

DHM5 - DHK5 - DHO5

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.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 10 ⁹ 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) | $\leq 500 \text{ m.s}^{-2}$ (during 6 ms) |
| Vibrations (EN 60068-2-6) | $\leq 200 \text{ m.s}^{-2}$ (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.

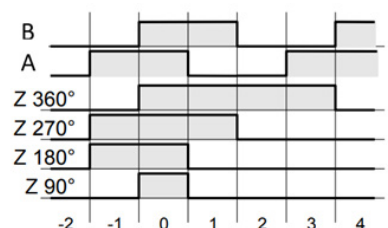
Diagnostics

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

Factory settings

- Output : HTL, incremental resolution 1024, direction : clockwise B before A, zero pulse : 90°, speed calculation window : 200ms, absolute resolution 16 bits

Table 1 : Z pulse width definition





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 |
| GP | PUR Cable 8 wires | | WH | BU | GY | BN | RD | PK | GN | BK | shield |
| G3 | PVC Cable 8 wires | | WH | BN | GN | YE | GY | PK | BU | RD | shield |

Electronics RGZ : Incremental AND IO-link (simultaneous)

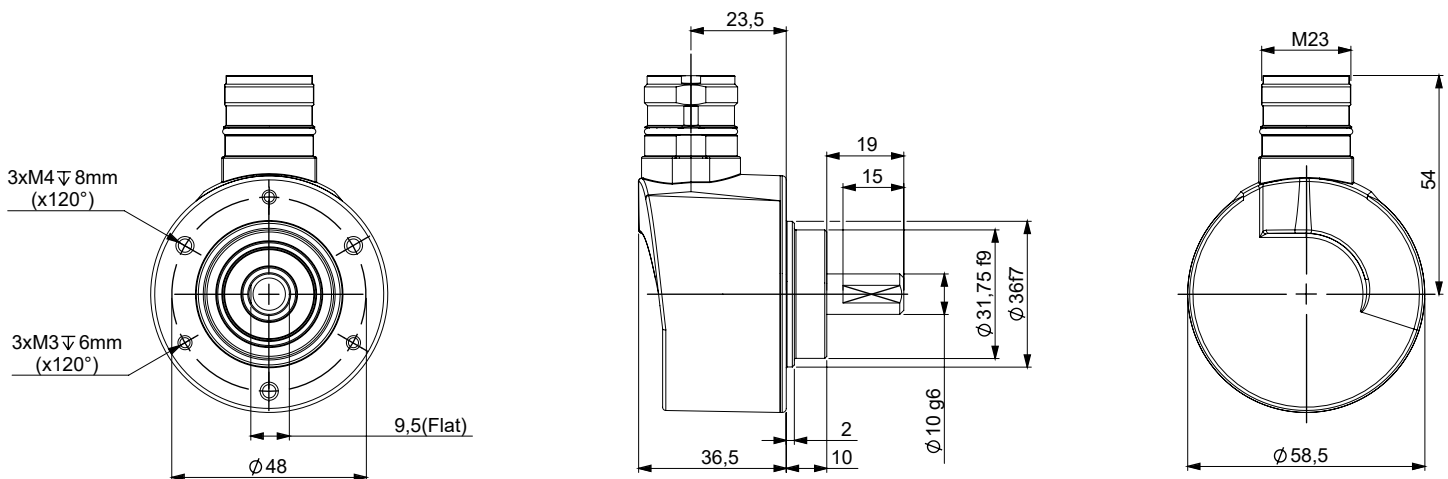
| | | GND (L-) | VCC (L+) | A | B | Z | A/ | B/ | Z/ | IO-link | Ground |
|-----------|-------------------|-------------|-------------|----|----|----|----|----|----|---------|--------|
| I6 | M23 12 pins CW | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | shield |
| IP | Cable PUR 9 wires | WH | BU | GY | BN | RD | PK | GN | BK | BN/GN | shield |



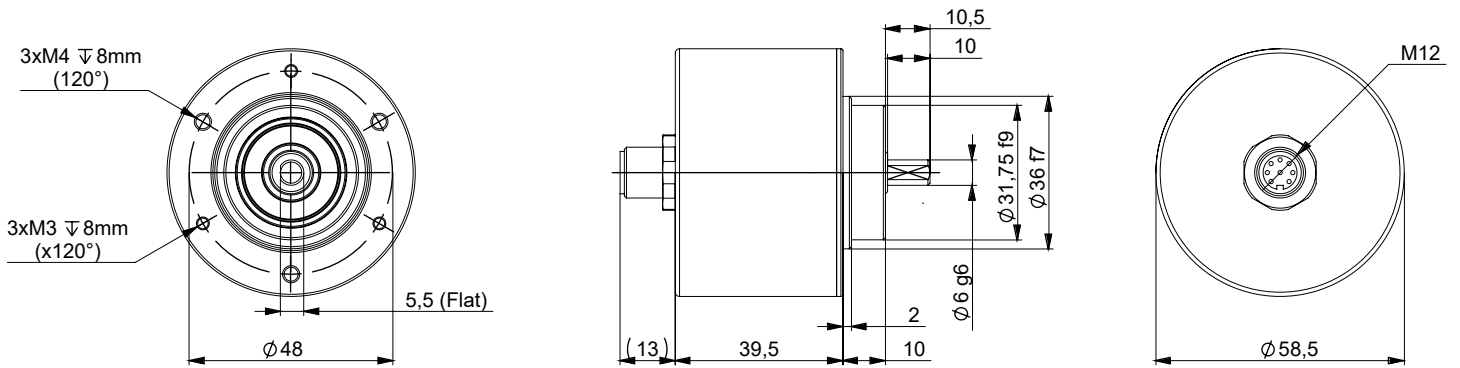
DIMENSIONS

All dimensions are in millimeters.

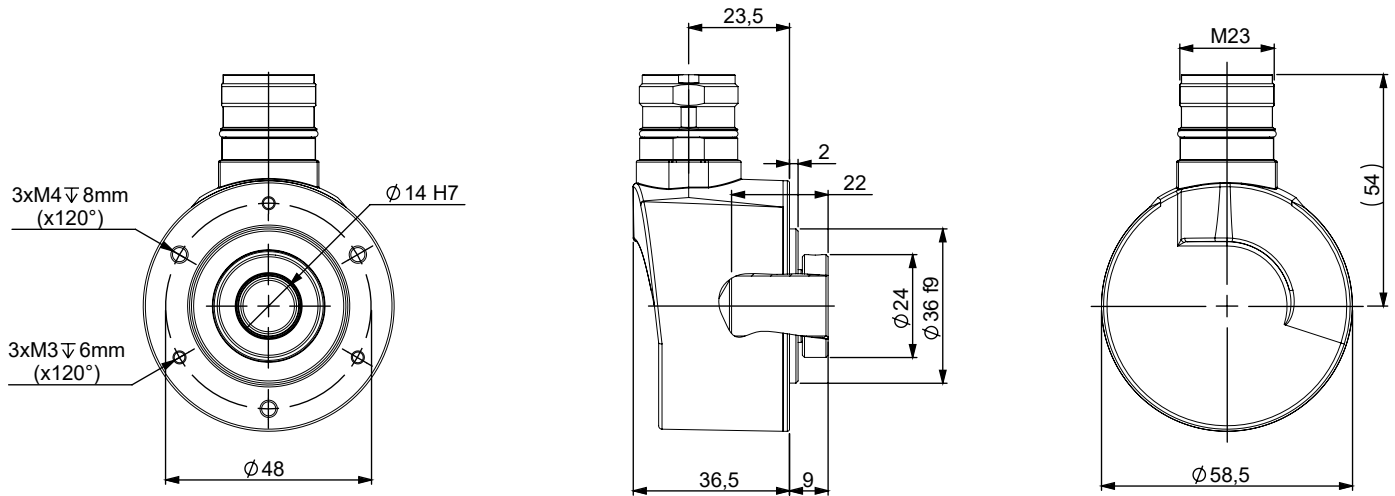
DHM5_10 Connection I6R (Radial M23)



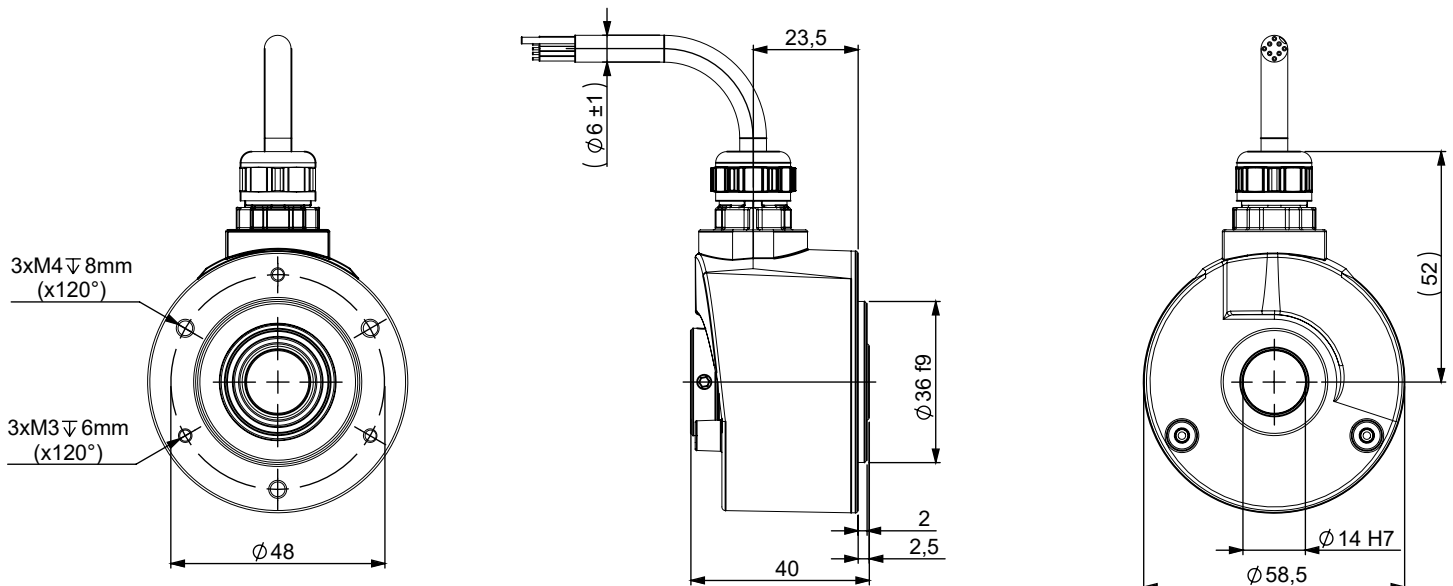
DHM5_06 Connection GMA (Axial M12)



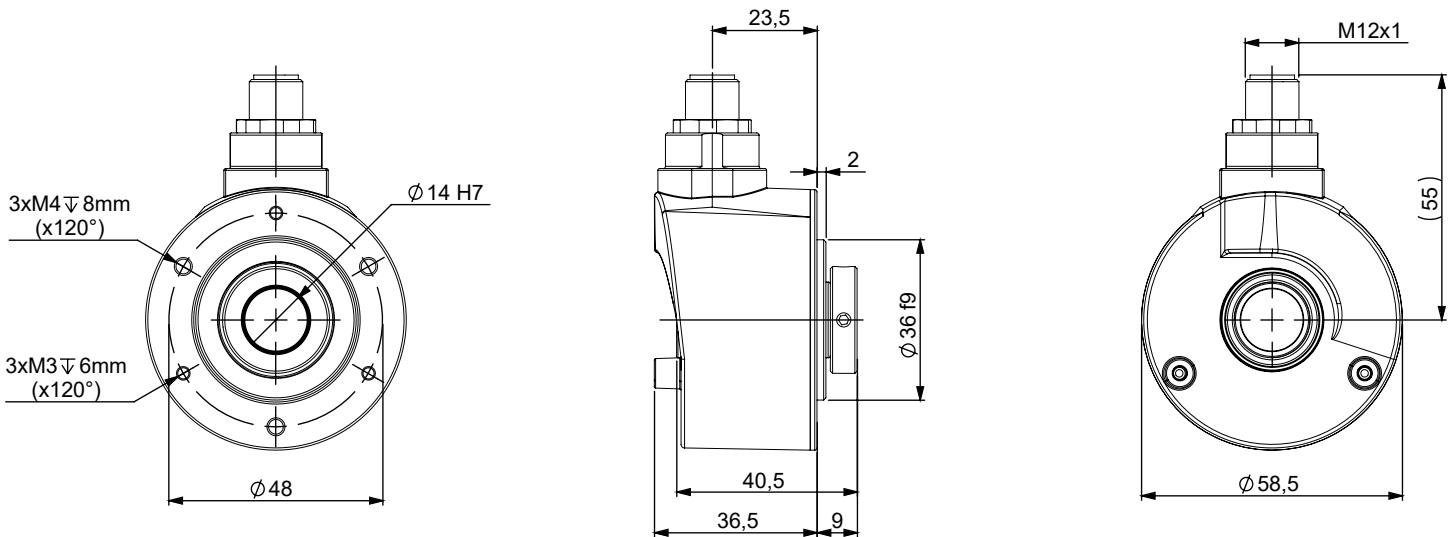
DHK5_14 Connection I6R (Radial M23)



DH05_14 Standard clamping, Connection G3R (Radial Cable)



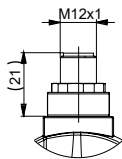
DH05S14/OM/ Flange side clamping, Connection GMR (Radial M12)



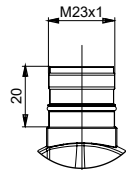
CONNECTION DIMENSIONS

Radial

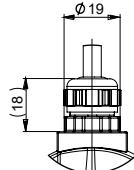
M12 GMR, BFR



M23 I6R

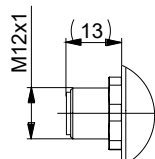


Cable G3R, GPR, IPR

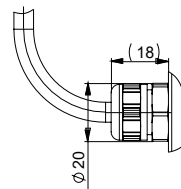


Axial

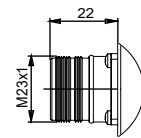
M12 GMA, BFA



Cable IPA, G3A, GPA



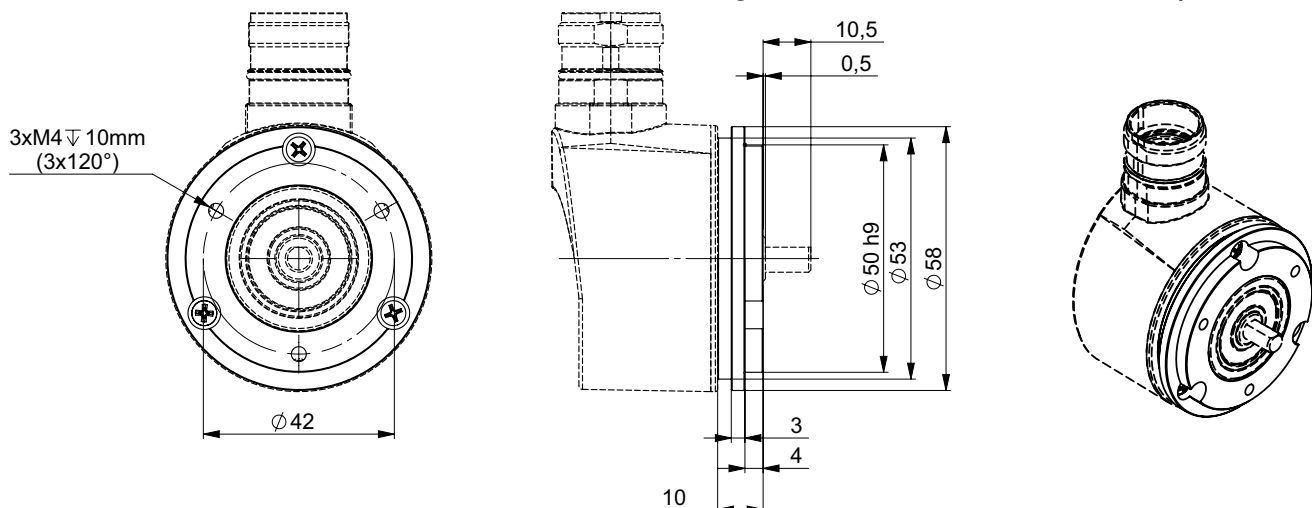
M23 I6A



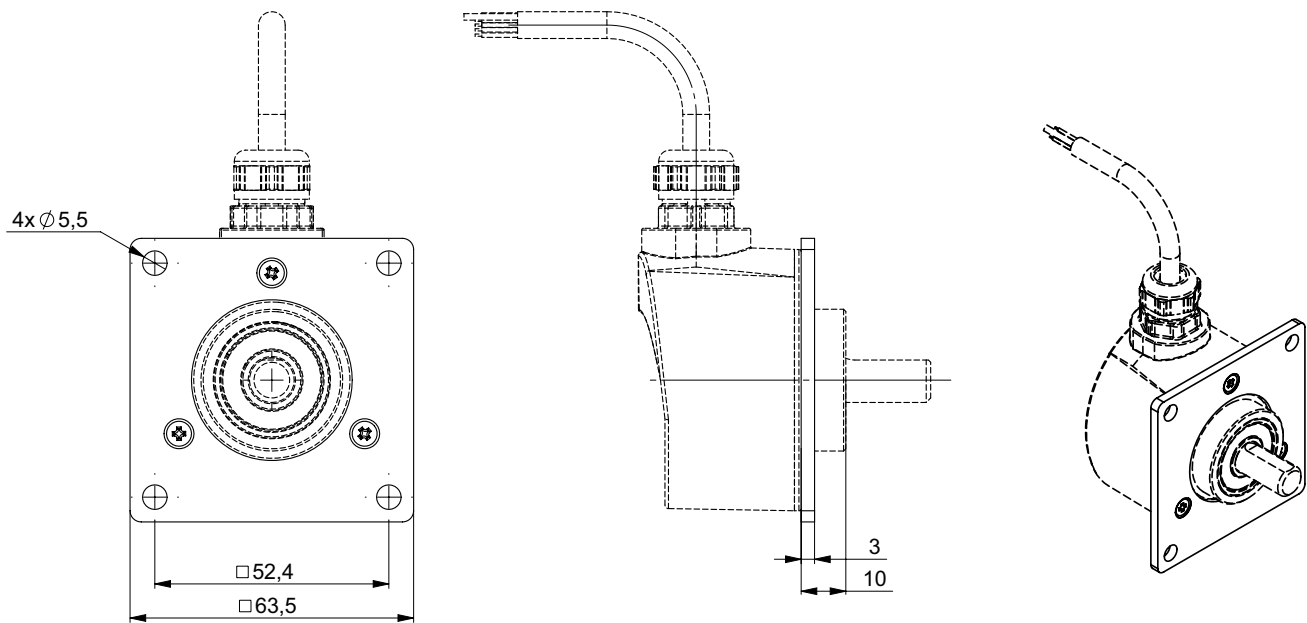
FLANGE AND COUPLING INTERFACES

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

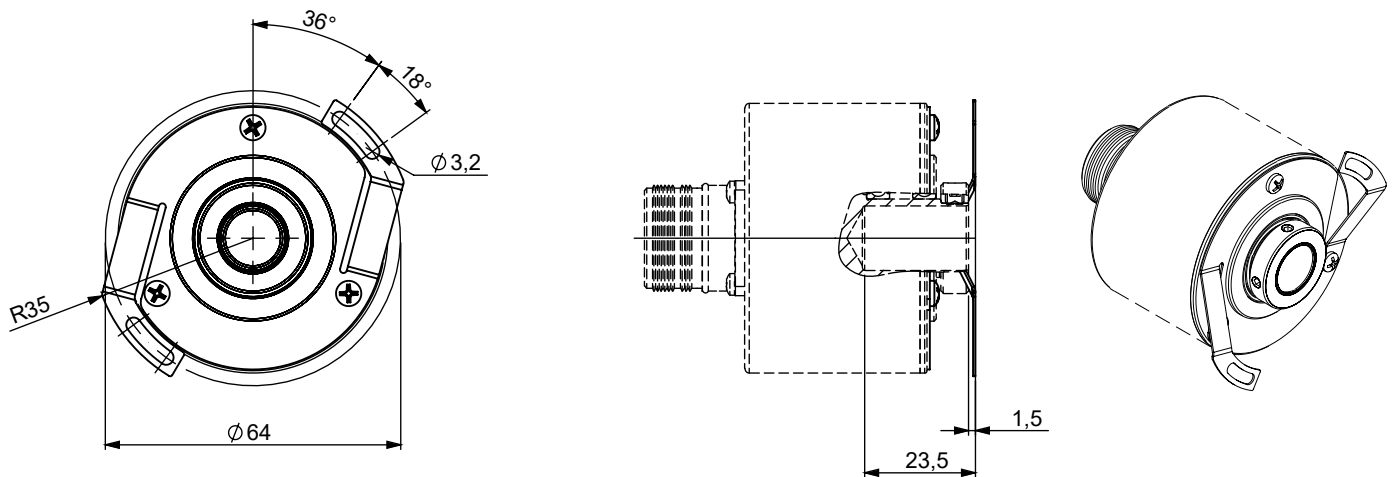
DHM5_06 Connection I6R (Radial M23), flange 9500/003 mounted on the body



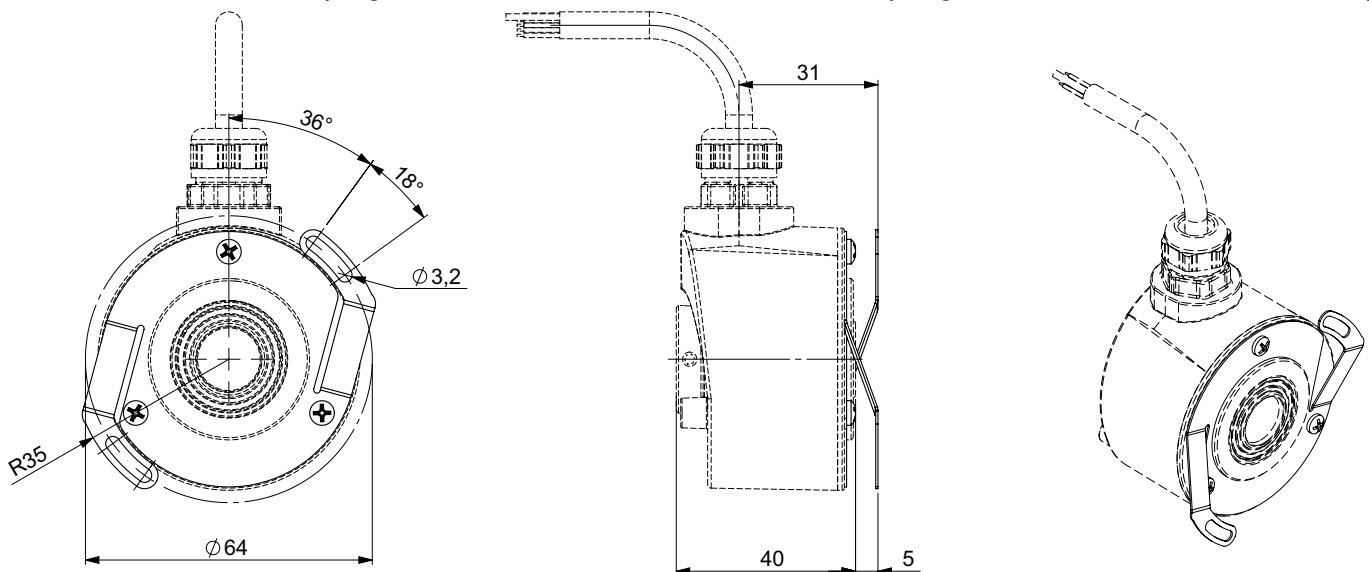
DHM5_10 Connection G3R (Radial cable), flange 9500/005 mounted on the body



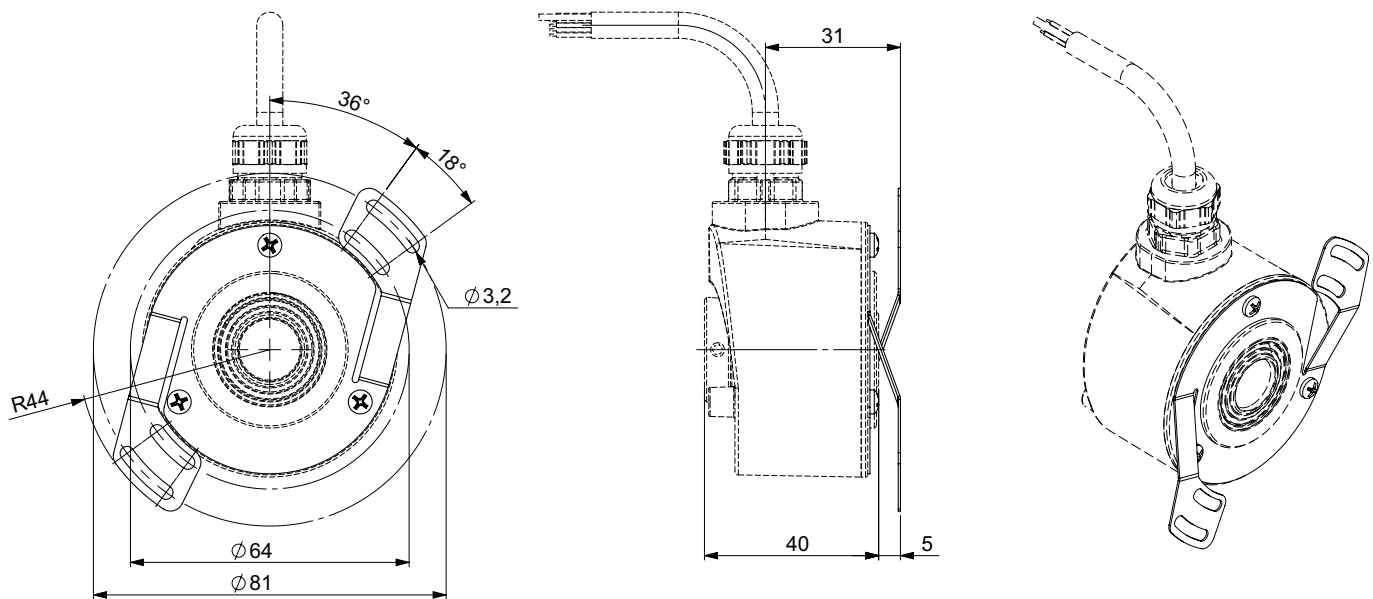
DHK5_14 Connection I6A (Axial M23), coupling 9445/016 mounted on the body



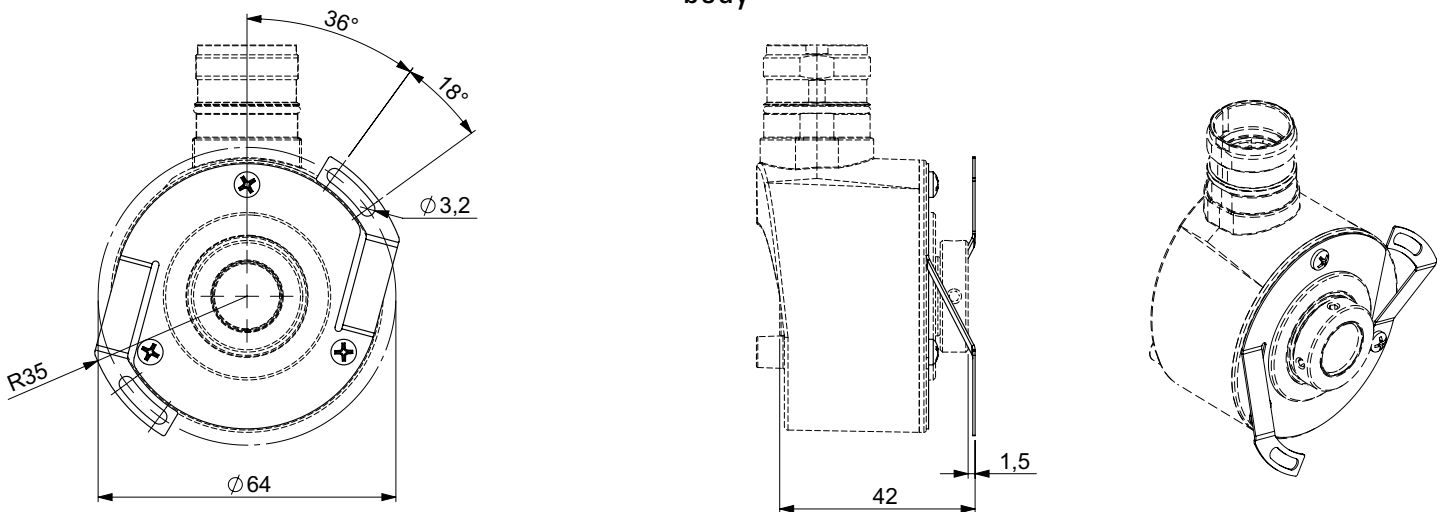
DH05_14 Standard clamping, Connection G3R (Radial Cable), coupling 9445/012 mounted on the body



DH05_14 Standard clamping, Connection G3R (Radial Cable), 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

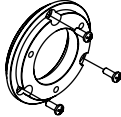
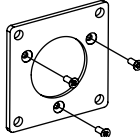
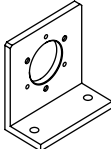
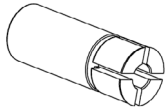
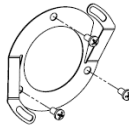
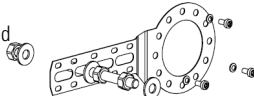
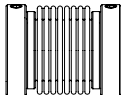
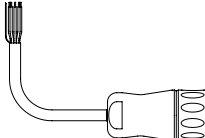




ORDERING OPTIONS

Example : DHM5_06//RGZ9//EPROG//I6R//**03**

| Family | DHM5 | 06 | / | RGZ | X | // | EPROG | // | I6 | R | // | **03** |
|--|------|----|---|-----|---|----|-------|----|----|---|----|--------|
| DHM5: Solid Shaft Encoder DHK5: Blind Shaft Encoder DH05: Hollow Shaft Encoder | | | | | | | | | | | | |
| Shaft Size | | | | | | | | | | | | |
| DHM5 06: 6 mm 09: 9.52 mm 10: 10 mm 08: 8mm (Option) | | | | | | | | | | | | |
| DHK5 or DH05: 10: 10 mm 12: 12 mm 14: 14 mm 15: 15mm (Option) | | | | | | | | | | | | |
| Contact factory for other configurations | | | | | | | | | | | | |
| Mechanical Option | | | | | | | | | | | | |
| Blank: No option OM: Flange side clamping | | | | | | | | | | | | |
| Voltage Output | | | | | | | | | | | | |
| RGY : 4,75-30V IO-link multiplexed on Z programmable output HTL/TTL RGZ : 4,75-30V programmable output HTL/TTL and IO-link | | | | | | | | | | | | |
| Channels | | | | | | | | | | | | |
| X : programmable outputs | | | | | | | | | | | | |
| Cycles / Turn | | | | | | | | | | | | |
| EPROG: Full programmable 1-10kppr with programming tool (IO-Link master) | | | | | | | | | | | | |
| Output Termination | | | | | | | | | | | | |
| GM: M12 8 Pins GP: PUR Cable - 8 Wires (not UL) G3: PVC Cable - 8 Wires BF : M12 5 pins I6: M23 12 Pins CW IP: PUR Cable - 9 wires | | | | | | | | | | | | |
| Output orientation | | | | | | | | | | | | |
| R: Radial (All configurations) A: Axial (DHM5 and DHK5 only) | | | | | | | | | | | | |
| Cable Length | | | | | | | | | | | | |
| xxx: Cable Length (ex.: 020 = 2 Meters) Maximum IO-link cable length is 20 meters Blank: No Cable | | | | | | | | | | | | |
| Accessories | | | | | | | | | | | | |
| D0****: DH05 with aluminum reduction sleeve D1****: DH05 with insulated reduction sleeve D2****: DHK5 with aluminum reduction sleeve **D2**: 9445/012 DH05 Stator coupling **D4**: 9445/015 DH05 Stator coupling **DK**: 9445/016 DHK5 & DH05.../OM/ Stator coupling **03**: 9500/003 Synchro flange **05**: 9500/005 Square flange | | | | | | | | | | | | |

| 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/I06 9431/I08 9431/I10 9431/I12 | 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 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-xxx = M23, PUR cable, 2m RAL-050-xxx = M23, PUR cable, 5m RAL-100-xxx = M23, PUR cable, 10m | Extension cords compatible with GM connection option: 8230/366 = M12 overmolded, PUR cable, 2m 8230/370 = M12 overmolded, PUR cable, 5m 8230/368 = M12 overmolded, PUR cable, 10m |
| Standard programing cable (only for GMR) IO-Link USB master | | | | |

Made in France

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