



**CREKEN**

# Online Data Sheet

**인크리멘탈 옵티컬 로터리 엔코더 - Ø40mm**

**WDG 40A 시리즈**

## **Wachendorff Automation**

### **... systems and encoders**

- Complete systems
- Industrial rugged encoders to suit your application
- Standard range and customer versions
- Maximum permissible loads
- 48-hour express production
- Made in Germany
- Worldwide distributor network

## **Encoder WDG 40A**

[www.wachendorff-automation.com/wdg40a](http://www.wachendorff-automation.com/wdg40a)

**IndustrieROBUST**

# Encoder WDG 40A



1. 내구성이 뛰어난 소형 로터리 엔코더  
- 좁은 공간에 설치가 용이함
2. 옵티컬(Optical)방식으로 고분해능 구현 가능  
- 4~2500PPR
3. 완전 방수로 열악한 환경에서 사용 가능  
- Shaft IP65, Housing IP67
4. CE 및 UL 인증 제품

[www.wachendorff-automation.com/wdg40a](http://www.wachendorff-automation.com/wdg40a)

| Resolution                     |                |
|--------------------------------|----------------|
| Max. pulses per revolution PPR | up to 2500 PPR |

| Mechanical Data |                         |
|-----------------|-------------------------|
| Housing         |                         |
| Flange          | Servo flange            |
| Flange material | aluminum                |
| Housing cap     | aluminum, powder coated |
| Housing         | Ø 40 mm                 |
| Cam mounting    | pitch 51 mm             |

| Shaft(s)        |                                        |
|-----------------|----------------------------------------|
| Shaft material  | stainless steel                        |
| Starting torque | approx. 0.2 Ncm at ambient temperature |

|                                       |            |
|---------------------------------------|------------|
| Shaft                                 | Ø 6 mm     |
| Shaft length                          | L: 11.5 mm |
| Max. Permissible shaft loading radial | 80 N       |
| Max. Permissible shaft loading axial  | 50 N       |

| Bearings             |                                                                                                                                                                   |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Bearings type        | 2 precision ball bearings                                                                                                                                         |
| Nominal service life | 1 x 10 <sup>9</sup> revs. at 100 % rated shaft load<br>1 x 10 <sup>10</sup> revs. at 40 % rated shaft load<br>1 x 10 <sup>11</sup> revs. at 20 % rated shaft load |
| Max. operating speed | 12000 rpm                                                                                                                                                         |

| Machinery Directive: basic data safety integrity level |                                                                   |
|--------------------------------------------------------|-------------------------------------------------------------------|
| MTTF <sub>d</sub>                                      | 200 a                                                             |
| Mission time (TM)                                      | 25 a                                                              |
| Nominal service life (L10h)                            | 1 x 10 <sup>11</sup> revs. at 20 % rated shaft load and 12000 rpm |
| Diagnostic coverage (DC)                               | 0 %                                                               |

| Electrical Data                  |                                    |
|----------------------------------|------------------------------------|
| Power supply/Current consumption | 4,75 VDC up to 5,5 VDC: typ. 70 mA |
| Power supply/Current consumption | 10 VDC up to 30 VDC: typ. 70 mA    |

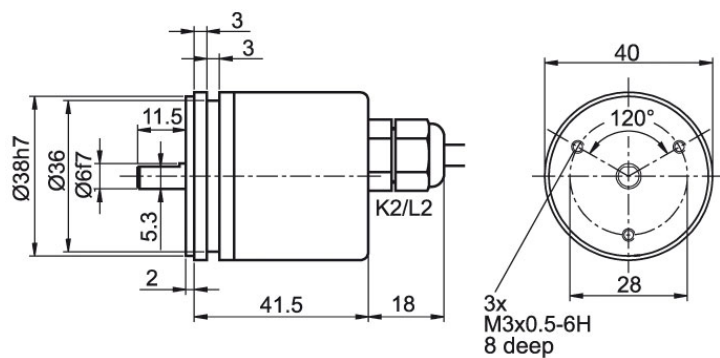
|                    |                                                              |
|--------------------|--------------------------------------------------------------|
| Output circuit     | TTL<br>TTL, RS422 compatible, inv.<br>HTL<br>HTL, inv.       |
| Pulse frequency    | TTL ≤ 2500 ppr: max. 200 kHz<br>HTL ≤ 2500 ppr: max. 200 kHz |
| Channels           | AB<br>ABN<br>and inverted signals                            |
| Load               | max. 40 mA / channel                                         |
| Circuit protection | circuit type H24 and R24 only                                |

| Accuracy           |                                      |
|--------------------|--------------------------------------|
| Phase offset       | 90° ± max. 7.5 % of the pulse length |
| pulse-/pause-ratio | 50 % ± max. 7 %                      |

| General Data                 |                                          |
|------------------------------|------------------------------------------|
| Weight                       | approx. 100 g                            |
| Connections                  | cable or connector outlet                |
| Protection rating (EN 60529) | IP67, shaft sealed to IP65 (IP40 for K1) |
| Operating temperature        | -20 °C up to +80 °C                      |
| Storage temperature          | -30 °C up to +80 °C                      |

| More Information                                                                                                                                    |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|--|
| General technical data and safety instructions<br><a href="http://www.wachendorff-automation.com/gtd">http://www.wachendorff-automation.com/gtd</a> |  |
| Options<br><a href="http://www.wachendorff-automation.com/acc">http://www.wachendorff-automation.com/acc</a>                                        |  |

## Cable connection K2, L2 with 2 m cable

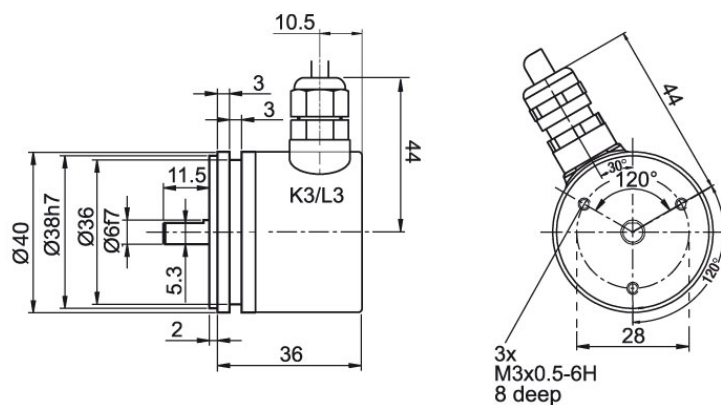


### Description

### ABN inv. poss.

|           |                                            |   |
|-----------|--------------------------------------------|---|
| <b>K2</b> | axial, shield not connected                | • |
| <b>L2</b> | axial, shield connected to encoder housing | • |

| Assignments                  |          |          |
|------------------------------|----------|----------|
|                              | K2, L2   | K2, L2   |
| <b>Circuit</b>               | H05, H24 | R05, R24 |
| <b>GND</b>                   | WH       | WH       |
| <b>(+) Vcc</b>               | BN       | BN       |
| <b>A</b>                     | GN       | GN       |
| <b>B</b>                     | YE       | YE       |
| <b>N</b>                     | GY       | GY       |
| <b>Light reserve warning</b> | -        | -        |
| <b>A inv.</b>                | -        | RD       |
| <b>B inv.</b>                | -        | BK       |
| <b>N inv.</b>                | -        | VT       |
| <b>Shield</b>                | flex     | flex     |

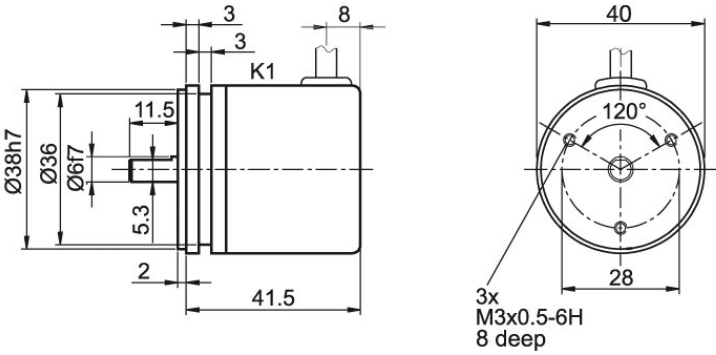
**Cable connection K3, L3 with 2 m cabel**

**Description**

|           |                                             |
|-----------|---------------------------------------------|
| <b>K3</b> | radial, shield not connected                |
| <b>L3</b> | radial, shield connected to encoder housing |

**ABN inv. poss.**

- 
- 

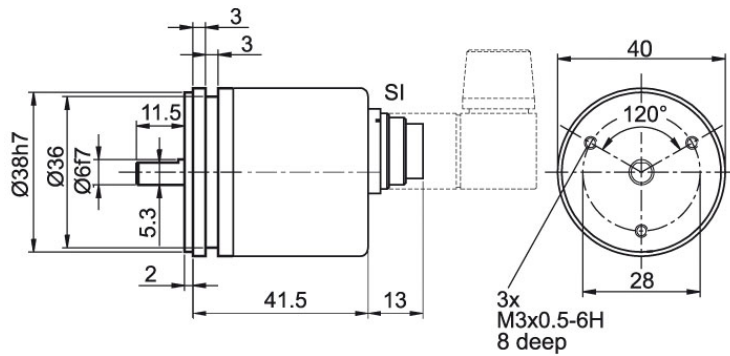
| Assignments                  |          |          |
|------------------------------|----------|----------|
|                              | K3, L3   | K3, L3   |
| <b>Circuit</b>               | H05, H24 | R05, R24 |
| <b>GND</b>                   | WH       | WH       |
| <b>(+) Vcc</b>               | BN       | BN       |
| <b>A</b>                     | GN       | GN       |
| <b>B</b>                     | YE       | YE       |
| <b>N</b>                     | GY       | GY       |
| <b>Light reserve warning</b> | -        | -        |
| <b>A inv.</b>                | -        | RD       |
| <b>B inv.</b>                | -        | BK       |
| <b>N inv.</b>                | -        | VT       |
| <b>Shield</b>                | flex     | flex     |

**Cable K1 (IP40) with 2 m cable****Description****ABN inv. poss.****K1** radial, shield not connected (IP40)

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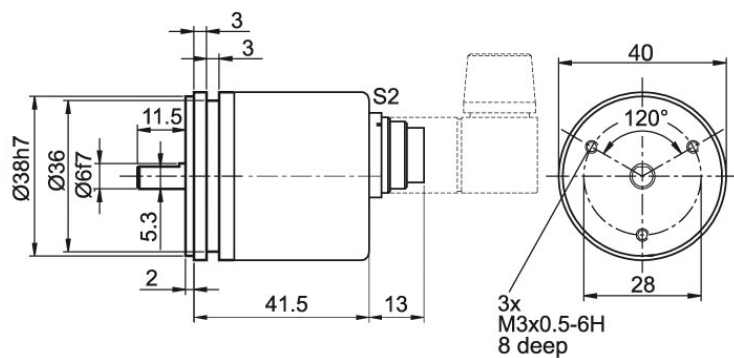
| Assignments           |          |          |
|-----------------------|----------|----------|
|                       | K1       | K1       |
| Circuit               | H05, H24 | R05, R24 |
| GND                   | WH       | WH       |
| (+) Vcc               | BN       | BN       |
| A                     | GN       | GN       |
| B                     | YE       | YE       |
| N                     | GY       | GY       |
| Light reserve warning | -        | -        |
| A inv.                | -        | RD       |
| N inv.                | -        | VT       |
| B inv.                | -        | BK       |
| Shield                | flex     | flex     |

**Connector (M16x0,75) SI, 5-, 6-, 8-, 12-pin**

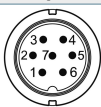


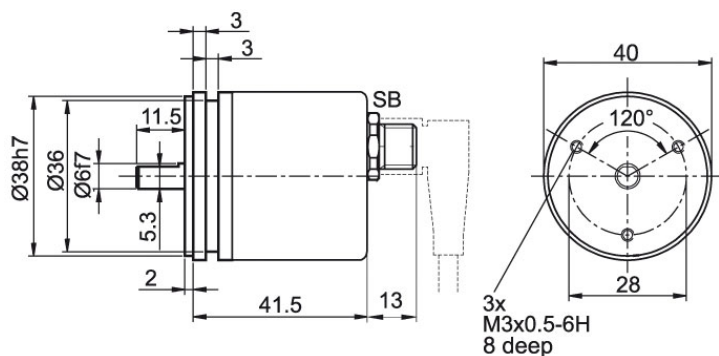
| Description                                                       | ABN inv. poss. |
|-------------------------------------------------------------------|----------------|
| <b>SI5</b> axial, 5-pin, Connector connected to encoder housing   | -              |
| <b>SI6</b> axial, 6-pin, Connector connected to encoder housing   | -              |
| <b>SI8</b> axial, 8-pin, Connector connected to encoder housing   | •              |
| <b>SI12</b> axial, 12-pin, Connector connected to encoder housing | •              |

| Assignments                  |          |          |          |          |               |          |
|------------------------------|----------|----------|----------|----------|---------------|----------|
|                              | SI5      | SI6      | SI8      | SI8      | SI12          | SI12     |
|                              | 5-pin    | 6-pin    | 8-pin    | 8-pin    | 12-pin        | 12-pin   |
|                              |          |          |          |          |               |          |
| <b>Circuit</b>               | H05, H24 | H05, H24 | H05, H24 | R05, R24 | H05, H24      | R05, R24 |
| <b>GND</b>                   | 1        | 6        | 1        | 1        | K, L          | K, L     |
| <b>(+) Vcc</b>               | 2        | 1        | 2        | 2        | M, B          | M, B     |
| <b>A</b>                     | 3        | 2        | 3        | 3        | E             | E        |
| <b>B</b>                     | 4        | 4        | 4        | 4        | H             | H        |
| <b>N</b>                     | 5        | 3        | 5        | 5        | C             | C        |
| <b>Light reserve warning</b> | -        | -        | -        | -        | -             | -        |
| <b>A inv.</b>                | -        | -        | -        | 6        | -             | F        |
| <b>B inv.</b>                | -        | -        | -        | 7        | -             | A        |
| <b>N inv.</b>                | -        | -        | -        | 8        | -             | D        |
| <b>n. c.</b>                 | -        | 5        | 6, 7, 8  | -        | A, D, F, G, J | G, J     |
| <b>Shield</b>                | -        | -        | -        | -        | -             | -        |

**Connector (M16x0.75) S2, 7-pin**

**Description**
**ABN inv. poss.**
**S2** axial, 7-pin, Connector connected to encoder housing

-

| Assignments                  |                                                                                    |
|------------------------------|------------------------------------------------------------------------------------|
|                              | <b>S2</b>                                                                          |
|                              | <b>7-pin</b>                                                                       |
|                              |  |
| <b>Circuit</b>               | H05, H24                                                                           |
| <b>GND</b>                   | 1                                                                                  |
| <b>(+) Vcc</b>               | 2                                                                                  |
| <b>A</b>                     | 3                                                                                  |
| <b>B</b>                     | 4                                                                                  |
| <b>N</b>                     | 5                                                                                  |
| <b>Light reserve warning</b> | -                                                                                  |
| <b>A inv.</b>                | -                                                                                  |
| <b>B inv.</b>                | -                                                                                  |
| <b>N inv.</b>                | -                                                                                  |
| <b>n. c.</b>                 | 6, 7                                                                               |
| <b>Shield</b>                | -                                                                                  |

**Sensor connector (M12x1) SB, 4-, 5-, 8-, 12-pin**


| Description                                                       | ABN inv. poss. |
|-------------------------------------------------------------------|----------------|
| <b>SB4</b> axial, 4-pin, Connector connected to encoder housing   | -              |
| <b>SB5</b> axial, 5-pin, Connector connected to encoder housing   | -              |
| <b>SB8</b> axial, 8-pin, Connector connected to encoder housing   | •              |
| <b>SB12</b> axial, 12-pin, Connector connected to encoder housing | •              |

| Assignments                  |                     |                     |                     |                     |                        |                       |
|------------------------------|---------------------|---------------------|---------------------|---------------------|------------------------|-----------------------|
|                              | <b>SB4</b><br>4-pin | <b>SB5</b><br>5-pin | <b>SB8</b><br>8-pin | <b>SB8</b><br>8-pin | <b>SB12</b><br>12-pin  | <b>SB12</b><br>12-pin |
|                              |                     |                     |                     |                     |                        |                       |
| <b>Circuit</b>               | H05, H24            | H05, H24            | H05, H24            | R05, R24            | H05, H24               | R05, R24              |
| <b>GND</b>                   | 3                   | 3                   | 1                   | 1                   | 3                      | 3                     |
| <b>(+) Vcc</b>               | 1                   | 1                   | 2                   | 2                   | 1                      | 1                     |
| <b>A</b>                     | 2                   | 4                   | 3                   | 3                   | 4                      | 4                     |
| <b>B</b>                     | 4                   | 2                   | 4                   | 4                   | 6                      | 6                     |
| <b>N</b>                     | -                   | 5                   | 5                   | 5                   | 8                      | 8                     |
| <b>Light reserve warning</b> | -                   | -                   | -                   | -                   | -                      | -                     |
| <b>A inv.</b>                | -                   | -                   | -                   | 6                   | -                      | 9                     |
| <b>B inv.</b>                | -                   | -                   | -                   | 7                   | -                      | 7                     |
| <b>N inv.</b>                | -                   | -                   | -                   | 8                   | -                      | 10                    |
| <b>n. c.</b>                 | -                   | -                   | 6, 7, 8             | -                   | 2, 5, 7, 9, 10, 11, 12 | 2, 5, 11, 12          |
| <b>Shield</b>                | -                   | -                   | -                   | -                   | -                      | -                     |

## Options

### Low-friction bearings

### Order key

The encoder WDG 40A is also available as a particularly smooth-running low-friction encoder. The starting torque is thereby changed to  $\leq 0.1$  Ncm and the protection class at the shaft input to IP50.

**AAC**

### IP67 all around

### Order key

The encoder WDG 40A can be supplied in a full IP67 version.

**AAO**

Max. RPM: 3500 rpm

Permitted Shaft-Loading, axial: 30 N

Permitted Shaft-Loading, radial: 45 N

Max. PPR: 1500 ppr

Starting-torque: approx. 1.2 Ncm at ambient temperature

### Low temperature

### Order key

The encoder WDG 40A with the output circuit types H24, R24 is also available with the extended temperature range -40 °C up to +80 °C (measured at the flange).

**ACA**

### Cable length

### Order key

The encoder WDG 40A can be supplied with more than 2 m cable. The maximum cable length depends on the supply voltage and the frequency; see [www.wachendorff-automation.com/atd](http://www.wachendorff-automation.com/atd)

**XXX = Decimeter**

Please extend the standard order code with a three figure number, specifying the cable length in decimetres.

Example: 5 m cable = 050

| Example Order No. | Type                                                                                                                                                                                                                                           |                         |                            |                              |                  | Your encoder |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|----------------------------|------------------------------|------------------|--------------|
| WDG 40A           | WDG 40A                                                                                                                                                                                                                                        |                         |                            |                              |                  | WDG 40A      |
|                   | <b>Pulses per revolution PPR:</b>                                                                                                                                                                                                              |                         |                            |                              |                  |              |
| 2048              | 4, 9, 10, 15, 20, 25, 28, 30, 36, 40, 50, 60, 90, 100, 120, 125, 128, 150, 160, 180, 200, 235, 250, 300, 314, 318, 360, 400, 500, 600, 625, 635, 720, 900, 1000, 1024, 1080, 1200, 1250, 1500, 1800, 2000, 2048, 2500<br>Other PPRs on request |                         |                            |                              |                  |              |
|                   | <b>Channels:</b>                                                                                                                                                                                                                               |                         |                            |                              |                  |              |
| ABN               | AB, ABN bis 2048 I/U                                                                                                                                                                                                                           |                         |                            |                              |                  |              |
|                   | <b>Output circuit</b>                                                                                                                                                                                                                          |                         |                            |                              |                  |              |
| H24               | <b>Resolution PPR</b>                                                                                                                                                                                                                          | <b>Power supply VDC</b> | <b>Output circuit</b>      | <b>Light reserve warning</b> | <b>Order key</b> |              |
|                   | up to 2500                                                                                                                                                                                                                                     | 4.75 - 5.5              | TTL                        | -                            | H05              |              |
|                   |                                                                                                                                                                                                                                                | 4.75 - 5.5              | TTL, RS422 comp., inverted | -                            | R05              |              |
|                   |                                                                                                                                                                                                                                                | 10 - 30                 | HTL                        | -                            | H24              |              |
|                   |                                                                                                                                                                                                                                                | 10 - 30                 | HTL inverted               | -                            | R24              |              |
|                   | <b>Electrical connections</b>                                                                                                                                                                                                                  |                         |                            |                              |                  |              |
| K2                | <b>Description</b>                                                                                                                                                                                                                             |                         |                            | <b>ABN inv. poss.</b>        | <b>Order key</b> |              |
|                   | <b>Cable: length (2 m standard, WDG 58T: 1 m)</b>                                                                                                                                                                                              |                         |                            |                              |                  |              |
|                   | radial, shield not connected (IP40)                                                                                                                                                                                                            |                         |                            | •                            | K1               |              |
|                   | axial, shield not connected                                                                                                                                                                                                                    |                         |                            | •                            | K2               |              |
|                   | axial, shield connected to encoder housing                                                                                                                                                                                                     |                         |                            | •                            | L2               |              |
|                   | radial, shield not connected                                                                                                                                                                                                                   |                         |                            | •                            | K3               |              |
|                   | radial, shield connected to encoder housing                                                                                                                                                                                                    |                         |                            | •                            | L3               |              |
|                   | <b>Connector: (shield connected to encoder housing)</b>                                                                                                                                                                                        |                         |                            |                              |                  |              |
|                   | connector, M16x0.75, 5-pin, axial                                                                                                                                                                                                              |                         |                            | -                            | SI5              |              |
|                   | connector, M16x0.75, 6-pin, axial                                                                                                                                                                                                              |                         |                            | -                            | SI6              |              |
|                   | connector, M16x0.75, 8-pin, axial                                                                                                                                                                                                              |                         |                            | •                            | SI8              |              |
|                   | connector, M16x0.75, 12-pin, axial                                                                                                                                                                                                             |                         |                            | •                            | SI12             |              |
|                   | connector, M16x0.75, 7-pin, axial                                                                                                                                                                                                              |                         |                            | -                            | S2               |              |
|                   | sensor-connector, M12x1, 4-pin, axial                                                                                                                                                                                                          |                         |                            | -                            | SB4              |              |
|                   | sensor-connector, M12x1, 5-pin, axial                                                                                                                                                                                                          |                         |                            | -                            | SB5              |              |
|                   | sensor-connector, M12x1, 8-pin, axial                                                                                                                                                                                                          |                         |                            | •                            | SB8              |              |
|                   | sensor-connector, M12x1, 12-pin, axial                                                                                                                                                                                                         |                         |                            | •                            | SB12             |              |
|                   | <b>Options</b>                                                                                                                                                                                                                                 |                         |                            |                              |                  |              |
|                   | <b>Description</b>                                                                                                                                                                                                                             |                         |                            | <b>Order key</b>             |                  |              |
|                   | Low-friction bearings                                                                                                                                                                                                                          |                         |                            | AAC                          |                  |              |
|                   | IP67                                                                                                                                                                                                                                           |                         |                            | AAO                          |                  |              |
|                   | Low temperature                                                                                                                                                                                                                                |                         |                            | ACA                          |                  |              |
|                   | Without option                                                                                                                                                                                                                                 |                         |                            | Empty                        |                  |              |
|                   | Cable length                                                                                                                                                                                                                                   |                         |                            | XXX = Decimeter              |                  |              |

|                           |         |      |     |     |    |  |         |  |  |  |  |                     |
|---------------------------|---------|------|-----|-----|----|--|---------|--|--|--|--|---------------------|
| <b>Example Order No.=</b> | WDG 40A | 2048 | ABN | H24 | K2 |  | WDG 40A |  |  |  |  | <b>Your encoder</b> |
|---------------------------|---------|------|-----|-----|----|--|---------|--|--|--|--|---------------------|



For further information please contact our local distributor.  
Here you find a list of our distributors worldwide.  
[http://www.wachendorff-automation.com/distributors\\_worldwide.html](http://www.wachendorff-automation.com/distributors_worldwide.html)

# CREKEN

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