31430-HD

DATA SHEET

FLOW METER

FHKSC Arnite using fastening pin
Integrated R1,2K pull-up resistor

Part number: 974-950X/XXX

Digmesa AG, Keltenstrasse 31, CH–2563 Ipsach / Switzerland
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www.digmesa.com
The FHKSC Flowmeter is a general-purpose device that has been specially designed for coffee machines that use vibratory pumps. The device is installed between the water container and the vibratory pump (on the suction side) and in this way prevents the measuring errors that arise during pulsating water flow caused by vibratory pumps.

**Material:**
- Housing: PBT 35%GF (Arnite)
- Bearing pin: Injection-moulded like the housing
- O-ring: MVQ (Silikon)
- Turbine: PVDF
- Magnets: Keramik Sr Fe O (in contact with the medium)

**Technical data:**
- Flow rate: 0.025 - 2 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: -1 bar to 0.3 bar at 20°C (-14.5 psi to 4.35 psi /68°F)
- Mounting position: Horizontal recommended
- Nozzle size: Ø 1.0, 1.2, 1.8, 2.0 mm

**Electrical connection ratings:**
- Power supply: 4.5–24 VDC
- Consumption: 8 mA to max. 25 mA
- Signal connection: Pull-up R1.2K, NPN
- Signal voltage: 0V 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:**

**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!

**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

**General Description**

Specific applications: Thanks to its closure system, the water outlet side can be assembled in four different positions. Central sprayed fastening pin Ø 2.8 mm x 7.5 mm. Recommended washer disk: Quicklock® Bearing Ø 3 mm. Integrated 1.2K pull-up resistor in its upper part.
Interface Connection: Examples using R1.2K pull-up

![Diagram of signal connections using R1.2K pull-up]

- **Simple Circuit**: Pull-up with R1.2K, signal 0 VDC, 100nF, +4.5 - 24 VDC, TTL output with 1N4148 diode.

- **TTL Output**: Pull-up with R1.2K, signal 0 VDC, 100nF, +5 VDC, 1N4148 diode.

- **Optocoupler Interface**: Pull-up with R1.2K, signal 0 VDC, 100nF, +5 VDC, +4.5 - 24 VDC, Rx = 4.7, +5 VDC, +12 VDC, +24 VDC.

We reserve the right to make modifications in the interests of technical progress.
Measurement guaranteed only if mounted horizontally

Loop with Silicon tube
Ø 5mm x 1.5mm 60 Shor A
# Measurement Curve FHKSC 1.20 mm 0°

<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>2362</td>
<td>0.4197</td>
<td>0.0333</td>
<td>0.4023</td>
<td>0.48</td>
</tr>
<tr>
<td>Ø 1.20 mm</td>
<td>1925</td>
<td>0.5194</td>
<td>0.0750</td>
<td>0.5692</td>
<td>0.42</td>
</tr>
<tr>
<td>Ø 1.80 mm</td>
<td>1315</td>
<td>0.7681</td>
<td>0.0753</td>
<td>0.8994</td>
<td>0.25</td>
</tr>
<tr>
<td>Ø 2.00 mm</td>
<td>1250</td>
<td>0.8001</td>
<td>0.1121</td>
<td>0.9668</td>
<td>0.21</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.

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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 FHKSC 1.20 mm 90°

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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<tbody>
<tr>
<td>Ø 1.00 mm</td>
<td>2386</td>
<td>0.4191</td>
<td>0.0500</td>
<td>0.4023</td>
<td>0.48</td>
</tr>
<tr>
<td>Ø 1.20 mm</td>
<td>1934</td>
<td>0.5171</td>
<td>0.0813</td>
<td>0.5667</td>
<td>0.43</td>
</tr>
<tr>
<td>Ø 1.80 mm</td>
<td>1300</td>
<td>0.7691</td>
<td>0.0910</td>
<td>0.9012</td>
<td>0.25</td>
</tr>
<tr>
<td>Ø 2.00 mm</td>
<td>1215</td>
<td>0.8231</td>
<td>0.1396</td>
<td>0.9156</td>
<td>0.21</td>
</tr>
</tbody>
</table>

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 FHKSC 1.20 mm 180°

### Measurement Curve

#### Linearitét/Linearity
![Linearitét/Linearity Graph](image)

#### Druckverlust/pressure drop
![Druckverlust/pressure drop Graph](image)

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</tr>
</thead>
<tbody>
<tr>
<td>Ø 1.00 mm</td>
<td>2476</td>
<td>0.4038</td>
<td>0.0560</td>
<td>0.4044</td>
<td>0.48</td>
</tr>
<tr>
<td>Ø 1.20 mm</td>
<td>2016</td>
<td>0.4960</td>
<td>0.1022</td>
<td>0.5705</td>
<td>0.43</td>
</tr>
<tr>
<td>Ø 1.80 mm</td>
<td>1360</td>
<td>0.7349</td>
<td>0.1185</td>
<td>0.8966</td>
<td>0.26</td>
</tr>
<tr>
<td>Ø 2.00 mm</td>
<td>1280</td>
<td>0.7815</td>
<td>0.1785</td>
<td>0.9175</td>
<td>0.22</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 FHKSC 1.20 mm 270°

Medium: Water / max. Pressure: 1 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>2436</td>
<td>0.4105</td>
<td>0.0427</td>
<td>0.4019</td>
<td>0.48</td>
</tr>
<tr>
<td>Ø 1.20 mm</td>
<td>2012</td>
<td>0.4969</td>
<td>0.0801</td>
<td>0.5677</td>
<td>0.42</td>
</tr>
<tr>
<td>Ø 1.80 mm</td>
<td>1352</td>
<td>0.7397</td>
<td>0.0824</td>
<td>0.8982</td>
<td>0.26</td>
</tr>
<tr>
<td>Ø 2.00 mm</td>
<td>1274</td>
<td>0.7849</td>
<td>0.1573</td>
<td>0.9056</td>
<td>0.22</td>
</tr>
</tbody>
</table>

- 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:

Upper section FHKSC double isolation Arnite 
# 532-8507/ST

O-ring MVQ (Silikon) # 350-0410

PP Turbine FT 36 # 527-0000/01

Lower section FHKSC Ø 1.00 mm # 313-4510/SCHN
Lower section FHKSC Ø 1.20 mm # 313-4512/SCHN
Lower section FHKSC Ø 1.80 mm # 313-4518/SCHN
Lower section FHKSC Ø 2.00 mm # 313-4520/SCHN