



## Vert-X 22E - 5V / 10...90% Ub

### Applications

- Wind vanes
- Valve control
- Level sensor
- Special purpose vehicles

### Features general

- High protection class IP68
- Flat design
- Non-contacting measuring method
- Very long life
- High accuracy of measurement
- Use in cramped installation conditions
- Full resolution and accuracy at programmed electrical angle

### Features MH-C

- Resolution of 12bit
- Full redundancy possible
- Lower price than MH-C2

### Features MH-C2

- 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
<b>Electrical data</b>			
Measuring range	°	0 ... 360	0 ... 360
Indep. linearity (without misalignment)	% of meas. range	±0.3	±0.3
Indep. linearity (with allowed misalignment @ 360°)	% of meas. range	±0.5	±0.5
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	50	50
MTTFd / MTBF	years	668 / 668	308 / 308
Power supply voltage	VDC	5 (±10%)	5 (±10%)
Current consumption without load (typ.) fast mode	mA	(14)	(15)
Current consumption without load (typ.) slow mode	mA	9	10
Min. ohmic load at output	kOhm	10	10
Max. capacitive load at output	nF	100	100
Reverse polarity protection of power supply		yes	no
Electrical connection axial		Wires (3x)	Wires (3x)
Cross section of single wires	mm <sup>2</sup>	0.25 (AWG24)	0.25 (AWG24)
Electrical connection radial		Cable 3pole	Cable 3pole
Cross section of single wires	mm <sup>2</sup>	0.25 (AWG24)	0.25 (AWG24)
Redundancy feasible		yes	no
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)	360 (continuous)
Protection class		IP68	IP68
Min. life	movements	no limitation	no limitation
Operating & storage temperature (with wires)	°C	-40 ... +125	-40 ... +85
Operating & storage temperature (with ribbon cable)	°C	-40 ... +105	-40 ... +85
Operating & storage temperature (with round cable)	°C	-40 ... +85	-40 ... +85
IEC 68-2-6 Vibration (Amax = 0.75mm, f = 5 ... 2000 Hz)	g	50	50
IEC 68-2-27 Shock	g	200	200
<b>Standards</b>			
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	±4 / ±8	±4 / ±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



## Vert-X 22E - 5V / 10...90% Ub Ordering code

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

Output characteristics		Electrical connection / axial	
Positive gradient CW	Standard 1	3 Optional Wires 4pole	
Positive gradient CCW	Optional 2	5 Standard Wires 3pole	
Redundant, positive gradient CW	Optional 3	7 Optional Ribbon cable 6pole	
Redundant, positive gradient CCW	Optional 4	9 Optional Special cable ; special wires	
Redundant, crossed signal curves	Optional 5		
Positive gradient CW with 1 switch output*	Optional A	Electrical connection / radial	
Positive gradient CCW with 1 switch output*	Optional B	4 Standard Round cable 3pole	
Positive gradient CW with 2 switch outputs*	Optional C	6 Optional Round cable 6pole	
Positive gradient CCW with 2 switch outputs*	Optional D	9 Optional Special cable ; special wires	
Sense of rotation settable	Optional E	Length of wires / ribbon cable	
Zero point & sense of rotation settable	Optional F	01 Optional 10cm	
Middle point & sense of rotation settable	Optional G	03 Optional 30cm	
Start + end point & sense of rotation settable	Optional H	05 Standard 50cm	
Programmable with Vert-X EasyAdapt	Optional P	99 Optional Special length	
Output signal		Length of cable	
10% ... 90% Ub	Standard 2	02 Standard 1.0m	
x% ... y% Ub (within 5 ... 95%)	Optional 3	06 Optional 3.0m	
		10 Optional 5.0m	
		99 Optional Special length	
Power supply voltage			
5VDC	Standard 2		
<b>Vert-X</b>	<b>2 2 E 2</b>	<b>7 3 6</b>	<b>2 2 1</b>
		<b>5 0 5</b>	
Electrical angle			
36	Standard Electrical angle 360°		
xx	Optional 03 to 35; Declaration in 10° steps		
99	Optional Special angle		
Sensor principle			
7	MH-C		
8	MH-C2		
Mechanical version			
22E1	Optional Servo mount size 9 ; magnetic actuator type 1		
22E2	Standard Servo mount size 9 ; magnetic actuator type 2		
22E9	Optional Special housing ; special magnetic actuator		

	MH-C	MH-C2
Custom magnetic actuator	X	X
Custom modification of the housing	X	X
Custom cable / wires	X	X
Interface x% ... y% Ub (within 5% ... 95% Ub)	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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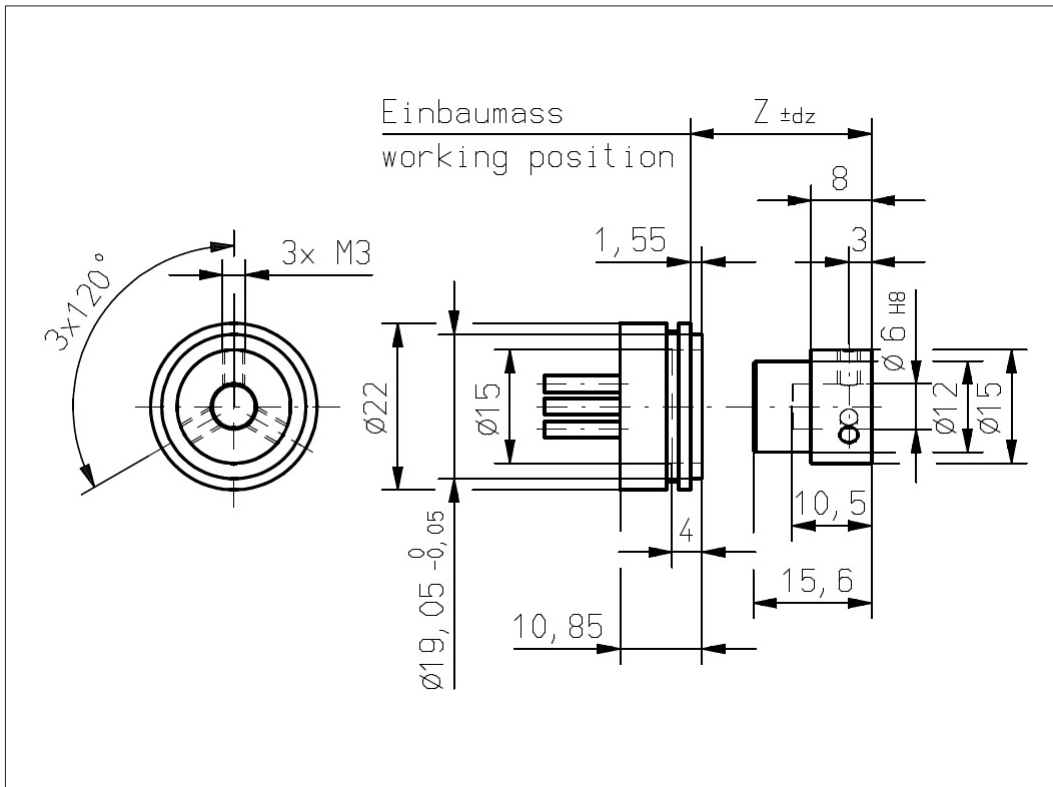
**Vert-X 22E2 xxx xxx 5xx**  
**Vert-X 22E2 xxx xxx 7xx**

**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



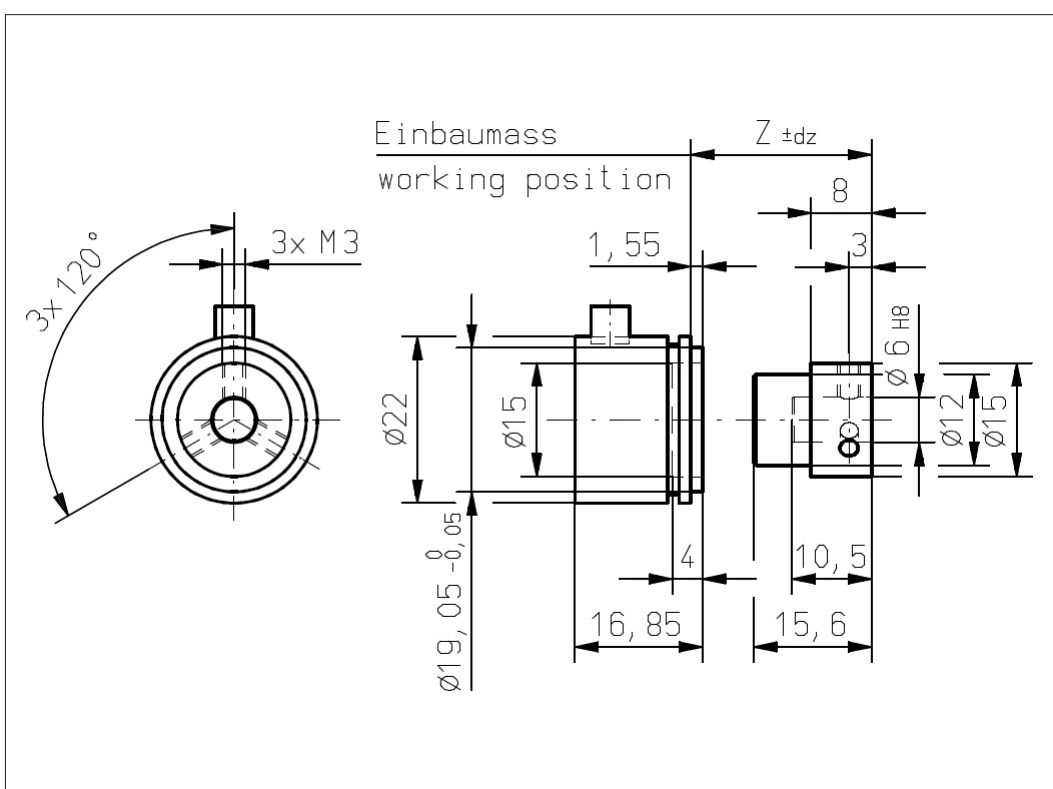
**Vert-X 22E2 xxx xxx 4xx**  
**Vert-X 22E2 xxx xxx 6xx**

**Accessoires (incl.)**

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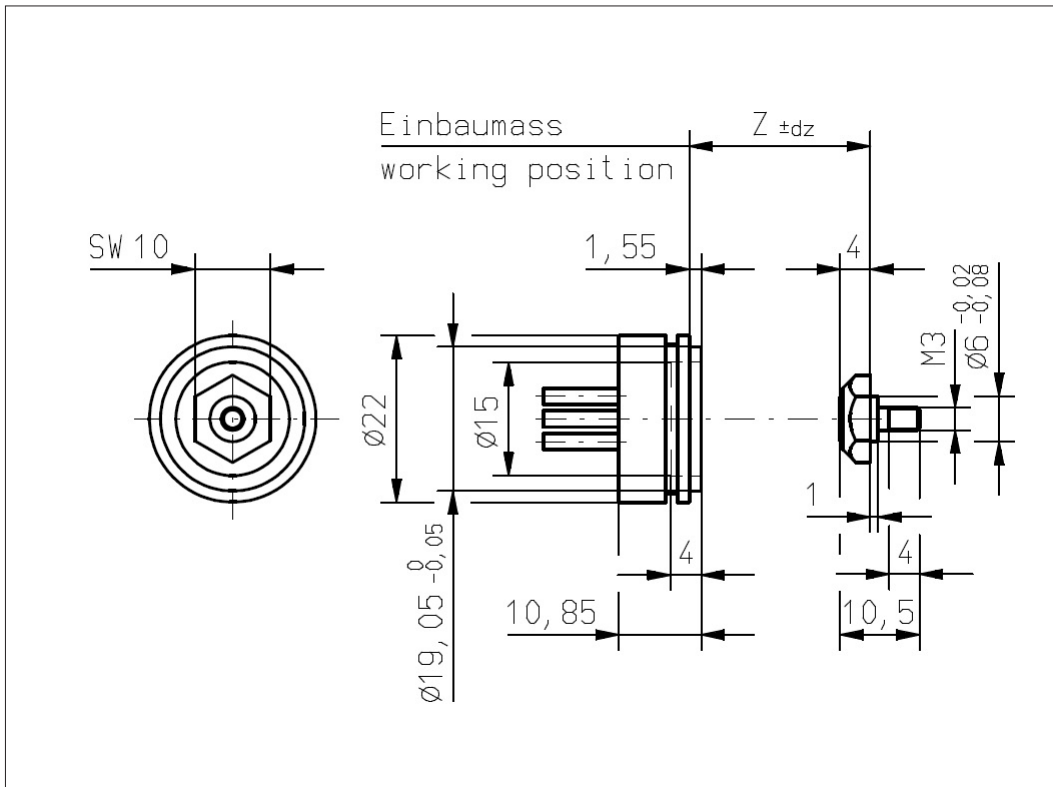
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**Vert-X 22E1 xxx xxx 7xx**

**Accessoires (incl.)**

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- 2x Slotted cylinder head screw M3x8

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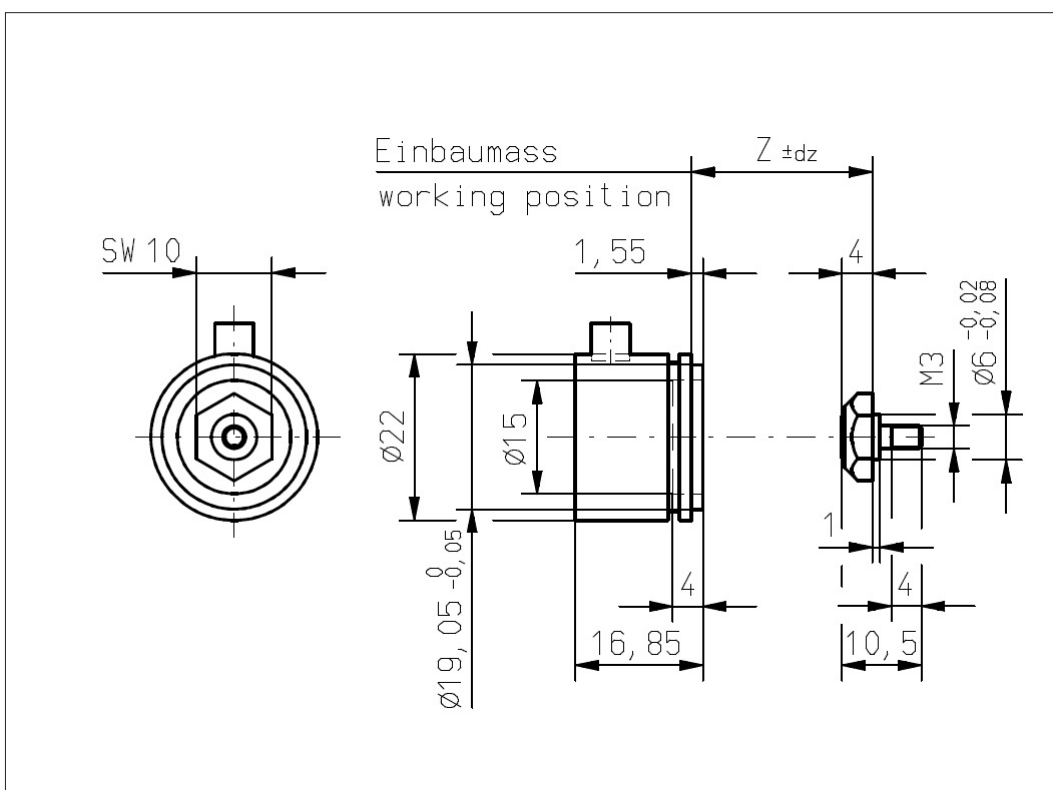
**Vert-X 22E1 xxx xxx 4xx**  
**Vert-X 22E1 xxx xxx 6xx**

**Accessoires (incl.)**

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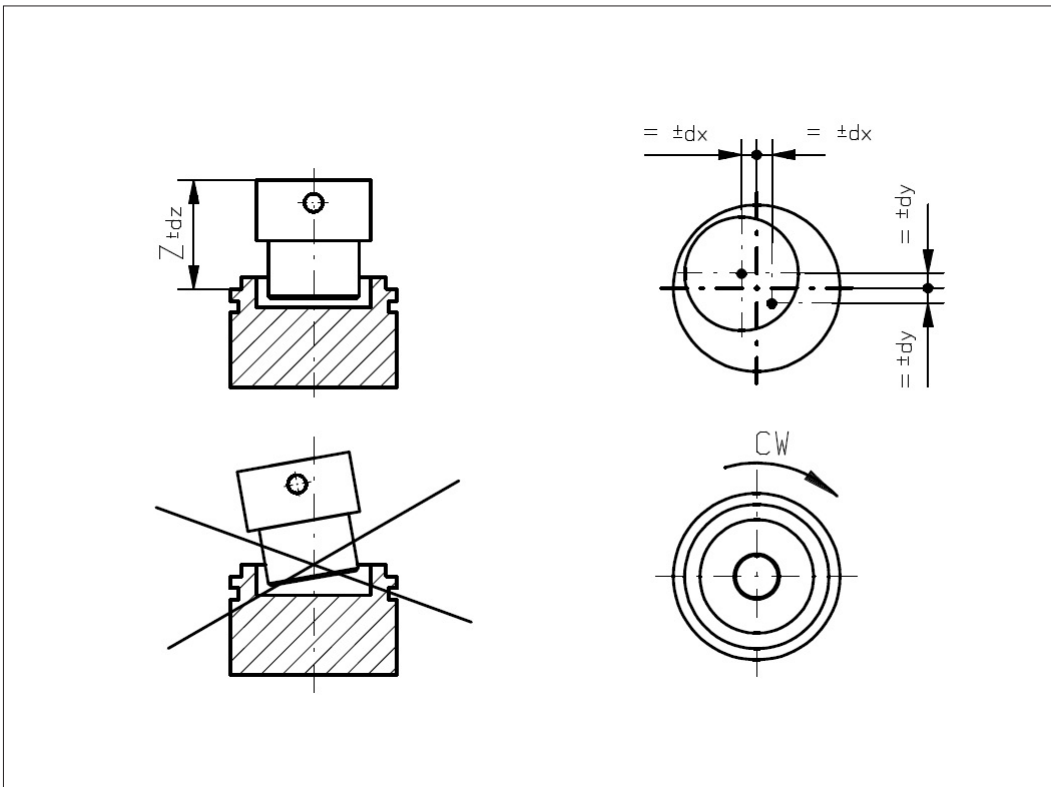
**Vert-X 22E2**  
**Mounting information**

**Working position (Z)**

MH-C	14.40mm
MH-C redundant	13.90mm
MH-C2	14.40mm

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

dx	±0.25mm
dy	±0.25mm
dz	±0.5mm



**Vert-X 22E1**  
**Mounting information**

**Working position (Z)**

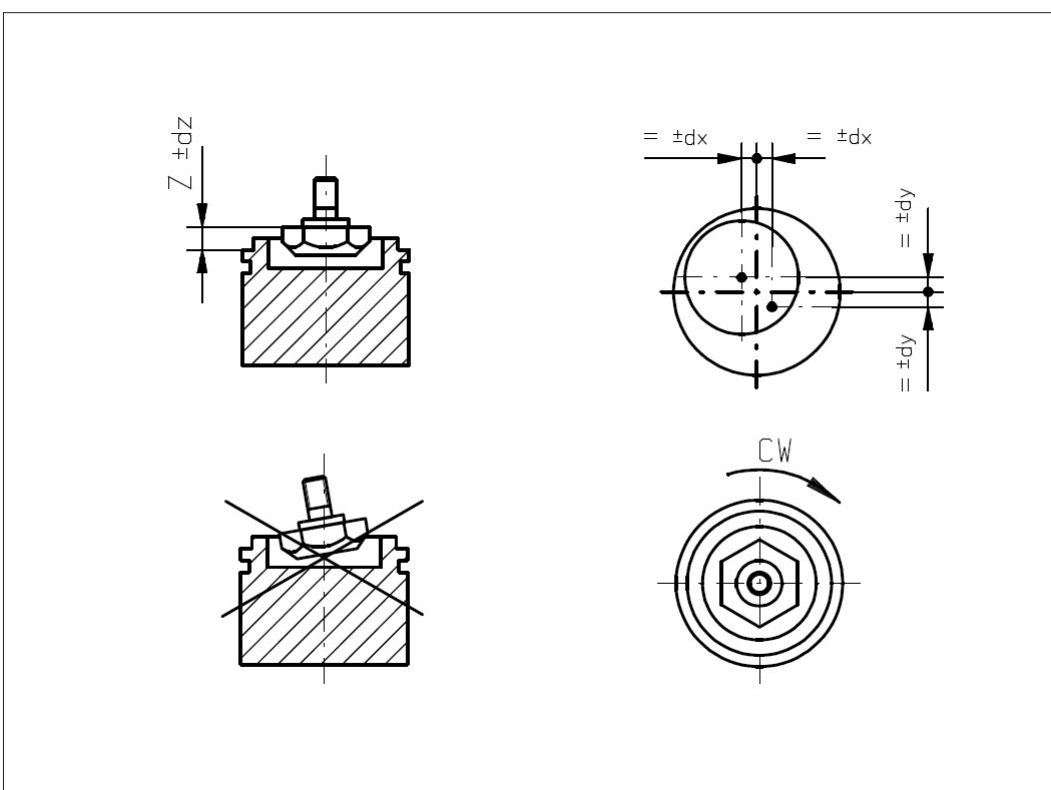
MH-C	3.00mm
MH-C redundant	2.50mm
MH-C2	3.00mm

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

dx	±0.25mm
dy	±0.25mm
dz	±0.5mm

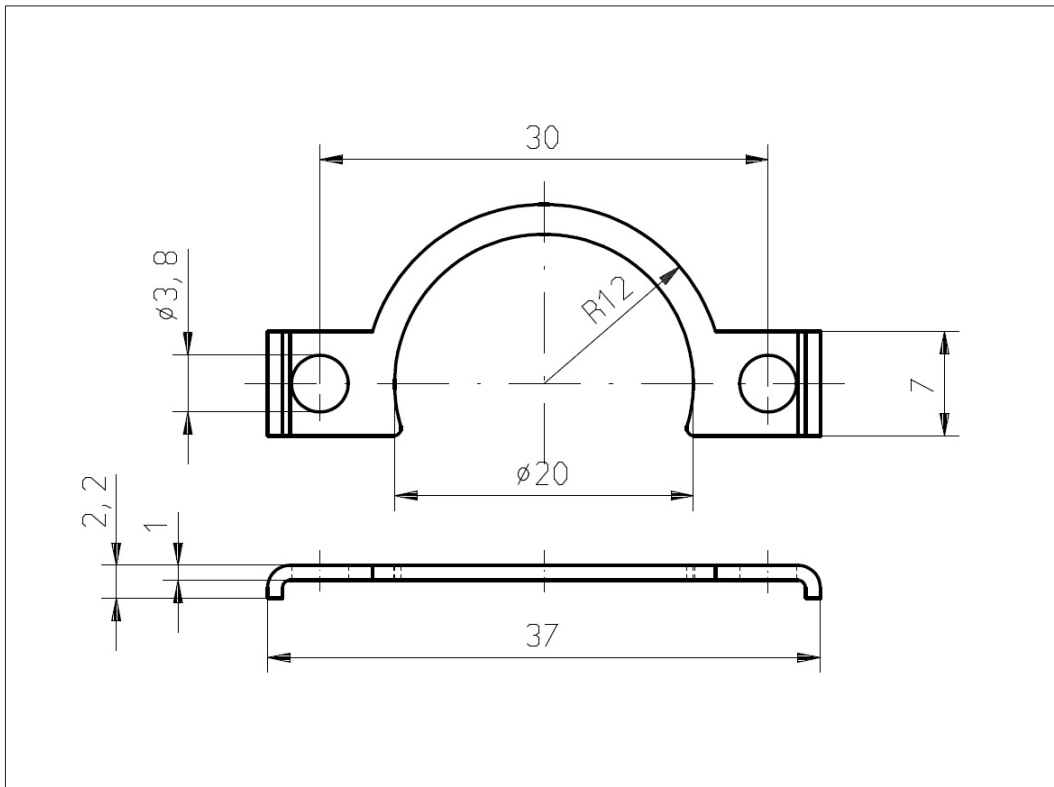
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**Vert-X 22E**  
**Accessoires**  
Fixation clip



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