

## Vert-X 31E - 24V / PWM

### Applications

- Concrete pump
- Access control system
- Fork lift

### Features

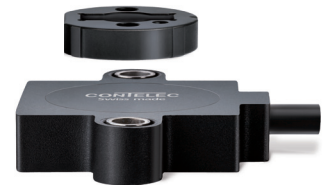
- High protection class IP68
- Compact dimensions
- Non-contacting measuring method
- Very long life
- High accuracy of measurement
- Applications under adverse ambient conditions possible (humidity, dampness, dust, vibrations etc.)
- Full resolution and accuracy at programmed electrical angle
- Detection of magnetic loss (with safety flag)

Sensor principle		MH-C	MH-C2
<b>Electrical data</b>			
Measuring range	°	0 ... 360	-
Indep. linearity (typ.)	% of meas. range	±0.3	-
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	240 / 240	-
Power supply voltage	VDC	8 ... 35	-
Current consumption without load (typ.) fast mode	mA	(19)	-
Current consumption without load (typ.) slow mode	mA	14	-
Min. ohmic load at output	kOhm	10	-
Max. capacitive load at output	nF	1	-
PWM frequency	Hz	855 (±20%)	-
Reverse polarity protection of power supply		yes	-
Electrical connection		Cable 3pole	-
Cross section of single wires	mm <sup>2</sup>	0.56 (AWG20)	-
Redundancy feasible		yes	-
Electrical connection redundant		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	°C	-40 ... +85	-
EN 60068-2-6 Vibration (Amax = 0.75mm, f = 5...2000Hz)	g	50	-
EN 60068-2-27 Shock	g	200	-
<b>Standards</b>			
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 55022 class B, Emission conducted (0.15...0.5MHz)	dB(µV)	max. 56 ... 46	-
EN 55022 class B, Emission conducted (0.5...5MHz)	dB(µV)	max. 46	-
EN 55022 class B, Emission conducted (5...30MHz)	dB(µV)	max. 50	-
EN 61000-4-2, ESD (contact discharge / air discharge)	kV	±4 / ±8	-
EN 61000-4-3, Immission HF radiated (80...1000MHz/1.4...2.7GHz) 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	300	-
EN 60393-1 Insulation resistance (500VDC, 1bar, 2s)	GOhm	20	-
EN 60393-1 Dielectric strength (VAC, 50Hz, 1min, 1bar)	kV	1	-

Errors and omissions excepted. Subject to change without notice. / State: 04.10.16

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**Vert-X 31E - 24V / PWM**  
**Ordering code**

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

Output signal	
PWM	Standard 4

Power supply voltage	
24VDC	Standard 1

Electrical connection	
4	Standard Cable 3pol
6	Optional Cable 6pol
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 1 4 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

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

Mechanical version	
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	-
Custom cable	X	-
Custom PWM frequency (0.1 ... 1kHz)	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)	-	-
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

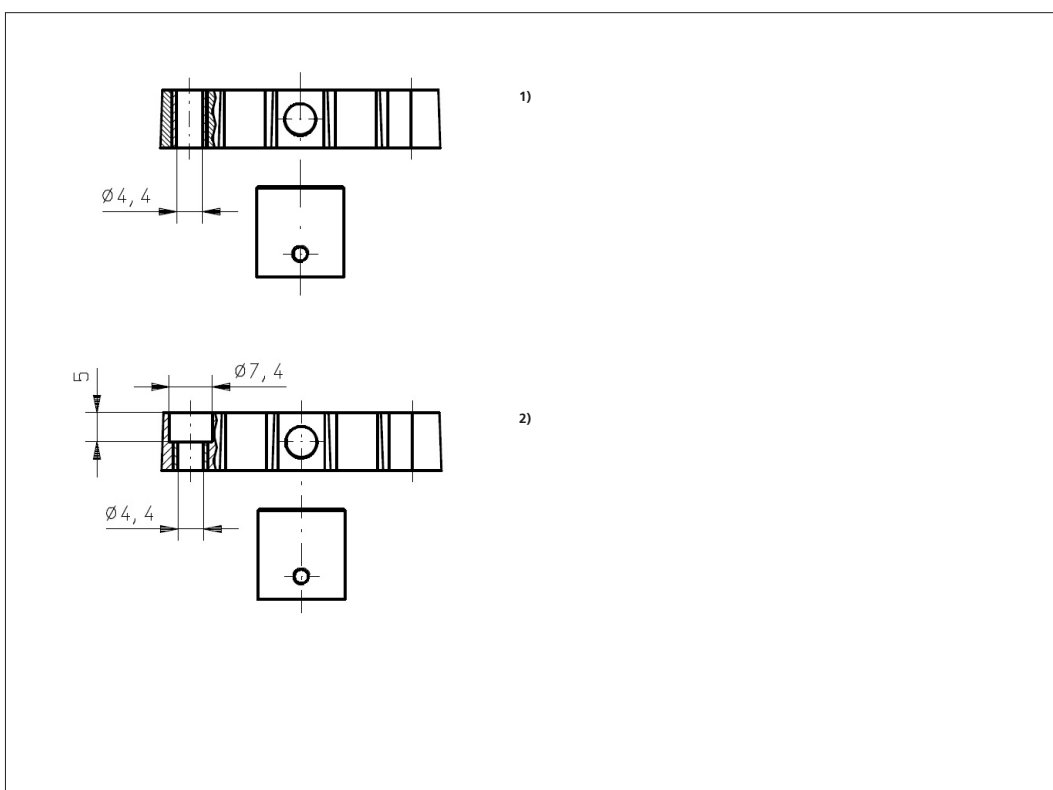
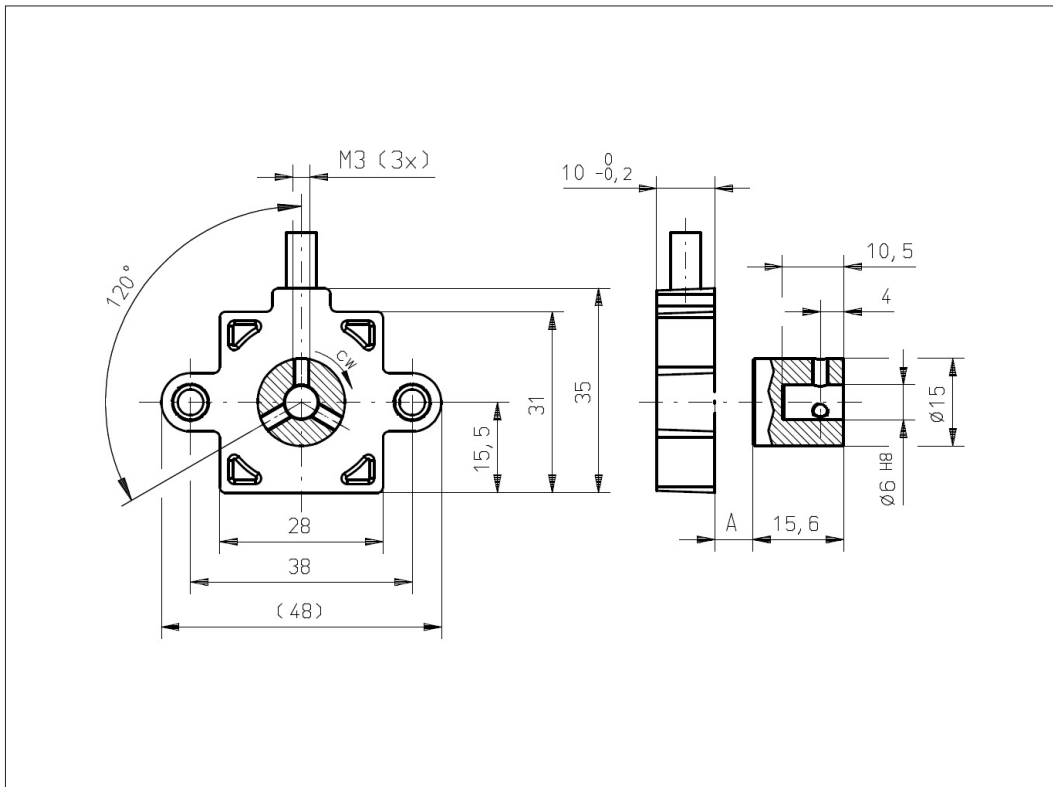
Single	0 ... 6.2mm
Redundant	0 ... 5.7mm

#### Extended without safety flag (Optional)

Single	0 ... 10.0mm
Redundant	0 ... 9.5mm

#### 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

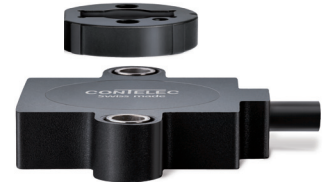


### Vert-X 31E5axxx 14x xxx <sup>1)</sup>

### Vert-X 31E5bxxx 14x xxx <sup>2)</sup>

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### Vert-X 31E6

#### Accessories (incl.)

- None

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

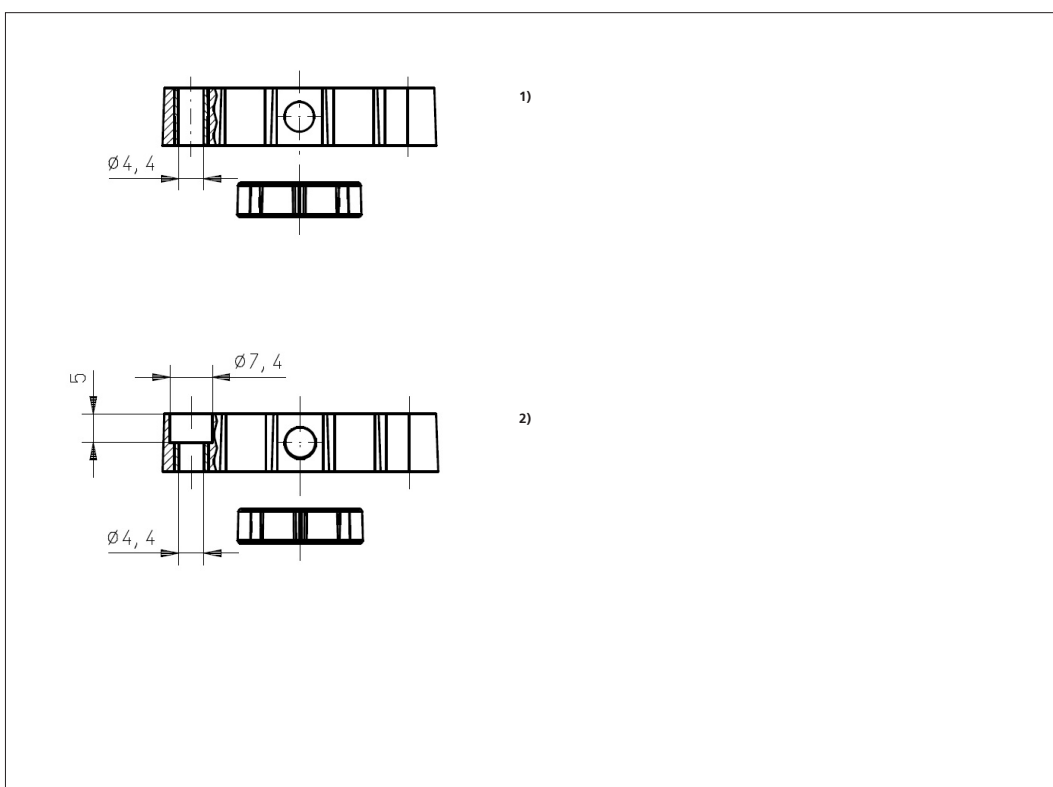
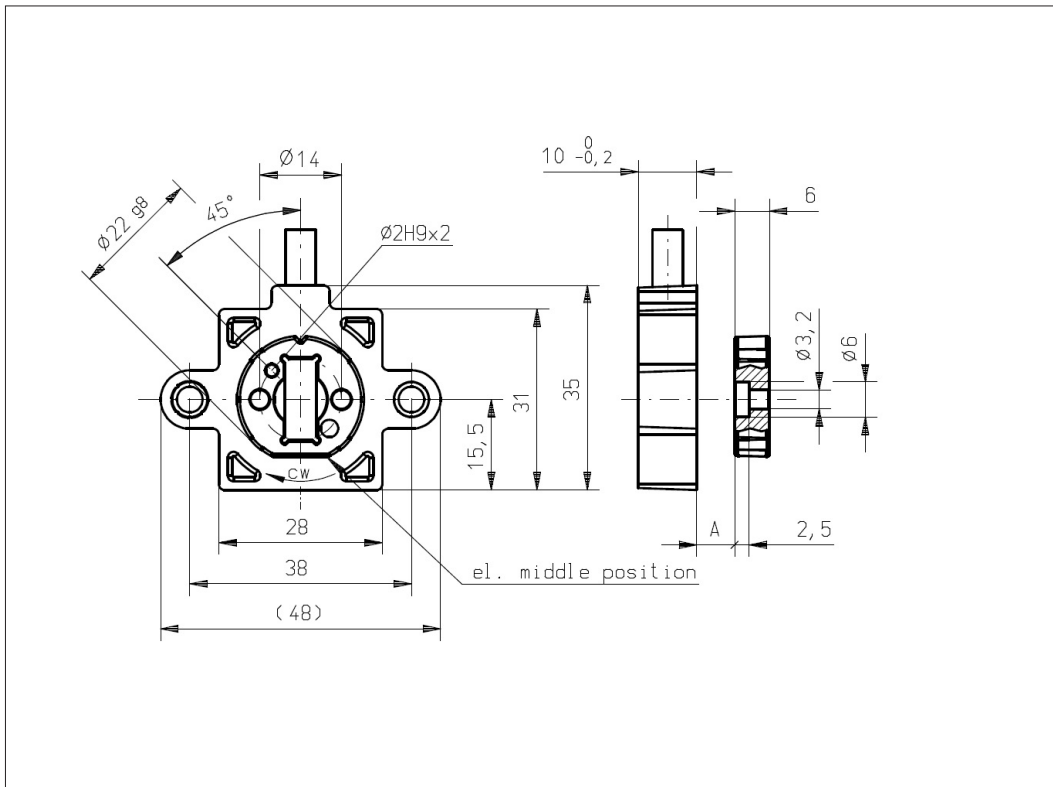
Single	0 ... 5.0mm
Redundant	0 ... 4.5mm

#### Extended without safety flag (Optional)

Single	0 ... 8.4mm
Redundant	0 ... 7.9mm

#### 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

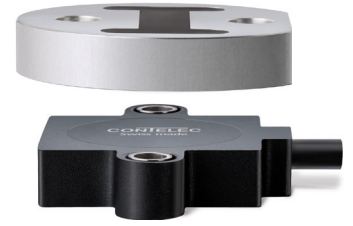


#### Vert-X 31E6axxx 14x xxx <sup>1)</sup>

#### Vert-X 31E6bxxx 14x xxx <sup>2)</sup>

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### Vert-X 31E7

#### Accessories (incl.)

- None

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

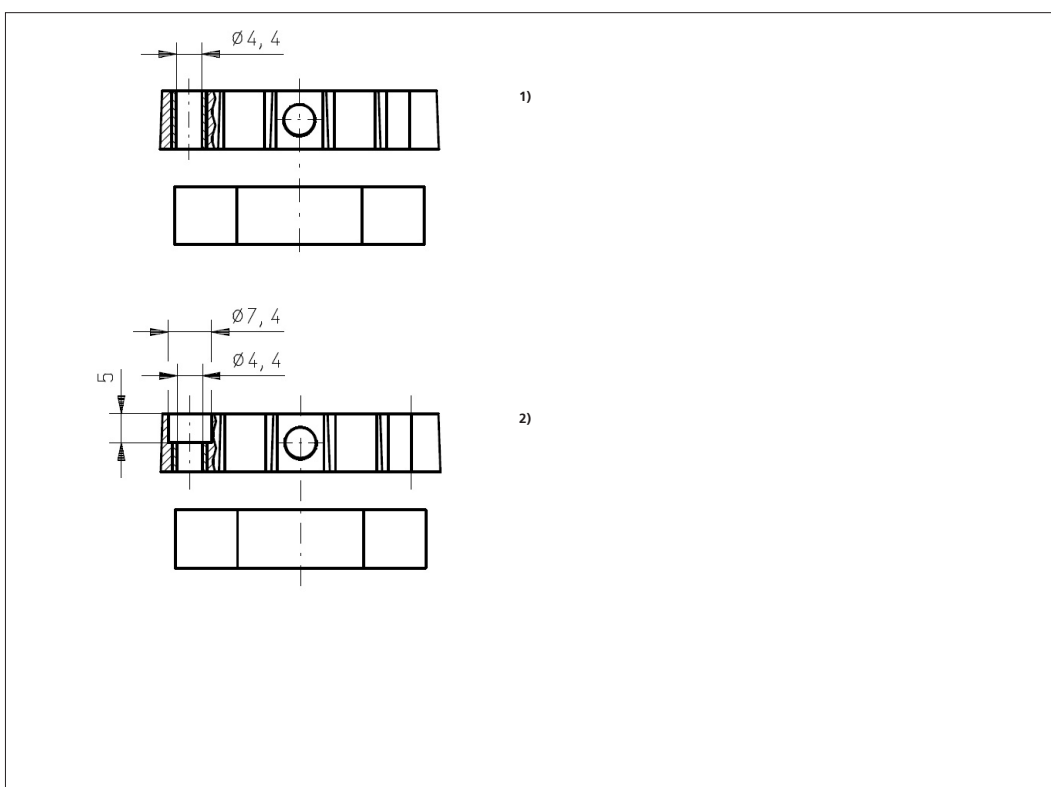
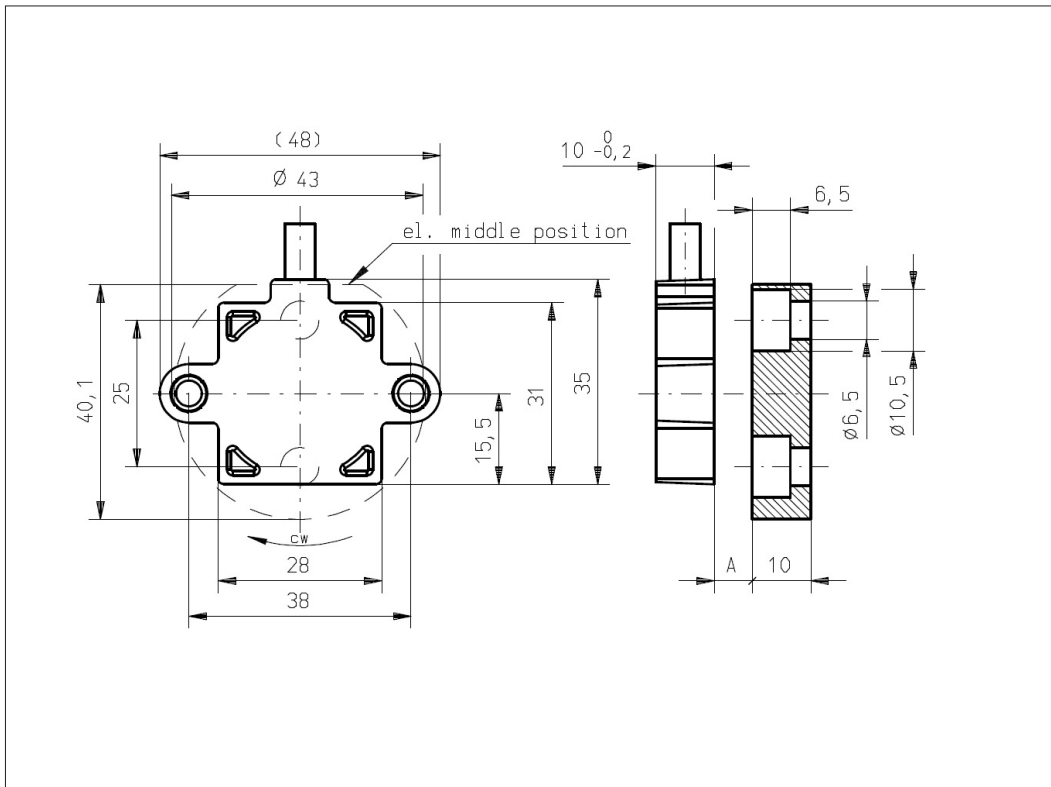
Single	0 ... 13.3mm
Redundant	0 ... 12.8mm

#### Extended without safety flag (Optional)

Single	0 ... 19.7mm
Redundant	0 ... 19.2mm

#### 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



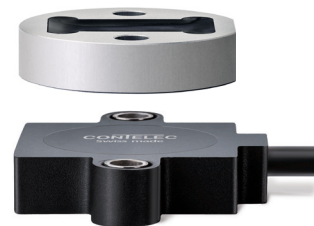
#### Vert-X 31E7axxx 14x xxx <sup>1)</sup>

#### Vert-X 31E7bxxx 14x xxx <sup>2)</sup>

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### Vert-X 31E8

#### Accessories (incl.)

- None

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

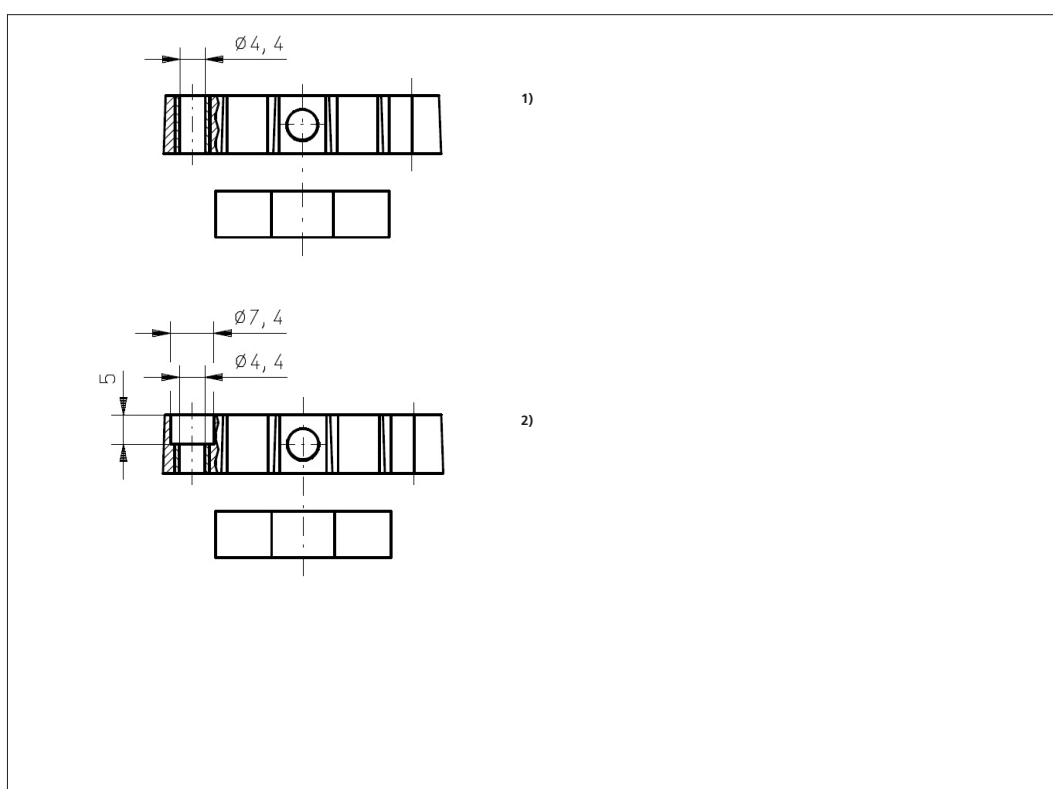
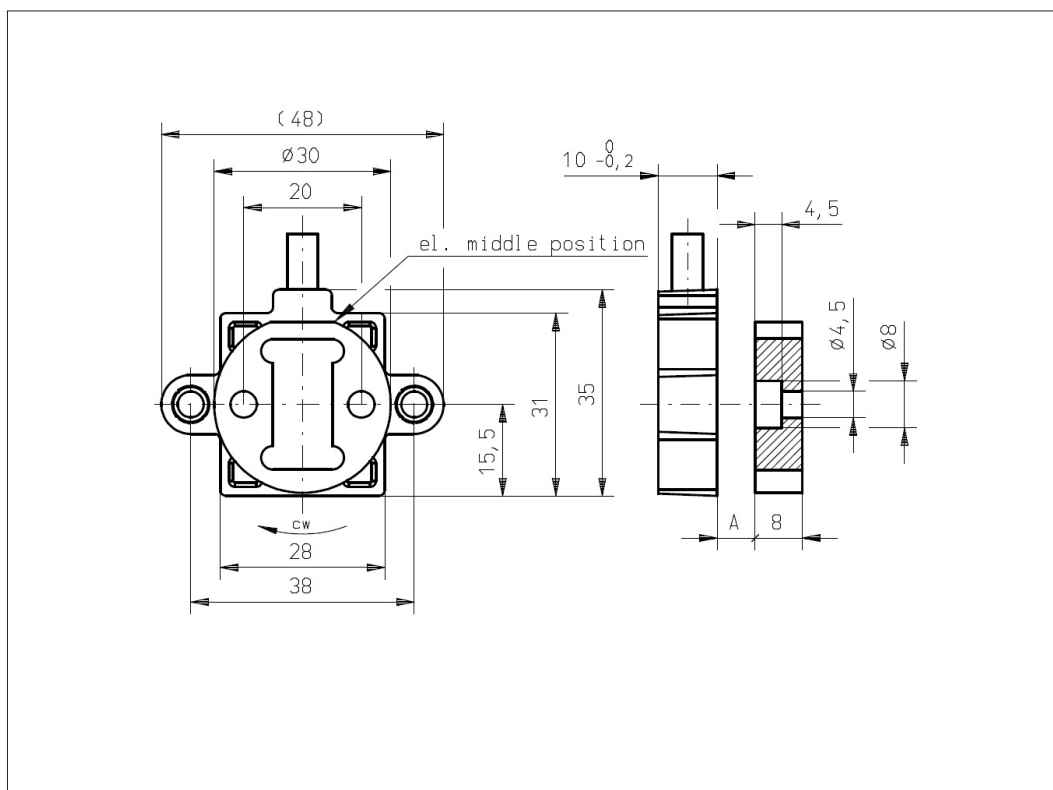
Single	0 ... 12.8mm
Redundant	0 ... 12.3mm

#### Extended without safety flag (Optional)

Single	0 ... 18.7mm
Redundant	0 ... 18.2mm

#### 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



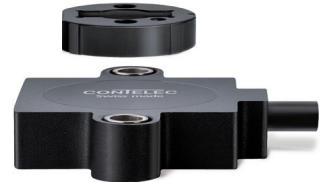
#### Vert-X 31E8axxx 14x xxx <sup>1)</sup>

#### Vert-X 31E8bxxx 14x xxx <sup>2)</sup>

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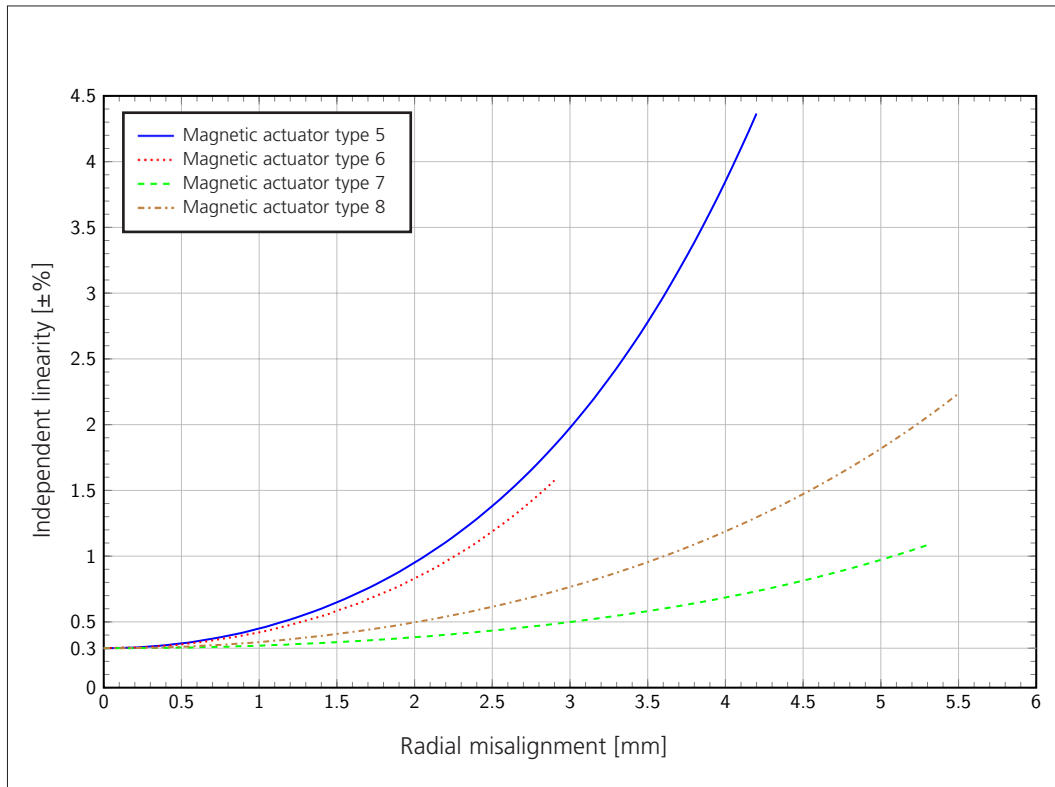
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### Vert-X 31E

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



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