



## Vert-X 21

### Applications

- Joysticks / Master switches
- Valve controls
- Inclinometer

### Features

- Compatible to the potentiometers of the PL300-family
- Compact dimensions
- Contactless measuring method
- Long life
- High accuracy of measurement
- Use in cramped installation conditions

### Options

- Special electrical angle
- Output signal X ... Y% UB
- Custom shaft design
- Custom wires

Version		B
<b>Electrical Data</b>		
Measuring range	°	0 ... 360
Independent linearity		see table B
Max. Hysteresis		see table B
Resolution		see table B
Max. Repeatability		see table B
Sample rate		see table B
System propagation delay		see table B
Max. temperature coefficient of the output signal ppm/°K		50
Min. life (electrical)	years	10
Power supply voltage	VDC	5 (±10 %)
Current consumption without load, typical		see table B
Min. Ohmic load at output		see table B
Max. Capacitive load at output		see table B
PWM frequency		see table B
Reverse polarity protection of power supply		see table B
Electrical connection		see table B
<b>Mechanical Data</b>		
Mechanical measuring range	°	360 (continuous)
Max. Torque at IP54 / IP65	Ncm	0.5 / 3
Max. rotating speed	rpm	6000
Min. life (mechanical)	movements	360 Mio.
Max. permitted axial shaft load	N	5
Max. permitted radial shaft load	N	5
Operating	°C	-40 ... +125
Storage temperature	°C	-40 ... +125
Protection class		IP54 / IP65
<b>Standards</b>		
EN 55022 Classe B, Emission radiated (30... 230 MHz)		max. 30 dB(µV/m)
EN 55022 Classe B, Emission radiated (230...1000MHz)		max. 37 dB(µV/m)
EN 61000-4-2, ESD on housing and connections (contact / air)		4 / 8 kV
EN 61000-4-3, Immission HF radiated (80... 1000 MHz)		30 V/m
EN 61000-4-4, Burst (on supply- / signal lines)		1 / 0.5 kV
EN 61000-4-5, Surge (on supply- / signal lines)		-
EN 61000-4-6, Immission HF conducted (0.15...80MHz)		10 Vemk
EN 61000-4-8, Immission magnetic field (50Hz)		30 A/m
IEC 60393-1 Insulating resistance (500VDC, 1bar, 2s)		20 GOhm
IEC 60393-1 Dielectric strength (VAC, 50Hz, 1min, 1bar)		1 kV
IEC 68-2-6 Vibration (Amax = 0.75mm, f = 5 ... 2000 Hz)		20 g
IEC 68-2-27 Shock		50 g

Errors and omissions excepted. Subject to change without notice. State: 23.04.08

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**Vert-X 21  
Table  
Version B**

**Additional features**

- High resolution and accuracy at programmed electrical angle

**Additional options**

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

Interface		10 ... 90% UB	PWM	SPI
		5 ... 95% UB		
Independent linearity	% meas. range	±0.3	±0.3	±0.3
Max. Hysteresis	°	0.5	0.5	0.5
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	Wires
Cross section of single wires	mm <sup>2</sup>	0.25 (AWG24)	0.25 (AWG24)	0.25 (AWG24)
Redundancy feasible		yes	yes	no

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**Vert-X 21**  
**Ordering code**  
**Version B**

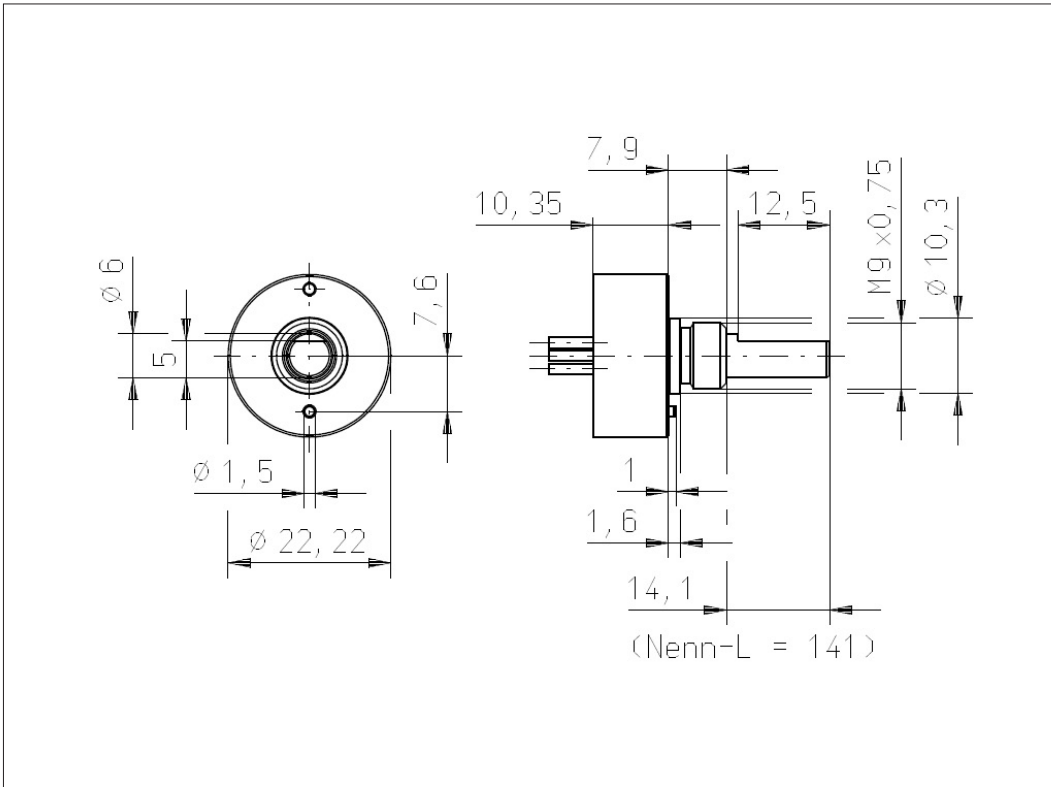
Vert-X	2	1	1	2	a	7	3	6	2	2	1	2	0	2
	<b>Power supply voltage</b>													
	2 Standard: 5VDC													
	<b>Output signal</b>													
	2 Standard: 10% ... 90% of power supply													
	3 Optional: x% ... y% of power supply (within 5 ... 95%)													
	4 Standard: PWM													
	8 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>														
2 Standard: Wires 3pol (not SPI)														
3 Standard: Wires 5pol / 6pol														
9 Optional: Special cable; special wires														
<b>Length of wires</b>														
01 Optional: 10cm														
02 Standard: 20cm														
03 Optional: 30cm														
04 Optional: 40cm														
05 Optional: 50cm														
99 Optional: Special length														
<b>Electrical angle</b>														
36 Standard: Electrical angle 360°														
xx Optional: 10 to 35; Declaration in 10° steps														
99 Optional: Special angle														
<b>Sensor principle</b>														
7 B														
<b>Protection class</b>														
a Standard: IP54														
b Optional: IP65														
<b>Shaft</b>														
0 Standard: 6mm shaft slotted / nominal length 14.1mm														
1 Standard: 6mm shaft D-shape / nominal length 14.1mm														
2 Standard: 3.175mm shaft slotted / nominal length 11.15mm														
9 Optional: Special shaft														
<b>Housing</b>														
211 Standard: Servo mount size 9														
212 Standard: Bushing M9 x 0.75 with pilot diameter														
219 Optional: Special housing														

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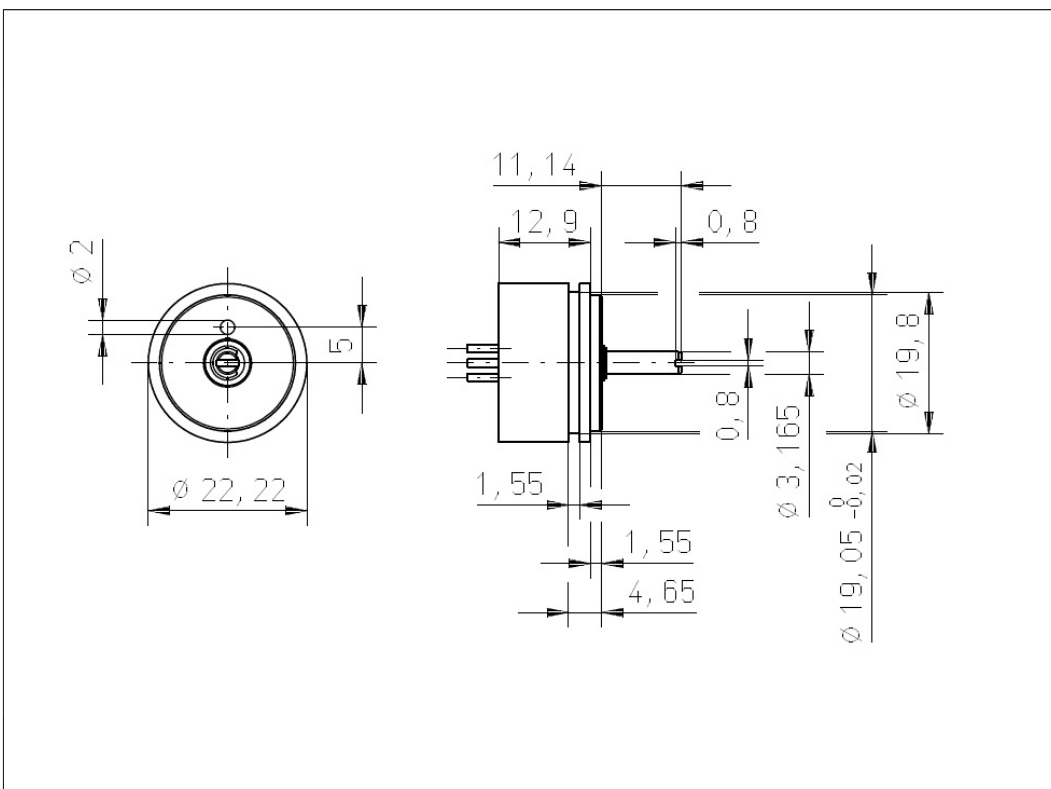
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Vert-X 2121



Vert-X 2112



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