

## CRT, CRTE

Vertical multistage centrifugal pumps in titanium  
60 Hz



# Contents

|   |    |                                 |    |
|---|----|---------------------------------|----|
| <b>Mission</b>                                | 3  | <b>Motors</b>                   |    |
|   |    | Grundfos specified TEFC motors  | 24 |
| <b>Product introduction</b>                   |    | MLE motors                      | 25 |
| Introduction                                  | 4  | <b>Pumped liquids</b>           |    |
| Applications                                  | 4  | Pumped liquids                  | 26 |
|   |    | Corrosion resistance for CRT(E) | 26 |
| <b>Product overview</b>                       |    | <b>Accessories</b>              |    |
| Pump  | 5  | Pipework connection             | 27 |
| Motors  | 5  | PJE couplings for CRT(E)        | 27 |
| Grundfos standard motors -                    |    | ANSI flange adapter for CRT(E)  | 27 |
| ML and Baldor® motors                         | 5  |                                 |    |
| Frequency-controlled motors - MLE motors      | 5  | <b>Variants</b>                 |    |
| Electrical data                               | 5  | Lists of variants - on request  | 28 |
| Optional motors                               | 5  | Motors                          | 28 |
| Motor protection                              | 5  | Shaft seals                     | 28 |
| Terminal box positions                        | 5  | Pumps                           | 28 |
| Performance range                             | 6  |                                 |    |
| Product range                                 | 7  | <b>Submittal data</b>           | 29 |
| <b>Identification</b>                         |    |                                 |    |
| Type key                                      | 8  | <b>Quotation text</b>           | 31 |
| <b>Construction</b>                           |    | <b>Further documentation</b>    |    |
| Sectional drawing                             | 9  | WebCAPS                         | 33 |
| Materials                                     | 9  | WinCAPS                         | 34 |
| <b>Operating conditions</b>                   |    |                                 |    |
| Operating conditions                          | 10 |                                 |    |
| Maximum inlet pressure                        | 10 |                                 |    |
| Maximum operating pressure                    | 10 |                                 |    |
| <b>Selection and sizing</b>                   |    |                                 |    |
| Selection of pumps                            | 11 |                                 |    |
| WinCAPS® and WebCAPS®                         | 12 |                                 |    |
| Inlet pressure and operating pressure         | 13 |                                 |    |
| Minimum inlet pressure - NPSH                 | 14 |                                 |    |
| How to read the curve charts                  | 15 |                                 |    |
| Guidelines to performance curves              | 15 |                                 |    |
| <b>Performance curves/<br/>technical data</b> |    |                                 |    |
| CRT, CRTE 2                                   | 16 |                                 |    |
| CRT, CRTE 4                                   | 18 |                                 |    |
| CRT, CRTE 8                                   | 20 |                                 |    |
| CRT, CRTE 16                                  | 22 |                                 |    |

# Mission

It is our mission — the basis of our existence — to successfully develop, produce and sell high-quality pumps and pumping systems worldwide, contributing to a better quality of life and a healthy environment



Bjerringbro, Denmark



Fresno, California



Olathe, Kansas



Monterrey, Mexico



Allentown, Pennsylvania



Oakville, Ontario

- World's leading pump company
- World's largest manufacturer of circulator pumps, covering more than 50% of the global market
- World headquarters in Denmark
- North American headquarters in Kansas City; manufacturing in Fresno, California
- 80 companies in 45 countries
- More than 16 million motors and pumps produced annually worldwide
- North American companies operating in USA, Canada and Mexico
- Continuous reinvestment in growth and development enables the company to **BE** responsible, **THINK** ahead, and **INNOVATE**

## Introduction

The CRT and CRTE pumps are non-self-priming, vertical multistage centrifugal pumps. The pumps are available with Grundfos standard motors (CRT pumps) or frequency-controlled motors (CRTE pumps). Reliable and cost efficient, CRT and CRTE pumps handle a variety of liquids from sea water to sodium hypochlorite. In CRT and CRTE pumps, all components in contact with the pumped liquid are constructed of titanium.

### Excellent corrosion resistance

Titanium is widely used for many industrial applications due to its high resistance to corrosion.

Totally unaffected by corrosive attacks by salt water or marine atmospheres, titanium also has an exceptional resistance to a wide range of acids, alkalies, natural water and industrial chemicals.

The fine corrosion resistance of titanium is due to a stable, protective and strongly adherent oxide film, formed instantly on the metal when a fresh surface is exposed to air or moisture.



GR7369

Fig. 1 CRT pumps

## Applications

Reliable and cost-efficient, CRT pumps handle a variety of liquids from sea water to sodium hypochlorite.

CRT and CRTE pumps are suitable for these types of applications:

### Marine environment

- Ballast pumps
- washing/cleaning.

### Pulp and paper industries

- Bleaching solutions

### Offshore industries and refineries

- Fire fighting
- cooling
- metal-finishing industries (electroplating)
- copper chloride etching
- ammonium chloride etching.

### Power generation plants

- FGD (Flue Gas Desulphurization)

### Food processing, brewing and pharmaceutical industries

- CIP (Cleaning In Place)
- disinfection.

### Desalination industries

- Reverse osmosis
- distillation.

### Chemical processing industries

- Chlorine and chlorates
- organic acids
- oxidizing acids (nitric acid, chromic acid)
- chloride-containing salts (ferric chloride)
- inhibited reducing acids.

### Other

- Fish farming
- aquariums
- water parks.

## Pump

The pump consists of a base and a pump head. The chamber stack and the outer sleeve are secured between the pump head and the base by means of staybolts. The base has suction and discharge ports on the same level (in-line).

All pumps are equipped with a maintenance-free mechanical shaft seal.

## Motors

### Grundfos standard motors - ML and Baldor® motors

CRT pumps are fitted with Grundfos specified motors. The motors are all heavy-duty 2-pole, energy efficient NEMA frame, C-face motors.

### Frequency-controlled motors - MLE motors

CRTE pumps are fitted with totally enclosed, fan-cooled, 2-pole frequency-controlled motors.




From 0.5 Hp to 1.5 Hp Grundfos offers CRTE pumps fitted with single-phase MLE motors (1 x 208-230 V).

From 1.5 Hp to 7.5 Hp Grundfos offers CRTE pumps fitted with three-phase MLE motors (3 x 208 x 230).

From 1.0 Hp to 10 Hp Grundfos offers CRTE pumps fitted with three-phase MLE motors (3 x 460-480 V).

## Electrical data

|                             |   |
|-----------------------------|---|
| <b>Mounting designation</b> | NEMA  |
| <b>Insulation class</b>     | F/B/H   |
| <b>Efficiency class*</b>    | Energy efficient<br>Premium efficiency - on request for 15 Hp and above |
| <b>Enclosure class</b>      | TEFC - Totally Enclosed Fan Cooled                                      |
| <b>60 Hz</b>                | 1 x 115/208-230 V   |
| <b>Standard voltages</b>    | 3 x 208-230/460 V<br>3 x 575 V  |

|                  |   |
|------------------|---|
| <b>Approvals</b> | <br><br> |
|------------------|---|

\* 1 - 10 Hp ML motors are premium efficient as standard.

## Optional motors

The Grundfos standard range of motors covers a wide variety of application demands. However, for special applications or operating conditions, custom-built motor solutions can be provided.

For special applications or operating conditions, Grundfos offers custom-built motors such as:

- explosion proof motors
- motors with anti-condensation heating units
- low-noise motors
- premium efficiency motors
- motors with thermal protection.

## Motor protection

Single-phase Grundfos specified motors have built-in thermal overload switches (up to 7.5 Hp).

Three-phase motors must be connected to motor starters in accordance with local regulations.

Single- and three-phase MLE motors have built-in thermal protection.

## Terminal box positions

As standard the terminal box is mounted on the suction side of the pump.

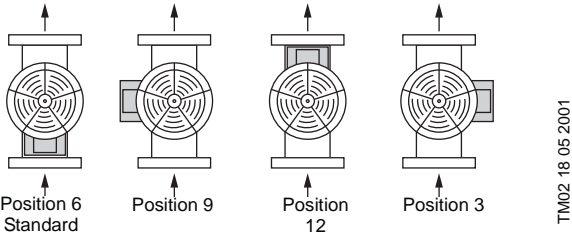
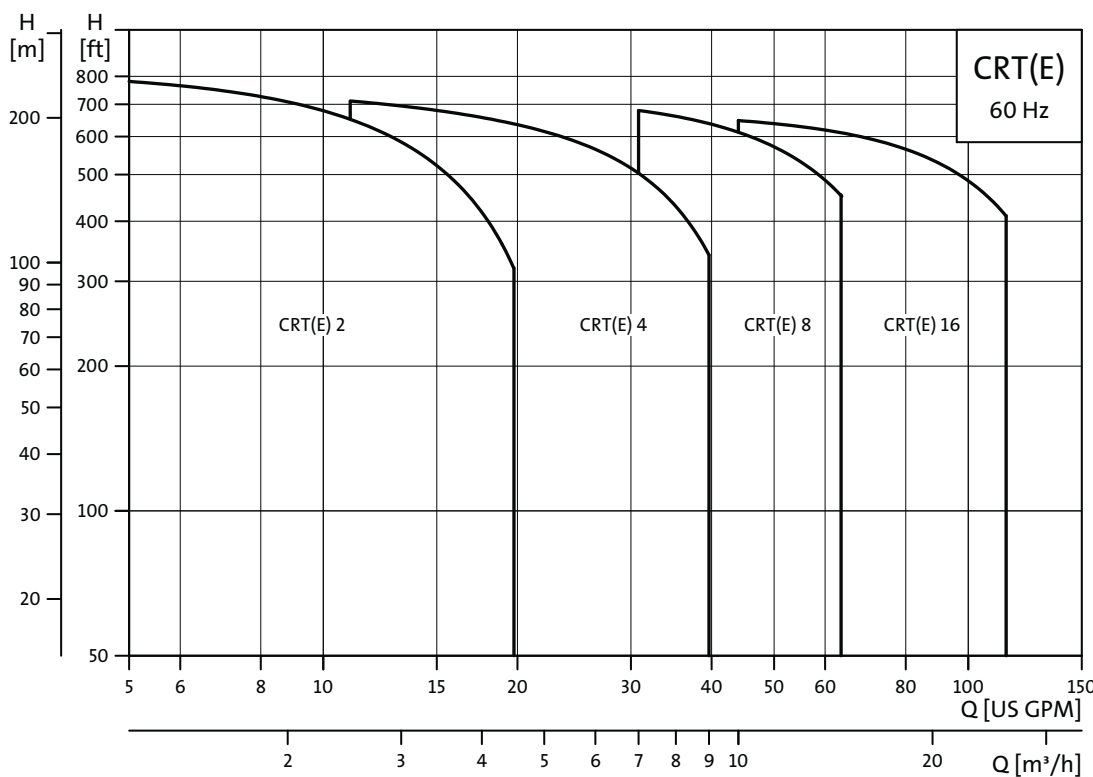


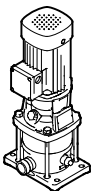
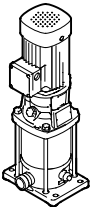
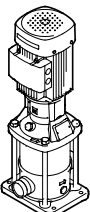
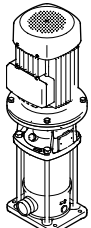
Fig. 2 CRT, CRTE terminal box positions

Performance range



TM02 8328 4903

## Product range

|   |   |                |   |                |   |                |   |                |
|---|---|----------------|---|----------------|---|----------------|---|----------------|
|   |  | TM02 7184 2703 |  | TM02 7331 3203 |  | TM02 7185 2703 |  | TM02 7195 2803 |
| <b>Description</b>                            | <b>CRT(E) 2</b>   |                | <b>CRT(E) 4</b>   |                | <b>CRT(E) 8</b>   |                | <b>CRT(E) 16</b>  |                |
| <b>Range</b>                                  |   |                |   |                |   |                |   |                |
| Nominal flow rate [US gpm (m <sup>3</sup> h)] | 13 (2.9)  |                | 30 (6.8)  |                | 50 (11.3)   |                | 80 (18.1)   |                |
| Max. operating pressure [psi (bar)]           | 362 (25)  |                | 362 (25)  |                | 362 (25)  |                | 362 (25)  |                |
| Temperature range [°F (C °)]                  | -4 to +248<br>(-20 to +120)   |                | -4 to +248<br>(-20 to +120)   |                | -4 to +248<br>(-20 to +120)   |                | -4 to +248<br>(-20 to +120)   |                |
| Maximum efficiency [%]                        | 48  |                | 59  |                | 64  |                | 70  |                |
| Flow range [US gpm (m <sup>3</sup> h)]        | 1.3 to 20<br>(.3 to 4.5)  |                | 3 to 40<br>(.7 to 9.0)  |                | 5 to 64<br>(1.1 to 14.5)  |                | 8 to 114<br>(1.8 to 25.9)   |                |
| Motor power range [Hp]                        | 0.5 to 5  |                | 0.5 to 7.5  |                | 0.75 to 15  |                | 5 to 25   |                |
| <b>Pipework connection</b>                    |   |                |   |                |   |                |   |                |
| PJE (victaulic type) coupling                 | 1.25"   |                | 1.25"   |                | 2"  |                | 2"  |                |
| ANSI flange adapter - on request              | -   |                | -   |                | 2"  |                | 2"  |                |

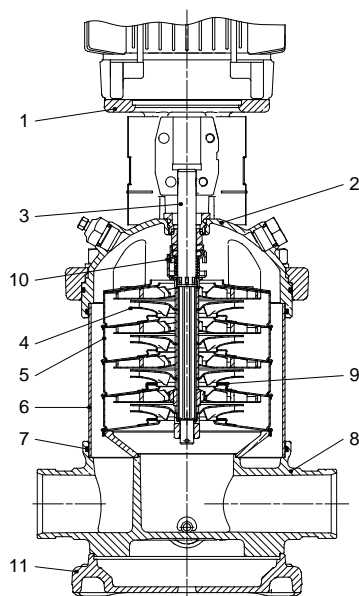


## Type key

| Example   | CR | T | E | 16 | - | 3 | A | - | P | - | A | - | E | AUUE |
|---|----|---|---|----|---|---|---|---|---|---|---|---|---|------|
| Pump range  |    |   |   |    |   |   |   |   |   |   |   |   |   |      |
| Version with vital parts in titanium                                      |    |   |   |    |   |   |   |   |   |   |   |   |   |      |
| Pump with integrated frequency control                                    |    |   |   |    |   |   |   |   |   |   |   |   |   |      |
| Nominal flow rate [m³/h]  |    |   |   |    |   |   |   |   |   |   |   |   |   |      |
| Number of impellers   |    |   |   |    |   |   |   |   |   |   |   |   |   |      |
| Code for pump version   |    |   |   |    |   |   |   |   |   |   |   |   |   |      |
| Code for pipework connection  |    |   |   |    |   |   |   |   |   |   |   |   |   |      |
| Code for materials, excl. plastic and rubber parts<br>(A = basic version) |    |   |   |    |   |   |   |   |   |   |   |   |   |      |
| Code for neck ring material   |    |   |   |    |   |   |   |   |   |   |   |   |   |      |
| Code for shaft seal and plastic/rubber parts,<br>excl. neck ring          |    |   |   |    |   |   |   |   |   |   |   |   |   |      |



## Sectional drawing



TM02 7196 2803

## Materials

| Pos. | Description             | Materials                         | EN/DIN | AISI/ASTM                  |
|------|-------------------------|-----------------------------------|--------|----------------------------|
| 1    | Pump head               | Stainless steel                   | 1.4308 | CF 8<br>(eq. to AISI 304)  |
| 2    | Pump head cover         | Titanium (cast)                   | - NA - | Grade 5                    |
| 3    | Shaft                   | Titanium                          | 3.7165 | Grade 5                    |
| 4    | Impeller                | Titanium                          | 3.7025 | Grade 1                    |
| 5    | Intermediate chamber    | Titanium                          | 3.7025 | Grade 1                    |
| 6    | Outer sleeve            | Titanium                          | 3.7035 | Grade 1                    |
| 7    | O-ring for outer sleeve | EPDM or FKM                       |        |                            |
| 8    | Base                    | Titanium (cast)                   | - NA - | Grade 5                    |
| 9    | Neck ring               | PTFE                              |        |                            |
| 10   | Shaft seal              | AUUE/AUUV <sup>1)</sup>           |        |                            |
| 11   | Base plate              | Stainless steel                   | 1.4408 | CF 8M<br>(eq. to AISI 316) |
|      | Rubber parts in pump    | Same as in shaft seal<br>EPDM/FKM |        |                            |
|      | Bearing rings           | Silicon carbide                   |        |                            |
|      | Plugs                   | Titanium                          | 3.7165 | Grade 2                    |
|      | Staybolts               | Stainless steel                   |        | AISI 431                   |
|      | Strap (CRT 8/16)        | Titanium                          | 3.7035 | Grade 2                    |

- NA - : Standard not available

1) : Standard is hastelloy C-276 / Binderless tungsten carbide / EPDM or FKM.

Shaft seal with titanium metal parts, silicon carbide/silicon carbide/ E/V/K available on request.

## Operating conditions

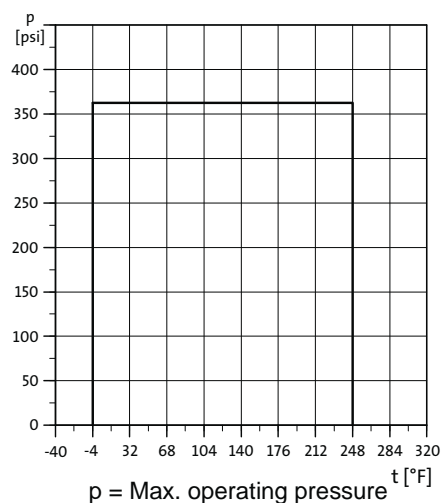
| Description            | Operating conditions  |
|------------------------|---|
| Liquid temperature     | EPDM:<br>-4 °F to +248 °F (-20 °C to +120 °C)                                     |
|                        | FKM:<br>-4 °F to +194 °F (-20 °C to 90 °C)  |
| Ambient temperature    | Maximum +104°F (40 °C)  |
| Minimum inlet pressure | According to the NPSH <sub>R</sub> curve + a safety margin of minimum 2 ft (.6 m) |

## Maximum inlet pressure

The following table shows the maximum permissible inlet pressure. However, the actual inlet pressure + pressure against a closed valve must always be lower than the maximum permissible operating pressure.

| 60 Hz               |                  |
|---------------------|------------------|
| CRT(E) 2-2 → 2-6    | 145 psi (10 bar) |
| CRT(E) 2-7 → 2-18   | 217 psi (15 bar) |
| CRT(E) 4-1 → 4-7    | 145 psi (10 bar) |
| CRT(E) 4-8 → 4-16   | 217 psi (15 bar) |
| CRT(E) 8-1 → 8-16   | 145 psi (10 bar) |
| CRT(E) 16-2 → 16-12 | 145 psi (10 bar) |

## Maximum operating pressure



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**Fig. 3** Operating pressure and temperature limits

Note: Liquid temperatures above +194°F (90 °C) may involve the risk of periodic noise from the shaft seal.

## Selection of pumps

Selection of pumps should be based on

- The duty point of the pump (see section 1)
- Sizing data such as pressure loss as a result of height differences, friction loss in the pipework, pump efficiency etc. (see section 2)
- Pump materials (see section 3)
- Pump connections (see section 4)
- Shaft seal (see section 5).

### 1. Duty point of the pump

From a duty point it is possible to select a pump on the basis of the curve charts shown in section *Performance curves / Technical data* from pages 16 to 23.

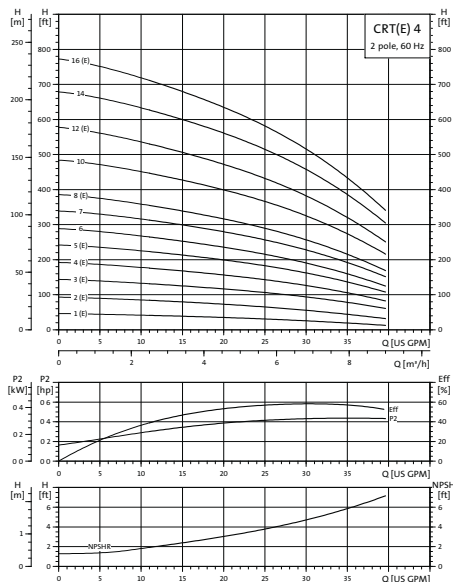


Fig. 4 Example of a curve chart

### 2. Sizing data

When sizing a pump the following must be taken into account (see Fig. 7).

- Required flow and pressure at the point of use.
- Pressure loss as a result of height differences ( $H_{geo}$ ).
- Friction loss in the pipework ( $H_f$ ). It may be necessary to account for pressure loss in connection with long pipes, bends or valves, etc.
- Best efficiency at the estimated duty point.
- NPSH value. For calculation of the NPSH value, see "Minimum inlet pressure - NPSH" page 14.

### Efficiency

Before determining the point of best efficiency, the operation pattern of the pump needs to be identified. If the pump is expected to operate at the same duty point, then select a CRT(E) pump which is operating at a duty point corresponding with the best efficiency of the pump.

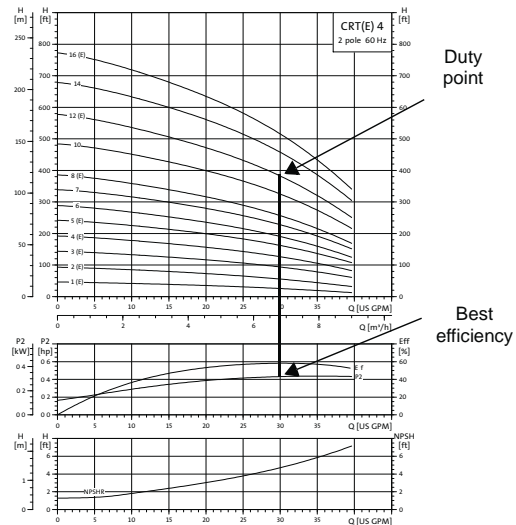


Fig. 5 Example of a CRT(E) pump's duty point

As the pump is sized on the basis of the highest possible flow, it is important to always have the duty point to the right of the optimum efficiency point (see fig. Fig. 6, range with check mark). This must be considered in order to keep efficiency high when the flow drops.

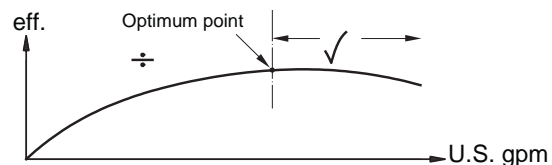


Fig. 6 Best efficiency

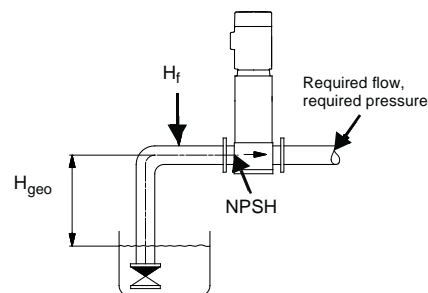


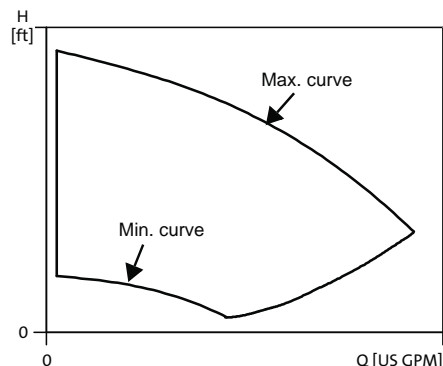
Fig. 7 Sizing data

Normally, E-pumps are used in applications characterized by a variable flow. Consequently, it is not possible to select a pump that is constantly operating at optimum efficiency.

In order to achieve optimum operating economy, the pump should be selected on the basis of the following criteria:

- The max. required duty point should be as close as possible to the QH curve of the pump.
- The required duty point should be positioned so that  $P_2$  is close to the max. point of the 100% curve.

Between the min. and max. performance curve E-pumps have an infinite number of performance curves each representing a specific speed. Therefore it may not be possible to select a duty point close to the 100% curve.



**Fig. 8** Min. and max. performance curves

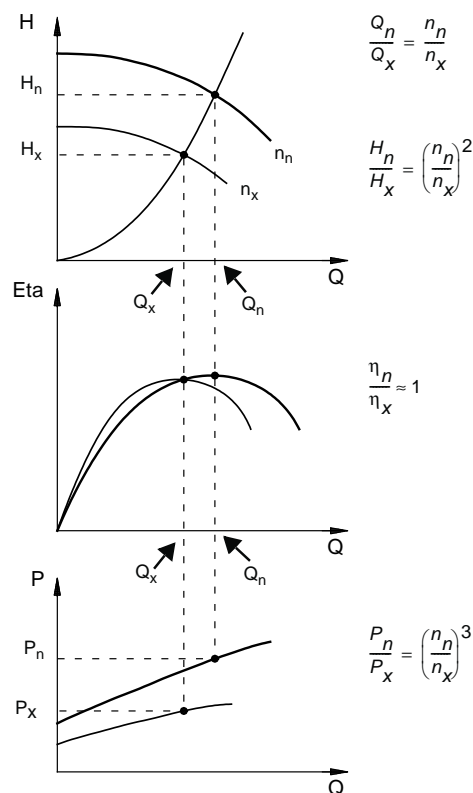
In situations where it is not possible to select a duty point close to the 100% curve the affinity equations to the right can be used. The head (H), the flow (Q) and the input power (P) are all the appropriate variables for the motor speed (n).

Note:

The approximated formulas apply on condition that the system characteristic remains unchanged for  $n_n$  and  $n_x$  and that it is based on the formula  $H = k \times Q^2$ , where k is a constant.

The power equation implies that the pump efficiency is unchanged at the two speeds. In practice this is not quite correct.

Finally, it is worth noting that the efficiencies of the frequency converter and the motor must be taken into account if a precise calculation of the power saving resulting from a reduction of the pump speed is wanted.



**Fig. 9** Affinity equations

## Legend

|          |  |
|----------|--|
| $H_n$    | Rated head in feet   |
| $H_x$    | Current head in feet   |
| $Q_n$    | Rated flow in US gpm   |
| $Q_x$    | Current flow in US gpm   |
| $n_n$    | Rated motor speed in $\text{min}^{-1}$ ( $n_n = 3500 \text{ min}^{-1}$ ) |
| $n_x$    | Current motor speed in $\text{min}^{-1}$                                 |
| $\eta_n$ | Rated efficiency in %  |
| $\eta_x$ | Current efficiency in %  |

## WinCAPS® and WebCAPS®

WinCAPS and WebCAPS are both selection programs offered by Grundfos.

The two programs make it possible to calculate an E-pump's specific duty point and energy consumption.

By entering the sizing data of the pump, WinCAPS and WebCAPS can calculate the exact duty point and energy consumption. For more information about WinCAPS or WebCAPS see *Further documentation* on page 33.

### 3. Material

The material variant should be selected based on the liquid to be pumped.

### 4. Pump connection

Selection of pump connection depends on the rated pressure and pipework. To meet any requirement the CRT(E) pumps offer the following connections:

- PJE coupling - see Fig. 11
- ANSI adapter  
(CRT 8 and CRT 16 only - sold separately)

### 5. Shaft seal

As standard, the CRT(E) range is fitted with a Grundfos type A shaft seal suitable for the most common applications, see Fig. 12.

In service situations Grundfos type A shaft seals can be replaced without dismantling the pump head.

The following three key parameters must be taken into account, when selecting the shaft seal:

- Type of pumped liquid
- liquid temperature
- maximum pressure.

### Inlet pressure and operating pressure

The limit values stated on page 10 must not be exceeded as regards ...

- maximum inlet pressure and
- maximum operating pressure.

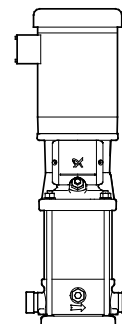


Fig. 10 CRT pump

TM02 9594 3404

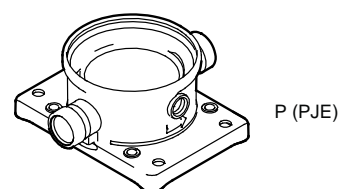


Fig. 11 Pump connections

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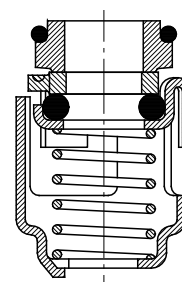


Fig. 12 Shaft seal

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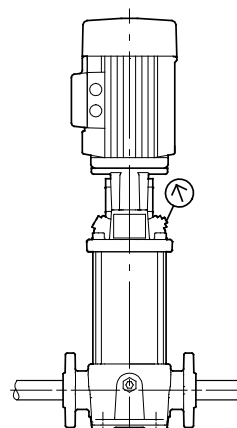


Fig. 13 Inlet and operating pressure

TM02 1204 0601

## Minimum inlet pressure - NPSH

Calculation of the inlet pressure "H" is recommended when ....

- the liquid temperature is high
- the flow is significantly higher than the rated flow
- water is drawn from depths
- water is drawn through long pipes
- inlet conditions are poor.

To avoid cavitation, make sure that there is a minimum pressure on the suction side of the pump. The maximum suction lift "H" in feet can be calculated as follows:

$$H = p_b - \text{NPSH} - H_f - H_v - H_s$$

$p_b$  = Barometric pressure in feet absolute.  
(Barometric pressure can be set to 33.9 ft at sea level).  
In closed systems,  $p_b$  indicates the system pressure in feet.

NPSH= Net Positive Suction Head in feet.  
(To be read from the NPSH curve at the highest flow the pump will be delivering).

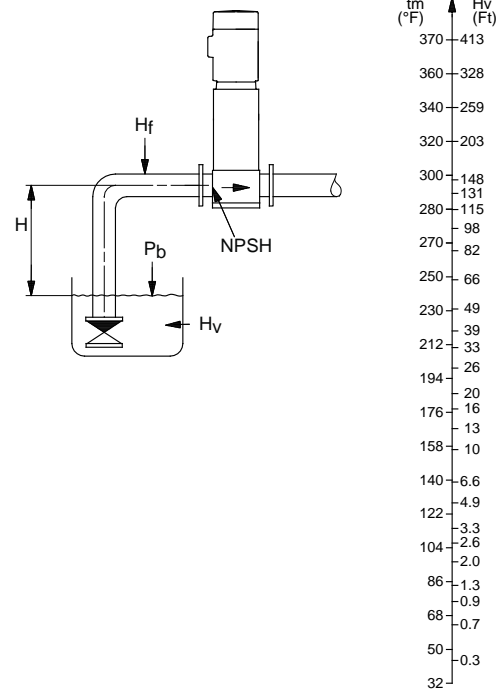
$H_f$  = Friction loss in suction pipe in feet.  
(At the highest flow the pump will be delivering.)

$H_v$  = Vapor pressure in feet.  
(To be read from the vapor pressure scale.  
"H<sub>v</sub>" depends on the liquid temperature "T<sub>m</sub>").

$H_s$  = Safety margin = minimum 2.0 feet.

If the "H" calculated is positive, the pump can operate at a suction lift of maximum "H" feet of head.

If the "H" calculated is negative, an inlet pressure of minimum "H" feet is required.



**Fig. 14** Minimum inlet pressure - NPSH

Note: In order to avoid cavitation, never select a pump whose duty point lies too far to the right on the NPSH curve.

Always check the NPSH value of the pump at the highest possible flow.

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## How to read the curve charts

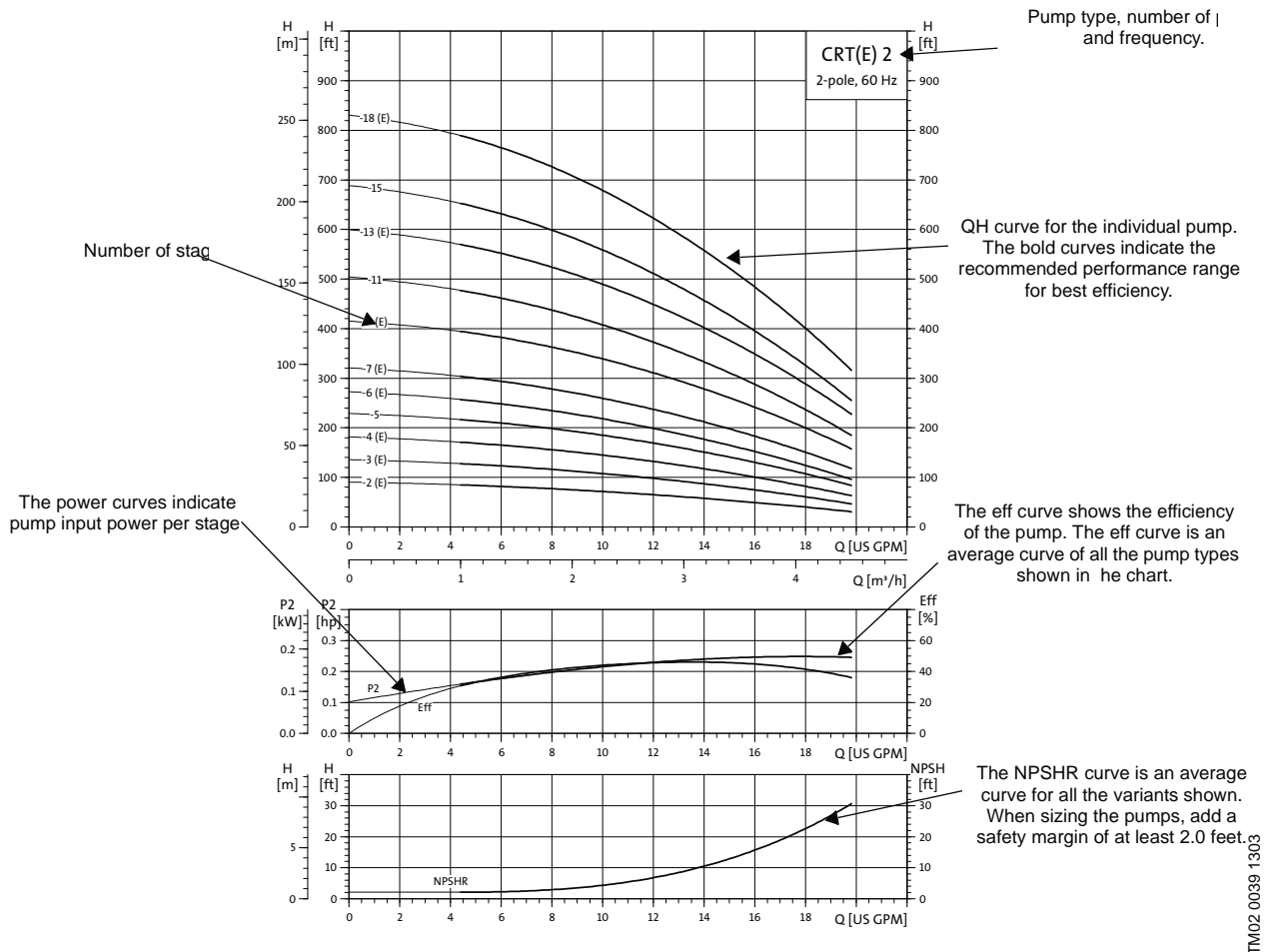


Fig. 15 How to read the curve charts

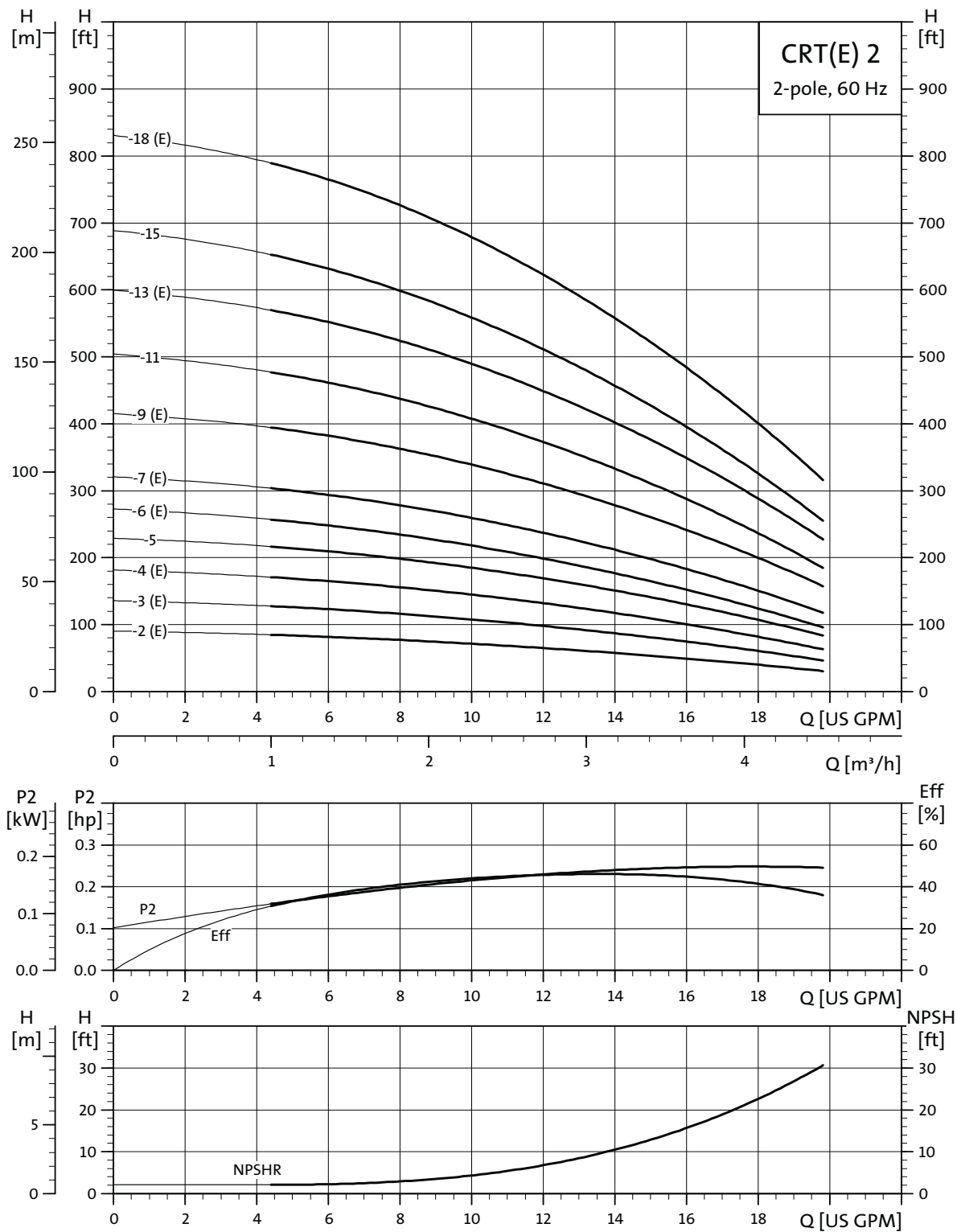
## Guidelines to performance curves

The guidelines below apply to the curves shown on the following pages:

1. The motors used for the measurements are standard motors (TEFC or MLE).
2. Measurements have been made with airless water at a temperature of 68 °F (20 °C).
3. The curves apply to a kinematic viscosity of  $\nu = 1 \text{ mm}^2/\text{s}$  (1 cSt).
4. Due to the risk of overheating, the pumps should not be used at a flow below the minimum flow rate.
5. The QH curves apply to actual speed with the motor types mentioned at 60 Hz.

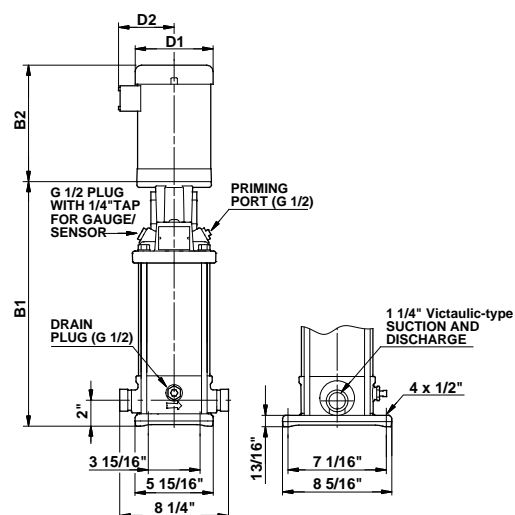
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TM02 8330 0405

## Dimensional sketches



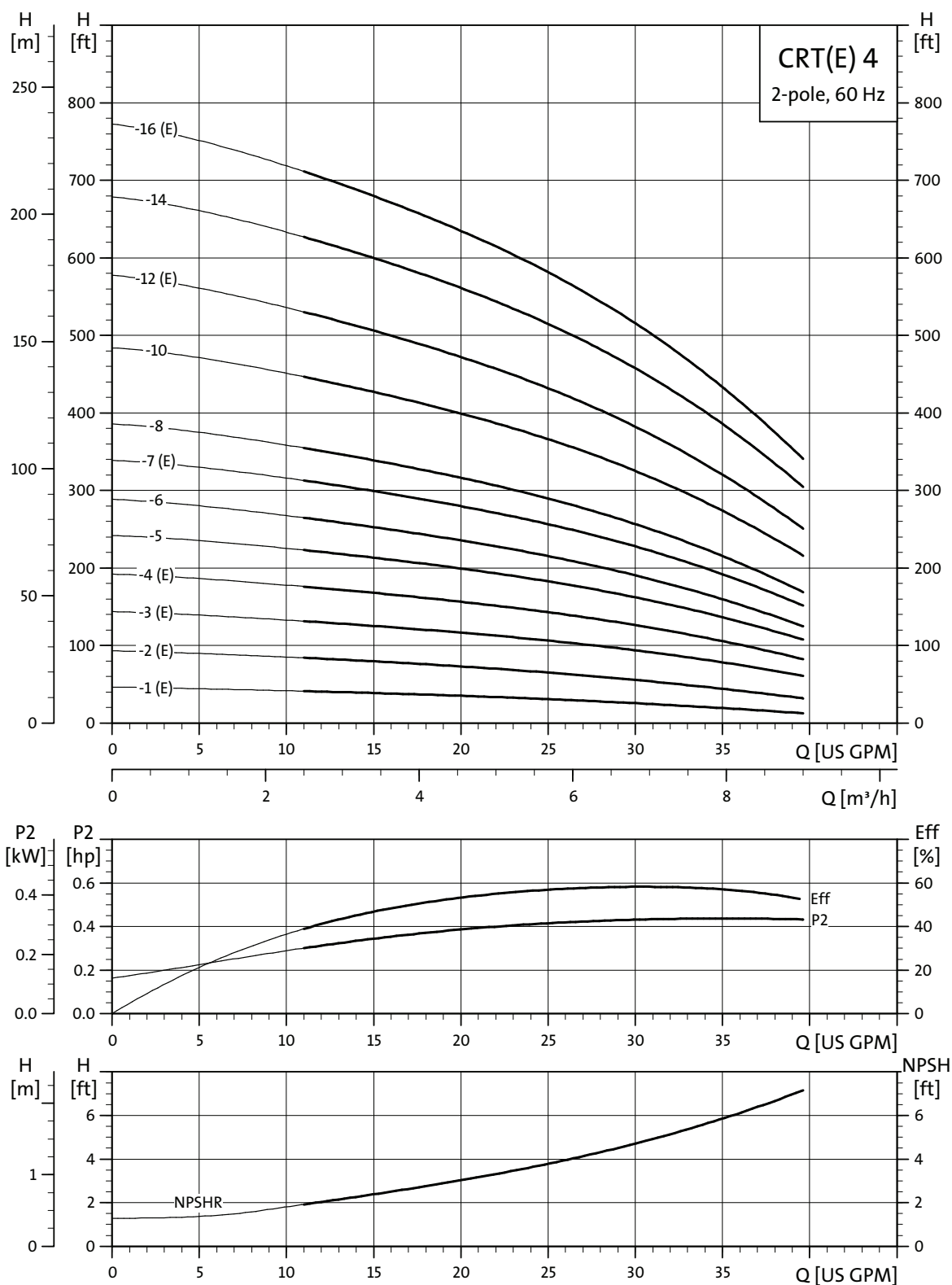
TM02 2149 4604

## Dimensions and weights

| Pump Type | Hp   | Ph | Voltage     | Frame Size | CRT TEFC |         |      |       |                 | CRTE MLE |      |       |                 |
|-----------|------|----|-------------|------------|----------|---------|------|-------|-----------------|----------|------|-------|-----------------|
|           |      |    |             |            | B1       | TEFC D1 | D2   | B1+B2 | Ship Wt. [lbs.] | D1       | D2   | B1+B2 | Ship Wt. [lbs.] |
| CRT 2-2   | 0.5  | 1  | 115/208-230 | 56C        | 9 96     | 6.19    | 5.18 | 19.25 | 53              | 5.55     | 5.51 | 17.38 | 57              |
|           |      | 3  | 208-230/460 | 56C        | 9 96     | 5.55    | 4 57 | 17.40 | 48              | —        | —    | —     | —               |
| CRT 2-3   | 0.75 | 1  | 115/208-230 | 56C        | 9 96     | 6.19    | 5.18 | 19.87 | 59              | 5.55     | 5.51 | 17.38 | 62              |
|           |      | 3  | 208-230/460 | 56C        | 9 96     | 5.55    | 4 57 | 17.40 | 49              | —        | —    | —     | —               |
| CRT 2-4   | 1.0  | 1  | 115-230     | 56C        | 11.61    | 7.19    | 5.73 | 22.80 | 70              | 5.55     | 5.51 | 20.59 | 63              |
|           |      | 3  | 208-230/460 | 56C        | 11.61    | 5.55    | 4 57 | 19.05 | 50              | 7.01     | 6.57 | 24.41 | 90              |
| CRT 2-5   | 1.5  | 1  | 115/208-230 | 56C        | 11.61    | 7.19    | 5.73 | 23.29 | 79              | —        | —    | —     | —               |
|           |      | 3  | 208-230/460 | 56C        | 11.61    | 5.55    | 4 57 | 20.23 | 52              | —        | —    | —     | —               |
| CRT 2-6   | 1.5  | 1  | 115/208-230 | 56C        | 13 03    | 7.19    | 5.73 | 24.71 | 80              | 5.55     | 5.51 | 22.01 | 68              |
|           |      | 3  | 208-230/460 | 56C        | 13 03    | 5.55    | 4 57 | 21.65 | 53              | 7.01     | 6.57 | 25.83 | 92              |
| CRT 2-7   | 2.0  | 1  | 115-230     | 56C        | 13 66    | 7.19    | 5.73 | 26.22 | 84              | —        | —    | —     | —               |
|           |      | 3  | 208-230/460 | 56C        | 13 66    | 7.01    | 4 33 | 24.88 | 75              | 7.01     | 6.57 | 26.46 | 93              |
| CRT 2-9   | 3.0  | 1  | 115/208-230 | 182TC      | 16 50    | 8.60    | 6 87 | 31.15 | 108             | —        | —    | —     | —               |
|           |      | 3  | 208-230/460 | 182TC      | 16 50    | 7.01    | 4 33 | 29.73 | 87              | 7.01     | 6.57 | 29.81 | 106             |
| CRT 2-11  | 3.0  | 1  | 115/208-230 | 182TC      | 16 50    | 8.60    | 6 87 | 31.15 | 110             | —        | —    | —     | —               |
|           |      | 3  | 208-230/460 | 182TC      | 16 50    | 7.01    | 4 33 | 29.73 | 89              | —        | —    | —     | —               |
| CRT 2-13  | 3.0  | 1  | 115/208-230 | 182TC      | 19 53    | 8.60    | 6 87 | 34.18 | 112             | —        | —    | —     | —               |
|           |      | 3  | 208-230/460 | 182TC      | 19 53    | 7.01    | 4 33 | 32.76 | 91              | 7.01     | 6.57 | 32.84 | 110             |
| CRT 2-15  | 5.0  | 1  | 208-230     | 182TC      | 19 53    | 10.62   | 7.46 | 35.05 | 149             | —        | —    | —     | —               |
|           |      | 3  | 208-230/460 | 182TC      | 19 53    | 8.66    | 5 28 | 35.04 | 147             | —        | —    | —     | —               |
| CRT 2-18  | 5.0  | 1  | 208-230     | 182TC      | 21 65    | 10.62   | 7.46 | 37.17 | 153             | —        | —    | —     | —               |
|           |      | 3  | 208-230/460 | 182TC      | 21 65    | 8.66    | 5 28 | 37.16 | 151             | 8.66     | 7.40 | 37.16 | 140             |

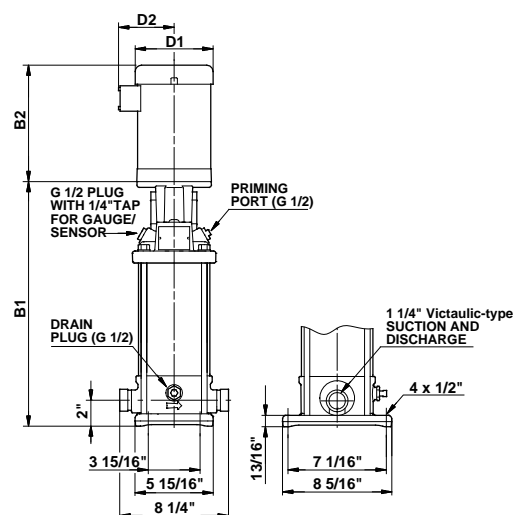
# Performance curves/ Technical data

CRT, CRTE 4



TM02 8331 3510

## Dimensional sketches

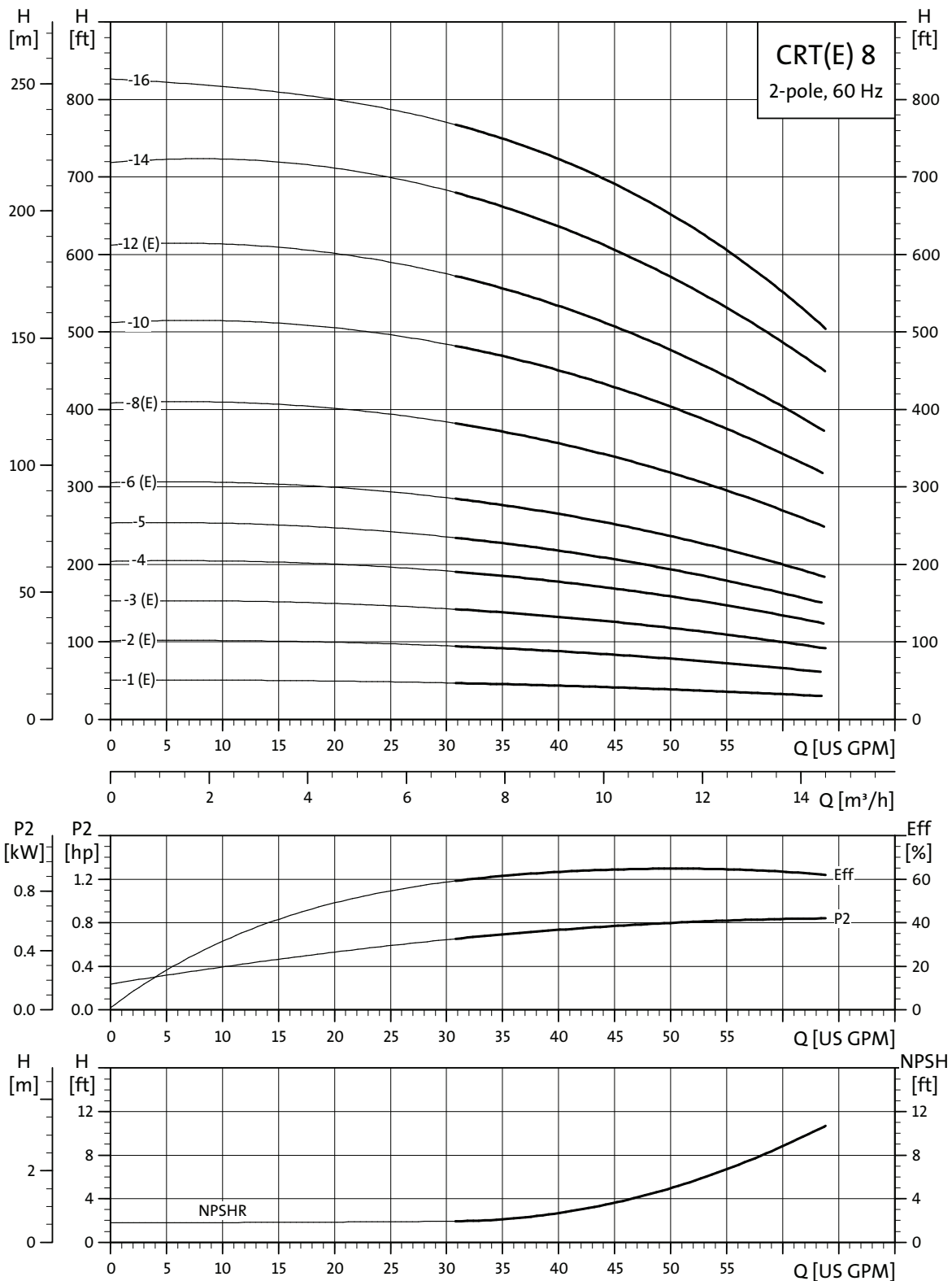


## Dimensions and weights

| Pump Type | Hp   | Ph | Voltage     | Frame size | CRT TEFC |       |      |       |                 | CRTE MLE |      |       |                 |
|-----------|------|----|-------------|------------|----------|-------|------|-------|-----------------|----------|------|-------|-----------------|
|           |      |    |             |            | B1       | D1    | D2   | B1+B2 | Ship wt. [lbs.] | D1       | D2   | B1+B2 | Ship wt. [lbs.] |
| CRT 4-1   | 0.5  | 1  | 115/208-230 | 56C        | 9.96     | 6.19  | 5.18 | 19.25 | 57              | 5 55     | 5.51 | 17.38 | 61              |
|           |      | 3  | 208-230/460 | 56C        | 9.96     | 5.55  | 4 57 | 17.40 | 52              | —        | —    | —     | —               |
| CRT 4-2   | 0.75 | 1  | 115/208-230 | 56C        | 9.96     | 6.19  | 5.18 | 19.87 | 64              | 5 55     | 5.51 | 17.38 | 67              |
|           |      | 3  | 208-230/460 | 56C        | 9.96     | 5.55  | 4 57 | 17.40 | 54              | —        | —    | —     | —               |
| CRT 4-3   | 1.5  | 1  | 115/208-230 | 56C        | 11.26    | 7.19  | 5.73 | 22.94 | 84              | 5 55     | 5.51 | 20.24 | 72              |
|           |      | 3  | 208-230/460 | 56C        | 11.26    | 5.55  | 4 57 | 19.88 | 57              | 7 01     | 6.57 | 24.06 | 96              |
| CRT 4-4   | 2.0  | 1  | 115-230     | 56C        | 12.95    | 7.19  | 5.73 | 25.51 | 89              | —        | —    | —     | —               |
|           |      | 3  | 208-230/460 | 56C        | 12.95    | 7.01  | 4 33 | 24.17 | 80              | 7 01     | 6.57 | 25.75 | 98              |
| CRT 4-5   | 3.0  | 1  | 115/208-230 | 182TC      | 15.08    | 8.60  | 6 87 | 29.73 | 113             | —        | —    | —     | —               |
|           |      | 3  | 208-230/460 | 182TC      | 15.08    | 7.01  | 4 33 | 28.31 | 92              | —        | —    | —     | —               |
| CRT 4-6   | 3.0  | 1  | 115/208-230 | 182TC      | 15.08    | 8.60  | 6 87 | 29.73 | 117             | —        | —    | —     | —               |
|           |      | 3  | 208-230/460 | 182TC      | 15.08    | 7.01  | 4 33 | 28.31 | 96              | —        | —    | —     | —               |
| CRT 4-7   | 3.0  | 1  | 115/208-230 | 182TC      | 17.40    | 8.60  | 6 87 | 32.05 | 119             | —        | —    | —     | —               |
|           |      | 3  | 208-230/460 | 182TC      | 17.40    | 7.01  | 4 33 | 30.63 | 98              | 7 01     | 6.57 | 30.71 | 117             |
| CRT 4-8   | 5.0  | 1  | 208-230     | 182TC      | 17.40    | 10.62 | 7.46 | 32.92 | 156             | —        | —    | —     | —               |
|           |      | 3  | 208-230/460 | 182TC      | 17.40    | 8.66  | 5 28 | 32.91 | 154             | —        | —    | —     | —               |
| CRT 4-10  | 5 0  | 1  | 208-230     | 182TC      | 21.65    | 10.62 | 7.46 | 37.17 | 163             | —        | —    | —     | —               |
|           |      | 3  | 208-230/460 | 182TC      | 21.65    | 8.66  | 5 28 | 37.16 | 161             | —        | —    | —     | —               |
| CRT 4-12  | 5 0  | 1  | 208-230     | 182TC      | 21.65    | 10.62 | 7.46 | 37.17 | 167             | —        | —    | —     | —               |
|           |      | 3  | 208-230/460 | 182TC      | 21.65    | 8.66  | 5 28 | 37.16 | 165             | 8 66     | 7.40 | 37.16 | 154             |
| CRT 4-14  | 7 5  | 1  | 208-230     | 213TC      | 27.05    | 10.22 | 7 62 | 42.58 | 185             | —        | —    | —     | —               |
|           |      | 3  | 208-230/460 | 213TC      | 27.05    | 8.66  | 5 28 | 42.56 | 173             | —        | —    | —     | —               |
| CRT 4-16  | 7 5  | 1  | 208-230     | 213TC      | 27.05    | 10.22 | 7 62 | 42.58 | 189             | —        | —    | —     | —               |
|           |      | 3  | 208-230/460 | 213TC      | 27.05    | 8.66  | 5 28 | 42.56 | 177             | 8 66     | 7.40 | 42.56 | 173             |

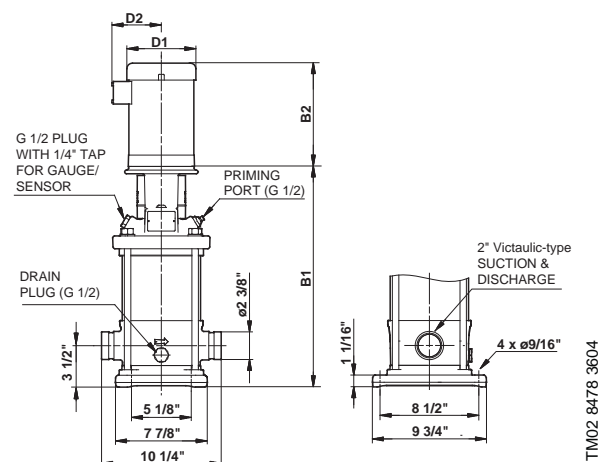
# Performance curves/ Technical data

CRT, CRTE 8



TM02 8332 3510

## Dimensional sketches

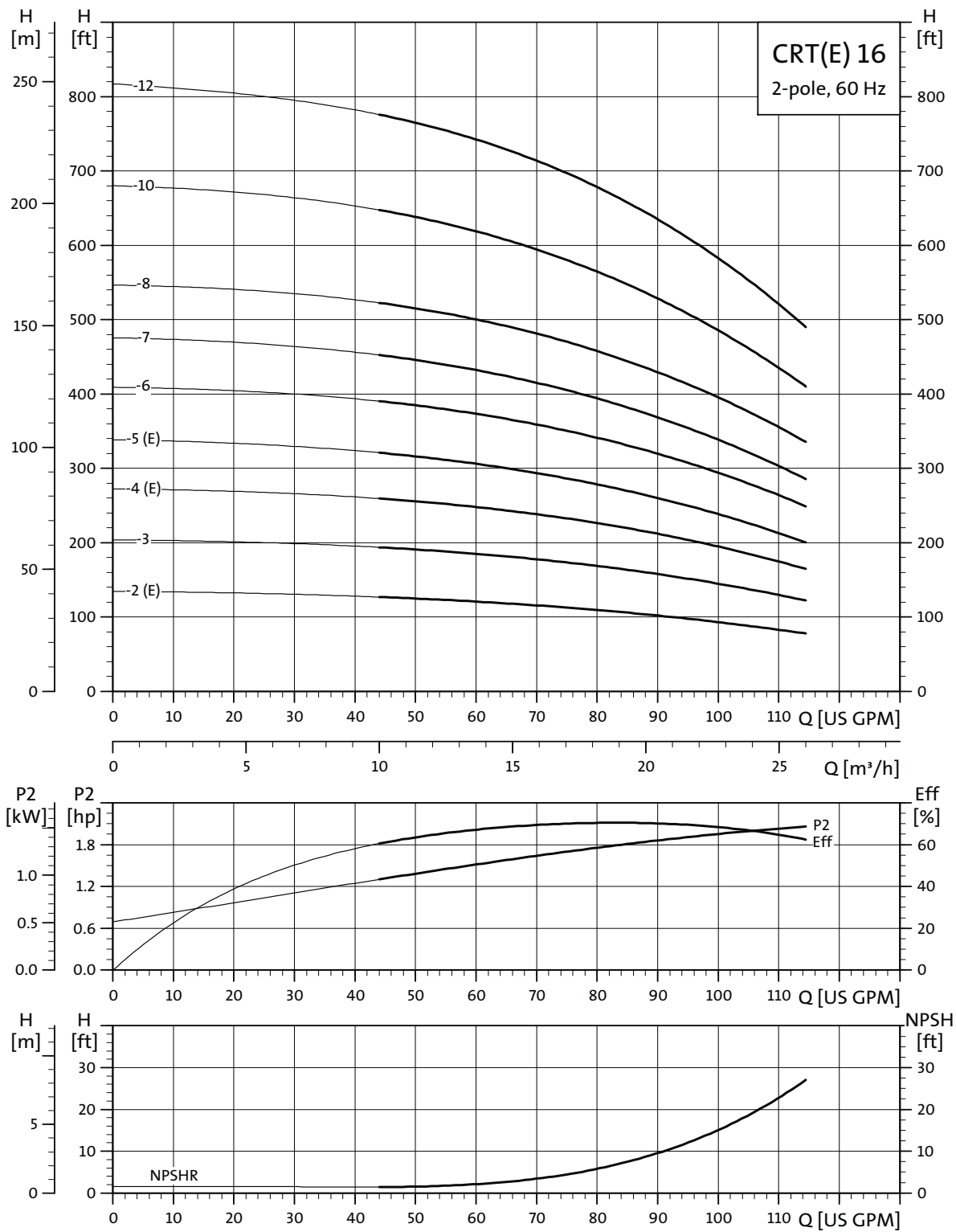


## Dimensions and weights

| Pump Type | Hp   | Ph | Voltage     | Frame size | CRT TEFC |       |       |       |                 | CRTE MLE |      |       |                 |
|-----------|------|----|-------------|------------|----------|-------|-------|-------|-----------------|----------|------|-------|-----------------|
|           |      |    |             |            | B1       | D1    | D2    | B1+B2 | Ship wt. [lbs.] | D1       | D2   | B1+B2 | Ship wt. [lbs.] |
| CRT 8-1   | 0.75 | 1  | 115/208-230 | 56C        | 14.06    | 6.19  | 5.18  | 23.97 | 75              | 5.55     | 5.51 | 21.48 | 78              |
|           |      | 3  | 208-230/460 | 56C        | 14.06    | 5.55  | 4.57  | 21.50 | 65              | —        | —    | —     | —               |
| CRT 8-2   | 2.0  | 1  | 115-230     | 56C        | 14.69    | 7.19  | 5.73  | 27.25 | 100             | —        | —    | —     | —               |
|           |      | 3  | 208-230/460 | 56C        | 14.69    | 7.01  | 4.33  | 25.91 | 91              | 7.01     | 6.57 | 27.49 | 109             |
| CRT 8-3   | 3.0  | 1  | 115/208-230 | 182TC      | 17.05    | 8.60  | 6.87  | 31.70 | 131             | —        | —    | —     | —               |
|           |      | 3  | 208-230/460 | 182TC      | 17.05    | 7.01  | 4.33  | 30.28 | 110             | 7.01     | 6.57 | 30.36 | 129             |
| CRT 8-4   | 5.0  | 1  | 208-230     | 182TC      | 17.24    | 10.62 | 7.46  | 32.76 | 170             | —        | —    | —     | —               |
|           |      | 3  | 208-230/460 | 182TC      | 17.24    | 8.66  | 5.28  | 32.75 | 168             | —        | —    | —     | —               |
| CRT 8-5   | 5.0  | 1  | 208-230     | 182TC      | 19.61    | 10.62 | 7.46  | 35.13 | 174             | —        | —    | —     | —               |
|           |      | 3  | 208-230/460 | 182TC      | 19.61    | 8.66  | 5.28  | 35.12 | 172             | —        | —    | —     | —               |
| CRT 8-6   | 5.0  | 1  | 208-230     | 182TC      | 19.61    | 10.62 | 7.46  | 35.13 | 178             | —        | —    | —     | —               |
|           |      | 3  | 208-230/460 | 182TC      | 19.61    | 8.66  | 5.28  | 35.12 | 176             | 8.66     | 7.40 | 35.12 | 165             |
| CRT 8-8   | 7.5  | 1  | 208-230     | 213TC      | 25.59    | 10.22 | 7.62  | 41.12 | 197             | —        | —    | —     | —               |
|           |      | 3  | 208-230/460 | 213TC      | 25.59    | 8.66  | 5.28  | 41.10 | 185             | 8.66     | 7.40 | 41.10 | 181             |
| CRT 8-10  | 10   | 1  | 230         | 213TC      | 25.59    | 10.23 | 10.30 | 41.66 | 260             | —        | —    | —     | —               |
|           |      | 3  | 208-230/460 | 213TC      | 25.59    | 8.66  | 5.28  | 41.10 | 193             | —        | —    | —     | —               |
| CRT 8-12  | 10   | 1  | 230         | 213TC      | 30.31    | 10.23 | 10.30 | 46.38 | 266             | —        | —    | —     | —               |
|           |      | 3  | 208-230/460 | 213TC      | 30.31    | 8.66  | 5.28  | 45.82 | 199             | 10.24    | 8.39 | 45.23 | 202             |
| CRT 8-14  | 15   | 3  | 208-230/460 | 254TCZ     | 31.50    | 10.22 | 8.67  | 48.08 | 334             | —        | —    | —     | —               |
| CRT 8-16  | 15   | 3  | 208-230/460 | 254TCZ     | 35.59    | 10.22 | 8.67  | 52.17 | 342             | —        | —    | —     | —               |

# Performance curves/ Technical data

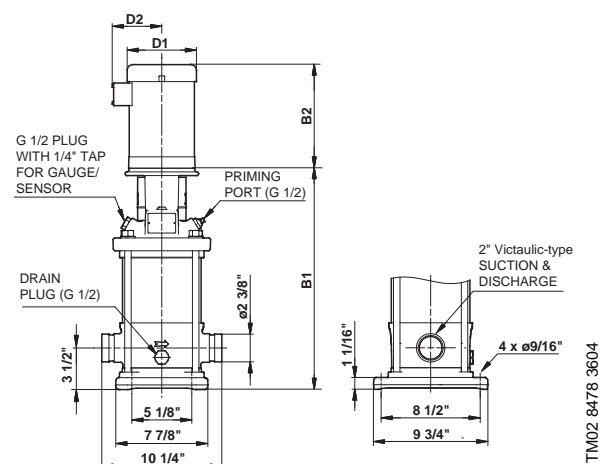
CRT, CRTE 16



TM02 8333 0405



## Dimensional sketches



## Dimensions and weights

| Pump Type | Hp  | Ph | Voltage     | Frame size | CRT TEFC |       |       |       |                 | CRTE MLE |      |       |                 |
|-----------|-----|----|-------------|------------|----------|-------|-------|-------|-----------------|----------|------|-------|-----------------|
|           |     |    |             |            | B1       | D1    | D2    | B1+B2 | Ship wt. [lbs.] | D1       | D2   | B1+B2 | Ship wt. [lbs.] |
| CRT 16-2  | 5.0 | 1  | 208-230     | 182TC      | 18.23    | 10.62 | 7.46  | 33.75 | 161             | —        | —    | —     | —               |
|           |     | 3  | 208-230/460 | 182TC      | 18.23    | 8.66  | 5.28  | 33.74 | 159             | 8.66     | 7.40 | 33.74 | 148             |
| CRT 16-3  | 7.5 | 1  | 208-230     | 213TC      | 19.49    | 10.22 | 7.62  | 35.02 | 184             | —        | —    | —     | —               |
|           |     | 3  | 208-230/460 | 213TC      | 19.49    | 8.66  | 5.28  | 35.00 | 172             | —        | —    | —     | —               |
| CRT 16-4  | 7.5 | 1  | 208-230     | 213TC      | 23.03    | 10.22 | 7.62  | 38.56 | 189             | —        | —    | —     | —               |
|           |     | 3  | 208-230/460 | 213TC      | 23.03    | 8.66  | 5.28  | 38.54 | 177             | 8.66     | 7.40 | 38.54 | 173             |
| CRT 16-5  | 10  | 1  | 230         | 213TC      | 23.03    | 10.23 | 10.30 | 39.10 | 249             | —        | —    | —     | —               |
|           |     | 3  | 208-230/460 | 213TC      | 23.03    | 8.66  | 5.28  | 38.54 | 182             | 10.24    | 8.39 | 37.95 | 185             |
| CRT 16-6  | 15  | 3  | 208-230/460 | 254TCZ     | 27.76    | 10.22 | 8.67  | 44.34 | 307             | —        | —    | —     | —               |
| CRT 16-7  | 15  | 3  | 208-230/460 | 254TCZ     | 27.76    | 10.22 | 8.67  | 44.34 | 311             | —        | —    | —     | —               |
| CRT 16-8  | 15  | 3  | 208-230/460 | 254TCZ     | 33.07    | 10.22 | 8.67  | 49.65 | 316             | —        | —    | —     | —               |
| CRT 16-10 | 20  | 3  | 230/460     | 254TCZ     | 33.07    | 10.22 | 8.67  | 49.65 | 329             | —        | —    | —     | —               |
| CRT 16-12 | 25  | 3  | 230/460     | 284TSCZ    | 40.55    | 12.94 | 11.52 | 60.37 | 398             | —        | —    | —     | —               |

## Grundfos specified TEFC motors

| Hp    | Ph | Frame   | S.F. | Voltage [V] | Motor Eff [%] | Insul. Class | KVA Code | Full Load Current [A] | Service Factor Current [A] | Start Current [A] | Motor Type |
|-------|----|---------|------|-------------|---------------|--------------|----------|-----------------------|----------------------------|-------------------|------------|
| 1/3   | 1  | 56C     | 1.35 | 115/230     | 55            | B            | K        | 6.0/3.0               | 7.6/3.8                    | 28/14             | Baldor     |
|       | 3  | 56C     | 1.35 | 208-230/460 | 78.5          | F            | L        | 1.12-1.1/0.55         | 1.5-1.45/0.75              | 7.1-7.7/3.9       | ML         |
| 1/2   | 1  | 56C     | 1.6  | 115/230     | 62            | B            | K        | 7.4/3.7               | 9.8/4.9                    | 39/19.5           | Baldor     |
|       | 3  | 56C     | 1.25 | 208-230/460 | 78.5          | F            | K        | 1.64-1.55/0.78        | 2.0-1.9/0.95               | 9.7-10.1/5.1      | ML         |
| 3/4   | 1  | 56C     | 1.25 | 115/230     | 66            | B            | K        | 9.6/4.8               | 11.4/5.7                   | 56/28             | Baldor     |
|       | 3  | 56C     | 1.25 | 208-230/460 | 79            | F            | K        | 2.4-2.3/1.2           | 2.9-2.75/1.4               | 14.2-15/7.8       | ML         |
| 1     | 1  | 56C     | 1.25 | 115/230     | 66            | B            | K        | 12/6.0                | 14.4/7.2                   | 77/38.5           | Baldor     |
|       | 3  | 56C     | 1.25 | 208-230/460 | 80            | F            | J        | 3.25-3.35/1.68        | 4.0-3.9/1.95               | 19.2-21.8/10.9    | ML         |
| 1 1/2 | 1  | 56C     | 1.3  | 115/208-230 | 71            | B            | K        | 17/9.5-8.6            | 20.4/11.3-10.2             | 106/58.6-53       | Baldor     |
|       | 3  | 56C     | 1.15 | 208-230/460 | 84            | F            | M        | 4.7-4.6/2.3           | 5.2-5.1/2.55               | 33.8-36.8/18.4    | ML         |
| 2     | 1  | 56C     | 1.15 | 115/208-230 | 74            | F            | K        | 23/12.7-11.5          | 25.4/14.0-12.7             | 156/86-78         | Baldor     |
|       | 3  | 56C     | 1.15 | 208-230/460 | 85.5          | F            | G        | 5.7-5.4/2.7           | 6.55-6.1/3.05              | 46.2-48.6/24.3    | ML         |
| 3     | 1  | 182TC   | 1.15 | 115/208-230 | 75            | F            | H        | 29/16-14.5            | 31.8/18-15.9               | 170/94-85         | Baldor     |
|       | 3  | 182TC   | 1.15 | 208-230/460 | 86.5          | F            | M        | 8.4-7.7/3.9           | 9.5-8.6/4.3                | 79.0-80.1/40.6    | ML         |
| 5     | 1  | 213TCZ  | 1.15 | 208-230     | 80            | F            | J        | 24-22                 | 27-25                      | 188-170           | Baldor     |
|       | 3  | 182TC   | 1.15 | 208-230/460 | 88.5          | F            | L        | 13.8-13.0/6.5         | 15.6-14.6/7.3              | 124-129/64.4      | ML         |
| 7 1/2 | 1  | 213TC   | 1.15 | 208-230     | 82            | F            | F        | 33.8-31               | 38.5-35.5                  | 244-220           | Baldor     |
|       | 3  | 213TC   | 1.15 | 208-230/460 | 90            | F            | N        | 20.4-19.4/9.7         | 23-21.5/10.8               | 192-202/101       | ML         |
| 10    | 1  | 213TC   | 1.15 | 230         | 85.5          | F            | F        | 40                    | 46                         | 284               | Baldor     |
|       | 3  | 213TC   | 1.15 | 208-230/460 | 90.2          | F            | L        | 26.5-25.5/12.8        | 30.5-28.5/14.5             | 239-252/127       | ML         |
| 15    | 3  | 254TCZ  | 1.15 | 208-230/460 | 90.2          | F            | K        | 37.5-34/17            | 42.5-39/19.5               | 270-304/152       | Baldor     |
| 20    | 3  | 254TCZ  | 1.15 | 208-230/460 | 90.2          | F            | K        | 47-46/23              | 53-52/26                   | 355-412/206       | Baldor     |
| 25    | 3  | 284TSCZ | 1.15 | 230/460     | 91            | F            | J        | 56/28                 | 64/32                      | 498/249           | Baldor     |



G47845sh

## Notes:

- The information in this chart applies to **Grundfos specified Baldor® motors and Grundfos ML motors.**

Grundfos CR pumps are supplied with heavy-duty 2-pole, NEMA C-frame motors built or selected to our rigid specifications. All CR pump motors have heavy-duty bearings in them for maximum thrust requirements.

**It is not recommended that an off-the-shelf standard Baldor motor be used on a Grundfos pump. Ideally, the best motor choice would be the Grundfos specified motor.**

- Other motor types are available (i.e., Explosion proof, Mill and Chem duty, Premium Efficiency, etc.), consult local Grundfos company for more information.
- Pumps supplied by Grundfos Canada are normally supplied with motors from other manufactures; 575 volt motors meet EPAct/NRC efficiency standards. Dimensions and data will vary, contact local Grundfos company for more information.
- All values are subject to change without notice.

## MLE motors

| HP    | Voltage | PH | NEMA Frame | Service Factor | Full Load Eff [%] * | Ins. Class | Full Load Amps ** | Service Factor Amps |
|-------|---------|----|------------|----------------|---------------------|------------|-------------------|---------------------|
| 1/2   | 208-230 | 1  | 56C        | 1.0            | 71.0                | F          | 2.80              | -                   |
| 3/4   | 208-230 | 1  | 56C        | 1.0            | 74.0                | F          | 3.90              | -                   |
| 1     | 208-230 | 1  | 56C        | 1.0            | 76.0                | F          | 5.20              | -                   |
|       | 460-480 | 3  | 56C        | 1.25           | 78.0                | F          | 1.70              | 2.10                |
| 1 1/2 | 208-230 | 1  | 56C        | 1.0            | 77.0                | F          | 7.50              | -                   |
|       | 208-230 | 3  | 56C        | 1.0            | 76.8                | F          | 4.20              | -                   |
|       | 460-480 | 3  | 56C        | 1.15           | 80.0                | F          | 2.15              | 2.50                |
| 2     | 208-230 | 3  | 56C        | 1.0            | 78.3                | F          | 5.60              | -                   |
|       | 460-480 | 3  | 56C        | 1.15           | 82.0                | F          | 2.70              | 3.10                |
| 3     | 208-230 | 3  | 182TC      | 1.0            | 79.5                | F          | 8.10              | -                   |
|       | 460-480 | 3  | 182TC      | 1.15           | 84.0                | F          | 3.70              | 4.30                |
| 5     | 208-230 | 3  | 184TC      | 1.0            | 79.7                | F          | 13.4              | -                   |
|       | 460-480 | 3  | 184TC      | 1.15           | 85.0                | F          | 6.10              | 7.00                |
| 7 1/2 | 208-230 | 3  | 215TC      | 1.0            | 82.5                | F          | 19.7              | -                   |
|       | 460-480 | 3  | 215TC      | 1.15           | 85.0                | F          | 8.90              | 10.3                |
| 10    | 460-480 | 3  | 215TC      | 1.15           | 86.0                | F          | 12.0              | 13.8                |

\* This is the combined full load efficiency of the motor and variable frequency drive.

\*\* At 208 volts for 208-230 volt motors and at 460 volts for 460-480 volt motors.



GR 8972\_P

## Pumped liquids

CRT, CRTE pumps are intended for pumping thin, non-explosive liquids, not containing solid particles or fibers. The liquid must not attack the pump materials chemically.

When pumping liquids with a density and/or viscosity higher than that of water, motors with correspondingly higher outputs must be used, if required.

CRT pumps can be used for liquid transfer, circulation and pressure boosting.

## Corrosion resistance for CRT(E)

| Media  | Conc. [%] | Temp. [°F (°C)] | Seal face                          |                        | Bearing         |
|--|-----------|-----------------|------------------------------------|------------------------|-----------------|
|  |           |                 | Binderless tungsten carbide (AUUX) | Silicon carbide (AQQx) | Silicon carbide |
| Demineralized water                                  |           | 248 (120)       | ●                                  |                        | ●               |
| Ground water   |           | 248 (120)       | ●                                  |                        | ●               |
| Brackish water                                       |           | 248 (120)       | ●                                  |                        | ●               |
| Seawater   |           | 176 (80)        | ●                                  |                        | ●               |
| Sulfuric acid  | 3         | 140 (60)        |                                    | ● ★ ★                  | ●               |
| Phosphoric acid                                      | 30        | 95 (35)         | ●                                  |                        | ●               |
|  | 10        | 140 (60)        |                                    |                        |                 |
| Formic acid  | 50        | 176 (80)        |                                    | ● ★ ★                  | ●               |
| Citric acid  | 50        | 212 (100)       | ●                                  |                        | ●               |
| Oxalic acid  | 5         | 68 (20)         | ●                                  |                        | ●               |
| Inorganic salts (including FeCl <sub>3</sub> )       |           |                 |                                    | ● ★ ★                  | ●               |
| Sodium hydroxide                                     | 10        | 212 (100)       | ●                                  |                        | ●               |
|  | 50        | 140 (60)        |                                    |                        |                 |
| Potassium hydroxide                                  | 50        | 68 (20)         | ●                                  |                        | ●               |
| Calcium hydroxide                                    | saturated | 212 (100)       | ●                                  |                        | ●               |
| Ammonium hydroxide                                   | 28        | 212 (100)       | ●                                  |                        | ●               |
| Alcohols (except for methanol ★), aldehydes, ketones |           |                 | ●                                  |                        | ●               |

★ Titanium is susceptible to stress corrosion cracking (SSC) in methanol and should not be used with methanol.  
 ★ ★ Available on request.

## Pipework connection

### PJE couplings for CRT(E)

A set includes 1 coupling, 1 gasket, 1 pipe stub and bolts and nuts.

| Pump type              | Pipe stub   | Pressure rating<br>[psi (bar)] | Pipework connection | Number of coupling sets needed | Material number |          |
|------------------------|-------------|--------------------------------|---------------------|--------------------------------|-----------------|----------|
|                        |             |                                |                     |                                | EPDM            | FKM      |
| CRT(E) 2 and CRT(E) 4  | Threaded    | 1015 (70)                      | 1.25" NPT           | 2                              | 415522          | 91134571 |
|                        | For welding | 1015 (70)                      | 1.25"               | 2                              | 415521          | 415539   |
| CRT(E) 8 and CRT(E) 16 | Threaded    | 1015 (70)                      | 2" NPT              | 2                              | 336924          | 91134572 |
|                        | For welding | 1015 (70)                      | 2"                  | 2                              | 425934          | 425952   |

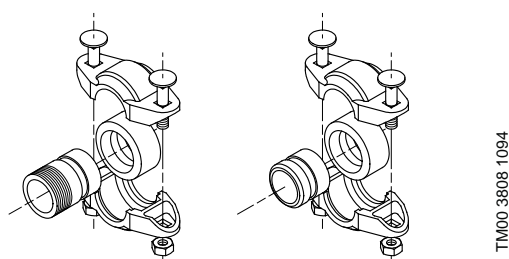


Fig. 16 PJE couplings

### ANSI flange adapter for CRT(E)

For pipework connection, Grundfos can offer an ANSI flange adapter set.

A set includes one flange adapter and one gasket, two sets are normally required. The set does not include connection nuts and bolts. Four 5/8" x 3" bolts and nuts are required for each adapter set.

| Pump type           | Pipework connection | EPDM     |
|---------------------|---------------------|----------|
| CRT(E) 8, CRT(E) 16 | ANSI 2" 150 lb.     | 91122697 |

## Lists of variants - on request

Although the Grundfos CRT(E) product range offers a number of pumps for different applications, customers require specific pump solutions to satisfy their needs.

To the side please find the range of options available for customizing the CRT(E) pumps to meet the customers' demands.

Contact Grundfos for further information or for requests other than the ones mentioned below.

## Motors

| Variant                                    | Description   |
|--|---|
| Explosion proof (including ATEX approved)  | For operation in hazardous atmospheres, explosion-proof or dust-ignition-proof motors may be required.  |
| Motors with anti-condensation heating unit | For operation in humid environments motors with built-in anti-condensation heating may be required.   |
| Efficiency class                           | Premium efficiency  |
| Integrated variable speed drive            | All Grundfos CRT pumps 10 hp and below are available as standard with integrated variable speed drive (type MLE) motors.  |
| Oversized motors                           | Ambient temperatures above +104°F (+40 °C) or installation at altitudes of more than 3,300 ft (1005 m) above sea level require the use of oversized motors (i.e. derating).   |
| 4-pole motors                              | Grundfos offers standard motors fitted with 4-poles.  |
| Different enclosure class                  | As standard, Grundfos can supply: <ul style="list-style-type: none"> <li>• ODP: open drip-proof</li> <li>• TEFC: total-enclosed fan-cooled</li> </ul> On request, we can supply: <ul style="list-style-type: none"> <li>• Chemical processing/mill and chem duty</li> <li>• Washdown duty (Up through 10 hp only)</li> <li>• Other</li> </ul> |

## Shaft seals

| Variant                                     | Description  |
|---|--|
| Shaft seal with FKM or FFKM O-ring material | Shaft seals with FKM or FFKM o-ring material are recommended for applications where the pumped liquid may damage the standard O-ring material. |
| Shaft seal with SiC/SiC                     | Grundfos offers shaft seals with silicon carbide/silicon carbide (SiC/SiC).  |

## Pumps

| Variant                    | Description  |
|----------------------------|--|
| Horizontally mounted pumps | For safety or height reasons, certain applications, for instance on ships, require the pumps to be mounted in the horizontal position. For easy installation the pumps are equipped with brackets that support motor and pump. |
| Pumps with bearing flange  | The bearing flange is suitable for applications where the inlet pressure is higher than the maximum pressure recommended. The bearing flange increases the life of motor bearings. (Recommended for standard motors).          |
| Belt-driven pumps          | Belt-driven pumps designed to operate in places with limited space or where no electrical power is available.  |

## CRT, CRTE

### Vertical Multistage Centrifugal Pumps

## Client Information

Project title:

Reference number:

Client contact:

## Location Information

For:

Site:

Address:

## Application Information

### Operating Conditions

|  | Max. | Norm. | Min. |
|--|------|-------|------|
| Capacity (gpm)                                 |      |       |      |
| Suction Pressure (psig)                        |      |       |      |
| Discharge Pressure (psig)                      |      |       |      |
| Differential Head (ft)                         |      |       |      |
| Hydraulic Power (hp)<br>at designated capacity |      |       |      |
| NPSH Available (ft)                            |      |       |      |

## Service

Continuous

Intermittent (starts/day):

## Pump Information

Model Information from Type Key and Codes:

Quantity Required:

Minimum required flow:

### Product Guide additional information pages

Materials page number:

Technical data page number:

## Motor Information

HP:

Phase:

Voltage:

### Custom-built pump information (optional):

Company name:

Prepared by:

Phone number: ( )

Fax number: ( )

Date:

Page 1 of:

Quote number:

Client name:

Client number:

Client phone number: ( )

Unit:

Service:

City:

State:

Zip  
Code:

### Pumped Fluid

Fluid type:

|  | Rated | Max. | Norm. |
|--|-------|------|-------|
| Fluid Temperature ( °F)<br>at designated temperature |       |      |       |
| Specific Gravity                                     |       |      |       |
| Vapor Pressure (psia)                                |       |      |       |
| Viscosity (cp)                                       |       |      |       |

Fluid pH:

Chlorides (ppm):

Hazardous:

Corrosion/Erosion

Flammable:

caused by:

Other:

----> (Example: CR 5-10 A-FGJ-A-E-HQQE )

NPSH required at duty point:

Performance curve page number:

Motor data page number:

Enclosure:

## Additional Information





## CRT, CRTE

Vertical, non-self-priming, multistage, in-line, centrifugal pump for installation in pipe systems and mounting on a foundation.

The pump has the following characteristics:

- impellers and intermediate chambers are made of AISI \_\_\_\_\_ Stainless steel
  - Pump head and base are made of \_\_\_\_\_
  - Power transmission is via cast iron split coupling.
  - pipework connections is via \_\_\_\_\_
- The motor is a \_\_\_\_\_ -phase AC motor.

### Technical

Rated flow: \_\_\_\_\_ GPM  
 Rated head: \_\_\_\_\_ Feet  
 Minimum liquid temperature: \_\_\_\_\_ °F  
 Maximum liquid temperature: \_\_\_\_\_ °F  
 Type of shaft seal: \_\_\_\_\_

### Materials

Material, pump housing: \_\_\_\_\_  
 Material, shaft: AISI \_\_\_\_\_ Stainless Steel  
 Material, impeller: AISI \_\_\_\_\_ Stainless Steel  
 Material, sleeve: AISI \_\_\_\_\_ Stainless Steel  
 Material, seal metal: AISI \_\_\_\_\_ Stainless Steel  
 - seal face: \_\_\_\_\_  
 - seal face: \_\_\_\_\_  
 - seal elastomer: \_\_\_\_\_

### Installation

Maximum ambient temperature: \_\_\_\_\_ °F  
 Max. pressure at stated temp.: \_\_\_\_\_ PSI/ °F  
 Standard, pipe connection: \_\_\_\_\_  
 Size, pipe connection: \_\_\_\_\_  
 Rated pressure, pipe connection: \_\_\_\_\_ PSI  
 Frame size for motor: \_\_\_\_\_ NEMA

### Electrical data

Motor type: \_\_\_\_\_  
 Rated power (P2): \_\_\_\_\_ HP  
 Frequency: \_\_\_\_\_ Hz  
 Rated voltage: \_\_\_\_\_ V  
 Rated current: \_\_\_\_\_ A  
 Service factor: \_\_\_\_\_  
 Starting current: \_\_\_\_\_ A  
 Rated speed: \_\_\_\_\_ RPM  
 Full load motor efficiency: \_\_\_\_\_ %  
 Insulation class: \_\_\_\_\_

### Additional

Gross weight: \_\_\_\_\_ Lbs.  
 Shipping volume: \_\_\_\_\_  
 Model: \_\_\_\_\_



## WebCAPS

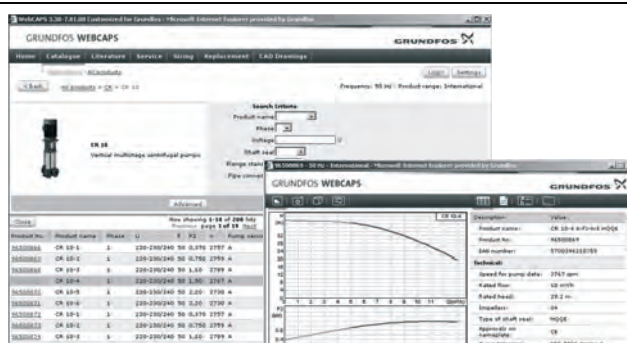


WebCAPS is a **Web-based Computer Aided Product Selection** program available on [www.grundfos.com](http://www.grundfos.com).

WebCAPS contains detailed information on more than 185,000 Grundfos products in more than 20 languages.

In WebCAPS, all information is divided into 6 sections:

- Catalog
- Literature
- Service
- Sizing
- Replacement
- CAD drawings.



### Catalog

This section is based on fields of application and pump types, and contains

- technical data
- curves (QH, Eta, P1, P2, etc) which can be adapted to the density and viscosity of the pumped liquid and show the number of pumps in operation
- product photos
- dimensional drawings
- wiring diagrams
- quotation texts, etc.



### Literature

In this section you can access all the latest documents of a given pump, such as

- product guides
- installation and operating instructions
- service documentation, such as Service kit catalog and Service kit instructions
- quick guides
- product brochures, etc.



### Service

This section contains an easy-to-use interactive service catalog. Here you can find and identify service parts of both existing and discontinued Grundfos pumps.

Furthermore, this section contains service videos showing you how to replace service parts.



## Sizing

This section is based on different fields of application and installation examples, and gives easy step-by-step instructions in how to

- select the most suitable and efficient pump for your installation
- carry out advanced calculations based on energy consumption, payback periods, load profiles, life cycle costs, etc.
- analyse your selected pump via the built-in life cycle cost tool
- determine the flow velocity in wastewater applications, etc.



## Replacement

In this section you find a guide to selecting and comparing replacement data of an installed pump in order to replace the pump with a more efficient Grundfos pump.

The section contains replacement data of a wide range of pumps produced by other manufacturers than Grundfos.

Based on an easy step-by-step guide, you can compare Grundfos pumps with the one you have installed on your site. When you have specified the installed pump, the guide will suggest a number of Grundfos pumps which can improve both comfort and efficiency.



## CAD drawings

In this section it is possible to download 2-dimensional (2D) and 3-dimensional (3D) CAD drawings of most Grundfos pumps.

These formats are available in WebCAPS:

2-dimensional drawings:

- .dxf, wireframe drawings
- .dwg, wireframe drawings.

3-dimensional drawings:

- .dwg, wireframe drawings (without surfaces)
- .stp, solid drawings (with surfaces)
- .eprt, E-drawings.

## WinCAPS



WinCAPS is a **Windows-based Computer Aided Product Selection** program containing detailed information on more than 185,000 Grundfos products in more than 20 languages.

The program contains the same features and functions as WebCAPS, but is an ideal solution if no Internet connection is available.

WinCAPS is available on CD-ROM and updated once a year.

Subject to alterations.



|                                   |           |
|-----------------------------------|-----------|
| <b>L-CRT-PG-01</b> Rev. 1210      | <b>US</b> |
| Repl. 0205                        |           |
| © 2005, 2010 Grundfos Pumps Corp. |           |

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