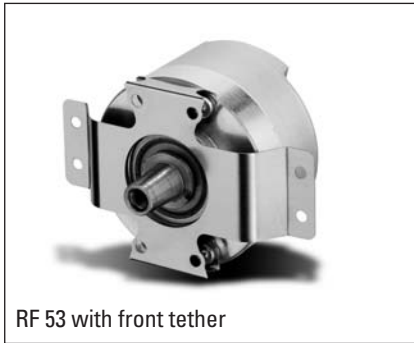


PRELIMINARY

Motor Feedback Systems Type RF 53 for AC Synchronous & BLDC Motors



RF 53 with front tether



RF 53 with rear tether

- Solid shaft motor encoder for BLDC and gearless elevator traction machines
- Incremental & Commutation
- up to 10 000 ppr
- up to +120 °C operating temperature
- IP54
- Housing diameter 53 mm

NUMBER OF PULSES

500 to 10 000 ppr;
optional additional 4, 6, 8, 10, 12, 16, 20, 24 or 32 pole commutation signals

TECHNICAL DATA mechanical

| | |
|-------------------------------|---|
| Housing diameter | 53 mm |
| Shaft | cone solid shaft |
| Flange | Spring tether |
| Protection class shaft input | IP54 |
| Protection class housing | IP54 |
| Shaft load axial/ radial | 20 / 90 N |
| Axial runout of mating shaft | ±1.4 mm |
| Radial runout of mating shaft | ±0.18 mm |
| Max. speed | 12 000 U/min (short term) 5 000 U/min (continuous) |
| Max. operating temperature | -20°C ... +120°C |
| Max. storage temperature | -40°C ... +120°C |
| Relative humidity | 95% non-condensing |
| Vibration resistance | 1 000 m/s ² |
| Shock resistance | 25 m/s ² |
| Material shaft | Stainless steel |
| Material housing | Aluminium |
| Weight | 200 g |
| Connection | Cable Cable with Sub-D connector |

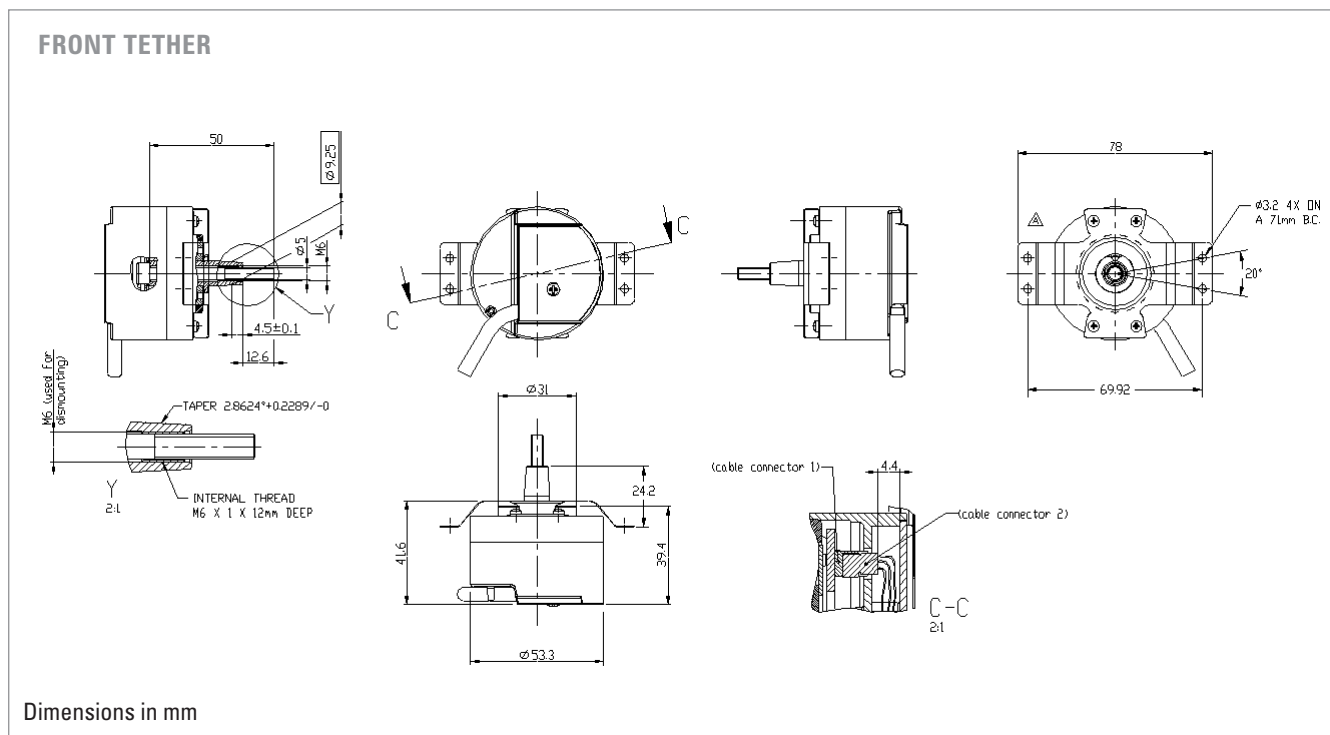
Motor Feedback Systems Type RF 53

for AC Synchronous & BLDC Motors

TECHNICAL DATA electrical

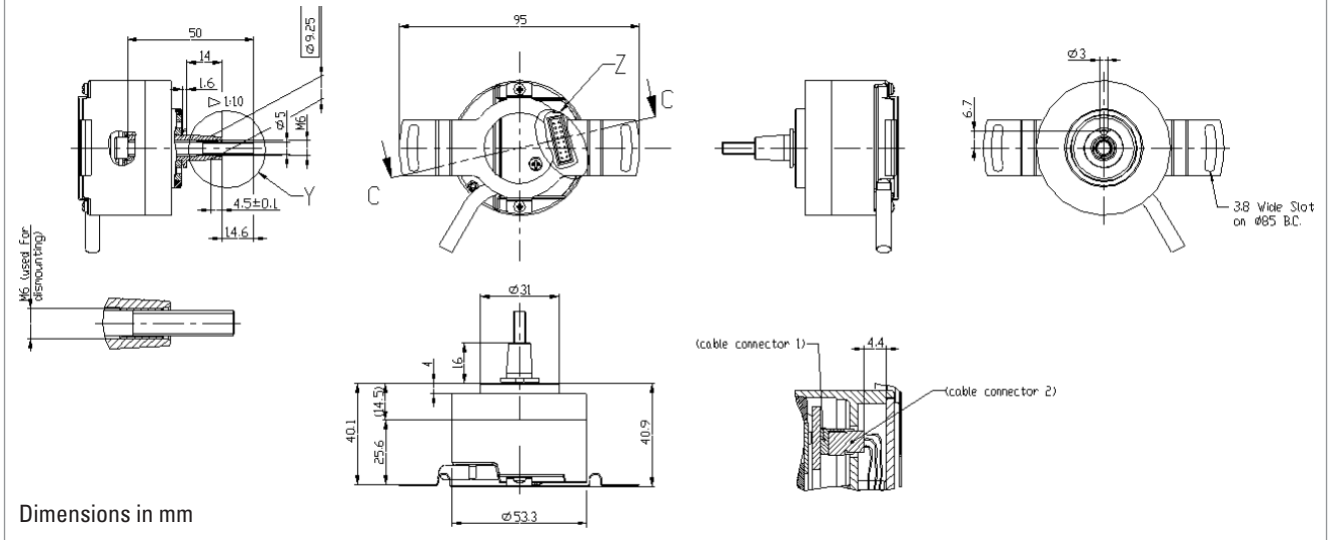
| | |
|-------------------------|--|
| Supply voltage | DC 5 ±10% |
| Max. current w/o load | 100 mA |
| Code | Incremental with commutation option, optical |
| Tolerance | |
| Incremental signals | ±2,5 arc-mins. max. (edge to edge) |
| Commutation | ±6 arc-mins. max. |
| Phasing | A to B by 90° and U to W by 120° |
| Minimum edge separation | A to B 45° |
| Index pulse width | 90° gated A and B high |
| Output frequency | max. 100 kHz |
| Output circuit | Differential line driver (ET7272), 40 mA max. Open Collector, max. 8 mA; Pull up with 2,0 kOhm |
| Output versions | RS 422 (incr.): A, B, N, \bar{A} , \bar{B} , \bar{N} RS 422 (incr. + com.): A, B, N, \bar{A} , \bar{B} , \bar{N} , U, V, W, \bar{U} , \bar{V} , \bar{W} RS 422 (incr.) + OC-NPN (com.): A, B, N, \bar{A} , \bar{B} , \bar{N} , U, V, W OC-NPN (incr.): A,B,N |

DIMENSIONAL DRAWINGS

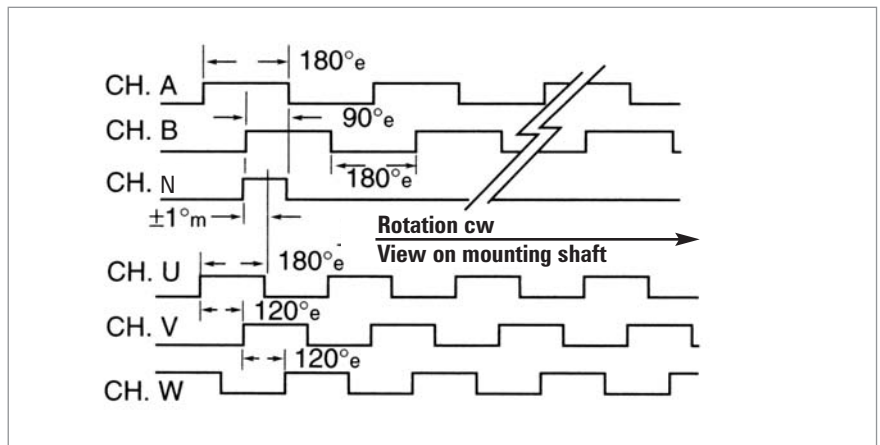


Motor Feedback Systems Type RF 53 for AC Synchronous & BLDC Motors

REAR TETHER



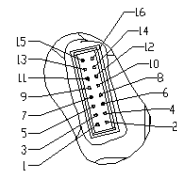
SIGNAL FORMAT



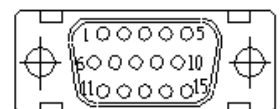
PIN ASSIGNMENT

| PIN | Signal | Color | SUB-D 15 PIN |
|-----|-----------|--------------|--------------|
| 1 | DC 5 V | red | 13 |
| 2 | U | brown | 7 |
| 3 | 0 V | black | 14 |
| 4 | V | grey | 9 |
| 5 | A | blue | 1 |
| 6 | W | white | 11 |
| 7 | \bar{A} | blue/black | 2 |
| 8 | N.C. | | |
| 9 | B | green | 3 |
| 10 | \bar{U} | brown/black | 8 |
| 11 | \bar{B} | green/black | 6 |
| 12 | \bar{V} | grey/black | 10 |
| 13 | N | violet | N.C. |
| 14 | \bar{W} | white/black | 12 |
| 15 | \bar{N} | violet/black | N.C. |
| 16 | N.C. | | |

PCB Connector



Sub-D- Connector



Motor Feedback Systems Type RF 53 for AC Synchronous & BLDC Motors

ORDERING INFORMATION

| Type | Pulses ppr incremental ¹ | Poles commutation ² | Spring tether | Electrical | Connection |
|---|---|---|---|---|--|
| □ | □ / | □ - | □ | □ | □ |
| RF53 | 0500 0512 1000 1024 2000 2048 2500 4096 5000 8192 10E3 = 10000 | 0 without 4 4 pole 6 6 pole 8 8 pole A 10 pole C 12 pole G 16 pole K 20 pole O 24 pole W 32 pole | 1 rear mount 2 front mount | Incremental only 0 $U_{inc}=DC\ 5\ V$; $output_{inc}=O.C.-NPN$ ³ 3 $U_{inc}=DC\ 5\ V$; $output_{inc}=RS\ 422$ Incremental plus Commutation signals 6 $U_{inc}=DC\ 5\ V$; $output_{inc}=RS\ 422$ $U_{com}=DC\ 5\ V$; $output_{com}=O.C.-NPN$ 9 $U_{inc}=DC\ 5\ V$; $output_{inc}=RS\ 422$, $U_{com}=DC\ 5\ V$; $output_{com}=RS\ 422$ | 0 PCB connector 16 pole A Cable 0.5 m B Cable 1 m C Cable 2 m D Cable 3 m E Cable 7 m K Cable 10 m P Cable 15 m 1 Sub-D connector at 3 m cable 2 Sub-D connector at 5 m cable 3 Sub-D connector at 10 m cable |
| ¹ Option redundant on request ² allowed combinations see available combinations pulses/ poles ³ only available with pulses/poles $\leq 2048/0$ | | | | | |

Available combinations (pulses/poles)

| Pulses ppr | Number of poles | | | | | | | | | |
|----------------|-----------------|---|---|---|---------|---------|---------|---------|---------|---------|
| | 0 | 4 | 6 | 8 | 10 (=A) | 12 (=C) | 16 (=G) | 20 (=K) | 24 (=O) | 32 (=W) |
| 0500 | X | X | X | X | X | X | | | | |
| 0512 | X | X | X | X | | | | | | |
| 1000 | X | X | X | X | X | X | | | | |
| 1024 | X | X | X | X | | X | | | | |
| 2000 | X | X | X | X | X | X | | | | |
| 2048 | X | X | X | X | X | X | X | X | X | X |
| 2500 | X | X | X | X | X | X | | | | |
| 4096 | X | X | X | X | X | X | X | X | X | X |
| 5000 | X | X | X | X | X | X | | | | |
| 8192 | X | X | X | X | X | X | X | X | X | X |
| 10E3 =10000 | X | X | X | X | X | X | | | | |