



Vert-X 31E 24V

Applications

- Concrete pump
- Access control system
- Fork lift

Features

- High protection class IP69
- Compact dimensions
- Non-contacting measuring method
- Very long life
- High accuracy of measurement
- Applications under adverse ambient conditions possible (humidity, dampness, oil, dust, vibrations etc.)

Options

- Special electrical angle
- Output signal X ... Y% UB
- Custom magnetic actuator design
- Custom cable

Version		B	C
Electrical Data			
Measuring range	°	0 ... 360	360
Linearity		see table B	see table C
Max. hysteresis		see table B	see table C
Resolution		see table B	see table C
Max. repeatability		see table B	see table C
Sample rate		see table B	see table C
System propagation delay		see table B	see table C
Max. temperature coefficient of the output signal ppm/°K		100	100
Min. life (electrical)	years	10	10
Power supply voltage		see table B	see table C
Current consumption without load (typical)		see table B	see table C
Min. ohmic load at output		see table B	see table C
Max. capacitive load at output		see table B	see table C
PWM frequency		see table B	-
Reverse polarity protection of power supply		see table B	see table C
Electrical connection		see table B	see table C
Mechanical Data			
Mechanical range	°	360 (continuous)	360 (continuous)
Min. life (mechanical)	movements	infinite	infinite
Operating temperature	°C	-40 ... +85	-40 ... +85
Storage temperature	°C	-40 ... +85	-40 ... +85
Protection class		IP69	IP69
Standards			
EN 55022 classe B, emission radiated (30... 230 MHz)		max. 30 dB(µV/m)	max. 30 dB(µV/m)
EN 55022 classe B, emission radiated (230...1000MHz)		max. 37 dB(µV/m)	max. 37 dB(µV/m)
EN 61000-4-2, ESD on housing and connections (contact / air)		4 / 8 kV	4 / 8 kV
EN 61000-4-3, immission HF radiated (80... 1000 MHz)		100 V/m	100 V/m
EN 61000-4-4, burst (on supply lines / signal lines)		1 / 0.5 kV	1 / 0.5 kV
EN 61000-4-5, surge (on supply lines / signal lines)		1 kV	1 kV
EN 61000-4-6, immission HF conducted (0.15...80MHz)		10 Vemk	10 Vemk
EN 61000-4-8, imission magnetic field (50Hz)		30 A/m	30 A/m
IEC 60393-1 insulation resistance (500VDC, 1bar, 2s)		20 GOhm	20 GOhm
IEC 60393-1 dielectric strength (VAC, 50Hz, 1min, 1bar)		1 kV	1 kV
IEC 68-2-6 Vibration (Amax = 0.75mm, f = 5 ... 2000 Hz)		50 g	50 g
IEC 68-2-27 Shock		200 g	200 g

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Vert-X 31E 24V Table Version B

Additional features

- Full resolution and accuracy at programmed electrical angle

Additional options

- Electrical angle within 0 ... 360° programmable
- Redundancy
- Fast mode / slow mode selectable (Standard ist slow mode, except for SPI: fast mode)

Interface		0.5 ... 4.5V	0.1 ... 10V	4 ... 20mA
Indep. linearity (without misalignment)	% meas. range	±0.3	±0.3	±0.3
Indep. linearity (with allowed misalignm. @ 360°)	% meas. range	±0.5	±0.5	±0.5
Max. hysteresis	°	0.1	0.1	0.1
Resolution	bit	12	12	12
Max. repeatability	°	0.1	0.1	0.1
Sample rate fast mode	kHz	(5)	(5)	(5)
Sample rate slow mode	kHz	1.66	1.66	1.66
System propagation delay fast mode	µs	(800)	(850)	(850)
System propagation delay slow mode	µs	4600	4650	4650
Power supply voltage	VDC	8 ... 35	10.8 ... 35	16 ... 35
Current consump. without load (typ.) fast mode	mA	(16)	(16)	(16)
Current consump. without load (typ.) slow mode	mA	10	10	10
Min. ohmic load at output	kOhm	5	10	0 ... 0.5
Max. capacitive load at output	nF	5	10	10
PWM frequency	kHz	-	-	-
Electrical connection radial		round cable 3pol	round cable 3pol	round cable 3pol
Cross section of single wires	mm ²	0.5 (AWG20)	0.5 (AWG20)	0.5 (AWG20)
Redundancy feasible		yes	no	no

Interface		PWM	SPI
Indep. linearity (without misalignment)	% meas. range	±0.3	±0.3
Indep. linearity (with allowed misalignm. @ 360°)	% 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)	2.2
Sample rate slow mode	kHz	1	(0.55)
System propagation delay fast mode	µs	(800)	400
System propagation delay slow mode	µs	4600	(600)
Power supply voltage	VDC	8 ... 35	8 ... 35
Current consump. without load (typ.) fast mode	mA	(16)	16
Current consump. without load (typ.) slow mode	mA	10	(10)
Min. ohmic load at output	kOhm	10	-
Max. capacitive load at output	nF	1	-
PWM frequency	kHz	0.1 (... 1)	-
Electrical connection radial		round cable 3pol	round cable 6pol
Cross section of single wires	mm ²	0.5 (AWG20)	0.25 (AWG24)
Redundancy feasible		yes	yes

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Vert-X 31E 24V
Ordering code
Version B

										Power supply voltage				
										1 Standard: 24VDC				
										Output signal				
										1 Standard: 0,1VDC ... 10VDC				
										2 Standard: 0,5VDC ... 4,5VDC				
										4 Standard: PWM				
										5 Standard: 4 mA ... 20 mA				
										8 Standard: SPI				
										Output characteristics				
										1 Standard: Positive gradient CW				
										2 Optional: Positive gradient CCW				
										3 Optional: Redundant, positive gradient CW				
										4 Optional: Redundant, positive gradient CCW				
										5 Optional: Redundant, crossed signal curves				
										Electrical connection				
										1 Optional: Round cable 10pol				
										4 Standard: Round cable 3pol (not SPI)				
										6 Standard: Round 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	5	a	7	3	6	1	1	1	4	0	2
										Electrical angle				
										36 Standard: Electrical angle 360°				
										xx Optional: 10 to 35; Declaration in 10° steps				
										99 Optional: Special angle				
										Sensor principle				
										7 B				
										Fixing hole				
										a Standard: through bore ø 4.4				
										b Standard: Bore ø 4.4 with counter bore ø 7.4				
										Mechanical version				
										31E5 Standard: magnetic actuator type 5				
										31E9 Optional: special housing ; special magnetic actuator				

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Interface		SSI	Incremental (A,B,Z)
Independent linearity	%	±0.5	±0.5
Max. hysteresis	°	0.1	0.7
Resolution	bit	10	10 (quadrature)
Resolution per channel	ppr	-	256 / (128 / 64 / 32)
Max. repeatability	°	0.12	0.12
Sample rate fast mode	kHz	10	10
System propagation delay	µs	65	200
Power supply voltage	VDC	8 ... 30	8 ... 30
Current consump. without load (typ.)	mA	16	16
Min. ohmic load at output	kOhm	5	5
Max. capacitive load at output	nF	1	1
Electrical connection radial		round cable 6pol	round cable 6pol
Cross section of single wires	mm ²	0.25 (AWG24)	0.25 (AWG24)
Redundancy feasible		no	no

Vert-X 31E 24V Table Version C

Additional features

- High operating speed

Additional options

- Incremental resolution 128 / 64 or 32ppr programmable (Standard 256ppr)

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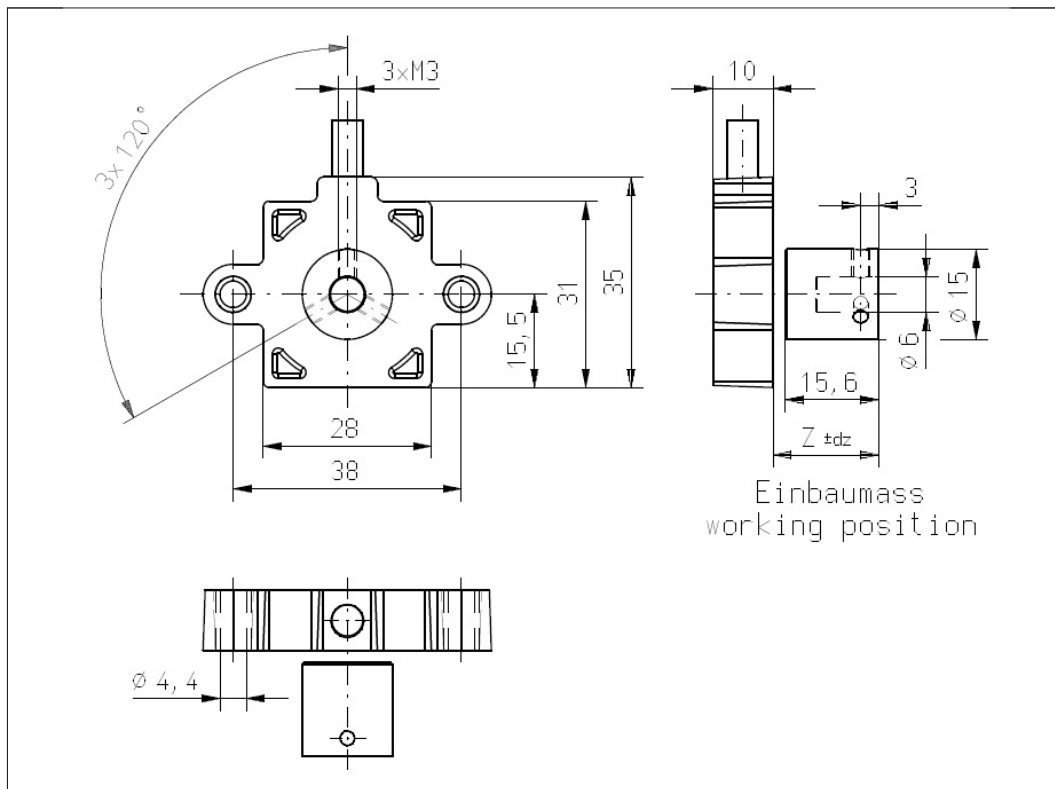


Vert-X 31E 24V
Ordering code
Version C

Vert-X	3	1	E	5	a	6	3	6	1	6	1	6	0	2	<p>Power supply voltage</p> <p>1 Standard: 24VDC</p>
															<p>Output signal</p> <p>6 Standard: SSI</p> <p>7 Standard: Incremental A,B,Z</p>
															<p>Output characteristics</p> <p>1 Standard: Positive gradient CW</p> <p>2 Optional: Positive gradient CCW (only SSI)</p>
															<p>Electrical connection</p> <p>1 Optional: Round cable 10pol</p> <p>6 Standard: Round cable 6pol</p> <p>9 Optional: Special cable ; special wires</p>
															<p>Length of cable</p> <p>02 Standard: 1.0m</p> <p>06 Optional: 3.0m</p> <p>10 Optional: 5.0m</p> <p>99 Optional: Special length</p>
															<p>Electrical angle</p> <p>36 Standard: Electrical angle 360°</p> <p>xx Optional: 10 to 35; Delcaration in 10° steps</p> <p>99 Optional: Special angle</p>
															<p>Sensor principle</p> <p>6 C</p>
															<p>Fixing hole</p> <p>a Standard: through bore ø 4.4</p> <p>b Standard: Bore ø 4.4 with counter bore ø 7.4</p>
															<p>Mechanical version</p> <p>31E5 Standard: magnetic actuator type 5</p> <p>31E9 Optional: special housing ; special magnetic actuator</p>

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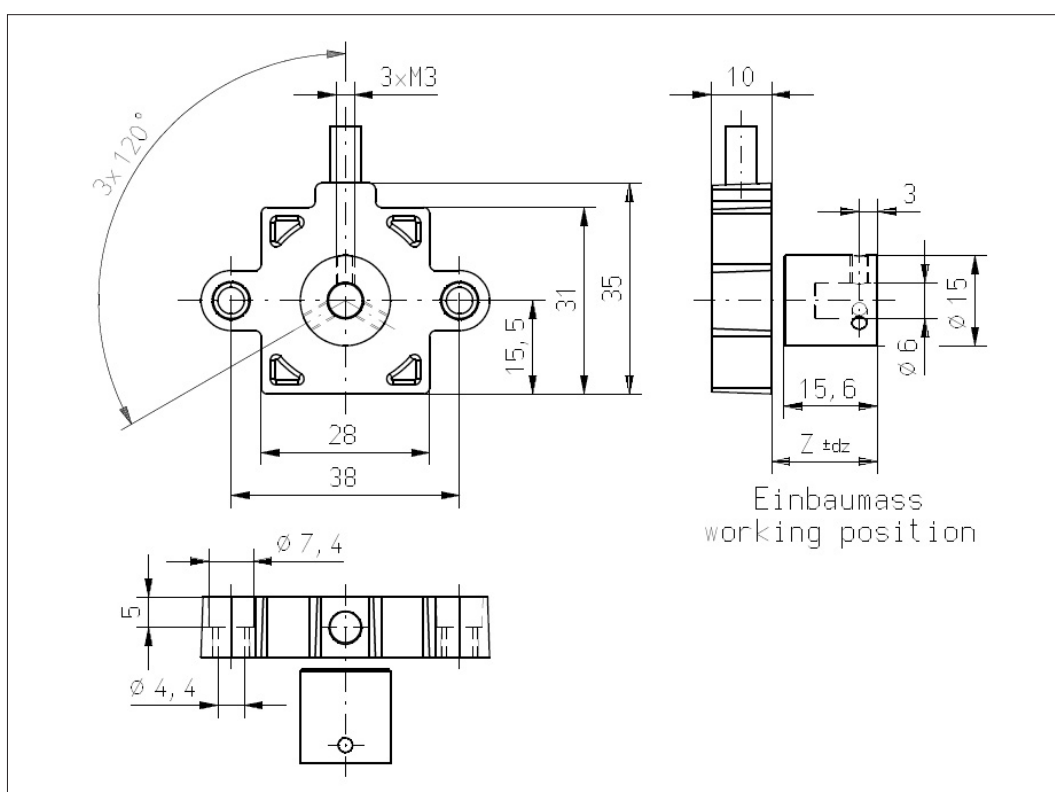
Vert-X 31E5a Mounting information

Working position (Z)

Version B	17.1mm
Version B redundant	16.6mm
Version C	16.6mm

Max. permitted misalignment of the magnetic actuator

dx	±0.25mm
dy	±0.25mm
dz	±0.5mm



Vert-X 31E5b Mounting information

Working position (Z)

Version B	17.1mm
Version B redundant	16.6mm
Version C	16.6mm

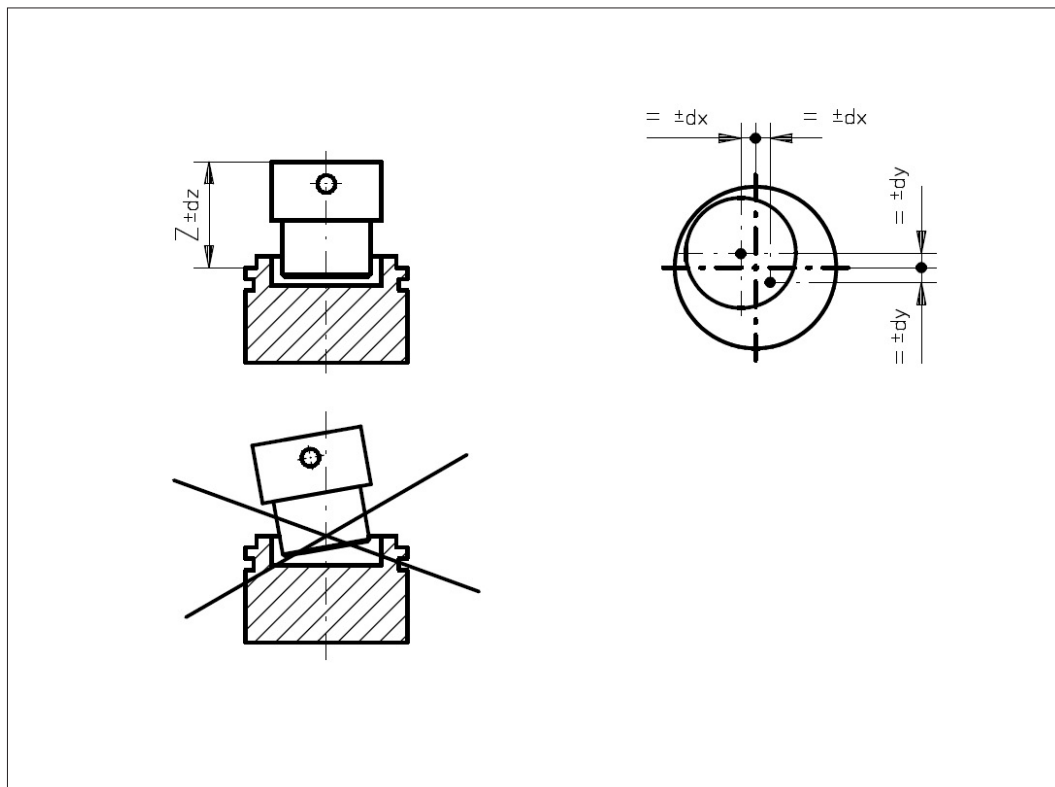
Max. permitted misalignment of the magnetic actuator

dx	±0.25mm
dy	±0.25mm
dz	±0.5mm

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Vert-X 31E
Mounting information

Working position (Z)

Version B	17.1mm
Version B redundant	16.6mm
Version C	16.6mm

Max. permitted misalignment of the magnetic actuator

dx	±0.25mm
dy	±0.25mm
dz	±0.5mm

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