



## Vert-X 28 - 24V / 4 - 20mA

### Applications

- Harvester
- Fork-lift
- Operating table
- Hydraulic pump

### Features general

- Compact dimensions
- Contactless measuring method
- Long life
- High accuracy of measurement
- Simple adjustment with elongated holes
- Full resolution and accuracy at programmed electrical angle

### Features MH-C

- Linearity of  $\pm 0.3\%$
- Resolution of 12bit
- Lower price than MH-C2

### Features MH-C2

- Linearity of  $\pm 0.1\%$
- Resolution of 14bit
- Index point(s), sense of rotation and angle settable resp. programmable by customer (optional)

Errors and omissions excepted. Subject to change without notice. State: 27.09.10

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 A company of the Siedle-Group

Sensor principle		MH-C	MH-C2
<b>Electrical data</b>			
Measuring range	°	0 ... 360	0 ... 360
Indep. linearity	% of meas. range	$\pm 0.3$	$\pm 0.1$
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	$\mu\text{s}$	(800)	(800)
System propagation delay slow mode	$\mu\text{s}$	4600	2500
Max. temperature coefficient of the output signal	ppm/°K	100	100
MTTFd / MTBF	years	185/185	147/147
Power supply voltage	VDC	16 ... 35	16 ... 35
Current consumption without load (typ.) fast mode	mA	(19)	(20)
Current consumption without load (typ.) slow mode	mA	14	15
Min. ohmic load at output	kOhm	0 ... 0.5	0 ... 0.5
Max. capacitive load at output	nF	100	100
Reverse polarity protection of power supply		yes	yes
Electrical connection		Cable 3pole	Cable 3pole
Cross section of single wires	mm <sup>2</sup>	0.56 (AWG20)	0.56 (AWG20)
Redundancy feasible		no	no
Electrical connection redundant		-	-
Cross section of single wires redundant	mm <sup>2</sup>	-	-
<b>Mechanical data</b>			
Mechanical range	°	360 (continuous)	360 (continuous)
Protection class		IP54 / IP65	IP54 / IP65
Max. starting torque at specified protection class	Ncm	0.5 / 3	0.5 / 3
Max. rotating speed	rpm	120	120
Min. life	movements	50 Mio.	50 Mio.
Max. permitted axial shaft load	N	20	20
Max. permitted radial shaft load	N	20	20
Operating & storage temperature	°C	-40 ... +85	-40 ... +85
IEC 68-2-6 Vibration (Amax = 0.75mm, f = 5 ... 2000 Hz)	g	20	20
IEC 68-2-27 Shock	g	50	50
<b>Standards</b>			
EN 55022 class B, Emission radiated (30... 230 MHz)	dB( $\mu\text{V}/\text{m}$ )	max. 30	max. 30
EN 55022 class B, Emission radiated (230...1000MHz)	dB( $\mu\text{V}/\text{m}$ )	max. 37	max. 37
EN 61000-4-2, ESD (contact discharge / air discharge)	kV	$\pm 4 / \pm 8$	$\pm 4 / \pm 8$
EN 61000-4-3, Immission HF radiated (80... 1000 MHz)	V/m	30	30
EN 61000-4-4, Burst (on all lines)	kV	$\pm 1$	$\pm 1$
EN 61000-4-5, Surge (lines to ground)	kV	$\pm 1$	$\pm 1$
EN 61000-4-6, Immission HF conducted (0.15...80MHz)	Vemk	10	10
EN 61000-4-8, Immission magnetic field (50Hz)	A/m	30	30
IEC 60393-1 Insulation resistance (500VDC, 1bar, 2s)	GOhm	20	20
IEC 60393-1 Dielectric strength (VAC, 50Hz, 1min, 1bar)	kV	1	1



## Vert-X 28 - 24V / 4 - 20mA Ordering code

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

Output characteristics		Electrical connection	
Positive gradient CW	Standard 1	1 Standard	Round cable 3pole
Positive gradient CCW	Optional 2	2 Optional	Wires 4pole
Redundant, positive gradient CW	Optional 3	3 Optional	Wires 5pole
Redundant, positive gradient CCW	Optional 4	4 Optional	Wires 6pole
Redundant, crossed signal curves	Optional 5	9 Optional	Special cable / wires
Positive gradient CW with 1 switch output*	Optional A	<b>Length of wires</b>	
Positive gradient CCW with 1 switch output*	Optional B	01 Optional	10cm
Positive gradient CW with 2 switch outputs*	Optional C	03 Optional	30cm
Positive gradient CCW with 2 switch outputs*	Optional D	05 Standard	50cm
Sense of rotation settable	Optional E	99 Optional	Special length
Zero point & sense of rotation settable	Optional F	<b>Length of cable</b>	
Middle point & sense of rotation settable	Optional G	02 Standard	1.0m
Start + end point & sense of rotation settable	Optional H	06 Optional	3.0m
Programmable with Vert-X EasyAdapt	Optional P	10 Optional	5.0m
		99 Optional	Special length
<b>Output signal</b>			
4mA ... 20mA	Standard 2		
<b>Power supply voltage</b>			
24VDC	Standard 6		
Vert-X <b>2 8 0 1 7 3 6 6 2 1 1 0 2</b>			
<b>Electrical angle</b>			
36	Standard	Electrical angle 360°	
xx	Optional	03 to 35; Declaration in 10° steps	
99	Optional	Special angle	
<b>Sensor principle</b>			
7	MH-C		
8	MH-C2		
<b>Mechanical version</b>			
2801	Standard	6mm shaft D-shape; IP54	
2821	Optional	Push on coupling; IP54	
2831	Standard	6mm shaft D-shape; IP65	
2841	Optional	Push on coupling; IP65	
2899	Optional	Special shaft	

	MH-C	MH-C2
Custom shaft design	X	X
Custom cable / wires	X	X
Sample rate in fast mode	X	X
Switch functions TTL (max. 2)	X	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

## Options (on request)

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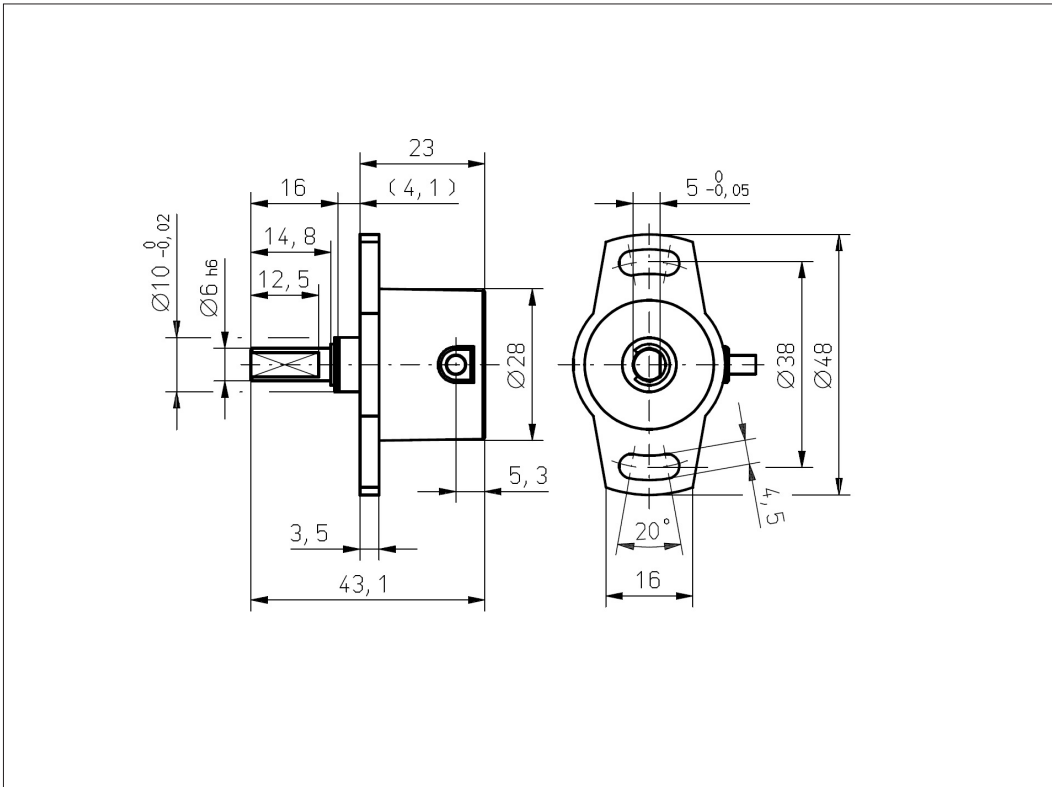
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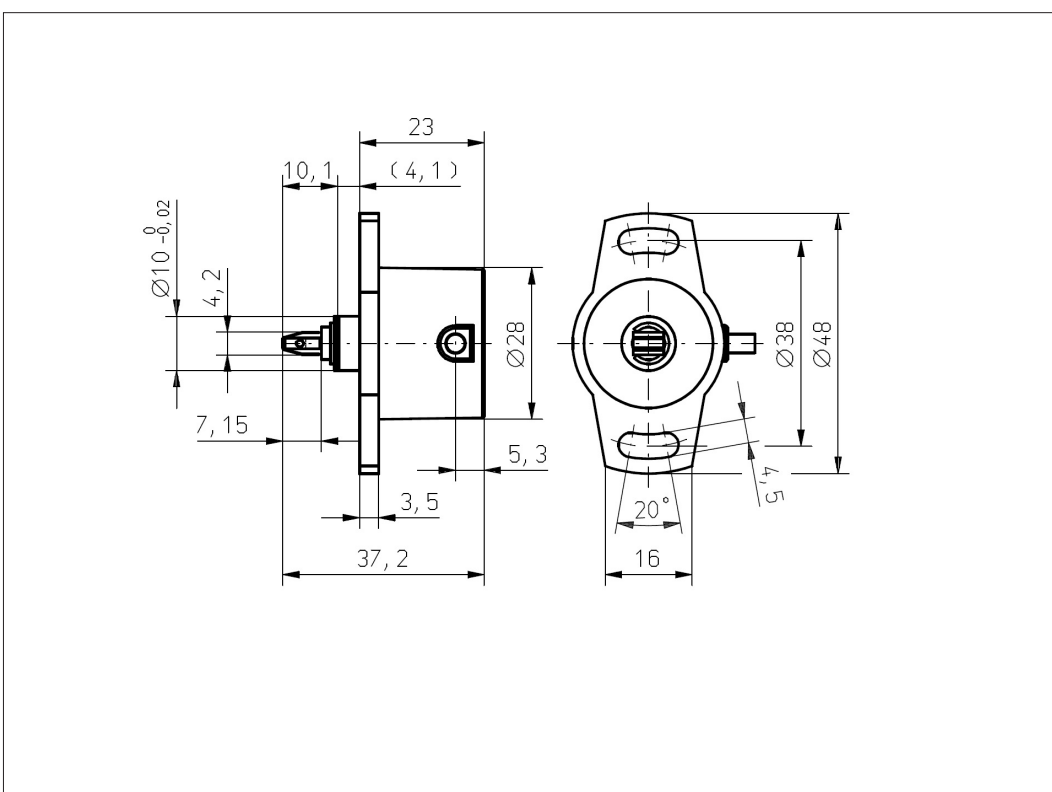
**Vert-X 2801**  
**Vert-X 2831**

- Accessories (incl.)**
- None



**Vert-X 2821**  
**Vert-X 2841**

- Accessories (incl.)**
- None



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