KHM5 - KHK5 - KHO5

58MM SOLID - BLIND - HOLLOW SHAFT INCREMENTAL ENCODERS WITH COMMUTATION TRACKS

Features

Based on a proven solid and reliable mechanical and electrical platform, this product series was designed and built for reliability and robustness. Electrical protection is built-in to reduce "first installation" errors. Mechanically, the high precision sealed bearings were chosen for long life, even in harsh conditions. And the product is tested and rated to perform from -40° to 100°C. Standard commutation options go as high as 16 pole pairs to handle a range of commutation requirements. This is an excellent 58MM encoder for general use in heavy duty industrial environments.

Features

KH_5 Rotary Incremental Encoder:

- Robust and excellent resistance to shocks / vibrations
- High Protection Level IP65, IP67 Option with a Sealing Flange
- High Resolutions Available: Up to 500 000 ppr
- Commutation channels up to 16 pole pairs
- Universal Electronic Circuits from 4.75 to 30 Vdc
- High Performance in Temperatures –40°C to 100°C
- High bandwidth: Up to 1MHz

Applications

- Industrial automation
- Automated guided vehicles
- Mills for lumber, steel & other metals
- Printing & packaging equipment
- Food processing equipment
- Forming & die presses

SPECIFICATIONS

Mechanical

		KHM5	KHK5	KHO5
Material		**Cover**: Zinc Alloy **Body:** Aluminium **Shaft:** Stainless Steel		
Bearings		6000 Series	6803 Series	
Maximum Loads	**Axial**	50 N	20 N	
	Radial	100 N	50 N	
Shaft inertia		$2{,}5.10^{-6}$ kg.m² (10mm)	$2{,}9.10^{-6}$ kg.m² (14mm)	$3{,}2.10^{-6}$ kg.m² (14mm)
Torque		4.10^{-3} N.m	16.10^{-3} N.m	20.10^{-3} N.m
Permissible Max. Speed		12 000 min^{-1}	6 000 min^{-1}	
Continuous Max. Speed		10 000 min^{-1}	6 000 min^{-1}	
Encoder Weight (Approx.)		0,300 kg		
Theoretical Mechanical Lifetime(F_{axial} / F_{radial})		26 $X10^9$ turns	>36 $X10^9$ turns	

Electrical

Ver.	Output Signals	Operating Voltage +V	Supply Current (no loads)	Current per Channel Pair	Short Circuit Proof	Reverse Polarity Tolerant	Frequency Capability	Resolutions category[1]	Operating Temperature Range[2][3]
RG5	HTL	4,75-30V	<75mA	<40mA	Yes	Yes	Up to 1MHz	Standard Low	-40°C ... +100°C
RP5	HTL	4,75-30V	<75mA	<40mA	Yes	Yes	Up to 1MHz	Programmable	-40°C ... +100°C
2G2	TTL	5V ± 5%	<75mA	<40mA	Yes	Yes	Up to 1MHz	Standard Low	-40°C ... +100°C

[1] See resolutions section for details.
[2] Surface encoder temperature.
[3] UL Listed: -20°C +80°C. Device must be supplied by a Class 2, LPS or SELV limited energy source 250mA.

Environmental

Shocks (EN 60068-2-27)	≤ 500 $m.s^{-2}$ (during 6 ms)
Vibrations (EN 60068-2-6)	≤ 200 $m.s^{-2}$ (10…2 000Hz))
EMC	EN 61000-6-2, EN 61000-6-4
Isolation	1 000V eff
Operating Temperature	See Electrical table above
Storage Temperature	- 40° ... + 100°C
Protection (EN 60529)	IP 65
Humidity	98% RH non-condensing at 20 °C

STANDARD CONNECTIONS

		-	+	A	B	Z	A/	B/	Z/	U	V	W	U/	V/	W/	Ground
KN	PVC cable 16 wires	WH (White)	BN (Brown)	GN (Green)	YE (Yellow)	GY (Gray)	OR (Orange)	BU (Blue)	RD (Red)	WH-GN (White-Green)	WH-YE (White-Yellow)	WH-BK (White-Black)	WH-OR (White-Orange)	WH-RD (White-Red)	WH-BN (White-Brown)	General shielding

RESOLUTIONS

Standard resolutions:
– Incremental channels (AA/ BB/ ZZ/): 1000, 1024, 2000, 2048, 2500, 4000, 4096, 5000, 10000
– Commutation tracks (UU/ VV/ WW/): 4 poles pair

Low resolutions[4]: (not found in the Standard resolutions range):
– Incremental channels (AA/ BB/ ZZ/): any resolution within the 1-2500ppr range.
– Commutation tracks (UU/ VV/ WW/): 1 to 16 poles pair

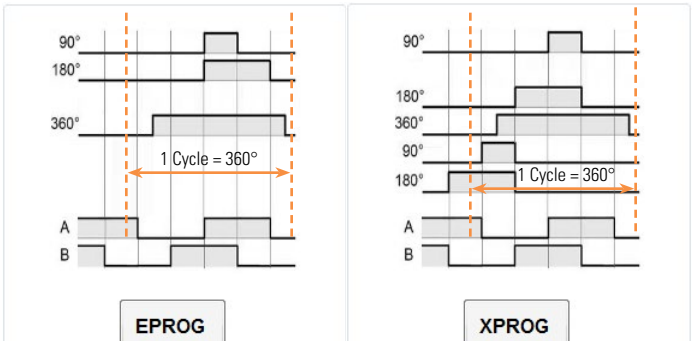
Programmable resolutions [4] (RP5 electronics):
Incremental channels (AA/ BB/):
from 1 to 10kppr

Index tracks ZZ/:
Standard index tracks configuration (EPROG in ordering key)
Alternate index tracks configuration (XPROG in ordering key)

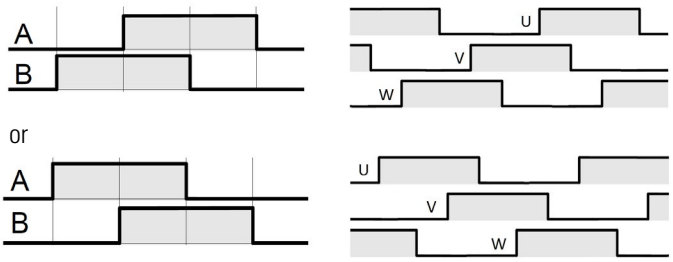
Commutation tracks (UU/ VV/ WW/):
1 to 16 poles pairs

Direction:
A before B with U before V before W
B before A with W before V before U
RP5 electronics can be configured with the programming tool P/N EAP-001 (ordered separately). Programming procedure available in Instruction Manual.

Index track gating possibilities[5]



Directions Possibilities[5]

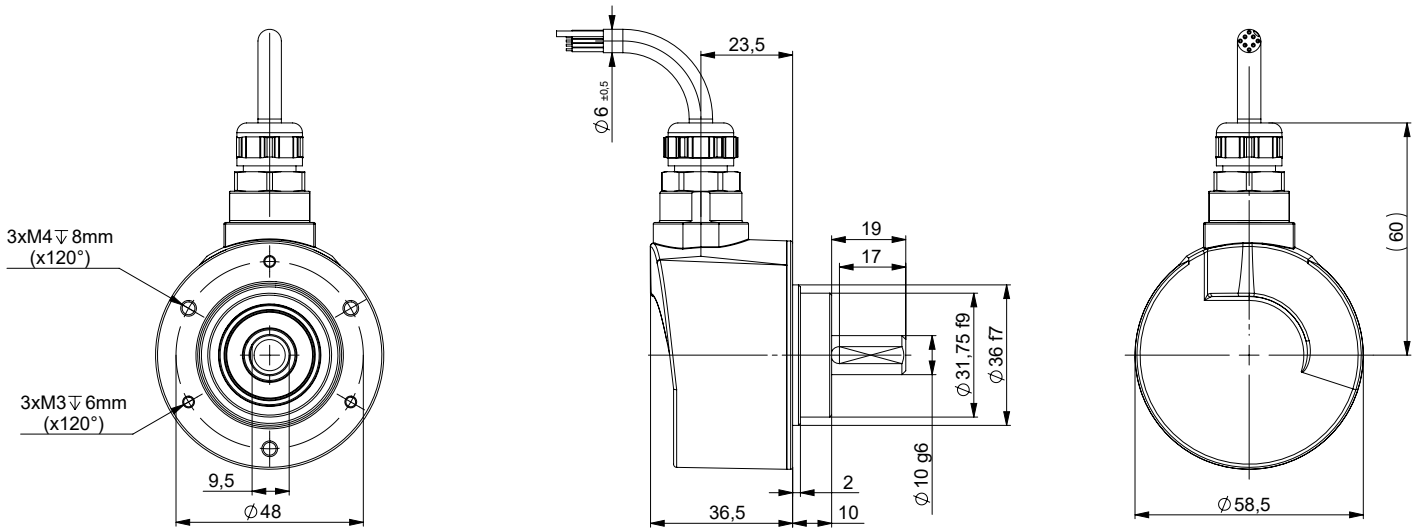


[4] Signal tolerances available in Instructions Manual
[5] Signals are shown for CW rotation when viewed from the face side of the encoder

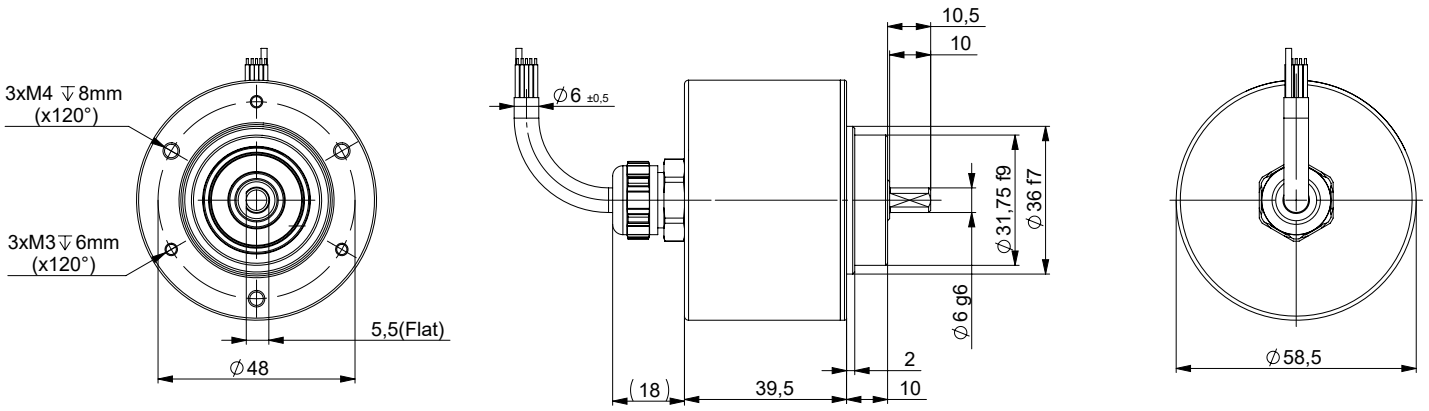
DIMENSIONS

All dimensions are in millimeters.

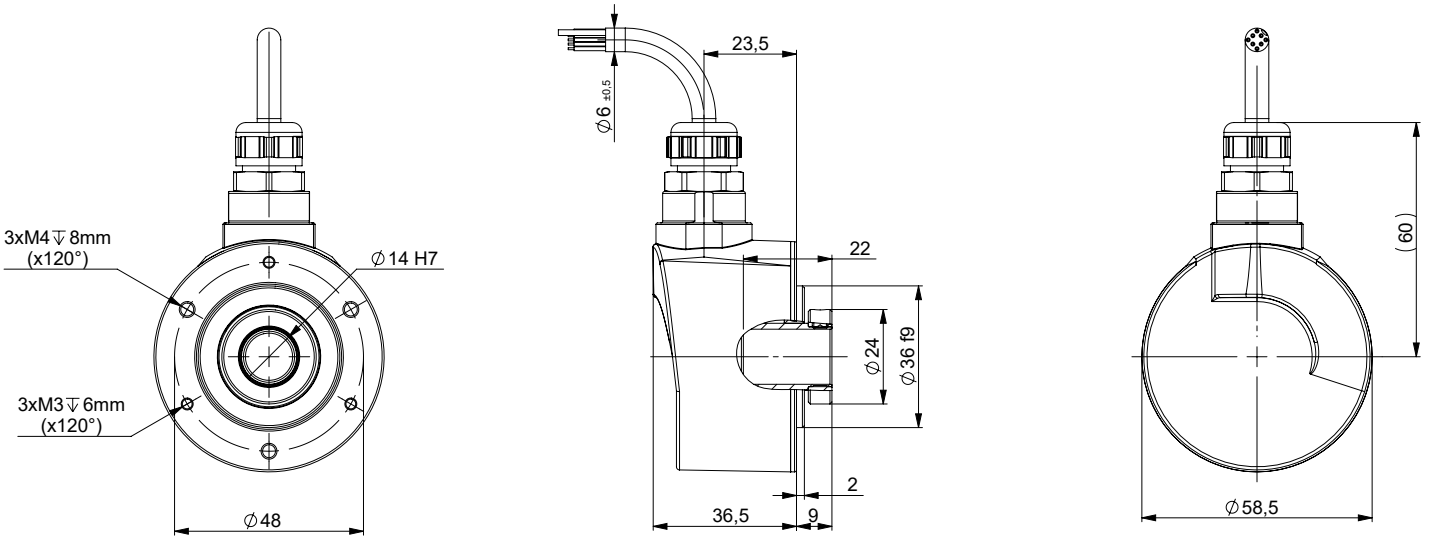
KHM5_10 Connection KNR (Radial cable)



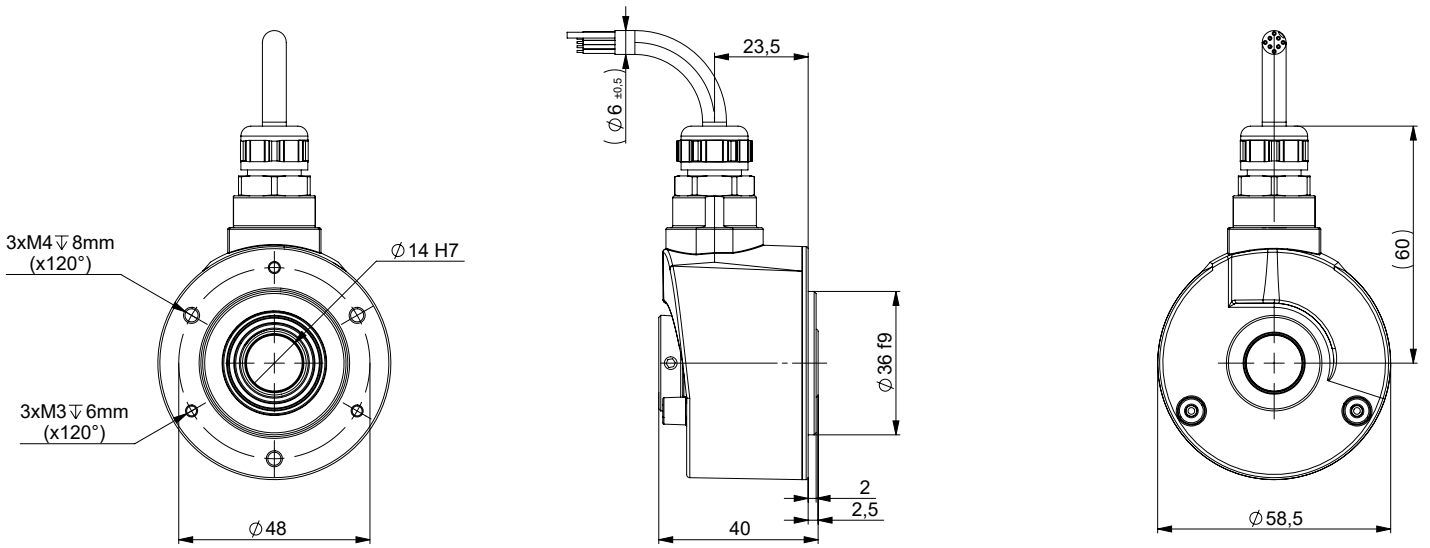
KHM5_06 Connection KNA (Axial cable)



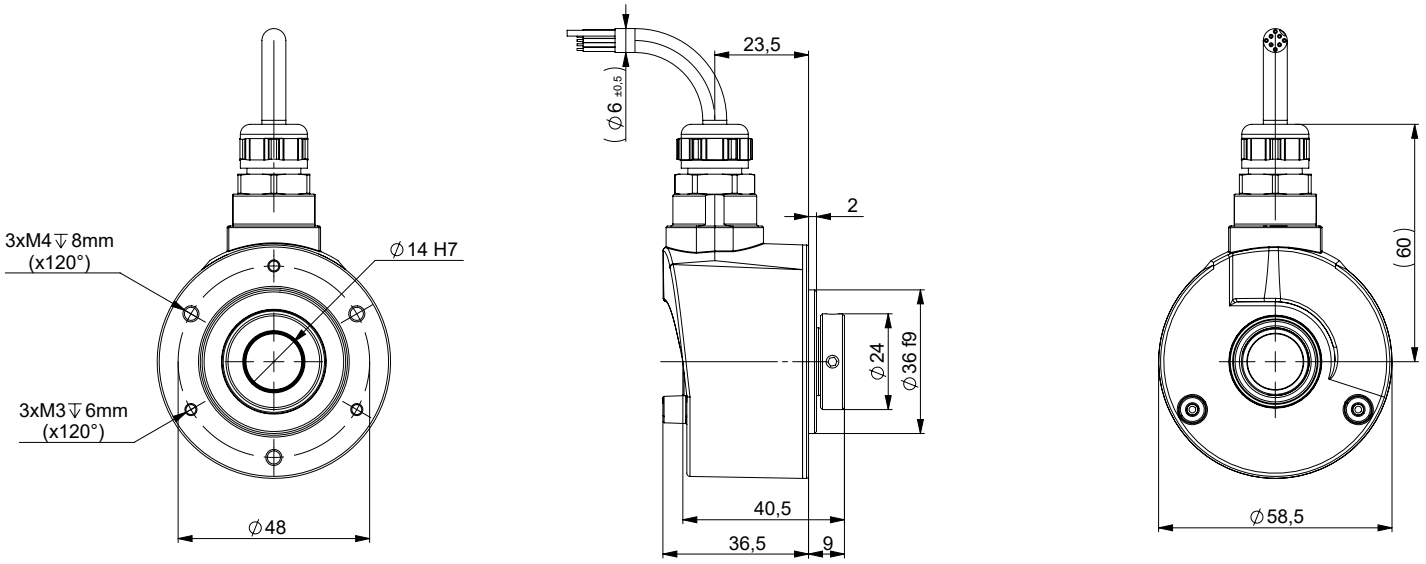
KHK5_14 Connection KNR (Radial cable)



KHO5_14 standard clamping, Connection KNR (Radial cable)



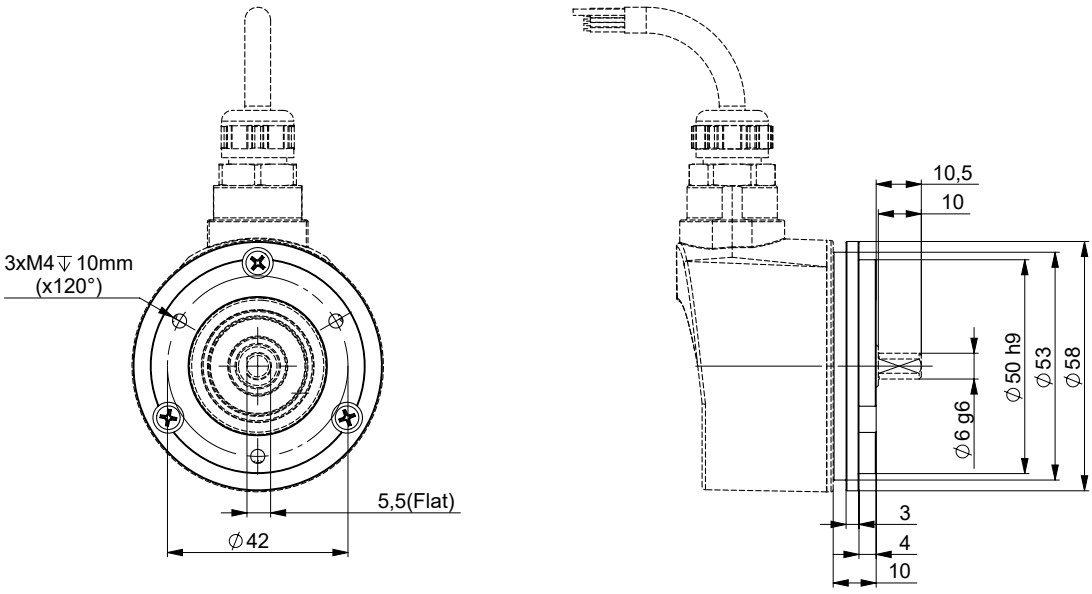
KHO5S14/OM/ Flange side clamping, Connection KNR (Radial cable)



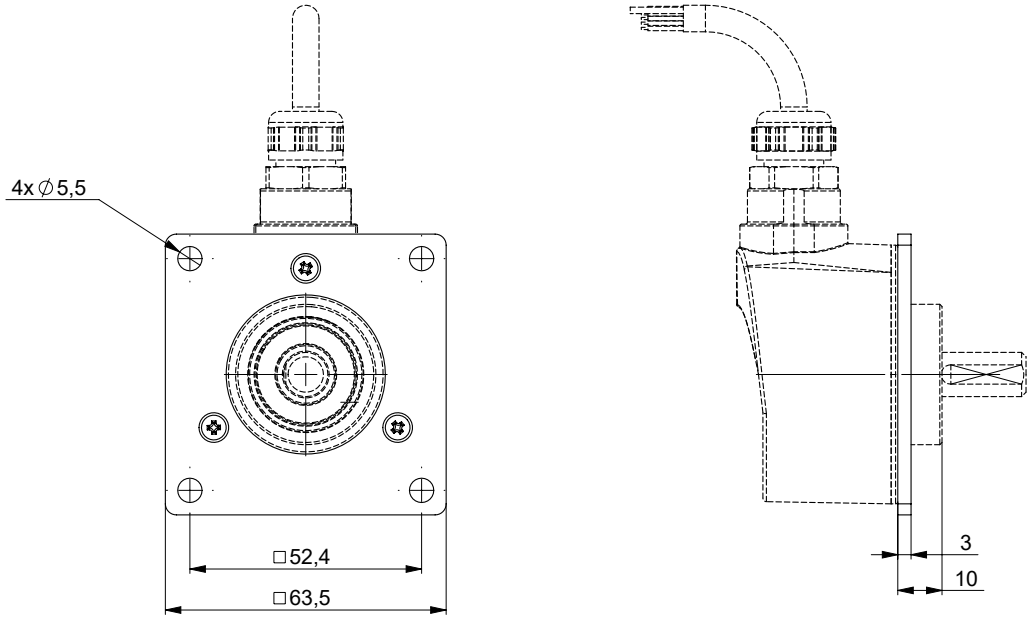
FLANGE AND COUPLING INTERFACES

The flange or coupling configurations can be defined in the ordering options. Selections are installed on the encoder at the factory. Flange or coupling kits can also be ordered separately (see Accessories section).

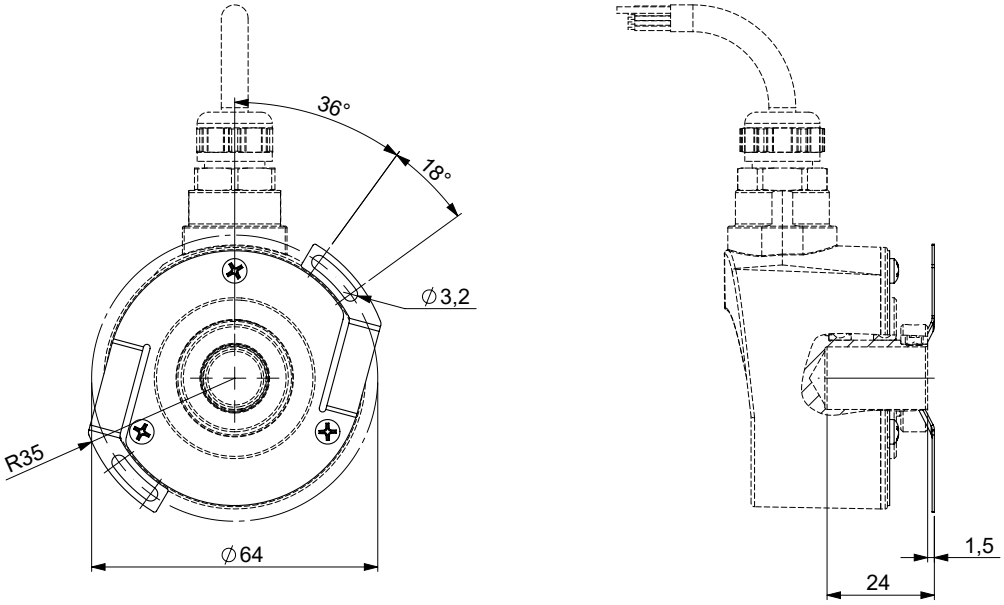
KHM5_06 Connection KNR (Radial cable), flange 9500/003 mounted on the body



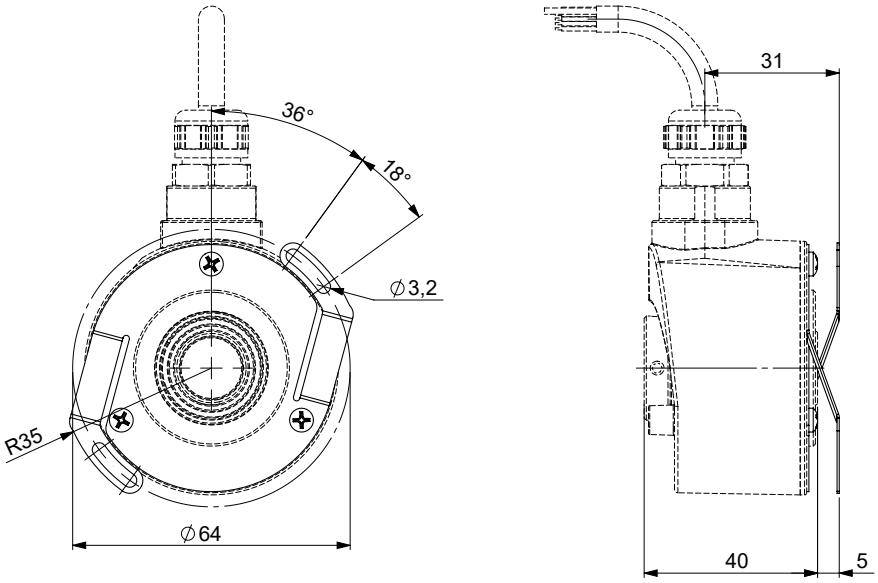
KHM5_10 Connection KNR (Radial cable), flange 9500/005 mounted on the body



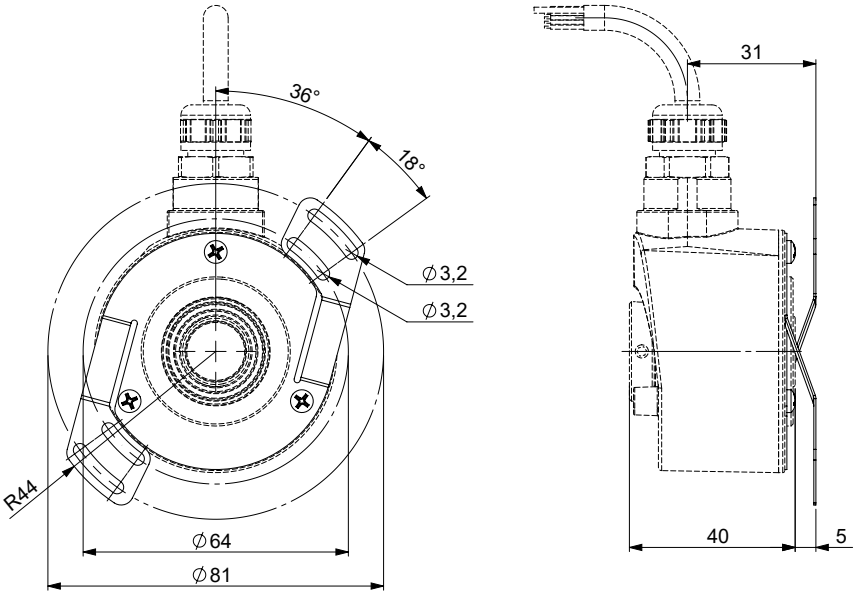
KHK5_14 Connection KNR (Radial cable), coupling 9445/016 mounted on the body



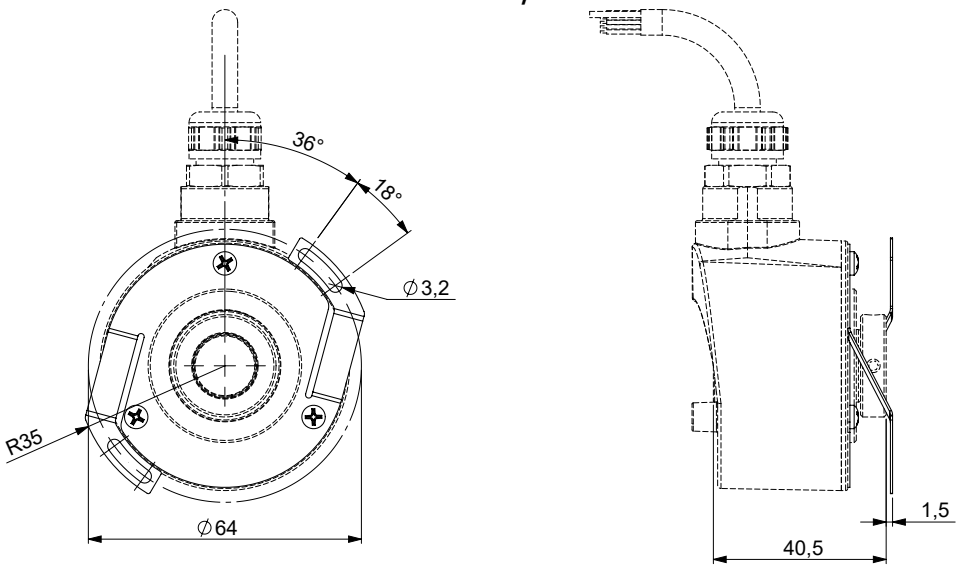
KHO5_14 Standard clamping, Connection KNR (Radial Cable), coupling 9445/012 mounted on the body



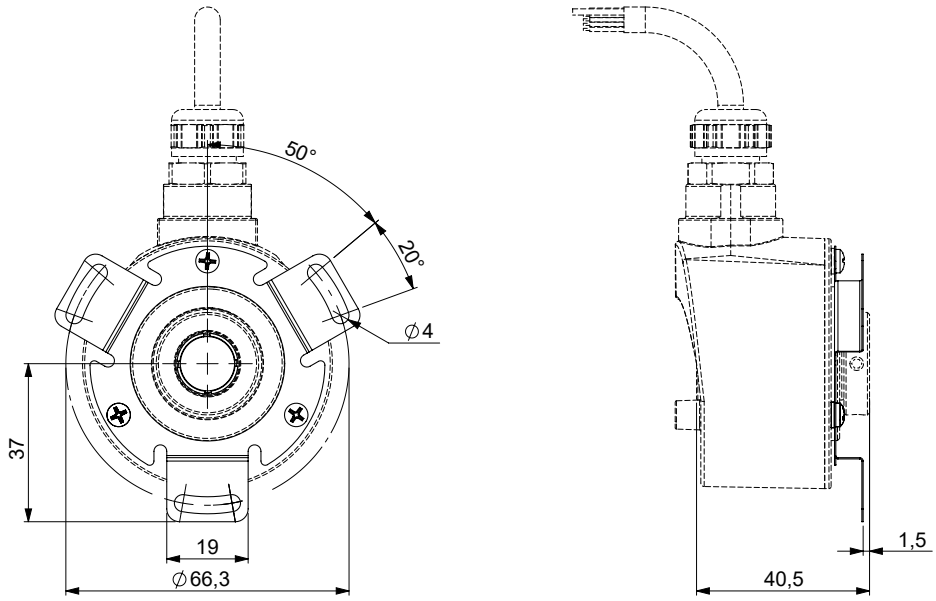
KHO5_14 Standard clamping, Connection KNR (Radial Cable), coupling 9445/015 mounted on the body



KHO5S14/OM/ Flange side clamping, Connection KNR (Radial cable), coupling 9445/016 mounted on the body



KHO5E4 Flange side clamping, Connection KNR (Radial cable), coupling 9445/068 mounted on the body



Note: 9445/068 coupling is available for replacing the previous HS22 model.

GENERAL NOTES

For an optimized installation meeting industrial standards, refer to the Installation Manual.
The Installation Manual provides the technical information (drawings, electrical data, etc...) for a proper integration.

AGENCY APPROVALS & CERTIFICATIONS

CE
c UL us LISTED Proc. Cont. Eq. E477663
RoHS

ORDERING OPTIONS

Example: KHO5_14//2G2L//01024K4//KNR020//D0D9**

KHO5 _ 14 / / 2G2 L// 01024 K4 // KN R 020 // D0D9**

Family

KHM5: Solid Shaft Encoder
KHK5: Blind Shaft Encoder
KHO5: Hollow Shaft Encoder

Shaft Size

KHM5	KHK5 or KHO5:
06: 6 mm	**10**: 10 mm
09: 9.52 mm	**12:** 12 mm
10: 10 mm	**14:** 14 mm
08: 8mm (Option)	**15:** 15mm (Option)
	E2: 1/4" (6.35 mm)
	E3: 3/8" (9.52 mm)
	E4: 1/2" (12.7 mm

Contact factory for other configurations

Mechanical Option

Blank: No option
OM: Flange side clamping

Voltage Output

2G2: 5V TTL
RG5: 4.75-30V HTL
RP5: 4.75-30V HTL Programmable

Signals

For all configurations AA/ BB/ ZZ/ & UU/ VV/ WW/ signals are referenced to CW rotation when viewed from the face side of the encoder
G//: B before A, W before V before U, Z gated with A&B high
G/US/: B before A, W before V before U, Z gated with A&B low
L//: A before B, U before V before W, Z gated with A&B high
L/US/: A before B, U before V before W, Z gated with A&B low
P//: B before A, U before V before W, Z gated with A&B high
P/US/: B before A, U before V before W, Z gated with A&B low
Y//: B before A, W before V before U, Z gated with B high
Y/US/: B before A, W before V before U, Z gated with B low (for replacing the previous HS22 model)
X//: Programmable channels (RP5 electronics)

Cycles / Turn

(Enter Cycles) Standard and low resolutions. See available resolutions in "Resolutions" section.
EPROG: Full programmable 1-10kppr (standard index tracks configurations).
XPROG: Full programmable 1-10kppr (alternate index tracks configurations).

Commutation Tracks

K1 to **K16:** 1 to 16 poles pairs (K4 = 4 pole pairs = 8 pole motor)
See possibilities in "Resolutions" section.
Contact factory for other pole pair configurations.

Output Termination

KN: PVC cable

Output Orientation

R: Radial (All configurations)
A: Axial (KHM5 and KHK5 only)

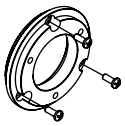
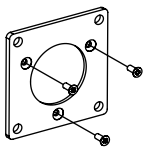
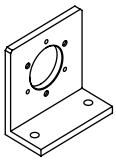
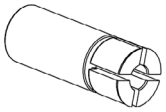
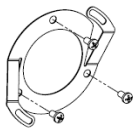
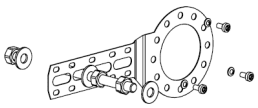
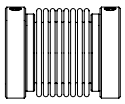
Cable Length

xxx: Cable Length (ex.: 020 = 2 Meters)

Accessories

D0**:** KHO5 with aluminum reduction sleeve
D1**:** KHO5 with insulated reduction sleeve
D2**:** KHK5 with aluminum reduction sleeve
****DS**:** 9445/012 KHO5 Stator coupling
****DD**:** 9445/015 KHO5 Stator coupling
****D9**:** 9445/068 KHO5 stator coupling (for replacing previous HS22 model)
****DK**:** 9445/016 KHK5 & KHO5.../OM/ Stator coupling
****03**:** 9500/003 Synchro flange
****05**:** 9500/005 Square flange

ACCESSORIES

Description	Part Number		
Synchro flange kit Hardware included 	M9500/003 Other synchro flanges dimensions available on request		
Square flange kit Hardware included 	M9500/005 Other square flanges dimensions available on request		
Mounting bracket Hardware included 	M9202 (Compatible with all models)		
Reduction sleeve 	Insulated (PEEK) KHO5 9431/I06 9431/I08 9431/I10 9431/I12	Non insulated (Aluminum) KHO5 / KHK5 9431/A06 9431/K06 9431/A08 9431/K08 9431/A10 9431/K10 9431/A12 9431/K12	Bore size (H7) 6 mm 1/4" (6.35 mm) 8 mm 3/8" (9.52 mm) 10 mm 1/2" (12.7 mm) 12 mm
Stator coupling kit Hardware included 	P/N M9445/012 M9445/015 M9445/016 M9445/068	Recommended use/Compatibility KHO5 KHK5 & KHO5 KHK5 & KHO5 with /OM/ option KHK5 & KHO5 retrofit for HS22	Fixing points 2 4 2 3
	Other stator coupling configurations available on request		
Tether arm kit Hardware included 	M9445/047 (Compatible with KHK5 and KHO5 models)		
Bellows coupling 	9403/xx-yy with: xx = 06 to 12 (side 1 bore diameter in mm) yy = 06 to 12 (side 2 bore diameter in mm) + Imperial sizes available: 6.35, 9.52, 12.7 (mm) Installation: Refer to Instruction Manual		

Mailing Address: Sensata Technologies, Inc., 529 Pleasant Street, Attleboro, MA 02703, USA

CONTACT US

Americas
+1 (800) 350 2727
sensors@sensata.com
Europe, Middle East & Africa
+33 (3) 88 20 8080
position-info.eu@sensata.com
Asia Pacific
sales.isasia@list.sensata.com
China +86 (21) 2306 1500
Japan +81 (45) 277 7117
Korea +82 (31) 601 2004
India +91 (80) 67920890
Rest of Asia +886 (2) 27602006 ext 2808

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