DHM5 - DHK5 - DHO5

58MM SOLID - BLIND - HOLLOW SHAFT INCREMENTAL ENCODERS

Introduction

Built from a solid and reliable mechanical and electrical platform, this product series was built from the ground up for reliability and robustness. Electrical protection is built in to reduce "first installation" errors. Mechanically, the high precision sealed bearings mean long life, even in harsh conditions. And the product is tested and rated to perform from -40°C to +100°C for operation in extreme environments. This is the best all around encoder in a 58mm package for heavy duty industrial use.

Features

DH_5 Rotary Incremental Encoder :

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

Applications

- Factory automation
- Motor feedback
- Conveyors
- Automated warehousing
- General industrial system monitoring and feedback

SPECIFICATIONS

Mechanical

		DHM5	DHK5	DHO5
Material		**Cover**: Zinc Alloy **Body:** Aluminum **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.m^2 (10mm)	2,9.10-6 kg.m^2 (14mm)	3,2.10-6 kg.m^2 (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 10^9 turns (F_{axial} / F_{radial})		30 N / 60 N : 26	20 N / 40 N : >36	

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	-40°C ... +100°C
								Low	
								High	-40°C … +80°C
RGX	HTL/TTL selectable	4,75-30V	<75mA	<40mA	HTL: refer RG5 TTL: refer RG2	Yes	Up to 1MHz	Full Programmable	-40°C ... +100°C
								Multiplier programmable	-40°C … +80°C
5GT	HTL + CTP	11-30V	<75mA	<40mA	Yes	Yes	Up to 300kHz	Standard	-40°C … +80°C
								Low	
RG2	TTL	4,75-30V	<75mA	<40mA	Yes (Except to +V)	Yes	Up to 1MHz	Standard	-40°C ... +100°C
								Low	
								High	-40°C … +80°C
2G2	TTL	5V ± 5%	<75mA	<40mA	Yes	Yes	Up to 1MHz	Standard	-40°C ... +100°C
								Low	
								High	-40°C … +80°C
2WT	1Vpp	5V ± 5%	<75mA	<8mA	Yes	Yes	Up to 300kHz	Sine wave	-40°C ... +100°C
RWT	1Vpp	4,75-30V	<75mA	<8mA	Yes (Except to +V)	Yes	Up to 300kHz	Sine wave	-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°C ... +100°C
Protection (EN 60529)	IP 65
Humidity	98% RH non-condensing at 20 °C

STANDARD CONNECTIONS

		-	+	A or S	B or C	Z	A/ or S/	B/ or C/	Z/	Ground
GM	M12 - 8 Pins	1	2	3	4	5	6	7	8	Connector Body
G6	M23 - 12 Pins CW	1	2	3	4	5	6	7	8	Connector Body
G8	M23 - 12 Pins CCW	10 + 11	2 + 12	8	5	3	1	6	4	Connector Body
U3	PVC Cable - 8 Wires	WH (White)	BN (Brown)	GN (Green)	YE (Yellow)	GY (Grey)	PK (Pink)	BU (Blue)	RD (Red)	General Shielding
GC	PUR Cable - 8 Wires	BK (Black)	RD (Red)	GN (Green)	BN (Brown)	VT (Violet)	YE (Yellow)	OG (Orange)	BU (Blue)	General Shielding
G3	PVC Cable - 8 Wires (not UL)	WH (White)	BN (Brown)	GN (Green)	YE (Yellow)	GY (Grey)	PK (Pink)	BU (Blue)	RD (Red)	General Shielding
GP	PUR Cable - 12 Wires (not UL)	WH (White) + WH/GN (White/ Green)	BU (Blue) + BN/GN (Brown/ Green)	GY (Grey)	BN (Brown)	RD (Red)	PK (Pink)	GN (Green)	BK (Black)	General Shielding
TE	Silicone Cable [3] - 8 Wires (Not UL)	WH (White)	BN (Brown)	GN (Green)	YE (Yellow)	GY (Grey)	PK (Pink)	BU (Blue)	RD (Red)	General Shielding

[3] Advised cable for mobile application, in extreme temperature from -40°C to +100°C

RESOLUTIONS

Standard resolutions:
1000, 1024, 1800, 2000, 2048, 2500, 3600, 4000, 4096, 5000, 7200, 10000

Low resolutions[4]: (not found in the Standard resolutions range):
Any resolution within the 1-2500ppr range.

High resolutions: (not found in the Standard resolutions range)
All multipliers of 1000, 1024, 1800, 2500 from 1 to 200.

Programmable resolutions [4] (RGX electronics):
- Full programmable (EPROG):
from 1 to 10kppr with direction and standard index tracks configuration

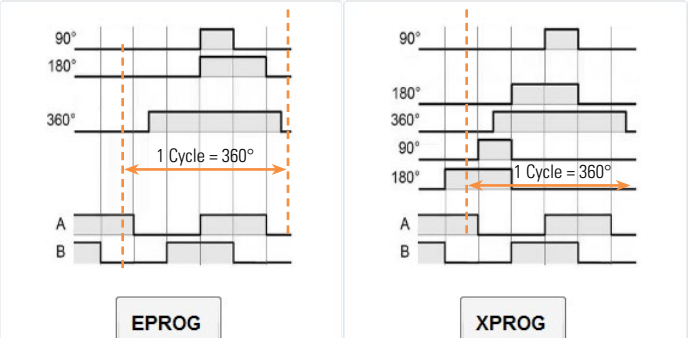
- Full programmable (XPROG):
from 1 to 10kppr with direction and alternate index tracks configuration

- Multiplier programmable (1000, 1024, 1800, 2500 native):
Programmability of the native resolution multiplier from 1 to 200 with direction and all index tracks configurations possibilities

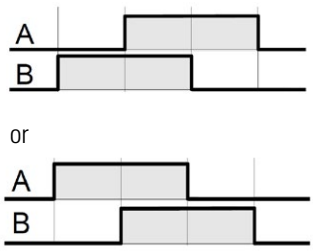
All those versions can be configured with one of the following programming tool P/N (ordered separately):
EAP-001 (for encoder with ''GM'' connection), EAP-002 (for encoder with ''G6'' connection), EAP-003 (for encoder with ''G8'' connection).
Programming procedure available in Instruction Manual.

Sine wave resolutions:
360, 500, 512, 600, 1000, 1024, 1800, 2500

Index track gating possibilities[5]



Directions Possibilities[5]

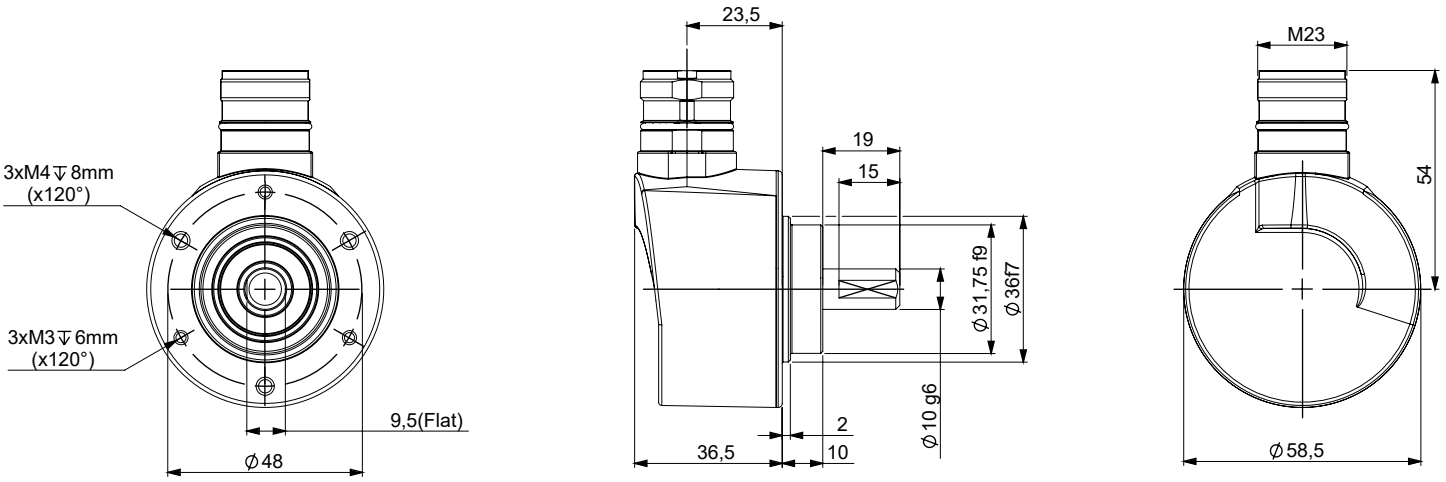


[4] Signal tolerances available in Instructions Manual
[5] Signals are shown for CW rotation when viewed from the face side of the encoder

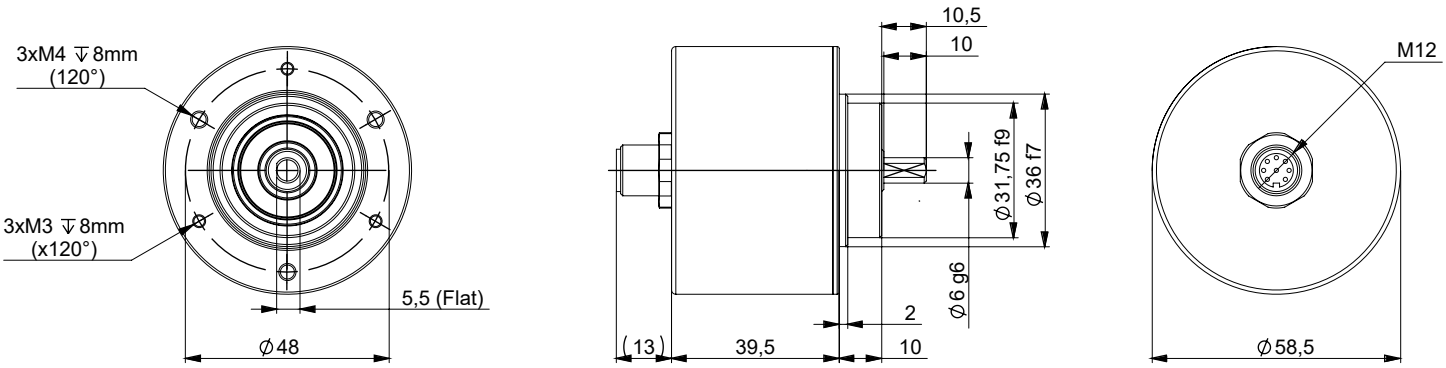
DIMENSIONS

All dimensions are in millimeters.

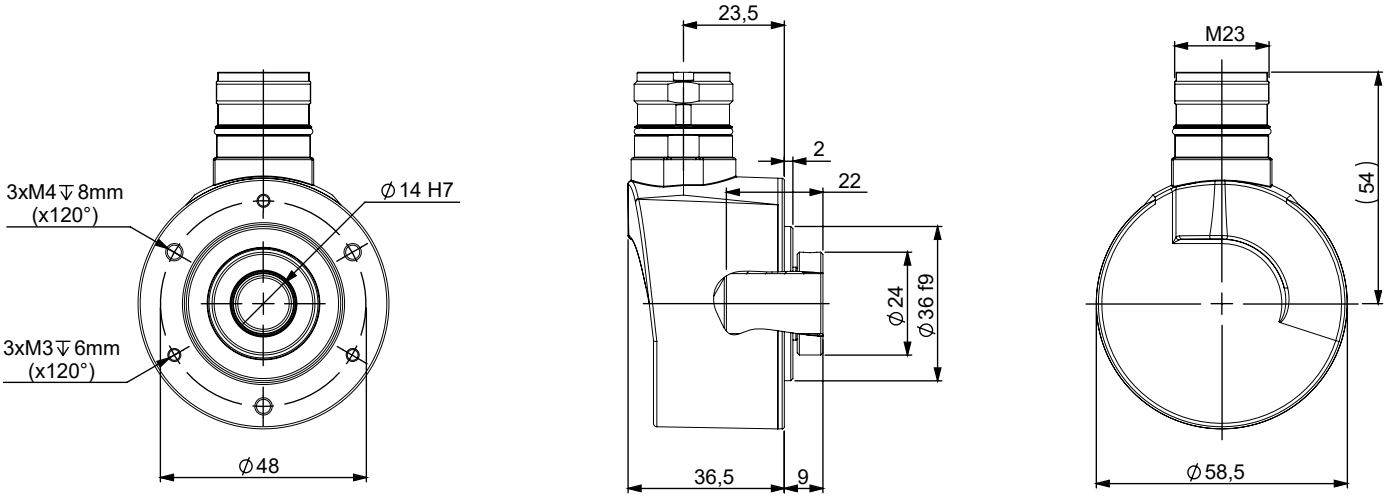
DHM5_10 Connection G6R (Radial M23)



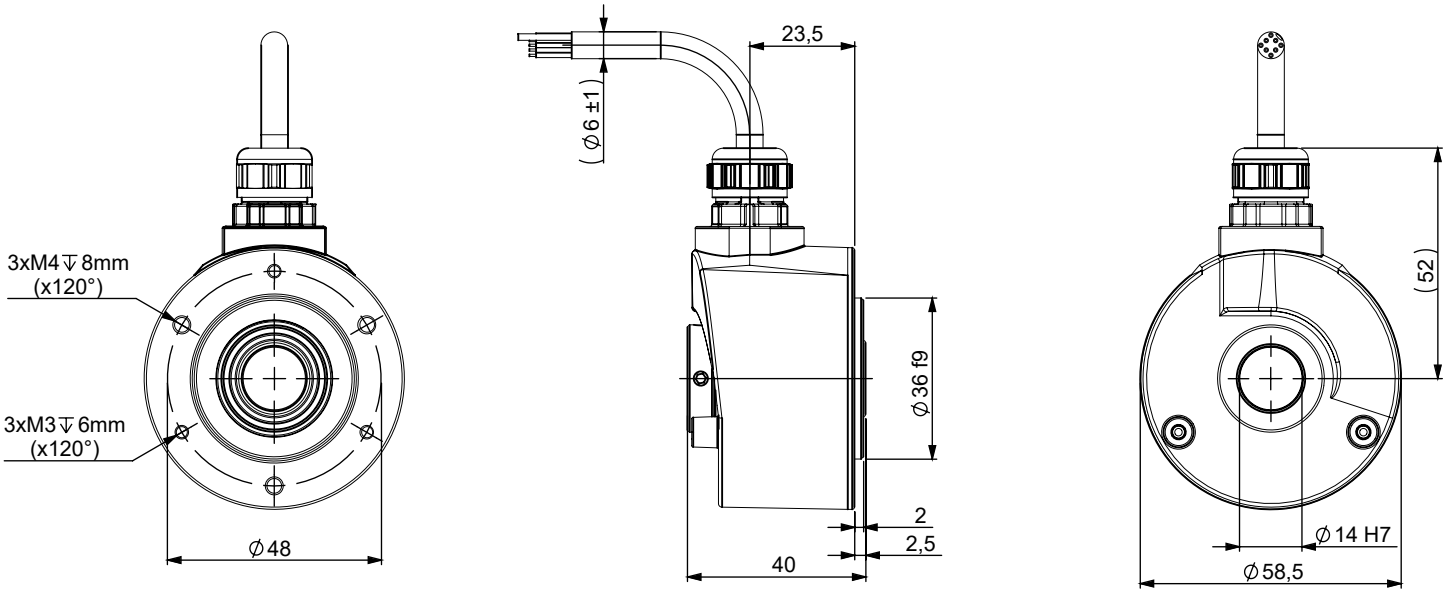
DHM5_06 Connection GMA (Axial M12)



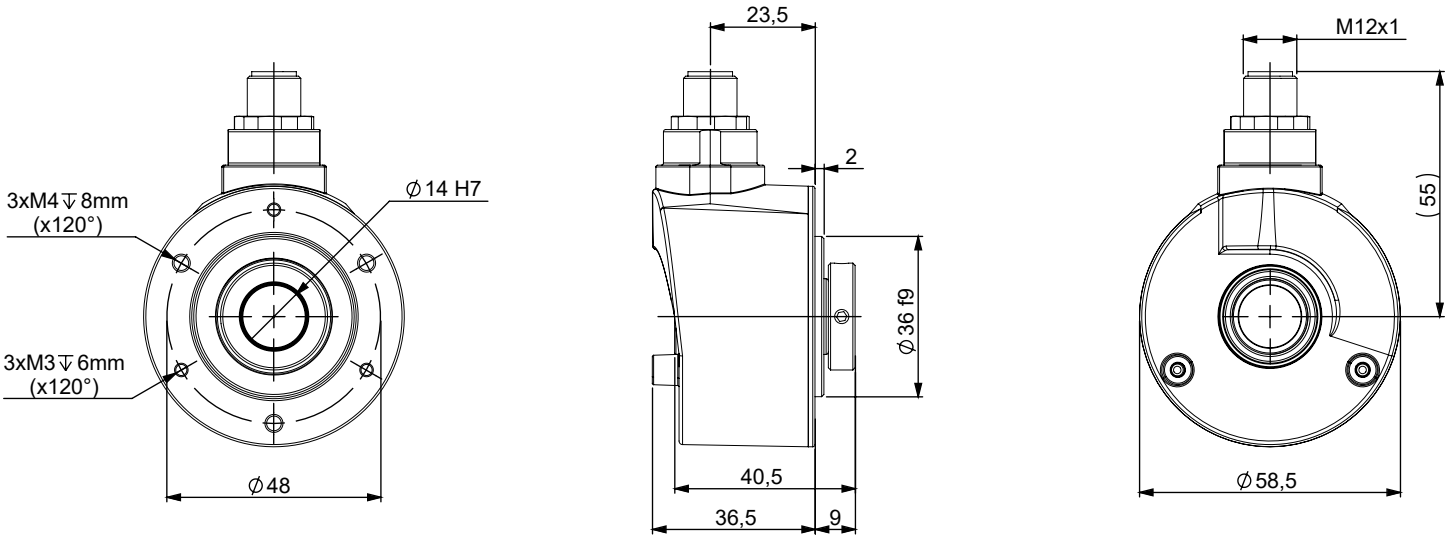
DHK5_14 Connection G6R (Radial M23)



DHO5_14 Standard clamping, Connection G3R (Radial Cable)



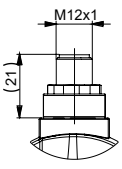
DHO5S14/OM/ Flange side clamping, Connection GMR (Radial M12)



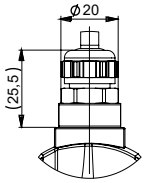
CONNECTION DIMENSIONS

Radial

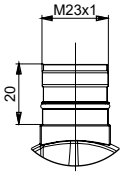
M12 GMR



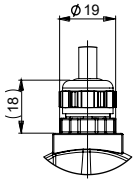
Cable U3R, GCR



M23 G6R, G8R

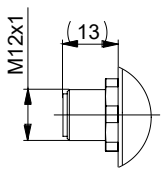


Cable G3R, GPR, TER

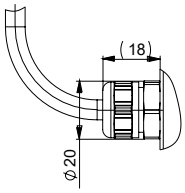


Axial

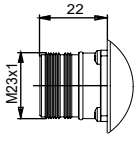
M12 GMA



Cable G3A, U3A, GPA, GCA, TEA



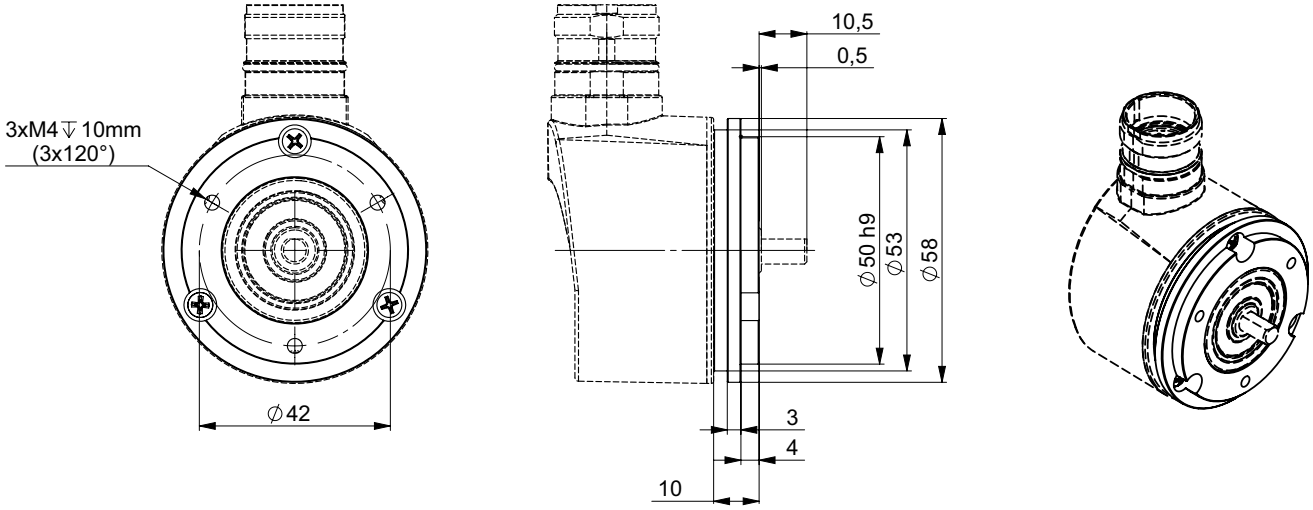
M23 G6A G8A



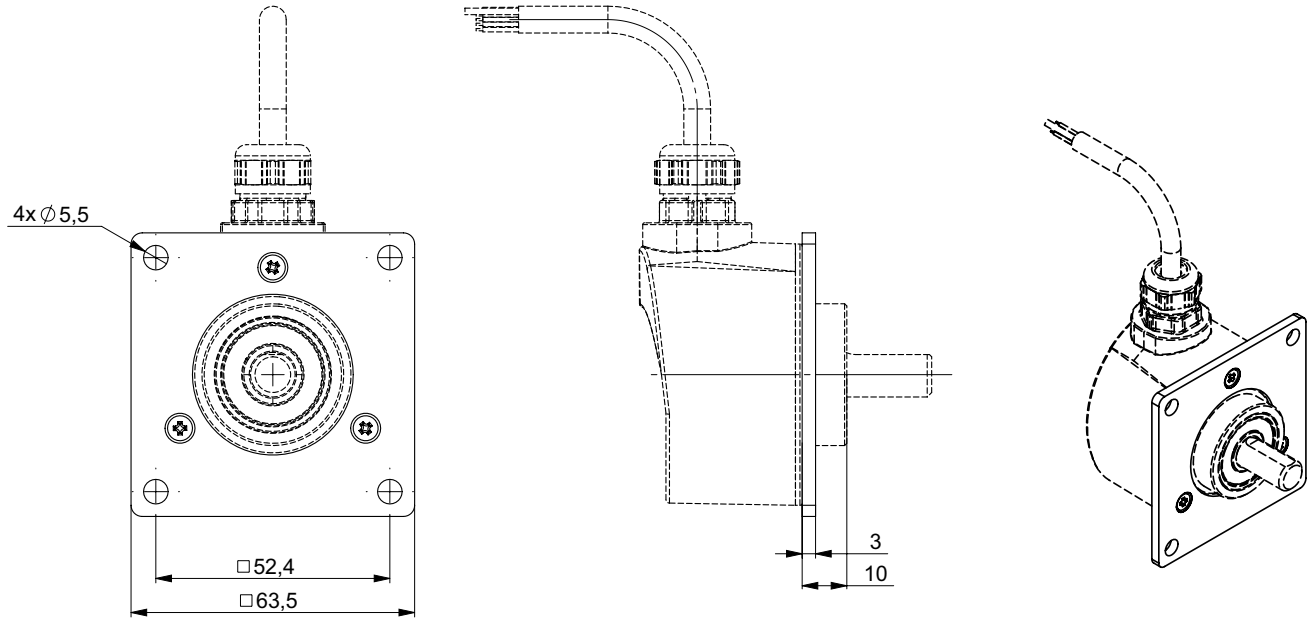
FLANGE AND COUPLING INTERFACES

The flange or coupling configurations can be defined in the ordering options for being installed on encoder in factory.
All flange or coupling kits can also be ordered separately (see accessories section).

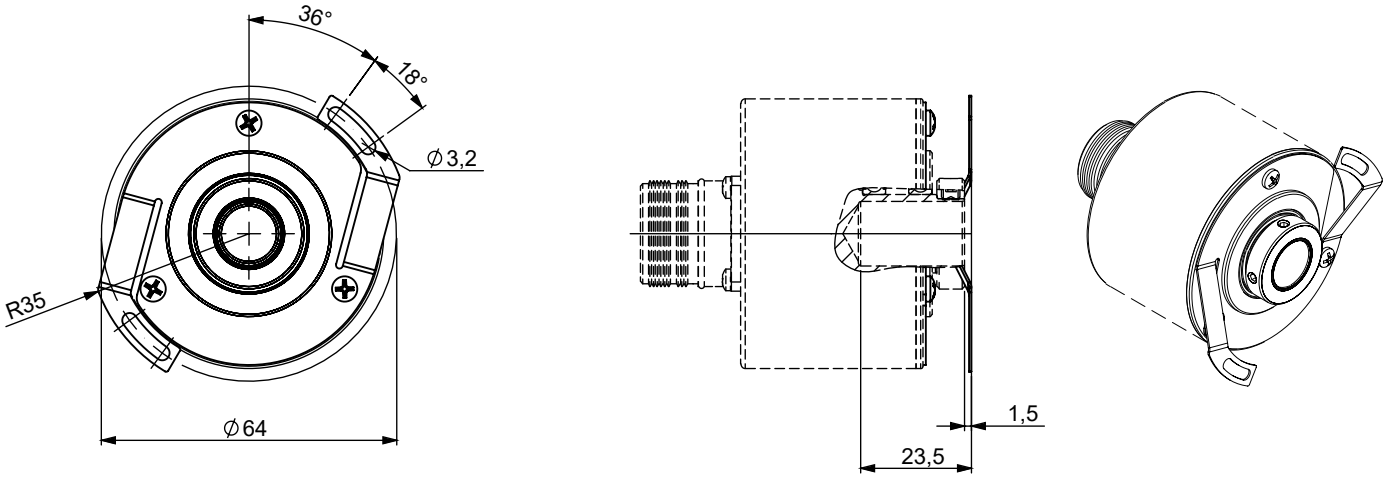
DHM5_06 Connection G6R (Radial M23), flange 9500/003 mounted on the body



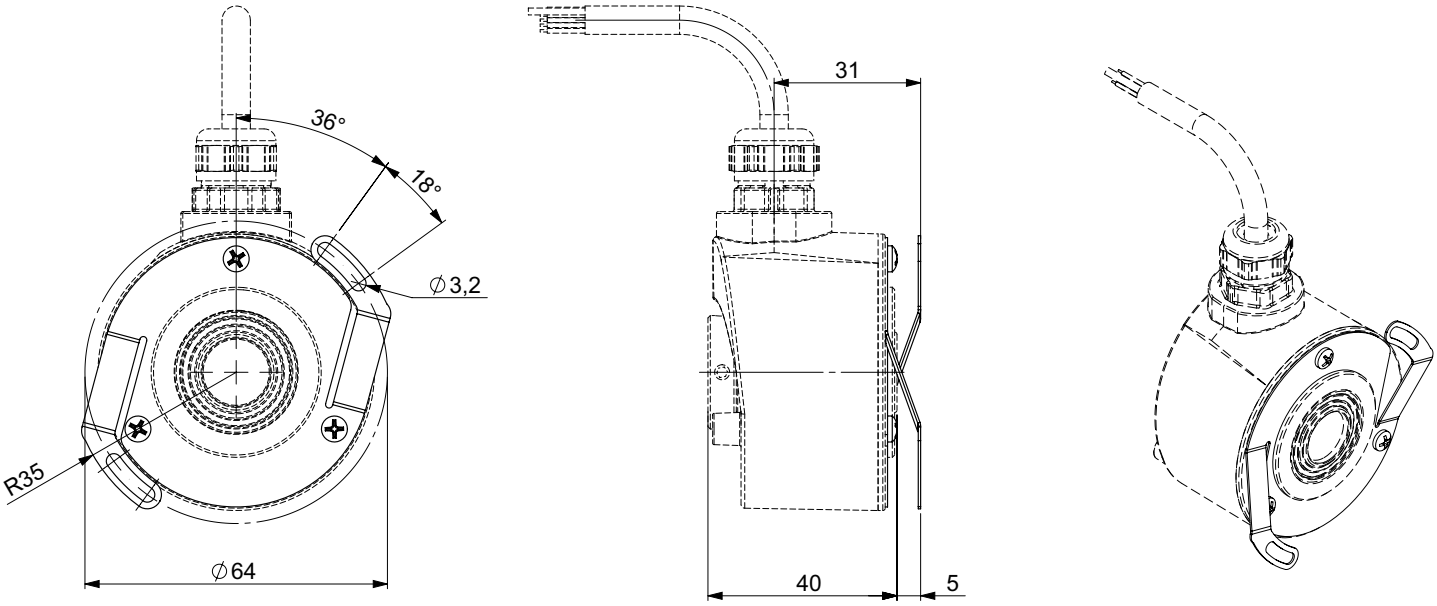
DHM5_10 Connection G3R (Radial cable), flange 9500/005 mounted on the body



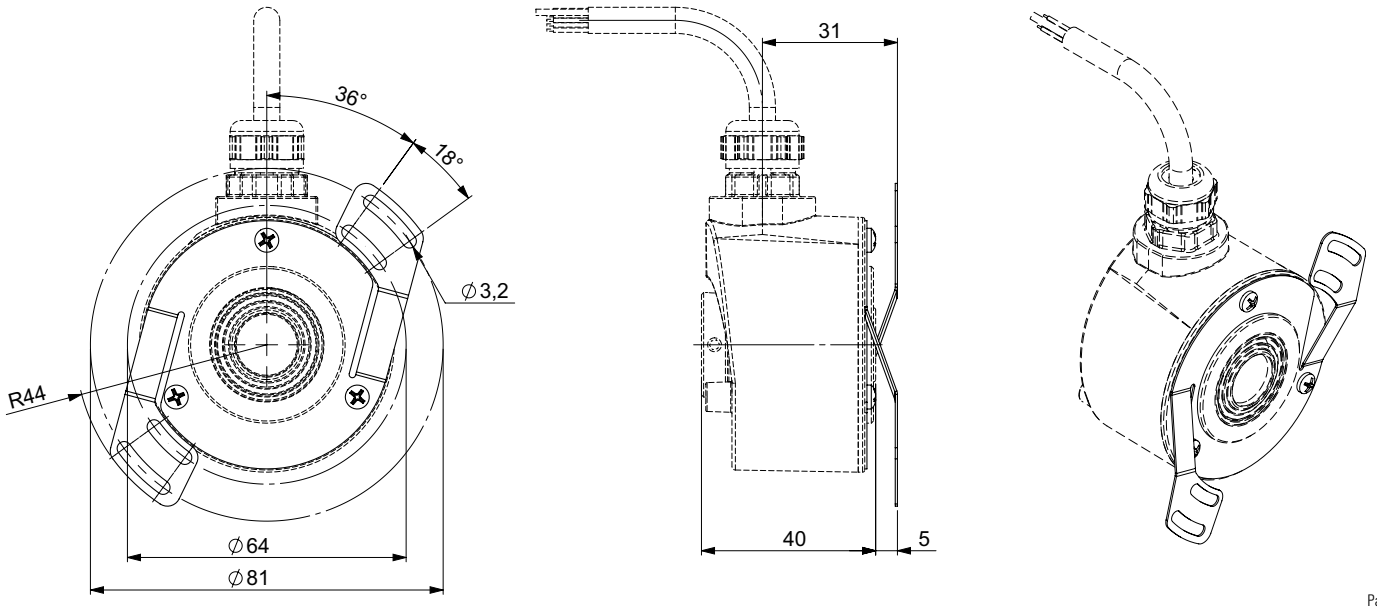
DHK5_14 Connection G6A (Axial M23), coupling 9445/016 mounted on the body



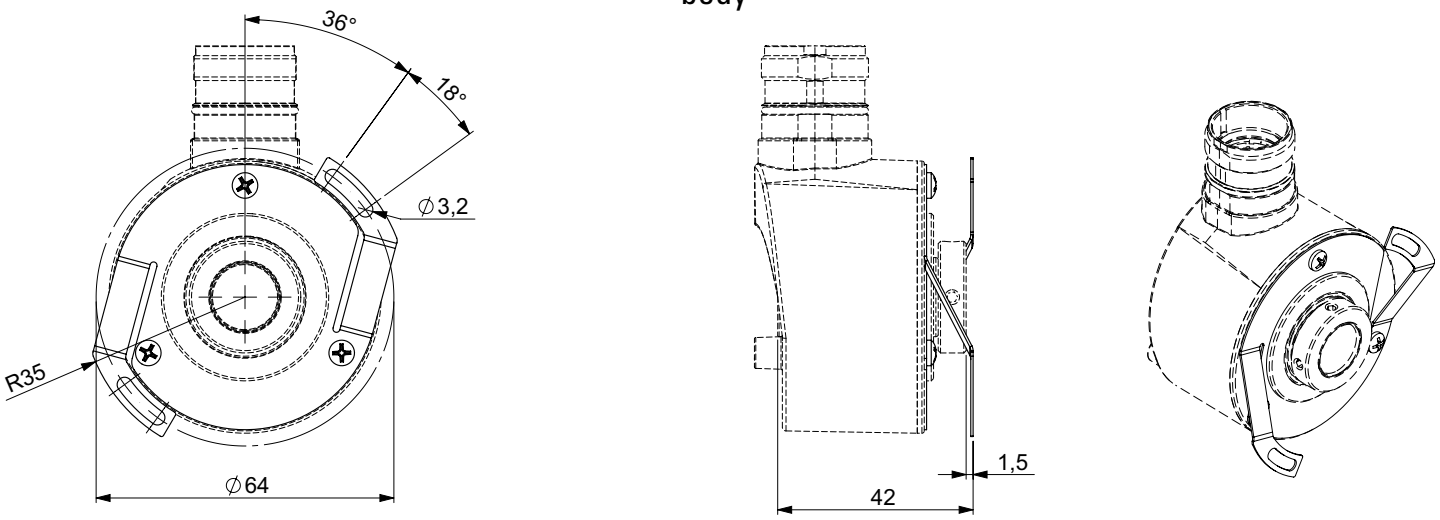
DHO5_14 Standard clamping, Connection G3R (Radial Cable), coupling 9445/012 mounted on the body



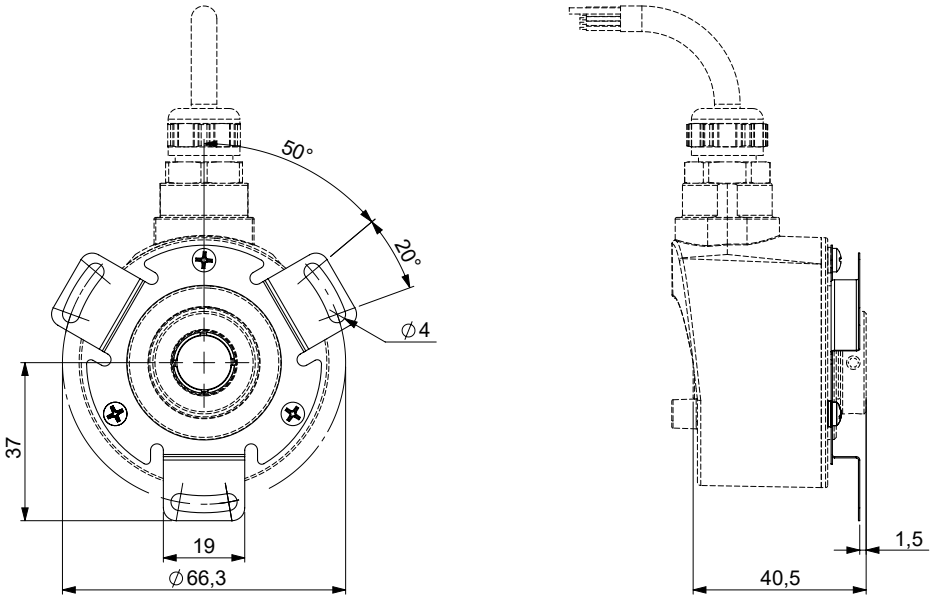
DHO5_14 Standard clamping, Connection G3R (Radial Cable), coupling 9445/015 mounted on the body



DHO5S14/OM/ Flange side clamping, Connection G6R (Radial M23)", coupling 9445/016 mounted on the body



DHO514 Flange side clamping, Connection U3R (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 Instructions Manual.
The Instructions 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 2002/95/EC

ORDERING OPTIONS

Example : DHM5_06//RG59//01024//G3R020//**03**

DHM5	_	06	/		/	RG5	9	//	01024	//	G3	R	020	//	**03**

Family

DHM5: Solid Shaft Encoder
DHK5: Blind Shaft Encoder
DHO5: Hollow Shaft Encoder

Shaft Size

DHM5	DHK5 or DHO5:
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)

Contact factory for other configurations

Mechanical Option

Blank: No option
OM: Flange side clamping

Voltage Output

RG5: 4.75-30V HTL
RGX: 4.75-30V Programmable
5GT: 11-30V HTL+CTP
RG2: 4.75-30V TTL
2G2: 5V TTL
2WT: 5V Analog 1Vpp
RWT: 4.75-30V Analog 1Vpp

Channels

9: Digital electronics
AA/ BB/ ZZ/
B before A, CW viewed from flange side
Z gated A&B
N: Analog electronics
SS/ CC/ ZZ/
C before S, CW viewed from flange side
Z ungated
X: Programmable Electronics (RGX)
Contact factory for other configurations

Cycles / Turn

Contact factory for other configurations

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

Output Termination

G3: PVC Cable
GC: PUR Cable
GP: PUR Cable (not UL)
TE: Silicone Cable (not UL)
GM: M12
G6: M23 12 Pins CW
G8: M23 12 Pins CCW

Output Orientation

R: Radial (All configurations)
A: Axial (DHM5 and DHK5 only)

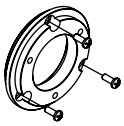
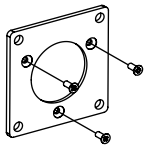
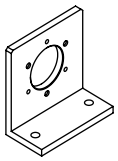
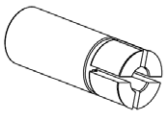
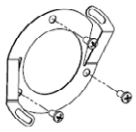
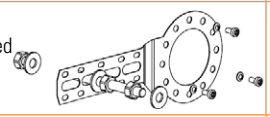
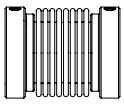
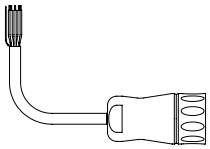
Cable Length

xxx: Cable Length (ex.: 020 = 2 Meters)
Blank: No Cable

Accesories

D0**:** DHO5 with aluminum reduction sleeve
D1**:** DHO5 with insulated reduction sleeve
D2**:** DHK5 with aluminum reduction sleeve
****D2**:** 9445/012 DHO5 Stator coupling
****D4**:** 9445/015 DHO5 Stator coupling
****DK**:** 9445/016 DHK5 & DHO5.../OM/ Stator coupling
****03**:** 9500/003 Synchro flange
****05**:** 9500/005 Square flange
****D9**:** 9445/069 DHO5 Stator coupling (for replacing previous HS22 model).

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) DHO5 9431/I06 9431/I08 9431/I10 9431/I12	Non insulated (Aluminum) DHO5 DHK5 9431/A06 9431/K06 9431/A08 9431/K08 9431/A10 9431/K10 9431/A12 9431/K12	Bore size (H7) 6 mm 8 mm 10 mm 12 mm
Stator coupling kit Hardware included 	P/N M9445/012 M9445/015 M9445/016 M9445/068	Recommended use/Compatibility DHO5 DHK5 & DHO5 DHK5 & DHO5 with /OM/ option DHK5 & DHO5 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 DHK5 and DHO5 models)		
Bellow 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		
Standard Mating Connector 2m, 5m, 10m Mating Cable Assembly 	Extension cords compatible with G6 connection option: RAL-020-001 = M23, PVC cable, 2m RAL-050-001 = M23, PVC cable, 5m RAL-100-001 = M23, PVC cable, 10m	Extension cords compatible with G8 connection option: RAL-020-012 = M23, PUR cable, 2m RAL-050-020 = M23, PUR cable, 5m RAL-100-028 = M23, PUR cable, 10m	Extension cords compatible with GM connection option: 8230/369 = M12 overmolded, PUR cable, 2m 8230/370 = M12 overmolded, PUR cable, 5m 8230/371 = M12 overmolded, PUR cable, 10m

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

Specification No. 02358-001 Rev:08/02/22