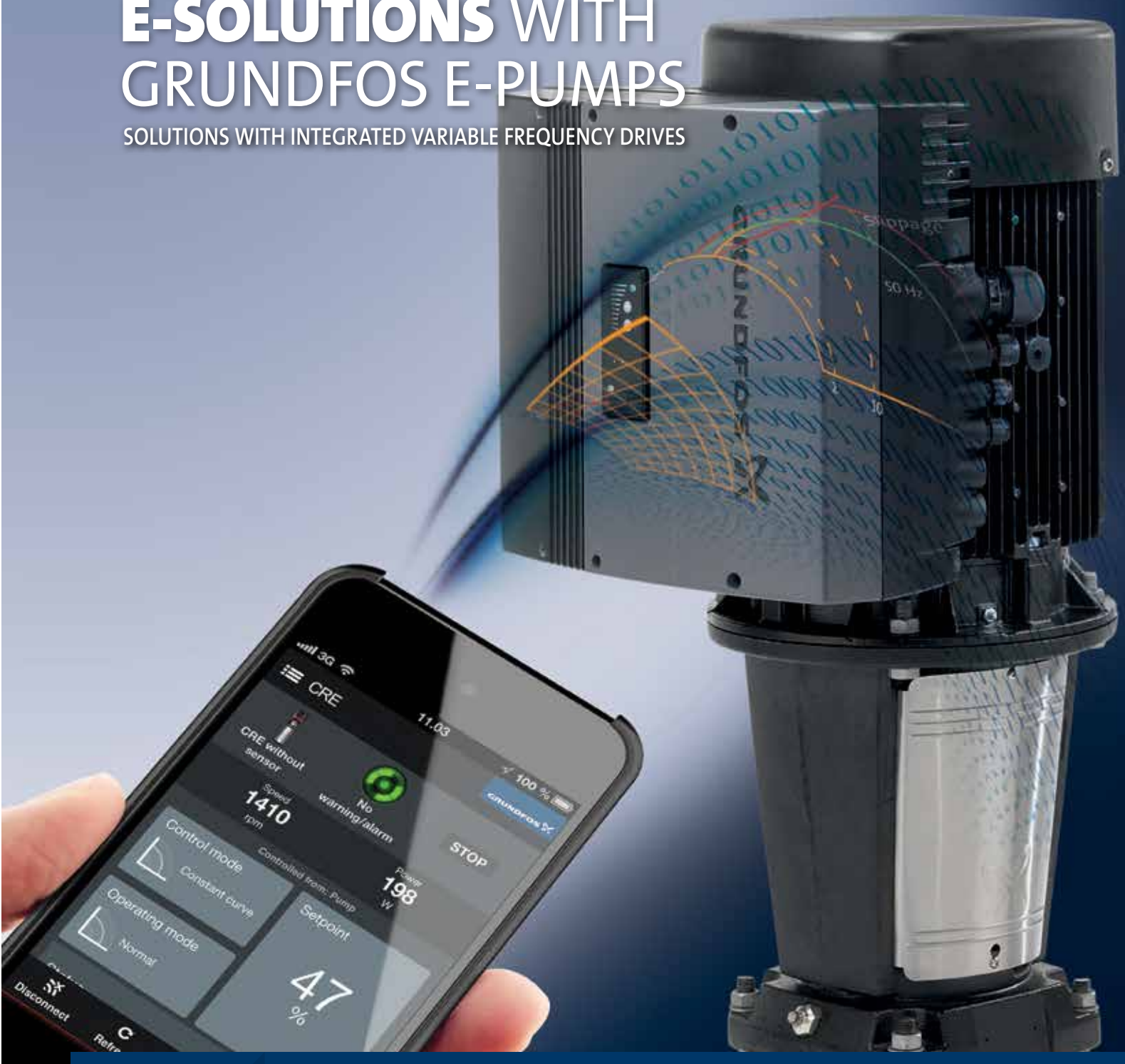
ALL-IN-ONE **E-SOLUTIONS** WITH GRUNDFOS E-PUMPS

SOLUTIONS WITH INTEGRATED VARIABLE FREQUENCY DRIVES



be
think
innovate

GRUNDFOS

GRUNDFOS E-PUMPS

–FOR A RANGE OF APPLICATIONS

The E in E-pump is synonymous with electronic control and energy savings. Using E-pumps in your systems, combined with the correct sizing and right control strategy, can achieve significant energy savings up to 60%. These savings are due to the pump performing based on demand. Grundfos is the first pump manufacturer in the world to offer a pump solution with built-in variable frequency drives.

BENEFITS INCLUDE:

- Energy and money savings due to on-demand performance
- Integrated pumps, motors, and Variable Frequency Drives (VFD) are all made by one supplier and are configured and interfaced for you
- Grundfos GO technology – control the pumps from your smart device
- "Plug and pump" technology for easy installation
- Reduced planning, purchasing, installation, commissioning, and wiring costs

A COMPREHENSIVE RANGE OF STANDARD E-PUMP SOLUTIONS

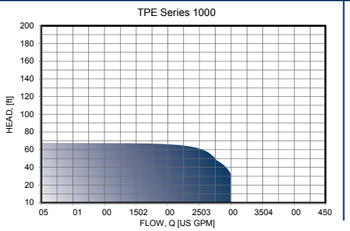
Grundfos offers a wide range of standard E-pumps for almost any conceivable type of application. Whether the system is intended for heating, air-conditioning, water supply, pressure boosting, or processing systems in an industrial plant, an E-pump will improve the cost effectiveness of your operation.

CUSTOMIZED E-PUMP SOLUTIONS

E-pumps are much more than just a standard range. Customized solutions where functions are changed or added are also available. MLE motors from 15-30 hp offer advanced functions such as motor bearings monitoring, which displays an automatic warning when it's time for relubrication or bearing replacement. If you want to monitor bearing temperature, the motor can alert you of overheating.

The E-pumps are also flexible in accessability options; either through the Grundfos GO technology via Apple or Android mobile devices, PC-based programming tools, or on the pump control panel itself.

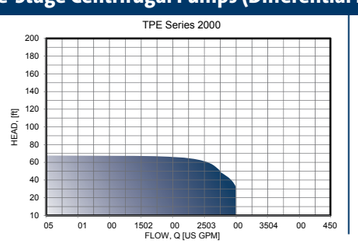
TPE Series 1000 – Single-Stage Centrifugal Pumps



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

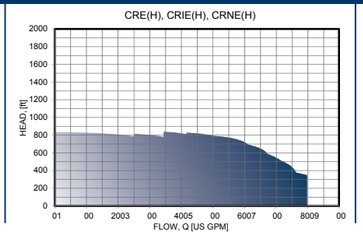
TPE Series 2000 – Single-Stage Centrifugal Pumps (Differential Pressure Sensor Included)



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

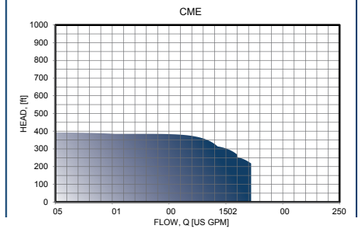
CRE(H), CRIE(H), CRNE(H) – Multi-Stage Centrifugal Pumps



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

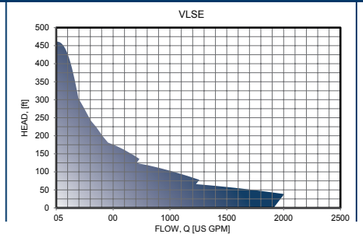
CME – Compact, Multi-Stage Centrifugal Pumps



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

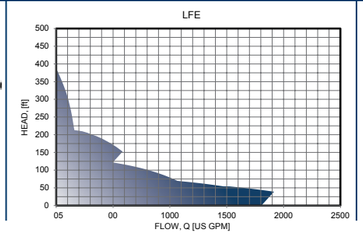
VLSE- In-line Split Coupled with Integrated VFD



DATA
Flow, Q: max 1,900 gpm
Head, H: max 405 ft.
Liquid Temp.: 10°F to 275°F
Working Press.: 175 psi *

APPLICATIONS
These pumps are suitable for liquid transfer in:
- Chilled water
- Condenser water
- Pressure boosting
- District Heating/Cooling
- Air Conditioning

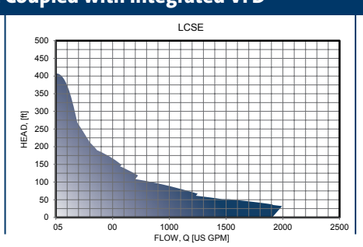
LFE- End Suction Freame Mounted with Interated VFD



DATA
Flow, Q: max 1,900 gpm
Head, H: max 380 ft.
Liquid Temp.: 10°F to 275°F
Working Press.: 175 psi *

APPLICATIONS
These pumps are suitable for liquid transfer in:
- Chilled water
- Condenser water
- Air Conditioning
- District Heating/Cooling
- Hot water

LCSE- End Suction Split Coupled with Integrated VFD



DATA
Flow, Q: max 1,900 gpm
Head, H: max 380 ft.
Liquid Temp.: 10°F to 275°F
Working Press.: 175 psi *

APPLICATIONS
These pumps are suitable for liquid transfer in:
- Chilled water
- Condenser water
- Pressure boosting
- District Heating/Cooling
- Air Conditioning

* 250 psi rating also available

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 variable frequency drive 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 integrated variable frequency drive 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.

BENEFITS OF AN MLE MOTOR

- 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 integrated variable frequency drive)
- Integrated variable frequency drive cooling by motor fan

THE VIRTUES OF A BUILT-IN DRIVE

A variable-speed solution with a separate integrated variable frequency drive 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.

Key benefits to having an E-pump with MLE motor compared to a separate integrated variable frequency drive 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 integrated variable frequency drive 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

ACCESSORIES

SENSORS

Grundfos Direct Sensor program offers a number of Transmitters to be used in connection with E-pumps. These can be delivered with 4-20mA or 0-10 V

- Pressure Transmitter up to 362 psi
- Differential Pressure Transmitter up to 232 psi
- Flow Sensor up to 1060 gpm

Another feature is the pressure and differential pressure transmitter that can be delivered with integrated temperature functions, thus giving the benefit of 2:1 solution flow sensor.

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

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
- Modbus
- BACnet
- Profibus
- GSM

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

The CIU family with the following possibilities:

CIU 100: For communication via LON

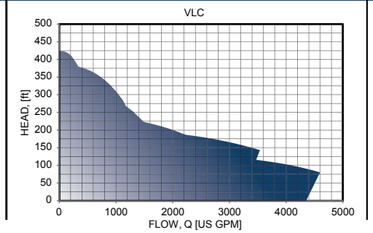
CIU 150: For communication via Profibus DP

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

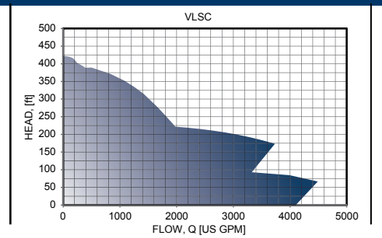
VLC- In-line with CUE drive



DATA
Flow, Q: max 4,100 gpm
Head, H: max 420 ft.
Liquid Temp.: 10°F to 275°F
Working Press.: 175 psi *

APPLICATIONS
These pumps are suitable for liquid transfer in:
- District heating plants
- Cooling and air conditioning systems
- Industrial plants

VLSC- In-line Split Coupled with CUE drive



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* 250 psi rating also available

GRUNDFOS GO

A world of data in the palm of your hand

Grundfos GO is the market's most comprehensive platform for mobile pump control and pump selection. With that in your hand you are ready to save valuable time on everything from commissioning, data collection and reporting to sizing and replacement. All while on the go.

FEATURES OF THE GRUNDFOS GO

- Control and monitor all relevant pump data, group pumps for increased manageability, and change settings using any Apple or Android wireless device
- Product Dashboard view for help in installation, commissioning, operation, service, and maintenance of all Grundfos E-pumps
- User-friendly interface works using both radio and infrared technology
- Easy-to-follow tips and guidance as well as live pump data feeds such as duty point, power consumption, speed, and temperature
- Detailed alarm log system with time stamps that makes error codes fully descriptive and intuitive
- Grundfos Go WebCAPS app provides online sizing and replacement tools
- View and modify pump curves and other data on-site
- On-site generation of PDF reports that can be signed and sent live, along with photo documentation for illustration

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 2 hp, and the group of 3-phase pumps ranges from 1.0 hp to 30 hp.

Power Supply Range	Power Range by Pumps			
+/- 10%, 60 Hz	2-Pole Motors		4-Pole Motors	
	CRE/CME/TPE	LFE/LCSE/VLSE	TPE	LFE/LCSE/VLSE
1x208-230 V	0.5 - 2 HP	—	0.33 - 1.0 HP	—
3x208-230 V	1.5 - 7.5 HP	3-7.5 HP	—	3-7.5 HP
3x460-480 V	1.0 - 30 HP	3-30 HP	—	3-25 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 Grundfos GO	All pumps can communicate with the Grundfos infrared (IR) and Radio communication via Grundfos GO.
IRS485 Bus Interface	An RS485 Grundfos GENIbus is included. It provides for communi - cation to Grundfos Controls and Gateways (15 - 30 hp pumps).
Enclosure Class	TEFC
EMC Immunity	All pumps comply with "The Electro-magnetic Compatibility Directive 89/336/EEC" EN61800-3 for both the first and the second environment.
UL	The MLE is a UL-recognized component.

CONSTANT - YOU CONTROL IT!

Proportional Differential Pressure - the E-pump maintains a straight line between the set point and half of the set point at closed valve conditions.

Constant Pressure *with a stop function* - maintains a constant pressure, except at low flow. At low flow, the E-pump operates in an on/off mode.

Constant Pressure *without a stop function* - maintains a constant pressure, regardless of flow rate.

Constant Differential Pressure - maintains a constant differential pressure regardless of flow rate.

Constant Temperature

Constant Flow - maintains a constant flow rate regardless of the pressure

Constant Level

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.

Efficiency meets innovation to create astounding electricity savings

Putting sustainability first, Grundfos has initiated “Meet the Energy Challenge NOW”. The purpose of this initiative is to position pumps on the global climate agenda and to make a wide range of stakeholders within different industries aware of the fact that energy savings and CO_2 reductions can be obtained by implementing already available technology. Pumps represent a massive and hidden potential for savings, in both energy and cost. With 10% of the world’s electricity consumption used for pumps, optimisation of pump systems evidently represents untapped potential. As a matter of fact it is possible to save as much as 4% of the world’s electricity consumption if everybody switches to high efficiency pump systems.

As the pioneers of this agenda, motors and variable frequency drives (VFD) exhibit minimal electricity usage while ensuring top-of-the-line performance and reliability. Grundfos is always working on advancements in integrated motor technology, and will continuously deliver the very highest possible level of efficiency.

Explore the complete Grundfos portfolio at
www.grundfos.us

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