**50 Hz**

# Ecocirc®, EB, EBV, TLCB, TLCHB Series

WET ROTOR CIRCULATORS FOR
HEATING, COOLING AND SANITARY SYSTEMS

**ErP 2009/125/EC**

Cod. 191007561 Rev.A Ed.03/2013

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# Ecocirc®, EB, EBV, TLCB, TLCHB SERIES
# PRODUCT RANGE CHART

| TYPE | Version | | Power supply | | Pump coupling | | Temperature of pumped liquid | | Ambient temperature | Protection class |
|---|---|---|---|---|---|---|---|---|---|---|
| | Single | Twin | Single-phase 230 V 50 Hz | Single-phase 200-240 V 50/60 Hz | Threaded | Flanged | +2°C ÷ +65°C | -10°C ÷ +110°C | Max 40°C | IP 44 |
| Ecocirc 15-4/130 | • | | | • | • | | | • | • | • |
| Ecocirc 15-6/130 | • | | | • | • | | | • | • | • |
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| Ecocirc 32-4/180 | • | | | • | • | | | • | • | • |
| Ecocirc 32-6/180 | • | | | • | • | | | • | • | • |
| **SANITARY** | | | | | | | | | | |
| EB 15-1/65 R | • | | • | | • | | • | | • | • |
| EB 15-1/65 RU | • | | • | | • | | • | | • | • |
| EB 15-1/110 R | • | | • | | • | | • | | • | • |
| EB 15-1/110 RU | • | | • | | • | | • | | • | • |
| EBV 15-1/65 | • | | • | | • | | • | | • | • |
| EBV 15-1/65 U | • | | • | | • | | • | | • | • |
| EBV 15-1/110 | • | | • | | • | | • | | • | • |
| EBV 15-1/110 U | • | | • | | • | | • | | • | • |
| EBV 15-3/65 | • | | • | | • | | • | | • | • |
| EBV 15-3/110 | • | | • | | • | | • | | • | • |
| TLCB 15-1.5 | • | | • | | • | | • | | • | • |
| TLCB 15-3 | • | | • | | • | | • | | • | • |
| TLCB 15-4 | • | | • | | • | | • | | • | • |
| TLCB 15-6 | • | | • | | • | | • | | • | • |
| TLCB 20-1.5M | • | | • | | • | | • | | • | • |
| TLCB 20-3M | • | | • | | • | | • | | • | • |
| TLCB 20-4M | • | | • | | • | | • | | • | • |
| TLCB 20-6M | • | | • | | • | | • | | • | • |
| TLCB 25-1.5 | • | | • | | • | | • | | • | • |
| TLCB 25-3 | • | | • | | • | | • | | • | • |
| TLCB 25-4 | • | | • | | • | | • | | • | • |
| TLCB 25-4L | • | | • | | • | | • | | • | • |
| TLCB 25-6L | • | | • | | • | | • | | • | • |
| TLCHB 20-7L | • | | • | | • | | • | | • | • |
| TLCHB 20-8L | • | | • | | • | | • | | • | • |
| TLCHB 20-10L | • | | • | | • | | • | | • | • |
| TLCHB 20-12L | • | | • | | • | | • | | • | • |
| TLCHB 25-7L | • | | • | | • | | • | | • | • |
| TLCHB 25-8L | • | | • | | • | | • | | • | • |
| TLCHB 25-10L | • | | • | | • | | • | | • | • |
| TLCHB 25-12L | • | | • | | • | | • | | • | • |

ecocirc-modelli-en_a_sc

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# High efficiency circulators for domesting heating

## Ecocirc® Series

*) ErP ready 2015 — L'alta efficienza del domani è disponibile adesso: i nuovi circolatori Ecocirc sono conformi alla Direttiva ErP per il 2015

## MARKET SECTORS

RESIDENTIAL.

## APPLICATIONS

- Water circulation in heating and air conditioning systems.
- Refurbishment or extension of existing systems.
- Recommended for facilities fitted with thermostatic valves.
- Single-family houses or apartment buildings.
- Floor heating systems.

## SPECIFICATIONS

### PUMP

- **Flow rate**: up to 3,2 $m^3/h$.
- **Head**: up to 5,7 m.
- **Maximum power consumption**: 23 W (for the 4 m model) and 42 W (for the 6 m model).
- **Temperature of pumped liquid**: -10°C ÷ +110°C.
  Avoid condensation and ice formation.
  Maximum 20% glycol and water mixture.
  For glycol quantities higher than 20%, hydraulic performances must be checked.
- **Maximum operating pressure**: 10 bar (PN 10).
- **Rotor assembly group**: made of stainless steel/composite material/carbon.

### MOTOR

- Permanent magnet EC (Electronically Commutated) type motor with spherical rotor/stator.
- Wet rotor with a single spherical ceramic/carbon bearing.
- Integrated motor protection; no external protection required.
- Single-phase 200-240 V 50/60 Hz power supply.
- Variable-speed motor, with automatic speed adjustment based on system requirement.
- **Insulation class** F (155°C).
- **Protection class** IP 44.

*) model 15-6/130 excluded.

## Ecocirc® Series

## CONSTRUCTION CHARACTERISTICS

- **Improved hydraulics to improved efficiency**: The very latest computer simulations have further optimized the pump housing and the impeller.
  The cast iron pump housing is cataphoresis coated completely and is therefore resistant to corrosion.
- **The spherical rotor**. The permanent magnet rotor/impeller unit is the only moving part. Spherical motor pumps are shaftless, and therefore whisper quiet over the whole lifetime. In case of an indicated rotor blocking, emergency software shakes and vibrates the rotor to avoid further blocking.
- The revolutionary **Anti-Block-Technology** allows to separate the magnetic chamber from the flow, preventing magnetite and sludge to block and damage the pump. Blocking up, even in very old, open systems is impossible by our pump design.
- Easy to control, **Two in one control**: Step-less manually control with constant speed, displayed by a white LED, or alternatively automatic differential pressure, displayed by a blue LED.
- **Optimized motor technology**: Doubled electric windings combined with the latest 32 Bit processor technology - that also makes the Ecocirc® even more efficient.
- **Overtemperature protection feature** that slows down the circulator in case the temperature of the electronic module is too high and shuts it down when temperature rises above the safety limit. The circulator will automatically restart after having cooled down.
- Always **easy to access**: The screw ring design results in a pump motor that can be rotated in any position around the 360°circle. The electrical connection as well as the control knob is therefore easy to access.
- 2 metres length **three cores cable** (3G0.75) for connection to the single-phase power source.
- **Automatic air purge**: Quick automatic air-venting-mode for a safe operation.
- According to EN standards 60335-1, 60335-2-51, 55014-1, 55014-2, 16297-1, 16297-2.

## CONTROL MODES

- Automatic regulation: the pump automatically adjusts the working conditions based on the requirement of the system. When the pump detects a decrease in the flow, the inverter reduces the differential pressure of the pump until it reaches the required head.

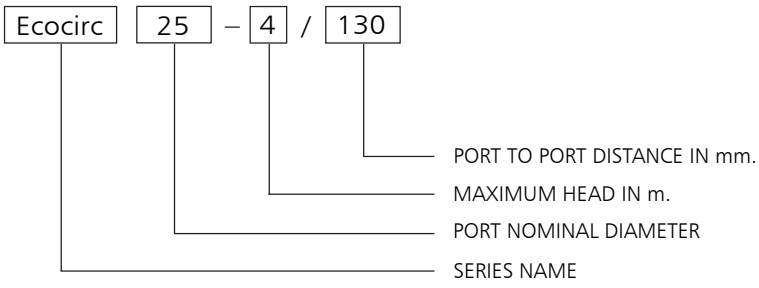
## ACCESSORIES

- Pipe unions.
- Insulation shell.

## INSTALLATION

- Suitable for installation in vertical or horizontal piping, in this last case not with the motor housing upward.

## Ecocirc® SERIES IDENTIFICATION CODE




EXAMPLE : Ecocirc 25-4/130

Electronic circulator of the Ecocirc series, port nominal diameter = 25,
max head = 4 m, with port to port distance 130 mm.

## TABLE OF MATERIALS

| PART | MATERIAL |
|---|---|
| Pump body | Cast iron ( EN-GJL-200 ) cataphoretically coated |
| Rotor assembly group | Stainless steel |
| | Composite material |
| | Carbon |
| Bearing | Ceramics |
| Gaskets | EPDM Rubber |
| Motor housing | Aluminum ( AlSi11Cu2 ) |
| Screw ring | Aluminum ( AlMgSi05 ) |

ecocirc-50-en_a_tm

### Regulations (EC) n. 641/2009 and (EU) n. 622/2012 – Annex I – point 2 (Product information requirements)

a) Energy efficiency index: see the EEI column in the tables in the Hydraulic performance section.
b) "The benchmark for most efficient circulators is EEI ≤ 0,20".
c) Information relevant for disassembly, recycling or disposal at end-of-life: observe the current laws and by-laws governing sorted waste disposal. Consult the product operating manual.
d) Information for circulators specifically designed to potable water uses: note not applicable to these products.

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## Ecocirc...4/ SERIES
## HYDRAULIC PERFORMANCE TABLE (CONSTANT SPEED)

| PUMP TYPE 230V 50Hz | EEI ≤ (1) | POWER ABSORBED MIN W | POWER ABSORBED MAX W | SPEED | Q = DELIVERY l/s 0 | 0,06 | 0,11 | 0,17 | 0,22 | 0,28 | 0,31 | 0,44 | 0,56 | 0,69 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | $m^3/h$ 0 | 0,2 | 0,4 | 0,6 | 0,8 | 1,0 | 1,1 | 1,6 | 2,0 | 2,5 |
| | | | | | H = TOTAL HEAD METRES COLUMN OF WATER | | | | | | | | | |
| Ecocirc 15-4/130 | 0,22 | 4 | 23 | min | 0,5 | 0,4 | 0,4 | 0,4 | 0,3 | 0,2 | 0,2 | | | |
| Ecocirc 20-4/130 | 0,21 | | | | | | | | | | | | | |
| Ecocirc 25-4/130 | 0,21 | | | | | | | | | | | | | |
| Ecocirc 25-4/180 | 0,21 | | | max | 3,6 | 3,4 | 3,1 | 2,9 | 2,7 | 2,5 | 2,4 | 1,8 | 1,3 | 0,5 |
| Ecocirc 32-4/180 | 0,21 | | | | | | | | | | | | | |

Performances according to standards EN 16297-2. (1) Energy efficiency index. ecocirc4-c-50-en_b_th

## (PROPORTIONAL PRESSURE)

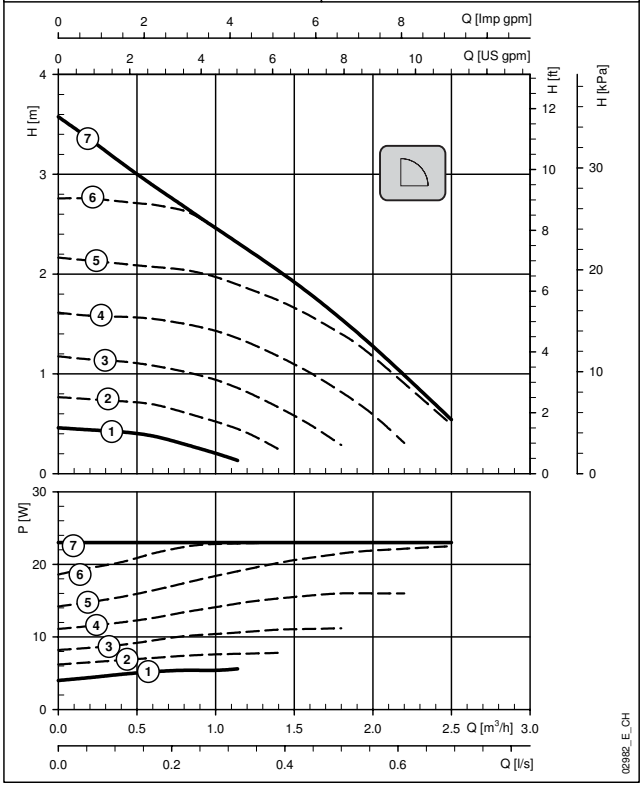
| PUMP TYPE 230V 50Hz | EEI ≤ (1) | POWER ABSORBED MIN W | POWER ABSORBED MAX W | CURRENT ABSORBED MIN A | CURRENT ABSORBED MAX A | SPEED | Q = DELIVERY l/s 0 | 0,06 | 0,11 | 0,17 | 0,22 | 0,28 | 0,33 | 0,44 | 0,56 | 0,69 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | $m^3/h$ 0 | 0,2 | 0,4 | 0,6 | 0,8 | 1,0 | 1,2 | 1,6 | 2,0 | 2,5 |
| | | | | | | | H = TOTAL HEAD METRES COLUMN OF WATER | | | | | | | | | |
| Ecocirc 15-4/130 | 0,22 | 4 | 23 | 0,09 | 0,28 | min | 0,52 | 0,53 | 0,52 | 0,49 | 0,45 | 0,43 | 0,39 | | | |
| Ecocirc 20-4/130 | 0,21 | | | | | | | | | | | | | | | |
| Ecocirc 25-4/130 | 0,21 | | | | | | | | | | | | | | | |
| Ecocirc 25-4/180 | 0,21 | | | | | max | 1,53 | 1,70 | 1,94 | 2,25 | 2,62 | 2,45 | 2,20 | 1,75 | 1,28 | 0,55 |
| Ecocirc 32-4/180 | 0,21 | | | | | | | | | | | | | | | |

Performances according to standards EN 16297-2. (1) Energy efficiency index. ecocirc4-p-50-en_b_th

## SINGLE-PHASE OPERATING CHARACTERISTICS

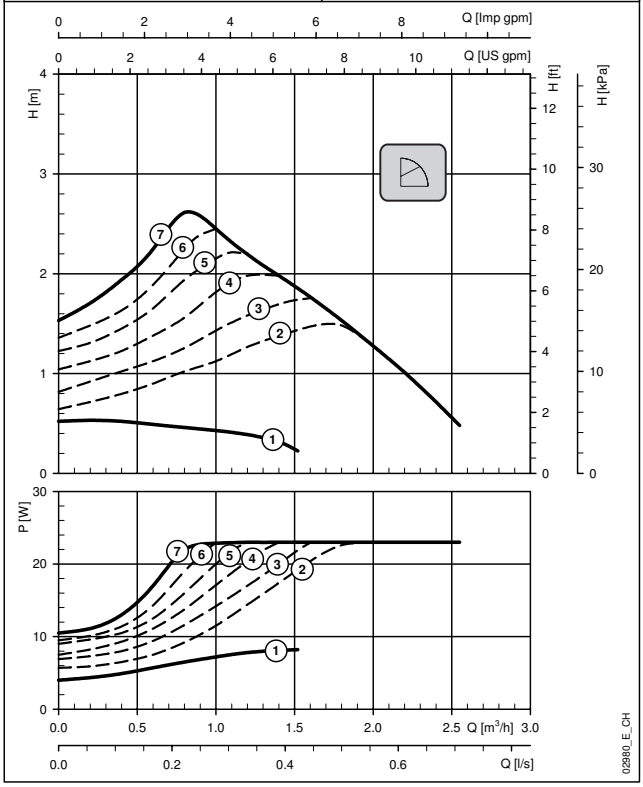
Ecocirc 15-4/130 Ecocirc 25-4/180
Ecocirc 20-4/130 Ecocirc 32-4/180
Ecocirc 25-4/130

EN 16297-2



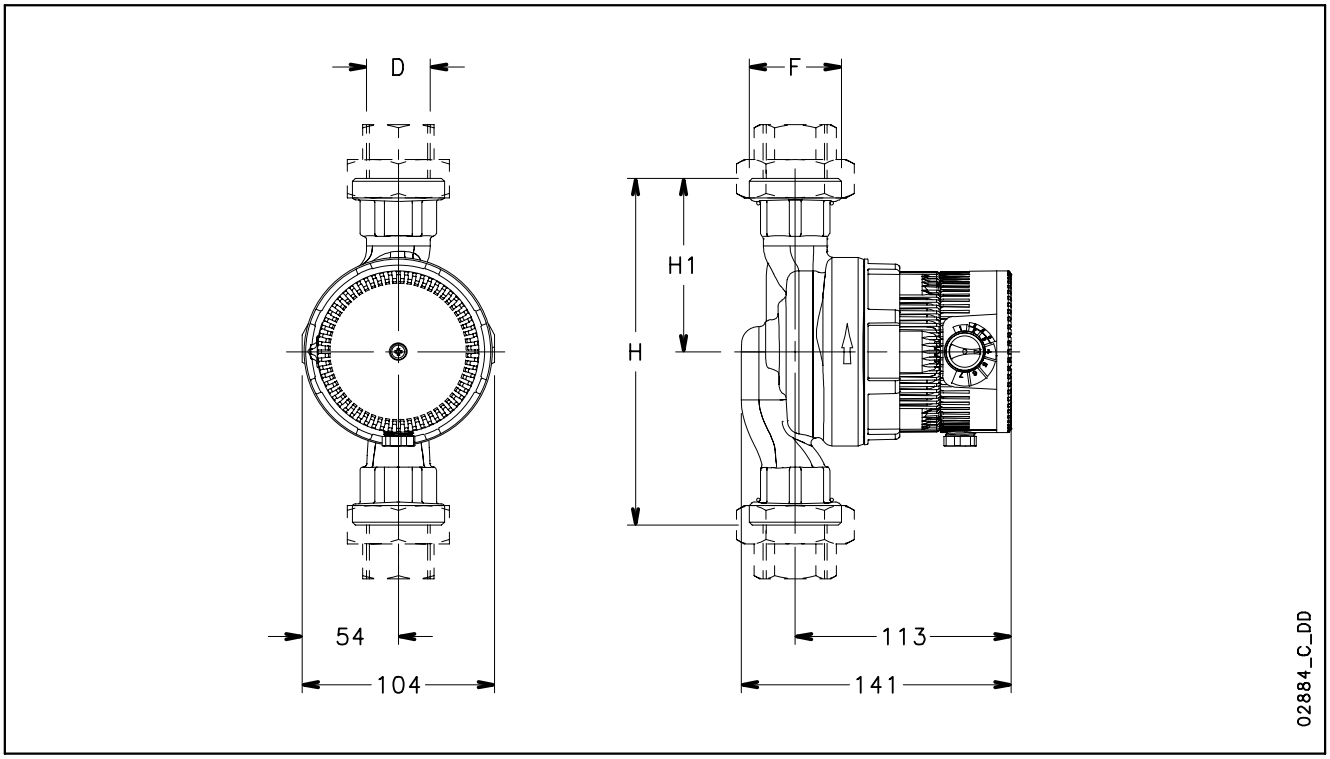

Ecocirc 15-4/130 Ecocirc 25-4/180
Ecocirc 20-4/130 Ecocirc 32-4/180
Ecocirc 25-4/130

EN 16297-2




These performances are valid for liquids with density ρ = 1.0 Kg/dm³ and kinematic viscosity ν = 1 mm²/sec.
Pump operates steplessly. Lines correspond to knob settings and are for reference only.

# Ecocirc...4/ SERIES
# DIMENSIONS AND WEIGHTS




## DIMENSIONS AND WEIGHTS TABLE

| PUMP TYPE | DIMENSIONS (mm) | | | | | WEIGHT |
|---|---|---|---|---|---|---|
| | H | H1 | D | F | DN | kg |
| Ecocirc 15-4/130 | 130 | 65 | Rp 1/2" | G 1" | 15 | 1,9 |
| Ecocirc 20-4/130 | 130 | 65 | Rp 3/4" | G 1"¼ | 20 | 2,0 |
| Ecocirc 25-4/130 | 130 | 65 | Rp 1" | G 1"½ | 25 | 2,1 |
| Ecocirc 25-4/180 | 180 | 90 | Rp 1" | G 1"½ | 25 | 2,4 |
| Ecocirc 32-4/180 | 180 | 90 | Rp 1"¼ | G 2" | 32 | 2,4 |

ecocirc4-2p50-en_a_td

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# Ecocirc...6/ SERIES
# HYDRAULIC PERFORMANCE TABLE (CONSTANT SPEED)

| PUMP TYPE 230V 50Hz | EEI ≤ (1) | POWER ABSORBED MIN W | POWER ABSORBED MAX W | SPEED | Q = DELIVERY l/s 0 | 0,06 | 0,11 | 0,17 | 0,22 | 0,31 | 0,44 | 0,56 | 0,69 | 0,89 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | m³/h 0 | 0,2 | 0,4 | 0,6 | 0,8 | 1,1 | 1,6 | 2,0 | 2,5 | 3,2 |
| | | | | | H = TOTAL HEAD METRES COLUMN OF WATER | | | | | | | | | |
| Ecocirc 15-6/130 | 0,26* | 4 | 42 | min | 0,5 | 0,5 | 0,4 | 0,4 | 0,3 | 0,1 | | | | |
| Ecocirc 20-6/130 | 0,23 | | | | | | | | | | | | | |
| Ecocirc 25-6/130 | 0,23 | | | max | 5,9 | 5,6 | 5,3 | 5,0 | 4,7 | 4,3 | 3,6 | 3,0 | 2,1 | 0,9 |
| Ecocirc 25-6/180 | 0,23 | | | | | | | | | | | | | |
| Ecocirc 32-6/180 | 0,23 | | | | | | | | | | | | | |

Performances according to standards EN 16297-2. (1) Energy efficiency index. * ErP ready 2013 ecocirc6-c-50-en_b_th

# (PROPORTIONAL PRESSURE)

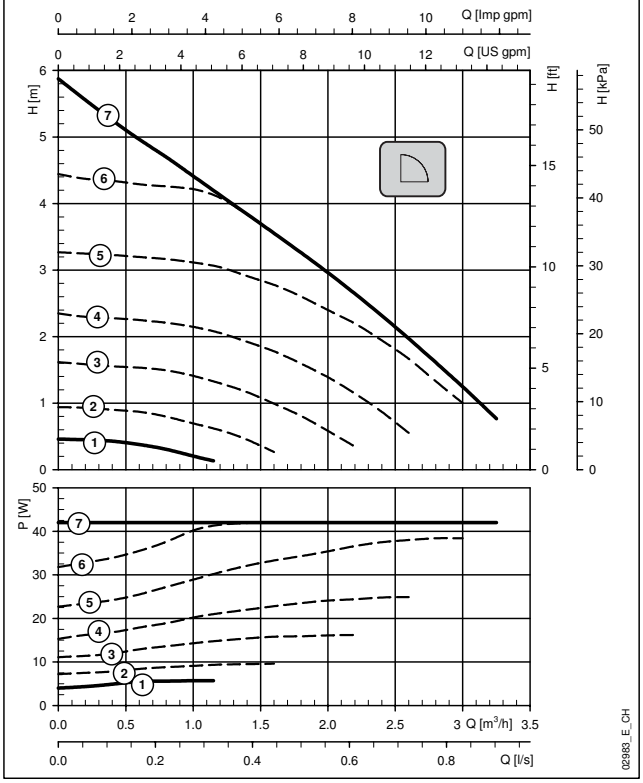
| PUMP TYPE 230V 50Hz | EEI ≤ (1) | POWER ABSORBED MIN W | POWER ABSORBED MAX W | CURRENT ABSORBED MIN A | CURRENT ABSORBED MAX A | SPEED | Q = DELIVERY l/s 0 | 0,06 | 0,11 | 0,17 | 0,22 | 0,28 | 0,42 | 0,56 | 0,69 | 0,83 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | m3/h 0 | 0,2 | 0,4 | 0,6 | 0,8 | 1,0 | 1,5 | 2,0 | 2,5 | 3,0 |
| | | | | | | | H = TOTAL HEAD METRES COLUMN OF WATER | | | | | | | | | |
| Ecocirc 15-6/130 | 0,26* | 4 | 42 | 0,09 | 0,47 | min | 0,54 | 0,54 | 0,54 | 0,54 | 0,54 | 0,54 | 0,25 | | | |
| Ecocirc 20-6/130 | 0,23 | | | | | | | | | | | | | | | |
| Ecocirc 25-6/130 | 0,23 | | | | | max | 2,86 | 3,09 | 3,38 | 3,70 | 4,05 | 4,38 | 3,70 | 2,95 | 2,15 | 1,25 |
| Ecocirc 25-6/180 | 0,23 | | | | | | | | | | | | | | | |
| Ecocirc 32-6/180 | 0,23 | | | | | | | | | | | | | | | |

Performances according to standards EN 16297-2. (1) Energy efficiency index. * ErP ready 2013 ecocirc6-p-50-en_b_th

# SINGLE-PHASE OPERATING CHARACTERISTICS

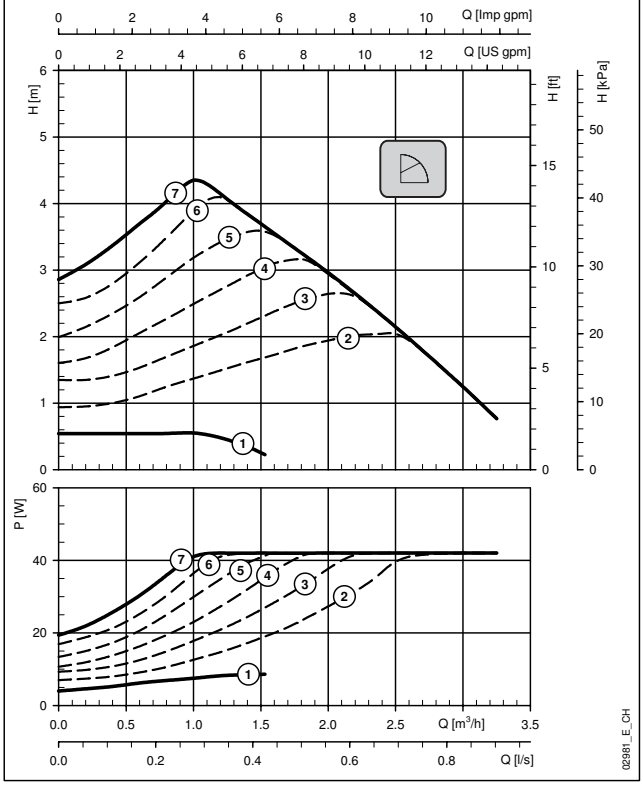
Ecocirc 15-6/130 Ecocirc 25-6/180
Ecocirc 20-6/130 Ecocirc 32-6/180
Ecocirc 25-6/130

EN 16297-2



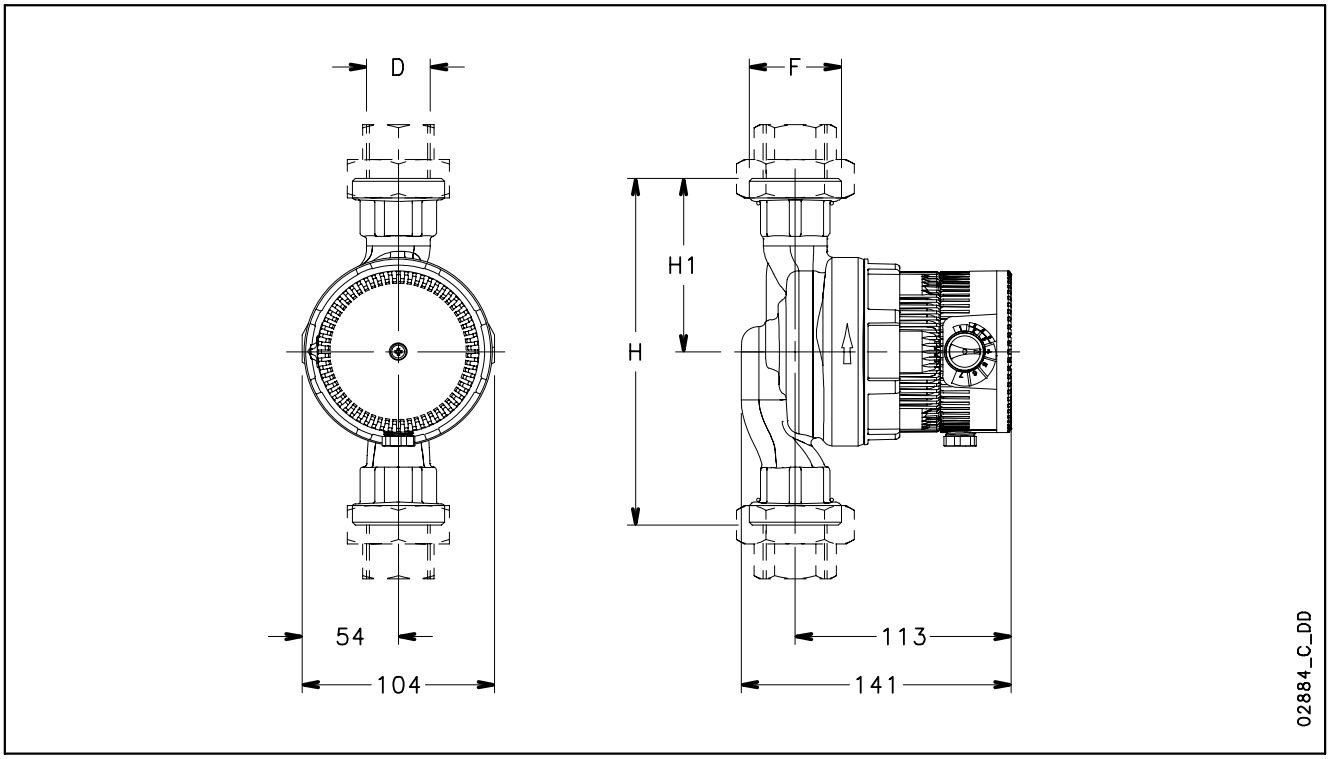

Ecocirc 15-6/130 Ecocirc 25-6/180
Ecocirc 20-6/130 Ecocirc 32-6/180
Ecocirc 25-6/130

EN 16297-2




These performances are valid for liquids with density ρ = 1.0 Kg/dm³ and kinematic viscosity ν = 1 mm²/sec.
Pump operates steplessly. Lines correspond to knob settings and are for reference only.

# Ecocirc...6/ SERIES
# DIMENSIONS AND WEIGHTS




## DIMENSIONS AND WEIGHTS TABLE

| PUMP TYPE | DIMENSIONS (mm) | | | | | WEIGHT |
|---|---|---|---|---|---|---|
| | H | H1 | D | F | DN | kg |
| Ecocirc 15-6/130 | 130 | 65 | Rp 1/2" | G 1" | 15 | 1,9 |
| Ecocirc 20-6/130 | 130 | 65 | Rp 3/4" | G 1"¼ | 20 | 2,0 |
| Ecocirc 25-6/130 | 130 | 65 | Rp 1" | G 1"½ | 25 | 2,1 |
| Ecocirc 25-6/180 | 180 | 90 | Rp 1" | G 1"½ | 25 | 2,4 |
| Ecocirc 32-6/180 | 180 | 90 | Rp 1"¼ | G 2" | 32 | 2,4 |

ecocirc6-2p50-en_a_td

# High efficiency electronic sanitary circulators

## EB, EBV Series

## MARKET SECTORS

RESIDENTIAL.

## APPLICATIONS

- Hot water circulation.

## SPECIFICATIONS

PUMP

- **Flow rate**: up to 1 $m^3/h$.
- **Head**: up to 3 m.
- **Temperature of pumped liquid**: +2°C ÷ +65°C.
  Avoid condensation and ice formation.
- **Maximum operating pressure**: 10 bar (PN 10).
- **Rotor assembly group**: made of stainless steel/composite material/carbon.

MOTOR

- Permanent magnet EC (Electronically Commutated) type motor with spherical rotor/stator.
- Wet rotor with a single spherical ceramic/carbon ball bearing.
- Integrated motor protection; no external protection required.
- Single-phase 200-240V 50/60 Hz power supply.
- Motor type:
  - Fixed speed for temperature sensor and temperature sensor + timer models;
  - Variable speed with automatic regulation for basic and timer models.
- **Insulation class** F (155°C).
- **Protection class**: IP 44 no-timer models.
  IP 42 timer models.

## EB, EBV Series

## CONSTRUCTION CHARACTERISTICS

- Electric circulator pumps for domestic hot water applications at maximun temperature of 65°C, at maximum hardness of 25° f (14°dH).
- Brassy pump body for direct installation onto piping for 1/2" and 1/2" - 1" 1/4" threaded union connections.
- The design is based on spherical rotor/stator technology.
  This means that:
  - The only moving part is the spherical rotor/impeller unit that turns on a hard ceramic ball.
  - Shaft seals or conventional bearing bushings with a shaft have been eliminated for a single self realigning spherical bearing.
- Blockage free rotor: the spherical motor principle does not require a manual unblocking device thanks to the small touching surface of the bearing on the ball. The starting torque required is minimal.
- Models available:
  - Fixed speed (EB.. models)
    - Temperature sensor to maintain the water onto piping at the required temperature . The circulator automatically turns off when the water temperature achieves the value. Temperature can be set up between 20°C and 70°C by the selector on the motor.
    - Temperature sensor and timer for more energy saving.
  - Variable speed (EBV.. models):
    - Performances optimized by system requests. Speed set up is done by a selector on the motor by 7 different positions. At 2 and 3 positions (ECO) the consumption is especially low.
    - Timer as a standard in order to daily set up the performances.
- 110 mm port-to-port length models are fitted out with non-return and shut off valve. 65 mm port-to-port length models are fitted out with a non-return valve to install to supply connection.
- According to EN standards 60335-1, 60335-2-51, 55014-1, 55014-2.

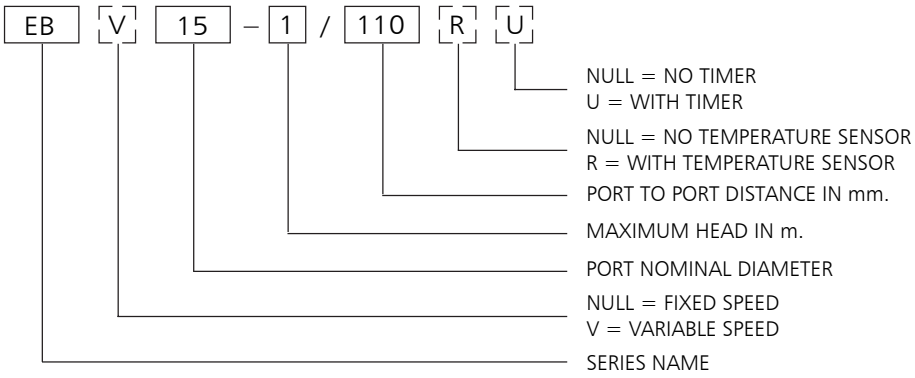
## ACCESSORIES

- Pipe unions.
- Insulation shell.

## INSTALLATION

- Suitable for installation in vertical or horizontal piping, in this last case not with the motor housing upward.

## EB, EBV SERIES
## IDENTIFICATION CODE




EXAMPLE : EB 15-1/110 RU

Electronic circulator of the EB series, port nominal diameter = 15,
max head = 1 m, port to port distance 110 mm, with temperature probe and timer.

## TABLE OF MATERIALS

| PART | MATERIAL |
|---|---|
| Pump body | Brass |
| Rotor assembly group | Stainless steel |
| | Composite material |
| | Carbon |
| Bearing | Ceramic |
| Gaskets | EPDM |

eb-50-en_b_tm

### Regulations (EC) n. 641/2009 and (EU) n. 622/2012 – Annex I – point 2 (Product information requirements)

a) Energy efficiency index: note not applicable to these products.
b) "The benchmark for most efficient circulators is EEI ≤ 0,20": note not applicable to these products.
c) Information relevant for disassembly, recycling or disposal at end-of-life: observe the current laws and by-laws governing sorted waste disposal. Consult the product operating manual.
d) Information for circulators specifically designed to potable water uses: "This circulator is suitable for drinking water only".

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# EB, EBV SERIES
# HYDRAULIC PERFORMANCE TABLE

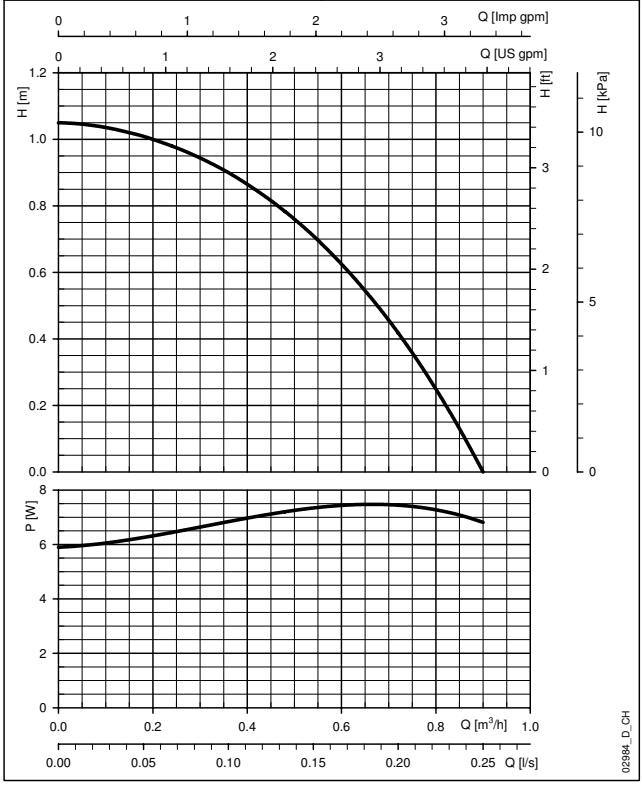
| PUMP TYPE | POWER ABSORBED | | SPEED | Q = DELIVERY | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | l/s 0 | 0,03 | 0,06 | 0,08 | 0,11 | 0,14 | 0,19 | 0,22 | 0,28 | 0,36 | 0,39 |
| | MIN | MAX | | $m^3/h$ 0 | 0,1 | 0,2 | 0,3 | 0,4 | 0,5 | 0,7 | 0,8 | 1 | 1,3 | 1,4 |
| 230V 50Hz | W | W | | H = TOTAL HEAD METRES COLUMN OF WATER | | | | | | | | | | |
| EB 15-1/65 R | 5,9 | 7,5 | max | 1,05 | 1,04 | 1,00 | 0,94 | 0,86 | 0,76 | 0,46 | 0,25 | | | |
| EB 15-1/65 RU | 7,4 | 9,0 | max | 1,05 | 1,04 | 1,00 | 0,94 | 0,86 | 0,76 | 0,46 | 0,25 | | | |
| EB 15-1/110 R | 5,8 | 7,3 | max | 1,05 | 0,95 | 0,83 | 0,69 | 0,51 | 0,29 | | | | | |
| EB 15-1/110 RU | 7,3 | 8,8 | max | 1,05 | 0,95 | 0,83 | 0,69 | 0,51 | 0,29 | | | | | |
| EBV 15-1/65 | 2,6 | 2,7 | min | 0,20 | 0,18 | 0,15 | 0,10 | | | | | | | |
| | 5,9 | 7,5 | max | 1,05 | 1,04 | 1,00 | 0,94 | 0,86 | 0,76 | 0,46 | 0,25 | | | |
| EBV 15-1/65 U | 4,1 | 4,2 | min | 0,20 | 0,18 | 0,15 | 0,10 | | | | | | | |
| | 7,4 | 9,0 | max | 1,05 | 1,04 | 1,00 | 0,94 | 0,86 | 0,76 | 0,46 | 0,25 | | | |
| EBV 15-1/110 | 2,2 | 2,3 | min | 0,10 | | | | | | | | | | |
| | 5,8 | 7,3 | max | 1,05 | 0,95 | 0,83 | 0,69 | 0,51 | 0,29 | | | | | |
| EBV 15-1/110 U | 3,7 | 3,8 | min | 0,10 | | | | | | | | | | |
| | 7,3 | 8,8 | max | 1,05 | 0,95 | 0,83 | 0,69 | 0,51 | 0,29 | | | | | |
| EBV 15-3/65 | 2,6 | 2,6 | min | 0,25 | 0,24 | 0,20 | 0,12 | | | | | | | |
| | 17,1 | 23,7 | max | 3,10 | 3,09 | 3,08 | 3,07 | 3,06 | 3,04 | 3,02 | 3,00 | 2,97 | 2,91 | 2,89 |
| EBV 15-3/110 | 4,0 | 4,0 | min | 0,20 | 0,11 | | | | | | | | | |
| | 17,1 | 26,6 | max | 3,31 | 3,20 | 3,08 | 2,96 | 2,84 | 2,71 | 2,43 | 2,28 | 1,96 | | |

Hydraulic performances in compliance with ISO 9906:2012 - Grade 3B (ex ISO 9906:1999 - Annex A)

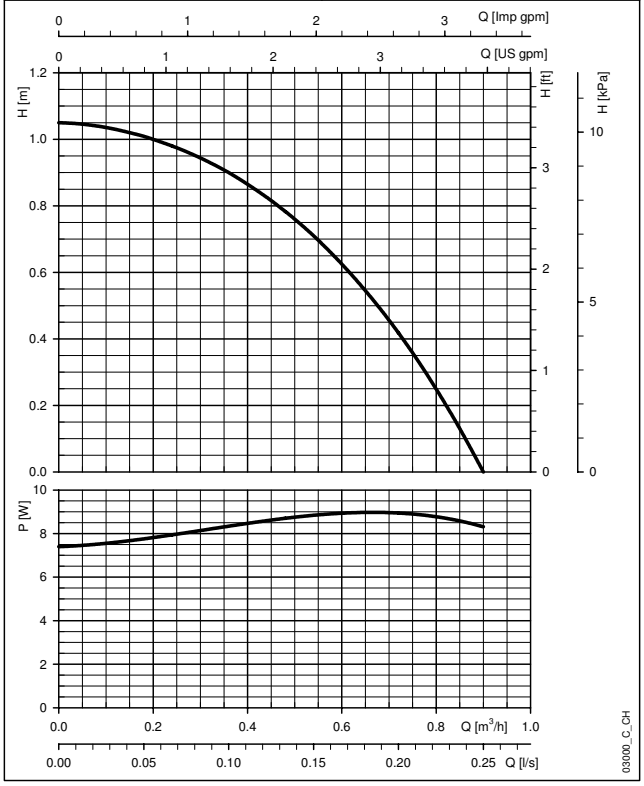
eb-50-en_e_th

# EB SERIES
# SINGLE-PHASE OPERATING CHARACTERISTICS

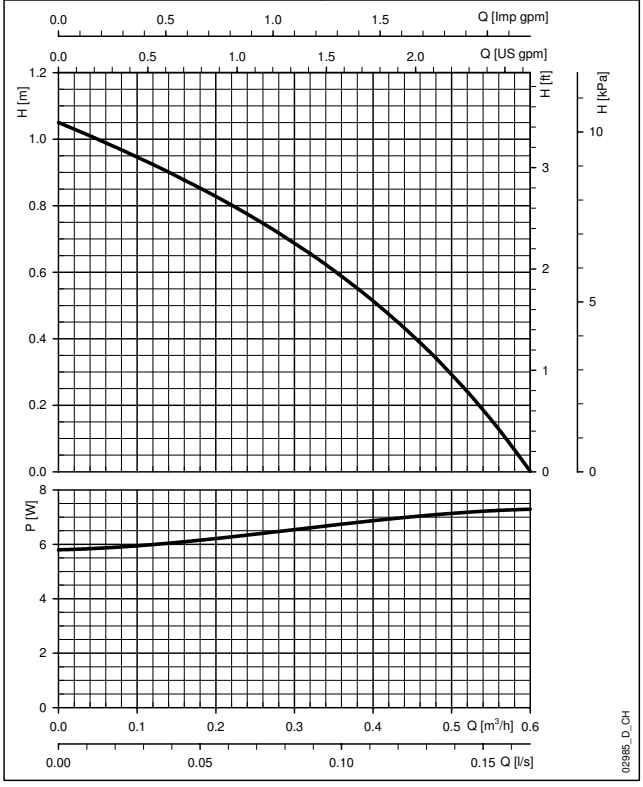
EB 15-1/65 R | ISO 9906:2012 - Grade 3B



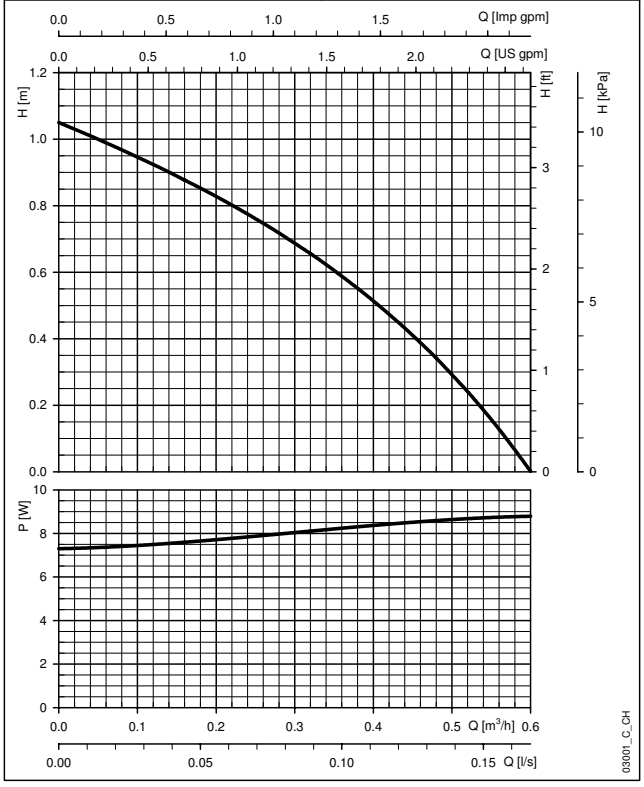

EB 15-1/65 RU | ISO 9906:2012 - Grade 3B




EB 15-1/110 R | ISO 9906:2012 - Grade 3B




EB 15-1/110 RU | ISO 9906:2012 - Grade 3B




These performances are valid for liquids with density $\rho = 1.0$ Kg/dm$^3$ and kinematic viscosity $\nu = 1$ mm$^2$/sec.

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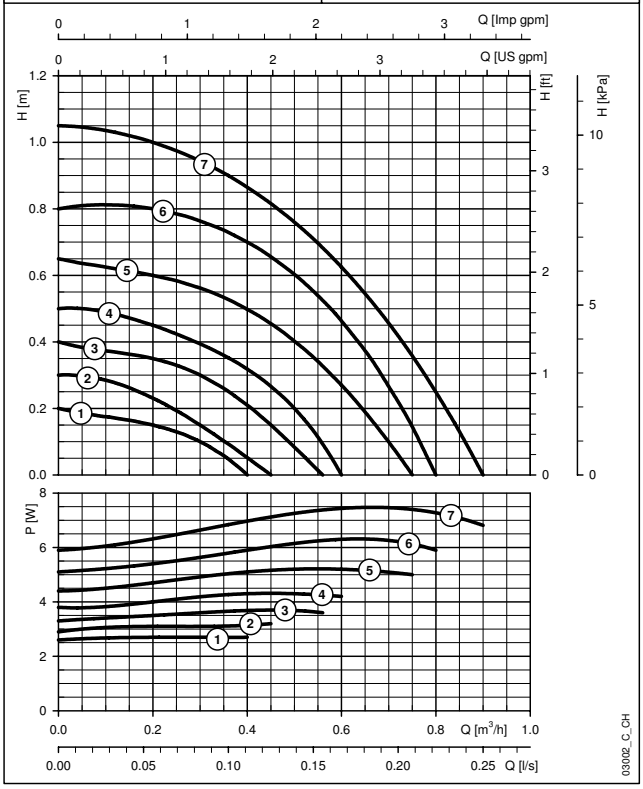
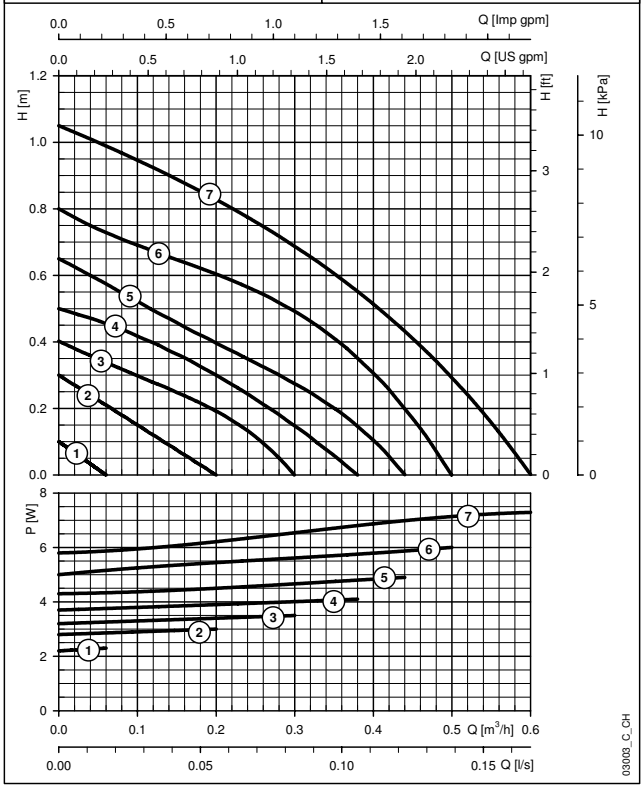
# EBV SERIES
# SINGLE-PHASE OPERATING CHARACTERISTICS

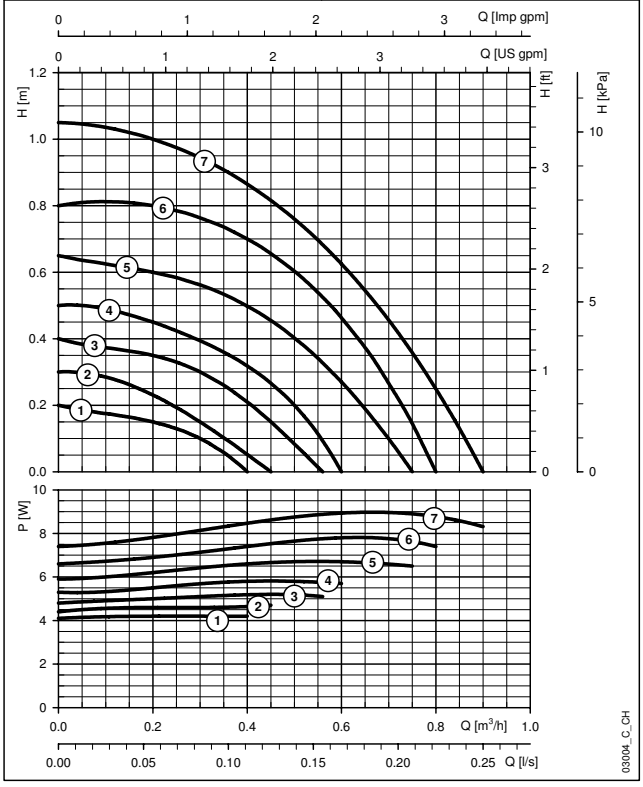
| * EBV 15-1/65 | ISO 9906:2012 - Grade 3B |
|---|---|



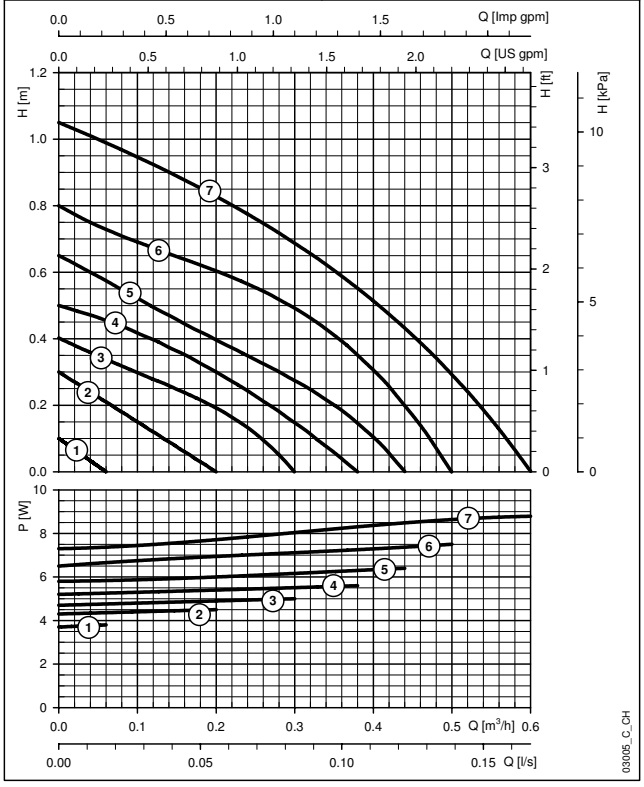

| * EBV 15-1/110 | ISO 9906:2012 - Grade 3B |
|---|---|




| * EBV 15-1/65 U | ISO 9906:2012 - Grade 3B |
|---|---|



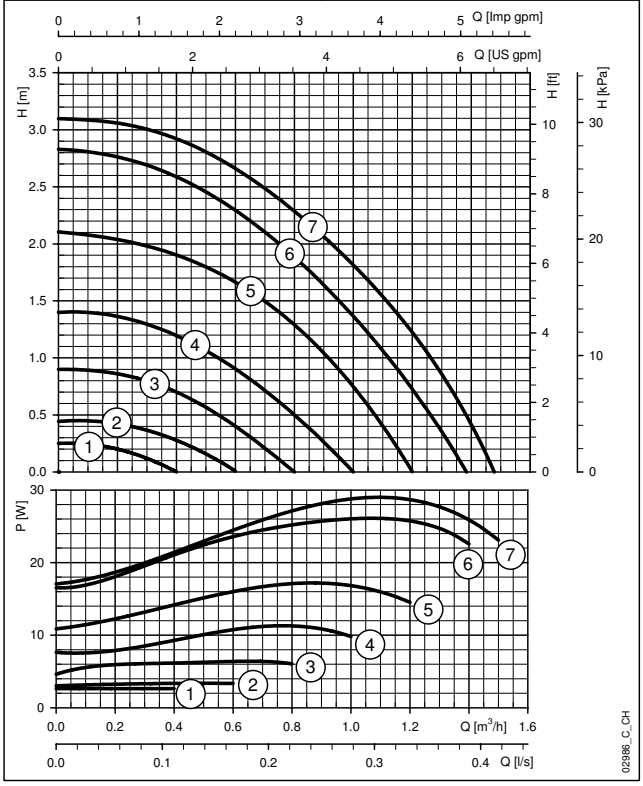

| * EBV 15-1/110 U | ISO 9906:2012 - Grade 3B |
|---|---|



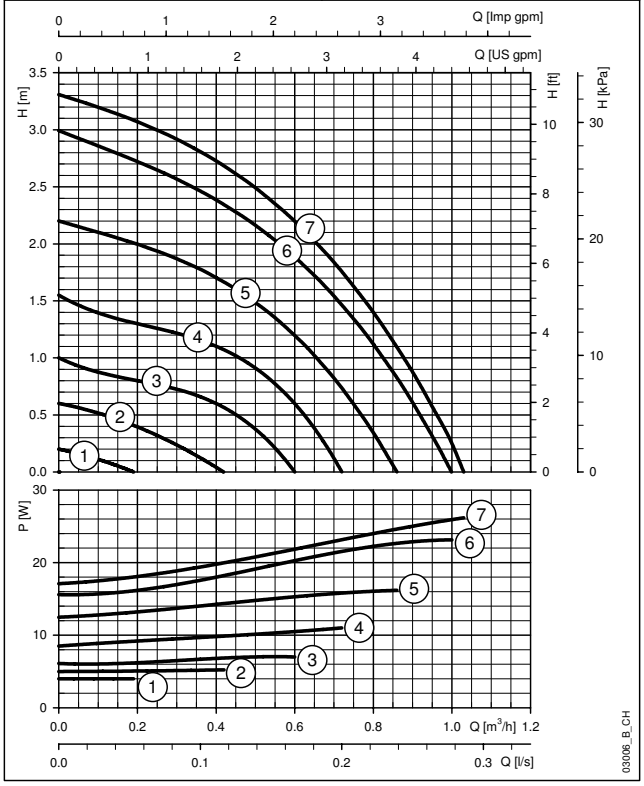

These performances are valid for liquids with density $\rho = 1.0$ Kg/dm$^3$ and kinematic viscosity $\nu = 1$ mm$^2$/sec.
* Pump operates steplessly. Lines correspond to knob settings and are for reference only.

# EBV SERIES
# SINGLE-PHASE OPERATING CHARACTERISTICS

| * EBV 15-3/65 | ISO 9906:2012 - Grade 3B |
|---|---|

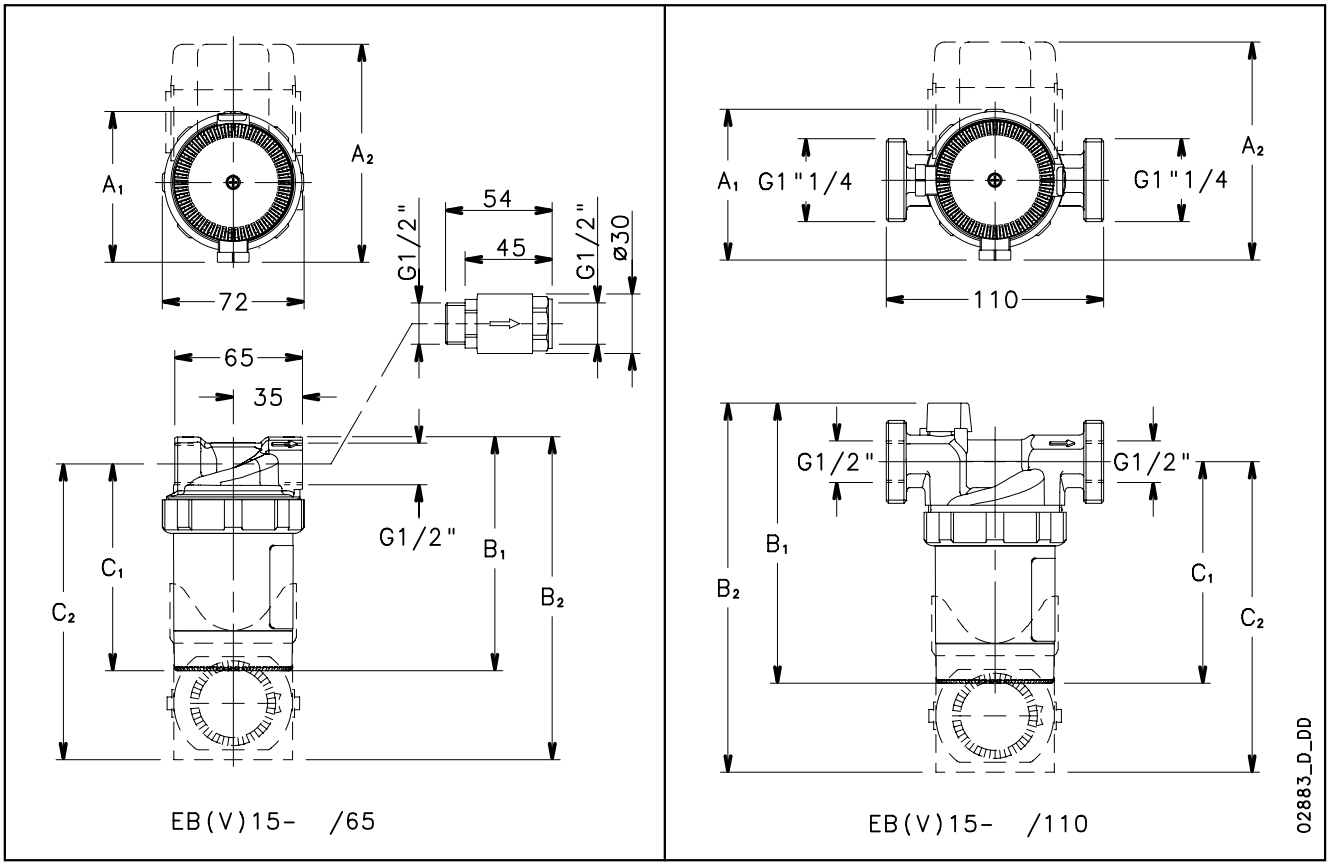



| * EBV 15-3/110 | ISO 9906:2012 - Grade 3B |
|---|---|




These performances are valid for liquids with density $\rho = 1.0$ Kg/dm³ and kinematic viscosity $\nu = 1$ mm²/sec.
* Pump operates steplessly. Lines correspond to knob settings and are for reference only.

# EB, EBV SERIES
# DIMENSIONS AND WEIGHTS




## DIMENSIONS AND WEIGHTS TABLE

| PUMP TYPE | | DIMENSIONS (mm) | | | | | | | PESO |
|---|---|---|---|---|---|---|---|---|---|
| | | $A_1$ | $A_2$ | $B_1$ | $B_2$ | $C_1$ | $C_2$ | DN | kg |
| EB 15-1/65R | EBV 15-1/65 | 76 | - | 118 | - | 105 | - | 15 | 0,9 |
| EB 15-1/65RU | EBV 15-1/65U | - | 110 | - | 163 | - | 150 | 15 | 1 |
| EB 15-1/110R | EBV 15-1/110 | 76 | - | 142 | - | 112 | - | 15 | 1,3 |
| EB 15-1/110RU | EBV 15-1/110U | - | 110 | - | 187 | - | 157 | 15 | 1,4 |
| | EBV 15-3/65 | 76 | - | 118 | - | 105 | - | 15 | 0,9 |
| | EBV 15-3/110 | 76 | - | 142 | - | 112 | - | 15 | 1,3 |

eb-2p50-en_d_td

# Sanitary Circulators

## MARKET SECTORS
RESIDENTIAL.

## APPLICATIONS
- Circulation of sanitary hot water.

## TLCB Series

## SPECIFICATIONS

PUMP
- **Flow rate**: up to 5 $m^3/h$.
- **Head**: up to 6 m.
- **Temperature of pumped liquid**: +2°C ÷ +65°C. Avoid condensation and ice formation.
- **Maximum operating pressure**: 10 bar (PN 10).
- **Impeller**: made of composite material.
- **Wear ring**: ceramic.

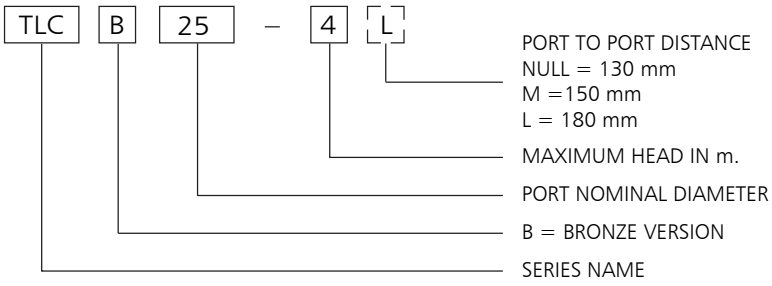
MOTOR
- Wet rotor type, with bearings lubricated by the pumped liquid. Axial and radial bearings made of ceramic.
- Single-phase 230 V 50 Hz power supply. Terminal box axially integrated in the motor.
- Three speed hand selector motor.
- **Insulation class** 180 (H).
- **Protection class** IP 44.

## CONSTRUCTION CHARACTERISTICS
- Electric circulator pumps for sanitary hot water circulation, at a maximum temperature of 65°C , maximum hardness of 25° f (14°dH) and maximum viscosity of 10 $mm^2/S$.
- Bronze pump body designed for direct installation onto copper piping, with 1", 1" ¼ and 1" ½ threaded connections.
- According to EN standards 60335-1, 60335-2-51, 55014-1, 55014-2.

## ACCESSORIES
- Pipe unions.
- Insulation shell.

## INSTALLATION
- Suitable for installation in horizontal or vertical piping, in any position provided that motor axis is horizontal.

## TLCB SERIES
## IDENTIFICATION CODE




EXAMPLE : TLCB 25-4L

TLC series circulator, bronze B version, port nominal diameter = 25,
max head= 4 m, with port to port distance of 180 mm.

## TABLE OF MATERIALS

| PART | MATERIAL |
|---|---|
| Pump body | Bronze |
| Impeller | Composite material |
| Shaft | Ceramics |
| Inner jacket | Stainless steel |
| Wear ring | Ceramics |
| Bearings | Ceramics |
| Gaskets | EPDM |

tlcb-2p50-en_a_tm

### Regulations (EC) n. 641/2009 and (EU) n. 622/2012 – Annex I – point 2 (Product information requirements)

a) Energy efficiency index: note not applicable to these products.
b) "The benchmark for most efficient circulators is EEI ≤ 0,20": note not applicable to these products.
c) Information relevant for disassembly, recycling or disposal at end-of-life: observe the current laws and by-laws governing sorted waste disposal. Consult the product operating manual.
d) Information for circulators specifically designed to potable water uses: "This circulator is suitable for drinking water only".

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# TLCB SERIES
# HYDRAULIC PERFORMANCE TABLE

| PUMP TYPE | MAXIMUM ABSORBED POWER | MAXIMUM ABSORBED CURRENT | CAPACITOR | | SPEED | Q = DELIVERY | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | l/s 0 | 0,2 | 0,3 | 0,4 | 0,5 | 0,7 | 0,8 | 1,0 | 1,2 |
| | | | | | | $m^3/h$ 0 | 0,6 | 1,2 | 1,5 | 1,8 | 2,4 | 3,0 | 3,6 | 4,2 |
| 230V 50Hz | W | A | µF | V | | H = TOTAL HEAD METRES COLUMN OF WATER | | | | | | | | |
| TLCB 15-1.5 | 28 | 0,16 | 2,0 | 400 | 1 | 1,0 | 0,8 | 0,4 | 0,2 | | | | | |
| TLCB 20-1.5M | 43 | 0,24 | | | 2 | 1,2 | 1,0 | 0,6 | 0,4 | | | | | |
| TLCB 25-1.5 | 58 | 0,28 | | | 3 | 1,4 | 1,2 | 0,8 | 0,6 | 0,4 | | | | |
| TLCB 15-3 | 33 | 0,17 | 2,0 | 400 | 1 | 1,3 | 0,6 | 0,2 | | | | | | |
| TLCB 20-3M | 48 | 0,25 | | | 2 | 2,5 | 1,7 | 1,0 | 0,8 | 0,5 | | | | |
| TLCB 25-3 | 63 | 0,30 | | | 3 | 3,0 | 2,7 | 2,2 | 2,0 | 1,7 | 1,1 | | | |
| TLCB 15-4 | 40 | 0,19 | 2,0 | 400 | 1 | 3,0 | 2,6 | 2,1 | 1,9 | 1,6 | 1,0 | | | |
| TLCB 20-4M | 59 | 0,28 | | | 2 | 3,5 | 3,3 | 2,9 | 2,7 | 2,4 | 1,8 | 1,3 | | |
| TLCB 25-4 (L) | 70 | 0,33 | | | 3 | 4,0 | 3,8 | 3,5 | 3,3 | 3,0 | 2,5 | 2,0 | 1,3 | |
| TLCB 15-6 | 56 | 0,27 | 3,0 | 400 | 1 | 3,1 | 1,9 | 1,2 | 0,9 | 0,6 | | | | |
| TLCB 20-6M | 83 | 0,37 | | | 2 | 4,7 | 3,6 | 2,7 | 2,3 | 1,9 | 1,2 | 0,7 | | |
| TLCB 25-6L | 100 | 0,44 | | | 3 | 5,6 | 5,0 | 4,4 | 4,0 | 3,7 | 3,1 | 2,4 | 1,8 | 1,2 |

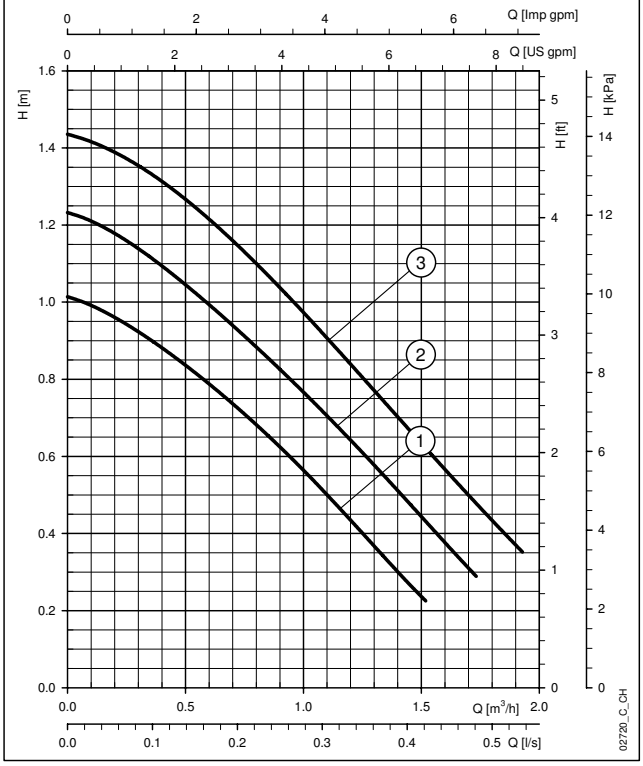
Hydraulic performances in compliance with ISO 9906:2012 - Grade 3B (ex ISO 9906:1999 - Annex A)

tlcb-2p50-en_c_th

# TLCB SERIES
# SINGLE-PHASE OPERATING CHARACTERISTICS

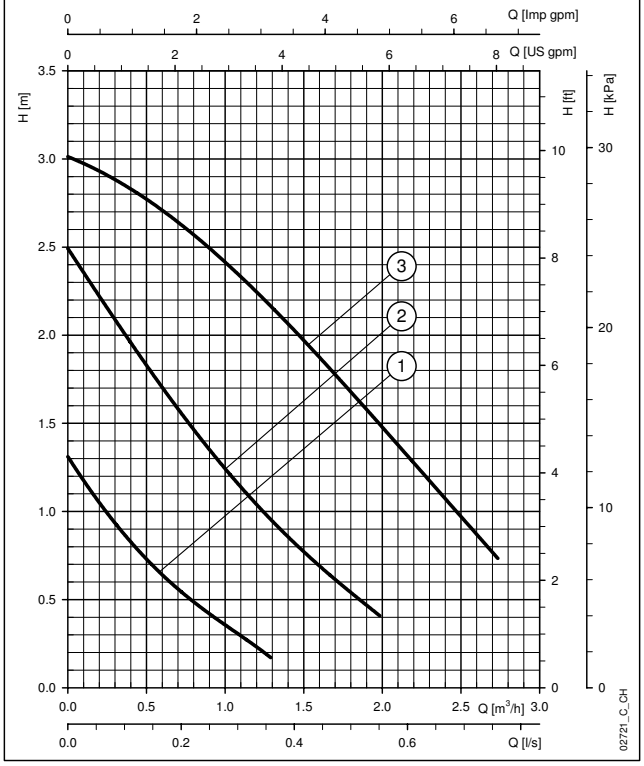
TLCB 15 - 1.5
TLCB 20 - 1.5M
TLCB 25 - 1.5

ISO 9906:2012 - Grade 3B



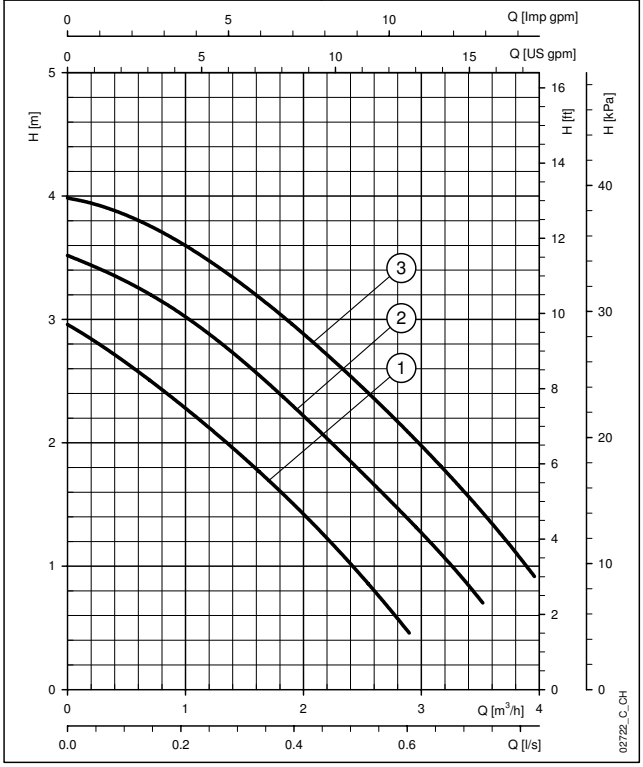

TLCB 15 - 3
TLCB 20 - 3M
TLCB 25 - 3

ISO 9906:2012 - Grade 3B



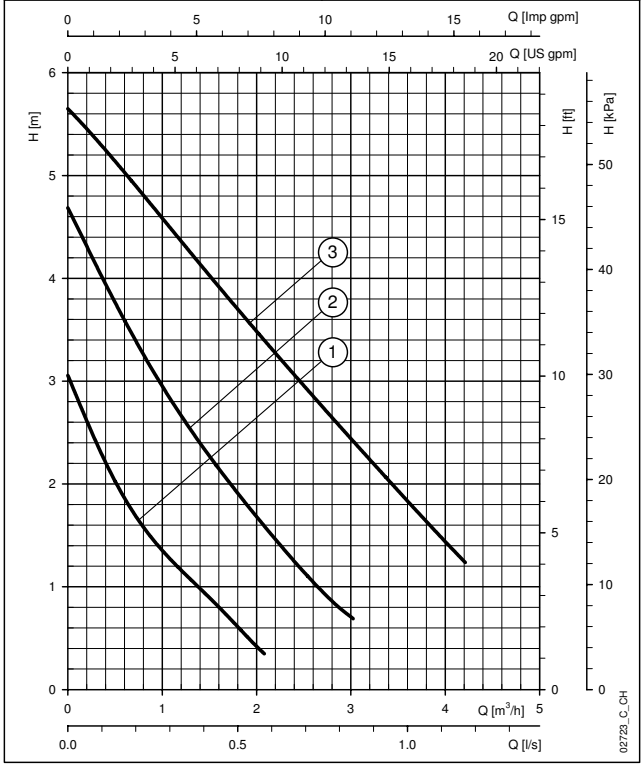

TLCB 15 - 4
TLCB 20 - 4M
TLCB 25 - 4
TLCB 25 - 4L

ISO 9906:2012 - Grade 3B




TLCB 15 - 6
TLCB 20 - 6M
TLCB 25 - 6L

ISO 9906:2012 - Grade 3B




These performances are valid for liquids with density ρ = 1.0 Kg/dm³ and kinematic viscosity ν = 1 mm²/sec.

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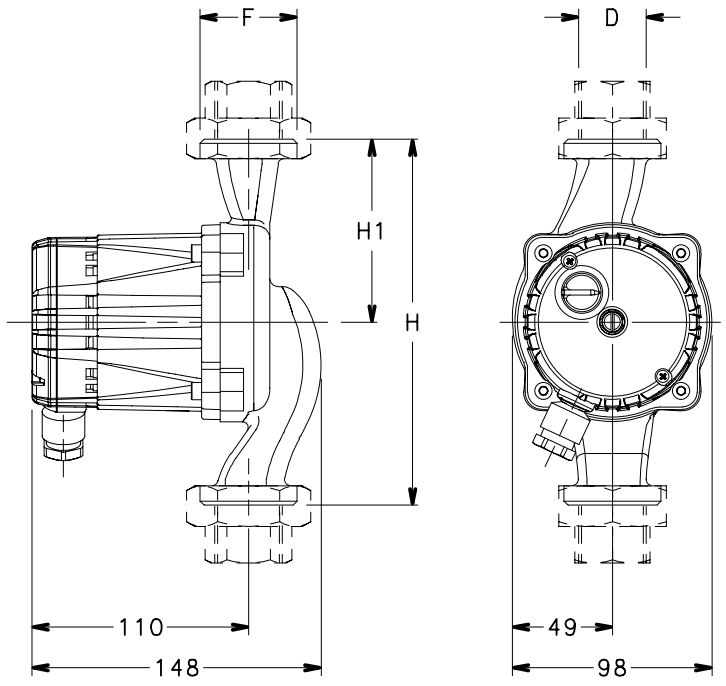
# TLCB SERIES
# DIMENSIONS AND WEIGHTS




02870_B_DD

## DIMENSIONS AND WEIGHTS TABLE

| PUMP TYPE | DIMENSIONS (mm) | | | | | WEIGHT |
|---|---|---|---|---|---|---|
| | H | H1 | D | F | DN | kg |
| TLCB 15-1.5 | 130 | 65 | 1/2" | G 1" | 15 | 2,9 |
| TLCB 20-1.5M | 150 | 75 | 3/4" | G 1"¼ | 20 | 3 |
| TLCB 25-1.5 | 130 | 65 | 1" | G 1"½ | 25 | 3 |
| TLCB 15-3 | 130 | 65 | 1/2" | G 1" | 15 | 2,9 |
| TLCB 20-3M | 150 | 75 | 3/4" | G 1"¼ | 20 | 3 |
| TLCB 25-3 | 130 | 65 | 1" | G 1"½ | 25 | 3 |
| TLCB 15-4 | 130 | 65 | 1/2" | G 1" | 15 | 2,9 |
| TLCB 20-4M | 150 | 75 | 3/4" | G 1"¼ | 20 | 3 |
| TLCB 25-4 | 130 | 65 | 1" | G 1"½ | 25 | 3 |
| TLCB 25-4L | 180 | 90 | 1" | G 1"½ | 25 | 3,1 |
| TLCB 15-6 | 130 | 65 | 1/2" | G 1" | 15 | 2,9 |
| TLCB 20-6M | 150 | 75 | R¾ | G 1"¼ | 20 | 3 |
| TLCB 25-6L | 180 | 90 | R 1 | G 1"½ | 25 | 3,1 |

tlcb-2p50-en_c_td

# Sanitary Circulators

## TLCHB Series

## MARKET SECTORS

SANITARY LIGHT COMMERCIAL.

## APPLICATIONS

- Circulation of sanitary hot water in high flow/high head installations.

## SPECIFICATIONS

PUMP

- **Flow rate**: up to 12 $m^3/h$.
- **Head**: up to 12 m.
- **Temperature of pumped liquid**: +2°C ÷ +65°C. Avoid condensation and ice formation.
- **Maximum operating pressure**: 10 bar (PN 10).
- **Impeller**: made of composite material.
- **Wear ring**: ceramic.

MOTOR

- Wet rotor type, with bearings lubricated by the pumped liquid. Axial and radial bearings made of ceramic.
- Single-phase 230 V 50 Hz power supply. Terminal box axially integrated in the motor.
- Three speed hand selector motor.
- **Insulation class** 180 (H).
- **Protection class** IP 44.

## CONSTRUCTION CHARACTERISTICS

- Electric circulator pumps for sanitary hot water circulation, at a maximum temperature of 65°C , maximum hardness of 25° f (14°dH) and maximum viscosity of 10 $mm^2/S$.
- Bronze pump body designed for direct installation onto copper piping, with 1" ¼ and 1" ½ threaded connections.
- According to EN standards 60335-1, 60335-2-51, 55014-1, 55014-2.

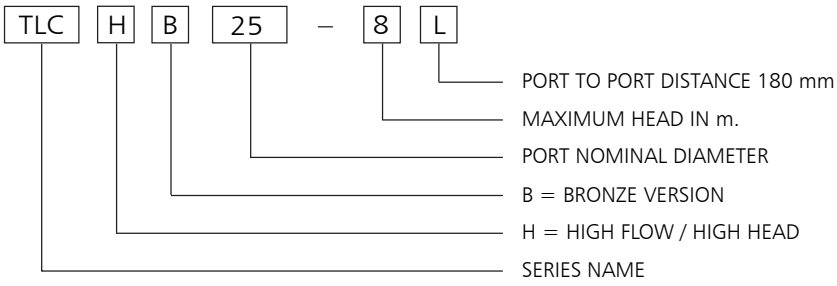
## ACCESSORIES

- Pipe unions.
- Insulation shell.

## INSTALLATION

- Suitable for installation in horizontal or vertical piping, in any position provided that motor axis is horizontal.

## TLCHB SERIES IDENTIFICATION CODE




EXAMPLE : TLCHB 25-8L

TLC series circulator, high flow/head H version, bronze B version, port nominal diameter = 25, max head= 8 m, with port to port distance of 180 mm.

## TABLE OF MATERIALS

| PART | MATERIAL |
|---|---|
| Pump body | Bronze |
| Impeller | Composite material |
| Shaft | Ceramics |
| Inner jacket | Stainless steel |
| Wear ring | Ceramics |
| Bearings | Ceramics |
| Gaskets | EPDM |

tlchb-2p50-en_a_tm

### Regulations (EC) n. 641/2009 and (EU) n. 622/2012 – Annex I – point 2 (Product information requirements)

a) Energy efficiency index: note not applicable to these products.
b) "The benchmark for most efficient circulators is EEI ≤ 0,20": note not applicable to these products.
c) Information relevant for disassembly, recycling or disposal at end-of-life: observe the current laws and by-laws governing sorted waste disposal. Consult the product operating manual.
d) Information for circulators specifically designed to potable water uses: "This circulator is suitable for drinking water only".

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a xylem brand

# TLCHB SERIES
# HYDRAULIC PERFORMANCE TABLE

| PUMP TYPE | MAXIMUM ABSORBED POWER | MAXIMUM ABSORBED CURRENT | CAPACITOR | | SPEED | Q = DELIVERY | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | l/s 0 | 0,3 | 0,7 | 1,0 | 1,3 | 1,7 | 2,0 | 2,3 | 2,7 |
| | | | | | | $m^3/h$ 0 | 1,2 | 2,4 | 3,6 | 4,8 | 6,0 | 7,2 | 8,4 | 9,6 |
| 230V 50Hz | W | A | µF | V | | H = TOTAL HEAD METRES COLUMN OF WATER | | | | | | | | |
| TLCHB 20-7L<br>TLCHB 25-7L | 220 | 1,03 | 8,0 | 400 | 1 | 5,8 | 5,1 | 4,2 | 3,1 | 1,9 | 1,1 | | | |
| | 228 | 1,04 | | | 2 | 6,7 | 6,2 | 5,4 | 4,4 | 3,3 | 2,2 | 1,2 | | |
| | 260 | 1,13 | | | 3 | 7,1 | 6,7 | 6,1 | 5,2 | 4,2 | 3,2 | 2,3 | 1,4 | |
| TLCHB 20-8L<br>TLCHB 25-8L | 260 | 1,23 | 8,0 | 400 | 1 | 6,6 | 5,9 | 4,7 | 3,1 | 1,8 | 0,8 | | | |
| | 270 | 1,24 | | | 2 | 7,5 | 7,0 | 6,2 | 5,1 | 3,9 | 2,7 | 1,7 | | |
| | 286 | 1,25 | | | 3 | 8,0 | 7,6 | 6,9 | 5,9 | 4,8 | 3,7 | 2,7 | 1,7 | |
| TLCHB 20-10L<br>TLCHB 25-10L | 283 | 1,35 | 8,0 | 400 | 1 | 8,3 | 7,0 | 5,0 | 2,7 | 1,1 | | | | |
| | 343 | 1,44 | | | 2 | 9,4 | 8,7 | 7,7 | 6,3 | 4,6 | 3,1 | 1,7 | | |
| | 357 | 1,56 | | | 3 | 10,0 | 9,5 | 8,8 | 7,7 | 6,5 | 5,1 | 3,8 | 2,6 | 1,5 |
| TLCHB 20-12L<br>TLCHB 25-12L | 285 | 1,36 | 8,0 | 400 | 1 | 7,8 | 6,5 | 4,5 | 2,2 | 0,7 | | | | |
| | 372 | 1,69 | | | 2 | 10,4 | 9,6 | 8,5 | 6,9 | 5,2 | 3,4 | 1,9 | | |
| | 400 | 1,73 | | | 3 | 11,9 | 11,2 | 10,3 | 9,2 | 7,7 | 6,2 | 4,7 | 3,3 | 2,0 |

Hydraulic performances in compliance with ISO 9906:2012 - Grade 3B (ex ISO 9906:1999 - Annex A)

tlchb-2p50-en_d_th

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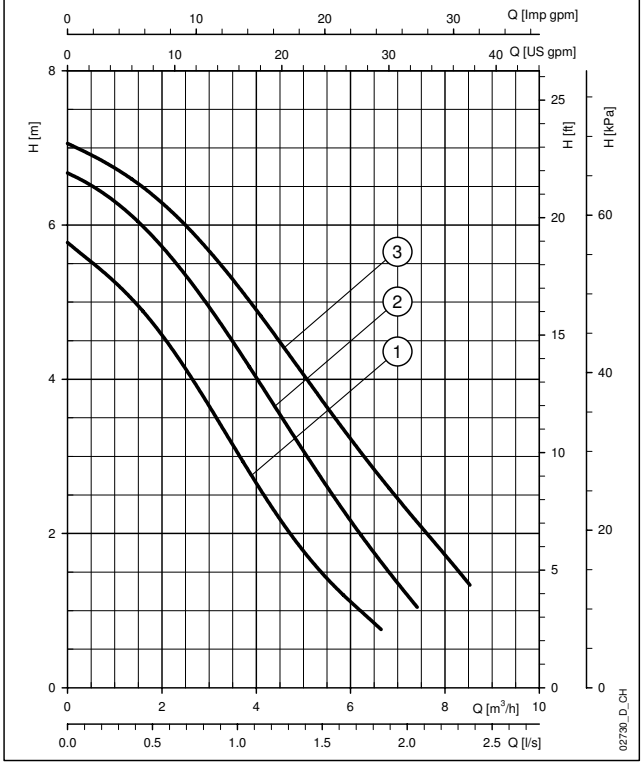
# TLCHB SERIES
# SINGLE-PHASE OPERATING CHARACTERISTICS

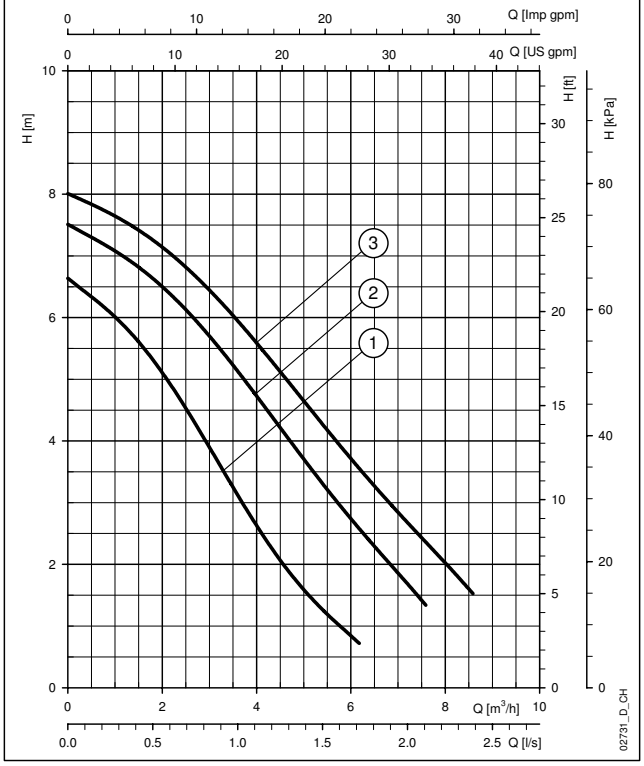
TLCHB 20 - 7L
TLCHB 25 - 7L

ISO 9906:2012 - Grade 3B



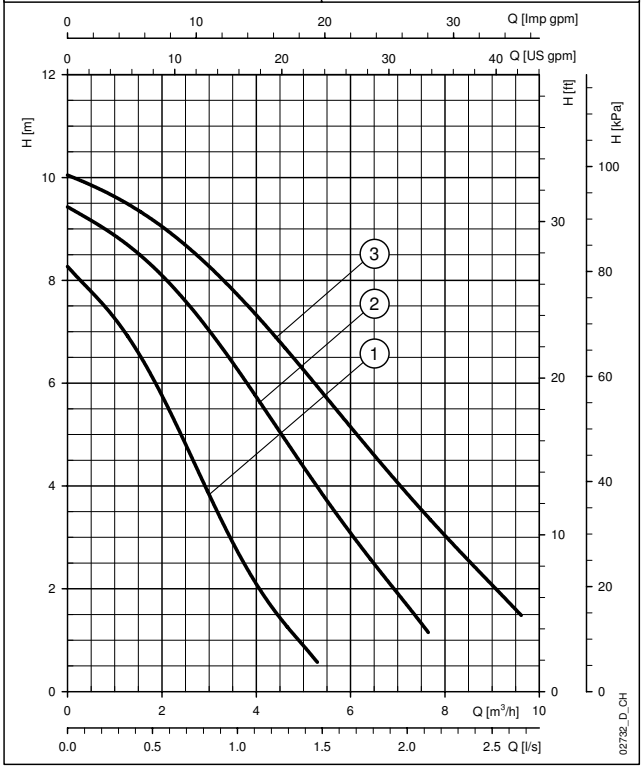

TLCHB 20 - 8L
TLCHB 25 - 8L

ISO 9906:2012 - Grade 3B



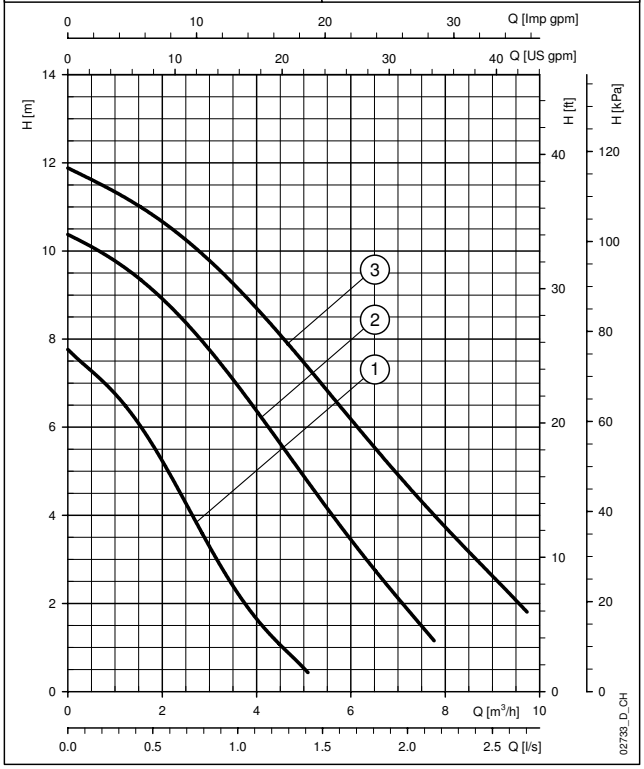

TLCHB 20 - 10L
TLCHB 25 - 10L

ISO 9906:2012 - Grade 3B



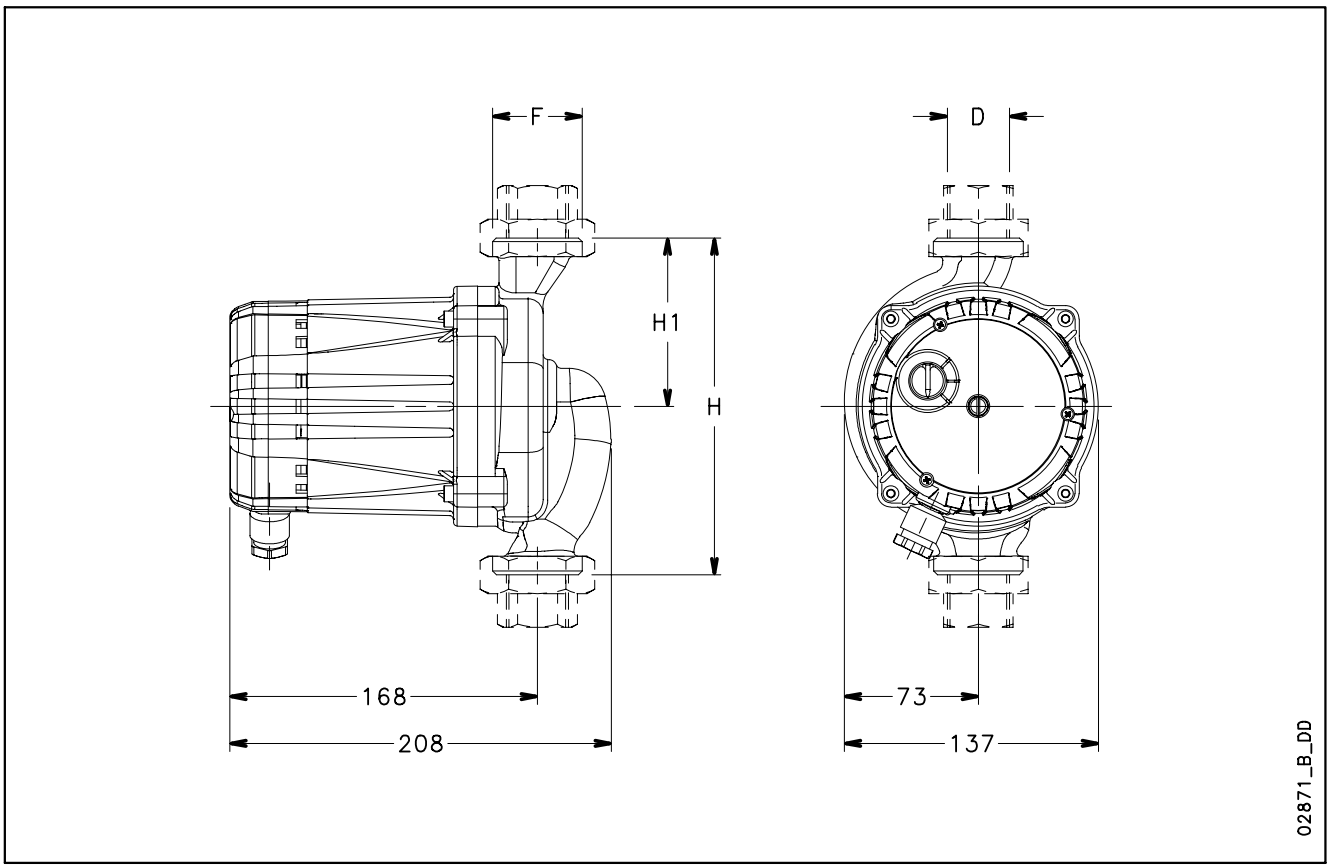

TLCHB 20 - 12L
TLCHB 25 - 12L

ISO 9906:2012 - Grade 3B




These performances are valid for liquids with density $\rho = 1.0$ Kg/dm$^3$ and kinematic viscosity $\nu = 1$ mm$^2$/sec.

# TLCHB SERIES
# DIMENSIONS AND WEIGHTS

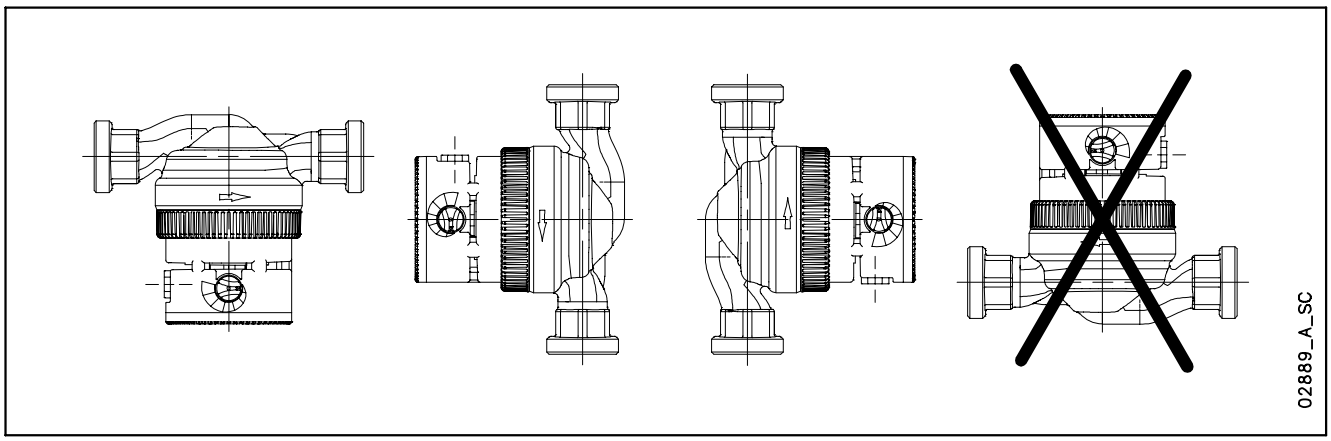



## DIMENSIONS AND WEIGHTS TABLE

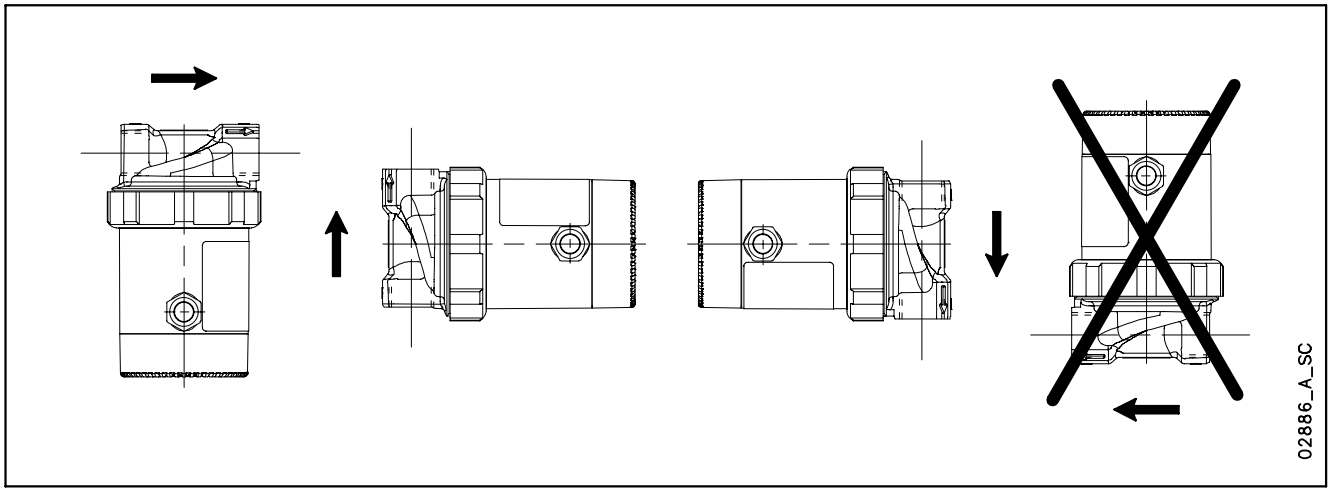
| PUMP TYPE | DIMENSIONS (mm) | | | | | WEIGHT |
|---|---|---|---|---|---|---|
| | H | H1 | D | F | DN | kg |
| TLCHB 20-7L | 180 | 90 | 3/4" | G 1"¼ | 20 | 6,7 |
| TLCHB 25-7L | 180 | 90 | 1" | G 1"½ | 25 | 6,7 |
| TLCHB 20-8L | 180 | 90 | 3/4" | G 1"¼ | 20 | 6,7 |
| TLCHB 25-8L | 180 | 90 | 1" | G 1"½ | 25 | 6,7 |
| TLCHB 20-10L | 180 | 90 | 3/4" | G 1"¼ | 20 | 6,7 |
| TLCHB 25-10L | 180 | 90 | 1" | G 1"½ | 25 | 6,7 |
| TLCHB 20-12L | 180 | 90 | 3/4" | G 1"¼ | 20 | 6,7 |
| TLCHB 25-12L | 180 | 90 | 1" | G 1"½ | 25 | 6,7 |

tlchb-2p50-en_c_td

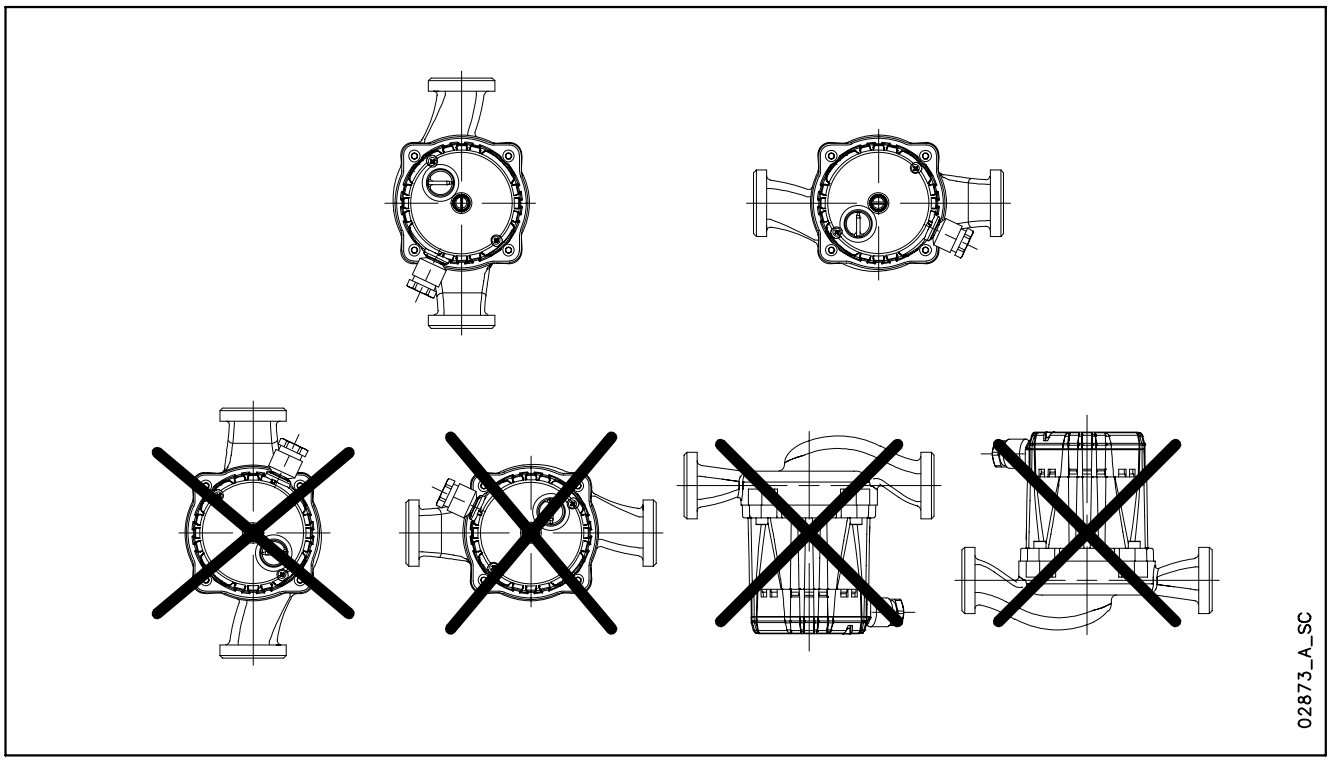
## Ecocirc® SERIES
## INSTALLATION POSITIONS




## EB, EBV SERIES




## TLCB, TLCHB SERIES



LOWARA
a xylem brand

# TECHNICAL APPENDIX

# VAPOUR PRESSURE
# VAPOUR PRESSURE ps AND ρ DENSITY OF WATER TABLE

| t | T | ps | ρ |
|---|---|---|---|
| °C | K | bar | kg/dm³ |
| 0 | 273,15 | 0,00611 | 0,9998 |
| 1 | 274,15 | 0,00657 | 0,9999 |
| 2 | 275,15 | 0,00706 | 0,9999 |
| 3 | 276,15 | 0,00758 | 0,9999 |
| 4 | 277,15 | 0,00813 | 1,0000 |
| 5 | 278,15 | 0,00872 | 1,0000 |
| 6 | 279,15 | 0,00935 | 1,0000 |
| 7 | 280,15 | 0,01001 | 0,9999 |
| 8 | 281,15 | 0,01072 | 0,9999 |
| 9 | 282,15 | 0,01147 | 0,9998 |
| 10 | 283,15 | 0,01227 | 0,9997 |
| 11 | 284,15 | 0,01312 | 0,9997 |
| 12 | 285,15 | 0,01401 | 0,9996 |
| 13 | 286,15 | 0,01497 | 0,9994 |
| 14 | 287,15 | 0,01597 | 0,9993 |
| 15 | 288,15 | 0,01704 | 0,9992 |
| 16 | 289,15 | 0,01817 | 0,9990 |
| 17 | 290,15 | 0,01936 | 0,9988 |
| 18 | 291,15 | 0,02062 | 0,9987 |
| 19 | 292,15 | 0,02196 | 0,9985 |
| 20 | 293,15 | 0,02337 | 0,9983 |
| 21 | 294,15 | 0,24850 | 0,9981 |
| 22 | 295,15 | 0,02642 | 0,9978 |
| 23 | 296,15 | 0,02808 | 0,9976 |
| 24 | 297,15 | 0,02982 | 0,9974 |
| 25 | 298,15 | 0,03166 | 0,9971 |
| 26 | 299,15 | 0,03360 | 0,9968 |
| 27 | 300,15 | 0,03564 | 0,9966 |
| 28 | 301,15 | 0,03778 | 0,9963 |
| 29 | 302,15 | 0,04004 | 0,9960 |
| 30 | 303,15 | 0,04241 | 0,9957 |
| 31 | 304,15 | 0,04491 | 0,9954 |
| 32 | 305,15 | 0,04753 | 0,9951 |
| 33 | 306,15 | 0,05029 | 0,9947 |
| 34 | 307,15 | 0,05318 | 0,9944 |
| 35 | 308,15 | 0,05622 | 0,9940 |
| 36 | 309,15 | 0,05940 | 0,9937 |
| 37 | 310,15 | 0,06274 | 0,9933 |
| 38 | 311,15 | 0,06624 | 0,9930 |
| 39 | 312,15 | 0,06991 | 0,9927 |
| 40 | 313,15 | 0,07375 | 0,9923 |
| 41 | 314,15 | 0,07777 | 0,9919 |
| 42 | 315,15 | 0,08198 | 0,9915 |
| 43 | 316,15 | 0,09639 | 0,9911 |
| 44 | 317,15 | 0,09100 | 0,9907 |
| 45 | 318,15 | 0,09582 | 0,9902 |
| 46 | 319,15 | 0,10086 | 0,9898 |
| 47 | 320,15 | 0,10612 | 0,9894 |
| 48 | 321,15 | 0,11162 | 0,9889 |
| 49 | 322,15 | 0,11736 | 0,9884 |
| 50 | 323,15 | 0,12335 | 0,9880 |
| 51 | 324,15 | 0,12961 | 0,9876 |
| 52 | 325,15 | 0,13613 | 0,9871 |
| 53 | 326,15 | 0,14293 | 0,9862 |
| 54 | 327,15 | 0,15002 | 0,9862 |

| t | T | ps | ρ |
|---|---|---|---|
| °C | K | bar | kg/dm³ |
| 55 | 328,15 | 0,15741 | 0,9857 |
| 56 | 329,15 | 0,16511 | 0,9852 |
| 57 | 330,15 | 0,17313 | 0,9846 |
| 58 | 331,15 | 0,18147 | 0,9842 |
| 59 | 332,15 | 0,19016 | 0,9837 |
| 60 | 333,15 | 0,1992 | 0,9832 |
| 61 | 334,15 | 0,2086 | 0,9826 |
| 62 | 335,15 | 0,2184 | 0,9821 |
| 63 | 336,15 | 0,2286 | 0,9816 |
| 64 | 337,15 | 0,2391 | 0,9811 |
| 65 | 338,15 | 0,2501 | 0,9805 |
| 66 | 339,15 | 0,2615 | 0,9799 |
| 67 | 340,15 | 0,2733 | 0,9793 |
| 68 | 341,15 | 0,2856 | 0,9788 |
| 69 | 342,15 | 0,2984 | 0,9782 |
| 70 | 343,15 | 0,3116 | 0,9777 |
| 71 | 344,15 | 0,3253 | 0,9770 |
| 72 | 345,15 | 0,3396 | 0,9765 |
| 73 | 346,15 | 0,3543 | 0,9760 |
| 74 | 347,15 | 0,3696 | 0,9753 |
| 75 | 348,15 | 0,3855 | 0,9748 |
| 76 | 349,15 | 0,4019 | 0,9741 |
| 77 | 350,15 | 0,4189 | 0,9735 |
| 78 | 351,15 | 0,4365 | 0,9729 |
| 79 | 352,15 | 0,4547 | 0,9723 |
| 80 | 353,15 | 0,4736 | 0,9716 |
| 81 | 354,15 | 0,4931 | 0,9710 |
| 82 | 355,15 | 0,5133 | 0,9704 |
| 83 | 356,15 | 0,5342 | 0,9697 |
| 84 | 357,15 | 0,5557 | 0,9691 |
| 85 | 358,15 | 0,5780 | 0,9684 |
| 86 | 359,15 | 0,6011 | 0,9678 |
| 87 | 360,15 | 0,6249 | 0,9671 |
| 88 | 361,15 | 0,6495 | 0,9665 |
| 89 | 362,15 | 0,6749 | 0,9658 |
| 90 | 363,15 | 0,7011 | 0,9652 |
| 91 | 364,15 | 0,7281 | 0,9644 |
| 92 | 365,15 | 0,7561 | 0,9638 |
| 93 | 366,15 | 0,7849 | 0,9630 |
| 94 | 367,15 | 0,8146 | 0,9624 |
| 95 | 368,15 | 0,8453 | 0,9616 |
| 96 | 369,15 | 0,8769 | 0,9610 |
| 97 | 370,15 | 0,9094 | 0,9602 |
| 98 | 371,15 | 0,9430 | 0,9596 |
| 99 | 372,15 | 0,9776 | 0,9586 |
| 100 | 373,15 | 1,0133 | 0,9581 |
| 102 | 375,15 | 1,0878 | 0,9567 |
| 104 | 377,15 | 1,1668 | 0,9552 |
| 106 | 379,15 | 1,2504 | 0,9537 |
| 108 | 381,15 | 1,3390 | 0,9522 |
| 110 | 383,15 | 1,4327 | 0,9507 |
| 112 | 385,15 | 1,5316 | 0,9491 |
| 114 | 387,15 | 1,6362 | 0,9476 |
| 116 | 389,15 | 1,7465 | 0,9460 |
| 118 | 391,15 | 1,8628 | 0,9445 |

| t | T | ps | ρ |
|---|---|---|---|
| °C | K | bar | kg/dm³ |
| 120 | 393,15 | 1,9854 | 0,9429 |
| 122 | 395,15 | 2,1145 | 0,9412 |
| 124 | 397,15 | 2,2504 | 0,9396 |
| 126 | 399,15 | 2,3933 | 0,9379 |
| 128 | 401,15 | 2,5435 | 0,9362 |
| 130 | 403,15 | 2,7013 | 0,9346 |
| 132 | 405,15 | 2,867 | 0,9328 |
| 134 | 407,15 | 3,041 | 0,9311 |
| 136 | 409,15 | 3,223 | 0,9294 |
| 138 | 411,15 | 3,414 | 0,9276 |
| 140 | 413,15 | 3,614 | 0,9258 |
| 145 | 418,15 | 4,155 | 0,9214 |
| 155 | 428,15 | 5,433 | 0,9121 |
| 160 | 433,15 | 6,181 | 0,9073 |
| 165 | 438,15 | 7,008 | 0,9024 |
| 170 | 433,15 | 7,920 | 0,8973 |
| 175 | 448,15 | 8,924 | 0,8921 |
| 180 | 453,15 | 10,027 | 0,8869 |
| 185 | 458,15 | 11,233 | 0,8815 |
| 190 | 463,15 | 12,551 | 0,8760 |
| 195 | 468,15 | 13,987 | 0,8704 |
| 200 | 473,15 | 15,550 | 0,8647 |
| 205 | 478,15 | 17,243 | 0,8588 |
| 210 | 483,15 | 19,077 | 0,8528 |
| 215 | 488,15 | 21,060 | 0,8467 |
| 220 | 493,15 | 23,198 | 0,8403 |
| 225 | 498,15 | 25,501 | 0,8339 |
| 230 | 503,15 | 27,976 | 0,8273 |
| 235 | 508,15 | 30,632 | 0,8205 |
| 240 | 513,15 | 33,478 | 0,8136 |
| 245 | 518,15 | 36,523 | 0,8065 |
| 250 | 523,15 | 39,776 | 0,7992 |
| 255 | 528,15 | 43,246 | 0,7916 |
| 260 | 533,15 | 46,943 | 0,7839 |
| 265 | 538,15 | 50,877 | 0,7759 |
| 270 | 543,15 | 55,058 | 0,7678 |
| 275 | 548,15 | 59,496 | 0,7593 |
| 280 | 553,15 | 64,202 | 0,7505 |
| 285 | 558,15 | 69,186 | 0,7415 |
| 290 | 563,15 | 74,461 | 0,7321 |
| 295 | 568,15 | 80,037 | 0,7223 |
| 300 | 573,15 | 85,927 | 0,7122 |
| 305 | 578,15 | 92,144 | 0,7017 |
| 310 | 583,15 | 98,70 | 0,6906 |
| 315 | 588,15 | 105,61 | 0,6791 |
| 320 | 593,15 | 112,89 | 0,6669 |
| 325 | 598,15 | 120,56 | 0,6541 |
| 330 | 603,15 | 128,63 | 0,6404 |
| 340 | 613,15 | 146,05 | 0,6102 |
| 350 | 623,15 | 165,35 | 0,5743 |
| 360 | 633,15 | 186,75 | 0,5275 |
| 370 | 643,15 | 210,54 | 0,4518 |
| 374,15 | 647,30 | 221,20 | 0,3154 |
| | | | |
| | | | |

G-at_npsh_b_sc

# TABLE OF FLOW RESISTANCE IN 100 m OF STRAIGHT CAST IRON PIPELINE (HAZEN-WILLIAMS FORMULA C=100)

| FLOW RATE | | | NOMINAL DIAMETER in mm and inches | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $m^3/h$ | l/min | | 15 | 20 | 25 | 32 | 40 | 50 | 65 | 80 | 100 | 125 | 150 | 175 | 200 | 250 | 300 | 350 | 400 |
| | | | 1/2" | 3/4" | 1" | 1 1/4" | 1 1/2" | 2 | 2 1/2" | 3" | 4" | 5" | 6" | 7" | 8" | 10" | 12" | 14" | 16" |
| 0,6 | 10 | v | 0,94 | 0,53 | 0,34 | 0,21 | 0,13 | | | | | | | | | | | | |
| | | hr | 16 | 3,94 | 1,33 | 0,40 | 0,13 | | | | | | | | | | | | |
| 0,9 | 15 | v | 1,42 | 0,80 | 0,51 | 0,31 | 0,20 | | | | | | | | | | | | |
| | | hr | 33,9 | 8,35 | 2,82 | 0,85 | 0,29 | | | | | | | | | | | | |
| 1,2 | 20 | v | 1,89 | 1,06 | 0,68 | 0,41 | 0,27 | 0,17 | | | | | | | | | | | |
| | | hr | 57,7 | 14,21 | 4,79 | 1,44 | 0,49 | 0,16 | | | | | | | | | | | |
| 1,5 | 25 | v | 2,36 | 1,33 | 0,85 | 0,52 | 0,33 | 0,21 | | | | | | | | | | | |
| | | hr | 87,2 | 21,5 | 7,24 | 2,18 | 0,73 | 0,25 | | | | | | | | | | | |
| 1,8 | 30 | v | 2,83 | 1,59 | 1,02 | 0,62 | 0,40 | 0,25 | | | | | | | | | | | |
| | | hr | 122 | 30,1 | 10,1 | 3,05 | 1,03 | 0,35 | | | | | | | | | | | |
| 2,1 | 35 | v | 3,30 | 1,86 | 1,19 | 0,73 | 0,46 | 0,30 | | | | | | | | | | | |
| | | hr | 162 | 40,0 | 13,5 | 4,06 | 1,37 | 0,46 | | | | | | | | | | | |
| 2,4 | 40 | v | | 2,12 | 1,36 | 0,83 | 0,53 | 0,34 | 0,20 | | | | | | | | | | |
| | | hr | | 51,2 | 17,3 | 5,19 | 1,75 | 0,59 | 0,16 | | | | | | | | | | |
| 3 | 50 | v | | 2,65 | 1,70 | 1,04 | 0,66 | 0,42 | 0,25 | | | | | | | | | | |
| | | hr | | 77,4 | 26,1 | 7,85 | 2,65 | 0,89 | 0,25 | | | | | | | | | | |
| 3,6 | 60 | v | | 3,18 | 2,04 | 1,24 | 0,80 | 0,51 | 0,30 | | | | | | | | | | |
| | | hr | | 108 | 36,6 | 11,0 | 3,71 | 1,25 | 0,35 | | | | | | | | | | |
| 4,2 | 70 | v | | 3,72 | 2,38 | 1,45 | 0,93 | 0,59 | 0,35 | | | | | | | | | | |
| | | hr | | 144 | 48,7 | 14,6 | 4,93 | 1,66 | 0,46 | | | | | | | | | | |
| 4,8 | 80 | v | | 4,25 | 2,72 | 1,66 | 1,06 | 0,68 | 0,40 | | | | | | | | | | |
| | | hr | | 185 | 62,3 | 18,7 | 6,32 | 2,13 | 0,59 | | | | | | | | | | |
| 5,4 | 90 | v | | | 3,06 | 1,87 | 1,19 | 0,76 | 0,45 | 0,30 | | | | | | | | | |
| | | hr | | | 77,5 | 23,3 | 7,85 | 2,65 | 0,74 | 0,27 | | | | | | | | | |
| 6 | 100 | v | | | 3,40 | 2,07 | 1,33 | 0,85 | 0,50 | 0,33 | | | | | | | | | |
| | | hr | | | 94,1 | 28,3 | 9,54 | 3,22 | 0,90 | 0,33 | | | | | | | | | |
| 7,5 | 125 | v | | | 4,25 | 2,59 | 1,66 | 1,06 | 0,63 | 0,41 | | | | | | | | | |
| | | hr | | | 142 | 42,8 | 14,4 | 4,86 | 1,36 | 0,49 | | | | | | | | | |
| 9 | 150 | v | | | | 3,11 | 1,99 | 1,27 | 0,75 | 0,50 | 0,32 | | | | | | | | |
| | | hr | | | | 59,9 | 20,2 | 6,82 | 1,90 | 0,69 | 0,23 | | | | | | | | |
| 10,5 | 175 | v | | | | 3,63 | 2,32 | 1,49 | 0,88 | 0,58 | 0,37 | | | | | | | | |
| | | hr | | | | 79,7 | 26,9 | 9,07 | 2,53 | 0,92 | 0,31 | | | | | | | | |
| 12 | 200 | v | | | | 4,15 | 2,65 | 1,70 | 1,01 | 0,66 | 0,42 | | | | | | | | |
| | | hr | | | | 102 | 34,4 | 11,6 | 3,23 | 1,18 | 0,40 | | | | | | | | |
| 15 | 250 | v | | | | 5,18 | 3,32 | 2,12 | 1,26 | 0,83 | 0,53 | 0,34 | | | | | | | |
| | | hr | | | | 154 | 52,0 | 17,5 | 4,89 | 1,78 | 0,60 | 0,20 | | | | | | | |
| 18 | 300 | v | | | | | 3,98 | 2,55 | 1,51 | 1,00 | 0,64 | 0,41 | | | | | | | |
| | | hr | | | | | 72,8 | 24,6 | 6,85 | 2,49 | 0,84 | 0,28 | | | | | | | |
| 24 | 400 | v | | | | | 5,31 | 3,40 | 2,01 | 1,33 | 0,85 | 0,54 | 0,38 | | | | | | |
| | | hr | | | | | 124 | 41,8 | 11,66 | 4,24 | 1,43 | 0,48 | 0,20 | | | | | | |
| 30 | 500 | v | | | | | 6,63 | 4,25 | 2,51 | 1,66 | 1,06 | 0,68 | 0,47 | | | | | | |
| | | hr | | | | | 187 | 63,2 | 17,6 | 6,41 | 2,16 | 0,73 | 0,30 | | | | | | |
| 36 | 600 | v | | | | | | 5,10 | 3,02 | 1,99 | 1,27 | 0,82 | 0,57 | 0,42 | | | | | |
| | | hr | | | | | | 88,6 | 24,7 | 8,98 | 3,03 | 1,02 | 0,42 | 0,20 | | | | | |
| 42 | 700 | v | | | | | | 5,94 | 3,52 | 2,32 | 1,49 | 0,95 | 0,66 | 0,49 | | | | | |
| | | hr | | | | | | 118 | 32,8 | 11,9 | 4,03 | 1,36 | 0,56 | 0,26 | | | | | |
| 48 | 800 | v | | | | | | 6,79 | 4,02 | 2,65 | 1,70 | 1,09 | 0,75 | 0,55 | | | | | |
| | | hr | | | | | | 151 | 42,0 | 15,3 | 5,16 | 1,74 | 0,72 | 0,34 | | | | | |
| 54 | 900 | v | | | | | | 7,64 | 4,52 | 2,99 | 1,91 | 1,22 | 0,85 | 0,62 | | | | | |
| | | hr | | | | | | 188 | 52,3 | 19,0 | 6,41 | 2,16 | 0,89 | 0,42 | | | | | |
| 60 | 1000 | v | | | | | | | 5,03 | 3,32 | 2,12 | 1,36 | 0,94 | 0,69 | 0,53 | | | | |
| | | hr | | | | | | | 63,5 | 23,1 | 7,79 | 2,63 | 1,08 | 0,51 | 0,27 | | | | |
| 75 | 1250 | v | | | | | | | 6,28 | 4,15 | 2,65 | 1,70 | 1,18 | 0,87 | 0,66 | | | | |
| | | hr | | | | | | | 96,0 | 34,9 | 11,8 | 3,97 | 1,63 | 0,77 | 0,40 | | | | |
| 90 | 1500 | v | | | | | | | 7,54 | 4,98 | 3,18 | 2,04 | 1,42 | 1,04 | 0,80 | | | | |
| | | hr | | | | | | | 134 | 48,9 | 16,5 | 5,57 | 2,29 | 1,08 | 0,56 | | | | |
| 105 | 1750 | v | | | | | | | 8,79 | 5,81 | 3,72 | 2,38 | 1,65 | 1,21 | 0,93 | | | | |
| | | hr | | | | | | | 179 | 65,1 | 21,9 | 7,40 | 3,05 | 1,44 | 0,75 | | | | |
| 120 | 2000 | v | | | | | | | | 6,63 | 4,25 | 2,72 | 1,89 | 1,39 | 1,06 | 0,68 | | | |
| | | hr | | | | | | | | 83,3 | 28,1 | 9,48 | 3,90 | 1,84 | 0,96 | 0,32 | | | |
| 150 | 2500 | v | | | | | | | | 8,29 | 5,31 | 3,40 | 2,36 | 1,73 | 1,33 | 0,85 | | | |
| | | hr | | | | | | | | 126 | 42,5 | 14,3 | 5,89 | 2,78 | 1,45 | 0,49 | | | |
| 180 | 3000 | v | | | | | | | | | 6,37 | 4,08 | 2,83 | 2,08 | 1,59 | 1,02 | 0,71 | | |
| | | hr | | | | | | | | | 59,5 | 20,1 | 8,26 | 3,90 | 2,03 | 0,69 | 0,28 | | |
| 210 | 3500 | v | | | | | | | | | 7,43 | 4,76 | 3,30 | 2,43 | 1,86 | 1,19 | 0,83 | | |
| | | hr | | | | | | | | | 79,1 | 26,7 | 11,0 | 5,18 | 2,71 | 0,91 | 0,38 | | |
| 240 | 4000 | v | | | | | | | | | 8,49 | 5,44 | 3,77 | 2,77 | 2,12 | 1,36 | 0,94 | | |
| | | hr | | | | | | | | | 101 | 34,2 | 14,1 | 6,64 | 3,46 | 1,17 | 0,48 | | |
| 300 | 5000 | v | | | | | | | | | | 6,79 | 4,72 | 3,47 | 2,65 | 1,70 | 1,18 | | |
| | | hr | | | | | | | | | | 51,6 | 21,2 | 10,0 | 5,23 | 1,77 | 0,73 | | |
| 360 | 6000 | v | | | | | | | | | | 8,15 | 5,66 | 4,16 | 3,18 | 2,04 | 1,42 | | |
| | | hr | | | | | | | | | | 72,3 | 29,8 | 14,1 | 7,33 | 2,47 | 1,02 | | |
| 420 | 7000 | v | | | | | | | | | | | 6,61 | 4,85 | 3,72 | 2,38 | 1,65 | 1,21 | |
| | | hr | | | | | | | | | | | 39,6 | 18,7 | 9,75 | 3,29 | 1,35 | 0,64 | |
| 480 | 8000 | v | | | | | | | | | | | 7,55 | 5,55 | 4,25 | 2,72 | 1,89 | 1,39 | |
| | | hr | | | | | | | | | | | 50,7 | 23,9 | 12,49 | 4,21 | 1,73 | 0,82 | |
| 540 | 9000 | v | | | | | | | | | | | 8,49 | 6,24 | 4,78 | 3,06 | 2,12 | 1,56 | 1,19 |
| | | hr | | | | | | | | | | | 63,0 | 29,8 | 15,5 | 5,24 | 2,16 | 1,02 | 0,53 |
| 600 | 10000 | v | | | | | | | | | | | | 6,93 | 5,31 | 3,40 | 2,36 | 1,73 | 1,33 |
| | | hr | | | | | | | | | | | | 36,2 | 18,9 | 6,36 | 2,62 | 1,24 | 0,65 |

The hr values must be multiplied by:
0,71 for galvanized or painted steel pipes
0,54 for stainless steel or copper pipes
0,47 for PVC or PE pipes

G-at-pct-en_a_th

hr = flow resistance for 100 m of straight pipeline (m)
V = water speed (m/s)

# FLOW RESISTANCE
# TABLE OF FLOW RESISTANCE IN BENDS, VALVES AND GATES

The flow resistance is calculated using the equivalent pipeline length method according to the table below:

| ACCESSORY TYPE | DN | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 25 | 32 | 40 | 50 | 65 | 80 | 100 | 125 | 150 | 200 | 250 | 300 |
| | Equivalent pipeline length (m) | | | | | | | | | | | |
| 45° bend | 0,2 | 0,2 | 0,4 | 0,4 | 0,6 | 0,6 | 0,9 | 1,1 | 1,5 | 1,9 | 2,4 | 2,8 |
| 90° bend | 0,4 | 0,6 | 0,9 | 1,1 | 1,3 | 1,5 | 2,1 | 2,6 | 3,0 | 3,9 | 4,7 | 5,8 |
| 90° smooth bend | 0,4 | 0,4 | 0,4 | 0,6 | 0,9 | 1,1 | 1,3 | 1,7 | 1,9 | 2,8 | 3,4 | 3,9 |
| Union tee or cross | 1,1 | 1,3 | 1,7 | 2,1 | 2,6 | 3,2 | 4,3 | 5,3 | 6,4 | 7,5 | 10,7 | 12,8 |
| Gate | - | - | - | 0,2 | 0,2 | 0,2 | 0,4 | 0,4 | 0,6 | 0,9 | 1,1 | 1,3 |
| Non return valve | 1,1 | 1,5 | 1,9 | 2,4 | 3,0 | 3,4 | 4,7 | 5,9 | 7,4 | 9,6 | 11,8 | 13,9 |

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The table is valid for the Hazen Williams coefficient C=100 (cast iron pipework);
for steel pipework, multiply the values by 1,41;
for stainless steel, copper and coated cast iron pipework, multiply the values by 1,85;
When the **equivalent pipeline length** has been determined, the flow resistance is obtained from the table of flow resistance.
The values given are guideline values which are bound to vary slightly according to the model, especially for gate valves and non-return valves, for which it is a good idea to check the values supplied by manufacturers.

## VOLUMETRIC CAPACITY

| Litres per minute l/min | Cubic metres per hour $m^3/h$ | Cubic feet per hour $ft^3/h$ | Cubic feet per minute $ft^3/min$ | Imp. gal. per minute Imp. gal/min | US gal. per minute Us gal./min |
|---|---|---|---|---|---|
| **1,0000** | 0,0600 | 2,1189 | 0,0353 | 0,2200 | **0,2642** |
| 16,6667 | **1,0000** | 35,3147 | 0,5886 | 3,6662 | 4,4029 |
| 0,4719 | 0,0283 | **1,0000** | 0,0167 | 0,1038 | **0,1247** |
| 28,3168 | 1,6990 | 60,0000 | **1,0000** | 6,2288 | 7,4805 |
| 4,5461 | 0,2728 | 9,6326 | 0,1605 | **1,0000** | 1,2009 |
| 3,7854 | 0,2271 | 8,0208 | 0,1337 | 0,8327 | **1,0000** |

## PRESSURE AND HEAD

| Newton per square metre $N/m^2$ | kilo Pascal kPa | bar bar | Pound force per square inch psi | metre of water m $H_2O$ | millimetre of mercury mm Hg |
|---|---|---|---|---|---|
| **1,0000** | 0,0010 | $1 \times 10^{-5}$ | $1.45 \times 10^{-4}$ | $1.02 \times 10^{-4}$ | **0,0075** |
| 1000,0000 | **1,0000** | 0,0100 | 0,1450 | 0,1020 | 7,5006 |
| $1 \times 10^5$ | 100,0000 | **1,0000** | 14,5038 | 10,1972 | **750,0638** |
| 6894,7570 | 6,8948 | 0,0689 | **1,0000** | 0,7031 | **51,7151** |
| 9806,6500 | 9,8067 | 0,0981 | 1,4223 | **1,0000** | **73,5561** |
| 133,3220 | 0,1333 | 0,0013 | 0,0193 | 0,0136 | **1,0000** |

## LENGTH

| millimetre mm | centimetre cm | metre m | inch in | foot ft | yard yd |
|---|---|---|---|---|---|
| **1,0000** | 0,1000 | 0,0010 | 0,0394 | 0,0033 | **0,0011** |
| 10,0000 | **1,0000** | 0,0100 | 0,3937 | 0,0328 | 0,0109 |
| 1000,0000 | 100,0000 | **1,0000** | 39,3701 | 3,2808 | **1,0936** |
| 25,4000 | 2,5400 | 0,0254 | **1,0000** | 0,0833 | 0,0278 |
| 304,8000 | 30,4800 | 0,3048 | 12,0000 | **1,0000** | **0,3333** |
| 914,4000 | 91,4400 | 0,9144 | 36,0000 | 3,0000 | **1,0000** |

## VOLUME

| cubic metre $m^3$ | litre litro | millilitre ml | imp. Gallon imp. gal. | US gallon US gal. | cubic foot $ft^3$ |
|---|---|---|---|---|---|
| **1,0000** | 1000,0000 | $1 \times 10^6$ | 219,9694 | 264,1720 | **35,3147** |
| 0,0010 | **1,0000** | 1000,0000 | 0,2200 | 0,2642 | 0,0353 |
| $1 \times 10^{-6}$ | 0,0010 | **1,0000** | $2.2 \times 10^{-4}$ | $2.642 \times 10^{-4}$ | $3.53 \times 10^{-5}$ |
| 0,0045 | 4,5461 | 4546,0870 | **1,0000** | 1,2009 | 0,1605 |
| 0,0038 | 3,7854 | 3785,4120 | 0,8327 | **1,0000** | **0,1337** |
| 0,0283 | 28,3168 | 28316,8466 | 6,2288 | 7,4805 | **1,0000** |

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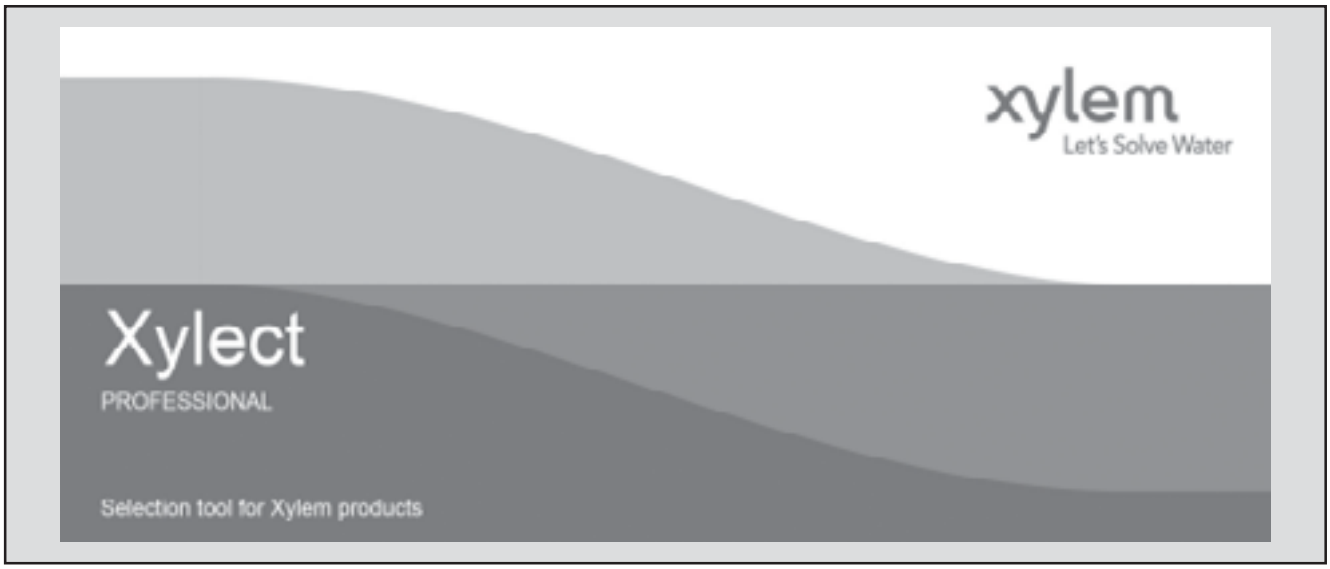
# FURTHER PRODUCT SELECTION AND DOCUMENTATION

## Xylect™




Xylect™ is pump solution selection software with an extensive online database of product information across the entire Lowara, and Vogel range of pumps and related products, with multiple search options and helpful project management facilities. The system holds up-to-date product information on thousands of products and accessories.

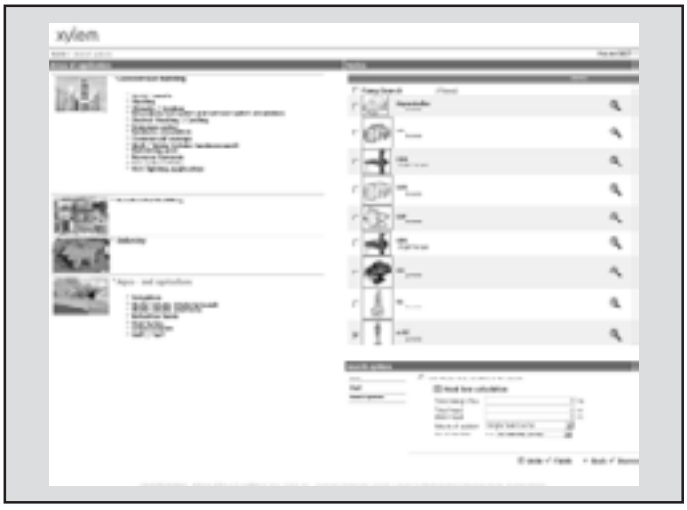
The possibility to search by applications and the detailed information output given makes it easy to make the optimal selection without having detailed knowledge about the Lowara and Vogel products.

The search can be made by:

- Application
- Product type
- Duty point

Xylect™ gives a detailed output:

- List with search results
- Performance curves (flow, head, power, efficiency, NPSH)
- Motor data
- Dimensional drawings
- Options
- Data sheet printouts
- Document downloads incl dxf files




*The search by application guides users not familiar with the product range to the right choice.*

# FURTHER PRODUCT SELECTION AND DOCUMENTATION

## Xylect™

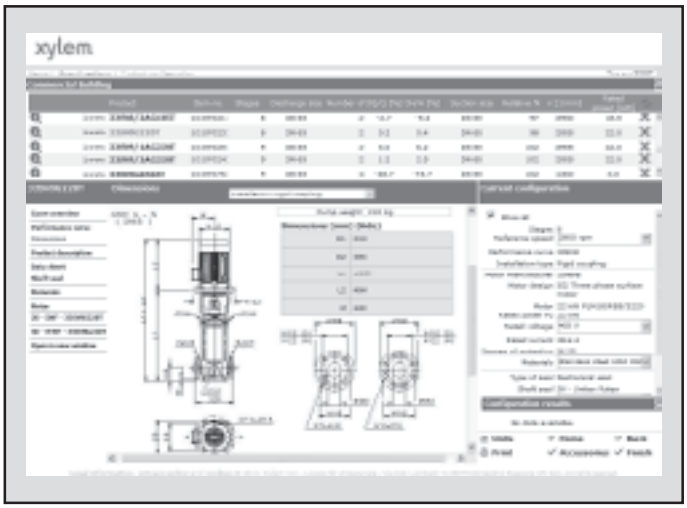

*The detailed output makes it easy to select the optimal pump from the given alternatives.*

The best way to work with Xylect™ is to create a personal account. This makes it possible to:

- Set own standard units
- Create and save projects
- Share projects with other Xylect™ users

Every user have a My Xylect space, where all projects are saved.

For more information about Xylect™ please contact our sales network or visit www.xylect.com.




*Dimensional drawings appear on the screen and can be downloaded in dxf format.*

# Xylem |'zīləm|

1) The tissue in plants that brings water upward from the roots;
2) a leading global water technology company.

We're approximately 12,700 people unified in a common purpose: creating innovative solutions to meet our world's water needs. Developing new technologies that will improve the way water is used, conserved, and re-used in the future is central to our work. We move, treat, analyze, and return water to the environment, and we help people use water efficiently, in their homes, buildings, factories and farms. In more than 150 countries, we have strong, long-standing relationships with customers who know us for our powerful combination of leading product brands and applications expertise, backed by a legacy of innovation.

**For more information on how Xylem can help you, go to xyleminc.com.**

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