

VERSATILE E-SOLUTIONS WITH GRUNDFOS CUE

WALL-MOUNTED SOLUTIONS WITH E-PUMPS FUNCTIONALITY

be
think
innovate

GRUNDFOS 

THE ULTIMATE IN CONTROL

EASY AND FLEXIBLE – TAKING E-SOLUTIONS EVEN FARTHER

Grundfos CUE is the latest addition to the E-solutions program of speed-controlled pump systems for industry, building services, municipal water supply, municipal wastewater, and irrigation applications.

Our new, comprehensive series of wall-mounted frequency converters with E-pump functionality and user interface is a complementary product to the Grundfos E-pumps featuring an integrated frequency converter.

With a CUE solution, you can control the speed of most Grundfos pumps regardless of size, power range, and application area.

WE THINK GREEN. DO YOU?

Sustainable development is key at Grundfos.

Our goal is to be one step ahead in the marketplace and encourage our customers and suppliers to go with forward-thinking environmentally friendly solutions.

Approximately 70% of the total costs incurred during the life of a variable-speed pump is attributed to power consumption. Being able to control pump speed according to demand contributes significantly to energy savings and reduced CO₂ emissions.

With a Grundfos speed-controlled pump, you can reduce your energy consumption and operating costs by as much as 50%.

SPEED CONTROL FOR EVERYONE

Speed control by way of frequency converters has been part of our product portfolio for almost 25 years. Since the early 1990s, integrated solutions – such as UPE pumps and E-pumps (CRE, CHIE, TPE) – have been a primary focus at Grundfos and in high demand with our customers as well.



FACTS ABOUT E-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 CO₂ EMISSIONS

Typically 2,150 lbs. per 5 hp

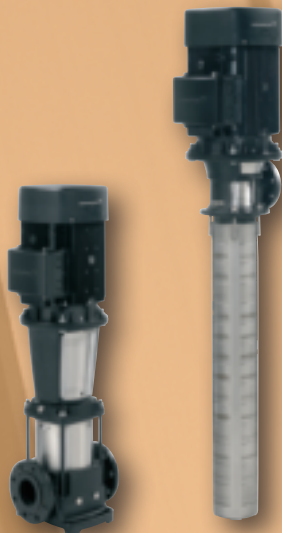
REDUCTION IN LIFE CYCLE COSTS

Typically 25%

PAYBACK TIME FOR THE EXTRA INVESTMENT IN AN E-SOLUTION

2 to 3 years

** Figures are based on a pump with a 5 hp motor in an application running 12 hours per day, 220 days per year. Average CO₂ per kWh is set to 0.82 lb. Life cycle cost calculation is based on a 10-year period.*



A speed-controlled solution is now the first choice for many pump professionals and end users – and the reasons are obvious.

Speed control in variable-demand applications saves an enormous amount of energy and money while increasing comfort and convenience for both installers and end users.

With a CUE solution, everything is automatic, which means you're in total control of your pump application at all times.

VERSATILE RANGE AND TYPICAL APPLICATIONS

The Grundfos CUE is suitable for most centrifugal pump types, all application areas, and all power ranges outside the E-pump range.

The CUE can be used in connection with both new and existing Grundfos pumps and in installations where the integrated solution will not fit, is not wanted, or prohibited.

Typical application areas include:

- Most ranges outside of E-pumps
- Submersible installations
- Wastewater applications
- Water supply and irrigation applications
- Hazardous or explosive areas
- Sanitary installations





THE POWER OF BEING IN CONTROL

EFFORTLESS CONTROL

Performance, reliability, and convenience are unmatched in the CUE series. It offers plug-and-pump installation and operation coupled with extensive control and monitoring possibilities.

All the well-known functionalities of the E-pump, including the unique user interface, have been incorporated into these new wall-mounted frequency converters to provide the same exceptional ease of operation.

Along with an extremely efficient frequency converter for automatic energy optimization, the CUE also includes an advanced controller and a number of monitoring functions.

NEW WAYS TO GO

The CUE opens up a whole new range of opportunities. The advantages of speed control can now be extended to pump areas and markets not currently covered by the E-pump program.

The CUE offers speed-controlled pump solutions with E-pump functionality and user interface for pumps above 30 hp, as well as for power supplies outside the E-pump program.

You can also implement E-solutions in sanitary applications, explosive or hazardous areas, and in many other application settings where electronics are unwanted or prohibited.

PLUG-AND-PUMP CONVENIENCE

When installing and commissioning the CUE, all you need to do is designate a few application-specific settings and variables. Using the Grundfos R100 Remote Control makes this a simple and easy task done in just minutes.

The CUE also offers extensive possibilities for monitoring of the pump, motor, frequency converter, and surroundings – as well as remote control and supervision via bus interface and input/outputs.

AN ARRAY OF SUPERIOR FEATURES

A CUE solution offers excellent features that provide increased comfort and convenience for the user. For example, water hammering is eliminated with a soft start and stop feature. Plus, the built-in PID controller is your guarantee for constant pressure independent of the required flow.

ONE SOLUTION, ONE SUPPLIER

With the CUE, you can rest assured knowing that the entire pump solution (pump, frequency converter, controller, and sensor) is perfectly matched and configured for your specific pump application and that all system interfaces and settings are optimized.

In addition to increased system security, dealing with just one supplier means that initial design, configuration, installation, and commissioning are greatly enhanced. Whenever you need expert assistance and service during the life of your CUE solution, you'll know where to go.

GREAT VALUE FOR THE MONEY

Everyone in the value chain has something to gain from a CUE E-solution.

THE WHOLESALER/DEALER

Your business can reap extensive benefits from systems sales. Instead of selling individual parts, you can offer a complete, speed-controlled pump solution from one supplier.

THE INSTALLER

You'll experience the comfort and convenience of a plug-and-pump concept as compared to that of a standard frequency converter. In addition, ordering everything you need from the same supplier makes selection, order handling, and installation significantly faster and easier.

THE END USER

You get an easy-to-operate, high-performance pump solution with low life cycle costs. It's your guarantee for years of cost-efficient and trouble-free pump operation.



GRUNDFOS CUE

A COMPREHENSIVE RANGE WITH FEATURE-RICH BENEFITS

With more than 100 different configuration possibilities, encompassing a power range from 0.75 hp to 300 hp, the CUE represents one of the most comprehensive and versatile ranges of frequency converters for pump applications currently on the market.

The CUE range is available with five different power supplies, two enclosure classes (IP20/21 (Nema 1)/IP55 (Nema 12)) and more than 24 different output powers – which means you'll find the perfect solution for your specific need.

The CUE is packed with exceptional features for providing you with maximum convenience and enhanced operational ease. Take a look at some of the added value that comes with a CUE.

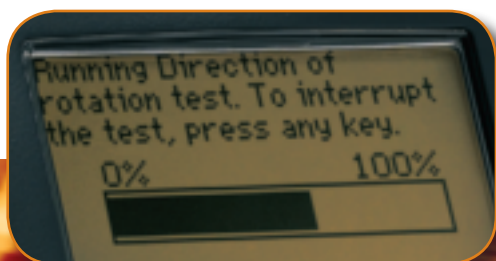
INTUITIVE START-UP GUIDE

The CUE start-up guide ensures easy installation and commissioning and plug-and-pump convenience. Only a few settings need to be specified on-site by the installer while the rest is either done automatically or preset at the factory.

SMART USER INTERFACE

The unique and user-friendly operating panel consists of a graphical display with backlight and buttons for pump start/stop, navigation, and menu settings.

With the CUE, you get the same “look and feel” as other Grundfos E-solutions: the user interface and menu structure are identical to the R100 Remote Control operating panel used in conjunction with E-pumps. Operating a CUE solution is basically like operating an E-pump.



AUTOMATIC DIRECTION OF ROTATION

A CUE solution offers automatic detection and setting of correct direction of rotation. During start-up, the CUE will automatically check the rotation and ensure that the pump is running in the proper direction.

If the rotation direction is wrong, the CUE will change it electronically, eliminating the need for manual interchange of motor wires.

CONSTANT – WHENEVER, WHATEVER

When we say constant, we mean constant! The CUE has a built-in PID controller that provides a closed-loop control of virtually any value you want to control, including:

Constant Pressure With or Without a Stop Function

With a stop function:

The pressure remains constant at high flow; on/off operation at low flow.

Without a stop function:

The pressure remains constant, regardless of flow rate.

Constant Differential Pressure

Differential pressure remains constant, regardless of flow rate.

Proportional Pressure

Pressure is reduced at low flow and at increased high flow.

Constant Level With or Without a Stop Function

With a stop function:

The fluid level remains constant at high flow; on/off operation at low flow.

Without a stop function:

The fluid level remains constant, regardless of flow rate.

Constant Temperature

Fluid temperature remains constant, regardless of flow rate.

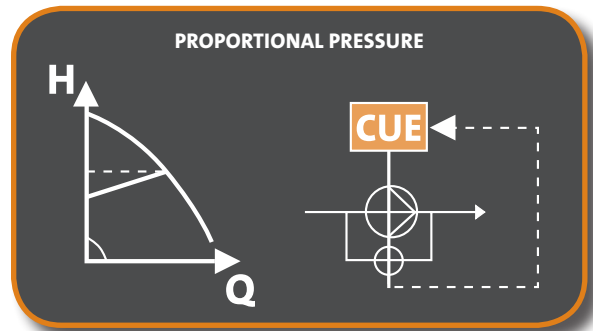
Constant Flow

Flow remains constant, regardless of pressure.

USER-FRIENDLY FUNCTIONS

Proportional Pressure

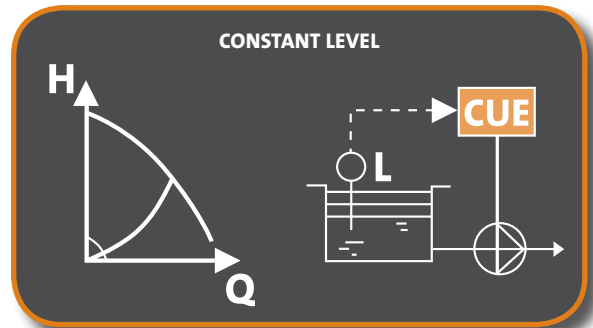
The proportional pressure function ensures that the differential pressure in a circulating application (i.e., a heating or air-conditioning system) is sufficient at low-flow as well as at high-flow demands. The differential pressure is automatically elevated with increased flow.



Stop Function

In most water supply applications, the required flow can be very low, sometimes even equal to zero. In those situations, on/off operation of the pump according to demand is more economical.

The CUE offers a stop function for constant pressure or constant level applications. The stop function prevents the pump from running against a closed valve with the risk of heating up the water in the pump and causing damage to the shaft seal, which can result in the growth of unhealthy bacteria.

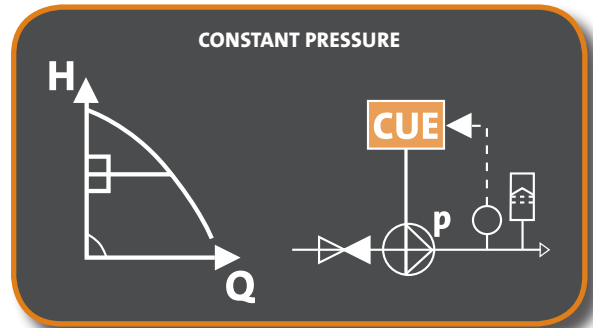


Dry-Running Protection

The CUE offers protection against dry running, as one of the inputs can be dedicated to a dry-running detector.

Duty/Standby

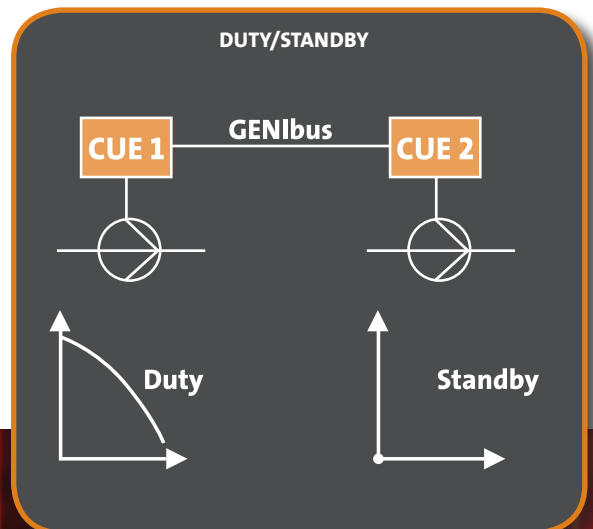
By interconnecting two CUE frequency converters via the standard built-in GENIbus interface, a duty/standby function of the two pumps can be obtained.



Motor Bearings Supervision

The CUE has a motor bearings monitoring function that displays an automatic warning when it's time for relubrication or replacement of bearings.

This function can be further optimized by the addition of bearings temperature measurement (requires an IO module), which provides a warning or discontinues pump operations automatically in case of overheating.

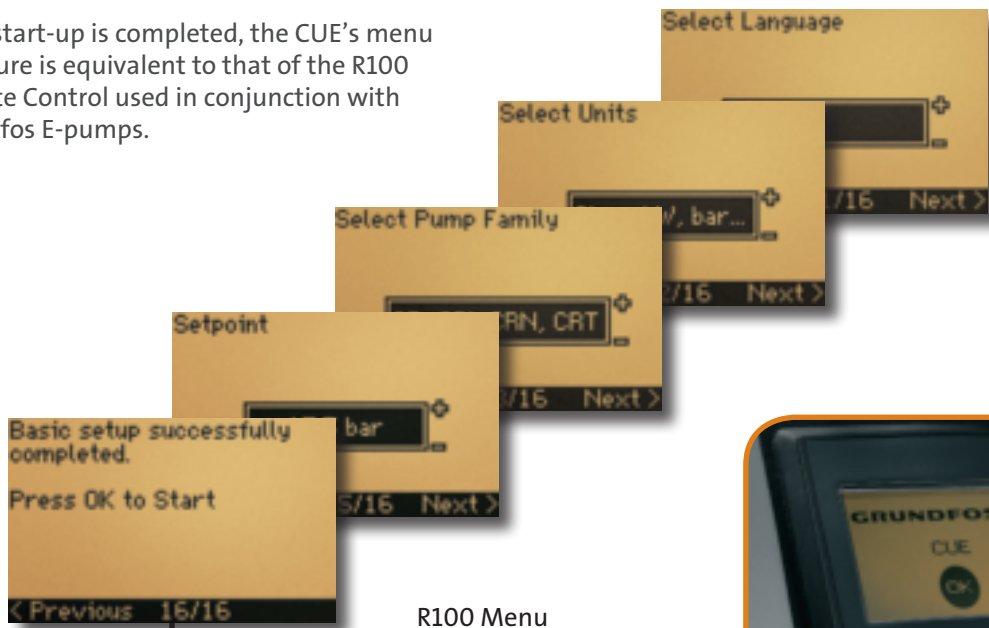


A SMART USER INTERFACE

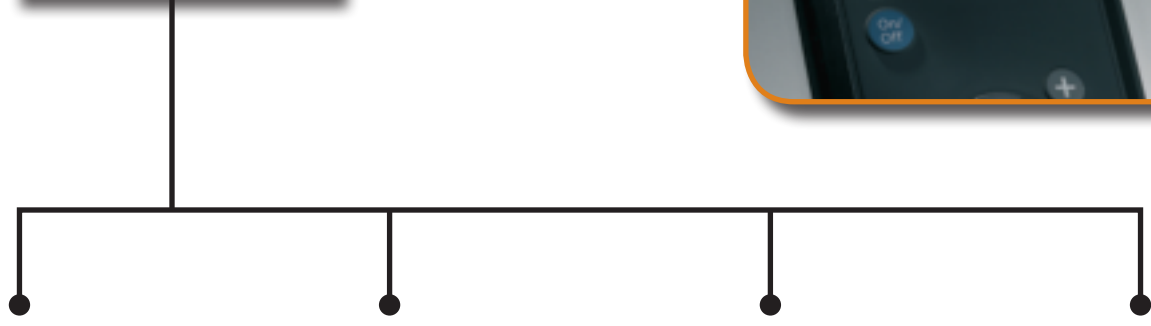
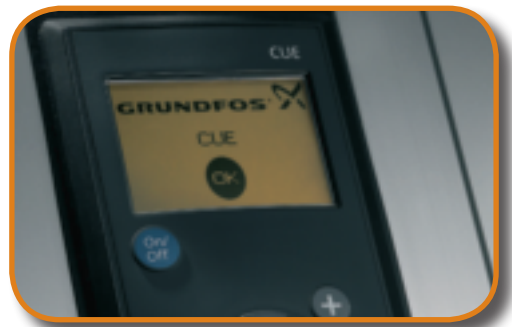
The CUE requires only a few settings at start-up, making set-up and commissioning quick and easy.

Simply key in application-specific variables, such as motor data, pump family, control function (i.e., constant pressure), sensor type, and setpoint, and the CUE automatically sets all the necessary parameters: ramp times, minimum speed, controller constants, available functions, etc.

After start-up is completed, the CUE's menu structure is equivalent to that of the R100 Remote Control used in conjunction with Grundfos E-pumps.



R100 Menu

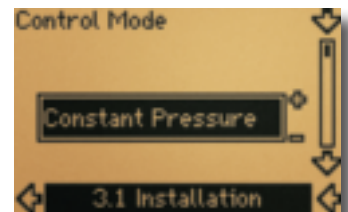
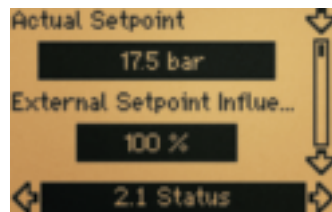
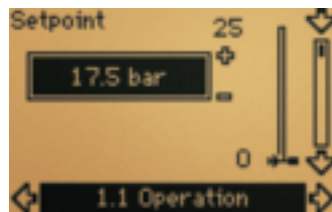
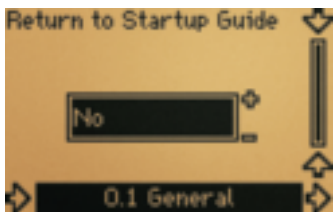


0. General

1. Operation

2. Status

3. Installation



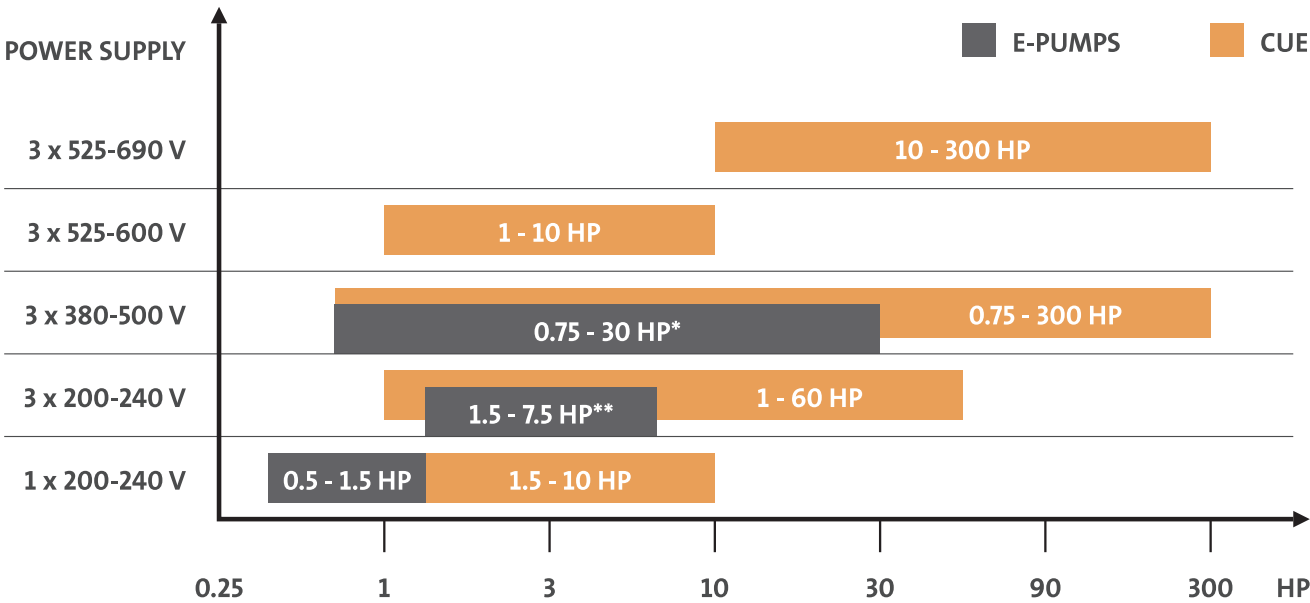


THE COMPREHENSIVE CUE RANGE

When you select a CUE solution, you get a choice of the following versions:

- > 1-phase, 1x200-240 V, 50/60 Hz (1.5 - 10 hp)
- > 3-phase, 3x200-240 V, 50/60 Hz (1 - 60 hp)
- > 3-phase, 3x380-500 V, 50/60 Hz (0.75 - 300 hp)
- > 3-phase, 3x525-600 V, 50/60 Hz (1 - 10 hp)
- > 3-phase, 3x525-690 V, 50/60 Hz (10 - 300 hp)

All CUE solutions are available in two enclosure classes: IP21 (Nema 1) or IP55 (Nema 12).



* Power supply only up to 480 V

** Power supply only 208 to 230 V

INPUT/OUTPUT POSSIBILITIES

FOUR DIGITAL INPUTS

One dedicated input for external start/stop.
Remaining inputs can be set to:

- › Min. (min. curve)
- › Max. (max. curve)
- › Ext. fault (external fault)
- › Flow switch
- › Alarm reset
- › Dry running (from external sensor)
- › Not active

THREE ANALOGUE INPUTS

- › One 0-10 V or 0/4-20 mA input for external setpoint
- › One 0/4-20 mA input for sensor feedback
- › One additional 0/4-20 mA input for sensor (requires an additional IO module)

TWO PT100/1000 INPUTS

- Used in connection with motor bearings:
- › temperature measurement or alternative
 - › temperature measurement, such as media
 - › temperature (requires an additional IO module)

ONE ANALOGUE OUTPUT

Can be set to indicate different parameters such as speed, actual value, etc.

TWO DIGITAL RELAY OUTPUTS

Can be set to report different operation modes such as running, warning, alarm, etc.

RS485 GENIBus INTERFACE

The CUE comes equipped with a standard RS485 interface that can communicate with Grundfos control systems and, via a Grundfos gateway, can be connected to other bus systems such as LONWorks, Profibus, Modbus, etc.



ACCESSORIES

ADD-ON CARD

Analogue IO module offering:

- › Two inputs for Pt100/1000 temperature sensors (the card will automatically detect if there is a Pt100 or a Pt1000 sensor)
- › One analogue 0/4-20 mA input for an additional sensor

MOTOR FILTERS

All CUE frequency converters deliver a non-sinusoidal voltage to the motor. In some cases, it's required or desired to filter the output voltage to make it more sinusoidal because

- › It reduces the dv/dt and the peak voltage delivered to the motor,
- › It reduces the acoustic noise generated in the motor windings, or
- › It allows the use of long motor cables.

The following motor filters are available:

dU/dt FILTERS	
Split on 16 different filters covering:	
Power Range	15 - 300 hp
Voltage Range	3x380-500V and 3x525-690V
Insulation Class	IP20
Ambient Temperature	max. 45°C

SINE WAVE FILTERS	
Split on 23 different filters covering:	
Power Range	0.75 - 300 hp
Voltage Range	1x200-240V, 3x200-240V, 3x380-500V, and 3x525-690V
Insulation Class	IP20
Ambient Temperature	max. 45°C

SENSORS

The following sensors can be used in connection with the CUE. All sensors come with a 4-20 mA output signal.

- › Pressure sensors – up to 25 bar
- › Temperature sensors
- › Differential pressure sensors
- › Differential temperature sensors
- › Flow sensors
- › Level sensors
- › Potentiometer box for external setpoint setting

GATEWAYS

The CUE is equipped with a standard RS485 GENIbus interface. Gateways to convert to other bus standards can be delivered as an accessory.

The CIU family can convert to the most common fieldbuses in the world:

- › CIU100 converts from GENIbus to LonWorks
- › CIU150 converts from GENIbus to Profibus
- › CIU200 converts from GENIbus to Modbus
- › CIU250 is a GSM modem, which can send SMS messages in case of alarms, etc.

OTHER ACCESSORIES

- › Dry-running protection sensor LiqTec
- › Control MPC – a multi-pump control system for parallel-connected E-pumps

E-SOLUTIONS WITH GRUNDFOS E-PUMPS

If you want an all-in-one solution with integrated pump and electronics, then select a Grundfos E-pump in place of a CUE. E-pumps are suitable for virtually all industry and building applications.

The E-pump program is available in a 1x208-230V version up to 1.5 hp, a 3x208-230V version up to 7.5 hp, and a 3x460-480V version up to 30 hp.

All-in-one solutions with integrated frequency converter are covered by the E-pump program (for more information, see the Grundfos E-pump brochure Lit. No. L-IND-SL-02).

L-IND-SL-03 Rev. 11-12

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