



ecocirc XL



Bell & Gossett
a xylem brand

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1 Introduction and Safety



1.1 Introduction

Purpose of this manual

The purpose of this manual is to provide necessary information for:

- Installation
- Operation
- Maintenance



CAUTION:

Read this manual carefully before installing and using the product. Improper use of the product can cause personal injury and damage to property, and may void the warranty.

NOTICE:

Save this manual for future reference, and keep it readily available at the location of the unit.

1.2 Safety terminology and symbols

Hazard levels

Hazard level	Indication
DANGER:	A hazardous situation which, if not avoided, will result in death or serious injury
WARNING:	A hazardous situation which, if not avoided, could result in death or serious injury
CAUTION:	A hazardous situation which, if not avoided, could result in minor or moderate injury
NOTICE:	<ul style="list-style-type: none"> • A potential situation which, if not avoided, could result in undesirable conditions • A practice not related to personal injury

Hazard categories

Hazard categories can either fall under hazard levels or let specific symbols replace the ordinary hazard level symbols.

Electrical hazards are indicated by the following specific symbol:



Electrical Hazard:

Hot surface hazard

Hot surface hazards are indicated by a specific symbol that replaces the typical hazard level symbols:



CAUTION:

Qualified personnel



WARNING:

This product is intended to be operated by qualified personnel only.

1.3 Environmental safety

The work area

Always keep the station clean.

Waste and emissions regulations

Observe these safety regulations regarding waste and emissions:

- Appropriately dispose of all waste.
- Handle and dispose of the processed liquid in compliance with applicable environmental regulations.
- Clean up all spills in accordance with safety and environmental procedures.
- Report all environmental emissions to the appropriate authorities.



CAUTION: Radiation Hazard

Do NOT send the product to Xylem if it has been exposed to nuclear radiation, unless Xylem has been informed and appropriate actions have been agreed upon.

Electrical installation

For electrical installation recycling requirements, consult your local electric utility.

Recycling guidelines

Always follow local laws and regulations regarding recycling.

FCC Statement — USA only (Federal Communications Commission)

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. this device may not cause harmful interference and
2. this device must accept any interference received, including interference that may cause undesirable operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications not expressly approved by the manufacturer responsible for compliance could void the user's authority to operate the equipment.

1.4 Product warranty

Coverage

Xylem undertakes to remedy defects in products from Xylem under these conditions:

- The faults are due to defects in design, materials, or workmanship.
- The faults are reported to a local sales and service representative within the warranty period.
- The product is used only under the conditions that are described in this manual.
- The monitoring equipment that is incorporated in the product is correctly connected and in use.
- All service and repair work that is done by Xylem authorized personnel.
- Genuine Xylem parts are used.
- Only Ex-approved spare parts and accessories that are authorized by an Ex-approved Xylem representative are used in Ex-approved products.

Limitations

The warranty does not cover defects that are caused by these situations:

- Deficient maintenance
- Improper installation
- Modifications or changes to the product and installation that are made without consulting a Xylem authorized representative
- Incorrectly executed repair work
- Normal wear and tear

Xylem assumes no liability for these situations:

- Bodily injuries
- Material damages
- Economic losses

Warranty claim

Xylem products are high-quality products with expected reliable operation and long life. However, should the need for a warranty claim arise, contact your local sales and service representative.

1.5 Spare parts



WARNING:

Only use original spare parts to replace any worn or faulty components. The use of imitation spare parts may cause malfunctions, damage, and injuries as well as void the warranty and the UL listing.

2 Transportation and Storage



2.1 Inspect the delivery

1. Inspect the package for damage or missing items upon delivery.
2. If applicable, unfasten the product by removing any screws, bolts, or straps. For your personal safety, be careful when you handle nails and straps.
3. Remove packing material from the product.
4. Dispose of all packing material in accordance with local regulations.
5. Inspect the product to determine if any parts have been damaged or are missing.

Contact your local sales representative if there are any issues.

2.2 Transportation guidelines

Precautions



WARNING:

- Observe accident prevention regulations in force.
- Crush hazard. The unit and the components can be heavy. Use proper lifting methods and wear steel-toed shoes at all times.

Check the gross weight that is indicated on the package in order to select proper lifting equipment.

Position and fastening

The unit should be transported in an upright position as indicated on the package. Make sure that the unit is securely fastened during transportation and cannot roll or fall over. The product can be safely transported at ambient temperature from -40°F to +158°F (-40°C to +70°C) with humidity <95% (non-condensing) and protected against dirt, heat source, and mechanical damage.

2.3 Storage guidelines

2.3.1 Storage location

NOTICE:

- Protect the product against humidity, dirt, heat sources, and mechanical damage.
- The product must be stored at an ambient temperature from -13°F to +131°F (-25°C to +55°C) and humidity < 95% (non-condensing).

3 Product Description



3.1 Pump design

- The ecocirc XL is a large wet rotor pump with energy efficient, electronically commutated permanent magnet motor.
- The pump is designed for systems with variable flow rates to optimize pump operation thus reducing energy consumption. The pump can be set to any one of the multiple operating modes available, with each designed for a specific application to achieve high performance and maximum energy savings.
- A single pump can handle heating, cooling, and plumbing applications with a choice for cast iron or bronze lead-free body pumps to handle HVAC and potable water applications. The pumps are also suitable for a 50/50 percent water/glycol circulating fluid. The built-in electrical overload and dry run protection provide safety and protection to pump from damage.

Intended use



WARNING:

California Proposition 65 warning! This product contains chemicals known to the state of California to cause cancer and birth defects or other reproductive harm.

The pump is suitable for:

- Potable hot water (only with bronze pump body models)
- Hot water heating systems
- Cooling and cold water systems

The pump can also be used for:

- Solar systems
- Geothermal applications

Improper use



DANGER:

Do not use this pump to handle flammable and/or explosive liquids.



WARNING:

Unintended use of the pump may create dangerous conditions and cause personal injury and damage to property.



WARNING:

Do NOT install this pump in swimming pools or marine areas. Failure to follow these instructions could result in serious personal injury, death and/or property damage.

THIS IS A NON-SUBMERSIBLE PUMP



WARNING:

Do NOT exceed the maximum working pressure of the pump. This information is listed on the nameplate of the pump.

NOTICE:

Do not use this pump to handle liquids containing abrasive, solid, or fibrous substances, toxic or corrosive liquids, potable liquids other than water, or liquids not compatible with the pump construction material. Water pH must be maintained between 7-9 and water hardness must not exceed 14 grains/ gallon.

An improper use of the product leads to the loss of the warranty.

3.2 Product nomenclature

Example: ecocirc XL B 15-75	
ecocirc XL	high efficiency pump series
B	Pump type: Blank = Cast iron B = bronze pump body for potable hot water pumping

Example: ecocirc XL B 15-75	
-15	Maximum pump head (FT)
-75	Maximum pump flow rate (GPM)

3.3 Technical data

Feature	Description
Motor model	Electronically commutated motor with permanent magnet rotor
Series	ecocirc XL
Rated voltage	1 x 115 V \pm 10% 1 x 208-230 V \pm 10%
Frequency	50/60 Hz
Power consumption	100-1700 W
IP protection	IP 44
Insulation class	Class 155 (F)
Maximum working pressure	The maximum pressure is indicated on pump nameplate 175 PSI (12 bars)
Liquid temperature range	14°F (-10°C) to 230°F (110°C)
Ambient temperature range	32°F (0°C) to 104°F (40°C)
Ambient humidity	95% non-condensing
Pumping media	Water and water/glycol mixtures ¹ up to 50%.
Sound pressure	\leq 43 dB (A)
EMC (electromagnetic compatibility)	EN 55014-1:2006 + A1:2009 + A2:2011, EN 55014-2:1997 + A1:2001 + A2:2008, EN 61000-3-2:2006 + A1:2009 + A2:2009, EN 61000-3-3:2008, 61800-3:2004+A1:2012.
Leakage current	$<$ 3.5 mA
I/O auxiliary +15 VDC power supply	I _{max} $<$ 40 mA
Fault signal relay	V _{max} $<$ 250 VAC I _{max} $<$ 2 A
CSA certification	NSF/ANSI-372 compliant (bronze body parts)

3.4 Scope of delivery

Inside the package you will find:

- Pump unit
- Insulating shells for pump body – for heating applications
- O-ring to be used as replacement between motor housing and pump body
- Two (2) gaskets for flanged connection
- 20 mm x 1/2" NPT electrical fitting
- IOM and Quick Start guide

3.5 Accessories

- Companion flanges
- Fastener Packs consisting of 4 bolts and 4 nuts (for 2-bolt models)
- Fastener Packs consisting of 8 bolts and 8 nuts (for 4-bolt models)
- Pressure sensor (for details see section 5.2.10 of this manual)
- Temperature sensor (for details see section 5.2.10 of this manual)
- Wireless module
- RS-485 module

¹ The pump can be used with water/propylene glycol mixtures up to 50% with a maximum viscosity of 50cST at 14°F (-10°C). The pump has built-in overload and thermal protection to protect the pump from overload due to increased fluid viscosity. Pump performance is based on 77°F (25°C). Therefore pumping of glycol mixtures will affect max performance, depending on mixture concentration and temperature.

4 Installation



Precautions



WARNING:

- Observe accident prevention regulations in force.
- Use suitable equipment and protection.
- Always refer to the local and/or national regulations, legislation, and codes in force regarding the selection of the installation site, plumbing, and power connections.

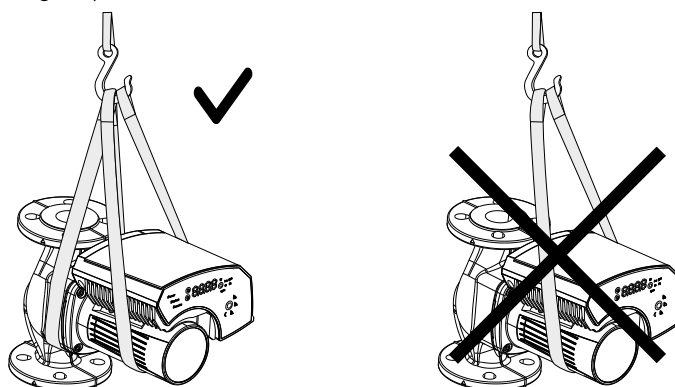
4.1 Pump handling



WARNING:

Observe local codes and regulations setting the limits for manual lifting or handling.

Always lift the pump by the motor housing or pump body. If the pump weight exceeds the manual handling limits, use lifting equipment with lifting straps.



4.2 Tools required for pump installation

- T-Handle with allen screw
- Control screw driver - with 2 mm blade size



Model number	Allen screw size (mm)	T-handle length (in)
20-35	5	8
36-45	5	8
15-75	5	8
55-45	6	10
20-140	6	10
65-130	8	12
40-200	8	12

4.3 Facility requirements

4.3.1 Pump location



DANGER:

Do not use this unit in environments that may contain flammable/explosive or chemically aggressive gases or powders.

Guidelines

Observe the following guidelines regarding the location of the product:

- Make sure that the installation area is protected from any fluid leaks, or flooding.
- If possible, place the pump slightly higher than the floor level.
- Provide shut-off valves on the suction and discharge sides of the pump.
- The relative humidity of the ambient air must be less than 95% non-condensing.
- This pump is suitable for indoor use only.

**CAUTION:**

CAUTION: PROPERTY DAMAGE HAZARD. It is not advisable to install circulators in an attic or upper floor over finished living space. If the circulator must be installed over head, or over expensive equipment, provide adequate drainage in the event of leakage. Failure to follow these instructions could result in property damage.

4.3.2 Minimum inlet pressure at the suction port

The values in the table below are the inlet pressures above the atmospheric pressure.

Nominal Suction Diameter	Fluid temperature 77°F (25°C)	Fluid temperature 203°F (95°C)	Fluid temperature 230°F (110°C)
1½"	4.5 PSI	16 PSI	25 PSI
2"	4.5 PSI	16 PSI	25 PSI
3"	7.5 PSI	19 PSI	28 PSI

NOTICE:

- Ensure that the suction pressure is never below the values specified above, as this could cause cavitation and damage the pump.
- The inlet pressure plus the pump pressure against a closed valve must be lower than maximum admissible system pressure.

4.3.3 De-rating table

The following table indicates percent decrease in input power draw, with the increase in temperature of circulating water and the ambient.

Ambient temperature	Fluid Temperature (°C)			
	-10	60	95	110
32°F–77°F (0°C–25°C)	100%	100%	100%	100%
86°F (30°C)	100%	100%	80%	70%
104°F (40°C)	100%	100%	70%	55%

4.3.4 Piping requirements**Precautions****CAUTION:**

- Use pipes suited to the maximum working pressure of the pump. Failure to do so can cause the system to rupture, with the risk of injury.
- Make sure that all connections are performed by qualified installation technicians and in compliance with the regulations in force.
- Do not use a shut-off valve on the discharge side in the closed position for more than a few seconds. If the pump must operate with the discharge side closed for more than a few seconds, a bypass circuit must be installed to prevent overheating of the water inside the pump.

Piping checklist

- Pipes and valves must be correctly sized.
- Pipe work must not transmit any load or torque to pump flanges.
- Be sure to minimize any pipe-strain on the pump:
 - Support suction and discharge piping by the use of pipe hangers near the pump.

- Line up the vertical and horizontal piping so that the bolt-holes in the pump flanges match the bolt-holes in the pipe flanges.
- Do not attempt to spring the suction or discharge lines in position. This may result in unwanted stress in the pump body, flange connections and piping.
- The code for pressure piping (ANSI B31.1) lists many types of supports available for various applications.

4.4 Electrical requirements

- The NEC and local codes must be followed at all times. If a branch circuit is fitted with ground fault circuit breaker, ensure that the circuit breaker is suitable for use with inverter-driven appliances.

Electrical connection checklist

Check that the following requirements are met:

- The electrical wires are protected from high temperature and vibrations.
- The current type and power supply voltage connection must correspond to the specifications on the name plate on the pump.
- Use wires at least 14 AWG to supply power to the pump. Follow all local and NEC wiring codes and practices.

The electrical control panel checklist**NOTICE:**

The electrical supply must match the electrical rating of the pump. Improper combination could fail to guarantee protection of the unit.

Check that the following requirements are met:

- The control panel circuit breaker be sized properly to protect the pump against short-circuit.
- The pump has built in overload and thermal protection, no additional overload protection is required.

The motor checklist

Electrical supply and grounding wires must be suitable for at least 194°F (90°C).

4.5 Pump installation

1. Install the pump according to the liquid flow direction.
 - The arrow on the pump housing shows the flow direction through the pump body.
 - The pump must be installed with the motor in a horizontal position. For more information about allowed positions, refer to the following image:

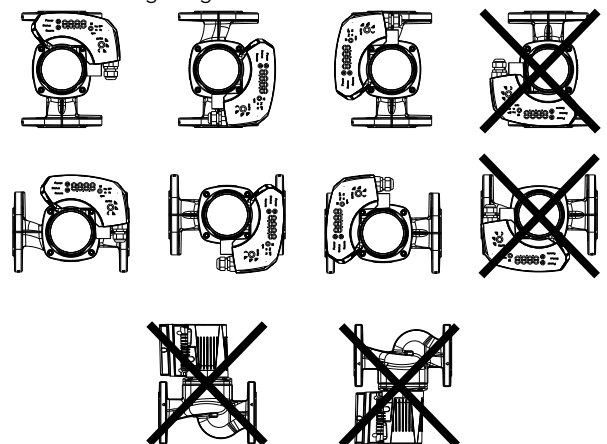


Figure 1: Allowed pump installation

2. If necessary, rotate the position of the motor for better visibility of the user interface.
Section 4.6 below describes the procedure of changing of motor orientation.
3. If applicable, install the thermal insulation shells.

- Only use the pump thermal shells that are included in the delivery. Do not insulate the motor housing, the electronics can overheat and cause the pump to thermally overload.
- The thermal shells that are included with the pump must only be used in hot water circulation applications with fluid temperature above 68°F (20°C). The thermal shells are permeable to water vapor.
- If the customer installs the vapor barrier insulation shells for cold water application, then the pump housing must not be insulated above the motor flange. The drain opening must be kept unobstructed in order that the accumulated condensation can run out.

4.6 Change the position of the motor housing



WARNING:

- Drain the system if possible or close the service valves on both sides of the pump before disassembling the pump. The pumped fluid can be pressurized and may be scalding hot.
- There is the risk of escaping vapor when the motor is separated from the pump housing.



Electrical Hazard:

Before starting work on the unit, make sure that the unit and the control panel are isolated from the power supply and cannot be energized.



CAUTION:

Burn hazard. During operation various surfaces on the unit will become hot. To avoid burn injury, use heat protective gloves.



WARNING:

- A strong magnetic field is created when the rotor is removed from or inserted into the motor housing. This magnetic field can be harmful to pacemaker wearers and others with medical implants. In addition, the magnetic field may attract metal parts to the rotor which can cause injuries and/or damage the bearing of the pump.

- Properly align and tighten the four hex-head screws (2) that affix the motor to the pump body (4) according to the torque table given below in a criss cross pattern.

M6	90 in-lb
M8	170 in-lb
M10	340 in-lb



CAUTION:

Check for the presence of leaks after reassembling the pump.

4.7 Electrical installation

Precautions



WARNING:

- Make sure that all connections are performed by a qualified electrician in accordance with all applicable codes, ordinances and good practices. Failure to follow these instructions could result in serious injury, death and/or property damage.
- Before starting work on the unit, make sure that the unit and the control panel are isolated from the power supply and cannot be energized.

Grounding (earthing)



WARNING:

Reduced risk of electric shock during operation of this pump requires the provision of acceptable grounding.

Be sure the following are adhered to. Failure to follow these instructions could result in serious personal injury, death, and/or property damage.

- If means of connection to the supply connection box (wiring compartment) is other than grounded metal conduit, ground the pump back to service using a copper conductor at least the size of the circuit conductors supplying the pump.
- Connect the ground wire to the green grounding terminal in the wiring compartment.

4.7.1 Power supply connection



WARNING:

Do not make any connection in the pump control box unless the power supply has been switched off for at least 2 minutes.

For models with standard terminal block connection:

- Open the terminal box cover removing the screws (5).
- Thread the 1/2" NPT electrical fitting into the conduit connection of the pump.
- Connect the cable according to the wiring diagram.
 - Connect the ground wire, if used.
 - Connect the wires.
- Close the terminal box cover.

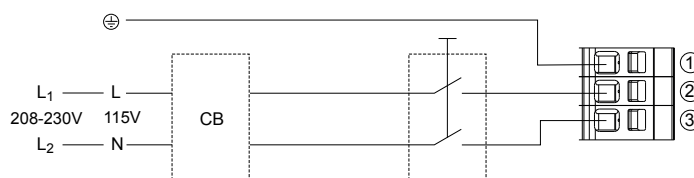


Figure 3: Wiring diagram

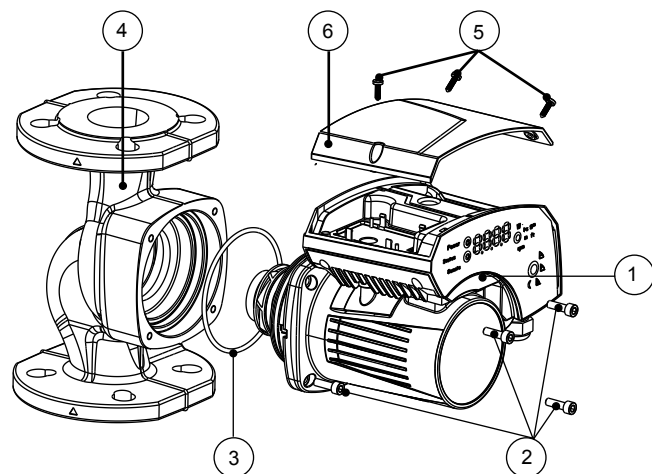


Figure 2: Change the position of the pump head

- Loosen the four hex-head screws (2) that fix the motor to the pump housing (4) using the T-handle allen wrench described.
- Rotate the motor (1) in 90° steps to the desired position.
- In case of separation of the motor housing from the pump body (4):
 - avoid removing the rotating assembly from motor housing;
 - pay attention to the magnetic hazard listed before.

A defective O-ring must be replaced. An O-ring is already available inside the package as spare part.

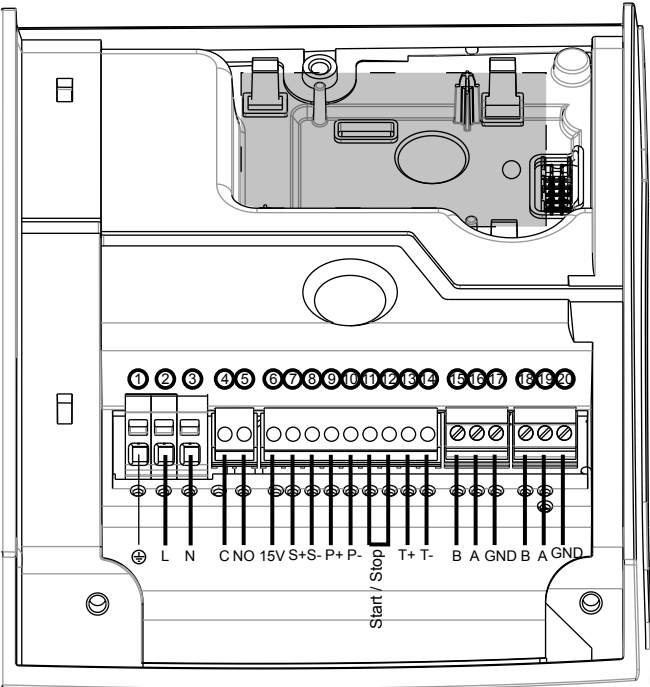


Figure 4: Connection diagram

For cable terminations, see above connection diagram.

4.7.2 I/O connections

- 1. Open the terminal box cover removing the screws (5). Refer to figure 2 on page 7. Use control screwdriver described under section 4.2 to access terminal blocks.
- 2. Connect the appropriate wires according to the terminal block diagram and the requirements of section [Connection assignment](#) (page 8) given below in section 4.7.3.
- 3. Close the terminal box cover.
 - For a two-pump connection, wire them through a communication cable connecting the 2 RS-485 ports at the pumps to terminals 15, 16 & 17.

4.7.3 Connection assignment

- For all electrical connections use heat resistant wires or cable rated for at least 194°F (90°C). The cables should not touch the motor housing, the pump or the piping.
- Power and control wires must be run in separate channels.
- Metal conduit for power wiring must only be attached to 1/2" NPT conduit fitting.

NOTICE:

Cable glands are only available for low voltage wiring to protect against cable slippage and vapor ingress into the terminal box.

5 System Description

5.1 User interface

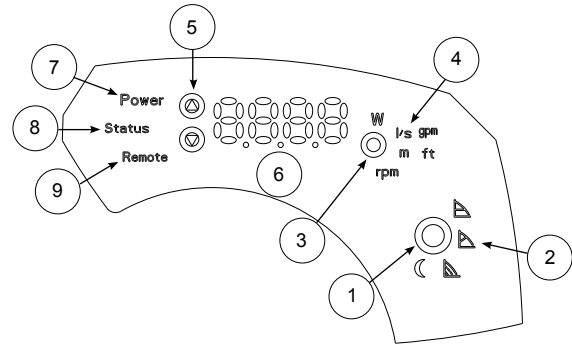


Figure 5: User interface diagram

- 1. Control mode button
- 2. Control mode indicators
- 3. Parameter button
- 4. Parameter indicators
- 5. Setting buttons
- 6. Numeric display
- 7. Power indicator
- 8. Status / Fault indicator
- 9. Remote control indicator



Hot Surface:

Burn hazard. During the normal operation, the pump surfaces may be so hot that only the buttons should be touched to avoid burns.

5.1.1 User interface locking/unlocking

The user interface will automatically lock if no button is pressed for ten minutes, or if the upper setting button (5) and the parameter button (3) are pressed for two seconds. See [User interface](#) (page 8).

If a button is pressed when the user interface is locked, the display (6) shows:



To unlock the user interface, press the upper setting button (5) and the parameter button (3) for two seconds. The display (6) will show:

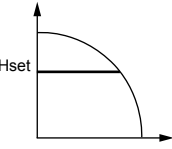


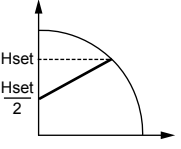
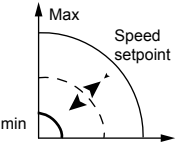
Now it is possible to change the pump setting as preferred.

5.2 Functions

The main functions of the pump and control modes are selectable through the pump user interface and the embedded I/O. Advanced functions or communication features, can only be set via bus protocol or the optional Wireless module. See the advanced functions manual at www.bellgossett.com.

5.2.1 Control mode

Mode	Description
Constant pressure	The pump maintains a constant pressure at any flow demand. The desired head of the pump can be set via user interface. See section 6.1.2 Change set point. <div></div>

Mode	Description
Proportional pressure 	The pump pressure is continuously increased/decreased depending on the increased/decreased flow demand. The maximum head of the pump can be set via user interface. See section 6.1.2 Change set point.
Fixed speed control 	The pump maintains a fixed speed at any flow demand. The speed of the pump can be set via user interface. See section 6.1.2 Change set point.

All the above control modes can be combined with the night mode function.

5.2.2 Night set back mode

The night set back mode cannot be used in cooling systems.

Prerequisite

- The pump is installed between boiler outlet and system supply.
- The night set back feature is initiated when the pump recognizes a water temperature change brought about by the boiler or high level control system.

The night set back mode is active only in combination with:

- Proportional pressure
- Constant pressure
- Constant speed

This function reduces power consumption of the pump to the minimum when heating system is not running. An algorithm detects the water temperature change and automatically adjusts the speed of the pump.

The pump returns to the original set point as soon as the system re-starts.

5.2.3 Δp -T control

This function adjusts the nominal differential pressure set point according to the temperature of the pumped media.

For details refer to advanced functions manual on www.bellgostett.com

5.2.4 T-Constant temperature control

This functional mode changes the speed of the pump in order to maintain a constant temperature of the pumped media. It is suitable for heating systems with fixed system characteristics, for example Domestic Hot Water Systems.

For details, refer to the advanced functions manual on www.bellgostett.com

5.2.5 Δp - ΔT control

This function requires the external temperature probe type KTY83 (see section 5.2.10 of this manual).

This function adjusts the nominal differential pressure set point depending on the differential temperature of the pumped media. An external temperature sensor Type: KTY83 is required for this functionality (see section 5.2.10 of this manual for details).

For details, refer to the advanced functions manual on www.bellgostett.com

5.2.6 ΔT constant

This function alters the speed of the pump in order to maintain a constant differential temperature of the pumped media.

For details, refer to the advanced functions manual on www.bellgostett.com

5.2.7 External start/stop

The pump can be started or stopped via an external dry contact or a relay that is connected to terminals 11 and 12. The pump unit is provided by default, with the terminals 11 and 12 jumpered. See Figure 4 on page 8.

NOTICE:

- The pump provides 5 VDC through the start / stop terminals.
- No external voltage must be provided to start / stop terminals.
- The cables connected to terminals 11 and 12 shall not exceed 65 feet in length.

5.2.8 Analog Input

The pump integrates a 0-10 V analog input at terminals 7 and 8. See terminal diagram figures for changing the setpoint. See Figure 4 on page 8.

When a voltage input is detected, the pump switches to fixed speed control mode automatically and starts to run according to the following diagram:

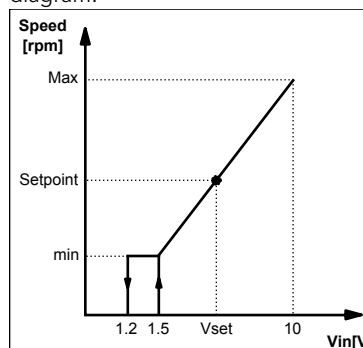


Figure 6: Voltage input detected

Pump stops at 1.2 V

Pump restarts at 1.5 V

5.2.9 Signal relay

A dry contact relay is provided at terminals 4 and 5. See connection diagram, figure 4 on page 8, for location. If there is a fault, the relay contact closes to display a red status light and the error code on the user interface display. See [User interface](#) (page 8). The relay contact closure can also be used to energize a remote fault display.

Ratings

- Voltage: 115/208 - 230/1
- I_{max} < 2 A

5.2.10 External sensors (optional)

The pump can be equipped with a differential pressure sensor and a temperature sensor according to the following table:

Sensor description	Type	Terminals
Differential pressure sensor 4-20mA	15 PSI 30 PSI	9 - 10
Temperature sensor	KTY83/121	13 - 14

Pressure sensor setup

1. Install pressure sensor on the pipe
2. Connect wires at terminals 9 and 10. See Figure 4 on page 8.
3. Power the pump on.
4. Upon startup, the pump detects the sensor and displays the setup menu.
5. Select the right sensor model and confirm the selection using the parameter button (3). See [User interface](#) (page 8).
6. The pump will run through the startup sequence and automatically start working in constant pressure mode.
7. The setpoint can be changed using the settings button (5). See [User interface](#) (page 8).

External temperature sensor setup

The external temperature sensor setup and related control modes are available only through RS-485 or wireless module connection.

For details refer to advanced functions manual on www.bellgostett.com

Wireless module

The wireless module is an optional module, to be coupled with the ecocircXL circulators. When correctly configured, it generates a wireless network accessible by a mobile device, tablet or a personal computer. See wireless module instructions manual for details.

5.2.11 Communication bus

The pump has a built-in RS-485 communication channel (terminals 15-16-17). See Figure 4 on page 8.

The pump can communicate with external BMS systems via Modbus or BACnet protocol. For a complete description of the protocols, refer to the advanced functions manual at www.bellgossett.com.

NOTICE:

When remote control is active, the set points and control modes are managed only through communication channels and cannot be changed via the user interface. The displayed quantity and unit of measurement remain active on the user interface.

5.2.12 Automatic two-pump operation

Backup operation

Only the lead pump runs. The second pump starts in case of failure of the lead pump.

Alternate operation

Only one pump runs at the time. The working time is switched every 24 hours so that workload is balanced between both pumps. The second pump is started immediately in case of failure of the lead pump.

Parallel operation

Both pumps run simultaneously at the same set point. The lead pump determines the behavior of the full system and is able to optimize the performance. To guarantee the required performance with the minimum power consumption, the lead pump starts or stops the lag (second) pump to satisfy system requirement of flow and head.

6 System Setup and Operation

Precaution



CAUTION:

Always wear protective gloves when handling the pumps and motor. When pumping hot liquids, the pump and its parts may exceed 40°C (104°F).

NOTICE:

The pump must not run dry as this can result in the destruction of the bearings. Fill the system correctly with liquid and vent the air before first start-up.

NOTICE:

- Never operate the pump with discharge valve closed for longer than a few seconds.
- Do not expose an idle pump to freezing conditions. Drain all liquid that is inside the pump. Failure to do so can cause liquid to freeze and damage the pump.
- The suction plus shut-off discharge pressure must not exceed the pump pressure rating.
- Do not use the pump if cavitation occurs. Cavitation can damage the internal components.

6.1 Configure the pump settings

Change the pump settings using one of the following methods:

- User interface
- Bus communication
- Wireless communication

6.1.1 Change the communication parameters

Change pump communication parameters. See [User interface](#) (page 8).

1. Switch off the pump.

Wait until the power indicator light turns off.

2. Switch on the pump.
3. When the display shows **COMM (COM)**, press the parameter button (3) to access the communication menu.
4. Select one of the below parameters using the settings button (5).
 - **BAUD (BDR)** = baud rate setup (available values 4.8 - 9.6 - 14.4 - 19.2 - 38.4 - 56.0 - 57.6 kbps)
 - **ADDR (ADD)** = address setup (available address 1-255 for Modbus 0÷127 for BACnet)
 - **MODU (MDL)** = optional module setup (0 = no module; 1 = Wireless module; 2 = RS-485 module)
5. Press the parameter button to enter the submenu
6. Edit the values using setting buttons.
7. Press the parameter button to confirm and store the new values.
8. Press mode button to exit the submenu.
9. Repeat above procedure for each of the three parameters.

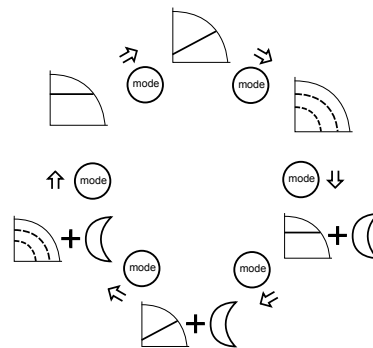
If no buttons are pressed for 10 seconds, then the pump exits the current menu and continues start-up procedure. All the parameters that are changed but not confirmed restore back to previous state.

6.1.2 Change the control mode

The pump can be controlled by a BMS (Building management system) or other devices through the RS-485 communication port via Modbus or BACnet protocol.

The following instructions are used when making the change on the user interface. See [User interface](#) (page 8).

- Press the operating mode button (1).
- The operating modes are cyclically changed by the pressed button.



6.1.3 Change the set point

See [User interface](#) (page 8).

1. Press one of the arrow setting buttons (5).
The display starts to blink.
2. Change the value using the buttons (5).
3. Wait 3 seconds to store and activate the new set point.
The display will stop blinking to confirm the change.

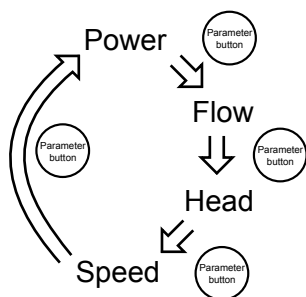
NOTICE:

If a check valve is installed on the system, ensure that the pump head is sufficient to allow flow through the system.

6.1.4 Change the displayed unit of measurement

Power, Flow, Head and Speed parameters cyclically change by pressing the parameter button (3). In order to change the unit of measurement, follow these steps:

1. Press the button (3) to change the unit of measurement. See [User interface](#) (page 8).



2. When flow and head are displayed, by pressing the button (3) for more than one second at each of these parameters, the unit of measurement automatically changes as below:

- Flow: m³/h ↔ gpm (US)
- Head: m ↔ ft

6.2 Start or stop the pump



CAUTION:

- The pump must not run dry as this can result in premature failure of the bearings in a very short time. Fill and vent the system correctly before first start-up. The pump rotor chamber will be vented after the pump is powered on with an automatic air venting procedure. "deg" will be displayed indicating degassing process.

NOTICE:

The system cannot be vented through the pump.

- Start the pump in one of the following ways:
 - Switch on power to supply the pump.
 - Close the start/stop contact by jumpering terminals 11 and 12 or through a remote dry contact..
 - Send start command through the communication bus.

The pump starts pumping in constant pressure mode with the following default set points:

7.5 ft	15-XX (Max head 15 ft)
10 ft	20-XX (Max head 20 ft)
18 ft	36-XX (Max head 36 ft)
20 ft	40-XX (Max head 40 ft)
27.5 ft	55-XX (Max head 55 ft)
32.5 ft	65-XX (Max head 65 ft)

For more information about how to change setting, see [Configure the pump settings](#) (page 10).

- Stop the pump in one of the following ways:
 - Switch off power supply to the pump.
 - Open the start/stop contact.
 - Send stop command through the communication bus.

6.2.1 Automatic air venting procedure

At each power-on of the pump unit, an automatic air venting procedure is executed. During this phase, the user interface displays "deg" (degassing) and a count-down begins until the completion of the procedure.

The procedure can be recalled or skipped:

- Manually by pressing simultaneously the two buttons (5). See [User interface](#) (page 8). The feature will remain disabled until power to pump is disconnected.

The procedure can be permanently enabled or disabled by:

- Manually by pressing simultaneously the two buttons (5) for at least 10 seconds. See [User interface](#) (page 8). Or
- Via communication bus. See the advanced functions manual on www.bellgossett.com.

6.2.2 Activate automatic two-pump operation

Once the communication cable is connected, configure only the "lead" pump. The twin pump submenu for this configuration is available at each power-on, when the drive is displaying **SING** (which stands for "Single Pump").

The following procedure must be executed during the start-up phase of the pump.

1. Enter the two-pump sub menu when the display is showing **TWMA (two-pump master)** or **TWSL (two-pump slave)**.
2. Select the applicable two-pump operation.
 - **bcup** = backup operation
 - **alte** = alternative operation
 - **para** = parallel operation
3. Push the parameter button to activate the new setting.

The second pump is configured by the lead pump.

7 Maintenance



Precaution



Electrical Hazard:

Disconnect and lock out electrical power before installing or servicing the unit.

Wait 2 minutes before opening the conduit box.



WARNING:

- Always wear protective gloves when handling the pumps and motor. When pumping hot liquids, the pump and its parts may exceed 40°C (104°F).
- Maintenance and service must be performed by skilled and qualified personnel only.
- Observe accident prevention regulations in force.
- Use suitable equipment and apply personal protection.
- Risk of property damage, serious personal injury or death. You must repair or replace the pump if corrosion or leakage is found.

8 Troubleshooting



Introduction

See [User interface](#) (page 8).

- In case of any alarm that allows the pump to continue running, the display shows a blinking alarm code and the last quantity selected, while the status indicator (8) becomes orange.
- In case of a failure that stops the pump, the display shows the error code permanently and the status indicator (8) becomes red

8.1 Periodic inspection

Bell & Gossett ecocircXL circulators are designed to provide years of trouble-free service. It is recommended that periodic inspections be made to check for potential problems with the pump. If any leakage or evidence of leakage is present, repair or replace the unit.

8.2 Display messages

Table 1: Default

Operating LEDs / Display	Cause
Power On	Pump powered
All LEDs and display On	Start-up of the pump
Status Green light	Pump is working properly
Remote On	Remote communication is activated

Table 2: Fault messages

Operating LEDs / Display	Cause	Solution
Power Off	Pump is not connected or is incorrectly connected	Check connection
	Power failure	Check power supply and circuit breaker
Status light Orange	Alarm for system problem	Check the displayed alarm code and find cause from table 8.3.
Status light Red	Pump failure	Check the displayed error code and find the cause from table 8.2.
Remote Off	Remote communication is deactivated	If the communication does not work, check the connection and the configuration parameters for communication on the external controller.

8.3 Fault and error codes

Error code	Cause	Solution
E01	Internal communication lost	Restart the pump ²
E02	High motor current	Restart the pump ²
E03	DC Bus overvoltage	Indicates excessive power through the pump. Confirm system setup, verify correct position and operation of check valves.
E04	Motor stall	Restart the pump ²
E05	Data memory corrupted	Restart the pump ²
E06	Voltage supply out of operating range	Check the electrical system voltage and wiring connection.
E07	Motor thermal protection trip	Check the presence of foreign material around impeller and rotor that cause overload. Check installation conditions and temperature of the water and ambient air. Wait until the motor is cooled. If the error persists try to restart the pump ² .
E08	Inverter thermal protection trip	Check installation conditions and ambient air temperature.
E09	Hardware error	Restart the pump.
E10	Dry run	Check for system leakage or fill the system.

8.4 Alarm codes

Alarm code	Cause	Solution
A01	Fluid sensor malfunction	Switch off the pump for 5 minutes and then power on. If the problem persists, contact local B&G representative.
A02	High temperature of the fluid	Check water temperature value
A03	Automatic speed reduction to prevent inverter overheating	Check installation conditions and rectify status of the system
A05	Data memory corrupted	Switch off the pump for 5 minutes and then power on. If the problem persists, contact local B&G representative.
A06	External temperature probe malfunction	Check the probe and the connection to the pump
A07	External pressure sensor malfunction	Check the sensor and the connection to the pump
A12	2-pump communication lost	If both pumps show the A12 alarm, check the connection between the pumps. If one of the pump is switched off or shows another error code, check the section 8.1 and 8.2 to find the problem
A20	Internal alarm	Switch off the pump for 5 minutes and then power on. If the problem persists, contact local B&G representative.

8.5 Faults, causes, and remedies

The pump does not start

Cause	Remedy
No power.	Check the power supply and ensure that it is properly terminated to the pump power.
Tripped circuit breaker or ground-fault protection device or the circuit breaker.	Reset power supply circuit breaker and determine cause for overload.

The pump starts but the thermal protection is triggered after a short time

Cause	Remedy
Incorrect wiring size or circuit breaker rating not suitable for motor current.	Check and replace the components as necessary.
Thermal overload protection due to excessive input.	Check the pump working conditions.
Missing a phase in the power supply.	Verify continuity and ensure proper wiring connections.

² Switch off the pump for 5 minutes and then power on. If the problem persists, contact service.

The pump is noisy

Cause	Remedy
Not thoroughly vented.	Switch off the pump and after 30 seconds switch on again to restart the automatic air-venting procedure.
Cavitation due to insufficient suction pressure.	Increase the system suction pressure within the admissible range.
Foreign objects in pump.	Clean the system.
Worn out bearing	Contact local B&G representative.

9 Other Relevant Documentation or Manuals

9.1 Embedded Software and Driver Software License Agreement

With the purchase of the product, the terms and conditions of the license for the software embedded on the product are considered accepted. For more information see license condition on www.bellgosssett.com

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- 1) The tissue in plants that brings water upward from the roots
- 2) A leading global water technology company

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