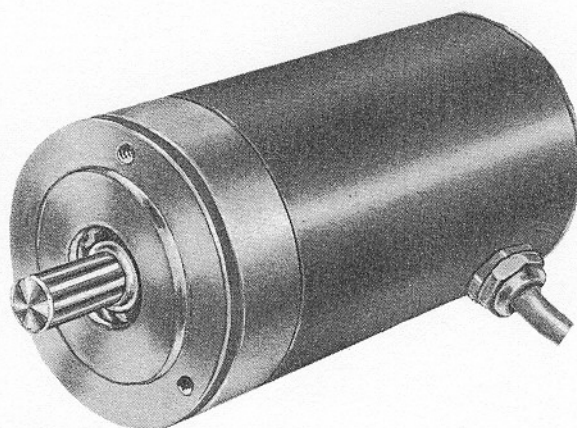


- Compact and robust for mechanical engineering applications
- Gray or Natural Binary output code
- Total capacity 24 Bit = 16.777.216 positions
- Resolution 4096 positions / 360° x max.
- Measuring range 4096 turns max.
- Mechanically adjustable zero point
- Protected to IP 65 and IP 66



Construction

Flange and case in anodised aluminium - Shaft in stainless steel
12 mm ball-bearings with Nilos ring or radial packing ring seal
code disc in deformation resistant plastic - GaAlAs diodes
photo-transistor array with comparator and trigger circuit - gate
array - SMD technology.

The models CR 58, CR 65, CR 66 and CR 105 have different
shaft, flange and case dimensions and different types of electrical
connections (for details see page 3).

Technical Data

(Valid for all models unless otherwise stated)

- Resolution: 2 to 4096 positions / 360°
- Measuring range : 2 to 4096 turns
- Total number of positions : $2^{12} \times 2^{12} = 2^{24}$
- Measurement position deviation : 2' 38"
- Output frequency * : 30 kHz max. up to 10 Bit / 360°
10 kHz max. from 11 Bit / 360°
- Disc coding : Gray code
- Output code, parallel : Gray or Natural Binary
- Output code, serial : Gray or Natural Binary
- Code sense : CW or CCW (signal input E2)
- Logic polarity : Positive
- Memory circuit : Store or not store,
(latch) signal input E1
- Enable circuit * : Active or inactive,
(for bus operation) (signal input E1)

* Only for parallel interface

- Sensor system : GaAlAs diodes,
photo-transistor array
- Parallel output circuits :
A = Open collector Darlington
C = Open emitter Darlington
B = Open collector, TTL compatible
D = Push-pull, Totem-pole
- Serial output SS/ : Differential data output
to RS 422,
- Clock input SS/ : Differential (opto-coupler) for
data driver to RS 422

- Supply voltage range : + 11 V to + 26 VDC
- Supply current
Parallel : 90 mA typ. / 120 mA max.
Serial SS/ : 130mA typ. / 160mA max.
- Operating speed : 3000 rpm max. (continuous)
4000 rpm max. (short period)
- Angular acceleration : $10^5 \text{ rad/s}^2 \text{ max.}$
- Inertial mass of rotor : 50 gcm²
- Operating torque : ≤ 5 Ncm (8 Ncm - CR 66)
- Wind-up torque : ≤ 1 Ncm (4 Ncm - CR 66)
- Permissible axial and radial shaft load : 250 N max.
- Bearing life expectancy : 10^9 revolutions
- Operating temperature range : - 20°C to + 60°C
- Storage temperature range : - 25°C to + 70°C
- Permissible rel. humidity : 85% without condensation
- Resistance to shock : 200 m/s²; 11 ms
(DIN IEC 68)
- Resistance to vibration : 5 Hz...1000 Hz; 100 m/s²
(DIN IEC 68)
- Protection class (DIN 40050)
CR 58, 65 and 105 : IP 65 (Nilos ring)
CR 66 : IP 66 (radial packing ring)
- Mass :
CR 58 0.6 kg
CR 65 0.7 kg
CR 66 0.7 kg
CR 105 1.3 kg

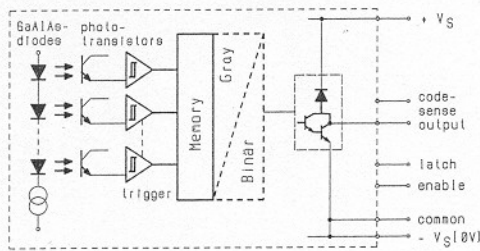
Electrical connections (standard versions):

- CR 58, 65 and 66 parallel : Lead with connector DC 37
(IP 30)
- CR 58, 65 and 66 serial : Round connector 7-way
(IP 65) on case
- CR 105 parallel and serial : Connector DC 37 (IP65)
on case

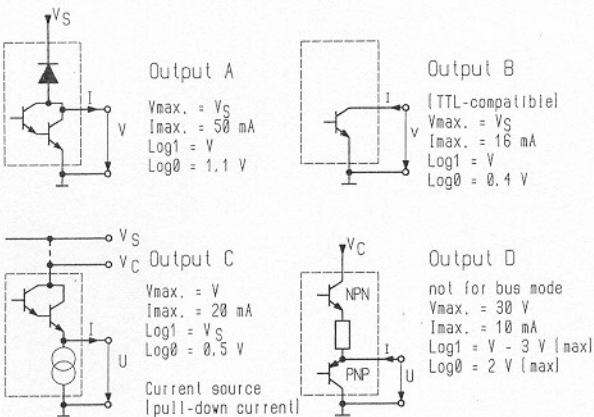
Mating connector included in supplied items. Other types of
connections on request.

The parallel interface

Block diagram (Output A)

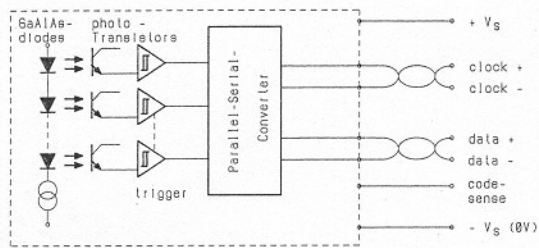


Output circuits



The synchronous serial interface SSI - 24 Bit

Block diagram SSI



The parallel, absolute angle information derived by the encoder is converted into serial information by a parallel-serial converter and then transmitted to a receiving electronic circuit in synchronism with a clock. High data transmission rates of up to 1.5 MHz are possible depending on the length of the cable.

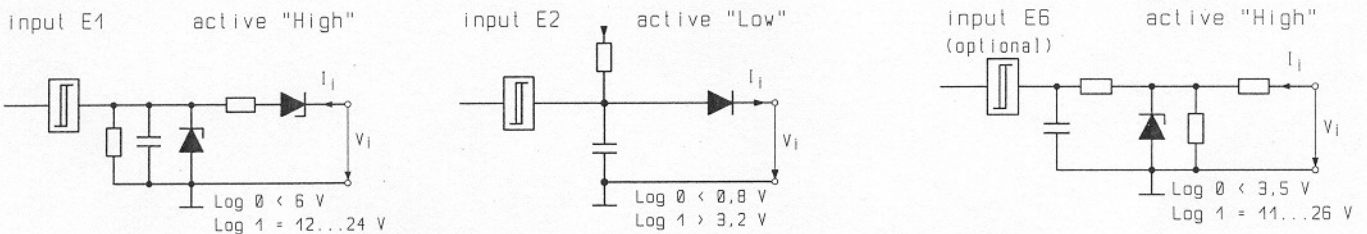
Significant advantages are:

- Low number of data lines
(A 24 Bit parallel encoder requires 24 data lines, but the SSI encoder only needs 4 data lines for the same resolution.)

- High reliability.

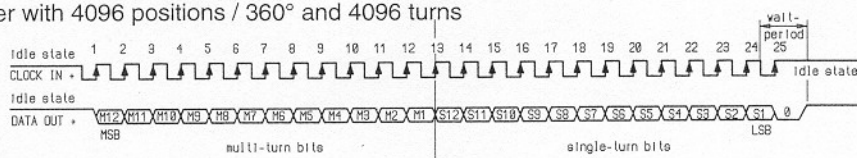
The SPC Converter Card is available for the conversion of the serial data into binary parallel data (Data Sheet 10109).

Signal inputs

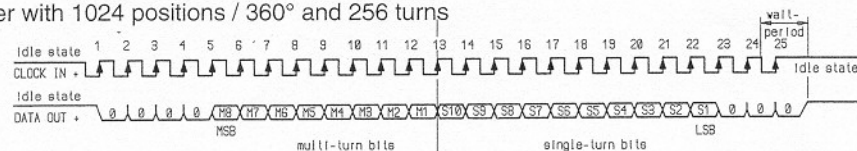


Interface profile SSI - 24 Bit

Example 1 : Multi-turn encoder with 4096 positions / 360° and 4096 turns

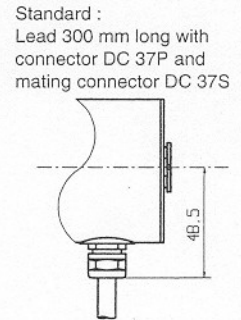
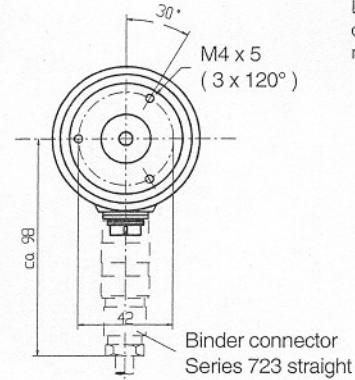
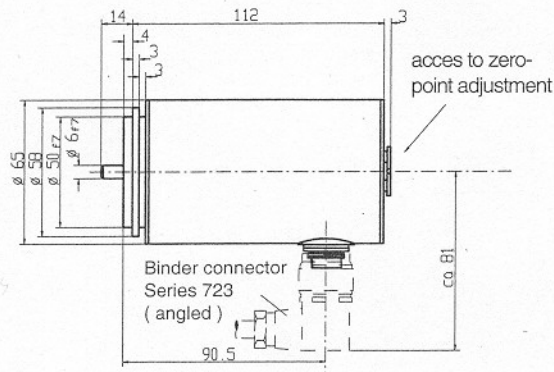


Example 2 : Multi-turn encoder with 1024 positions / 360° and 256 turns

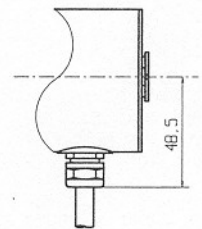
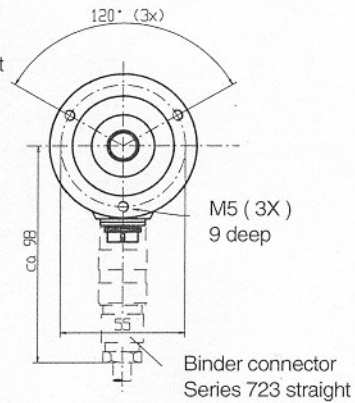
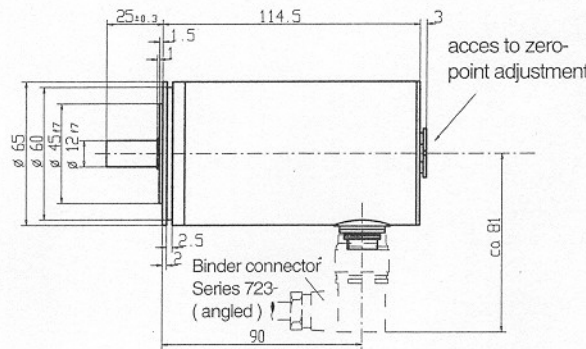


Dimensions in mm

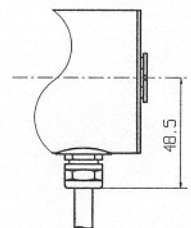
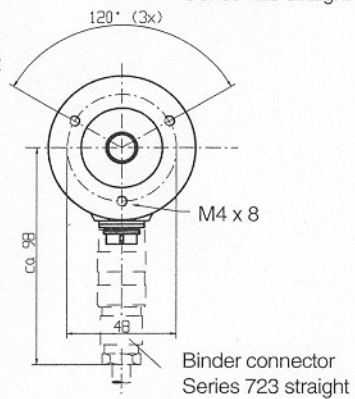
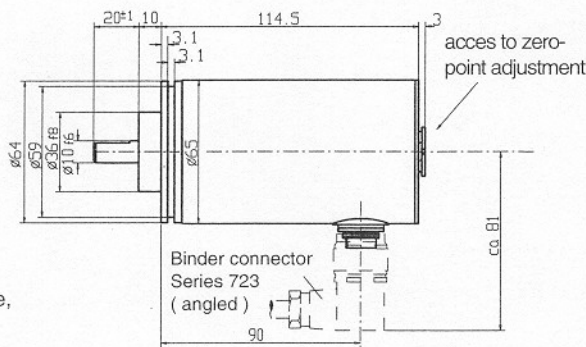
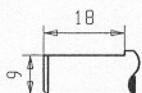
Model CR 58
with synchro flange



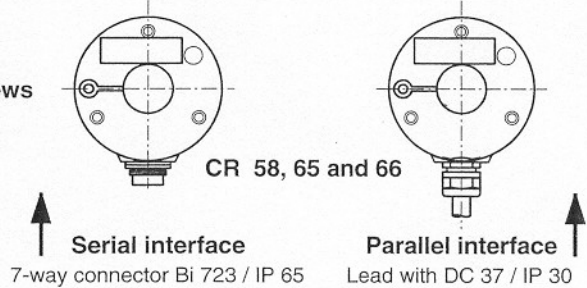
Model CR 65
with synchro flange



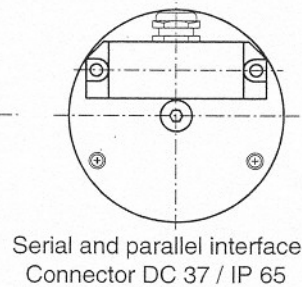
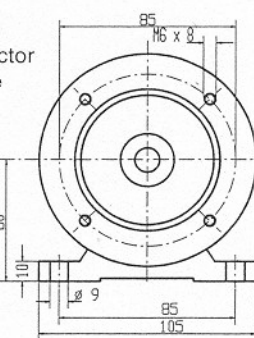
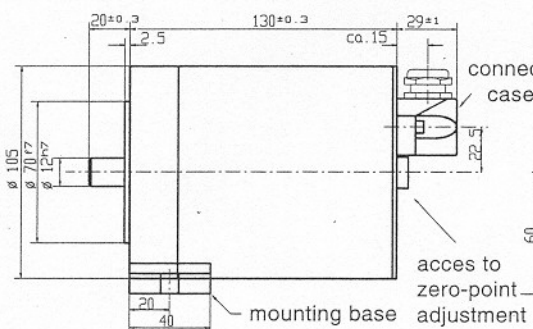
Model CR 66
with clamping flange,
shaft with flat



Rear views



Model CR 105



Serial and parallel interface
Connector DC 37 / IP 65

Mechanical gear drives for Model CR 106

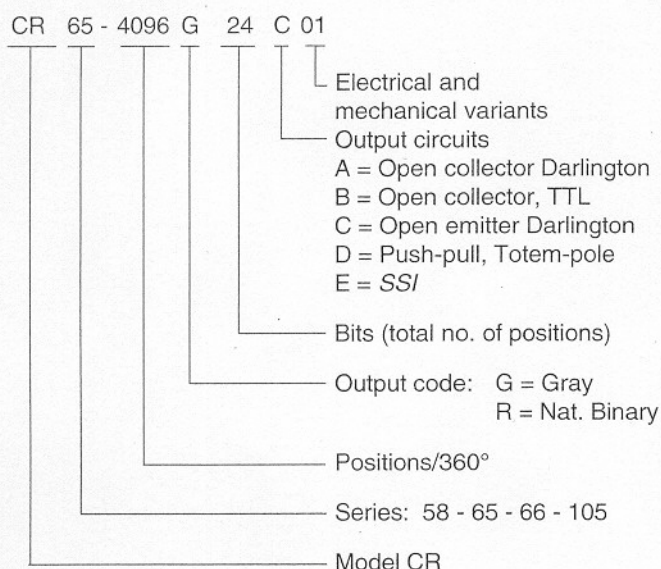
If required, the encoders in the series 105 with the designation CR 106 can also be supplied with an integral supplementary gear drive between the coding disc and the input shaft.

Referred to the input shaft, resolutions can be obtained which would not be possible without an adapter gear. This enables a non-integer number of positions to be obtained, e.g. 118.7 or 136.5 positions per turn.

A maximum of 314 positions are possible per turn. Play in the gear drive cannot be neglected and for this reason it is only available as a reduction gear. The following data values change compared to the basic model CR 105:

- Length of case 166 mm (instead of 130 mm)
- Mass 1.9 kg (instead of 1.3 kg)

Order code format



Zero-point adjustment

The zero point can be adjusted with the encoder mounted and mechanically coupled. To do this a captive fastener located at the back of the encoder must be removed. The coding disc is then turned into the desired position using a screwdriver.

Supplementary items for Models CR 105 / CR 106

- Thermostatically controlled heating for applications with extended operating range down to -30°C and for the prevention of water, condensation.
- Mounting base.

Other items in the TWK range of products

Programmable encoders □ Selectable by the user with programming device or PC: output code (Gray, Binary, or BCD), resolution, measuring range, logic polarity, parity bit, two reference values and one offset value □ Data Sheets CRP 10113 and CRF 10120.

Encoders with InterBus-S interface □ Versions for 32 Bit input and for 32 Bit input and output (parameters selectable)
□ For through or star coupling configurations □ Data Sheet CRS 10133

LOW COST encoders □ 24 bit □ Short version with SSI interface □ Data Sheet CRE 10106.

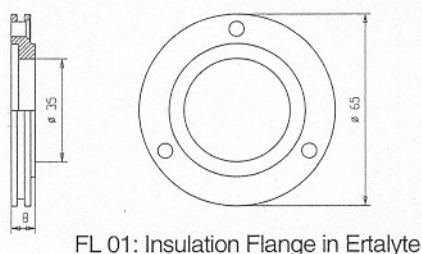
Single-turn encoders □ Resolution to 13 bit / 360° □ Gray, Binary or BCD code □ Case diameter 27, 58, 65 and 105 mm □ Extended temperature range from -40° to +85°C □ Data Sheets CB 10119, CE 10147, C3A 10127 and C3A 10128.

Tandem □ Encoders in combination with pulse generators
□ Absolute + incremental + analogue □ Data Sheet TAN 10104.

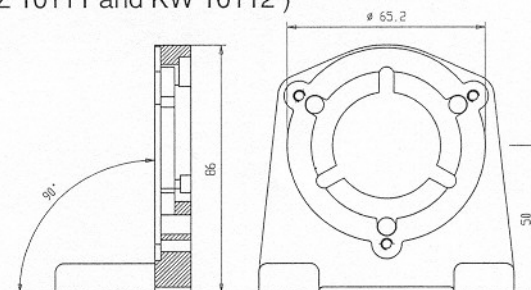
Cable displacement-angle converter □ For fitting to encoders and rotary pulse generators □ Measuring range up to 2000 mm □ Data Sheet SWA 10171.

Case for Ex protection ☐ For single and multi-turn encoders with serial interface ☐ Data Sheet EX 10110.

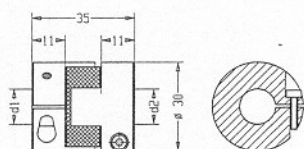
Mounting accessories and couplings (Data Sheets MZ 10111 and KW 10112)



FL 01: Insulation Flange in Ertalyte



MW 01: Mounting Bracket in injection moulded aluminium



KK 14S : Oldham-Coupling with insulating bush



Bellow coupling in stainless steel