

## DIAPHRAGM VACUUM PUMPS AND COMPRESSORS TO ATEX

DATA SHEET E 174



Diaphragm pump N 143 ST.9E Ex - for use in potentially explosive atmospheres

### 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 KNF modular system permits selection of materials with various levels of gas resistance for parts in contact with gas; the pump drive is available in a variety of voltages and frequencies. Please contact us!

Pumps and pump drives in this product series are explosion proof according to 94/9/EC (ATEX).

### FEATURES

**Pure transfer, evacuation and compression of air, gases and vapours**

No contamination of the media due to oil-free operation

**Explosion protected to ATEX**

**Corrosion resistant models**

**High level of gas tightness:**  
approx.  $6 \times 10^{-3}$  mbar x l/s

**Long product life**

**Very quiet and little vibration**

**Cool running motor**  
even when in constant use

**Can operate in any installed position**

### AREAS OF USE

The Diaphragm Vacuum Pumps offer a high level of performance despite their compact size, as well as an excellent price performance ratio. They are required especially in the potentially explosive fields of chemical, analysis, energy and production technology.

The pumps are used for transferring, compressing and sucking air, gases and vapours, taking samples (even transferring liquids using a vacuum) and evacuating and compressing vessels etc.

## PERFORMANCE DATA

Type	Delivery (l/min) *	Vacuum (mbar absolute)	atm. Press.	Pressure (bar g)	Weight (kg) **
N 143 AT.9E Ex	27	100		4	15.7 / 24.5
N 143 ST.9E Ex	27	100		4	18.0 / 26.8
N 186.1.2 AT.9E Ex	48	100		4	17.8 / 26.6
N 186.1.2 ST.9E Ex	48	100		4	22.4 / 31.2

\*Delivery at atm. pressure

\*\* With motor: Ex II 2G Ex e IIC T3 Gb / Ex II 2G Ex de IIC T4, Ex II 2G Ex d IIC T4

# N 143 ... T.9E Ex

## PERFORMANCE DATA

Type and Order No. <sup>2)</sup>	Delivery at atm. pressure (l/min) <sup>1)</sup>	Max. operating pressure (bar g)	Ultimate vacuum (mbar abs.)
N 143 AT.9E	27	4	100
N 143 ST.9E	27	4	100

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

## MODEL CODES AND MATERIALS

Type and Order No. <sup>2)</sup>	Pump head	Diaphragm	Valves
N 143 AT.9E	Aluminium	PTFE-coated	Stainless steel
For aggressive and corrosive gases and vapours			
N 143 ST.9E	Stainless steel	PTFE-coated	Stainless steel

<sup>2)</sup> See also „MODEL CODES FOR EASY ORDERING“

## MOTOR DATA

Protection class	IP 55	IP 55	IP 55
	Ex II 2G Ex e IIC T3 Gb	Ex II 2G Ex de IIC T4	Ex II 2G Ex d IIC T4
Voltage/Frequencies (V/Hz)	3~230-400/50	3~230-400/50	3~230-400/50
Motor rating (W)	370	250	250
Rated motor current (A)	1.84/1.06	1.19/0.69	1.19/0.69

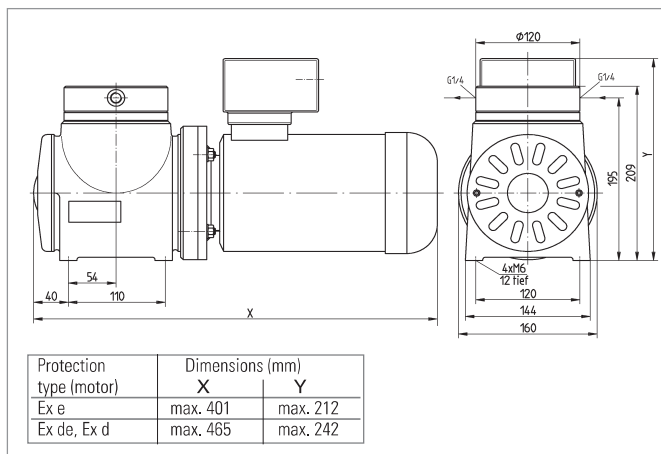
Motors with other voltages and frequencies on request.

## EXPLOSION PROTECTED

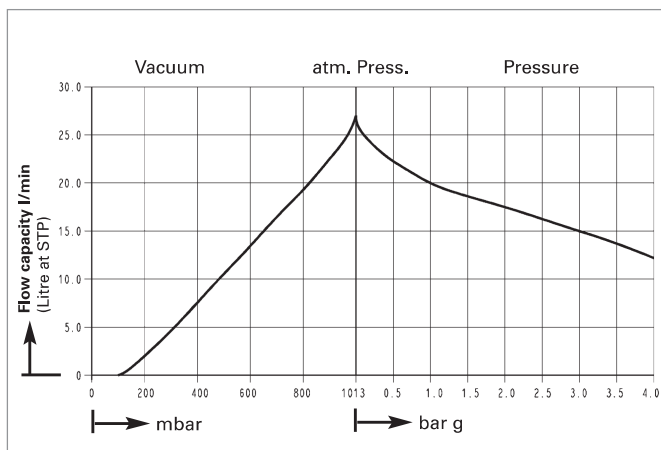
Type/Order No.	Pump parts	three-phase A.C. motor		
N 143 AT.9E	Ex II 2G IIB-T4 X	Ex II 2G Ex e IIC T3 Gb	Ex II 2G Ex de IIC T4	Ex II 2G Ex d IIC T4
N 143 ST.9E	Ex II 2G IIB-T4 X	Ex II 2G Ex e IIC T3 Gb	Ex II 2G Ex de IIC T4	Ex II 2G Ex d IIC T4

Pumps for gases the Group of IIC on request.

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



## Performance characteristics



# N 186.1.2 ... T.9E Ex

## PERFORMANCE DATA

Type and Order No. <sup>2)</sup>	Delivery at atm. pressure (l/min) <sup>1)</sup>	Max. operating pressure (bar g)	Ultimate vacuum (mbar abs.)
N 186.1.2 AT.9E	48	4	100
N 186.1.2 ST.9E	48	4	100

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

## MODEL CODES AND MATERIALS

Type and Order No. <sup>2)</sup>	Pump head	Diaphragm	Valves
N 186.1.2 AT.9E	Aluminium	PTFE-coated	Stainless steel
For aggressive and corrosive gases and vapours			
N 186.1.2 ST.9E	Stainless steel	PTFE-coated	Stainless steel

## MOTOR DATA

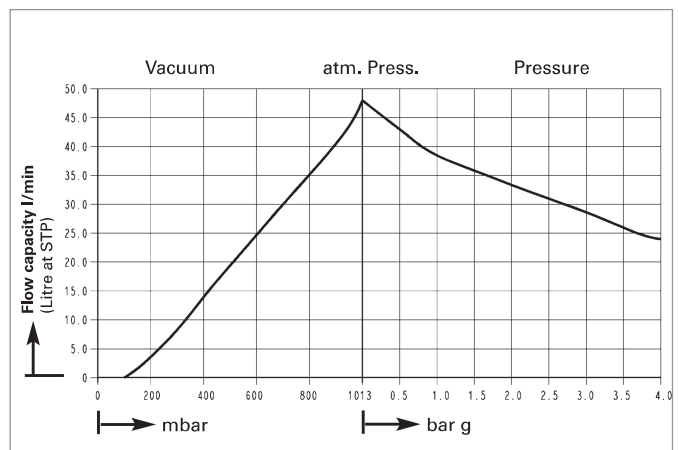
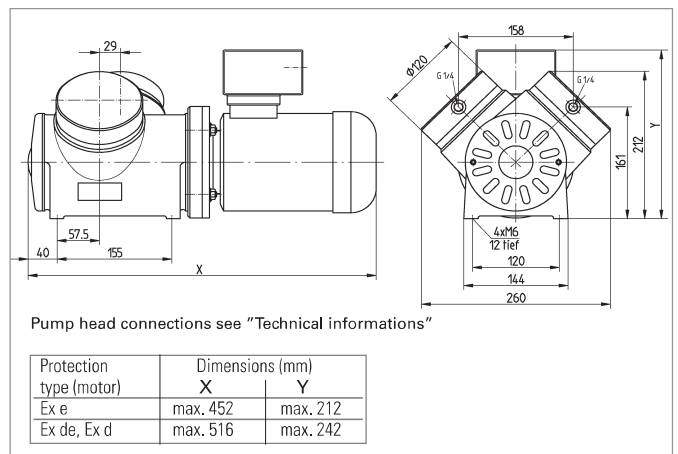
Protection class	IP 55	IP 55	IP 55
	Ex II 2G Ex e IIC T3 Gb	Ex II 2G Ex de IIC T4	Ex II 2G Ex d IIC T4
Voltage/Frequencies (V/Hz)	3~230-400/50	3~230-400/50	3~230-400/50
Motor rating (W)	370	250	250
Rated motor current (A)	1.84/1.06	1.19/0.69	1.19/0.69

Motors with other voltages and frequencies on request.

## EXPLOSION PROTECTED

Type/Order No.	Pump parts	three-phase A.C. motor		
N 186.1.2 AT.9E	Ex II 2G IIB-T4 X	Ex II 2G Ex e IIC T3 Gb	Ex II 2G Ex de IIC T4	Ex II 2G Ex d IIC T4
N 186.1.2 ST.9E	Ex II 2G IIB-T4 X	Ex II 2G Ex e IIC T3 Gb	Ex II 2G Ex de IIC T4	Ex II 2G Ex d IIC T4

Pumps for gases the Group of IIC on request.



# TECHNICAL INFORMATIONS

## DIAPHRAGM PUMPS CONFORMING TO 94/9/EC (ATEX): FOR USE IN POTENTIALLY EXPLOSIVE ATMOSPHERES.

ATEX - The new standard for explosion protection. As part of the new single market, the regulations on explosion prevention and protection have now been unified throughout Europe. The legal requirements are set out in the directive 94/9/EC (also known as ATEX). In Germany e.g., the directive was passed into national law on March 1st, 1996.

Compared to the previous legal requirement, the scope of the regulations have now been extended: whereas the old regulations were concerned with electrical equipment, mechanical equipment is now also included. For pumps, this means that besides the drive section (drive motor, an electrical device), the working section (pump part, a non-electrical device) now also falls within the regulations.

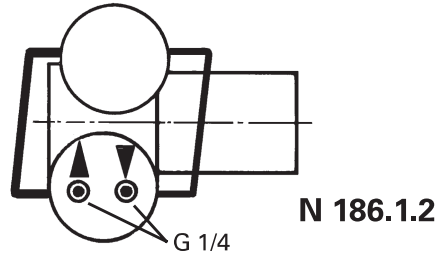
The explosion prevention and protection requirements depend on the specific equipment group and the relevant equipment category. Rather than concrete requirements, the directive formulates the assurance of protection levels, thus placing greater responsibility than before on the product manufacturer.

### WHAT KNF OFFERS

KNF Neuberger offers transfer pumps, vacuum pumps and compressors for

- Equipment Group II and
- Category 2 G (for gases, vapors and mists where explosive atmospheres are likely to occur) and 3 G (for gases, vapors and mists where explosive atmospheres are unlikely to occur or, if they do occur, are likely to do so only infrequently and for a short period only).
- approved gases the group of II B, temperature up to class T4

## Pump heads connection



Heads in parallel both side

Hints on function, installation and service:  
see back side

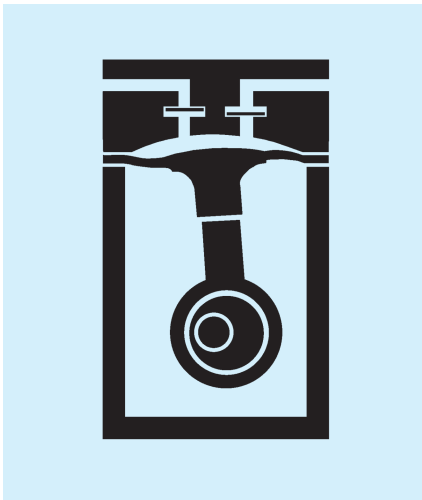
KNF - the competent partner for vacuum and compressor technology. Especially for unusual problems. Call us and talk to our application engineers.

## HINTS ON FUNCTION, INSTALLATION AND SERVICE

### 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.  
Use in potentially explosive atmospheres for equipment group II, categories 2 G and 3 G and for authorized gases of group II B (for gases of group IIC upon request) up to temperature class T4.
- Permissible ambient temperature: between +5°C and +40°C
- The pumps are not designed to start against pressure or vacuum; when a pump is switched on the pressure in the suction and pressure lines must be atmospheric. Pumps that start against pressure or vacuum 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.

### MODEL CODE FOR EASY ORDERING

The model code is identical to the order number. It is made up as follows e.g.:

<b>N 186</b>	<b>.1.2</b>	<b>AT</b>	<b>.9</b>	<b>E</b>	<b>3~230-400 V 50 Hz/IP 55, Ex II 2G Ex de IIC T4</b>
■ Base model	■ Head connections	■ Head materials	■ Gas-tightness, leakage rates <math><6 \times 10^{-3}</math> mbar/l/s	■ OEM version with 3 phase motor	■ Other motor data e.g.:

In addition the motor data must be given in the purchase order (voltage and frequency). In our extensive program you are sure to find the pump you need for your particular application.

### HINTS ON SERVICE

Please refer to the operating instructions as supplied with the pump.

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

### KNF Neuberger GmbH Diaphragm Pumps + Systems

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