

# NOVAPLEX

## Process Pumps



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## Flexible High Performance Diaphragm Pumps For High Flow Rates and Pressure

NOVAPLEX Pumps are powerful diaphragm process pumps for a variety of applications. They are best suited for critical high pressure installations, and they can be used when the capability of classical metering pumps is exceeded.

Use of Bran+Luebbe metering pump technology allows the process pumps to be used even as metering pumps for high flow rate and pressure.

### Diaphragm Pump Technology

NOVAPLEX pumps utilize hydraulically actuated diaphragm pumpheads. The plunger movement induced by the crank gear acts on hydraulic fluid rather than the process fluid directly. The hydraulic fluid in turn displaces a freely moving diaphragm. This diaphragm acts as a hermetic seal that separates the hydraulic fluid from the pumped liquid. There are no dynamic seals between liquid and environment, resulting in zero leakage operation.

### Applications

NOVAPLEX Pumps are ideal for toxic or chemically aggressive liquids, and for slurries/suspensions with particle sizes up to 100  $\mu\text{m}$ .

Typical applications include chemical and petrochemical production, oil & gas exploration, pharmaceutical and food processing.

### Examples of Liquids (several hundred successfully pumped)

- Ammonia
- Hydrocarbon Condensate
- Liquid CO<sub>2</sub>
- Naphtha Suspension
- Raney Nickel
- Butane
- Latex Emulsion
- LPG
- Methanol
- Sulphuric Acid
- Toluene
- Water

### Examples of Pump Duties

- Reactor Feed Pump
- High Pressure Injection Pump
- Transfer Pump
- Recirculation Pump



Type:

N-160-4D-25

Flow Rate/Pressure:

6,600 GPH, 3,200 PSIG

Duty:

Reactor Feed Pump

Packaging - Processing

**Bid on Equipment**

1-847-683-7720

[www.bid-on-equipment.com](http://www.bid-on-equipment.com)

## Advantages

### Excellent Emission Control

- Double diaphragm design offers double containment against product leakage.
- Anti-friction bearings result in minimized energy consumption.

## High Reliability

- Bran+Luebbe diaphragm pumphead design has proven its suitability for severe industrial applications several thousand times. Diaphragm service life can exceed 20,000 operating hours.
- Bran+Luebbe diaphragm pumpheads are protected against damage from excessive pressure by a built-in pressure relief valve.
- Gears use a simple, reliable and well-proven immersion lubrication principle.

## Simplified Maintenance

- All pumpheads are equipped with an interface for off-line monitoring capabilities.
- Modular concept allows easy access to any part of the pump.

## Minimized Life Cycle Cost

- The exclusive use of anti-friction bearings reduce energy consumption to almost theoretical minimum.
- No measures needed to control emission of pumped liquid due to diaphragm concept. Zero leakage is an inherent property of this pump.

## Features Of The Pump

- Double diaphragm pumpheads with positive diaphragm position control.
- Double diaphragm pumpheads with built-in pressure relief valve.
- Crank gears with integrated lubrication system.
- Crank gear bearings executed as anti-friction bearings.
- Modular concept.



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## Function Diaphragm Pumpheads, Gears

### Function of a diaphragm pumphead with positive diaphragm position control.

The patented Positive Diaphragm Position Control (PDPC) system ensures that the diaphragm cannot be damaged even under critical conditions such as a blocked pipe or closed valves on both suction or discharge side.

The replenishing valve is activated only when the diaphragm is fully retracted at the end of the suction stroke; the diaphragm itself releases the replenishing valve interlock mechanism by pushing a control pin. This interlock mechanism prevents overfilling of the hydraulic system.

A pressure relief valve within the hydraulic system of the pumphead protects not only the pumphead but also the pump gear from overload due to excessive pressure. This protection system allows clean liquids of low up to high viscosity as well as dirty fluids and all types of suspensions to be pumped safely.

The integrated air bleed valve “bleeds” out a small amount of hydraulic fluid and entrapped air with each pumping stroke from the hydraulic chamber, thus ensuring high metering accuracy and repeatability.

### Advantages of Positive Diaphragm Position Control (PDPC)

- Increased diaphragm life compared to non-positive control systems.
- Diaphragm protection even under critical operating conditions.
- High metering accuracy due to constant hydraulic volume and permanent de-aeration of the hydraulic fluid.
- Vacuum operation possible.
- Dry running capabilities.

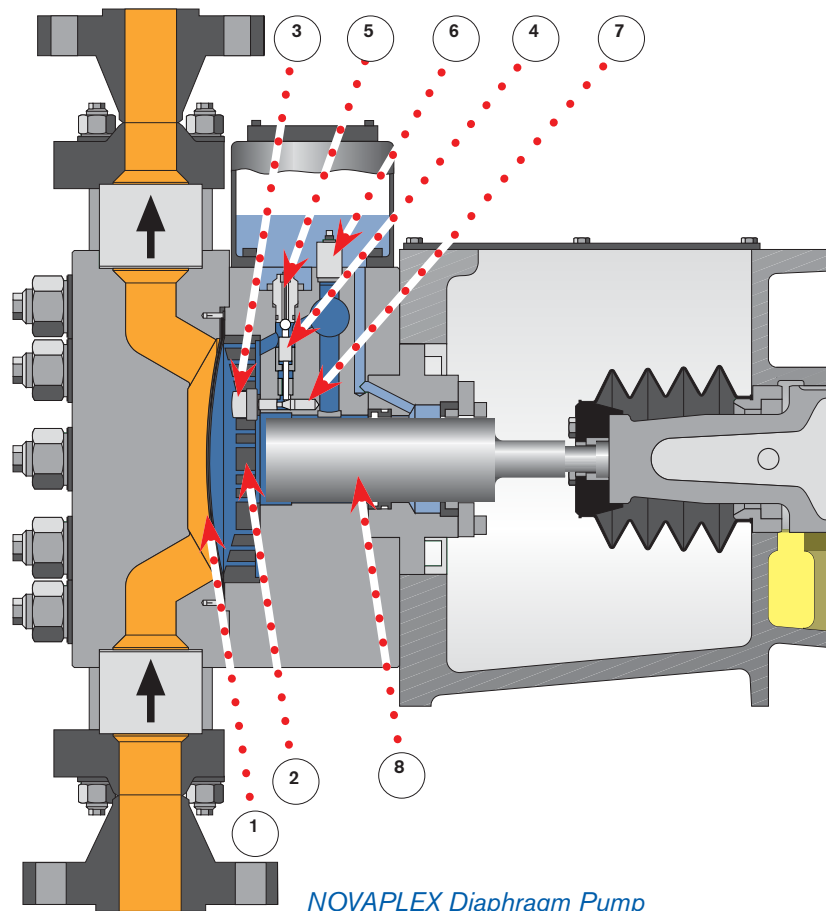
### Additional Features of Double-Diaphragm Pumpheads

Due to their design - featuring a diaphragm condition monitoring system in conjunction with two adjacent diaphragms

- double-diaphragm pumpheads are safer and more reliable than single diaphragm pumpheads.

If one diaphragm ruptures the pumped liquid is protected from contamination by hydraulic fluid and, vice versa. Containment of the pumped liquid is assured, avoiding the immediate need for shutting the pump down.

The diaphragm condition monitoring system is based on pressure measurement. A thin circular disc with a capillary system is positioned between the two diaphragms and connects the evacuated interstitial space with the monitoring system. Should either one of the diaphragms be ruptured, the pressure in the interstitial space and the capillary rises. It can be signaled externally by a variety of optional indicating devices such as pressure gauges, pressure switches or pressure sensors.



NOVAPLEX Diaphragm Pump

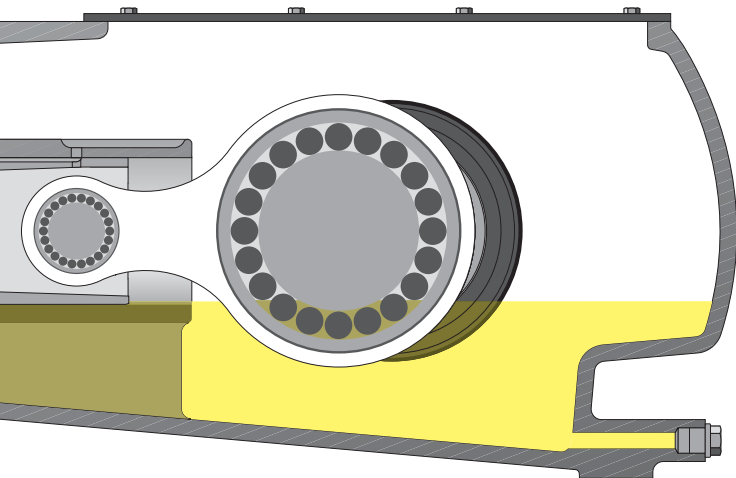
## Equipped To Your Requirements

### Pumphead Technology

- Hydraulically actuated PTFE double-diaphragm (up to 5,800 psi).
- Hydraulically actuated stainless steel double-diaphragm (up to 14,500 psi).
- Pumphead and valve housing in stainless steel. Special materials available for individual applications.

### Multi-head Pumps

- Depending on the required flow rate and delivery characteristics, multi-head pumps can be supplied with 2, 3, 4, 5, 6 or 7 pumping elements. The optimum number depends on the physical characteristics of the pumped liquid.



- |                    |                      |
|--------------------|----------------------|
| 1 Double-Diaphragm | 5 Replenishing Valve |
| 2 Support Plate    | 6 Air Bleed Valve    |
| 3 Control Pin      | 7 Spring             |
| 4 Tappet           | 8 Plunger            |

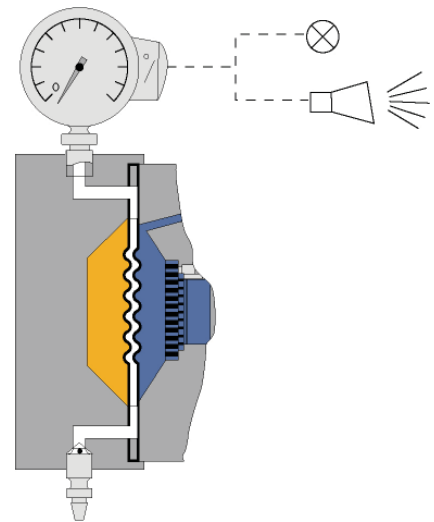
## Flow Rate Adjustment

Infinitely variable flow rate adjustment is achieved by varying the pump stroking speed.

- AC motor with frequency converter (preferred).
- All other types of variable-speed drives.

## NOVAPLEX Crank Gear Technology

- The modular concept of NOVAPLEX pumps allows multiplex pumps with up to 7 pumping elements.
- The exclusive use of anti-friction bearings allows the pump to run continuously at rotational speed from almost zero up to maximum, even at extremely elevated suction pressures.



*Air bleed screw with hose fitting*

# Free Choices of Drives

Another advantage of the modular concept is that all types of drives, including electric motors, combustion engines and hydraulic drives can be utilized.

The positioning of the drive depends on individual installation requirements and is to customer specification. Different gears are available, including bevel types.

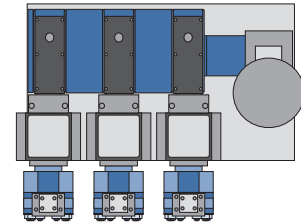
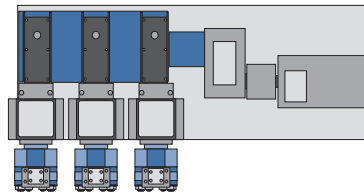
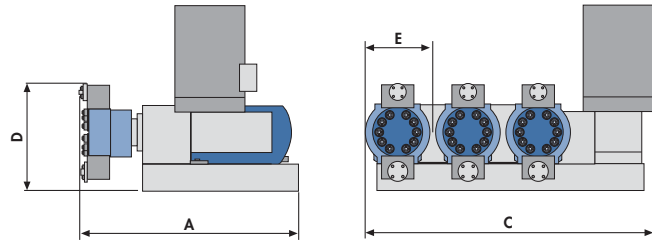
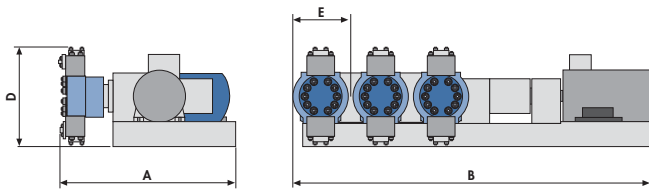
The flow rate is adjustable via the rotational speed of the drive. Asynchronous AC motors with frequency converters are particularly economical, but other types of speed control may also be used.



*Example of Control Cabinet*

## Layout and Dimensions

Example: Triplex version



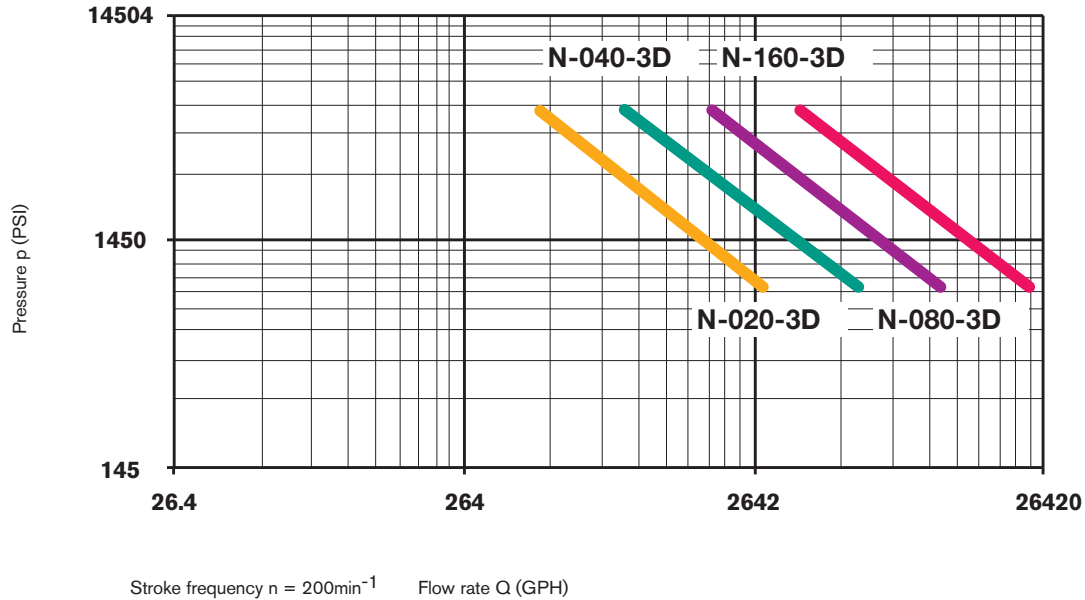
**Horizontal motor position with helical gear**

**Vertical motor position with bevel gear**

## Main Dimensions in inches\*

NOVAPLEX	A	B	C	D	E
N-020-3D	47.3	98.5	70.9	31.5	16.2
N-040-3D	63.1	118	82.7	39.4	20.5
N-080-3D	78.8	146	106	47.3	26.0
N-160-3D	86.7	173	130	51.2	32.3

# Performance Graph of NOVAPLEX Triplex Pumps with PTFE-diaphragm



## Selection of NOVAPLEX Pump Combinations

Three to seven pump units may be combined.

TYPE	NOMINAL PRESSURE PSI	PLUNGER Ø	TRIPLEX GPH	FLOW RATE Q* QUADRUPLEX GPH	SEPTUPLEX GPH
020	5076	32	459	765	1071
	3626	40	717	1195	1673
	2320	50	1120	1867	2615
	1450	63	1779	2965	4151
	914	80	2868	4781	6693
040	5076	36	968	1613	2259
	3626	45	1513	2521	3530
	2320	56	2343	3904	5466
	1450	70	3660	6101	8541
	914	90	6051	10085	14119
080	5076	50	1867	3113	4357
	3626	63	2965	4942	6918
	2320	80	4781	7968	11156
	1450	100	7470	12450	17431
	914	125	11672	19454	27235
160	5076	63	3706	6177	
	3626	80	5976	9960	
	2320	100	9338	15563	
	1450	125	14590	24317	
	914	160	23905	39842	

\* Volumetric efficiency  $\eta = 100\%$ , stroke frequency  $n = 200 \text{ min}^{-1}$   
 Note: Allow for liquid transmission losses.