



## Vert-X 16

### Applications

- Servodrives
- Dancer arm
- Operating table

### Features

- Compact dimensions
- Mounting tabs with metal inlets
- Contactless measuring method
- Long life
- High accuracy of measurement
- Use in cramped installation conditions

### Optionen

- Custom electrical angles
- Output signal  
X ... Y% UB
- Custom shaft design
- Custom cable / wires

Version		B	C
<b>Electrical Data</b>			
Measuring range	°	0 ... 360	360
Independent 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		50	50
Min. life (electrical)	years	10	10
Power supply voltage	VDC	5 (±10 %)	5 (±10 %)
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
<b>Mechanical Data</b>			
Mechanical range	°	360 (continuous)	360 (continuous)
Max. starting torque at IP54 / IP65	Ncm	0.5 / 3	0.5 / 3
Max. rotating speed	rpm	120	120
Min. life (mechanical)	movements	50 Mio.	50 Mio.
Max. permitted axial shaft load	N	10	10
Max. permitted radial shaft load	N	10	10
Operating temperature	°C	see table B	-40 ... +105
Storage temperature	°C	see table B	-40 ... +105
Protection class		IP54 / IP65	IP54 / IP65
<b>Standards</b>			
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, emission HF radiated (80... 1000 MHz)		30 V/m	30 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)		0.5 kV	0.5 kV
EN 61000-4-6, immission HF conducted (0.15...80MHz)		10 Vemk	10 Vemk
EN 61000-4-8, immission magnetic field (50Hz)		30 A/m	30 A/m
IEC 60393-1 Insulations resistance (500VDC, 1bar, 2s)		20 GOhm	20 GOhm
IEC 60393-1 Dielectric strenght (VAC, 50Hz, 1min, 1bar)		1 kV	1 kV
IEC 68-2-6 Vibration (Amax = 0.75mm, f = 5 ... 2000 Hz)		20 g	20 g
IEC 68-2-27 Shock		50 g	50 g

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Interface	10 ... 90% UB		PWM	SPI
		5 ... 95% UB		
Independent linearity	% meas. range	±0.3	±0.3	±0.3
Max. hysteresis	°	0.1	0.1	0.1
Resolution	bit	12	12	14
Max. repeatability	°	0.1	0.1	0.1
Sample rate fast mode	kHz	(5)	(5)	2.2
Sample rate slow mode	kHz	1.66	1.66	(0.55)
System propagation delay fast mode	µs	(800)	(800)	400
System propagation delay slow mode	µs	4600	4600	(600)
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	10	10	-
Max. capacitive load at output	nF	10	1	-
PWM frequency	kHz	-	0.1 (... 1)	-
Reverse polarity protection of power supply		yes	yes	yes
Electrical connection		wires	wires	ribbon cable
Cross section of single wires	mm <sup>2</sup>	0.25 (AWG24)	0.25 (AWG24)	0.09 (AWG28)
Redundancy feasible		yes	yes	no
Operating temperature	°C	-40 ... +125	-40 ... +125	-40 ... +105
Storage temperature	°C	-40 ... +125	-40 ... +125	-40 ... +105

## Vert-X 16 Table Version B

### Additional features

- Full resolution and accuracy at programmed electrical angle

### Additional options

- Electrical angle within 0 ... 360° programmable
- Redundancy
- Operating temperature -40 ... + 125°C
- Fast mode / slow mode selectable (Standard: slow mode, except for SPI: fast mode)

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**Vert-X 16**  
**Ordering code**  
**Version B**

<b>Power supply voltage</b>													
2 Standard: 5VDC													
<b>Output signal</b>													
2 Standard: 10% ... 90% of power supply													
4 Optional: x% ... y% of power supply (within 5 ... 95%)													
5 Standard: PWM													
8 Standard: SPI													
<b>Output characteristics</b>													
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													
<b>Electrical connection</b>													
1 Standard: Ribbon cable 6pol													
2 Standard: Wires 3pol (not SPI)													
9 Optional: Special cable; special wires													
<b>Length of wires / ribbon cable</b>													
01 Optional: 10cm													
02 Standard: 20cm													
03 Optional: 30cm													
04 Optional: 40cm													
05 Optional: 50cm													
99 Optional: Special length													
<b>Vert-X</b>	<b>1</b>	<b>6</b>	<b>0</b>	<b>1</b>	<b>7</b>	<b>3</b>	<b>6</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>2</b>
<b>Electrical angle</b>						<b>Electrical angle</b>							
36 Standard: Electrical angle 360°						36 Standard: Electrical angle 360°							
xx Optional: 10 to 35; Declaration in 10° steps						xx Optional: 10 to 35; Declaration in 10° steps							
99 Optional: Special angle						99 Optional: Special angle							
<b>Sensor principle</b>						<b>Sensor principle</b>							
7 B						7 B							
<b>Mechanical version</b>													
1601 Standard: 6mm shaft D-shape ; IP54													
1631 Standard: 6mm shaft D-shape ; IP65													
1699 Optional: Special shaft													

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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	kHz	10	10
System propagation delay	µs	65	200
Current consumption without load (typical)	mA	16	16
Min. ohmic load at output	kOhm	5	5
Max. capacitive load at output	nF	1	1
Reverse polarity protection of power supply		no	no
Electrical connection		ribbon cable	ribbon cable
Cross section of single wires	mm <sup>2</sup>	0.09 (AWG28)	0.09 (AWG28)
Redundancy feasible		no	no

### Vert-X 16 Table Version C

#### Additional features

- High operating speed

#### Additional options

- Operating temperature -40 ... + 125°C
- Incremental resolution 128 / 64 or 32ppr programmable (Standard 256ppr)

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**Vert-X 16**  
**Ordering code**  
**Version C**

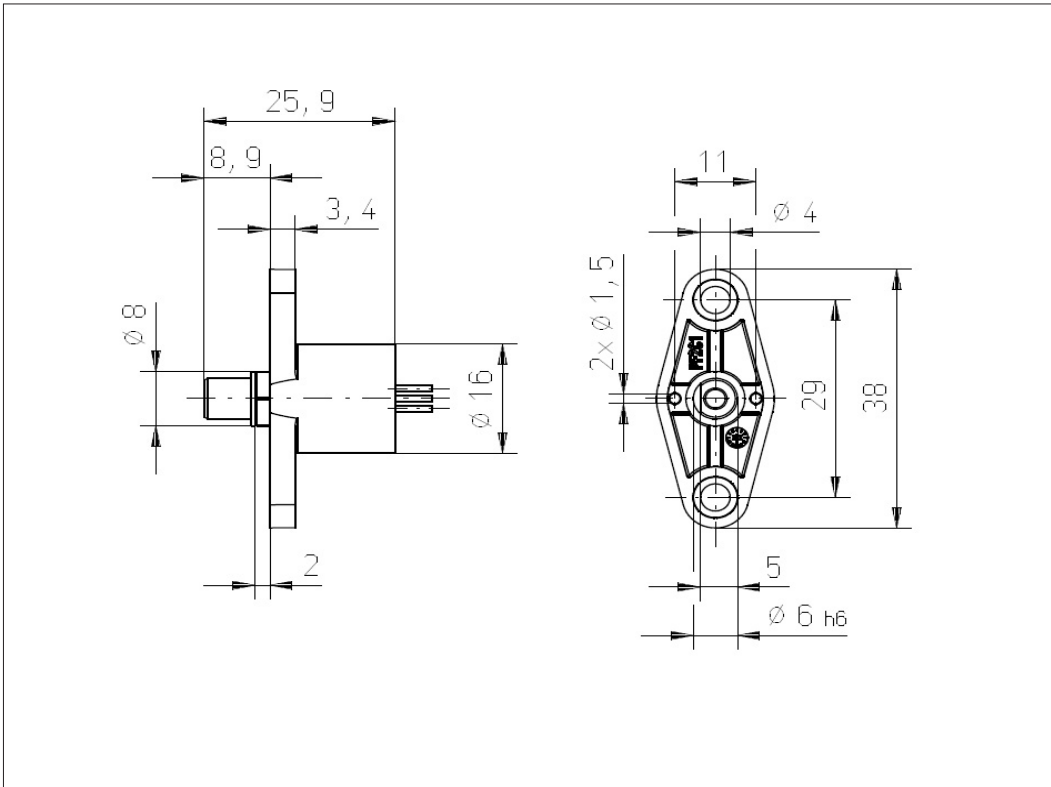
										<b>Power supply voltage</b>			
										2	Standard: 5VDC		
										<b>Output signal</b>			
										6	Standard: SSI		
										7	Standard: Incremental A,B,Z		
										<b>Output characteristics</b>			
										1	Standard: Positive gradient CW		
										2	Optional: Positive gradient CCW (only SSI)		
										<b>Electrical connection</b>			
										1	Standard: Ribbon cable 6pol		
										9	Optional: Special cable; special wires		
										<b>Length of wires / ribbon cable</b>			
										01	Optional: 10cm		
										02	Standard: 20cm		
										03	Optional: 30cm		
										04	Optional: 40cm		
										05	Optional: 50cm		
										99	Optional: Special length		
Vert-X	1	6	0	1	6	3	6	2	6	1	1	0	2
										<b>Electrical angle</b>			
										36	Standard: Electrical angle 360°		
										<b>Sensor principle</b>			
										6	C		
										<b>Mechanical version</b>			
										1601	Standard: 6mm shaft D-shape ; IP54		
										1631	Standard: 6mm shaft D-shape ; IP65		
										1699	Optional: Special shaft		

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