



## Vert-X 13 - 5V / PWM

### Applications

- Servodrives
- Insetting machines
- Sewer inspection robots
- Medical applications

### Features

- Compact dimensions
- Contactless measuring method
- Long life
- High accuracy of measurement
- Use in cramped installation conditions
- Full resolution and accuracy at programmed electrical angle
- Full redundancy possible

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	50	-
MTTFd / MTBF	years	668 / 668	-
Power supply voltage	VDC	5 (±10 %)	-
Current consump. without load (typ.) fast mode	mA	(14)	-
Current consump. 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		Wires (3x)	-
Cross section of single wires	mm <sup>2</sup>	0.25 (AWG24)	-
Redundancy feasible		yes	-
Electrical connection redundant		Ribbon cable 6pole	-
Cross section of single wires		0.09 (AWG28)	-

### Mechanical data

Mechanical range	°	360 (continuous)	-
Protection class		IP54 / IP65	-
Max. starting torque at spec. protection class	Ncm	0.5 / 3	-
Max. rotating speed	rpm	6000	-
Min. life	movements	360 Mio.	-
Max. permitted axial shaft load	N	5	-
Max. permitted radial shaft load	N	5	-
Operating & Storage temperature (with wires)	°C	-40 ... +125	-
Operating & Storage temperature (with ribbon cable)	°C	-40 ... +105	-
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	100	-
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	300	-
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: 11.02.14

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**Vert-X 13 - 5V / PWM**  
**Ordering code**

Output characteristics		Electrical connection	
Positive gradient CW	Standard 1	1	Optional Ribbon cable 6pole
Positive gradient CCW	Optional 2	2	Standard Wires 3pole
Redundant, positive gradient CW	Optional 3	9	Optional Special cable; special wires
Redundant, positive gradient CCW	Optional 4		
Redundant, crossed signal curves	Optional 5		
Output signal		Length of wires / ribbon cable	
PWM	Standard 5	01	Optional 10cm
		02	Standard 20cm
		03	Optional 30cm
		04	Optional 40cm
		05	Optional 50cm
		99	Optional Special length
Power supply voltage			
5VDC	Standard 2		

Vert-X	1	3	0	2	7	3	6	2	5	1	2	0	2
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Electrical angle	
36	Standard Electrical angle 360°
xx	Optional 10 to 35; Declaration in 10° steps
99	Optional Special angle

Sensor principle	
7	MH-C

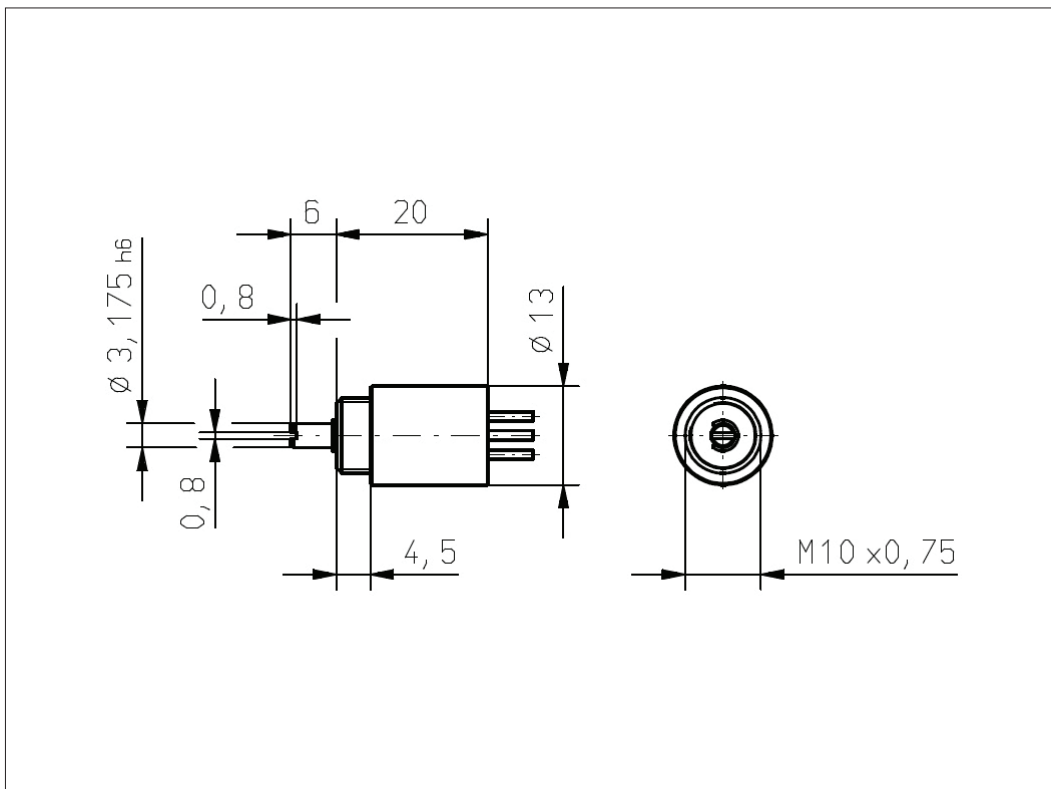
Mechanical version	
1302	Standard Bushing M10x0,75 ; 3,175mm shaft slotted ; ball bearing ; IP54
1312	Optional Servo mount ; 3,175mm shaft slotted ; ball bearing ; IP54
1332	Optional Bushing M10x0,75 ; 3,175mm shaft slotted ; ball bearing ; IP65
1342	Optional Servo mount ; 3,175mm shaft slotted ; ball bearing ; IP65
1303	Optional Bushing M10x0,75 ; 3,175mm shaft slotted ; slide bearing ; IP54
1313	Optional Servo mount ; 3,175mm shaft slotted ; slide bearing ; IP54
1333	Optional Bushing M10x0,75 ; 3,175mm shaft slotted ; slide bearing ; IP65
1343	Optional Servo mount ; 3,175mm shaft slotted ; slide bearing ; IP65
1399	Optional Special housing ; Special shaft

	MH-C	MH-C2
Custom shaft design	X	-
Custom modification of the housing	X	-
Custom cable / wires	X	-
Sample rate in fast mode	X	-
Switch functions TTL (max. 2)	-	-
Special characteristic curve	-	-
Special electrical angle within 30 to 360° (ex factory)	X	-
Electrical angle programmable (Software)	-	-
Start & end point settable / programmable (Additional wires or Software)	-	-
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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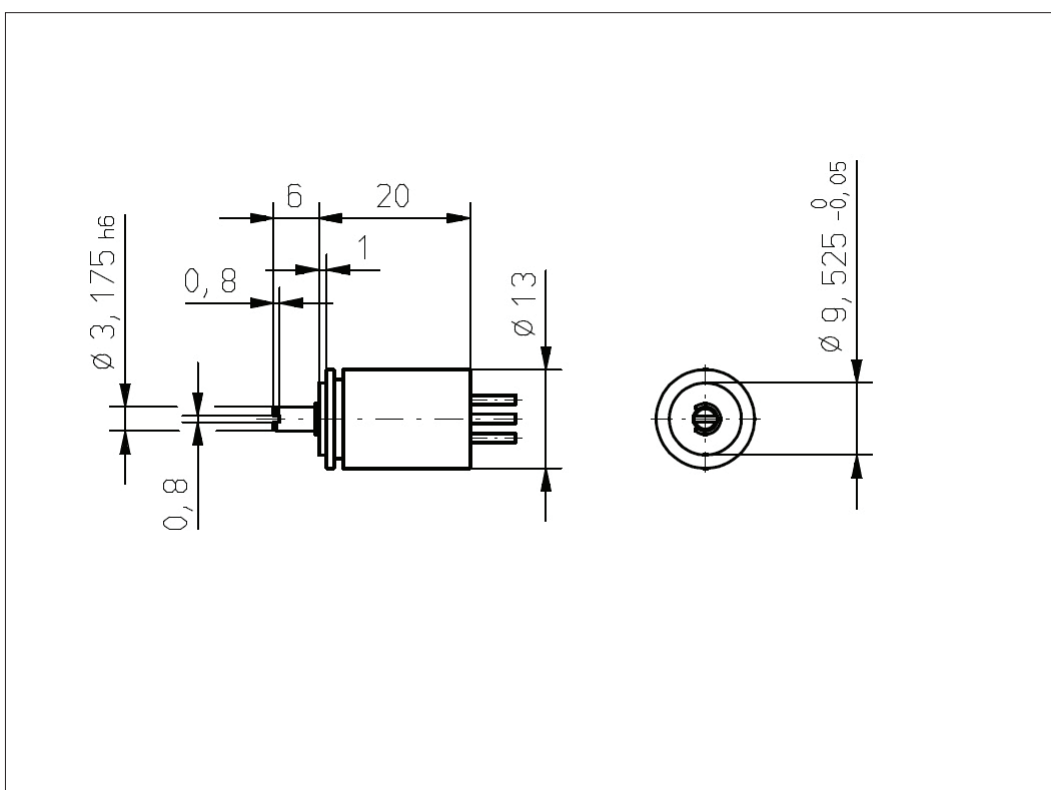
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**Vert-X 1302**  
**Vert-X 1332**  
**Vert-X 1303**  
**Vert-X 1333**

**Accessoires (incl.)**

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



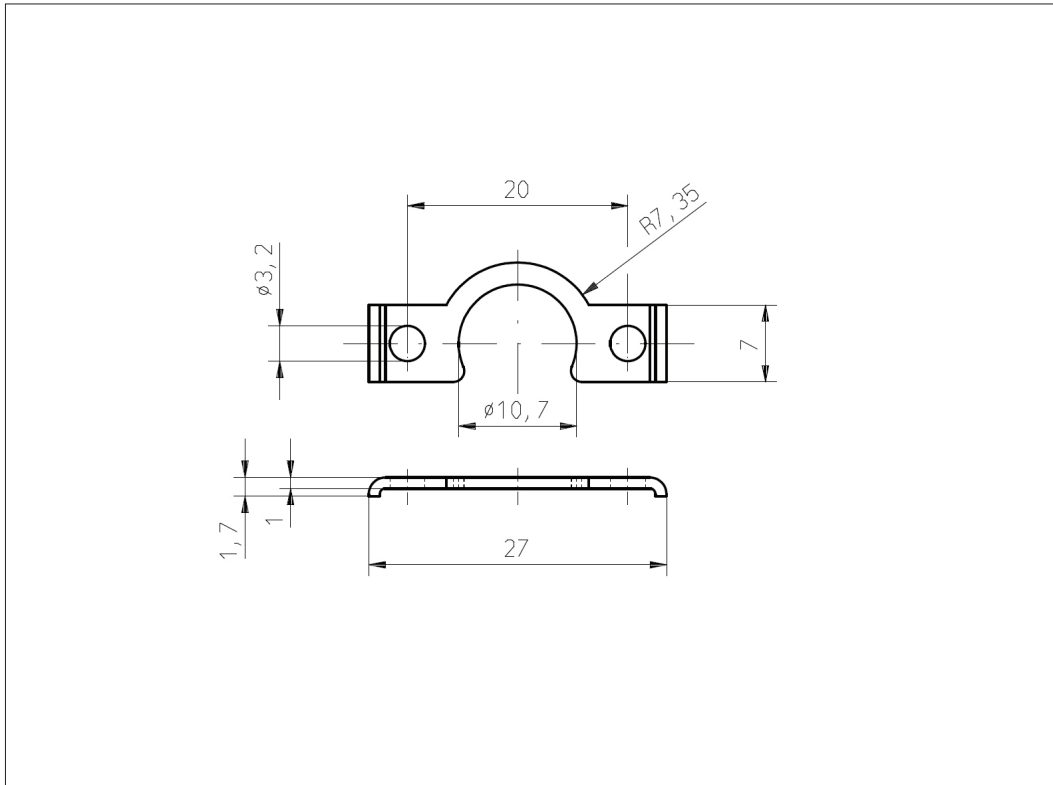
**Vert-X 1312**  
**Vert-X 1342**  
**Vert-X 1313**  
**Vert-X 1343**

**Accessoires (incl.)**

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

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**Accessoires**  
Fixation clip

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