

## DIAPHRAGM VACUUM PUMPS ROUGHING PUMPS

DATA SHEET E 039



**N 813.4 ANDC-B**



**N 880.3 AN.22E**  
(with dynamic mass balancing)

### Concept

The diaphragm vacuum pumps from KNF are based on a simple principal - an elastic diaphragm, fixed on its edge, moves up and down its central point by means of an eccentric. In this way the medium is transferred using automatic valves.

The pumps are equipped with the patented stress-optimized structured diaphragm, resulting in a high pneumatic performance, a durable product and compact size. Special valves ensure that the product can cope easily with vapor and condensation.

Several different drive motors are available.

ATEX versions available upon request.

### Features

#### Uncontaminated flow

No contamination of the media due to oil-free operation

#### Maintenance-free

**Compact size**  
due to structured diaphragm

**High performance**  
because of structured diaphragm

**High level of gas tightness**

**Long product life**  
thanks to structured diaphragm

**Very quiet and little vibration**

**Copes well with vapor and condensation**

**Starts against vacuum**

**May be used as roughing pumps for turbomolecular pumps**

**Can operate in any installed position**

### Areas of use

The diaphragm vacuum pumps offer a high level of performance despite their small size, as well as an excellent price performance ratio. They are required especially in the fields of analysis, medicine, production technology or be used as roughing pump for turbomolecular pumps.

The pumps are used for sucking gases, taking samples (even liquids in a vacuum) and evacuating vessels and systems.

### The dynamic mass balancing

For applications that demand especially smooth running throughout the whole working range of the pump, KNF has developed a dynamic mass balancing. It automatically damps out the out-of-balance resulting from gas forces.

### Performance data

Type	Delivery (l/min)	Vacuum (mbar absolute)	atm. Pressure	Pressure (bar g)	Weight (kg)
N 813.3 ANE/DC-B	13	3		1	5.9/2.34
N 813.3 AN.29DC-B	13	3		1	2.34
N 813.4 ANE/DC-B	13	0.5		1	7.5/3.83
N 813.4 AN.29DC-B	13	0.5		1	3.83
N 813.5 ANE	19	1		1	7.5
N 880.3 AN.22E	80	2		1	18.0

**N 813.4 ANE | ANDC-B | AN.29DC-B**

### Performance data

Type	Delivery at atm. pressure (l/min) <sup>1)</sup>	Max. operating pressure (bar g)	Ultimate vacuum (mbar abs.)
N 813.4 ANE ①	13	1	0.5
N 813.4 ANDC-B ②	13	1	0.5
N 813.4 AN.29DC-B ②	3.5-13	1	0.5

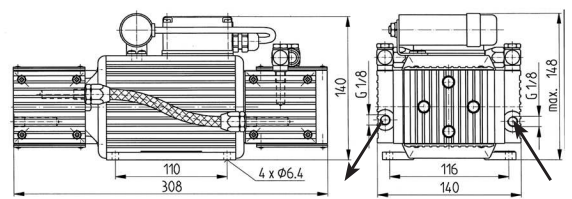
## Motor data

Protection class	① IP 44	② IP 20
Voltage (V)	230	24 V DC
Frequencies (Hz)	50	
Power P <sub>1</sub> (W)	80	65
I <sub>max</sub> (A)	0.5	2.7

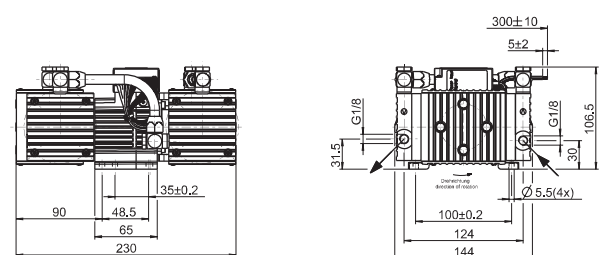
### Pump material

Type	Pump head	Diaphragm	Valves
N 813,4 AN . . .	Aluminum	EPDM	EPDM

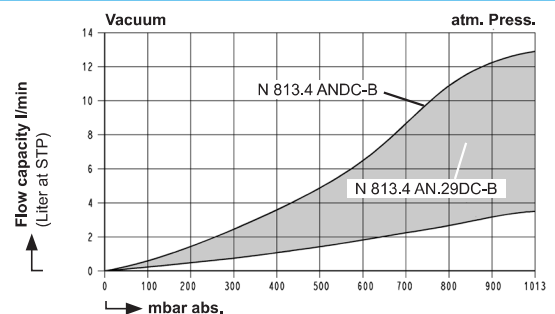
N 813.4 ANE



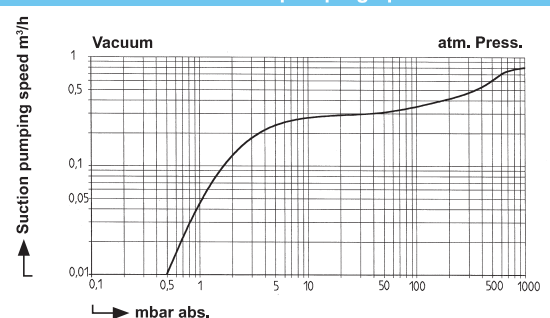
**N 813.4 ANDC-B | N 813.4 AN.29DC-B**



## Flow capacity



### Suction pumping speed



# N 813.5 ANE

## Performance data

Type	Delivery at atm. pressure (l/min) <sup>1)</sup>	Max. operating pressure (bar g)	Ultimate vacuum (mbar abs.)
N 813.5 ANE	19	1	1

<sup>1)</sup> Liter at STP

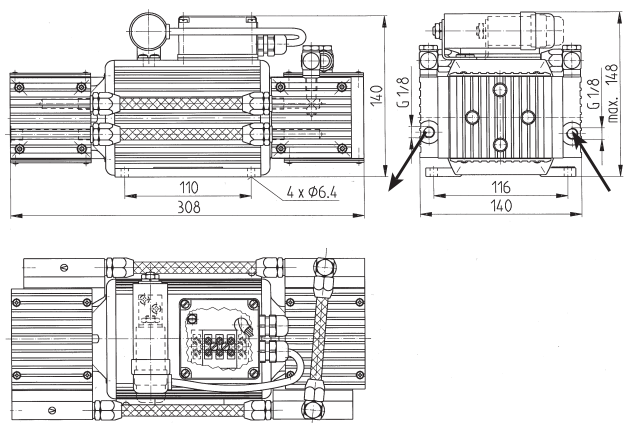
## Motor data

Protection class	IP 44
Voltage (V)	230
Frequencies (Hz)	50
Power P <sub>1</sub> (W)	80
I <sub>max</sub> (A)	0.5

## Pump material

Type	Pump head	Diaphragm	Valves
N 813.5 ANE	Aluminum	EPDM	EPDM

## N 813.5 ANE



# N 880.3 AN.22E

## Performance data

Type	Delivery at atm. pressure (l/min) <sup>1)</sup>	Max. operating pressure (bar g)	Ultimate vacuum (mbar abs.)
N 880.3 AN.22E	80	1	2

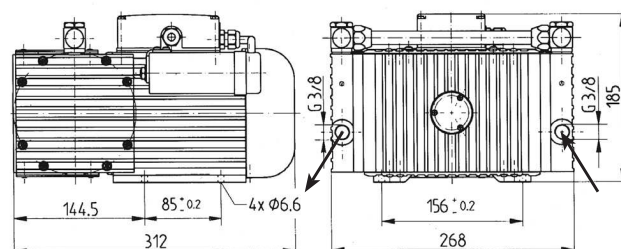
## Motor data

Protection class	IP 54
Voltage (V)	230
Frequencies (Hz)	50
Power P <sub>1</sub> (W)	310
I <sub>max</sub> (A)	1.6

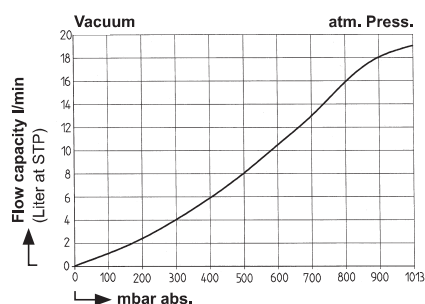
## Pump material

Type	Pump head	Diaphragm	Valves
N 880.3 AN.22E	Aluminum	EPDM	FPM

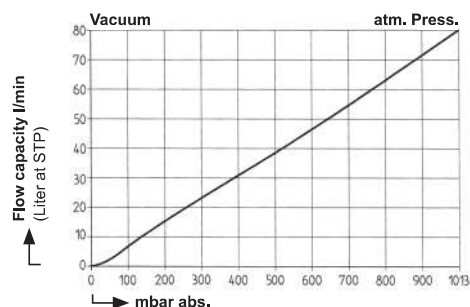
## N 880.3 AN.22E



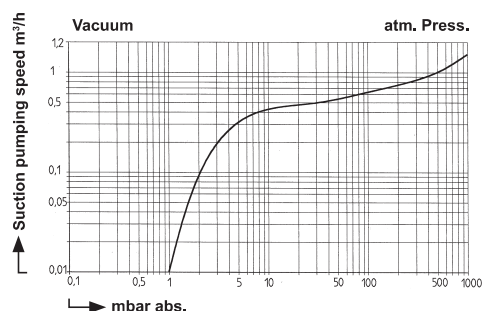
## Flow capacity



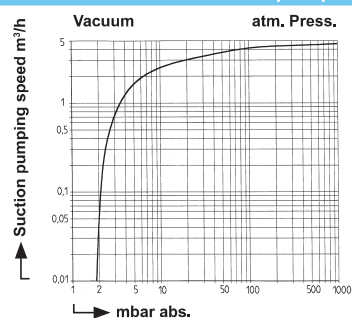
## Flow capacity



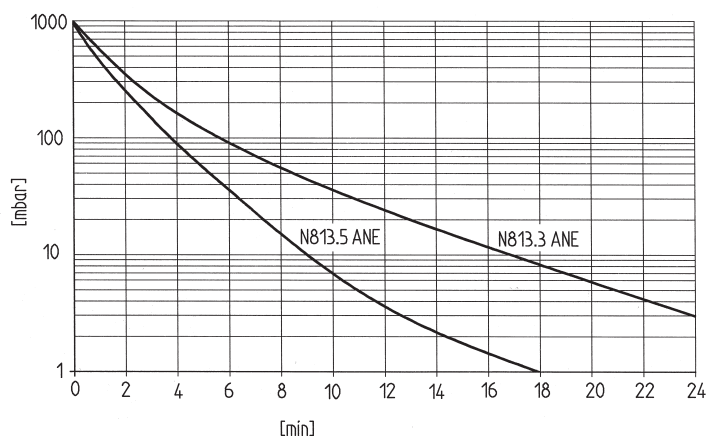
## Suction pumping speed



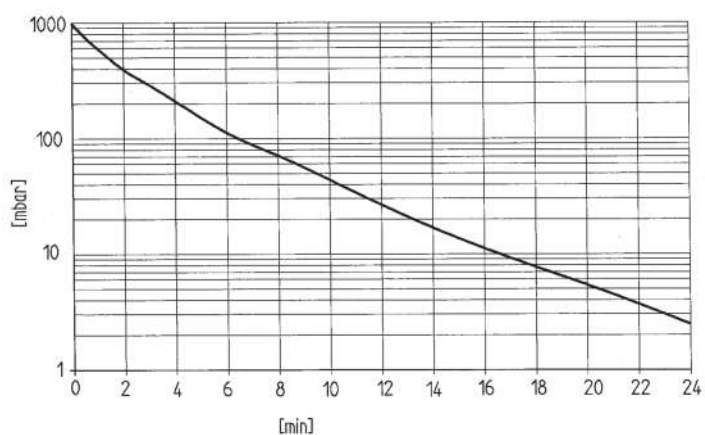
## Suction pumping speed



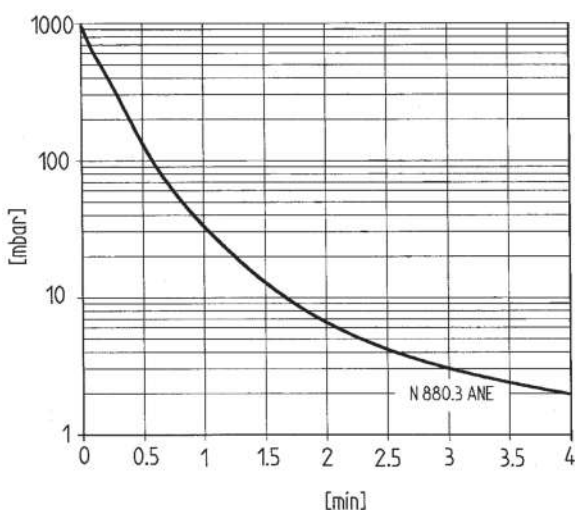
Pump down time 20 l receiver | N 813.5 ANE | N 813.3 ANE



Pump down time 20 l receiver | N 813.4 ANE



Pump down time 20 l receiver | N 880.3 AN.22E



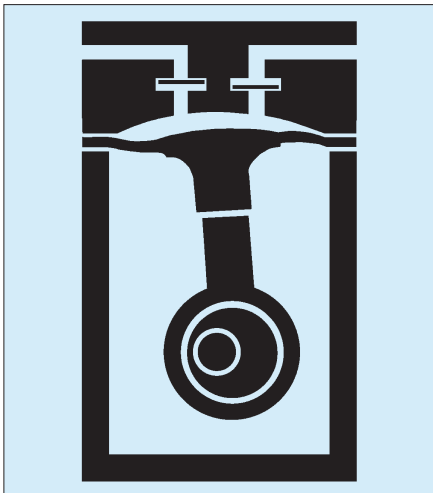
#### Accessories

Description	Order No.	Details
Silencer (for N 813...)	000346	G 1/8
Silencer (for N 880.3...)	045993	G 3/8
Hose connector (for N 813...)	005148	G 1/8
Hose connector (for N 880.3...)	045859	G 3/8
Small flange (for N 813...)	042191	G 1/8, DN 10
Small flange (for N 880.3...)	045857	G 3/8, DN 16
Gasket (for N 813...)	026906	for G 1/8
Gasket (for N 880.3...)	044982	for G 3/8

## HINTS ON FUNCTION, INSTALLATION AND TECHNIQUE

### Function of KNF diaphragm gas sampling pumps

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.



### Hints on installation and operation

- Range of use: Transferring air and gases at temperatures between +5 °C and +40 °C.
- Permissible ambient temperature: between +5 °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.
- The 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.
- The pumps are designed to start against vacuum. Pumps that start against pressure are available on request.
- 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 - that prolongs working-life.

### ■ For pumps with dynamic mass balancing:

The pump must be supported on rubber mounts or springs so that the natural frequency of the system is  $f_{ei} > 1.7$  Hz. For lower values of  $f_{ei}$  correct operation of the dynamic mass balancing cannot be guaranteed.

If the pump is mounted on a platform that is itself a vibrating system, or contains one, care must be taken to ensure that the two systems do not interfere with each other.

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