

GRUNDFOS TP/TPE

Grundfos TP/TPE is the world's most comprehensive range of high efficiency in-line pumps Grundfos Grundfos Blueflux® IE3. The TP/TPE pumps feature the world-renowned IE3 motor as standard, along with integrated frequency converters that ensure maximum efficiency at all times. This guarantees the lowest possible life cycle costs and the best conditions for the environment.

Grundfos application areas:

- Heating
- District heating
- Air-conditioning
- District cooling
- Industrial cooling
- Industrial processes
- Water supply

GRUNDFOS TP/TPE HIGH CLASS EFFICIENCY

FULL RANGE OF FLEXIBLE IN-LINE PUMPS



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TP/TPE
INTRODUCTION

GRUNDFOS TP/TPE IS THE WORLD'S MOST COMPREHENSIVE RANGE OF HIGH EFFICIENCY IN-LINE PUMPS DESIGNED FOR USE IN A VARIETY OF APPLICATIONS

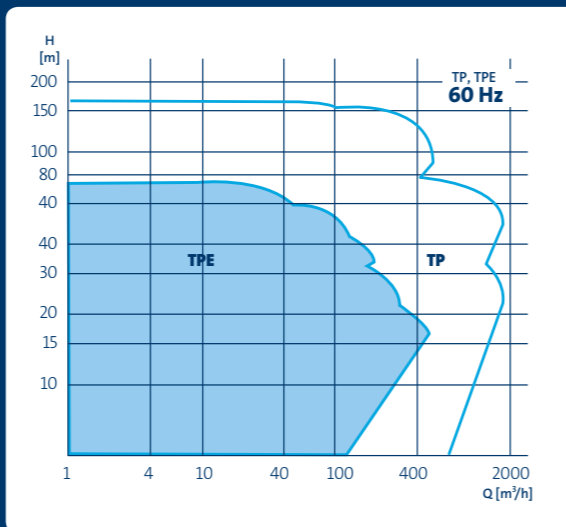
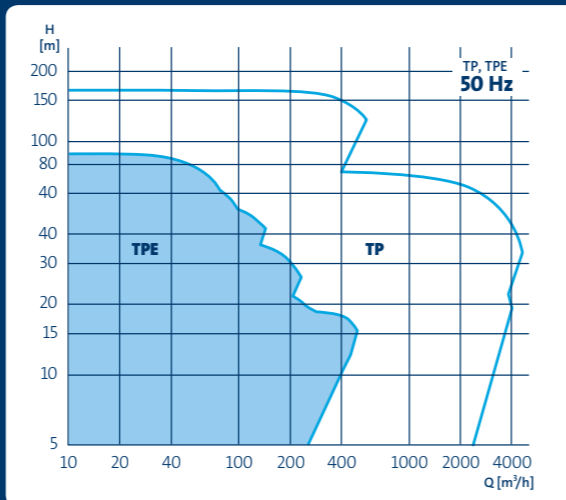
Comprehensive range:

- | | |
|--|--|
| 50 Hz: | 60 Hz: |
| • From 0.12 kW to 630 kW | • From 0.37 kW to 315 kW |
| • Capacities of up to more than 4500 m ³ /h | • Capacities of up to 1250 m ³ /h |
| • Head up to 170 m | • Head up to 235 m |

The whole range features:

- Liquid temperature range up to +150° C
- Ambient temperature up to +60° C
- Operating pressure up to 25 bar
- Compatible with all application areas:
 - heating
 - district heating
 - air-conditioning
 - district cooling
 - industrial cooling
 - industrial processes
 - water supply

Performance area for TP/TPE



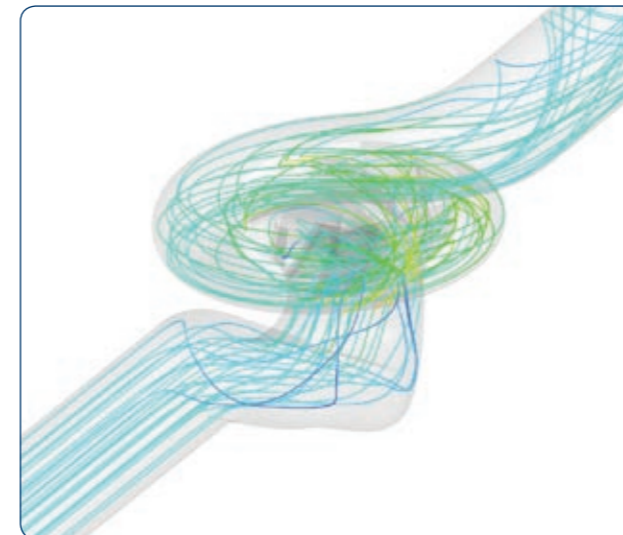
The curves show the performance area of Grundfos In-Line pumps. Curves show the performance area of pumps with integrated frequency converters (TPE pumps).

Optimised flow geometry

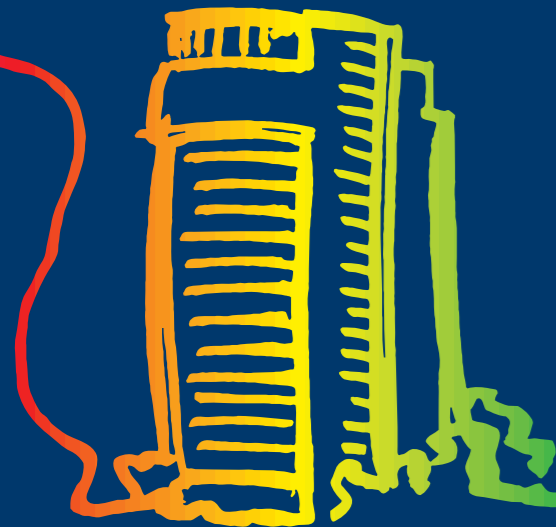
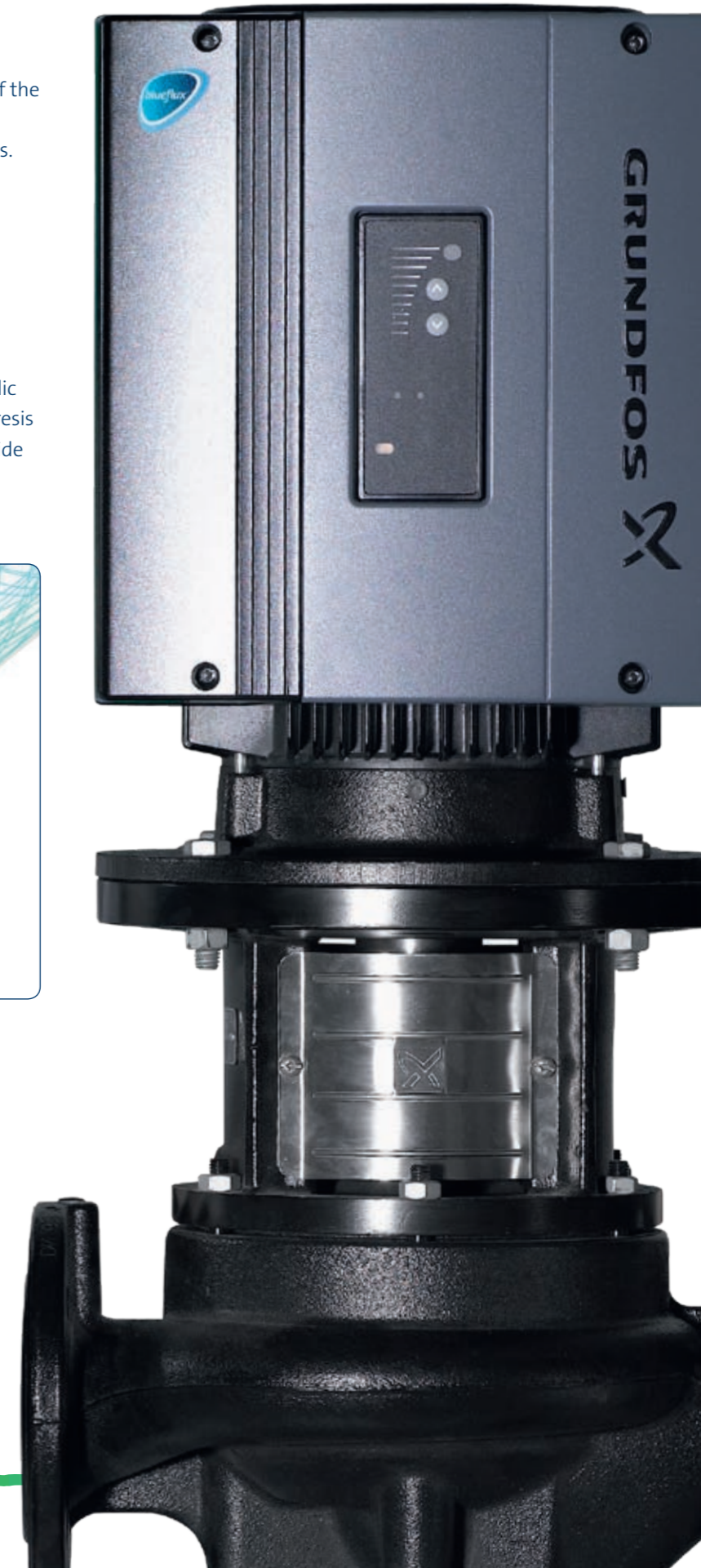
With our unique high-precision machinery, we have minimised the tolerances used in the manufacture of the impeller and pump casing, and optimised the flow geometries of these two crucial components. The result: minimal backflow and increased energy efficiency.

Surface details

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



Here, streamlines show the relative velocity of water passing through a TP pump





TP – GRUNDFOS BLUEFLUX® MOTORS MAKE THE DIFFERENCE

The standard Grundfos Blueflux® motor in Grundfos TP pumps is anything but standard. First of all, Grundfos Blueflux® motors are the most efficient motors available. They meet the highest IE3 standard in the EuP directive for motors. Second, Grundfos leads the way by featuring only Grundfos Blueflux® motors as standard in our pumps.* The IE3 standard motor 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.

*For some 60Hz pumps only IE2 motors are currently available.



The amazing Grundfos Blueflux® motors

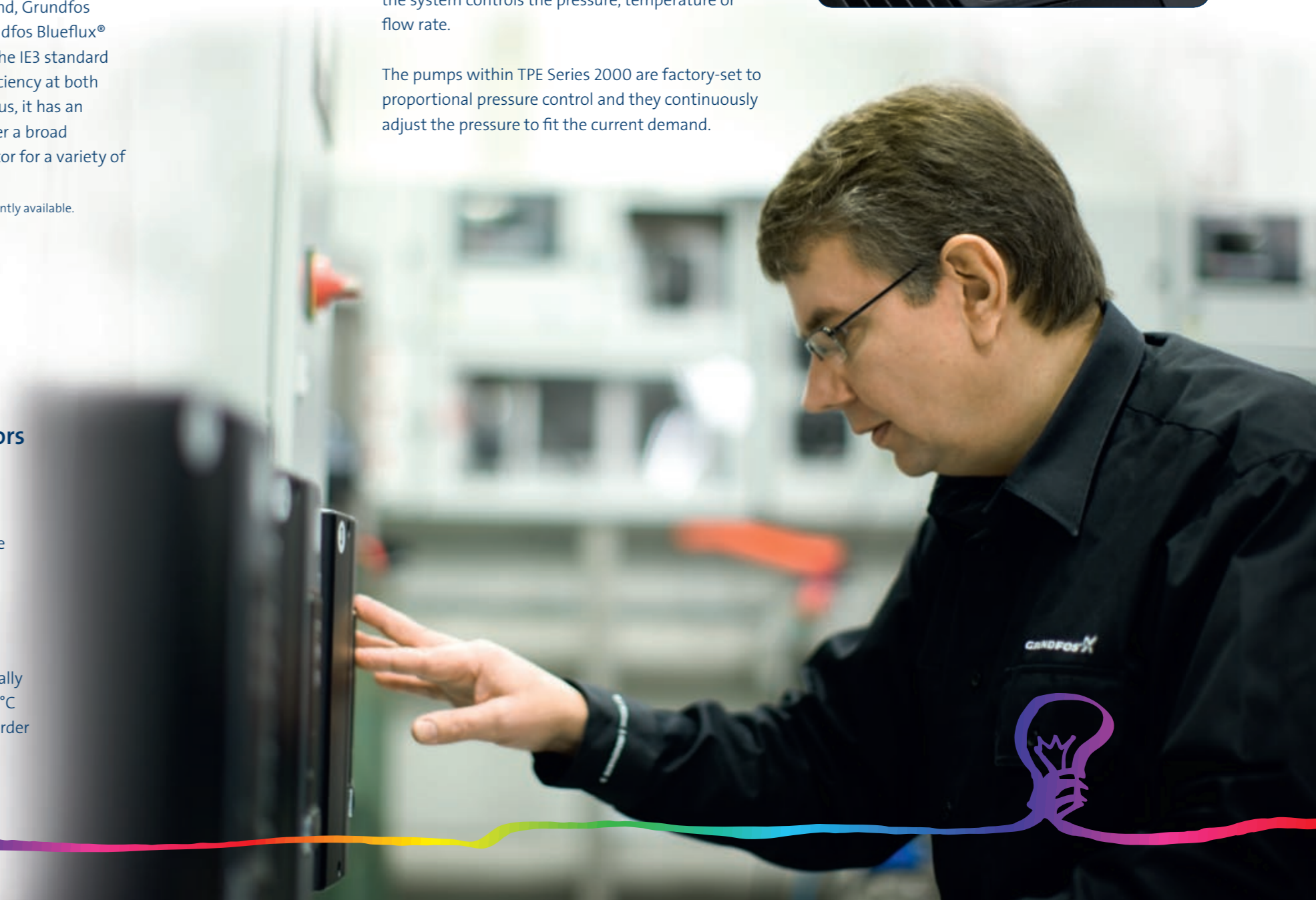
- Minimal heat development increases lubrication intervals and winding insulation service life
- Low bearing temperatures increase bearing service life
- Extremely low noise levels due to advanced axial fan design
- Operational at high ambient temperatures (up to +60°C). Normally an ambient temperature above 40°C requires one motor size bigger in order to prevent overheating.

TPE – PUMPS FOR LIFE

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

Grundfos offers two concepts within E-pumps: the TPE Series 1000 is the standard configuration of E-pumps suitable for applications where a sensor in the system controls the pressure, temperature or flow rate.

The pumps within TPE Series 2000 are factory-set to proportional pressure control and they continuously adjust the pressure to fit the current demand.



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

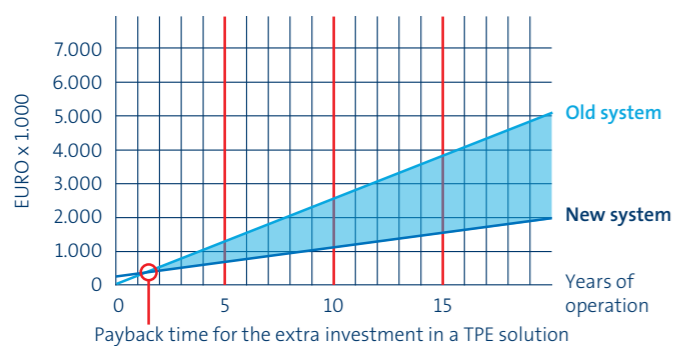
C_s = down time costs (loss of production)

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 per year. Energy price set to 0.1 Euro/kWh. New system – 3 units of TP 300-750/4, 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 CO₂ dramatically and thereby make an important contribution to the well-being of our planet. All Grundfos TPE 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 TPE 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 CO ₂ per 3 kW
Reduction in life cycle costs	Typically 25%
Payback time for the extra investment in a TPE-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 CO₂ per kWh is set to 0.37 kg. Life cycle cost calculation is based on a 10-year period.

“Did you know that a refurbishment of pumping systems typically result in energy savings of 20-80%?” Grundfos has several ways to do an energy refurbishment, depending on your pumping system.

The pump refurbishment scale:

- Small:** Replace old pumps with new state-of-the-art high efficiency ones.
- Medium:** Ensure that all pumps are sized correctly and replace ones that are not.
- Large:** Conduct full assessment of the pump system and draw up action plan.

For more information contact your local Grundfos company.



TP/TPE

THE DETAILS

Advanced fan design

Advanced axial fan design means dramatically reduced noise levels

Integrated frequency converter in TPE

- 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

The all-in-one solution

In Grundfos TP/TPE pumps, coupling and shaft have been friction-welded together to create a completely stable mechanical unit, which drastically reduces the vibration levels. The stability of this all-in-one solution prolongs the lifetime of both shaft seal and bearings.

Anti-corrosion surface

Cataphoresis surface treatment consisting of Powercron® cathodic electrocoating and zinc phosphate coating.

- Maximal 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

Renewable neck rings

All TP and TPE pumps come with renewable neck rings, making it possible to upgrade your pump when necessary.

Grundfos Blueflux® IE3

Grundfos Blueflux® motors as standard in both TP and TPE pumps. Only motors with the official IE3 logo are certified maximum efficiency motors

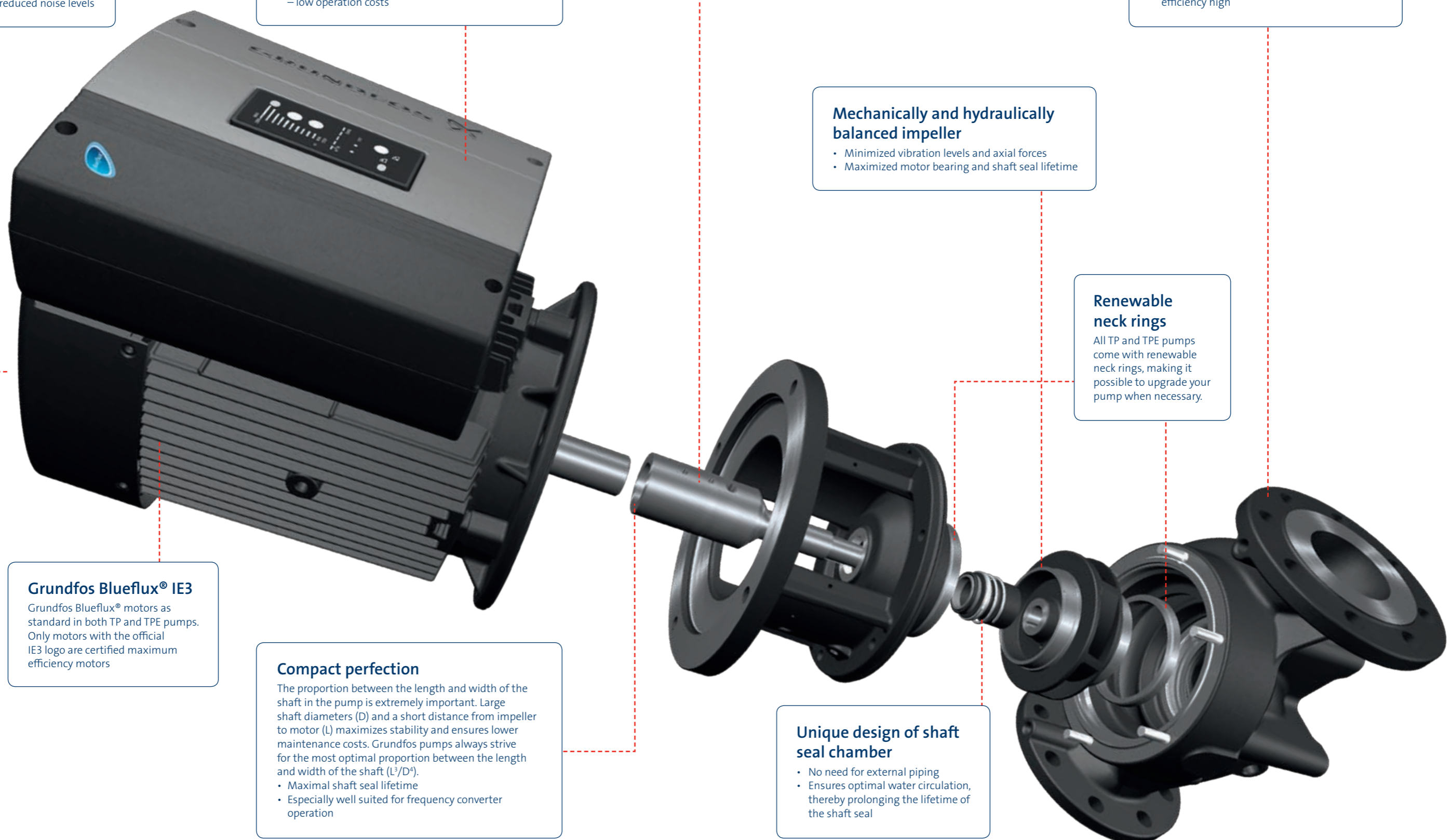
Compact perfection

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 (L^3/D^4).

- Maximal shaft seal lifetime
- Especially well suited for frequency converter operation

Unique design of shaft seal chamber

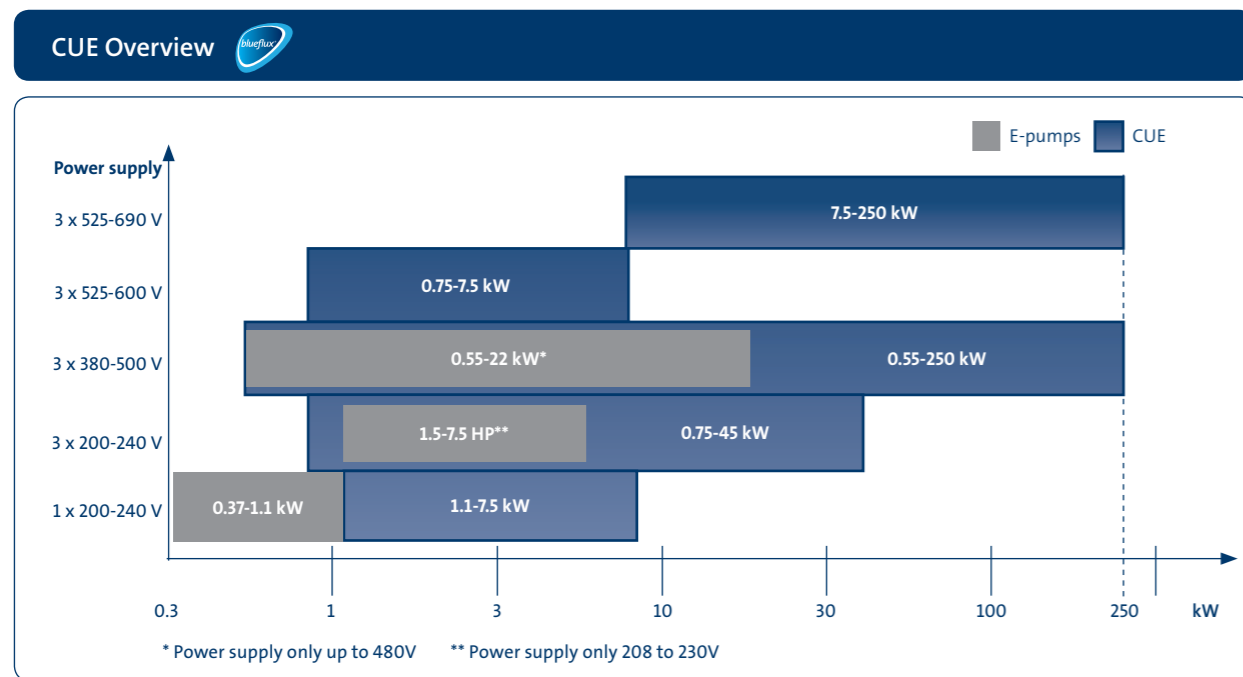
- No need for external piping
- Ensures optimal water circulation, thereby prolonging the lifetime of the shaft seal



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.



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.

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.

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

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

EXPLORE OUR ONLINE UNIVERSE

Make the most of Grundfos CBS – visit the Thinking Buildings Universe at www.thinkingbuildings.com.

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 BLUEPRINT that 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!

