

# NOVAPLEX *Integral* Process Diaphragm Pumps



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**SPX**<sup>®</sup>

# Flexible high performance process diaphragm pumps for high flow rates and pressure

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

## Applications

NOVAPLEX *Integral* Pumps are ideal for toxic or chemically aggressive liquids, and for slurries/suspensions with particle sizes up to 100 µm.

Typical industrial fields are the chemical and petrochemical industry, the Oil & Gas industry, the pharmaceutical industry and also the food industry.

Examples of liquids  
(excerpt of several hundred successfully pumped)

- Ammonia
- Butane
- Hydrocarbon condensate
- Latex emulsion
- Liquid CO<sub>2</sub>
- LPG
- Methanol
- Naphtha
- Raney Nickel Suspension
- Sulphuric acid
- Toluene
- Water

Examples of pump duties

- Reactor feed pump
- High pressure injection pump
- Transfer pump
- Re-circulation pump

## Features of the NOVAPLEX *Integral* - Process 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
- Integrated gear reducer
- Minimized footprint
- Compact design

## Advantages

### Excellent Emission Control

- Double diaphragm design offers double containment against product leakage
- Anti friction bearings result in minimized energy consumption
- Integrated worm gear reducer for minimized noise emissions

### Simplified Maintenance

- All pumpheads are equipped with interface for the NOVALINK-CSM diagnosis system
- Modular concept allows easy access to any part of the pump

### High Reliability

- Bran+Luebbe diaphragm pumphead design has proven its suitability for severe industrial applications several thousand times. A diaphragm service life time of 20.000 operating hours is no exception
- Bran+Luebbe diaphragm pumpheads are save against damage by overload due to built-in pressure relief valve
- The simple and well-proven immersion lubrication is a system without any wear parts

### Minimized Life Cycle Cost

- The use of anti-friction bearings reduces 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

## Diaphragm pump technology

Diaphragm pumpheads of NOVAPLEX *Integral* pumps are utilizing the principle of hydraulic actuation of diaphragms. 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, consequently securing zero leakage much easier.

NOVAPLEX *Integral* Process Pump  
Type N-080I-3D



# Function of diaphragm pumpheads & gears

The Bran+Luebbe Positive Diaphragm Position Control (PDPC) system ensures that the diaphragm cannot be damaged even under critical conditions such as a blocked pipes 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 pump head protects not only the pump head 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.

Furthermore, 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 reproducibility.

## 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 reproducibility due to constant hydraulic volume and permanent de-aeration of the hydraulic fluid
- Vacuum operation possible
- Dry running capabilities

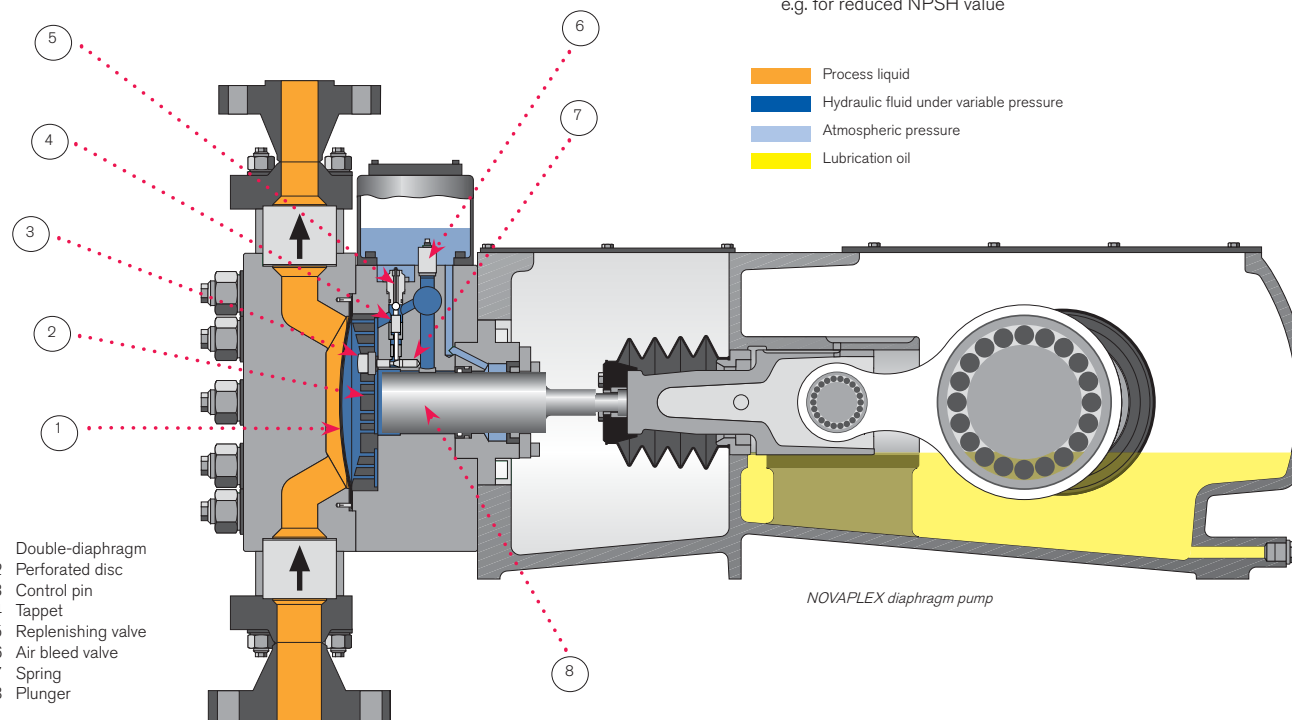
## Additional features of double-diaphragm pumpheads

Due to their design - featuring a diaphragm condition monitoring system in conjunction with two adjacent diaphragms - double-diaphragm pumpheads offer higher operation security than single diaphragm pumpheads.

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

risks. It can be signalled externally by a variety of optional indicating devices such as pressure gauges, pressure switches or pressure sensors.

In case of one ruptured diaphragm the pumped liquid is prevented from contamination with hydraulic fluid and, vice versa, the hydraulic fluid from contamination with pumping fluid. Also, containment of the pumped liquid is still assured therefore avoiding the immediate need for shutting the pump down.



## Equipped to your requirements

### Pump head technology

- Hydraulically actuated PTFE double-diaphragm (up to 400 bar)
- Hydraulically actuated stainless steel double-diaphragm (up to 1000 bar)
- Pump head and valve housing in stainless steel. Special materials available for individual applications
- All pumpheads are equipped with interface for the NOVALINK-CSM diagnosis system
- Suction and discharge valves with various geometries with or without springs. Special designs and materials for valve bodies, e.g. for reduced NPSH value

### Multi-head pumps

- NOVAPLEX *Integral* process pumps are designed as Triplex pumps
- The integrated gear reducer is based on the proven worm gear technology

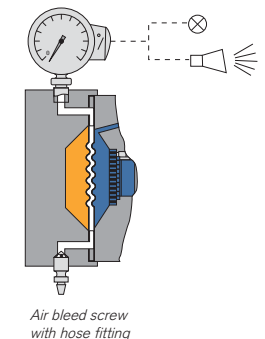
### Flow rate adjustment

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

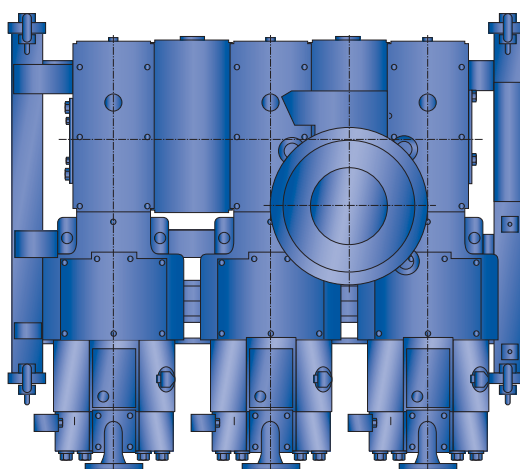
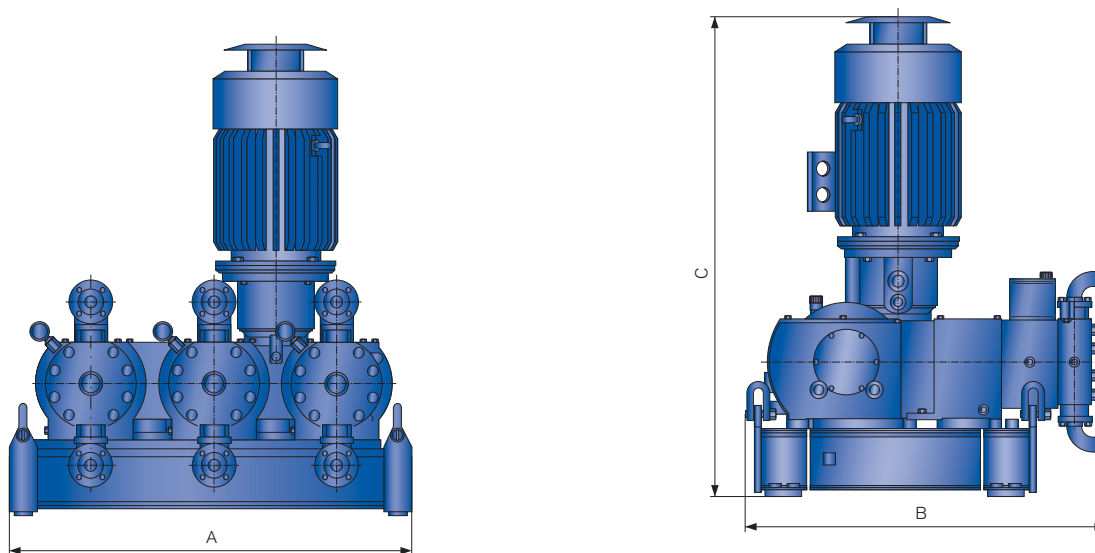
- AC motor with frequency converter (preferred)
- All other types of variable-speed drive

## NOVAPLEX *Integral* crank gear technology

- The use of anti-friction bearings allows to run the pump continuously at rotational speed from low to maximum, even at extremely elevated suction pressures.
- The modular concept allows simplified handling of components in case of service



# Layout and dimensions

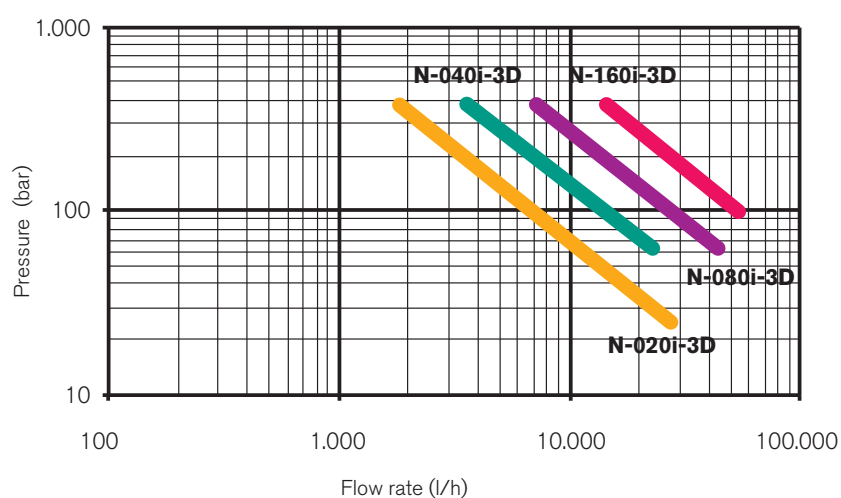


|          | Length (A) | Width (B) | Height (C) | approx. Weight | Oil capacity | Max. electr. power |
|----------|------------|-----------|------------|----------------|--------------|--------------------|
|          | mm         | mm        | mm         | kg             | l            | kW                 |
| N-020-3D | 1.345      | 1.170     | 1.580      | 1.800          | 45           | 22-37              |
| N-040-3D | 1.680      | 1.550     | 2.250      | 5.000          | 85           | 45-90              |
| N-080-3D | 2.300      | 1.920     | 2.500      | 10.000         | 150          | 75-160             |
| N-160-3D | 2.650      | 2.140     | 2.950      | 11.800         | 230          | 110-250            |

## ➤ Flow rate for NOVAPLEX *Integral* with PTFE diaphragm\*

| Type  | Pressure (bar) | max. flow rate (l/h)* |
|-------|----------------|-----------------------|
| N-020 | 25 - 400       | 1.730 - 26.500        |
| N-040 | 63 - 400       | 3.360 - 22.900        |
| N-080 | 63 - 400       | 7.070 - 44.200        |
| N-160 | 80 - 400       | 14.000 - 62.300       |

\*Theoretical values at 100% volum. efficiency and stroke frequency 200 1/min, 50Hz



## ➤ NOVAPLEX *Classic* Process Diaphragm pumps

Alternatively to the NOVAPLEX *Integral* pumps with integrated gear reducer the NOVAPLEX *Classic* is still available.



Process pump NOVAPLEX Classic N-160-4D





# > The product range

> More examples of Bran+Luebbe products with high quality standard, innovation and know-how.

## Metering pumps

for universal application  
in the low to medium  
requirement range

*ProCam*

*ProCam Smart*

*ProCam Sainitary & Hygienic*



## Process systems

as a complete  
solution for increased  
productivity and  
quality

*AutoBlend*

*Metering and mixing systems*



## Metering pumps

for all process areas  
where liquids are  
metered and mixed.

*NOVADOS*



## Oil & Gas systems

to aid oil & gas recovery  
onshore and offshore

*Solar Panel Packages*

*Chemical Injection Systems*

*Flow Control Device Panels*



## Dynamic in-line mixer

for gentle but intensive mixing

*PENTAX*

*PENTAX Hygienic*



## On-line analyzers

for use in water and  
effluent treatment

*PowerMon*

*PowerMon S*



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