

ALL-IN-ONE E-SOLUTIONS WITH GRUNDFOS E-PUMPS

SOLUTIONS WITH INTEGRATED FREQUENCY CONVERTERS

GRUNDFOS 
INDUSTRIAL SOLUTIONS™

INTEGRATION AT ITS BEST

MAKING A DIFFERENCE WITH “E”

The “E” is synonymous with energy savings and electronic control.

As a world market leader of intelligent, high-quality pumps and pumping systems, we at Grundfos feel obligated to be at the forefront of technological development by introducing truly innovative solutions for the benefit of our customers and the environment.

With our comprehensive E-pump program, we are fulfilling that obligation.

Radiating quality and innovation inside and out, Grundfos E-pumps – with integrated frequency converter – are designed with total control, customer convenience and environmental sustainability in mind.

This means less hassle, less operational cost and greater piece of mind for you.

THE NEED FOR SPEED CONTROL

The ability to control pump speed according to the pump’s demand is the single most important factor in reducing a pump’s life cycle costs and energy consumption.

Approximately 85% of the total cost of owning a pump during its life is attributed to power consumption. With a Grundfos E-pump, energy consumption can be reduced drastically – up to 50% in some applications.

That’s why an E-pump from Grundfos is the optimum choice.

Along with speed-control functionality and built-in controller, Grundfos E-pumps are packed with intelligent features that make installation, operation and service exceptionally easy and much less time consuming than a speed-controlled pump solution with conventional frequency converter.



WHEN ONLY THE BEST IS GOOD ENOUGH

Grundfos has decades of experience in building state-of-the-art E-pumps with energy-saving and speed-control functionality for domestic, commercial and industrial pump applications.

The world’s first speed-controlled pump with integrated frequency converter was developed in our laboratories back in the late 1980s.

Every year since then, we have worked intensively to optimize and expand the E-pump program, which is based on innovative pump technology and the Grundfos MLE motor.

The MLE is a high-efficiency motor with a built-in frequency converter and controller with pump-related functions.

All Grundfos E-pumps comply with UL and other international standards and are manufactured in-house to guarantee outstanding quality and performance.

When you buy a Grundfos E-pump, you can be sure you are buying quality from top to bottom!

VERSATILE APPLICATION

E-pumps are ideal anywhere you need an integrated pump solution, in variable-load operations, and in applications where a high degree of process control is of the essence.

E-pumps are typically used in the following industrial and commercial building applications:

- Heating and air conditioning systems
- Pressure boosting systems
- Industrial cooling systems
- Process systems with fluctuating load
- Irrigation systems

ENERGY SAVINGS AND OTHER GREAT BENEFITS

OPTIMUM CONTROL IN MIND

E-pumps with a built-in frequency converter are developed with optimum electronic control in mind. They provide several added benefits compared to a conventional solution with a separate standard frequency converter.

A PERFECT MATCH

Pump, motor and frequency converter are perfectly configured and interfaced to ensure reliable operation at all times, with functionalities matched to the specific pump application.

TOTAL SECURITY

Grundfos supplies the entire E-pump solution and is completely responsible for all interfaces and the reliable interaction of all components, including the sensor and application software. This greatly facilitates the initial buying process and any subsequent after-sales service.

EASE AND SIMPLICITY

Grundfos E-pumps utilize “plug and pump” technology, making it just as easy to install as a standard fixed-speed pump. No extra programming or cabling is needed, and the E-pump is operational as soon as it’s connected to the power supply.

DRIVING DOWN LIFE CYCLE COSTS

Grundfos pumps with an integrated frequency converter will cut planning, purchasing, installation and commissioning costs. Operating costs are also significantly reduced due to the E-pump’s special pump functionalities and automatic energy optimization.

REDUCED NOISE LEVEL

An E-pump operates at a lower noise level than many pumps with standard frequency converters due to its high switch frequency from the frequency converter to the motor.

EXTENDED FLEXIBILITY

E-pumps are ideal for replacement because they don’t require extra space or wiring in the control cabinet. Their innovative design and modular blueprint provide maximum flexibility in new as well as retrofit applications.

SAVE MONEY AS YOU SAVE ENERGY

Regulating pump speed according to demand is the best way to reduce energy consumption and operating costs.

The Flux Control functionality in the MLE motor offers integrated automatic optimization, which in practice means that the frequency converter minimizes motor losses at all times, depending on the actual motor load.

WIN-WIN FOR ALL STAKEHOLDERS

Everyone in the value chain has something to gain from an E-pump solution. It’s a win-win situation for all stakeholders, including:

THE WHOLESALER/DEALER

Your business can derive extensive benefits from systems sales. Rather than selling individual parts, you can now 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 compared to that of a pump with 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. If you ever need service, then you know who to contact. It’s our guarantee to you for years of cost-efficient and trouble-free pump operation.



THE VIRTUES OF A BUILT-IN DRIVE

THE CLOSER THE BETTER

A variable-speed solution with a separate frequency converter placed in the control cabinet is common in many industrial applications today.

However, E-pumps take systems integration one step further by offering an integrated solution with a decentralized variable-speed drive placed in close proximity to the motor.

E-pumps have the built-in drive mounted directly on the motor. Some key benefits to having an E-pump with MLE motor compared to a separate frequency converter solution include:

- › Total systems integration – one unit
- › As easy to install as a standard fixed-speed pump
- › Reduced cabling costs – no need for a screened cable between frequency converter and motor
- › Optimum interface between motor and drive
- › Space-saving installation – no need for control cabinets/rooms or space on a wall
- › Reduced logistics costs – one product, one supplier



A LOOK INSIDE THE MLE MOTOR

UNSURPASSED DURABILITY AND STRENGTH

All E-pumps are built with an MLE motor. Motor electronics are housed in an aluminum casing that provides superb protection against mechanical impact.

All connections between the PCB (Printed Circuit Board) and housing are extremely robust to prevent damage from vibration. Interconnections between the various PCBs are designed by means of lead frames and connectors instead of cables to obtain increased motor stability and durability.

The terminal box with integrated frequency converter was developed to resist harsh environmental conditions, such as those found in industrial and some commercial applications.

One of the measures taken to ensure superior durability is cooling the built-in frequency converter by the motor fan rather than the small fans inside the terminal box. This significantly prolongs motor life, extends service intervals, and expands suitable application ranges.

ADDED BENEFITS OF E-PUMPS WITH AN MLE MOTOR

E-pumps offer the same features and functionality as a standard frequency converter – and more. A whole range of extra features have been added to increase performance and durability.

- › Special pump-related functionalities, which are matched to specific pump types
- › Low acoustic noise from motor due to high switching frequency (9 to 18 kHz)
- › Automatic motor efficiency optimization
- › Nominal output by highest pulse frequency as a standard option
- › Motor temperature rise class B (even with frequency converter)
- › Frequency converter cooling by motor fan

GRUNDFOS E-PUMPS

MEANINGFUL FEATURES AND BENEFITS

E-pumps provide a comprehensive range of pump-related functions that offer operating economy, comfort, user friendliness, and process adaptability.

A SMART USER INTERFACE

All E-pumps are equipped with an operating panel that provides easy monitoring of operating conditions and offers simple control of basic functions like start/stop and setpoint setting.

The universal Grundfos R100 Remote Control can be used with installation, commissioning, operation, service, and fault finding for a number of Grundfos products, including the E-pumps.

The R100 provides access to several extended functions and unique possibilities for monitoring operating conditions such as power consumption and actual pressure value. The R100 has an intuitive, easy-to-use menu, making commissioning and operation of the E-pumps extremely user-friendly.

CONSTANT – YOU CONTROL IT!

When we say constant, we mean constant! E-pumps have a built-in PID controller that provides a closed-loop control of virtually any value you want to regulate (available functions depend on E-pump type and variant), including:

Constant Pressure With or Without a Stop Function

With a stop function:

The E-pump maintains a constant pressure, except at low flow. At low flow, the E-pump operates in an on/off mode.

Without a stop function:

The E-pump maintains a constant pressure, regardless of flow rate.

Constant Differential Pressure

The E-pump maintains a constant differential pressure regardless of flow rate.

Constant Flow

The E-pump maintains a constant flow rate regardless of the pressure.

Constant Level

The E-pump maintains a constant level in the tank, regardless of flow rate.

Constant Temperature

The E-pump maintains constant temperature control.

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 CRE pumps for water supply applications offer this stop function in constant pressure 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 damaging the shaft seal.

Dry-Running Protection

E-pumps can be protected against dry running with a simple switch. A dry run switch, such as a pressure switch, is connected to the digital input contacts to turn the E-pump off in a dry running condition.

Duty/Standby

By interconnecting two E-pumps via the standard built-in GENibus interface, a duty/standby function of the two pumps in parallel can be obtained (available in all 3-phase MLE motors).

ADVANCED FUNCTIONALITY FOR LARGE SIZE E-PUMPS

MLE motors from 15-30 hp offer even more advanced functions that further increase the benefits of using E-pumps.

Motor Bearings Supervision

The large E-pumps (15-30 hp) are delivered with a motor bearings monitoring function that displays an automatic warning when it's time for relubrication or bearing replacement.

This function can be optimized even further by the addition of bearing temperature measurement, which provides a warning or stops pump operation automatically in case of overheating.

Stand Still Heating

An anti-condensation heater function makes it possible to heat up the motor during stand still to avoid condensation in the motor.



R100 REMOTE CONTROL – NEW AND IMPROVED

INTELLIGENT DATA COLLECTION

The Grundfos R100 Remote Control is designed for wireless infrared (IR) communication with Grundfos products.

The R100 can be used when installing and commissioning Grundfos E-pumps, where a number of settings and selection of functions can be carried out. It's also an important tool for subsequent operation, service, and maintenance of E-pumps.

By means of the R100, status messages – such as actual head, power and energy consumption, operating hours, and alarms – can be read. In addition, the last five alarms, their causes, and time of occurrence are displayed in the Alarm Log menu.

The R100 is available in an updated version equipped with several new and improved features and functions.

For example, its memory enables the service personnel to log pump settings, status, etc. from service visits and later transfer this data to a PC via the USB port. Collected data can then be stored and processed on the PC and/or printed for documentation purposes.

The ten latest status data files generated during the storage process are also available on the R100 remote control.

SOFTWARE UPDATES VIA USB

On delivery, the R100 contains a standard menu structure for all Grundfos products currently available with IR communication.

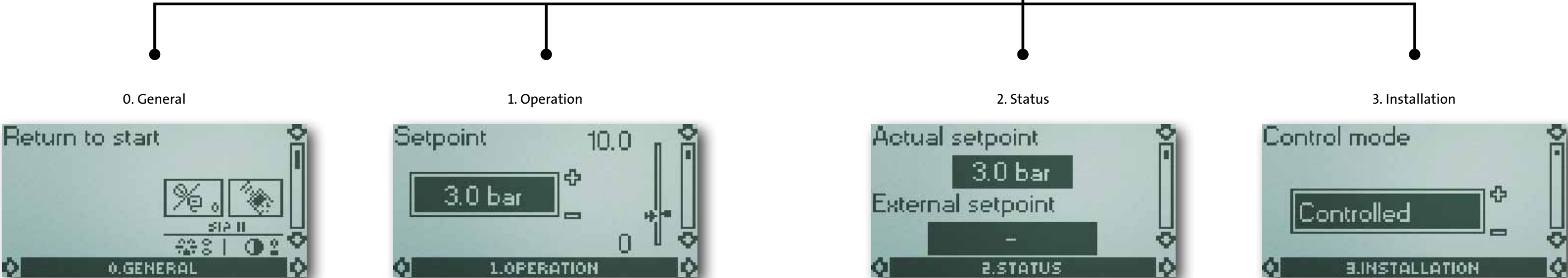
When new products with IR communication are released, or if the menu structure of an existing product changes, the R100 software must be updated. The USB port of the new R100 makes this update very easy as it can be done from a basic PC or laptop.

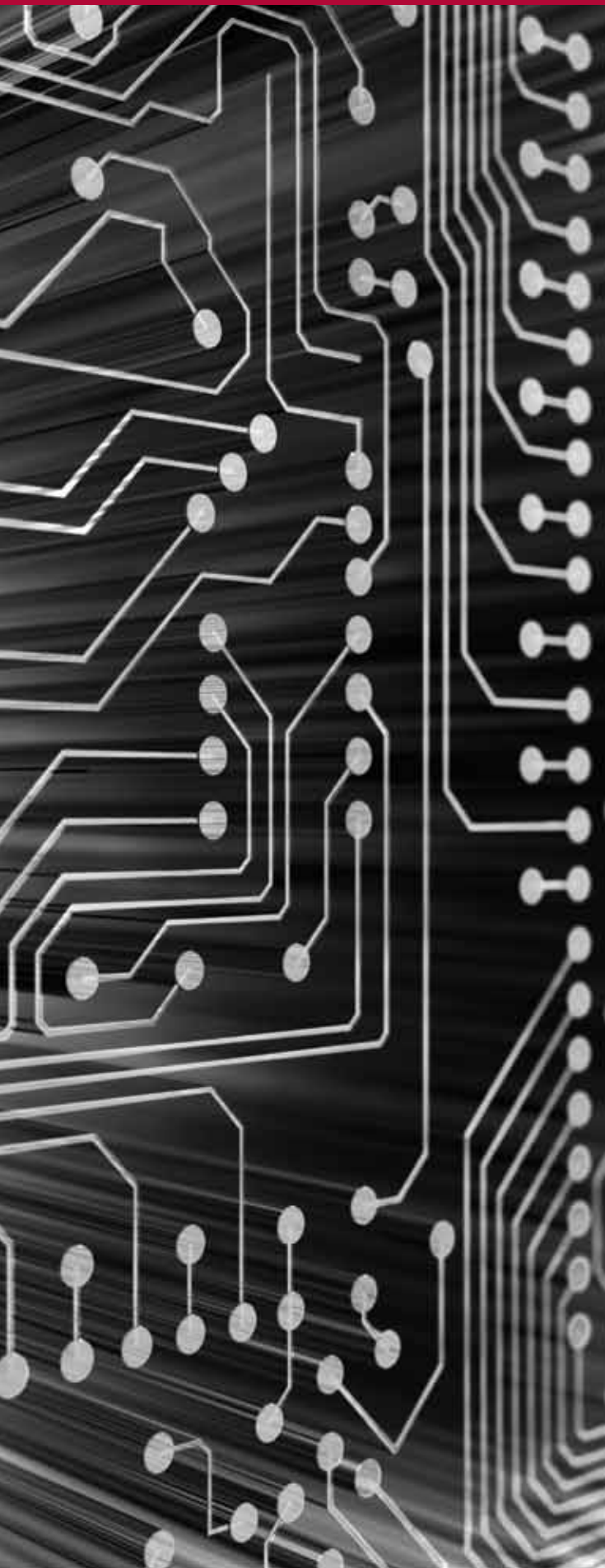
UNIQUE USER INTERFACE

The intuitive and easy-to-use R100 menu is divided into four sub-menus: General, Operation, Status, and Installation (see below).

All Grundfos pumps have the same unique user interface; so, regardless of the E-pump type you want to communicate with, the R100 menus will contain the exact same contents. The only exception is the Installation menu, which differs with each pump family.

The R100 can only communicate with one product at a time and will automatically detect the nearest Grundfos pump and display the appropriate menu.





E-PUMP SOLUTIONS FOR A RANGE OF APPLICATIONS

A COMPREHENSIVE RANGE OF STANDARD E-PUMP SOLUTIONS

Grundfos offers a wide range of standard E-pumps for almost any conceivable type of application. Whether the system is intended for heating, air-conditioning, water supply, pressure boosting, or processing systems in an industrial plant, an E-pump will improve the cost effectiveness of your operation.

CUSTOMIZED E-PUMP SOLUTIONS WHEN YOU NEED MORE THAN STANDARD


E-pumps are much more than just a standard range of pumps. Customized solutions where functions are changed, or extra functions are added, are also available. Pump curves can be stretched, inputs can be dedicated, other functions and special operating panels can be included, just to mention a few.

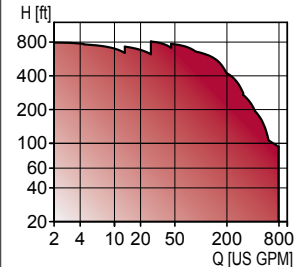
For professional users of E-pumps, like OEM customers, Grundfos provides a PC-based programming and monitoring tool.

When standard just isn't enough, then call on us for more details about customizing a solution to fit your particular need!



CRE(H), CRIE(H), CRNE(H) – Multi-Stage Centrifugal Pumps






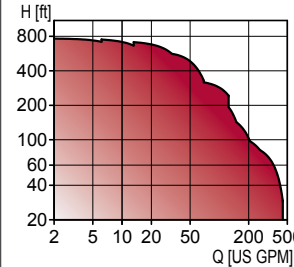
DATA
Flow, Q: max 790 gpm
Head, H: max 865 ft.
Liquid Temp.: -22°F to +248°F
Working Press.: max 435 psi

APPLICATIONS
These pumps are suitable for liquid transfer in:

- Washing systems
- Cooling systems
- Water supply systems
- Water treatment systems
- Fire fighting systems
- Boiler feed systems
- Industrial plants

MTRE – Multi-Stage Centrifugal Immersible Pumps






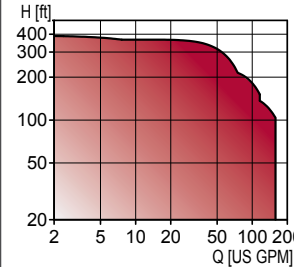
DATA
Flow, Q: max 450 gpm
Head, H: max 835 ft.
Liquid Temp.: -4°F to +194°F
Working Press.: max 435 psi

APPLICATIONS
These pumps are suitable for:

- Boiler feed systems
- Pumping of cooling lubricants
- Water treatment systems
- Temperature control
- Industrial washing machines

CME – Compact, Multi-Stage Centrifugal Pumps






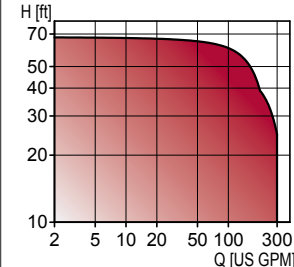
DATA
Flow, Q: max 158 gpm
Head, H: max 392 ft.
Liquid Temp.: -4°F to +248°F
Working Press.: max 232 psi

APPLICATIONS
These pumps are suitable for liquid transfer in:

- Cooling systems
- Industrial washing systems
- Aquafarms
- Fertilizer systems
- Dosing systems
- Industrial plants

TPE Series 2000 – Single-Stage Centrifugal Pumps (Differential Pressure Sensor Included)






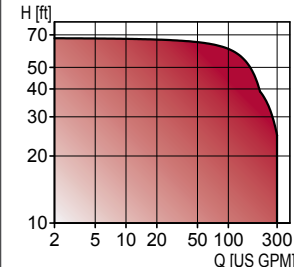
DATA
Flow, Q: max 300 gpm
Head, H: max 67 ft.
Liquid Temp.: +13°F to +284°F
Working Press.: max 165 psi

APPLICATIONS
These pumps are suitable for circulation of water in:

- Heating systems
- Domestic hot water systems
- Cooling and air conditioning systems

TPE Series 1000 – Single-Stage Centrifugal Pumps





DATA
Flow, Q: max 300 gpm
Head, H: max 67 ft.
Liquid Temp.: +13°F to +284°F
Working Press.: max 165 psi

APPLICATIONS
These pumps are suitable for liquid transfer in:

- District heating plants
- Cooling and air conditioning systems
- Industrial plants

TECHNICAL DATA

The E-pump family is divided into two groups with respect to power supply voltage and power range. The group of 1-phase pumps ranges from 0.3 hp to 1.5 hp, and the group of 3-phase pumps ranges from 1.0 hp to 30 hp.



Power Supply Range	Power Range for Pumps With	
+/- 10%, 60 Hz	2-Pole Motors	4-Pole Motors
1x208-230 V	0.5 - 1.5 hp	0.33 - 1.0 hp
3x208-230V	1.5 - 7.5 hp	
3x460-480 V	1.0 - 30 hp	

Analog Output	Yes
Built-In PID Controller	Yes
Sensor Input Signal	0/4-20 mA or 0-10 V 24 V supply for sensor is included.
External Setpoint Signal	0/4-20 mA or 0-10 V 10 V supply for setpoint potentiometer is included.
Start/Stop Input	Input for potential-free contact. Pump runs by closed contact.
Signal Relay	Potential-free signal relay is included. 15-30 hp pumps have two signal relays.
Interface to R100	All pumps can communicate with the Grundfos infrared (IR) R100 Remote Control.
RS485 Bus Interface	An RS485 Grundfos GENIbus is included. It provides for communication to Grundfos Controls and Gateways (15 - 30 hp pumps).
Enclosure Class	TEFC
EMC Immunity	All pumps comply with “The Electromagnetic Compatibility Directive 89/336/EEC” EN61800-3 for both the first and the second environment.
UL	The MLE is a UL-recognized component.

ACCESSORIES

SENSORS

Grundfos offers a number of sensors to be used in connection with E-pumps. All sensors are with 4-20 mA output signal.

- Pressure sensors – up to 870 psi
- Differential pressure sensors

CR(N/I) E-pumps can be delivered with a factory-mounted pressure sensor. TPE Series 2000 is delivered from the factory with an integrated differential pressure sensor.

R100 REMOTE CONTROL

The Grundfos R100 Remote Control provides access to a number of extended functions and possibilities for monitoring operating conditions such as power consumption and actual pressure value. The R100 has an intuitive, easy-to-use menu structure that makes commissioning and operation of the E-pumps user-friendly.

BUS COMMUNICATION/GATEWAYS

The 15-30 hp E-pumps are equipped with a standard RS485 GENIbus interface. E-pumps can also be delivered with:

- LonWorks
- Profibus
- Modbus
- GSM

As an accessory, we deliver gateways to convert from GENIbus to other bus standards.

The following external gateways are available:

The CIU family with the following possibilities:

- CIU 100:** for communication via LON
- CIU 150:** for communication via Profibus DP
- CIU 200:** for communication via Modbus RTU
- CIU 250:** for wireless communication via GSM, GPRS or SMS
- CIU 300:** for communication via BACnet MS/TP

OTHER ACCESSORIES

- Dry-running protection sensor LiqTec
- Control MPC – a multi-pump control system for parallel-connected E-pumps
- Potentiometer box for external setpoint setting
- Inlet pressure switch

E-SOLUTIONS WITH GRUNDFOS CUE

In cases where the E-pump program does not cover the desired pump type or performance area, or if you want to separate pump and electronics, then select a Grundfos CUE solution instead.

The CUE program covers supply voltages up to 690 V and power sizes up to 300 hp and can be used together with all Grundfos standard pumps. CUE offers the same functionality and user interface as the E-pumps.

All ranges and pump applications outside the E-pump range are covered by the Grundfos CUE solution with a wall-mounted frequency converter and a Grundfos standard fixed-speed pump (for more information, see the Grundfos CUE brochure Lit. No. L-IND-SL-03).



USA

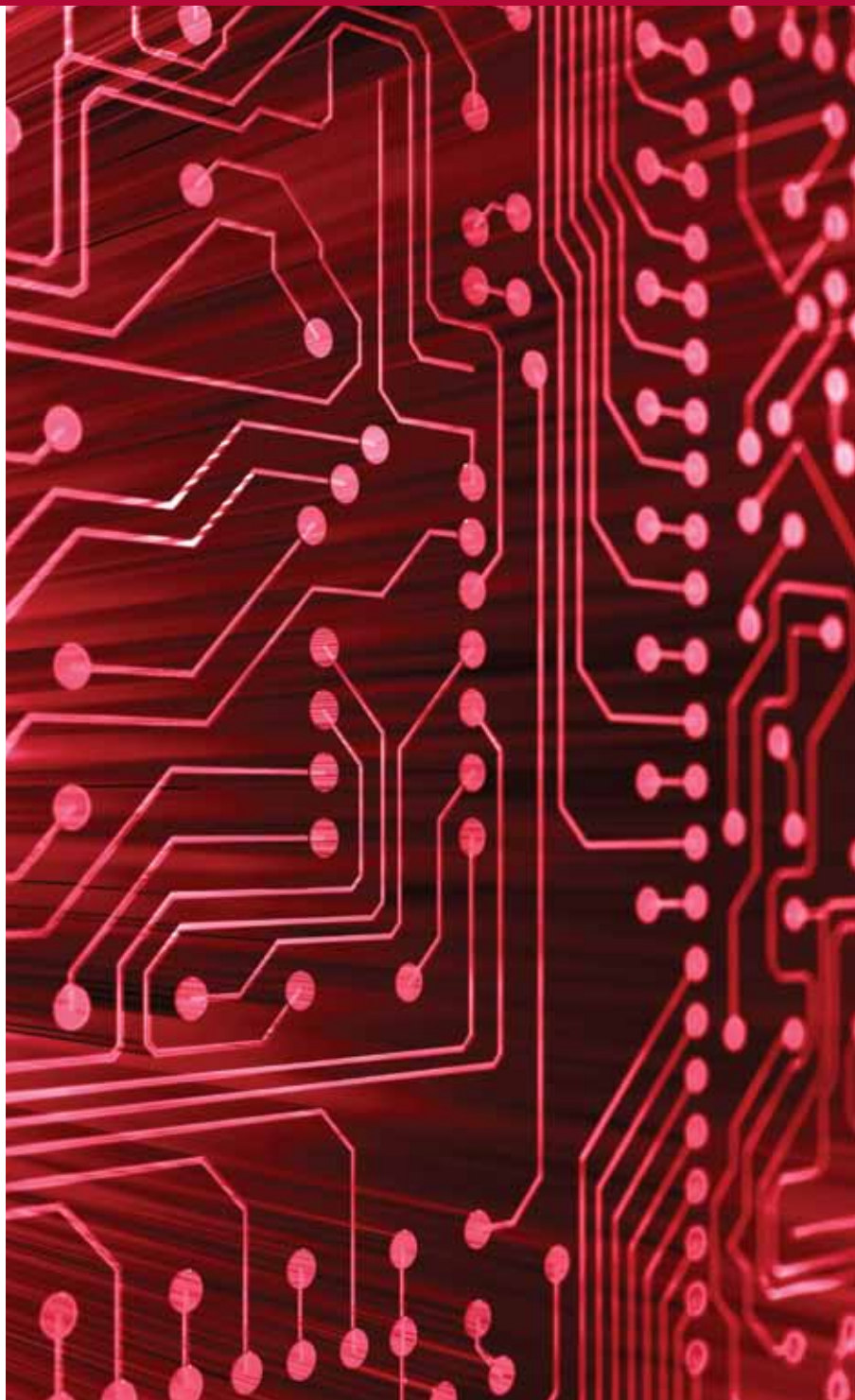
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L-IND-SL-02 • 02/12 (US)



Mixed Sources
Product group from well-managed
forests, controlled sources and
recycled wood or fibre
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