

# WACHENDORFF

The Encoder Experts

# WDG 58V Series Encoders

The Wachendorff WDG 58V series incremental encoders are purpose-built for the Food and Beverage and pharmaceutical industries where aggressive washdown with acid or alkaline agents is routine. These rugged encoders feature a robust stainless steel (V4A) body, optical sensing, and add EHEDG-tested hygienic design and Ecolab certification for resistance to cleaning and disinfection agents.

## Features

- 60 to 5,000 PPR optical resolution
- IP67 + IP69K all-around protection (high-pressure steam cleaning)
- Salt mist resistance per IEC 60068-2-11
- EHEDG-tested hygienic design
- Ecolab certified — resistance to cleaning and disinfection agents
- AISI 316/V4A stainless steel housing, shaft, and flange
- Radial PTFE shaft sealing ring with no dead-room
- Full connection protection with 5–30 and 10–30 VDC supply range
- Universal electrical output (quadrature A, B, Z signals that work with single-ended and differential inputs)
- Integrated 5m cable
- 5 year warranty, cULus, Made in Germany



## Wachendorff WDG 58V Series Encoders

| AutomationDirect Part Number   | Wachendorff Part Number     | Price    | Pulses per Revolution | Dimensional Drawing | Shaft Diameter   | Flange Diameter | Input Voltage | Cable            | Output   |
|--------------------------------|-----------------------------|----------|-----------------------|---------------------|------------------|-----------------|---------------|------------------|--|
| <a href="#">58V603EL3050</a>   | WDG 58V-60-ABN-R30-L3-050   | \$549.00 | 60                    | <a href="#">PDF</a> | 10mm solid shaft | 58mm clamping   | 5–30 VDC      | Radial cable, 5m | Universal (HTL or TTL, single-ended or differential) |
| <a href="#">58V1003EL3050</a>  | WDG 58V-100-ABN-R30-L3-050  | \$549.00 | 100                   | <a href="#">PDF</a> |                  |                 |               |                  |  |
| <a href="#">58V3603EL3050</a>  | WDG 58V-360-ABN-R30-L3-050  | \$549.00 | 360                   | <a href="#">PDF</a> |                  |                 |               |                  |  |
| <a href="#">58V5003EL3050</a>  | WDG 58V-500-ABN-R30-L3-050  | \$549.00 | 500                   | <a href="#">PDF</a> |                  |                 |               |                  |  |
| <a href="#">58V10003EL3050</a> | WDG 58V-1000-ABN-R30-L3-050 | \$549.00 | 1000                  | <a href="#">PDF</a> |                  |                 |               |                  |  |
| <a href="#">58V10243EL3050</a> | WDG 58V-1024-ABN-R30-L3-050 | \$549.00 | 1024                  | <a href="#">PDF</a> |                  |                 |               |                  |  |
| <a href="#">58V20003EL3050</a> | WDG 58V-2000-ABN-R30-L3-050 | \$549.00 | 2000                  | <a href="#">PDF</a> |                  |                 | 4.75–5.5 VDC  |                  | Line Driver (differential)                           |
| <a href="#">58V25003EL3050</a> | WDG 58V-2500-ABN-R30-L3-050 | \$549.00 | 2500                  | <a href="#">PDF</a> |                  |                 |               |                  |  |
| <a href="#">58V40963CL3050</a> | WDG 58V-4096-ABN-R05-L3-050 | \$549.00 | 4096                  | <a href="#">PDF</a> |                  |                 |               |                  |  |
| <a href="#">58V50003CL3050</a> | WDG 58V-5000-ABN-R05-L3-050 | \$549.00 | 5000                  | <a href="#">PDF</a> |                  |                 | 10–30 VDC     |                  | Push-pull (totem)                                    |
| <a href="#">58V40963DL3050</a> | WDG 58V-4096-ABN-R24-L3-050 | \$549.00 | 4096                  | <a href="#">PDF</a> |                  |                 |               |                  |  |
| <a href="#">58V50003DL3050</a> | WDG 58V-5000-ABN-R24-L3-050 | \$549.00 | 5000                  | <a href="#">PDF</a> |                  |                 |               |                  |  |

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## WDG 58V Wiring

| Wachendorff 58V Connector Pinout |            |
|----------------------------------|------------|
| Signal                           | Wire Color |
| GND                              | White      |
| V+                               | Brown      |
| A                                | Green      |
| B                                | Yellow     |
| N                                | Grey       |
| A inv.                           | Red        |
| B inv.                           | Blue       |
| N inv.                           | Violet     |
| Shield                           | Drain wire |

| Wachendorff 58V Circuit Protection |                    |  |                                 |
|------------------------------------|--------------------|--|---------------------------------|
| Output Circuit Type                | Circuit Protection | Power Supply Inverse-Polarity Protection | Output Short Circuit Resistance |
| R05                                | no                 | no                                       | yes                             |
| R24                                | yes                | yes                                      | yes                             |
| R30                                | no                 | yes                                      | yes                             |

**Circuit protection:**

Reversing the polarity of the power supply while simultaneously short-circuiting the outputs to each other or to GND or V+ will not result in damage.

- Applying GND and V+ to two outputs is not permitted and can lead to failure.

**Power Supply Inverse-polarity protection:**

Encoders have reverse polarity protection and can be mis-wired without concern of damage to the encoder. It does not matter if the connections are reversed, even on a long-term basis. Reversing the connection cables of the power supply when the outputs are connected correctly will not result in damage. However, the encoder will not function properly.

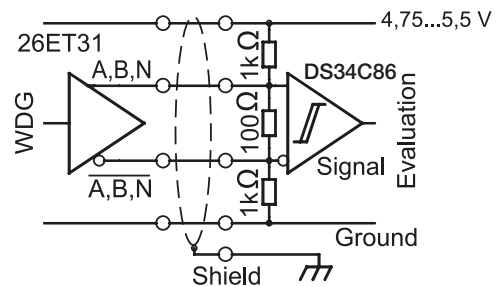
**Output Short circuit resistance:**

Requirements:

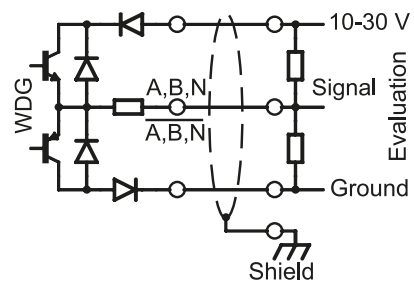
- Supply lines not reversed!
- Only one output and max. permissible supply voltage observed!

Wachendorff encoders are short-circuit-proof between two outputs or against GND or V+.

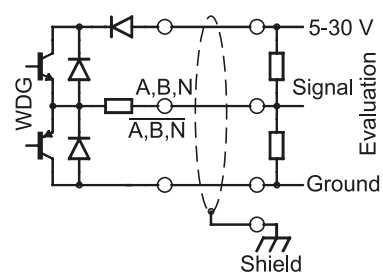
**R05 Output Circuit (CL models)**



**R24 Output Circuit (DL models)**



**R30 Output Circuit (EL models)**



### Specifications - WDG 58V Series

| Electrical Specifications            |  |
|--------------------------------------|--|
| <b>Resolution (PPR)</b>              | 60, 100, 360, 500, 1000, 1024, 2000, 2500, 4096, 5000  |
| <b>Operating Principle</b>           | Optical  |
| <b>Output Signals</b>                | Quadrature output signals with index (ABN, /ABN)   |
| <b>Max Pulse Frequency</b>           | 200 kHz  |
| <b>Output Circuits</b>               | EL models: Universal (HTL or TTL, single-ended or differential)<br>CL models are line driver (differential)<br>DL models are push-pull (totem) |
| <b>Power Supply</b>                  | EL models: 5–30 VDC<br>CL models: 4.75–5.5 VDC<br>DL models: 10–30 VDC   |
| <b>Consumption</b>                   | 70 mA (typical), 100 mA (max)  |
| <b>Output Current (each channel)</b> | 40 mA  |
| <b>EMC</b>                           | DIN EN 61000-6-2 / 61000-6-3   |
| Mechanical Specifications            |  |
| <b>Shaft Diameter</b>                | Ø 10mm (0.394in)   |
| <b>Flange Diameter</b>               | Ø 58mm [2.283in]   |
| <b>Flange Type</b>                   | Clamping flange  |
| <b>Max. Radial Shaft Load</b>        | 100N [10.197 kp]   |
| <b>Max. Axial Shaft Load</b>         | 100N [10.197 kp]   |
| <b>Starting Torque</b>               | Approx. 1 N-cm [1.416 in-ozf] at ambient temperature   |
| <b>Bearings</b>                      | 2 precision ball bearings  |
| <b>Max. Operating Speed</b>          | 3600 rpm   |
| <b>Nominal Service Life</b>          | 1×10 <sup>9</sup> rev. @ 100% load; 1×10 <sup>10</sup> @ 40%; 1×10 <sup>11</sup> @ 20% rated load  |
| <b>Electrical Connection</b>         | 5 meter cable, pigtail   |
| <b>Weight</b>                        | Approx. 600 g [21.164 oz]  |
| Materials                            |  |
| <b>Flange</b>                        | Stainless steel, V4A (AISI 316)  |
| <b>Housing</b>                       | Stainless steel, V4A (AISI 316)  |
| <b>Shaft</b>                         | Stainless steel, V4A (AISI 316)  |
| Environmental Specifications         |  |
| <b>Protection</b>                    | IP67 + IP69K all around (EN 60529)   |
| <b>Operating Temperature</b>         | -20 °C to +80 °C [-4 °F to +176 °F]  |
| <b>Storage Temperature</b>           | -20 °C to +80 °C [-4 °F to +176 °F]  |
| <b>Vibration</b>                     | 50 m/s <sup>2</sup> (10–2000 Hz) per DIN EN 60068-2-6  |
| <b>Shock</b>                         | 1000 m/s <sup>2</sup> (6 ms) per DIN EN 60068-2-27   |
| <b>Electrical Safety</b>             | DIN VDE 0160   |
| <b>Approvals</b>                     | CE, UKCA, cULus, RoHS  |

# Encoder Selection Guide

## SAE Dimension Encoders & Metric Dimension Encoders

| Encoder Selection Guide |             |                   |  |  |                  |   |                            |   |                     |                       |   |             |
|-------------------------|-------------|-------------------|--|--|------------------|---|----------------------------|---|---------------------|-----------------------|---|-------------|
| Type                    | Duty        | Series            | Encoder Diameter   | Shaft Diameter   | Shaft Type       | Operating Voltage (VDC) and Electrical Output   | IP Rating                  | Cable                                     | Max Radial Load (N) | Max Axial Load (N)    | Available Resolutions (PPR)   | Brand       |
| Incremental             | Modular Kit | AMT               | 28mm, 42mm   | 2, 3, 4, 5, 6, 8 mm<br>3/16, 1/4, 3/8, 1/2, 5/8 inch   | Hollow           | 5V Line Driver (TTL) or 5V Push-Pull (Totem Pole)   | IP20                       | Custom cables sold separately             | N/A                 | N/A                   | Programmable up to 4096   | Same Sky    |
|                         |             | MTRA              | 31mm   | 5mm<br>1/4", 3/8"  | Hollow           | 5V Line Driver (TTL) or 5V Push-Pull (Totem Pole)   | IP20                       | Custom cables sold separately             | N/A                 | N/A                   | 400, 1000   | SureStep    |
|                         | Light Duty  | TRD-S(H)R         | 38mm, 40mm   | 8mm  | Solid or Hollow  | 5V Line Driver (TTL) or 5-26V NPN/PNP Open Collector (HTL)  | IP50 or IP65               | Integral 2m pigtail cable                 | 20                  | 10                    | 100, 200, 360, 500, 600, 1000, 1024, 2000, 2500   | JTEKT       |
|                         |             | A41               | 41mm   | 1/4"   | Solid or Hollow  | 5-30 VDC Universal output circuit: Push-Pull (Totem Pole), or NPN/PNP Open Collector (HTL), or Line Driver (TTL)                        | IP64                       | Integral 2m pigtail cable                 | 20                  | 20                    | 100, 200, 360, 500, 1000, 1024, 200, 2048, 3600, 4096   | Lika        |
|                         | A50         | 50mm              | 1/4", 3/8"   | Hollow   | IP65             |   | M12 cables sold separately | 20  | 20                  | 360, 1000, 1024, 2048 |   |             |
|                         | A80         | 80mm              | 30mm (reducer bushings available for 19 & 20mm, 5/8", 7/8", 1, and 1 1/8") | Hollow   | IP64             |   | M23 cables sold separately | 30  | 30                  | 1024                  |   |             |
|                         | Medium Duty | AQ58/59           | 58mm, 59mm   | 3/8" solid, 15mm hollow (reducer bushings available for 6, 8, 10, 11, 12 mm; 1/4, 3/8, 1/2 inch) | Solid or Hollow  | 5-30 VDC Universal output circuit: Push-Pull (Totem Pole), or NPN/PNP Open Collector (HTL), or Line Driver (TTL)                        | IP65                       | M12 cables sold separately                | 100                 | 100                   | Programmable from 1 to 16,384 (default 1024)  | JTEKT       |
|                         |             | AR01              | 58mm   | 15mm   | Solid Dual-shaft |   | IP65                       | M12 cables sold separately                | 50                  | 50                    | 250 (linear res: 0.36 deg/cts)<br>1250 (linear res: 0.072 deg/cts)  |             |
|                         |             | TRDA-20           | 2"   | 3/8"   | Solid            | 5VDC Line Driver (TTL) or 5-30 VDC Push-Pull (Totem Pole)   | IP50                       | Integral 2m pigtail cable                 | 50                  | 30                    | 100, 360, 500, 1000, 1024, 2500   | JTEKT       |
|                         |             | TRDA-25           | 2.5" flange (w/2.0" body)  | 3/8"   | Solid            |   | IP65                       | Military Spec (MS) cables sold separately | 50                  | 30                    | 100, 360, 500, 1000, 1024, 2500   |             |
|                         |             | TRD-N(H)          | 50mm   | 8mm  | Solid or Hollow  |   | IP65                       | Integral 2m pigtail cable                 | 50                  | 30                    | 3, 4, 5, 10, 30, 40, 50, 60, 100, 120, 200, 240, 250, 300, 360, 400, 480, 500, 600, 750, 1000, 1024, 1200, 2000, 2500 |             |
|                         | Heavy Duty  | WDGI 36J          | 36mm   | 10mm   | Solid            | 4.75-30 VDC Universal (HTL or TTL, single-ended or differential)  | IP69K                      | 8-pin M12 A-coded cable                   | 300                 | 300                   | 60, 100, 360, 500, 1000, 1024, 2000, 2500, 4096, 5000   | Wachendorff |
|                         |             | WDG 58V           | 58mm   | 10mm   | Solid            | 5-30 VDC universal (HTL or TTL, single-ended or differential) or 4.75-5.5 VDC Line Driver (Differential) or 10-30 VDC Push-Pull (Totem) | IP69K                      | Integral 5m pigtail                       | 100                 | 100                   | 60, 100, 360, 500, 1000, 1024, 2000, 2500, 4096, 5000   |             |
|                         |             | TRD-GK            | 78mm   | 10mm   | Solid            | 10-30 VDC Push-Pull (Totem Pole)  | IP65                       | Integral 2m pigtail cable                 | 100                 | 50                    | 30, 100, 120, 200, 240, 250, 300, 360, 400, 500, 600, 1000, 1200, 2000, 2500, 3600, 5000                              |             |
| Absolute                | Medium Duty | TRD-NA            | 50mm   | 8mm  | Solid            | 10-30V NPN/PNP Open Collector (HTL)   | IP65                       | Integral 2m pigtail cable                 | 50                  | 30                    | 32, 64, 128, 180, 256, 360, 512, 720, 1024 (Gray code)  | Lika        |
|                         |             | AM5x <sup>1</sup> | 58mm   | 6-15mm, 3/8"   | Solid or Hollow  | 5-30 VDC, 10-30 VDC   | IP65                       | M12 cables sold separately                | 40                  | 40                    | Programmable up to 8192 ppr (13 bit), up to 16384 turns (14 bit)  |             |

1 - AM5x encoders have different versions supporting 4 different outputs - Ethernet/IP, Modbus TCP, EtherCAT, and Modbus RTU (RS485).