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CUSTOMIZED PUMP SOLUTIONS FOR 3D JETTING TECHNOLOGIES





KNF GAS AND LIQUID PUMPS AT WORK IN 3D PRINTING

DURABLE, RELIABLE, OPTIMAL FOR JETTING TECHNOLOGIES

Custom-fit solutions for pioneers

The first 3D printers have been fitted with our diaphragm pumps. Our modular gas and liquid pumps were adapted to the specific needs of these machines in collaboration with the pioneers of jetting technologies. We are looking forward to even more exciting projects and the opportunity to use our extensive knowledge of pumps to continue to support this important cutting-edge technology.

Print head expertise

In the end, it all comes down to an optimized print head with a seamless supply of binder. We have been producing pumps to perform this task for decades in industrial digital printing, where the medium is ink but the goal is the same— a perfectly functioning print head. Our diaphragm pumps ensure all of the functions required for continuous transfer of the binder, from transporting the binder to the print head to degassing, print head cleaning and purging to generating a vacuum for the meniscus effect.

An ideal partner

Thanks to our extensive expertise acquired over many years and our close working relationship with printing system developers, we know exactly how vital fault-free operation is to both you as a manufacturer and your customers, as well as flawlessly produced components with the exact physical and qualitative properties required. Maximizing your added value is our priority as your partner. We work tirelessly to make your wishes a reality, from the specifications to test conditions to packaging and logistics.

Growing together

We have been involved in jetting technologies for 3D printing from the beginning, and so we know that growth sometimes takes time. No matter the size of the production run you need, we produce and deliver an optimal solution.

KNF pumps support the following jetting processes:

- Binder jetting
- Material jetting
- Metal jetting
- Ceramic jetting
- Photopolymer jetting
- ColorJet Printing
- Liquid additive manufacturing
- MultiJet Printing



Scan the QR code and quickly find optimal pump solutions for your 3D jetting application.



JETTING TECHNOLOGY IN THE SPOTLIGHT

PRECISE MANUFACTURING LAYER BY LAYER

Chemical resistance

In order to cope with binders of various chemical compositions whose aggressiveness can change with the temperature, KNF gas and liquid pumps offer scalable chemical resistance. When working with highly aggressive binders such as furan, for example, KNF liquid pumps are equipped with a PP pump head and a PTFE-coated diaphragm.

Satisfying process requirements

Our pumps are fully operational even at the low temperatures necessary for preventing the binder from hardening, and the elastomeric materials in the pump head and the diaphragm remain both completely functional and chemically resistant. As hazardous environments may occasionally occur, our liquid pumps are manufactured with protection class up to IP65, thus supporting the Ex requirements for the entire system. Equipping our diaphragm pumps with brushless motors promotes durability.

Maximum precision

KNF gas and liquid pumps fulfill a range of tasks within the 3D printer, always guaranteeing high-quality results. Our liquid pumps transfer the binder to the print head at the right time. Our gas pumps degas the binder, ensuring the functionality of the 3D print head and industrial-grade quality. Our gas pumps also ensure optimal suction of the 3D-printed components to construction support surfaces, for example vacuum tables and panels. The carrier material is suction-fixed across the entire surface, which guarantees vibration-free attachment and smooths out any minor uneven patches or bulges.

KNF modular system

Thanks to our modular system, every one of our pump series models can be quickly and inexpensively adapted to meet specific needs. We will be happy to support you throughout the specification process and provide advice drawn from our practical experience. You will have an individual contact person every step of the way who will be responsible for the central coordination of each phase of project planning, including technical, commercial and organizational aspects.

KNF MODULAR SYSTEM

FLEXIBLE, CUSTOM-FIT, COST-EFFECTIVE – FROM STANDARD TO HIGH-END

Every application is different and some are one of a kind. Our modular system is designed to give you a high degree of flexibility, speed and reliability. You can be sure that every gas and liquid pump supplied by KNF will exactly meet your requirements, no matter how complex or unusual these might be.

Series models – the first step to customized pumps

KNF offers a range of up to 90 series models designed for handling gases and liquids. The performances of these are described in our data sheets.

The KNF modular system for creating customized pumps

By selecting and combining a variety of options, ranging from the material used to make the pump components that come into contact with the media, to the drive and the mechanical elements such as the circuit points and connections, it is easy to tailor every series model to meet application-specific requirements. The configurations created by the KNF modular system are based on tried and tested individual components, meaning that developing customized pumps is quick and inexpensive.

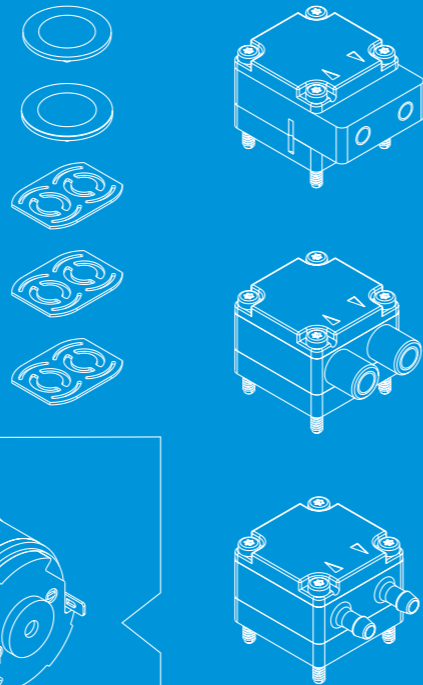
Project pumps – precisely designed for the application

We support your development project by providing you with sample pumps quickly and easily. In consultation with you, our employees from the sales, engineering, and product management divisions determine the modifications to be made to the product's standard technical parameters.

MATERIAL OPTIONS

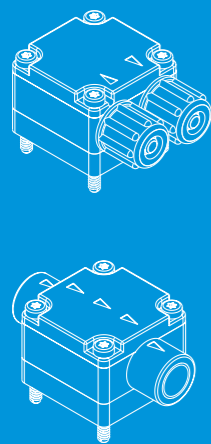
Valve/Diaphragm:
EPDM, FKM, FFKM,
HNBR, stainless steel
and others

Pump head:
PP, PPS, fluoroplastics,
stainless steel,
aluminum and others



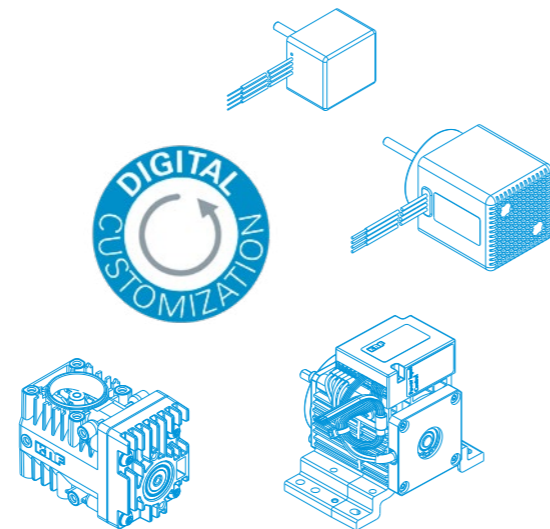
MECHANICAL OPTIONS

Circuit points and connections



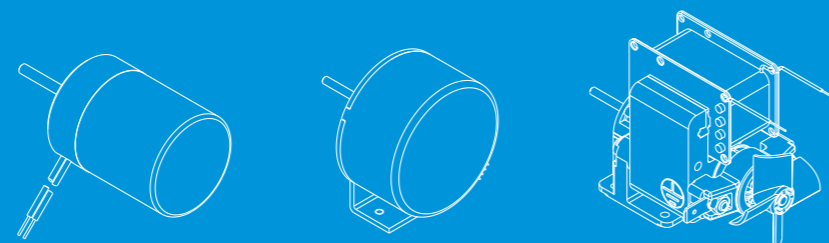
MOTOR OPTIONS

“DIGITAL CUSTOMIZATION” sets our brushless DC motors apart, allowing for their unique configuration. And we do mean unique. We develop and produce these motors ourselves or as part of an exclusive development partnership with a leading motor manufacturer. These motors map complex operating profiles with comprehensive safety equipment, allowing you to benefit from improved energy efficiency, precise management of target values and easy digital control.



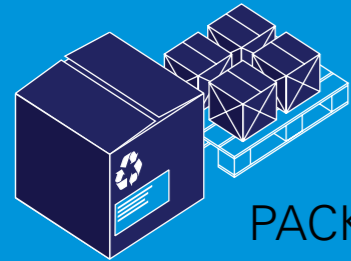
Explosion-proof options and all common voltage configurations available.

Motor types: DC, DC-B, AC.



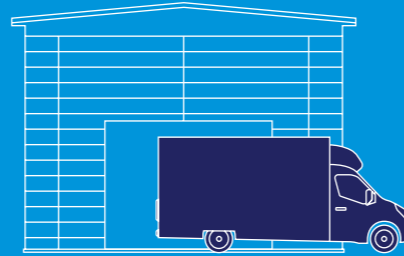
FLEXIBLE SUPPORT FROM START TO FINISH – YOUR ADDED VALUE IS OUR PRIORITY

WITH KNF, FLEXIBILITY DOESN'T STOP AT THE TECHNICAL SOLUTION. WE FULFILL YOUR INDIVIDUAL REQUESTS EVERY STEP OF THE WAY UNTIL DELIVERY AND SERVICE.



PACKAGING

We'll be happy to implement any measures that make life easier for your goods receiving department, as well as to support your efforts toward recycling and environmental protection.



LOGISTICS

We support all types of production lot ordering – including Kanban, VMI, CMI, B2B and others.



DOCUMENTATION

Together, we'll define the type, scope and design of the documentation.

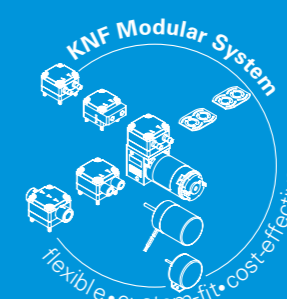


We inspect and test 100% in line with your requests.



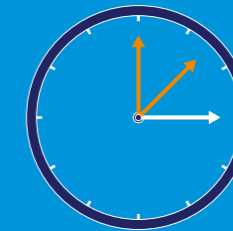
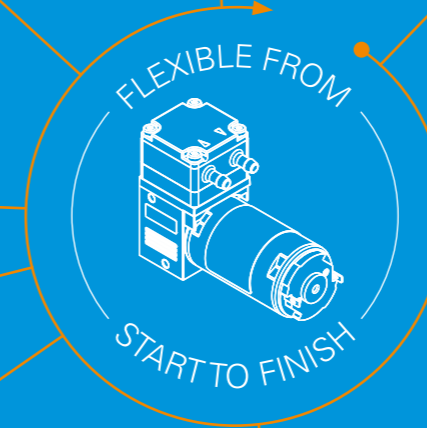
SERVICE

We implement custom-fit service concepts for you. It is important to us to minimize the overall running costs of our pumps, and we take this into account in the pricing of replacement parts.



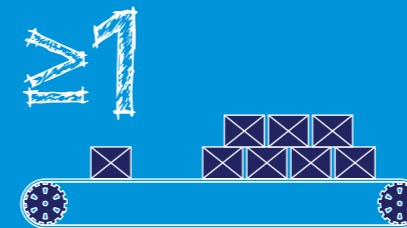
~3,000

customized adaptations are carried out at KNF every year for all our customers worldwide – quickly and inexpensively thanks to our modular system. We also develop exclusive pumps and drive concepts for individual customers.



"ASSEMBLY AND ENGINEERING IN ONE"

We will provide you with the pump as an assembly. This may include completing steps in the production process or installing components such as a valve block, sensors, tubing etc.



PRODUCTION

You can rely on the flexibility and quality of our support for every order with KNF, from large lot sizes to a single pump.

GAS AND LIQUID PUMPS FOR PRECISE 3D JETTING PROCESS RESULTS

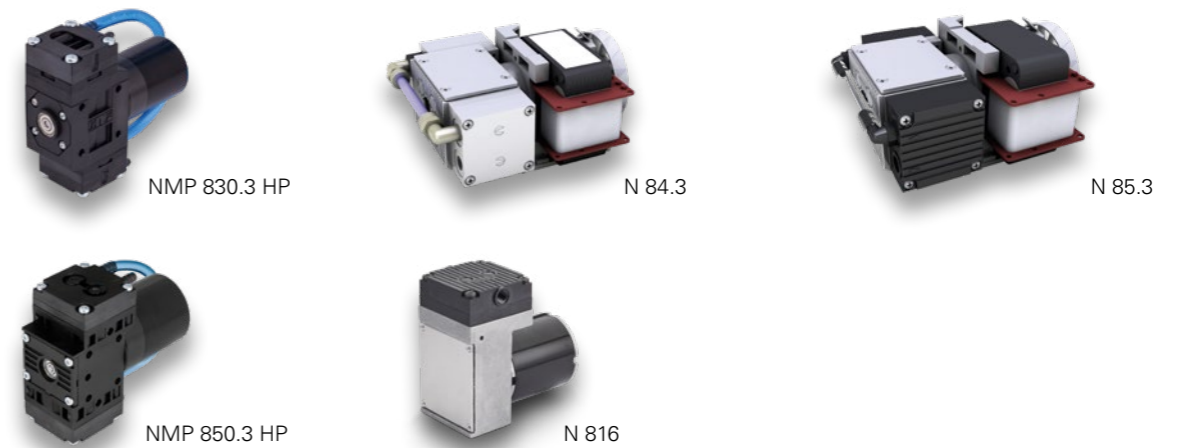
BINDER SUPPLY – DIRECT TRANSFER OF BINDER TO THE PRINT HEAD

PERFORMANCE RANGE OF LIQUID PUMPS					
Series model	Flow rate at atm. pressure (ml/min)	max. suction head (mWg)	max. pressure head (mWg)	Material design	max. protection class
FL 10	100	2	10	Pump head: PP Diaphragm: PTFE Valves: EPDM, FFKM	IP 65
FF 12	150	3	10	Pump head: PP Diaphragm: EPDM, PTFE Valves: EPDM, FFKM	IP 40
FF 20	230	3.5	30	Pump head: PP Diaphragm: PTFE, EPDM Valves: EPDM, FFKM	IP 40
NF 25 / NF 1.25	300	3	60	Pump head: PP, PPS, PVDF Diaphragm: PTFE, EPDM Valves: EPDM, FFKM	IP 40
NF 60 / NF 1.60	650	3	60	Pump head: PP, PVDF, PTFE Diaphragm: PTFE Valves: EPDM, FFKM	IP 30
FP 70	850	3	20	Pump head: PP Diaphragm: EPDM, PTFE Valves: EPDM, FFKM	IP 20
FP 150 / FP 1.150	1,500	2.7	60	Pump head: PP Diaphragm: PTFE Valves: EPDM, FFKM/FFKM	IP 65
NF 300	3,000	3	10	Pump head: PP, PVDF, PTFE Diaphragm: PTFE Valves: EPDM, FFKM	IP 54
FP 400 / FP 1.400	4,600	3	60	Pump head: PP Diaphragm: PTFE Valves: EPDM, FFKM	IP 65
FK 1100 / FK 1.1100	12,400	4.5	60	Pump head: PP, PPS Diaphragm: PTFE Valves: EPDM, FFKM	IP 55



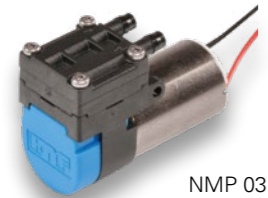
DEGASSING – RELIABLE REMOVAL OF DISSOLVED GAS IN THE BINDER AND THE FEEDER LINE

PERFORMANCE RANGE OF VACUUM PUMPS						
Series model	Flow rate at atm. pressure (l/min)	Vacuum (mbar abs.)		Pressure (bar g)	Material design	max. protection class
NMP 830.3 HP	3.7	55		atm. pressure	Pump head: PPS Diaphragm: EPDM, FKM, PTFE Valves: EPDM, FKM, FFKM	IP 54
N 84.3	5	7			Pump head: Aluminium Diaphragm: PTFE Valves: EPDM	IP 30
N 85.3	5.5	25			Pump head: PPS Diaphragm: EPDM, PTFE Valves: CR, FFPM	IP 30
NMP 850.3 HP	6.7	50			Pump head: PPS Diaphragm: EPDM, PTFE, FKM Valves: EPDM, FFKM, FKM	IP 30
N 816	16	100			Pump head: PPS Diaphragm: EPDM, PTFE Valves: EPDM, FFPM	IP 30



VACUUM GENERATION ON THE PRINT HEAD FOR THE MENISCUS EFFECT

PERFORMANCE RANGE OF VACUUM/PRESSURE PUMPS						
Series model	Flow rate at atm. pressure (l/min)	Vacuum (mbar abs.)		Pressure (bar g)	Material design	max. protection class
NMP 03	0.33	600		0.33	Pump head: PPS Diaphragm: EPDM, FKM, FFKM Valves: EPDM, FKM, FFKM	IP 00
NMS 010	0.75	600		0.5	Pump head: PPS Diaphragm: EPDM, FFKM Valves: EPDM, FFKM	IP 00
NMP 015	1.6	400		0.9	Pump head: PPS Diaphragm: EPDM, PTFE Valves: EPDM, FFKM	IP 00
NMP 820	2.1	300		1.2	Pump head: PPS Diaphragm: EPDM Valves: EPDM	IP 30
NMP 830 DC-B14 HP	5	230		3	Pump head: PPS Diaphragm: EPDM Valves: EPDM	IP 30
NMP 850 DC-B14 HP	7	220		2.2	Pump head: PPS Diaphragm: EPDM Valves: EPDM	IP 30



NMP 03



NMS 010



NMP 015



NMP 820



NMP 830 DC-B14 HP



NMP 850 DC-B14 HP

VACUUM GENERATION FOR WORKPIECE FIXATION

PERFORMANCE RANGE OF VACUUM/PRESSURE PUMPS						
Series model	Flow rate at atm. pressure (l/min)	Vacuum (mbar abs.)		Pressure (bar g)	Material design	max. protection class
N 96	8.5	100		2.5	Pump head: PPS Diaphragm: PTFE, EPDM Valves: FKM, FFKM	IP 20
N 816	16	100		0.5	Pump head: PPS Diaphragm: EPDM, PTFE Valves: EPDM, FFKM	IP 30
NMP 850.1.2 HP	16	220		2.2	Pump head: PPS Diaphragm: EPDM, PTFE, FKM Valves: EPDM, FFKM, FKM	IP 30
N 838.1.2	60	90		0.5	Pump head: PPS Diaphragm: EPDM Valves: FKM	IP 20



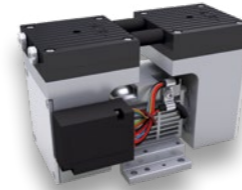
N 96



N 816



NMP 850.1.2 HP



N 838.1.2

PRINT HEAD CLEANING – SUPPLY OF SOLVENTS TO REMOVE IMPURITIES AND CLOGGING FOR CLEAN PRINT HEADS

PERFORMANCE RANGE OF LIQUID PUMPS				
Series model	Flow rate at atm. pressure (ml/min)	max. pressure head (mWg)	Material design	max. protection class
FL 10	100	10	Pump head: PP Diaphragm: PTFE Valves: EPDM, FFKM	IP 65
FF 12	150	10	Pump head: PP Diaphragm: EPDM, PTFE Valves: EPDM, FFKM	IP 40
NF 25	250	10	Pump head: PP, PVDF Diaphragm: PTFE, EPDM Valves: EPDM, FFKM	IP 40



FL 10



FF 12



NF 25

PERFORMANCE RANGE OF PRESSURE PUMPS				
Series model	Flow rate at atm. pressure (l/min)	Pressure (bar g)	Material design	max. protection class
NMP 820	2.1	1.2	Pump head: PPS Diaphragm: EPDM Valves: EPDM	IP 30
NMP 830 DC-BI4 HP	5	3	Pump head: PPS Diaphragm: EPDM Valves: EPDM	IP 30
NMP 850 DC-BI4 HP	7	2.2	Pump head: PPS Diaphragm: EPDM Valves: EPDM	IP 30
NPK 012	13.5	5	Pump head: PPS Piston sealing: PTFE Valves: FKM	IP 20



NMP 820



NMP 830 DC-BI4 HP



NMP 850 DC-BI4 HP



NPK 012

PURGING – RINSING OF PRINT HEADS FOR CONSISTENTLY HIGH PRINT QUALITY

PERFORMANCE RANGE OF LIQUID PUMPS				
Series model	Flow rate at atm. pressure (ml/min)	max. pressure head (mWg)	Material design	max. protection class
FMM 20	18	10	Pump head: PP, PVDF Diaphragm: EPDM, FFKM Valves: EPDM, FFKM	IP 54
NF 30.27	300	10	Pump head: PP, PVDF Diaphragm: EPDM, PTFE Valves: EPDM, FFKM	IP 40



FMM 20



NF 30.27

PERFORMANCE RANGE OF PRESSURE PUMPS				
Series model	Flow rate at atm. pressure (l/min)	Pressure (bar g)	Material design	max. protection class
NMP 015	1.6	0.9	Pump head: PPS Diaphragm: EPDM, PTFE Valves: EPDM, FFKM	IP 00
NMP 820	2.1	1.2	Pump head: PPS Diaphragm: EPDM Valves: EPDM	IP 30
NPK 03	3	5.5	Pump head: PPS Piston sealing: PTFE Valves: FPM	IP 30
NMP 830 DC-BI4 HP	5	3	Pump head: PPS Diaphragm: EPDM Valves: EPDM	IP 30
NMP 850 DC-BI4 HP	7	2.2	Pump head: PPS Diaphragm: EPDM Valves: EPDM	IP 30
NPK 06	8	5.5	Pump head: PPS Piston sealing: PTFE Valves: FPM	IP 20
NPK 012	13.5	5	Pump head: PPS Piston sealing: PTFE Valves: FKM	IP 20



NMP 015



NMP 820



NPK 03



NMP 830 DC-BI4 HP



NMP 850 DC-BI4 HP



NPK 06



NPK 012

