SINGLETURN SHAFT ENCODER Models CF 105/106 absolute/electro-optical

- For the conversion of one full circle into digital signals

- Many different resolutions (counts per 360°)

- Output codes: Gray, Binary, BCD or Gray-Excess

- Zero-point adjustment device

- Heavy duty configuration

TWK

Constructional features

Anodized aluminium housing – Stainless steel shaft (10 mm dia) – Sealed ball bearings – Sealed connector exit – Plastic code disc – Gallium-Arsenide-diodes – Phototransistors followed by comparator and trigger – Disc code format: unambiguous Gray or Gray-Excess – Internal trans-coder supplies Binary or BCD-output – Code direction (upward or downward counting) at option.

Model **CF 106** features an additional integrated gear drive between the input shaft and the code disc. This allows to provide many unpopular re-solutions up to 314 counts per 360° max. The total length od Model CF 106 is increased by 25 mm in comparison to model CF 105.

Mechanical specification of CF 105 and CF 106

- Slewing speed: 3000 rpm (permanently) 4000 rpm (inter-mittently)
- Starting torque: ≤ 3 Ncm
- Shaft load max: 250N radial, 200N axial
- Useful life of bearings: 10^9 rev. at max. load and max. speed
- Operating temperature: – 5°C to + 50°C
- Storage temperature: – 25°C to + 70°C
- Weight: 1.8 kg
- Environmental protection: IP 65 (dust and water to DIN 40050)
- Connector type: DB 25 with special sealed case (IP 65)

Electrical specification of CF 105 and CF 106

- Light sources: GaAs-diodes
- Signal conditioning: Phototransistor-compa-rator-trigger, memory-transcoder
- Output circuitry: Open collector, positive logic (TCA 971) Umax = 24 V, Imax = 50 mA
- Output level: log "1" $\hat{=}$ U, log "0" $\leq$ 0,4 V
- Supply voltage: 12 to 24 VDC
- Current requirements: 80 mA (Gray and Gray-Excess) 300 mA (BCD and Binary)
- Code direction: Upward count when turning CCW, can be inverted by external strap
- Readout frequency: 8 kHz max.
- Output codes: G=Gray, E=Gray-Excess, R=Binary, B=BCD (ref. table/page 2)
- Latch (output signal memory): Available for BCD and Binary code only

Basic circuitry of both models
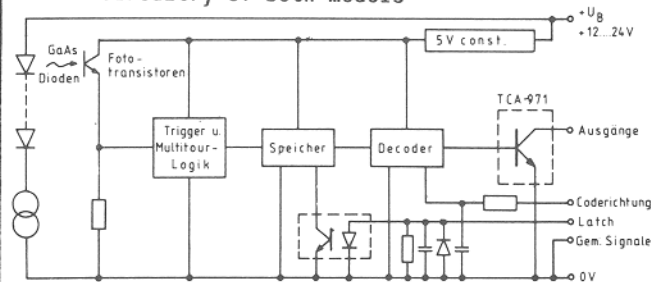
Additional functions (optional)

- Enable input for use with bus operation
- Push-pull output circuitry
- Heating (thermostatic controlled) to extend operating temperature to – 20°C and to avoid water condensation due to extreme temperature variations
- Parity-Bit (BCD and Binary only)
- Zero-point indication by LED

Note: The number of additional functions is limited by the 25-contact connector.

Standard type resolutions and output codes Model CF 105

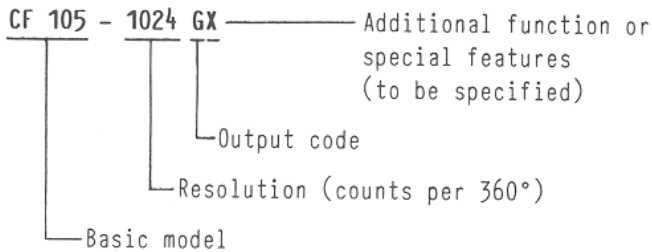| counts/360°	10	16	20	32	50	60	64	80	100	128	200	250	256	300	360	400	500	512	600	720	800	1000	1024
Code	E B R G	B R	E B R G	B R	E B R	E B R	E B R G	B R	E B R	E B R	E B R G	B R	E B R	E B R	E B R	E B R	E B R	E B R	G B R	E B R	E B R	E B R	G R
Bit	4 4 4 4	4 5	4 5 5 5	6 6	6 6 7	6 6 7	6 7 6 7	7 7	7 7 8	7 9 7	9 8 8 9	8 8	10 8 8	10 8 9	10 9 9	10 9 9	10 9 11	9 9 11	9 11 10	11 10 10	11 10 10	11 10 12	10 10

G=Gray, E=Gray-Excess, R=Binary; B=BCD

Non-standard resolutions covering full figures upon request.

Gray-Excess code format

The Gray-Excess code format comprises a segment of the next-higher complete Gray code format, e.g. 1000 counts out of 1024 (0 to 1023). The excess of 24 counts is divided by 2. One half is added to zero, one half is substracted from 1023. The first count is, therefore, identical to count 12 of the Gray code, the last count corresponds to count 1011 of the Gray code. The unambiguous read-out is fully guaranteed.

Ordering code

```
CF 105 - 1024 GX ──── Additional function or
                      special features
                      (to be specified)
              └─Output code
          └─Resolution (counts per 360°)
  └─Basic model
```
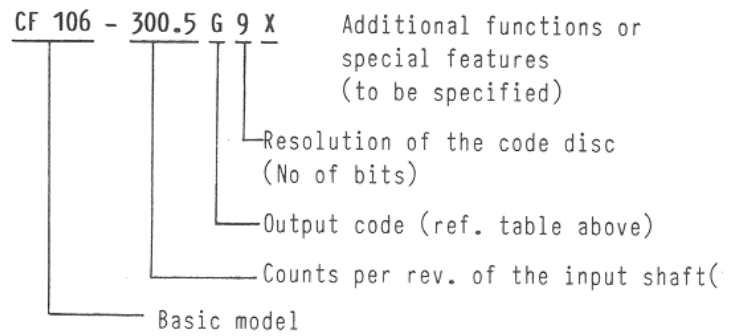
Resolution of Model CF 106

The additional gear drive between the input shaft and the code disc permits to provide resolutions of fractions of figures such as 95.238 counts per 360°, within the range of 1 to 314 counts per 360°.

When using a Model CF 106 encoder it has to be considered that after one full revolution of the input shaft the output signal does not jump back to its starting value, e.g. "000", until a full revolution of the code disc has been performed.

Ordering code

```
CF 106 - 300.5 G 9 X ──── Additional functions or
                          special features
                          (to be specified)
               └─Resolution of the code disc
                 (No of bits)
           └─Output code (ref. table above)
         └─Counts per rev. of the input shaft(
  └─Basic model
```

(1)For fractional figures only first figure after decimal point

Dimensions in mm

Plug housing

M6/8 deep

CF 105 = 92
CF 106 = 117
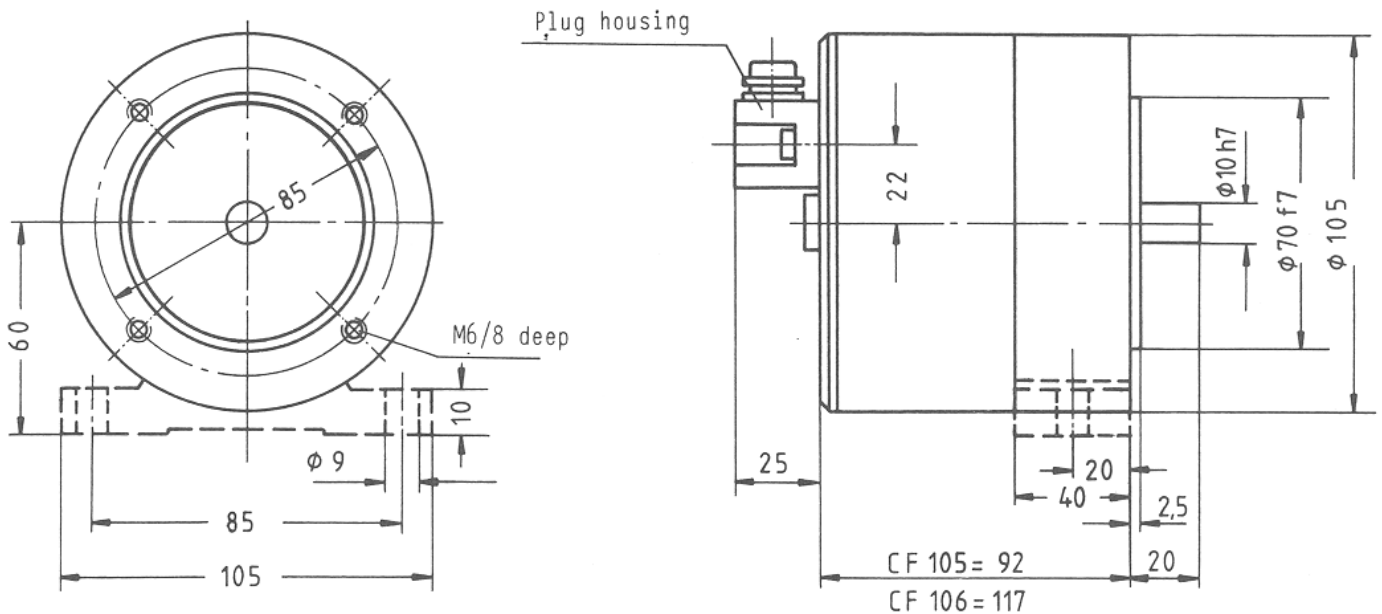
Accessories

Mating plug with DB 25 S sockets and sealed housing is supplied with each encoder. Coupling and mounting bracket must be ordered separateley.

Encoders with BCD-output can be used with TWK-indicators WA 100 and WV 104 (Data Sheet 2833EA).

Stainless steel bellow coupling 491/...
Dia "Ød": 8,10 or 12 mm both sides