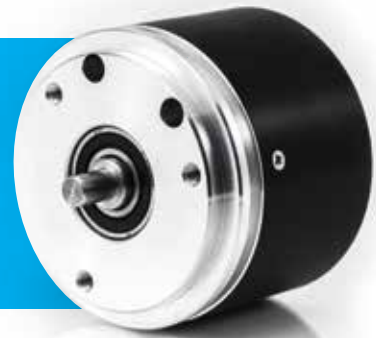


A58

A58M, A58B,
A58C, A58C2,
A58C3, A58D

PHOTOELECTRIC ROTARY ENCODER



The photoelectric rotary encoder A58 is used to establish an informational link between the key machine components, industrial robots, comparators and DCC, NC or Digital Readout Units. It provides information about the value and direction of the motion. The encoder is used in automatic control, on-line gauging, process monitoring systems, etc.

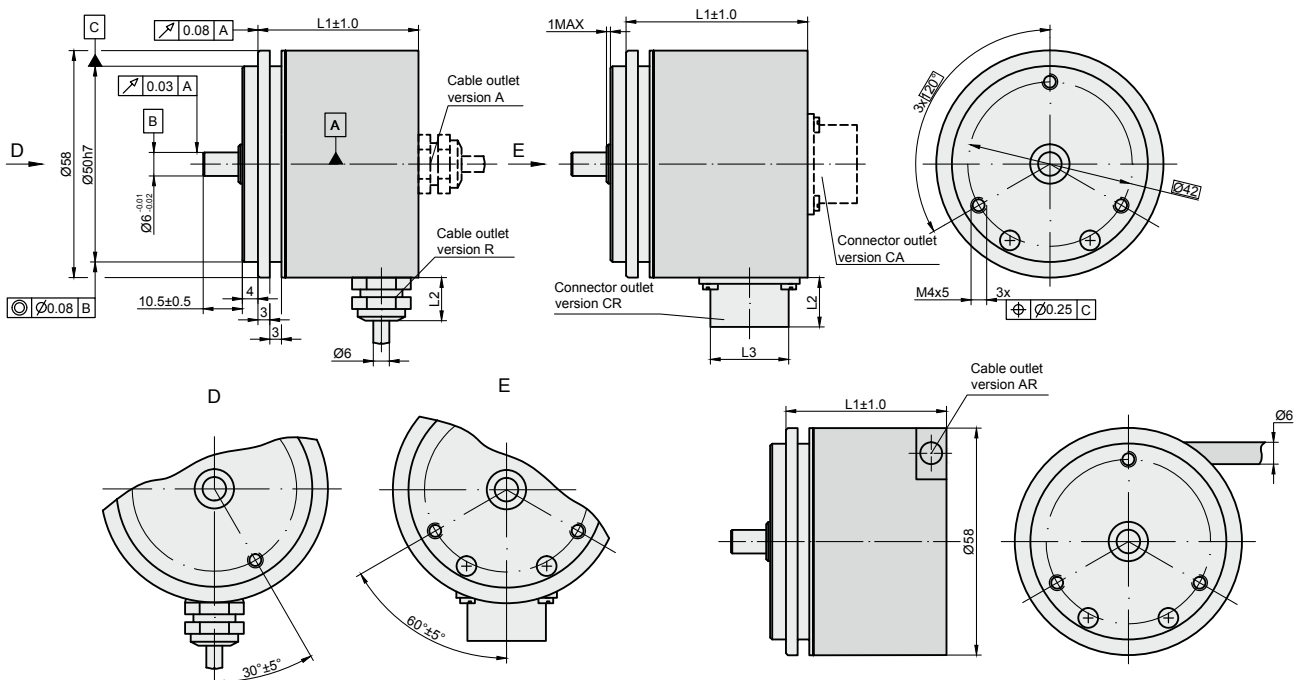
Three versions of output signals are available:

- A - sinusoidal signals, with amplitude approx. 1 μ App;
- AV - sinusoidal signals, with amplitude approx. 1 Vpp;
- F - square-wave signals TTL or HTL.

MECHANICAL DATA

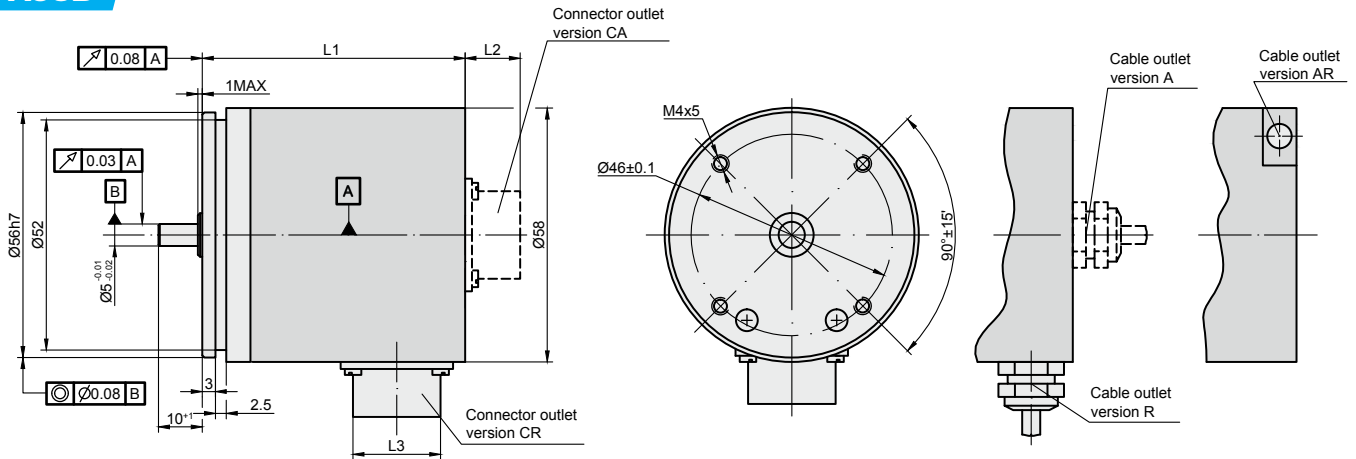
| | | | |
|---|---|--|------------------------------|
| Line number on disc (z) | 100; 250; 500; 600; 800; 1000; 1024; 1125; 1250; 1500; 2000; 2048; 2500; 3000; 3600; 4000; 5000; 9000; 10800 | Accuracy (T_1 -period of lines on disc in arc. sec) | $\pm 0.1T_1$ arc. sec |
| Pulse number per shaft revolution for A58-F | Z x k, where k=1,2,3,4,5,8,10 | Starting torque at 20°C | ≤ 0.01 Nm |
| Maximum shaft speed | 12000 rpm | Rotor moment of inertia | < 15 gcm ² |
| Maximum shaft load: | | Protection (IEC 529) | IP64 |
| - axial | 10 N | Maximum weight without cable | 0.25 kg |
| - radial (at shaft end) | 20 N | 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) | ≤ 1000 m/s ² |

A58M



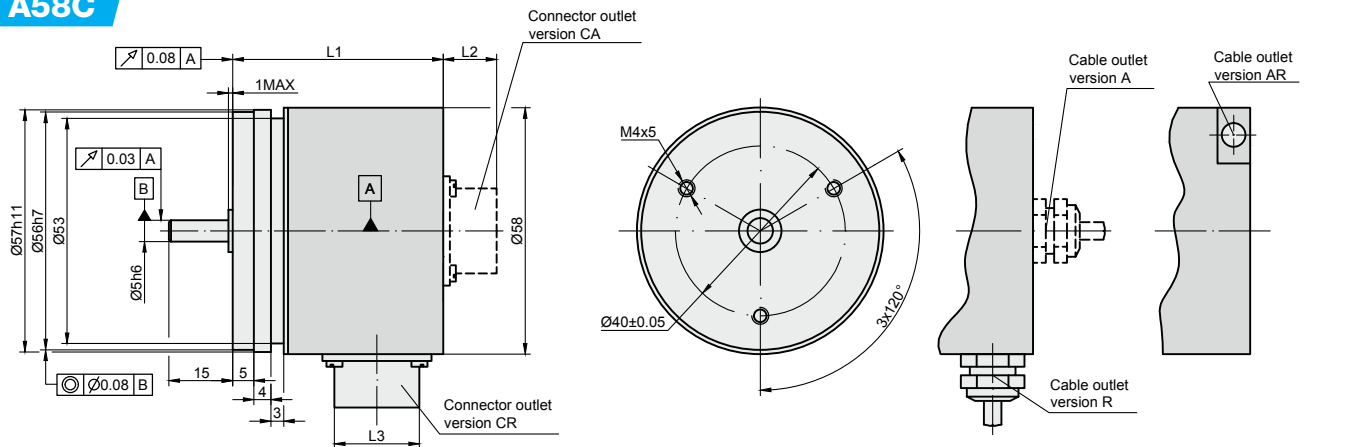
| Connector type / cable outlet | ONC axial | RS10 axial | C12, C9 axial | ONC radial | RS10 radial | C12, C9 radial | Cable axial (ver. A) | Cable radial (ver. R) | Cable axial-radial (ver. AR) |
|-------------------------------|-----------|------------|---------------|------------|-------------|----------------|----------------------|-----------------------|------------------------------|
| L1 | 41 mm | 41 mm | 41 mm | 54 mm | 53 mm | 53 mm | 41 mm | 41 mm | 43 mm |
| L2 | 16 mm | 9 mm | 22 mm | 16 mm | 9 mm | 22 mm | 12 mm | 12 mm | - |
| L3 | M24 | M14 | M23 | M24 | M14 | M23 | - | - | - |

A58B



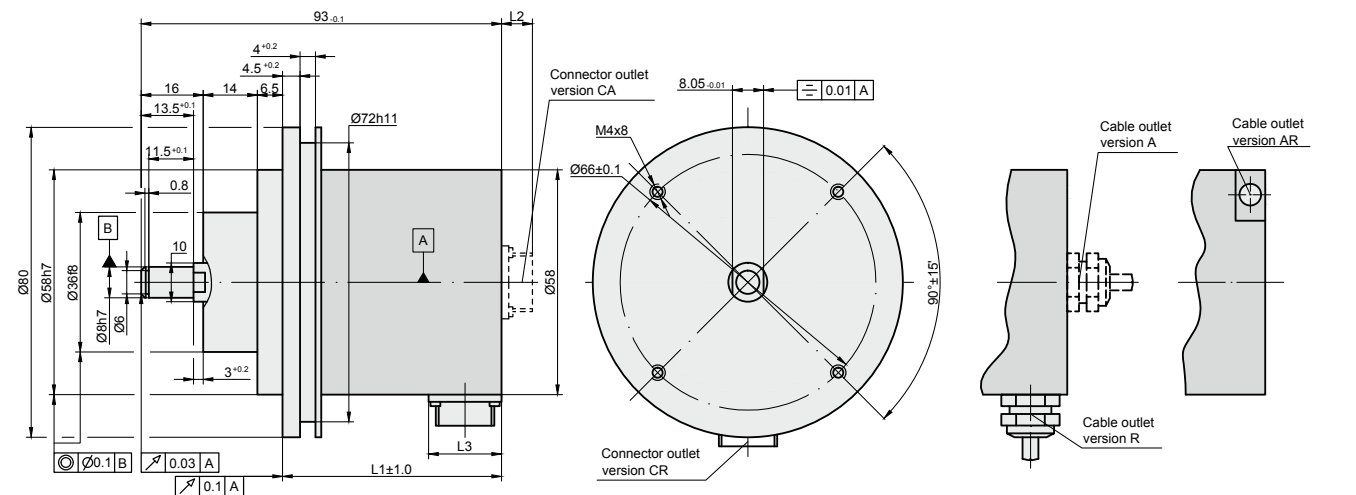
| Connector type / cable outlet | ONC axial | RS10 axial | C12, C9 axial | ONC radial | RS10 radial | C12, C9 radial | Cable axial (ver. A) | Cable radial (ver. R) | Cable axial-radial (ver. AR) |
|-------------------------------|-----------|------------|---------------|------------|-------------|----------------|----------------------|-----------------------|------------------------------|
| L1 | 44.5 mm | 44.5 mm | 44.5 mm | 57.5 mm | 56.5 mm | 56.5 mm | 44.5 mm | 44.5 mm | 46.6 mm |
| L2 | 16 mm | 9 mm | 22 mm | 16 mm | 9 mm | 22 mm | 12 mm | 12 mm | - |
| L3 | M24 | M14 | M23 | M24 | M14 | M23 | - | - | - |

A58C



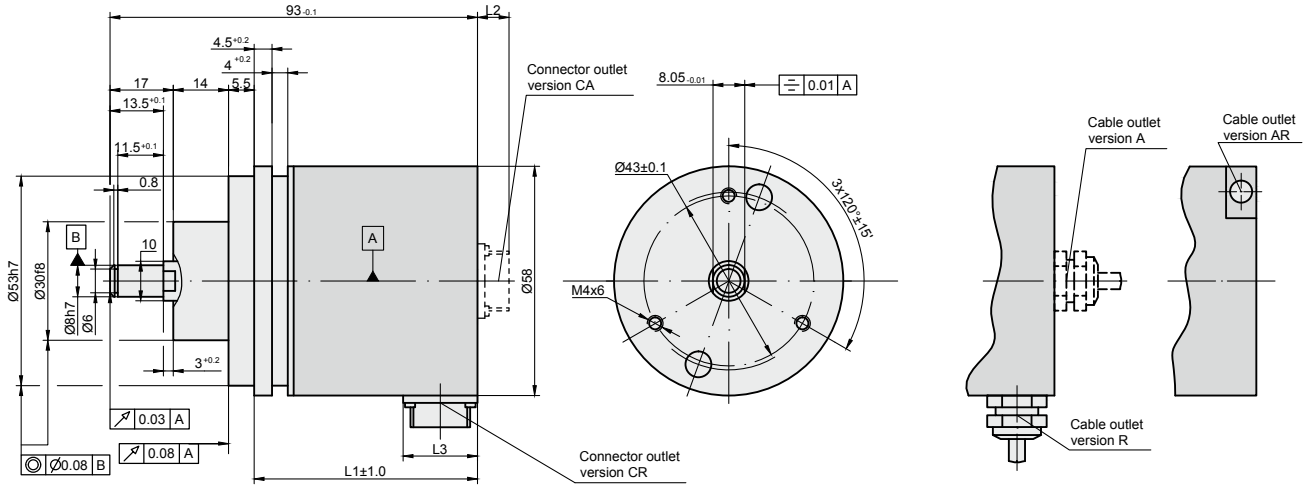
| Connector type / cable outlet | ONC axial | RS10 axial | C12, C9 axial | ONC radial | RS10 radial | C12, C9 radial | Cable axial (ver. A) | Cable radial (ver. R) | Cable axial-radial (ver. AR) |
|-------------------------------|-----------|------------|---------------|------------|-------------|----------------|----------------------|-----------------------|------------------------------|
| L1 | 47 mm | 47 mm | 47 mm | 60 mm | 59 mm | 59 mm | 47 mm | 47 mm | 49 mm |
| L2 | 16 mm | 9 mm | 22 mm | 16 mm | 9 mm | 22 mm | 12 mm | 12 mm | - |
| L3 | M24 | M14 | M23 | M24 | M14 | M23 | - | - | - |

A58C2



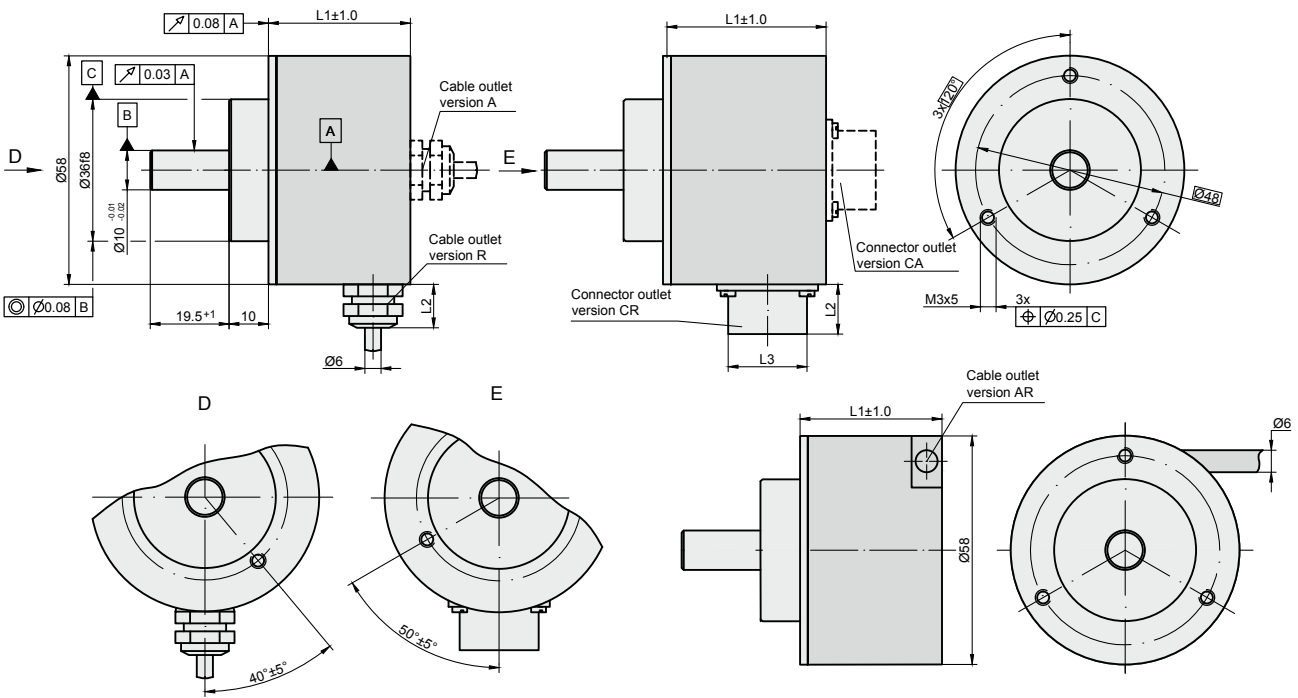
| Connector type / cable outlet | ONC axial | RS10 axial | C12, C9 axial | ONC radial | RS10 radial | C12, C9 radial | Cable axial (ver. A) | Cable radial (ver. R) | Cable axial-radial (ver. AR) |
|-------------------------------|-----------|------------|---------------|------------|-------------|----------------|----------------------|-----------------------|------------------------------|
| L1 | 44.5 mm | 44.5 mm | 44.5 mm | - | 56.5 mm | 56.5 mm | 44.5 mm | 44.5 mm | 46.5 mm |
| L2 | 16 mm | 9 mm | 22 mm | 16 mm | 9 mm | 22 mm | 12 mm | 12 mm | - |
| L3 | M24 | M14 | M23 | M24 | M14 | M23 | - | - | - |

A58C3



| Connector type / cable outlet | ONC axial | RS10 axial | C12, C9 axial | ONC radial | RS10 radial | C12, C9 radial | Cable axial (ver. A) | Cable radial (ver. R) | Cable axial-radial (ver. AR) |
|-------------------------------|-----------|------------|---------------|------------|-------------|----------------|----------------------|-----------------------|------------------------------|
| L1 | 50 mm | 50 mm | 50 mm | - | 62 mm | 62 mm | 50 mm | 50 mm | 52 mm |
| L2 | 16 mm | 9 mm | 22 mm | 16 mm | 9 mm | 22 mm | 12 mm | 12 mm | - |
| L3 | M24 | M14 | M23 | M24 | M14 | M23 | - | - | - |

A58D



| Connector type / cable outlet | ONC axial | RS10 axial | C12, C9 axial | ONC radial | RS10 radial | C12, C9 radial | Cable axial (ver. A) | Cable radial (ver. R) | Cable axial-radial (ver. AR) |
|-------------------------------|-----------|------------|---------------|------------|-------------|----------------|----------------------|-----------------------|------------------------------|
| L1 | 37.5 mm | 37.5 mm | 37.5 mm | - | 49.5 mm | 49.5 mm | 37.5 mm | 37.5 mm | 39.5 mm |
| L2 | 16 mm | 9 mm | 22 mm | 16 mm | 9 mm | 22 mm | 12 mm | 12 mm | - |
| L3 | M24 | M14 | M23 | M24 | M14 | M23 | - | - | - |

ELECTRICAL DATA

| VERSION | A58-A $\sim 11 \mu\text{App}$ | A58-AV $\sim 1 \text{Vpp}$ | A58-F \square TTL; \square HTL |
|------------------------------------|---|---|--|
| Supply voltage (U_p) | +5 V $\pm 5\%$ | +5 V $\pm 5\%$ | +5 V $\pm 5\%$; +(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 Amplitude at 1 k Ω load: - $I_1 = 7\text{-}16 \mu\text{A}$ - $I_2 = 7\text{-}16 \mu\text{A}$ | Differential sine +A/-A and +B/-B Amplitude at 120 Ω load: - A = 0.6-1.2 V - B = 0.6-1.2 V | Differential square-wave $U1/\overline{U1}$ and $U2/\overline{U2}$. Signal levels at 20 mA load current: - low (logic "0") $\leq 0.5 \text{ V}$ at $U_p=+5 \text{ V}$ - low (logic "0") $\leq 1.5 \text{ V}$ at $U_p=10 \text{ to } 30 \text{ V}$ - high (logic "1") $\geq 2.4 \text{ V}$ at $U_p=+5 \text{ V}$ - high (logic "1") $\geq (U_p-2) \text{ V}$ at $U_p=10 \text{ to } 30 \text{ V}$ |
| Reference signal | One quasi-triangular I_0 peak per revolution. Signal magnitude at 1 k Ω load: - $I_0 = 2\text{-}8 \mu\text{A}$ (usable component) | One quasi-triangular +R and its complementary -R per revolution. Signals magnitude at 120 Ω load - R = 0.2-0.8 V (usable component) | One differential square-wave $U0/\overline{U0}$ per revolution. Signal levels at 20 mA load current: - low (logic "0") $< 0.5 \text{ V}$ at $U_p=+5 \text{ V}$ - low (logic "0") $< 1.5 \text{ V}$ at $U_p=10 \text{ to } 30 \text{ V}$ - high (logic "1") $> 2.4 \text{ V}$ at $U_p=+5 \text{ V}$ - high (logic "1") $> (U_p-2) \text{ V}$ at $U_p=10 \text{ to } 30 \text{ V}$ |
| Maximum operating frequency | (-3 dB) $\geq 160 \text{ kHz}$ | (-3 dB) $\geq 180 \text{ kHz}$ | (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 | - | - | $< 0.5 \mu\text{s}$ |
| 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:

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

ACCESSORIES

| | | | | | | | |
|--------------------------------|-------------------------------|------------------------------|-------------------------------|----------------------------|--------------------------------|--------------------------------|-------------------------------|
| CONNECTORS FOR CABLE | B12 12-pin round connector | C9 12-pin round connector | C12 12-pin round connector | D9 9-pin flat connector | D15 15-pin flat connector | RS10 10-pin round connector | ONC 10-pin round connector |
| CONNECTORS ON HOUSING | C9 12-pin round connector | | C12 12-pin round connector | | RS10 10-pin round connector | | ONC 10-pin round connector |
| DIGITAL READOUT DEVICES | CS3000 | | | CS5500 | | | |
| COUPLING | SC30 | | | | | | |
| EXTERNAL INTERPOLATOR | NK | | | | | | |

ORDER FORM

| TYPE: | OUTPUT SIGNALS VERSION: | PULSE NUMBER PER REVOLUTION: | OPTIONAL LINE NUMBER ON DISC (Z): | SUPPLY VOLTAGE: | CABLE LENGTH AND OUTLET OR FLANGE SOCKET ON CASE OUTLET: | CONNECTOR OR FLANGE SOCKET TYPE: | COUPLING: |
|--|--|------------------------------|---|---|--|---|----------------------------------|
| M - A58M B - A58B C - A58C C2 - A58C2 C3 - A58C3 D - A58D | A AV F | 100 ... 108000 | 100 ... 10800 * only for F-signals | 05V - +5V 30V - +(10 to 30)V* *only for A58-F with HTL output signals | A01 - 1m (A-axial cable) ... R01 - 1m (R-radial cable) ... AR01 - 1m (AR-universal cable outlet) ... CA - flange socket axial CR - flange socket radial | W* - without connector B12* - round, 12 pins C9 - round, 9 pins C12 - round, 12 pins D9* - flat, 9 pins D15* - flat, 15 pins RS10 - round, 10 pins ONC - round, 10 pins *only for cable | 0 - without 1 - with coupling |
| ORDER EXAMPLES: | 1) A58M-A-1024-05V-A01/W-0 2) A58B-F-2500-05V-AR01/W-1 3) A58B-F-2500/500-05V-AR01/W-1 | | | | | | |