

DHM5 - DHK5 - DH05

INCREMENTAL IO-LINK 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 to +85°C. This is the best all around encoder in a 58mm package for heavy duty industrial use.



SPECIFICATIONS

Mechanical

		DHM5	DHK5	DH05
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.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 10⁹ turns (F_{axial} / F_{radial})		30 N / 60 N : 26	20 N / 40 N : >36	

Features

- Incremental encoder with IO-link programmable parameters
- IO-Link COM3 with minimal cycle time of 1ms
- Absolute position available via IO-link
- Easy programming with standard IO-Link tool
- Simple device replacement with Data Storage capability
- Universal Electronic Circuits from 4.75 to 30 Vdc
- Robust and excellent resistance to shock and vibration
- High protection level IP65, IP67 option with a sealing flange
- Operating temperature range from -40°C to 85°C
- Standard M12 connector available

Applications

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



Electrical

This encoder series offers an incremental encoder augmented by IO-Link configurability and diagnostics capabilities. There are two different implementations:

- Incremental encoder and IO-link on a dedicated wire (RGZ electronics)
- Incremental encoder with IO-link multiplexed on Z wire, in this case when working in a mode, the other one is disabled (RGY electronics)

Ver.	Mode	Output Signals	Operating Voltage	Supply current (no loads)	Current per channel pair	Short-circuit proof	Reverse polarity tolerant	Frequency Capability	Resolution	Temperature range
RGY RGZ	Incremental	programmable (HTL or TTL)	4,75V to 30V	< 75mA	< 40mA	Yes	Yes	Up to 1MHz	programmable (1 to 10kppr)	-40°C to +85°C
	IO-Link	IO-Link	18V to 30V					IO-link COM3 (230,4 kbits/s)	programmable (1 to 16bits)	

(1) RGY outputs are multiplexed, they are in incremental mode or IO-link mode (default startup mode is incremental)

(2) RGZ have Incremental and IO-link outputs working simultaneously

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	-40 ... + 85°C (encoder T°)
Storage Temperature	-40 ... + 85°C
Protection (EN 60529)	IP 65
Humidity	98% RH non-condensing at 20 °C

IO-LINK features

Process data

- Position : single turn 16 bits max
- Speed : calculated speed in rpm (signed)

Programmable Parameters

- Direction : clockwise or counter-clockwise, changes counting direction and speed sign.
- Set Zero Pulse command : Set the current position as the incremental zero pulse position. Set also the absolute position to zero.

For incremental mode :

- Incremental resolution : number of cycles per turn : from 1 to 10000
- Output voltage level : HTL or TTL
- Zero pulse width : 90°, 180° 270° or 360° (See figure for details)

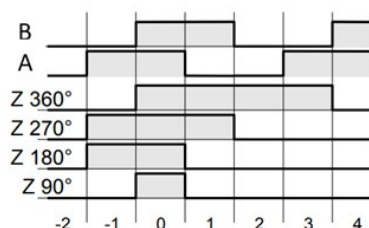
Absolute parameters (in IO-Link mode) :

- Resolution per turn: 1 to 16 bits
- Speed window calculation : time between each speed data update.

Diagnostics

- Operating Hours : number of hours since factory reset
- Temperature : event triggers when temperature exceeds specifications
- Device Status : Access to the status of the encoder

Table 1 : Z pulse width definition



Factory settings

Name	Index	Factory Setting	Comment
Encoder Output	70	1 : HTL	Set the incremental output voltage
Incremental	71	1024	Set the incremental resolution
Rotation direction	72	false : CW	Set the rotation direction
Z pulse width	74	0 : 90°	Set the zero pulse format (see table 1)
Enter in Factory setup mode	75	0: Encoder mode	Do not use
Speed calculation window	80	1 : 200ms	Time between each speed data update
Absolute Position Resolution	90	16	Resolution of the turn counter (in bits)
Operating-hours	110	0	Number of hours with device on

STANDARD CONNECTIONS

Electronics RGY : Incremental OR IO-link on Z (multiplexed)

	Mode	INC	GND	VCC	A	B	Z	A/	B/	Z/	Ground
		IO-link	L-	L+	NC	NC	IO-link	NC	NC	NC	NC
GM	M12 8 pins		1	2	3	4	5	6	7	8	shield
BF	M12 5 pins		3	1	2	5	4	-	-	-	shield

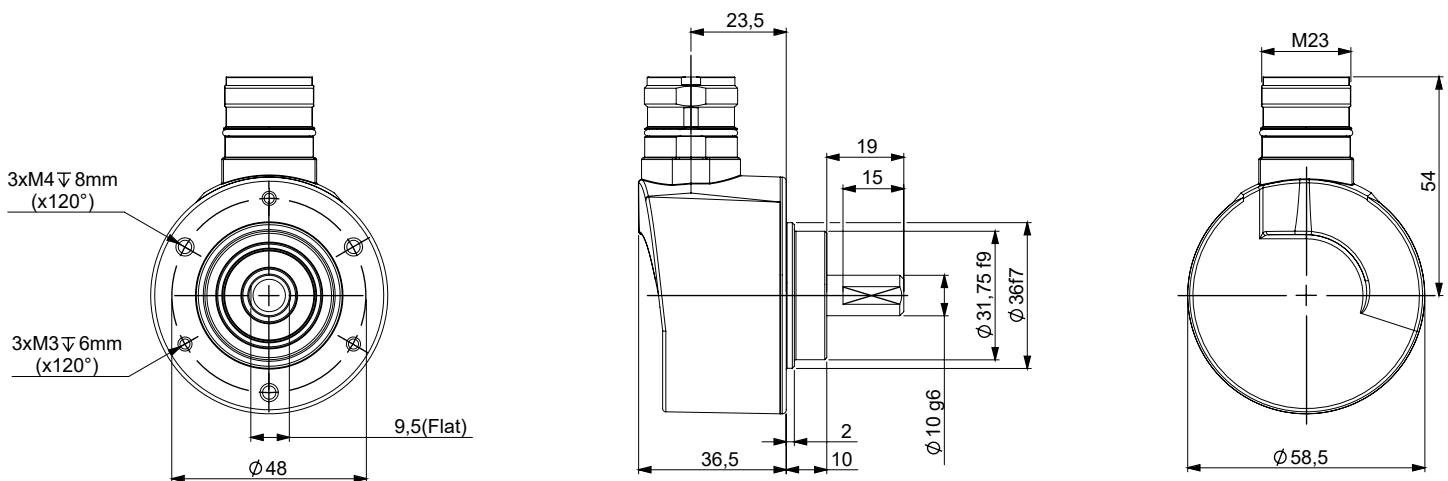
Electronics RGZ : Incremental AND IO-link (simultaneous)

		GND (L-)	VCC (L+)	A	B	Z	A/	B/	Z/	IO-link	Ground
I6	M23 12 pins CW	1	2	3	4	5	6	7	8	9	shield

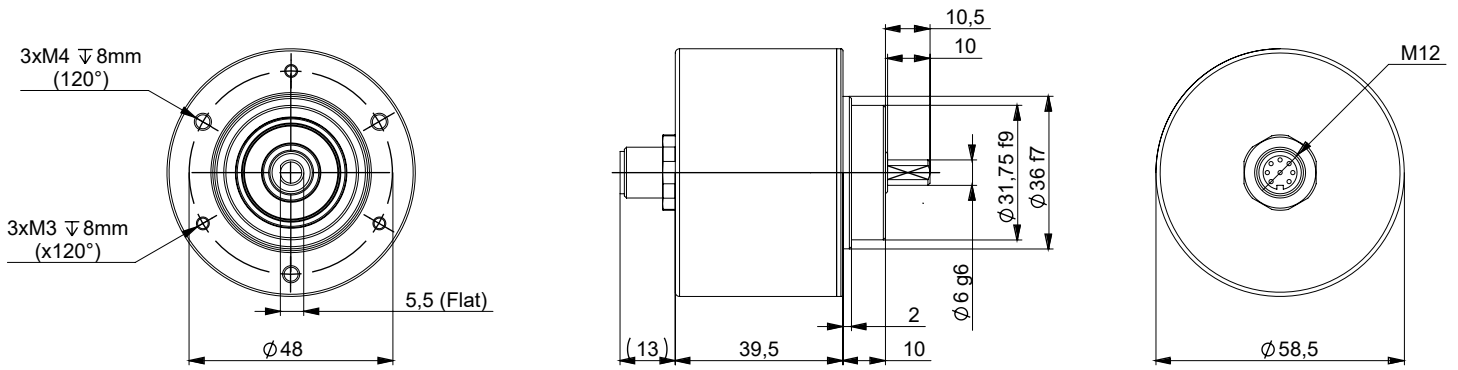
DIMENSIONS

All dimensions are in millimeters.

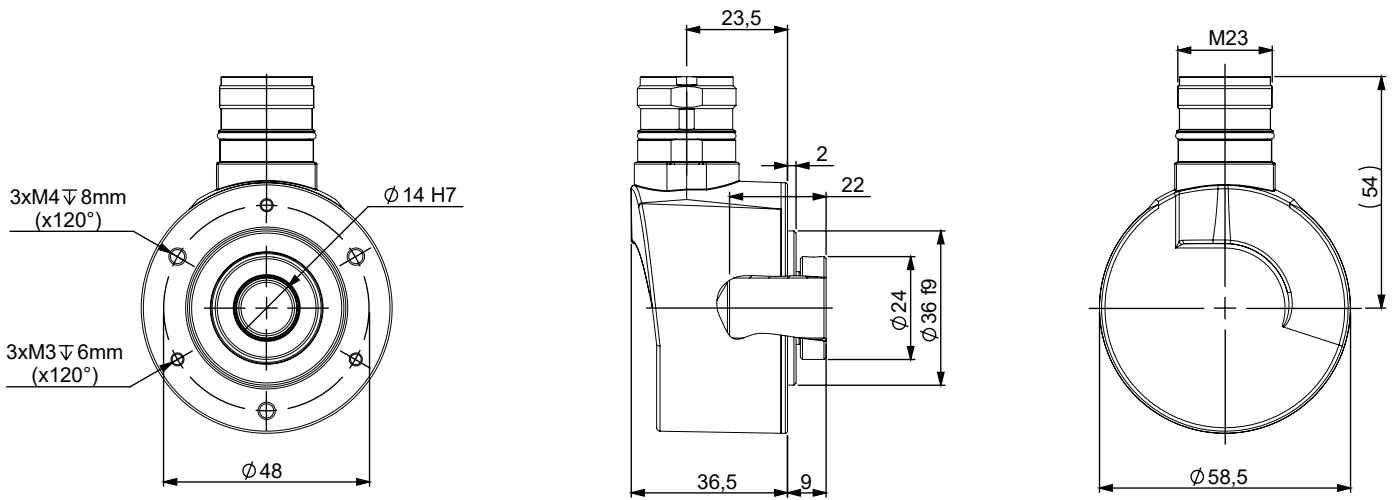
DHM5_10 Connection I6R (Radial M23)



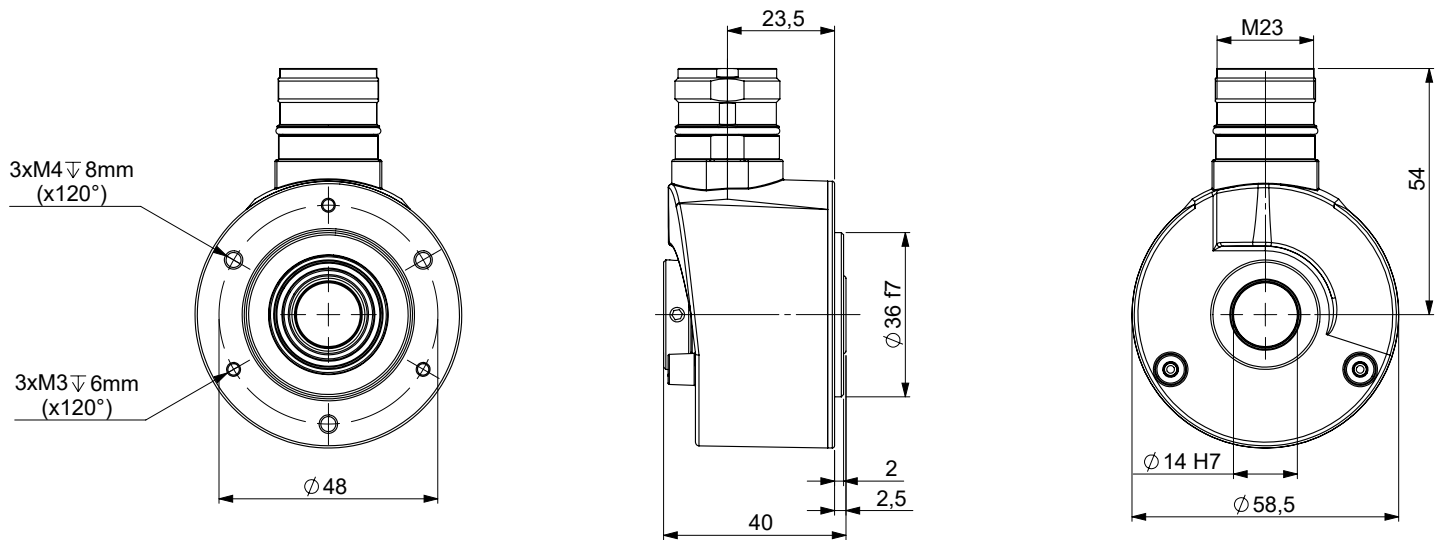
DHM5_06 Connection GMA (Axial M12)



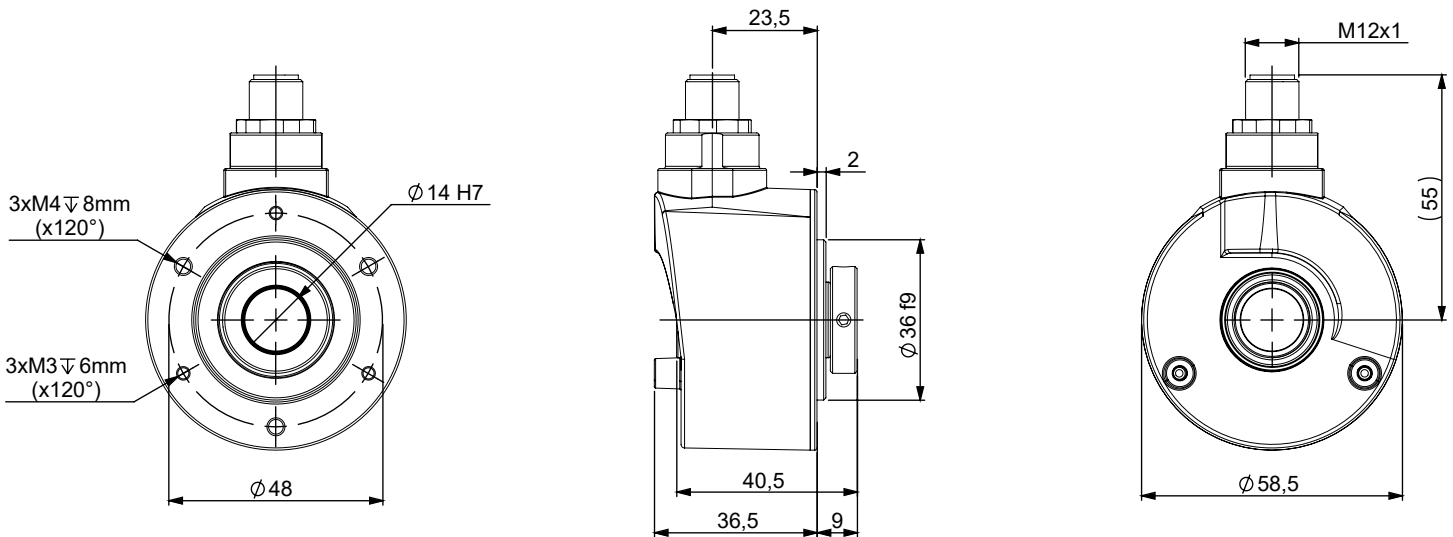
DHK5_14 Connection I6R (Radial M23)



DH05_14 Standard clamping, Connection I6R (Radial M23)



DH05S14/OM/ Flange side clamping, Connection GMR (Radial M12)



CONNECTION DIMENSIONS

Radial

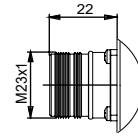
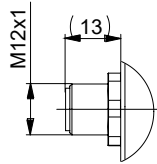
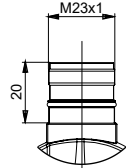
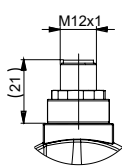
Axial

**M12
GMR, BFR**

**M23
I6R**

**M12
GMA, BFA**

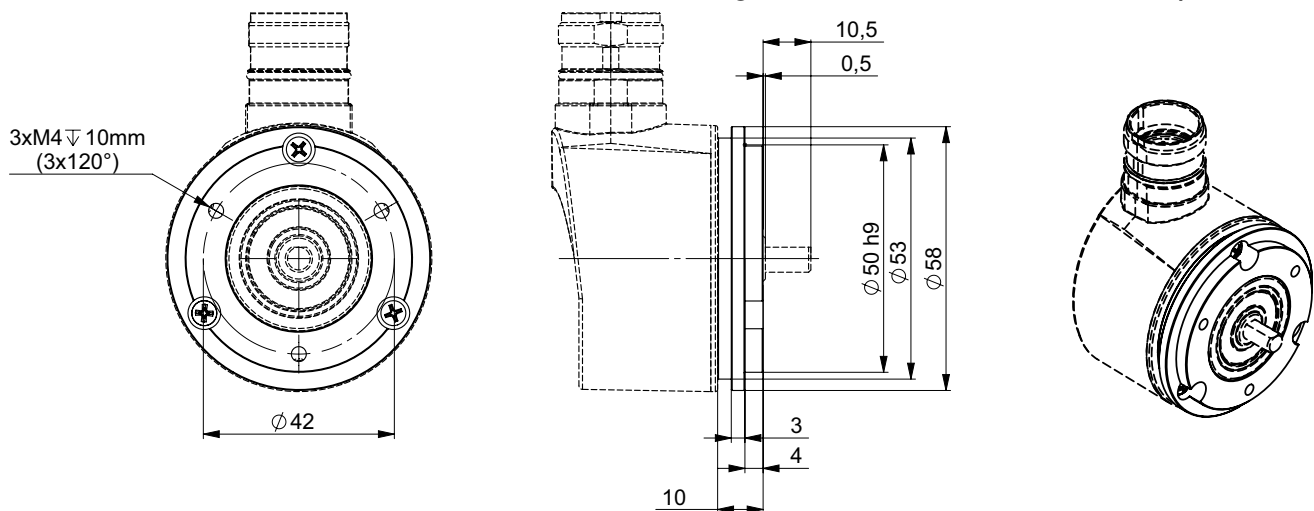
**M23
I6A**



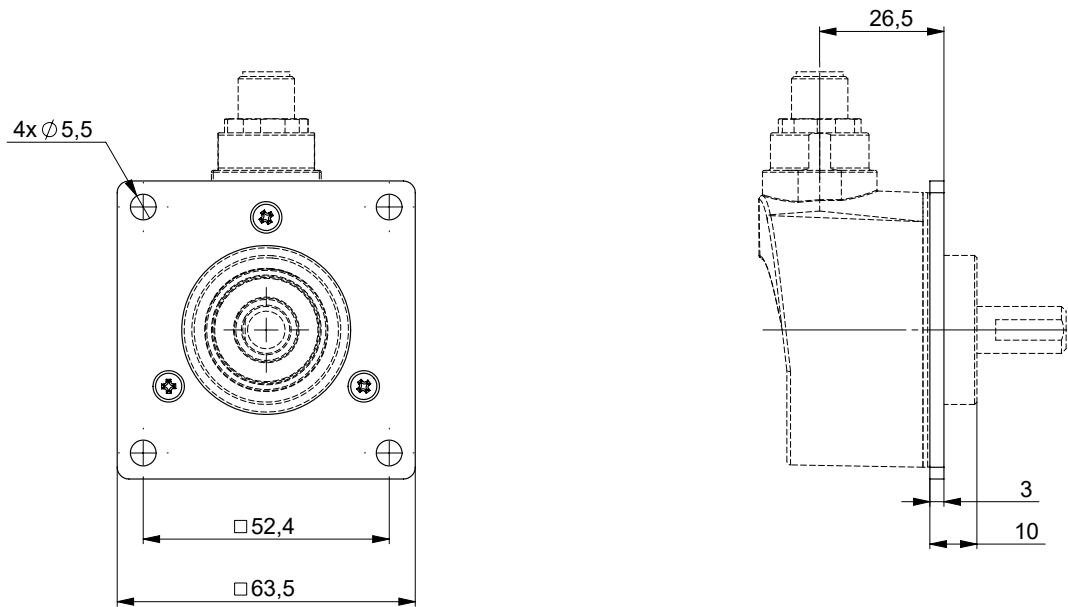
FLANGE AND COUPLING INTERFACES

All flange or coupling kits shall be ordered separately (see accessories section).

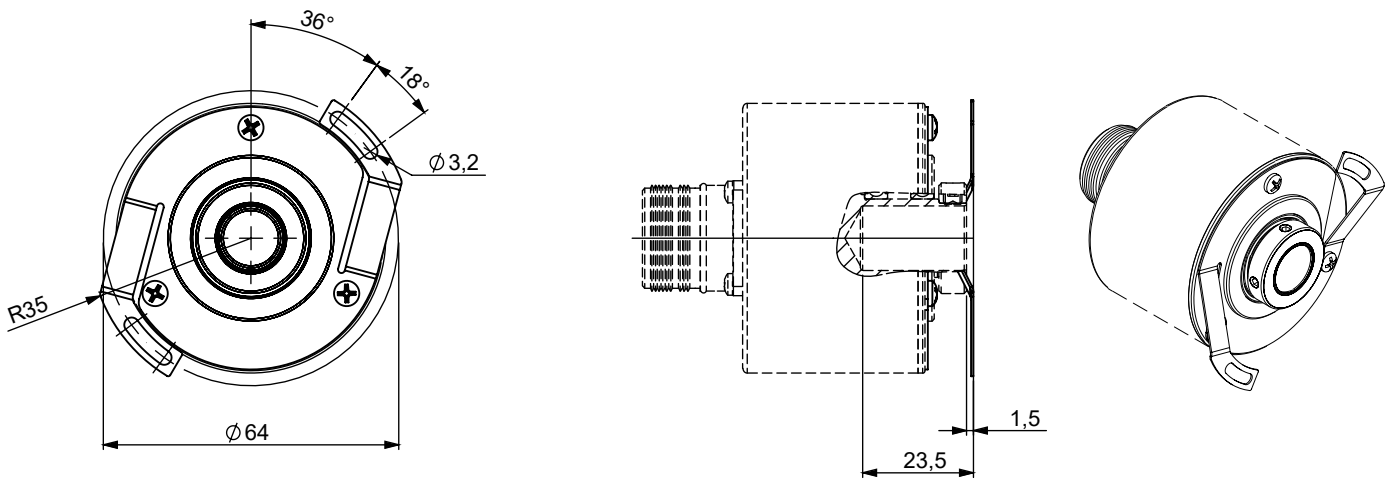
DHM5_06 Connection I6R (Radial M23), flange 9500/003 mounted on the body



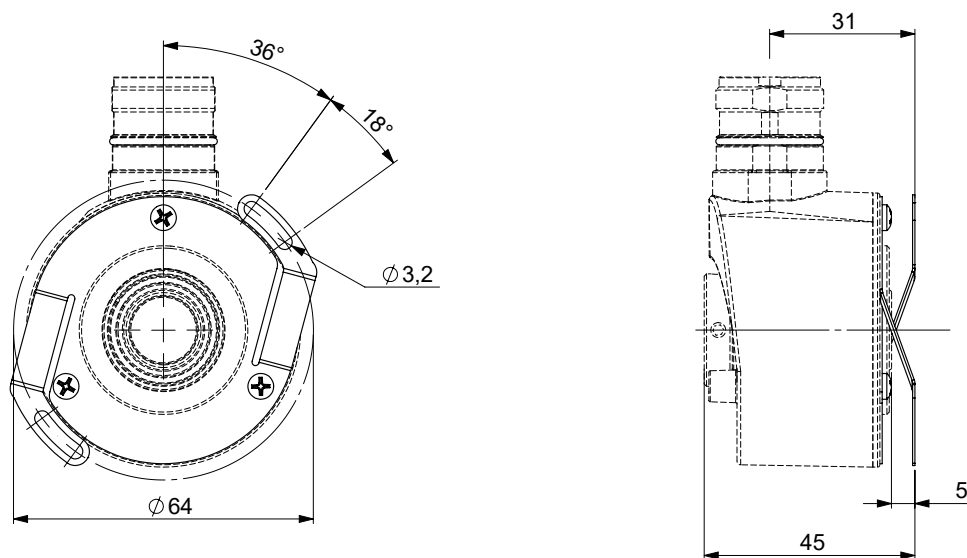
DHM5_10 Connection GMR (Radial M12), flange 9500/005 mounted on the body



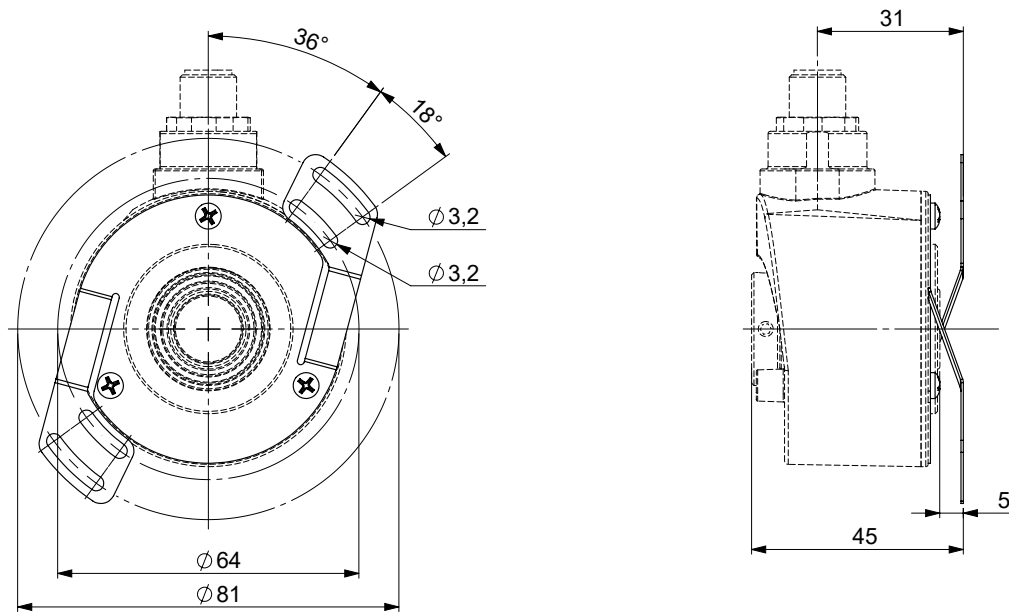
DHK5_14 Connection I6A (Axial M23), coupling 9445/016 mounted on the body



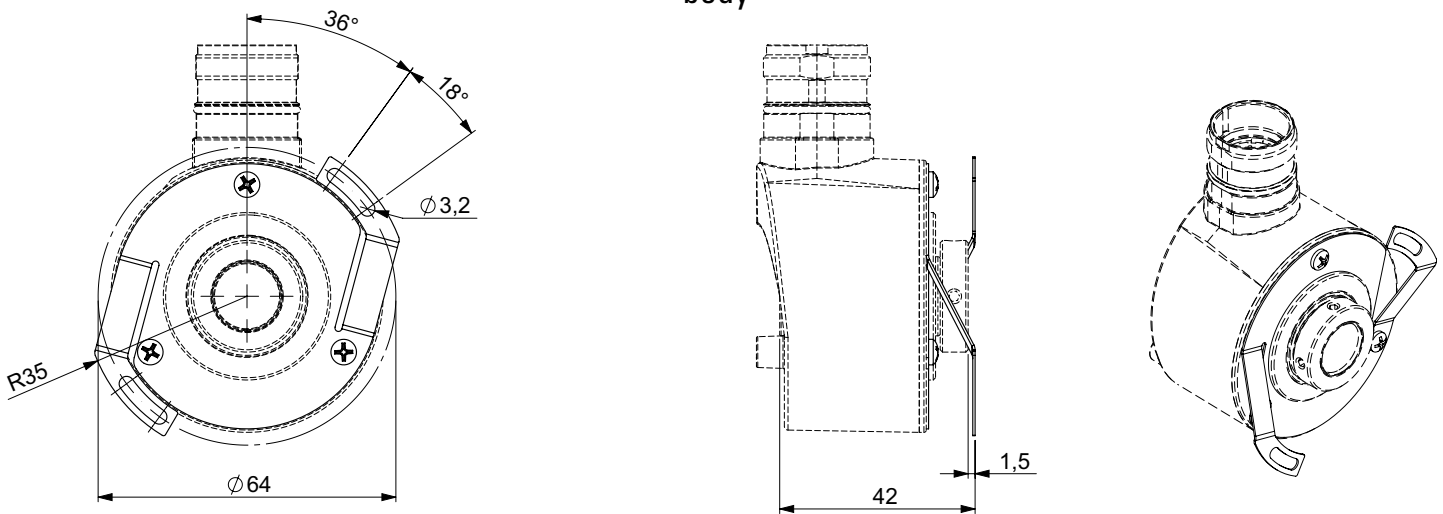
DH05_14 Standard clamping, Connection I6R (Radial M23), coupling 9445/012 mounted on the body



DH05_14 Standard clamping, Connection GMR (Radial M12), coupling 9445/015 mounted on the body



DH05S14/OM/ Flange side clamping, Connection IPR (Radial M23)", coupling 9445/016 mounted on the body



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

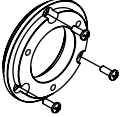
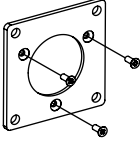
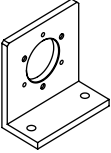
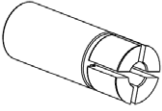
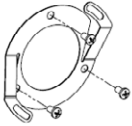
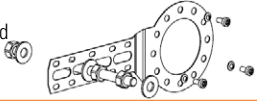
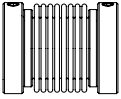
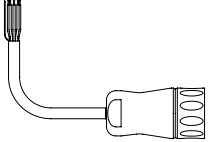




ORDERING OPTIONS

Example : DHM5_06/RGZ//EPROG//I6R

	DHM5	06	/	RGZ	X	//	EPROG	//	I6	R	
Family	<ul style="list-style-type: none"> DHM5: Solid Shaft Encoder DHK5: Blind Shaft Encoder DH05: Hollow Shaft Encoder 										
Shaft Size	<ul style="list-style-type: none"> DHM5 06: 6 mm 10: 10 mm DHK5 or DH05: 14: 14 mm 										
Voltage Output	<ul style="list-style-type: none"> RGY : 4,75-30V IO-link multiplexed on Z programmable output HTL/TTL (only with M12 connector) RGZ : 4,75-30V programmable output HTL/TTL and IO-link (only with M23 connector) 										
Channels	<ul style="list-style-type: none"> X : programmable outputs 										
Cycles / Turn	<ul style="list-style-type: none"> EPROG: Full programmable 1-10kppr with programming tool (IO-Link master) 										
Output Termination	<ul style="list-style-type: none"> GM: M12 8 Pins (only RGY) BF : M12 5 pins (only RGY) I6: M23 12 Pins CW (only RGZ) 										
Output orientation	<ul style="list-style-type: none"> R: Radial (All configurations) A: Axial (DHM5 and DHK5 only) 										

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) DH05 9431/106 9431/108 9431/110 9431/112	Non insulated (Aluminum) DH05 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	Recommended use/Compatibility DH05 DHK5 & DH05 DHK5 & DH05 with /OM/ option	Fixing points 2 4 2
Other stator coupling configurations available on request			
Tether arm kit Hardware included 	M9445/047 (Compatible with DHK5 and DH05 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		
Standard Mating Connector 2m, 5m, 10m Mating Cable Assembly 	Extension cords compatible with I6 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 BF connection option: 8230/375 = M12 overmolded, PUR cable, 2m	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
Standard programming cable (only for GMR) IO-Link USB master			

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