# A58H1

## PHOTOELECTRIC ROTARY ENCODER


The encoder A58H1 is used to measure angular position of the key machine components, industrial robots, comparators, rotary tables, servo drives and to establish an informational link with DCC, NC or Digital Readout Units. The encoder has external flexible coupling.

The encoder is used in automatic control, on-line gauging, process monitoring systems, etc.

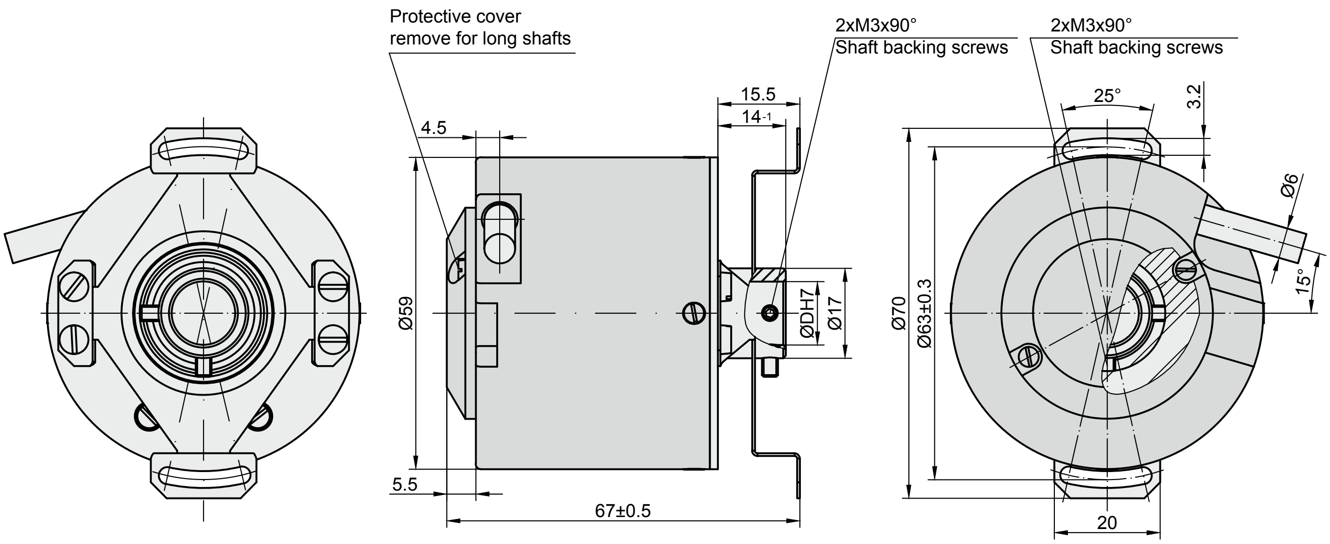
Three versions of output signals are available:

- A58H1-A - sinusoidal signals, with amplitude approx. 11 µApp;
- A58H1-AV - sinusoidal signals, with amplitude approx. 1 Vpp;
- A58H1-F - square-wave signals (TTL) with integrated subdividing electronics for interpolation x1, x2, x3, x4, x5, x8, x10.

## MECHANICAL DATA

| | |
|---|---|
| Line number on disc (z) | 100 ;250; 500; 600; 800; 1000; 1024; 1125; 1250; 1500; 2000; 2048; 2500; 3000; 3600; 4000; 5000; 9000; 10800 |
| Pulse number per shaft revolution for A58H1-F | Z x k, where k=1,2,3,4,5,8,10 |
| Maximum shaft speed | 10000 rpm |
| Permissible motion of shaft:<br>- axial<br>- radial (at shaft end) | <br>±0.03 mm<br>0.05 mm |
| Accuracy ($T_1$-period of lines on disc in arc. sec) | ±0.1$T_1$ arc. sec |
| Starting torque at 20°C | ≤ 0.025 Nm |

| | |
|---|---|
| Rotor moment of inertia | < 1.5x10$^{-4}$ kgm$^2$ |
| Protection (housing) ( IEC 529) | IP64 |
| Protection (shaft side) ( IEC 529) | IP64 |
| Maximum weight without cable | 0.3 kg |
| Operating temperature | -10...+70 °C |
| Storage temperature | -30...+80 °C |
| Maximum humidity (non-condensing) | 98 % |
| Permissible vibration (55 to 2000 Hz) | ≤ 100 m/s$^2$ |
| Permissible shock (11 ms) | ≤ 300 m/s$^2$ |



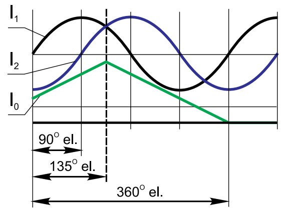

| D, mm | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 14* (on option) |
|---|---|---|---|---|---|

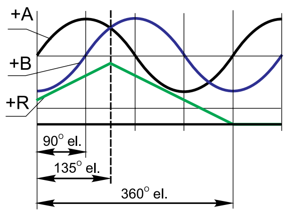
*For one side fixation from encoder flange side*

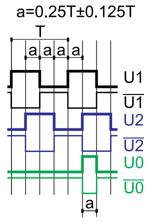
# ELECTRICAL DATA

| VERSION | A58H1-A ∿ 11 µApp | A58H1-AV ∿ 1 Vpp | A58H1-F ⊓⊔ TTL; ⊓⊔ HTL |
|---|---|---|---|
| Supply voltage ($U_P$) | +5 V ± 5% | +5 V ± 5% | +5 V ± 5%; +(10 to 30) V |
| Max. supply current (without load) | 80 mA | 120 mA | 120 mA |
| Light source | LED | LED | LED |
| Incremental signals | Two sinusoidal $I_1$ and $I_2$<br>Amplitude at 1 kΩ load:<br>- I1 = 7-16 µA<br>- I2 = 7-16 µA | Differential sine +A/-A and +B/-B<br>Amplitude at 120 Ω load:<br>- A = 0.6-1.2 V<br>- B = 0.6-1.2 V | Differential square-wave U1/$\overline{U1}$ and U2/$\overline{U2}$.<br>Signal levels at 20 mA load current:<br>- low (logic "0") ≤ 0.5 V at $U_P$=+5 V<br>- low (logic "0") ≤ 1.5 V at $U_P$=10 to 30 V<br>- high (logic "1") ≥ 2.4 V at $U_P$=+5 V<br>- high (logic "1") ≥ ($U_P$-2) V at $U_P$=10 to 30 V |
| Reference signal | One quasi-triangular $I_0$ peak per revolution. Signal magnitude at 1 kΩ load:<br>- $I_0$ = 2-8 µA (usable component) | One quasi-triangular +R and its complementary -R per revolution. Signals magnitude at 120Ω load<br>- R = 0.2-0.8 V (usable component) | One differential square-wave U0/U0 per revolution. Signal levels at 20 mA load current:<br>- low (logic "0") < 0.5 V at $U_P$=+5 V<br>- low (logic "0") < 1.5 V at $U_P$=10 to 30 V<br>- high (logic "1") > 2.4 V at $U_P$=+5 V<br>- high (logic "1") > ($U_P$-2) V at $U_P$=10 to 30 V |
| Maximum operating frequency | (-3 dB) ≥ 160 kHz | (-3 dB) ≥ 180 kHz | (160 x k) kHz, k-interpolation factor |
| Direction of signals | $I_2$ lags $I_1$ for clockwise rotation (viewed from shaft side) | +B lags +A for clockwise rotation (viewed from shaft side) | U2 lags U1 with clockwise rotation (viewed from shaft side) |
| Maximum rise and fall time | - | - | < 0.5 µs |
| Standard cable length | 1 m, without connector | 1 m, without connector | 1 m, without connector |
| Maximum cable length | 5 m | 25 m | 25 m |

Output signals



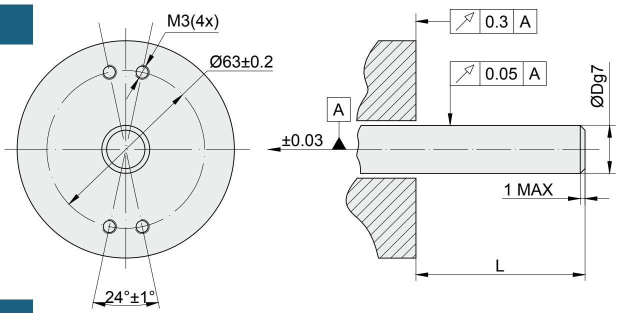




*Note:*

1. *Maximum working rotation speed (with proper encoder counting) is limited by maximum operating frequency and maximum mechanica rotation speed.*
2. *If cable extension is used, power supply conductor cross-section should not be smaller than 0.5 mm².*

# MOUNTING REQUIREMENTS

| | |
|---|---|
| L, mm | 11 min for one side fixation |
| | 56 min for both side fixation |
| | 56 max for version with protective cover |
| | 11 min for version without protective cover |




# ACCESSORIES

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CONNECTORS FOR CABLE | B12<br>12-pin round connector | C9<br>9-pin round connector | C12<br>12-pin round connector | D9<br>9-pin flat connector | D15<br>15-pin flat connector | RS10<br>10-pin round connector | ONC<br>10-pin round connector |
| DIGITAL READOUT DEVICES | CS3000 | | | CS5000 | | | |
| EXTERNAL INTERPOLATOR | NK | | | | | | |

# ORDER FORM

A58H1 - XX - XXXX - XX - XXX - XX/X

| OUTPUT SIGNAL VERSION: | PULSE NUMBER PER REVOLUTION: | SHAFT HOLE DIAMETER: | SUPPLY VOLTAGE: | CABLE LENGTH: | CONNECTOR TYPE: |
|---|---|---|---|---|---|
| A<br>AV<br>F | 1...100<br>...<br>1...108000 | 6, 8, 10, 12,14* mm<br><br>*with additional hub for shaft mounting, for one side fixation from flange side | 05V - +5V<br>30V - +(10 to 30)V*<br><br>*only for A58H-F with HTL output | AR01 - 1m<br>AR02 - 2m<br>AR03 - 3m<br>... | W - without connector<br>B12 - round, 12 pins<br>C9 -round, 9 pins<br>C12 - round, 12 pins<br>D9 - flat, 9 pins<br>D15 - flat, 15 pins<br>RS10 - round, 10 pins<br>ONC - round, 10 pins |

ORDER EXAMPLES:

1) A58H1-AV-1024-6-05V-AR01/W
2) A58H1-F-4000-8-30V-AR06/C12
3) A58H1-F-4000/500-8-30V-AR06/C12

Photoelectric rotary encoders