

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
- Detection of magnetic loss (with safety flag)

Features MH-C

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

Features MH-C2

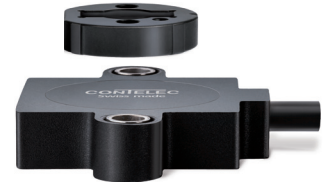
- Resolution of 14bit
- Index point(s), sense of rotation and angle settable resp. programmable by customer (optional)

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Sensor principle		MH-C	MH-C2
Electrical data			
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	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 ²	0.56 (AWG20)	0.56 (AWG20)
Redundancy feasible		yes	no
Electrical connection redundant		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
EN 60068-2-6 Vibration (Amax = 0.75mm, f = 5...2000Hz)	g	50	50
EN 60068-2-27 Shock	g	200	200
Standards			
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 - 5V / 10...90% Ub Ordering code

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

Output characteristics		Output signal		Power supply voltage		Electrical connection		Length of cable			
Positive gradient CW	Standard	10% ... 90% Ub	Standard	5VDC	Standard	4	Standard	Cable 3pole	02	Standard	1.0m
Positive gradient CCW	Optional	x% ... y% Ub (within 5 ... 95%)	Optional			6	Optional	Cable 6pole	06	Optional	3.0m
Redundant, positive gradient CW	Optional					9	Optional	Special cable	10	Optional	5.0m
Redundant, positive gradient CCW	Optional								99	Optional	Special length
Redundant, crossed signal curves	Optional										
Positive gradient CW with 1 switch output*	Optional										
Positive gradient CCW with 1 switch output*	Optional										
Positive gradient CW with 2 switch outputs*	Optional										
Positive gradient CCW with 2 switch outputs*	Optional										
Sense of rotation settable	Optional										
Zero point & sense of rotation settable	Optional										
Middle point & sense of rotation settable	Optional										
Start + end point & sense of rotation settable	Optional										
Programmable with Vert-X EasyAdapt	Optional										

Electrical angle		Sensor principle		Mounting hole		
36	Standard	7	MH-C	a	Standard	Through-hole ø 4.4mm
xx	Optional	8	MH-C2	b	Optional	Through-hole ø 4.4mm with counterbore ø 7.4mm
99	Optional					

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

Vert-X	3	1	E	6	a	7	3	6	2	2	1	4	0	2
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	MH-C	MH-C2
Custom magnetic actuator	X	X
Custom modification of the housing	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
Extended operating range, axial (without safety flag)	X	X

Options (on request)

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Vert-X 31E5

Accessories (incl.)

- None

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

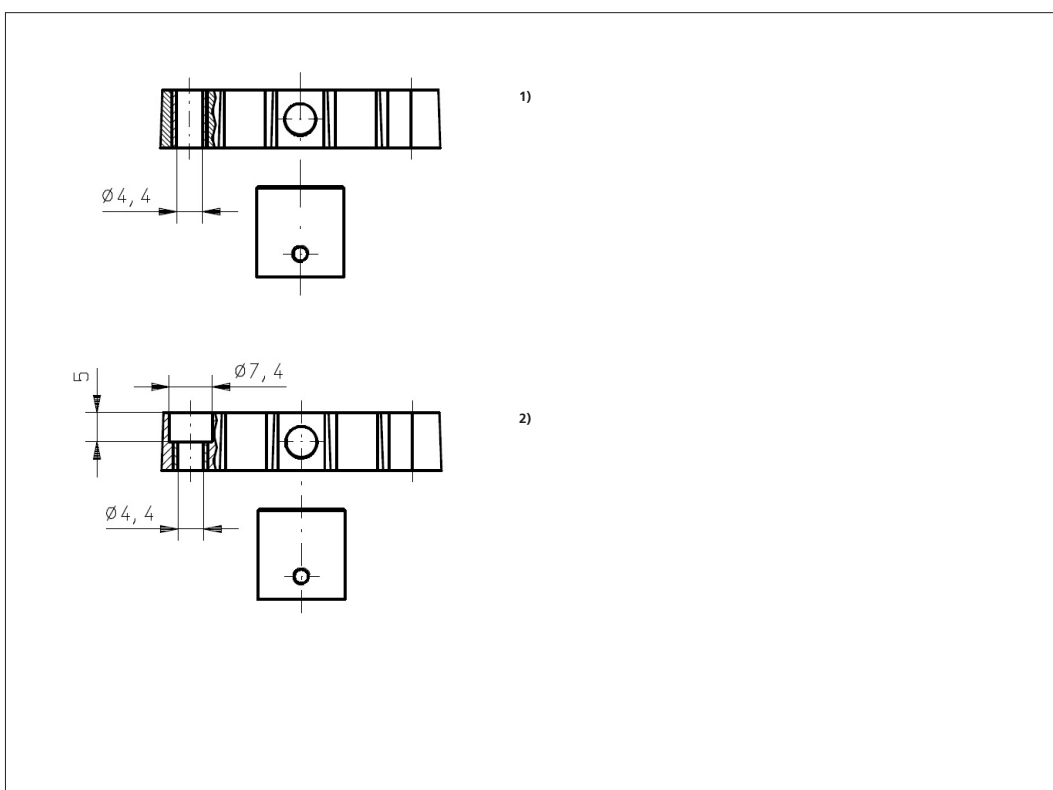
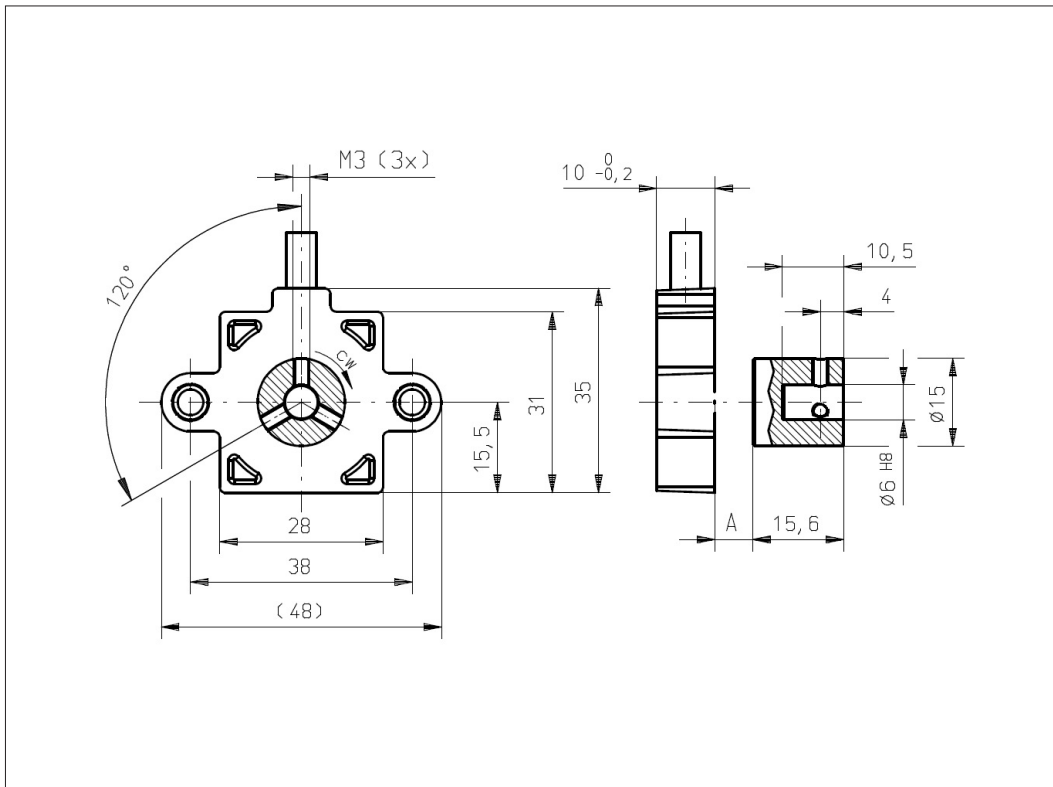
Single	0 ... 6.2mm
Redundant	0 ... 5.7mm

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

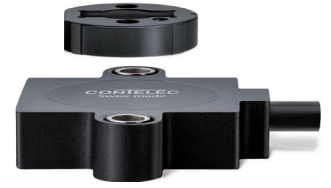


Vert-X 31E5axxx 2xx xxx ¹⁾

Vert-X 31E5bxxx 2xx xxx ²⁾

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Vert-X 31E6

Accessories (incl.)

- None

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

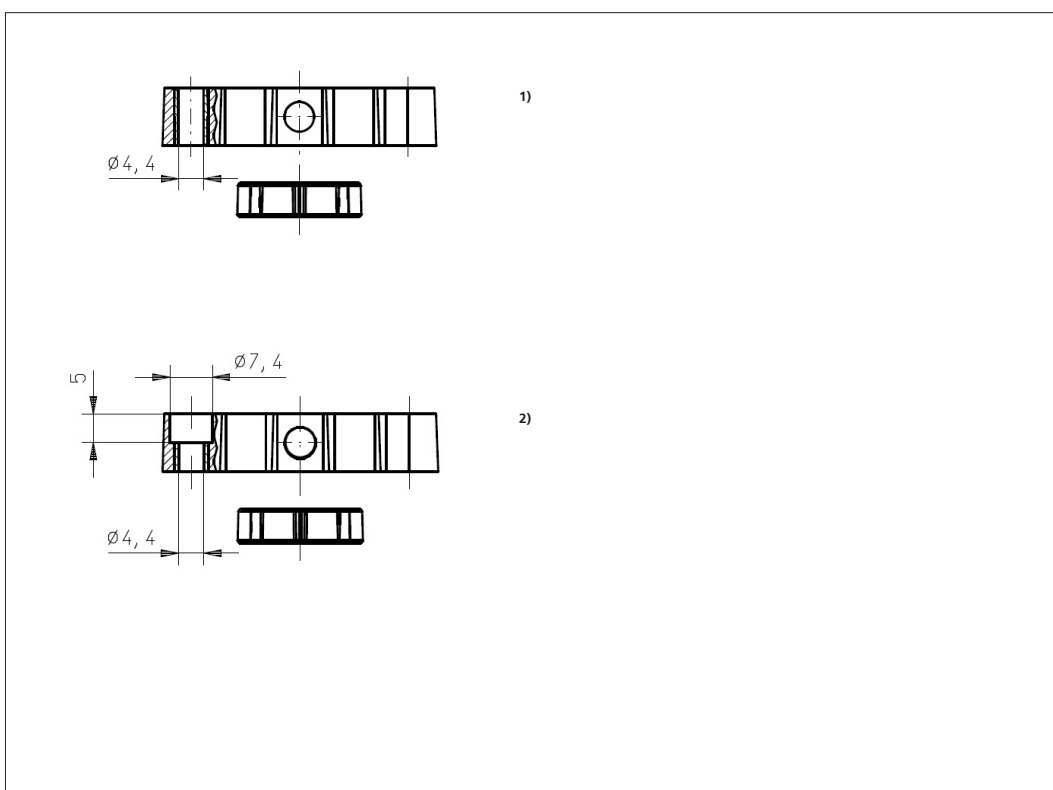
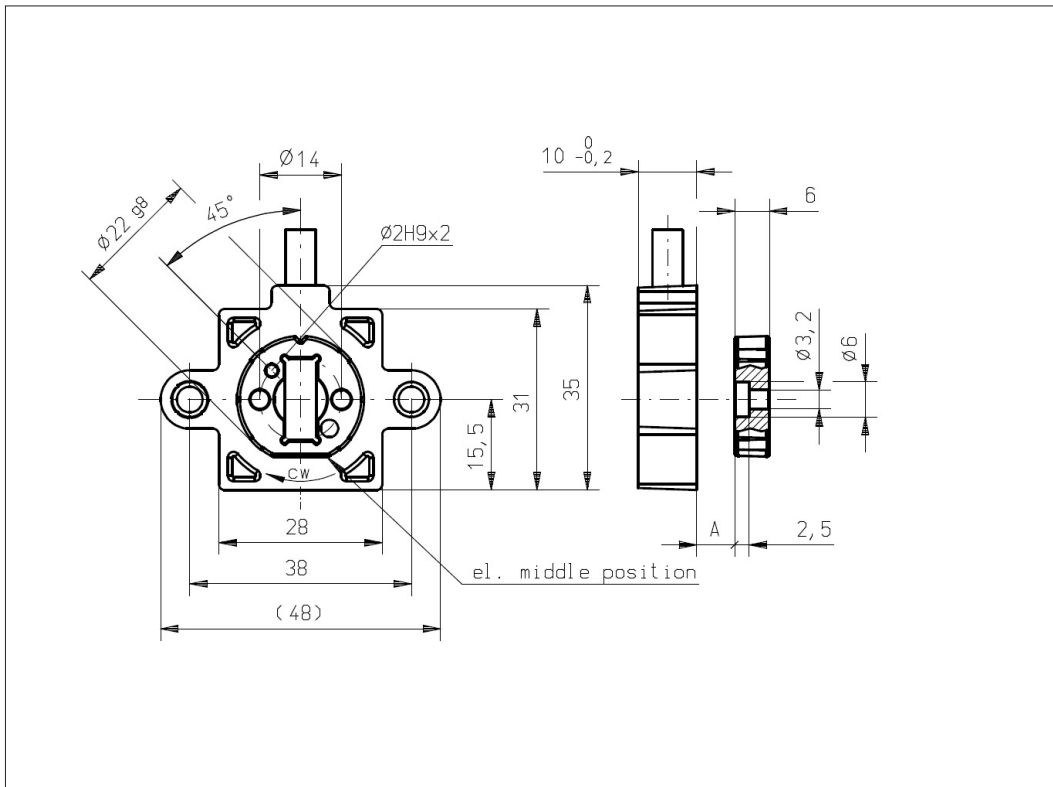
Single	0 ... 5.0mm
Redundant	0 ... 4.5mm

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



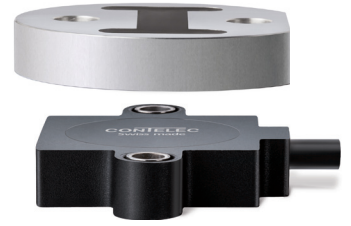
Vert-X 31E6axxx 2xx xxx ¹⁾

Vert-X 31E6bxxx 2xx xxx ²⁾

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Vert-X 31E7

Accessories (incl.)

- None

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

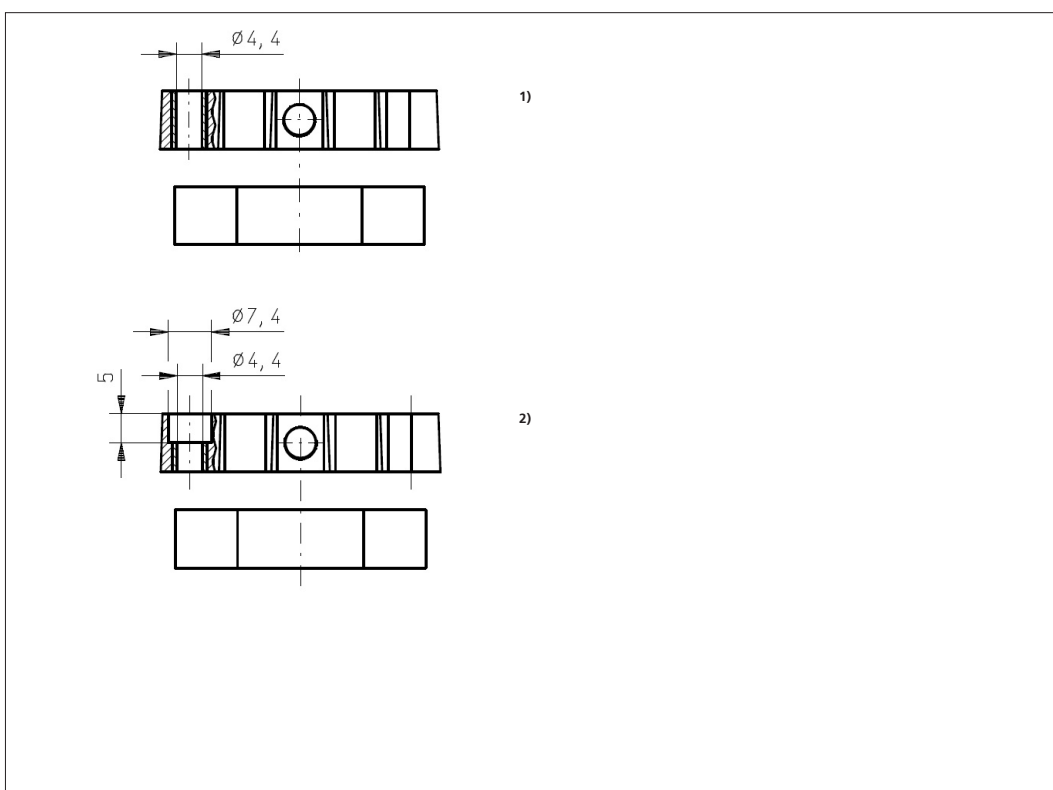
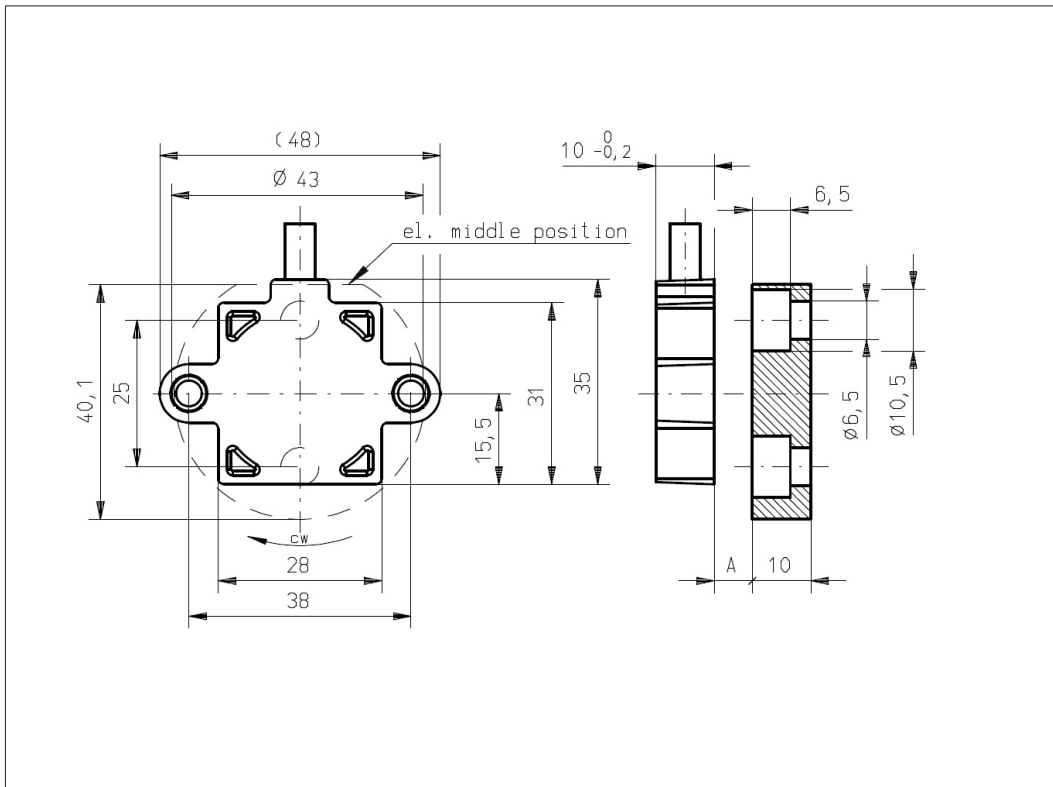
Single	0 ... 13.3mm
Redundant	0 ... 12.8mm

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

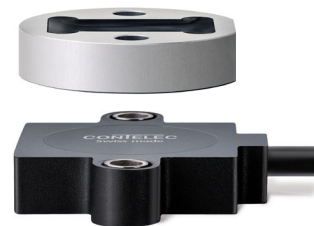


Vert-X 31E7axxx 2xx xxx ¹⁾

Vert-X 31E7bxxx 2xx xxx ²⁾

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Vert-X 31E8

Accessories (incl.)

- None

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

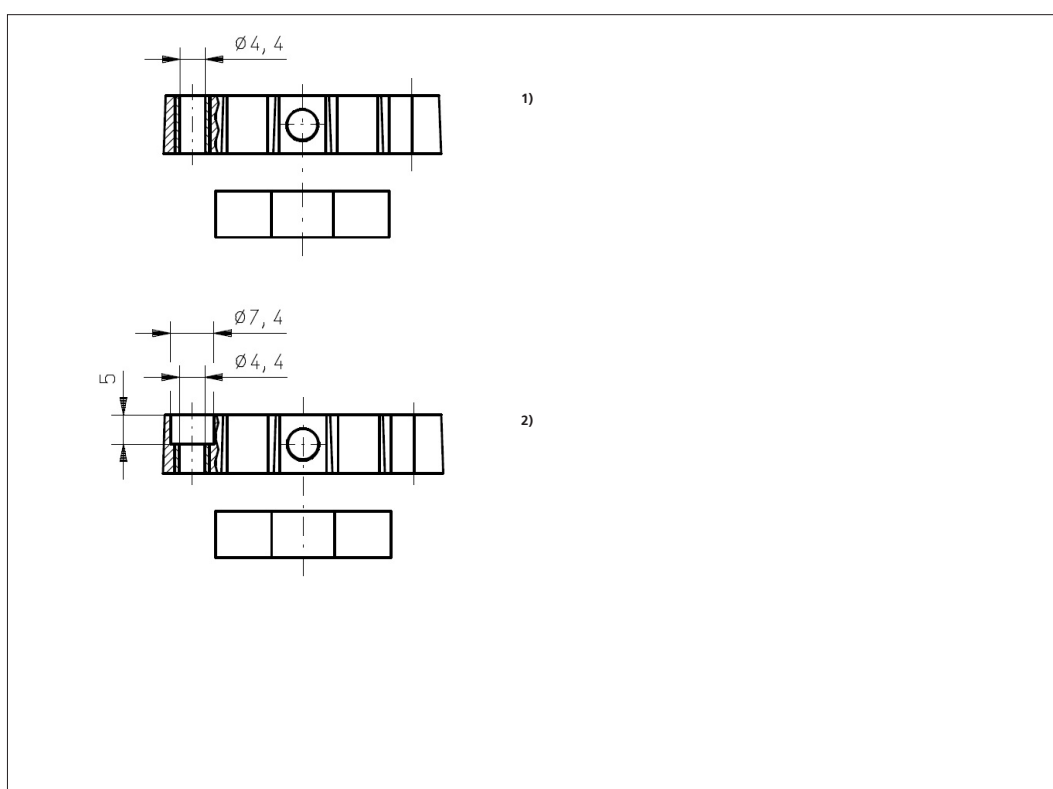
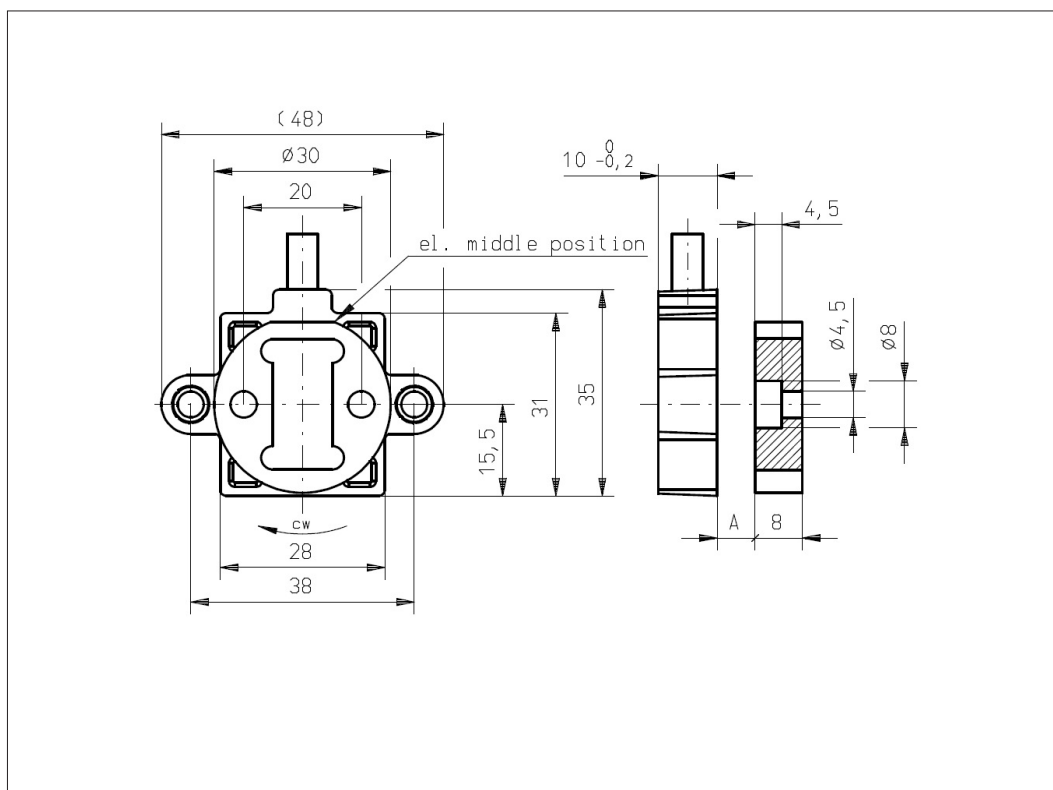
Single	0 ... 12.8mm
Redundant	0 ... 12.3mm

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



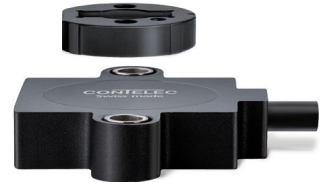
Vert-X 31E8axxx 2xx xxx ¹⁾

Vert-X 31E8bxxx 2xx xxx ²⁾

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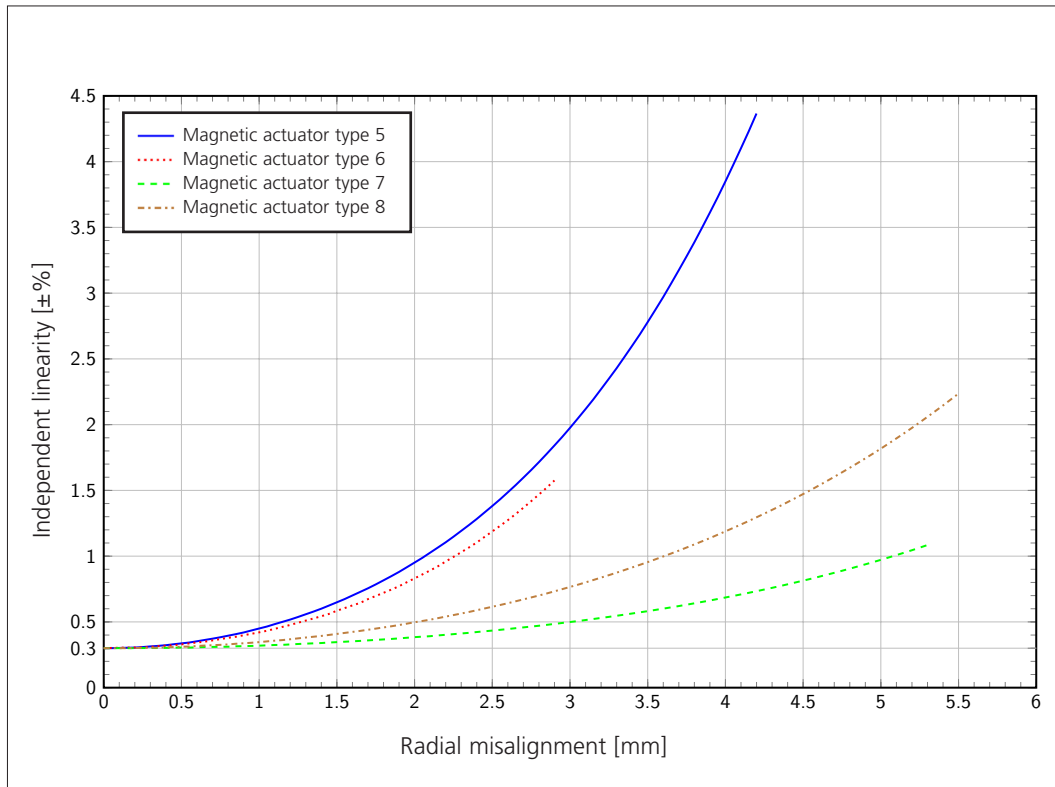
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Vert-X 31E

Indep. linearity with radial misalignment (@360°)



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