



## Vert-X 22 - 5V / PWM

### Applications

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

### Features

- 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

Sensor principle		MH-C	MH-C2
<b>Electrical data</b>			
Measuring range	°	0 ... 360	-
Indep. linearity	% of meas. range	±0.3	-
Max. hysteresis	°	0.1	-
Resolution	bit	12	-
Max. repeatability	°	0.1	-
Sample rate fast mode	kHz	(5)	-
Sample rate slow mode	kHz	1.66	-
System propagation delay fast mode	µs	(800)	-
System propagation delay slow mode	µs	4600	-
Max. temperature coefficient of the output signal	ppm/°K	25	-
MTTFd / MTBF	years	668 / 668	-
Power supply voltage	VDC	5 (±10%)	-
Current consumption without load (typ.) fast mode	mA	(14)	-
Current consumption without load (typ.) slow mode	mA	9	-
Min. ohmic load at output	kOhm	10	-
Max. capacitive load at output	nF	1	-
PWM frequency	Hz	855 (±20%)	-
Reverse polarity protection of power supply		yes	-
Electrical connection (s = shielded)		Cable 3pole, s	-
Cross section of single wires	mm <sup>2</sup>	0.25 (AWG24)	-
Redundancy feasible		yes	-
Electrical connection redundant (s = shielded)		Cable 6pole, s	-
Cross section of single wires redundant	mm <sup>2</sup>	0.25 (AWG24)	-

### Mechanical data

Mechanical range	°	360 (continuous)	-
Protection class		IP54 / IP67	-
Max. starting torque at specified protection class	Ncm	0.5 / 3	-
Max. rotating speed	rpm	6000	-
Min. life	movements	360 Mio.	-
Max. permitted axial shaft load	N	100	-
Max. permitted radial shaft load	N	50	-
Operating & storage temperature	°C	-40 ... +125	-
IEC 68-2-6 Vibration (Amax = 0.75mm, f = 5 ... 2000 Hz)	g	20	-
IEC 68-2-27 Shock	g	50	-

### Standards

EN 55022 class B, Emission radiated (30... 230 MHz)	dB(µV/m)	max. 30	-
EN 55022 class B, Emission radiated (230...1000MHz)	dB(µV/m)	max. 37	-
EN 61000-4-2, ESD (contact discharge / air discharge)	kV	±4 / ±8	-
EN 61000-4-3, Immision HF radiated (80... 1000 MHz)	V/m	30	-
EN 61000-4-4, Burst (on all lines)	kV	±1	-
EN 61000-4-5, Surge (lines to ground)	kV	±1	-
EN 61000-4-6, Immision HF conducted (0.15...80MHz)	Vemk	10	-
EN 61000-4-8, Immision magnetic field (50Hz)	A/m	30	-
IEC 60393-1 Insulation resistance (500VDC, 1bar, 2s)	GOhm	20	-
IEC 60393-1 Dielectric strength (VAC, 50Hz, 1min, 1bar)	kV	1	-

Errors and omissions excepted. Subject to change without notice. / State: 31.10.11

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**CONTELEC**  
 A company of the Siedle-Group



**Vert-X 22 - 5V / PWM**  
Ordering code

Output characteristics													
											Positive gradient CW	Standard	1
											Positive gradient CCW	Optional	2
											Redundant, positive gradient CW	Optional	3
											Redundant, positive gradient CCW	Optional	4
											Redundant, crossed signal curves	Optional	5

Output signal													
											PWM	Standard	4

Power supply voltage													
											5VDC	Standard	2

Electrical connection													
											4	Standard	Round cable 3pole
											6	Optional	Round cable 6pole
											9	Optional	Special cable

Length of cable													
											02	Standard	1.0m
											06	Optional	3.0m
											10	Optional	5.0m
											99	Optional	Special length

Vert-X	2	2	0	1	7	3	6	2	4	1	4	0	2										
														<b>Electrical angle</b>									
														36	Standard	Electrical angle 360°							
														xx	Optional	03 to 35; Declaration in 10° steps							
														99	Optional	Special angle							

Sensor principle												
											7	MH-C

Mechanical version													
											2201	Standard	Bushing M10x0,75 ; 6 mm shaft D-shape ; IP54
											2202	Standard	Bushing M10x0,75 ; 3,175 mm shaft slotted ; IP54
											2211	Standard	Servo mount size 9 ; 6 mm shaft D-shape ; IP54
											2212	Standard	Servo mount size 9 ; 3,175 mm shaft slotted ; IP54
											2231	Standard	Bushing M10x0,75 ; 6 mm shaft D-shape ; IP67
											2232	Standard	Bushing M10x0,75 ; 3,175 mm shaft slotted ; IP67
											2241	Standard	Servo mount size 9 ; 6 mm shaft D-shape ; IP67
											2242	Standard	Servo mount size 9 ; 3,175 mm shaft slotted ; IP67
											2299	Optional	Special housing ; Special shaft

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

**Options (on request)**

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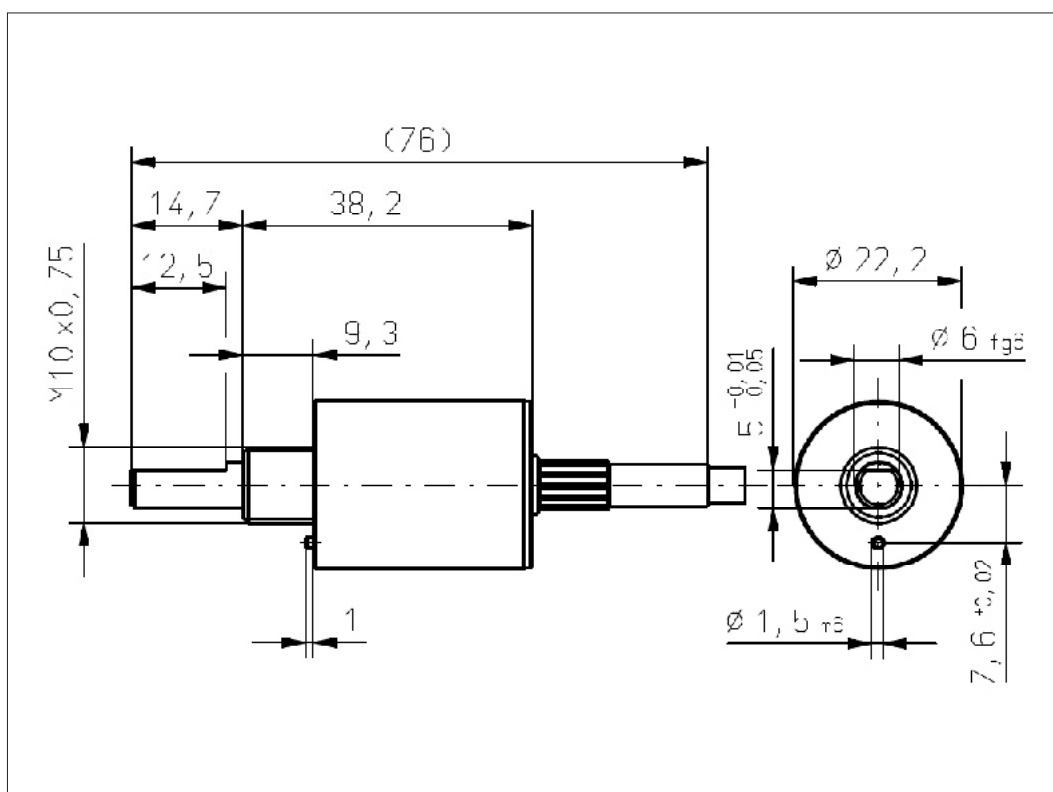
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**Vert-X 2201 / Vert-X 2231**

**Accessoires (incl.)**

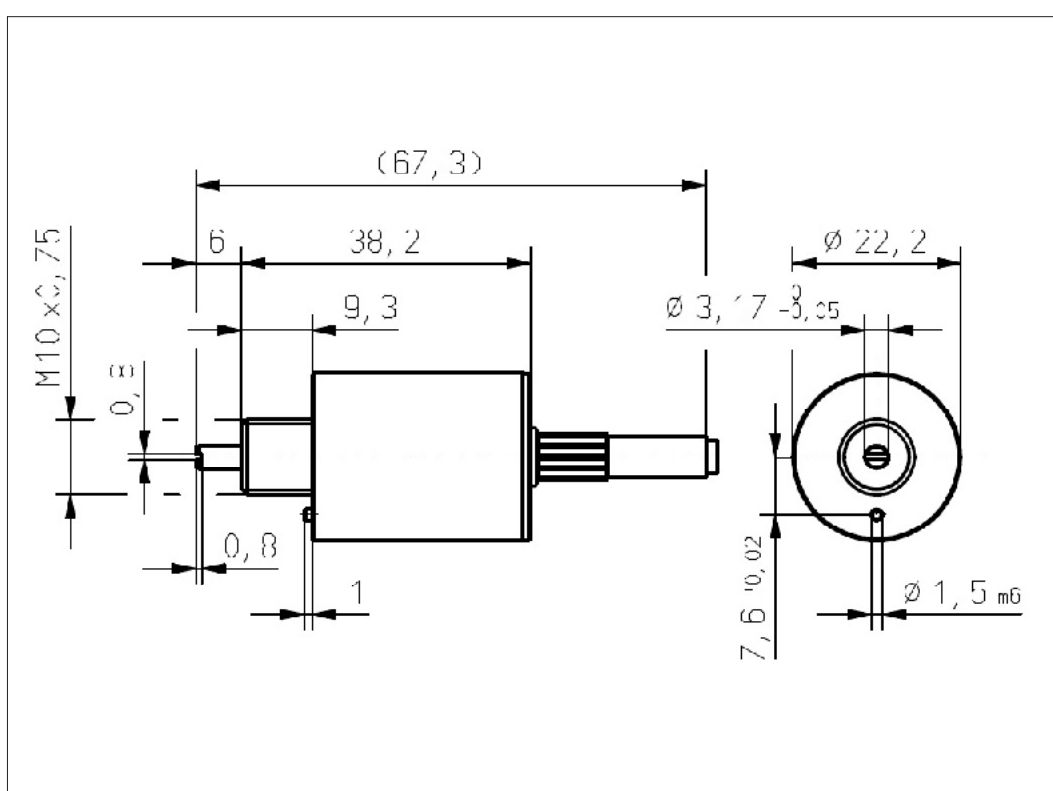
- 1x Nut M10x0.75 / SW13
- 1x Serrated lock washer



**Vert-X 2202 / Vert-X 2232**

**Accessoires (incl.)**

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



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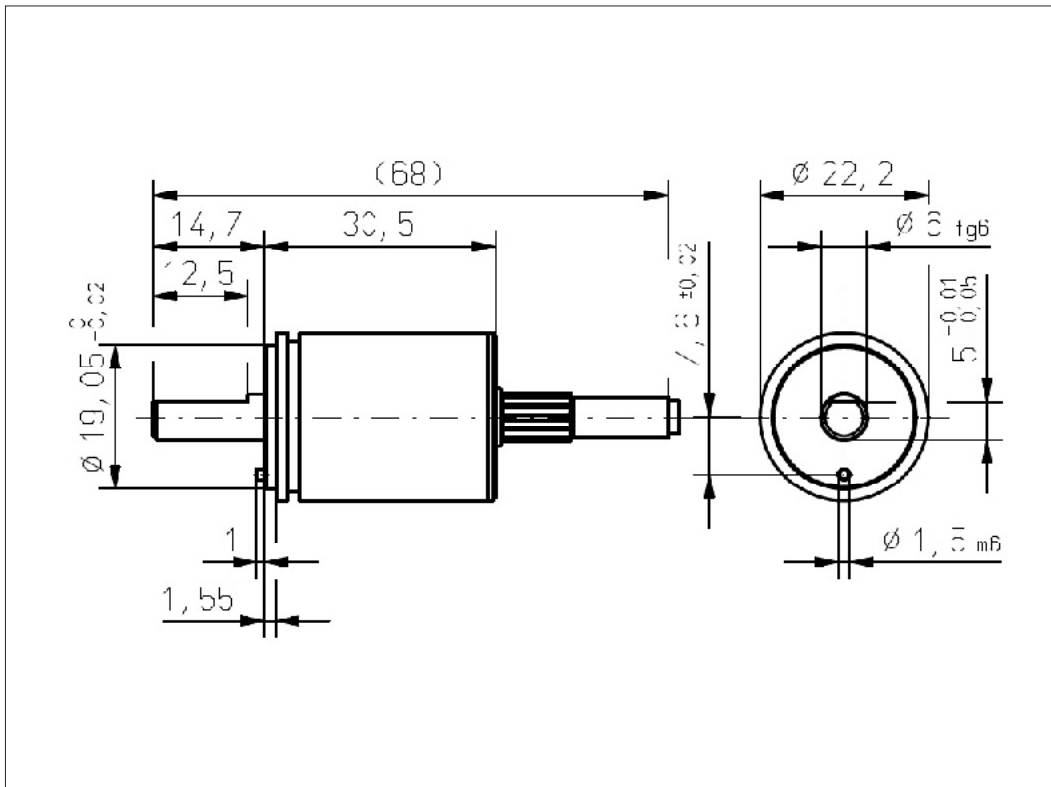
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### Vert-X 2211 / Vert-X 2241

#### Accessoires (incl.)

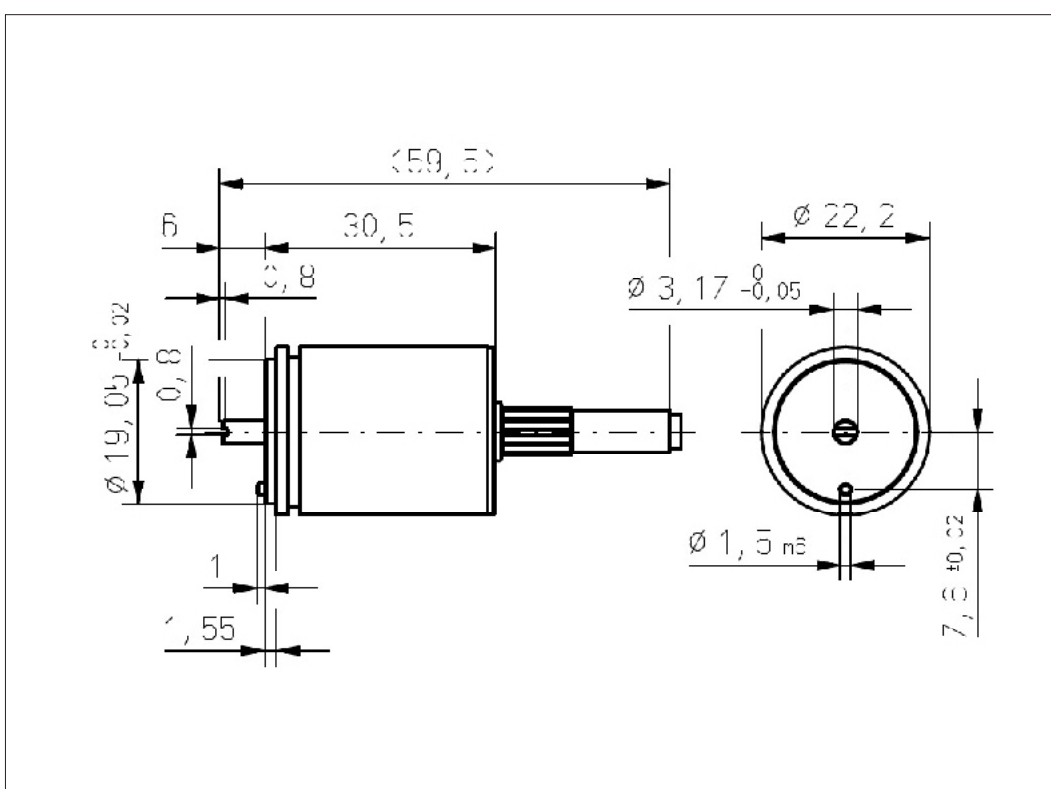
- 1x Fixation clip
- 2x Slotted cylinder head screw M3x8



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

#### Accessoires (incl.)

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

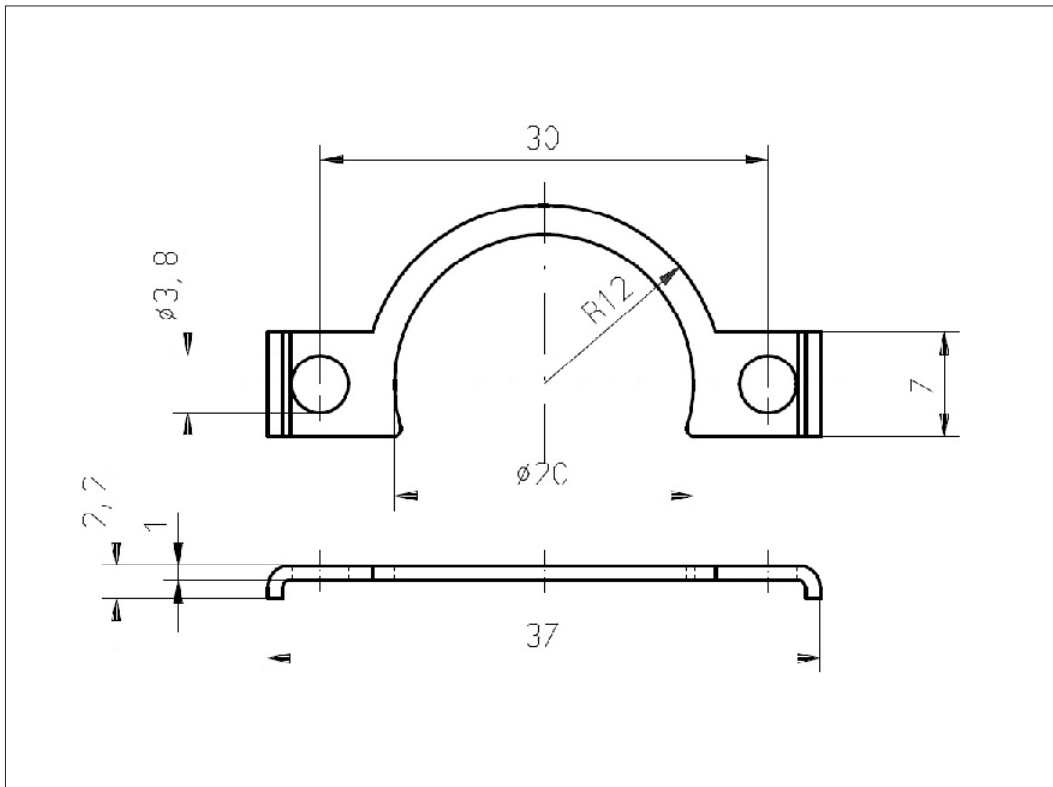


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**Vert-X 2211 / Vert-X 2212**  
**Vert-X 2241 / Vert-X 2242**  
**Accessoires**  
Fixation clip



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