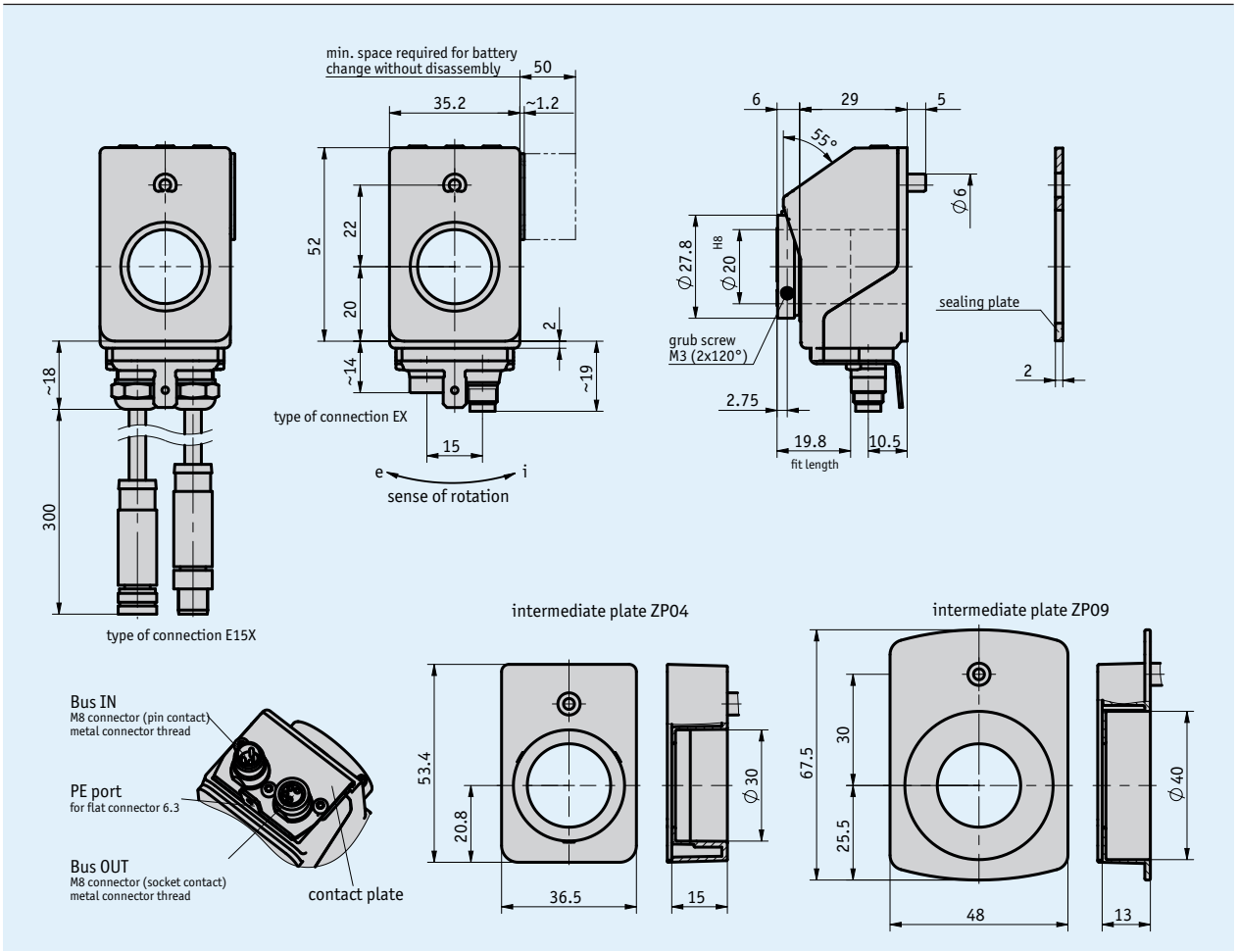
Electronic position indicator AP05
With bus interface

Profile

- Electronic position indicator with bus interface
- Backlit two-row LCD
- Display of target and actual value displays with integrated alignment
- User guidance through status LEDs
- Hollow shaft with Ø 20 mm and clamping ring made of stainless steel
- Enhanced shock resistance owing to protective display glass
- Integrated RS485 interface, CAN bus as an option
- Robust sensor technology unit thanks to magnetic scanning
- Mechanically compatible with the AP04 and DA04 position indicators
- IP53 type of protection, IP65 as an option



Mechanical data

Feature	Technical data	Additional information
Shaft	plastic	
Housing	reinforced plastic	plug thread / PE connection metal
Color	black, RAL 9005	
Clamping ring	stainless steel	
Speed	≤500 rpm	
Cable sheath	PUR	EX15 type of connection
Cable bending radius	≥30 mm	permanently laid

Electrical data

Feature	Technical data	Additional information
Operating voltage	24 V DC ±20 %	reverse polarity protected
Current consumption	~30 mA	
Battery service life	~8 year(s)	
Display/display range	5-digit LCD 7-segment, ~6 mm height	decimal points, 2 rows, special characters (LED backlit red/white)
Special character	arrow clockwise, arrow conter-clockwise, incremental dimension, battery	
Status display	2x two-color LED (red/green)	position status, configurable
Keys	incremental measurement function, parameterizing, resetting	
Bus connection	RS485; CANopen	no galvanic isolation
Type of connection	2x M8-plug connectors (A-coded)	4-pole, 1x socket, 1x pin
	grounding via flat connector 6.3 mm	

System data

Feature	Technical data	Additional information
Scanning	magnetic	
Resolution	720 increments/revolution	displayed value/revolution freely configurable
Measuring range	≤932067 revolution(s)	coded

Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	0 ... 60 °C	
Storage temperature	-20 ... 80 °C	
Relative humidity		condensation inadmissible
EMC	EN 61000-6-2	interference resistance / immission
	EN 61000-6-4	emitted interference / emission
Protection category	IP53	EN 60529, in the fitted condition, with mating connector mounted
	IP65	EN 60529, in the fitted condition, with mating connector mounted
Shock resistance	≤500 m/s^2, 11 ms	EN 60068-2-27, half-sine, 3 axes (+/-), each 3 pulses
Vibration resistance	≤100 m/s^2, 10 ... 2000 Hz	EN 60068-2-6, 3 axes, each 10 cycles

Pin assignment

Interfaces

RS485	CAN	PIN
TxRx-/DÜB	CANL	1
TxRx+/DÜA	CANH	2
+24 V DC	+24 V DC	3
GND	GND	4

Order

Ordering table

Feature	Ordering data		Specification	Additional information
Interface/protocol	CAN	A	CANopen	
	S3/09		RS485/SIKONETZ5	
Hollow shaft/diameter	20	B	ø20 mm	
	...		RH12, RH14, RH15, RH16	reducing bushes
Intermediate plate	OZP	C	without cable	
	ZP04			
	ZP09		adaptation DA09S	
Protection category	IP53	D	IP53	
	IP65		IP65	
Type of connection	EX	E	industrial connector	without cable
	E15X		cable outlet	length 0.3 m
Software	S	F	standard software	
	SW04		compatible to AP04-CAN	
	SW05		compatible to AP04-SN5	
	SW06		compatible to AP04-SN3/4	

Order key

AP05 - [A] - [B] - A - [C] - [D] - [E] - [F]

1.2

Scope of delivery: *AP05, Mounting instructions*

Accessories:

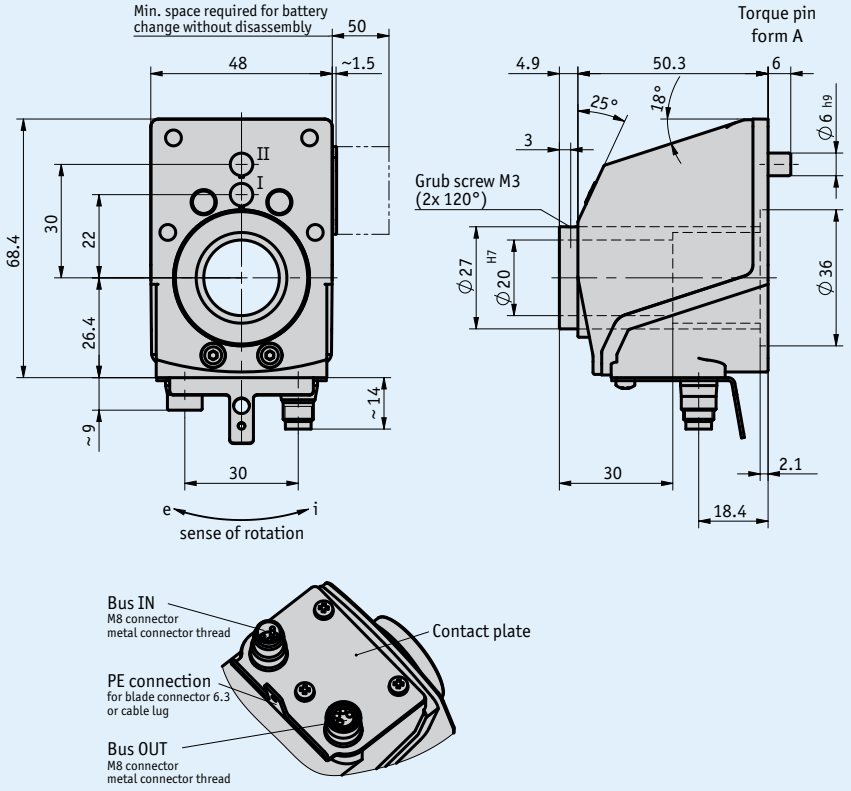
Reduction sleeve RH09	*www.siko-global.com*
Pneumatic clamping plate KP09P	*page 131*
Clamping plate KPE04	*page 128*
Battery unit ZB1027	*page 143*
Easy Touch Control ETC5000	*www.siko-global.com*
Cable extension KV04S1	*page 138*
Mating Connector Overview	*page 140*
Mating connector, 4-pole, socket	*Order key 84209*
Mating connector, 4-pole, pin	*Order key 84210*
Bus terminating connector, 4-pole, pin	*Order key BAS-0005*

Additional information:

General information and areas of application	*page 34*

Profile

- Electronic position indicator with bus interface
- Stainless-steel hollow shaft ø20 mm, up to ø25.4 mm as an option
- Backlit display
- Two-line LCD for target and actual values
- Reset, incremental measurement, offset via keyboard
- Integrated RS485 interface, CAN bus as an option
- Robust sensor technology unit thanks to magnetic scanning
- User guidance through status LEDs
- Mechanically compatible with the DA09S position indicator
- IP53 type of protection, IP65 as an option



Mechanical data

Feature	Technical data	Additional information
Shaft	stainless steel	
Housing	reinforced plastic	metal plug thread
Color	black, RAL 9005	
Speed	≤500 rpm	

Electrical data

Feature	Technical data	Additional information
Operating voltage	24 V DC ±20 %	
Current consumption	~30 mA	additional ~3 mA per LED when operated with LEDs
Battery service life	~5 year(s)	
Display/display range	6-digit LCD 14-segment, ~8 mm height	decimal points, 2 rows, special characters (backlit LED red/white)
Special character	cw arrow, ccw arrow, incremental measurement, battery	
Status display	2x two-color LED (red/green)	position status, configurable
Keys	incremental measurement function, parameterizing, resetting	
Bus connection	RS485; CANopen	no galvanic isolation
Type of connection	2x M8-plug connectors (A-coded)	4-pole, 1x socket, 1x pin
	grounding via flat male tab 6.3 mm or terminal lug	

System data

Feature	Technical data	Additional information
Scanning	magnetic	
Resolution	freely configurable between 1 and 65535 increments/revolution	
	880 increments/revolution	
Measuring range	≤11914	

1.2

Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	0 ... 60 °C	
Storage temperature	-20 ... 80 °C	
Relative humidity		condensation inadmissible
Protection category	IP53	EN 60529, only with mating connector
	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

Interfaces

RS485	CAN bus	PIN
TxRx-/DÜB	CANL	1
TxRx+/DÜA	CANH	2
+24 V DC	+24 V DC	3
GND	GND	4

Order

Ordering table

Feature	Ordering data		Specification	Additional information
Interface/protocol	CAN	A	CANopen	
	S3/09		RS485/SIKONETZ5	
Hollow shaft/diameter	20	B	ø20 mm	
	25.4		ø25.4 mm	
Torque pin/position	II	C	30 mm distance	
	I		22 mm distance	optional
Protection category	IP53	D	IP53	
	IP65		IP65	
Viewing window	SF	E	front foil	
	K		plastic	impact protection

Order key

AP10 - [A] - [B] - A - [C] - [D] - EX - [E] - S

Scope of delivery: *AP10, Mounting instructions*

Accessories:

Clamping plate KPL09	*page 130*
Pneumatic clamping plate KP09P	*page 131*
Reduction sleeve RH09	*www.siko-global.com*
Cable extension KV04S1	*page 138*
Easy Touch Control ETC5000	*www.siko-global.com*
Mating Connector Overview	*page 140*
Mating connector, 4-pole, socket	*Order key 84209*
Mating connector, 4-pole, pin	*Order key 84210*
Bus terminating connector, 4-pole, pin	*Order key BAS-0005*

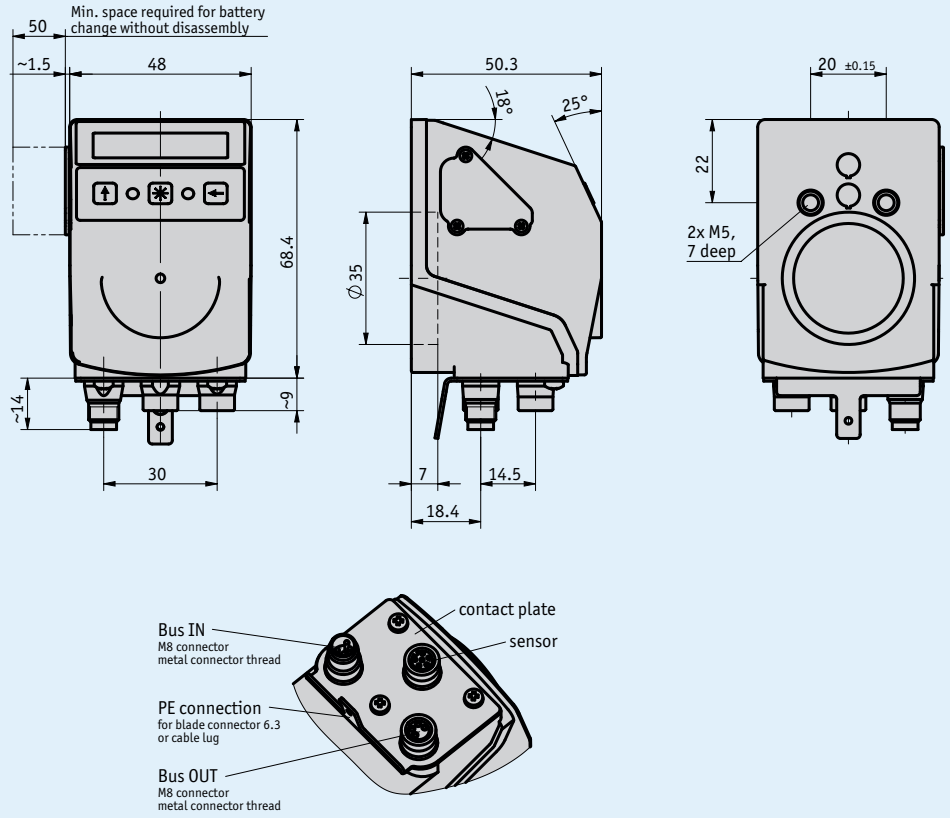
Additional information:

General information and areas of application	*page 34*

Electronic position indicator AP10S
with bus interface, for direct linar length measurement

Profile

- Electronic position indicator with plug connection for magnetic sensor
- Optimally readable backlit display
- Two-line LCD for target and actual values
- Reset, incremental measurement, offset via keyboard
- Integrated RS485 interface, CAN bus as an option
- Display accuracy up to 0.01 mm
- Absolute function via internal backup
- User guidance via bicolor status LEDs
- IP53 type of protection, IP65 as an option



Mechanical data

Feature	Technical data	Additional information
Housing	reinforced plastic	metal plug thread
Color	black, RAL 9005	

Electrical data

Feature	Technical data	Additional information
Operating voltage	24 V DC ±20 %	
Current consumption	~30 mA	additional ~3 mA per LED when operated with LEDs
Battery service life	~5 year(s)	
Display/display range	6-digit LCD 14-segment, ~8 mm height	decimal points, 2 rows, special characters (backlit LED red/white)
Special character	cw arrow, ccw arrow, incremental measurement, battery	
Status display	2x two-color LED (red/green)	position status, configurable
Keys	incremental measurement function, parameterizing, resetting	
Bus connection	RS485; CANopen	no galvanic isolation
Type of connection	2x M8-plug connectors (A-coded)	4-pole, 1x socket, 1x pin
	1x M8 plug connector (A-coded)	6-pole, 1x socket (sensor)
	grounding via flat male tab 6.3 mm or terminal lug	

System data

Feature	Technical data	Additional information
Scanning	external sensor	
Resolution	freely configurable	
	720 increments/revolution	use with GS04
	0.01 mm	use with MS500H
System accuracy	±35 µm	use with MS500H
Measuring range	±655 m	use with MS500H
	≤14562 revolution(s)	use with GS04

Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	0 ... 60 °C	
Storage temperature	-20 ... 80 °C	
Relative humidity		condensation inadmissible
EMC	EN 61000-6-2	interference resistance / immission
	EN 61000-6-4	emitted interference/emission
Protection category	IP53	EN 60529, only with mating connector
	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

Interfaces

RS485	CAN bus	PIN
TxRx-/DÜB	CANL	1
TxRx+/DÜA	CANH	2
+24 V DC	+24 V DC	3
GND	GND	4

Order

Ordering information

One or more system components are required:

Magnetic sensor MS500H PL	page 59
Hollow shaft sensor GS04	page 57

Ordering table

Feature	Ordering data		Specification	Additional information
Interface/protocol	S3/09	A	RS485/SIKONETZ5	
	CAN		CANopen	
Protection category	IP53	B	IP53	
	IP65		IP65	
Viewing window	SF	C	front foil	
	K		plastic	impact protection

Order key

AP10S - [ ] - [ ] - EX - [ ] - S

A B C

1.2

Scope of delivery: *AP10S, Mounting instructions, Documentation on CD*

Accessories:

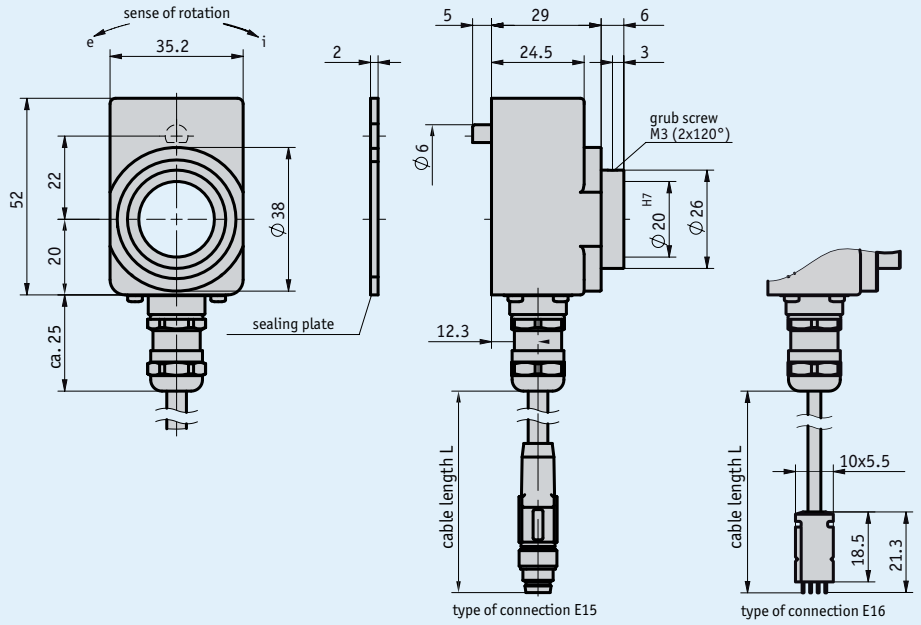
Cable extension KV04S1	*page 138*
Easy Touch Control ETC5000	*www.siko-global.com*
Mating Connector Overview	*page 140*
Mating connector, 4-pole, socket	*Order key 84209*
Mating connector, 4-pole, pin	*Order key 84210*
Bus terminating connector, 4-pole, pin	*Order key BAS-0005*

Additional information:

General information and areas of application	*page 34*

Profile

- Rotatively measuring sensor with magnetic scanning
- Pluggable connection to AP10S, MA503/2, MA504/1 position indicators
- Easy hollow-shaft mounting, max. Ø 20 mm
- IP65 protection category



Mechanical data

Feature	Technical data	Additional information
Shaft	stainless steel	
Housing	plastic	
Color	black RAL 9005	
Speed	≤600 rpm	
Cable sheath	PUR	E15 type of connection
	PVC	E16 type of connection
Cable bending radius	≥52 mm	permanently/flexibly laid (E15 type of connection)
	>17 mm	hard-wired (E16 type of connection)

Electrical data

Feature	Technical data	Additional information
Operating voltage	supply via downstream electronic unit	
Type of connection	M8 plug connector	6-pole, 1x pin (E15 type of connection)
	flat connector	8-pole, 1x pin (E16 type of connection)

System data

Feature	Technical data	Additional information
Scanning	magnetic	polewheel with 18 poles of 5 mm each
Resolution	depending on downstream electronic unit	
Measuring range	depending on downstream electronic unit	

Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	0 ... 60 °C	
Storage temperature	-20 ... 70 °C	
Relative humidity		condensation inadmissible
EMC	EN 61000-6-2	interference resistance / immission
	EN 61000-6-4	emitted interference / emission
Protection category	IP65	EN 60529

Order

Ordering information

One or more system components are required:

Electronic position indicator AP10S	page 54
Electronic display MA503/2	www.siko-global.com
Electronic display MA504/1	www.siko-global.com

Ordering table

Feature	Ordering data		Specification	Additional information
Hollow shaft/diameter	20	A	ø20 mm	
	RH14		reducing bush	
			others on request	
Type of connection	E15	B	M8 plug connector	suitable for AP04S and AP10S
	E16		connector	suitable for MA503/2 and MA504/1
Cable length L	...	C	00.5 ... 02.0 m, in steps of 0.5 m	

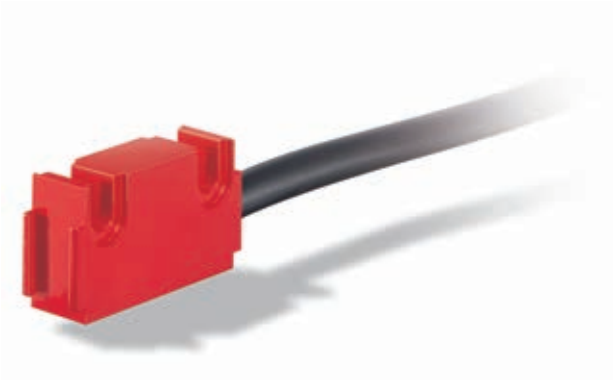
Order key

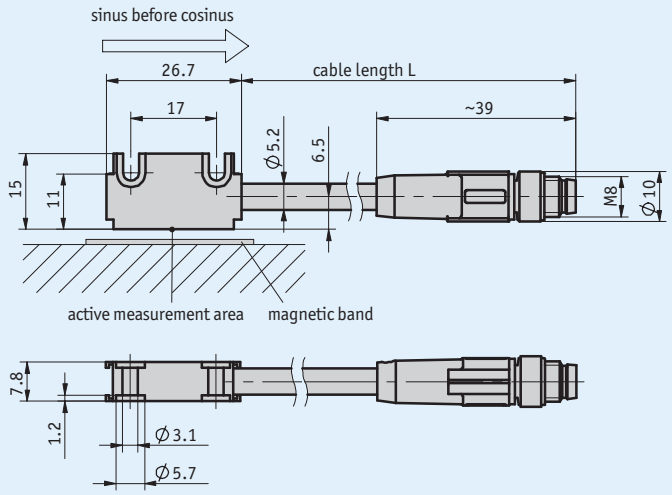
GS04 - [ ] - [ ] - [ ]
A B C

Scope of delivery: *GS04, Mounting instructions*

Profile

- Compact design of sensor and connector
- To be connected to AP04S or AP10S
- Works with magnetic tape MB500/1, MR500, MBR500
- Reading distance ≤2 mm





Mechanical data

Feature	Technical data	Additional information
Housing	aluminum red	L design
Sensor/band reading distance	0.1 ... 2 mm	
Cable sheath	PUR	6-wire ø5.2 mm (E15 type of connection)
Cable bending radius	≥52 mm (dynamic)	E15 type of connection

Electrical data

Feature	Technical data	Additional information
Operating voltage	supply via measurement display / downstream electronic unit	
Current consumption	supply via measurement display / downstream electronic unit	
Type of connection	M8 plug connector	6-pole, 1x pin (E15)

Magnetic sensor MS500H PL
Passive sensor, miniature design

System data

Feature	Technical data	Additional information
System accuracy	depending on downstream electronic unit	
Repeat accuracy	depending on downstream electronic unit	
Travel speed	depending on downstream electronic unit	

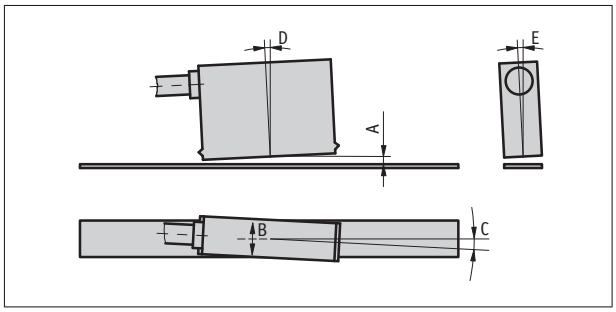
Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	0 ... 60 °C	
Storage temperature	-20 ... 70 °C	
Relative humidity	100 %	Betauung zulässig (Sensorkopf)
Protection category	IP67	EN 60529 (sensor head)
Shock resistance	2000 m/s², 11 ms	EN 60068-2-27
Vibration resistance	200 m/s², 50 Hz ... 2 kHz	EN 60068-2-6

Hint for mounting

A, Sensor/tape reading distance	≤2 mm
B, Lateral offset	±2 mm
C, Alignment error	±3°
D, Longitudinal inclination	±1°
E, Lateral inclination	±3°

The length of the cable between the sensor and connector cannot be subsequently increased or decreased.



Symbolic representation

Order

Ordering information

One or more system components are required:

Magnetic band MB500/1	page 61
Magnetic ring MR500	www.siko-global.com
Magnetic band ring MBR500	www.siko-global.com

Ordering table

Feature	Ordering data	Specification	Additional information
Cable length	... A	00.5 ... 02.0 m, in intervals of 0.5 m	E15

Order key

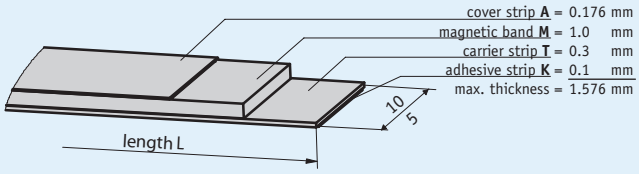
MS500H PL - L - E15 - [ ] A

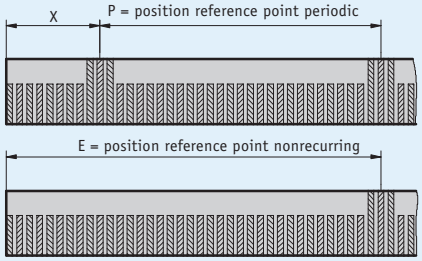
Scope of delivery: *MS500H PL, Mounting instructions, Fastening set*

Magnetic band MB500/1
Incrementally coded scale, pole length 5 mm

Profile

- Easy adhesive mounting, self-assembly possible
- Reels up to 100 m available
- System accuracy up to 50 µm





Mechanical data

Feature	Technical data	Additional information
Material	stainless steel	cover strip
Band width	10 mm or 5 mm	
Band thickness	1.4 mm	without cover strip
Mounting type	adhesive connection	premounted double-sided adhesive tape
Accuracy class	50 µm or 100 µm	

- **Measurement table of reference points**

Reference points [m]	
Fixed distance **X**	0.05
Periodic **P**	0.2, 0.3, 0.5
Onetime **E**	0.05, 0.1, 0.2, 0.5, 1, 2

System data

Feature	Technical data	Additional information
Pole length	5 mm	
Measuring range	∞	

Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	-20 ... 70 °C	
Storage temperature	-40 ... 70 °C	
Expansion coefficient	(11 ±1) x 10^{-6}/K	spring steel
	(16 ±1) x 10^{-6}/K	stainless steel
Relative humidity	100 %	condensation admissible

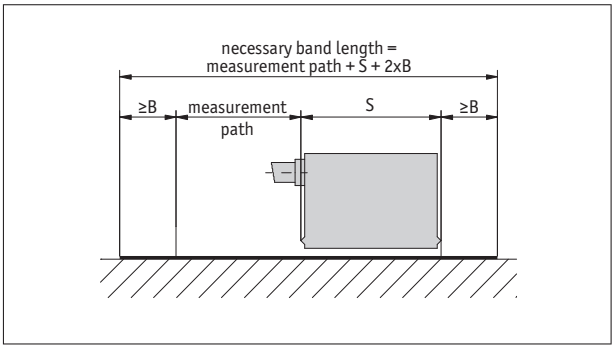
Magnetic band MB500/1
Incrementally coded scale, pole length 5 mm

Order

Ordering information

The necessary tape length is calculated from:
Measured distance + sensor length "S" + (2 x forerun or overrun "B", resp.).

S	see the drawing of the sensor used
B	10 mm (forerun and overrun)



Symbolic representation

Ordering table

Feature	Ordering data		Specification	Additional information
Length	...	A	000.10 ... 100.00 m, in intervals of 0.1 m	ordering detail, see "Ordering information"
tapewidth	10/10	B	in mm	
	5		in mm	
Accuracy	0.1	C	0.1 mm	
	0.05		0.05 mm	
Material carrier tape	St	D	steel	
	VA		stainless steel	
Adhesive carrier tape	TM	E	with	
	T0		without	
Cover strip	AM	F	with	stainless steel
	A0		without	
Masking tape width	10.0	G	in mm	
	5.0		in mm	
Reference point	0	H	without	at width 10 mm optional with flexible reference mark, see accessories
	E		unique	only with 10 mm width
	P		periodic	only with 10 mm width
Reference point position	...	I	0.05, 0.1, 0.2, 0.5, 1.0, 2.0 in m	indicate only if reference point E is chosen, ≤5.0 m
	...		0.2, 0.3, 0.5 in m	indicate only if reference point P is chosen
			others on request	

Order key

MB500/1 - [A] - [B] - [C] - [D] - [E] - [F] - [G] - [H] - [I]

Scope of delivery: *MB500/1*

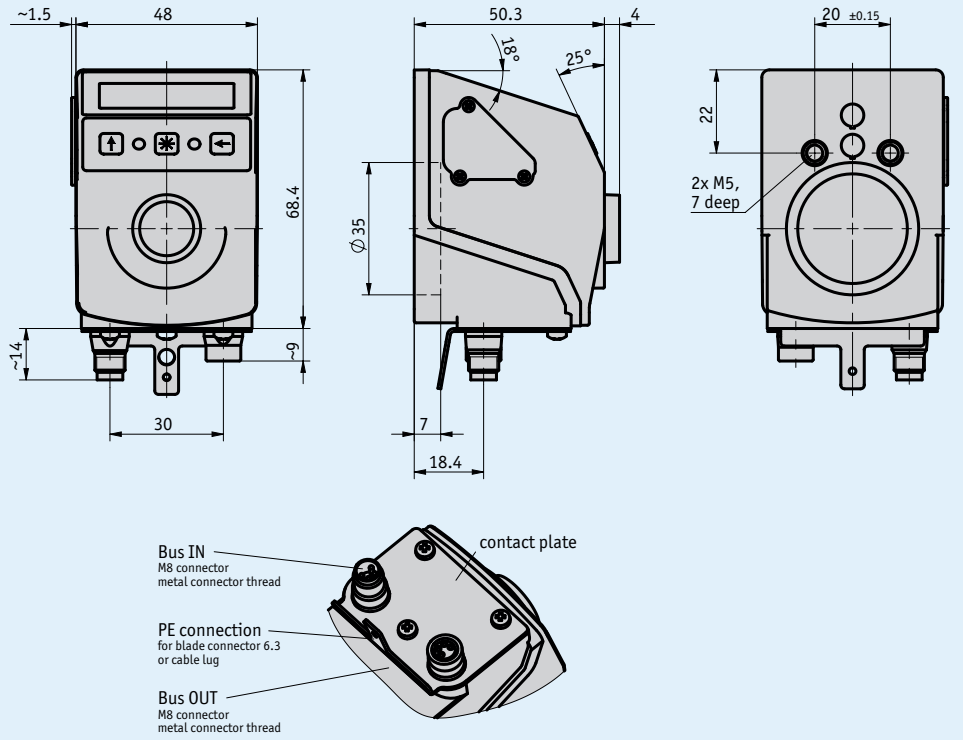
Accessories:

Profile Rail PS	*www.siko-global.com*
Protective band SB	*www.siko-global.com*
Profile Rail PS1	*www.siko-global.com*
flexible reference mark	*Order key 88436*

Setpoint display AP10T
with bus interface, for format part or tool change

Profile

- Setpoint display with bus interface without measurement of actual value
- Large control key to confirm target value
- Optimally readable backlit display
- Two-line LCD-Display
- Integrated RS485 interface, CAN bus as an option
- User guidance via bicolor status LEDs
- IP53 type of protection, IP65 as an option



Mechanical data

Feature	Technical data	Additional information
Housing	reinforced plastic	metal plug thread
Color	black, RAL 9005	

Electrical data

Feature	Technical data	Additional information
Operating voltage	24 V DC ±20 %	
Current consumption	~30 mA	additional ~3 mA per LED when operated with LEDs
Display/display range	6-digit LCD 14-segment, ~8 mm height	decimal points, 2 rows, (backlit LED red/white)
Status display	2x two-color LED (red/green)	acknowledgment status, configurable
Keys	acknowledgment, parameterization	
Bus connection	RS485; CANopen	no galvanic isolation
Type of connection	2x M8-plug connectors (A-coded)	4-pole, 1x socket, 1x pin
	grounding via flat male tab 6.3 mm or terminal lug	

Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	0 ... 60 °C	
Storage temperature	-20 ... 80 °C	
Relative humidity		condensation inadmissible
EMC	EN 61000-6-2	interference resistance / immission
	EN 61000-6-4	emitted interference/emission
Protection category	IP53	EN 60529, only with mating connector
	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

1.2

Pin assignment

- **Interfaces**

RS485	CAN bus	PIN
TxRx-/DÜB	CANL	1
TxRx+/DÜA	CANH	2
+24 V DC	+24 V DC	3
GND	GND	4

Order

Ordering table

Feature	Ordering data		Specification	Additional information
Interface/protocol	S3/09	A	RS485/SIKONETZ5	
	CAN		CANopen	
Protection category	IP53	B	IP53	
	IP65		IP65	
Viewing window	SF	C	front foil	
	K		plastic	impact protection

Order key

AP10T - [ ] - [ ] - EX - [ ] - S

A B C

Scope of delivery: *AP10T, Mounting instructions, Documentation on CD*

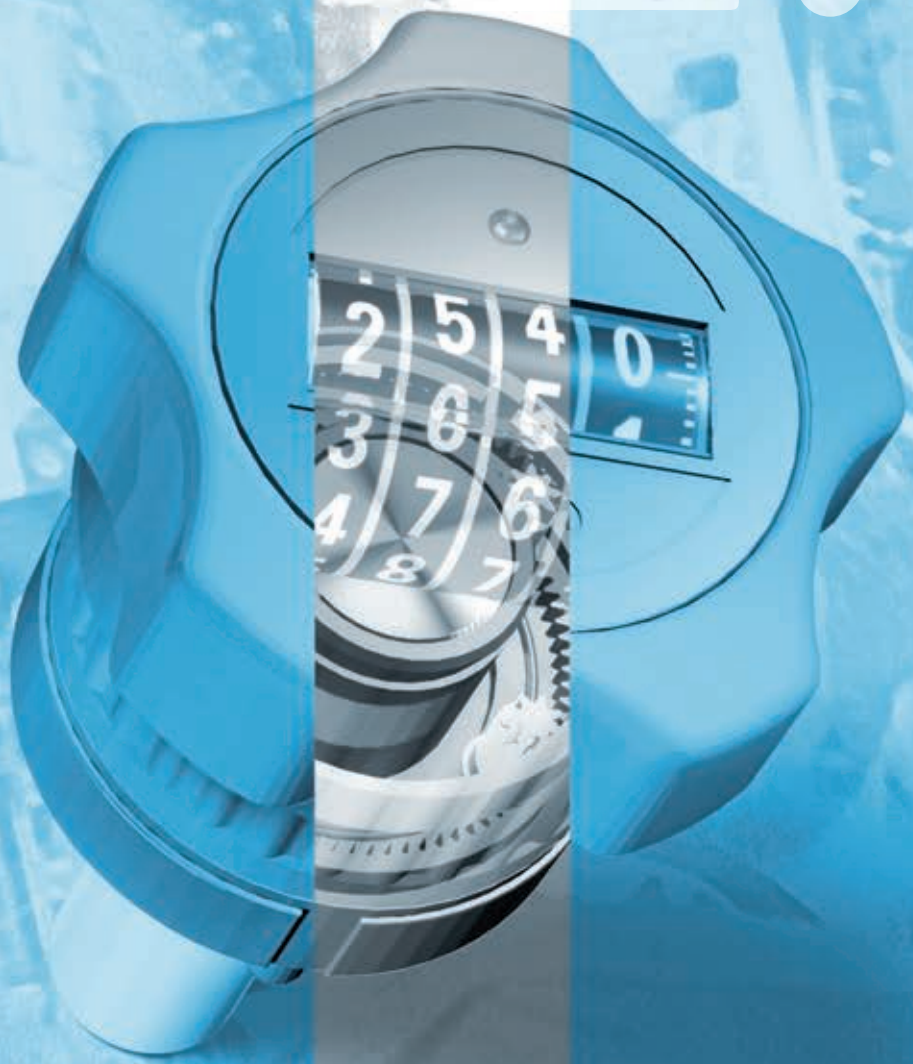
Accessories:

Cable extension KV04S1 — *page 138*
Mating Connector Overview — *page 140*
Mating connector, 4-pole, socket — *Order key 84209*
Mating connector, 4-pole, pin — *Order key 84210*
Bus terminating connector, 4-pole, pin — *Order key BAS-0005*

Additional information:

General information and areas of application — *page 34*

1.3



Less is more – elegant double function in a flash

Since their introduction a few years ago, the SIKO mechanical control knobs (referred to as DK) with their integrated measurement system have successfully conquered many new fields of application. This is literally due to their "sensitive touch", as the control knobs are filigree, industrial standard adjusting knobs comprising a clever combination of miniature handwheel and mechanical digital position indicator.

With the control knobs, applications are possible in which multiple shaft or spindle rotations must be shown under restricted space conditions. The easy-to-handle control knobs already demonstrate their direct effect on the installed mechanical indicators with the most minimal movement, because all DKs have a full reduction gear in spite of their small dimensions. Only this gear technology enables the extremely fine-resolution tracking and precise absolute depiction of adjustment values directly at the measuring point.

Mounting is also extremely simple: Slip on, lock in place - ready.
Only a small drilled hole on the machine is necessary to accommodate the torque pin. The track-proven SIKO gear technology enables installation in any position.

The innovative concept of the DK range inspires mechanical engineering companies to create very compact, ergonomic and particularly inexpensive solutions. Users profit from the development experience in both areas of competence combined in this product group – handwheel technology and mechanical indicators.

The mechanical control knobs stand for economy, a wide application range and user-oriented product design.

Benefits

- Long service life due to consistent further development of technology and user-oriented choice of materials
- Excellent cost-benefit ratio
- Clear and precisely readable digital and analog value
- Modifiable displays owing to individual ratios
- Can be mounted in any position
- Cost-efficient retrofitting
- Easy slip-on hollow shaft mounting
- Special scales with analog knobs

1.3

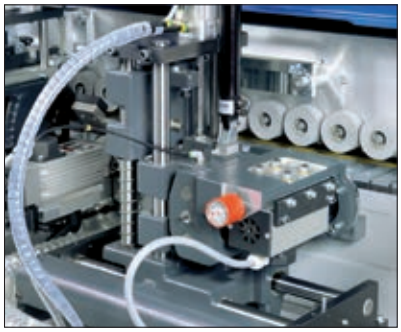
Setting values firmly under control – the DK01 is an example of a new ergonomic design for manual adjustment of adjustment shafts under particularly restricted space conditions. Value display meets the highest precision demands.

Applications

SIKO control knobs are versatile series-manufactured products which provide a number of additional displayed values in addition to the standard values.

Their suitability for industrial environments is demonstrated, for example, in process engineering applications, because these require a high level of precision during valve adjustment for numerous dosing applications. Many available actuators prove to be unsuitable as the necessary accuracy and reproducibility requirements cannot be met. The SIKO control knobs meet both criteria with ease and even visualize non-linear adjustment sequences.

1



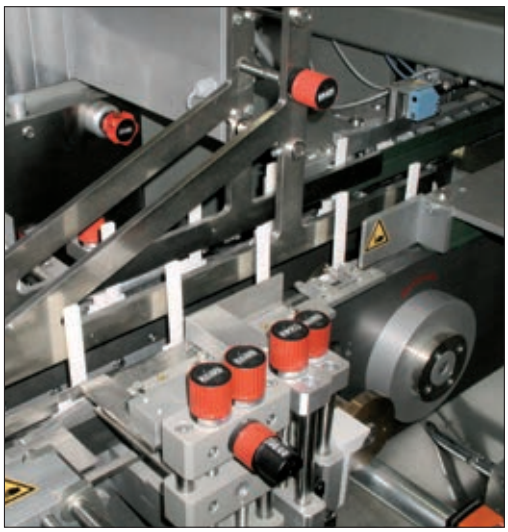
Felder KG

2

Vögtlin Instruments AG

3

4



5

Gallus Druckmaschinen GmbH

[1] Correct posioting with one grip: DK03 for tool postioning on an edge banding machine. [2] Fine adjustment: Control knob for adjustment and monitoring opening of needle valves. [3] Use on dosing valves: DK01 with integrated position indicator enables reproducible valve settings without additional measuring devices. [4] The compact design of the SIKO control knobs: Ideal for cramped mounting areas. [5] DK03 with analog display for positioning print cylinders. Owing to the device's design with torque support, zero-point calibration of the display is maintained even when opened „headfirst".

Determining decimal points

The table opposite shows the decimal point principle of the digital indicators. For example, to obtain the reading “10.0”, the indicator must count “100” with the decimal place 1 after the first rotation. The decimal point is marked by a colored intermediate ring during series production.

Order figure	Indication	Display
for decimal place	e.g., 4-digit	
0	0000	0000
1	000.0	000|0
2	00.00	00|00
3	0.000	0|000

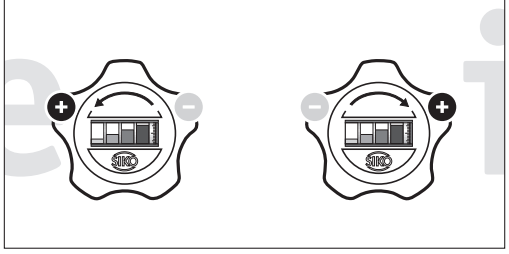
Sense of rotation

The sense of rotation of the shaft influences the gear unit installed in the DK. Digital control knobs are available in two directions of rotations in relation to the corresponding machine shaft:

“i” stands for clockwise
“e” stands for counter-clockwise

Ascending values are shown on the display in accordance with the “i” and “e” ordering code.

Sense of rotation



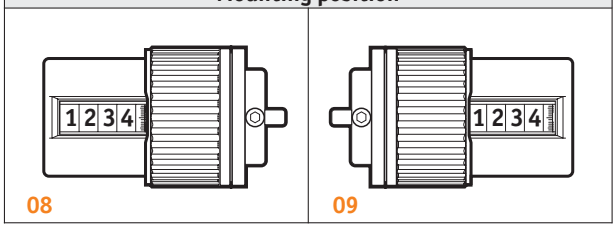
“+” shows the direction of rotation of the respective machine shaft. The ordering codes “e” and “i” specify in which direction of rotation the increasing values appear on the display.

Mounting position

Two factors determine the ordering codes of DK02*, DK05:
a) The orientation of the machine shaft
b) The line of vision to the window (decades)

The position and orientation of the DK window and the visible decades are determined with a numeric code (e.g., 08, 09, etc.).

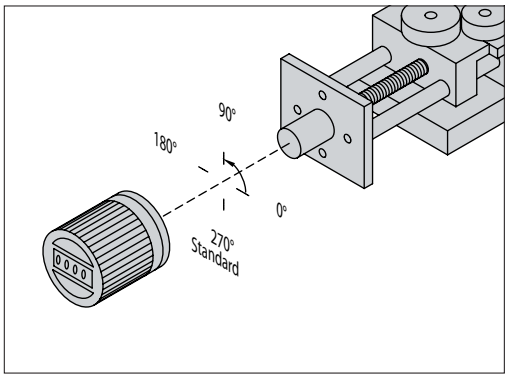
Mounting position



* Mounting example, DK02

Torque support

Several control knobs offer a choice of torque support positioning. These control knobs can therefore be mounted in a range of positions to suit the customer’s equipment.



Scales for control knobs with analog display

Each scale must meet different requirements depending on the wide range of applications of analog control knobs. The basis for the displayed values is always the gear ratio. This defines the path which must be traversed after a specific number of rotations of the pointer (DK03) itself or the scale under the stationary pointer (DKA02).

This why standard scales cannot do justice to all requirements. For these cases, SIKO supplies special scales which can be designed to suit customer requirements, for example for tracking adjustment in both directions, starting at zero and requiring a scale with ascending and descending values.

Non-linear scales are also possible, for example to display the opening degree of a valve.

Precise information in the form of diagrams or technical drawings are necessary for manufacturing such scales. Special requirements such as graduation, digits, company logos and color wishes can also be met.

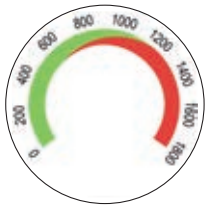
DK03-Normalskala

DK03-Sonderskalen (linear/nicht linear, ein- und mehrfarbig bedruckt)

Free angle

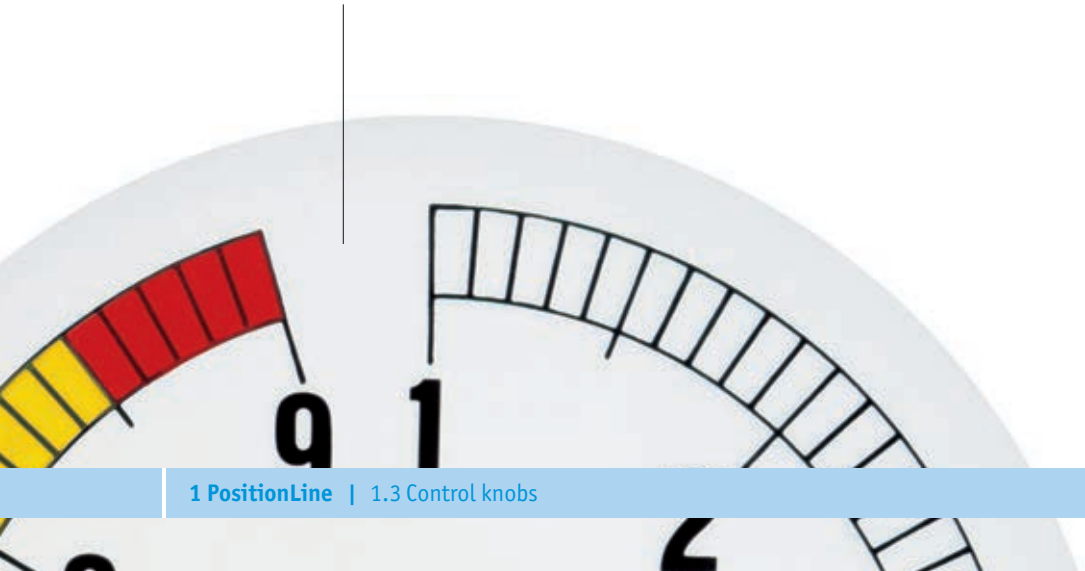
In some cases it can be necessary to provide a free angle,i.e. a zone on the scale which is not used for display purposes. This depends on your application and the ratios supplied by SIKO.

Free angles for the display of adjustment with a lower ratio are particularly used for the DKA02 control knob, which is only available with a fixed ratio of 26:1. Refer to the section on handwheels (page 23) for more information on this topic.



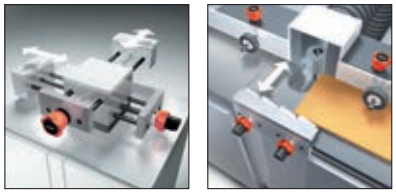
Normal scale (DKA02) and special customized scales: A sketch is normally sufficient in most cases. Refer to drawing aids (handwheels, accessories).

In some cases it can be necessary to provide a free angle,i.e., a zone on the scale which is not used for display purposes. This depends on your application and the ratios supplied by SIKO.



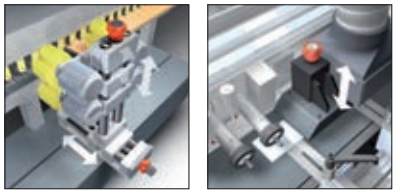
Ambient conditions	Examples of use	Benefits

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



E.g., compound tables, planing or dowel drilling machines ...

- Direct display after x,y adjustment
- Easy mounting
- Precise positioning
- Flexible indication of values
- mm or inch



E.g., tooling in the lumber and metal industries ...

Process engineering
Visualization of valve settings, flow control ...

E.g., flow controllers for gases, liquids and granule, dosing pumps ...

- Variable mounting positions
- Visual representation of valve settings
- Exact reproducibility of set
- values (e.g. flow quantities)
- Non-linear special scales

E.g., gas mixer taps ...

Drive technology
Speed setting ...

E.g.,. miniature motors

- Ultra-fine speed setting
- Non-linear special scales

Control knobs

	DK01	DK02	DK03	DK04	DK05	DKA02	DKE01
Page	74	76	78	80	82	84	86
Display type							
Analog			•			•	
Mechanical digital	•	•		•	•		
Electronic digital							•
Displays							
2 decades*				•			
3 decades*				•	•		
4 decades*	•	•					
5-digit LCD							•
Analog			•			•	
Hollow shaft							
Diameter (mm)	14	14	14	8	10	10	20
Control knob dimensions							
External diameter (mm)	36	36	36	23.5	40	40	80

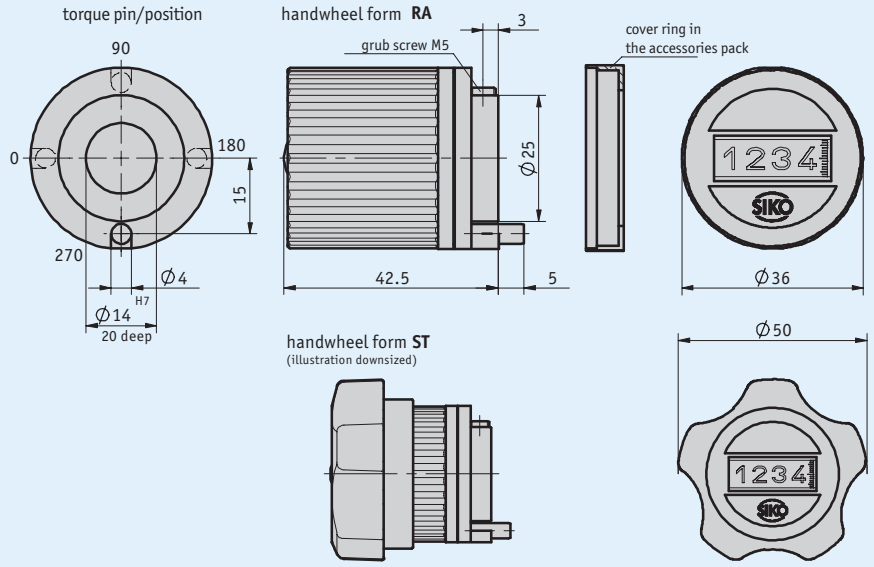
* Decade = digit ring with 10-division

1.3

Control knob DK01
Front display

Profile

- Control knob with integrated position indicator
- Shaft support: max. Ø 14 mm
- Counter with 4 decades and fine reading
- Various display values
- Star wheel as an option



1.3

Mechanical data

Feature	Technical data	Additional information
Housing	plastic	
Sight window	plastic	mineral glass as an option
Counter	4 decades, fine reading	
Digit height	~6 mm	
Weight	0.06 kg	

Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	0 ... 80 °C	

Order

Ordering table

Feature	Ordering data		Specification	Additional information
Indication after 1st revolution	...	A	12/5, 15, 17/5, 20, 25, 30, 40, 50, 100	/5 = arithmetical value not displayed
			others on request	
Decimal place	0	B	0 = 0000	
	1		1 = 000.0	
	2		2 = 00.00	
	3		3 = 0.000	
Counting direction	i	C	clockwise ascending values	
	e		counter-clockwise ascending values	
Hollow shaft/diameter	14	D	ø 14 mm	
	...		RH8, RH10, RH12	reducing bushes
			others on request	
Torque pin/position	270	E	see drawing	
	0		see drawing	
	90		see drawing	
	180		see drawing	
Handwheel form	RA	F	knurled handle	
	ST		star knob	
Handwheel color	FR	G	red RAL 3000	
	S		black RAL 9005	
Cover ring	0	H	without cover ring	
	M		cover ring supplied	

Order key

DK01 - [A] - [B] - [C] - [D] - [E] - [F] - [G] - K - [H]

Scope of delivery: DK01

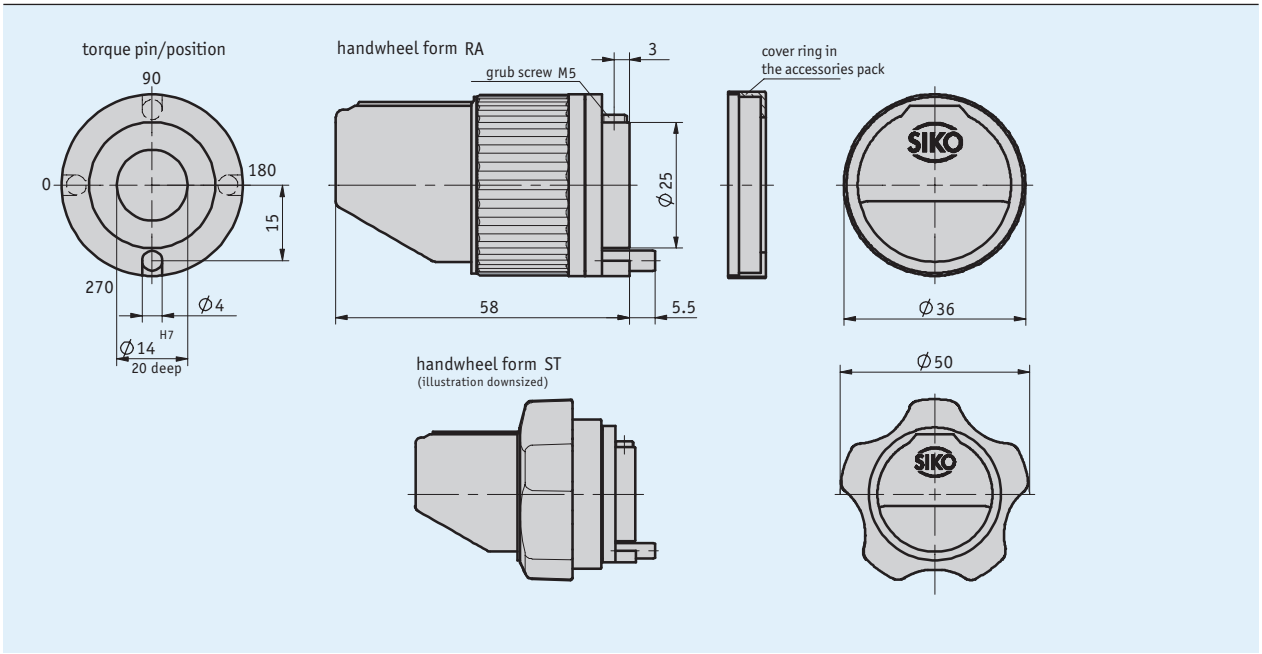
Accessories:
Reduction sleeve RH page 132

Additional information:
General information and areas of application page 68

Control knob DK02
Side display

Profile

- Control knob with integrated position indicator
- Shaft support: max. Ø 14 mm
- Counter with 4 decades and fine reading
- Various display values
- Star wheel as an option



Mechanical data

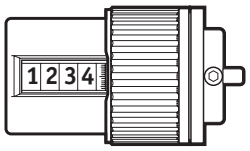
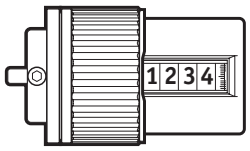
Feature	Technical data	Additional information
Housing	plastic	
Sight window	plastic	mineral glass as an option
Counter	4 decades, fine reading	
Digit height	~6 mm	
Weight	0.06 kg	

Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	0 ... 80 °C	

Order

Ordering information

Mounting position	
	
08	09

Hint: Texts highlighted in orange color are ordering features

Ordering table

Feature	Ordering data		Specification	Additional information
Mounting position	08	A	left-side	
	09		right-side	
Indication after 1st revolution	...	B	12/5, 15, 17/5, 20, 25, 30, 40, 50, 100	/5 = arithmetical value not displayed
			others on request	
Decimal place	0	C	0 = 0000	
	1		1 = 000.0	
	2		2 = 00.00	
	3		3 = 0.000	
Counting direction	i	D	clockwise ascending values	
	e		counter-clockwise ascending values	
Hollow shaft/diameter	14	E	ø14 mm	
	...		RH8, RH10, RH12	reducing bushes
			others on request	
Torque pin/position	270	F	see drawing	
	0		see drawing	
	90		see drawing	
	180		see drawing	
Handwheel form	RA	G	knurled handle	
	ST		star knob	
Cover ring	0	H	without cover ring	
	M		cover ring supplied	

Order key

DK02 - [ ] - [ ] - [ ] - [ ] - [ ] - [ ] - [ ] - FR - K - [ ]

A B C D E F G H

Scope of delivery: *DK02*

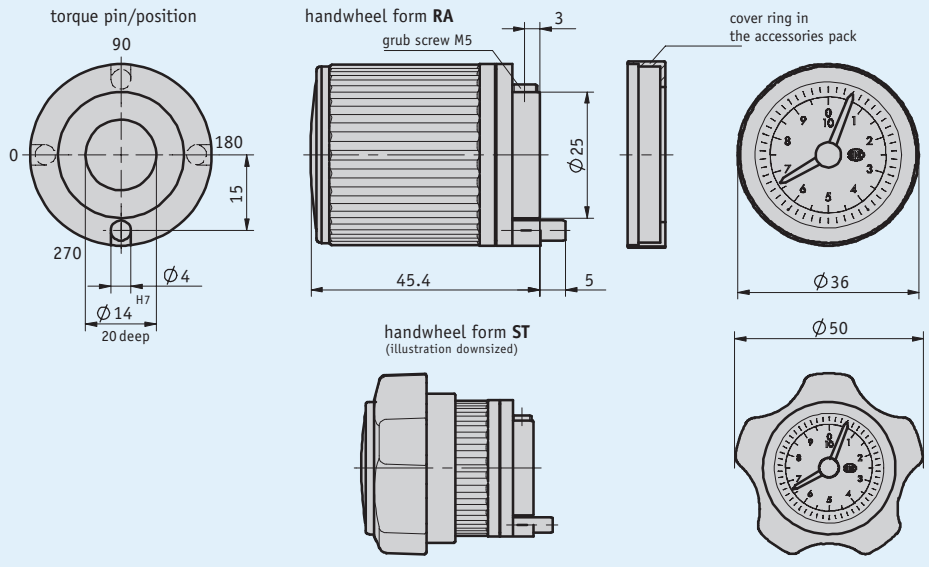
Accessories:
Reduction sleeve RH *page 132*

Additional information:
General information and areas of application *page 68*

Control knob DK03
With analog scale

Profile

- Control knob with integrated position indicator
- Shaft support: max. Ø 14 mm
- Front analog display
- Various gear ratios
- Special scales, also for non-linear settings
- Star wheel as an option



Mechanical data

Feature	Technical data	Additional information
Housing	plastic	
Weight	0.07 kg	

Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	0 ... 80 °C	

Order

Ordering table

Feature	Ordering data		Specification	Additional information
Gear ratio	...	A	2, 3, 6, 10, 12, 15, 18, 20, 24, 30, 36, 48	
			others on request	
Sense of rotation	i	B	clockwise ascending values	
	e		counter-clockwise ascending values	
Pointer	1	C	red with transmission	
	2		red with transmission + black 1:1	
Scale	N..	D	normal scale	related to display after 1st revolution
	VK..		special scale	customer-specific, no VK for first production
Multi-color scale	C1	E	1-colored	
	C2		2-colored	
	C3		3-colored	
Hollow shaft/diameter	14	F	ø14 mm	
	...		RH8, RH10, RH12	reducing bushes
			others on request	
Torque pin/position	270	G	see drawing	
	0		see drawing	
	90		see drawing	
	180		see drawing	
Handwheel form	RA	H	knurled handle	
	ST		star knob	
Handwheel color	FR	I	red RAL 3000	
	S		black RAL 9005	
Cover ring	0	J	without cover ring	
	M		cover ring supplied	

Order key

DK03 - [A] - [B] - [C] - [D] - [E] - [F] - [G] - [H] - [I] - [J]

Scope of delivery: DK03

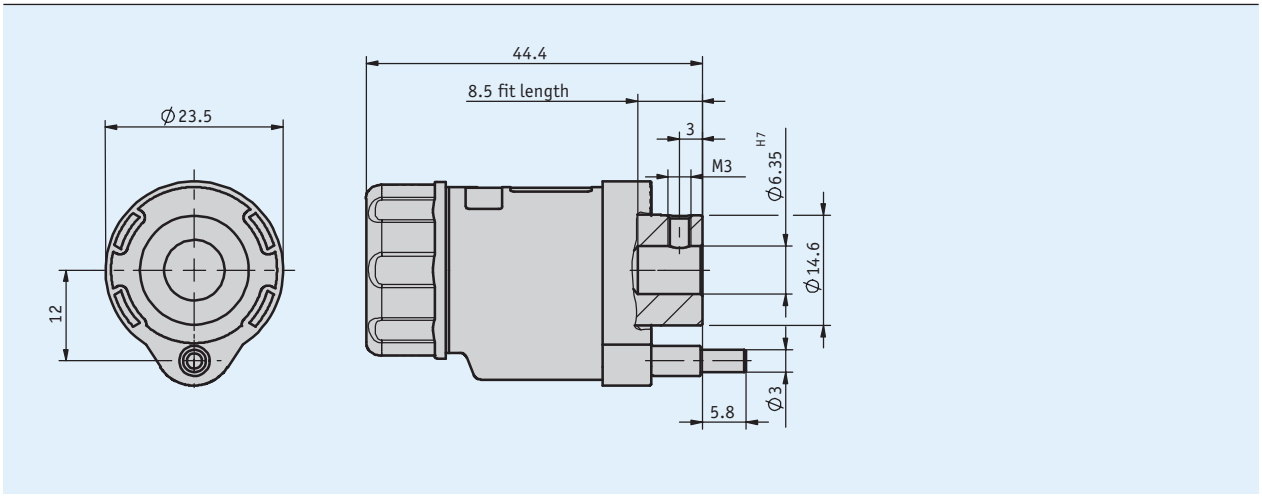
Accessories:
Reduction sleeve RH page 132

Additional information:
General information and areas of application page 68
Drawing aid for scales page 146

Control knob DK04
For fine adjustment

Profile

- Miniature rotaty knob with digital display
- Free choice of mounting situation
- Shaft support max. Ø 6.35 mm
- Measuring range of max. 100 revolutions



Mechanical data

Feature	Technical data	Additional information
Shaft	stainless steel	
Housing	plastic	
Weight	~0.02 kg	

System data

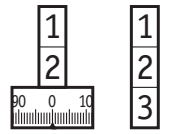
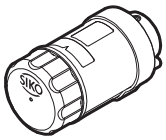
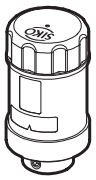
Feature	Technical data	Additional information
Measuring range	≤100 revolution(s)	

Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	0 ... 80 °C	

Order

Ordering information

Display	Mounting position		Counting direction
			
01F 010	02	04	

Hint: Texts highlighted in orange color are ordering features

Ordering table

Feature	Ordering data		Specification	Additional information
Mounting position	02	A	horizontal spindle	
	04		vertical spindle	
Indication after 1st revolution	01F	B	with fine scaling	two-digit digital
	010		without fine scaling	three-digit digital
Decimal place	0	C	0 = 000	
	1		1 = 00.0	
	2		2 = 0.00	
Sense of rotation	i	D	clockwise ascending values	
	e		counter-clockwise ascending values	
Hollow shaft/diameter	6.35	E	ø6.35 mm	
			others on request	

Order key

DK04 - [A] - [B] - [C] - [D] - [E]

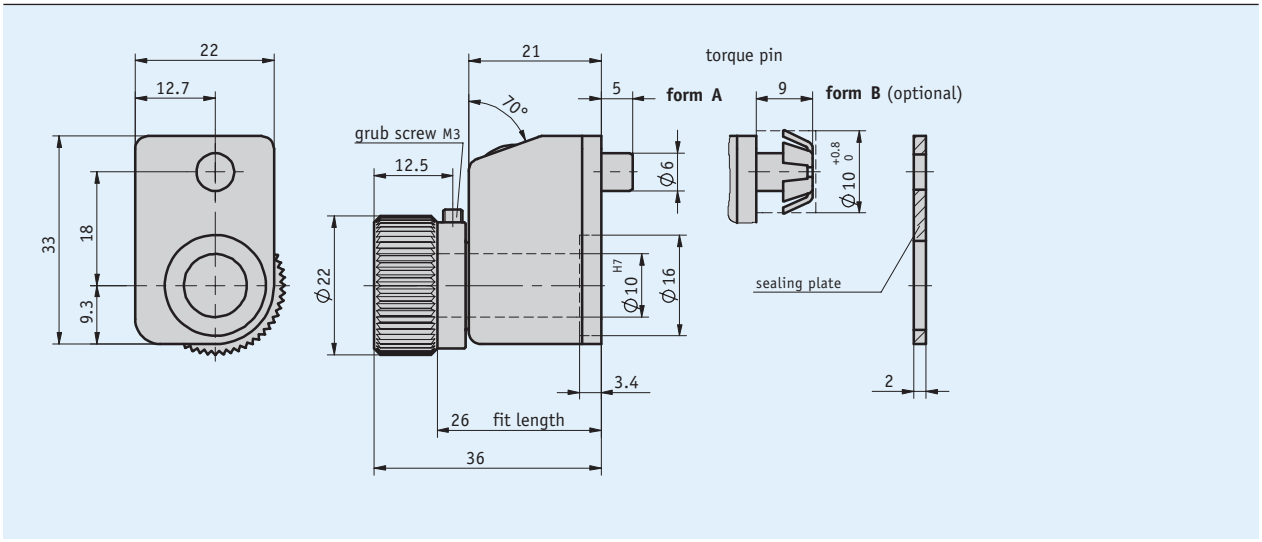
Scope of delivery: DK04

Additional information:
General information and areas of application page 68

Control knob DK05
Miniaturized design with digital display

Profile

- Miniature control knob
- Shaft support: max. Ø 10 mm
- Front display
- Counter with 3 decades
- Display can be designed for “mm” or “inch”
- Housing color: orange or black



Mechanical data

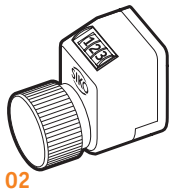
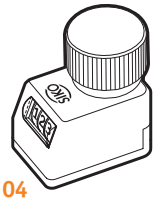
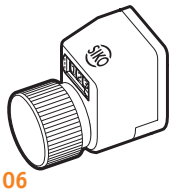
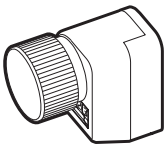
Feature	Technical data	Additional information
Shaft	anodized aluminum (supported in friction bearings)	
Housing	reinforced plastic	
Counter	3 decades	
Digit height	~4 mm	
Weight	~0.02 kg	

Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	0 ... 80 °C	

Order

Ordering information

Display	Mounting position				Counting direction
123	 02	 04	 06	 07	

Hint: Texts highlighted in orange color are ordering features

Ordering table

Feature	Ordering data		Specification	Additional information
Mounting position	...	A	02, 04, 06, 07	see the icons illustrating the mounting positions
Indication after 1st revolution	...	B	7/5, 10, 100, 12/5, 15, 17/5, 20, 25, 30, 40, 50, 60, 80	/5 = arithmetical value not displayed
			others on request	
Decimal place	0	C	0 = 000	
	1		1 = 00.0	
	2		2 = 0.00	
Counting direction	i	D	clockwise ascending values	
	e		counter-clockwise ascending values	
Hollow shaft/diameter	10	E	ø10 mm	
	...		RH6, RH8	reducing bushes
			others on request	
Color	0	F	orange RAL 2004	
	S		black RAL 9005	

Order key

DK05 - [ ] - [ ] - [ ] - [ ] - [ ] - [ ] - [A]
A B C D E F

Scope of delivery: DK05

Accessories:
Reduction sleeve RH page 132

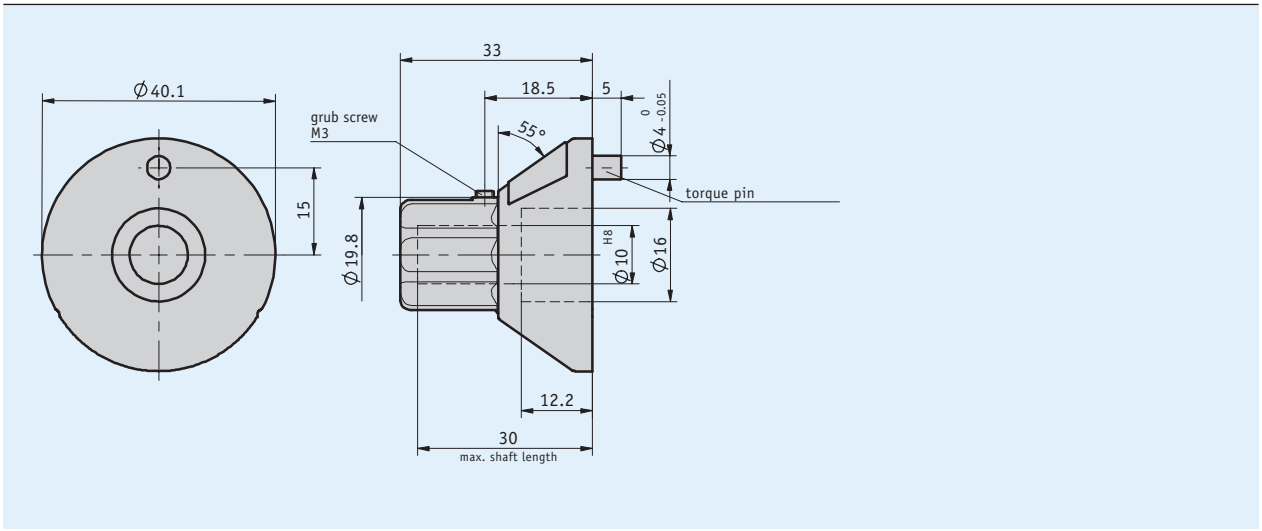
Additional information:
General information and areas of application page 68

subject to technical alteration • 2016/11/18 • 09:19 • K

Control knob DKA02
Miniaturized design with analog display

Profile

- Miniature control knob with analog display
- Shaft support: max. Ø 10 mm
- Use of normal scales or custom-designed displays
- Fine scaling as an option
- Free choice of mounting situation



Mechanical data

Feature	Technical data	Additional information
Housing	plastic	
Gear ratio	i = 26	
Weight	~0.016 kg	

Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	0 ... 80 °C	

Order

Ordering table

Feature	Ordering data		Specification	Additional information
Bore/diameter	10	A	ø10 mm	
			others on request	
Sense of rotation	i	B	clockwise ascending values	
	e		counter-clockwise ascending values	
Scale	N26	C	normal scale	
	VK..		special scale	customer-specific, no VK for first production
Multi-color scale	C1	D	1-colored	
	C2		2-colored	
	C3		3-colored	
Fine scaling	F100	E	print 0 ... 100	
	0F		unprinted	

Order key

DKA02 - [A] - [B] - [C] - [D] - [E]

Scope of delivery: *DKA02*

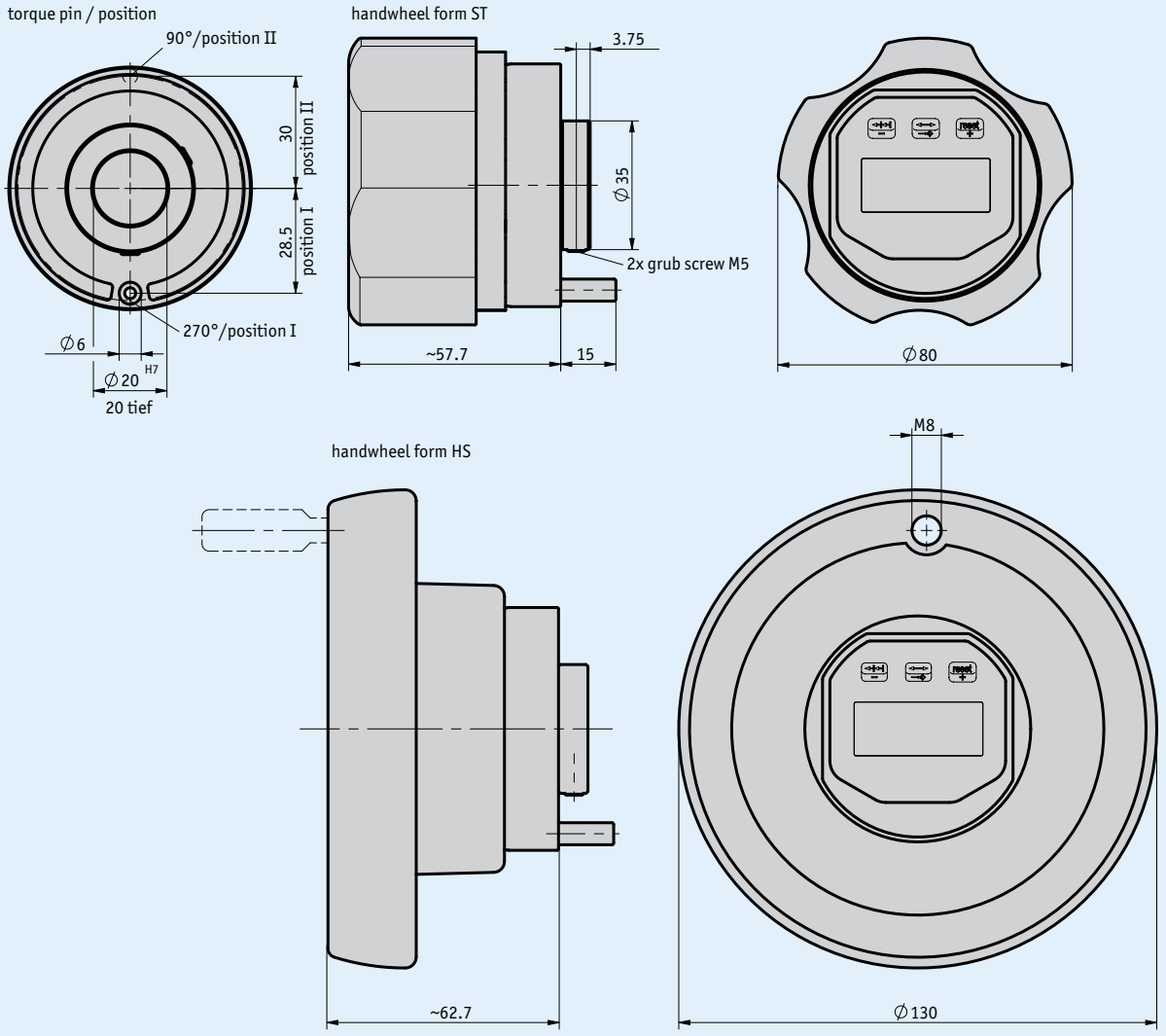
Additional information:

General information and areas of application *page 68*
Drawing aid for scales *page 146*

Electronic control knob DKE01
Freely programmable

Profile

- Turning knob with integrated 5-digit LCD display
- Digit height approx. 11,5 mm
- Freely programmable via the ProToolDE programming software
- Usable for length or angle measurement
- Shaft accommodation: max. Ø 20 mm
- Long battery life
- With disk handwheel as an option



Mechanical data

Feature	Technical data	Additional information
Shaft	black-finished steel (supported in friction bearings)	
Housing	plastic	
Speed	≤200 rpm	
Weight	~0.25 kg	

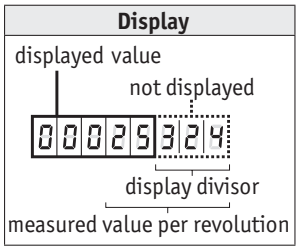
Electrical data

Feature	Technical data	Additional information
Battery	lithium coin cell, 3 V, CR2477 or CR2477N types	~8-year service life
Display/display range	5-digit LCD 7-segment, ~11.5 mm height	-19999 ... 99999

Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	-10 ... 60 °C	
Storage temperature	-30 ... 80 °C	
Relative humidity		condensation inadmissible
Protection category	IP65	EN 60529

Display divisor



Display divisor
The indication of the measured value on the display can be influenced by means of the divisor (divider). The divisor shifts figures of the measured value into the invisible sector of the display unit. Although the figures are not displayed, they are also calculated by the lectronics unit and mathematically rounded.

Calculation of value displayed (example order text):

Measured value per revolution	25324
Display divisor	1000

Feature	Displayed value	Measured value
1st revolution	25	25324
2nd revolution	51	50648
3rd revolution	76	75972

Please note that the value displayed (=measured value per revolution / display divisor) must be at least 2!

Order

Ordering table

Feature	Ordering data		Specification	Additional information
Handwheel	ST	A	star knob	
	HS		disk hand wheel	
Measured value per revolution*	...	B	00002 ... 90000	see calculation of displayed value
	W3600		angle mode 0-360°, resolution 0.1°	only with decimal place "1"
	Z3600		angle mode -180 ... +180°, resolution 0.1°	only with decimal place "1"
Decimal place*	0	C	0 = 00000	
	1		1 = 0000.0	
	2		2 = 000.00	
	3		3 = 00.000	
Display divisor*	...	D	1, 10, 100, 1000	see calculation of displayed value
Counting direction*	i	E	clockwise ascending values	
	e		counter-clockwise ascending values	
Key pad operation*	D	F	reset direct	
	V		reset 5 sec. delayed	
Hollow shaft/diameter	20	G	ø20 mm	
	...		RH8, RH10, RH12, RH14	reducing bushes
			others on request	
Torque pin/position	I	H	28.5 mm	
	II		30.0 mm	
Torque pin/position	270	I	see drawing	only with position I
	90		see drawing	only with position II

* Programmable via ProTool DE programming software

Order key

DKE01 - [A] - [B] - [C] - [D] - [E] - [F] - [G] - [H] - [I]

1.3

Scope of delivery: *DKE01*

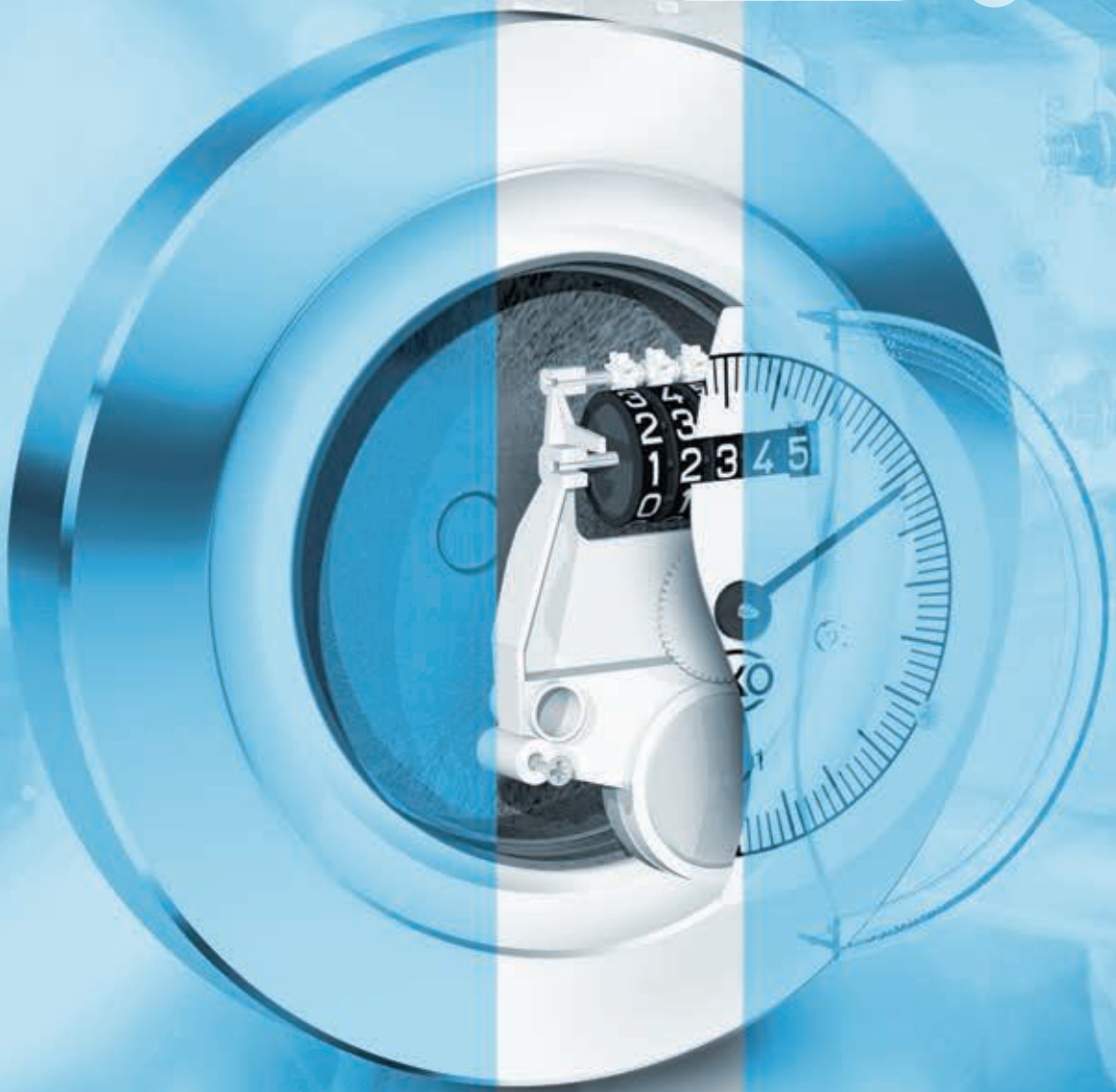
Accessories:

Programming software ProTool DE *page 142*
Reduction sleeve RH *page 132*
Handwheel holder UG *page 137*
Handwheel holder ZGD *page 136*
Handwheel holder BGF *page 134*
Handwheel holder BGD *page 135*

Additional information:

General information and areas of application *page 68*

1.4



1.4 | Mechanical-analog position indicators and hand wheels

Also stay in full control with multiple turns - digital absolute indicators embedded in the analog pointer scale.

Track-proven precision display and adjustment equipment for robust manual operation

While the handwheel is mainly used for manual adjustment of axial rotation, an integrated display permits reproducibility in addition to indication of rotation positions.

The range of possible applications is very wide – even in our electronic age. This is particularly true as the analog displays also work in the event of a power failure.

The "clocks" (indicators) are high-precision mechanical measuring devices, which are coupled to a motion work for direct, analog display of the adjustment values. The combination of analog pointer indication and digital counter alternatively ensures a high reading reliability for multiple rotations.

Individual solutions

A wide range of scales is available for actually reading off the value. Cutomization is possible depending on the respective ratio or to suit individual customer requirements. As for the spindle pitch, almost any standard ratio can be accommodated at the works.

In addition to integrated position indication, handwheels are basically designed for mounting on horizontal spindles. A combination of the standard display with a planetary gear and a torque pin also enables mounting on spindles with any spatial orientation. Only the correct mechanical connection between the handwheel and the shaft must be ensured.

Rugged outside, fine inside

Versions with non-corrosive, watertight or oil-filled display dials are also available for heavy-duty operation. The particularly robust analog SIKO measuring concept "handwheel plus indicator" is also very efficient in everyday, long-term use.

Benefits

- Precise display of measured value owing to a pointer shaft with double bearings
- Very good readability owing to large scales
- Robust handwheels made of metal or fiber-glass reinforced plastic
- Rugged measuring system with favorable mounting and operation features
- Ideal adaptation to customer requirements owing to various ratios and provision of customized special scales

1.4

Robust handwheels for precise spindle adjustment

Precision is based on the interaction of many sophisticated details. SIKO handwheels – mechanically high-tech solutions for long-term service.

Counterweight for steady gravimetric alignment of the indicator on horizontal shafts

Applications

There are many reasons why handwheels are undergoing a renaissance. The most important aspect is probably the human factor, as we have a well-developed, pronounced “analog eye”. For example with his trained vision, an offset printer can see from a distance whether a setting is correct or if it deviates from the standard.

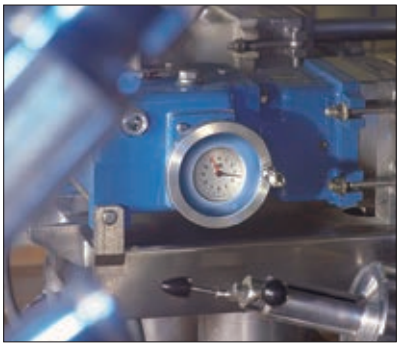
SIKO handwheels with position indicators are already standard in a wide range of different industrial environments. With their precise, highly reliable function they are used on printing machines for regulating the contact pressure of rotary cylinders or in chemical or food cylinders – as here for example in a brewery – for controlling mixing ratios.

With their tangible ergonomics they also prove their robustness in tough production and trade environments. The solid functional design upgrades a number of standard applications, especially the equipment used in the metal, plastic and wood processing industries. In the chemical industry they are used for direct flow control.

1

2

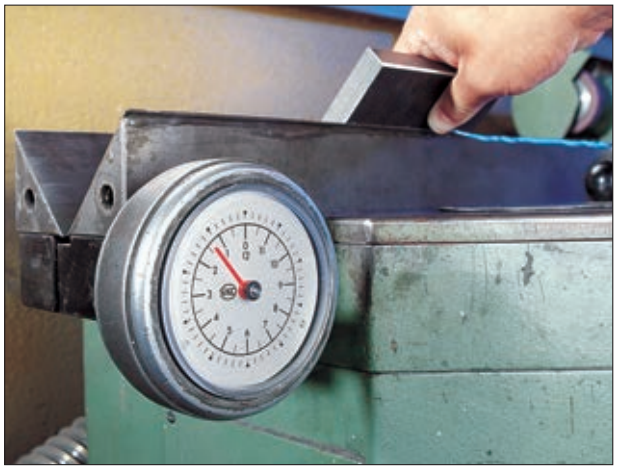
3



[1] Fine height adjustment of the saw blade of a circular saw. [2] Laminate coating system: Space monitoring during the coating process. [3] Tasty beer requires constantly controlled conditions: Control of mixing ratios in a brewery. [4] Control of roller pressure and ink mixing on small printing machines is still manual work. [5] A robust handwheel design is an important advantage in the metal processing industry.

4

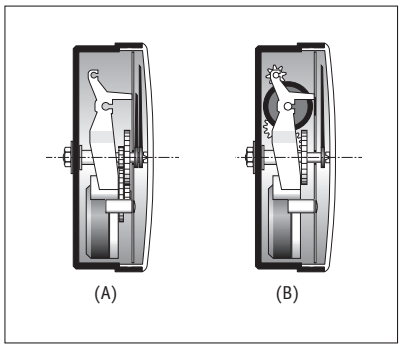
5



Function

The functional principle of the SIKO position indicators is based on the physical force of gravity. The suspension design in the housings allows a double-mounted pointer shaft, which serves as a suspension shaft for a free-hanging weight.

The orientation of the scale, the gear unit with the required gear ratio and the pointer sleeve is based on the weight alignment. If the handwheel is turned, a gear wheel fixed in position on the pointer shaft ensures that the rotation is transmitted to the oscillating gear unit with a ratio of 1 : x. This direct connection between the handwheel and the bearing-mounted gear unit permits a display accuracy of 100 %.



Configuration of analog (A) and digital (B) position indicators. Small weights in this example ensure the vertical orientation of the indicator.

Zero setting function

When handwheels are used on horizontal spindles, this maintenance-free and reliable configuration permits simple referencing of the measured value.

Referencing (zero setting) is performed simply with a screwdriver from the front of the housing. Various covers are available for the use of SIKO handwheels without an indicator (e.g. as a simple crank). Ordering options are described under accessories.

1.4

Versions

SIKO supplies versions with non-corrosive, watertight or oil-filled dials for industrial applications (refer to table). An oil-filled version, for example, prevents misting of the glass caused by penetrating moisture, so that important data is always visible. Paraffin oil is also advantageous for all applications subject to strong vibration.

The properties of the dials can also be changed by using different glass types. Plastic glasses are light and break-resistant. The dials are equipped with Plexiglas as a standard; PMMA, polyamide glasses ensure acetone resistance and hard mineral glass is a solution which is resistant to cleaning agents, solvents and corrosion.

N	• Dust-tight version, standard
P	• Filled with paraffin oil, absorbs vibration and impact • Non-misting dial
W	• Watertight, without filling

Background information

Due to the very different handwheel specifications, each scale or position indicator graduation must meet various requirements. The selected gear ratio is always used as a basis for the display values. This defines the distance which must be covered after a specific number of rotations.

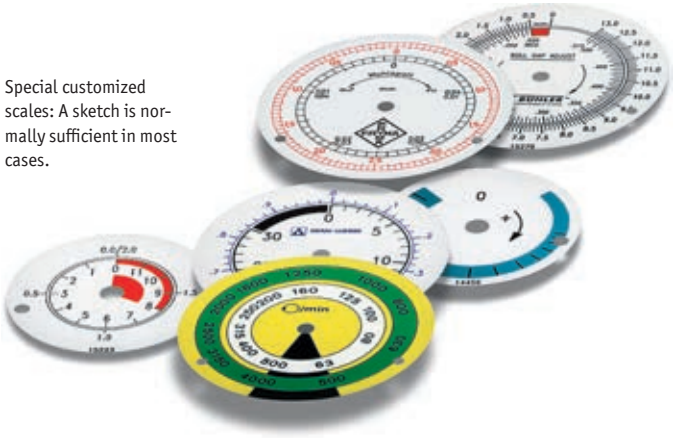
Normal scales

The type S position indicator can be equipped with two pointers, whereby one pointer is always moved with a gear ratio. With only one pointer and an assumed gear ratio of 20, a pointer moves across a scale range of 360° over 20 handwheel rotations, i.e., the entire adjustment path must be within only one rotation of this pointer. If a second pointer is selected, this runs 1:1 with the actual handwheel motion.

The position indicator type SZ is designed for larger measurement lengths. In this indicator the pointer of the display type S is replaced with a digital counter. Absolute display of more than one rotation of the pointer with a gear ratio is therefore possible. This combination has proven to be particularly advantageous in applications in which a large number of rotations and precise position information is required.

Normal scales for position indicators

Special customized scales: A sketch is normally sufficient in most cases.



Special versions

Standard scales can naturally not do justice to all requirements. For this reason SIKO supplies special scales which can be designed to suit customer requirements, for example for tracking adjustment in both directions, starting at zero and requiring a scale with ascending and descending values. Precise information in the form of diagrams or technical drawings are necessary for manufacturing such scales. Special requirements such as graduation, digits, company logos and color wishes can also be met.

Calculation example* for type S:
Machine shaft, pitch p = 2
Measuring range 150 mm

Solution method:
Number of rotations "U" over the entire measuring range

$$\frac{150\ \text{mm}}{2} = 75\ \text{U}$$

If the ratio i = 75 is not available, select the next possible ratio (refer to the product pages "mechanical analog position indicators", ordering table "ratios"). Assuming that the available standard ratio is 84 with a free angle, the calculation is this free angle: 84 rotations = 360°

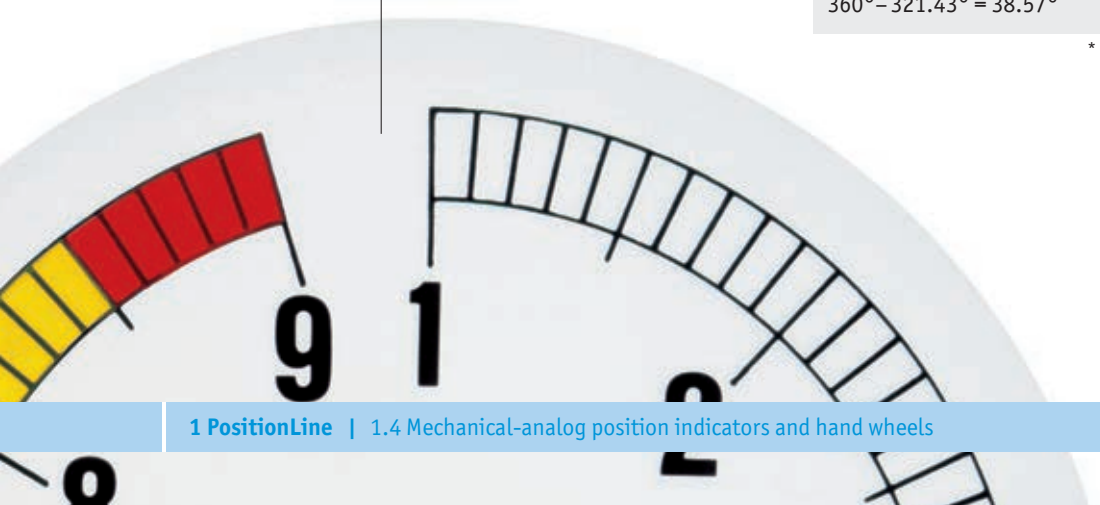
Pointer motion:

$$\frac{75\ \text{U} \times 360°}{84\ \text{U}} = 321.43°$$

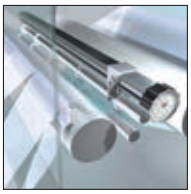
Free angle:
360° – 321.43° = 38.57°

* Example not valid for SZ80/1

In several cases, it can be necessary to include a so-called free angle on the scale. This depends on your application and the ratios supplied by SIKO.



Mechanical-analog position indicators and hand wheels
Function and benefit

Ambient conditions	Examples of use	Benefits
 E.g., motor control	**Drive equipment** Setting and monitoring of speeds on variable speed gear units and disks. Setting of hydraulic units ...	■ Easy mounting ■ Precise speed setting ■ Indication of speed rpm ■ Normal and special scales, perfectly suited to the application
 E.g., flow setting	**Process engineering** Valve settings, pump capacity, stroke length adjustment on dosing pumps, setting of tablet presses ...	■ Easy mounting ■ Exact reproducibility of process settings ■ Mapping of non-linear adjustments ■ Normal and special scales, perfectly suited to the application
 E.g., rewind cutting machines (paper/foil industries)	**Printing and paper processing** Adjustment of ink application (inking rollers), setting of register and buckle plates, positioning of punching tools, stop adjustment ...	■ Easy mounting ■ Precise positioning and exact repositionability ■ Normal and special scales, perfectly suited to the application
 E.g., wood cutting	**Stop setting** Setting of stop depth, cutting width, angle or drill head for wood or sheet metal processing, tooling machines ...	■ Precise positioning ■ Exact angle indication ■ Robust metal handwheels for rough environmental conditions ■ Oil-filled versions for compensation of vibrations
	Roller positioning For direct or angled rotational motion, for example on textile machines, laminating or coating systems ...	■ Versions for horizontal mounting ■ HKF design for all mounting positions (torque support, epicyclic gear) ■ Normal and special scales, perfectly suited to the application

Mechanical analog position indicators and handwheels



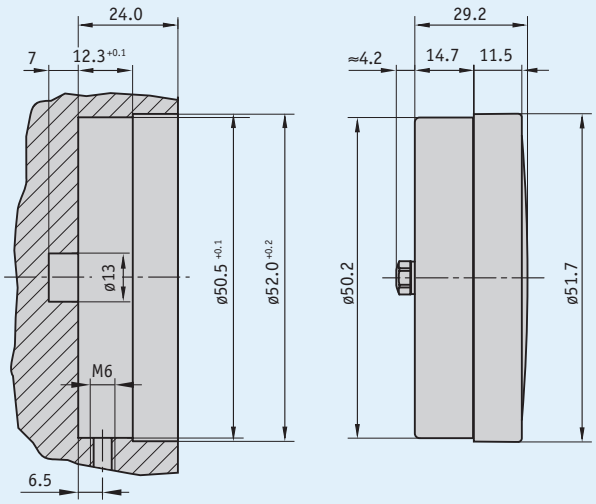

			S50/1	S70/1	S80/1	SZ80/1
Page			98	100	102	104
Display						
analog			•	•	•	
analog-digital						•
Handwheel type, combinable with ...						
	Ø in mm	Form	Page			
Aluminum, integrated position indicator						
HR5	56		122			
Aluminum, separate position indicator						
HR	65 - 108		120	•		•	•
HST	75 - 110		114	•		•	•
HK	80 - 200		108	•		•	•
HS	80 - 180		111	•		•	•
Plastic, separate position indicator						
HG	63 - 98		117	•		•	•
KHB	87 - 150		106	•		•	•

1.4

Analog position indicator S50/1
For small SIKO handwheels

Profile

- Analog position indicator
- Measured value acquisition based on the gravity principle
- High stability thanks to doubly supported pointer shaft
- Very robust, glass-fiber reinforced plastic housing
- Wide range of gear ratios
- Special scales, also for small numbers of pieces
- Dustproof, oil-filled or waterproof versions



Mechanical data

Feature	Technical data	Additional information
Housing	reinforced plastic	
Weight	0.1 kg	N, W design
	0.1 kg	P design

Order

Ordering information

One or more system components are required:

Handwheel HR...	page 120
Handwheel HST...	page 114
Handwheel HK...	page 108
Handwheel HS...	page 111
Handwheel HG...	page 117
Handwheel KHB...	page 106

Ordering table

Feature	Ordering data		Specification	Additional information
Version	N	A	dust-proof	
	P		oil-filled	
	W		waterproof	
Gear ratio	...	B	1, 2, 3, 6, 10, 12, 15, 18, 20, 24, 30, 36, 48, 50, 60, 72, 84, 96, 100	
			others on request	
Sense of rotation	i	C	clockwise ascending values	
	e		counter-clockwise ascending values	
Pointer	1	D	red with transmission	
	2		red with transmission + black 1:1	
Covering glass	S	E	plastic	
	A		synthetic material, aceton-resistant	
Scale	N..	F	normal scale	related to the transformation ratio
	VK..		special scale	customer-specific, no VK for first production
Multi-color scale	C1	G	1-colored	
	C2		2-colored	
	C3		3-colored	

Order key

S50/1 - [A] - [B] - [C] - [D] - [E] - [F] - [G]

Scope of delivery: *S50/1*

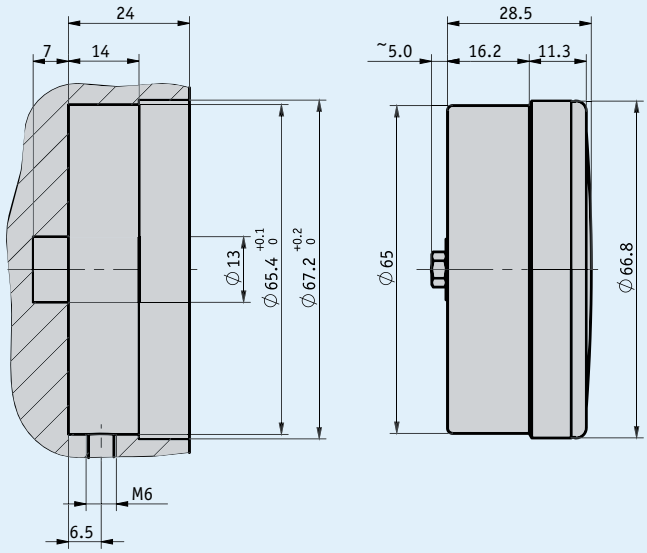
Additional information:

General information and areas of application *page 92*
Drawing aid for scales *page 146*

Analog position indicator S70/1
Individually usable for third-party handwheels

Profile

- Analog position indicator
- Measured value acquisition based on the gravity principle
- High stability thanks to doubly supported pointer shaft
- Very robust, glass-fiber reinforced plastic housing
- Wide range of gear ratios
- Special scales, also for small numbers of pieces
- Dustproof, oil-filled or waterproof versions



Mechanical data

Feature	Technical data	Additional information
Housing	reinforced plastic	
Weight	0.1 kg	N, W design
	0.2 kg	P design

Order

Ordering table

Feature	Ordering data		Specification	Additional information
Version	N	A	dust-proof	
	P		oil-filled	
	W		waterproof	
Gear ratio	...	B	1, 2, 3, 6, 10, 12, 15, 18, 20, 24, 30, 36, 48, 50, 60, 72, 84, 96, 100	
			others on request	
Sense of rotation	i	C	clockwise ascending values	
	e		counter-clockwise ascending values	
Pointer	1	D	red with transmission	
	2		red with transmission + black 1:1	
Scale	N..	E	normal scale	related to the transformation ratio
	VK..		special scale	customer-specific, no VK for first production
Multi-color scale	C1	F	1-colored	
	C2		2-colored	
	C3		3-colored	

Order key

S70/1 - [A] - [B] - [C] - [D] - [E] - [F]

1.4

Scope of delivery: S70/1

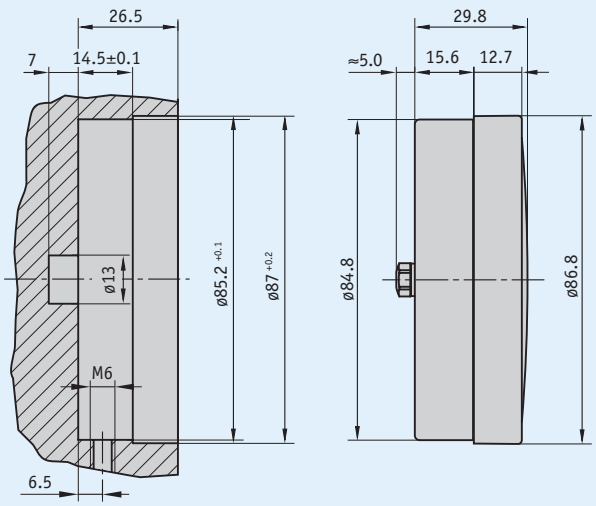
Additional information:

General information and areas of application page 92
Drawing aid for scales page 146

Analog position indicator S80/1
Compatible with many common handwheels

Profile

- Analog position indicator
- Measured value acquisition based on the gravity principle
- High stability thanks to doubly supported pointer shaft
- Very robust, glass-fiber reinforced plastic housing
- Wide range of gear ratios
- Special scales, also for small numbers of pieces
- Dustproof, oil-filled or waterproof versions



Mechanical data

Feature	Technical data	Additional information
Housing	reinforced plastic	
Weight	0.1 kg	N, W design
	0.2 kg	P design

Order

Ordering information

One or more system components are required:

Handwheel HR...	page 120
Handwheel HST...	page 114
Handwheel HK...	page 108
Handwheel HS...	page 111
Handwheel HG...	page 117
Handwheel KHB...	page 106

Ordering table

Feature	Ordering data		Specification	Additional information
Version	N	A	dust-proof	
	P		oil-filled	
	W		waterproof	
Gear ratio	...	B	1, 2, 3, 6, 10, 12, 15, 18, 20, 24, 30, 36, 48, 50, 60, 72, 84, 96, 100	
			others on request	
Sense of rotation	i	C	clockwise ascending values	
	e		counter-clockwise ascending values	
Pointer	1	D	red with transmission	
	2		red with transmission + black 1:1	
Covering glass	S	E	plastic	
	A		synthetic material, aceton-resistant	
	M		mineral glass	
Zero position	ON	F	without zero position	
	MN		with zero position	
Scale	N..	G	normal scale	related to the transformation ratio
	VK..		special scale	customer-specific, no VK for first production
Multi-color scale	C1	H	1-colored	
	C2		2-colored	
	C3		3-colored	

Order key

S80/1 - [A] - [B] - [C] - [D] - [E] - [F] - [G] - [H]

Scope of delivery: *S80/1*

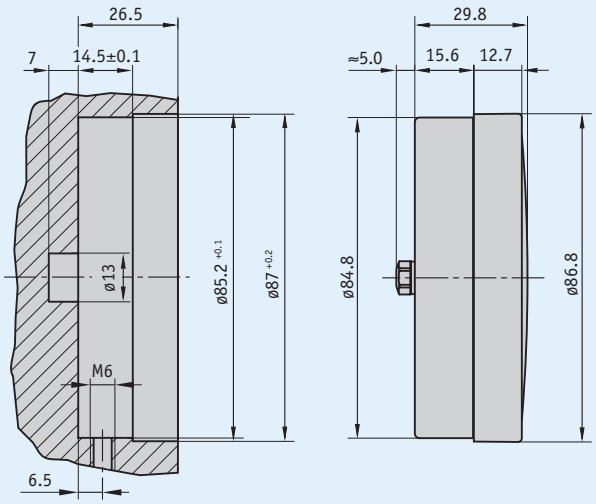
Additional information:

General information and areas of application *page 92*
Drawing aid for scales *page 146*

Analog position indicator SZ80/1
With additional digital counter

Profile

- Combined analog-digital position indicator
- Measured value acquisition based on the gravity principle
- High stability thanks to doubly supported pointer shaft
- Very robust, glass-fiber reinforced plastic housing
- Counter with 5 decades
- Special scales, also for small numbers of pieces
- Dustproof or oil-filled versions



1.4

Mechanical data

Feature	Technical data	Additional information
Housing	reinforced plastic	
Weight	0.2 kg	N and W design
	0.3 kg	P design

Order

Ordering information

One or more system components are required:

Handwheel HR...	page 120
Handwheel HST...	page 114
Handwheel HK...	page 108
Handwheel HS...	page 111
Handwheel HG...	page 117
Handwheel KHB...	page 106

Ordering table

Feature	Ordering data		Specification	Additional information
Version	N	A	dust-proof	
	P		oil-filled	
Indication after 1st revolution	...	B	2, 2/5, 3, 4, 5, 6, 8, 10, 15	
			others on request	
Decimal place	0	C	0 = 00000	
	1		1 = 0000.0	
	2		2 = 000.00	
	3		3 = 00.000	
	4		4 = 0.0000	
Sense of rotation	i	D	clockwise ascending values	
	e		counter-clockwise ascending values	
Pointer	1	E	1:1 running	
	OZ		without pointer	
Covering glass	S	F	plastic	
	A		synthetic material, aceton-resistant	
Scale	N..	G	normal scale	related to display after 1st revolution
	VK..		special scale	customer-specific, no VK for first production
Multi-color scale	C1	H	1-colored	
	C2		2-colored	
	C3		3-colored	

Order key

SZ80/1 - [A] - [B] - [C] - [D] - [E] - [F] - [G] - [H]

Scope of delivery: *SZ80/1*

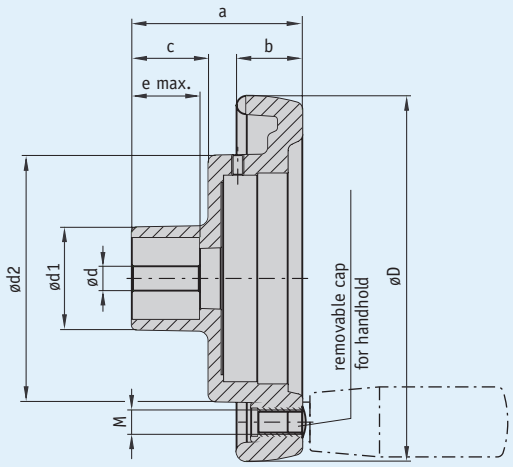
Additional information:

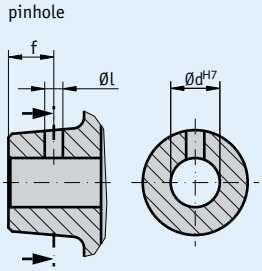
General information and areas of application *page 92*
Drawing aid for scales *page 146*

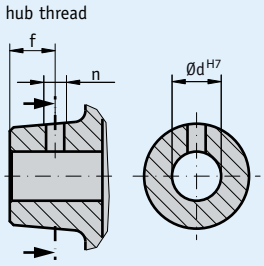
Handwheel KHB...
Made of fiber-glass reinforced plastic

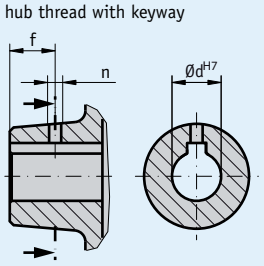
Profile

- Robust and economic plastic handwheel
- Various sizes
- Hub made of zinc-coated steel for high stability and easy shaft mounting
- Various hub versions
- With thread for mounting a turning handle (see accessories)









1.4

Mechanical data

Feature	Technical data	Additional information
Material	plastic	hub of hot-dip steel
Weight	0.16 kg	KHB9
	0.35 kg	KHB13
	0.43 kg	KHB15

- **Maßtabelle**

Type	øD	ødv	ødx	ød1	ød2	a	b	c	e	GfG	Suitable for
KHB9	87	5.8	16	32	63	54	17	21	20	M6	S50/1
KHB13	130	6.8	26	42	98.2	66	24	28.5	24	M8	S80/1; SZ80/1
KHB15	150	6.8	26	42	101	70	27	30.5	28	M10	S80/1; SZ80/1

ødv =d prebored; ødx = d max.; GfG = Thread for handle

Sonderbearbeitung

Handwheel type	KHB9					KHB13 / KHB15						
Bore dH7	6 ... 8	9, 10	11, 12	13, 14	15, 16	7, 8	9, 10	11, 12	13 ... 17	18 ... 20	21 ... 24	25, 26
Groove width with keyhole JS9		3	4				3	4	5	6		
Pin hole	3.8/8	3.8/8	3.8/8	4.8/8		3.8/12	3.8/12	3.8/12	4.8/12	4.8/12	4.8/12	
Hub thread without keyhole JS9	M4/8	M4/8	M4/8	M6/8		M4/12	M4/12	M4/12	M6/12	M6/12	M6/12	
Hub thread with keyhole JS9		M3/8	M3/8				M3/12	M3/12	M4/12	M5/12		

Texts highlighted in orange color are ordering features

Order

Ordering information

One or more system components are required:

Analog position indicator S50/1	page 98
Analog position indicator S80/1	page 102
Analog position indicator SZ80/1	page 104

Ordering table

Feature	Ordering data		Specification	Additional information
handwheel type	9	A	KHB9	
	13		KHB13	
	15		KHB15	
Bore diameter	5.8	B	prebored	only with KHB9
	6.8		prebored	only with KHB13, KHB15
	...		6 ... 26 mm, in steps of 1 mm	see Table of dimensions, maximum value ødx
Feather key groove	OP	C	without keyway	
	JS9		light seat	according to DIN 6885/1 T1
Pinhole	OS	D	without pin hole	
	...		diameter "øl"/measure "f" (e.g. 3.8/12)	see table Special processing, depending on the handwheel type, only if keyway is "OP", only if hub thread is "ONG"
			others on request	
Hub thread	ONG	E	without hub thread	
	...		thread "n"/measure "f" (e.g. M4/12)	see table Special processing, depending on the handwheel type, only if pin hole is "OS"
			others on request	
Position indicator	PM	F	position indicator mounted	separate ordering of a position indicator required!
	PS		position indicator separate	separate ordering of a position indicator required!
Tapered hub	OAN	G	without turned hub	
			others on request	only with KHB9

Order key

KHB - [A] - [B] - [C] - [D] - [E] - [F] - [G]

Scope of delivery: *KHB...*

Accessories:

Handwheel holder BGF	*page 134*
Handwheel holder UG	*page 137*
Handwheel holder ZGD	*page 136*
Handwheel holder BGD	*page 135*
End Plate AD	*www.siko-global.com*

Additional information:

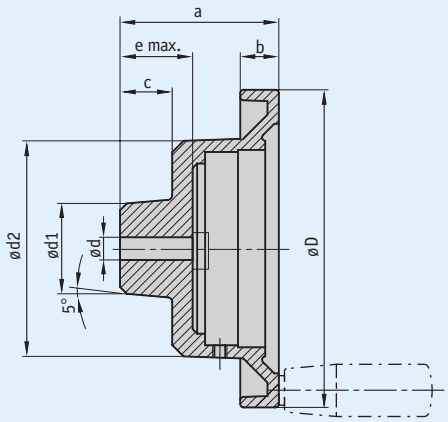
General information and areas of application	*page 92*

1.4

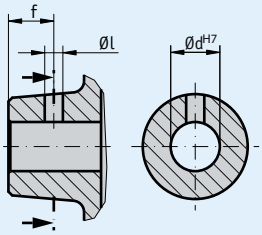
Handwheel HK...
Aluminum handwheel in common design

Profile

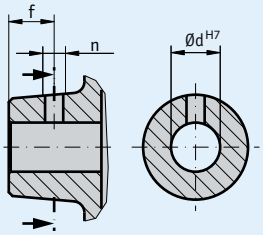
- Classical handwheel made of aluminum casting
- Various sizes
- Plastic-coated or bright-finished surface
- Various hub versions
- Turning handle as an option (see accessories)



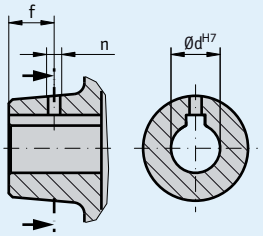
pinhole



hub thread



hub thread with keyway



1.4

Mechanical data

Feature	Technical data	Additional information
Material	aluminum	
Weight	0.2 kg	HK8
	0.5 kg	HK12
	0.6 kg	HK14
	0.7 kg	HK16
	0.8 kg	HK20

Table of dimensions

Type	øD	ødv	ødx	ød1	ød2	a	b	c	e	GfG	Suitable for
HK8	80	5.8	16	26	60	52	14	20	21	M6	S50/1
HK12	120	6.8	25	40	95	64	15	23	30	M6	S80/1; SZ80/1
HK14	140	6.8	25	40	95	70	17	23	30	M8	S80/1; SZ80/1
HK16	160	7.8	25	40	95	70	20	23	28	M8	S80/1; SZ80/1
HK20	200	7.8	30	45	95	75	22	25	32	M10	S80/1; SZ80/1

dv = d prebored; dx = d max.; GfG = Thread for handle

Special treatment

Handwheel type	HK8				HK12 / HK14 / HK16						
Bore dH7	6 ... 8	9, 10	11, 12	13 ... 16	7*, 8	9, 10	11, 12	13 ... 17	18 ... 21	22	23 ... 25
Groove width with keyway JS9		3	4	5		3	4	5	6	6	8
Pin hole	3.8/12	3.8/12	3.8/12	4.8/12	3.8/12	3.8/12	3.8/12	4.8/12	4.8/12	4.8/12	4.8/12
Hub thread without keyway JS9	M4/12	M4/12	M4/12	M6/12	M4/12	M4/12	M4/12	M6/12	M6/12	M6/12	M6/12
Hub thread with keyway JS9		M3/12	M3/12			M3/12	M3/12	M4/12	M5/12		

* only with HK12, HK14

Handwheel type	HK20							
Bore dH7	8	9, 10	11, 12	13 ... 17	18 ... 22	23 ... 25	26	27 ... 30
Groove width with keyway JS9		3	4	5	6	8	8	8
Pin hole	3.8/12	3.8/12	3.8/12	4.8/12	4.8/12	4.8/12	5.8/12	5.8/12
Hub thread without keyway JS9	M4/12	M4/12	M4/12	M6/12	M6/12	M6/12	M8/12	M8/12
Hub thread with keyway JS9		M3/12	M3/12	M4/12	M5/12			

Texts highlighted in orange color are ordering features

Order

Ordering information

One or more system components are required:

Analog position indicator S50/1	page 98
Analog position indicator S80/1	page 102
Analog position indicator SZ80/1	page 104

Ordering table

Feature	Ordering data		Specification	Additional information
handwheel type	8	A	HK8	
	12		HK12	
	14		HK14	
	16		HK16	
	20		HK20	
Surface	B	B	unpainted	
	C		plastic-coated, light gray hammertone	
			others on request	
Handle bore	OG	C	without handle drill hole	
	...		M6 ... M10 with handle drill hole or handle thread	see Table of dimensions; value GfG
Bore diameter	5.8	D	prebored	only with HK8
	6.8		prebored	only with HK12, HK14
	7.8		prebored	only with HK16, HK20
	...		6 ... 30 mm, in steps of 1 mm	see Table of dimensions, maximum value ødx
Feather key groove	OP	E	without keyway	
	JS9		light seat	according to DIN 6885/1 T1
	P9		tight fit	according to DIN 6885/1 T1
Pinhole	OS	F	without pin hole	
	...		diameter "øl"/measure "f" (e.g. 3.8/12)	see table Special processing, depending on the handwheel type, only if keyway is "OP", only if hub thread is "ONG"
			others on request	
Hub thread	ONG	G	without hub thread	
	...		thread "n"/measure "f" (e.g. M4/12)	see table Special processing, depending on the handwheel type, only if pin hole is "OS"
			others on request	
Tapered hub	OAN	H	without turned hub	
			others on request	
Position indicator	PM	I	position indicator mounted	separate ordering of a position indicator required!
	PS		position indicator separate	separate ordering of a position indicator required!

Order key

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

Scope of delivery: *HK...*

Accessories:

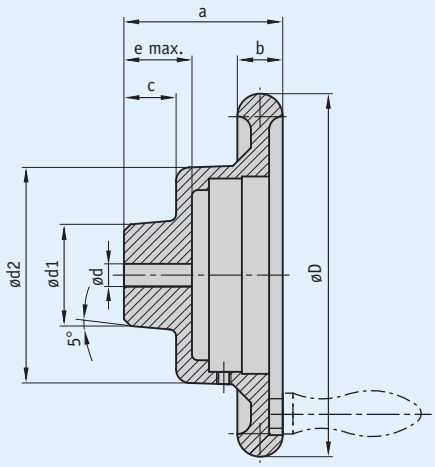
Handwheel holder BGF	*page 134*
Handwheel holder BGD	*page 135*
Handwheel holder UG	*page 137*
Handwheel holder ZGD	*page 136*

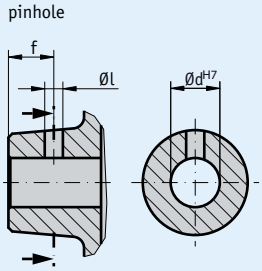
Additional information:

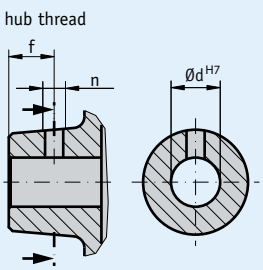
General information and areas of application	*page 92*

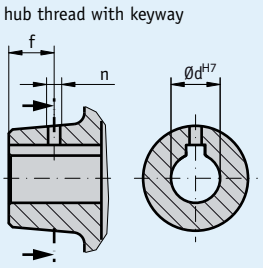
Profile

- Robust handwheel made of aluminum casting
- Rounded design with dirt corners minimized
- Various sizes
- Plastic-coated or bright-finished surface
- Various hub versions
- Turning handle as an option (see accessories)









Mechanical data

Feature	Technical data	Additional information
Material	aluminum	
Weight	0.2 kg	HS8
	0.5 kg	HS12
	0.6 kg	HS14
	0.7 kg	HS16
	0.8 kg	HS18

Table of dimensions

Type	øD	ødv	ødx	ød1	ød2	a	b	c	e	GfG	Suitable for
HS8	80	5.8	16	26	60	55	15	18	20	M6	S50/1
HS12	125	6.8	25	40	95	70	16.5	23	30	M6	S80/1; SZ80/1
HS14	140	6.8	20	32	95	70	18	23	29	M8	S80/1; SZ80/1
HS16	160	7.8	30	45	95	70	20	23	30	M8	S80/1; SZ80/1
HS18	180	7.8	30	45	95	75	22	28	34	M10	S80/1; SZ80/1

dv = d prebored; dx = d max.; GfG = Thread for handle

Special treatment

Handwheel type	HS8					
Bore dH7	6 ... 8	9, 10	11, 12	13, 14	15	16
Groove width with keyway JS9		3	4	5		
Pin hole	3.8/12	3.8/12	3.8/12	4.8/12	4.8/12	4.8/12
Hub thread without keyway JS9	M4/12	M4/12	M4/12	M6/12	M6/12	M6/12
Hub thread with keyway JS9		M3/12	M3/12			

* not with HS8

Handwheel type	HS12 / HS14							
Bore dH7	7, 8	9, 10	11, 12	13 ... 17	18 ... 20	21**	22**	23 ... 25**
Grrove width with keyway JS9		3	4	5	6**	6**	6**	
Pin hole	3.8/12	3.8/12	3.8/12	4.8/12	4.8/12	4.8/126**	4.8/12**	4.8/12**
Hub thread without keyway JS9	M4/12	M4/12	M4/12	M6/12	M6/12	M6/12**	M6/12**	M6/12**
Hub thread with keyway JS9		M3/12	M3/12	M4/12	M5/12**	M5/12**		

**not with HS14

Handradtyp	HS16 / HS18							
Bore dH7	8	9, 10	11, 12	13 ... 17	18 ... 22	23 ... 25	26, 27	28 ... 30
Groove width with keyway JS9		3	4	5	6	8	8	
Pin hole	3.8/12	3.8/12	3.8/12	4.8/12	4.8/12	4.8/126	5.8/12	5.8/12
Hub thread without keyway JS9	M4/12	M4/12	M4/12	M6/12	M6/12	M6/12	M8/12	M8/12
Hub thread with keyway JS9		M3/12	M3/12	M4/12	M5/12			

Texts highlighted in orange color are ordering features

1.4

Order

Ordering information

One or more system components are required:

Analog position indicator S50/1	page 98
Analog position indicator S80/1	page 102
Analog position indicator SZ80/1	page 104

Ordering table

Feature	Ordering data		Specification	Additional information
handwheel type	8	A	HS8	
	12		HS12	
	14		HS14	
	16		HS16	
	18		HS18	
Surface	B	B	unpainted	
	C		plastic-coated, light gray hammertone	
			others on request	
Handle bore	OG	C	without handle drill hole	
	...		M6 ... M10 with handle drill hole or handle thread	see Table of dimensions; value GfG
Bore diameter	5.8	D	prebored	only with HS8
	6.8		prebored	only with HS12, HS14
	7.8		prebored	only with HS16, HS18
	...		6 ... 30 mm, in steps of 1 mm	see Table of dimensions, maximum value ødx
Feather key groove	OP	E	without keyway	
	JS9		light seat	according to DIN 6885/1 T1
	P9		tight fit	according to DIN 6885/1 T1
Pinhole	OS	F	without pin hole	
	...		diameter "øl"/measure "f" (e.g. 3.8/12)	see table Special processing, depending on the handwheel type, only if keyway is "OP", only if hub thread is "ONG"
			others on request	
Hub thread	ONG	G	without hub thread	
	...		thread "n"/measure "f" (e.g. M4/12)	see table Special processing, depending on the handwheel type, only if pin hole is "OS"
			others on request	
Tapered hub	OAN	H	without turned hub	
			others on request	
Position indicator	PM	I	position indicator mounted	separate ordering of a position indicator required!
	PS		position indicator separate	separate ordering of a position indicator required!

Order key

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

Scope of delivery: *HS...*

Accessories:

Handwheel holder BGF	*page 134*
Handwheel holder BGD	*page 135*
Handwheel holder ZGD	*page 136*
Handwheel holder UG	*page 137*

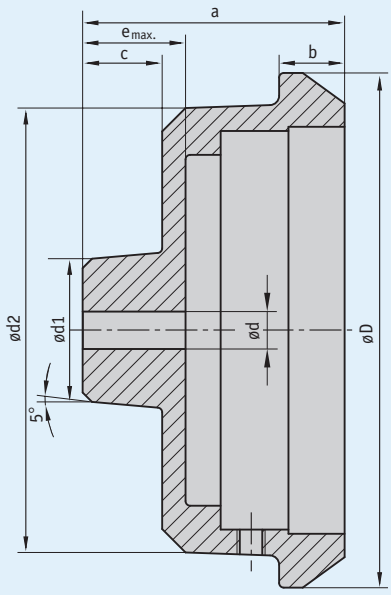
Additional information:

General information and areas of application	*page 92*

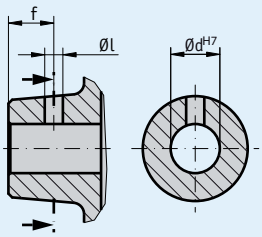
Handwheel HST...
Star wheel made of aluminum

Profile

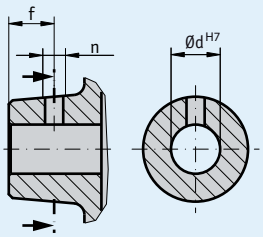
- Various sizes
- Plastic-coated or bright-finished surface
- Various hub versions



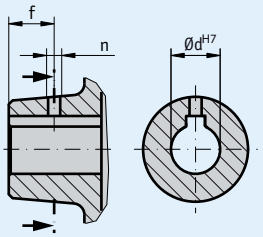
pinhole



hub thread



hub thread with keyway



1.4

Mechanical data

Feature	Technical data	Additional information
Material	aluminum	
Weight	0.2 kg	HST7
	0.2 kg	HST8
	0.5 kg	HST11

Table of dimensions

Type	øD	ødv	ødx	ød1	ød2	a	b	c	e	Suitable for
HST7	78	5.8	20	32	60	50	20	15	20	S50/1
HST8	75	5.8	12	20	60	43	10	10	13	S50/1
HST11	110	6.8	16	30	95	56	14	17	22	S80/1; SZ80/1

ødv =d prebored; ødx = d max.

Special treatment

Handwheel type	HST7					HST8		
Bore dH7	6 ... 8	9, 10	11, 12	13 ... 16	17 ... 20	6 ... 8	9, 10	11, 12
Groove width with keyway JS9		3	4	5			3	
Pin hole	3.8/10	3.8/10	3.8/10	4.8/10	4.8/10	3.8/6	3.8/6	3.8/6
Hub thread without keyway JS9	M4/10	M4/10	M4/10	M6/10	M6/10	M4/6	M4/6	M4/6
Hub thread with keyway JS9		M3/10	M3/10	M4/10				

Handwheel typ	HST11				
Bore dH7	7, 8	9, 10	11, 12	13 ... 15	16
Groove width with keyway JS9		3	4	5	5
Pin hole	3.8/12	3.8/12	3.8/12	4.8/12	4.8/12
Hub thread without keyway JS9	M4/12	M4/12	M4/12	M6/12	M6/12
Hub thread with keyway JS9		M3/12	M3/12	M4/12	

Texts highlighted in orange color are ordering features

Order

Ordering information

One or more system components are required:

Analog position indicator S50/1	page 98
Analog position indicator S80/1	page 102

Ordering table

Feature	Ordering data		Specification	Additional information
handwheel type	7	A	HST7	
	8		HST8	
	11		HST11	
Surface	B	B	unpainted	
	CS		plastic-coated, black matt	not with HST7
			others on request	
Bore diameter	5.8	C	prebored	only with HST7, HST8
	6.8		prebored	only with HST11
	...		6 ... 20 mm, in steps of 1 mm	see Table of dimensions, maximum value ødx
Feather key groove	OP	D	without keyway	
	JS9		light seat	according to DIN 6885/1 T1
	P9		tight fit	according to DIN 6885/1 T1
Pinhole	OS	E	without pin hole	
	...		diameter "øl"/measure "f" (e.g. 3.8/12)	see table Special processing, depending on the handwheel type, only if keyway is "OP", only if hub thread is "ONG"
			others on request	
Hub thread	ONG	F	without hub thread	
	...		thread "n"/measure "f" (e.g. M4/12)	see table Special processing, depending on the handwheel type, only if pin hole is "OS"
			others on request	
Tapered hub	OAN	G	without turned hub	
			others on request	
Position indicator	PM	H	position indicator mounted	separate ordering of a position indicator required!
	PS		position indicator separate	separate ordering of a position indicator required!

Order key

HST - [A] - [B] - [C] - [D] - [E] - [F] - [G] - [H]

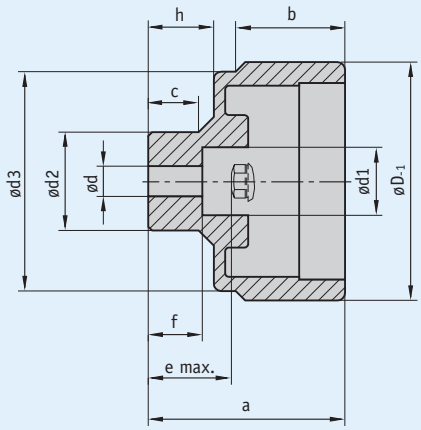
Scope of delivery: HST...

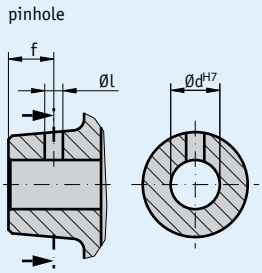
Accessories:
End Plate AD — *www.siko-global.com*

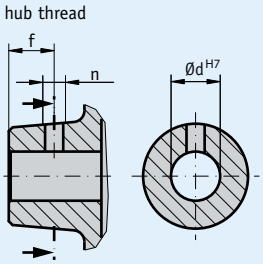
Additional information:
General information and areas of application — *page 92*

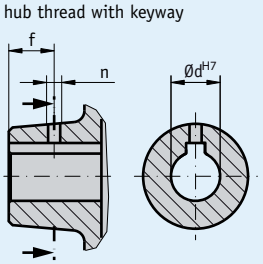
Profile

- Low-cost and compact turning handle made of glass-fiber reinforced plastic
- Various sizes
- Surface with rounded edges avoids accumulation of dirt
- Hub made of plastic or metal
- Various hub versions









Mechanical data

Feature	Technical data	Additional information
Material	plastic	
Weight	0.1 kg	HG5
	0.2 kg	HG10

Table of dimensions

Type	Hub	øD	ødv	ødx	ød1	ød2	ød3	a	b	c	e	f	h	Suitable for
HG5	synthetic	63		6 ... 12^{H9}	13	21	58	49	28.9	14.3	19.2	17.2	14.3	S50/1
	metal	63	5.8	6 ... 14^{H7}	18	26	58	52	28.9	13.3	22.2	14.3	17.3	S50/1
HG10	synthetic	98		6 ... 16^{H9}	16	30	93	56	31.5	18.7	22.8	20.7	18.7	S80/1; SZ80/1
	metall	98	5.8	6 ... 16^{H7}	25.5	35	93	59	31.5	18.2	25.8	18	21.7	S80/1; SZ80/1

ødv =d prebored

Special treatment

Handwheel type	HG5				HG10			
Bore dH7	6, 8	9, 10	12	14*	6 ... 8	9, 10	11, 12	13 ...16
Groove width with keyway JS9		3	4	5		3	4	5
Pin hole	3.8/10	3.8/10	3.8/10	4.8/10*	3.8/10	3.8/10	3.8/10	4.8/10
Hub thread without keyway JS9	M4/10	M4/10	M4/10*	M6/10*	M4/10	M4/10	M4/10	M6/10
Hub thread with keyway JS9	M3/10	M3/10	M3/10			M3/10	M3/10	M4/10

* possible with metal hub only; **Texts highlighted in orange color are ordering features**

Order

Ordering information

One or more system components are required:

Analog position indicator S50/1	page 98
Analog position indicator S80/1	page 102
Analog position indicator SZ80/1	page 104

Ordering table

Feature	Ordering data		Specification	Additional information
handwheel type	5	A	HG5	
	10		HG10	
Hub material	A	B	aluminium	
	K		plastic	
	VA		stainless steel	
Bore diameter	5.8	C	prebored	
	...		6 ... 16 mm, in steps of 1 mm	see Table of dimensions, maximum value ødx
Feather key groove	OP	D	without keyway	
	JS9		light seat	according to DIN 6885/1 T1, only with hub material "VA" or "A"
	P9		tight fit	according to DIN 6885/1 T1, only with hub material "VA" or "A"
Pinhole	OS	E	without pin hole	
	...		diameter "øl"/measure "f" (e.g. 3.8/10)	see table Special processing, depending on the handwheel type, only if keyway is "OP", only if hub thread is "ONG"
			others on request	
Hub thread	ONG	F	without hub thread	
	...		thread "n"/measure "f" (e.g. M4/10)	see table Special processing, depending on the handwheel type, only if pin hole is "OS", only with hub material "VA" or "A"
			others on request	
Tapered hub	OAN	G	without turned hub	
			others on request	
Position indicator	PM	H	position indicator mounted	separate ordering of a position indicator required!
	PS		position indicator separate	separate ordering of a position indicator required!

Order key

HG - [A] - [B] - [C] - [D] - [E] - [F] - [G] - [H]

Scope of delivery: HG...

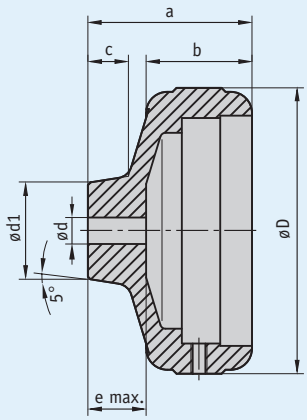
Accessories:
End Plate AD — *www.siko-global.com*

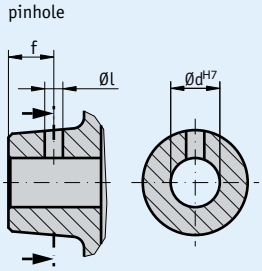
Additional information:
General information and areas of application — *page 92*

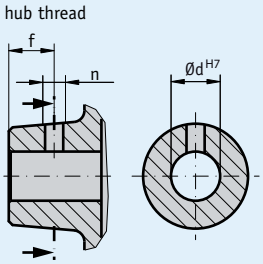
Handwheel HR...
Premium knurled aluminum handwheel

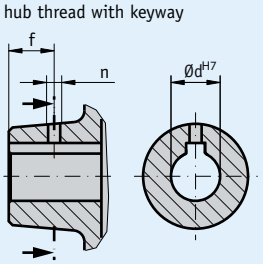
Profile

- Premium knurled aluminum handwheel
- Compact design
- Various sizes
- Surface plastic-coated, anodized or bright-finished
- Various hub versions









1.4

Mechanical data

Feature	Technical data	Additional information
Material	aluminum	
Weight	0.3 kg	HR6
	0.5 kg	HR11

Table of dimensions

Type	øD	ødv	ødx	ød1	a	b	c	e	Suitable for
HR6	65	5.8	20	30	50	35	15	20	S50/1
HR11	108	6.8	20	36	62	40	15	22	S80/1; SZ80/1

ødv =d prebored; ødx = d max.

Special treatment

Handwheel type	HR6					HR11				
Bore dH7	6 ... 8	9, 10	11, 12	13 ... 16	17 ... 20	7, 8	9, 10	11, 12	13 ... 17	18 ... 20
Groove width with keyway JS9		3	4	5			3	4	5	6
Pin hole	3.8/10	3.8/10	3.8/10	4.8/10		3.8/10	3.8/10	3.8/10	4.8/10	4.8/10
Hub thread without keyway JS9	M4/10	M4/10	M4/10	M6/10		M4/10	M4/10	M4/10	M6/10	M6/10
Hub thread with keyway JS9		M3/10	M3/10	M4/10			M3/10	M3/10	M4/10	

Texts highlighted in orange color are ordering features

Order

Ordering information

One or more system components are required:

Analog position indicator S50/1 page 98
Analog position indicator S80/1 page 102
Analog position indicator SZ80/1 page 104

Ordering table

Feature	Ordering data		Specification	Additional information
handwheel type	6	A	HR6	
	11		HR11	
Surface	B	B	unpainted	
	ES		black anodized	
	EF		natural anodized	
			others on request	
Bore diameter	5.8	C	prebored	only with HR6
	6.8		prebored	only with HR11
	...		6 ... 20 mm, in steps of 1 mm	see Table of dimensions, maximum value ødx
Feather key groove	OP	D	without keyway	
	JS9		light seat	according to DIN 6885/1 T1
	P9		tight fit	according to DIN 6885/1 T1
Pinhole	OS	E	without pin hole	
	...		diameter "øl"/measure "f" (e.g. 3.8/10)	see table Special processing, depending on the handwheel type, only if keyway is "OP", only if hub thread is "ONG"
			others on request	
Hub thread	ONG	F	without hub thread	
	...		thread "n"/measure "f" (e.g. M4/10)	see table Special processing, depending on the handwheel type, only if pin hole is "OS"
			others on request	
Tapered hub	OAN	G	without turned hub	
			others on request	
Position indicator	PM	H	position indicator mounted	separate ordering of a position indicator required!
	PS		position indicator separate	separate ordering of a position indicator required!

Order key

HR	-		-		-		-		-		-		-	
		A		B		C		D		E		F		G	H

Scope of delivery: HR...

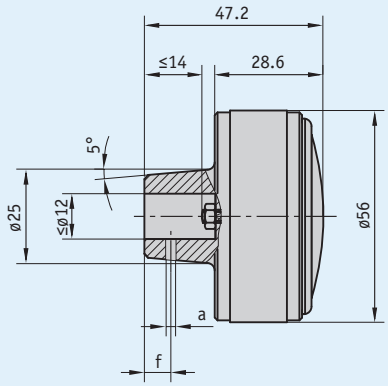
Accessories:
End Plate AD *www.siko-global.com*

Additional information:
General information and areas of application *page 92*

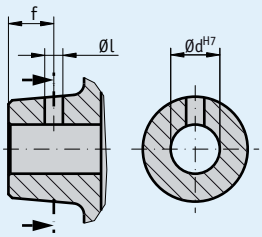
Handwheel HR5
Aluminum turning handle with integrated display

Profile

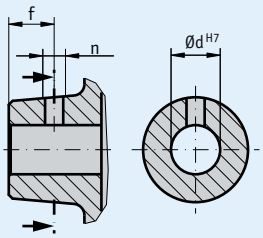
- Compact turning handle made of aluminum casting
- with integrated position indicator
- Analog display with various gear ratios and special scales
- Surface anodized or bright-finished
- Various hub versions



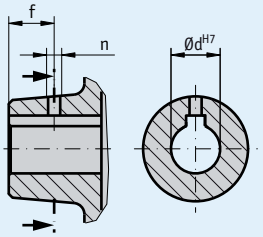
pinhole



hub thread



hub thread with keyway



1.4

Mechanical data

Feature	Technical data	Additional information
Material	aluminum	
Weight	0.1 kg	

Order

Ordering table

Feature	Ordering data		Specification	Additional information
Bore/diameter	...	A	08 ... 12 mm, in steps of 1 mm	see drawing
Surface	B	B	unpainted	
	ES		black anodized	
	EF		natural anodized	
Gear ratio	...	C	1, 2, 3, 6, 12, 18, 20, 30, 36, 48, 50, 60, 72, 84, 96, 100	
Sense of rotation	i	D	clockwise ascending values	
	e		counter-clockwise ascending values	
Pointer	1	E	red with transmission	
	2		red with transmission + black 1:1	
Pinhole	OS	F	without pin hole	
	2.5/7		diameter "øl"/measure "f"	only if hub thread is "ONG"
			others on request	
Hub thread	ONG	G	without hub thread	
	M6/8		thread "n"/measure "f"	only if pin hole is "OS"
			others on request	
Scale	N..	H	normal scale	related to display after 1st revolution
	VK..		special scale	customer-specific, no VK for first production
Multi-color scale	C1	I	1-colored	
	C2		2-colored	
	C3		3-colored	

Order key

	-		-		-		-		-		-		-	
A		B		C		D		E		F		G		H		I

Scope of delivery: HR5

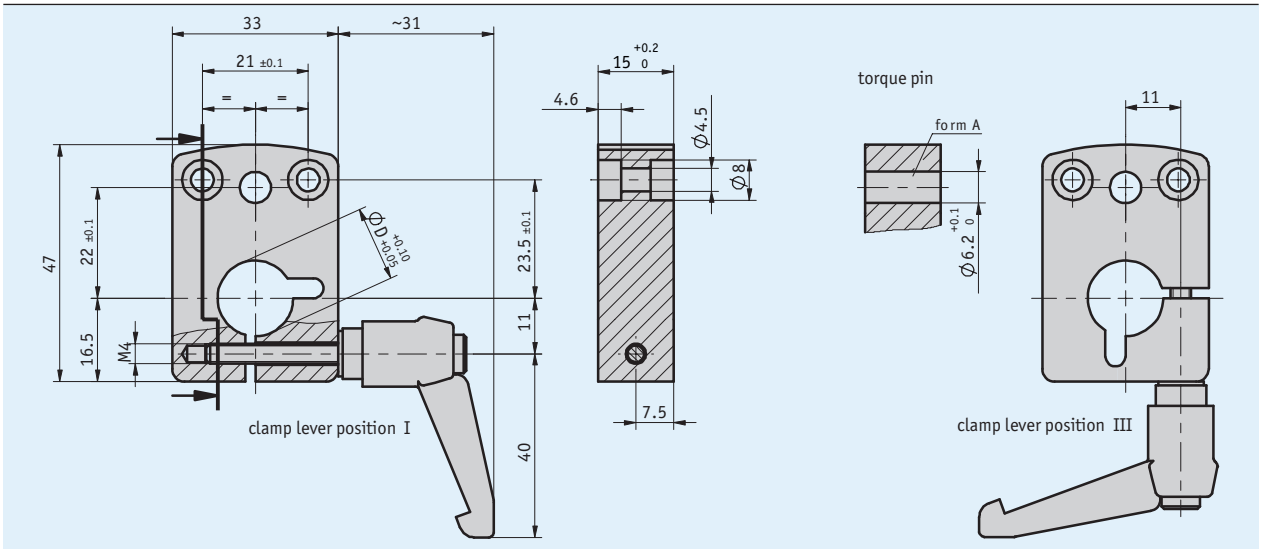
Additional information:
General information and areas of application *page 92*

1.5

Clamping plate KP04
Accessory for position indicator DA04

Profile

- For shaft diameters 8 ... 15 mm
- Selectable clamp lever position
- Easy mounting and retrofitting



Mechanical data

Feature	Technical data	Additional information
Housing	anodized aluminum	
Clamping lever	plastic, engaging	

Order

- **Ordering table**

Feature	Ordering data		Specification	Additional information
Bore/diameter	...	A	8, 10, 12, 14, 15 in mm	
			others on request	
Clamp lever/position	I	B	position I	
	III		position III	

- **Order key**

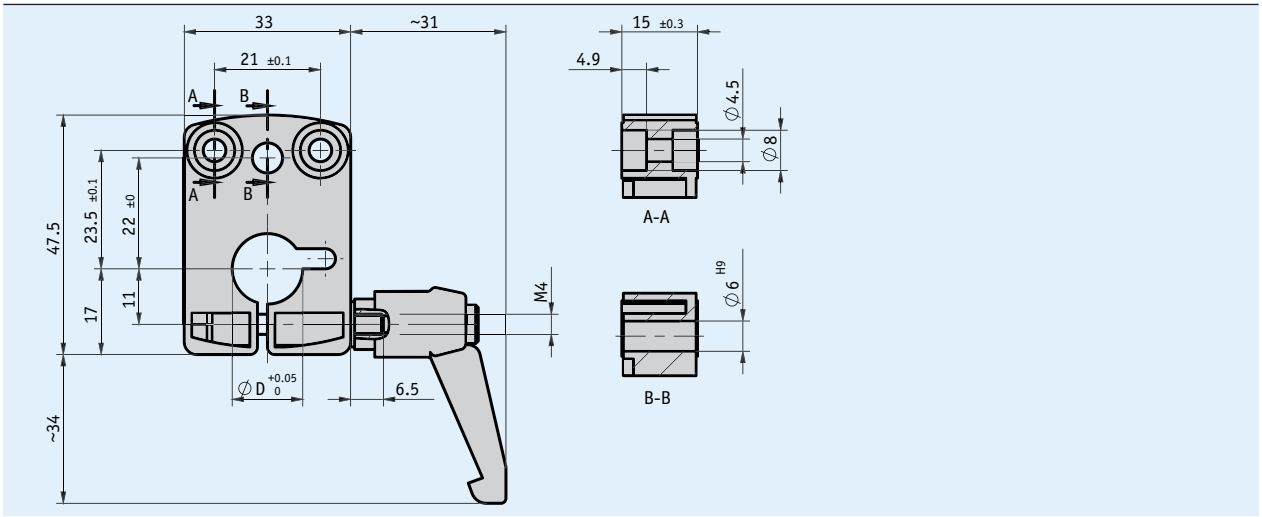
KP04 - [ ] - [ ] - A

A B

Scope of delivery: KP04

Profile

- Contour matching with DA04 position indicator
- For shaft diameters 8 ... 14 mm
- Robust zinc die-cast design
- Easy mounting and retrofitting



Mechanical data

Feature	Technical data	Additional information
Housing	zinc die-cast	
Clamping lever	plastic, engaging	
Weight	~0.09 kg	

Order

Ordering table

Feature	Ordering data	Specification	Additional information
Bore/diameter	... A	8, 10, 12, 14 in mm	

Order key

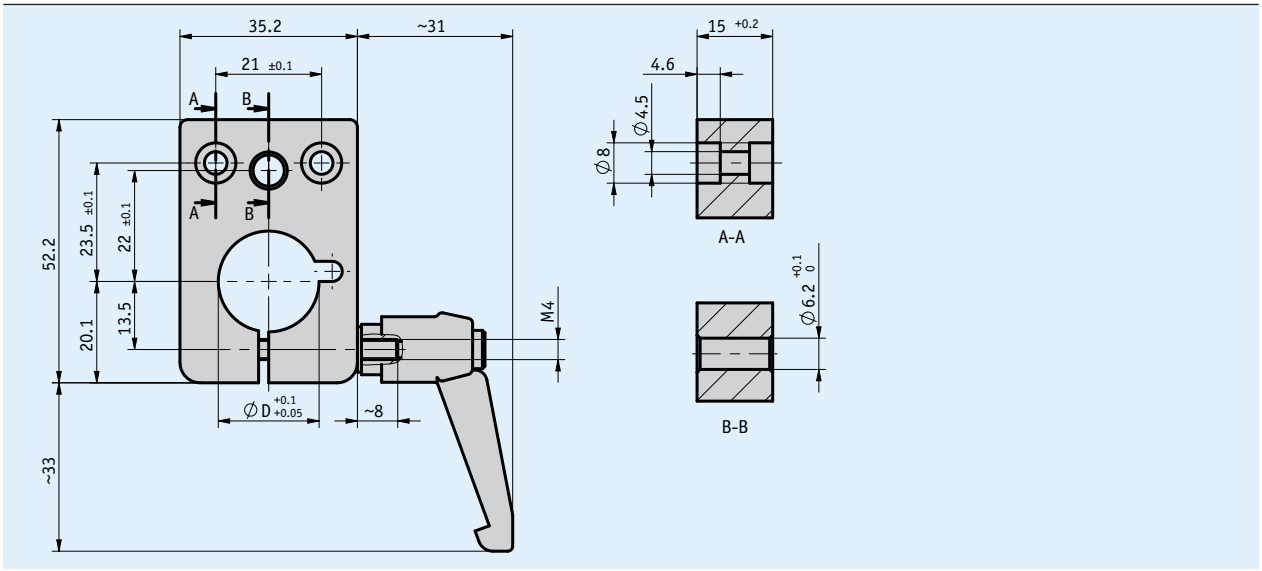
KPL04 - [ ] - KH
A

Scope of delivery: KPL04

Clamping plate KPE04
Accessory for position indicators DE04, AP05

Profile

- Contour matching with DE04, AP04 position indicators
- For shaft diameters 10 ... 20 mm
- Lateral position of the clamping lever
- Easy mounting and retrofitting



Mechanical data

Feature	Technical data	Additional information
Housing	anodized aluminum	
Clamping lever	plastic, engaging	
Weight	~0.06 kg	

Order

- **Ordering table**

Feature	Ordering data	Specification	Additional information
Bore diameter	... A	10, 12, 14, 20 in mm	
		others on request	

- **Order key**

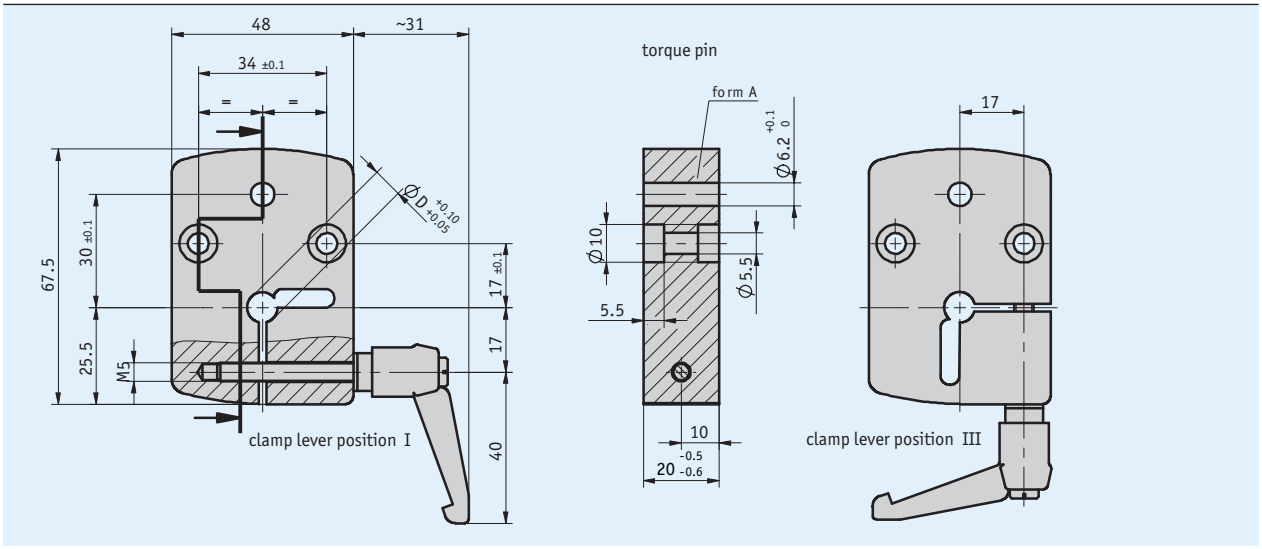
KPE04 - [ ] - [I] - [A] - [KH]

[ ]: A

Scope of delivery: KPE04

Profile

- For shaft diameters 8 ... 20 mm
- Selectable clamp lever position
- Easy mounting and retrofitting



Mechanical data

Feature	Technical data	Additional information
Housing	anodized aluminum	
Clamping lever	plastic, engaging	

Order

Ordering table

Feature	Ordering data		Specification	Additional information
Bore/diameter	...	A	8, 10, 12, 14, 15, 16, 18, 20 in mm	
			others on request	
Clamp lever/position	I	B	position I	
	III		position III	

Order key

KP09 - [ ] - [ ] - A

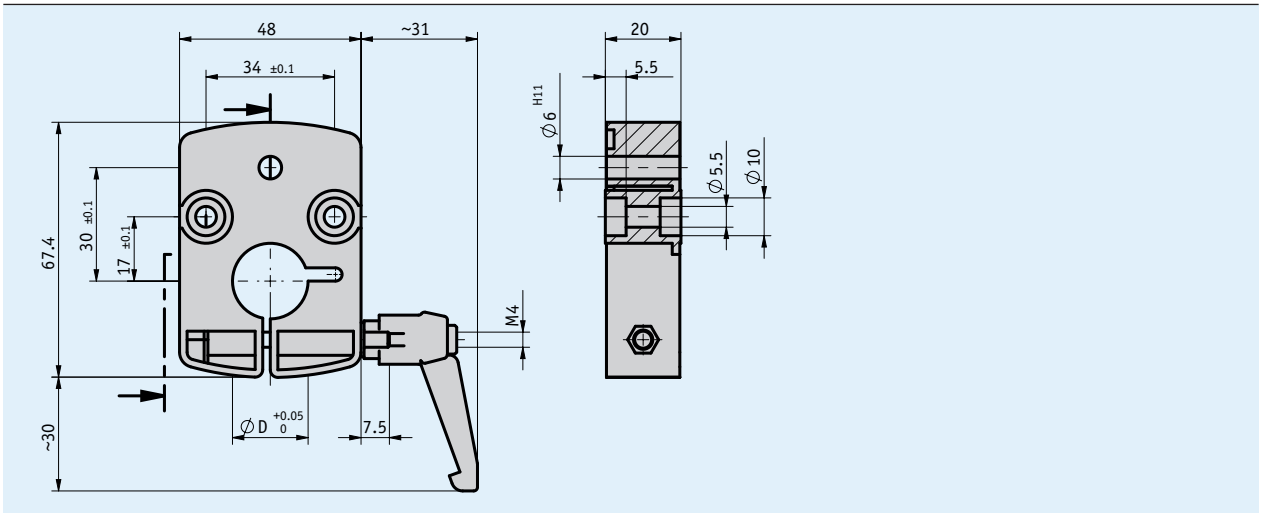
A B

Scope of delivery: KP09

Clamping plate KPL09
Accessory for position indicator DA09S

Profile

- Contour matching with DA09S position indicator
- For shaft diameter 12 ... 20 mm
- Robust zinc die-cast design
- Easy mounting and retrofitting



Mechanical data

Feature	Technical data	Additional information
Housing	zinc die-cast	
Clamping lever	plastic, engaging	
Weight	~0.15 kg	

Order

- **Ordering table**

Feature	Ordering data	Specification	Additional information
Bore/diameter	... A	12, 14, 16, 20 in mm	

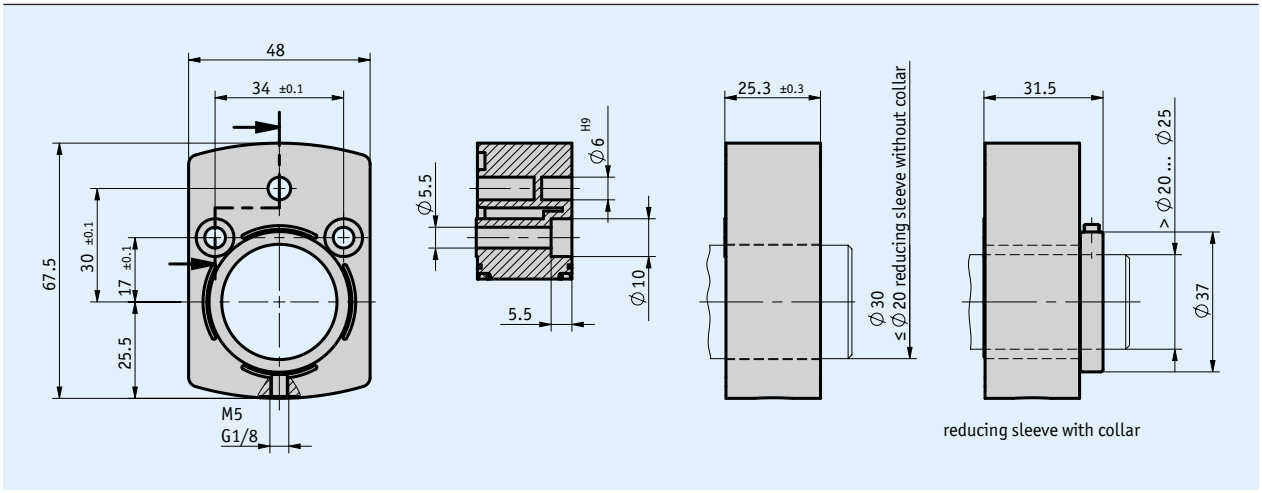
- **Order key**

KPL09 - [ ] - KH
A

Scope of delivery: KPL09

Profile

- Pneumatic clamping plate for shaft clamping
- Selectable sizes of the compressed-air connection
- Easy mounting and retrofitting



1.5

Mechanical data

Feature	Technical data	Additional information
Housing	zinc die-cast	
Weight	~0.25 kg	

Order

Ordering table

Feature	Ordering data		Specification	Additional information
Bore/diameter	30	A	ø30 mm	
	...		RH14, RH20, RH25	reducing bushes
			others on request	
Compressed air connection	R1/8	B	R1/8 thread	
	M5		M5 thread	

Order key

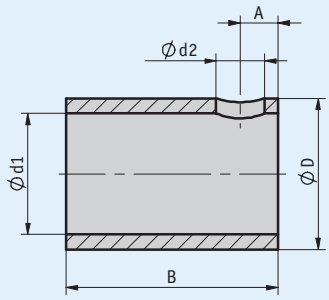
KP09P - [ ] - [ ]
A B

Scope of delivery: *KP09P*

Reduction sleeve RH
Accessories

Profile

- Easy and fast mounting
- Steel browned or stainless steel



	A	B	ØD	Ød1	Ød2
RH01	3.75	20	20_{f7}	$\leq 18^{H7}$	5.5
RH02	4.0	30	30_{f7}	$\leq 28^{H7}$	5.5
RH03	4.5	30	25_{f7}	$\leq 22^{H7}$	5.5
RH04	2.8	17	14_{f7}	$\leq 12^{H7}$	4.2
RH05	3	25	$30^{-0.1}_{-0.2}$	$\leq 20^{H7}$	2xM4 (120°)
RH07	2.5	14	10_{f7}	$\leq 8^{H7}$	3.2
RH08	3.0	20	14_{f7}	$\leq 12^{H7}$	5.2
RH09	3.0	20	20_{f7}	$\leq 18^{H7}$	2x3.6 (120°)
RH10	3.75	20	20_{f7}	$\leq 16^{H7}$	2x5.5 (120°)

1.5

Mechanical data

	RH01	RH02	RH03	RH04	RH05	RH07	RH08	RH09	RH10
compatible with display	DA05/1 DA08 DA09S DE10***	DA10* DA10R/1* DE10**** DE10P	DA10** DA10R/1**	DA04 DE04	KP09P	DA02 DK05	DK01 DK02 DK03	AP04 AP10 GS04	DKE01
ød^{H7} steel, burnished	6, 6.35, 8, 10, 12, 12.7, 14, 15, 15.875, 16, 17, 18	10, 12, 12.7, 14, 15, 16, 18, 19.05, 20, 22, 24, 25, 25.4, 26, 28	18, 20, 22	4, 5, 6, 6.35, 8, 9.525, 10, 12	12, 14, 15, 16, 20	6, 6.35, 7, 8	5, 6, 6.35, 8, 9, 9.525, 10, 12		14, 16
ød^{H7} stainless steel	VA8, VA9.525, VA10, VA12, VA12.7, VA14, VA15, VA15.875, VA16, VA19.05	VA12.7, VA20, VA24, VA25, VA25.4		VA6.35, VA8, VA9.525, VA10, VA12, VA12.7, VA13		VA8		VA8, VA9.525, VA10, VA12, VA12.7, VA14, VA15, VA15.875, VA16, VA18, VA19.05	

* only with shaft WK; ** only with shaft WL; *** only with shaft 20; **** only with shaft 30

Hint: Texts highlighted in orange color are order characteristics.

Order

Ordering table

Feature	Ordering data	Specification	Additional information
Mounting position	... A	RH01, RH02, RH03, RH04, RH05, RH07, RH08, RH09, RH10	
internal diameter d1	... B	see table "Mechanical data"	

Order key

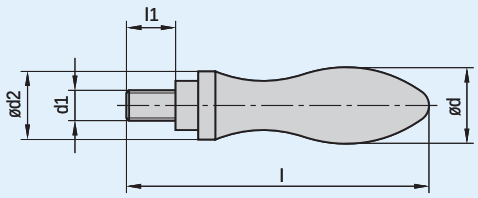
[ ] - [ ]
A B

Scope of delivery: RH, headless screw

Handwheel holder BGF
Accessory, fixed ball handle

Profile

- Customized handling
- Easy to mount



Mechanical data

- **Dimensions table**

d	d1	d2	l	l1
16	M6	10	61	11
20	M8	13	77	13
25	M10	16	94	14

1.5

Order

- **Ordering table**

Feature	Ordering data		Specification	Additional information
Size	M6	A	M6	
	M8		M8	
	M10		M10	

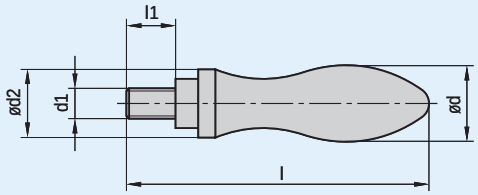
- **Order key**

BGF - [ ]
A

Scope of delivery: BGF

Profile

- Customized handling
- Easy to mount



Mechanical data

- **Dimensions table**

d	d1	d2	l	l1
16	M6	14	66	11
20	M8	18	80	13
25	M10	21	97	14

Order

- **Ordering table**

Feature	Ordering data		Specification	Additional information
Size	M6	A	M6	
	M8		M8	
	M10		M10	

- **Order key**

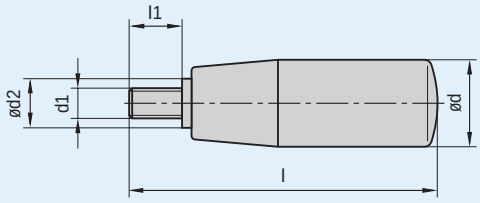
BGD - [ ]
A

Scope of delivery: BGD

Handwheel holder ZGD
Accessories, turnable cylinder handle

Profile

- Customized handling
- Easy to mount



Mechanical data

- **Dimensions table**

d	d1	d2	l	l1
18	M6	10	55	12
23	M8	13	82	14
26	M10	13	99	16

1.5

Order

- **Ordering table**

Feature	Ordering data		Specification	Additional information
Size	M6	A	M6	
	M8		M8	
	M10		M10	

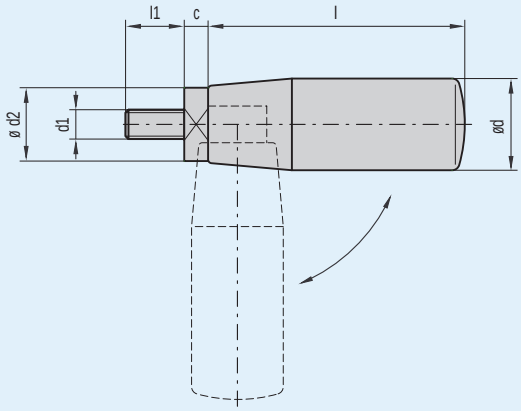
- **Order key**

ZGD - [ ]
A

Scope of delivery: ZGD

Profile

- Customized handling
- Easy to mount
- Space-saving handle



Mechanical data

Dimensions table

d	d1	d2	l	l1	c
25	M8	19	69	10	6
26	M10	26	82	17	7.5

Order

Ordering table

Feature	Ordering data		Specification	Additional information
Size	M8	A	M8	
	M10		M10	

Order key

UG - [ ]
A

Scope of delivery: UG

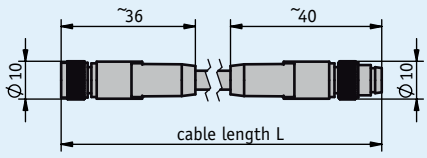
Cable extension KV04S1
Accessories

Profile

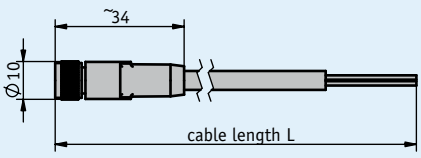
- Ready-to-use cable connection
- Cable lengths up to 10 m
- Connection technology M8, 4-pole

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

type of connection GE/GE



type of connection GE



Mechanical data

Feature	Technical data	Additional information
Cable sheath	PUR	ø4.5 mm

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	only with cable length 03.0 or 10.0 m
	GE/GE		2x straight connector	
Cable length	...	B	00.5, 01.0, 03.0, 05.0, 10.0 m	
			others on request	

Order key

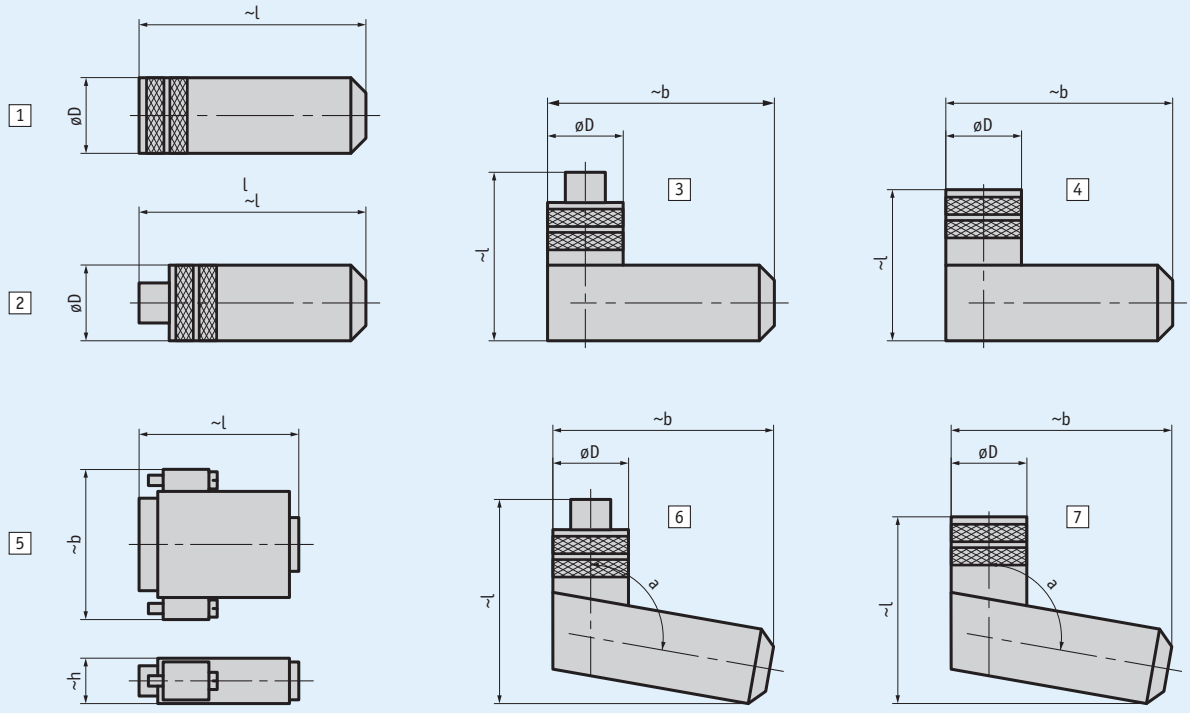
KV04S1 - [A] - [B]

Scope of delivery: KV04S1

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

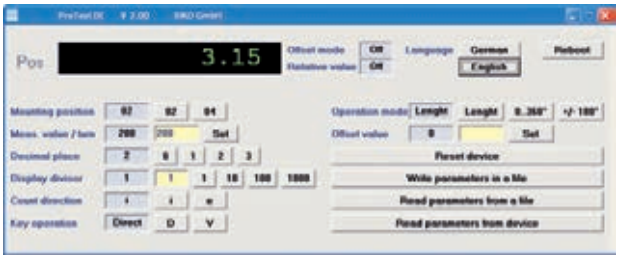
...

Scope of delivery: *mating connector*

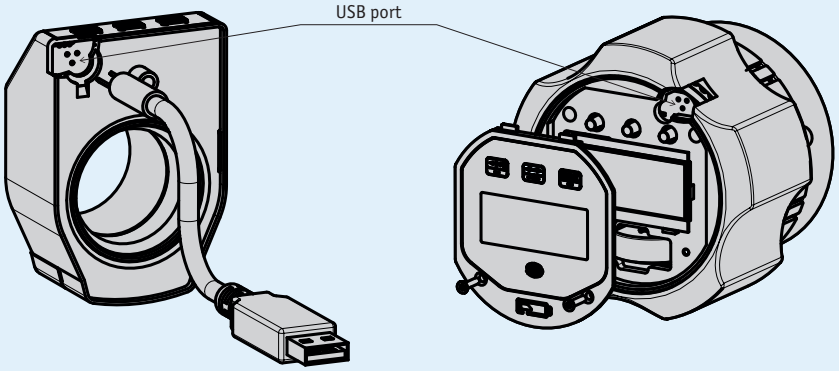
Programming software ProTool DE
Accessories for DE04, DE10, DKE01

Profile

- Parameters can be freely programmed
- Toggle mode between angle and linear measurement
- With USB connection cable



DE04/DE10 DKE01



1.5

Order

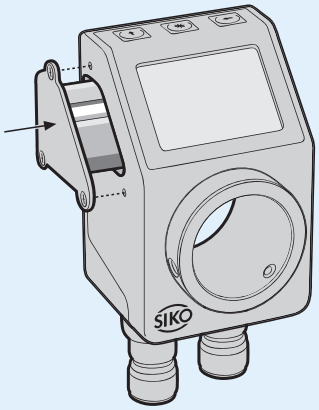
- **Order key**

ProTool DE

Scope of delivery: *ProTool DE, USB programming cable, User information on CD*

Profile

- Unit of battery and holder with contacts
- For easy und reliable replacement of the backup battery



1.5

Electrical data

Feature	Technical data	Additional information
Operating voltage	3 V	
Battery service life	~5 year(s)	

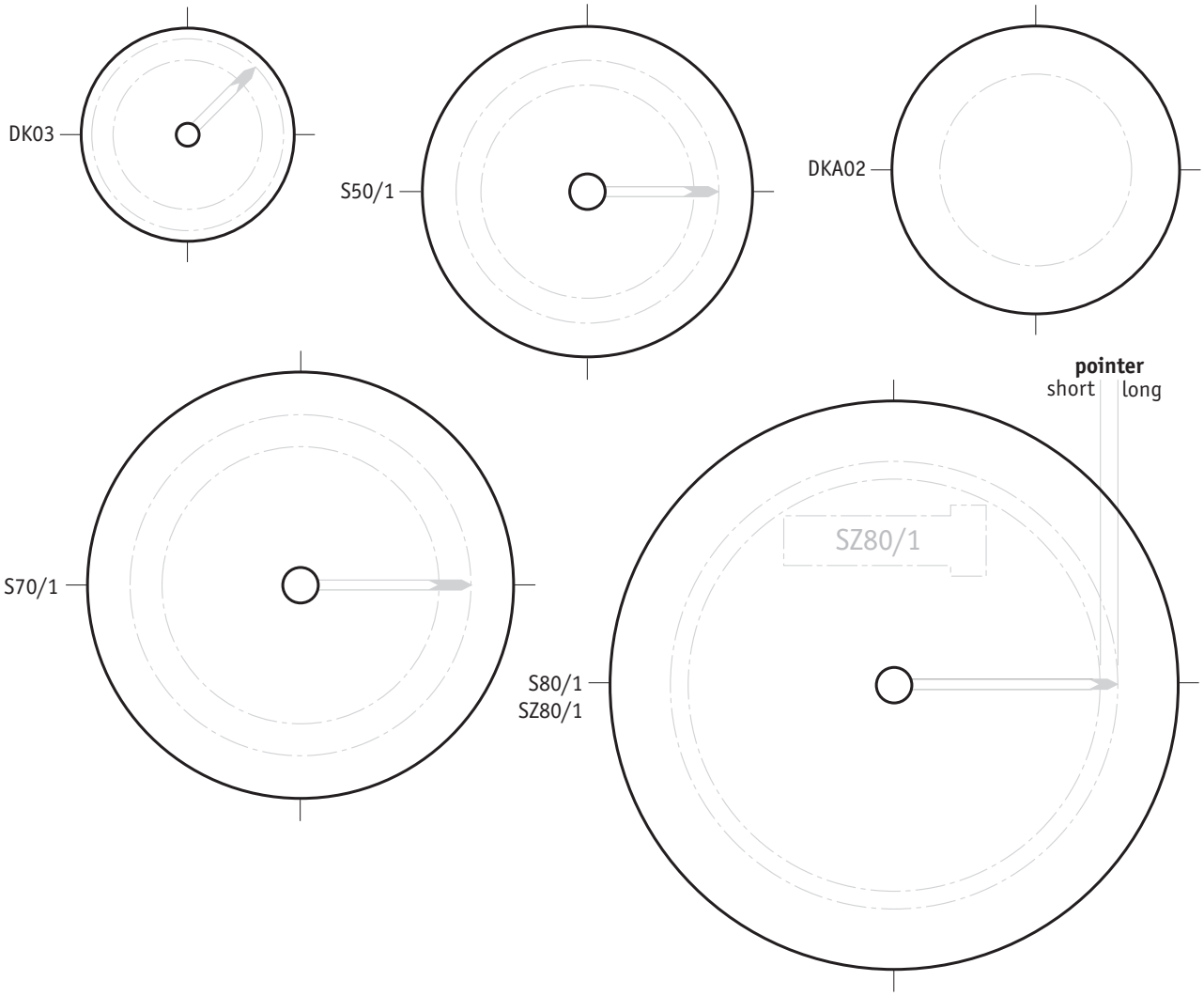
Order

- **Order key**

ZB1027

Scope of delivery: *ZB1027, Quick Start Guide*


360°
[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]


DK03
S50/1
DKA02
S70/1
pointer
short
long
SZ80/1
S80/1
SZ80/1

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.

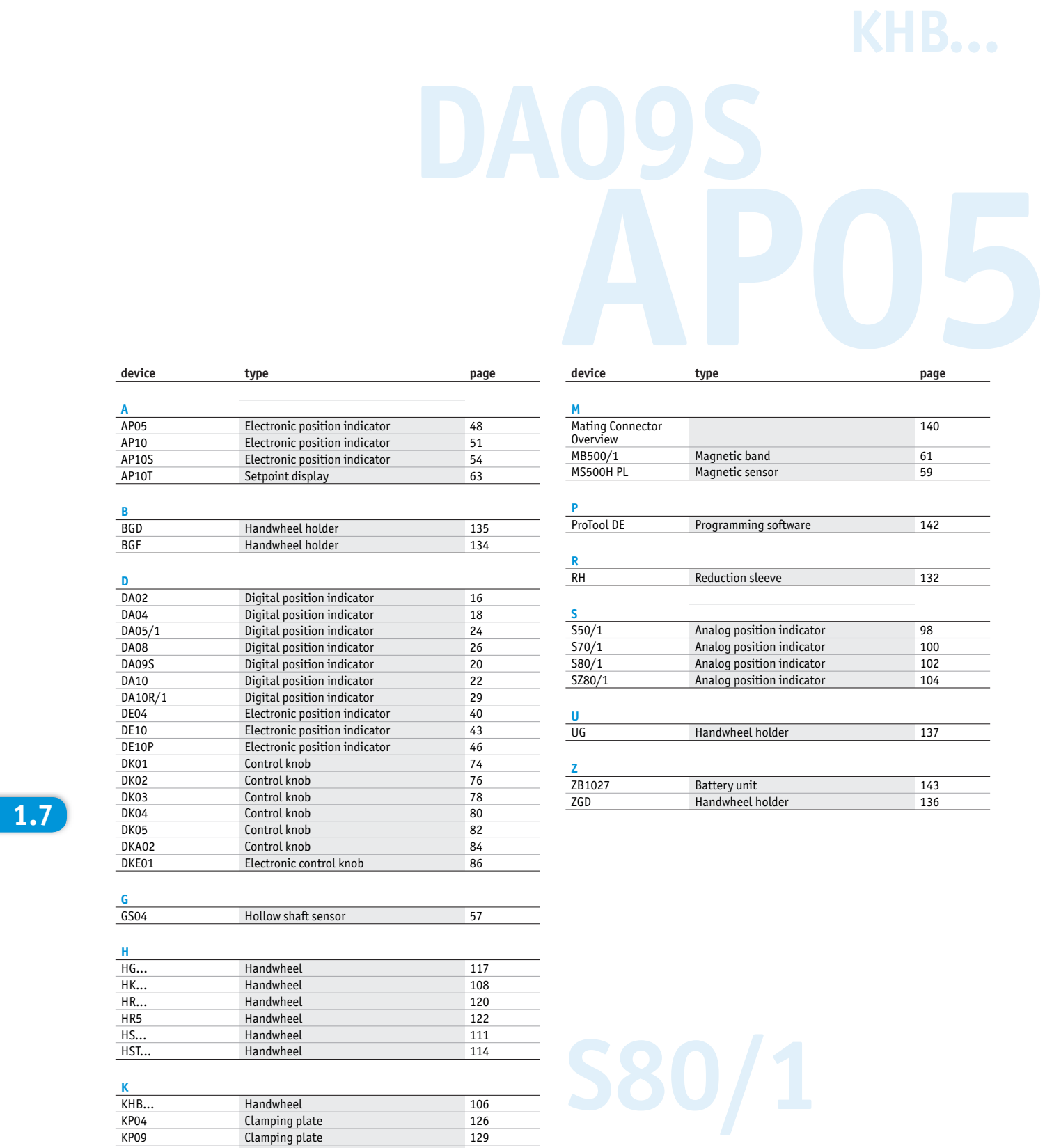
The two numbers are not indicative of the protection against ingress of oils or similar liquids. The second figure indicates the protection class exclusively for water.

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

1.6

1.7

1.7 | Product index, contact information



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South Korea
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United Arab Emirates
Vietnam

Australia
Australia
New Zealand

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Croatia
Cyprus
Czech Republic
Denmark
Estonia
Finland
France
Germany
Great Britain
Greece
Hungary
Italy
Latvia
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