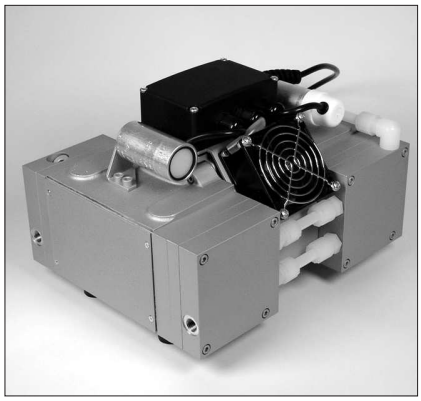
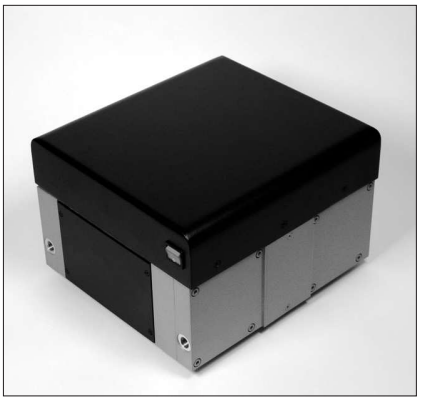
DIAPHRAGM PUMPS WITH KNF STABILIZATION SYSTEM

DATA SHEET E 037



N 940.5 APE as AC version in IP 54



N 940.5 APE-W with multi-voltage power supply input (As an option adjustable with potentiometer or by external signal input).

Concept

The powerful diaphragm vacuum pumps N 940 series are especially well suited for all applications requiring excellent suction speed with low absolute pressures. A series of technical innovations, including a diaphragm stabilization system, allows the high suction especially in the low-vacuum range.

The vacuum pump N 940.5 APE-W is available with optional adjustable flow rate; in this case, either an potentiometer or an external controller with an analog signal input will alter the motor speed. These pump version make it possible to adapt the flow rate to the requirements of a specific applications process.

Features

Transferring and evacuation of air and gases
No contamination of the media due to oil-free operation

KNF stabilization system
Optimized suction speed, also for low absolute pressures

High level of gas tightness
approx. 6 x 10^{-3} mbar x l/s (not tested in serial production)

Quiet running

Cool and efficient brushless motor

Multi-voltage power supply input by N 940.5 APE-W

Can operate in any installed position

Areas of use

The N 940 series of diaphragm vacuum pumps offer a high level of performance in a compact unit size. Typical applications are in the fields of analysis, chemistry, medicine and production technologies.

The N 940 pumps also support turbomolecular systems as roughing pumps.

There are many applications for the N 940 series, please contact KNF for application advice.

PERFORMANCE DATA

Type	Delivery (l/min)	Vacuum (mbar absolute)	atm. Press.	Pressure (bar g)	Weight (kg)
N 940.5 APE	50	1.5		0.5	18.9
N 940.5 APE-W	50	1.5		0.5	16.8

N 940.5 APE

PERFORMANCE DATA

Type and Order No.	Delivery **(l/min)**[1] at atm. pressure	Max. operating pressure **(bar g)**	Ultimate vacuum **(mbar abs.)**
N 940.5 APE	50	0.5	< 1.5

[1] Litre at STP

MODEL CODES AND MATERIALS

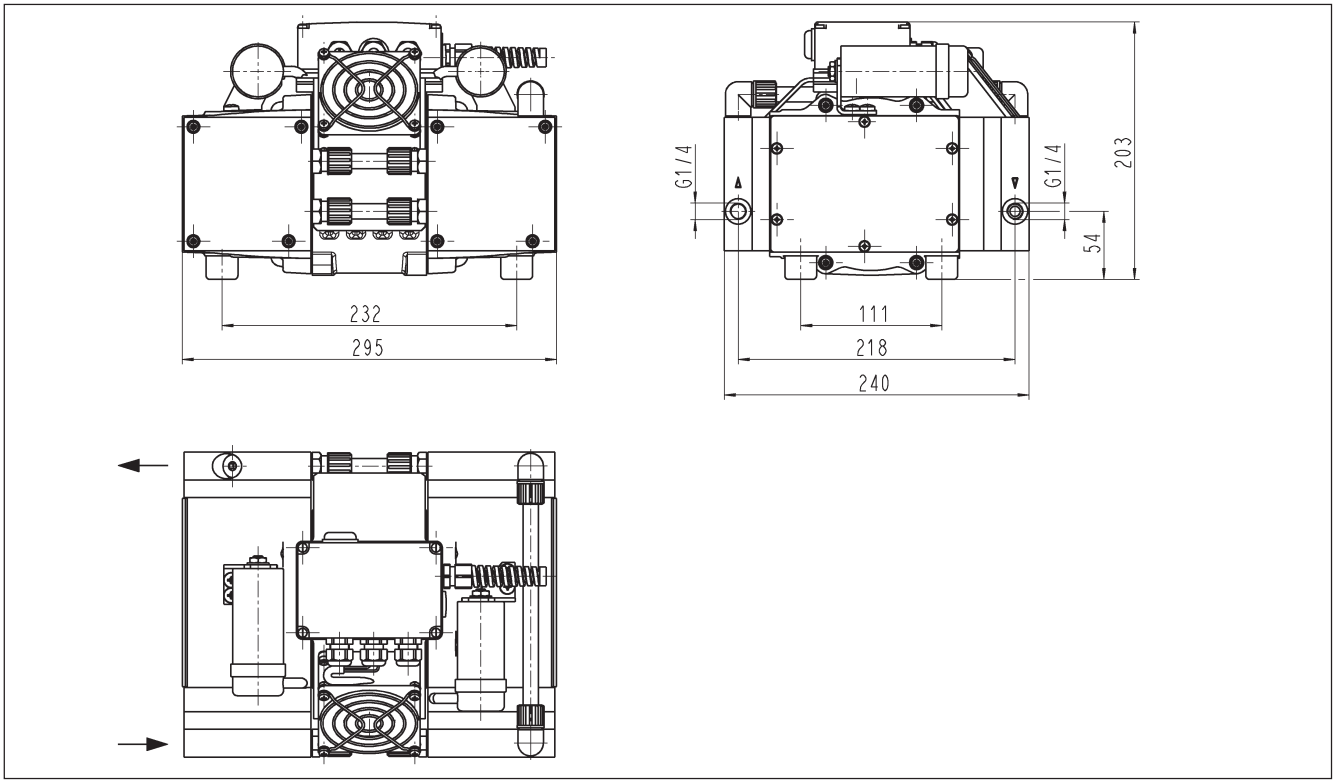
Type and Order No.	**Pump head**	**Diaphragm**	**Valves**
N 940.5 APE	Aluminium	EPDM	EPDM

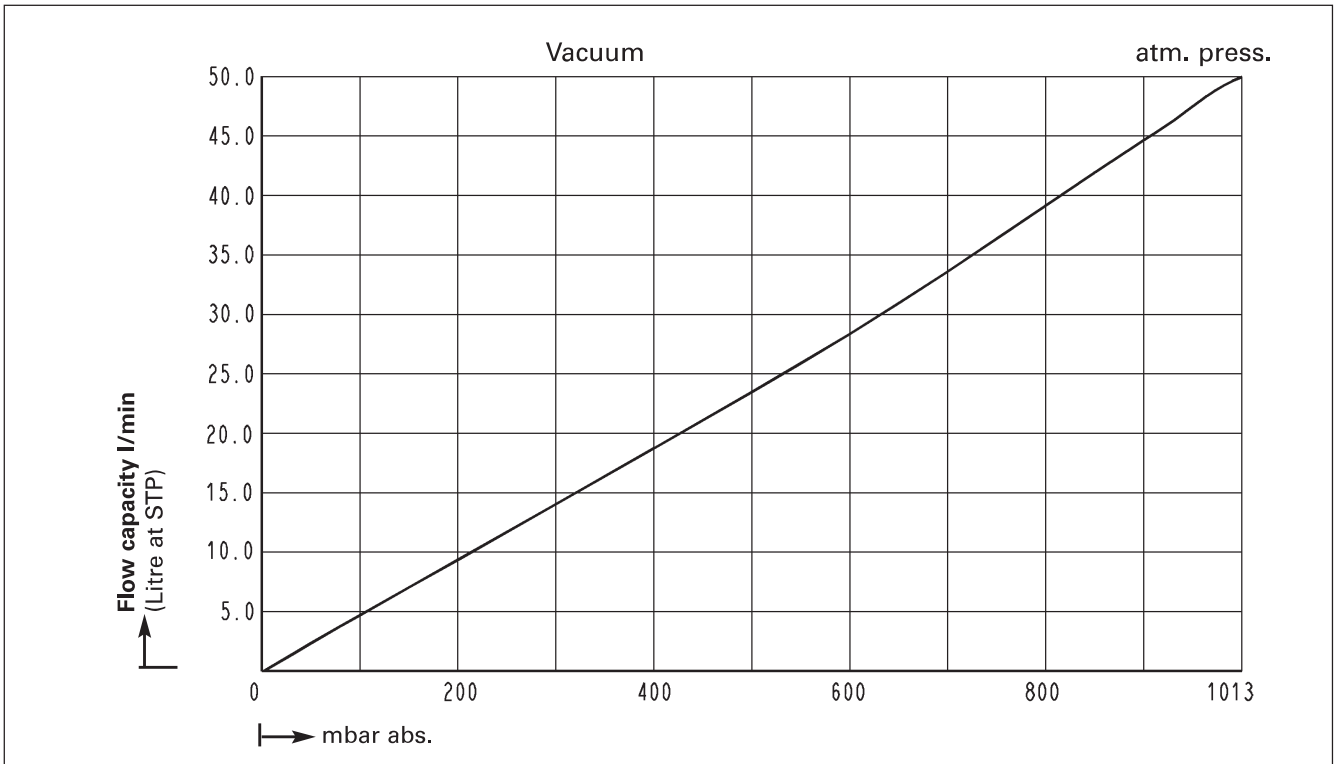
MOTOR DATA

Motor type: AC version		
Protection class	IP 54	
Voltage/Frequencies (V/Hz)	230/50	
Power P_1 (W)	250	
Operating current (A)	1.7	

Motors with other voltages, frequencies and protection classes on request.

Dimensions mm (All dimensional tolerances conform to DIN ISO 2768-1, Tolerance Class V)





N 940.5 APE-W

PERFORMANCE DATA

Type and Order No.	Delivery (l/min)[1] at atm. pressure	Max. operating pressure (bar g)	Ultimate vacuum (mbar abs.)
N 940.5 APE-W	50	0.5	< 1.5

[1] Litre at STP

MOTOR DATA

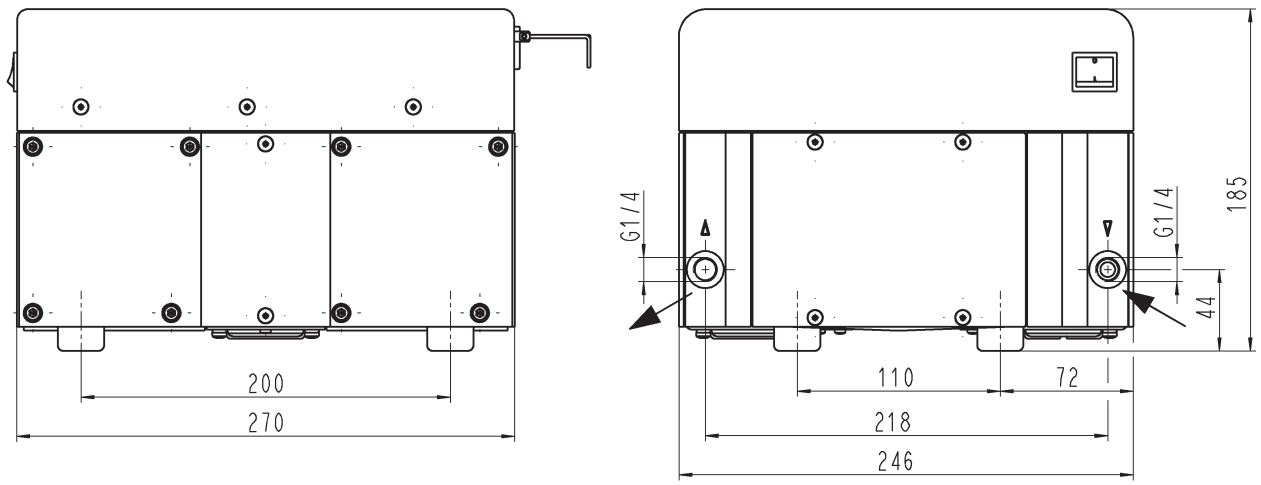
Motor type: brushless DC motor with AC power supply	
Protection class	IP 20
Voltage (V)	~100-240/50-60
Power P_1 (W)	250
Operating current (A)	2.8

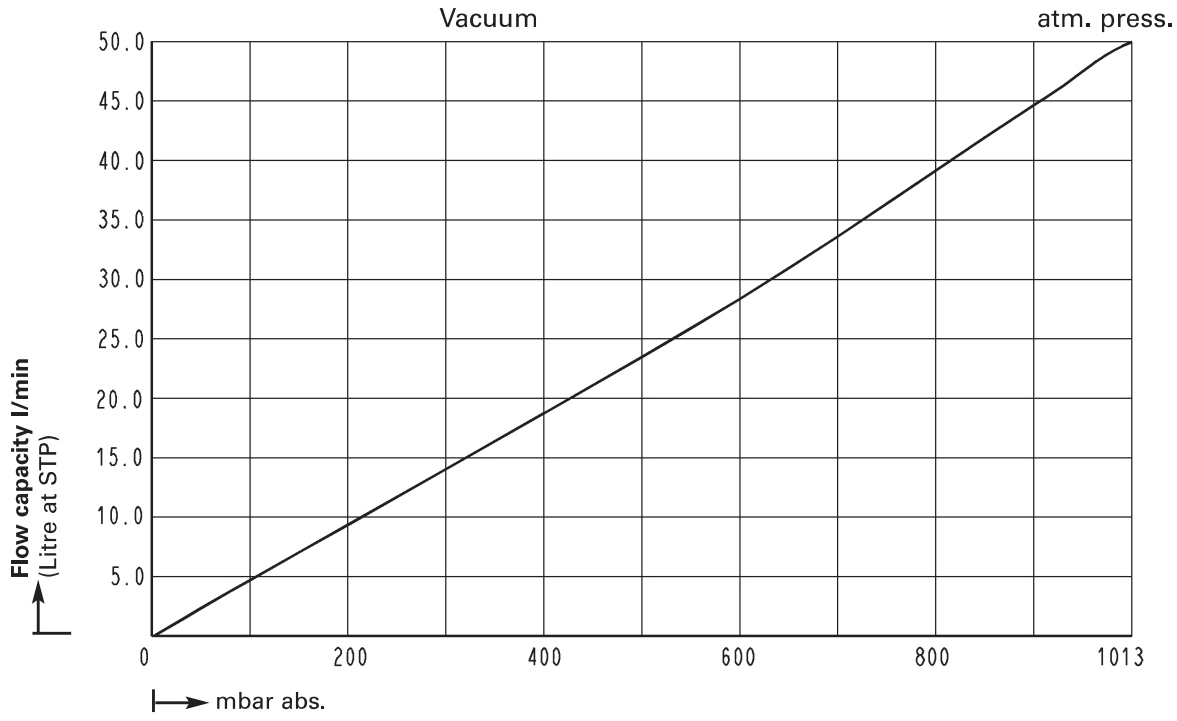
MODEL CODES AND MATERIALS

Type and Order No.	**Pump head**	**Diaphragm**	**Valves**
N 940.5 APE-W	Aluminium	EPDM	EPDM

The delivery of the N 940.5 APE-W series pumps can be adjusted with an optional potentiometer or by external analog signal. Please contact us for further information.

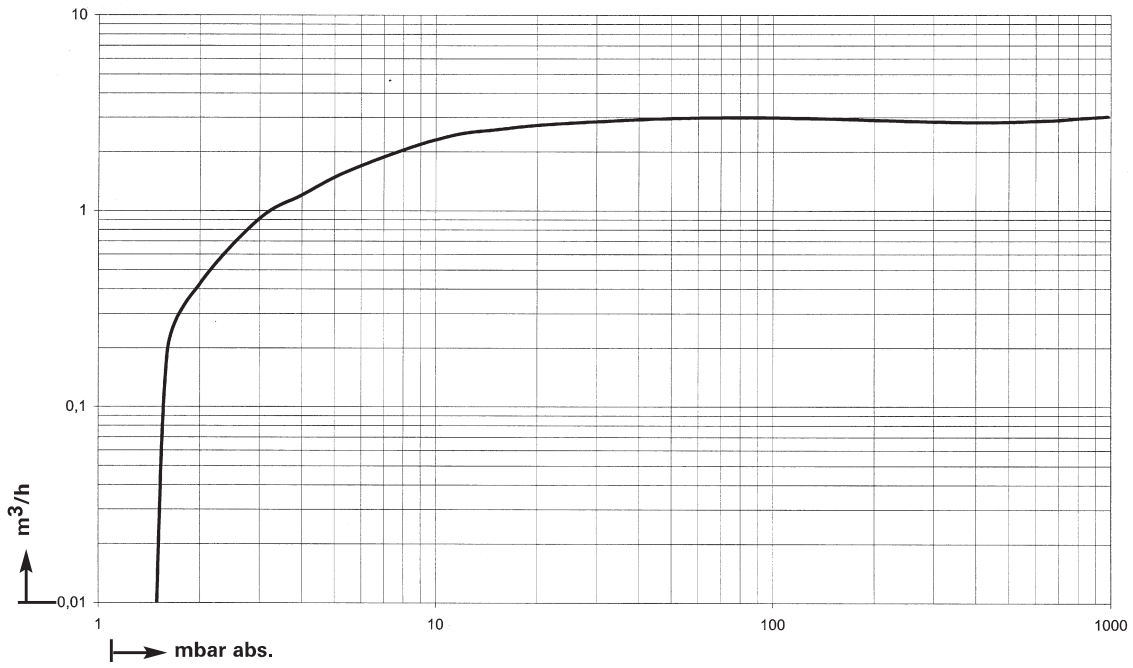
Dimensions mm (All dimensional tolerances conform to DIN ISO 2768-1, Tolerance Class V)



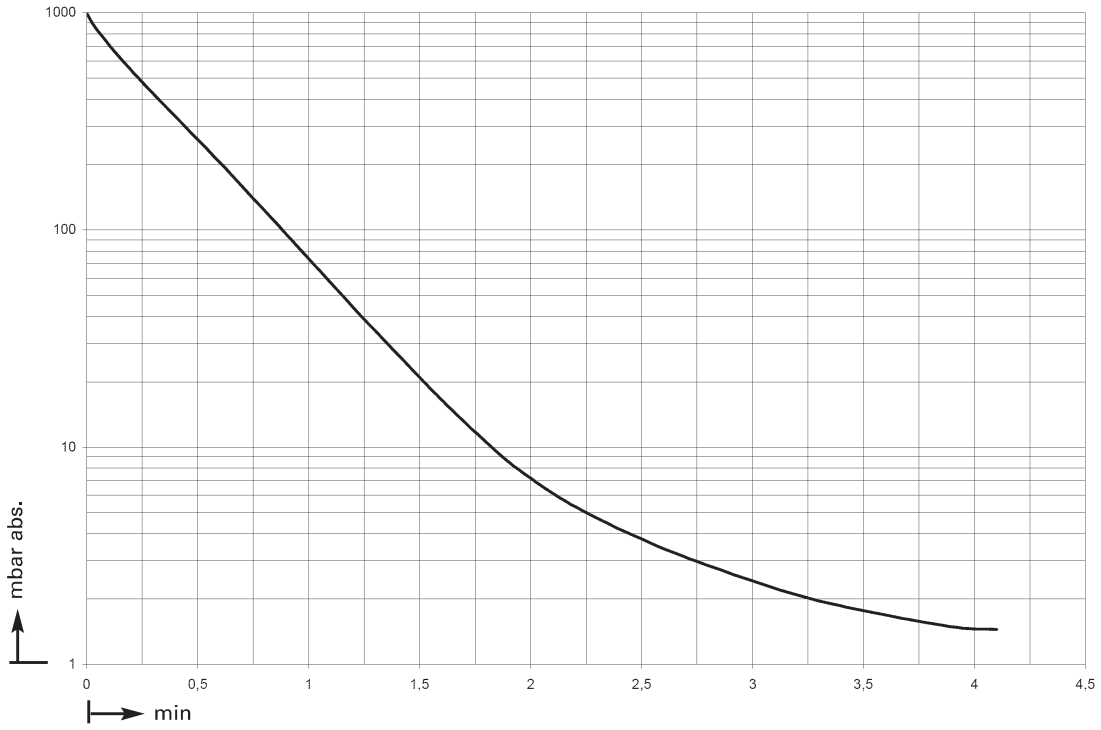


PERFORMANCE DATA

Suction pumping speed



Pump down time for 20 litre receiver



Accessories

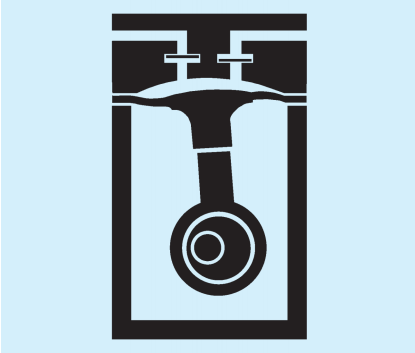
Description	Order No.	Details
Silencer	045993	G 3/8
Adapter for silencer	014757	G 3/8 to G 1/4
Small flange, stainless steel	048116	G 1/4, DN 16
Hose connector, Ms	049880	G 1/4, for tube ID 13
Hose connector, PP	0045293	G 1/4, for tube ID 10
Sealing for hose connector, Ms	029112	
Adjustable delivery through speed regulation for N 940.5 APE-W	on request	with potentiometer or analog signal input

HINTS ON FUNCTION, INSTALLATION AND SERVICE

THE BASIC FUNCTION OF KNF DIAPHRAGM VACUUM PUMPS AND COMPRESSORS

An elastic diaphragm is moved up and down by an eccentric (see illustration). On the down-stroke it draws the air or gas being handled through the inlet valve. On the up-stroke the diaphragm forces the medium through the exhaust valve and out of the head. The compression chamber is hermetically separated from the drive mechanism by the diaphragm. The pumps transfer, evacuate and compress completely oil-free.

Diaphragm pump



HINTS ON INSTALLATION AND OPERATION

- Range of use: Transferring air and gases at temperatures between + 5 °C and + 40 °C
- Permissible ambient temperature: between + 10 °C and + 40 °C
- Please check the compatibility of the materials of the pump head, diaphragm and valves with the medium.
- The KNF product line contains pumps suitable for pumping aggressive gases and vapors - please contact us.
- Standard pumps are not suitable for use in areas where there is a risk of explosion. In these cases there are other products in the KNF program - please ask us for details
- To prevent the maximum operating pressure being exceeded, restriction or regulation of the air flow should only be carried out in the suction line
- Components connected to the pump must be designed to withstand the pneumatic performance of the pump
- Install the pump so that the fan can draw in sufficient cooling air
- Fit the pump at the highest point in the system, so that condensate cannot collect in the head of the pump.

HINTS ON SERVICE

The diaphragm and valves are the only parts of the KNF diaphragm pumps subject to wear. They are easy to change, as no special tools are needed.

If you have any questions, please call our application engineers (see below for contact telephone number)

Diaphragm stabilization system

An additional diaphragm, the stabilization diaphragm, separates the underside of the working diaphragm from the "crank" space of the pump (see Fig. 2). The space between the two diaphragms (called a vacuum chamber) is connected with the suction side of the pump via an balancing connection. This way, the vacuum chamber has approximately the same pressure as the working space of the diaphragm pump. The pressure difference between the upper and underside of the diaphragm approaches zero. The working diaphragm remains stable, independent of the inlet pressure of the pump. This improves the suction speed of the pump significantly, over its entire working range.

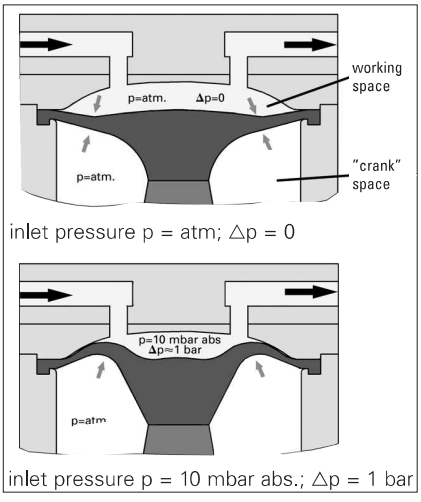


Fig. 1: Diaphragm behavior, due to the pressure difference between working space and "crank" space (normal diaphragm pump)

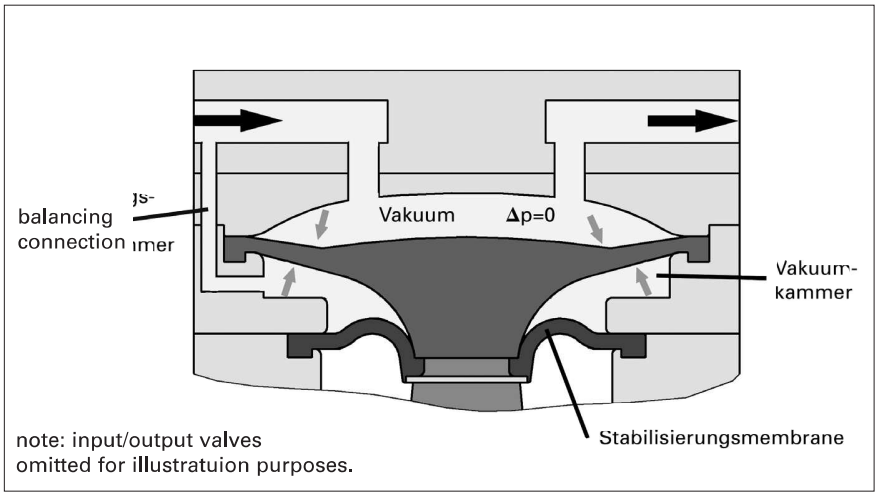


Fig. 2: Diaphragm stabilization system with additional diaphragm. This improves the suction speed of the pump significantly, over its entire working range.

KNF Neuberger GmbH
Diaphragm Pumps + Systems
Alter Weg 3
D-79112 Freiburg
Tel. ++49 (0)7664/5909-0
Fax ++49 (0)7664/5909-99
E-mail: info@knf.de
www.knf.de

Please visit our website at www.knf.com
for further information.

O 09/2012 Produced in Germany