



## Vert-X 13E - 5V / 10...90% Ub

### Applications

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

### Features

- High protection class IP68
- Very compact dimensions
- Non-contacting measuring method
- Very 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 (without misalignment)	% of meas. range	±0.3	-
Indep. linearity (with allowed misalignment @ 360°)	% of meas. range	±0.5	-
Max. hysteresis	°	0.1	-
Resolution	bit	12	-
Max. repeatability	°	0.1	-
System propagation delay fast mode	kHz	(5)	-
System propagation delay 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 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	10	-
Reverse polarity protection of power supply		yes	-
Electrical connection axial		Wires (3x)	-
Cross section of single wires	mm <sup>2</sup>	0.25 (AWG24)	-
Electrical connection radial		Cable 3pole	-
Cross section of single wires	mm <sup>2</sup>	0.25 (AWG24)	-
Redundancy feasible		yes	-
Electrical connection redundant axial		Ribbon cable 6pole	-
Cross section of single wires redundant	mm <sup>2</sup>	0.09 (AWG28)	-
Electrical connection redundant radial		Cable 6pole	-
Cross section of single wires redundant	mm <sup>2</sup>	0.25 (AWG24)	-

<b>Mechanical data</b>			
Mechanical range	°	360 (continuous)	-
Protection class		IP68	-
Min. life	movements	no limitation	-
Operating & storage temperature (with wires)	°C	-40 ... +125	-
Operating & storage temperature (with ribbon cable)	°C	-40 ... +105	-
Operating & storage temperature (with round cable)	°C	-40 ... +85	-
IEC 68-2-6 Vibration (Amax = 0.75mm, f = 5 ... 2000 Hz)	g	50	-
IEC 68-2-27 Shock	g	200	-

<b>Standards</b>			
EN 55022 classe B, Emission radiated (30... 230 MHz)	dB(µV/m)	max. 30	-
EN 55022 classe 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, Immission 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, Immission HF conducted (0.15...80MHz)	Vemk	10	-
EN 61000-4-8, Immission 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: 15.01.14

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**Vert-X 13E - 5V / 10...90% Ub**  
**Ordering code**

		<b>Output characteristics</b>				<b>Electrical connection / axial</b>	
	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	2	9	Optional	Special cable ; special wires
	Redundant, positive gradient CCW	Optional	4				
	Redundant, crossed signal curves	Optional	5				
		<b>Output signal</b>				<b>Electrical connection / radial</b>	
	10%...90% Ub	Standard	2	4	4	Standard	Round cable 3pole
	x% ... y% Ub (within 5 ... 95%)	Optional	4		6	Optional	Round cable 6pole
					9	Optional	Special cable
		<b>Power supply voltage</b>				<b>Length of wires / ribbon cable</b>	
	5VDC	Standard	2		01	Optional	10cm
					02	Standard	20cm
					03	Optional	30cm
					04	Optional	40cm
					05	Optional	50cm
					99	Optional	Special length
		<b>Sensor principle</b>				<b>Length of cable</b>	
	7	MH-C			02	Standard	1.0m
					06	Optional	3.0m
					10	Optional	5.0m
					99	Optional	Special length
		<b>Electrical angle</b>					
	36	Standard	Electrical angle 360°				
	xx	Optional	03 to 35; Declaration in 10° steps				
	99	Optional	Special angle				
		<b>Mechanical version</b>					
	13E3	Standard	Servo mount ; magnetic actuator type 3				
	13E9	Optional	Special housing ; special magnetic actuator				

	MH-C	MH-C2
Custom magnetic actuator	X	-
Custom modification of the housing	X	-
Custom cable / wires	X	-
Interface x% ... y% Ub (within 5% ... 95% Ub)	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 (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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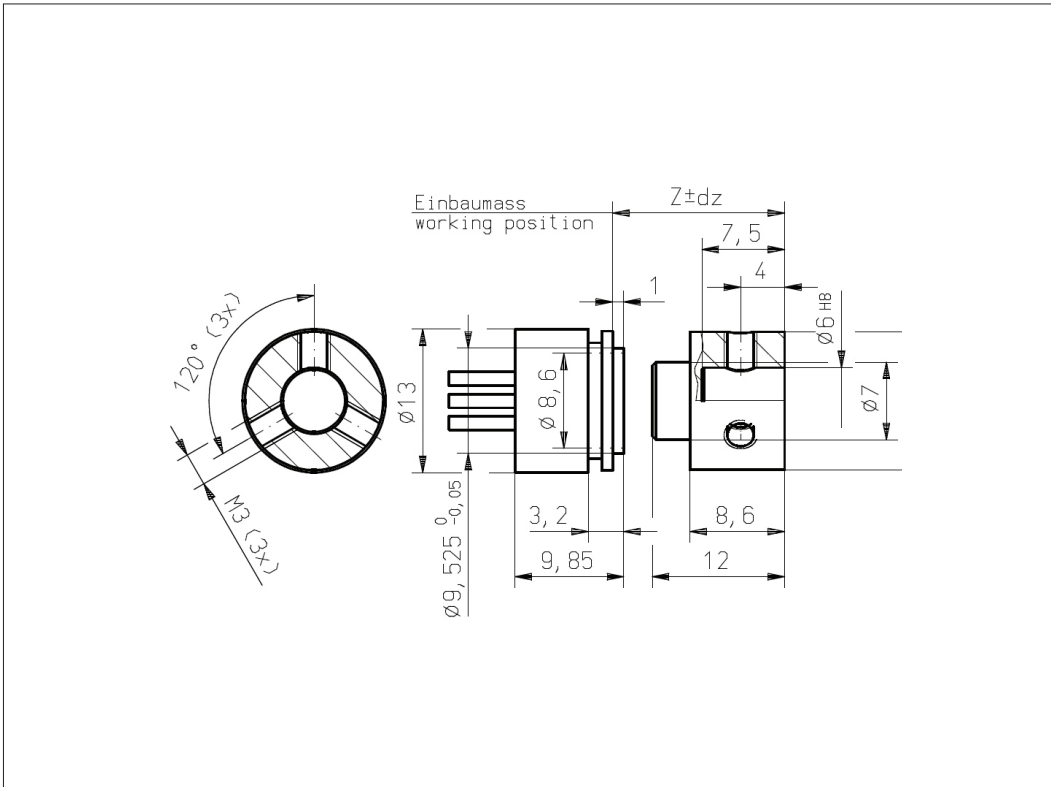
**Vert-X 13E3 xxx xxx 1xx**  
**Vert-X 13E3 xxx xxx 2xx**

**Accessoires (incl.)**

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

**Working position (Z) and max. permitted misalignment of the magnetic actuator**

see mounting information



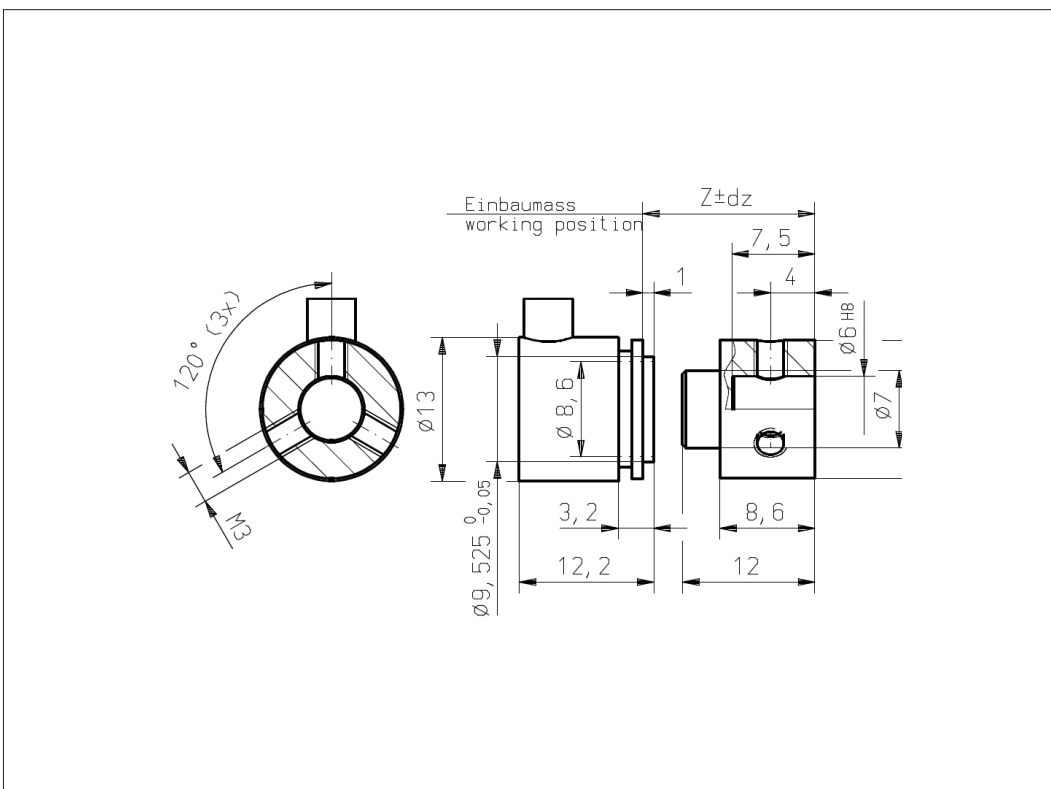
**Vert-X 13E3 xxx xxx 4xx**  
**Vert-X 13E3 xxx xxx 6xx**

**Accessoires (incl.)**

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- 2x Slotted cylinder head screw M3x8

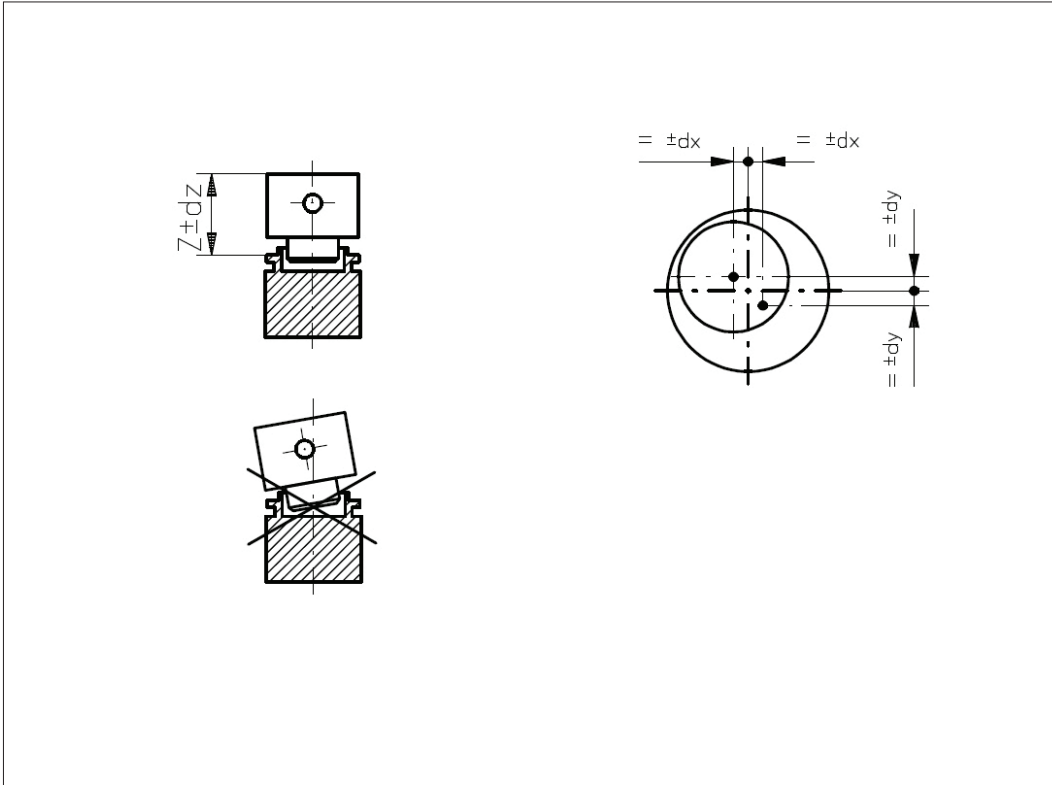
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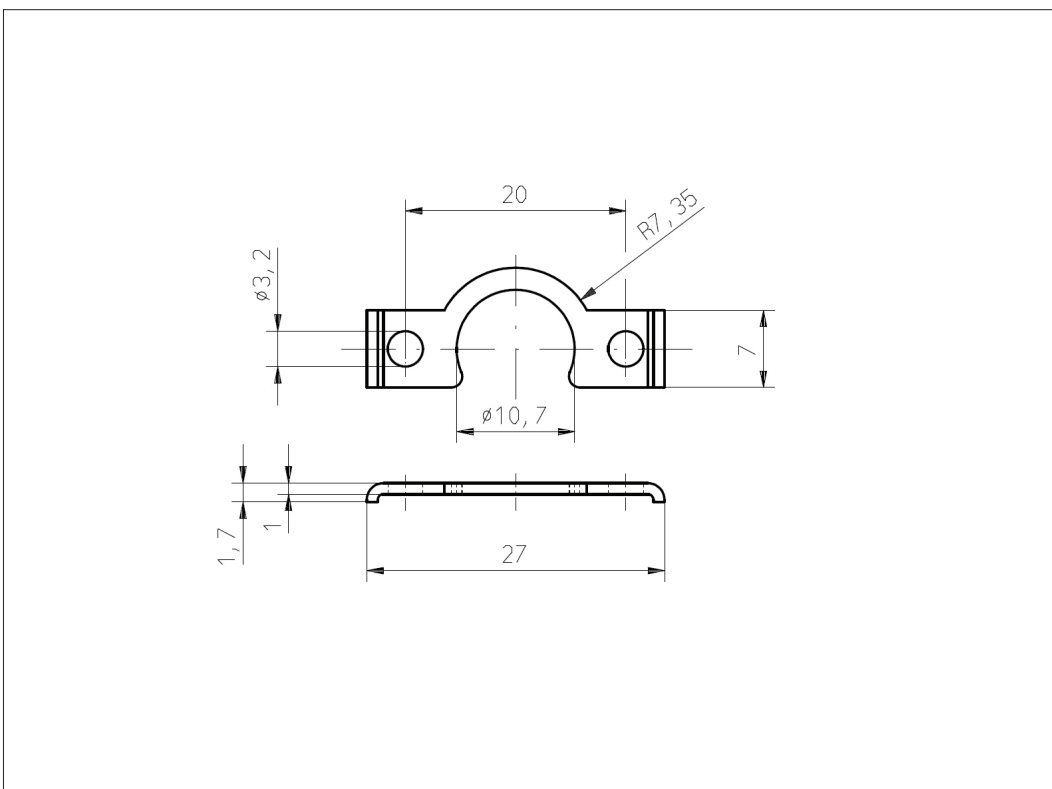
**Vert-X 13E**  
**Mounting information**

**Working position (Z)**

MH-C	11.05mm
MH-C redundant	10.55mm

**Max. permitted misalignment of the magnetic actuator**

dx	±0.25mm
dy	±0.25mm
dz	±0.50mm



**Vert-X 13E**  
**Accessoires**  
 Fixation clip

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