GRUNDFOS
NB/NK

Grundfos offers a virtually limitless range of close-coupled (NB) and long-coupled (NK) end-suction pumps, whose sturdiness and reliability make them ideal for use in demanding environments. The pumps feature the world-renowned EFF1 motor as a standard, and integrated frequency converters ensure maximum efficiency at all times.

Grundfos application areas:
- Water supply
- Industrial pressure boosting
- Industrial liquid transfer
- Irrigation
- Heating/district heating
- Air-conditioning
- District cooling

GRUNDFOS **NB/NK** END-SUCTION RANGE

PERFECTION UNDER HIGH DEMANDS

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GRUNDFOS

BE › THINK › INNOVATE ›

GRUNDFOS

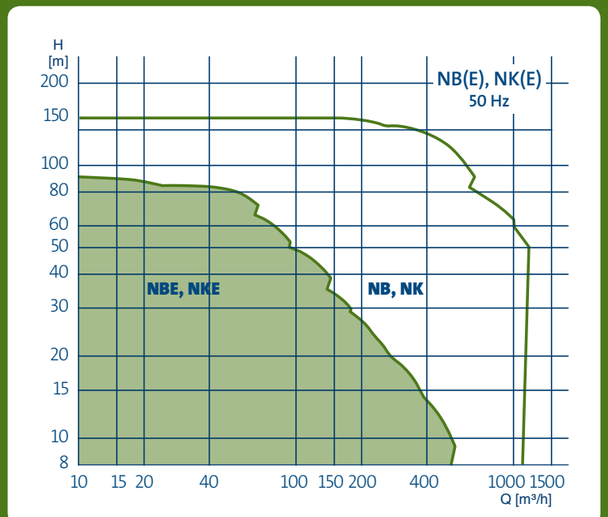
NB/NK
INTRODUCTION

GRUNDFOS OFFERS AN ALMOST LIMITLESS RANGE OF CLOSE-COUPLED (NB) AND LONG-COUPLED (NK) END-SUCTION PUMPS, WHOSE STURDINESS AND RELIABILITY MAKE THEM IDEAL FOR USE IN DEMANDING ENVIRONMENTS

Comprehensive range:

- More than 1 million variants of the same pump
- From 0.25 kW to 355 kW
- Capacities of up to 1200 m^3/h
- Head up to 150 m
- Temperature range: up to + 140° C
- Operating pressure PN10 and PN16
- Close-coupled and long-coupled versions
- Range according to EN733 and ISO2858
- Compatible with all application areas:
  - water supply
  - industrial pressure boosting
  - industrial liquid transfer
  - irrigation
  - heating/district heating
  - air-conditioning
  - district cooling

Performance area for NB/NK



The curve shows the performance area of Grundfos end-suction pumps. The shaded area shows the performance area of pumps with integrated frequency converters (NBE/NKE pumps).

STANDARD PUMPS THAT DELIVER ANYTHING BUT STANDARD PERFORMANCE

The Grundfos end-suction range offers you energy-efficient and reliable high-quality pumps that fully comply with the EN733 and ISO2858 standards. The modular design lets you configure the pump to fit your exact needs and avoid the efficiency drop that comes with an over-dimensioned pump.

Optimised flow geometry

With our unique, high precision machinery, we have minimised the tolerances used in the manufacture of the impeller and the pump casing and optimised the flow geometries of these two crucial components. The result: minimal backflow and increased energy efficiency.

Surface details

Sometimes, looking at the surface is a good thing. Grundfos NB/NK pumps are given cataphoresis surface treatments, consisting of Powercron® cathodic electrocoating and zinc phosphate coating. Cataphoresis on the inside of the pump means a longer lasting inside surface that keeps efficiency high.

Close-coupled In close-coupled pumps, motor and pump are mounted directly together to make one compact and space-saving unit. Close-coupled pumps are easy to install, require no alignment during installation, and are less susceptible to wear because of its compact design.

Long-coupled In long-coupled pumps, motor and pump are mounted on a common base frame and coupled by a coupling and bearing bracket system. The pump can be serviced without moving the motor, making this design ideal for applications where large motors are employed.

SPOTLESS PERFORMANCE IN STAINLESS STEEL

Grundfos offers a complete range of stainless steel pumps in grade 1.4408 (AISI 304) for water with chemicals and high-grade 1.4517 (AISI 316) for seawater and higher concentrations of chemicals. The stainless steel pump range is available up to 340 m^3/h. The stainless steel models comply with the EN733 and ISO2858 standards, and are available as both close-coupled and long-coupled pumps. The same applies for cast-iron pumps fitted with stainless steel impellers.

NB/NK – the motor makes the difference

The standard motor in Grundfos NB/NK pumps is nothing but standard. First of all, the EFF1 is the most efficient motor available according to the European CEMEP agreement. Second, Grundfos leads the way by featuring EFF1 motors in our pumps. The EFF1 is designed for maximum efficiency at both full-load and part-load operation. Thus, it has an extremely high level of efficiency over a broad operations band and is the ideal motor for a variety of application areas.
Furthermore EFF1 motors offers extremely low noise levels and can operate up to +60° C ambient temperatures.

Only motors with the official EFF1 logo are certified maximum efficiency motors.

NBE/NKE - PUMPS FOR LIFE

If you are looking for the ultimate end-suction pump on the market, look no further than Grundfos NBE/NKE. These highly adaptable, intelligent pumps feature integrated frequency converters that ensure maximum efficiency at all times. All NBE/NKE components are tailor-made and mutually optimised, resulting in energy savings of up to 50% compared to conventional pumps.

The NBE/NKE is the standard configuration of E-pumps, suitable for applications where a sensor in the system controls the pressure, temperature or flow rate.

SAVE MONEY WHILE SAVING THE PLANET

Energy costs account for up to 90% of the overall cost of a pump during its lifetime. In other words, thinking about energy efficiency is not only beneficial to the environment – it could also save you a lot of money.

Life Cycle Cost (LCC) analysis is an objective standard that allows you to benchmark different pump solutions and suppliers based on initial investment and the costs of installation, maintenance and energy.

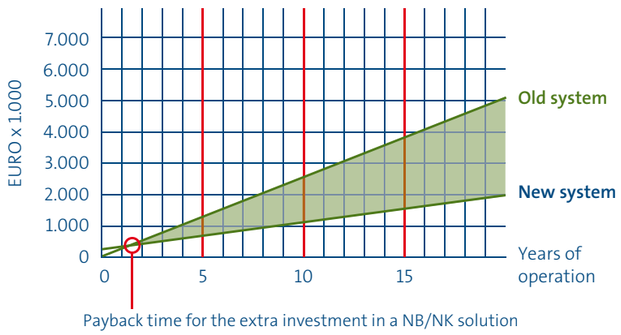
How to calculate Life Cycle Cost (LCC)

$LCC = C_{ic} + C_{in} + C_e + C_o + C_m + C_s + C_{env} + C_d$

C_{ic} = initial costs, purchase price
C_{in} = installation and commissioning
C_e = energy costs
C_o = operation cost (labour cost)
C_m = maintenance and repair costs
C_s = down time costs (loss of production)
C_{env} = environmental costs
C_d = decommissioning /disposal costs

LCC process will show the most cost effective solution within the limits of available data.

District Heating system. Maximum capacity 2500 m³/h and 60 m.



8 months of operation pr. year. Energy price set to 0.1 Euro/kWh.
New system - 3 units of NK pumps, 315 kW. 2 pumps in operation and 1 in standby.
2 x 315 kW frequency converters. Old system consists of 20 year old uncontrolled pumps.

E MEANS GREEN FOR FUTURE GENERATIONS

By considering life cycle cost when you choose your pumps, you can help reduce CO^2 dramatically and thereby make an important contribution to the well-being of our planet. All Grundfos NBE/NKE pumps come with integrated frequency converters that reduce energy consumption and ensure the lowest possible life cycle cost and the best conditions for our environment.

Facts about NB/NK solutions

E-solution versus fixed-speed solution in a typical pump application with variable pumping demand *

Annual energy savings	Up to 50% (typically 25-35%)
Annual reduction in CO_2 emissions	Typically 1 ton CO2 per 3 kW
Reduction in life cycle costs	Typically 25%
Payback time for the extra investment in a NBE/NKE-solution	2-3 years

* Figures are based on a pump with a 3 kW motor in an application running 12 hours per day, 220 days per year. Average CO_2 per kWh is set to 0.37 kg. Life cycle cost calculation is based on a 10-year period.

NB/NK
THE DETAILS

Advanced fan design
Advanced axial fan design means dramatically reduced noise levels

Integrated frequency converter in NBE/NKE
- Easy commissioning
- Easy installation – no need for cabling
- Preset solution for quick and safe installation
- Space saving
- Motor, frequency converter and motor protection in one
- Software optimised for pump operation – low operation costs.

EFF1
EFF1 motor as standard in both NB/NK and NBE/NKE pumps. Only motors with the official EFF1 logo are certified maximum efficiency motors.

Compact perfection
The proportion between the length and width of the shaft in the pump is extremely important. Large shaft diameters (D) and a short distance from impeller to motor (L) maximizes stability and ensures lower maintenance costs. Grundfos pumps always strive for the most optimal proportion between the length and width of the shaft (L3/D4).
- Maximal shaft seal lifetime
- Especially well suited for frequency converter operation

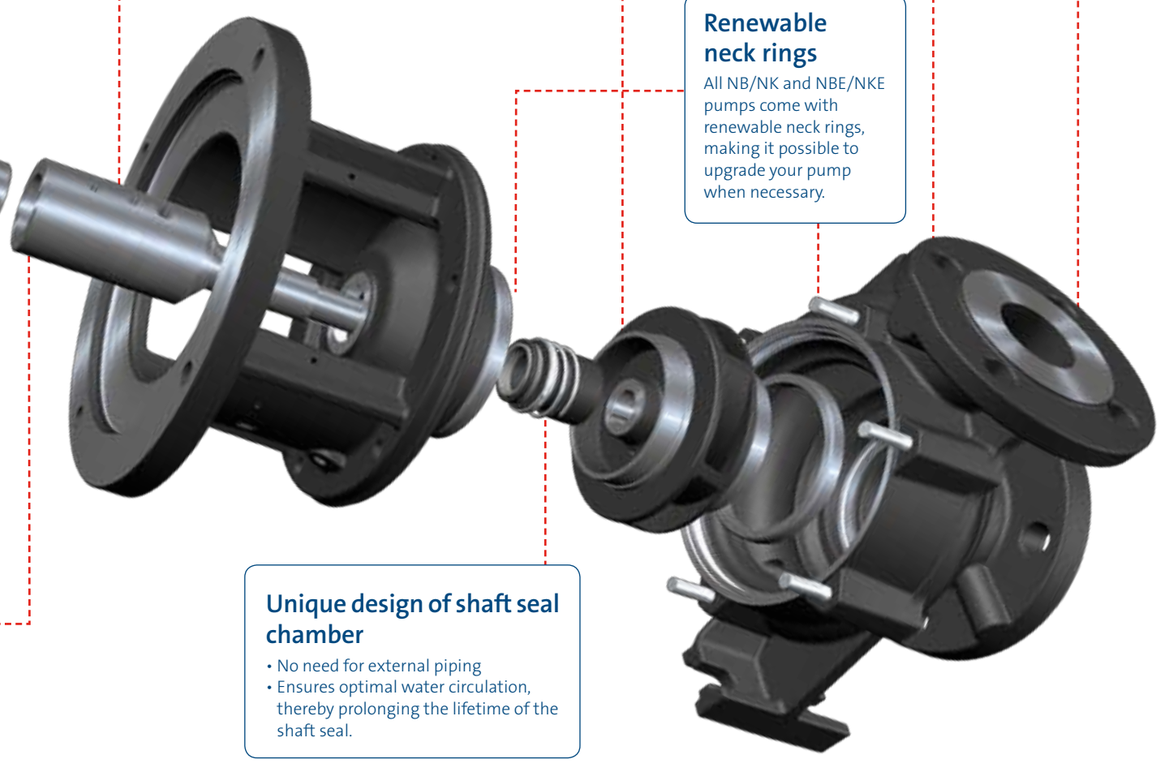
The all-in-one solution
In Grundfos NB/NK and NBE/NKE pumps, coupling and shaft have been friction-welded together to create a completely stable mechanical unit, which reduces vibration and friction. This all-in-one solution prolongs the life of both shaft seal and bearings.

Anti-corrosion surface
Cataphoresis surface treatment consisting of Powercron® cathodic electrocoating and zinc phosphate coating.
- Maximum protection against corrosion
- Cataphoresis on the inside of the pump means a longer lasting inside surface that keeps efficiency high.

Mechanically and hydraulically balanced impeller
- Minimized vibration levels and axial forces
- Maximized motor bearing and shaft seal lifetime.

EN733 and ISO2858
Complete range of pumps with dimensions and design in accordance with EN733 (PN10/PN16) and ISO2858 (PN16).

Renewable neck rings
All NB/NK and NBE/NKE pumps come with renewable neck rings, making it possible to upgrade your pump when necessary.



Unique design of shaft seal chamber
- No need for external piping
- Ensures optimal water circulation, thereby prolonging the lifetime of the shaft seal.

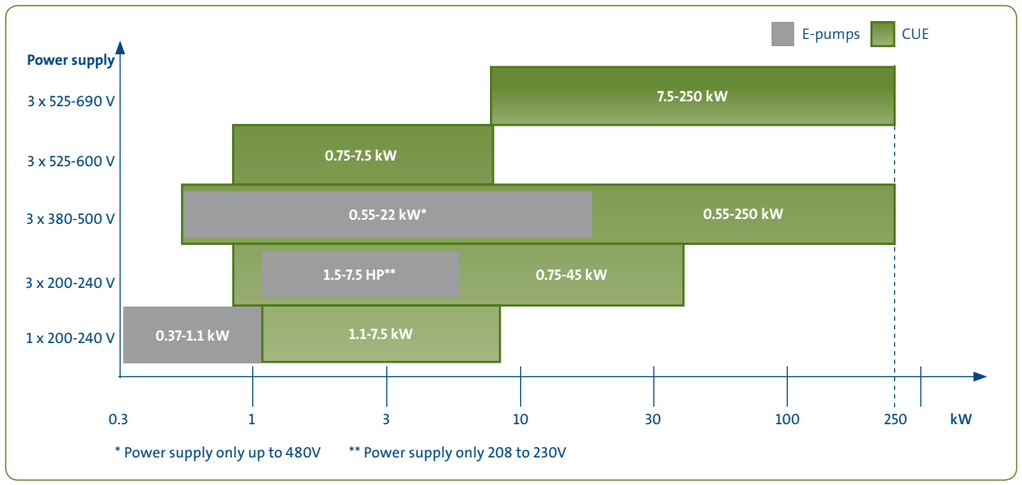
NB/NK
VERSATILITY

CUE – THE FUTURE IS HERE

Up to 22 kW, Grundfos offers a complete range of pumps with integrated frequency converters. For larger motor sizes, Grundfos offers a solution up to 250 kW called CUE.

The CUE range is a series of wall-mounted frequency converters with E-pump functionality. The CUE allows you to control the speed of virtually any Grundfos pump regardless of size, power range or application area. Now, that's a solution perfect for the future.

CUE Overview



GRUNDFOS

THINKING BUILDINGS

At Grundfos CBS, we are always thinking buildings, and our products contribute to making buildings that can almost think for themselves. We do not just consider our products as stand alone devices – we consider them an integral part of a living building whose purpose is to function in the best way possible for its inhabitants.

Grundfos CBS offers products across the full range of applications, including heating, air conditioning, waste water, booster systems, fire protection systems and district energy.

Our expertise is founded in decades of global experience and we are proud to share our knowledge with our clients. We are also determined to take the lead on new technologies and innovation opportunities.

To learn more about Grundfos CBS and to find out how we can be of assistance, contact Grundfos or visit us at **www.grundfos.com/commercialbuilding**.

EXPLORE OUR ONLINE UNIVERSE

Make the most of Grundfos CBS – visit the Thinking Buildings Universe at **www.grundfos.com/commercialbuilding**.

Our website contains a range of services that function as your online Grundfos CBS expert:

- **Quick Pump Selection with an extensive product database and dimensioning tool that helps you choose the right pump for your needs**
- **E-learning programme that lets you improve your specialist knowledge**
- **Access to Thinking Buildings E-News, which keeps you up to date on the latest technology, product information and background material**
- **Lexicon where you can look up definitions of relevant professional terms**

Welcome to the Grundfos CBS Thinking Buildings Universe!