INNOVATIVE
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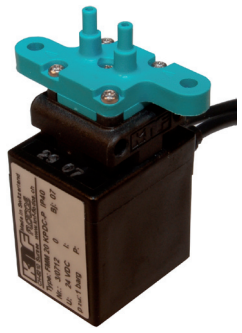
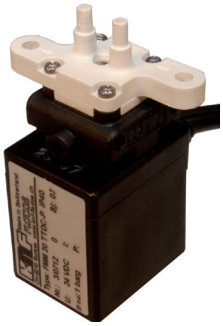
Solenoid diaphragm metering pump FMM 20

DATA SHEET E 750

FMM 20 KPDC-P



FMM 20 TTDC-P



Concept

The FMM 20 pump is a solenoid driven diaphragm pump which has been designed to dispense an accurate volume of 20 µl per stroke. The volume can be adjusted between approx. 5 and 25 µl thus allowing the pump to be calibrated to fit the parameters of the application. It is also possible to run the pump at 20 Hz in order to prime system.

An electrical impulse 12/24V sent to the solenoid creates a magnetic field which in turn draws the diaphragm down compressing a spring. As the impulse stops the spring pushes the diaphragm up which coupled with the patented valve system creates a pumping action.

The pump can be mounted in any position using either a manifold or tubing. Different connection possibilities can be seen on the last page.

Area of use

- Medical diagnostics
- Industrial dosing systems
- Inkjet printing
- Fuel cells
- Semi conductor industry
- Water analysis
- Others

Features / Advantages

- **Long lifetime**
  Over 250 million strokes.
- **Adjustable dispense volume 5-25 µl**
  This allows the pump to be calibrated.
- **Large flow range**
  The pump can be operated between 0-20 Hz (flow rate of 0 - 30 ml/min).
- **Flow tight in both directions**
  At rest the pump is sealed internally for pressures up to 0.5 bar.
- **High chemical resistance**
  Large choice of wetted materials.
- **Self priming**
  Capable of pumping both liquids and gases.
- **Quiet running**
  Noise suppression system.
- **High repeatability**
  Stable pump characteristics over the entire life time.

Performance Data

Type	Dispense volume	Calibration range	Max. Frequency	Max. Pressure
FMM 20	20 µl	5 - 25 µl	20 Hz	10 mWg

FMM 20

Technical Data

Electrical Data

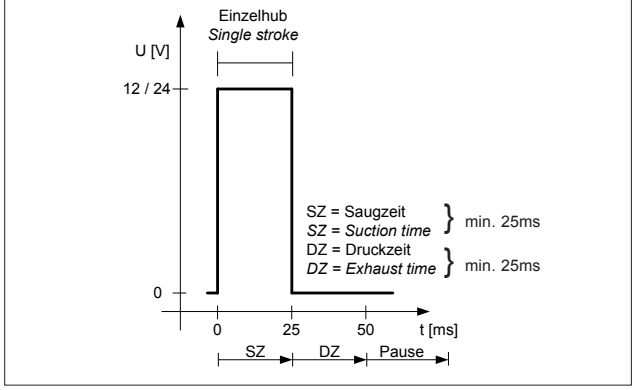
Voltage (V)	12/24
Max. allowed frequency (Hz)	20
I last max during impulse (A)	0.7/0.35
Effective continuous power at 20 Hz. (W)	4.2
Power rating (W)	8.4
Minimum impulse on time (ms)	25
Motor leads (AWG)	18
Weight (g)	88
Protection factor	IP 54

Hydraulic Data

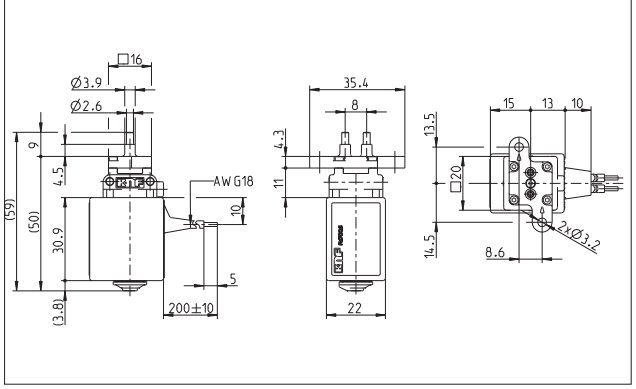
Nominal stroke volume (µl)	20
Repeatability from set point* (CV)	2%
Set point accuracy	+/-5%
Stroke volume range/calibration (µl)	5-25
Max. allowed pressure (bar)	1.0
Max flow rate (ml/min)	30
Suction height (mWg)	3

* coefficient of variation

Control signal (impulse)



FMM 20__DC-P



Pump description

FMM 20 K P DC - P

- Pulsing DC signal
- DC-voltage
- EPDM valves / diaphragm
- PP Head
- Stroke volume
- Metering
- Magnetic
- Flodos

Materials of head components

Pump type	Head material	Valve material	Diaphragm material
FMM 20 KPDC - P 12/24V	PP	EPDM	EPDM
FMM 20 KTDC - P 12/24V	PP	FFPM	FFPM
FMM 20 TTDC - P 12/24V	PVDF	FFPM	FFPM

If you have any questions about material compatibility don't hesitate to get in touch with your local KNF company.

FMM 20

General notes

All values given in this data sheet are based on the standard FMM20 pump and depend on the liquid, choice of head materials and tubing.

The standard FMM 20 is adjusted to a stroke volume of 20µl per stroke using standardised test equipement with water at 20°C.

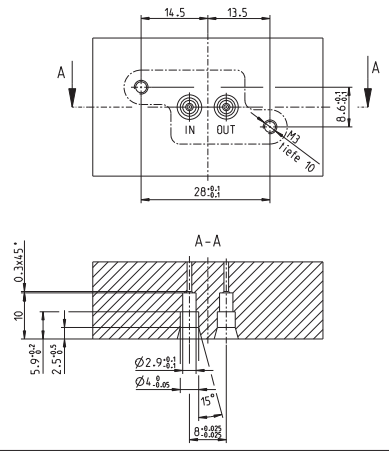
Manifold mounting the pump

The standard FMM 20 pump comes with two top ports designed for manifold mounting (see drawing). To seal the manifold we suggest using an O-ring 2.5 x 1. It is also possible to use 3mm tubing on the ports but only if no pressure build up is in the system.

We also offer different tubing / manifold connection possibilities depending on your requirements (see next page).

O-ring material	Dimensions	Order No.
EPDM	2.5 ID / 4.5 OD	157 604
FFPM	2.5 ID / 4.5 OD	157 734

Manifold mounting



Important notes

- **Accuracy**
  The 20µl is set and measured during testing at KNF. If the pump is subject to different parameters then the stroke volume can differ.

- **Calibration**
  It is possible to calibrate the dispense volume to fit the specific conditions of the application by adjusting the stroke length using the calibration screw on the base of the pump between approx. 5-25 µl (allen key 1.5).

- **Repeatability**
  In order to achieve the best accuracy and repeatability it is important to ensure that the surrounding parameters stay constant. E.g. pressure, suction height, liquid temperature, type of hosing etc.

- **Vacuum**
  At low frequencies the time taken to achieve the maximum vacuum will be longer. The end vacuum may vary depending on the adjusted stroke length.

- **Priming**
  Before dispensing starts it is important that the system is completely filled with liquid as air bubbles will lead to false results. The system is best primed by running the pump at 20 Hz.

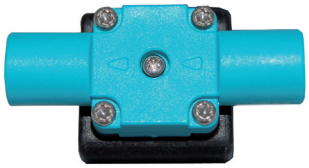
- **Fittings**
  Check that the fittings are connected properly and are not letting air in.

- **Filter**
  The presence of particles in the liquid being pumped can result in the valves being blocked. We therefore recommend the use of an approx. 50 micron filter on the suction side.

Connections (available on request)

Flat manifold mounting – It is possible to flange the pump straight onto a manifold using o-rings to seal the two surfaces.

Hose barbs – A good option when using 3mm ID tubing. At high pressures it may be necessary to fix the tubing on with a clamping device.



UNF ¼"-28 inside threads – This type of fitting is becoming very popular. As the fitting is screwed in a clamp ring is compressed creating a very good seal.

Options

Control module for test purposes on request available.

KNF offers a wide range of accessories such as pressure control valves or pulsation dampeners which can be used to make the perfect fluidic solution for your application.

We specialise in tailor made solutions. For all the possible options feel free to contact us.

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