



## Vert-X 22 - 24V / 4 - 20mA

### Applications

- Wind vanes
- Valve control
- Steering angle sensor for F1-racing cars

### Features general

- Robust design, sealed stainless steel housing
- Contactless measuring method
- Long life
- High accuracy of measurement
- Applications under adverse ambient conditions possible (humidity, dampness, dust, vibrations etc.)
- Full resolution and accuracy at programmed electrical angle

### Features MH-C

- Linearity of  $\pm 0.3\%$
- Resolution of 12bit
- Lower price than MH-C2

### Features MH-C2

- Linearity of  $\pm 0.1\%$
- Resolution of 14bit
- Index point(s), sense of rotation and angle settable resp. programmable by customer (optional)

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| Sensor principle                                        |                  | MH-C              | MH-C2             |
|---------------------------------------------------------|------------------|-------------------|-------------------|
| Electrical data                                         |                  |                   |                   |
| Measuring range                                         | °                | 0 ... 360         | 0 ... 360         |
| Indep. linearity                                        | % of meas. range | $\pm 0.3$         | $\pm 0.1$         |
| Max. hysteresis                                         | °                | 0.1               | 0.1               |
| Resolution                                              | bit              | 12                | 14                |
| Max. repeatability                                      | °                | 0.1               | 0.1               |
| Sample rate fast mode                                   | kHz              | (5)               | (2)               |
| Sample rate slow mode                                   | kHz              | 1.66              | 0.5               |
| System propagation delay fast mode                      | µs               | (800)             | (800)             |
| System propagation delay slow mode                      | µs               | 4600              | 2500              |
| Max. temperature coefficient of the output signal       | ppm/°K           | 100               | 100               |
| MTTFd / MTBF                                            | years            | 185 / 185         | 147 / 147         |
| Power supply voltage                                    | VDC              | 16 ... 35         | 16 ... 35         |
| Current consumption without load (typ.) fast mode       | mA               | (19)              | (20)              |
| Current consumption without load (typ.) slow mode       | mA               | 14                | 15                |
| Min. ohmic load at output                               | kOhm             | 0 ... 0.5         | 0 ... 0.5         |
| Max. capacitive load at output                          | nF               | 100               | 100               |
| Reverse polarity protection of power supply             |                  | yes               | yes               |
| Electrical connection (s = shielded)                    |                  | Cable 3pole, s    | Cable 3pole, s    |
| Cross section of single wires                           | mm <sup>2</sup>  | 0.25 (AWG24)      | 0.25 (AWG24)      |
| Redundancy feasible                                     |                  | no                | no                |
| Electrical connection redundant (s = shielded)          |                  | -                 | -                 |
| Cross section of single wires redundant                 | mm <sup>2</sup>  | -                 | -                 |
| Mechanical data                                         |                  |                   |                   |
| Mechanical range                                        | °                | 360 (continuous)  | 360 (continuous)  |
| Protection class                                        |                  | IP54 / IP67       | IP54 / IP67       |
| Max. starting torque at specified protection class      | Ncm              | 0.5 / 3           | 0.5 / 3           |
| Max. rotating speed                                     | rpm              | 6000              | 6000              |
| Min. life                                               | movements        | 360 Mio.          | 360 Mio.          |
| Max. permitted axial shaft load                         | N                | 100               | 100               |
| Max. permitted radial shaft load                        | N                | 50                | 50                |
| Operating & storage temperature                         | °C               | -40 ... +85       | -40 ... +85       |
| IEC 68-2-6 Vibration (Amax = 0.75mm, f = 5 ... 2000 Hz) | g                | 20                | 20                |
| IEC 68-2-27 Shock                                       | g                | 50                | 50                |
| Standards                                               |                  |                   |                   |
| EN 55022 class B, Emission radiated (30... 230 MHz)     | dB(µV/m)         | max. 30           | max. 30           |
| EN 55022 class B, Emission radiated (230...1000MHz)     | dB(µV/m)         | max. 37           | max. 37           |
| EN 61000-4-2, ESD (contact discharge / air discharge)   | kV               | $\pm 4$ / $\pm 8$ | $\pm 4$ / $\pm 8$ |
| EN 61000-4-3, Immision HF radiated (80... 1000 MHz)     | V/m              | 30                | 30                |
| EN 61000-4-4, Burst (on all lines)                      | kV               | $\pm 1$           | $\pm 1$           |
| EN 61000-4-5, Surge (lines to ground)                   | kV               | $\pm 1$           | $\pm 1$           |
| EN 61000-4-6, Immision HF conducted (0.15...80MHz)      | Vemk             | 10                | 10                |
| EN 61000-4-8, Immision magnetic field (50Hz)            | A/m              | 30                | 30                |
| IEC 60393-1 Insulation resistance (500VDC, 1bar, 2s)    | GOhm             | 20                | 20                |
| IEC 60393-1 Dielectric strength (VAC, 50Hz, 1min, 1bar) | kV               | 1                 | 1                 |



|                                                                                 | MH-C | MH-C2 |
|---------------------------------------------------------------------------------|------|-------|
| Custom shaft design                                                             | X    | X     |
| Custom modification of the housing                                              | X    | X     |
| Custom cable                                                                    | X    | X     |
| Sample rate in fast mode                                                        | X    | X     |
| Switch functions TTL (max. 2)                                                   | X    | X     |
| Special characteristic curve                                                    | -    | X     |
| Special electrical angle within 30° to 360° (ex factory)                        | X    | X     |
| Electrical angle programmable (Software)                                        | -    | X     |
| Start & end point settable (Additional wires)                                   | -    | X     |
| Sense of rotation CW/CCW settable / programmable (Additional wires or Software) | -    | X     |
| Index point settable / programmable (Additional wires or Software)              | -    | X     |
|                                                                                 |      |       |
|                                                                                 |      |       |

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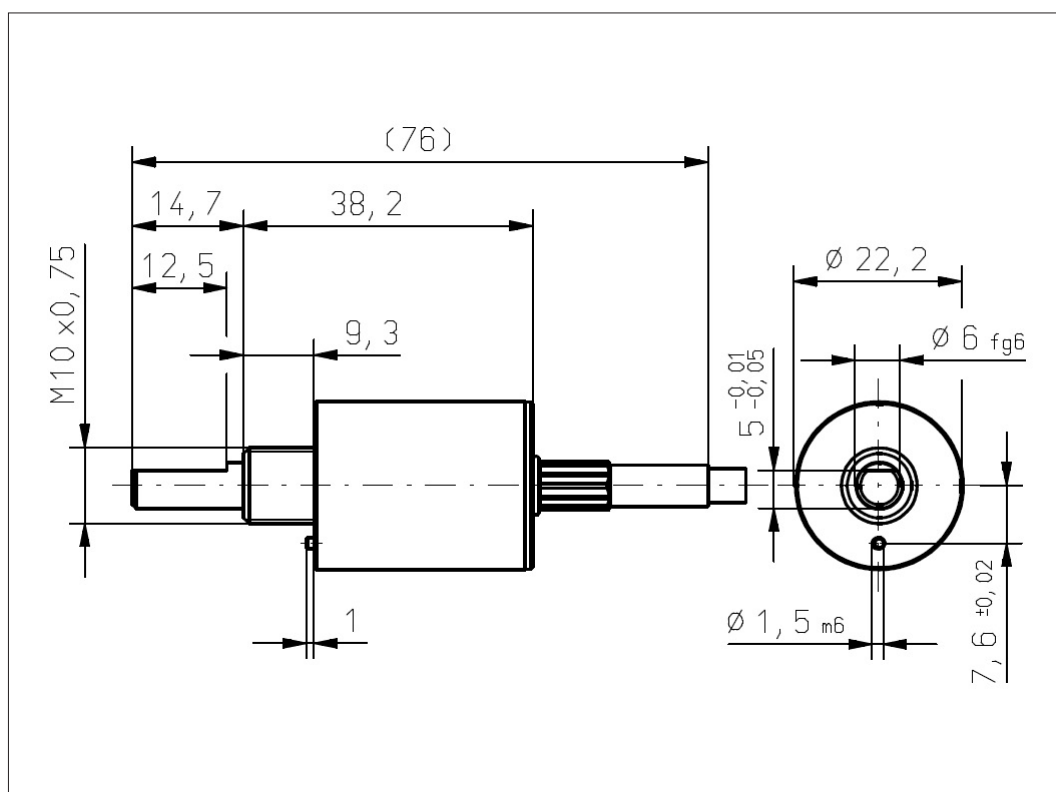
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#### Vert-X 2201 / Vert-X 2231

##### Accessoires (incl.)

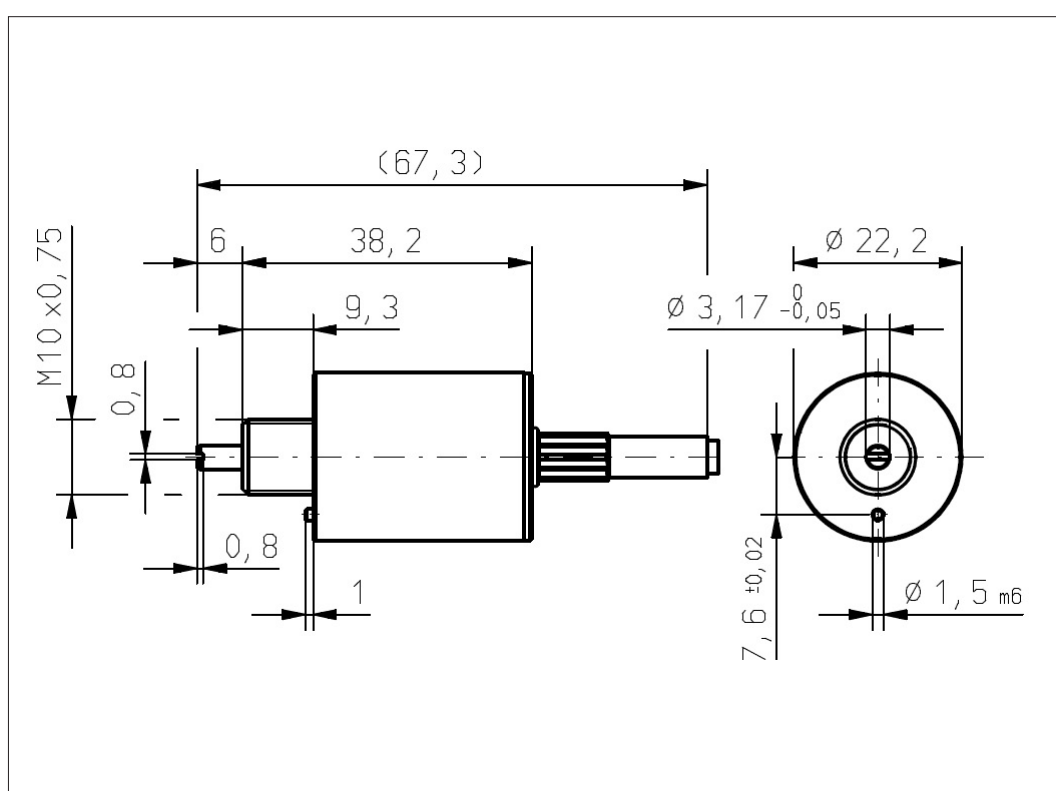
- 1x Nut M10x0.75 / SW13
- 1x Serrated lock washer



#### Vert-X 2202 / Vert-X 2232

##### Accessoires (incl.)

- 1x Nut M10x0.75 / SW13
- 1x Serrated lock washer



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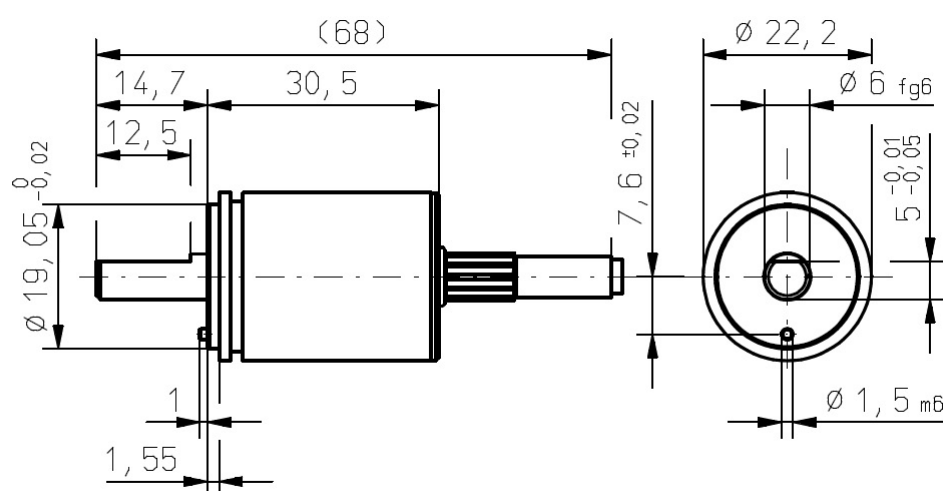
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#### Vert-X 2211 / Vert-X 2241

##### Accessoires (incl.)

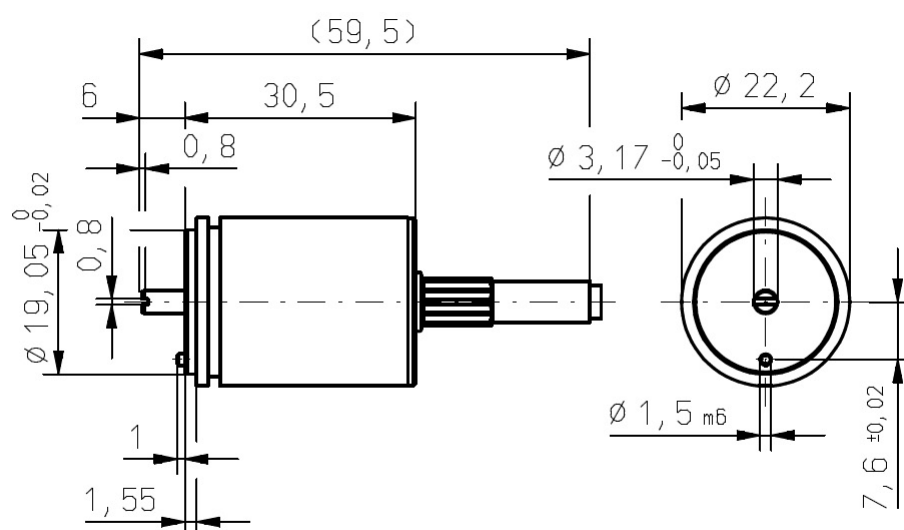
- 1x Fixation clip
- 2x Slotted cylinder head screw M3x8



#### Vert-X 2212 / Vert-X 2242

##### Accessoires (incl.)

- 1x Fixation clip
- 2x Slotted cylinder head screw M3x8



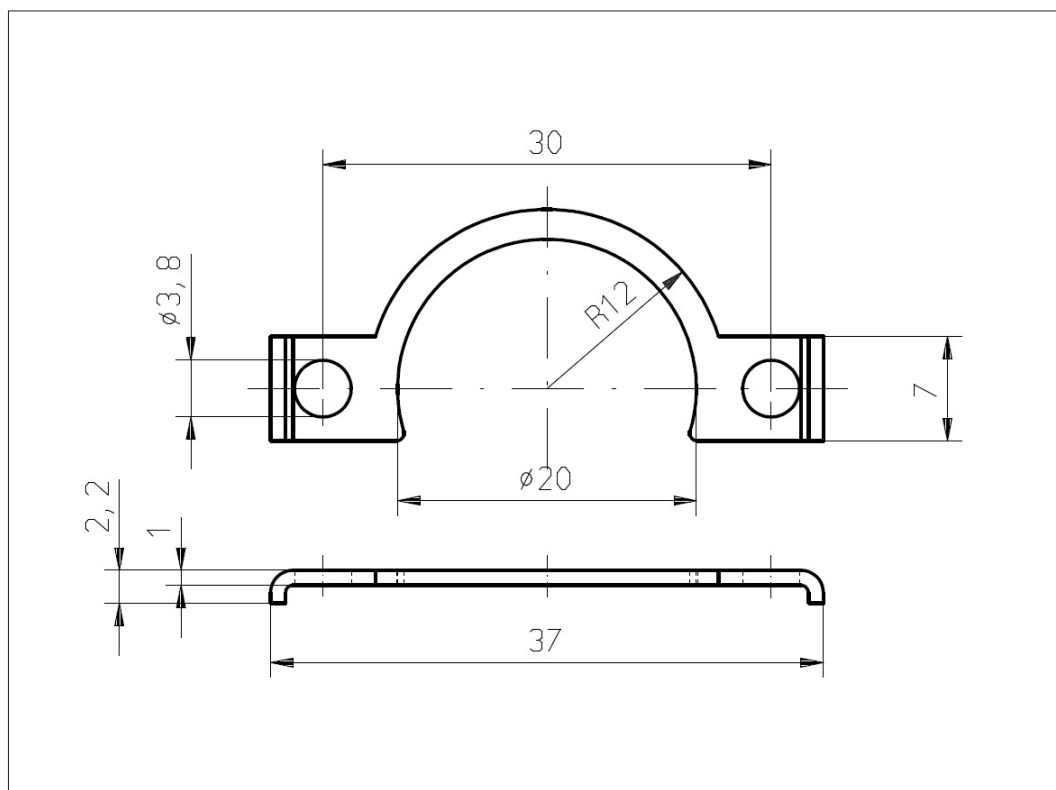
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**Vert-X 2211 / Vert-X 2212**  
**Vert-X 2241 / Vert-X 2242**  
**Accessoires**  
 Fixation clip



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