

Function and technology used in handwheels

The change from a handwheel directly coupled to the spindle or axes to CNC-controlled axes has meant dramatic new developments for the handwheels. The rotation of the handwheel generates square-wave outputs. The CNC axis controller evaluates the pulses and so signals the axis to move. With over 20 years of handwheel experience, EUCHNER provides a wide selection of handwheels built with the finest quality and highest possible reliability.

Daily use of handwheels places high demands on the mechanical functioning. With twin bearings and a wear-free detent mechanism, the EUCHNER handwheels are the optimum choice for trouble-free operation. The detent moment maintains position even in the event of machine vibration. The detent moment and 100 or 25 pulses per revolution allow a desired value to be set quickly, reliably and accurately. In addition to the manual positioning of axes with CNC-controlled machines, EUCHNER also offers handwheels used for medical and telecommunication applications. EUCHNER also offers handwheels for these applications.





Magnetic detent mechanism

Handwheels with magnetic detent are characterized by their absolutely wear-free and noiseless detent mechanism.

With 100 detent positions (100 or 25 pulses)

The detent mechanism is generated by a magnetic field. A combination of 100 magnetic north/south positions is generated by the opposing magnetic fields with one revolution of the handwheel. Thanks to an air gap, the detent mechanism has no wear and is absolutely maintenance-free. With two ball bearings, the bearing assembly of the handwheel can withstand high axial and radial forces. Different circuit outputs are available for all current control systems.

There are three different designs available:

- Design HKB
 - Ideal for flat machine panels and small, light hand-held pendant stations.



- Design HKC
 - Suitable for installation in operator panels
 - Its design makes it particularly suitable for flat operator panels



- Design HKD
 - Suitable for installation in operator panels and EUCHNER handheld pendant stations from series HBL
 - Suitable for installation in universal turning and milling machines for axis movement, for example



Mechanical detent mechanism

Handwheels with mechanical detent are characterized by their light weight and shallow mounting depth.

With 100 detent positions (100 or 25 pulses)

A toothed rotor working in conjunction with a roller creates the detent mechanism. The roller is pushed between the teeth of the rotor by a spring and dial. The detent moment is produced by the movement of the roller over the teeth.

There are two different designs available:

- Design HWA
 - Suitable for installation in operator panels.
 - Suitable for installation in EUCHNER hand-held pendant stations
 - With center point fixing



- Design HWB
 - Suitable for installation in operator panels
 - With 3-point fixing





C SUSTED C SUS

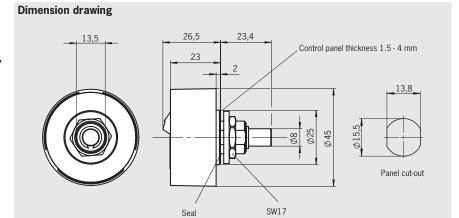
Handwheel HKB

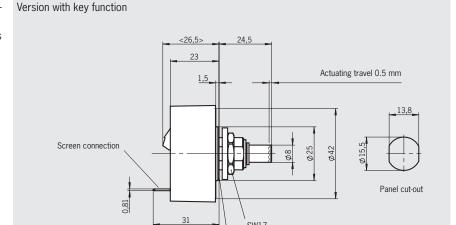
- ▶ 100 detent positions per revolution
- ► Wear-free magnetic detent mechanism
- ▶ 100 or 25 pulses per revolution
- Key function in axial direction optional
- Ideal for flat operator panels and small, light hand-held pendant stations like HBA/HBM



Notes

- ▶ Output A05 suitable for Siemens control systems with RS422 input
- ▶ Output G05 suitable for Fanuc control systems
- ▶ Dial: see accessories page 72
- ▶ Front panel: see accessories page 72





Seal

Series	Number of pulses per revolution	Connection	Detent positions	Outputs	Order No./item
	25	S Screw terminal	100	G12 Push-pull 5 V U _B = 10 30 V DC	105137 HKB025S7G12
				A05 RS422A U _B = 5 V DC	105134 HKB100S7A05
НКВ	100	100 S Screw terminal	100	A12 RS422A U _B = 10 30 V DC	105135 HKB100S7A12
				G05 5 V push-pull U _B = 5 V DC	105136 HKB100S7G05
				G24 Push-pull 1030 V U _B = 10 30 V DC	105138 HKB100S7G24
HKB with key function	100	S Screw terminal	100	A05 RS422A U _B = 5 V DC	109429 HKB100S7A05K



Parameter			Value	Unit
Pulses per revolution		2 x 25 or 2 x 100		
Detent positions			100	
Housing material		Aluminum		
Weight		0.095		
Detent mechanism			Magnetic	kg
Shaft loading, axial, max.			25	N
haft loading, radial, max.			40	N
Mechanical life, min.			5 x 10 ⁶	Rev.
Operating temperature			0 +50	°C
Storage temperature			-20 +50	°C
Atmospheric humidity, max.		80%	(condensation not permissible)	
Front degree of protection	acc. to EN 60529/IEC 529	307	IP 65	
Tone degree or protection	acc. to NEMA 250		250-12	
Resistance to vibration				
/ibrations (3 axes)			DIN/IEC 68-2-6	
Shock (3 axes)			DIN/IEC 68-2-27	
MC protection requirement	s in accordance with CE	E	N 61000-6-2, EN 61000-6-4	
(ey function				
Mechanical life, min.			1 x 10 ⁶ actuations	
ctuating travel			0.3 0.7 mm	
pecification output OUT			Output stage	
		A05/G05	A12/G12/G24	
perating voltage U _B		DC 5 V ± 5 %	DC 10 30 V	
Output voltage	HIGH (1), min.	4.0 V/0 mA		
acpat voitage	111011 (17, 11111)	3.4 V/5 mA		
		3.0 V/20 mA	U _B - 3 V/20 mA	
	LOW (0)			
National Administration of the Control	LOW (0), max.	1.3 V/15 mA	3 V/20 mA	
Output circuit RS422A		*05	840	
Output stage		A05	A12	
Output signals			A, /A, B, /B	
)perating voltage U _B		5 ± 5 %	10 30	V DC
perating current, no load, i	max.		80	mA
Output circuit			22A, use RS422 differential receiver module	
Output signals cw (clockwise	e rotation)	25 pulses	100 pulses	
		A 90°	A /A	
		/A B //B	B /B 200 µs 400 µs	
Ferminal assignment		Screw terminal, 7-pin, co	nductor cross-section 0.082 1.52 (AWG 22 16) with key function Output	
			U _B OV A B Out	
Output circuit, push-pull				
Output stage		G05	G12 G24	
Output signals			А, В	
perating voltage U _B		5 ± 5 %	10 30	V DC
perating current, no load, i	max	3 ± 0 /0	80	mA
Output voltage	HIGH (1), min.	4.0 V / 0 mA	4.9 V / 0 mA –	111/4
atput voituge	111311 (1), 111111.	3.4 V / 5 mA	3.9 V / 5 mA –	
		3.0 V / 20 mA	3.6 V / 20 mA	——
	LOW (O) may			
Jutant ankroat and antant	LOW (0), max.	1.3 V / 15 mA	1.3 V / 15 mA 3 V / 20 mA	A
Output current per output, n		05	20	mA
utput signals cw (clockwise	e rotation)	25 pulses	A 100 pulses	
		B 90° 360°	B 200 µs 400 µs 800 µs	
erminal assignment		Screw terminal, 7-pin, co Tig	nductor cross-section 0.08 ² 1.5 ² (AWG 22 16) shtening torque, max. 0.5 Nm	
		without key function	with key function	



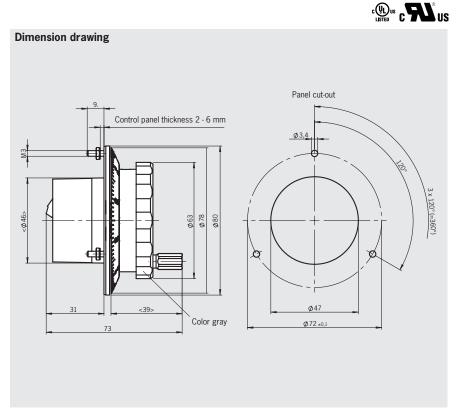
Handwheel HKC

- 100 detent positions per revolution
 Wear-free magnetic detent mechanism
- 100 or 25 pulses per revolution
- Flat design



Notes

- ▶ Output A05 suitable for Siemens control systems with RS422 input
- ▶ Output G05 suitable for Fanuc control systems



Series	Number of pulses per revolution	Connection	Detent positions	Outputs	Order No./item
	25	S Screw terminal	100	G12 Push-pull 5 V U _B = 10 30 V DC	072940 HKC025S100G12
НКС		100 S Screw terminal	100	A05 RS422A U _B = 5 V DC	087733 HKC100S100A05
	100			G05 Push-pull 5 V U _B = 5 V DC	082573 HKC100S100G05
				G24 Push-pull 1030 V U _B = 10 30 V DC	087739 HKC100S100G24



	2 x 25 or 2 x 100 100 Plastic/metal 0.25 Magnetic		
	Plastic/metal 0.25 Magnetic		
	0.25 Magnetic		
	Magnetic		
			kg
	25		N
	40		N
	5 x 10 ⁶		Rev.
	0 +50		°C
			°C
80%		Jo)	+ -
80%		ie)	+
	25012		
	250-12		_
	DIN 450 CO O C		
t	.N 61000-6-2, EN 61000-6-4		
	A, /A, B, /B		
	5 ± 5 %		V DC
			mA
According to RS/		receiver module	
	FLET, use NO+LL differential i		
•		100 puises	
	→ A	1 1 1	
◆ 90	.		
Λ : : : : : : : : : : : : : : : : : : :] []	
^	/A		
= : : : : : : : : : : : : : : : : : : :	<u> </u>		
/A	R		
' 			
ь і і і і	=	# #	
	/B		
		100	
/B	1	4 → 4 →	
1	1	800 μs	
	Screw terminal S		
	L U ₂ OV A /A B /B		
G05		G24	
	A, B		
5 ± 5 %	10	30	V DC
			mA
4 0 V / 0 mA		_	
			\dashv
			\dashv
			-
1.3 V / 15 MA		3 V / 2U MA	
	20		mA
25 pulses		100 pulses	
	_		
Λ Ι Ι	I A	1 1 1	
A	1		1
A	- ``—	1	
	_		
В	В		
	_	200 μς 400 μς	
В	_	200 µs 400 µs 800 µs	
B 90°	B	4 № 	
B 90°	B B Screw terminal S	4 № 	
B 90°	B B Screw terminal S	4 № 	
B 90°	B	4 № 	
	According to RS4 25 pulses 360° A A B B A A B A A B A A B A A	P 65 250-12 DIN/IEC 68-2-6 DIN/IEC 68-2-7 EN 61000-6-2, EN 61000-6-4 A05 A, /A, B, /B 5 ± 5 % 80 According to RS422A, use RS422 differential r 25 pulses 360°	80% (condensation not permissible) IP 65 250-12 DIN/IEC 68-2-6 DIN/IEC 68-2-7 EN 61000-6-2, EN 61000-6-4 A05 A, /A, B, /B 5 ± 5 % 80 According to RS422A, use RS422 differential receiver module 25 pulses 360° A /A B B B B B B B B B B B B B



Handwheel HKD

- ▶ 100 detent positions per revolution
- ► Wear-free magnetic detent mechanism
- ▶ 100 or 25 pulses per revolution
- Installation in operator panels and EUCHNER hand-held pendant stations HBL



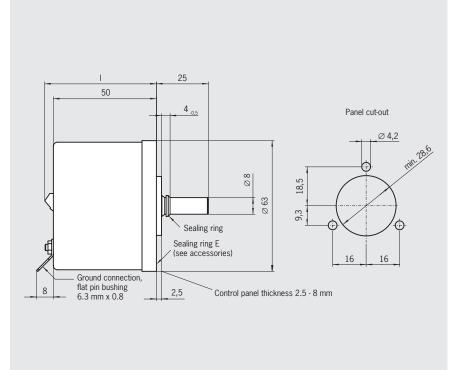
Notes

- ▶ Output A05 suitable for Siemens control systems with RS422 input
- ▶ Output G05 suitable for Fanuc control systems
- ▶ Dial: see accessories page 72
- ▶ Front panel: see accessories page 72

Mounting depth I

Connection	l [mm]
Screw terminal S	55
Ribbon cable, 6-pin V	53

Dimension drawing



Series	Number of pulses per revolution	Connection	Detent positions	Outputs	Order No./item
	25	S Screw terminal	100	$ \begin{array}{c} \textbf{G12} \\ \text{Push-pull 5 V} \\ \text{U}_{\text{B}} = 10 \dots 30 \text{ V DC} \end{array} $	091525 HKD025S100G12
HKD				A05 RS422A U _B = 5 V DC	054866 HKD100S100A05
		S Screw terminal	100	G05 Push-pull 5 V U _B = 5 V DC	083354 HKD100S100G05
	V Ribbon cable 6-pin with plug			G24 Push-pull 1030 V U _B = 10 30 V DC	054868 HKD100S100G24
		Ribbon cable		A05 RS422A U _B = 5 V DC	057036 HKD100V100A05
			100	G05 Push-pull 5 V U _B = 5 V DC	091527 HKD100V100G05
				G24 Push-pull 1030 V U _B = 10 30 V DC	057037 HKD100V100G24



Parameter		Value		Unit
Pulses per revolution	2	x 25 or 2 x 100		
Detent positions		100		
Housing material		Aluminum		
Weight		0.5		kg
Detent mechanism		Magnetic		
Shaft loading, axial, max.		25		N
Shaft loading, radial, max.		40		N
Mechanical life, min.	20 x 10 ⁶			Rev.
Operating temperature		0 +70		°C
Storage temperature		-25 +85		°C
Atmospheric humidity, max.	80% (cond	ensation not permissible)	
Front degree of protection acc. to EN 60529/IEC 529		IP 65		
acc. to NEMA 250		250-12		
Resistance to vibration		DIN 450 CO O C		
Vibrations (3 axes)		DIN/IEC 68-2-6		
Shock (3 axes)		DIN/IEC 68-2-27		
EMC protection requirements in accordance with CE	EN 610	00-6-2, EN 61000-6-4		
Output circuit RS422A		A05		
Output stage				
Output signals		A, /A, B, /B 5 ± 5 %		V DC
Operating voltage U _B Operating current, no load, max.		5 ± 5 % 80		mA
Output circuit	According to DCA22A	use RS422 differential re	coiver module	IIIA
Output signals cw (clockwise rotation)	25 pulses	15e N3422 uillelelluai le	100 pulses	
Output signals cw (clockwise rotation)	23 puises 360°		360°	
	90°		75° 210°	
	A	А		
		=		
	/A	/A		
	· L			
	В	В		
		_		
	/B	/B		
	/B	/0		
			/	
	Detent position areas	De	tent position area	
Terminal assignment	Ribbon cable V		crew terminal S	
Torriman doorgramone	/B/A OV			
		<u> </u>	00000	
		U _B	OV A /A B /B	
	B A U _B			
Output circuit, push-pull				
Output stage	G05	G12	G24	+
Output signals	400	A, B	uL-T	
Operating voltage U _B	5 ± 5 %	10	30	V DC
Operating voltage of Operating current, no load, max.	3 ± 3 /0	80	30	mA
Output voltage HIGH (1), min.	4.0 V / 0 mA	4.9 V / 0 mA	_	1117
output voltage <u>man (1), min.</u>	3.4 V / 5 mA	3.9 V / 5 mA		-
		3.6 V / 20 mA	U _B - 3 V / 20 mA	1
LOW (0), max.	1.3 V / 15 mA	1.3 V / 15 mA	3 V / 20 mA	1
Output current per output, max.	1.5 7 / 15 11/1	20	3 7 / 20 11111	mA
Output signals cw (clockwise rotation)	25 pulses	20	100 pulses	1101
output signals on (clockwise rotation)	360°		360°	
	90°	1 7		
	**************************************	<u> </u>		
	A	A		
	J 			
	p i i i	В		
	B	D		
	Detent position areas	Dα	tent position area	
Terminal assignment	-		crew terminal S	+
Terminal assignment	Ribbon cable V	5	crew fellilligi 2	
	/B /A OV	O	00000	
		U _B	OV A B	
	B A U _B			
	J A ∪B			



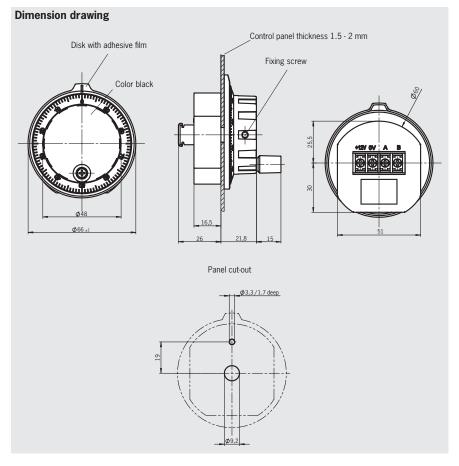
Handwheel HWA

- ▶ 100 detent positions per revolution
- Mechanical detent mechanism
- ▶ 100 or 25 pulses per revolution
- Center point fixing



Notes

- ▶ Output A05 suitable for Siemens control systems with RS422 input
- ▶ Output G05 suitable for Fanuc control systems
- ▶ Packaging unit 10 pieces



Series	Number of pulses per revolution	Connection	Detent positions	Outputs	Order No./item
	25	T Screw terminal	100	$\begin{array}{c} \textbf{G12} \\ \text{Push-pull 5 V} \\ \text{U}_{\text{B}} = 12 \text{ V DC} \end{array}$	072972 HWA025T100G12/V10 (10 ea.)
HWA Packaging unit 10 ea.	100	00 T Screw terminal	100	A05 RS422A U _B = 5 V DC	072970 HWA100T100A05/V10 (10 ea.)
	100			$\begin{array}{c} \textbf{G05} \\ \textbf{Push-pull 5 V} \\ \textbf{U}_{B} = \textbf{5 V DC} \end{array}$	072971 HWA100T100G05/V10 (10 ea.)



Parameter	,	Value	Unit
Pulses per revolution		or 2 x 100	Offic
Detent positions	2 X 23	100	
Housing material	Diag	tic/metal	+
	Flas	0.1	l. m
Weight	0.0		kg
Detent mechanism	Me	echanical	N.
Shaft loading, axial, max.		25	N
Shaft loading, radial, max.		40	N
Mechanical life, min.		x 10 ⁶	Rev.
Operating temperature		+50	°C
Storage temperature) +50	°C
Atmospheric humidity, max.		tion not permissible)	
Front degree of protection acc. to EN 60529/IEC 529		IP65	
acc. to NEMA 250	2	250-12	
Output circuit RS422A			
Output stage		A05	
Output signals		/A, B, /B	
Operating voltage U _B	5	± 10 %	V DC
Operating current, no load, max.		80	mA
Output specifications	According to PSA22A use P	RS422 differential receiver module	IIIA
Output specifications Output signals cw (clockwise rotation)	According to NO422A, use N	0 pulses	
Output signals cw (clockwise rotation)	10		
	[*] 90°	360°	
	30	1	
	A		
	/A		
	//\	i L	
	5		
	В		
	/B		
	Detent	position area	
Tamainal anaissanant		•	
Terminal assignment		v terminal T	
	+5V 0V	АĀВВ	
Output circuit, push-pull			
Output stage	G05	G12	
Output signals		A, B	
Operating voltage U _B	5 ± 10 %	12 ± 10 %	V DC
Operating current, no load, max.		20	mA
Output voltage HIGH (1), min.	4.0 \	V / 20 mA	
LOW (0), max.		V / 20 mA	
Output current per output, max.	0.3	20	mA
Output signals CW (clockwise rotation)	100 pulses	25 pulses	IIIA
Output signals GW (Clockwise rotation)	·	•	
	360°	360°	
	→ →	490	
	Α 🗍	Α 📑 🗎	
		^_ ; ; ; ; ; ;	
	В ;	B	
	/	Data = 111	
	-		
	Detent position area	Detent position areas	
Terminal assignment	•	v terminal T	
Terminal assignment	Screw	v terminal T	
Terminal assignment	Screw		
Terminal assignment	Screw	v terminal T	



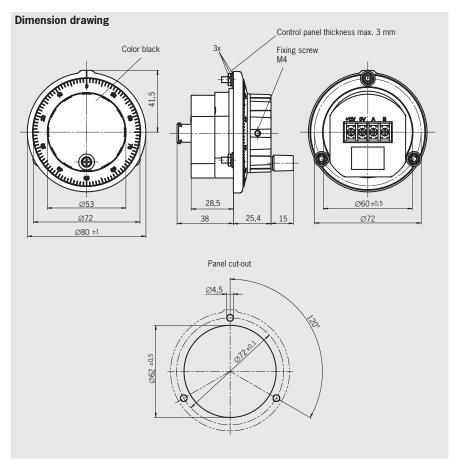
Handwheel HWB

- ▶ 100 detent positions per revolution
- Mechanical detent mechanism
- ▶ 100 or 25 pulses per revolution
- 3-point fixing



Notes

- ▶ Output A05 suitable for Siemens control systems with RS422 input
- ▶ Output G05 suitable for Fanuc control systems



Series	Number of pulses per revolution	Connection	Detent positions	Outputs	Order No./item
	25	T Screw terminal	100	$\begin{array}{c} \textbf{G12} \\ \textbf{Push-pull 5 V} \\ \textbf{U}_{B} = 12 \ \textbf{V DC} \end{array}$	072975 HWB025T100G12/V05 (5 ea.)
HWB Packaging unit 5 ea.	100	T Screw terminal	100	A05 RS422A U _B = 5 V DC	072973 HWB10T100A05/V05 (5 ea.)
	100		100	G05 Push-pull 5 V U _B = 5 V DC	072974 HWB100T100G05/V05 (5 ea.)



Parameter		Value	Unit
Pulses per revolution		5 or 2 x 100	Onic
Detent positions	2 / 2	100	
Housing material	Pla	stic/metal	
Weight	1 10	0.125	kg
Detent mechanism	M	lechanical	ng ng
Shaft loading, axial, max.	IV	25	N
Shaft loading, radial, max.		40	N N
Mechanical life, min.		1 x 10 ⁶	Rev.
) +50	°C
Operating temperature		°C	
Storage temperature		0 +50	C
Atmospheric humidity, max.	80% (condens	ation not permissible) IP65	
Front degree of protection acc. to EN 60529/IEC 529			
acc. to NEMA 250		250-12	
Output circuit RS422A			
Output stage		A05	
Output signals		/A, B, /B	
Operating voltage U _B	5	5 ± 10 %	V DC
Operating current, no load, max.		80	mA
Output specifications	According to RS422A, use	RS422 differential receiver module	
Output signals cw (clockwise rotation)	10	00 pulses	
	<u> </u>	360°	
	90)°	
	, –	+	
	A		
	<u>"</u> =		
	/A		
	_		
	В		
	/B		
	,		
	B	/	
		position area	
Terminal assignment		w terminal T	
	+5V 0V	A A B B	
	[설달]	<u> </u>	
Output circuit, push-pull			
Output stage	G05	G12	
Output signals		A, B	
Operating voltage U _B	5 ± 10 %	12 ± 10 %	V DC
Operating current, no load, max.	<u> </u>	20	mA
Output voltage HIGH (1), min.	4.0	V / 20 mA	1181
LOW (0), max.		V / 20 mA	
Output current per output, max.	0.5	20	mA
	100 pulses	25 pulses	IIIA
Output signals CW (clockwise rotation)	360°	360°	
	*90°.	*90°	
	 • • • 	30	
	A	A [] [
	``_		
		p i i i i	
	В	B ; ; ; ;	
	Detent position area	Detent position areas	
Tarminal acciment		w terminal T	
Terminal assignment			
	+U _B	OV A B	
	ILT-11		



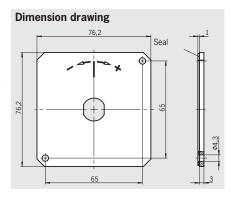
Accessories

Front panel for handwheel HKB

► Front panel with bonded seal

Ordering table

Item	Order no.
Front panel for handwheel HKB with dial 100914, anodized silver	105072
Front panel for handwheel HKB with dial 100914, anodized black	105073



Front panel for handwheel HKD

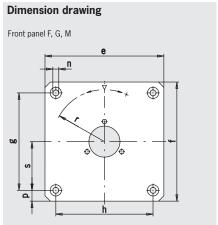
- ► Front panel with bonded seal
- ▶ Seal handwheels without front panel with sealing ring E

Dimensions

Design	е	f	g	h	k	m	n	р	s	r
F	110	110	90	90	-	-	DIN74-Am5	-	-	R48
G	108	108	89	89	-	-	5.2	-	-	R48
M	76.2	76.2	-	-	65	65	4.2	-	-	R35.5

Ordering table

Item	Order no.
Sealing ring E	054861
Front panel F with seal	028760
Front panel G with seal	028761
Front panel M with seal	041758

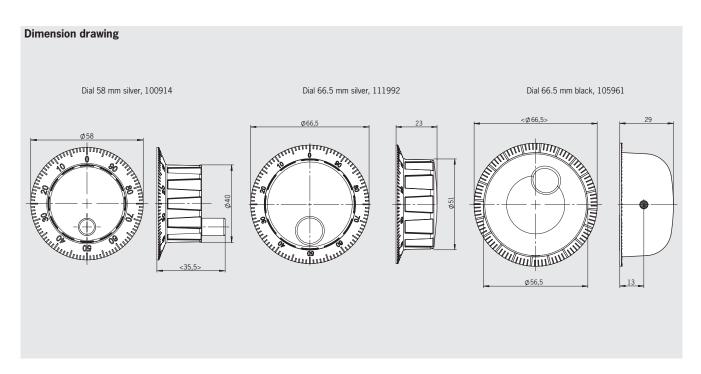


Dials for handwheel HKB

Item	Order no.
Dial 58 mm silver, metal with crank 1)	100914
Dial 66.5 mm silver, metal with finger recess 1) 2)	111992
Dial 66.5 mm black, plastic with finger recess ²⁾	105961

Suitable for installation in operator panels

²⁾ For use of handwheel HKB in the kits for hand-held pendant stations HBA and HBM $\,$





Dials for handwheel HKD

Dimensions

Design	∅ a	∅ b	С
Dial 90 mm	90	63	41
Dial 78 mm	78	63	39
Dial 75 mm	75	63	39
Dial 65 mm	65	44	42
Dial 58 mm	58	44	40

Item	Order no.
Dial 90 mm black	057266
Dial 90 mm silver	057268
Dial 78 mm black	057280
Dial 78 mm silver	057272
Dial 75 mm silver	072597
Dial 65 mm black, for HBL kit	057318
Dial 65 mm silver, for HBL kit	057314
Dial 58 mm black	059276

