DATA SHEET

FHKU G1/4” PEEK
Part number: 938-12XX/P014
General Description

The FHKU Flowmeter is a general-purpose device; its working range can be individually defined according to its nozzle size. It is employed for measuring, regulating or metering and guarantees the most precise measurement of fluid quantities. In addition, a pulse generator integrated into the flowmeter guarantees a practically unlimited useful life.

Special features: Able to withstand high temperatures, good resistance to chemicals. Linear inlet and outlet, compact design, great working range, depending on the nozzle diameter. Employed in the semiconductor (wafer polishing) sector due to the high purity of materials used.

Options:
3-pin solenoid socket
Item number: 941-0002/3

Material:
- Housing: PEEK 450G
- Bearing pin: PEEK 450G
- Nozzle: PEEK 450G
- O-ring: FPM (Viton)
- Nozzle: PEEK 450G
- Turbine: PFA 4 /Magnets
- Magnets: Keramik Sr Fe O
- Screw: Inox A2 PT-screws (Phillips cross recessed)

Technical data:
Flow rate: 0.041 - 15 l/min depending on the nozzle diameter
Measuring accuracy: +/- 2.0%
Repetition: < +/- 0.25%
Temperature range: -10°C to +100°C
Pressure range: 20 bar at 20°C
Mounting position: Horizontal recommended
Nose size: Ø 1.0, 1.2, 1.5, 2.0, 2.5, 3.0, 4.0, 5.6 mm

Electrical connection ratings:
- Power supply: 4.5 – 24 VDC
- Consumption: 5 mA to max. 13 mA
- Signal connection: Open collector NPN
- Signal voltage: 0 V GND
- Signal load: max. 20 mA
- Leakage current: max. 10 µA
- Connections: 3-pin AMP 2.8 x 0.8 mm
- Signal: Square-wave output
- Duty Cycle: 50% / ±5%

Approvals / Standards
- EN 50081-1:92, EN 50082-1:97, EN 61000-3-2:00, EN 61000-3-3:95, IEC 61000-6-3:96, IEC 61000-6-1:96, IEC 61000-3-2-00, IEC 61000-3-94 + A1:01

Dimensions in mm:

Options:
- 3-pin solenoid socket
  Item number: 941-0002/3

We reserve the right to make modifications in the interest of technical progress.

Digital AG, Keletinstrasse 31, CH-2563 Ispach / Switzerland, Phone +41 (32) 332 77 77, Fax +41 (32) 332 77 88, www.digmesa.com
**Interface Connection: Examples Open Collector**

- **Simple Circuit**
  - Signal
  - +4.5 - 24 VDC
  - 100nF
  - 4k7
  - 0 VDC

- **TTL Output**
  - Signal
  - +4.5 - 24 VDC
  - 100nF
  - 1N4148
  - 2k2

- **Optocoupler Interface**
  - Signal
  - +4.5 - 24 VDC
  - Rx
  - 0 VDC
  - +5 VDC
  - +12 VDC
  - +24 VDC
  - Rx = 1kΩ
  - Rx = 4.7kΩ
  - Rx = 10kΩ

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Measurement Curve FHKU PVDF 1.00 mm (4 Magnets)

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Medium: Water / max. Pressure: 3.3 bar

The values specified must be considered as approximate values.
The number of pulses per litre may differ depending on medium and installation.
We recommend to calibrate the number of pulses per litre in line with the complete installation.

MEASUREMENT TIPS

- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
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**Medium:** Water / **max. Pressure:** 3.3 bar

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<td>0.1147</td>
<td>2.7205</td>
<td>0.64</td>
</tr>
<tr>
<td>Ø 3.00 mm</td>
<td>1109</td>
<td>0.9018</td>
<td>0.1048</td>
<td>2.8494</td>
<td>0.41</td>
</tr>
<tr>
<td>Ø 4.00 mm</td>
<td>793</td>
<td>1.2610</td>
<td>0.2098</td>
<td>9.2712</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 5.60 mm</td>
<td>511</td>
<td>1.9566</td>
<td>1.7820</td>
<td>10.7990</td>
<td>0.49</td>
</tr>
</tbody>
</table>

The values specified must be considered as approximate values. The number of pulses per litre may differ depending on medium and installation. We recommend to calibrate the number of pulses per litre in line with the complete installation.

Measurement Curve FHKU PVDF 5.60 mm (4 Magnets)

Measurement Tips:
- Ensure that there is no fast-pulmonary movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
- Clean the system at appropriate intervals
- Avoid electrical current peaks
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter
- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
Spare parts:

- Inox A2 PT-screws # 443-0008 (Phillips cross recessed)
- Upper section FHK PEEK # 532-0200
- O-ring FPM (Viton) # 350-0900
- Turbine FT 35 PFA chemie # 527-0202/4
- Lower section FHKU PEEK, bearing pin PEEK, Nozzle PEEK
- Lower section FHKU PEEK Ø 1.00 mm # 513-0033/C10
- Lower section FHKU PEEK Ø 1.20 mm # 513-0033/C12
- Lower section FHKU PEEK Ø 1.50 mm # 513-0033/C15
- Lower section FHKU PEEK Ø 2.00 mm # 513-0033/C20
- Lower section FHKU PEEK Ø 2.50 mm # 513-0033/C25
- Lower section FHKU PEEK Ø 3.00 mm # 513-0033/C30
- Lower section FHKU PEEK Ø 4.00 mm # 513-0033/C40
- Lower section FHKU PEEK Ø 5.60 mm # 513-0033/C56
General Description

The FHKU Flowmeter is a general-purpose device; its working range can be individually defined according to its nozzle size. It is employed for measuring, regulating or metering and guarantees most precise measurement of fluid quantities. In addition, a pulse generator integrated into the flowmeter guarantees a practically unlimited useful life.

**Material:**
- Housing: PVDF
- Bearing pin: PCTFE
- Nozzle: PTFE
- O-ring: FPM (Viton)
- EPDM / Kalrez on request
- Turbine: PVDF 4 Magnets
- 2 Magnets on request
- Magnets: Keramik Sr Fe O
  (not in contact with the medium)
- Screw: Inox A2 PT-screws
  (Phillips cross recessed)

**Technical data:**
- Flow rate: 0.041 - 15 l/min depending on the nozzle diameter
- Measuring accuracy: +/- 2.0%
- Repetition: < +/- 0.25%
- Temperature range: -10°C to +100°C
  14°F to 212°F
- Pressure range: 20 bar at 20°C
  290 psi /68°F
- Mounting position: Horizontal recommended
- Nozzle size: Ø 1.0, 1.2, 1.5, 2.0, 2.5, 3.0, 4.0, 5.6 mm

**Options:**
- 3-pin solenoid socket
  Item number: 941-0002/3

**Approvals / Standards**
- EN 50081-1:92, EN 50082-1:97,
- EN 61000-3-2:00, EN 61000-3-3:95,
- IEC 61000-6-3:96, IEC 61000-6-1:96,
- IEC 61000-3-2-00, IEC 61000-3-9.4 + A1.01

**Electrical connection ratings:**
- Power supply: 4.5–24 VDC
- Consumption: 5 mA to max. 13 mA
- Signal connection: Open collector NPN
- Signal voltage: 0 V GND
- Signal load: max. 20 mA
- Leakage current: max. 10 µA
- Connections: 3-pin AMP 2.8 x 0.8 mm
- Signal: Square-wave output
- Duty Cycle: 50% / ± 5%

**Dimensions in mm:**

**Special features:** Able to withstand high temperatures, good resistance to chemicals. Linear inlet and outlet, compact design, great working range, depending on the nozzle diameter. Employed in the semiconductor (wafer polishing) sector due to the high purity of materials used.

**Special regulations which must be complied with by the flowmeter manufacturer apply to each country, e.g. CE, NSF, FDA and SK. The various media flowing through the flowmeter differ from application to application. You are advised to enquire with the medium manufacturer as to whether the entire installation and the flowmeter are resistant to the medium itself (see Material)!!**

**DIGMESA**

DIGMESA electronic circuitry is always designed for operation with DIGMESA flowmeters. Please note the following if connecting to other electronic circuitry:

- The flowmeter does not supply an output voltage but switches the signal terminal to 0 V ground (actuated) or leaves it open (non-actuated)
- There must be a pull-up resistor between power supply + and signal depending on electronic circuitry!

---

Digmesa AG, Kaltenstrasse 31, CH–2563 Iünsch / Switzerland, Phone + 41 (32) 332 77 77, Fax + 41 (32) 332 77 88, www.digmesa.com
### Interface Connection: Examples Open Collector

**Simple Circuit**

- Supply: +4.5 - 24 VDC
- Signal: 0 VDC
- Feedback: +4.5 - 24 VDC
- Load: 4.7 kΩ
- Filter: 100 nF
- Output: 0 VDC

**TTL Output**

- Supply: +4.5 - 24 VDC
- Signal: 0 VDC
- Feedback: +5 VDC
- Load: 2 kΩ
- Buffer: 1N4148
- Filter: 100 nF
- Output: 0 VDC

**Optocoupler Interface**

- Supply: +4.5 - 24 VDC
- Signal: 0 VDC
- Feedback: +5 VDC
- Load: 4.7 kΩ
- Diode: 1N4148
- Filter: 100 nF
- Output: 0 VDC

Note: We reserve the right to make modifications in the interests of technical progress.
Measurement Curve FHKU PVDF 1.00 mm (4 Magnets)

Medium: Water / max. Pressure: 3.3 bar

The values specified must be considered as approximate values. The number of pulses per litre may differ depending on medium and installation. We recommend to calibrate the number of pulses per litre in line with the complete installation.

<table>
<thead>
<tr>
<th>Nozzle size</th>
<th>Pulses/litre</th>
<th>g/pulse</th>
<th>min. flow rate in litres/min at Linear start</th>
<th>max. flow rate in litres/min</th>
<th>Pressure loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø 1.00 mm</td>
<td>4366</td>
<td>0.2290</td>
<td>0.0440</td>
<td>0.5498</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 1.20 mm</td>
<td>3485</td>
<td>0.2869</td>
<td>0.0532</td>
<td>0.8447</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 1.50 mm</td>
<td>2827</td>
<td>0.3537</td>
<td>0.0668</td>
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</tr>
<tr>
<td>Ø 2.00 mm</td>
<td>2049</td>
<td>0.4879</td>
<td>0.1170</td>
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MEASUREMENT TIPS

- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
- Clean the system at appropriate intervals
- Avoid electrical current peaks
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter
- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
Measurement Curve FHKU PVDF 1.20 mm (4 Magnets)

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The values specified must be considered as approximate values. The number of pulses per litre may differ depending on medium and installation. We recommend to calibrate the number of pulses per litre in line with the complete installation.

MEASUREMENT TIPS

- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
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- Avoid electrical current peaks
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter
- Do not mechanically load electrical contacts
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- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
Medium: Water / max. Pressure: 3.3 bar

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**Measurement Curve FHKU PVDF 1.50 mm (4 Magnets)**

The values specified must be considered as approximate values.
The number of pulses per litre may differ depending on medium and installation.
We recommend to calibrate the number of pulses per litre in line with the complete installation.

**Measurement Tips**
- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
- Clean the system at appropriate intervals
- Avoid electrical current peaks
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter
- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
Medium: Water / max. Pressure: 3.3 bar

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<th>Nozzle size</th>
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<td>2049</td>
<td>0.4879</td>
<td>0.1170</td>
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<td>1544</td>
<td>0.6477</td>
<td>0.1147</td>
<td>2.7205</td>
<td>0.64</td>
</tr>
<tr>
<td>Ø 3.00 mm</td>
<td>1199</td>
<td>0.9018</td>
<td>0.1048</td>
<td>2.8494</td>
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<tr>
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<td>793</td>
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The values specified must be considered as approximate values. The number of pulses per litre may differ depending on medium and installation. We recommend to calibrate the number of pulses per litre in line with the complete installation.

**MEASUREMENT TIPS**

- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
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- Avoid electrical current peaks
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter
- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
Measurement Curve FHKU PVDF 2.50 mm (4 Magnets)

Medium: Water / max. Pressure: 3.3 bar

<table>
<thead>
<tr>
<th>Nozzle size</th>
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<td>0.4879</td>
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<tr>
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<td>0.9018</td>
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The number of pulses per litre may differ depending on medium and installation.
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Measurements Curve FHKU PVDF 3.00 mm (4 Magnets)

**Measurement Tips**
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- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
- Clean the system at appropriate intervals
- Avoid electrical current peaks
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter
- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
Measurement Curve FHKU PVDF 4.00 mm (4 Magnets)

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<td>0.6477</td>
<td>0.1147</td>
<td>2.7205</td>
<td>0.64</td>
</tr>
<tr>
<td>Ø 3.00 mm</td>
<td>1109</td>
<td>0.9018</td>
<td>0.1048</td>
<td>2.8494</td>
<td>0.41</td>
</tr>
<tr>
<td>Ø 4.00 mm</td>
<td>793</td>
<td>1.2610</td>
<td>0.2098</td>
<td>9.2712</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 5.60 mm</td>
<td>511</td>
<td>1.9566</td>
<td>1.7820</td>
<td>10.7990</td>
<td>0.49</td>
</tr>
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The values specified must be considered as approximate values.
The number of pulses per litre may differ depending on medium and installation.
We recommend to calibrate the number of pulses per litre in line with the complete installation.

Medium: Water / max. Pressure: 3.3 bar

Measurement Tips

- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
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Medium: Water / max. Pressure: 3.3 bar

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<tr>
<td>Ø 1.00 mm</td>
<td>4366</td>
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<td>0.0440</td>
<td>0.5498</td>
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<td>0.1170</td>
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The values specified must be considered as approximate values. The number of pulses per litre may differ depending on medium and installation. We recommend to calibrate the number of pulses per litre in line with the complete installation.

MEASUREMENT TIPS

- Ensure that there is no fast-pulsatory movement of the media
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- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
Spare parts:

- Inox A2 PT-screws # 443-0008
  (Phillips cross recessed)

- Upper section FHK PVDF # 532-0300

- O-ring FPM (Viton) # 350-0900

- Turbine FT 35 chemie # 527-0301/4

- Lower section FHK PVDF, bearing pin PCTFE, Nozzle PTFE
- Lower section FHKU PVDF Ø 1.00 mm # 513-0023/C10
- Lower section FHKU PVDF Ø 1.20 mm # 513-0023/C12
- Lower section FHKU PVDF Ø 1.50 mm # 513-0023/C15
- Lower section FHKU PVDF Ø 2.00 mm # 513-0023/C20
- Lower section FHKU PVDF Ø 2.50 mm # 513-0023/C25
- Lower section FHKU PVDF Ø 3.00 mm # 513-0023/C30
- Lower section FHKU PVDF Ø 4.00 mm # 513-0023/C40
- Lower section FHKU PVDF Ø 5.60 mm # 513-0023/C56

Notes:
**General Description**

The FHKU Flowmeter is a general-purpose device; its working range can be individually defined according to its nozzle size. It is employed for measuring, regulating or metering and guarantees most precise measurement of fluid quantities. In addition, a pulse generator integrated into the flowmeter guarantees a practically unlimited useful life.

**Material:**
- Housing: PBT 35%GF (Arnite)
- Bearing pin: Inox 1.4305 (18/8) Inox 1.4571 on request
- O-ring: MVQ (Silikon) FPM (Viton)/EPDM on request
- Turbine: PVDF
- Magnets: Keramik Sr Fe O (in contact with the medium)
- Screw: PT-screws (Phillips cross recessed)

**Technical data:**
- Flow rate: 0.041 - 15 l/min depending on the nozzle diameter
- Measuring accuracy: +/- 2.0%
- Repetition: < +/- 0.25%
- Temperature range: -10°C to +65°C 14°F to 149°F
- Pressure range: 20 bar at 20°C 290 psi / 68°F
- Mounting position: Horizontal recommended
- Nozzle size: Ø 1.0, 1.2, 1.5, 2.0, 2.5, 3.0, 4.0, 5.6 mm

**Electrical connection ratings:**
- Power supply: 4.5–24 VDC
- Consumption: 5 mA to max. 13 mA
- Signal connection: Open collector NPN
- Signal voltage: 0 V GND
- Signal load: max. 20 mA
- Leakage current: max. 10 μA
- Connections: 3-pin AMP 2.8 x 0.8 mm
- Duty Cycle: 50% / ± 5%

**Approvals / Standards**
- EN 50081-1:92, EN 50082-1:97, EN 61000-3-2:00, EN 61000-3-3:95, IEC 61000-6-3:96, IEC 61000-6-1:96, IEC 61000-3-2-00, IEC 61000-3-94 + A1:01

**Special features:** Linear inlet and outlet, compact design, great working range, depending on the nozzle diameter.

**Options:**
- 3-pin solenoid socket Item number: 941-0002/3

**Dimensions in mm:**

**RESISTANCE**

Special regulations which must be complied with by the flowmeter manufacturer apply to each country, e.g. CE, NSF, FDA and SK. The various media flowing through the flowmeter differ from application to application. You are advised to enquire with the medium manufacturer as to whether the entire installation and the flowmeter are resistant to the medium itself (see Material)!

**ELECTRONIC**

DIGMESA electronic circuitry is always designed for operation with DIGMESA flowmeters. Please note the following if connecting to other electronic circuitry:

- The flowmeter does not supply an output voltage but switches the signal terminal to 0 V ground (actuated) or leaves it open (non-actuated)
- There must be a pull-up resistor between power supply + and signal depending on electronic circuitry!
Interface Connection: Examples Open Collector

- **Simple Circuit**:
  - Signal (+) and (-) with +4.5 - 24 VDC, 100nF capacitance, and 4.7k Ohm resistor.
  - Open collector input.

- **TTL Output**:  
  - Signal (+) and (-) with +4.5 - 24 VDC, 100nF capacitance, 2k2 Ohm resistor, and 1N4148 diode.
  - Open collector input.

- **Optocoupler Interface**:  
  - Signal (+) and (-) with +4.5 - 24 VDC, 100nF capacitance, and 4.7k Ohm resistor.
  - Optocoupled input with 5 VDC, 12 VDC, and 24 VDC with corresponding resistances: 1kOhm, 4.7kOhm, 4.7kOhm.

We reserve the right to make modifications in the interest of technical progress.
Measurement Curve FHKU G1/4” 1.00 mm

<table>
<thead>
<tr>
<th>Nozzle size</th>
<th>Pulses/litre</th>
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<tr>
<td>Ø 1.00 mm</td>
<td>2063</td>
<td>0.4846</td>
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<td>Ø 1.20 mm</td>
<td>1700</td>
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<td>1.00</td>
</tr>
<tr>
<td>Ø 1.50 mm</td>
<td>1314</td>
<td>0.7608</td>
<td>0.0427</td>
<td>1.2504</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 2.00 mm</td>
<td>988</td>
<td>1.0117</td>
<td>0.0911</td>
<td>2.4055</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 2.50 mm</td>
<td>760</td>
<td>1.3153</td>
<td>0.1503</td>
<td>3.7478</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 3.00 mm</td>
<td>565</td>
<td>1.7677</td>
<td>0.1022</td>
<td>5.6310</td>
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<tr>
<td>Ø 4.00 mm</td>
<td>381</td>
<td>2.6715</td>
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<td>8.3893</td>
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<td>Ø 5.60 mm</td>
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The values specified must be considered as approximate values.
The number of pulses per litre may differ depending on medium and installation.
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MEASUREMENT TIPS

- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
- Clean the system at appropriate intervals
- Avoid electrical current peaks
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter
- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
**Measurement Curve FHKU G1/4” 1.20 mm**

**Medium:** Water  /  **max. Pressure:** 3.3 bar

### Measurement Tips

- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
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- Note the mounting position of the flowmeter
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**Measurement Curve FHKU G1/4” 1.50 mm**

**MEASUREMENT TIPS**

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**Medium:** Water  /  **max. Pressure:** 3.3 bar
Measurement Curve FHKU G1/4" 2.00 mm

Medium: Water / max. Pressure: 3.3 bar

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**Measurement Curve FHKU G1/4” 2.50 mm**

- **Medium**: Water  /  **max. Pressure**: 3.3 bar

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**Measurement Curve FHKU G1/4” 3.00 mm**

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</tr>
<tr>
<td>Ø 2.00 mm</td>
<td>988</td>
<td>1.0117</td>
<td>0.0911</td>
<td>2.4055</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 2.50 mm</td>
<td>760</td>
<td>1.3153</td>
<td>0.1503</td>
<td>3.7478</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 3.00 mm</td>
<td>565</td>
<td>1.7677</td>
<td>0.1022</td>
<td>5.6310</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 4.00 mm</td>
<td>381</td>
<td>2.6715</td>
<td>0.1235</td>
<td>8.3893</td>
<td>0.80</td>
</tr>
<tr>
<td>Ø 5.60 mm</td>
<td>236</td>
<td>4.2266</td>
<td>0.3088</td>
<td>9.2647</td>
<td>0.45</td>
</tr>
</tbody>
</table>

Medium: Water / max. Pressure: 3.3 bar

The values specified must be considered as approximate values.
The number of pulses per litre may differ depending on medium and installation.
We recommend to calibrate the number of pulses per litre in line with the complete installation.

**MEASUREMENT TIPS**

- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
- Clean the system at appropriate intervals
- Avoid electrical current peaks
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter
- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
Measurement Curve FHKU G1/4" 4.00 mm

### Nozzle size and Flow Rate

<table>
<thead>
<tr>
<th>Nozzle Size</th>
<th>Pulses/litre</th>
<th>g/pulse</th>
<th>min. Flow Rate in litres/min at Linear Start</th>
<th>max. Flow Rate in litres/min</th>
<th>Pressure Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>ø 1.00 mm</td>
<td>2063</td>
<td>0.4846</td>
<td>0.0410</td>
<td>0.5670</td>
<td>1.00</td>
</tr>
<tr>
<td>ø 1.20 mm</td>
<td>1700</td>
<td>0.5880</td>
<td>0.0505</td>
<td>0.8225</td>
<td>1.00</td>
</tr>
<tr>
<td>ø 1.50 mm</td>
<td>1314</td>
<td>0.7608</td>
<td>0.0427</td>
<td>1.2504</td>
<td>1.00</td>
</tr>
<tr>
<td>ø 2.00 mm</td>
<td>988</td>
<td>1.0117</td>
<td>0.0911</td>
<td>2.4055</td>
<td>1.00</td>
</tr>
<tr>
<td>ø 2.50 mm</td>
<td>760</td>
<td>1.3153</td>
<td>0.1503</td>
<td>3.7478</td>
<td>1.00</td>
</tr>
<tr>
<td>ø 3.00 mm</td>
<td>565</td>
<td>1.7677</td>
<td>0.1022</td>
<td>5.6310</td>
<td>1.00</td>
</tr>
<tr>
<td>ø 4.00 mm</td>
<td>381</td>
<td>2.6275</td>
<td>0.1235</td>
<td>8.3893</td>
<td>0.80</td>
</tr>
<tr>
<td>ø 5.60 mm</td>
<td>236</td>
<td>4.2266</td>
<td>0.3088</td>
<td>9.2647</td>
<td>0.45</td>
</tr>
</tbody>
</table>

The values specified must be considered as approximate values. The number of pulses per litre may differ depending on medium and installation. We recommend to calibrate the number of pulses per litre in line with the complete installation.

### MEASUREMENT TIPS

- Ensure that there is no fast-pulsatory movement of the medium
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
- Clean the system at appropriate intervals
- Avoid electrical current peaks
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter
- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
Measurement Curve FHKU G1/4" 5.60 mm

<table>
<thead>
<tr>
<th>Nozzle size</th>
<th>Pulses/litre</th>
<th>g/pulse</th>
<th>min. flow rate in litres/min at linear start</th>
<th>max. flow rate in litres/min</th>
<th>Pressure loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø 1.00 mm</td>
<td>2063</td>
<td>0.4846</td>
<td>0.0410</td>
<td>0.5670</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 1.20 mm</td>
<td>1700</td>
<td>0.5880</td>
<td>0.0505</td>
<td>0.8225</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 1.50 mm</td>
<td>1314</td>
<td>0.7608</td>
<td>0.0427</td>
<td>1.2504</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 2.00 mm</td>
<td>988</td>
<td>1.0117</td>
<td>0.0911</td>
<td>2.4055</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 2.50 mm</td>
<td>760</td>
<td>1.3153</td>
<td>0.1503</td>
<td>3.7478</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 3.00 mm</td>
<td>565</td>
<td>1.7677</td>
<td>0.1022</td>
<td>5.6310</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 4.00 mm</td>
<td>381</td>
<td>2.6215</td>
<td>0.1235</td>
<td>8.3893</td>
<td>0.80</td>
</tr>
<tr>
<td>Ø 5.60 mm</td>
<td>236</td>
<td>4.2266</td>
<td>0.3088</td>
<td>9.2647</td>
<td>0.45</td>
</tr>
</tbody>
</table>

Medium: Water / max. Pressure: 3.3 bar

The values specified must be considered as approximate values. The number of pulses per litre may differ depending on medium and installation. We recommend to calibrate the number of pulses per litre in line with the complete installation.

MEASUREMENT TIPS
- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
- Clean the system at appropriate intervals
- Avoid electrical current peaks
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter
- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
Spare parts:

PT-screws # 443-0005 (Phillips cross recessed)

Upper section FHK Arnite # 532-0500

O-ring MVQ (Silikon) # 350-0410

Turbine FT 36 # 527-0303

Lower section FHKU G1/4" Ø 1.00 mm # 513-0024/10
Lower section FHKU G1/4" Ø 1.20 mm # 513-0024/12
Lower section FHKU G1/4" Ø 1.50 mm # 513-0024/15
Lower section FHKU G1/4" Ø 2.00 mm # 513-0024/20
Lower section FHKU G1/4" Ø 2.50 mm # 513-0024/25
Lower section FHKU G1/4" Ø 3.00 mm # 513-0024/30
Lower section FHKU G1/4" Ø 4.00 mm # 513-0024/40
Lower section FHKU G1/4" Ø 5.60 mm # 513-0024/56

Notes:
DATA SHEET

FHU G1/4" Ryton
Part number: 938-18XX/01
General Description

The FHKU Flowmeter is a general-purpose device; its working range can be individually defined according to its nozzle size. It is employed for measuring, regulating or metering and guarantees most precise measurement of fluid quantities. In addition, a pulse generator integrated into the flowmeter guarantees a practically unlimited useful life.

**Special features:** Linear inlet and outlet, compact design, great working range, depending on the nozzle diameter.

**Approvals / Standards**
EN 50081-1:92, EN 50082-1:97, EN 61000-3-2:00, EN 61000-3-3:95, IEC 61000-6-3:96, IEC 61000-6-1:96, IEC 61000-3-2:00, IEC 61000-3-9:4 +A1:01

**Material:**
- Housing: PPS 40% GF (Ryton)
- Inox 1.4305 (18/8)
- Inox 1.4571 on request
- Bearing pin: Inox 1.4305 (18/8)
- MVO (Silikon)
- FPM (Viton)/EPDM on request
- Turbine: PVDF
- Magnets: Keramik Sr Fe O
- Inox A2 PT-screws (Phillips cross recessed)

**Technical data:**
- Flow rate: 0.041 - 15 l/min depending on the nozzle diameter
- Measuring accuracy: +/- 2.0%
- Repetition: < +/- 0.25%
- Temperature range: -10°C to +100°C / 14°F to 212°F
- Pressure range: 20 bar at 20°C / 290 psi / 68°F
- Mounting position: Horizontal recommended
- Nozzle size: Ø 1.0, 1.2, 1.5, 2.0, 2.5, 3.0, 4.0, 5.6 mm

**Electrical connection ratings:**
- Power supply: 4.5–24 VDC
- Consumption: 5 mA to max. 13 mA
- Signal connection: Open collector NPN
- Signal voltage: 0 V GND
- Signal load: max. 20 mA
- Leakage current: max. 10 µA
- Connections: 3-pin AMP 2.8 x 0.8 mm
- Duty Cycle: 50% / ± 5%

**Dimensions in mm:**

**Options:**
- 3-pin solenoid socket
  Item number: 941-0002/3

**RESISTANCE**
Special regulations which must be complied with by the flowmeter manufacturer apply to each country, e.g. CE, NSF, FDA and SK. The various medias flowing through the flowmeter differ from application to application. You are advised to enquire with the medium manufacturer as to whether the entire installation and the flowmeter are resistant to the medium itself (see Material)!

**ELECTRONIC**
DIGMESA electronic circuitry is always designed for operation with DIGMESA flowmeters. Please note the following if connecting to other electronic circuitry:
- The flowmeter does not supply an output voltage but switches the signal terminal to 0 V ground (actuated) or leaves it open (non-acted)
- There must be a pull-up resistor between power supply + and signal depending on electronic circuitry!

We reserve the right to make modifications in the interests of technical progress.

Digmesa AG, Katenstrasse 31, CH–2563 Irschach / Switzerland, Phone +41 (32) 332 77 77, Fax +41 (32) 332 77 88, www.digmesa.com
Interface Connection: Examples Open Collector

**Simple Circuit**

```
+4.5 - 24 VDC

 Signal

  +

  4.7

  100nF

  0 VDC

Signal
```

**TTL Output**

```
+4.5 - 24 VDC

 Signal

  +

  2k2

  1N4148

  1N4148

  100nF

  0 VDC

Signal
```

**Optocoupler Interface**

```
+4.5 - 24 VDC

 Signal

  +

  Rx

  +

  100nF

  0 VDC

Rx = 1k
Rx = 4.7
Rx = 10k
```

We reserve the right to make modifications in the interest of technical progress.
### Measurement Curve FHKU G1/4" 1.00 mm

#### Linear Start

<table>
<thead>
<tr>
<th>Nozzle size</th>
<th>Pulses/litre</th>
<th>g/pulse</th>
<th>min. flow rate in litres/min at Linear start</th>
<th>max. flow rate in litres/min</th>
<th>Pressure loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø 1.00 mm</td>
<td>2063</td>
<td>0.4846</td>
<td>0.0410</td>
<td>0.5670</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 1.20 mm</td>
<td>1700</td>
<td>0.5880</td>
<td>0.0595</td>
<td>0.8225</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 1.50 mm</td>
<td>1314</td>
<td>0.7608</td>
<td>0.0472</td>
<td>1.2504</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 2.00 mm</td>
<td>988</td>
<td>1.0117</td>
<td>0.0911</td>
<td>2.4055</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 2.50 mm</td>
<td>760</td>
<td>1.3153</td>
<td>0.1503</td>
<td>3.7478</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 3.00 mm</td>
<td>565</td>
<td>1.7677</td>
<td>0.1022</td>
<td>5.6310</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 4.00 mm</td>
<td>381</td>
<td>2.6215</td>
<td>0.1235</td>
<td>8.3893</td>
<td>0.80</td>
</tr>
<tr>
<td>Ø 5.60 mm</td>
<td>236</td>
<td>4.2266</td>
<td>0.3088</td>
<td>9.2647</td>
<td>0.45</td>
</tr>
</tbody>
</table>

The values specified must be considered as approximate values. The number of pulses per litre may differ depending on medium and installation. We recommend to calibrate the number of pulses per litre in line with the complete installation.

**Measurement Tips**

- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
- Clean the system at appropriate intervals
- Avoid electrical current peaks
- Incorrect cabling of power supply + , signal and ground will destroy the flowmeter
- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
**Measurement Curve FHKU G1/4” 1.20 mm**

### Nozzle size

<table>
<thead>
<tr>
<th>Nozzle size</th>
<th>Pulses/litre</th>
<th>g/pulse</th>
<th>min. flow rate in litres/min at Linear start</th>
<th>max. flow rate in litres/min</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Ø 1.00 mm</td>
<td>2063</td>
<td>0.4846</td>
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</tr>
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<td>Ø 1.20 mm</td>
<td>1700</td>
<td>0.5880</td>
<td>0.0505</td>
<td>0.8225</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 1.50 mm</td>
<td>1314</td>
<td>0.7608</td>
<td>0.0427</td>
<td>1.2504</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 2.00 mm</td>
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<td>1.0117</td>
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<td>0.1022</td>
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</tr>
<tr>
<td>Ø 4.00 mm</td>
<td>381</td>
<td>2.6715</td>
<td>0.1235</td>
<td>8.3893</td>
<td>0.80</td>
</tr>
<tr>
<td>Ø 5.60 mm</td>
<td>236</td>
<td>4.2266</td>
<td>0.3088</td>
<td>9.2647</td>
<td>0.45</td>
</tr>
</tbody>
</table>

The values specified must be considered as approximate values. The number of pulses per litre may differ depending on medium and installation. We recommend to calibrate the number of pulses per litre in line with the complete installation.

---

### MEASUREMENT TIPS

- Ensure that there is no fast-pulsatory movement of the media.
- Ensure that there are no reverse pressure surges.
- Ensure that there is no air in the system.
- Note the mounting position of the flowmeter.
- Min/max flow should be in the linear range of the selected flowmeter.
- Clean the system at appropriate intervals.
- Avoid electrical current peaks.
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter.
- Do not mechanically load electrical contacts.
- Avoid moisture on the electrical contacts.
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads).
### Nozzle size Pulses/litre g/pulse min. flow rate in litres/min at Linear start max. flow rate in litres/min Pressure loss

| Ø 1.00 mm | 2063 | 0.4846 | 0.0410 | 0.5670 | 1.00 |
| Ø 1.20 mm | 1700 | 0.5880 | 0.0505 | 0.8225 | 1.00 |
| Ø 1.50 mm | 1314 | 0.7608 | 0.0427 | 1.2504 | 1.00 |
| Ø 2.00 mm | 988  | 1.0117 | 0.0911 | 2.4055 | 1.00 |
| Ø 2.50 mm | 760  | 1.3153 | 0.1503 | 3.7478 | 1.00 |
| Ø 3.00 mm | 565  | 1.7677 | 0.1022 | 5.6310 | 1.00 |
| Ø 4.00 mm | 381  | 2.6215 | 0.1235 | 8.3893 | 0.80 |
| Ø 5.60 mm | 236  | 4.2266 | 0.3088 | 9.2647 | 0.45 |

**Measurement Curve FHKU G1/4” 1.50 mm**

- **Medium**: Water / **max. Pressure**: 3.3 bar

---

The values specified must be considered as approximate values. The number of pulses per litre may differ depending on medium and installation. We recommend to calibrate the number of pulses per litre in line with the complete installation.

**Measurement Tips**

- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
- Clean the system at appropriate intervals
- Avoid electrical current peaks
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter
- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
### Measurement Curve FHKU G1/4" 2.00 mm

*Medium: Water / max. Pressure: 3.3 bar*

<table>
<thead>
<tr>
<th>Nozzle size</th>
<th>Pulses/litre</th>
<th>g/pulse</th>
<th>min. flow rate in litres/min at Linear start</th>
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<tr>
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<td>2.4055</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 2.50 mm</td>
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<td>Ø 3.00 mm</td>
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<td>Ø 4.00 mm</td>
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<tr>
<td>Ø 5.60 mm</td>
<td>236</td>
<td>4.2266</td>
<td>0.3088</td>
<td>9.2647</td>
<td>0.45</td>
</tr>
</tbody>
</table>

The values specified must be considered as approximate values.
The number of pulses per litre may differ depending on medium and installation.

We recommend to calibrate the number of pulses per litre in line with the complete installation.

**MEASUREMENT TIPS**
- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
- Clean the system at appropriate intervals
- Avoid electrical current peaks
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter
- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
### Measurement Curve FHKU G1/4” 2.50 mm

**Nozzle size** | **Pulses/litre** | **g/pulse** | **min. flow rate in litres/min at Linear start** | **max. flow rate in litres/min** | **Pressure loss**
--- | --- | --- | --- | --- | ---
Ø 1.00 mm | 2063 | 0.4846 | 0.0410 | 0.5670 | 1.00
Ø 1.20 mm | 1700 | 0.5880 | 0.0505 | 0.8225 | 1.00
Ø 1.50 mm | 1314 | 0.7608 | 0.0427 | 1.2504 | 1.00
Ø 2.00 mm | 988 | 1.0117 | 0.0911 | 2.4055 | 1.00
Ø 2.50 mm | 760 | 1.3153 | 0.1503 | 3.7478 | 1.00
Ø 3.00 mm | 565 | 1.7677 | 0.1022 | 5.6310 | 1.00
Ø 4.00 mm | 381 | 2.6215 | 0.1235 | 8.3893 | 0.80
Ø 5.60 mm | 236 | 4.2266 | 0.3088 | 9.2647 | 0.45

**MEASUREMENT TIPS**

- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
- Clean the system at appropriate intervals
- Avoid electrical current peaks
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter
- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)

**The values specified must be considered as approximate values.**

*The number of pulses per litre may differ depending on medium and installation.*

We recommend to calibrate the number of pulses per litre in line with the complete installation.
Measurement Curve FHKU G1/4" 3.00 mm

Nozzle size  | Pulses/litre | g/pulse  | min. flow rate in litres/min at Linear start | max. flow rate in litres/min | Pressure loss
---|---|---|---|---|---
Ø 1.00 mm  | 2063  | 0.4846  | 0.0410  | 0.5670  | 1.00
Ø 1.20 mm  | 1700  | 0.5880  | 0.0505  | 0.8225  | 1.00
Ø 1.50 mm  | 1314  | 0.7608  | 0.0427  | 1.2504  | 1.00
Ø 2.00 mm  | 988   | 1.0117  | 0.0911  | 2.4055  | 1.00
Ø 2.50 mm  | 760   | 1.3153  | 0.1503  | 3.7478  | 1.00
Ø 3.00 mm  | 565   | 1.7677  | 0.1022  | 5.6310  | 1.00
Ø 4.00 mm  | 381   | 2.6215  | 0.1235  | 8.3893  | 0.80
Ø 5.60 mm  | 236   | 4.2266  | 0.3088  | 9.2647  | 0.45

The values specified must be considered as approximate values. The number of pulses per litre may differ depending on medium and installation. We recommend to calibrate the number of pulses per litre in line with the complete installation.

MEASUREMENT TIPS

- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
- Clean the system at appropriate intervals
- Avoid electrical current peaks
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter
- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
### Measurement Curve FHKU G1/4" 4.00 mm

#### Linear Start

<table>
<thead>
<tr>
<th>Nozzle size</th>
<th>Pulses/litre</th>
<th>g/pulse</th>
<th>min. flow rate in litres/min at Linear start</th>
<th>max. flow rate in litres/min</th>
<th>Pressure loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø 1.00 mm</td>
<td>2063</td>
<td>0.4846</td>
<td>0.0410</td>
<td>0.5670</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 1.20 mm</td>
<td>1700</td>
<td>0.5880</td>
<td>0.0505</td>
<td>0.8225</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 1.50 mm</td>
<td>1314</td>
<td>0.7680</td>
<td>0.0427</td>
<td>1.2504</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 2.00 mm</td>
<td>988</td>
<td>1.0117</td>
<td>0.0911</td>
<td>2.4055</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 2.50 mm</td>
<td>760</td>
<td>1.3153</td>
<td>0.1503</td>
<td>3.7478</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 3.00 mm</td>
<td>565</td>
<td>1.7677</td>
<td>0.1022</td>
<td>5.6310</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 4.00 mm</td>
<td>381</td>
<td>2.6215</td>
<td>0.1235</td>
<td>8.3893</td>
<td>0.80</td>
</tr>
<tr>
<td>Ø 5.60 mm</td>
<td>236</td>
<td>4.2266</td>
<td>0.3088</td>
<td>9.2647</td>
<td>0.45</td>
</tr>
</tbody>
</table>

**The values specified must be considered as approximate values.**

The number of pulses per litre may differ depending on medium and installation.

We recommend to calibrate the number of pulses per litre in line with the complete installation.

---

**MEASUREMENT TIPS**

- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
- Clean the system at appropriate intervals
- Avoid electrical current peaks
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter
- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
Measurement Curve FHKU G1/4” 5.60 mm

<table>
<thead>
<tr>
<th>Nozzle size</th>
<th>Pulses/litre</th>
<th>g/pulse</th>
<th>min. flow rate in litres/min at Linear start</th>
<th>max. flow rate in litres/min</th>
<th>Pressure loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø 1.00 mm</td>
<td>2063</td>
<td>0.4846</td>
<td>0.0410</td>
<td>0.5670</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 1.20 mm</td>
<td>1700</td>
<td>0.5880</td>
<td>0.0505</td>
<td>0.8225</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 1.50 mm</td>
<td>1314</td>
<td>0.7608</td>
<td>0.0427</td>
<td>1.2504</td>
<td>1.00</td>
</tr>
<tr>
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<td>1.3153</td>
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</tr>
<tr>
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<td>1.7677</td>
<td>0.1022</td>
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<td>2.6215</td>
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</tr>
<tr>
<td>Ø 5.60 mm</td>
<td>236</td>
<td>4.2266</td>
<td>0.3088</td>
<td>9.2647</td>
<td>0.45</td>
</tr>
</tbody>
</table>

The values specified must be considered as approximate values. The number of pulses per litre may differ depending on medium and installation. We recommend to calibrate the number of pulses per litre in line with the complete installation.
Spare parts:

- Inox A2 PT-screws # 443-0008 (Phillips cross recessed)
- Upper section FHK Rytton # 532-0800
- O-ring Silikon # 350-0410
- Turbine FT 36 # 527-0303

Lower section FHKU G1/4" Ø 1.00 mm # 513-0025/10
Lower section FHKU G1/4" Ø 1.20 mm # 513-0025/12
Lower section FHKU G1/4" Ø 1.50 mm # 513-0025/15
Lower section FHKU G1/4" Ø 2.00 mm # 513-0025/20
Lower section FHKU G1/4" Ø 2.50 mm # 513-0025/25
Lower section FHKU G1/4" Ø 3.00 mm # 513-0025/30
Lower section FHKU G1/4" Ø 4.00 mm # 513-0025/40
Lower section FHKU G1/4" Ø 5.60 mm # 513-0025/56

Notes:
FHKU Hose connection Arnite
Part number: 938-3570/01
General Description

The FHKU Flowmeter is a general-purpose device; specially for higher throughputs of up to approx. 25 l/min. It is employed for measuring, regulating or metering and guarantees most precise measurement of fluid quantities. In addition, a pulse generator integrated into the flowmeter guarantees a practically unlimited useful life.

**Special features:** Able to withstand high temperatures, good resistance to chemicals. Linear inlet and outlet, compact design.

**Approvals / Standards**

<table>
<thead>
<tr>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>EN 50081-1:92, EN 50082-1:97,</td>
</tr>
<tr>
<td>EN 61000-3-2:00, EN 61000-3-3-95,</td>
</tr>
<tr>
<td>IEC 61000-6-3-96, IEC 61000-6-1:96,</td>
</tr>
<tr>
<td>IEC 61000-3-2-00, IEC 61000-3-94 + A1:01</td>
</tr>
</tbody>
</table>

**Material:**

- Housing: PBT 35%GF (Amite)
- Bearing pin: Inox 1.4305 (18/8); Inox 1.4571 on request
- O-ring: MVQ (Silikon); FPM (Viton)/EPDM on request
- Turbine: PVDF
- Magnets: Keramik Sr Fe O (in contact with the medium)
- Screw: PT-screws (Phillips cross recessed)

**Technical data:**

- Flow rate: 1.4 - 25 l/min
- Measuring accuracy: +/- 2.0%
- Repetition: < +/- 0.25%
- Temperature range: -10°C to +65°C
- Pressure range: 20 bar at 20°C
- Mounting position: Horizontal recommended
- Nozzle size: Ø 7.0 mm

**Electrical connection ratings:**

- Power supply: 4.5–24 VDC
- Consumption: 5 mA to max. 13 mA
- Signal connection: Open collector NPN
- Signal voltage: 0 V GND
- Signal load: max. 20 mA
- Leakage current: max. 10 µA
- Connections: 3-pin AMP 2.8 x 0.8 mm
- Signal: Square-wave output
- Duty Cycle: 50% / ± 5%

**Dimensions in mm:**

**Options:**

- 3-pin solenoid socket
  - Item number: 941-0002/3

**RESISTANCE**

Special regulations which must be complied with by the flowmeter manufacturer apply to each country, e.g. CE, NSF, FDA and SK. The various media flowing through the flowmeter differ from application to application. You are advised to enquire with the medium manufacturer as to whether the entire installation and the flowmeter are resistant to the medium itself (see Material)!

**ELECTRONIC**

DIGMESA electronic circuitry is always designed for operation with DIGMESA flowmeters. Please note the following if connecting to other electronic circuitry:

- The flowmeter does not supply an output voltage but switches the signal terminal to 0 V ground (actuated) or leaves it open (non-actuated)
- There must be a pull-up resistor between power supply + and signal depending on electronic circuitry!

We reserve the right to make modifications in the interests of technical progress.
Interface Connection: Examples Open Collector
Measurement Curve FHKU Hose connection 7.00 mm

Medium: Water / max. Pressure: 3.3 bar

The values specified must be considered as approximate values.
The number of pulses per litre may differ depending on medium and installation.
We recommend to calibrate the number of pulses per litre in line with the complete installation.

<table>
<thead>
<tr>
<th>Nozzle size</th>
<th>Pulses/litre</th>
<th>g/pulse</th>
<th>min. flow rate in litres/min at Linear start</th>
<th>max. flow rate in litres/min</th>
<th>Pressure loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø 7.00 mm</td>
<td>165</td>
<td>6.06</td>
<td>1.40</td>
<td>18.00</td>
<td>0.54</td>
</tr>
</tbody>
</table>

MEASUREMENT TIPS

- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
- Clean the system at appropriate intervals
- Avoid electrical current peaks
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter
- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
Spare parts:

- PT-screws # 443-0005 (Phillips cross recessed)
- Upper section FHK Arnite # 532-0500
- O-ring Silikon # 350-0410
- Turbine FT 36 # 527-0303
- Lower section FHKU Ø 7.00 mm # 513-0026

Notes:
FHCU Hose connection Ryton
Part number: 938-3870/01
**General Description**

The FHKU Flowmeter is a general-purpose device; specially for higher throughputs of up to approx. 25 l/min. It is employed for measuring, regulating or metering and guarantees most precise measurement of fluid quantities. In addition, a pulse generator integrated into the flowmeter guarantees a practically unlimited useful life.

### Special features:
Able to withstand high temperatures, good resistance to chemicals. Linear inlet and outlet, compact design.

### Approvals / Standards
- EN 50081-1:92, EN 50082-1:97,
- EN 61000-3-2:00, EN 61000-3-3:95,
- IEC 61000-6-3:96, IEC 61000-6-1:96,
- IEC 61000-3-2-00, IEC 61000-3-94 + A1:01

### Material:
- **Housing:** PPS 40GF (Ryton)
- **Bearing pin:** Inox 1.4305 (18/8) + Inox 1.4571 on request
- **O-ring:** MVQ (Silikon), FPM (Viton)/EPDM on request
- **Turbine:** PVDF
- **Magnets:** Keramik Sr Fe O (in contact with the medium)
- **Screw:** Inox A2 PT-screws (Phillips cross recessed)

### Technical data:
- **Flow rate:** 1.4 - 25 l/min
- **Measuring accuracy:** +/- 2.0%
- **Repetition:** < +/- 0.25%
- **Temperature range:** -10°C to +100°C
- **Pressure range:** 20 bar at 20°C
- **Mounting position:** Horizontal recommended
- **Nozzle size:** Ø 7.0 mm

### Electrical connection ratings:
- **Power supply:** 4.5–24 VDC
- **Consumption:** 5 mA to max. 13 mA
- **Signal connection:** Open collector NPN
- **Signal voltage:** 0 V GND
- **Signal load:** max. 20 mA
- **Leakage current:** max. 10 µA
- **Connections:** 3-pin AMP 2.8 x 0.8 mm
- **Signal:** Square-wave output
- **Duty Cycle:** 50% / ±5%

### Dimensions in mm:

**Options:**
- 3-pin solenoid socket
  - Item number: 941-0002/3

**RESISTANCE**

Special regulations which must be complied with by the flowmeter manufacturer apply to each country, e.g. CE, NSF, FDA and SK. The various media flowing through the flowmeter differ from application to application. You are advised to enquire with the medium manufacturer as to whether the entire installation and the flowmeter are resistant to the medium itself (see Material)!

**ELECTRONIC**

DIGMESA electronic circuitry is always designed for operation with DIGMESA flowmeters. Please note the following if connecting to other electronic circuitry:

- The flowmeter does not supply an output voltage but switches the signal terminal to 0 V ground (actuated) or leaves it open (non-actuated)
- There must be a pull-up resistor between power supply + and signal depending on electronic circuitry!
Interface Connection: Examples Open Collector

- **Open Collector (Simple Circuit)**
  - Signal: +4.5 - 24 VDC
  - 100nF
  - 0 VDC

- **Open Collector (TTL Output)**
  - Signal: +4.5 - 24 VDC
  - 2k2
  - 1N4148
  - 0 VDC

- **Optocoupler Interface**
  - Signal: +4.5 - 24 VDC
  - Rx: 1k
  - 100nF
  - 0 VDC
Measurement Curve FHKU Hose connection 7.00 mm

- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
- Clean the system at appropriate intervals
- Avoid electrical current peaks
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter
- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)

**MEASUREMENT TIPS**

<table>
<thead>
<tr>
<th>Nozzle size</th>
<th>Pulses/litre</th>
<th>g/pulse</th>
<th>min. flow rate in litres/min at Linear start</th>
<th>max. flow rate in litres/min</th>
<th>Pressure loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø 7.00 mm</td>
<td>165</td>
<td>6.06</td>
<td>1.40</td>
<td>18.00</td>
<td>0.54</td>
</tr>
</tbody>
</table>

The values specified must be considered as approximate values. The number of pulses per litre may differ depending on medium and installation. We recommend to calibrate the number of pulses per litre in line with the complete installation.
Spare parts:

- Inox A2 PT-screws # 443-0008
  (Phillips cross recessed)

- Upper section FHK Ryton # 532-0800

- O-ring Silikon # 350-0410

- Turbine FT 36 # 527-0303

- Lower section FHKU Ø 7.00 mm # 513-0027

Notes:
FHKU 100 G1/2'' PEEK
Part number: 938-6200/P014
General Description

The FHKU Flowmeter is a general-purpose device, specially for higher throughputs of up to approx. 30 l/min. It is employed for measuring, regulating or metering and guarantees most precise measurement of fluid quantities. In addition, a pulse generator integrated into the flowmeter guarantees a practically unlimited useful life.

**Material:**
- Housing: PEEK 450G
- Bearing pin: PEEK 450G
- Nozzle: PEEK 450G
- O-ring: FPM (Viton)
- EPDM / Kalrez on request
- Turbine: PFA 4 Magnets
- Magnets: Keramik Sr Fe O
- (not in contact with the medium)
- Screw: Inox A2 PT-screws
  (Phillips cross recessed)

**Technical data:**
- Flow rate: 3 - 30 l/min
- Measuring accuracy: +/- 2.0%
- Repetition: < +/- 0.25%
- Temperature range: -10°C to +100°C
  14°F to 212°F
- Pressure range: 20 bar at 20°C
  290 psi /68°F
- Mounting position: Vertical recommended
- Nozzle size: Ø 10.0 mm

**Electrical connection ratings:**
- Power supply: 4.5–24 VDC
- Consumption: 5 mA to max. 13 mA
- Signal connection: Open collector NPN
- Signal voltage: 0 V GND
- Signal load: max. 20 mA
- Leakage current: max. 10 µA
- Connections: 3-pin AMP 2.8 x 0.8 mm
- Signal: Square-wave output
  Duty Cycle: 50% / ±5%

**Dimensions in mm:**

**Options:**
- 3-pin solenoid socket
  Item number: 941-0002/3

**RESISTANCE**
Special regulations which must be complied with by the flowmeter manufacturer apply to each country, e.g. CE, NSF, FDA and SK. The various media flowing through the flowmeter differ from application to application. You are advised to enquire with the medium manufacturer as to whether the entire installation and the flowmeter are resistant to the medium itself (see Material)!

**Approvals / Standards**
- EN 50081-1:1992, EN 50082-1:1997,
- EN 61000-3-2:2000, EN 61000-3-3:1995,
- IEC 61000-6-3:1996, IEC 61000-6-1:1996,

We reserve the right to make modifications in the interests of technical progress.

Digmesa AG, Kaltenstrasse 31, CH–2563 Ipsach / Switzerland, Phone + 41 (32) 332 77 77, Fax + 41 (32) 332 77 88, www.digmesa.com
Interface Connection: Examples Open Collector

**Simple Circuit**

- **Signal**: +4.5 - 24 VDC
- **Rx**: 1kΩ
- **0 VDC**: 100nF

**TTL Output**

- **Signal**: +4.5 - 24 VDC
- **Rx**: 2kΩ
- **0 VDC**: 100nF
- **1N4148**

**Optocoupler Interface**

- **Signal**: +4.5 - 24 VDC
- **Rx**: 1kΩ
- **0 VDC**: 100nF
- **5 VDC**: 4k7
- **+ 12 VDC**: Rx = 4k7
- **24 VDC**: Rx = 10k
Measurement Curve FHKU Arnite 10.00mm (4 Magnets)

Medium: Water / max. Pressure: 3.3 bar

<table>
<thead>
<tr>
<th>Nozzle size</th>
<th>Pulses/litre</th>
<th>g/pulse</th>
<th>min. flow rate in litres/min at Linear start</th>
<th>max. flow rate in litres/min</th>
<th>Pressure loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø 10.00 mm</td>
<td>130</td>
<td>7.685</td>
<td>3.00</td>
<td>26.69</td>
<td>0.32</td>
</tr>
</tbody>
</table>

The values specified must be considered as approximate values. The number of pulses per litre may differ depending on medium and installation. We recommend to calibrate the number of pulses per litre in line with the complete installation.

MEASUREMENT TIPS

- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
- Clean the system at appropriate intervals
- Avoid electrical current peaks
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter
- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
Spare parts:

- Inox A2 PT-screws # 443-0008 (Phillips cross recessed)
- Upper section FHK PEEK # 532-0200
- O-ring FPM (Viton) # 350-0900
- Turbine FT 35 PFA chemie # 527-0202/4
- Lower section FHKU PEEK, bearing pin PEEK, Nozzle PEEK
- Lower section FHKU G1/2" PEEK Ø10.00 mm # 513-0034/C
- Upper section FHK PEEK # 532-0200

Notes:
DATA SHEET

FHKU 100 G1/2” PVDF
Part number: 938-6300/C014
General Description

The FHKU Flowmeter is a general-purpose device; specially for higher throughputs of up to approx. 30 l/min. It is employed for measuring, regulating and metering and guarantees most precise measurement of fluid quantities. In addition, a pulse generator integrated into the flowmeter guarantees a practically unlimited useful life.

Special features: Able to withstand high temperatures, good resistance to chemicals. Linear inlet and outlet, compact design. Employed in the semiconductor (wafer polishing) sector due to the high purity of materials used.

Material:
- Housing: PVDF
- Bearing pin: PCTFE
- O-ring: FPM (Viton), EPDM / Kalrez on request
- Turbine: PVDF 4 Magnets, 2 Magnets on request
- Magnets: Keramik Sr Fe O (not in contact with the medium)
- Screw: Inox A2 PT-screws (Phillips cross recessed)

Technical data:
- Flow rate: 3 - 30 l/min
- Measuring accuracy: +/- 2.0%
- Repetition: < +/- 0.25%
- Temperature range: -10°C to +100°C
- Pressure range: 20 bar at 20°C
- Mounting position: Horizontal recommended
- Nozzle size: Ø 10.0 mm
- Temperature range: 14°F to 212°F
- Pressure range: 290 psi /68°F

Electrical connection ratings:
- Power supply: 4.5–24 VDC
- Consumption: 5 mA to max. 13 mA
- Signal connection: Open collector NPN
- Signal voltage: 0 V GND
- Signal load: max. 20 mA
- Leakage current: max. 10 µA
- Connections: 3-pin AMP 2.8 x 0.8 mm
- Signal: Square-wave output
- Duty Cycle: 50% / ±5%

Dimensions in mm:

Options:
- 3-pin solenoid socket
  Item number: 941-0002/3

Approvals / Standards
- EN 50081-1-92, EN 50082-1-97,
- EN 61000-3-2-00, EN 61000-3-3-95,
- IEC 61000-6-3, IEC 61000-6-1-96,
- IEC 61000-3-2-00, IEC 61000-3-3-94 + A1.01

RESISTANCE

DIGMESA electronic circuitry is always designed for operation with DIGMESA flowmeters. Please note the following if connecting to other electronic circuitry:
- The flowmeter does not supply an output voltage but switches the signal terminal to 0 V ground (actuated) or leaves it open (non-actuated)
- There must be a pull-up resistor between power supply + and signal depending on electronic circuitry!

ELECTRONIC

DIGMESA electronic circuitry is always designed for operation with DIGMESA flowmeters. Please note the following if connecting to other electronic circuitry:
- The flowmeter does not supply an output voltage but switches the signal terminal to 0 V ground (actuated) or leaves it open (non-actuated)
- There must be a pull-up resistor between power supply + and signal depending on electronic circuitry!

We reserve the right to make modifications in the interests of technical progress.
Interface Connection: Examples Open Collector

**Simple Circuit**

```
+4.5 - 24 VDC

4k7

100nF

0 VDC
```

**TTL Output**

```
+4.5 - 24 VDC

+5 VDC

2k2

1N4148

1N4148

0 VDC
```

**Optocoupler Interface**

```
+4.5 - 24 VDC

+5 VDC

Rx = 1k0

Rx = 4k7

Rx = 10k

0 VDC
```

We reserve the right to make modifications in the interests of technical progress.
Measurement Curve FHKU Arnite 10.00mm (4 Magnets)

<table>
<thead>
<tr>
<th>Nozzle size</th>
<th>Pulses/litre</th>
<th>g/pulse</th>
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<tbody>
<tr>
<td>Ø 10.00 mm</td>
<td>130</td>
<td>7.685</td>
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</table>

The values specified must be considered as approximate values. The number of pulses per litre may differ depending on medium and installation. We recommend to calibrate the number of pulses per litre in line with the complete installation.

Medium: Water / max. Pressure: 3.3 bar

**MEASUREMENT TIPS**

- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
- Clean the system at appropriate intervals
- Avoid electrical current peaks
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter
- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
Spare parts:

- Inox A2 PT-screws # 443-0008 (Phillips cross recessed)
- Upper section FHK PVDF # 532-0300
- O-ring FPM (Viton) # 350-0900
- Turbine FT 35 chemie # 527-0301/4
- Lower section FHKU PVDF, bearing pin PCTFE
  Lower section FHKU G1/2" PVDF Ø10.00 mm # 513-0022/C
- Upper section FHK PVDF # 532-0300
- Inox A2 PT-screws # 443-0008 (Phillips cross recessed)

Notes:
DATA SHEET

FHKU G1/2” 100 Arnite
Part number: 938-6500/01

Digmesa AG, Kaltenstrasse 31, CH–2563 Ipsach / Switzerland
Phone +41 (32) 332 77 77, Fax +41 (32) 332 77 88
www.digmesa.com
General Description

The FHKU Flowmeter is a general-purpose device; specially for higher throughputs of up to approx. 30 l/min. It is employed for measuring, regulating or metering and guarantees most precise measurement of fluid quantities. In addition, a pulse generator integrated into the flowmeter guarantees a practically unlimited useful life.

Special features: Able to withstand high temperatures, good resistance to chemicals. Linear inlet and outlet, compact design.

Approvals / Standards
EN 50081-1:92, EN 50082-1:97, EN 61000-3-2, EN 61000-3-3, IEC 61000-6-3, IEC 61000-6-1, IEC 61000-3-2, IEC 61000-3-94 + A1:01

Material:
- Housing: PBT 35%GF (Arnite)
- Bearing pin: Inox 1.4305 (18/8) / Inox 1.4571 on request
- O-ring: MVQ (Silikon) / FPM (Viton)/EPDM on request
- Turbine: PVDF
- Magnets: Keramik Sr Fe O (in contact with the medium)
- Screw: PT-screws (Phillips cross recessed)

Technical data:
- Flow rate: 3 – 30 l/min
- Measuring accuracy: +/- 2.0%
- Repetition: +/- 0.25%
- Temperature range: -10°C to +65°C / 14°F to 149°F
- Pressure range: 20 bar at 20°C / 290 psi / 68°F
- Mounting position: Horizontal recommended
- Nozzle size: Ø 10.0 mm

Electrical connection ratings:
- Power supply: 4.5 – 24 VDC
- Consumption: 5 mA to max. 13 mA
- Signal connection: Open collector NPN
- Signal voltage: 0 V GND
- Signal load: max. 20 mA
- Leakage current: max. 10 µA
- Connections: 3-pin AMP 2.8 x 0.8 mm
- Signal: Square-wave output
- Duty Cycle: 50% / ±5%

Dimensions in mm:

Options:
- 3-pin solenoid socket
  Item number: 941-0002/3

RESISTANCE
Special regulations which must be complied with by the flowmeter manufacturer apply to each country, e.g. CE, NSF, FDA and SK. The various media flowing through the flowmeter differ from application to application. You are advised to enquire with the medium manufacturer as to whether the entire installation and the flowmeter are resistant to the medium itself (see Material)!

ELECTRONIC
DIGMESA electronic circuitry is always designed for operation with DIGMESA flowmeters. Please note the following if connecting to other electronic circuitry:
- The flowmeter does not supply an output voltage but switches the signal terminal to 0 V ground (actuated) or leaves it open (non-actuated)
- There must be a pull-up resistor between power supply + and signal depending on electronic circuitry!
Interface Connection: Examples Open Collector

Open Collector

- +4.5 - 24 VDC
- +5 VDC
- 0 VDC

Simple Circuit

- +4.5 - 24 VDC
- +5 VDC
- 0 VDC

TTL Output

- +4.5 - 24 VDC
- +5 VDC
- 0 VDC

Optocoupler Interface

- +4.5 - 24 VDC
- +5 VDC
- 0 VDC

We reserve the right to make modifications in the interests of technical progress.

Version 01 FMM 5.00-1999/01 GB Page 3-5

Digmesa AG, Kaltenstrasse 31, CH–2563 Ipsach / Switzerland, Phone +41 (32) 332 77 77, Fax +41 (32) 332 77 88, www.digmesa.com
Measurement Curve FHKU G1/2” 10.00 mm

Medium: Water / max. Pressure: 3.3 bar

<table>
<thead>
<tr>
<th>Nozzle size</th>
<th>Pulses/litre</th>
<th>g/pulse</th>
<th>min. flow rate in litres/min at Linear start</th>
<th>max. flow rate in litres/min</th>
<th>Pressure loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø 10.00 mm</td>
<td>65</td>
<td>15.37</td>
<td>3.00</td>
<td>26.69</td>
<td>0.32</td>
</tr>
</tbody>
</table>

The values specified must be considered as approximate values. The number of pulses per litre may differ depending on medium and installation. We recommend to calibrate the number of pulses per litre in line with the complete installation.

MEASUREMENT TIPS

- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
- Clean the system at appropriate intervals
- Avoid electrical current peaks
- Incorrect cabling of power supply +-, signal and ground will destroy the flowmeter
- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
Spare parts:

PT-screws # 443-0005 (Phillips cross recessed)

Upper section FHK Arnite # 532-0500

O-ring Silikon # 350-0410

Turbine FT 36 # 527-0303

Lower section FHKU G1/2” Ø 10.00 mm # 513-0020

Notes:
DATA SHEET

FHKU G1/2" 100 Ryton
Part number: 938-6800/01
General Description

The FHKU Flowmeter is a general-purpose device; specially for higher throughputs of up to approx. 30 l/min. It is employed for measuring, regulating or metering and guarantees most precise measurement of fluid quantities. In addition, a pulse generator integrated into the flowmeter guarantees a practically unlimited useful life.

Special features: Able to withstand high temperatures, good resistance to chemicals. Linear inlet and outlet, compact design.

Approvals / Standards
EN 50081-1:92, EN 50082-1:97, EN 61000-3-2:00, EN 61000-3-3:95, IEC 61000-6-3:96, IEC 61000-6-1:96, IEC 61000-3-2:00, IEC 61000-3-9:94 + A1:01

Material:
- Housing: PPS 40%GF (Ryton)
- Bearing pin: Inox 1.4305 (18/8), Inox 1.4571 on request
- O-ring: MVQ (Silikon), FPM (Viton)/EPDM on request
- Turbine: PVDF
- Magnets: Keramik Sr Fe O (in contact with the medium)
- Screw: Inox A2 PT-screws (Phillips cross recessed)

Technical data:
- Flow rate: 3 - 30 l/min
- Measuring accuracy: +/- 2.0%
- Repetition: < +/- 0.25%
- Temperature range: -10°C to +100°C, 14°F to 212°F
- Pressure range: 20 bar at 20°C, 290 psi /68°F
- Mounting position: Horizontal recommended
- Nozzle size: Ø 10.0 mm

Electrical connection ratings:
- Power supply: 4.5–24 VDC
- Consumption: 5 mA to max. 13 mA
- Signal connection: Open collector NPN
- Signal voltage: 0 V GND
- Signal load: max. 20 mA
- Leakage current: max. 10 μA
- Connections: 3-pin AMP 2.8 x 0.8 mm
- Signal: Square-wave output
- Duty Cycle: 50% / ±5%

Dimensions in mm:

Options:
- 3-pin solenoid socket
  Item number: 941-0002/3

RESISTANCE
Special regulations which must be complied with by the flowmeter manufacturer apply to each country, e.g. CE, NSF, FDA and SK. The various media flowing through the flowmeter differ from application to application. You are advised to enquire with the medium manufacturer as to whether the entire installation and the flowmeter are resistant to the medium itself (see Material)!

ELECTRONIC
DIGMESA electronic circuitry is always designed for operation with DIGMESA flowmeters. Please note the following if connecting to other electronic circuitry:
- The flowmeter does not supply an output voltage but switches the signal terminal to 0 V ground (actuated) or leaves it open (non-actuated)
- There must be a pull-up resistor between power supply + and signal depending on electronic circuitry!
Interface Connection: Examples Open Collector

**simple circuit**

- Signal +
- Signal
t
- 4k7
- 100nF
- 0 VDC

**TTL output**

- Signal +
- Signal
- 2k2
- 1N4148
- 100nF
- 0 VDC

**optocoupler interface**

- Signal +
- Signal
- Rx
- 100nF
- 0 VDC
- + 5 VDC
- + 12 VDC
- + 24 VDC
- Rx = 1kΩ
- Rx = 4.7kΩ
- Rx = 10kΩ
Measurement Curve FHKU G1/2” 10.00 mm

Medium: Water / max. Pressure: 3.3 bar

The values specified must be considered as approximate values.
The number of pulses per litre may differ depending on medium and installation.
We recommend to calibrate the number of pulses per litre in line with the complete installation.

<table>
<thead>
<tr>
<th>Nozzle size</th>
<th>Pulses/litre</th>
<th>g/pulse</th>
<th>min. flow rate in litres/min at Linear start</th>
<th>max. flow rate in litres/min</th>
<th>Pressure loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø 10.00 mm</td>
<td>65</td>
<td>15.37</td>
<td>3.00</td>
<td>26.69</td>
<td>0.32</td>
</tr>
</tbody>
</table>

MEASUREMENT TIPS

- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
- Clean the system at appropriate intervals
- Avoid electrical current peaks
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter
- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
Spare parts:

- Inox A2 PT-screws # 443-0008
  (Phillips cross recessed)
- Upper section FHK Ryton # 532-0800
- O-ring Silikon # 350-0410
- Turbine FT 36 # 527-0303
- Lower section FHKU G1/2" Ryton Ø 10.00 mm # 513-0021

Notes:
DATA SHEET

FHKU John Guest 3/8" Arnite
Part number: 938-75XX/01

Digmesa AG, Kolonstrasse 81, CH–2563 Ipsach / Switzerland
Phone +41 (32) 332 77 77, Fax +41 (32) 332 77 88
www.digmesa.com
General Description

The FHKU JG Flowmeter is a general-purpose device; its working range can be individually defined according to its nozzle size. It is employed for measuring, regulating or metering and guarantees most precise measurement of fluid quantities. In addition, a pulse generator integrated into the flowmeter guarantees a practically unlimited useful life.

**Special features:** Linear inlet and outlet, compact design, great working range, depending on the nozzle diameter. Hose diameters from 3/8" (9.5mm) can be directly connected.

**Material:**
- **Housing:** PBT 35% GF (Amidite)
- **Bearing pin:** Inox 1.4305 (18/8)
- **Nozzle:** Inox 1.4305 (18/8)
- **O-ring:** MVQ (Silikon) / FPM (Viton) / EPDM on request
- **Turbine:** PVDF
- **Magnets:** Keramik Sr Fe O (in contact with the medium)
- **Screw:** PT screws (Phillips cross recessed)

**Technical data:**
- **Flow rate:** 0.041 - 15 l/min depending on the nozzle diameter
- **Measuring accuracy:** +/- 2.0%
- **Repetition:** < +/- 0.25%
- **Temperature range:** as shown on page 3
- **Pressure range:** as shown on page 3
- **Mounting position:** Horizontal recommended
- **Nozzle size:** Ø 1.0, 1.2, 1.5, 2.0, 2.5, 3.0, 4.0, 5.6 mm

**Electrical connection ratings:**
- **Power supply:** 4.5–24 VDC
- **Consumption:** 5 mA to max. 13 mA
- **Signal connection:** Open collector NPN
- **Signal voltage:** 0 V GND
- **Signal load:** max. 20 mA
- **Leakage current:** max. 10 µA
- **Connections:** 3-pin AMP 2.8 x 0.8 mm
- **Duty Cycle:** 50% / ± 5%

**Options:**
- 3-pin solenoid socket
  Item number: 941-0002/3

**Dimensions in mm:**

**IMPORTANT:** The two red safety clips supplied must be refitted once the hose has been attached!

**Approvals / Standards**
- EN 50081-1:92, EN 50082-1:97,
- EN 61000-3-2:00, EN 61000-3-3:95,
- IEC 61000-6-3:96, IEC 61000-6-1:96,
- IEC 61000-3-2-00, IEC 61000-3-9.4 + A1:01

**Special regulations which must be complied with by the flowmeter manufacturer apply to each country, e.g. CE, NSF, FDA and SK. The various media flowing through the flowmeter differ from application to application. You are advised to enquire with the medium manufacturer as to whether the entire installation and the flowmeter are resistant to the medium itself (see Material)!!**

**RESISTANCE**

DIGMESA electronic circuitry is always designed for operation with DIGMESA flowmeters. Please note the following if connecting to other electronic circuitry:
- The flowmeter does not supply an output voltage but switches the signal terminal to 0 V ground (actuated) or leaves it open (non-actuated)
- There must be a pull-up resistor between power supply + and signal depending on electronic circuitry!!

**ELECTRONIC**
Technical data John Guest

Working Pressure and Temperature Range

Super Speedfit fittings are suitable for the following:

<table>
<thead>
<tr>
<th>Temp.</th>
<th>Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5/32”- 5/16”</td>
</tr>
<tr>
<td></td>
<td>4mm - 8mm</td>
</tr>
<tr>
<td>Air</td>
<td>+20°C</td>
</tr>
<tr>
<td></td>
<td>-20°C</td>
</tr>
<tr>
<td>Potable Liquids and Air</td>
<td>+1°C</td>
</tr>
<tr>
<td></td>
<td>+23°C</td>
</tr>
<tr>
<td></td>
<td>+65°C</td>
</tr>
</tbody>
</table>

Also suitable for vacuum

Depending on the tube used, under certain conditions fittings may be used at higher pressures and temperatures. Please refer to our Customer Services Department for guidance. Note 1 Bar = 14.5 PSI.

Tube Types

Plastic Tube - Polyethylene, nylon and polyurethane conforming to the tolerances shown below. For soft tubing or thin wall tube we recommend the use of tube inserts.

Braided Tube - Use of Tube to Hose Stems listed on pages 5 and 12 is essential when using tube. Use of clamps to retain braided tube on bars is recommended.

Metal Tube (soft) - Brass, copper or mild steel conforming to the tolerances below.

Metal Tube (hard) - We do not recommend Super Speedfit fittings for hard metal tubes.

For stainless steel and other polished metal tubes we recommend the use of Superseal fittings. These are shown on page 9 of this brochure.

It is essential that outside diameters be free from score marks and that the tube be deburred before inserting the fitting.

Tube Tolerances

Super Speedfit fittings are offered for tubes with outside diameters to the following tolerances.

<table>
<thead>
<tr>
<th>Size (inches)</th>
<th>5/32” - 3/16”</th>
<th>1/4” - 1/2”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tolerance (inches)</td>
<td>+0.001” - 0.003”</td>
<td>+0.001” - 0.004”</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Size (mm)</th>
<th>4mm - 5mm</th>
<th>6mm - 22mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tolerance (mm)</td>
<td>+0.05” - 0.07”</td>
<td>+0.05” - 0.10”</td>
</tr>
</tbody>
</table>

Installation and System Testing

Fittings and tube should be kept clean and undamaged before use. All tube and fittings installations must be pressure tested after installation to ensure system integrity before handing over to the final user. See also “How to make a connection”.

Chemicals

For use with chemicals or other potentially aggressive liquids, please refer to our Customer Services Department.

Super Speedfit fittings are not recommended for use with explosive gases, petroleum spirits, and other fuels or for central heating systems.

Collet Covers

Are available as additional security against removal of the tube or to provide a simple means of colour coding. The cover is offered in a range of six colours. Please see pages 6 and 12 of this brochure.

Food Quality

All the fittings in the brochure are produced in Food and Drug Administration (FDA) approved materials and are therefore recommended for food quality applications.

Maximum Torque Values for Plastic Threads BSP, BSPT & NPT.

<table>
<thead>
<tr>
<th>Threads</th>
<th>1/8” - 1/4”</th>
<th>3/8” - 1/2”</th>
<th>3/4”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. Torque (Nm)</td>
<td>1.0 Nm</td>
<td>3.0 Nm</td>
<td>4.0 Nm</td>
</tr>
</tbody>
</table>

a. It is recommended that all installations are checked prior to use to determine that a seal has been made.
b. The maximum torque figures quoted for use with Speedfit fittings are dependent on the mating thread conforming to the relevant British or International thread standard.

Cleaners and Sanitising of Acetal Fittings

Our advice to customers is to use cleaners and sanitising agents that are above pH 4 and low in hypochlorite level. Acetal fittings and parts that are cleaned and/or sanitised should be rinsed immediately with copious amounts of clean tap water to remove all traces of the cleaners. Details of which products are made from acetal are shown in our catalogues but generally John Guest products incorporating acetal are designated by the part number prefix PI, PM, CI, CM and RM. Polypropylene fittings offer greater resistance to aggressive chemicals than acetal fittings. Polypropylene does not have the same mechanical properties as acetal and John Guest polypropylene fittings are generally designated by the part number prefix PP.

Our material suppliers recommend ECOLAB Oasis 133 as a suitable external cleaner for acetal products manufactured by John Guest.

Warranty

Whilst we give a warranty against defects in manufacture or materials, it is the responsibility of the specifier to ensure that fittings and related products are suitable for their application. The installation must be carried out correctly in accordance with our recommendations, complying with recognised codes of practice and relevant national
Interface Connection: Examples Open Collector

**Simple Circuit**

- Signal: +4.5 - 24 VDC
- +4.5 VDC
- -4.5 VDC
- +12 VDC
- -12 VDC
- +24 VDC
- -24 VDC

**TTL Output**

- Signal: +4.5 - 24 VDC
- +5 VDC
- 2k2
- 1N4148
- 1N4148

**Optocoupler Interface**

- Signal: +4.5 - 24 VDC
- +5 VDC
- 4k7
- Rx = 1kΩ
- 12 VDC
- Rx = 4.7kΩ
- 24 VDC
- Rx = 10kΩ

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We reserve the right to make modifications in the interests of technical progress.

Digmesa AG, Keltenstrasse 31, CH–2563 Ipsach / Switzerland, Phone +41 (32) 332 77 77, Fax +41 (32) 332 77 88, www.digmesa.com
**Measurement Curve FHKU 1.00 mm**

### Measurement Tips
- Ensure that there is no fast-pulsatory movement of the media.
- Ensure that there are no reverse pressure surges.
- Ensure that there is no air in the system.
- Note the mounting position of the flowmeter.
- Min/max flow should be in the linear range of the selected flowmeter.
- Clean the system at appropriate intervals.
- Avoid electrical current peaks.
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter.
- Do not mechanically load electrical contacts.
- Avoid moisture on the electrical contacts.
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads).

---

**Table:**

<table>
<thead>
<tr>
<th>Nozzle size</th>
<th>Pulses/litre</th>
<th>g/pulse</th>
<th>min. flow rate in litres/min at Linear start</th>
<th>max. flow rate in litres/min</th>
<th>Pressure loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø 1.00 mm</td>
<td>2063</td>
<td>0.4846</td>
<td>0.0410</td>
<td>0.5670</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 1.20 mm</td>
<td>1700</td>
<td>0.5880</td>
<td>0.0505</td>
<td>0.8225</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 1.50 mm</td>
<td>1314</td>
<td>0.7608</td>
<td>0.0427</td>
<td>1.2504</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 2.00 mm</td>
<td>988</td>
<td>1.0017</td>
<td>0.0911</td>
<td>2.4055</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 2.50 mm</td>
<td>760</td>
<td>1.3153</td>
<td>0.1503</td>
<td>3.7478</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 3.00 mm</td>
<td>565</td>
<td>1.7677</td>
<td>0.1022</td>
<td>5.6310</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 4.00 mm</td>
<td>381</td>
<td>2.6215</td>
<td>0.1235</td>
<td>8.3893</td>
<td>0.80</td>
</tr>
<tr>
<td>Ø 5.60 mm</td>
<td>236</td>
<td>4.2266</td>
<td>0.3088</td>
<td>9.2647</td>
<td>0.45</td>
</tr>
</tbody>
</table>

---

**The values specified must be considered as approximate values.**

The number of pulses per litre may differ depending on medium and installation. We recommend to calibrate the number of pulses per litre in line with the complete installation.
Measurement Curve FHKU 1.20 mm

**MEASUREMENT TIPS**

- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
- Clean the system at appropriate intervals
- Avoid electrical current peaks
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter
- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)

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<td>0.0410</td>
<td>0.5670</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 1.20 mm</td>
<td>1700</td>
<td>0.5880</td>
<td>0.0505</td>
<td>0.8225</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 1.50 mm</td>
<td>1314</td>
<td>0.7608</td>
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<td>0.0911</td>
<td>2.4055</td>
<td>1.00</td>
</tr>
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<td>0.1503</td>
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<td>Ø 4.00 mm</td>
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<td>2.6215</td>
<td>0.1235</td>
<td>8.3893</td>
<td>0.80</td>
</tr>
<tr>
<td>Ø 5.60 mm</td>
<td>236</td>
<td>4.2266</td>
<td>0.3088</td>
<td>9.2647</td>
<td>0.45</td>
</tr>
</tbody>
</table>

The values specified must be considered as approximate values.
The number of pulses per litre may differ depending on medium and installation.
We recommend to calibrate the number of pulses per litre in line with the complete installation.

Medium: Water / max. Pressure: 3.3 bar
Measurement Curve FHKU 1.50 mm

<table>
<thead>
<tr>
<th>Nozzle size</th>
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<th>g/pulse</th>
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<tr>
<td>Ø 1.20 mm</td>
<td>1700</td>
<td>0.5880</td>
<td>0.0505</td>
<td>0.8225</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 1.50 mm</td>
<td>1314</td>
<td>0.7608</td>
<td>0.0427</td>
<td>1.2504</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 2.00 mm</td>
<td>988</td>
<td>1.0117</td>
<td>0.0911</td>
<td>2.4055</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 2.50 mm</td>
<td>760</td>
<td>1.3153</td>
<td>0.1503</td>
<td>3.7478</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 3.00 mm</td>
<td>565</td>
<td>1.7677</td>
<td>0.1022</td>
<td>5.6310</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 4.00 mm</td>
<td>381</td>
<td>2.6215</td>
<td>0.1235</td>
<td>8.3893</td>
<td>0.80</td>
</tr>
<tr>
<td>Ø 5.60 mm</td>
<td>236</td>
<td>4.2266</td>
<td>0.3888</td>
<td>9.2647</td>
<td>0.45</td>
</tr>
</tbody>
</table>

The values specified must be considered as approximate values. The number of pulses per litre may differ depending on medium and installation. We recommend to calibrate the number of pulses per litre in line with the complete installation.

MEASUREMENT TIPS

- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
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- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
Measurement Curve FHKU 2.00 mm

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<thead>
<tr>
<th>Nozzle size</th>
<th>Pulses/litre</th>
<th>g/pulse</th>
<th>min. flow rate in litres/min at Linear start</th>
<th>max. flow rate in litres/min</th>
<th>Pressure loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø 1.00 mm</td>
<td>2063</td>
<td>0.4846</td>
<td>0.0410</td>
<td>0.5670</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 1.20 mm</td>
<td>1700</td>
<td>0.5880</td>
<td>0.0505</td>
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<td>1.00</td>
</tr>
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<td>0.7608</td>
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<td>Ø 4.00 mm</td>
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<td>2.6215</td>
<td>0.1235</td>
<td>8.3893</td>
<td>0.80</td>
</tr>
<tr>
<td>Ø 5.60 mm</td>
<td>236</td>
<td>4.2266</td>
<td>0.3088</td>
<td>9.2647</td>
<td>0.45</td>
</tr>
</tbody>
</table>

The values specified must be considered as approximate values.
The number of pulses per litre may differ depending on medium and installation.
We recommend to calibrate the number of pulses per litre in line with the complete installation.

Medium: Water / max. Pressure: 3.3 bar
**Measurement Curve FHKU 2.50 mm**

**MEASUREMENT TIPS**

- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
- Clean the system at appropriate intervals
- Avoid electrical current peaks
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter
- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)

**Nozzle size**

<table>
<thead>
<tr>
<th>Nozzle size</th>
<th>Pulses/litre</th>
<th>g/pulse</th>
<th>min. flow rate in litres/min at Linear start</th>
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</tr>
</thead>
<tbody>
<tr>
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<td>0.4846</td>
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<td>0.5670</td>
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</tr>
<tr>
<td>Ø 1.20 mm</td>
<td>1700</td>
<td>0.5880</td>
<td>0.0505</td>
<td>0.8225</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 1.50 mm</td>
<td>1314</td>
<td>0.7608</td>
<td>0.0427</td>
<td>1.2504</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 2.00 mm</td>
<td>988</td>
<td>1.017</td>
<td>0.0911</td>
<td>2.4055</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 2.50 mm</td>
<td>760</td>
<td>1.3153</td>
<td>0.1503</td>
<td>3.7478</td>
<td>1.00</td>
</tr>
<tr>
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<td>1.7677</td>
<td>0.1022</td>
<td>5.6310</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 4.00 mm</td>
<td>381</td>
<td>2.6215</td>
<td>0.1235</td>
<td>8.3893</td>
<td>0.80</td>
</tr>
<tr>
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<td>236</td>
<td>4.2266</td>
<td>0.3088</td>
<td>9.2647</td>
<td>0.45</td>
</tr>
</tbody>
</table>

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The number of pulses per litre may differ depending on medium and installation.
We recommend to calibrate the number of pulses per litre in line with the complete installation.
Measurement Curve FHKU 3.00 mm

<table>
<thead>
<tr>
<th>Nozzle size</th>
<th>Pulses/litre</th>
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<th>min. flow rate in litres/min at Linear start</th>
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<td>0.8225</td>
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</tr>
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</tr>
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<td>0.1503</td>
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</tr>
</tbody>
</table>

The values specified must be considered as approximate values.
The number of pulses per litre may differ depending on medium and installation.
We recommend to calibrate the number of pulses per litre in line with the complete installation.

Medium: Water / max. Pressure: 3.3 bar
Measurement Curve FHKU 4.00 mm

<table>
<thead>
<tr>
<th>Nozzle size (mm)</th>
<th>Pulses/litre</th>
<th>g/pulse</th>
<th>min. flow rate in litres/min at Linear start</th>
<th>max. flow rate in litres/min</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Ø 1.00</td>
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<td>0.5670</td>
<td>1.00</td>
</tr>
<tr>
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<td>0.5880</td>
<td>0.0505</td>
<td>0.8225</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 1.50</td>
<td>1314</td>
<td>0.7608</td>
<td>0.0427</td>
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<tr>
<td>Ø 2.00</td>
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<td>1.0117</td>
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<tr>
<td>Ø 2.50</td>
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<td>1.3153</td>
<td>0.1503</td>
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<td>4.2266</td>
<td>0.3088</td>
<td>9.2647</td>
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</tr>
</tbody>
</table>

Medium: Water / max. Pressure: 3.3 bar

The values specified must be considered as approximate values.
The number of pulses per litre may differ depending on medium and installation.
We recommend to calibrate the number of pulses per litre in line with the complete installation.

MEASUREMENT TIPS

• Ensure that there is no fast-pulsatory movement of the media
• Ensure that there are no reverse pressure surges
• Ensure that there is no air in the system
• Note the mounting position of the flowmeter
• Min/max flow should be in the linear range of the selected flowmeter
• Clean the system at appropriate intervals
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• Do not mechanically load electrical contacts
• Avoid moisture on the electrical contacts
• Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
### Measurement Curve FHKU 5.60 mm

#### Linearität/linearity

<table>
<thead>
<tr>
<th>Durchfluss/flow rate L/min.</th>
<th>Abweichung/deviation %</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>-4</td>
</tr>
<tr>
<td>0.5</td>
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<tr>
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<td>-1.5</td>
</tr>
<tr>
<td>1.5</td>
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<tr>
<td>2</td>
<td>1.5</td>
</tr>
<tr>
<td>2.5</td>
<td>2.5</td>
</tr>
<tr>
<td>3</td>
<td>3.5</td>
</tr>
<tr>
<td>3.5</td>
<td>4.5</td>
</tr>
<tr>
<td>4</td>
<td>5.5</td>
</tr>
<tr>
<td>4.5</td>
<td>6.5</td>
</tr>
<tr>
<td>5</td>
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</tr>
<tr>
<td>6</td>
<td>9.5</td>
</tr>
<tr>
<td>6.5</td>
<td>10</td>
</tr>
</tbody>
</table>

#### Druckverlust/pressure drop

<table>
<thead>
<tr>
<th>Durchfluss/flow rate L/min.</th>
<th>Druckverlust/pressure drop bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0.5</td>
<td>0.2</td>
</tr>
<tr>
<td>1</td>
<td>0.4</td>
</tr>
<tr>
<td>1.5</td>
<td>0.6</td>
</tr>
<tr>
<td>2</td>
<td>0.8</td>
</tr>
<tr>
<td>2.5</td>
<td>1.0</td>
</tr>
<tr>
<td>3</td>
<td>1.2</td>
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<tr>
<td>3.5</td>
<td>1.4</td>
</tr>
<tr>
<td>4</td>
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<td>5</td>
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</tr>
<tr>
<td>6</td>
<td>2.4</td>
</tr>
<tr>
<td>6.5</td>
<td>2.6</td>
</tr>
<tr>
<td>7</td>
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<tr>
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<td>3.2</td>
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#### Measurement Tips

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#### Medium

- Water
- max. Pressure: 3.3 bar

---

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<td>4.2266</td>
<td>0.3088</td>
<td>9.2647</td>
<td>0.45</td>
</tr>
</tbody>
</table>
Spare parts:

PT-screws # 443-0005
(Phillips cross recessed)

Upper section FHK Arnite # 532-0500

O-ring MVQ (Silikon) # 350-0410

Turbine FT 36 # 527-0303

Lower section FHKU JG 3/8" Ø 1.00 mm # 513-0030/10
Lower section FHKU JG 3/8" Ø 1.20 mm # 513-0030/12
Lower section FHKU JG 3/8" Ø 1.50 mm # 513-0030/15
Lower section FHKU JG 3/8" Ø 2.00 mm # 513-0030/20
Lower section FHKU JG 3/8" Ø 2.50 mm # 513-0030/25
Lower section FHKU JG 3/8" Ø 3.00 mm # 513-0030/30
Lower section FHKU JG 3/8" Ø 4.00 mm # 513-0030/40
Lower section FHKU JG 3/8" Ø 5.60 mm # 513-0030/56

Notes:
FHKUF John Guest 3/8” Arnite
Part number: 938-75XX/02
General Description

The FHKU JG Flowmeter is a general-purpose device, its working range can be individually defined according to its nozzle size. It is employed for measuring, regulating or metering and guarantees most precise measurement of fluid quantities. In addition, a pulse generator integrated into the flowmeter guarantees a practically unlimited useful life.

**Special features:** Linear inlet and outlet, compact design, great working range, depending on the nozzle diameter. Hose diameters from 3/8" (9.5mm) can be directly connected.

**Approvals / Standards**
- EN 50081-1:92, EN 50082-1:97,
- EN 61000-3-2:00, EN 61000-3-3:95,
- IEC 61000-6-3:96, IEC 61000-6-1:96,
- IEC 61000-3-2-00, IEC 61000-3-94 +A1:01

---

**Material:**

- **Housing:** PBT 35% GF (Arnite)
- **Bearing pin:** Inox 1.4305 (18/8)
  - Inox 1.4571 on request
- **Nozzle:** Inox 1.4305 (18/8)
  - PTFE on request
- **O-ring:** MVQ (Silikon)
  - FPM (Viton) / EPDM on request
- **Turbine:** PVDF
- **Magnets:** Keramik Sr Fe O
  - (in contact with the medium)
- **Screw:** PT-screws
  - (Phillips cross recessed)

**Technical data:**

- **Flow rate:** 0.041 - 15 l/min depending on the nozzle diameter
- **Measuring accuracy:** +/- 2.0%
- **Repetition:** < +/- 0.25%
- **Temperature range:** as shown on page 3
- **Pressure range:** as shown on page 3
- **Mounting position:** Horizontal recommended
- **Nozzle size:** Ø 1.0, 1.2, 1.5, 2.0, 2.5, 3.0, 4.0, 5.6 mm

**Electrical connection ratings:**

- **Power supply:** 4.5 – 24 VDC
- **Consumption:** 5 mA to max. 13 mA
- **Signal connection:** Open collector NPN
- **Signal voltage:** 0 V GND
- **Signal load:** max. 20 mA
- **Leakage current:** max. 10 µA
- **Connections:** Faston AMP 6.3 x 2.8mm
- **Signal:** Square-wave output
- **Duty Cycle:** 50% / ±5%

---

**Dimensions in mm:**

```
Dimensions in mm:

IN  47  33  2 x 3/8" (9.50)

OUT

9.20

22

43

3.5 x 2.8 (9.50)

12

38.70

IN  47  33  2 x 3/8" (9.50)
```

**ELECTRONIC**

DIGMESA electronic circuitry is always designed for operation with DIGMESA flowmeters. Please note the following if connecting to other electronic circuitry:

- The flowmeter does not supply an output voltage but switches the signal terminal to 0 V ground (actuated) or leaves it open (non-actuated)
- There must be a pull-up resistor between power supply + and signal depending on electronic circuitry!

**RESISTANCE**

Special regulations which must be complied with by the flowmeter manufacturer apply to each country, e.g. CE, NSF, FDA and SK. The various media flowing through the flowmeter differ from application to application. You are advised to enquire with the medium manufacturer as to whether the entire installation and the flowmeter are resistant to the medium itself (see Material)!

---

**IMPORTANT:**

The two red safety clips supplied must be refitted once the hose has been attached!
Technical data John Guest

Working Pressure and Temperature Range

<table>
<thead>
<tr>
<th>Temp.</th>
<th>5/32&quot; - 5/16&quot;</th>
<th>3/8&quot; - 1/2&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air</td>
<td>4mm - 8mm</td>
<td>10mm - 22mm</td>
</tr>
<tr>
<td>-20°C</td>
<td>16 Bar</td>
<td>10 Bar</td>
</tr>
<tr>
<td>Potable Liquids and Air</td>
<td>16 Bar</td>
<td>10 Bar</td>
</tr>
<tr>
<td>+1°C</td>
<td>16 Bar</td>
<td>10 Bar</td>
</tr>
<tr>
<td>+23°C</td>
<td>16 Bar</td>
<td>10 Bar</td>
</tr>
<tr>
<td>+65°C</td>
<td>10 Bar</td>
<td>7 Bar</td>
</tr>
</tbody>
</table>

Also suitable for vacuum

Depending on the type used, under certain conditions fittings may be used at higher pressures and temperatures. Please refer to our Customer Services Department for guidance. Note 1 Bar = 14.5 PSIG.

Tube Types

Plastic Tube - Polyethylene, nylon and polyurethane conforming to the tolerances shown below. For soft tubing or thin wall tube we recommend the use of tube inserts.

Braided Tube - Use of Tube to Hose Stems listed on pages 5 and 12 is essential when using tube. Use of clamps to retain braided tube on bars is recommended.

Metal Tube (soft) - Brass, copper or mild steel conforming to the tolerances below.

Metal Tube (hard) - We do not recommend Super Speedfit fittings for hard metal tubes.

For stainless steel and other polished metal tubes we recommend the use of Superseal fittings. These are shown on page 9 of this brochure. It is essential that outside diameters be free from score marks and that the tube be deburred before inserting the fitting.

Tube Tolerances

Super Speedfit fittings are offered for tubes with outside diameters to the following tolerances.

<table>
<thead>
<tr>
<th>Size (inches)</th>
<th>5/32 - 3/16</th>
<th>1/4 - 1/2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tolerance</td>
<td>+0.001 / -0.003</td>
<td>+0.004 / -0.004</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Size (mm)</th>
<th>4mm - 5mm</th>
<th>6mm - 22mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tolerance</td>
<td>+0.05 / -0.07</td>
<td>+0.05 / -0.10</td>
</tr>
</tbody>
</table>

Installation and System Testing

Fittings and tube should be kept clean and undamaged before use. All tube and fittings installations must be pressure tested after installation to ensure system integrity before handing over to the final user. See also “How to make a connection.”

Chemicals

For use with chemicals or other potentially aggressive liquids, please refer to our Customer Services Department. Super Speedfit fittings are not recommended for use with explosive gases, petroleum spirits, and other fuels or for central heating systems.

Collet Covers

Are available as additional security against removal of the tube or to provide a simple means of colour coding. The cover is offered in a range of six colours. Please see pages 6 and 12 of this brochure.

Food Quality

All the fittings in the brochure are produced in Food and Drug Administration (FDA) approved materials and are therefore recommended for food quality applications.

Maximum Torque Values for Plastic Threads BSP, BSPT & NPT.

<table>
<thead>
<tr>
<th>Threads</th>
<th>1/8 - 1/4</th>
<th>3/8 - 1/2</th>
<th>3/4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. Torque</td>
<td>1.5Nm</td>
<td>3.0Nm</td>
<td>4.0Nm</td>
</tr>
</tbody>
</table>

a. It is recommended that all installations are checked prior to use to determine that a seal has been made.
b. The maximum torque figures quoted for use with Speedfit fittings are dependent on the mating thread conforming to the relevant British or International thread standard.

Cleaners and Sanitising of Acetal Fittings

Our advice to customers is to use cleaners and sanitising agents that are above pH4 and low in hypochlorite level. Acetal fittings and parts that are cleaned and/or sanitised should be rinsed immediately with copious amounts of clean tap water to remove all traces of the cleaners. Details of which products are made from acetal are shown in our catalogues but generally John Guest products incorporating acetal are designated by the part number prefix PI, PM, CI, CM and RI. Polypropylene fittings offer greater resistance to aggressive chemicals than acetal fittings. Polypropylene does not have the same mechanical properties as acetal and John Guest polypropylene fittings are generally designated by the part number prefix PP. Our material suppliers recommend ECOLAB Oasis 133 as a suitable external cleaner for acetal products manufactured by John Guest.

Warranty

Whilst we give a warranty against defects in manufacture or materials, it is the responsibility of the specifier to ensure that fittings and related products are suitable for their application. The installation must be carried out correctly in accordance with our recommendations, complying with recognised codes of practice and relevant national
Interface Connection: Examples Open Collector

open collector

[Diagram of simple circuit with various signal levels and resistors]

Signal + 4.5 - 24 VDC

Signal 0 VDC +5 VDC

Rx = 1k0

Rx = 4k7

Rx = 10k

open collector

[Diagram of TTL output circuit with various signal levels and components]

Signal + 4.5 - 24 VDC + 5 VDC

Rx = 1k0

Rx = 4k7

Rx = 10k

open collector

[Diagram of optocoupler interface circuit with various signal levels and components]

Signal + 4.5 - 24 VDC

Rx = 1k0

Rx = 4k7

Rx = 10k
Medium: Water / max. Pressure: 3.3 bar

<table>
<thead>
<tr>
<th>Nozzle size</th>
<th>Pulses/litre</th>
<th>g/pulse</th>
<th>min. flow rate in litres/min at Linear start</th>
<th>max. flow rate in litres/min</th>
<th>Pressure loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø 1.00 mm</td>
<td>2063</td>
<td>0.4846</td>
<td>0.0410</td>
<td>0.5670</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 1.20 mm</td>
<td>1700</td>
<td>0.5880</td>
<td>0.0505</td>
<td>0.8225</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 1.50 mm</td>
<td>1314</td>
<td>0.7608</td>
<td>0.0427</td>
<td>1.2504</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 2.00 mm</td>
<td>988</td>
<td>1.0117</td>
<td>0.0911</td>
<td>2.4055</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 2.50 mm</td>
<td>760</td>
<td>1.3153</td>
<td>0.1403</td>
<td>3.7478</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 3.00 mm</td>
<td>565</td>
<td>1.3767</td>
<td>0.1200</td>
<td>5.6310</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 4.00 mm</td>
<td>381</td>
<td>2.6215</td>
<td>0.1235</td>
<td>8.3893</td>
<td>0.80</td>
</tr>
<tr>
<td>Ø 5.60 mm</td>
<td>236</td>
<td>4.2266</td>
<td>0.3088</td>
<td>9.2647</td>
<td>0.45</td>
</tr>
</tbody>
</table>

The values specified must be considered as approximate values.
The number of pulses per litre may differ depending on medium and installation.
We recommend to calibrate the number of pulses per litre in line with the complete installation.

MEASUREMENT TIPS

- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
- Clean the system at appropriate intervals
- Avoid electrical current peaks
- Incorrect cabling of power supply +,- signal and ground will destroy the flowmeter
- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
Measurement Curve FHKU 1.20 mm

<table>
<thead>
<tr>
<th>Nozzle size</th>
<th>Pulses/litre</th>
<th>g/pulse</th>
<th>min. flow rate in litres/min at Linear start</th>
<th>max. flow rate in litres/min</th>
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<td>0.8225</td>
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</tr>
<tr>
<td>Ø 1.50 mm</td>
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<td>1.00</td>
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<tr>
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<td>3.7478</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 3.00 mm</td>
<td>565</td>
<td>1.7677</td>
<td>0.1022</td>
<td>5.6310</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 4.00 mm</td>
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<td>2.6275</td>
<td>0.1235</td>
<td>8.3893</td>
<td>0.80</td>
</tr>
<tr>
<td>Ø 5.60 mm</td>
<td>236</td>
<td>4.2266</td>
<td>0.3088</td>
<td>9.2647</td>
<td>0.45</td>
</tr>
</tbody>
</table>

Medium: Water / max. Pressure: 3.3 bar

The values specified must be considered as approximate values. The number of pulses per litre may differ depending on medium and installation. We recommend to calibrate the number of pulses per litre in line with the complete installation.

MEASUREMENT TIPS

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- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
Measurement Curve FHKU 1.50 mm

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</tr>
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Medium: Water / max. Pressure: 3.3 bar

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The number of pulses per litre may differ depending on medium and installation.
We recommend to calibrate the number of pulses per litre in line with the complete installation.

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Measurement Curve FHKU 2.00 mm

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Measurement Curve FHKU 2.50 mm

<table>
<thead>
<tr>
<th>Nozzle size</th>
<th>Pulses/litre</th>
<th>g/pulse</th>
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</tr>
</tbody>
</table>

Medium: Water / max. Pressure: 3.3 bar

**The values specified must be considered as approximate values.**

**The number of pulses per litre may differ depending on medium and installation.**

We recommend to calibrate the number of pulses per litre in line with the complete installation.

---

**MEASUREMENT TIPS**

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- Ensure that there are no reverse pressure surges
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Measurement Curve FHKU 3.00 mm

![Graph of measurement curve](image)

Medium: Water / max. Pressure: 3.3 bar

<table>
<thead>
<tr>
<th>Nozzle size</th>
<th>Pulses/litre</th>
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**MEASUREMENT TIPS**

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- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
Measurement Curve FHKU 4.00 mm

<table>
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<tr>
<th>Nozzle size</th>
<th>Pulses/litre</th>
<th>g/pulse</th>
<th>min. flow rate in litres/min at Linear start</th>
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Medium: Water / max. Pressure: 3.3 bar

**MEASUREMENT TIPS**

- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
- Clean the system at appropriate intervals
- Avoid electrical current peaks
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter
- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
Measurement Curve FHKU 5.60 mm

<table>
<thead>
<tr>
<th>Nozzle size</th>
<th>Pulses/litre</th>
<th>g/pulse</th>
<th>min. flow rate in litres/min at Linear start</th>
<th>max. flow rate in litres/min</th>
<th>Pressure loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø 1.00 mm</td>
<td>2063</td>
<td>0.4846</td>
<td>0.0410</td>
<td>0.5670</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 1.20 mm</td>
<td>1700</td>
<td>0.5880</td>
<td>0.0505</td>
<td>0.8225</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 1.50 mm</td>
<td>1314</td>
<td>0.7608</td>
<td>0.0427</td>
<td>1.2504</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 2.00 mm</td>
<td>988</td>
<td>1.0117</td>
<td>0.0911</td>
<td>2.4055</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 2.50 mm</td>
<td>760</td>
<td>1.3153</td>
<td>0.1503</td>
<td>3.7478</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 3.00 mm</td>
<td>565</td>
<td>1.7677</td>
<td>0.1022</td>
<td>5.6310</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 4.00 mm</td>
<td>381</td>
<td>2.6215</td>
<td>0.1235</td>
<td>8.3893</td>
<td>0.80</td>
</tr>
<tr>
<td>Ø 5.60 mm</td>
<td>236</td>
<td>4.2266</td>
<td>0.3088</td>
<td>9.2647</td>
<td>0.45</td>
</tr>
</tbody>
</table>

Medium: Water / max. Pressure: 3.3 bar

The values specified must be considered as approximate values.
The number of pulses per litre may differ depending on medium and installation.
We recommend to calibrate the number of pulses per litre in line with the complete installation.

MEASUREMENT TIPS

- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
- Clean the system at appropriate intervals
- Avoid electrical current peaks
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter
- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
Spare parts:

PT-screws # 443-0005  
(Phillips cross recessed)

Upper section FHKF Arnite # 532-2500

O-ring MVQ (Silikon) # 350-0410

Turbine FT 36 # 527-0303

Lower section FHKU JG 3/8" Ø 1.00 mm # 513-0030/10
Lower section FHKU JG 3/8" Ø 1.20 mm # 513-0030/12
Lower section FHKU JG 3/8" Ø 1.50 mm # 513-0030/15
Lower section FHKU JG 3/8" Ø 2.00 mm # 513-0030/20
Lower section FHKU JG 3/8" Ø 2.50 mm # 513-0030/25
Lower section FHKU JG 3/8" Ø 3.00 mm # 513-0030/30
Lower section FHKU JG 3/8" Ø 4.00 mm # 513-0030/40
Lower section FHKU JG 3/8" Ø 5.60 mm # 513-0030/56

Notes:
FKUC John Guest 3/8" Arnite
Part number: 938-75XX/03
General Description

The FHKU JG Flowmeter is a general-purpose device, its working range can be individually defined according to its nozzle size. It is employed for measuring, regulating or metering and guarantees most precise measurement of fluid quantities. In addition, a pulse generator integrated into the flowmeter guarantees a practically unlimited useful life.

**Special features:** Linear inlet and outlet, compact design, great working range, depending on the nozzle diameter. Hose diameters from 3/8" (9.5mm) can be directly connected.

**Material:**
- Housing: PBT 35% GF (Arnite)
- Bearing pin: Inox 1.4305 (18/8)
- Inox 1.4571 on request
- Nozzle: Inox 1.4305 (18/8)
- PTFE on request
- O-ring: MVQ (Silikon)
- FPM (Viton) / EPDM on request
- Turbine: PVDF
- Magnets: Keramik Sr Fe O
  (in contact with the medium)
- Screw: PT-screws
  (Phillips cross recessed)

**Technical data:**
- Flow rate: 0.04 - 15 l/min depending on the nozzle diameter
- Measuring accuracy: +/- 2.0%
- Repetition: <+/- 0.25%
- Temperature range: as shown on page 3
- Pressure range: as shown on page 3
- Mounting position: Horizontal recommended
- Nozzle size: Ø 1.0, 1.2, 1.5, 2.0, 2.5, 3.0, 4.0, 5.6 mm

**Electrical connection ratings:**
- Power supply: 4.5–24 VDC
- Consumption: 5 mA to max. 13 mA
- Signal connection: Open collector NPN
- Signal voltage: 0 V GND
- Signal load: max. 20 mA
- Leakage current: max. 10 µA
- Connections: PANCON MAS-CON 156 MLSS
- Signal: Square-wave output
- Duty Cycle: 50%, ± 5%

**IMPORTANT:**
The two red safety clips supplied must be refitted once the hose has been attached!

**Dimensions in mm:**

**RESISTANCE**

Special regulations which must be complied with by the flowmeter manufacturer apply to each country, e.g. CE, NSF, FDA and SK. The various media flowing through the flowmeter differ from application to application. You are advised to enquire with the medium manufacturer as to whether the entire installation and the flowmeter are resistant to the medium itself (see Material)!

**ELECTRONIC**

DIGMESA electronic circuitry is always designed for operation with DIGMESA flowmeters. Please note the following if connecting to other electronic circuitry:
- The flowmeter does not supply an output voltage but switches the signal terminal to 0 V ground (actuated) or leaves it open (non-actuated)
- There must be a pull-up resistor between power supply + and signal depending on electronic circuitry!
### Technical data John Guest

**Working Pressure and Temperature Range**

<table>
<thead>
<tr>
<th>Temp. and Pressure</th>
<th>Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>-20°C</td>
<td>16 Bar</td>
</tr>
<tr>
<td>0°C</td>
<td>10 Bar</td>
</tr>
<tr>
<td>1°C</td>
<td>16 Bar</td>
</tr>
<tr>
<td>23°C</td>
<td>10 Bar</td>
</tr>
<tr>
<td>65°C</td>
<td>7 Bar</td>
</tr>
</tbody>
</table>

**Also suitable for vacuum**

Depending on the tube used, under certain conditions fittings may be used at higher pressures and temperatures. Please refer to our Customer Services Department for guidance. Note 1 Bar = 14.5 PSI.

**Tube Types**

**Plastic Tube** - Polyethylene, nylon and polyurethane conforming to the tolerances shown below. For soft tubing or thin wall tube we recommend the use of tube inserts.

**Braided Tube** - Use of Tube to Hose Stems listed on pages 5 and 12 is essential when using tube. Use of clamps to retain braided tube on bars is recommended.

**Metal Tube (soft)** - Brass, copper or mild steel conforming to the tolerances below.

**Metal Tube (hard)** - We do not recommend Super Speedfit fittings for hard metal tubes.

For stainless steel and other polished metal tubes we recommend the use of Superseal fittings. These are shown on page 9 of this brochure. It is essential that outside diameters be free from score marks and that the tube be deburred before inserting the fitting.

**Tube Tolerances**

**Super Speedfit** fittings are offered for tubes with outside diameters to the following tolerances.

<table>
<thead>
<tr>
<th>Size (inches)</th>
<th>5/32 - 3/16</th>
<th>1/4 - 1/2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tolerance (inches)</td>
<td>+0.001 / -0.003</td>
<td>+0.001 / -0.004</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Size (mm)</th>
<th>4mm - 5mm</th>
<th>6mm - 22mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tolerance (mm)</td>
<td>+0.05 / -0.07</td>
<td>+0.05 / -0.10</td>
</tr>
</tbody>
</table>

**Installation and System Testing**

Fittings and tube should be kept clean and undamaged before use.

All tube and fittings installations must be pressure tested after installation to ensure system integrity before handing over to the final user. See also "How to make a connection".

**Chemicals**

For use with chemicals or other potentially aggressive liquids, please refer to our Customer Services Department.

**Super Speedfit** fittings are not recommended for use with explosive gases, petroleum spirits, and other fuels or for central heating systems.

**Collet Covers**

Are available as additional security against removal of the tube or to provide a simple means of colour coding. The cover is offered in a range of six colours. Please see pages 6 and 12 of this brochure.

**Food Quality**

All the fittings in the brochure are produced in Food and Drug Administration (FDA) approved materials and are therefore recommended for food quality applications.

**Maximum Torque Values for Plastic Threads BSP, BSPT & NPT.**

<table>
<thead>
<tr>
<th>Threads</th>
<th>1/8 - 1/4</th>
<th>3/8 - 1/2</th>
<th>3/4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. Torque 1.5Nm</td>
<td>3.0Nm</td>
<td>4.0Nm</td>
<td></td>
</tr>
</tbody>
</table>

* a. It is recommended that all installations are checked prior to use to determine that all seals have been made.

b. The maximum torque figures quoted for use with Speedfit fittings are dependent on the mating thread conforming to the relevant British or International thread standard.

**Cleaners and Sanitising of Acetal Fittings**

Our advice to customers is to use cleaners and sanitising agents that are above pH4 and low in hypochlorite level. Acetal fittings and parts that are cleaned and/or sanitised should be rinsed immediately with copious amounts of clean tap water to remove all traces of the cleansers. Details of which products are made from acetal are shown in our catalogues but generally John Guest products incorporating acetal are designated by the part number prefix PI, PM, CI, CM and RM. Polypropylene fittings offer greater resistance to aggressive chemicals than acetal fittings. Polypropylene does not have the same mechanical properties as acetal and John Guest polypropylene fittings are generally designated by the part number prefix PP.

Our material suppliers recommend ECOLAB Oasis 133 as a suitable external cleaner for acetal products manufactured by John Guest.

**Warranty**

Whilst we give a warranty against defects in manufacture or materials, it is the responsibility of the specifier to ensure that fittings and related products are suitable for their application. The installation must be carried out correctly in accordance with our recommendations, complying with recognised codes of practice and relevant national
Measurement Curve FHKU 1.00 mm

<table>
<thead>
<tr>
<th>Nozzle size</th>
<th>Pulses/litre</th>
<th>g/pulse</th>
<th>min. flow rate in litres/min at Linear start</th>
<th>max. flow rate in litres/min</th>
<th>Pressure loss</th>
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<tbody>
<tr>
<td>Ø 1.00 mm</td>
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<td>0.4846</td>
<td>0.0410</td>
<td>0.5670</td>
<td>1.00</td>
</tr>
<tr>
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<td>0.5880</td>
<td>0.0505</td>
<td>0.8225</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 1.50 mm</td>
<td>1314</td>
<td>0.7608</td>
<td>0.0427</td>
<td>1.2504</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 2.00 mm</td>
<td>988</td>
<td>1.0117</td>
<td>0.0911</td>
<td>2.4055</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 2.50 mm</td>
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<td>1.3153</td>
<td>0.1503</td>
<td>3.7478</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 3.00 mm</td>
<td>565</td>
<td>1.7677</td>
<td>0.1022</td>
<td>5.6310</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 4.00 mm</td>
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<td>2.6215</td>
<td>0.1235</td>
<td>8.3893</td>
<td>0.80</td>
</tr>
<tr>
<td>Ø 5.60 mm</td>
<td>236</td>
<td>4.2266</td>
<td>0.3088</td>
<td>9.2647</td>
<td>0.45</td>
</tr>
</tbody>
</table>

Medium: Water / max. Pressure: 3.3 bar

The values specified must be considered as approximate values.
The number of pulses per litre may differ depending on medium and installation.
We recommend to calibrate the number of pulses per litre in line with the complete installation.

MEASUREMENT TIPS

- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
- Clean the system at appropriate intervals
- Avoid electrical current peaks
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter
- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
Measurement Curve FHKU 1.20 mm

<table>
<thead>
<tr>
<th>Nozzle size</th>
<th>Pulses/litre</th>
<th>g/pulse</th>
<th>min. flow rate in litres/min at Linear start</th>
<th>max. flow rate in litres/min</th>
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</tr>
</thead>
<tbody>
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<td>1.00</td>
</tr>
<tr>
<td>Ø 1.50 mm</td>
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<td>0.7608</td>
<td>0.0427</td>
<td>1.2504</td>
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<td>988</td>
<td>1.0117</td>
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</tr>
<tr>
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<td>760</td>
<td>1.3153</td>
<td>0.1503</td>
<td>3.7478</td>
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<td>Ø 4.00 mm</td>
<td>381</td>
<td>2.6215</td>
<td>0.1235</td>
<td>8.3893</td>
<td>0.80</td>
</tr>
<tr>
<td>Ø 5.60 mm</td>
<td>236</td>
<td>4.2266</td>
<td>0.3088</td>
<td>9.2647</td>
<td>0.45</td>
</tr>
</tbody>
</table>

The values specified must be considered as approximate values.
The number of pulses per litre may differ depending on medium and installation.
We recommend to calibrate the number of pulses per litre in line with the complete installation.

Medium: Water / max. Pressure: 3.3 bar

MEASUREMENT TIPS

- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
- Clean the system at appropriate intervals
- Avoid electrical current peaks
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter
- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
### Measurement Curve FHKU 1.50 mm

#### Linearität/linearity

<table>
<thead>
<tr>
<th>Durchfluss/flow rate L/min.</th>
<th>Abweichung/deviation %</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0.1</td>
<td>0</td>
</tr>
<tr>
<td>0.2</td>
<td>0</td>
</tr>
<tr>
<td>0.3</td>
<td>0</td>
</tr>
<tr>
<td>0.4</td>
<td>0</td>
</tr>
<tr>
<td>0.5</td>
<td>0</td>
</tr>
<tr>
<td>0.6</td>
<td>0</td>
</tr>
<tr>
<td>0.7</td>
<td>0</td>
</tr>
<tr>
<td>0.8</td>
<td>0</td>
</tr>
<tr>
<td>0.9</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>1.1</td>
<td>0</td>
</tr>
<tr>
<td>1.2</td>
<td>-1.0</td>
</tr>
<tr>
<td>1.3</td>
<td>-2.0</td>
</tr>
<tr>
<td>1.4</td>
<td>-3.0</td>
</tr>
<tr>
<td>1.5</td>
<td>-4.0</td>
</tr>
<tr>
<td>1.6</td>
<td>-5.0</td>
</tr>
<tr>
<td>1.7</td>
<td>-6.0</td>
</tr>
<tr>
<td>1.8</td>
<td>-7.0</td>
</tr>
</tbody>
</table>

#### Druckverlust/pressure drop

<table>
<thead>
<tr>
<th>Durchfluss/flow rate L/min.</th>
<th>Druckverlust/pressure drop bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0.1</td>
<td>0.05</td>
</tr>
<tr>
<td>0.2</td>
<td>0.10</td>
</tr>
<tr>
<td>0.3</td>
<td>0.15</td>
</tr>
<tr>
<td>0.4</td>
<td>0.20</td>
</tr>
<tr>
<td>0.5</td>
<td>0.25</td>
</tr>
<tr>
<td>0.6</td>
<td>0.30</td>
</tr>
<tr>
<td>0.7</td>
<td>0.35</td>
</tr>
<tr>
<td>0.8</td>
<td>0.40</td>
</tr>
<tr>
<td>0.9</td>
<td>0.45</td>
</tr>
<tr>
<td>1</td>
<td>0.50</td>
</tr>
<tr>
<td>1.1</td>
<td>0.55</td>
</tr>
<tr>
<td>1.2</td>
<td>0.60</td>
</tr>
<tr>
<td>1.3</td>
<td>0.65</td>
</tr>
<tr>
<td>1.4</td>
<td>0.70</td>
</tr>
<tr>
<td>1.5</td>
<td>0.75</td>
</tr>
<tr>
<td>1.6</td>
<td>0.80</td>
</tr>
<tr>
<td>1.7</td>
<td>0.85</td>
</tr>
<tr>
<td>1.8</td>
<td>0.90</td>
</tr>
</tbody>
</table>

#### Nozzle size Pulses/litre g/pulse min. flow rate in litres/min at Linear start max. flow rate in litres/min Pressure loss

| Ø 1.00 mm | 2063 | 0.4846 | 0.0410 | 0.5670 | 1.00 |
| Ø 1.20 mm | 1700 | 0.5880 | 0.0505 | 0.8225 | 1.00 |
| Ø 1.50 mm | 1314 | 0.7608 | 0.0427 | 1.2504 | 1.00 |
| Ø 2.00 mm | 988  | 1.0117 | 0.0911 | 2.4055 | 1.00 |
| Ø 2.50 mm | 760  | 1.3153 | 0.1503 | 3.7478 | 1.00 |
| Ø 3.00 mm | 565  | 1.7677 | 0.1022 | 5.6310 | 1.00 |
| Ø 4.00 mm | 381  | 2.6215 | 0.1235 | 8.3893 | 0.80 |
| Ø 5.60 mm | 236  | 4.2266 | 0.3086 | 9.2647 | 0.45 |

#### Medium: Water / max. Pressure: 3.3 bar

The values specified must be considered as approximate values. The number of pulses per litre may differ depending on medium and installation. We recommend to calibrate the number of pulses per litre in line with the complete installation.

### MEASUREMENT TIPS

- Ensure that there is no fast-pulsatory movement of the media
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- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
Measurement Curve FHKU 2.00 mm

Nozzle size | Pulses/litre | g/pulse | min. flow rate in litres/min at Linear start | max. flow rate in litres/min | Pressure loss in litres/min
--- | --- | --- | --- | --- | ---
Ø 1.00 mm | 2063 | 0.4846 | 0.0410 | 0.5670 | 1.00
Ø 1.20 mm | 1700 | 0.5880 | 0.0505 | 0.8225 | 1.00
Ø 1.50 mm | 1314 | 0.7608 | 0.0427 | 1.2504 | 1.00
Ø 2.00 mm | 988 | 1.0117 | 0.0911 | 2.4055 | 1.00
Ø 2.50 mm | 760 | 1.3153 | 0.1503 | 3.7478 | 1.00
Ø 3.00 mm | 565 | 1.7677 | 0.1022 | 5.6310 | 1.00
Ø 4.00 mm | 381 | 2.6215 | 0.1235 | 8.3893 | 0.80
Ø 5.60 mm | 236 | 4.2266 | 0.3088 | 9.2647 | 0.45

The values specified must be considered as approximate values. The number of pulses per litre may differ depending on medium and installation. We recommend to calibrate the number of pulses per litre in line with the complete installation.

MEASUREMENT TIPS

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- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
### Measurement Curve FHKU 2.50 mm

#### Linearität/linearity

<table>
<thead>
<tr>
<th>Durchfluss / flow rate L/min.</th>
<th>Abweichung / deviation %</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>0.5</td>
<td>0.0</td>
</tr>
<tr>
<td>1.0</td>
<td>0.0</td>
</tr>
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<td>1.5</td>
<td>0.0</td>
</tr>
<tr>
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<tr>
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<tr>
<td>3.0</td>
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<tr>
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<td>4.0</td>
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<tr>
<td>5.0</td>
<td>0.0</td>
</tr>
<tr>
<td>5.5</td>
<td>0.0</td>
</tr>
</tbody>
</table>

#### Druckverlust / pressure drop

<table>
<thead>
<tr>
<th>Durchfluss / flow rate L/min.</th>
<th>Druckverlust / pressure drop bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>0.5</td>
<td>0.0</td>
</tr>
<tr>
<td>1.0</td>
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<tr>
<td>1.5</td>
<td>0.0</td>
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<td>2.5</td>
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</tbody>
</table>

#### Medium: Water / max. Pressure: 3.3 bar

**The values specified must be considered as approximate values.**

The number of pulses per litre may differ depending on medium and installation. We recommend to calibrate the number of pulses per litre in line with the complete installation.

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<thead>
<tr>
<th>Nozzle size</th>
<th>Puls/litre</th>
<th>g/pulse</th>
<th>min. flow rate in litres/min at Linear start</th>
<th>max. flow rate in litres/min</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Ø 1.00 mm</td>
<td>2063</td>
<td>0.4846</td>
<td>0.0410</td>
<td>0.5670</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 1.20 mm</td>
<td>1700</td>
<td>0.5880</td>
<td>0.0505</td>
<td>0.8225</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 1.50 mm</td>
<td>1314</td>
<td>0.7608</td>
<td>0.0427</td>
<td>1.2504</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 2.00 mm</td>
<td>988</td>
<td>1.0017</td>
<td>0.0911</td>
<td>2.4055</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 2.50 mm</td>
<td>760</td>
<td>1.3153</td>
<td>0.1503</td>
<td>3.7478</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 3.00 mm</td>
<td>565</td>
<td>1.7677</td>
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</tr>
<tr>
<td>Ø 4.00 mm</td>
<td>381</td>
<td>2.6215</td>
<td>0.1235</td>
<td>8.3893</td>
<td>0.80</td>
</tr>
<tr>
<td>Ø 5.60 mm</td>
<td>236</td>
<td>4.2266</td>
<td>0.3088</td>
<td>9.2647</td>
<td>0.45</td>
</tr>
</tbody>
</table>

**MEASUREMENT TIPS**

- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
- Clean the system at appropriate intervals
- Avoid electrical current peaks
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter
- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
Measurement Curve FHKU 3.00 mm

Nozzle size  | Puls/litre  | g/pulse | min. flow rate in litres/min at Linear start | max. flow rate in litres/min | Pressure loss
--- | --- | --- | --- | --- | ---
Ø 1.00 mm  | 2063  | 0.4846  | 0.0410  | 0.5670  | 1.00
Ø 1.20 mm  | 1700  | 0.5880  | 0.0505  | 0.8225  | 1.00
Ø 1.50 mm  | 1314  | 0.7608  | 0.0427  | 1.2504  | 1.00
Ø 2.00 mm  | 988   | 1.0117  | 0.0911  | 2.4055  | 1.00
Ø 2.50 mm  | 760   | 1.3153  | 0.1503  | 3.7478  | 1.00
Ø 3.00 mm  | 565   | 1.7677  | 0.1022  | 5.6310  | 1.00
Ø 4.00 mm  | 381   | 2.6215  | 0.1235  | 8.3893  | 0.80
Ø 5.60 mm  | 236   | 4.2266  | 0.3088  | 9.2647  | 0.45

The values specified must be considered as approximate values.
The number of pulses per litre may differ depending on medium and installation.
We recommend to calibrate the number of pulses per litre in line with the complete installation.

MEASUREMENT TIPS

- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
- Clean the system at appropriate intervals
- Avoid electrical current peaks
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter
- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
Measurement Curve FHKU 4.00 mm

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<tr>
<th>Nozzle size</th>
<th>Pulses/litre</th>
<th>g/pulse</th>
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</tr>
<tr>
<td>Ø 2.50 mm</td>
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<td>3.7478</td>
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</tr>
<tr>
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<td>0.3088</td>
<td>9.2647</td>
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</tr>
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</table>

Medium: Water / max. Pressure: 3.3 bar

The values specified must be considered as approximate values.
The number of pulses per litre may differ depending on medium and installation.
We recommend to calibrate the number of pulses per litre in line with the complete installation.

MEASUREMENT TIPS

- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
- Clean the system at appropriate intervals
- Avoid electrical current peaks
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter
- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
Measurement Curve FHKU 5.60 mm

The values specified must be considered as approximate values.
The number of pulses per litre may differ depending on medium and installation.
We recommend to calibrate the number of pulses per litre in line with the complete installation.

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<tr>
<th>Nozzle size</th>
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<th>g/pulse</th>
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<td>0.3088</td>
<td>9.2647</td>
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</tr>
</tbody>
</table>

Medium: Water / max. Pressure: 3.3 bar

MEASUREMENT TIPS

- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
- Clean the system at appropriate intervals
- Avoid electrical current peaks
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter
- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
Spare parts:

- PT-screws # 443-0005 (Phillips cross recessed)
- Upper section FHKC Arnite # 532-5502/ST
- O-ring MVQ (Silikon) # 350-0410
- Turbine FT 36 # 527-0303
- Lower section FHKU JG 3/8" Ø 1.00 mm # 513-0030/10
- Lower section FHKU JG 3/8" Ø 1.20 mm # 513-0030/12
- Lower section FHKU JG 3/8" Ø 1.50 mm # 513-0030/15
- Lower section FHKU JG 3/8" Ø 2.00 mm # 513-0030/20
- Lower section FHKU JG 3/8" Ø 2.50 mm # 513-0030/25
- Lower section FHKU JG 3/8" Ø 3.00 mm # 513-0030/30
- Lower section FHKU JG 3/8" Ø 4.00 mm # 513-0030/40
- Lower section FHKU JG 3/8" Ø 5.60 mm # 513-0030/56

Notes:
The FHKU JG Flowmeter is a general-purpose device; its working range can be individually defined according to its nozzle size. It is employed for measuring, regulating or metering and guarantees most precise measurement of fluid quantities. In addition, a pulse generator integrated into the flowmeter guarantees a practically unlimited useful life.

**Special features:** Linear inlet and outlet, compact design, great working range, depending on the nozzle diameter. Hose diameters from 1/4” (6.35mm) can be directly connected.

**Approvals / Standards**
- EN 50081-1:92, EN 50082-1:97,
- EN 61000-3-2:00, EN 61000-3-3:95,
- IEC 61000-6-3:96, IEC 61000-6-1:96,
- IEC 61000-3-2-00, IEC 61000-3-9.4 + A1.01

**Dimensions in mm:**

- IN
- OUT
- 2 x 1/4” (6.35)
- 47.50
- 31.10
- 3.5
- 1.5
- 2.0
- 2.5
- 3.0
- 4.0
- 5.6
- 9.20
- 14
- 14
- 33
- 4.3
- 5.7
- IMPORTANT: The two red safety clips supplied must be refitted once the hose has been attached!

**Material:**
- Housing: PBT 35% GF (Arnite)
- Bearing pin: Inox 1.4305 (18/8)
- Nozzle: Inox 1.4305 (18/8)
- O-ring: MVQ (Silikon)
- Turbine: PVDF
- Magnets: Keramik Sr Fe O
- Screw: PT-screws (Phillips cross recessed)

**Technical data:**
- Flow rate: 0.041 - 15 l/min depending on the nozzle diameter
- Measuring accuracy: +/- 2.0%
- Repetition: < +/- 0.25%
- Temperature range: as shown on page 3
- Pressure range: as shown on page 3
- Mounting position: Horizontal recommended
- Nozzle size: Ø 1.0, 1.2, 1.5, 2.0, 2.5, 3.0, 4.0, 5.6 mm

**Electrical connection ratings:**
- Power supply: 4.5 – 24 VDC
- Consumption: 5 mA to max. 13 mA
- Signal connection: Open collector NPN
- Signal voltage: 0 V GND
- Signal load: max. 20 mA
- Leakage current: max. 10 µA
- Connections: 3-pin AMP 2.8 x 0.8 mm
- Signal: Square-wave output
- Duty Cycle: 50% / ± 5%

**Options:**
- 3-pin solenoid socket
  - Item number: 941-0002/3
Technical data John Guest

Working Pressure and Temperature Range
Super Speedfit fittings are suitable for the following

<table>
<thead>
<tr>
<th>Temp.</th>
<th>Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>-20°C</td>
<td>16 Bar</td>
</tr>
<tr>
<td>+1°C</td>
<td>16 Bar</td>
</tr>
<tr>
<td>+23°C</td>
<td>16 Bar</td>
</tr>
<tr>
<td>+65°C</td>
<td>10 Bar</td>
</tr>
</tbody>
</table>

Also suitable for vacuum

Depending on the tube used, under certain conditions fittings may be used at higher pressures and temperatures. Please refer to our Customer Services Department for guidance. Note 1 Bar = 14.5 PSI.

Tube Types

Plastic Tube - Polyethylene, nylon and polyurethane conforming to the tolerances shown below. For soft tubing or thin wall tube we recommend the use of tube inserts.

Braided Tube - Use of Tube to Hose Stems listed on pages 5 and 12 is essential when using tube. Use of clamps to retain braided tube on bars is recommended.

Metal Tube (soft) - Brass, copper or mild steel conforming to the tolerances below.

Metal Tube (hard) - We do not recommend Super Speedfit fittings for hard metal tubes.

For stainless steel and other polished metal tubes we recommend the use of Superseal fittings. These are shown on page 9 of this brochure.

It is essential that outside diameters be free from score marks and that the tube be deburred before inserting the fitting.

Tube Tolerances

Super Speedfit fittings are offered for tubes with outside diameters to the following tolerances.

<table>
<thead>
<tr>
<th>Size (inches)</th>
<th>5/32 - 3/16</th>
<th>1/4 - 1/2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tolerance (inches)</td>
<td>+0.001 / -0.003</td>
<td>+0.001 / -0.004</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Size (mm)</th>
<th>4mm - 5mm</th>
<th>6mm - 22mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tolerance (mm)</td>
<td>+0.05 / -0.07</td>
<td>+0.05 / -0.10</td>
</tr>
</tbody>
</table>

Installation and System Testing

Fittings and tube should be kept clean and undamaged before use.

All tube and fittings installations must be pressure tested after installation to ensure system integrity before handing over to the final user. See also "How to make a connection".

Chemicals

For use with chemicals or other potentially aggressive liquids, please refer to our Customer Services Department.

Super Speedfit fittings are not recommended for use with explosive gases, petroleum spirits, and other fuels or for central heating systems.

Collet Covers

Are available as additional security against removal of the tube or to provide a simple method of colour coding. The cover is offered in a range of six colours. Please see pages 6 and 12 of this brochure.

Food Quality

All the fittings in the brochure are produced in Food and Drug Administration (FDA) approved materials and are therefore recommended for food quality applications.

Maximum Torque Values for Plastic Threads BSP, BSPT & NPT.

<table>
<thead>
<tr>
<th>Threads</th>
<th>1/8 - 1/4</th>
<th>3/16 - 1/2</th>
<th>3/4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. Torque</td>
<td>1.5Nm</td>
<td>3.0Nm</td>
<td>4.0Nm</td>
</tr>
</tbody>
</table>

a. It is recommended that all installations are checked prior to use to determine that a seal has been made.
b. The maximum torque figures quoted for use with Speedfit fittings are dependent on the mating thread conforming to the relevant British or International thread standard.

Cleaners and Sanitising of Acetal Fittings

Our advice to customers is to use cleaners and sanitising agents that are above pH4 and low in hypochlorite level. Acetal fittings and parts that are cleaned and/or sanitised should be rinsed immediately with copious amounts of clean tap water to remove all traces of the cleaners. Details of which products are made from acetal are shown in our catalogues but generally John Guest products incorporating acetal are designated by the part number prefix PI, PM, CI, CM and RM. Polypropylene fittings offer greater resistance to aggressive chemicals than acetal fittings. Polypropylene does not have the same mechanical properties as acetal and John Guest polypropylene fittings are generally designated by the part number prefix PP.

Our material suppliers recommend ECOLAB Oasis 133 as a suitable external cleaner for acetal products manufactured by John Guest.

Warranty

Whilst we give a warranty against defects in manufacture or materials, it is the responsibility of the specifier to ensure that fittings and related products are suitable for their application. The installation must be carried out correctly in accordance with our recommendations, complying with recognised codes of practice and relevant national
Interface Connection: Examples Open Collector

**Simple Circuit**
- +4.5 - 24 VDC
- +5 VDC
- +12 VDC
- +24 VDC
- 0 VDC
- 100nF
- Rx = 1kΩ
- Rx = 4.7kΩ
- Rx = 10kΩ

**TTL Output**
- +4.5 - 24 VDC
- +5 VDC
- +12 VDC
- +24 VDC
- 0 VDC
- 1N4148
- 2kΩ
- 100nF

**Optocoupler Interface**
- +4.5 - 24 VDC
- +5 VDC
- Rx
- 0 VDC
- 100nF
Measurement Curve FHKU 1.00 mm

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<tr>
<th>Nozzle size</th>
<th>Pulses/litre</th>
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Medium: Water / max. Pressure: 3.3 bar

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The number of pulses per litre may differ depending on medium and installation.
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- Avoid electrical current peaks
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter
- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
# Measurement Curve FHKU 1.20 mm

![Graph](image)

**Medium:** Water / **max. Pressure:** 3.3 bar

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<th>Nozzle size</th>
<th>Pulses/litre</th>
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<td>0.1503</td>
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<td>8.3893</td>
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</tr>
<tr>
<td>Ø 5.60 mm</td>
<td>236</td>
<td>4.2266</td>
<td>0.3088</td>
<td>9.2647</td>
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</tr>
</tbody>
</table>

The values specified must be considered as approximate values. The number of pulses per litre may differ depending on medium and installation. We recommend to calibrate the number of pulses per litre in line with the complete installation.

**MEASUREMENT TIPS**

- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
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- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
**Measurement Curve FHKU 1.50 mm**

![Measurement Curve](image)

**Nozzle size** | **Pulses/litre** | **g/pulse** | **min. flow rate in litres/min at Linear start** | **max. flow rate in litres/min** | **Pressure loss**
--- | --- | --- | --- | --- | ---
Ø 1.00 mm | 2063 | 0.4846 | 0.0410 | 0.5670 | 1.00
Ø 1.20 mm | 1700 | 0.5880 | 0.0505 | 0.8225 | 1.00
Ø 1.50 mm | 1314 | 0.7608 | 0.0427 | 1.2504 | 1.00
Ø 2.00 mm | 988 | 1.0117 | 0.0911 | 2.4055 | 1.00
Ø 2.50 mm | 760 | 1.3153 | 0.1503 | 3.7478 | 1.00
Ø 3.00 mm | 565 | 1.7677 | 0.1022 | 5.6310 | 1.00
Ø 4.00 mm | 381 | 2.6215 | 0.1235 | 8.3893 | 0.80
Ø 5.60 mm | 236 | 4.2266 | 0.3088 | 9.2647 | 0.45

The values specified must be considered as approximate values. The number of pulses per litre may differ depending on medium and installation. We recommend to calibrate the number of pulses per litre in line with the complete installation.

**MEASUREMENT TIPS**

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- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)

Medium: Water / max. Pressure: 3.3 bar
Measurement Curve FHKU 2.00 mm

Nozzle size | Pulses/litre | g/pulse | min. flow rate in litres/min at Linear start | max. flow rate in litres/min | Pressure loss
---|---|---|---|---|---
Ø 1.00 mm | 2063 | 0.4846 | 0.0410 | 0.5670 | 1.00
Ø 1.20 mm | 1700 | 0.5880 | 0.0505 | 0.8225 | 1.00
Ø 1.50 mm | 1314 | 0.7608 | 0.0427 | 1.2504 | 1.00
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Ø 4.00 mm | 381 | 2.6215 | 0.1235 | 8.3893 | 0.80
Ø 5.60 mm | 236 | 3.8268 | 0.3088 | 9.2647 | 0.45

The values specified must be considered as approximate values.
The number of pulses per litre may differ depending on medium and installation.
We recommend to calibrate the number of pulses per litre in line with the complete installation.
Measurement Curve FHKU 2.50 mm

<table>
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<tr>
<th>Nozzle size</th>
<th>Pulses/litre</th>
<th>g/pulse</th>
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Medium: Water / max. Pressure: 3.3 bar

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- Ensure that there are no reverse pressure surges
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- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
- Clean the system at appropriate intervals
- Avoid electrical current peaks
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter
- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
Measurement Curve FHKU 3.00 mm

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<th>Nozzle size</th>
<th>Pulses/litre</th>
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Medium: Water / max. Pressure: 3.3 bar

### MEASUREMENT TIPS

- Ensure that there is no fast-pulsatory movement of the media
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- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
Measurement Curve FHKU 4.00 mm

Nozzle size | Pulses/litre | g/pulse | min. flow rate in litres/min at Linear start | max. flow rate in litres/min | Pressure loss
--- | --- | --- | --- | --- | ---
Ø 1.00 mm | 2063 | 0.4846 | 0.0410 | 0.5670 | 1.00
Ø 1.20 mm | 1700 | 0.5880 | 0.0505 | 0.8225 | 1.00
Ø 1.50 mm | 1314 | 0.7608 | 0.0427 | 1.2504 | 1.00
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Medium: Water / max. Pressure: 3.3 bar

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Measurement Curve FHKU 5.60 mm

Medium: Water / max. Pressure: 3.3 bar

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We reserve the right to make modifications in the interest of technical progress.
Spare parts:

PT-screws # 443-0005 (Phillips cross recessed)

Upper section FHK Arnite # 532-0500

O-ring MVQ (Silikon) # 350-0410

Turbine FT 36 # 527-0303

Lower section FHKU JG 1/4" Ø 1.00 mm # 513-0031/10
Lower section FHKU JG 1/4" Ø 1.20 mm # 513-0031/12
Lower section FHKU JG 1/4" Ø 1.50 mm # 513-0031/15
Lower section FHKU JG 1/4" Ø 2.00 mm # 513-0031/20
Lower section FHKU JG 1/4" Ø 2.50 mm # 513-0031/25
Lower section FHKU JG 1/4" Ø 3.00 mm # 513-0031/30
Lower section FHKU JG 1/4" Ø 4.00 mm # 513-0031/40
Lower section FHKU JG 1/4" Ø 5.60 mm # 513-0031/56

Notes:
FHKUF John Guest 1/4" Arnite
Part number: 938-85XX/02
General Description

The FHKU JG Flowmeter is a general-purpose device; its working range can be individually defined according to its nozzle size. It is employed for measuring, regulating or metering and guarantees most precise measurement of fluid quantities. In addition, a pulse generator integrated into the flowmeter guarantees a practically unlimited useful life.

Special features: Linear inlet and outlet, compact design, great working range, depending on the nozzle diameter. Hose diameters from 1/4" (6.35mm) can be directly connected.

Approvals / Standards

EN 50081-1:92, EN 50082-1:97, EN 61000-3-2:00, EN 61000-3-3:95, IEC 61000-6-3, IEC 61000-6-1:96, IEC 61000-3-2:00, IEC 61000-3-94 + A1:01

Technical data:

Flow rate: 0.041 - 15 l/min depending on the nozzle diameter
Measuring accuracy: +/- 2.0%
Repetition: < +/-. 0.25%
Temperature range: as shown on page 3
Pressure range: as shown on page 3
Mounting position: Horizontal recommended
Nozzle size: Ø 1.0, 1.2, 1.5, 2.0, 2.5, 3.0, 4.0, 5.6 mm

Electrical connection ratings:

Power supply: 4.5 – 24 VDC
Consumption: 5 mA to max. 13 mA
Signal connection: Open collector NPN
Signal voltage: 0 V GND
Signal load: max. 20 mA
Leakage current: max. 10 µA
Connections: Faston AMP 6.3 x 2.8 mm
Signal: Square-wave output
Duty Cycle: 50% / ±5%

Materials:

- Housing: PBT 35% GF (Arnite)
- Bearing pin: Inox 1.4305 (18/8)
- Inox 1.4571 on request
- Nozzle: Inox 1.4305 (18/8)
- PTFE on request
- O-ring: MVQ (Silikon)
- FPM (Viton) / EPDM on request
- Turbine: PVDF
- Magnets: Keramik Sr Fe O (in contact with the medium)
- Screw: PT-screws (Phillips cross recessed)

Dimensions in mm:

- IN
- OUT
- 2 x 1/4" (6.35mm)
- Ø 20
- 33
- 14
- 9.20
- 3 x AMP 6.3 mm / 2.8 mm

IMPORTANT: The two red safety clips supplied must be refitted once the hose has been attached!

The FHKU JG Flowmeter is a general-purpose device; its working range can be individually defined according to its nozzle size. It is employed for measuring, regulating or metering and guarantees most precise measurement of fluid quantities. In addition, a pulse generator integrated into the flowmeter guarantees a practically unlimited useful life.

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Technical data John Guest

Working Pressure and Temperature Range

Super Speedfit fittings are suitable for the following

<table>
<thead>
<tr>
<th>Temp.</th>
<th>Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>-20°C</td>
<td>16 Bar</td>
</tr>
<tr>
<td>+1°C</td>
<td>16 Bar</td>
</tr>
<tr>
<td>+23°C</td>
<td>16 Bar</td>
</tr>
<tr>
<td>+65°C</td>
<td>10 Bar</td>
</tr>
</tbody>
</table>

Also suitable for vacuum

Depending on the tube used, under certain conditions fittings may be used at higher pressures and temperatures. Please refer to our Customer Services Department for guidance. Note 1 Bar = 14.5 PSIG.

Tube Types

Plastic Tube - Polyethylene, nylon and polyurethane conforming to the tolerances shown below. For soft tubing or thin wall tube we recommend the use of tube inserts.

Braided Tube - Use of Tube to Hose Stems listed on pages 5 and 12 is essential when using tube. Use of clamps to retain braided tube on bars is recommended.

Metal Tube (soft) - Brass, copper or mild steel conforming to the tolerances below.

Metal Tube (hard) - We do not recommend Super Speedfit fittings for hard metal tubes.

For stainless steel and other polished metal tubes we recommend the use of Superseal fittings. These are shown on page 9 of this brochure.

It is essential that outside diameters be free from score marks and that the tube be deburred before inserting the fitting.

Tube Tolerances

Super Speedfit fittings are offered for tubes with outside diameters to the following tolerances.

<table>
<thead>
<tr>
<th>Size (inches)</th>
<th>5/32 - 3/16</th>
<th>1/4 - 1/2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tolerance (inches)</td>
<td>+0.001 / -0.003</td>
<td>+0.001 / -0.004</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Size (mm)</th>
<th>4mm - 5mm</th>
<th>6mm - 22mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tolerance (mm)</td>
<td>+0.05 / -0.07</td>
<td>+0.05 / -0.10</td>
</tr>
</tbody>
</table>

Installation and System Testing

Fittings and tube should be kept clean and undamaged before use.

All tube and fittings installations must be pressure tested after installation to ensure system integrity before handing over to the final user. See also "How to make a connection".

Chemicals

For use with chemicals or other potentially aggressive liquids, please refer to our Customer Services Department.

Super Speedfit fittings are not recommended for use with explosive gases, petroleum spirits, and other fuels or for central heating systems.

Collet Covers

Are available as additional security against removal of the tube or to provide a simple means of colour coding. The cover is offered in a range of six colours. Please see pages 6 and 12 of this brochure.

Food Quality

All the fittings in the brochure are produced in Food and Drug Administration (FDA) approved materials and are therefore recommended for food quality applications.

Maximum Torque Values for Plastic Threads BSP, BSPT & NPT.

<table>
<thead>
<tr>
<th>Threads</th>
<th>1/8 - 1/4</th>
<th>3/8 - 1/2</th>
<th>3/4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. Torque (Nm)</td>
<td>1.0</td>
<td>3.0</td>
<td>4.0</td>
</tr>
</tbody>
</table>

a. It is recommended that all installations are checked prior to use to determine that a seal has been made.

b. The maximum torque figures quoted for use with Speedfit fittings are dependent on the mating thread conforming to the relevant British or International thread standard.

Cleaners and Sanitising of Acetal Fittings

Our advice to customers is to use cleaners and sanitising agents that are above pH 4 and low in hypochlorite level. Acetal fittings and parts that are cleaned and/or sanitised should be rinsed immediately with copious amounts of clean tap water to remove all traces of the cleaners. Details of which products are made from acetal are shown in our catalogues but generally John Guest products incorporating acetal are designated by the part number prefix PJ, PM, CI, CM and RM. Polypropylene fittings offer greater resistance to aggressive chemicals than acetal fittings. Polypropylene does not have the same mechanical properties as acetal and John Guest polypropylene fittings are generally designated by the part number prefix PP.

Our material suppliers recommend ECOLAB Oasis 133 as a suitable external cleaner for acetal products manufactured by John Guest.

Warranty

Whilst we give a warranty against defects in manufacture or materials, it is the responsibility of the specifier to ensure that fittings and related products are suitable for their application. The installation must be carried out correctly in accordance with our recommendations, complying with recognised codes of practice and relevant national
Interface Connection: Examples Open Collector

**Simple Circuit**

- Signal: +4.5 - 24 VDC
- 100nF
- 0 VDC

**TTL Output**

- Signal: +4.5 - 24 VDC
- 2k2
- 1N4148
- 0 VDC

**Optocoupler Interface**

- Signal: +4.5 - 24 VDC
- Rx: 1k0, 4.7, 10k
**Measurement Curve FHKU 1.00 mm**

![Measurement Curve Image]

**Medium:** Water / max. Pressure: 3.3 bar

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<td>0.1503</td>
<td>3.7478</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 3.00 mm</td>
<td>565</td>
<td>1.7677</td>
<td>0.1972</td>
<td>5.6310</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 4.00 mm</td>
<td>381</td>
<td>2.6215</td>
<td>0.1235</td>
<td>8.3893</td>
<td>0.80</td>
</tr>
<tr>
<td>Ø 5.60 mm</td>
<td>236</td>
<td>4.2266</td>
<td>0.3088</td>
<td>9.2647</td>
<td>0.45</td>
</tr>
</tbody>
</table>

**The values specified must be considered as approximate values.**

The number of pulses per litre may differ depending on medium and installation.

We recommend to calibrate the number of pulses per litre in line with the complete installation.

**MEASUREMENT TIPS**

- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
- Clean the system at appropriate intervals
- Avoid electrical current peaks
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter
- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
**Measurement Curve FHKU 1.20 mm**

**Nozzle size** | **Pulses/litre** | **g/pulse** | **min. flow rate in litres/min at Linear start** | **max. flow rate in litres/min** | **Pressure loss** |
---|---|---|---|---|---|
Ø 1.00 mm | 2063 | 0.4846 | 0.0410 | 0.5670 | 1.00 |
Ø 1.20 mm | 1700 | 0.5880 | 0.0505 | 0.8225 | 1.00 |
Ø 1.50 mm | 1314 | 0.7608 | 0.0427 | 1.2504 | 1.00 |
Ø 2.00 mm | 988 | 1.0117 | 0.0911 | 2.4055 | 1.00 |
Ø 2.50 mm | 760 | 1.3153 | 0.1503 | 3.7478 | 1.00 |
Ø 3.00 mm | 565 | 1.7677 | 0.1022 | 5.6310 | 1.00 |
Ø 4.00 mm | 381 | 2.6215 | 0.1235 | 8.3893 | 0.80 |
Ø 5.60 mm | 236 | 4.2266 | 0.3088 | 9.2647 | 0.45 |

The values specified must be considered as approximate values. The number of pulses per litre may differ depending on medium and installation. We recommend to calibrate the number of pulses per litre in line with the complete installation.

**MEASUREMENT TIPS**

- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
- Clean the system at appropriate intervals
- Avoid electrical current peaks
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter
- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
### Measurement Curve FHKU 1.50 mm

#### Linearity/linearity

<table>
<thead>
<tr>
<th>Durchfluss/flow rate L/min.</th>
<th>Abweichung/deviation %</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0.1</td>
<td>-0.5</td>
</tr>
<tr>
<td>0.2</td>
<td>-1.0</td>
</tr>
<tr>
<td>0.3</td>
<td>-1.5</td>
</tr>
<tr>
<td>0.4</td>
<td>-2.0</td>
</tr>
<tr>
<td>0.5</td>
<td>-2.5</td>
</tr>
<tr>
<td>0.6</td>
<td>-3.0</td>
</tr>
<tr>
<td>0.7</td>
<td>-3.5</td>
</tr>
<tr>
<td>0.8</td>
<td>-4.0</td>
</tr>
<tr>
<td>0.9</td>
<td>-4.5</td>
</tr>
<tr>
<td>1.0</td>
<td>-5.0</td>
</tr>
<tr>
<td>1.1</td>
<td>-5.5</td>
</tr>
<tr>
<td>1.2</td>
<td>-6.0</td>
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<tr>
<td>1.3</td>
<td>-6.5</td>
</tr>
<tr>
<td>1.4</td>
<td>-7.0</td>
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<tr>
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<td>-8.0</td>
</tr>
<tr>
<td>1.7</td>
<td>-8.5</td>
</tr>
<tr>
<td>1.8</td>
<td>-9.0</td>
</tr>
</tbody>
</table>

#### Pressure loss/drop bar

<table>
<thead>
<tr>
<th>Durchfluss/flow rate L/min.</th>
<th>Druckverlust/pressure drop bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>0.1</td>
<td>0.2</td>
</tr>
<tr>
<td>0.2</td>
<td>0.4</td>
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<tr>
<td>0.3</td>
<td>0.6</td>
</tr>
<tr>
<td>0.4</td>
<td>0.8</td>
</tr>
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<td>0.5</td>
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<td>0.8</td>
<td>1.6</td>
</tr>
<tr>
<td>0.9</td>
<td>1.8</td>
</tr>
<tr>
<td>1.0</td>
<td>2.0</td>
</tr>
</tbody>
</table>

**Medium:** Water / **max. Pressure:** 3.3 bar

### Table: Nozzle and Flow Characteristics

<table>
<thead>
<tr>
<th>Nozzle size</th>
<th>Pulses/litre</th>
<th>g/pulse</th>
<th>min. flow rate in litres/min at Linear start</th>
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<td>1.2504</td>
<td>1.00</td>
</tr>
<tr>
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<td>9.2647</td>
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</table>

**MEASUREMENT TIPS**

- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
- Clean the system at appropriate intervals
- Avoid electrical current peaks
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter
- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)

**The values specified must be considered as approximate values.**

**The number of pulses per litre may differ depending on medium and installation.**

We recommend to calibrate the number of pulses per litre in line with the complete installation.
Measurement Curve FHKU 2.00 mm

<table>
<thead>
<tr>
<th>Nozzle size</th>
<th>Pulses/litre</th>
<th>g/pulse</th>
<th>min. flow rate in litres/min at Linear start</th>
<th>max. flow rate in litres/min</th>
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<td>1.00</td>
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The values specified must be considered as approximate values.
The number of pulses per litre may differ depending on medium and installation.
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MEASUREMENT TIPS

- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
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- Min/max flow should be in the linear range of the selected flowmeter
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- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter
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- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
Measurement Curve FHKU 2.50 mm

### Measurement Curve FHKU 2.50 mm

**Linearität/linearity**

**Druckverlust/pressure drop**

---

**Medium:** Water / **max. Pressure:** 3.3 bar

**Nozzle size** | **Pulses/litre** | **g/pulse** | **min. flow rate in litres/min at Linear start** | **max. flow rate in litres/min** | **Pressure loss**
--- | --- | --- | --- | --- | ---
Ø 1.00 mm | 2063 | 0.4846 | 0.0410 | 0.5670 | 1.00
Ø 1.20 mm | 1700 | 0.5880 | 0.0505 | 0.8225 | 1.00
Ø 1.50 mm | 1314 | 0.7608 | 0.0427 | 1.2504 | 1.00
Ø 2.00 mm | 988 | 1.0117 | 0.0911 | 2.4055 | 1.00
Ø 2.50 mm | 760 | 1.3153 | 0.1503 | 3.7478 | 1.00
Ø 3.00 mm | 565 | 1.7677 | 0.1022 | 5.6310 | 1.00
Ø 4.00 mm | 381 | 2.6215 | 0.1235 | 8.3893 | 0.80
Ø 5.60 mm | 236 | 4.2266 | 0.3088 | 9.2647 | 0.45

---

**The values specified must be considered as approximate values.**

The number of pulses per litre may differ depending on medium and installation. We recommend to calibrate the number of pulses per litre in line with the complete installation.
Measurement Curve FHKU 3.00 mm

### Nozzle size | Puls/ltre | g/pulse | min. flow rate in litres/min at Linear start | max. flow rate in litres/min | Pressure loss
--- | --- | --- | --- | --- | ---
Ø 1.00 mm | 2063 | 0.4846 | 0.0410 | 0.5670 | 1.00
Ø 1.20 mm | 1700 | 0.5880 | 0.0505 | 0.8225 | 1.00
Ø 1.50 mm | 1314 | 0.7608 | 0.0427 | 1.2504 | 1.00
Ø 2.00 mm | 988 | 1.0117 | 0.0911 | 2.4055 | 1.00
Ø 2.50 mm | 760 | 1.3153 | 0.1503 | 3.7478 | 1.00
Ø 3.00 mm | 565 | 1.7677 | 0.1022 | 5.6310 | 1.00
Ø 4.00 mm | 381 | 2.6215 | 0.1235 | 8.3893 | 0.80
Ø 5.60 mm | 236 | 4.2266 | 0.3088 | 9.2647 | 0.45

**MEASUREMENT TIPS**

- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
- Clean the system at appropriate intervals
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- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter
- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
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The values specified must be considered as approximate values. The number of pulses per litre may differ depending on medium and installation. We recommend to calibrate the number of pulses per litre in line with the complete installation.
Measurement Curve FHKU 4.00 mm

### MEASUREMENT TIPS
- Ensure that there is no fast-pulsatory movement of the media.
- Ensure that there are no reverse pressure surges.
- Ensure that there is no air in the system.
- Note the mounting position of the flowmeter.
- Min/max flow should be in the linear range of the selected flowmeter.
- Clean the system at appropriate intervals.
- Avoid electrical current peaks.
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter.
- Do not mechanically load electrical contacts.
- Avoid moisture on the electrical contacts.
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads).

### Measurement Curve FHKU 4.00 mm

#### Nozzle size vs. Pulses/litre, g/pulse, Flow rate

<table>
<thead>
<tr>
<th>Nozzle size</th>
<th>Pulses/litre</th>
<th>g/pulse</th>
<th>min. flow rate in litres/min at Linear start</th>
<th>max. flow rate in litres/min</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Ø 1.00 mm</td>
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<td>1.00</td>
</tr>
<tr>
<td>Ø 1.50 mm</td>
<td>1314</td>
<td>0.7608</td>
<td>0.0427</td>
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<td>1.00</td>
</tr>
<tr>
<td>Ø 2.00 mm</td>
<td>988</td>
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<td>1.7677</td>
<td>0.1022</td>
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<td>Ø 4.00 mm</td>
<td>381</td>
<td>2.6215</td>
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<td>Ø 5.60 mm</td>
<td>236</td>
<td>4.2266</td>
<td>0.3088</td>
<td>9.2647</td>
<td>0.45</td>
</tr>
</tbody>
</table>

The values specified must be considered as approximate values.
The number of pulses per litre may differ depending on medium and installation.
We recommend to calibrate the number of pulses per litre in line with the complete installation.
Measurement Curve FHKU 5.60 mm

The values specified must be considered as approximate values. The number of pulses per litre may differ depending on medium and installation. We recommend to calibrate the number of pulses per litre in line with the complete installation.

<table>
<thead>
<tr>
<th>Nozzle size</th>
<th>Pulses/litre</th>
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<th>min. flow rate in litres/min at Linear start</th>
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</tr>
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<tbody>
<tr>
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</tr>
</tbody>
</table>

Medium: Water / max. Pressure: 3.3 bar

**MEASUREMENT TIPS**

- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
- Clean the system at appropriate intervals
- Avoid electrical current peaks
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter
- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
Spare parts:

PT-screws # 443-0005 (Phillips cross recessed)

Upper section FHKF Arnite # 532-2500

O-ring MVQ (Silikon) # 350-0410

Turbine FT 36 # 527-0303

Lower section FHKU JG 1/4" Ø 1.00 mm # 513-0031/10
Lower section FHKU JG 1/4" Ø 1.20 mm # 513-0031/12
Lower section FHKU JG 1/4" Ø 1.50 mm # 513-0031/15
Lower section FHKU JG 1/4" Ø 2.00 mm # 513-0031/20
Lower section FHKU JG 1/4" Ø 2.50 mm # 513-0031/25
Lower section FHKU JG 1/4" Ø 3.00 mm # 513-0031/30
Lower section FHKU JG 1/4" Ø 4.00 mm # 513-0031/40
Lower section FHKU JG 1/4" Ø 5.60 mm # 513-0031/56

Notes:
### General Description

The FHKU JG Flowmeter is a general-purpose device; its working range can be individually defined according to its nozzle size. It is employed for measuring, regulating or metering and guarantees most precise measurement of fluid quantities. In addition, a pulse generator integrated into the flowmeter guarantees a practically unlimited useful life.

**Special features:** Linear inlet and outlet, compact design, great working range, depending on the nozzle diameter. Hose diameters from 1/4” (6.35mm) can be directly connected.

**Approvals / Standards**

- EN 50081-1-92, EN 50082-1-97, EN 61000-3-2-00, EN 61000-3-3-95
- IEC 61000-6-3-96, IEC 61000-6-1-96, IEC 61000-3-2-00, IEC 61000-3-3-94 + A1.01

---

### Material:

- **Housing:** PBT 35% GF (Arnite)
- **Bearing pin:** Inox 1.4305 (18/8)
- **Nozzle:** Inox 1.4305 (18/8)
- **O-ring:** MVQ (Silikon)
- **Turbine:** PVDF
- **Magnets:** Keramik Sr Fe O
- **Screw:** PT-screws (Phillips cross recessed)

### Technical data:

- **Flow rate:** 0.041 - 15 l/min depending on the nozzle diameter
- **Measuring accuracy:** +/- 2.0%
- **Repetition:** +/- 0.25%
- **Temperature range:** as shown on page 3
- **Pressure range:** as shown on page 3
- **Mounting position:** Horizontal recommended
- **Nozzle size:** Ø 1.0, 1.2, 1.5, 2.0, 2.5, 3.0, 4.0, 5.6 mm

### Electrical connection ratings:

- **Power supply:** 4.5 – 24 VDC
- **Consumption:** 5 mA to max. 13 mA
- **Signal connection:** Open-collector NPN
- **Signal voltage:** 0 V GND
- **Signal load:** max. 20 mA
- **Leakage current:** max. 10 μA
- **Connections:** PANCON MAS-CON 156 MLSS
- **Signal:** Square-wave output
- **Duty Cycle:** 50%, ± 5%

### Dimensions in mm:

![Diagram showing dimensions](image)

**IMPORTANT:** The two red safety clips supplied must be refitted once the hose has been attached!

---

**RESISTANCE**

Special regulations which must be complied with by the flowmeter manufacturer apply to each country, e.g. CE, NSF, FDA and SK. The various media flowing through the flowmeter differ from application to application. You are advised to enquire with the medium manufacturer as to whether the entire installation and the flowmeter are resistant to the medium itself (see Material)! 

**ELECTRONIC**

DIGMESA electronic circuitry is always designed for operation with DIGMESA flowmeters. Please note the following if connecting to other electronic circuitry:

- The flowmeter does not supply an output voltage but switches the signal terminal to 0 V ground (actuated) or leaves it open (non-actuated)
- There must be a pull-up resistor between power supply + and signal depending on electronic circuitry!
Technical data John Guest

Working Pressure and Temperature Range

**Super Speedfit** fittings are suitable for the following conditions:

<table>
<thead>
<tr>
<th>Temp</th>
<th>Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>5/32” - 5/16”</td>
<td>4mm - 8mm</td>
</tr>
<tr>
<td>3/8” - 1/2”</td>
<td>10mm - 22mm</td>
</tr>
</tbody>
</table>

-20°C: 16 Bar, 10 Bar

Potable Liquids and Air:

+1°C: 16 Bar, 10 Bar
+23°C: 16 Bar, 10 Bar
+65°C: 10 Bar, 7 Bar

Also suitable for vacuum.

Depending on the tube used, under certain conditions fittings may be used at higher pressures and temperatures. Please refer to our Customer Services Department for guidance. Note 1 Bar = 14.5 PSI.

Tube Types

**Plastic Tube** - Polyethylene, nylon and polyurethane conforming to the tolerances shown below. For soft tubing or thin wall tube we recommend the use of tube inserts.

**Braided Tube** - Use of Tube to Hose Stems listed on pages 5 and 12 is essential when using tube. Use of clamps to retain braided tube on bars is recommended.

**Metal Tube (soft)** - Brass, copper or mild steel conforming to the tolerances below.

**Metal Tube (hard)** - We do not recommend **Super Speedfit** fittings for hard metal tubes.

For stainless steel and other polished metal tubes we recommend the use of **Superseal** fittings. These are shown on page 9 of this brochure.

It is essential that outside diameters be free from score marks and that the tube be deburred before inserting the fitting.

Tube Tolerances

**Super Speedfit** fittings are offered for tubes with outside diameters to the following tolerances.

<table>
<thead>
<tr>
<th>Size (inches)</th>
<th>5/32 - 3/16</th>
<th>1/4 - 1/2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tolerance (inches)</td>
<td>+0.001 / -0.003</td>
<td>+0.001 / -0.004</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Size (mm)</th>
<th>4mm - 5mm</th>
<th>6mm - 22mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tolerance (mm)</td>
<td>+0.05 / -0.07</td>
<td>+0.05 / -0.10</td>
</tr>
</tbody>
</table>

Installation and System Testing

**Fittings and tube should be kept clean and undamaged before use.**

All tube and fittings installations must be pressure tested after installation to ensure system integrity before handing over to the final user. See also "How to make a connection".

**Chemicals**

For use with chemicals or other potentially aggressive liquids, please refer to our Customer Services Department.

**Super Speedfit** fittings are not recommended for use with explosive gases, petroleum spirits, and other fuels or for central heating systems.

**Collet Covers**

Available as additional security against removal of the tube or to provide a simple means of colour coding. The cover is offered in a range of six colours. Please see pages 6 and 12 of this brochure.

**Food Quality**

All the fittings in the brochure are produced in Food and Drug Administration (FDA) approved materials and are therefore recommended for food quality applications.

**Maximum Torque Values for Plastic Threads BSP, BSPT & NPT.**

<table>
<thead>
<tr>
<th>Threads</th>
<th>1/8 - 1/4</th>
<th>3/8 - 1/2</th>
<th>3/4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. Torque (Nm)</td>
<td>1.5NM</td>
<td>3.0NM</td>
<td>4.0NM</td>
</tr>
</tbody>
</table>

a. It is recommended that all installations are checked prior to use to determine that a seal has been made.
b. The maximum torque figures quoted for use with Speedfit fittings are dependent on the mating thread conforming to the relevant British or International thread standard.

**Cleaners and Sanitising of Acetal Fittings**

Our advice to customers is to use cleaners and sanitising agents that are above pH 4 and low in hypochlorite level. Acetal fittings and parts that are cleaned and/or sanitised should be rinsed immediately with copious amounts of clean tap water to remove all traces of the cleaners. Details of which products are made from acetal are shown in our catalogues but generally John Guest products incorporating acetal are designated by the part number prefix PI, PM, CI, CM and RM. Polypropylene fittings offer greater resistance to aggressive chemicals than acetal fittings. Polypropylene does not have the same mechanical properties as acetal and John Guest polypropylene fittings are generally designated by the part number prefix PP.

Our material suppliers recommend ECOLAB Oasis 133 as a suitable external cleaner for acetal products manufactured by John Guest.

**Warranty**

Whilst we give a warranty against defects in manufacture or materials, it is the responsibility of the specifier to ensure that fittings and related products are suitable for their application. The installation must be carried out correctly in accordance with our recommendations, complying with recognised codes of practice and relevant national standards.
Interface Connection: Examples Open Collector

- **Open Collector**
  - Signal: +4.5 - 24 VDC
  - 100nF

- **Simple Circuit**
  - Signal: 0 VDC
  - +4.5 - 24 VDC
  - 4k7
  - Rx = 1k0
  - +12 VDC
  - Rx = 4k7
  - +24 VDC
  - Rx = 10k

- **TTL Output**
  - Signal: +5 VDC
  - 1N4148

- **Optocoupler Interface**
  - Signal: +5 VDC
  - Rx = 1k0
  - +12 VDC
  - Rx = 4k7
  - +24 VDC
  - Rx = 10k

---

DiQmesa AG, Keltenstrasse 31, CH–2563 Ipsach / Switzerland, Phone +41 (32) 332 77 77, Fax +41 (32) 332 77 88, www.digmesa.com
## Measurement Curve FHKU 1.00 mm

### Measurement Curve FHKU 1.00 mm

#### Linearität/linearity

<table>
<thead>
<tr>
<th>Durchfluss/flow rate L/min.</th>
<th>Abweichung/deviation %</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>0.1</td>
<td>0.0</td>
</tr>
<tr>
<td>0.2</td>
<td>0.0</td>
</tr>
<tr>
<td>0.3</td>
<td>0.0</td>
</tr>
<tr>
<td>0.4</td>
<td>0.0</td>
</tr>
<tr>
<td>0.5</td>
<td>0.0</td>
</tr>
<tr>
<td>0.6</td>
<td>0.0</td>
</tr>
<tr>
<td>0.7</td>
<td>0.0</td>
</tr>
<tr>
<td>0.8</td>
<td>0.0</td>
</tr>
<tr>
<td>0.9</td>
<td>0.0</td>
</tr>
<tr>
<td>1.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

#### Druckverlust/pressure drop

<table>
<thead>
<tr>
<th>Durchfluss/flow rate L/min.</th>
<th>Druckverlust/pressure drop bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>0.1</td>
<td>0.0</td>
</tr>
<tr>
<td>0.2</td>
<td>0.0</td>
</tr>
<tr>
<td>0.3</td>
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</tr>
<tr>
<td>0.4</td>
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</tr>
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<tr>
<td>0.7</td>
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<tr>
<td>0.8</td>
<td>0.0</td>
</tr>
<tr>
<td>0.9</td>
<td>0.0</td>
</tr>
<tr>
<td>1.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

### Nozzle size

<table>
<thead>
<tr>
<th>Nozzle size</th>
<th>Pulses/litre</th>
<th>g/pulse</th>
<th>min. flow rate in litres/min at Linear start</th>
<th>max. flow rate in litres/min</th>
<th>Pressure loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø 1.00 mm</td>
<td>2063</td>
<td>0.4846</td>
<td>0.0410</td>
<td>0.5670</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 1.20 mm</td>
<td>1700</td>
<td>0.5880</td>
<td>0.0505</td>
<td>0.8225</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 1.50 mm</td>
<td>1314</td>
<td>0.7608</td>
<td>0.0427</td>
<td>1.2504</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 2.00 mm</td>
<td>988</td>
<td>1.0117</td>
<td>0.0911</td>
<td>2.4055</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 2.50 mm</td>
<td>760</td>
<td>1.3153</td>
<td>0.1503</td>
<td>3.7478</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 3.00 mm</td>
<td>565</td>
<td>1.7677</td>
<td>0.1022</td>
<td>5.6310</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 4.00 mm</td>
<td>381</td>
<td>2.6215</td>
<td>0.1235</td>
<td>8.3893</td>
<td>0.80</td>
</tr>
<tr>
<td>Ø 5.60 mm</td>
<td>236</td>
<td>4.2266</td>
<td>0.3088</td>
<td>9.2647</td>
<td>0.45</td>
</tr>
</tbody>
</table>

### Measurement Tips

- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
- Clean the system at appropriate intervals
- Avoid electrical current peaks
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter
- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)

### Medium: Water / max. Pressure: 3.3 bar

The values specified must be considered as approximate values. The number of pulses per litre may differ depending on medium and installation. We recommend to calibrate the number of pulses per litre in line with the complete installation.
### Measurement Curve FHKU 1.20 mm

#### Measurement Tips
- Ensure that there is no fast-pulsatory movement of the media
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#### Nozzle size

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<th>Nozzle size</th>
<th>Pulses/litre</th>
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<td>0.3088</td>
<td>9.2647</td>
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</table>

The values specified must be considered as approximate values.
The number of pulses per litre may differ depending on medium and installation.
We recommend to calibrate the number of pulses per litre in line with the complete installation.

Medium: Water / max. Pressure: 3.3 bar
Measurement Curve FHKU 1.50 mm

<table>
<thead>
<tr>
<th>Nozzle size</th>
<th>Pulses/litre</th>
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</tr>
</tbody>
</table>

Medium: Water / max. Pressure: 3.3 bar

The values specified must be considered as approximate values. The number of pulses per litre may differ depending on medium and installation. We recommend to calibrate the number of pulses per litre in line with the complete installation.

**Measurement Tips**

- Ensure that there is no fast-pulsatory movement of the media
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- Avoid electrical current peaks
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- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
Measurement Curve FHKU 2.00 mm

The values specified must be considered as approximate values. The number of pulses per litre may differ depending on medium and installation.

We recommend to calibrate the number of pulses per litre in line with the complete installation.

<table>
<thead>
<tr>
<th>Nozzle size</th>
<th>Pulses/litre</th>
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</tr>
<tr>
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<td>1700</td>
<td>0.5880</td>
<td>0.0505</td>
<td>0.8225</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 1.50 mm</td>
<td>1314</td>
<td>0.7680</td>
<td>0.0427</td>
<td>1.2504</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 2.00 mm</td>
<td>988</td>
<td>1.0117</td>
<td>0.0911</td>
<td>2.4055</td>
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<td>Ø 2.50 mm</td>
<td>760</td>
<td>1.3153</td>
<td>0.1503</td>
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</tr>
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<td>236</td>
<td>4.2266</td>
<td>0.3088</td>
<td>9.2647</td>
<td>0.45</td>
</tr>
</tbody>
</table>

Medium: Water / max. Pressure: 3.3 bar

MEASUREMENT TIPS

- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
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- Min/max flow should be in the linear range of the selected flowmeter
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- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter
- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
### Measurement Curve FHKU 2.50 mm

#### Linearität/linearity

<table>
<thead>
<tr>
<th>Durchfluss/litres/min</th>
<th>Abweichung/deviation %</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.25</td>
<td>0.5</td>
</tr>
<tr>
<td>0.50</td>
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<td>11.0</td>
</tr>
<tr>
<td>5.75</td>
<td>11.5</td>
</tr>
</tbody>
</table>

#### Druckverlust/pressure drop

<table>
<thead>
<tr>
<th>Durchfluss/litres/min</th>
<th>Druckverlust/pressure drop bar</th>
</tr>
</thead>
<tbody>
<tr>
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<td>0.2</td>
</tr>
<tr>
<td>0.50</td>
<td>0.4</td>
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<td>0.75</td>
<td>0.6</td>
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<tr>
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<td>0.8</td>
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<tr>
<td>1.50</td>
<td>1.2</td>
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</table>

#### Medium: Water / max. Pressure: 3.3 bar

<table>
<thead>
<tr>
<th>Nozzle size</th>
<th>Pulses/litre</th>
<th>g/pulse</th>
<th>min. flow rate in litres/min at Linear start</th>
<th>max. flow rate in litres/min</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Ø 1.00 mm</td>
<td>2063</td>
<td>0.4846</td>
<td>0.0410</td>
<td>0.5670</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 1.20 mm</td>
<td>1700</td>
<td>0.5880</td>
<td>0.0505</td>
<td>0.8225</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 1.50 mm</td>
<td>1314</td>
<td>0.7608</td>
<td>0.0427</td>
<td>1.2504</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 2.00 mm</td>
<td>988</td>
<td>1.0117</td>
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<td>2.4055</td>
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</tr>
<tr>
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<td>1.3153</td>
<td>0.1503</td>
<td>3.7478</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 3.00 mm</td>
<td>565</td>
<td>1.7677</td>
<td>0.1022</td>
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<td>Ø 4.00 mm</td>
<td>381</td>
<td>2.6215</td>
<td>0.1235</td>
<td>8.3893</td>
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<td>Ø 5.60 mm</td>
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<td>4.2266</td>
<td>0.3088</td>
<td>9.2647</td>
<td>0.45</td>
</tr>
</tbody>
</table>

The values specified must be considered as approximate values.
The number of pulses per litre may differ depending on medium and installation.
We recommend to calibrate the number of pulses per litre in line with the complete installation.

**MEASUREMENT TIPS**

- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
- Clean the system at appropriate intervals
- Avoid electrical current peaks
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter
- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
**Measurement Curve FHU 3.00 mm**

### Measurement Curve

**Medium:** Water / **max Pressure:** 3.3 bar

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<tr>
<th>Nozzle size</th>
<th>Pulses/litre</th>
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- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter
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- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
## Measurement Curve FHKU 4.00 mm

### Nozzle size Pulses/litre g/pulse min. flow rate in litres/min at Linear start max. flow rate in litres/min Pressure loss

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<tr>
<th>Nozzle size</th>
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**Medium:** Water / max. Pressure: 3.3 bar

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Measurement Curve FHKU 5.60 mm

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Spare parts:

- PT-screws # 443-0005 (Phillips cross recessed)
- Upper section FHKC Arnite # 532-5502/ST
- O-ring MVQ (Silikon) # 350-0410
- Turbine FT 36 # 527-0303
- Lower section FHKU JG 1/4” Ø 1.00 mm # 513-0031/10
- Lower section FHKU JG 1/4” Ø 1.20 mm # 513-0031/12
- Lower section FHKU JG 1/4” Ø 1.50 mm # 513-0031/15
- Lower section FHKU JG 1/4” Ø 2.00 mm # 513-0031/20
- Lower section FHKU JG 1/4” Ø 2.50 mm # 513-0031/25
- Lower section FHKU JG 1/4” Ø 3.00 mm # 513-0031/30
- Lower section FHKU JG 1/4” Ø 4.00 mm # 513-0031/40
- Lower section FHKU JG 1/4” Ø 5.60 mm # 513-0031/56

Notes:
**General Description**

The FHUK JG Flowmeter is a general-purpose device, its working range can be individually defined according to its nozzle size. It is employed for measuring, regulating or metering and guarantees most precise measurement of fluid quantities. In addition, a pulse generator integrated into the flowmeter guarantees a practically unlimited useful life.

**Special features:** Linear inlet and outlet, compact design, great working range, depending on the nozzle diameter. Hose diameters from 10.0mm can be directly connected.

**Material:**
- Housing: PBT 35% GF (Arnite)
- Bearing pin: Inox 1.4305 (18/8)
- Nozzle: Inox 1.4305 (18/8)
- O-ring: MVQ (Silikon) / FPM (Viton) / EPDM on request
- Turbine: PVDF
- Magnets: Keramik Sr Fe O
  (in contact with the medium)
- Screw: PT-screws (Phillips cross recessed)

**Technical data:**
- Flow rate: 0.041 - 15 l/min depending on the nozzle diameter
- Measuring accuracy: +/- 2.0%
- Repetition: < +/- 0.25%
- Temperature range: as shown on page 3
- Pressure range: as shown on page 3
- Mounting position: Horizontal recommended
- Nozzle size: Ø 1.0, 1.2, 1.5, 2.0, 2.5, 3.0, 4.0, 5.6 mm

**Electrical connection ratings:**
- Power supply: 4.5 – 24 VDC
- Consumption: 5 mA to max. 13 mA
- Signal connection: Open collector NPN
- Signal voltage: 0 V GND
- Signal load: max. 20 mA
- Leakage current: max. 10 µA
- Connections: 3-pin AMP 2.8 x 0.8 mm
- Duty Cycle: Square-wave output
- Duty Cycle: 50% / ± 5%

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**Technical data:**
- Flow rate: 0.041 - 15 l/min depending on the nozzle diameter
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- Repetition: < +/- 0.25%
- Temperature range: as shown on page 3
- Pressure range: as shown on page 3
- Mounting position: Horizontal recommended
- Nozzle size: Ø 1.0, 1.2, 1.5, 2.0, 2.5, 3.0, 4.0, 5.6 mm

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- Connections: 3-pin AMP 2.8 x 0.8 mm
- Duty Cycle: Square-wave output
- Duty Cycle: 50% / ± 5%

**Dimensions in mm:**

**Options:**
- 3-pin solenoid socket
  Item number: 941-0002/3

**IMPORTANT:** The two red safety clips supplied must be refitted once the hose has been attached!
Technical data John Guest

Working Pressure and Temperature Range

<table>
<thead>
<tr>
<th>Temp.</th>
<th>Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>-20°C</td>
<td>16 Bar</td>
</tr>
<tr>
<td>1°C</td>
<td>16 Bar</td>
</tr>
<tr>
<td>23°C</td>
<td>16 Bar</td>
</tr>
<tr>
<td>65°C</td>
<td>10 Bar</td>
</tr>
</tbody>
</table>

Super Speedfit fittings are suitable for the following:

<table>
<thead>
<tr>
<th>Temp.</th>
<th>Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>5/32&quot; - 5/16&quot;</td>
<td>4mm - 8mm</td>
</tr>
<tr>
<td>3/8&quot; - 1/2&quot;</td>
<td>10mm - 22mm</td>
</tr>
</tbody>
</table>

Also suitable for vacuum.

Depending on the tube used, under certain conditions fittings may be used at higher pressures and temperatures. Please refer to our Customer Services Department for guidance. Note 1 Bar = 14.5 PSI G.

Tube Types

- Plastic Tube - Polyethylene, nylon and polyurethane conforming to the tolerances shown below. For soft tubing or thin wall tube we recommend the use of tube inserts.
- Braided Tube - Use of Tube to Hose Stem listed on pages 5 and 12 is essential when using tube. Use of clamps to retain braided tube on barbs is recommended.
- Metal Tube (soft) - Brass, copper or mild steel conforming to the tolerances below.
- Metal Tube (hard) - We do not recommend Super Speedfit fittings for hard metal tubes.

For stainless steel and other polished metal tubes we recommend the use of Supersleeve fittings. These are shown on page 9 of this brochure.

It is essential that outside diameters be free from score marks and that the tube be deburred before inserting the fitting.

Tube Tolerances

<table>
<thead>
<tr>
<th>Size (inch)</th>
<th>Tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td>5/32 - 3/16</td>
<td>+0.001 / -0.003</td>
</tr>
<tr>
<td>1/4 - 1/2</td>
<td>+0.001 / -0.004</td>
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<table>
<thead>
<tr>
<th>Size (mm)</th>
<th>Tolerance</th>
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<tr>
<td>4mm - 5mm</td>
<td>+0.05 / -0.07</td>
</tr>
<tr>
<td>6mm - 22mm</td>
<td>+0.05 / -0.10</td>
</tr>
</tbody>
</table>

Installation and System Testing

Fittings and tube should be kept clean and undamaged before use.

All tube and fittings installations must be pressure tested after installation to ensure system integrity before handing over to the final user. See also "How to make a connection".

Chemicals

For use with chemicals or other potentially aggressive liquids, please refer to our Customer Services Department.

Super Speedfit fittings are not recommended for use with explosive gases, petroleum spirits, and other fuels or for central heating systems.

Collet Covers

Are available as additional security against removal of the tube or to provide a simple means of colour coding. The cover is offered in a range of six colours. Please see pages 6 and 12 of this brochure.

Food Quality

All the fittings in the brochure are produced in Food and Drug Administration (FDA) approved materials and are therefore recommended for food quality applications.

Maximum Torque Values for Plastic Threads BSP, BSPT & NPT.

<table>
<thead>
<tr>
<th>Threads</th>
<th>1/8 - 1/4</th>
<th>3/8 - 1/2</th>
<th>3/4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. Torque</td>
<td>1.5Nm</td>
<td>3.0Nm</td>
<td>4.0Nm</td>
</tr>
</tbody>
</table>

a. It is recommended that all installations are checked prior to use to determine that a seal has been made.
b. The maximum torque figures quoted for use with Speedfit fittings are dependent on the mating thread conforming to the relevant British or International thread standard.

Cleaners and Sanitising of Acetal Fittings

Our advice to customers is to use cleaners and sanitising agents that are above pH 4 and low in hypochlorite level. Acetal fittings and parts that are cleaned and/or sanitised should be rinsed immediately with copious amounts of clean tap water to remove all traces of the cleaners. Details of which products are made from acetal are shown in our catalogues but generally John Guest products incorporating acetal are designated by the part number prefix PI, PM, CI, CM and RM. Polypropylene fittings offer greater resistance to aggressive chemicals than acetal fittings. Polypropylene does not have the same mechanical properties as acetal and John Guest polypropylene fittings are generally designated by the part number prefix PP.

Our material suppliers recommend ECOLAB Oasis 133 as a suitable external cleaner for acetal products manufactured by John Guest.

Warranty

Whilst we give a warranty against defects in manufacture or materials, it is the responsibility of the specifier to ensure that fittings and related products are suitable for their application. The installation must be carried out correctly in accordance with our recommendations, complying with recognised codes of practice and relevant national standards.
Interface Connection: Examples Open Collector

- Simple circuit
- TTL output
- Optocoupler interface
Measurement Curve FHKU 1.00 mm

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Measurement Curve FHKU 1.20 mm

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<td>1314</td>
<td>0.7608</td>
<td>0.0427</td>
<td>1.2504</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 2.00 mm</td>
<td>988</td>
<td>1.0117</td>
<td>0.0911</td>
<td>2.4055</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 2.50 mm</td>
<td>760</td>
<td>1.3153</td>
<td>0.1503</td>
<td>3.7478</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 3.00 mm</td>
<td>565</td>
<td>1.7677</td>
<td>0.1022</td>
<td>5.6310</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 4.00 mm</td>
<td>381</td>
<td>2.6215</td>
<td>0.1235</td>
<td>8.3893</td>
<td>0.80</td>
</tr>
<tr>
<td>Ø 5.60 mm</td>
<td>236</td>
<td>4.2266</td>
<td>0.3088</td>
<td>9.2647</td>
<td>0.45</td>
</tr>
</tbody>
</table>

The values specified must be considered as approximate values.
The number of pulses per litre may differ depending on medium and installation.
We recommend to calibrate the number of pulses per litre in line with the complete installation.

MEASUREMENT TIPS

- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
- Clean the system at appropriate intervals
- Avoid electrical current peaks
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter
- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
### Measurement Curve FHKU 1.50 mm

#### Measurement Tips
- Ensure that there is no fast-pulsatory movement of the media.
- Ensure that there are no reverse pressure surges.
- Ensure that there is no air in the system.
- Note the mounting position of the flowmeter.
- Min/max flow should be in the linear range of the selected flowmeter.
- Clean the system at appropriate intervals.
- Avoid electrical current peaks.
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter.
- Do not mechanically load electrical contacts.
- Avoid moisture on the electrical contacts.
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads).

#### MEASUREMENT TIPS

The values specified must be considered as approximate values.
The number of pulses per litre may differ depending on medium and installation.
We recommend to calibrate the number of pulses per litre in line with the complete installation.

<table>
<thead>
<tr>
<th>Nozzle size</th>
<th>Pulses/litre</th>
<th>g/pulse</th>
<th>min. flow rate in litres/min at Linear start</th>
<th>max. flow rate in litres/min</th>
<th>Pressure loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø 1.00 mm</td>
<td>2063</td>
<td>0.4846</td>
<td>0.0410</td>
<td>0.5670</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 1.20 mm</td>
<td>1700</td>
<td>0.5880</td>
<td>0.0505</td>
<td>0.8225</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 1.50 mm</td>
<td>1314</td>
<td>0.7608</td>
<td>0.0427</td>
<td>1.2504</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 2.00 mm</td>
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<td>0.0911</td>
<td>2.4055</td>
<td>1.00</td>
</tr>
<tr>
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<td>0.1503</td>
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</tr>
<tr>
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<td>1.00</td>
</tr>
<tr>
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<td>0.1235</td>
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<tr>
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<td>4.2266</td>
<td>0.3088</td>
<td>9.2647</td>
<td>0.45</td>
</tr>
</tbody>
</table>
### Measurement Curve FHKU 2.00 mm

#### Tip Chart

- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
- Clean the system at appropriate intervals
- Avoid electrical current peaks
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter
- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)

---

<table>
<thead>
<tr>
<th>Nozzle size</th>
<th>Pulses/litre</th>
<th>g/pulse</th>
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</tr>
</thead>
<tbody>
<tr>
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<td>2063</td>
<td>0.4846</td>
<td>0.0410</td>
<td>0.5670</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 1.20 mm</td>
<td>1700</td>
<td>0.5880</td>
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<td>0.8225</td>
<td>1.00</td>
</tr>
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<td>Ø 1.50 mm</td>
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<td>0.7608</td>
<td>0.0427</td>
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<td>1.00</td>
</tr>
<tr>
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</tr>
<tr>
<td>Ø 5.60 mm</td>
<td>236</td>
<td>4.2266</td>
<td>0.3088</td>
<td>9.2647</td>
<td>0.45</td>
</tr>
</tbody>
</table>

Medium: Water / max. Pressure: 3.3 bar

---

The values specified must be considered as approximate values.
The number of pulses per litre may differ depending on medium and installation.
We recommend to calibrate the number of pulses per litre in line with the complete installation.
Measurement Curve FHKU 2.50 mm

Nozzle size | Pulses/litre | g/pulse | min. flow rate in litres/min at Linear start | max. flow rate in litres/min | Pressure loss
---|---|---|---|---|---
Ø 1.00 mm | 2063 | 0.4846 | 0.0410 | 0.5670 | 1.00
Ø 1.20 mm | 1700 | 0.5880 | 0.0505 | 0.8225 | 1.00
Ø 1.50 mm | 1314 | 0.7608 | 0.0427 | 1.2504 | 1.00
Ø 2.00 mm | 988 | 1.0117 | 0.0911 | 2.4055 | 1.00
Ø 2.50 mm | 760 | 1.3153 | 0.1503 | 3.7478 | 1.00
Ø 3.00 mm | 565 | 1.7677 | 0.1022 | 5.6310 | 1.00
Ø 4.00 mm | 381 | 2.6215 | 0.1235 | 8.3893 | 0.80
Ø 5.60 mm | 236 | 4.2266 | 0.3088 | 9.2647 | 0.45

The values specified must be considered as approximate values. The number of pulses per litre may differ depending on medium and installation. We recommend to calibrate the number of pulses per litre in line with the complete installation.

MEASUREMENT TIPS

- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
- Clean the system at appropriate intervals
- Avoid electrical current peaks
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter
- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
Measurement Curve FHKU 3.00 mm

<table>
<thead>
<tr>
<th>Nozzle size</th>
<th>Pulses/litre</th>
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<tr>
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<td>1.00</td>
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<tr>
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<td>Ø 4.00 mm</td>
<td>381</td>
<td>2.6215</td>
<td>0.1235</td>
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<td>0.80</td>
</tr>
<tr>
<td>Ø 5.60 mm</td>
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<td>4.2266</td>
<td>0.3088</td>
<td>9.2647</td>
<td>0.45</td>
</tr>
</tbody>
</table>

The values specified must be considered as approximate values. The number of pulses per litre may differ depending on medium and installation. We recommend to calibrate the number of pulses per litre in line with the complete installation.

Medium: Water / max. Pressure: 3.3 bar

**MEASUREMENT TIPS**

- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
- Clean the system at appropriate intervals
- Avoid electrical current peaks
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter
- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
Measurement Curve FHKU 4.00 mm

<table>
<thead>
<tr>
<th>Nozzle size</th>
<th>Pulses/litre</th>
<th>g/pulse</th>
<th>min. flow rate in litres/min at Linear start</th>
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</tr>
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<td>Ø 1.00 mm</td>
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<td>0.1235</td>
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<td>236</td>
<td>4.2266</td>
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<td>9.2647</td>
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</tr>
</tbody>
</table>

The values specified must be considered as approximate values.
The number of pulses per litre may differ depending on medium and installation.
We recommend to calibrate the number of pulses per litre in line with the complete installation.

**MEASUREMENT TIPS**

- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
- Clean the system at appropriate intervals
- Avoid electrical current peaks
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter
- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
Measurement Curve FHKU 5.60 mm

<table>
<thead>
<tr>
<th>Nozzle size</th>
<th>Pulses/litre</th>
<th>g/pulse</th>
<th>min. flow rate in litres/min at Linear start</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Ø 1.00 mm</td>
<td>2063</td>
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<td>Ø 1.20 mm</td>
<td>1700</td>
<td>0.5880</td>
<td>0.0505</td>
<td>0.8225</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 1.50 mm</td>
<td>1314</td>
<td>0.7608</td>
<td>0.0427</td>
<td>1.2504</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 2.00 mm</td>
<td>988</td>
<td>1.0117</td>
<td>0.0911</td>
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<tr>
<td>Ø 2.50 mm</td>
<td>760</td>
<td>1.3153</td>
<td>0.1503</td>
<td>3.7478</td>
<td>1.00</td>
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<tr>
<td>Ø 3.00 mm</td>
<td>565</td>
<td>1.7677</td>
<td>0.1022</td>
<td>5.6310</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 4.00 mm</td>
<td>381</td>
<td>2.6215</td>
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<td>8.3893</td>
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<td>Ø 5.60 mm</td>
<td>236</td>
<td>4.2266</td>
<td>0.3088</td>
<td>9.2647</td>
<td>0.45</td>
</tr>
</tbody>
</table>

Medium: Water / Max. Pressure: 3.3 bar

The values specified must be considered as approximate values.
The number of pulses per litre may differ depending on medium and installation.
We recommend to calibrate the number of pulses per litre in line with the complete installation.

**MEASUREMENT TIPS**

- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
- Clean the system at appropriate intervals
- Avoid electrical current peaks
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter
- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
Spare parts:

- PT-screws # 443-0005 (Phillips cross recessed)
- Upper section FHK Arnite # 532-0500
- O-ring MVQ (Silikon) # 350-0410
- Turbine FT 36 # 527-0303

Lower section FHKU JG 10mm Ø 1.00 mm # 513-0032/10
Lower section FHKU JG 10mm Ø 1.20 mm # 513-0032/12
Lower section FHKU JG 10mm Ø 1.50 mm # 513-0032/15
Lower section FHKU JG 10mm Ø 2.00 mm # 513-0032/20
Lower section FHKU JG 10mm Ø 2.50 mm # 513-0032/25
Lower section FHKU JG 10mm Ø 3.00 mm # 513-0032/30
Lower section FHKU JG 10mm Ø 4.00 mm # 513-0032/40
Lower section FHKU JG 10mm Ø 5.60 mm # 513-0032/56

Notes:
### General Description

The FHKU JG Flowmeter is a general-purpose device; its working range can be individually defined according to its nozzle size. It is employed for measuring, regulating or metering and guarantees most precise measurement of fluid quantities. In addition, a pulse generator integrated into the flowmeter guarantees a practically unlimited useful life.

#### Special features:
- Linear inlet and outlet, compact design, great working range, depending on the nozzle diameter. Hose diameters from 10.0mm can be directly connected.

#### Material:

**Housing:** PBT 35% GF (Arnite)

**Bearing pin:** Inox 1.4305 (18/8)  
Inox 1.4571 on request

**Nozzle:** Inox 1.4305 (18/8)  
PTFE on request

**O-ring:** MVQ (Silikon)  
FPM (Viton) / EPDM on request

**Turbine:** PVDF

**Magnets:** Keramik Sr Fe O  
(in contact with the medium)

**Screw:** PT-screws  
(Phillips cross recessed)

#### Technical data:

- **Flow rate:** 0.041 - 15 l/min depending on the nozzle diameter
- **Measuring accuracy:** +/- 2.0%
- **Repetition:** < +/-. 0.25%
- **Temperature range:** as shown on page 3
- **Pressure range:** as shown on page 3
- **Mounting position:** Horizontal recommended
- **Nozzle size:** Ø 1.0, 1.2, 1.5, 2.0, 2.5, 3.0, 4.0, 5.6 mm

#### Electrical connection ratings:

- **Power supply:** 4.5–24 VDC
- **Consumption:** 5 mA to max. 13 mA
- **Signal connection:** Open collector NPN
- **Signal voltage:** 0 V GND
- **Signal load:** max. 20 mA
- **Leakage current:** max. 10 µA
- **Connections:** Faston AMP 6.3 x 2.8mm
- **Signal:** Square-wave output
- **Duty Cycle:** 50% / ±5%

#### Dimensions in mm:

![Dimensions diagram](image)

**IMPORTANT:** The two red safety clips supplied must be refitted once the hose has been attached!

### RESISTANCE

Special regulations which must be complied with by the flowmeter manufacturer apply to each country, e.g. CE, NSF, FDA and SK. The various media flowing through the flowmeter differ from application to application. You are advised to enquire with the medium manufacturer as to whether the entire installation and the flowmeter are resistant to the medium itself (see Material)!

### ELECTRONIC

DIGMESA electronic circuitry is always designed for operation with DIGMESA flowmeters. Please note the following if connecting to other electronic circuitry:

- The flowmeter does not supply an output voltage but switches the signal terminal to 0 V ground (actuated) or leaves it open (non-actuated)
- There must be a pull-up resistor between power supply + and signal depending on electronic circuitry!
Technical data John Guest

Working Pressure and Temperature Range

<table>
<thead>
<tr>
<th>Temp.</th>
<th>Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>-20°C</td>
<td>16 Bar</td>
</tr>
<tr>
<td>+1°C</td>
<td>16 Bar</td>
</tr>
<tr>
<td>+23°C</td>
<td>16 Bar</td>
</tr>
<tr>
<td>+65°C</td>
<td>10 Bar</td>
</tr>
<tr>
<td>Potable Liquids</td>
<td>10 Bar</td>
</tr>
<tr>
<td>and Air</td>
<td>7 Bar</td>
</tr>
</tbody>
</table>

Also suitable for vacuum

Depending on the tube used, under certain conditions fittings may be used at higher pressures and temperatures. Please refer to our Customer Services Department for guidance. Note 1 Bar = 14.5 PSI.

Tube Types

Plastic Tube - Polyethylene, nylon and polyurethane conforming to the tolerances shown below. For soft tubing or thin wall tubing we recommend the use of tube inserts.

Braided Tube - Use of Tube to Hose stems listed on pages 5 and 12 is essential when using tube. Use of clamps to retain braided tube on barbs is recommended.

Metal Tube (soft) - Brass, copper or mild steel conforming to the tolerances below.

Metal Tube (hard) - We do not recommend Super Speedfit fittings for hard metal tubes.

For stainless steel and other polished metal tubes we recommend the use of Supersafe fittings. These are shown on page 9 of this brochure.

It is essential that outside diameters be free from score marks and that the tube be deburred before inserting the fitting.

Tube Tolerances

Super Speedfit fittings are offered for tubes with outside diameters to the following tolerances.

<table>
<thead>
<tr>
<th>Size (inches)</th>
<th>5/32 - 3/16</th>
<th>1/4 - 1/2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tolerance</td>
<td>+0.001 / -0.003</td>
<td>+0.001 / -0.004</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Size (mm)</th>
<th>4mm - 5mm</th>
<th>6mm - 22mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tolerance</td>
<td>+0.05 / -0.07</td>
<td>+0.05 / -0.10</td>
</tr>
</tbody>
</table>

Installation and System Testing

Fittings and tube should be kept clean and undamaged before use.

All tube and fittings installations must be pressure tested after installation to ensure system integrity before handing over to the final user. See also "How to make a connection".

Chemicals

For use with chemicals or other potentially aggressive liquids, please refer to our Customer Services Department.

Super Speedfit fittings are not recommended for use with explosive gases, petroleum spirits, and other fuels or for central heating systems.

Collet Covers

Are available as additional security against removal of the tube or to provide a simple means of colour coding. The cover is offered in a range of six colours. Please see pages 6 and 12 of this brochure.

Food Quality

All the fittings in the brochure are produced in Food and Drug Administration (FDA) approved materials and are therefore recommended for food quality applications.

Maximum Torque Values for Plastic Threads BSP, BSPT & NPT.

<table>
<thead>
<tr>
<th>Threads</th>
<th>Max. Torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/8 - 1/4</td>
<td>1.5Nm</td>
</tr>
<tr>
<td>3/8 - 1/2</td>
<td>3.0Nm</td>
</tr>
<tr>
<td>3/4</td>
<td>4.0Nm</td>
</tr>
</tbody>
</table>

a. It is recommended that all installations are checked prior to use to determine that a seal has been made.

b. The maximum torque figures quoted for use with Speedfit fittings are dependent on the mating thread conforming to the relevant British or International thread standard.

Cleaners and Sanitising of Acetal Fittings

Our advice to customers is to use cleaners and sanitising agents that are above pH 4 and low in hypochlorite level. Acetal fittings and parts that are cleaned and/or sanitised should be rinsed immediately with copious amounts of clean tap water to remove all traces of the cleaners. Details of which products are made from acetal are shown in our catalogues but generally John Guest products incorporating acetal are designated by the part number prefix PI, PM, CI, CM and RM. Polypropylene fittings offer greater resistance to aggressive chemicals than acetal fittings. Polypropylene does not have the same mechanical properties as acetal and John Guest polypropylene fittings are generally designated by the part number prefix PP.

Our material suppliers recommend ECOLAB Oasis 133 as a suitable external cleaner for acetal products manufactured by John Guest.

Warranty

Whilst we give a warranty against defects in manufacture or materials, it is the responsibility of the specifier to ensure that fittings and related products are suitable for their application. The installation must be carried out correctly in accordance with our recommendations, complying with recognised codes of practice and relevant national
Interface Connection: Examples Open Collector

open collector

![Diagram of open collector interface with examples of signal connections for open collector, simple circuit, TTL output, and optocoupler interface.](image)

We reserve the right to make modifications in the interest of technical progress.
Measurements Curve FHKU 1.00 mm

Medium: Water / max. Pressure: 3.3 bar

<table>
<thead>
<tr>
<th>Nozzle size</th>
<th>Pulses/litre</th>
<th>g/pulse</th>
<th>min. flow rate in litres/min at Linear start</th>
<th>max. flow rate in litres/min</th>
<th>Pressure loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø 1.00 mm</td>
<td>2063</td>
<td>0.4846</td>
<td>0.0410</td>
<td>0.5670</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 1.20 mm</td>
<td>1700</td>
<td>0.5880</td>
<td>0.0505</td>
<td>0.8225</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 1.50 mm</td>
<td>1314</td>
<td>0.7608</td>
<td>0.0427</td>
<td>1.2504</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 2.00 mm</td>
<td>988</td>
<td>1.0117</td>
<td>0.0911</td>
<td>2.4055</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 2.50 mm</td>
<td>760</td>
<td>1.3153</td>
<td>0.1503</td>
<td>3.7478</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 3.00 mm</td>
<td>565</td>
<td>1.7677</td>
<td>0.1022</td>
<td>5.6310</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 4.00 mm</td>
<td>381</td>
<td>2.6215</td>
<td>0.1235</td>
<td>8.3893</td>
<td>0.80</td>
</tr>
<tr>
<td>Ø 5.60 mm</td>
<td>236</td>
<td>4.2266</td>
<td>0.3088</td>
<td>9.2647</td>
<td>0.45</td>
</tr>
</tbody>
</table>

The values specified must be considered as approximate values.
The number of pulses per litre may differ depending on medium and installation.
We recommend to calibrate the number of pulses per litre in line with the complete installation.

MEASUREMENT TIPS

- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
- Clean the system at appropriate intervals
- Avoid electrical current peaks
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter
- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
Measurement Curve FHKU 1.20 mm

<table>
<thead>
<tr>
<th>Nozzle size</th>
<th>Pulses/litre</th>
<th>g/pulse</th>
<th>min. flow rate in litres/min at Linear start</th>
<th>max. flow rate in litres/min</th>
<th>Pressure loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø 1.00 mm</td>
<td>2063</td>
<td>0.4846</td>
<td>0.0410</td>
<td>0.5670</td>
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</tr>
<tr>
<td>Ø 1.20 mm</td>
<td>1700</td>
<td>0.5880</td>
<td>0.0505</td>
<td>0.8225</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 1.50 mm</td>
<td>1314</td>
<td>0.7608</td>
<td>0.0427</td>
<td>1.2504</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 2.00 mm</td>
<td>988</td>
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<td>2.4055</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 2.50 mm</td>
<td>760</td>
<td>1.3153</td>
<td>0.1503</td>
<td>3.7478</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 3.00 mm</td>
<td>565</td>
<td>1.7677</td>
<td>0.1022</td>
<td>5.6310</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 4.00 mm</td>
<td>381</td>
<td>2.6715</td>
<td>0.1235</td>
<td>8.3993</td>
<td>0.80</td>
</tr>
<tr>
<td>Ø 5.60 mm</td>
<td>236</td>
<td>4.2266</td>
<td>0.3088</td>
<td>9.2647</td>
<td>0.45</td>
</tr>
</tbody>
</table>

The values specified must be considered as approximate values.
The number of pulses per litre may differ depending on medium and installation.
We recommend to calibrate the number of pulses per litre in line with the complete installation.

MEASUREMENT TIPS

- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
- Clean the system at appropriate intervals
- Avoid electrical current peaks
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter
- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
###测量曲线 FHKU 1.50 mm

<table>
<thead>
<tr>
<th>针孔直径</th>
<th>每升脉冲数</th>
<th>每次脉冲量</th>
<th>最小流量</th>
<th>最大流量</th>
<th>压力损失</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø 1.00 mm</td>
<td>2063</td>
<td>0.4846</td>
<td>0.0410</td>
<td>0.5670</td>
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</tr>
<tr>
<td>Ø 1.20 mm</td>
<td>1700</td>
<td>0.5880</td>
<td>0.0505</td>
<td>0.8225</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 1.50 mm</td>
<td>1314</td>
<td>0.7608</td>
<td>0.0427</td>
<td>1.2504</td>
<td>1.00</td>
</tr>
<tr>
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<td>988</td>
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<td>0.0911</td>
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</tr>
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<td>Ø 4.00 mm</td>
<td>381</td>
<td>2.6215</td>
<td>0.1235</td>
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<td>0.80</td>
</tr>
<tr>
<td>Ø 5.60 mm</td>
<td>236</td>
<td>4.2266</td>
<td>0.3088</td>
<td>9.2647</td>
<td>0.45</td>
</tr>
</tbody>
</table>

**测量Tips**

- 确保没有快速脉动的介质
- 确保没有反向压力突变
- 确保系统中没有空气
- 注意流量计的安装位置
- 最小/最大流量应在所选流量计的线性范围内
- 在适当间隔清洁系统
- 避免电气电流峰值
- 错误的电源+、信号和接地线缆将损坏流量计
- 避免机械加载电气触点
- 避免触点上的湿气
- 避免干扰信号（不要将电缆并排放置在高电流负载附近）

**备注**

- 中间：水 / 最大压力：3.3 bar
- 所提供的值视为近似值。
- 每升脉冲数可能因介质和安装而有所不同。
- 建议根据整个安装系统校准每升脉冲数。

---

Measurement Curve FHKU 1.50 mm

Medium: Water / max. Pressure: 3.3 bar

The values specified must be considered as approximate values.
The number of pulses per litre may differ depending on medium and installation.
We recommend to calibrate the number of pulses per litre in line with the complete installation.
### Measurement Curve FHKU 2.00 mm

**Measurement Tips**

- Ensure that there is no fast-pulsatory movement of the media.
- Ensure that there are no reverse pressure surges.
- Ensure that there is no air in the system.
- Note the mounting position of the flowmeter.
- Min/max flow should be in the linear range of the selected flowmeter.
- Clean the system at appropriate intervals.
- Avoid electrical current peaks.
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter.
- Do not mechanically load electrical contacts.
- Avoid moisture on the electrical contacts.
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads).

---

**Table: Nozzle size vs Flow Rate and Pressure Loss**

<table>
<thead>
<tr>
<th>Nozzle size</th>
<th>Pulses/litre</th>
<th>g/pulse</th>
<th>min. flow rate in litres/min at Linear start</th>
<th>max. flow rate in litres/min</th>
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<tbody>
<tr>
<td>Ø 1.00 mm</td>
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</tr>
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<td>Ø 1.20 mm</td>
<td>1700</td>
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<td>0.0505</td>
<td>0.8225</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 1.50 mm</td>
<td>1314</td>
<td>0.7680</td>
<td>0.0427</td>
<td>1.2504</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 2.00 mm</td>
<td>988</td>
<td>1.0117</td>
<td>0.0911</td>
<td>2.4055</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 2.50 mm</td>
<td>760</td>
<td>1.3153</td>
<td>0.1503</td>
<td>3.7478</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 3.00 mm</td>
<td>565</td>
<td>1.7677</td>
<td>0.1022</td>
<td>5.6310</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 4.00 mm</td>
<td>381</td>
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<td>0.1235</td>
<td>8.3893</td>
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<td>0.3088</td>
<td>9.2647</td>
<td>0.45</td>
</tr>
</tbody>
</table>

---

The values specified must be considered as approximate values. The number of pulses per litre may differ depending on medium and installation. We recommend to calibrate the number of pulses per litre in line with the complete installation.
Measurement Curve FHKU 2.50 mm

<table>
<thead>
<tr>
<th>Nozzle size</th>
<th>Pulses/litre</th>
<th>g/pulse</th>
<th>min. flow rate in litres/min at Linear start</th>
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</tr>
<tr>
<td>Ø 1.50 mm</td>
<td>1314</td>
<td>0.7608</td>
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</tr>
<tr>
<td>Ø 3.00 mm</td>
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<td>1.7677</td>
<td>0.1022</td>
<td>5.6310</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 4.00 mm</td>
<td>381</td>
<td>2.6215</td>
<td>0.1235</td>
<td>8.3893</td>
<td>0.80</td>
</tr>
<tr>
<td>Ø 5.60 mm</td>
<td>236</td>
<td>4.2266</td>
<td>0.3088</td>
<td>9.2647</td>
<td>0.45</td>
</tr>
</tbody>
</table>

Medium: Water / max. Pressure: 3.3 bar

The values specified must be considered as approximate values. The number of pulses per litre may differ depending on medium and installation. We recommend to calibrate the number of pulses per litre in line with the complete installation.

MEASUREMENT TIPS

- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
- Clean the system at appropriate intervals
- Avoid electrical current peaks
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter
- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
**Measurement Curve FHKU 3.00 mm**

### Measurement Tips
- Ensure that there is no fast-pulsatory movement of the media.
- Ensure that there are no reverse pressure surges.
- Ensure that there is no air in the system.
- Note the mounting position of the flowmeter.
- Min/max flow should be in the linear range of the selected flowmeter.
- Clean the system at appropriate intervals.
- Avoid electrical current peaks.
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter.
- Do not mechanically load electrical contacts.
- Avoid moisture on the electrical contacts.
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads).

### Nozzle size specifications

<table>
<thead>
<tr>
<th>Nozzle size</th>
<th>Pulses/litre</th>
<th>g/pulse</th>
<th>min. flow rate in litres/min at Linear start</th>
<th>max. flow rate in litres/min</th>
<th>Pressure loss</th>
<th>Druckverlust/pressure drop</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø 1.00 mm</td>
<td>2063</td>
<td>0.4846</td>
<td>0.0410</td>
<td>0.5670</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Ø 1.20 mm</td>
<td>1700</td>
<td>0.5880</td>
<td>0.0505</td>
<td>0.8225</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Ø 1.50 mm</td>
<td>1314</td>
<td>0.7608</td>
<td>0.0427</td>
<td>1.2504</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Ø 2.00 mm</td>
<td>988</td>
<td>1.0017</td>
<td>0.0911</td>
<td>2.4055</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Ø 2.50 mm</td>
<td>760</td>
<td>1.3153</td>
<td>0.1503</td>
<td>3.7478</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Ø 3.00 mm</td>
<td>565</td>
<td>1.7677</td>
<td>0.1022</td>
<td>5.6310</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Ø 4.00 mm</td>
<td>381</td>
<td>2.6215</td>
<td>0.1235</td>
<td>8.3893</td>
<td>0.80</td>
<td></td>
</tr>
<tr>
<td>Ø 5.60 mm</td>
<td>236</td>
<td>4.2266</td>
<td>0.3088</td>
<td>9.2647</td>
<td>0.45</td>
<td></td>
</tr>
</tbody>
</table>

The values specified must be considered as approximate values. The number of pulses per litre may differ depending on medium and installation. We recommend to calibrate the number of pulses per litre in line with the complete installation.
### Measurement Curve FHKU 4.00 mm

#### Measurement Tips
- Ensure that there is no fast-pulsatory movement of the media.
- Ensure that there are no reverse pressure surges.
- Ensure that there is no air in the system.
- Note the mounting position of the flowmeter.
- Min/max flow should be in the linear range of the selected flowmeter.
- Clean the system at appropriate intervals.
- Avoid electrical current peaks.
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter.
- Do not mechanically load electrical contacts.
- Avoid moisture on the electrical contacts.
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads).

#### Measurement Data

<table>
<thead>
<tr>
<th>Nozzle size (mm)</th>
<th>Pulsates/litre</th>
<th>g/pulse</th>
<th>min. flow rate in litres/min at Linear start</th>
<th>max. flow rate in litres/min</th>
<th>Pressure loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø 1.00</td>
<td>2063</td>
<td>0.4846</td>
<td>0.0410</td>
<td>0.5670</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 1.20</td>
<td>1700</td>
<td>0.5880</td>
<td>0.0505</td>
<td>0.8225</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 1.50</td>
<td>1314</td>
<td>0.7608</td>
<td>0.0427</td>
<td>1.2504</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 2.00</td>
<td>988</td>
<td>1.0117</td>
<td>0.0911</td>
<td>2.4055</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 2.50</td>
<td>760</td>
<td>1.3153</td>
<td>0.1503</td>
<td>3.7478</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 3.00</td>
<td>565</td>
<td>1.7677</td>
<td>0.1022</td>
<td>5.6310</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 4.00</td>
<td>381</td>
<td>2.6215</td>
<td>0.1235</td>
<td>8.3893</td>
<td>0.80</td>
</tr>
<tr>
<td>Ø 5.60</td>
<td>236</td>
<td>4.2266</td>
<td>0.3088</td>
<td>9.2647</td>
<td>0.45</td>
</tr>
</tbody>
</table>

The values specified must be considered as approximate values.
The number of pulses per litre may differ depending on medium and installation.
We recommend to calibrate the number of pulses per litre in line with the complete installation.

Medium: Water / max. Pressure: 3.3 bar

---

We reserve the right to make modifications in the interests of technical progress.
Measurement Curve FHKU 5.60 mm

<table>
<thead>
<tr>
<th>Nozzle size</th>
<th>Pulses/litre</th>
<th>g/pulse</th>
<th>min. flow rate in litres/min at Linear start</th>
<th>max. flow rate in litres/min</th>
<th>Pressure loss in litres/min</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø 1.00 mm</td>
<td>2063</td>
<td>0.4846</td>
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<td>2.4055</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 2.50 mm</td>
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<td>1.3153</td>
<td>0.1503</td>
<td>3.7478</td>
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<td>0.1022</td>
<td>5.6310</td>
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<td>0.1235</td>
<td>8.3893</td>
<td>0.80</td>
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<tr>
<td>Ø 5.60 mm</td>
<td>236</td>
<td>4.2266</td>
<td>0.3088</td>
<td>9.2647</td>
<td>0.45</td>
</tr>
</tbody>
</table>

Medium: Water / max. Pressure: 3.3 bar

The values specified must be considered as approximate values.

The number of pulses per litre may differ depending on medium and installation. We recommend to calibrate the number of pulses per litre in line with the complete installation.

MEASUREMENT TIPS

- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
- Clean the system at appropriate intervals
- Avoid electrical current peaks
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter
- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
Spare parts:

PT-screws # 443-0005 (Phillips cross recessed)

Upper section FHKF Arnite # 532-2500

O-ring MVQ (Silikon) # 350-0410

Turbine FT 36 # 527-0303

Lower section FHKU JG 10mm Ø 1.00 mm # 513-0032/10
Lower section FHKU JG 10mm Ø 1.20 mm # 513-0032/12
Lower section FHKU JG 10mm Ø 1.50 mm # 513-0032/15
Lower section FHKU JG 10mm Ø 2.00 mm # 513-0032/20
Lower section FHKU JG 10mm Ø 2.50 mm # 513-0032/25
Lower section FHKU JG 10mm Ø 3.00 mm # 513-0032/30
Lower section FHKU JG 10mm Ø 4.00 mm # 513-0032/40
Lower section FHKU JG 10mm Ø 5.60 mm # 513-0032/56

Notes:
FKHC John Guest 10mm Arnite
Part number: 938-95XX/03
General Description

The FHKU JG Flowmeter is a general-purpose device, its working range can be individually defined according to its nozzle size. It is employed for measuring, regulating or metering and guarantees most precise measurement of fluid quantities. In addition, a pulse generator integrated into the flowmeter guarantees a practically unlimited useful life.

**Special features:** Linear inlet and outlet, compact design, great working range, depending on the nozzle diameter. Those diameters from 10.0mm can be directly connected.

**Technical data:**
- Flow rate: 0.041 - 15 l/min depending on the nozzle diameter
- Measuring accuracy: +/- 2.0%
- Repetition: < +/- 0.25%
- Temperature range: as shown on page 3
- Pressure range: as shown on page 3
- Mounting position: Horizontal recommended
- Nozzle size: Ø 1.0, 1.2, 1.5, 2.0, 2.5, 3.0, 4.0, 5.6 mm

**Electrical connection ratings:**
- Power supply: 4.5 – 24 VDC
- Consumption: 5 mA to max. 13 mA
- Signal connection: Open collector NPN
- Signal voltage: 0 V GND
- Signal load: max. 20 mA
- Leakage current: max. 10 µA
- Connections: PANCON MAS-CON 156 MLSS
- Signal: Square-wave output
- Duty Cycle: 50% / ± 5%

**Material:**
- Housing: PBT 35% GF (Arnite)
- Bearing pin: Inox 1.4305 (18/8), Inox 1.4571 on request
- Nozzle: Inox 1.4305 (18/8), PTFE on request
- O-ring: MVQ (Silikon), FPM (Viton) / EPDM on request
- Turbine: PVDF
- Magnets: Keramik Sr Fe O (in contact with the medium)
- Screw: PT-screws (Phillips cross recessed)

**Dimensions in mm:**

**IMPORTANT:**
The two red safety clips supplied must be refitted once the hose has been attached!

**Resistances**

Special regulations which must be complied with by the flowmeter manufacturer apply to each country, e.g. CE, NSF, FDA and SK. The various media flowing through the flowmeter differ from application to application. You are advised to enquire with the medium manufacturer as to whether the entire installation and the flowmeter are resistant to the medium itself (see Material)!

**Electronics**

DIGMESA electronic circuitry is always designed for operation with DIGMESA flowmeters. Please note the following if connecting to other electronic circuitry:

- The flowmeter does not supply an output voltage but switches the signal terminal to 0 V ground (actuated) or leaves it open (non-actuated)
- There must be a pull-up resistor between power supply + and signal depending on electronic circuitry!
Technical data John Guest

Working Pressure and Temperature Range

**Super Speedfit** fittings are suitable for the following temperature and pressure ranges.

<table>
<thead>
<tr>
<th>Temp.</th>
<th>Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5/32&quot; - 5/16&quot;</td>
</tr>
<tr>
<td></td>
<td>4mm - 8mm</td>
</tr>
<tr>
<td>Air</td>
<td>-20°C</td>
</tr>
<tr>
<td>Potable Liquids and Air</td>
<td>+1°C</td>
</tr>
<tr>
<td></td>
<td>+23°C</td>
</tr>
<tr>
<td></td>
<td>+65°C</td>
</tr>
</tbody>
</table>

Also suitable for vacuum

Depending on the type used, under certain conditions fittings may be used at higher pressures and temperatures. Please refer to our Customer Services Department for guidance. Note 1 Bar = 14.5 PSI.

Tube Types

- **Plastic Tube** - Polyethylene, nylon and polyurethane conforming to the tolerances shown below. For soft tubing or thin wall tubing we recommend the use of tube inserts.

- **Braided Tube** - Use of Tube to Hose Stems listed on pages 5 and 12 is essential when using tube. Use of clamps to retain braided tube on bars is recommended.

- **Metal Tube (soft)** - Brass, copper or mild steel conforming to the tolerances below.

- **Metal Tube (hard)** - We do not recommend **Super Speedfit** fittings for hard metal tubes.

For stainless steel and other polished metal tubes we recommend the use of **Superseal** fittings. These are shown on page 9 of this brochure.

It is essential that outside diameters be free from score marks and that the tube be deburred before inserting the fitting.

Tube Tolerances

**Super Speedfit** fittings are offered for tubes with outside diameters to the following tolerances.

<table>
<thead>
<tr>
<th>Size (inches)</th>
<th>Tolerance (inches)</th>
<th>5/32 - 3/16</th>
<th>1/4 - 1/2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>+0.001 / -0.003</td>
<td>+0.001 / -0.004</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Size (mm)</th>
<th>Tolerance (mm)</th>
<th>4mm - 5mm</th>
<th>6mm - 22mm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>+0.05 / -0.07</td>
<td>+0.05 / -0.10</td>
<td></td>
</tr>
</tbody>
</table>

Installation and System Testing

**Fittings and tube should be kept clean and undamaged before use.**

All tube and fittings installation must be pressure tested after installation to ensure system integrity before handing over to the final user. See also "How to make a connection".

Chemicals

For use with chemicals or other potentially aggressive liquids, please refer to our Customer Services Department.

**Super Speedfit** fittings are not recommended for use with explosive gases, petroleum spirits, and other fuels or for central heating systems.

Collet Covers

Available as an additional security against removal of the tube or to provide a simple means of colour coding. The cover is offered in a range of six colours. Please see pages 6 and 12 of this brochure.

Food Quality

All the fittings in the brochure are produced in Food and Drug Administration (FDA) approved materials and are therefore recommended for food quality applications.

Maximum Torque Values for Plastic Threads BSP, BSPT & NPT.

<table>
<thead>
<tr>
<th>Threads</th>
<th>1/8 - 1/4</th>
<th>3/8 - 1/2</th>
<th>3/4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. Torque 1.5Nm</td>
<td>3.0Nm</td>
<td>4.0Nm</td>
<td></td>
</tr>
</tbody>
</table>

a. It is recommended that all installations are checked prior to use to determine that a seal has been made.

b. The maximum torque figures quoted for use with Speedfit fittings are dependent on the mating thread conforming to the relevant British or International thread standard.

Cleaners and Sanitisising of Acetal Fittings

Our advice to customers is to use cleaners and sanitising agents that are above pH4 and low in hypochlorite level. Acetal fittings and parts that are cleaned and/or sanitised should be rinsed immediately with copious amounts of clean tap water to remove all traces of the cleaners. Details of which products are made from acetal are shown in our catalogues but generally John Guest products incorporating acetal are designated by the part number prefix PI, PM, CI, CM and RM. Polypropylene fittings offer greater resistance to aggressive chemicals than acetal fittings. Polypropylene does not have the same mechanical properties as acetal and John Guest polypropylene fittings are generally designated by the part number prefix PP.

Our material suppliers recommend ECOLAB Oasis 133 as a suitable external cleaner for acetal products manufactured by John Guest.

Warranty

Whilst we give a warranty against defects in manufacture or materials, it is the responsibility of the specifier to ensure that fittings and related products are suitable for their application. The installation must be carried out correctly in accordance with our recommendations, complying with recognised codes of practice and relevant national regulations.
Interface Connection: Examples Open Collector

- **Simple Circuit**
  - Signal: +4.5 - 24 VDC
  - RX = 10k
  - 100nF
  - 4.7k
  - 5 VDC
  - 12 VDC

- **TTL Output**
  - Signal: +4.5 - 24 VDC
  - RX = 4.7k
  - 100nF
  - 1N4148
  - 2N2222

- **Optocoupler Interface**
  - Signal: +4.5 - 24 VDC
  - RX = 10k
  - 100nF
  - 4.7k
  - 5 VDC
  - 12 VDC
  - 24 VDC

We reserve the right to make modifications in the interests of technical progress.
Measurement Curve FHKU 1.00 mm

Medium: Water / max. Pressure: 3.3 bar

The values specified must be considered as approximate values.
The number of pulses per litre may differ depending on medium and installation.
We recommend to calibrate the number of pulses per litre in line with the complete installation.

Nozzle size | Pulses/litre | g/pulse | min. flow rate in litres/min at Linear start | max. flow rate in litres/min | Pressure loss
--- | --- | --- | --- | --- | ---
Ø 1.00 mm | 2063 | 0.4846 | 0.0410 | 0.5670 | 1.00
Ø 1.20 mm | 1700 | 0.5880 | 0.0505 | 0.8225 | 1.00
Ø 1.50 mm | 1314 | 0.7608 | 0.0427 | 1.2504 | 1.00
Ø 2.00 mm | 988 | 1.0117 | 0.0911 | 2.4055 | 1.00
Ø 2.50 mm | 760 | 1.3153 | 0.1503 | 3.7478 | 1.00
Ø 3.00 mm | 565 | 1.7677 | 0.1022 | 5.6310 | 1.00
Ø 4.00 mm | 381 | 2.6215 | 0.1235 | 8.3893 | 0.80
Ø 5.60 mm | 236 | 4.2266 | 0.3088 | 9.2647 | 0.45

MEASUREMENT TIPS

- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
- Clean the system at appropriate intervals
- Avoid electrical current peaks
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter
- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
Measurement Curve FHKU 1.20 mm

![Graph of linearity](image1)

![Graph of pressure drop](image2)

Medium: Water / max. Pressure: 3.3 bar

<table>
<thead>
<tr>
<th>Nozzle size</th>
<th>Pulses/litre</th>
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<td>1.00</td>
</tr>
<tr>
<td>Ø 2.00 mm</td>
<td>988</td>
<td>1.0117</td>
<td>0.0911</td>
<td>2.4055</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 2.50 mm</td>
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**Measurement Curve FHKU 1.50 mm**

**Medium: Water / max. Pressure: 3.3 bar**

<table>
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<tr>
<th>Nozzle size</th>
<th>Pulses/litre</th>
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**Measurement Curve FHKU 2.00 mm**

### Measurement Tips
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*Medium: Water / max. Pressure: 3.3 bar*
Measurement Curve FHKU 2.50 mm

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Measurement Curve FHKU 3.00 mm

Medium: Water / max. Pressure: 3.3 bar

### Nozzle size

<table>
<thead>
<tr>
<th>Nozzle size</th>
<th>Pulses/litre</th>
<th>g/pulse</th>
<th>min. flow rate in litres/min at Linear start</th>
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<td>1.00</td>
</tr>
<tr>
<td>Ø 1.20 mm</td>
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<td>0.6250</td>
<td>1.00</td>
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<tr>
<td>Ø 1.50 mm</td>
<td>1314</td>
<td>0.7608</td>
<td>0.0427</td>
<td>1.2504</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 2.00 mm</td>
<td>988</td>
<td>1.0117</td>
<td>0.0911</td>
<td>2.055</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 2.50 mm</td>
<td>760</td>
<td>1.3153</td>
<td>0.1503</td>
<td>3.7478</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 3.00 mm</td>
<td>565</td>
<td>1.7677</td>
<td>0.1022</td>
<td>5.6310</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 4.00 mm</td>
<td>381</td>
<td>2.6215</td>
<td>0.1235</td>
<td>8.3893</td>
<td>0.80</td>
</tr>
<tr>
<td>Ø 5.60 mm</td>
<td>236</td>
<td>4.2266</td>
<td>0.3088</td>
<td>9.2647</td>
<td>0.45</td>
</tr>
</tbody>
</table>

The values specified must be considered as approximate values. The number of pulses per litre may differ depending on medium and installation. We recommend to calibrate the number of pulses per litre in line with the complete installation.

**MEASUREMENT TIPS**

- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
- Clean the system at appropriate intervals
- Avoid electrical current peaks
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter
- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
Measurement Curve FHKU 4.00 mm

<table>
<thead>
<tr>
<th>Nozzle size</th>
<th>Pulses/litre</th>
<th>g/pulse</th>
<th>min. flow rate in litres/min at Linear start</th>
<th>max. flow rate in litres/min</th>
<th>Pressure loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø 1.00 mm</td>
<td>2063</td>
<td>0.4846</td>
<td>0.0410</td>
<td>0.5670</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 1.20 mm</td>
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<td>0.5880</td>
<td>0.0905</td>
<td>0.8225</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 1.50 mm</td>
<td>1314</td>
<td>0.7608</td>
<td>0.0427</td>
<td>1.2504</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 2.00 mm</td>
<td>988</td>
<td>1.0117</td>
<td>0.0911</td>
<td>2.4055</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 2.50 mm</td>
<td>760</td>
<td>1.3153</td>
<td>0.1503</td>
<td>3.7478</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 3.00 mm</td>
<td>565</td>
<td>1.7677</td>
<td>0.1022</td>
<td>5.6310</td>
<td>1.00</td>
</tr>
<tr>
<td>Ø 4.00 mm</td>
<td>381</td>
<td>2.6715</td>
<td>0.1235</td>
<td>8.3893</td>
<td>0.80</td>
</tr>
<tr>
<td>Ø 5.60 mm</td>
<td>236</td>
<td>4.2266</td>
<td>0.3088</td>
<td>9.2647</td>
<td>0.45</td>
</tr>
</tbody>
</table>

The values specified must be considered as approximate values. The number of pulses per litre may differ depending on medium and installation. We recommend to calibrate the number of pulses per litre in line with the complete installation.

Medium: Water / max. Pressure: 3.3 bar

- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
- Clean the system at appropriate intervals
- Avoid electrical current peaks
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter
- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)
**Measurement Curve FHKU 5.60 mm**

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**MEASUREMENT TIPS**

- Ensure that there is no fast-pulsatory movement of the media
- Ensure that there are no reverse pressure surges
- Ensure that there is no air in the system
- Note the mounting position of the flowmeter
- Min/max flow should be in the linear range of the selected flowmeter
- Clean the system at appropriate intervals
- Avoid electrical current peaks
- Incorrect cabling of power supply +, signal and ground will destroy the flowmeter
- Do not mechanically load electrical contacts
- Avoid moisture on the electrical contacts
- Avoid stray pick-up via the cable (Do not lay cables in parallel with high current loads)

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**Nozzle size** | **Pulses/litre** | **g/pulse** | **min. flow rate in litres/min at Linear start** | **max. flow rate in litres/min** | **Pressure loss**
--- | --- | --- | --- | --- | ---
Ø 1.00 mm | 2063 | 0.4846 | 0.0410 | 0.5670 | 1.00
Ø 1.20 mm | 1700 | 0.5880 | 0.0505 | 0.8225 | 1.00
Ø 1.50 mm | 1314 | 0.7608 | 0.0427 | 1.2504 | 1.00
Ø 2.00 mm | 988 | 1.0117 | 0.0911 | 2.4055 | 1.00
Ø 2.50 mm | 760 | 1.3153 | 0.1503 | 3.7478 | 1.00
Ø 3.00 mm | 565 | 1.7677 | 0.1022 | 5.6310 | 1.00
Ø 4.00 mm | 381 | 2.6215 | 0.1235 | 8.3893 | 0.80
Ø 5.60 mm | 236 | 4.2266 | 0.3088 | 9.2647 | 0.45

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The values specified must be considered as approximate values. The number of pulses per litre may differ depending on medium and installation. We recommend to calibrate the number of pulses per litre in line with the complete installation.
Spare parts:

PT-screws # 443-0005  
(Phillips cross recessed)

Upper section FHKC Arnite # 532-5502/ST

O-ring MVQ (Silikon) # 350-0410

Turbine FT 36 # 527-0303

Lower section FHKU JG 10mm Ø 1.00 mm # 513-0032/10
Lower section FHKU JG 10mm Ø 1.20 mm # 513-0032/12
Lower section FHKU JG 10mm Ø 1.50 mm # 513-0032/15
Lower section FHKU JG 10mm Ø 2.00 mm # 513-0032/20
Lower section FHKU JG 10mm Ø 2.50 mm # 513-0032/25
Lower section FHKU JG 10mm Ø 3.00 mm # 513-0032/30
Lower section FHKU JG 10mm Ø 4.00 mm # 513-0032/40
Lower section FHKU JG 10mm Ø 5.60 mm # 513-0032/56

Notes: