



Vert-X 22E - 24V / 0.1 - 10V

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
- 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)

Sensor principle		MH-C	MH-C2
Electrical data			
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	100	100
MTTFd / MTBF	years	185 / 185	147 / 147
Power supply voltage	VDC	10.8 ... 35	11 ... 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	10	10
Max. capacitive load at output	nF	100	100
Reverse polarity protection of power supply		yes	yes
Electrical connection axial		Wires (3x)	Wires (3x)
Cross section of single wires	mm ²	0.25 (AWG24)	0.25 (AWG24)
Electrical connection radial		Cable 3pole	Cable 3pole
Cross section of single wires	mm ²	0.25 (AWG24)	0.25 (AWG24)
Redundancy feasible		no	no
Electrical connection redundant axial		-	-
Cross section of single wires redundant	mm ²	-	-
Electrical connection redundant radial		-	-
Cross section of single wires redundant	mm ²	-	-
Mechanical data			
Mechanical range	°	360 (continuous)	360 (continuous)
Protection class		IP68	IP68
Min. life	movements	no limitation	no limitation
Operating & storage temperature	°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
Standards			
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

Errors and omissions excepted. Subject to change without notice. / State: 01.10.10

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CONTELEC
 A company of the Siedle-Group



Vert-X 22E - 24V / 0.1 - 10V
Ordering code

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

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
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

Electrical connection / axial	
3	Optional Wires 4pole
5	Standard Wires 3pole
7	Optional Ribbon cable 6pole
9	Optional Special cable ; special wires

Electrical connection / radial	
4	Standard Round cable 3pole
6	Optional Round cable 6pole
9	Optional Special cable ; special wires

Length of wires / ribbon cable	
01	Optional 10cm
03	Optional 30cm
05	Standard 50cm
99	Optional Special length

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

Output signal	
0,1VDC ... 10VDC	Standard 1

Power supply voltage	
24VDC	Standard 1

Vert-X **2 2 E 2 7 3 6 1 1 1 5 0 5**

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
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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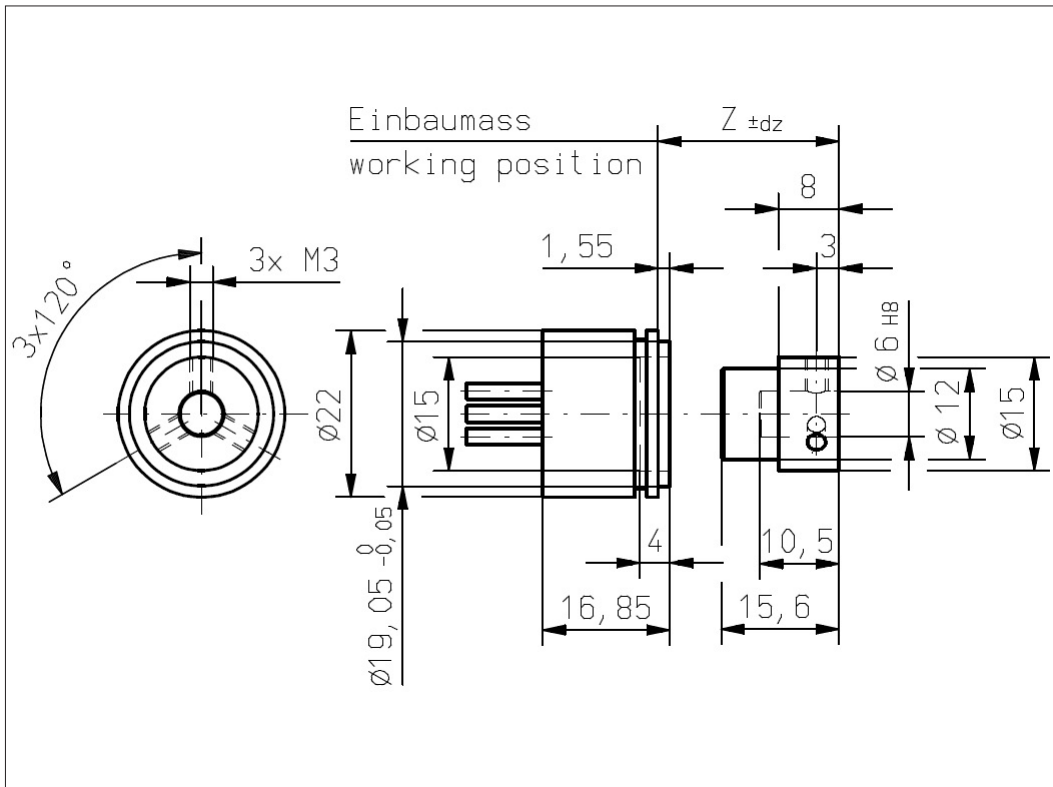
Vert-X 22E2 xxx xxx 5xx
Vert-X 22E2 xxx xxx 7xx

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



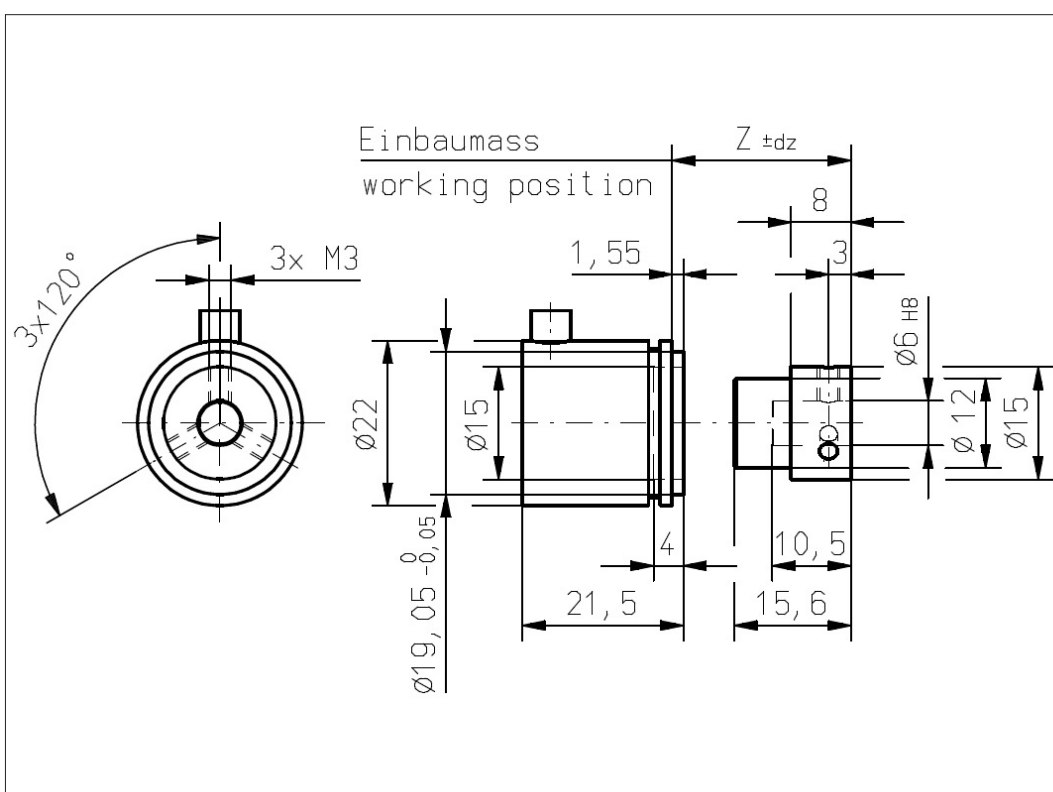
Vert-X 22E2 xxx xxx 4xx
Vert-X 22E2 xxx xxx 6xx

Accessoires (incl.)

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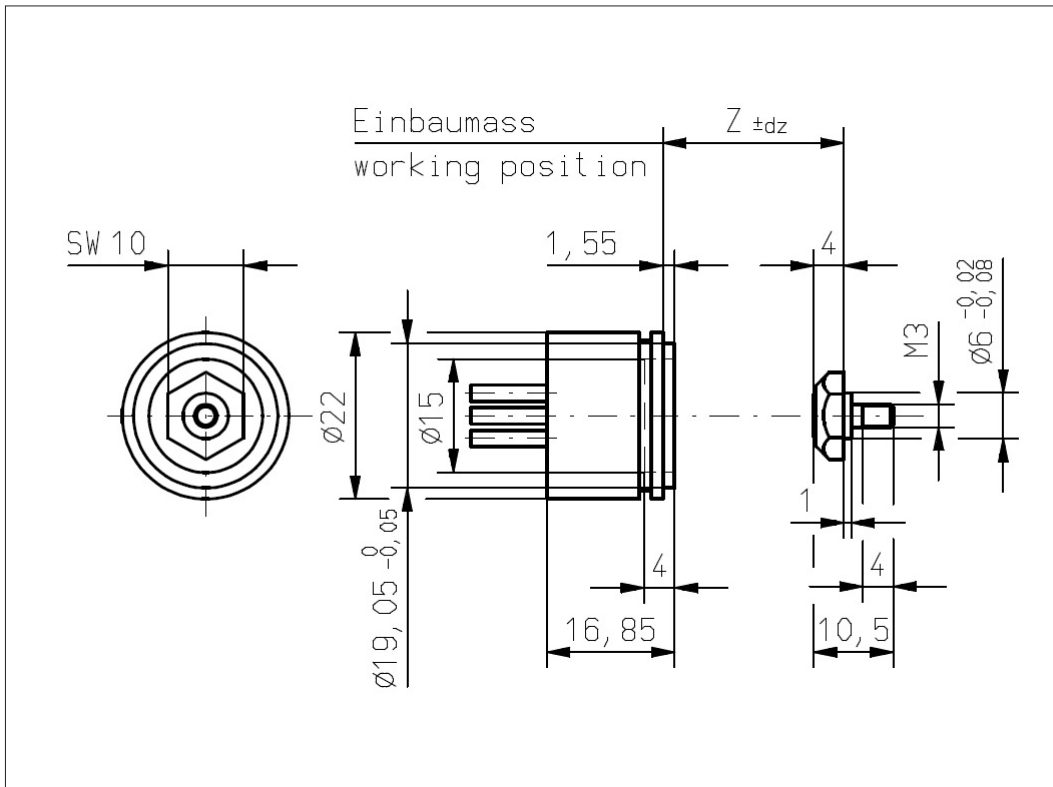
Vert-X 22E1 xxx xxx 5xx
Vert-X 22E2 xxx xxx 7xx

Accessoires (incl.)

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

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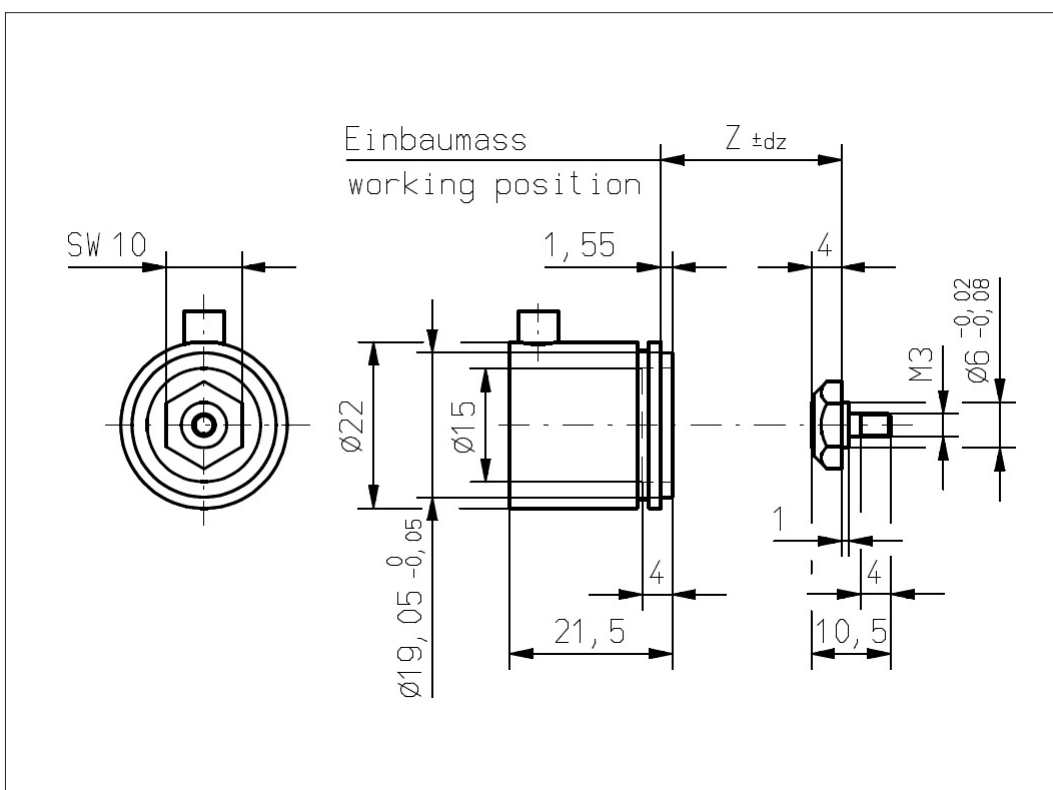
Vert-X 22E1 xxx xxx 4xx
Vert-X 22E2 xxx xxx 6xx

Accessoires (incl.)

- 1x Fixation clip
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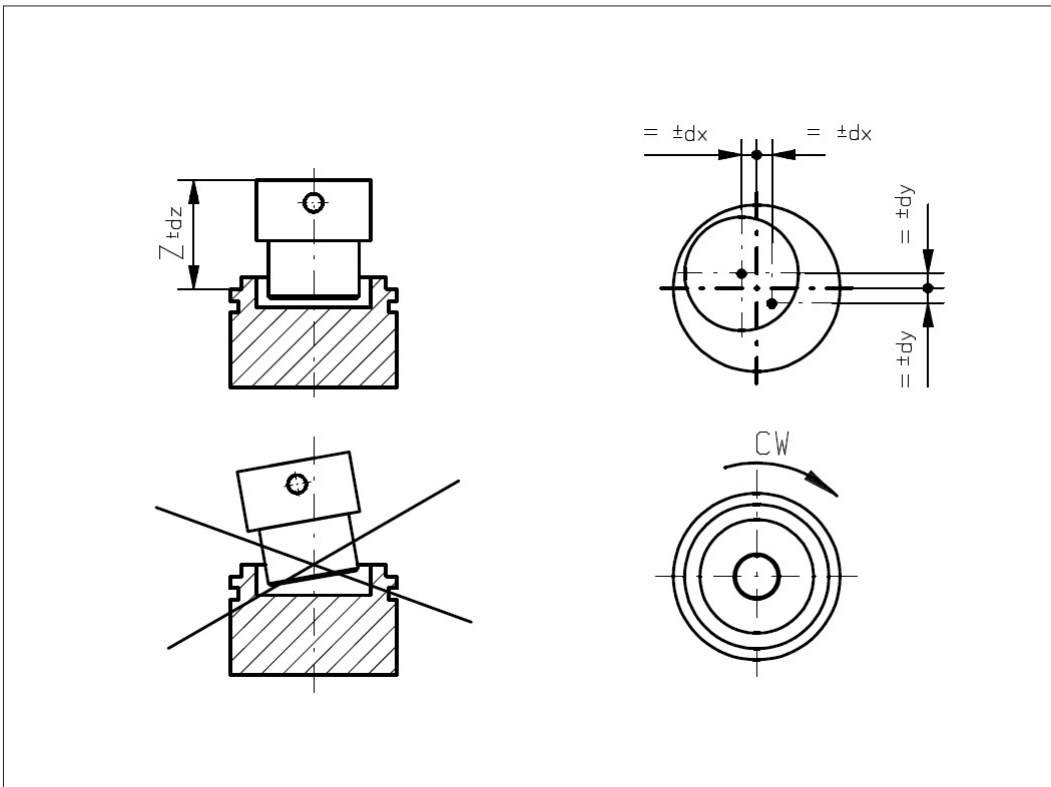
Vert-X 22E2
Mounting information

Working position (Z)

MH-C	14.40mm
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)

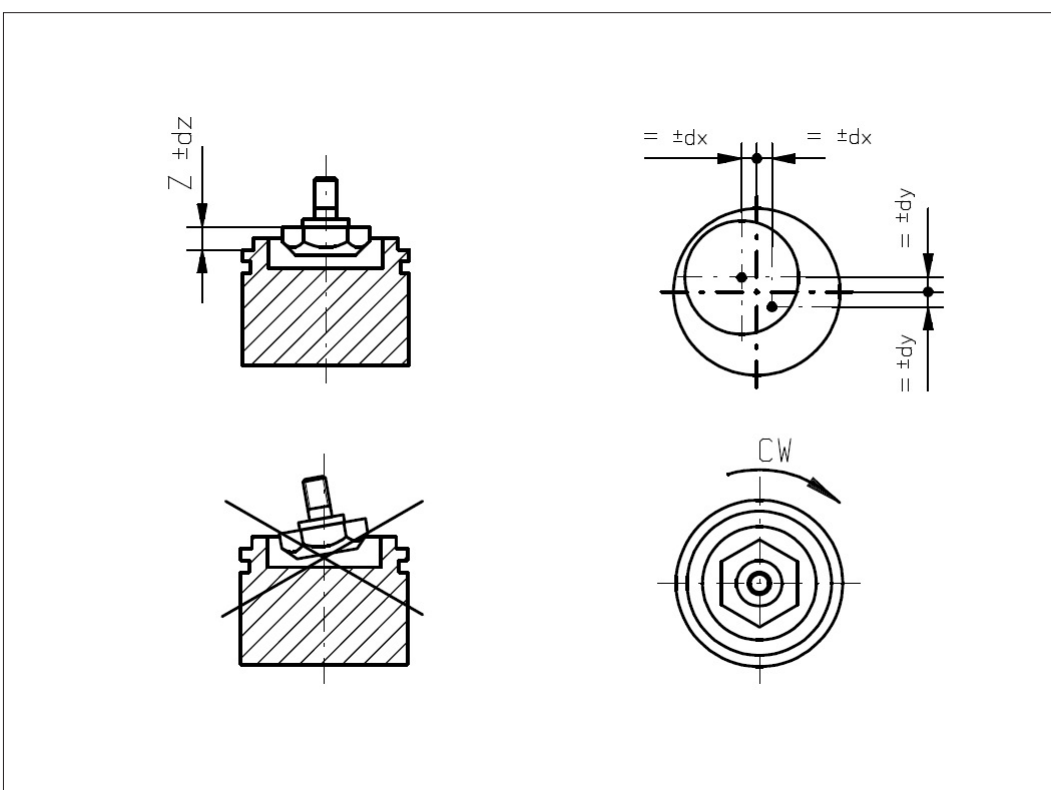
MH-C	3.00mm
MH-C2	3.00mm

Max. permitted misalignment of the magnetic actuator

dx	±0.25mm
dy	±0.25mm
dz	±0.5mm

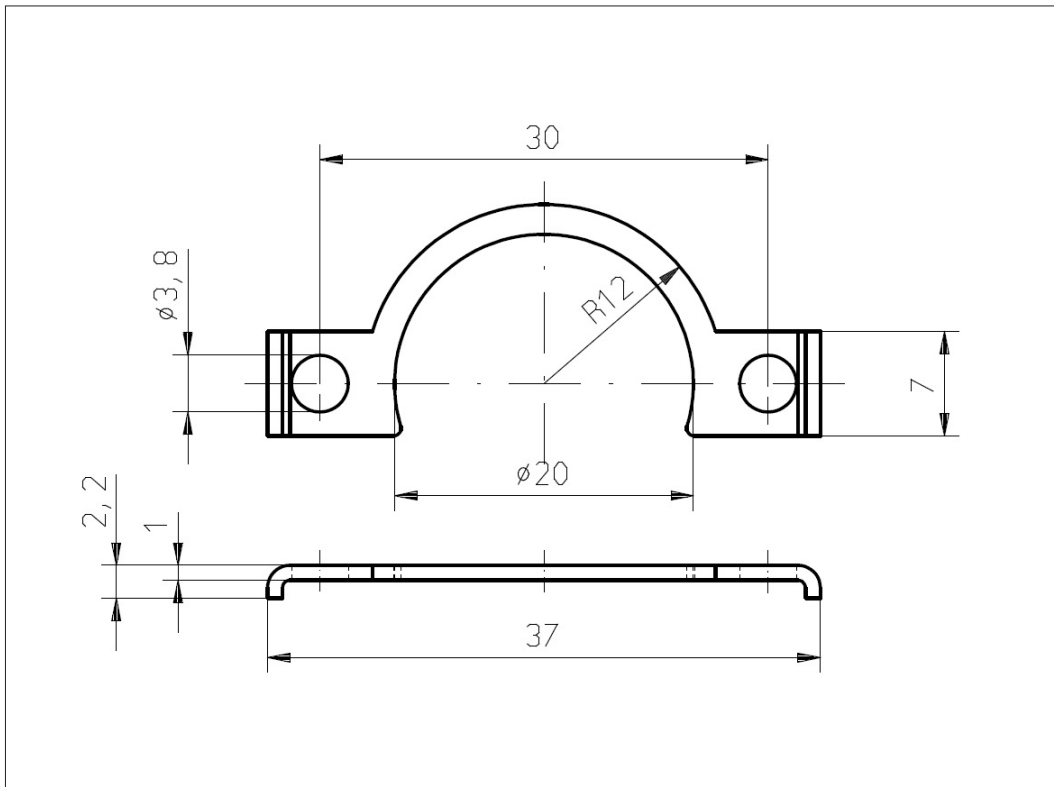
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Vert-X 22E
Accessoires
Fixation clip



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Applications

- Wind vanes
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- 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)

Sensor principle		MH-C	MH-C2
Electrical data			
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	100	100
MTTFd / MTBF	years	240 / 240	209 / 209
Power supply voltage	VDC	8 ... 35	8 ... 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	10	10
Max. capacitive load at output	nF	100	100
Reverse polarity protection of power supply		yes	yes
Electrical connection axial		Wires (3x)	Wires (3x)
Cross section of single wires	mm ²	0.25 (AWG24)	0.25 (AWG24)
Electrical connection radial		Cable 3pole	Cable 3pole
Cross section of single wires	mm ²	0.25 (AWG24)	0.25 (AWG24)
Redundancy feasible		yes	no
Electrical connection redundant axial		Ribbon cable 6pole	-
Cross section of single wires redundant	mm ²	0.09 (AWG28)	-
Electrical connection redundant radial		Cable 6pole	-
Cross section of single wires redundant	mm ²	0.25 (AWG24)	-
Mechanical data			
Mechanical range	°	360 (continuous)	360 (continuous)
Protection class		IP68	IP68
Min. life	movements	no limitation	no limitation
Operating & storage temperature	°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
Standards			
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, Immision 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, Immision HF conducted (0.15...80MHz)	Vemk	10	10
EN 61000-4-8, Immision 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.

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	Electrical connection / radial	
Positive gradient CW with 1 switch output*	Optional A	4 Standard	Round cable 3pole
Positive gradient CCW with 1 switch output*	Optional B	6 Optional	Round cable 6pole
Positive gradient CW with 2 switch outputs*	Optional C	9 Optional	Special cable ; special wires
Positive gradient CCW with 2 switch outputs*	Optional D	Length of wires / ribbon cable	
Sense of rotation settable	Optional E	01 Optional	10cm
Zero point & sense of rotation settable	Optional F	03 Optional	30cm
Middle point & sense of rotation settable	Optional G	05 Standard	50cm
Start + end point & sense of rotation settable	Optional H	99 Optional	Special length
Programmable with Vert-X EasyAdapt	Optional P	Length of cable	
		02 Standard	1.0m
		06 Optional	3.0m
		10 Optional	5.0m
		99 Optional	Special length
		Output signal	
0,5VDC ... 4,5VDC	Standard 2	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	
		Power supply voltage	
24VDC	Standard 1		
Vert-X	2 2 E 2	7 3 6	1 2 1
		5 0 5	

	MH-C	MH-C2
Custom magnetic actuator	X	X
Custom modification of the housing	X	X
Custom cable / wires	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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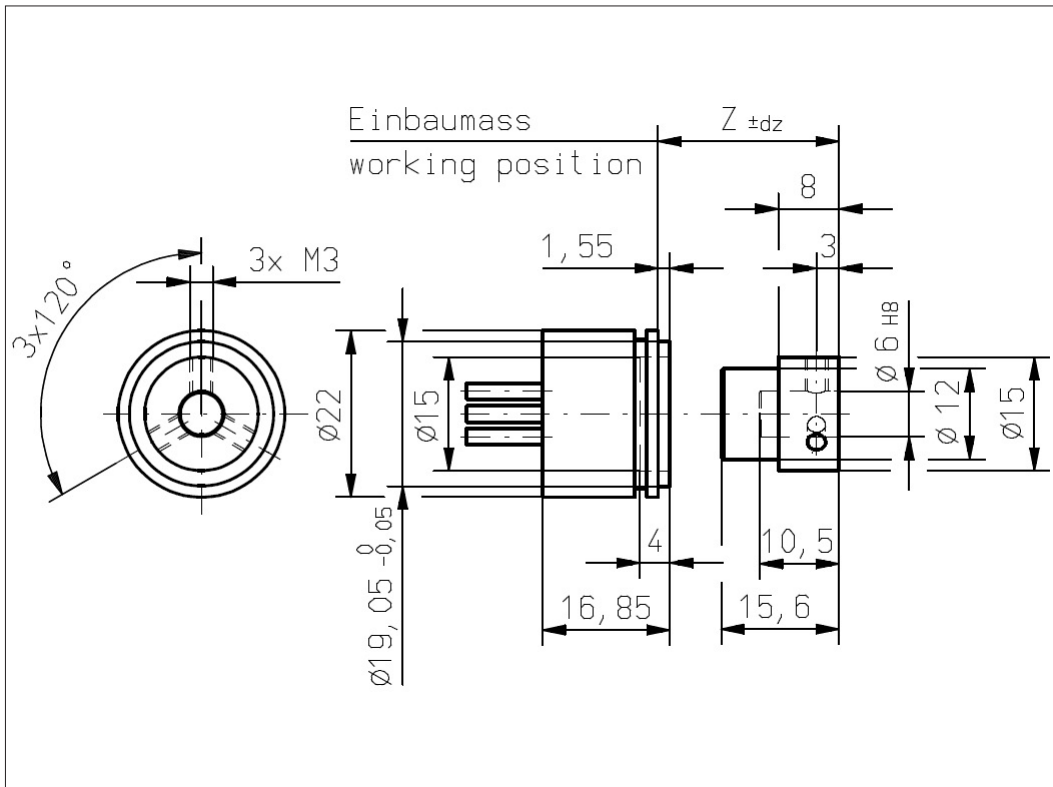
Vert-X 22E2 xxx xxx 5xx
Vert-X 22E2 xxx xxx 7xx

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



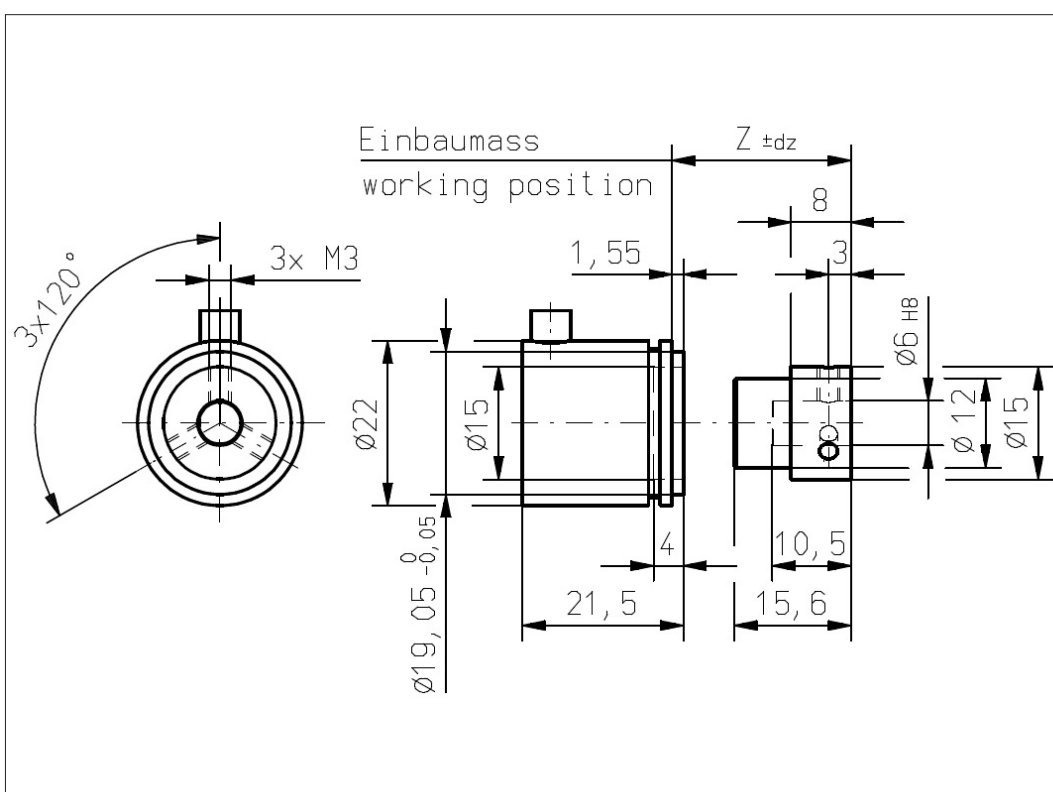
Vert-X 22E2 xxx xxx 4xx
Vert-X 22E2 xxx xxx 6xx

Accessoires (incl.)

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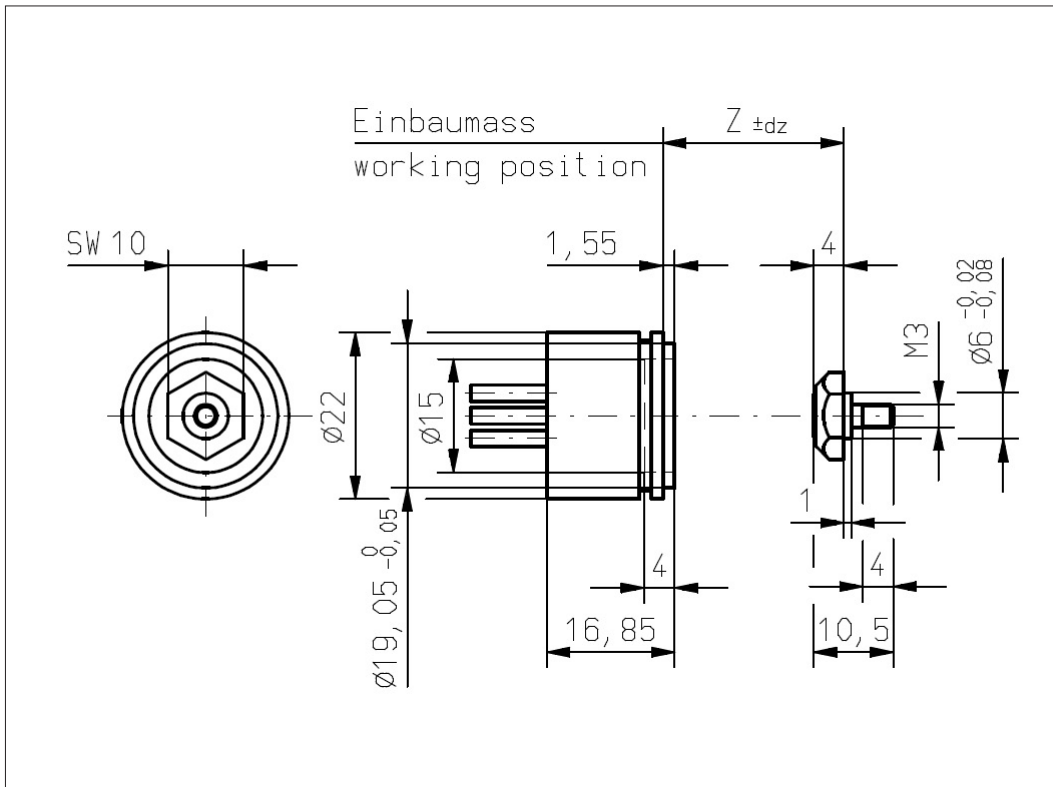
Vert-X 22E1 xxx xxx 5xx
Vert-X 22E1 xxx xxx 7xx

Accessoires (incl.)

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- 2x Slotted cylinder head screw M3x8

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

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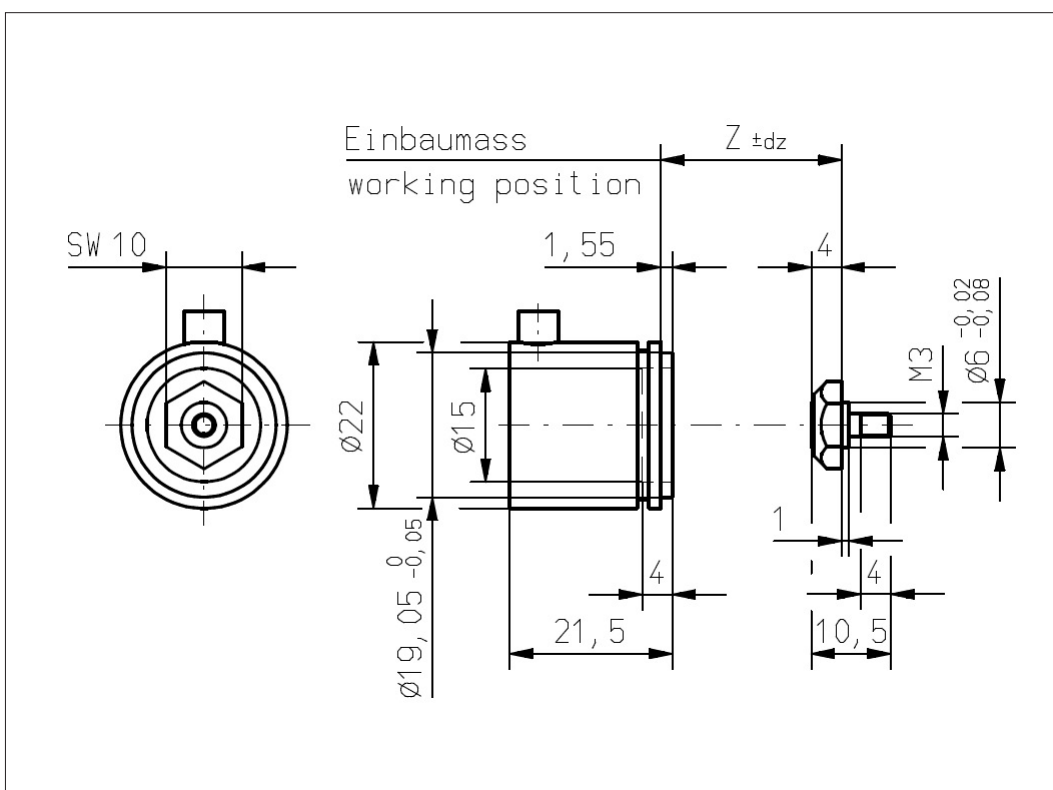
Vert-X 22E1 xxx xxx 4xx
Vert-X 22E1 xxx xxx 6xx

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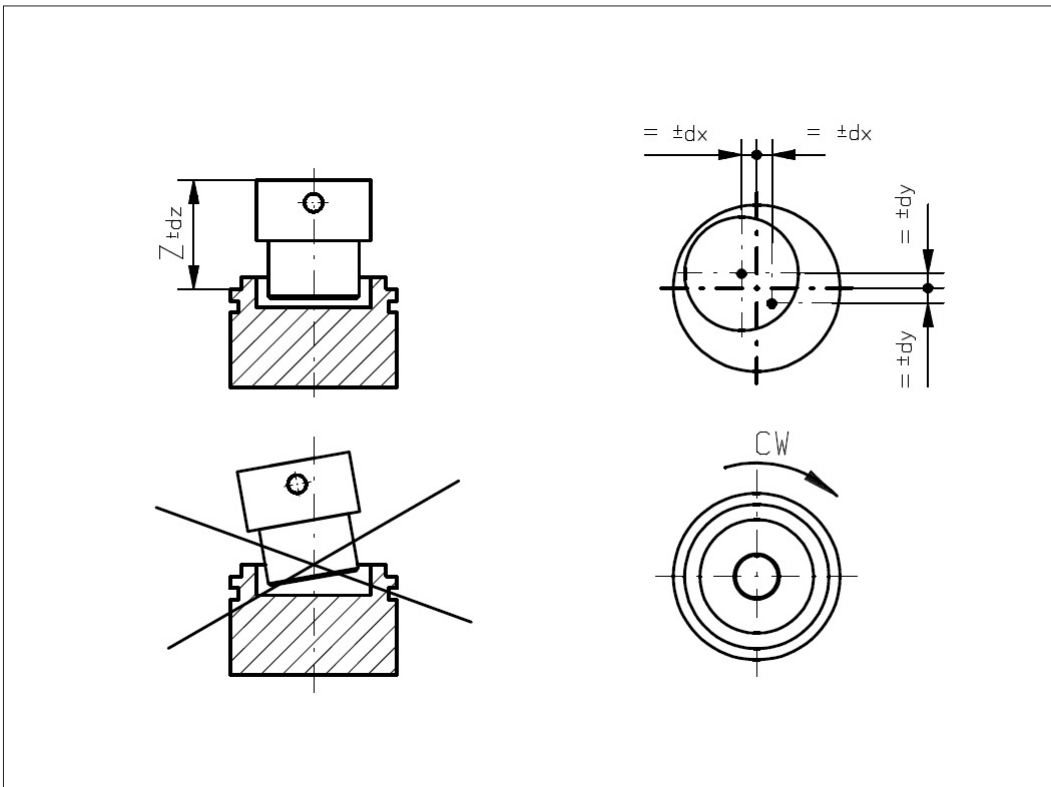
Vert-X 22E2
Mounting information

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)

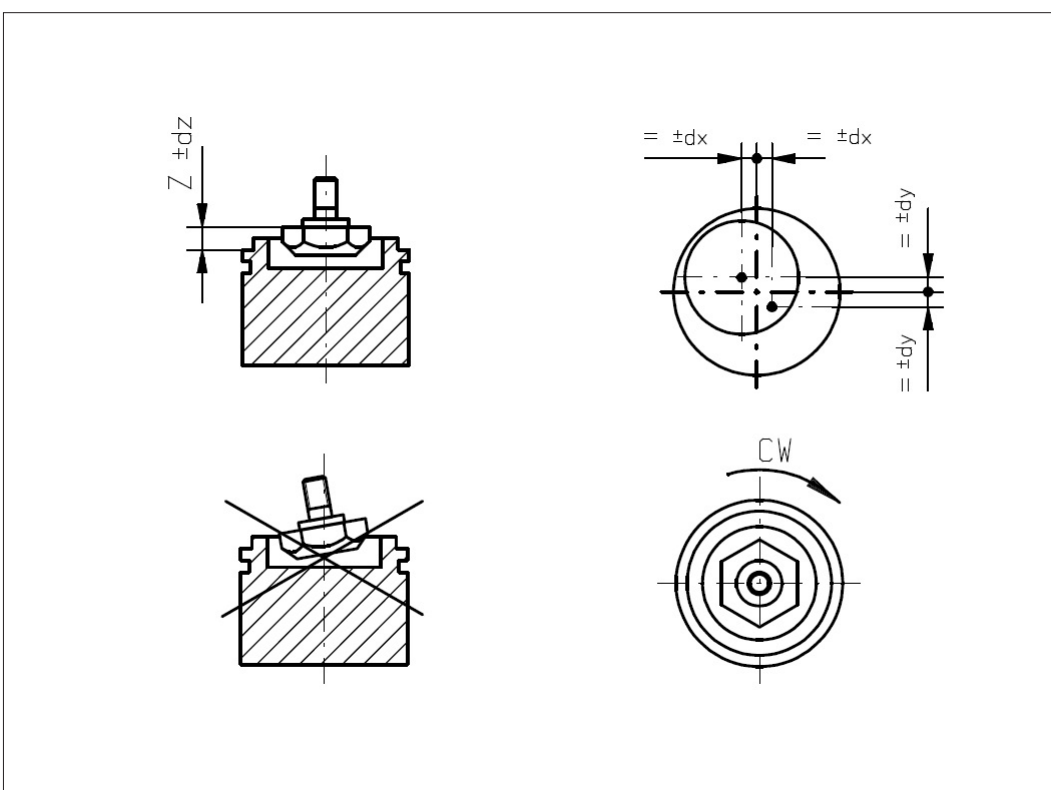
MH-C	3.00mm
MH-C redundant	2.50mm
MH-C2	3.00mm

Max. permitted misalignment of the magnetic actuator

dx	±0.25mm
dy	±0.25mm
dz	±0.5mm

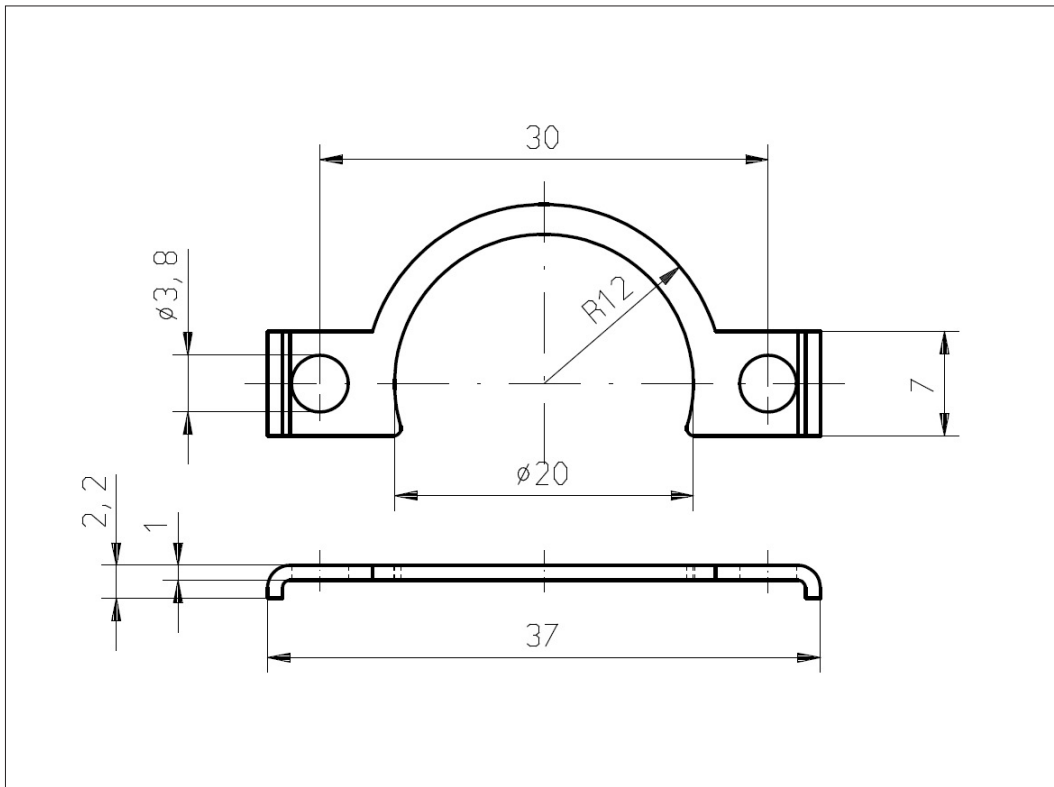
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Vert-X 22E
Accessoires
Fixation clip



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Vert-X 22E - 24V / 4 - 20mA

Applications

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- 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
- 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
Electrical data			
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	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 axial		Wires (3x)	Wires (3x)
Cross section of single wires	mm ²	0.25 (AWG24)	0.25 (AWG24)
Electrical connection radial		Cable 3pole	Cable 3pole
Cross section of single wires	mm ²	0.25 (AWG24)	0.25 (AWG24)
Redundancy feasible		no	no
Electrical connection redundant axial		-	-
Cross section of single wires redundant	mm ²	-	-
Electrical connection redundant radial		-	-
Cross section of single wires redundant	mm ²	-	-
Mechanical data			
Mechanical range	°	360 (continuous)	360 (continuous)
Protection class		IP68	IP68
Min. life	movements	no limitation	no limitation
Operating & storage temperature	°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
Standards			
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 - 24V / 4 - 20mA
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	Electrical connection / radial	
Positive gradient CW with 1 switch output*	Optional A	4 Standard	Round cable 3pole
Positive gradient CCW with 1 switch output*	Optional B	6 Optional	Round cable 6pole
Positive gradient CW with 2 switch outputs*	Optional C	9 Optional	Special cable ; special wires
Positive gradient CCW with 2 switch outputs*	Optional D	Length of wires / ribbon cable	
Sense of rotation settable	Optional E	01 Optional	10cm
Zero point & sense of rotation settable	Optional F	03 Optional	30cm
Middle point & sense of rotation settable	Optional G	05 Standard	50cm
Start + end point & sense of rotation settable	Optional H	99 Optional	Special length
Programmable with Vert-X EasyAdapt	Optional P	Length of cable	
Output signal		02 Standard	1.0m
4mA ... 20mA	Standard 5	06 Optional	3.0m
Power supply voltage		10 Optional	5.0m
24VDC	Standard 1	99 Optional	Special length
Vert-X 2 2 E 2 7 3 6 1 5 1 5 0 5			
		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
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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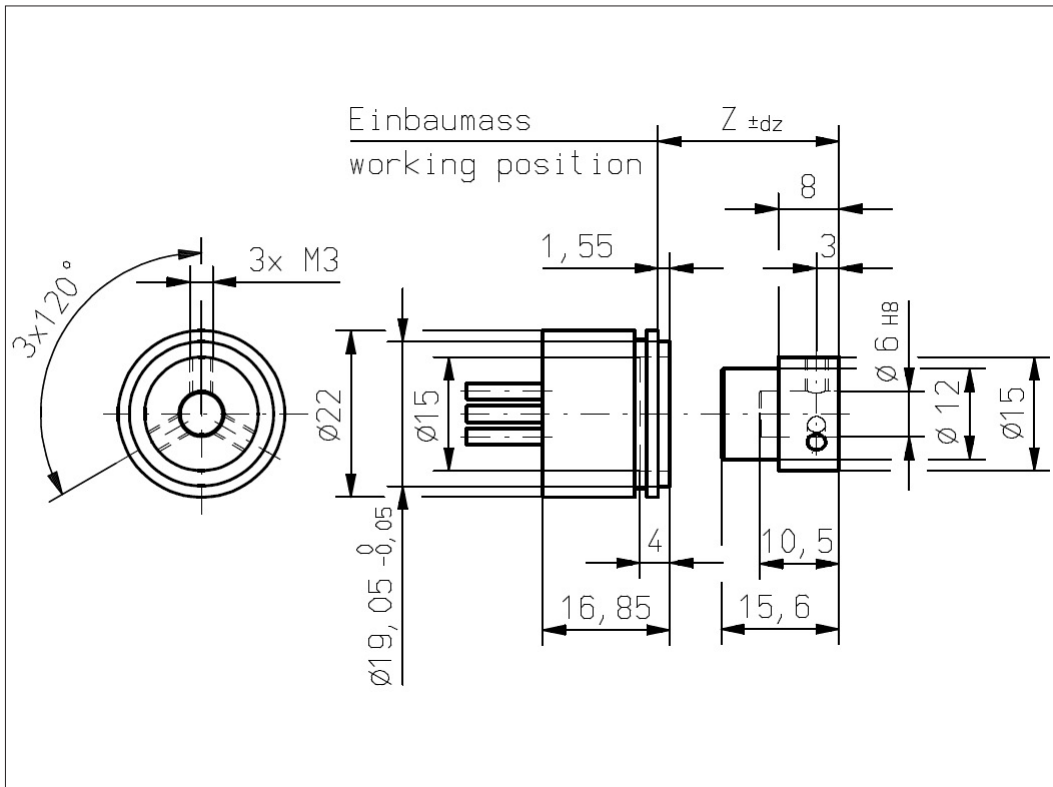
**Vert-X 22E2 xxx xxx 5xx
Vert-X 22E2 xxx xxx 7xx**

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



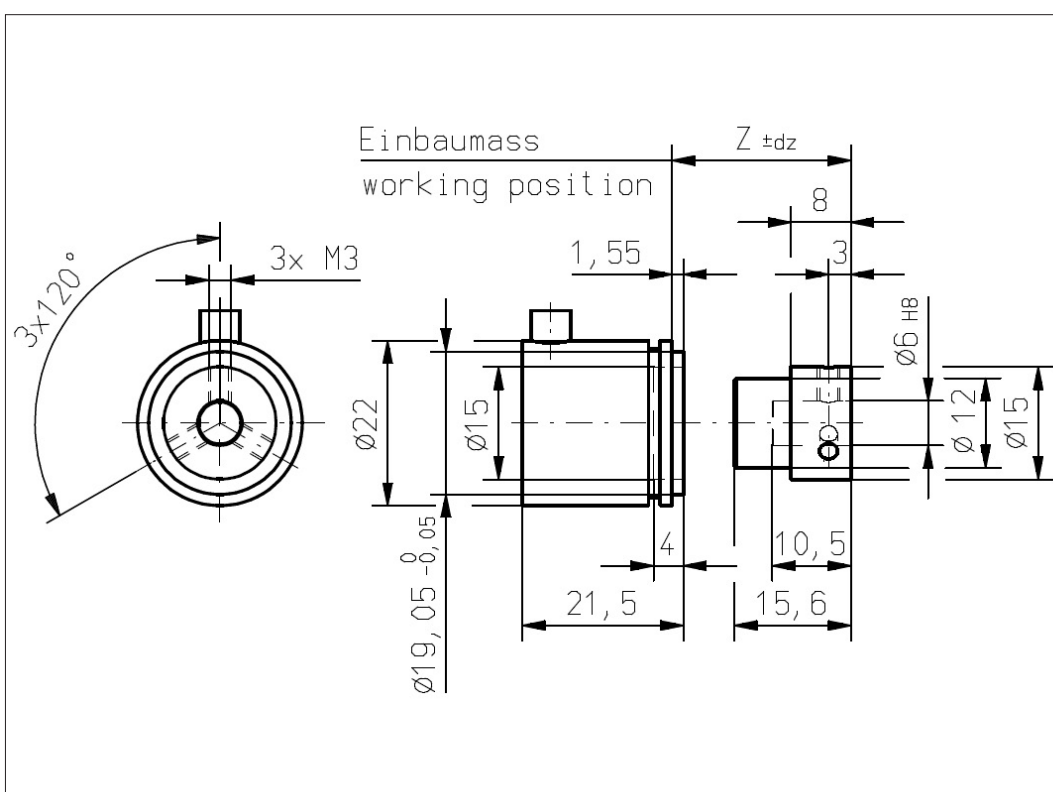
**Vert-X 22E2 xxx xxx 4xx
Vert-X 22E2 xxx xxx 6xx**

Accessoires (incl.)

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

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

see mounting information



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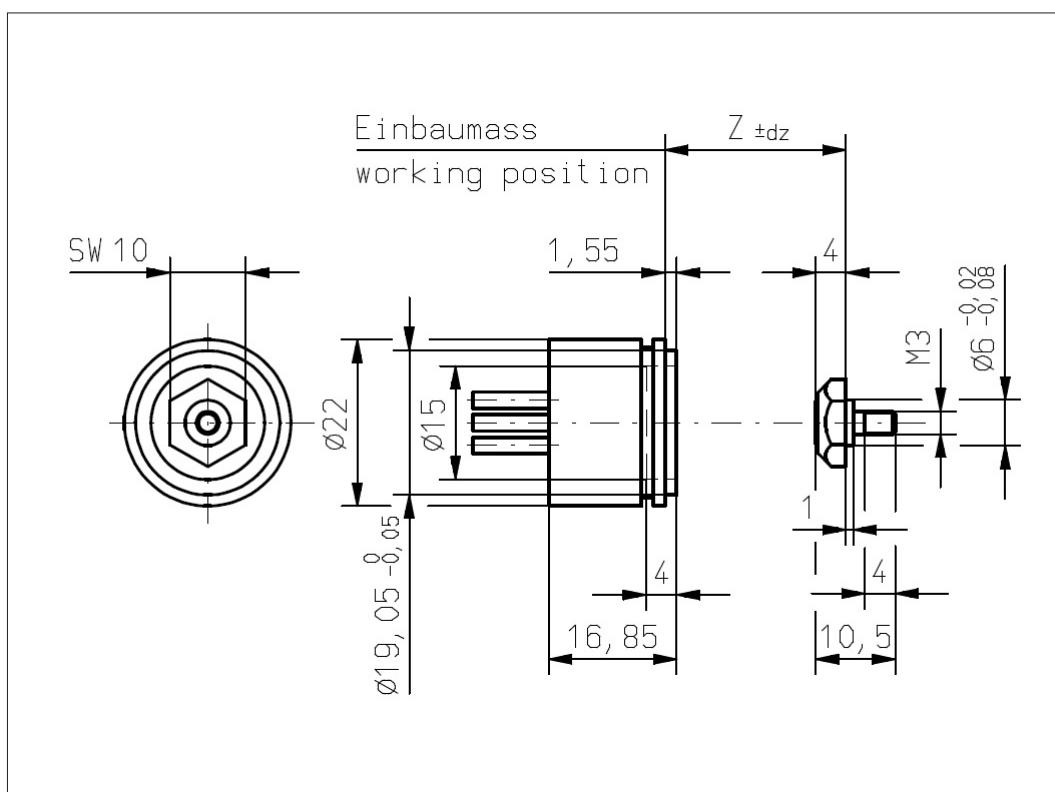
Vert-X 22E1 xxx xxx 5xx
Vert-X 22E2 xxx xxx 7xx

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 22E1 xxx xxx 4xx
Vert-X 22E2 xxx xxx 6xx

Accessoires (incl.)

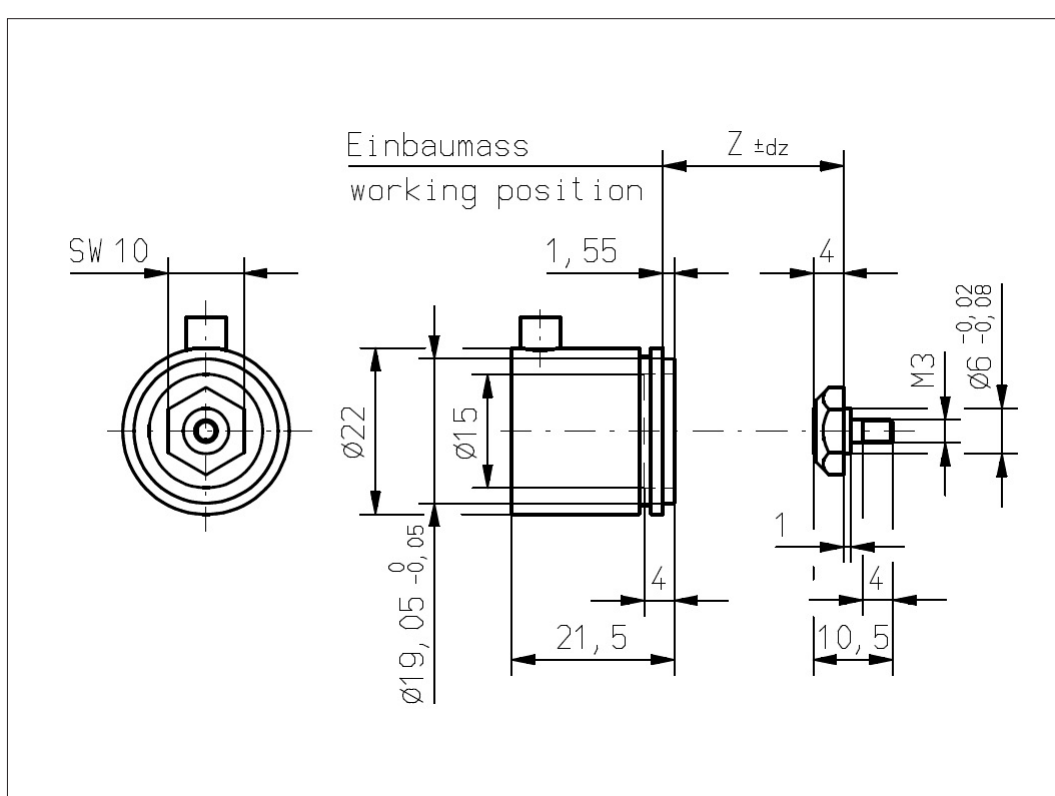
- 1x Fixation clip
- 2x Slotted cylinder head screw M3x8

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

see mounting information

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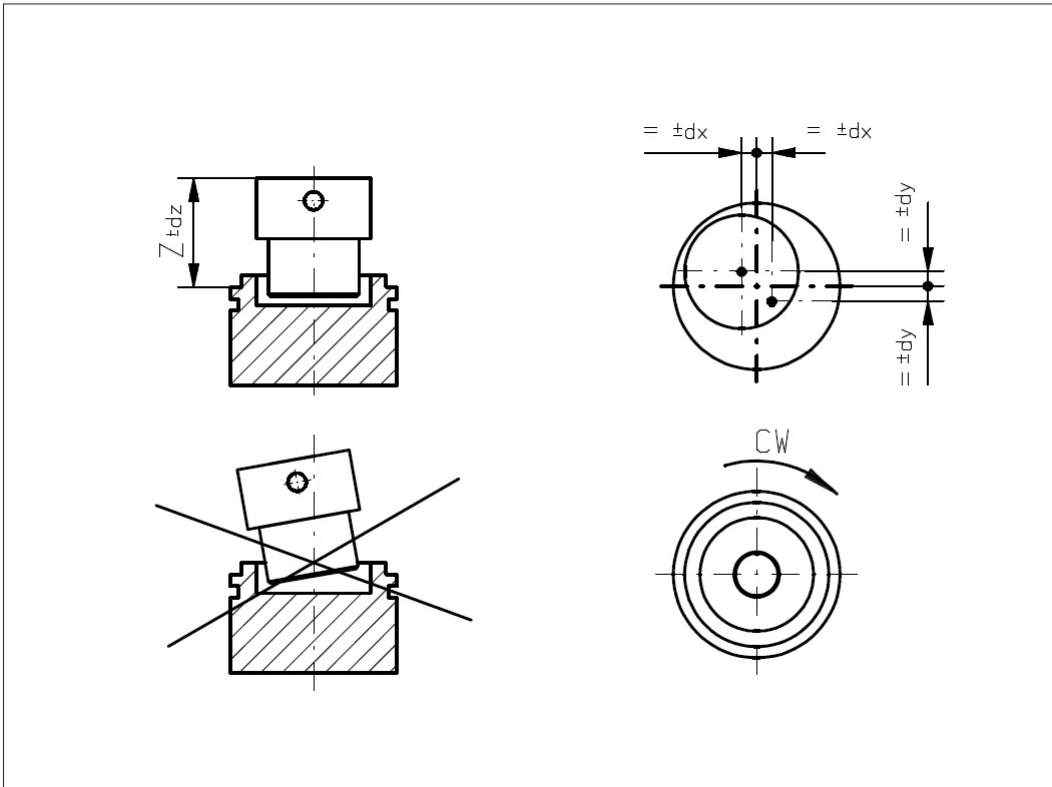
Vert-X 22E2
Mounting information

Working position (Z)

MH-C	14.40mm
MH-C2	14.40mm

**Max. permitted misalign-
ment of the magnetic
actuator**

dx	±0.25mm
dy	±0.25mm
dz	±0.5mm



Vert-X 22E1
Mounting information

Working position (Z)

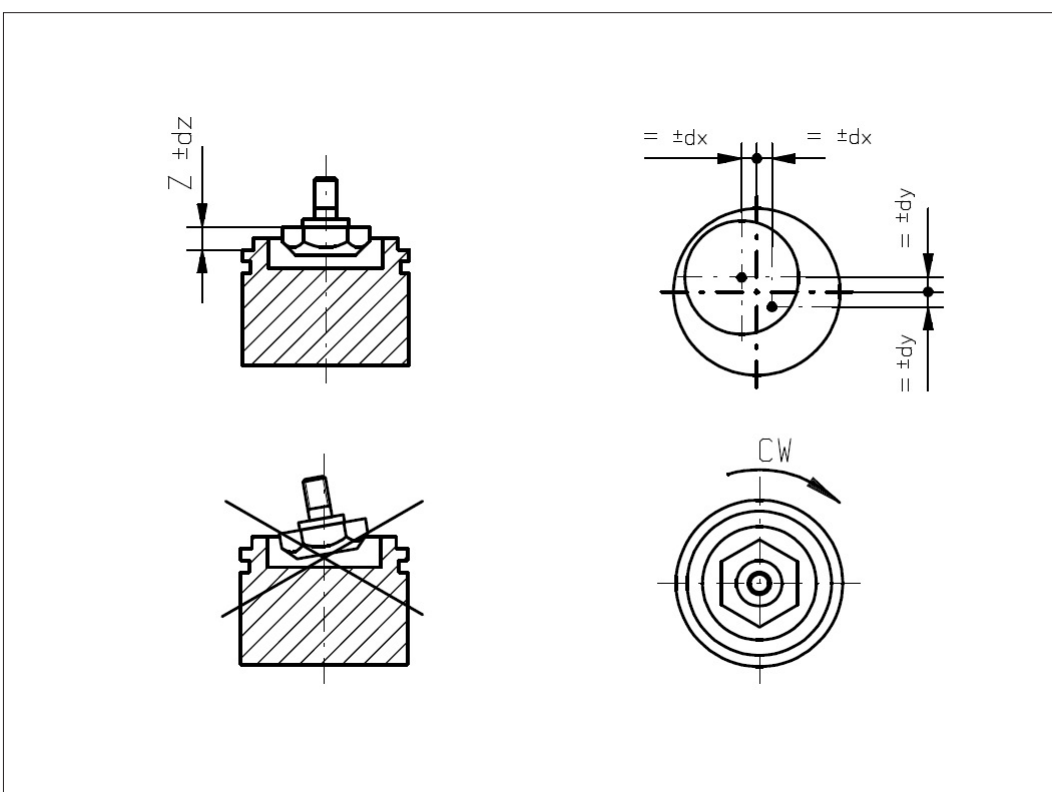
MH-C	3.00mm
MH-C2	3.00mm

**Max. permitted misalign-
ment of the magnetic
actuator**

dx	±0.25mm
dy	±0.25mm
dz	±0.5mm

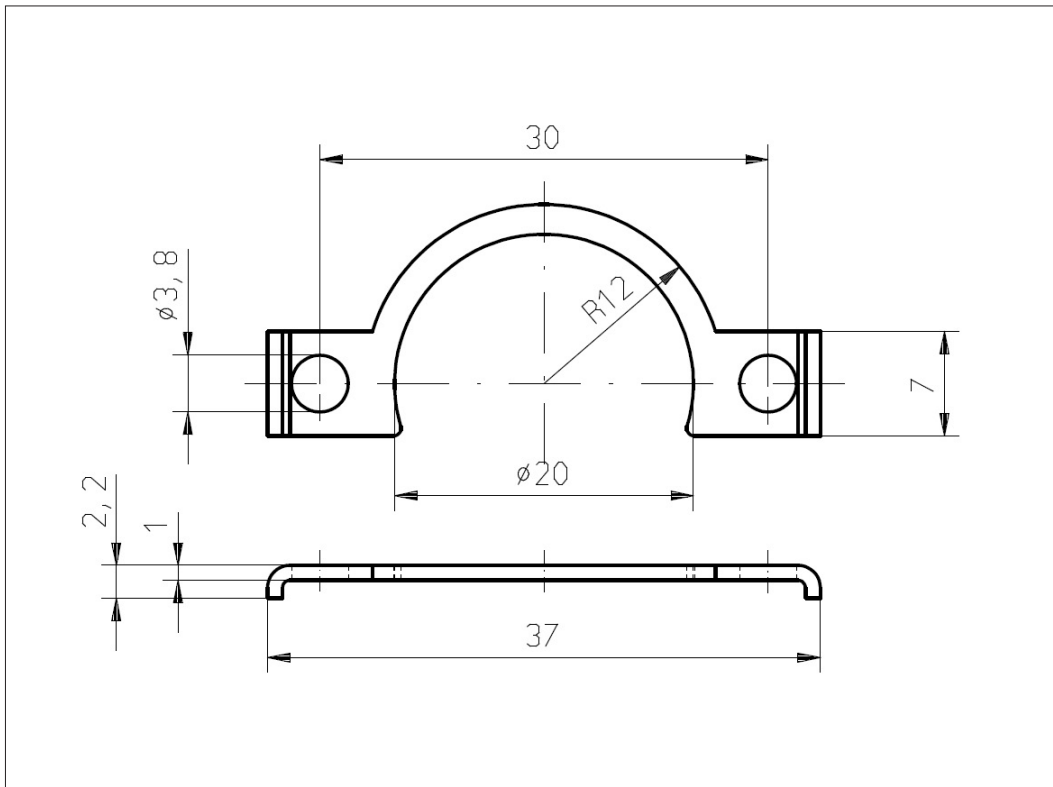
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Vert-X 22E
Accessoires
Fixation clip



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Vert-X 22E - 24V / PWM

Applications

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

Features

- 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

Sensor principle		MH-C	MH-C2
Electrical data			
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	-
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	kHz	0.1 ... 1	-
Reverse polarity protection of power supply		yes	-
Electrical connection axial		Wires (3x)	-
Cross section of single wires	mm ²	0.25 (AWG24)	-
Electrical connection radial		Cable 3pole	-
Cross section of single wires	mm ²	0.25 (AWG24)	-
Redundancy feasible		yes	-
Electrical connection redundant axial		Ribbon cable 6pole	-
Cross section of single wires redundant	mm ²	0.09 (AWG28)	-
Electrical connection redundant radial		Cable 6pole	-
Cross section of single wires redundant	mm ²	0.25 (AWG24)	-
Mechanical data			
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	-
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, Immission 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, Immission HF conducted (0.15...80MHz)	Vemk	10	-
EN 61000-4-8, Immission 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	-

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Vert-X 22E - 24V / PWM
Ordering code

		Output characteristics				Electrical connection / axial	
	Positive gradient CW	Standard	1	5	Standard	Wires 3pole	
	Positive gradient CCW	Optional	2	7	Optional	Ribbon cable 6pole	
	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				Electrical connection / radial	
	PWM	Standard	4	4	Standard	Round cable 3pole	
		Power supply voltage				Length of wires / ribbon cable	
	24VDC	Standard	1	6	Optional	Round cable 6pole	
						Length of cable	
Vert-X	2	2	E	2	7	3	6
					1	4	1
					5	0	5
		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					
		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	-
Custom modification of the housing	X	-
Custom cable / wires	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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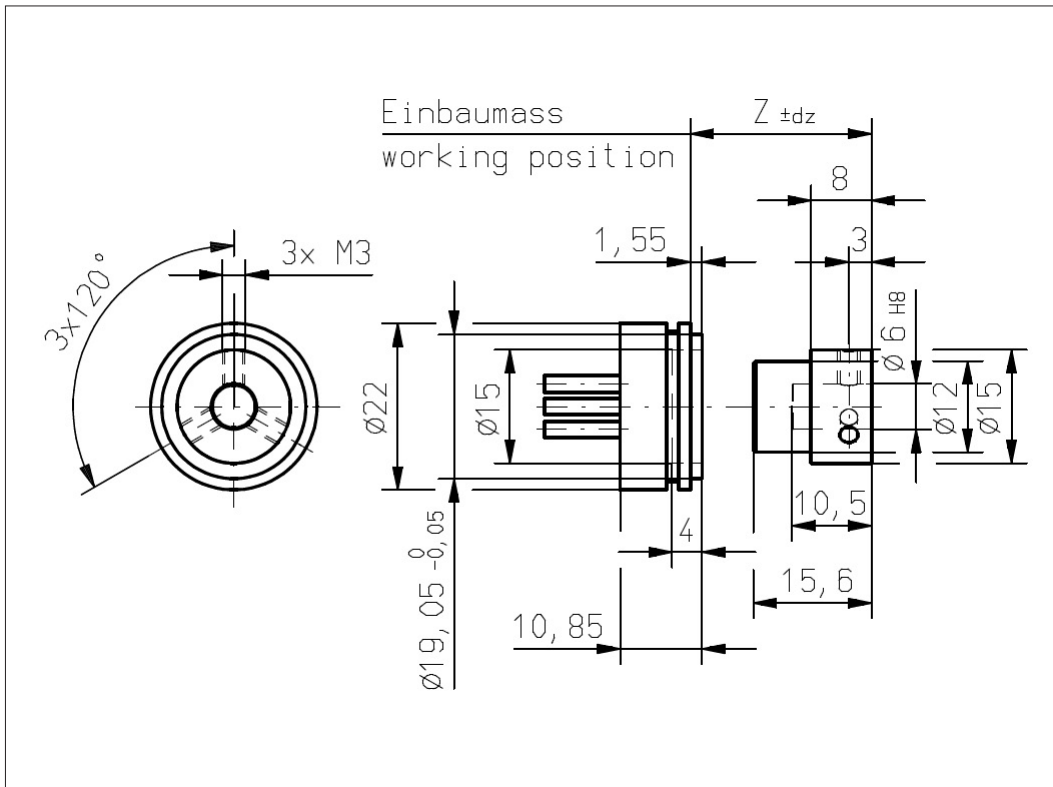
Vert-X 22E2 xxx xxx 5xx
Vert-X 22E2 xxx xxx 7xx

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



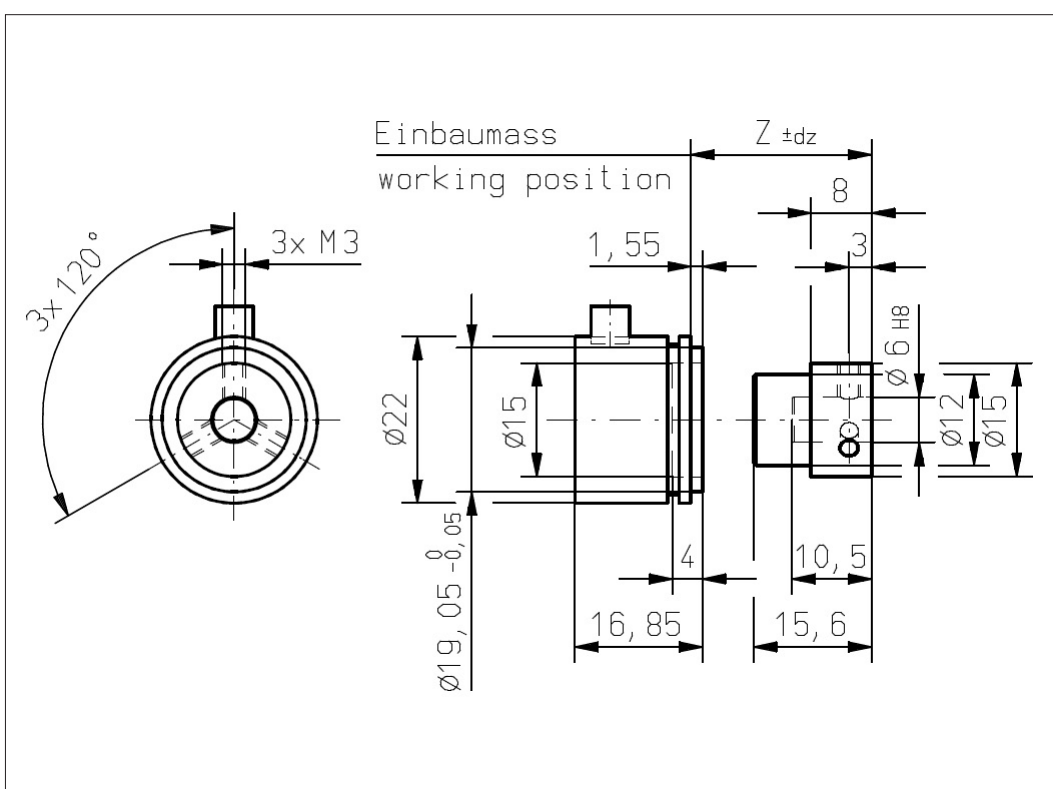
Vert-X 22E2 xxx xxx 4xx
Vert-X 22E2 xxx xxx 6xx

Accessoires (incl.)

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

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

see mounting information



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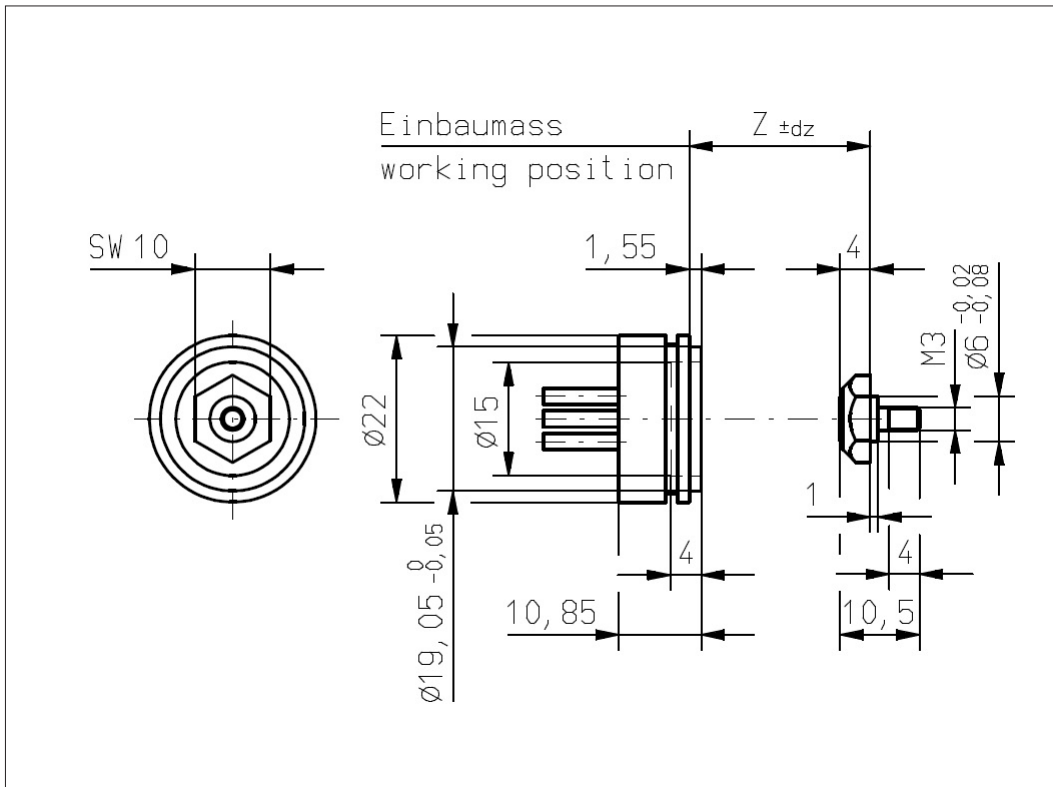
Vert-X 22E1 xxx xxx 5xx
Vert-X 22E1 xxx xxx 7xx

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



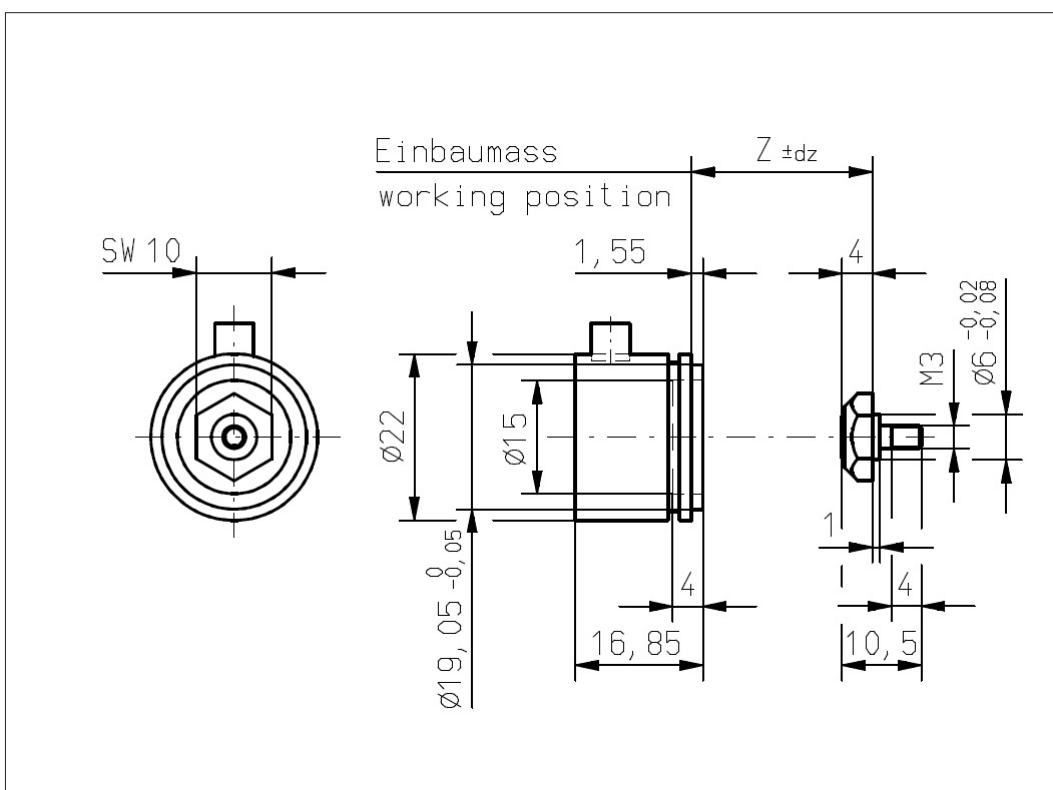
Vert-X 22E1 xxx xxx 4xx
Vert-X 22E1 xxx xxx 6xx

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



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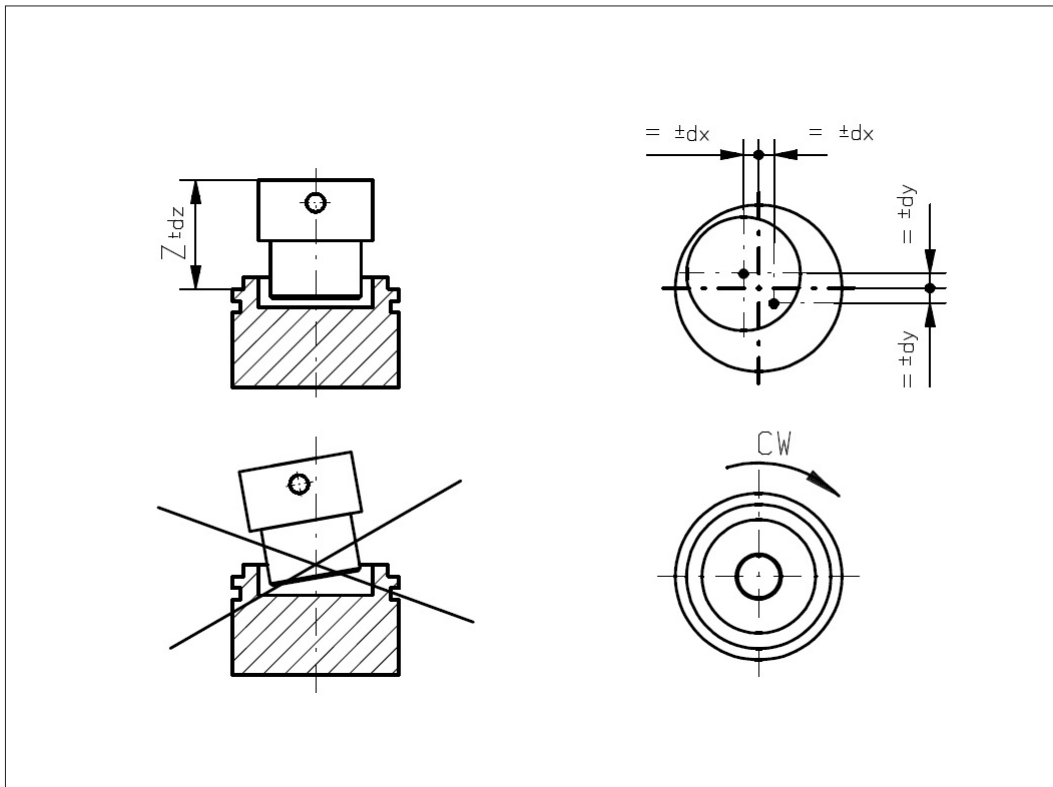
Vert-X 22E2
Mounting information

Working position (Z)

MH-C	14.40mm
MH-C redundant	13.90mm

Max. permitted misalignment of the magnetic actuator

dx	±0.25mm
dy	±0.25mm
dz	±0.5mm



Vert-X 22E1
Mounting information

Working position (Z)

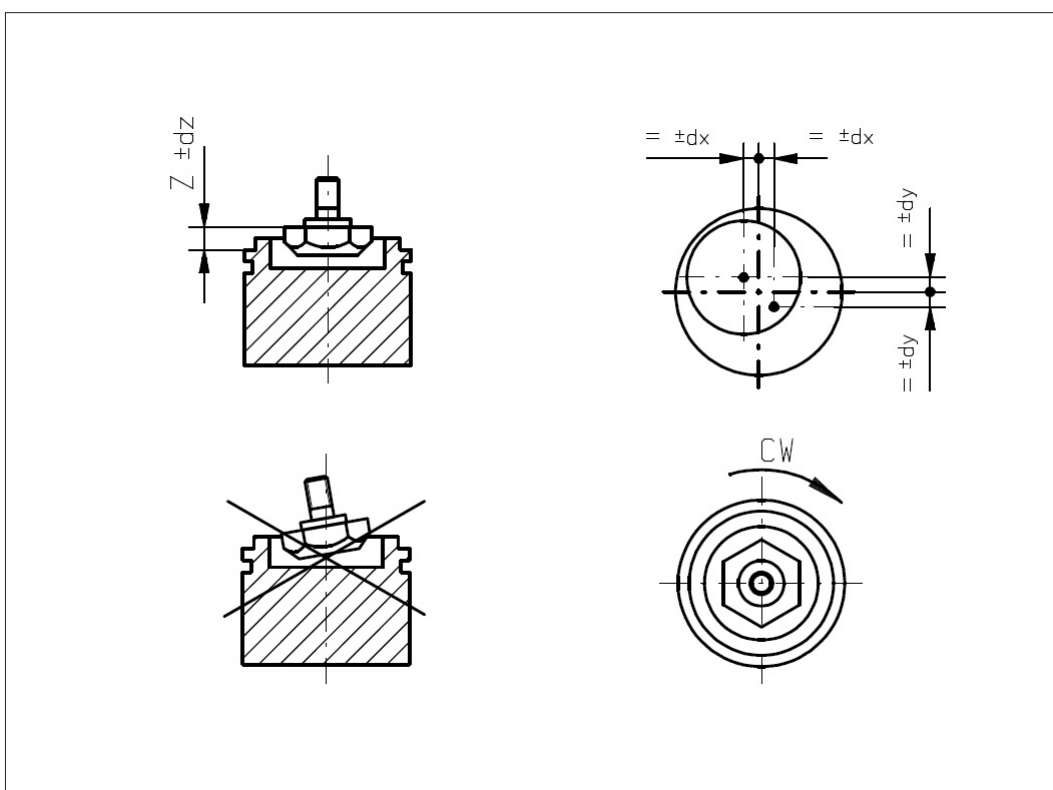
MH-C	3.00mm
MH-C redundant	2.50mm

Max. permitted misalignment of the magnetic actuator

dx	±0.25mm
dy	±0.25mm
dz	±0.5mm

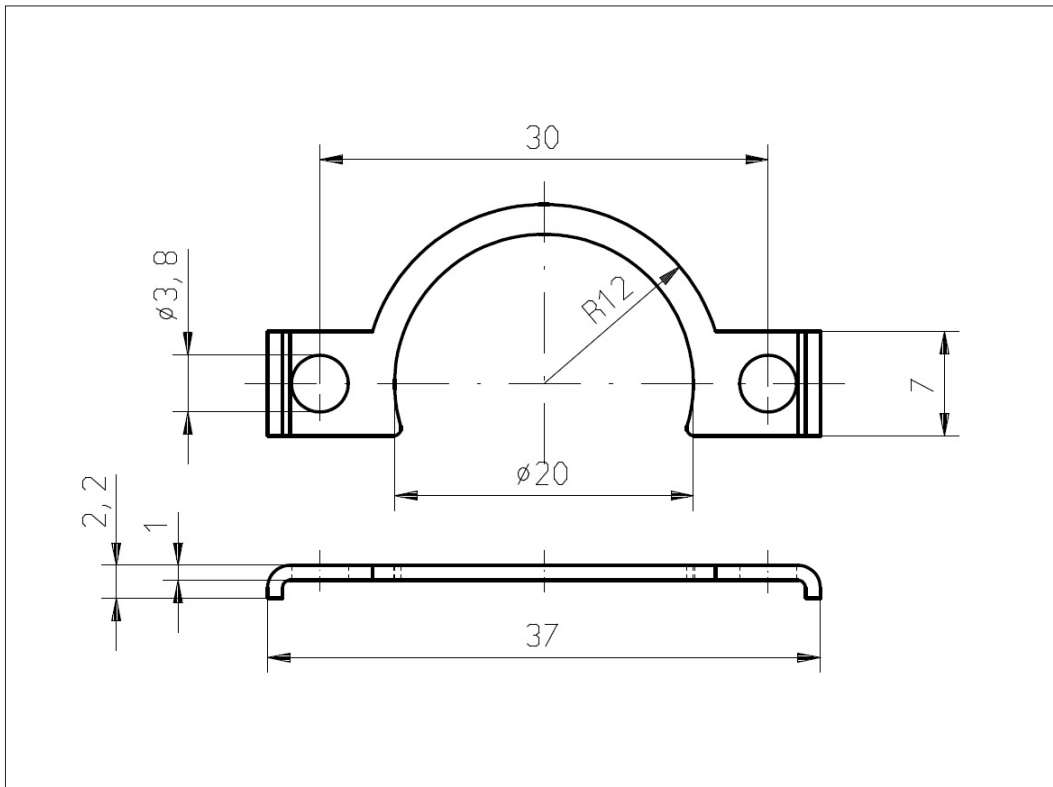
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Vert-X 22E
Accessoires
Fixation clip



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Vert-X 22E - 24V / SPI

Applications

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

Features

- 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

Sensor principle		MH-C	MH-C2
Electrical data			
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	14	-
Max. repeatability	°	0.1	-
Sample rate fast mode	kHz	2.2	-
Sample rate slow mode	kHz	(0.55)	-
System propagation delay fast mode	µs	400	-
System propagation delay slow mode	µs	(600)	-
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	19	-
Current consumption without load (typ.) slow mode	mA	(14)	-
Min. ohmic load at output	kOhm	-	-
Max. capacitive load at output	nF	-	-
Reverse polarity protection of power supply		yes	-
Electrical connection axial		Ribbon cable 6pole	-
Cross section of single wires	mm ²	0.09 (AWG28)	-
Electrical connection radial		Cable 6pole	-
Cross section of single wires	mm ²	0.25 (AWG24)	-
Redundancy feasible		yes	-
Electrical connection redundant axial		Ribbon cable 10pole	-
Cross section of single wires redundant	mm ²	0.09 (AWG28)	-
Electrical connection redundant radial		Cable 10pole	-
Cross section of single wires redundant	mm ²	0.09 (AWG28)	-
Mechanical data			
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	-
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	-

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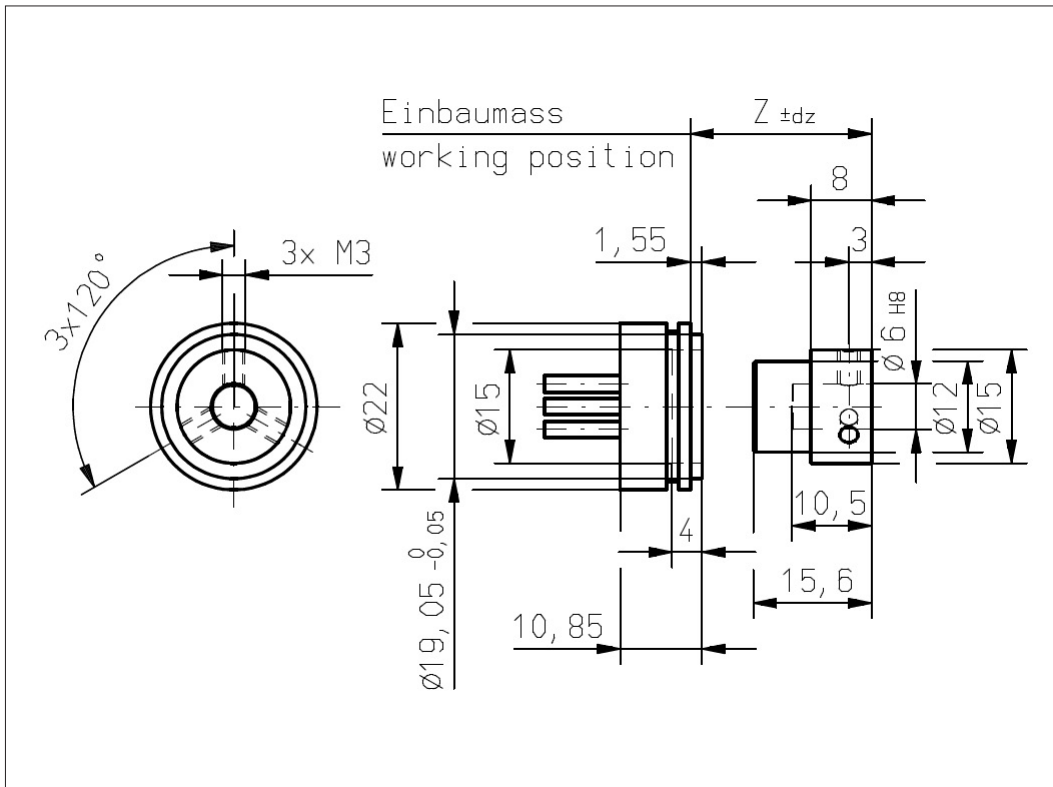
Vert-X 22E2 xxx xxx 2xx
Vert-X 22E2 xxx xxx 7xx

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



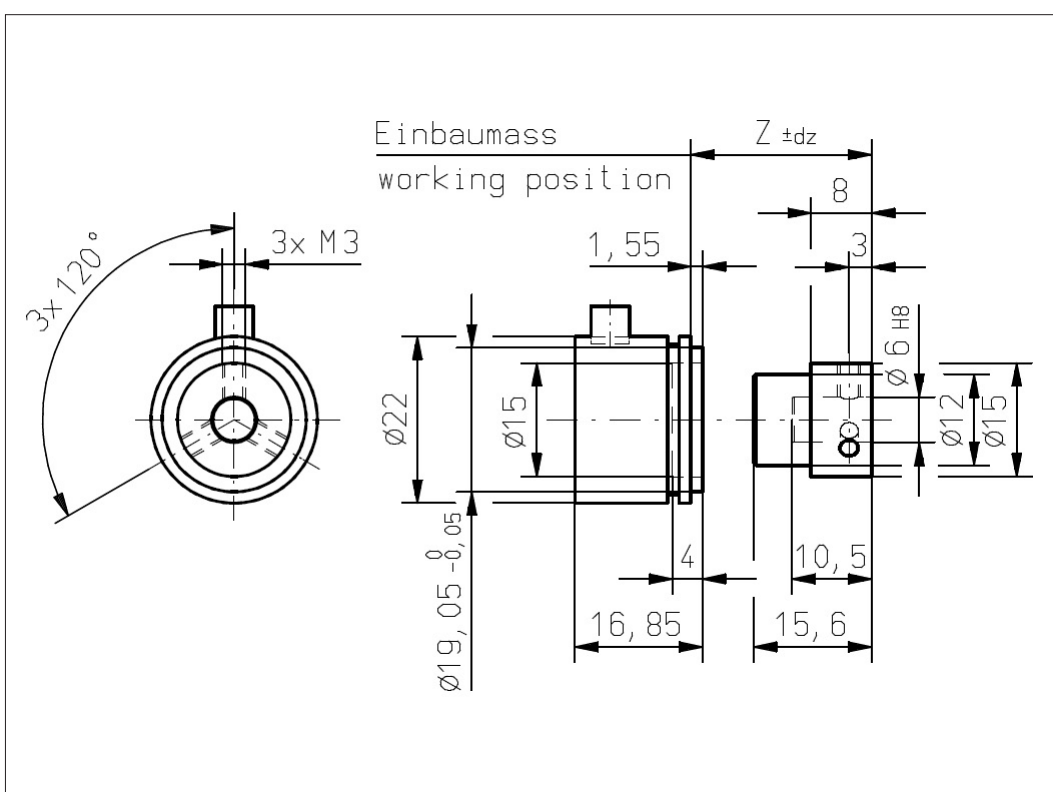
Vert-X 22E2 xxx xxx 1xx
Vert-X 22E2 xxx xxx 6xx

Accessoires (incl.)

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

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

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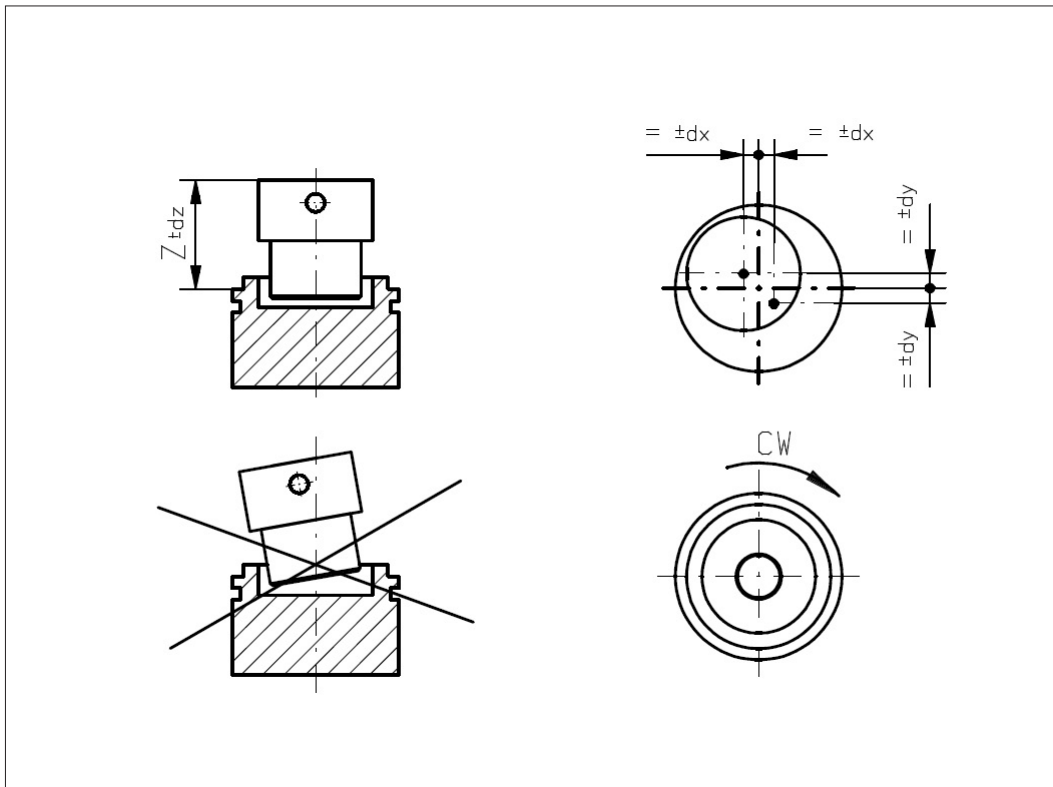
Vert-X 22E2
Mounting information

Working position (Z)

MH-C	14.40mm
MH-C redundant	13.90mm

Max. permitted misalignment of the magnetic actuator

dx	±0.25mm
dy	±0.25mm
dz	±0.5mm



Vert-X 22E1
Mounting information

Working position (Z)

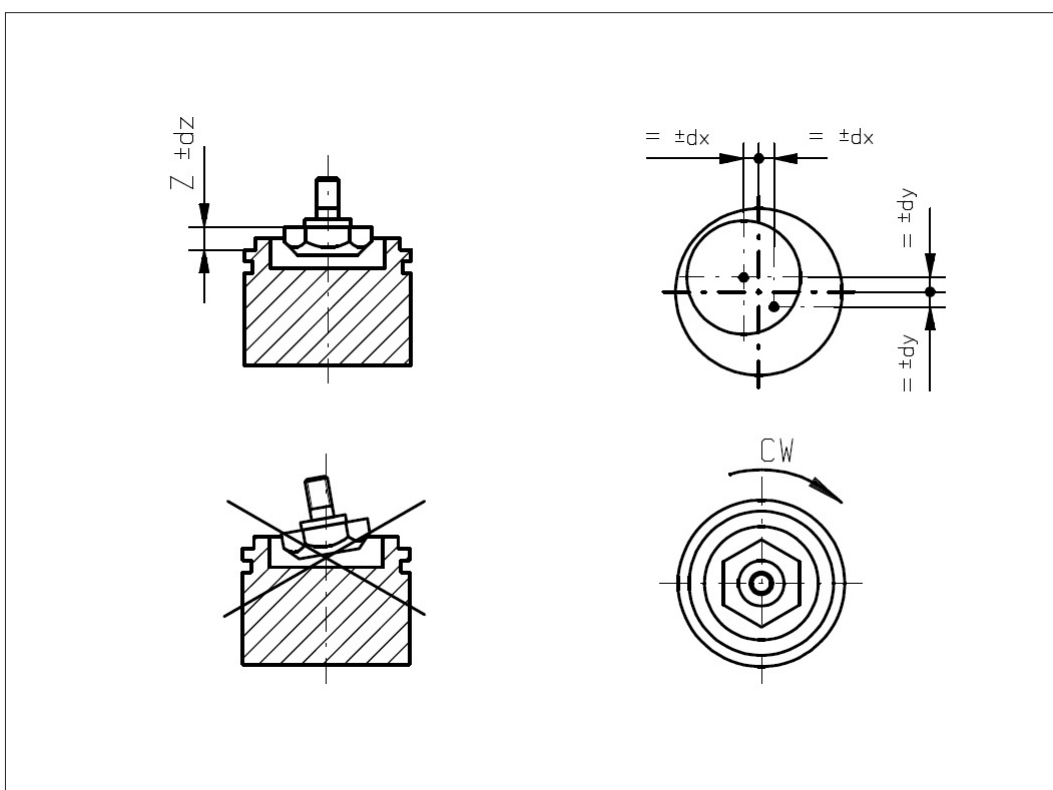
MH-C	3.00mm
MH-C redundant	2.50mm

Max. permitted misalignment of the magnetic actuator

dx	±0.25mm
dy	±0.25mm
dz	±0.5mm

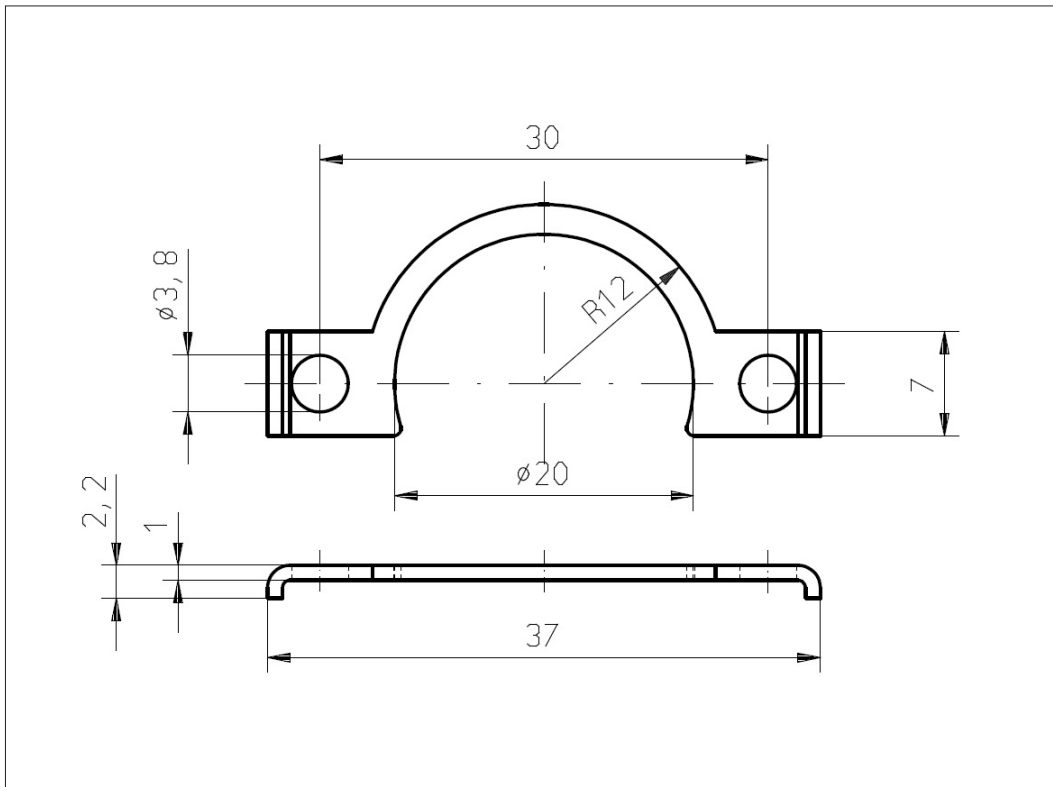
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Vert-X 22E
Accessoires
Fixation clip



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