

## Vert-X 31E 5V / 10...90% Ub

### Applications

- Concrete pump
- Access control system
- Fork lift

### Features general

- High protection class IP68
- Compact dimensions
- Non-contacting measuring method
- Very 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

- 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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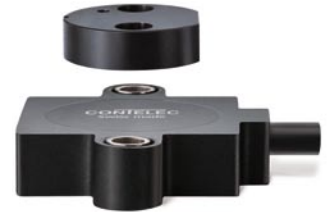
Sensor principle		MH-C	MH-C2
<b>Electrical data</b>			
Measuring range	°	0 ... 360	0 ... 360
Indep. linearity (without misalignment)	% of meas. range	±0.3	±0.3
Indep. linearity (with allowed misalignment @ 360°)	% of meas. range	±0.5	±0.5
Max. hysteresis	°	0.1	0.1
Resolution	bit	12	14
Max. repeatability	°	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		Cable 3pole	Cable 3pole
Cross section of single wires	mm <sup>2</sup>	0.56 (AWG20)	0.56 (AWG20)
Redundancy feasible		yes	no
Electrical connection redundant		Cable 6pole	-
Cross section of single wires redundant	mm <sup>2</sup>	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, 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	300	300
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 31E 5V / 10...90% Ub 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							

Output signal	
10% ... 90% Ub	Standard 2
x% ... y% Ub (within 5 ... 95%)	Optional 3

Power supply voltage	
5VDC	Standard 2

Electrical connection	
4	Standard Cable 3pole
6	Optional Cable 6pole
9	Optional Special cable ; Special wires

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

Vert-X **3 1 E 6 a 7 3 6 2 2 1 4 0 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

Mounting hole	
a	Standard Through-hole ø 4.4mm
b	Optional Through-hole ø 4.4mm with counterbore ø 7.4mm

Mechanical version		
31E5	Standard	Magnetic actuator type 5
31E6	Standard	Magnetic actuator type 6
31E7	Optional	Magnetic acutator type 7
31E9	Optional	Special magnetic actuator

	MH-C	MH-C2
Custom magnetic actuator	X	X
Custom cable	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
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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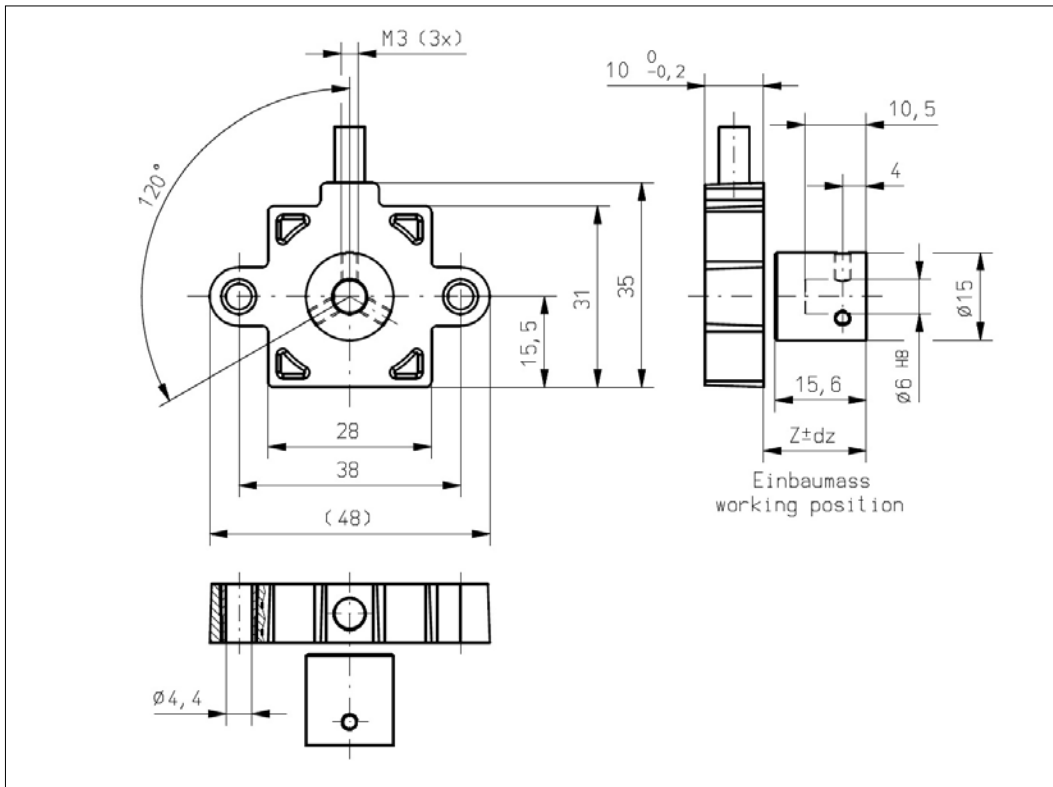
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**Vert-X 31E5axxx xxx 4xx**  
**Vert-X 31E5axxx xxx 6xx**

**Accessoires (incl.)**  
 • None

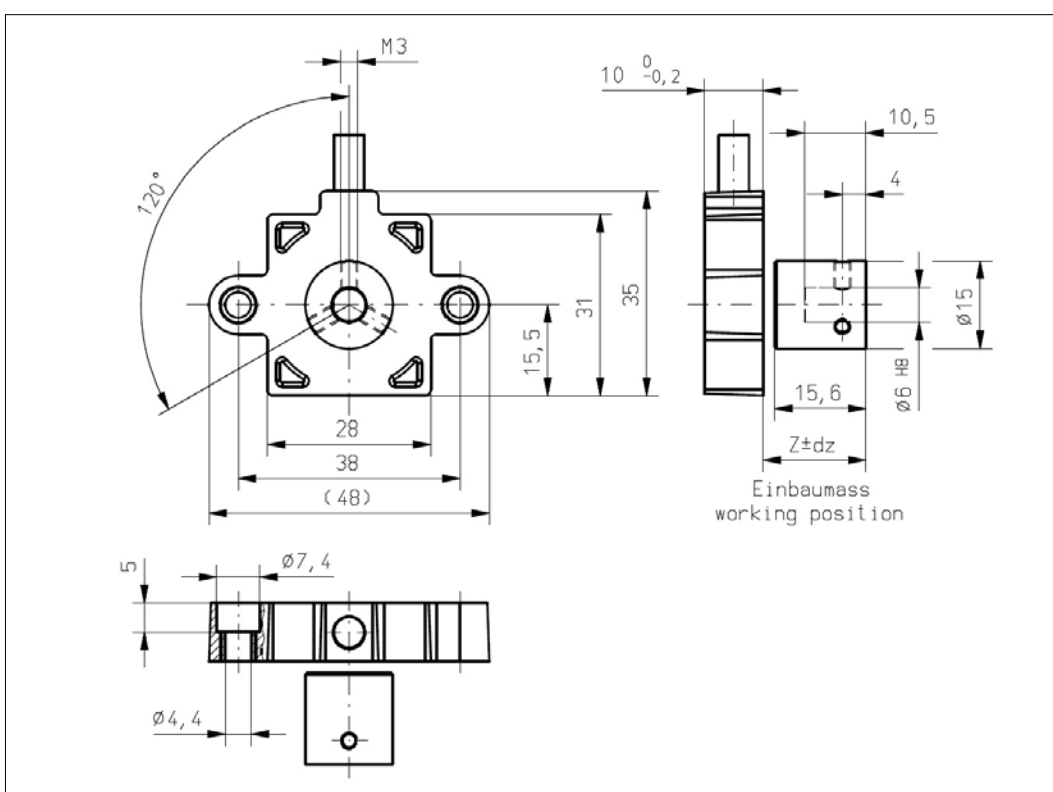
**Working position (Z) and max. permitted misalignment of the magnetic actuator**  
 see mounting information



**Vert-X 31E5bxxx xxx 4xx**  
**Vert-X 31E5bxxx xxx 6xx**

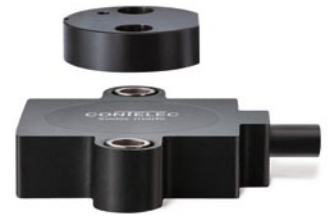
**Accessoires (incl.)**  
 • None

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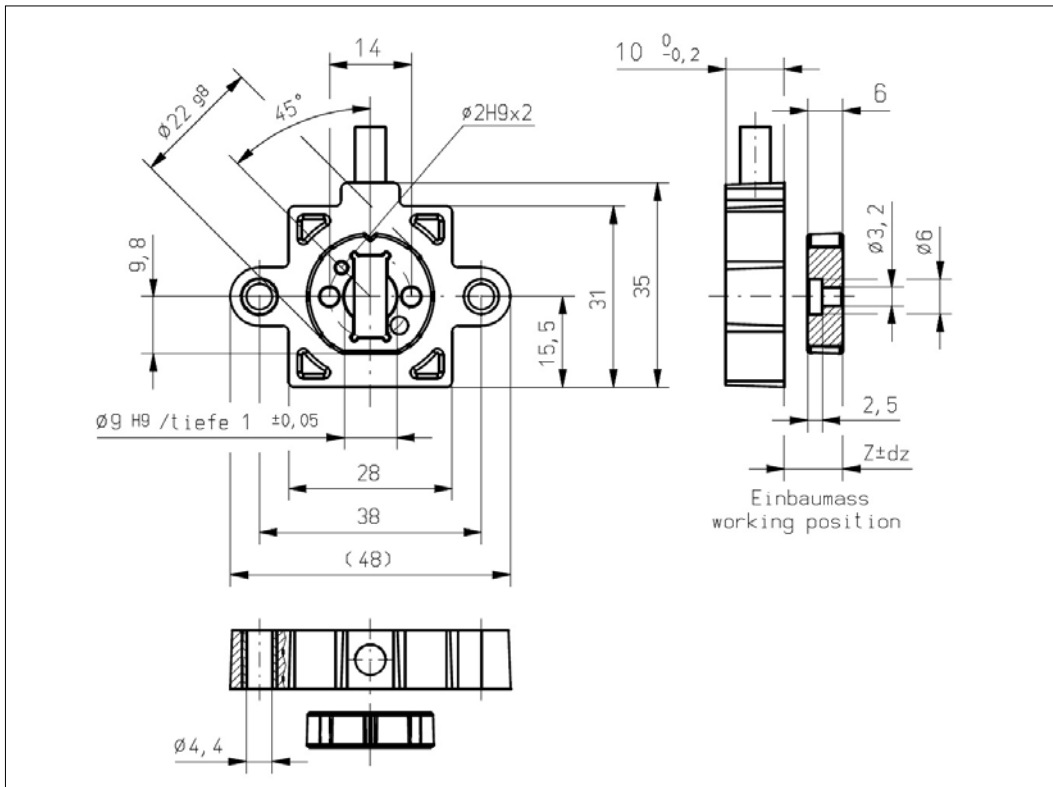
**Vert-X 31E6axxx xxx 4xx**  
**Vert-X 31E6axxx xxx 6xx**

**Accessoires (incl.)**

- None

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

see mounting information



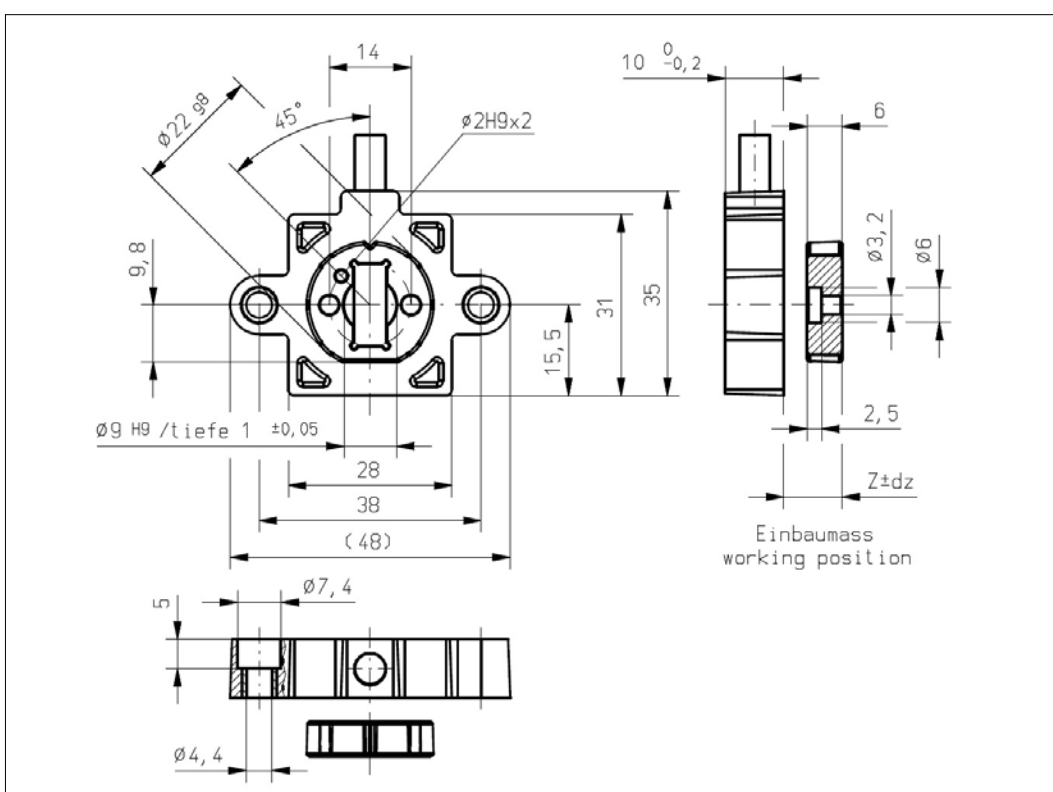
**Vert-X 31E6bxxx xxx 4xx**  
**Vert-X 31E6bxxx xxx 6xx**

**Accessoires (incl.)**

- None

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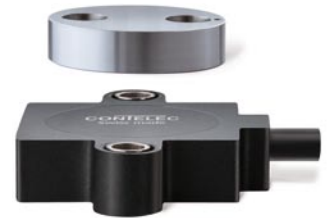
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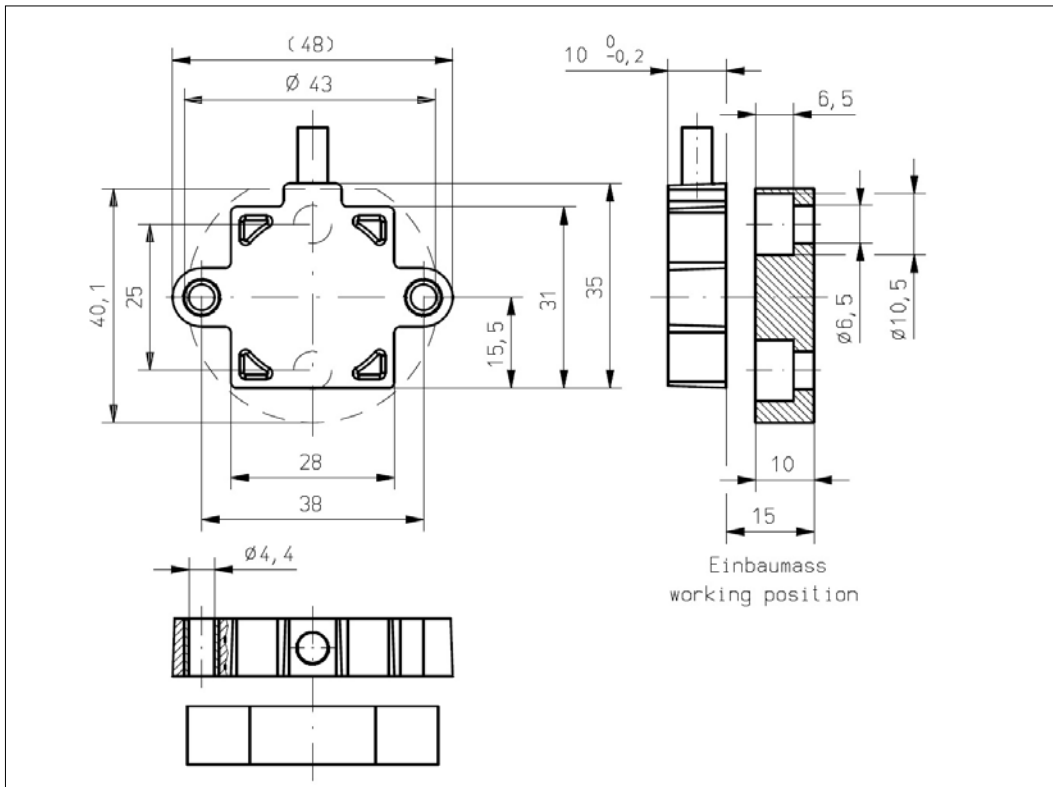
**Vert-X 31E7axxx xxx 4xx**  
**Vert-X 31E7axxx xxx 6xx**

**Accessoires (incl.)**

- None

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

see mounting information



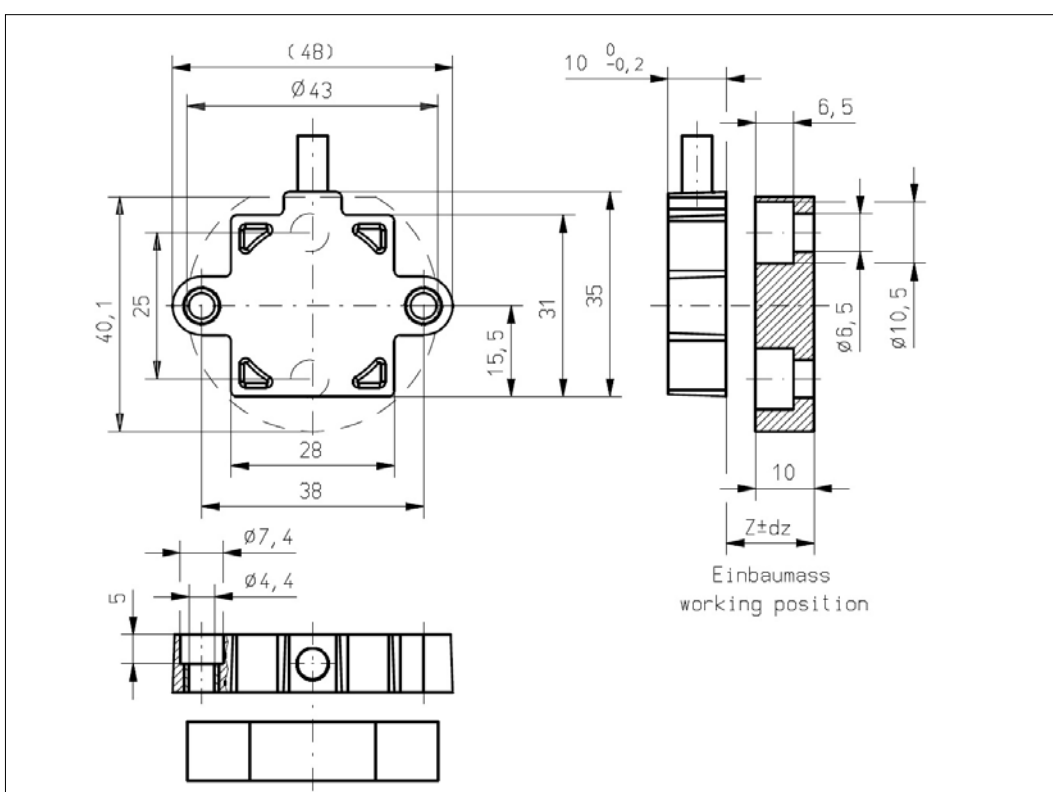
**Vert-X 31E7bxxx xxx 4xx**  
**Vert-X 31E7bxxx xxx 6xx**

**Accessoires (incl.)**

- None

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

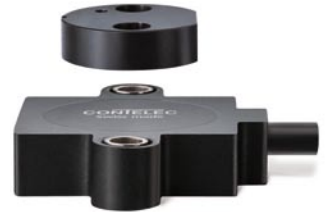
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### Vert-X 31E5

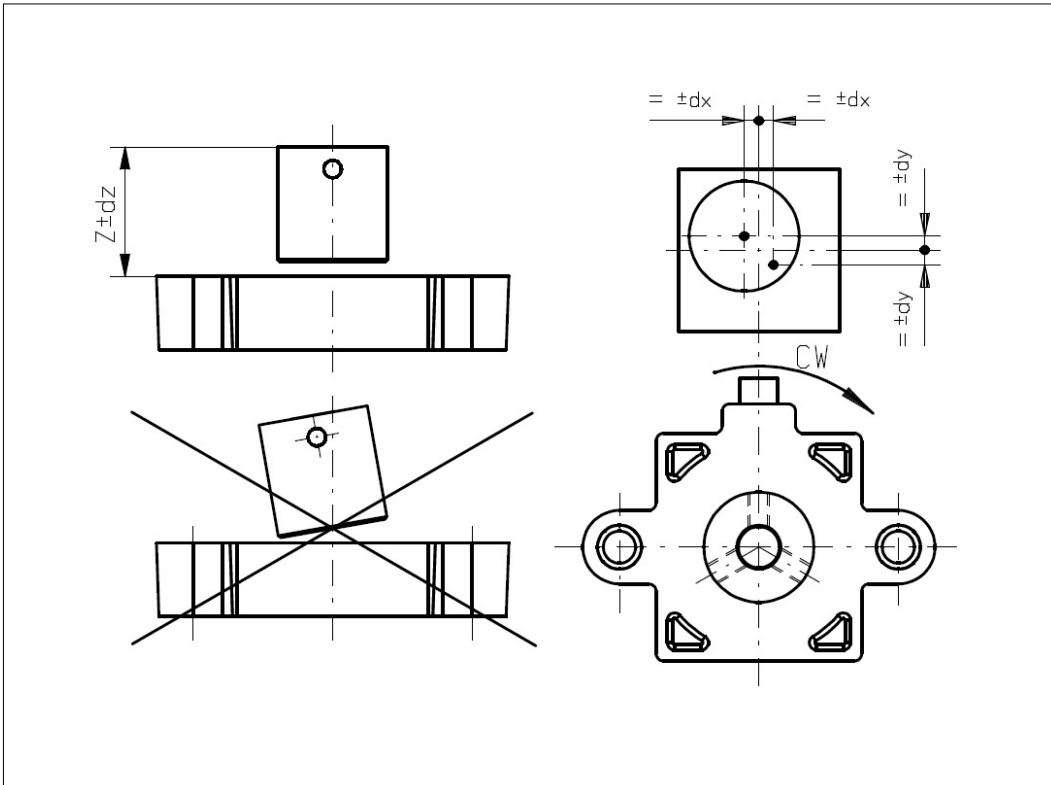
#### Mounting information

#### Working position (Z)

MH-C	17.50mm
MH-C redundant	17.00mm
MH-C2	17.50mm

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

dx	±0.50mm
dy	±0.50mm
dz	±1.00mm



### Vert-X 31E6

#### Mounting information

#### Working position (Z)

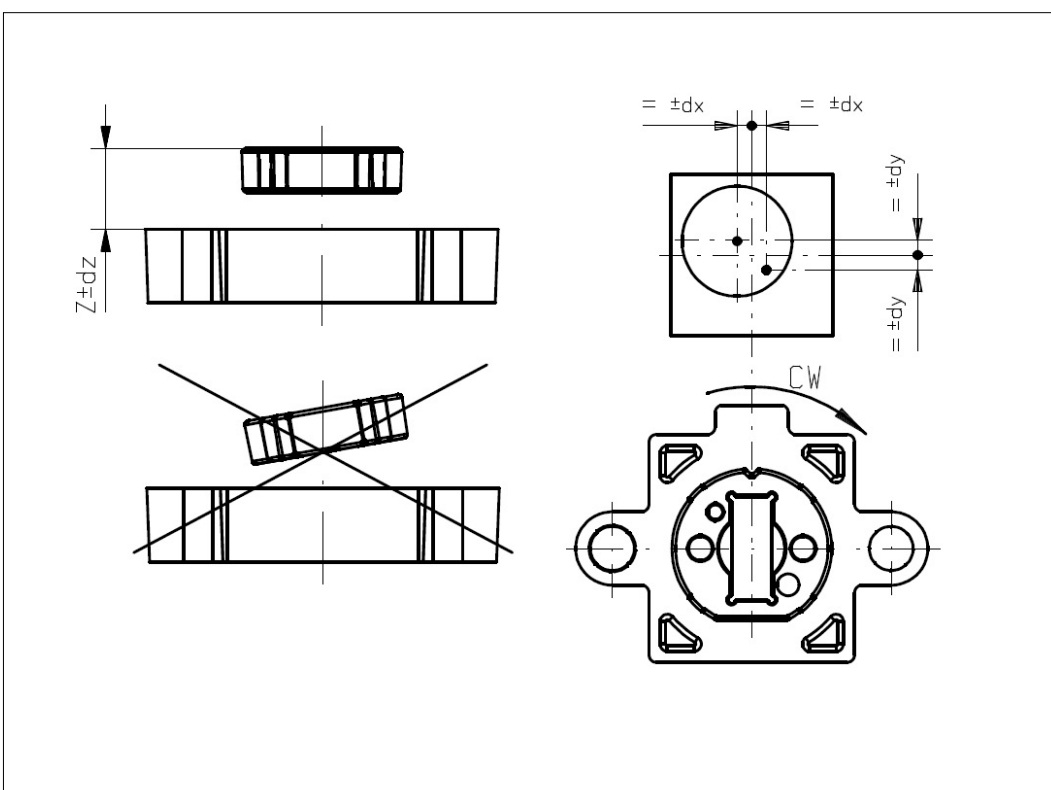
MH-C	7.50mm
MH-C redundant	7.00mm
MH-C2	7.50mm

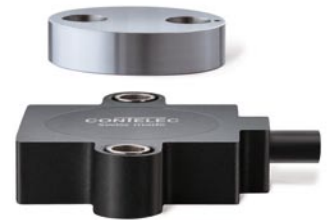
#### Max. permitted misalignment of the magnetic actuator

dx	±0.50mm
dy	±0.50mm
dz	±0.75mm

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## Vert-X 31E7

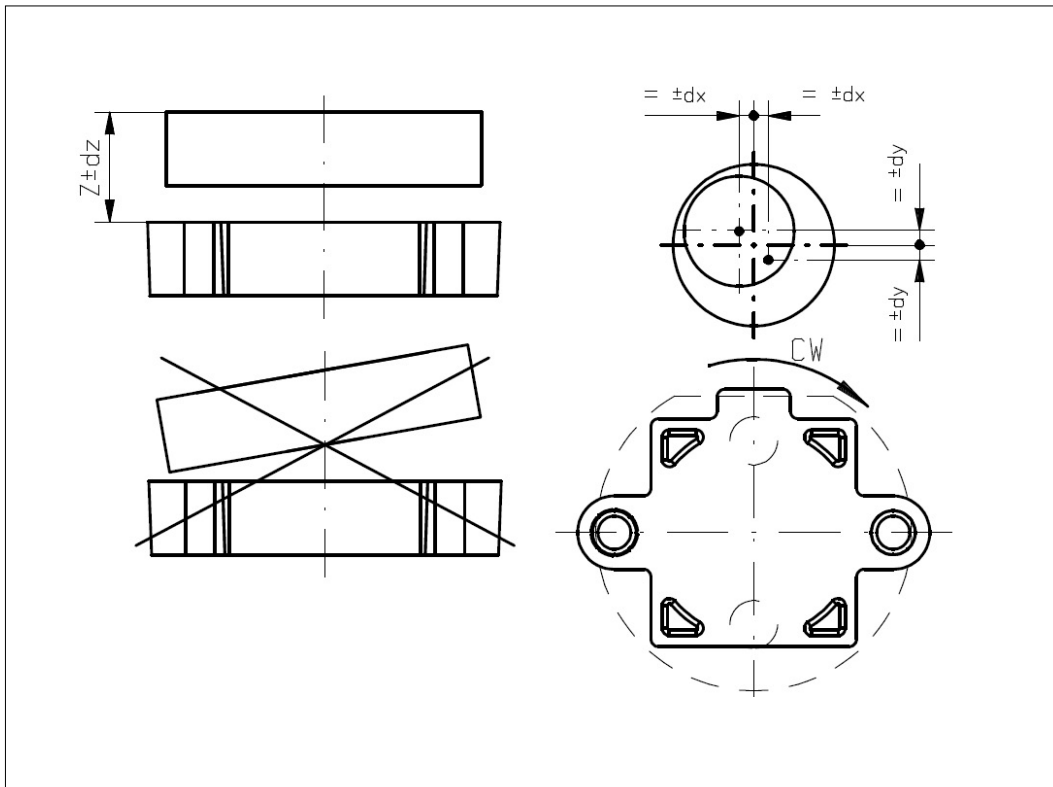
### Mounting information

#### Working position (Z)

MH-C	15.80mm
MH-C redundant	15.30mm
MH-C2	15.80mm

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

dx	±1.00mm
dy	±1.00mm
dz	±2.00mm



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