



# CUSTOMIZED PUMP SOLUTIONS FOR DOD AND CIJ PRINTING SYSTEMS





KNF GAS AND LIQUID PUMPS IN ACTION: DIGITAL INKJET PRINTERS

## RELIABLE INK TRANSFER – ROBUST AND MAINTENANCE-FREE

KNF gas and liquid pumps are used in all areas of industrial inkjet printing, from printing equipment for large-format banners to decorative printing on furniture and ceramics as well as printing systems for barcodes and packaging labels. Our custom-built solutions ensure a continuous transfer of ink and boast a reliable, durable and maintenance-free design.

### **A valued solution partner**

KNF works alongside the world's leading inkjet printer manufacturers. Thanks to our extensive expertise acquired over many years and our close working relationship with developers and designers, we know exactly how vital maximum running times are to both you as a manufacturer and your customers.

KNF gas and liquid pumps are the products of decades of engineering experience in diaphragm pump technology. Each of our solutions is tailored precisely to your printing equipment and process requirements.

### **We grow with your business**

We have been involved in digital printing from the beginning, and so we know that some things just need time. And we are happy to invest this time to support you in the development of new printing systems. A single pump or serial production? Small or large production numbers? It makes no difference for us – we produce and deliver an optimal solution. Thanks to

the KNF 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 many years of practical experience.

### **Global network**

As a technology leader in diaphragm pumps and systems, KNF provides its customers with a close-knit network of outstanding services and competent advisors. Highly skilled employees across a number of locations worldwide and efficient coordination ensure that our business operations run smoothly. KNF is by your side every step of the way from the development stage to the series production of your industrial digital printing systems. An ongoing commitment to quality, efficient processes and reliability are values that you can count on at KNF.

KNF gas and liquid pumps are used in industrial digital printing equipment for:

- Wide-format printing
- Packaging printing
- Decorative printing on ceramics, glass, wood, metal and plastic
- Labelling, marking
- Textile printing





CONFIGURED TO MEET DOD AND CIJ REQUIREMENTS

## PINPOINT PRECISION

From ink supply and degassing to the cleaning and purging of print heads, vacuum generation on the print heads for the meniscus effect and ink circulation, our customized, comprehensive solutions use gas and liquid pumps to perform all the processes needed to ensure the continuous transfer of ink. KNF's diaphragm pumps are tailored to all the specific requirements of both DOD and CIJ technology.

### Fully adaptable

KNF pumps are known for their outstanding flexibility. With their compact design, ability to be installed in any position and fully adjustable controls, all pump components can be adapted to meet the exact needs of your equipment.

### Chemically resistant and robust

When designing our gas and liquid pumps, we take the chemical composition of the ink, the pigment density and the use of solvents into account. To ensure that our solution fulfils your specifications, you can choose to have your wetted pump components produced from

like FFKM, PTFE, EPDM, FKM and others. KNF pumps are able to transfer all types of ink used in the printing industry, from water-based and pigment inks to solvent-based and UV inks. What's more, even our pump name plates are solvent resistant.

### Flexible and efficient levels of performance

The wide array of industrial inkjet printing solutions on the market cover an extensive range of sophisticated printing processes. The variety of options available in our modular system help you to stand out from the crowd and can be used to create a solution with a price/performance ratio tailored precisely to any set of requirements.

### Perfectly airtight

Leak-proof printer components are essential for long-term, fault-free operation. KNF liquid pumps feature an outstanding, tried-and-tested hermetically sealed pump head design and a large selection of hydraulic connection options, keeping them fully airtight at all times.

## 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.

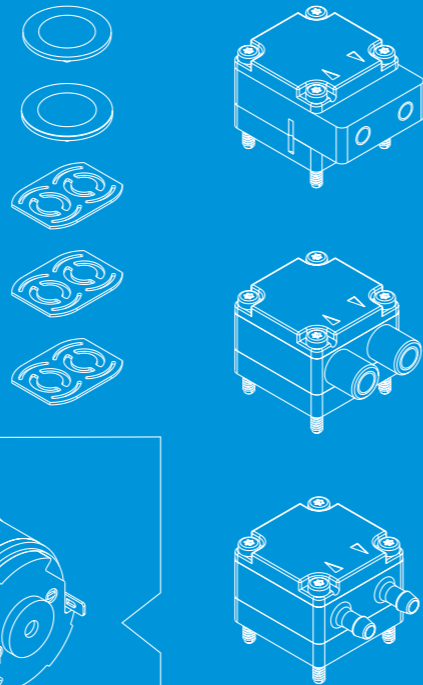
### Project pumps – precisely designed for the application

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

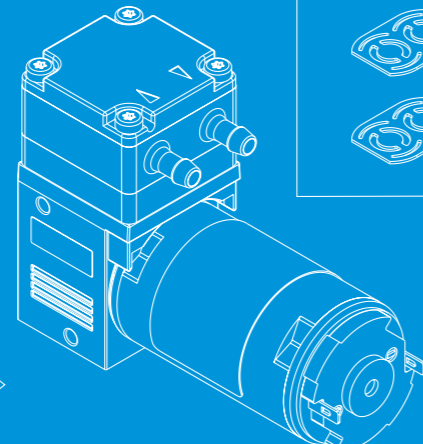
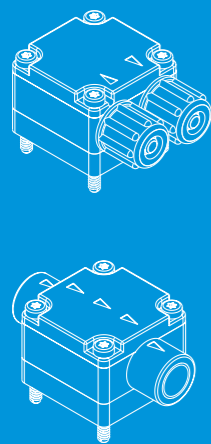
Valve/Diaphragm:  
EPDM, FKM, FFKM,  
HNBR, stainless steel  
and others

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



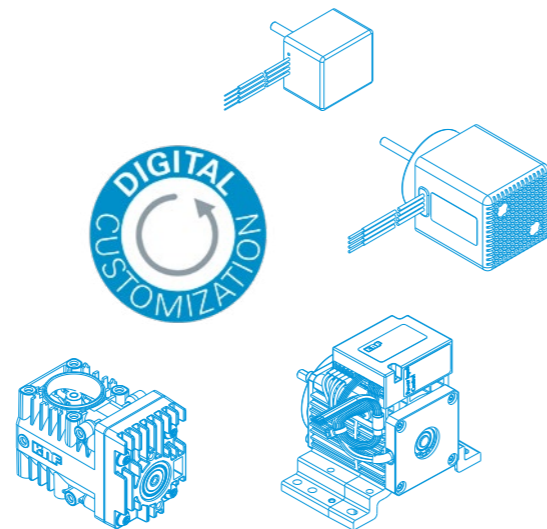
## MECHANICAL OPTIONS

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.



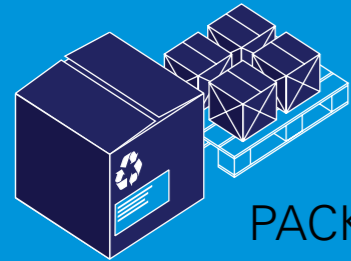
Explosion-proof options and all common voltage configurations available.  
Motor types: DC, DC-B, AC.





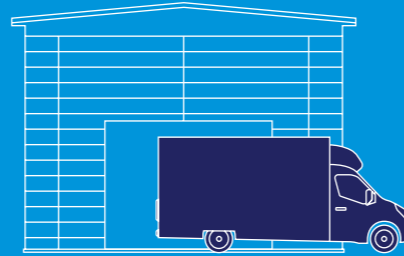
# FLEXIBLE SUPPORT FROM START TO FINISH – YOUR ADDED VALUE IS OUR PRIORITY

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.

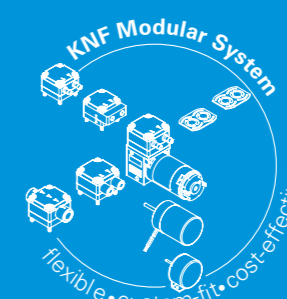


We inspect and test 100% in line with your requests.



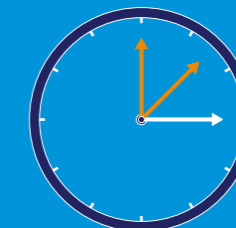
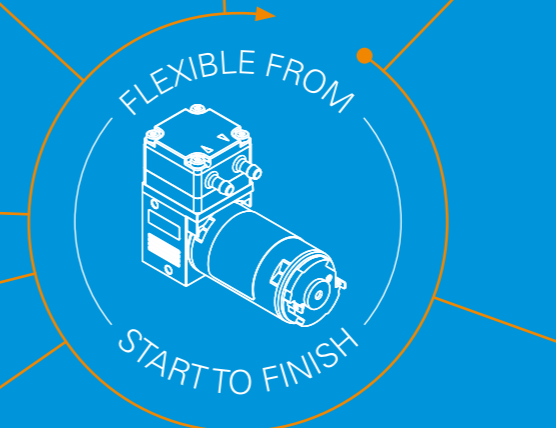
## SERVICE

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.



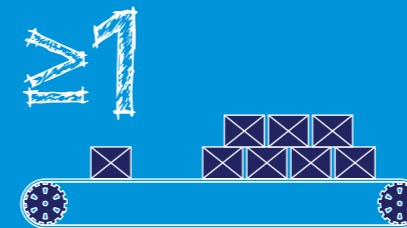
~3,000

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 THE CONTINUOUS TRANSFER OF INK

## INK DELIVERY – DIRECT TRANSFER OF INK TO THE PRINT HEADS

PERFORMANCE RANGE OF LIQUID PUMPS			
Series model	Flow rate at atm. pressure (ml/min)	max. suction head (mWg)	max. pressure head (mWg)
FL 10	100	2	10
FF 12/20	230	3.5	30
NF 25/NF 1.25	300	3	60
NF 60/NF 1.60	650	3	60
FP 70	850	3	20
FP 150/FP 1.150	1,500	2.7	60
NF 300	3,000	3	10
FP 400/FP 1.400	4,600	3	60
FK 1100/1.1100	12,400	4.5	60



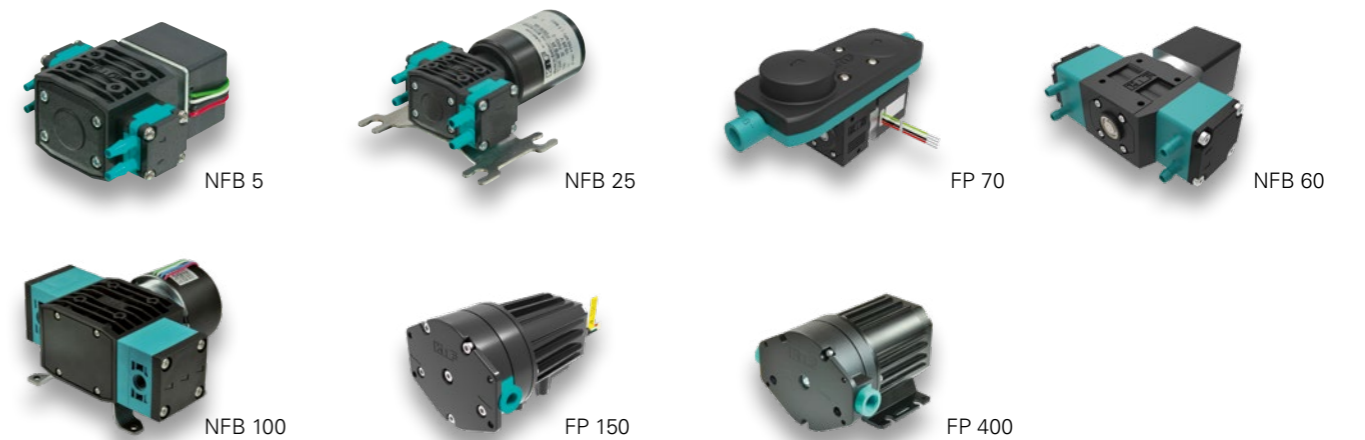
## INK DELIVERY – INDIRECT TRANSFER OF INK BY MEANS OF PRESSURE SUPERPOSITION

PERFORMANCE RANGE OF VACUUM / PRESSURE PUMPS			
Series model	Flow rate at atm. pressure (l/min)	Vacuum (mbar abs.)	Pressure (bar g)
NMP 820	2.1	300	1.2
NPK 03	3	250	5.5
NPK 04	3.3	300	1
NMP 830 DC-BI4 HP	5	230	3



## INK CIRCULATION – TO MAINTAIN THE COLOR INTENSITY

PERFORMANCE RANGE OF LIQUID PUMPS			
Series model	Flow rate at atm. pressure (ml/min)	max. suction head (mWg)	max. pressure head (mWg)
NFB 5	2 x 5–40	3	10
NFB 25	2 x 300	3	10
FP 70	850	3	20
NFB 60	2 x 600	3	10
NFB 100	2 x 1,300	3	10
FP 150/FP 1.150	1,500	2.7	60
FP 400/FP 1.400	4,600	3	60



DEGASSING – FOR THE RELIABLE REMOVAL OF DISSOLVED GAS FROM THE INK AND FEED LINE

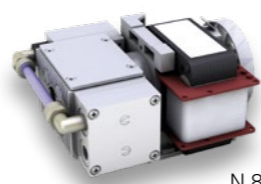
PERFORMANCE RANGE OF VACUUM PUMPS				
Series model	Flow rate at atm. pressure (l/min)		Vacuum (mbar abs.)	Pressure (bar g)
NMP 830.3	3	40		-
NMP 830.3 HP	3.7	55		-
N 84.3	5	7		0.3
NMP 850.3 HP	6.7	50		-
N 816	16	100		0.5



NMP 830.3



NMP 830.3 HP



N 84.3



NMP 850.3 HP



N 816

VACUUM GENERATION ON THE PRINT HEADS 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)
NMP 03	0.33	600		0.33
NMP 015	1.6	400		0.9
NMP 820	2.1	330		1.2
NMP 830 DC-BI4	2.5	250		1.4
NMP 830 DC-BI4 HP	5	230		3
NMP 850 DC-BI4 HP	7	220		2.2



NMP 03



NMP 015



NMP 820



NMP 830 DC-BI4



NMP 830 DC-BI4 HP



NMP 850 DC-BI4 HP

PRINT HEAD CLEANING – DIRECT 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. suction head (mWg)	max. pressure head (mWg)
FL 10	100	2	10
FF 12	150	3	10
NF 25	250	3	10



FL 10



FF 12



NF 25

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

PERFORMANCE RANGE OF VACUUM PUMPS				
Series model	Flow rate at atm. pressure (l/min)	Vacuum (mbar abs.)	Pressure (bar g)	atm. pressure
NMP 820	2.1	330	1.2	
NMP 830 DC-BI4	2.5	250	1.4	
NMP 830 DC-BI4 HP	5	230	3	
NMP 850 DC-BI4 HP	7	220	2.2	
NPK 06	8	250	5.5	
N 96	8.5	100	2.5	
NPK 012	13.5	140	2.5	



NMP 820



NMP 830 DC-BI4



NMP 830 DC-BI4 HP



NMP 850 DC-BI4 HP



NPK 06



N 96



NPK 012

PURGING – DIRECT RINSING OF PRINT HEADS FOR GUARANTEED HIGH PRINT QUALITY

PERFORMANCE RANGE OF LIQUID PUMPS		
Series model	Flow rate at atm. pressure (ml/min)	max. pressure head (mWg)
FMM 20	18	10
NF 30.27	300	10



FMM 20



NF 30.27

PURGING – INDIRECT RINSING OF PRINT HEADS BY WAY OF PRESSURE SUPERPOSITION FOR GUARANTEED HIGH PRINT QUALITY

PERFORMANCE RANGE OF PRESSURE PUMPS		
Series model	Flow rate at atm. pressure (l/min)	max. Pressure (bar g)
NMP 820	2.1	1.2
NMP 830 DC-BI4	2.5	1.4
NPK 03	3	5.5
NMP 850 DC-BI4	4.2	2.5
NMP 830 DC-BI4 HP	5	3
NMP 850 DC-BI4 HP	7	2.2
NPK 06	8	5.5
N 96	8.5	2.5
NPK 012	13.5	5



NMP 820



NMP 830 DC-BI4



NPK 03



NMP 850 DC-BI4



NMP 830 DC-BI4 HP



NMP 850 DC-BI4 HP



NPK 06



N 96



NPK 012



