



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)

Errors and omissions excepted. Subject to change without notice. / State: 27.09.10

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Sensor principle		MH-C	MH-C2
Electrical data			
Measuring range	°	0 ... 360	0 ... 360
Indep. linearity	% of meas. range	± 0.3	± 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	μ s	(800)	(800)
System propagation delay slow mode	μ s	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 ²	0.25 (AWG24)	0.25 (AWG24)
Redundancy feasible		no	no
Electrical connection redundant (s = shielded)		-	-
Cross section of single wires redundant	mm ²	-	-
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(μ V/m)	max. 30	max. 30
EN 55022 class B, Emission radiated (230...1000MHz)	dB(μ V/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, Immission HF radiated (80... 1000 MHz)	V/m	30	30
EN 61000-4-4, Burst (on all lines)	kV	± 1	± 1
EN 61000-4-5, Surge (lines to ground)	kV	± 1	± 1
EN 61000-4-6, Immission HF conducted (0.15...80MHz)	Vemk	10	10
EN 61000-4-8, Immission 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



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Ordering code

*** Switch outputs**
Please define number (max. 127), position and width of the pulses.

Vert-X												
2	2	0	1	7	3	6	1	5	1	4	0	2
Output characteristics			Output signal			Power supply voltage			Electrical connection			
Positive gradient CW	Standard	1	4mA ... 20mA	Standard	5	24VDC	Standard	1	4	Standard	Round cable 3pole	
Positive gradient CCW	Optional	2							6	Optional	Round cable 6pole	
Redundant, positive gradient CW	Optional	3							9	Optional	Special cable	
Redundant, positive gradient CCW	Optional	4										
Redundant, crossed signal curves	Optional	5										
Positive gradient CW with 1 switch output*	Optional	A										
Positive gradient CCW with 1 switch output*	Optional	B										
Positive gradient CW with 2 switch outputs*	Optional	C										
Positive gradient CCW with 2 switch outputs*	Optional	D										
Sense of rotation settable	Optional	E										
Zero point & sense of rotation settable	Optional	F										
Middle point & sense of rotation settable	Optional	G										
Start + end point & sense of rotation settable	Optional	H										
Programmable with Vert-X EasyAdapt	Optional	P										
Length of cable			Electrical angle			Sensor principle			Mechanical version			
02	Standard	1.0m	36	Standard	Electrical angle 360°	7	MH-C	2201	Standard	Bushing M10x0,75 ; 6 mm shaft D-shape ; IP54		
06	Optional	3.0m	xx	Optional	03 to 35; Declaration in 10° steps	8	MH-C2	2202	Standard	Bushing M10x0,75 ; 3,175 mm shaft slotted ; IP54		
10	Optional	5.0m	99	Optional	Special angle			2211	Standard	Servo mount size 9 ; 6 mm shaft D-shape ; IP54		
99	Optional	Special cable						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	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

Options (on request)

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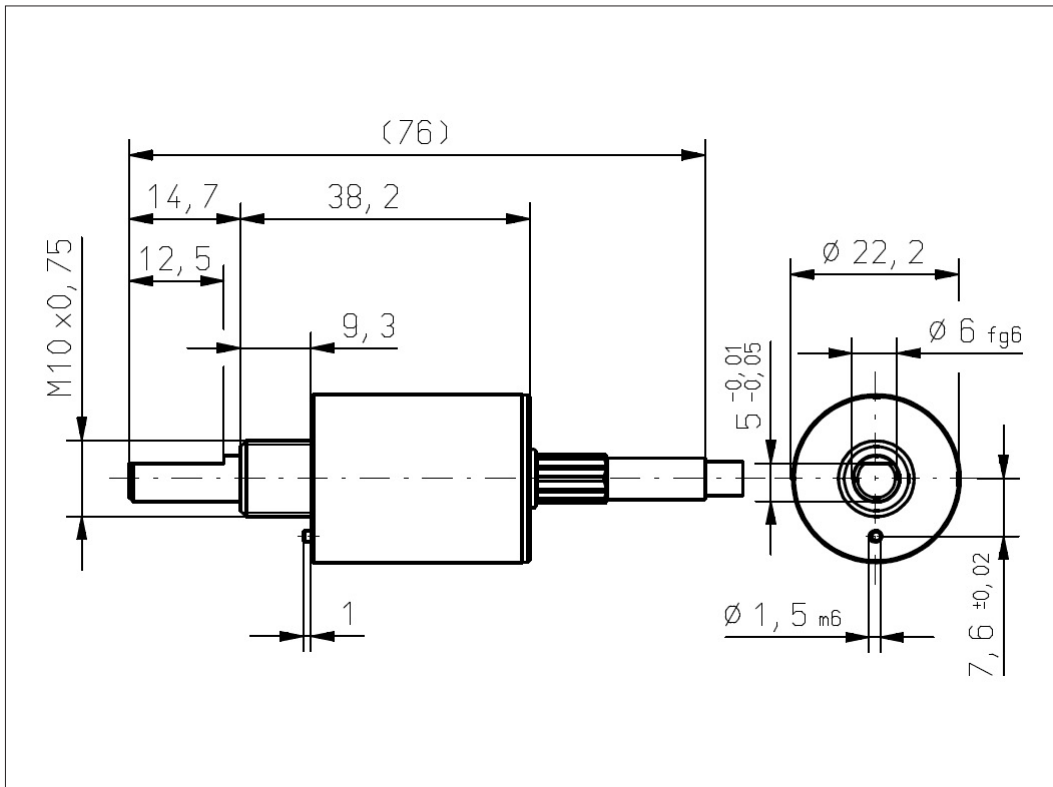
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Vert-X 2201 / Vert-X 2231

Accessoires (incl.)

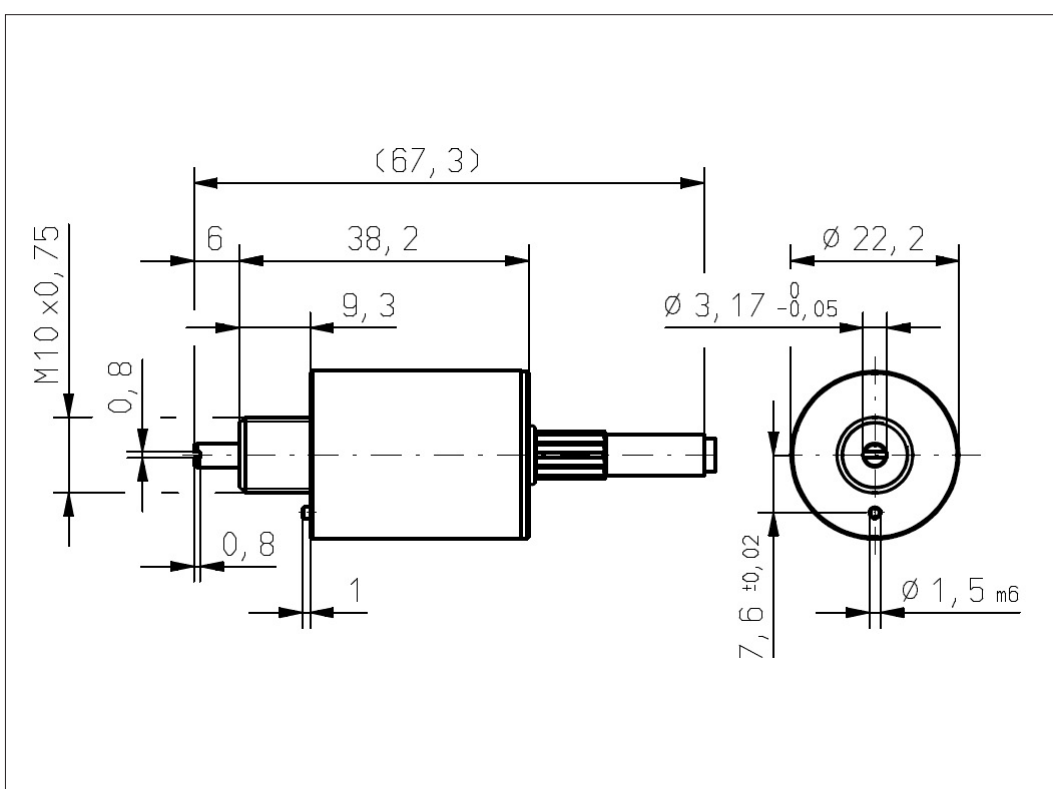
- 1x Nut M10x0.75 / SW13
- 1x Serrated lock washer



Vert-X 2202 / Vert-X 2232

Accessoires (incl.)

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



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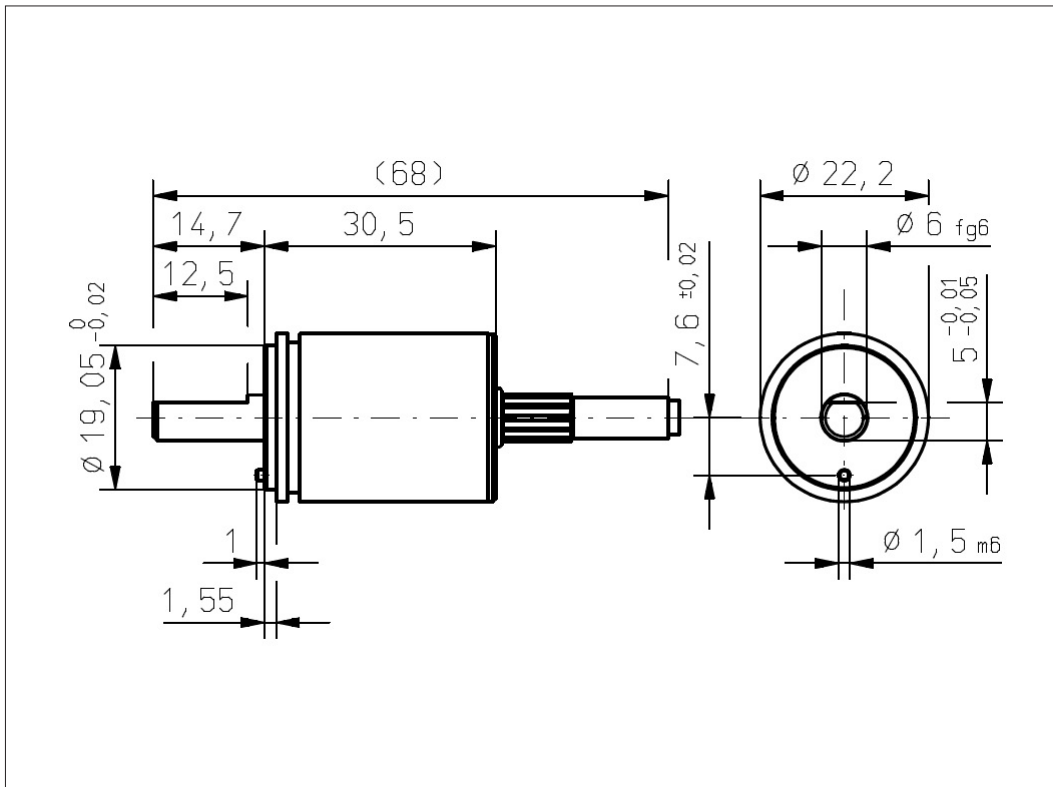
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Vert-X 2211 / Vert-X 2241

Accessoires (incl.)

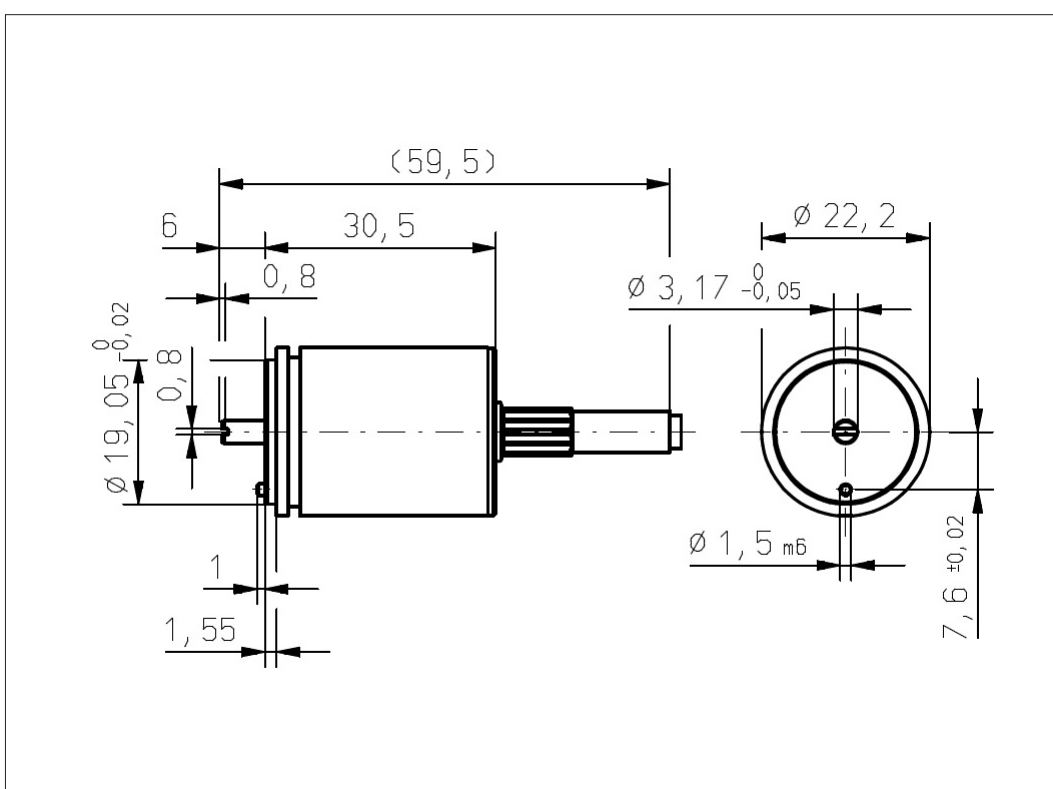
- 1x Fixation clip
- 2x Slotted cylinder head screw M3x8



Vert-X 2212 / Vert-X 2242

Accessoires (incl.)

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



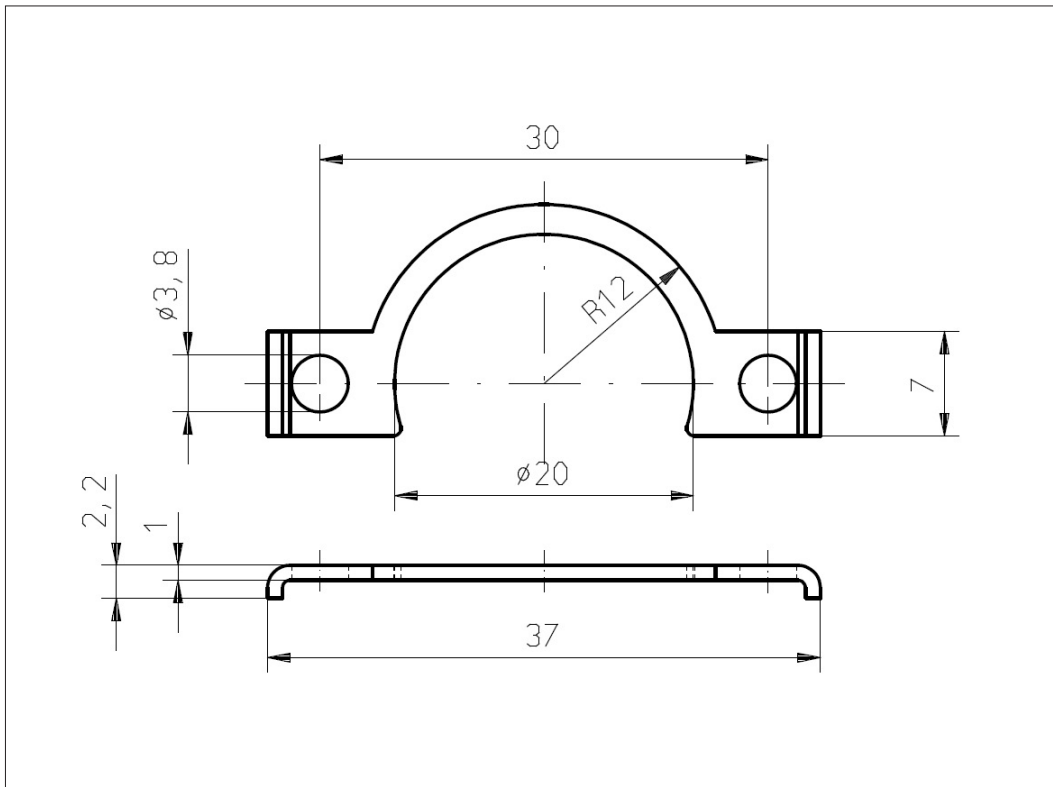
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Vert-X 2211 / Vert-X 2212
Vert-X 2241 / Vert-X 2242
Accessoires
Fixation clip



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