



Vert-X 48E - 24V / 4 - 20mA

Applications

- Mining machine
- Agricultural machine
- Container side loader

Features general

- High protection class IP68 / IP69K
- Very robust design
- 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
- 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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 A company of the Siedle-Group

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	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
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 (s = shielded)		Cable 3pole, s	Cable 3pole, s
Cross section of single wires	mm ²	0.56 (AWG20)	0.56 (AWG20)
Redundancy feasible		yes	no
Electrical connection redundant (s = shielded)		Cable 6pole, s	-
Cross section of single wires redundant	mm ²	0.25 (AWG24)	-
Mechanical data			
Mechanical range	°	360 (continuous)	360 (continuous)
Protection class		IP68 / IP69K	IP68 / IP69K
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...230 MHz)	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, Immision 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, Immision HF conducted (0.15...80MHz)	Vemk	12	12
EN 61000-4-8, Immision 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



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Ordering code

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

Output characteristics		Electrical connection	
Positive gradient CW	Standard 1	4 Standard	Round cable 3pole
Positive gradient CCW	Optional 2	6 Optional	Round cable 6pole
Redundant, positive gradient CW	Optional 3	9 Optional	Special cable
Redundant, positive gradient CCW	Optional 4		
Redundant, crossed signal curves	Optional 5		
Positive gradient CW with 1 switch output*	Optional A		
Positive gradient CCW with 1 switch output*	Optional B		
Positive gradient CW with 2 switch outputs*	Optional C		
Positive gradient CCW with 2 switch outputs*	Optional D		
Sense of rotation settable	Optional E		
Zero point & sense of rotation settable	Optional F		
Middle point & sense of rotation settable	Optional G		
Start + end point & sense of rotation settable	Optional H		
Programmable with Vert-X EasyAdapt	Optional P		
		Length of cable	
		02 Standard	1.0m
		06 Optional	3.0m
		10 Optional	5.0m
		99 Optional	Special length
Output signal			
4mA ... 20mA	Standard 5		
Power supply voltage			
24VDC	Standard 1		
Vert-X	4 8 E 8	7 3 6	1 5 1
		4 0 2	
		Electrical angle	
		36 Standard	Electrical angle 360°
		xx Optional	03 to 35 ; Declaration in 10° steps
		99 Optional	Special angle
		Sensor principle	
		7 MH-C	
		8 MH-C2	
		Mechanical version	
		48E5 Optional	Magnetic actuator type 5
		48E6 Optional	Magnetic actuator type 6
		48E7 Optional	Magnetic actuator type 7
		48E8 Standard	Magnetic actuator type 8
		48E9 Optional	Special housing ; special magnetic actuator

	MH-C	MH-C2
Custom magnetic actuator	X	X
Custom modification of the housing	X	X
Custom cable	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
Extended operating range, axial (without safety flag)	X	X

Options (on request)

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Vert-X 48E5

Accessories (incl.)

- None

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

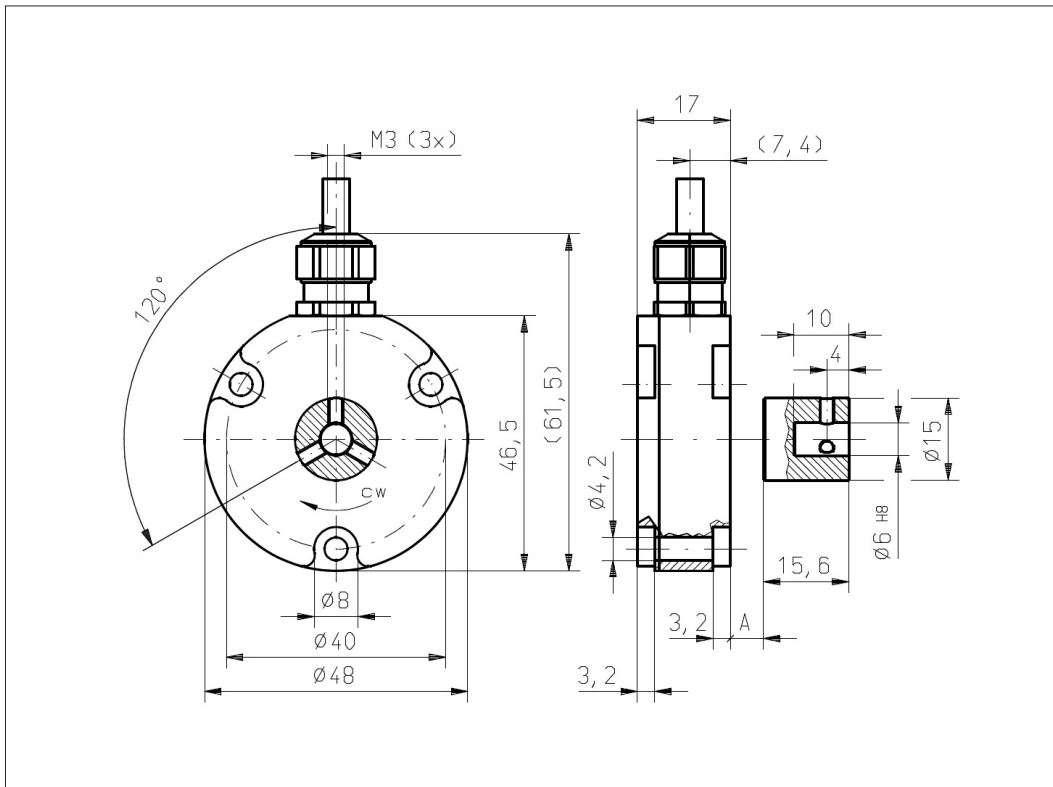
Single	0 ... 6.7mm
Redundant	0 ... 6.2mm

Extended without safety flag (Optional)

Single	0 ... 10.5mm
Redundant	0 ... 10.0mm

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 48E6

Accessories (incl.)

- None

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

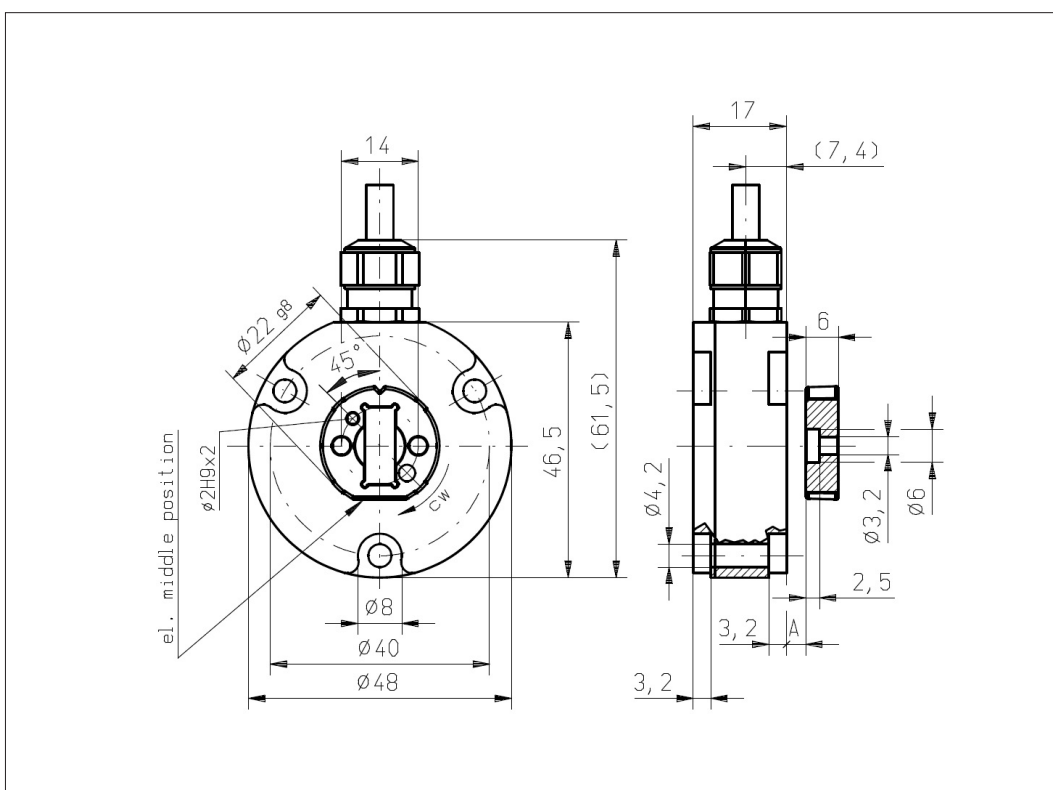
Single	0 ... 5.5mm
Redundant	0 ... 5.0mm

Extended without safety flag (Optional)

Single	0 ... 8.9mm
Redundant	0 ... 8.4mm

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Vert-X 48E7

Accessories (incl.)

- None

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

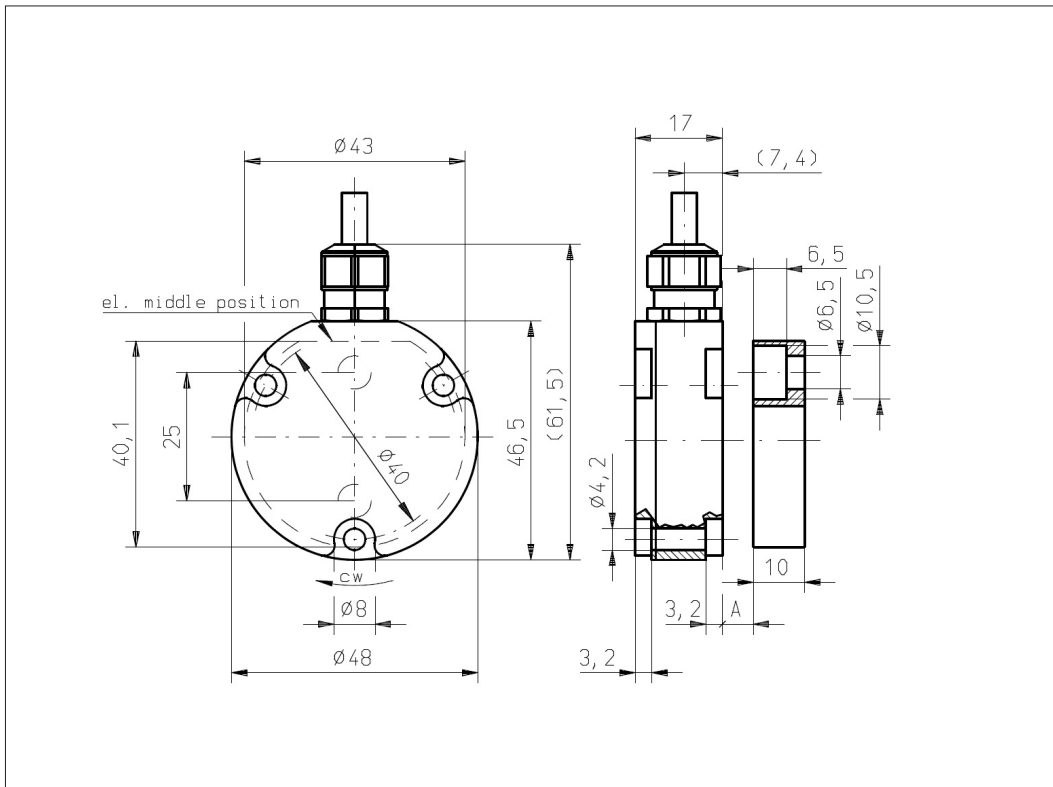
Single	0 ... 13.8mm
Redundant	0 ... 13.3mm

Extended without safety flag (Optional)

Single	0 ... 20.2mm
Redundant	0 ... 19.7mm

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 48E8

Accessories (incl.)

- None

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

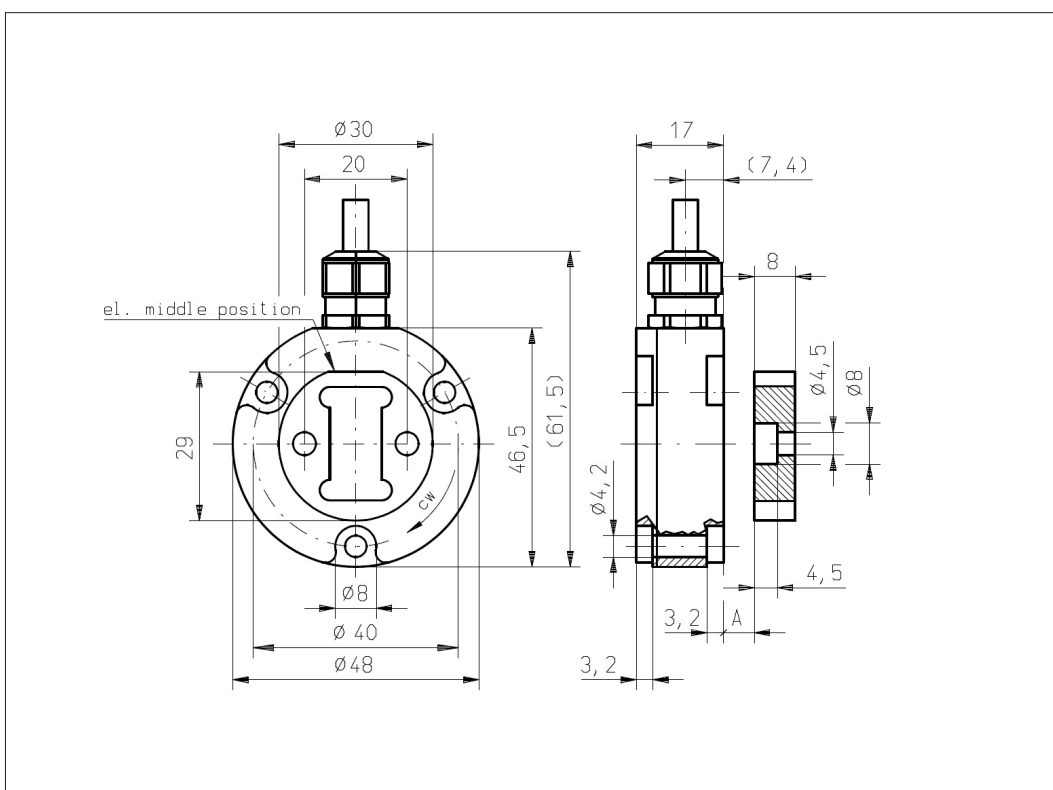
Single	0 ... 13.3mm
Redundant	0 ... 12.8mm

Extended without safety flag (Optional)

Single	0 ... 19.2mm
Redundant	0 ... 18.7mm

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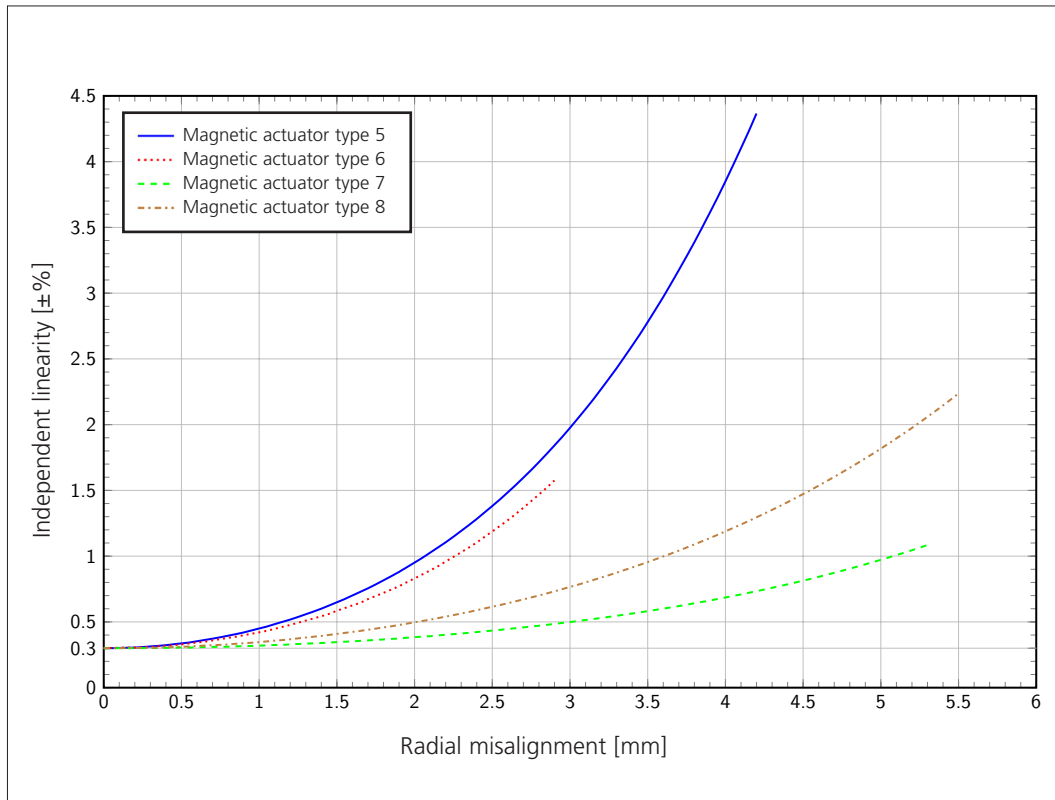
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Vert-X 48E

Indep. linearity with radial misalignment (@360°)



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