

## Vert-X 31E - 24V / 4 - 20mA

### 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
- Detection of magnetic loss (with safety flag)

### Features MH-C

- Resolution of 12bit
- Lower price than MH-C2

### Features MH-C2

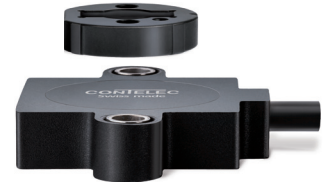
- Resolution of 14bit
- Index point(s), sense of rotation and angle settable resp. programmable by customer (optional)

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Sensor principle		MH-C	MH-C2
<b>Electrical data</b>			
Measuring range	°	0 ... 360	0 ... 360
Indep. linearity (typ.)	% of meas. range	±0.3	±0.3
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
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		Cable 3pole	Cable 3pole
Cross section of single wires	mm <sup>2</sup>	0.56 (AWG20)	0.56 (AWG20)
Redundancy feasible		no	no
Electrical connection redundant		-	-
Cross section of single wires redundant	mm <sup>2</sup>	-	-
<b>Mechanical data</b>			
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
EN 60068-2-6 Vibration (Amax = 0.75mm, f = 5...2000Hz)	g	50	50
EN 60068-2-27 Shock	g	200	200
<b>Standards</b>			
EN 55022 class B, Emission radiated (30...230MHz)	dB(µV/m)	max. 30	max. 30
EN 55022 class B, Emission radiated (230...1000MHz)	dB(µV/m)	max. 37	max. 37
EN 55022 class B, Emission conducted (0.15...0.5MHz)	dB(µV)	max. 56 ... 46	max. 56 ... 46
EN 55022 class B, Emission conducted (0.5...5MHz)	dB(µV)	max. 46	max. 46
EN 55022 class B, Emission conducted (5...30MHz)	dB(µV)	max. 50	max. 50
EN 61000-4-2, ESD (contact discharge / air discharge)	kV	±4 / ±8	±4 / ±8
EN 61000-4-3, Immission HF radiated (80...1000MHz/1.4...2.7GHz) 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
EN 60393-1 Insulation resistance (500VDC, 1bar, 2s)	GOhm	20	20
EN 60393-1 Dielectric strength (VAC, 50Hz, 1min, 1bar)	kV	1	1



**Vert-X 31E - 24V / 4 - 20mA**  
**Ordering code**

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

Vert-X													
3	1	E	6	a	7	3	6	1	5	1	4	0	2
<b>Output characteristics</b> Positive gradient CW Standard 1 Positive gradient CCW Optional 2 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										<b>Electrical connection</b> 4 Standard Cable 3pole 6 Optional Cable 6pole 9 Optional Special cable ; Special wires			
4mA ... 20mA										<b>Output signal</b> Standard 5			
24VDC										<b>Power supply voltage</b> Standard 1			
<b>Electrical angle</b> 36 Standard Electrical angle 360° xx Optional 03 to 35 ; Declaration in 10° steps 99 Optional Special angle										<b>Sensor principle</b> 7 MH-C 8 MH-C2			
<b>Mounting hole</b> a Standard Through-hole ø 4.4mm b Optional Through-hole ø 4.4mm with counterbore ø 7.4mm										<b>Length of cable</b> 02 Standard 1.0m 06 Optional 3.0m 10 Optional 5.0m 99 Optional Special length			
<b>Mechanical version</b> 31E5 Optional Magnetic actuator type 5 31E6 Standard Magnetic actuator type 6 31E7 Optional Magnetic actuator type 7 31E8 Optional Magnetic actuator type 8 31E9 Optional Special magnetic actuator													

	MH-C	MH-C2
Custom magnetic actuator	X	X
Custom cable	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
Extended operating range, axial (without safety flag)	X	-

**Options (on request)**

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### Vert-X 31E5

#### Accessories (incl.)

- None

#### Operating range/Air gap (A) Standard with safety flag

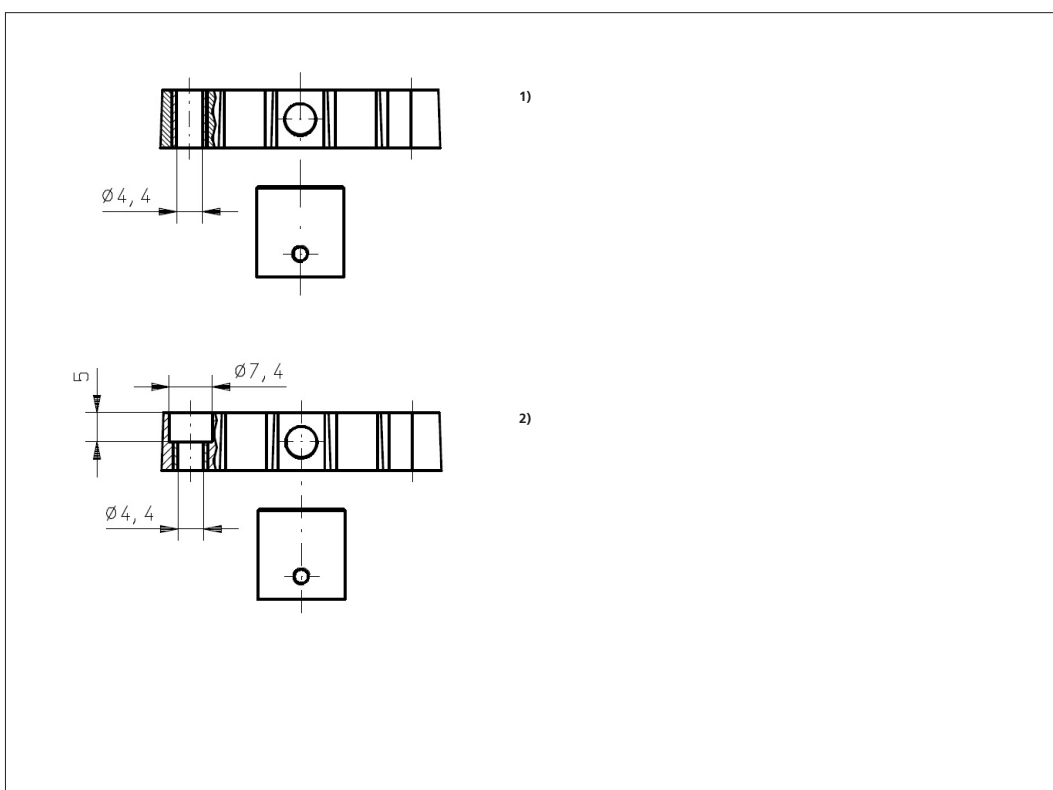
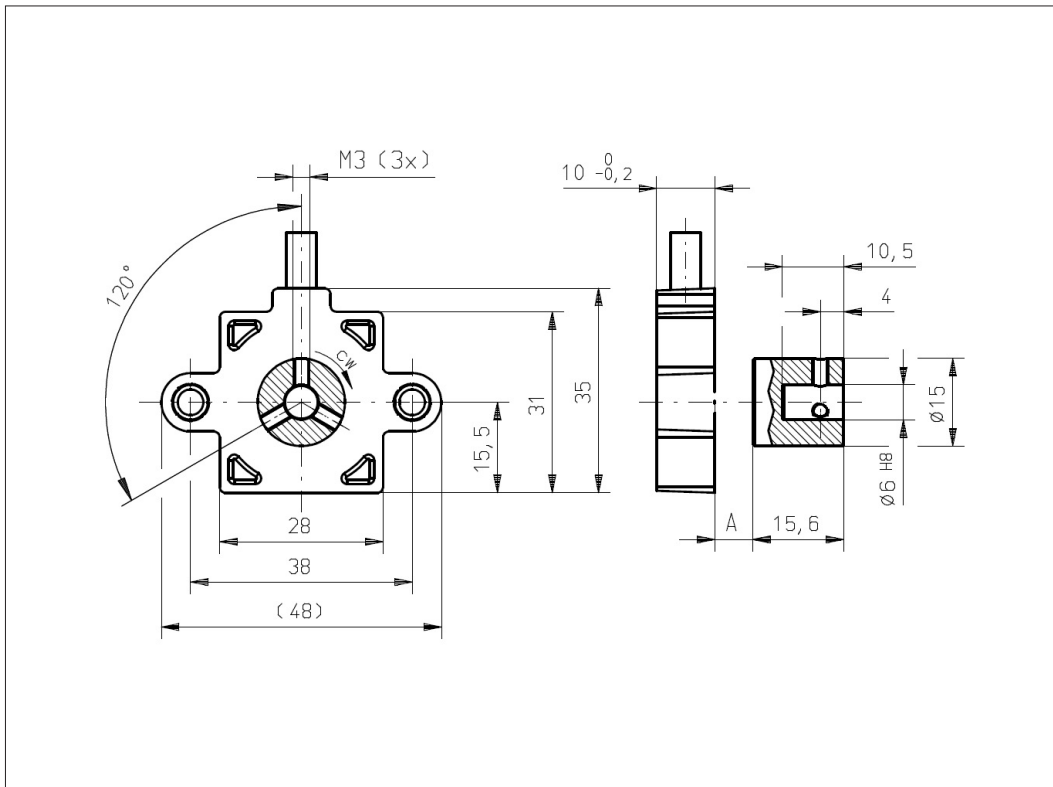
Single 0 ... 6.2mm

#### Extended without safety flag (Optional)

Single 0 ... 10.0mm

#### Features Safety Flag

- Detection of magnetic loss
- System shut-down in case of magnetic actuator out of valid operating range
- Recommended for safety relevant applications



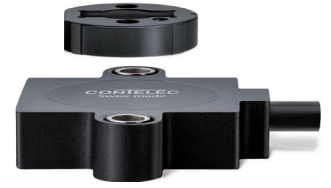
#### Vert-X 31E5axxx 15x xxx <sup>1)</sup>

#### Vert-X 31E5bxxx 15x xxx <sup>2)</sup>

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### Vert-X 31E6

#### Accessories (incl.)

- None

#### Operating range/Air gap (A) Standard with safety flag

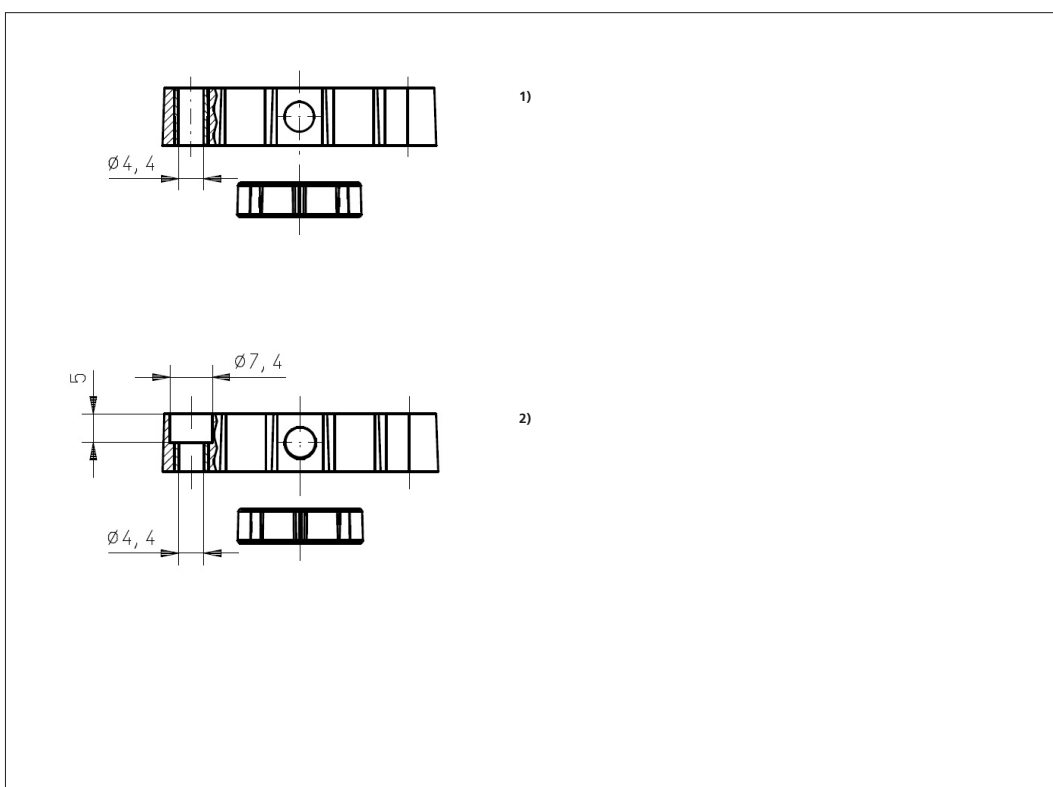
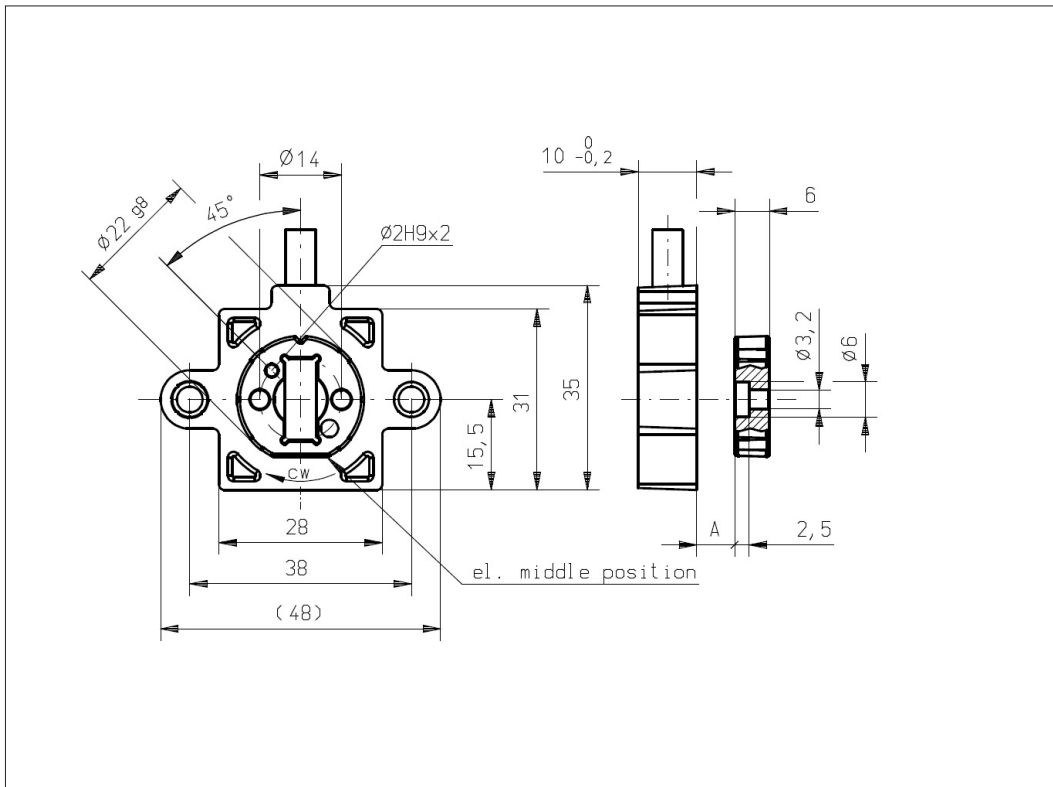
Single 0 ... 5.0mm

#### Extended without safety flag (Optional)

Single 0 ... 8.4mm

#### Features Safety Flag

- Detection of magnetic loss
- System shut-down in case of magnetic actuator out of valid operating range
- Recommended for safety relevant applications



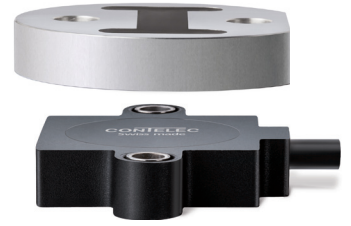
#### Vert-X 31E6axxx 15x xxx <sup>1)</sup>

#### Vert-X 31E6bxxx 15x xxx <sup>2)</sup>

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### Vert-X 31E7

#### Accessories (incl.)

- None

#### Operating range/Air gap (A) Standard with safety flag

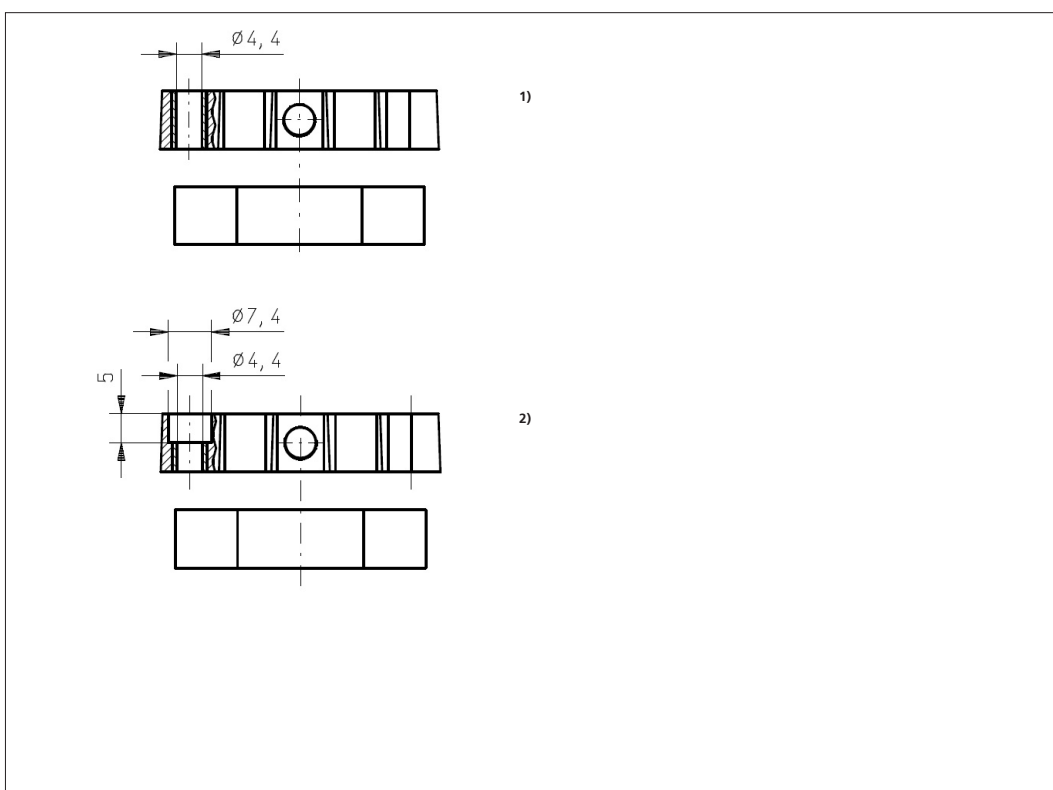
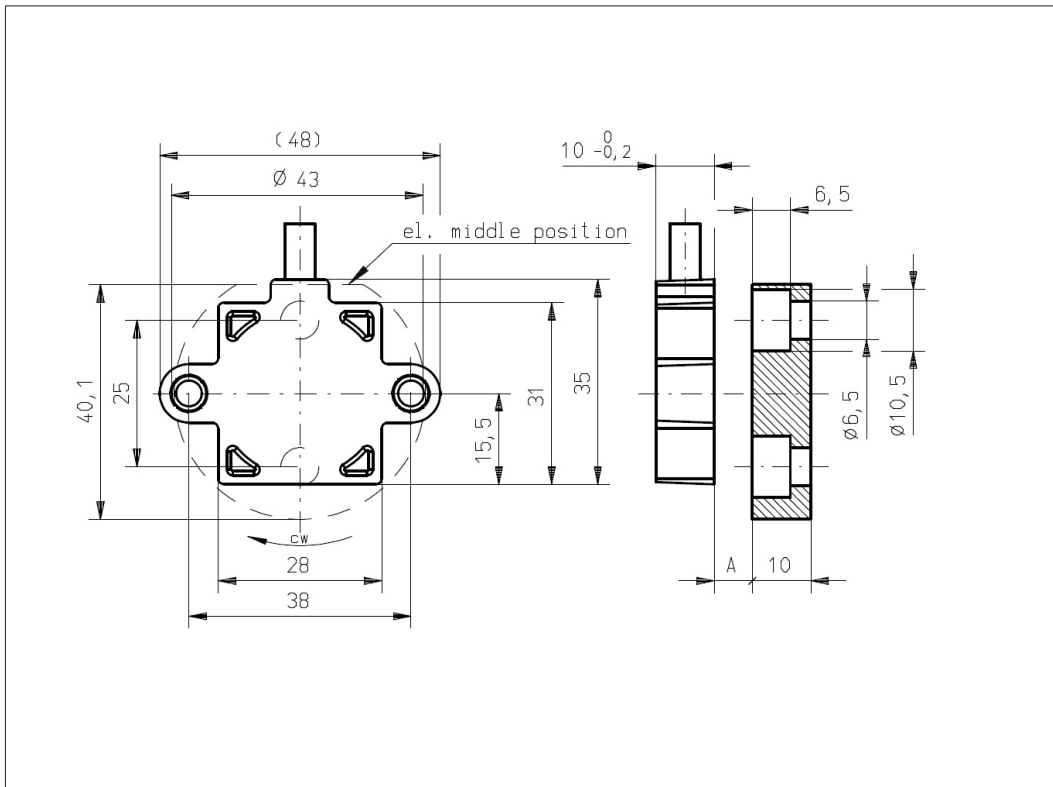
Single 0 ... 13.3mm

#### Extended without safety flag (Optional)

Single 0 ... 19.7mm

#### Features Safety Flag

- Detection of magnetic loss
- System shut-down in case of magnetic actuator out of valid operating range
- Recommended for safety relevant applications



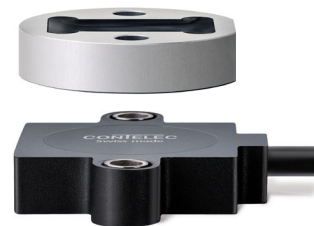
#### Vert-X 31E7axxx 15x xxx <sup>1)</sup>

#### Vert-X 31E7bxxx 15x xxx <sup>2)</sup>

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### Vert-X 31E8

#### Accessories (incl.)

- None

#### Operating range/Air gap (A) Standard with safety flag

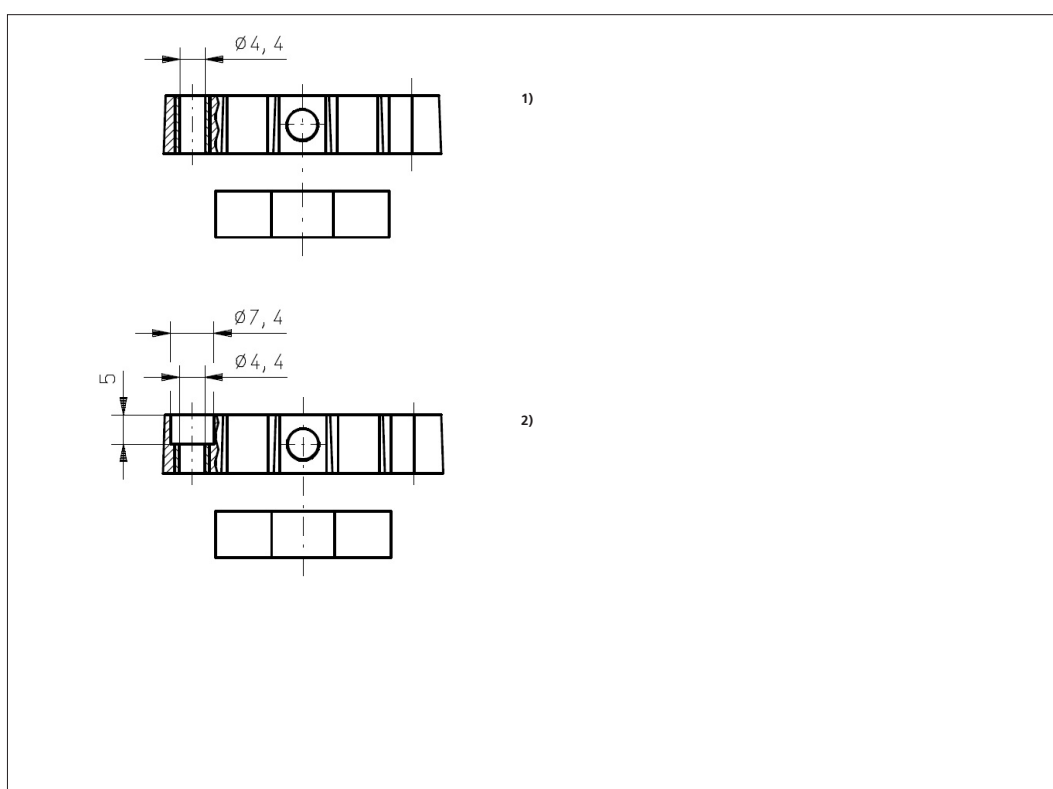
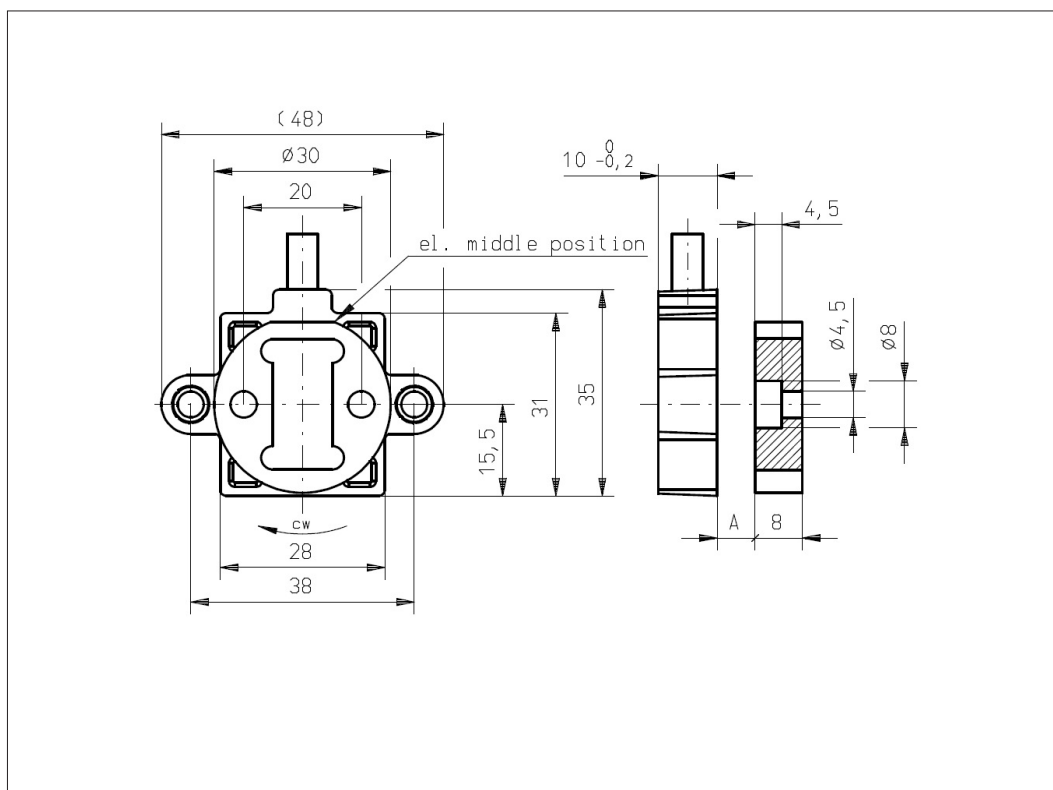
Single 0 ... 12.8mm

#### Extended without safety flag (Optional)

Single 0 ... 18.7mm

#### Features Safety Flag

- Detection of magnetic loss
- System shut-down in case of magnetic actuator out of valid operating range
- Recommended for safety relevant applications



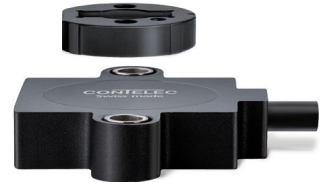
### Vert-X 31E8axxx 15x xxx <sup>1)</sup>

### Vert-X 31E8bxxx 15x xxx <sup>2)</sup>

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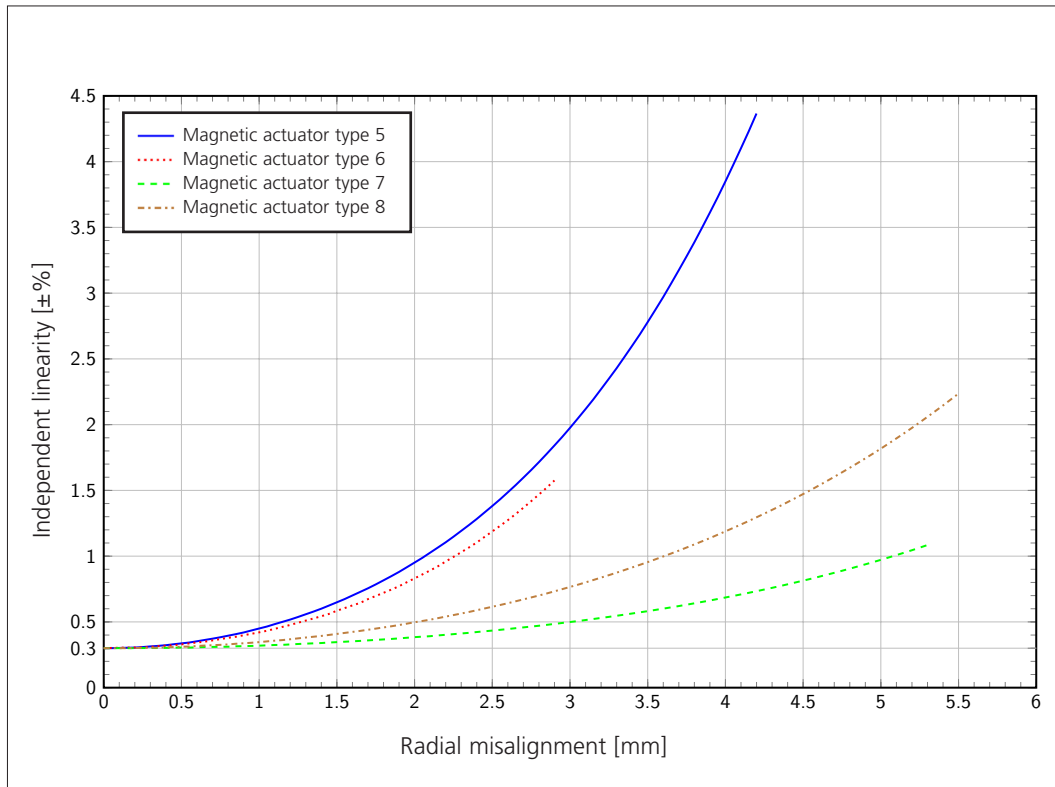
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### Vert-X 31E

**Indep. linearity with radial misalignment (@360°)**



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