



## Vert-X 37E - 5V / 10...90% Ub

### Applications

- Agricultural machines
- Construction machines
- Forest machines
- Special purpose vehicles

### Features general

- High protection class IP68
- 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

### Features MH-C

- Resolution of 12bit
- 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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**CONTELEC**  
 A company of the Siedle-Group

| Sensor principle                                        |                  | MH-C             | MH-C2            |
|---------------------------------------------------------|------------------|------------------|------------------|
| <b>Electrical data</b>                                  |                  |                  |                  |
| Measuring range                                         | °                | 0 ... 360        | 0 ... 360        |
| Indep. linearity (without misalignment)                 | % of meas. range | ±0.3             | ±0.3             |
| Indep. linearity (with allowed misalignment @ 360°)     | % of 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)              |
| 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           | 50               | 50               |
| MTTFd / MTBF                                            | years            | 668 / 668        | 308 / 308        |
| Power supply voltage                                    | VDC              | 5 (±10%)         | 5 (±10%)         |
| Current consumption without load (typ.) fast mode       | mA               | (14)             | (15)             |
| Current consumption without load (typ.) slow mode       | mA               | 9                | 10               |
| Min. ohmic load at output                               | kOhm             | 10               | 10               |
| Max. capacitive load at output                          | nF               | 100              | 100              |
| Reverse polarity protection of power supply             |                  | yes              | no               |
| Electrical connection axial                             |                  | Wires (3x)       | Wires (3x)       |
| Cross section of single wires                           | mm <sup>2</sup>  | 0.56 (AWG20)     | 0.56 (AWG20)     |
| Electrical connection radial                            |                  | Cable 3pole      | Cable 3pole      |
| Cross section of single wires                           | mm <sup>2</sup>  | 0.56 (AWG20)     | 0.56 (AWG20)     |
| Redundancy feasible                                     |                  | yes              | yes              |
| Electrical connection redundant axial                   |                  | Wires (6x)       | Wires (6x)       |
| Cross section of single wires redundant                 | mm <sup>2</sup>  | 0.56 (AWG20)     | 0.56 (AWG20)     |
| Electrical connection redundant radial                  |                  | Cable 6pole      | Cable 6pole      |
| Cross section of single wires redundant                 | mm <sup>2</sup>  | 0.25 (AWG24)     | 0.25 (AWG24)     |
| <b>Mechanical data</b>                                  |                  |                  |                  |
| Mechanical range                                        | °                | 360 (continuous) | 360 (continuous) |
| Protection class                                        |                  | IP68             | IP68             |
| Min. life                                               | movements        | no limitation    | no limitation    |
| Operating & storage temperature (with wires)            | °C               | -40 ... +125     | -40 ... +85      |
| Operating & storage temperature (with round cable)      | °C               | -40 ... +85      | -40 ... +85      |
| IEC 68-2-6 Vibration (Amax = 0.75mm, f = 5 ... 2000 Hz) | g                | 50               | 50               |
| IEC 68-2-27 Shock                                       | g                | 200              | 200              |
| <b>Standards</b>                                        |                  |                  |                  |
| 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 61000-4-2, ESD (contact discharge / air discharge)   | kV               | ±4 / ±8          | ±4 / ±8          |
| EN 61000-4-3, Immission HF radiated (80... 1000 MHz)    | 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, 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 37E - 5V / 10...90% Ub**  
**Ordering code**

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

| Output characteristics                         |                 | Electrical connection / axial                  |                               |
|------------------------------------------------|-----------------|------------------------------------------------|-------------------------------|
| Positive gradient CW                           | Standard 1      | 3 Optional                                     | Wires 4pole                   |
| Positive gradient CCW                          | Optional 2      | 5 Standard                                     | Wires 3pole                   |
| Redundant, positive gradient CW                | Optional 3      | 7 Optional                                     | Wires 5pole / 6pole           |
| Redundant, positive gradient CCW               | Optional 4      | 9 Optional                                     | Special cable ; special wires |
| Redundant, crossed signal curves               | Optional 5      | <b>Electrical connection / radial</b>          |                               |
| Positive gradient CW with 1 switch output*     | Optional A      | 4 Standard                                     | Round cable 3pole             |
| Positive gradient CCW with 1 switch output*    | Optional B      | 6 Optional                                     | Round cable 6pole             |
| Positive gradient CW with 2 switch outputs*    | Optional C      | 9 Optional                                     | Special cable ; special wires |
| Positive gradient CCW with 2 switch outputs*   | Optional D      | <b>Length of wires</b>                         |                               |
| Sense of rotation settable                     | Optional E      | 01 Optional                                    | 10cm                          |
| Zero point & sense of rotation settable        | Optional F      | 03 Optional                                    | 30cm                          |
| Middle point & sense of rotation settable      | Optional G      | 05 Standard                                    | 50cm                          |
| Start + end point & sense of rotation settable | Optional H      | 99 Optional                                    | Special length                |
| Programmable with Vert-X EasyAdapt             | Optional P      | <b>Length of cable</b>                         |                               |
|                                                |                 | 02 Standard                                    | 1.0m                          |
|                                                |                 | 06 Optional                                    | 3.0m                          |
|                                                |                 | 10 Optional                                    | 5.0m                          |
|                                                |                 | 99 Optional                                    | Special length                |
|                                                |                 | <b>Output signal</b>                           |                               |
| 10% ... 90% Ub                                 | Standard 2      |                                                |                               |
| x% ... y% Ub (within 5 ... 95%)                | Optional 3      |                                                |                               |
|                                                |                 | <b>Power supply voltage</b>                    |                               |
|                                                | 5VDC Standard 2 |                                                |                               |
| Vert-X <b>3 7 E 4 7 3 6 2 2 1 5 0 5</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>                      |                 |                                                |                               |
| 37E1                                           | Optional        | Servo mount size 13 ; magnetic actuator type 1 |                               |
| 37E2                                           | Optional        | Servo mount size 13 ; magnetic actuator type 2 |                               |
| 37E4                                           | Standard        | Servo mount size 13 ; magnetic actuator type 4 |                               |
| 37E9                                           | Optional        | Special housing ; special magnetic actuator    |                               |

|                                                                                 | MH-C | MH-C2 |
|---------------------------------------------------------------------------------|------|-------|
| Custom magnetic actuator                                                        | X    | X     |
| Custom modification of the housing                                              | X    | X     |
| Custom cable / wires                                                            | X    | X     |
| Interface x% ... y% Ub (within 5% ... 95% Ub)                                   | 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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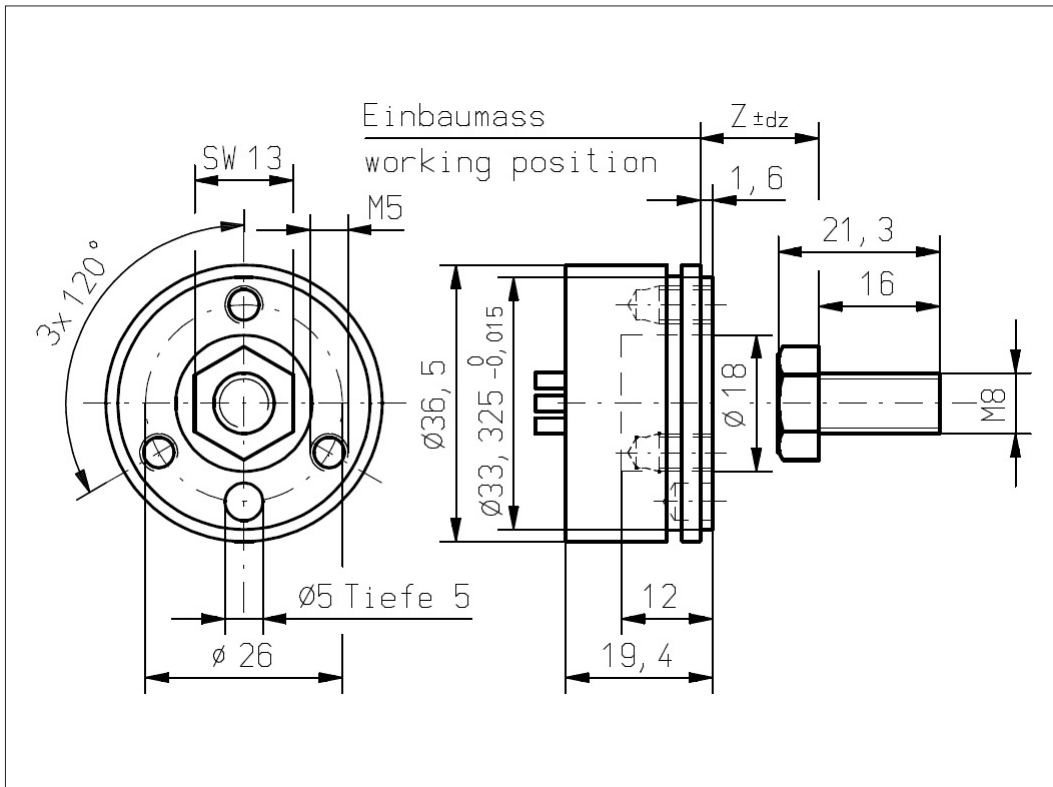
**Vert-X 37E4 xxx xxx 5xx**  
**Vert-X 37E4 xxx xxx 7xx**

**Accessoires (incl.)**

- 1x Fixation clip
- 2x Slotted cylinder head screw M5x12

**Working position (Z) and max. permitted misalignment of the magnetic actuator**

see mounting information



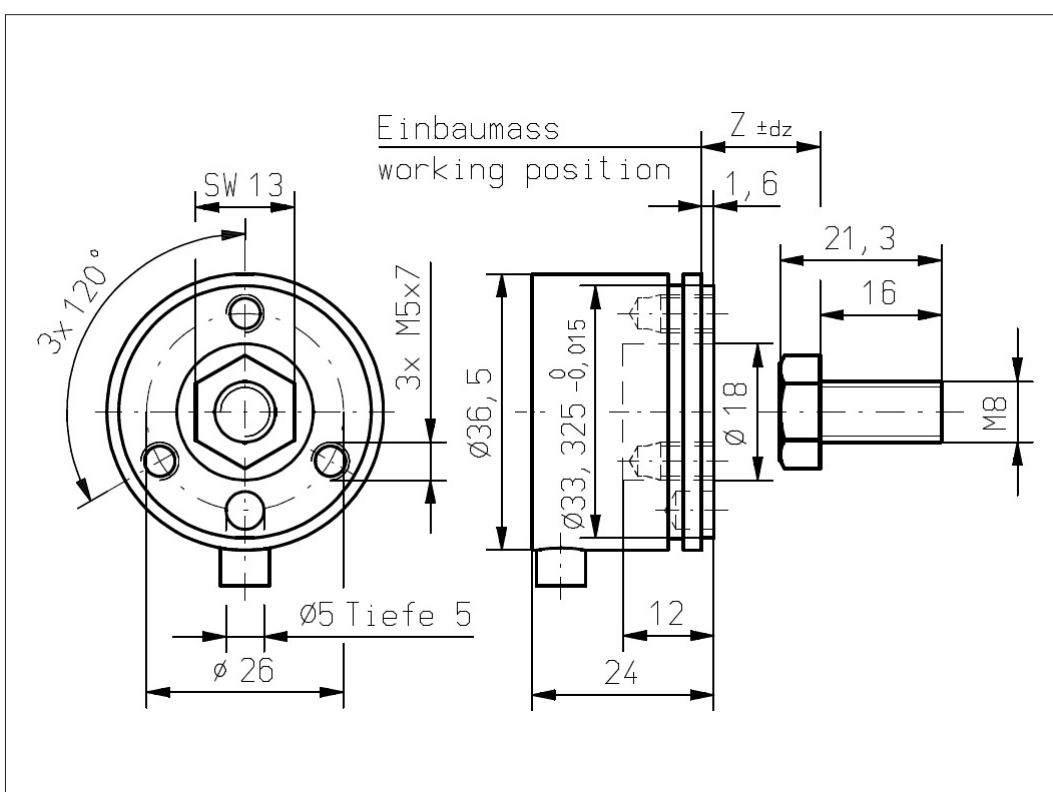
**Vert-X 37E4 xxx xxx 4xx**  
**Vert-X 37E4 xxx xxx 6xx**

**Accessoires (incl.)**

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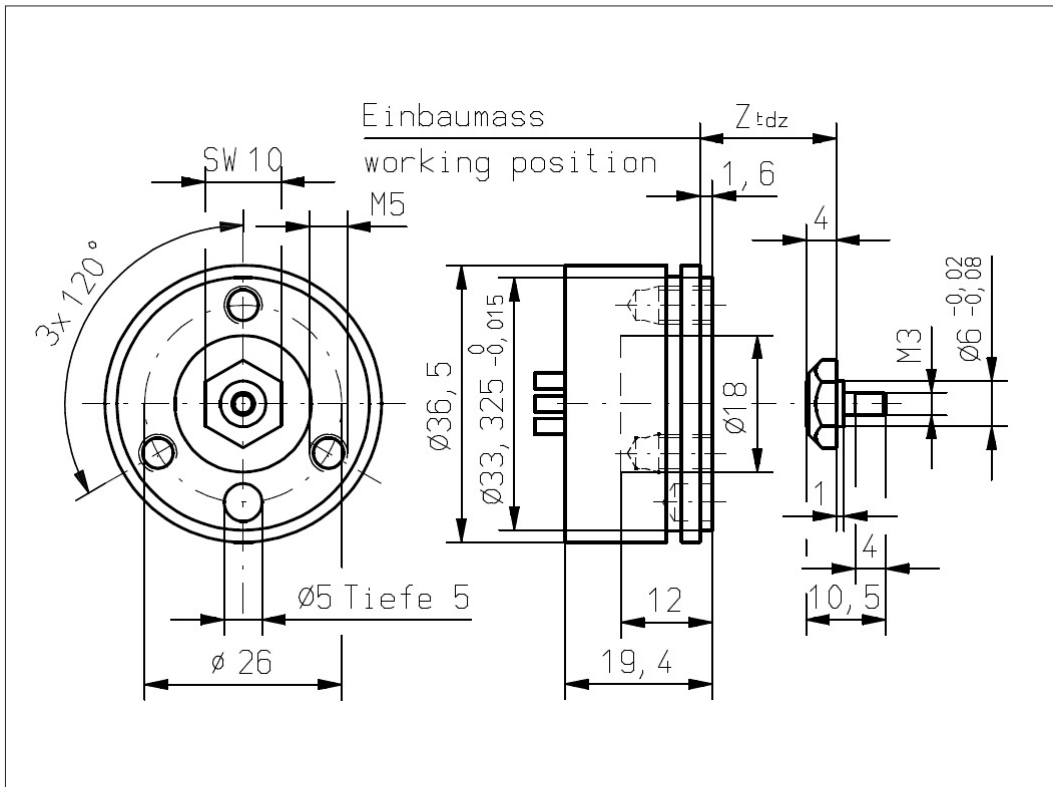
**Vert-X 37E1 xxx xxx 5xx**  
**Vert-X 37E1 xxx xxx 7xx**

**Accessoires (incl.)**

- 1x Fixation clip
- 2x Slotted cylinder head screw M5x12

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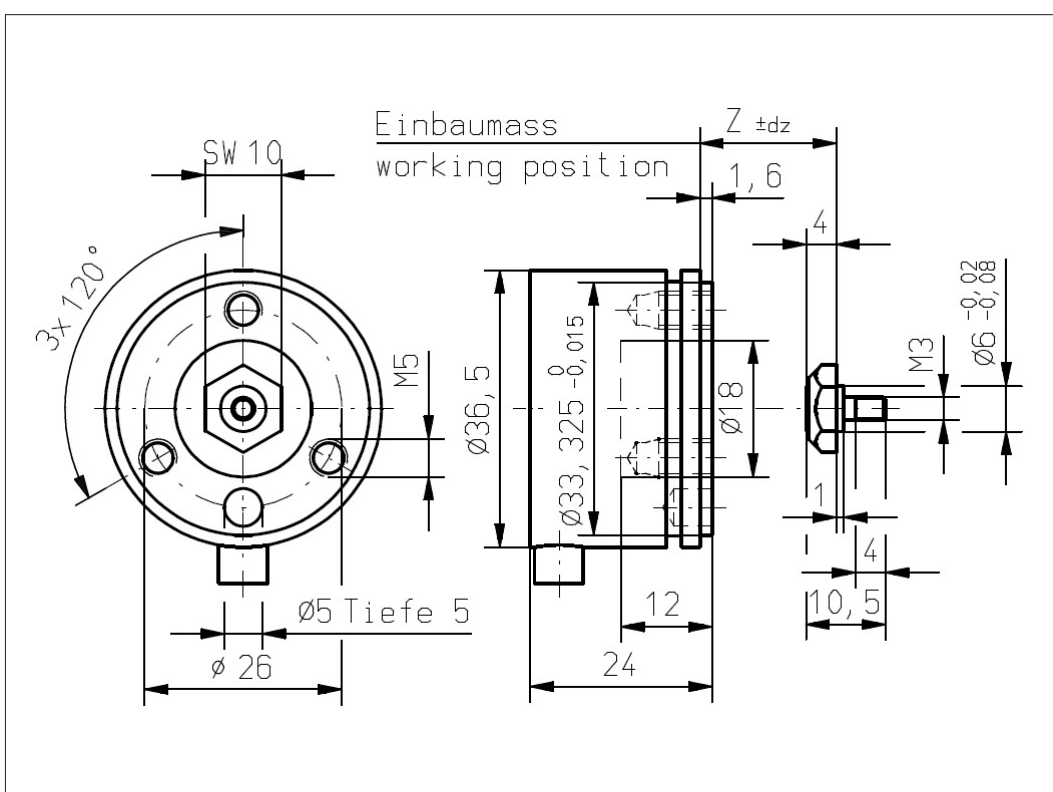
**Vert-X 37E1 xxx xxx 4xx**  
**Vert-X 37E1 xxx xxx 6xx**

**Accessoires (incl.)**

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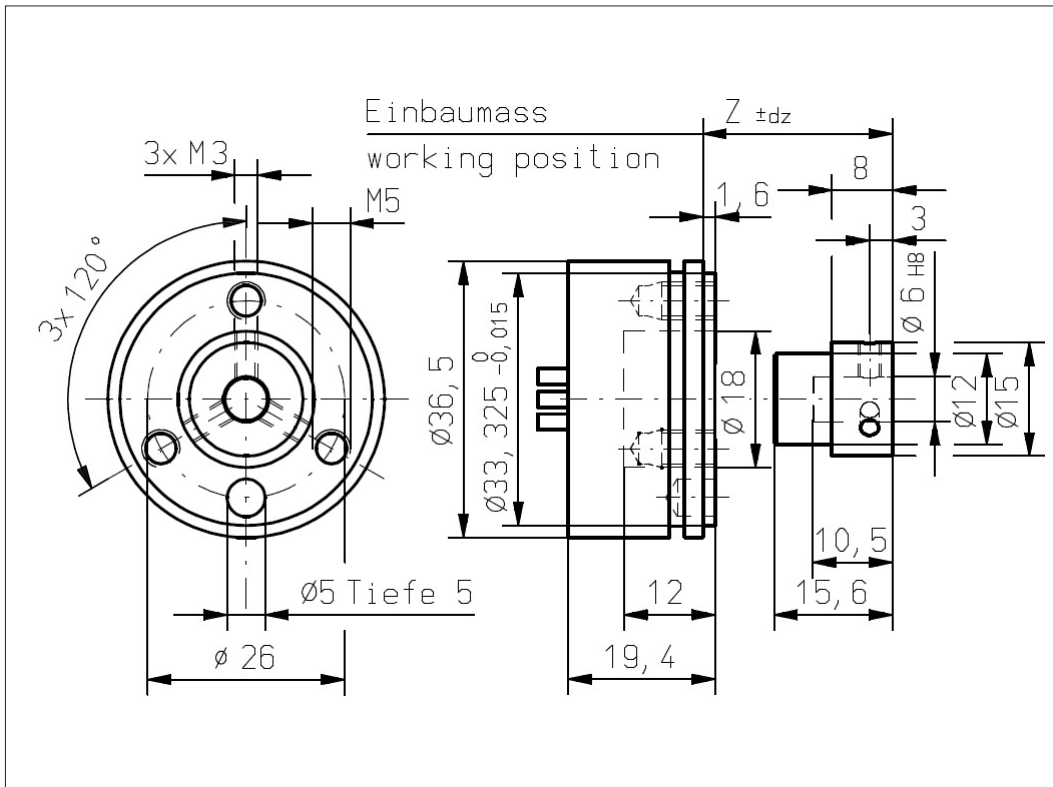
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**Vert-X 37E2 xxx xxx 7xx**

**Accessoires (incl.)**

- 1x Fixation clip
- 2x Slotted cylinder head screw M5x12

**Working position (Z) and max. permitted misalignment of the magnetic actuator**

see mounting information



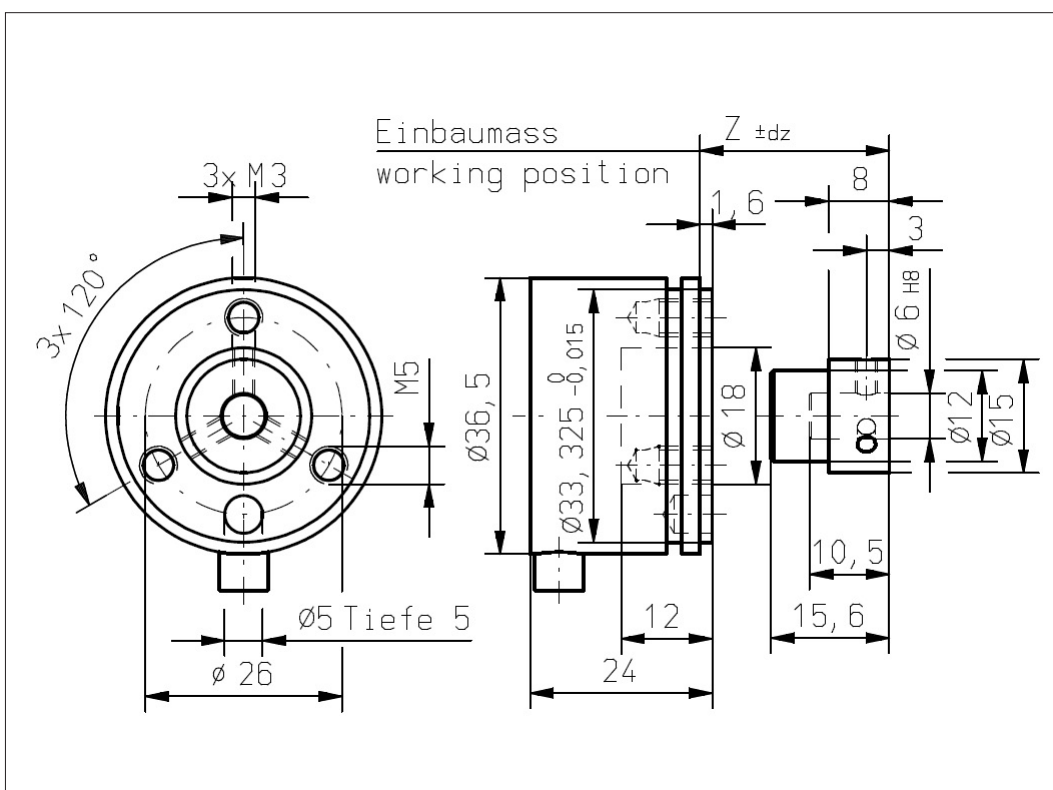
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**Vert-X 37E2 xxx xxx 6xx**

**Accessoires (incl.)**

- 1x Fixation clip
- 2x Slotted cylinder head screw M5x12

**Working position (Z) and max. permitted misalignment of the magnetic actuator**

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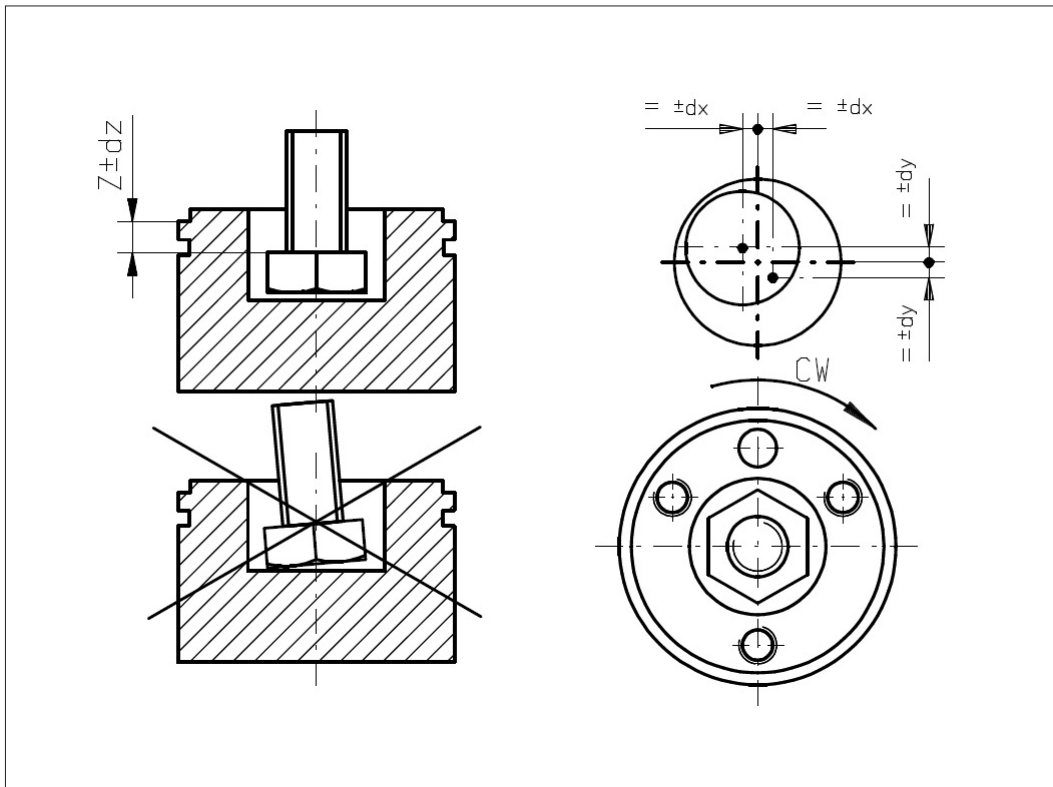
**Vert-X 37E4**  
**Mounting information**

**Working position (Z)**

|                 |        |
|-----------------|--------|
| MH-C            | 3.85mm |
| MH-C redundant  | 4.35mm |
| MH-C2           | 3.85mm |
| MH-C2 redundant | 4.35mm |

**Max. permitted misalignment of the magnetic actuator**

|    |         |
|----|---------|
| dx | ±0.25mm |
| dy | ±0.25mm |
| dz | ±0.5mm  |



**Vert-X 37E1**  
**Mounting information**

**Working position (Z)**

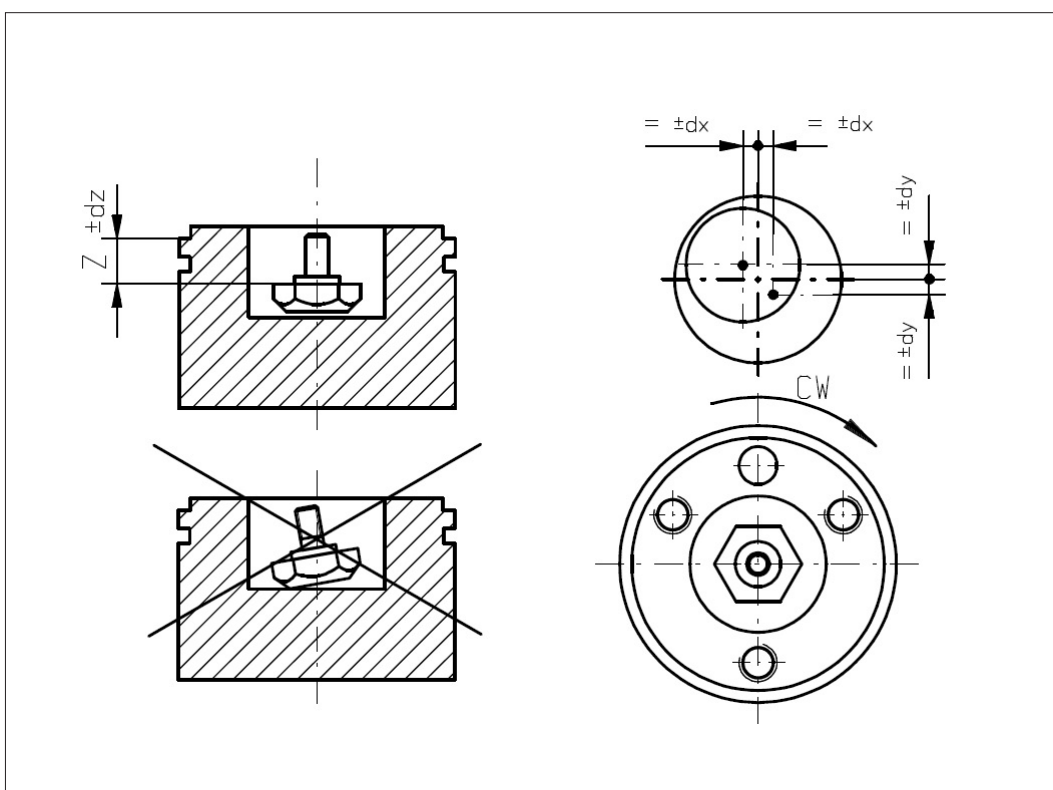
|                 |        |
|-----------------|--------|
| MH-C            | 4.95mm |
| MH-C redundant  | 5.45mm |
| MH-C2           | 4.95mm |
| MH-C2 redundant | 5.45mm |

**Max. permitted misalignment of the magnetic actuator**

|    |         |
|----|---------|
| dx | ±0.25mm |
| dy | ±0.25mm |
| dz | ±0.5mm  |

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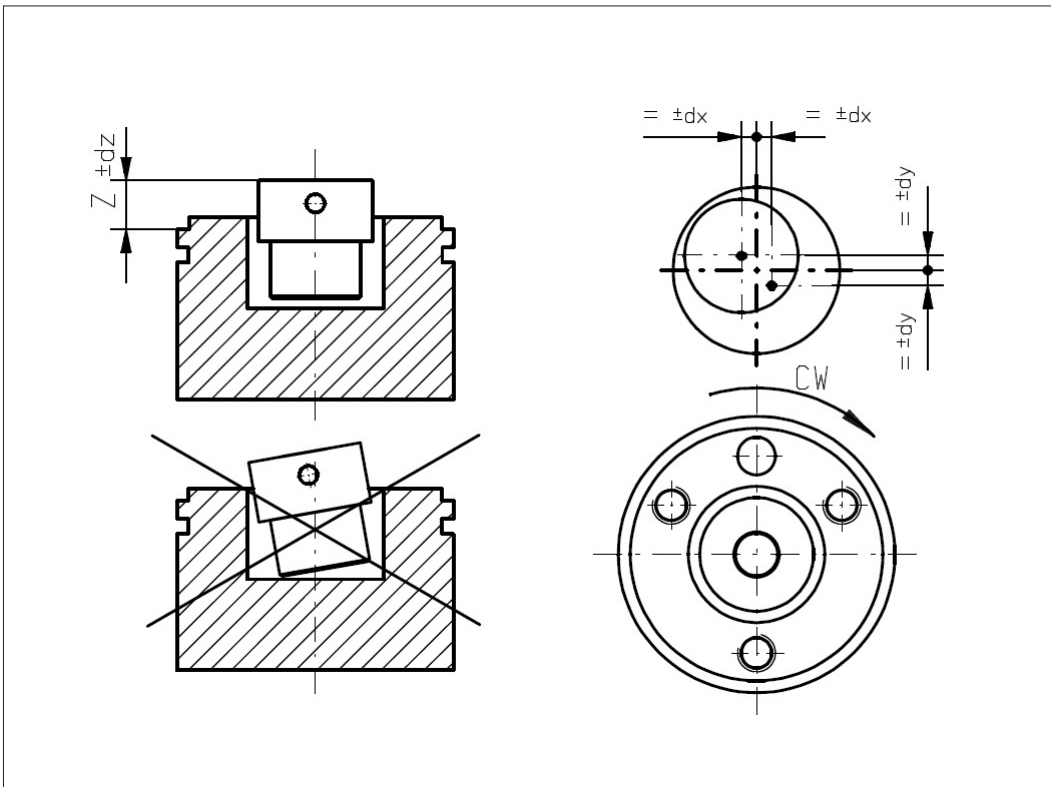
**Vert-X 37E2**  
**Mounting information**

**Working position (Z)**

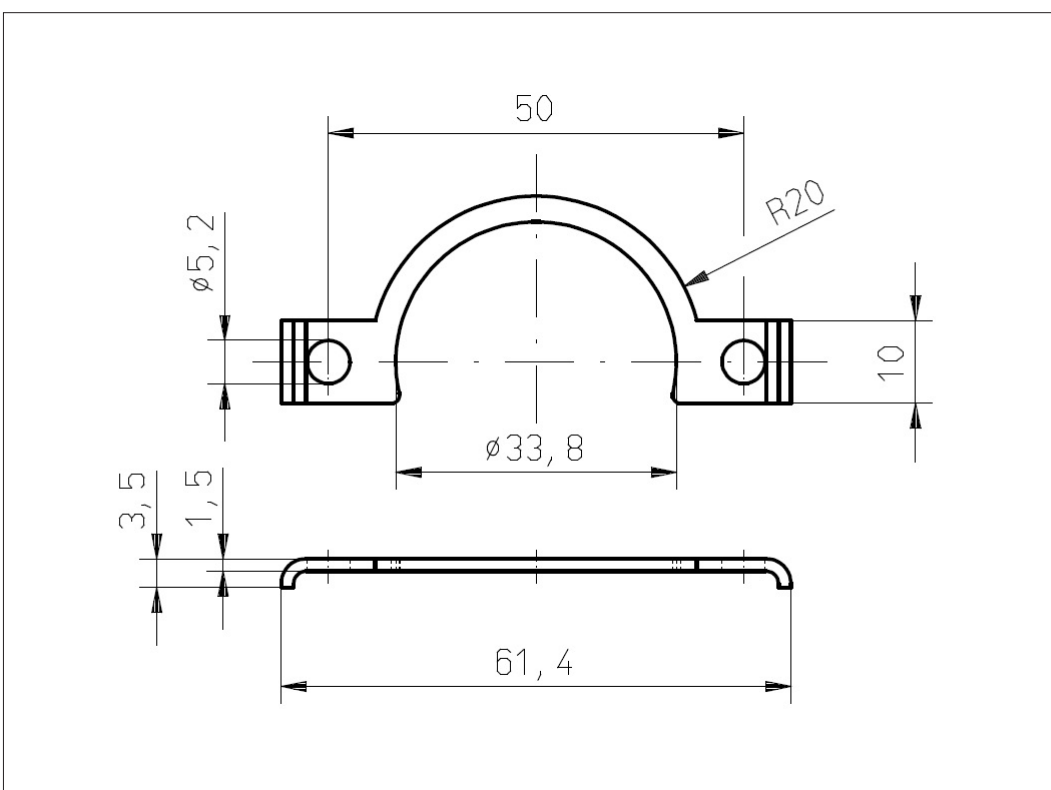
|                 |        |
|-----------------|--------|
| MH-C            | 6.45mm |
| MH-C redundant  | 5.95mm |
| MH-C2           | 6.45mm |
| MH-C2 redundant | 5.95mm |

**Max. permitted misalignment of the magnetic actuator**

|    |         |
|----|---------|
| dx | ±0.25mm |
| dy | ±0.25mm |
| dz | ±0.5mm  |



**Vert-X 37E**  
**Accessoires**  
Fixation clip



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